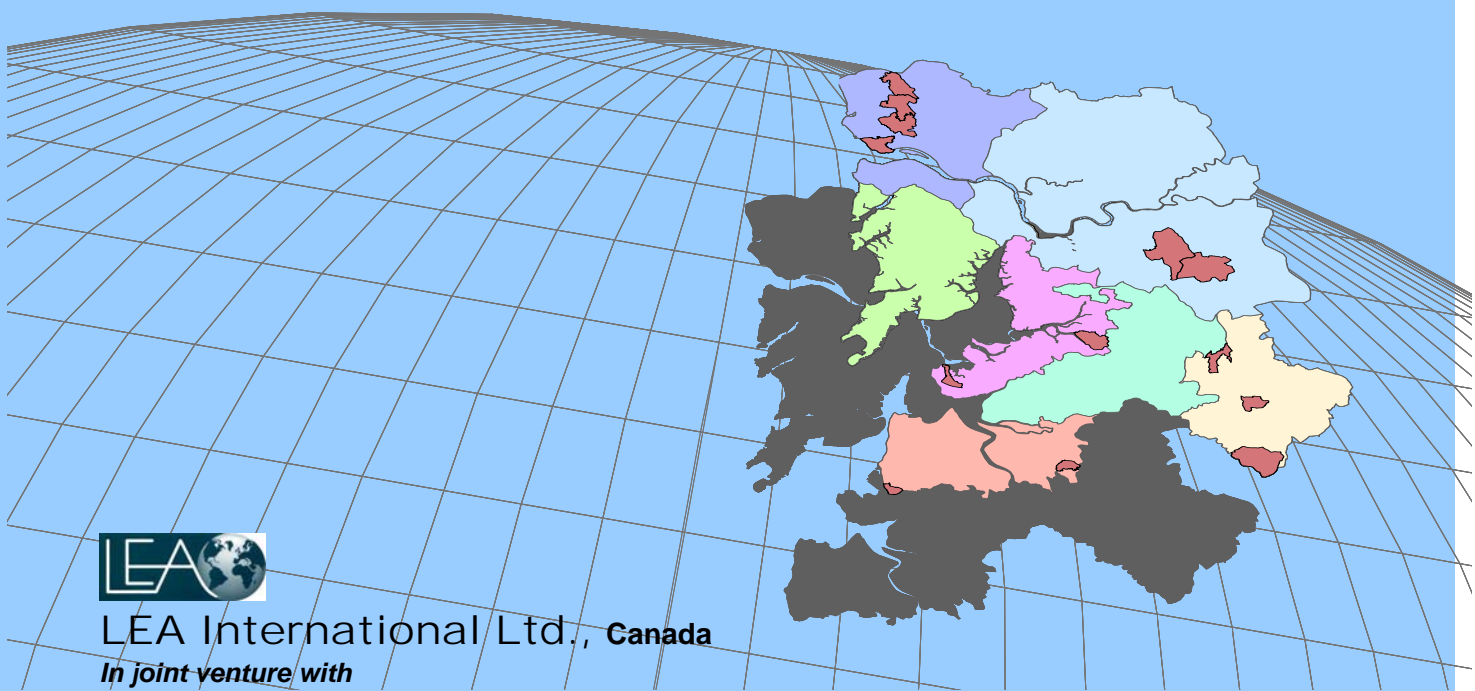




MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Business Plan for Mumbai Metropolitan Region

FINAL REPORT



LEA International Ltd., Canada

In joint venture with

LEA Associates South Asia Pvt. Ltd., India

MARCH 2009

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We believe that the Business Plan would provide a launching pad for pursuing an agenda for reform that would usher the metropolis in the World Cities.

LEA International Ltd., Canada
and
LEA Associates South Asia Pvt. Ltd., India

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Abbreviations

AIIISG	All India Institute of Local Self Government
ALM	Advanced Locality Management
AMC	Ambarnath Municipal Corporation
BEST	Brihanmumbai Electric Supply & Transport
BKC	Bandra Kurla Complex
BMC, MCGM	Brihanmumbai Municipal Corporation, Municipal Corporation of Greater Mumbai, (different names for same body)
BSDP	Bombay Sewage Development Project
BOT	Build Operate Transfer
BMRDA	Bombay Metropolitan Regional Development Authority (now MMRDA)
BRIMSTOWAD	Brihanmumbai Storm Water Drainage and Sewer Rehabilitation Project, 1993
CAG	Citizens Action Group
CAGR	Compound Annual Growth Rate
CBD	Central Business District
CBO	Community Based Organization
CDP	City Development Plan
CIDCO	City and Industrial Development Corporation of Maharashtra
CIP	Capital Investment Plans
CRZ	Coastal Regulation Zone
CTS	Comprehensive Transport Study (known as TranSfoRM)
cu m	cubic metre, m ³
DCR	development control regulation
DEA	Department of Economic Affairs
DP	Development Plan
DPC	District Planning Committee
DPR	detailed project report
EC	Empowered Committee
ESR	Elevated Surface Reservoir
FDI	foreign direct investment
FOP	Financial Operating Plan
FSI	Floor Space Index
GDP	Gross Domestic Product
GIS	Geographic Information System
GoI	Government of India
GoM	Government of Maharashtra
HPEC	High Power Empowered Committee
IR	Indian Railways
IFC	International Financial Center
ISBT	Interstate Bus Terminal
IT	Information Technology
ITES	Information Technology Enabled Services
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JNPT	Jawaharlal Nehru Port Trust
JVPD	Juhu Vileparle Development
k	kilo (thousand)
KHAB	Konkan Housing Area Development Board
KDMC	Kalyan Dombivali Municipal Corporation
LED	Local Economic Development
LIG	Lower Income Group
lpcd	litres per capita per day
M	mega (million)
MbPT	Mumbai Port Trust

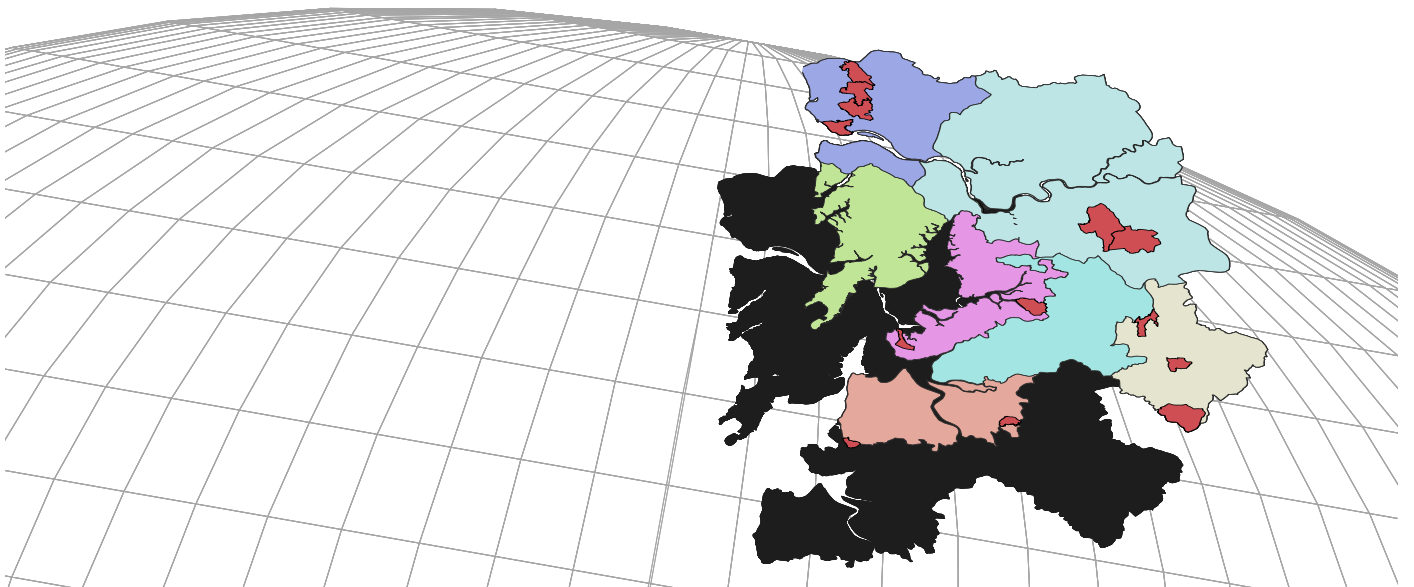


MBR & RB	Mumbai Building Repair and Reconstruct Board
mcm	microgram per cubic meter
MDF	Mumbai Development Fund
M&E	Monitoring and Evaluation
MERI	Maharashtra Engineering Research Institute
MHADA	Maharashtra Housing and Area Development Authority
MIDC	Maharashtra Industrial Development Corporation
MJP	Maharashtra Jeevan Pradhikaran (formerly MWSSB)
ml/d	million liters per day
MMB	Maharashtra Maritime Board
MMCNPIT	Maharashtra Municipal Councils, Nagar Panchayath and Industrial Township Act 1965
MMR	Mumbai Metropolitan Region
MMRDA	Mumbai Metropolitan Regional Development Authority
MoEF	Ministry of Environment and Forest
MPC	Metropolitan Planning Committee
MPA	Municipal Parking Authority
MPCB	Maharashtra Pollution Control Board
MPTD	Metric Tons Per day
MR&TP Act	Maharashtra Regional and Town Planning Act, 1966
MRDPA	Mithi River Development Project Authority
MRTS	Mass Rapid Transport System
MRVC	Mumbai Railway Vikas Corporation
MSEB	Maharashtra State Electricity Board
MSRDC	Maharashtra State Road Development Corporation
MSRTC	Maharashtra State Road Transport Corporation
MSW	Municipal Solid Waste
MTDC	Maharashtra Tourism Development Corporation
MTHL	Mumbai trans-harbor link
MTSU	Mumbai Transformation Support Unit (under AILSG)
MUD	Ministry of Urban Development
MUIF	Maharashtra Urban Infrastructure Fund
MUIP	Mumbai Urban Infrastructure Project
municipality	municipal corporation or municipal council
MUTP	Mumbai Urban Transport Project
MW	Million Watts (megawatt)
MWSSB	Maharashtra Water Supply and Sewerage Board (now MJP)
$\mu\text{g}/\text{m}^3$	microgram per cubic metre
NA	Non Agricultural Area
NDP	Net Domestic Product
NMMC	Navi Mumbai Municipal Corporation
NHB	National Housing Bank
NSSO	National Survey Sample Organisation
NTDA	New Town Development Authority
O&M	Operations and Maintenance
octroi	a tax on goods brought into a town or district
PPP	Public Private Partnership
R&R	Resettlement and Rehabilitation
RCA	Rent Control Act
RoR	Rest of the Region
SEZ	Special Economic Zone
SPA	Special Planning Authority
SPM	Suspended particulate matter
SPV	Special purpose vehicle
SPFE	State Pooled Finance Entity
sq ft	square foot, ft^2
sq m	square metre, m^2

STP	Sewage Treatment Plant
SWD	Storm Water Drainage
SWM	Solid Waste Management
SWOT	strength, weakness, opportunities and constraints
TDR	Transferable Development Rights
TOD	Transit Oriented Development
TPD	Tonnes per day
TP	Town planning Scheme
TNUDF	Tamilnadu Urban Development Fund
TTC	Trans Thane Creek Industrial Area
UAKBSNA	Ulhasnagar, Ambarnath, Kulgaon-Badlapur and Surrounding Notified Area
UFW	Unaccounted for Water
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	Urban Local Body
ULCRA	Urban Land (Ceiling & Regulation) Act 1976
WFPR	Work Force Participation Ratio
WTO	World Trade Organization



Executive Summary



Executive Summary



0.1 ENVISIONING MMR

Mumbai has a history of planning dominated by physical plans prepared within the inward looking national economic framework. Greater Mumbai has had two Development Plans one sanctioned in 1967 and the other 1993. Similarly there have been two Regional Plans covering the Mumbai Metropolitan Region sanctioned in 1973 and 1999 respectively. Except for the Regional Plan, 1999 the other plans were essentially based on the perception that interventions in the nature of land use zoning, restrictive FSI and diverting growth to the mainland have to be used to manage runaway growth of Mumbai including migration. Furthermore all infrastructure services were supposed to be provided by public sector by deploying public resource. The Regional Plan, 1999 (prepared in 1995) noted the trends of declining manufacturing sector and also the potential for growth of financial and other services in competition with other Indian and international cities within the larger of context liberalizing Indian economy. The Plan also recognized the potential role of private sector in infrastructure development and delivery of services.

BOX 0-1: Objectives of Regional Development Management

The Regional Plan proposed “to promote and sustain growth with social justice in a resource efficient manner and in consonance with the goals of national development planning” as the strategic goal of regional development management.

This basic goal was translated into following specific objectives;

- to facilitate and promote economic growth of the region taking into account its role in the process of national development;
- to improve quality of life particularly of the poor and the deprived;
- to minimise the impact of negative externalities - particularly the adverse environmental impacts - that may occur in the process of economic growth;
- to achieve these objectives improve the efficiency of existing methods of resource mobilisation, adopt innovative methods of resource mobilisation and facilitate, attract and guide private investment in the desired direction; and
- to achieve these objectives, promote effective citizen participation in the process of development through decentralisation of institutions.

The Regional Plan further observed that policies, programmes, procedures and projects would have to be evaluated with reference to these basic objectives on a continuing basis, requiring a drastic change in metropolitan planning - moving away from land use planning to truly comprehensive development planning.

But towards the end of the century Mumbai’s economy declined. The Task Force, appointed by the Chief Minister following the Bombay First-McKinsey report “Mumbai Vision: Transforming Mumbai into a world-class city”, adopted the vision of “Transforming Mumbai into a world class city with a vibrant economy and globally comparable quality of life for its citizens” to counter the declining economy and achieve true potential of growth. The World Bank agreed to support a market-friendly growth inducing strategy that is equitable and inclusive and based on a business plan approach. MMRDA at the behest



of Government of Maharashtra appointed LEA International (in association with LEA Associates South Asia Pvt. Ltd. (LASA), who were already engaged in preparation of CTS, to prepare the Business Plan for MMR. The vision of MMR adopted for the preparation of business plan - **“Transforming MMR into a world class metropolis with a vibrant economy and globally comparable quality of life for all its citizens”** is based on the following SWOT of MMR.

BOX 0-2: SWOT of MMR	
<p>STRENGTHS</p> <ul style="list-style-type: none"> Presence of two sea ports and airport Long history of international trade and financial services Presence of reputed research and educational institutions Large talent pool, good work culture Good power supply in Mumbai (though now under stress) Efficient public transport with a successful PPP in MRT Barely satisfactory water supply in Mumbai Citizens that pay user fees and taxes. Presence of MMRDA – A metropolitan planning and development authority 	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> The presence of ports and airport offer opportunities for improved external trade under the new WTO regime GOI policy of SEZs to boost export Possibilities of setting up of off-shore banking units and international financial services centre in SEZs Growing demand for IT and ITES Growth of high end manufacturing – Gems and Jewelry, Fashion Goods etc. Potential for growth in media and entertainment
<p>WEAKNESS</p> <ul style="list-style-type: none"> Topographic constraints, limited land supply. High real estate and housing prices Large proportion of slum dwellers Inadequate power supply Extremely overcrowded trains and slow moving buses on congested roads Water supply on the brink of turning into weakness in Mumbai and already a weakness in parts of MMR Generally poor solid waste management Vulnerability to flooding Mumbai ranked 150 in quality of life index in international comparison. Mumbai ranked 11th amongst 12 Indian cities in “ease of doing business” 	<p>THREATS</p> <ul style="list-style-type: none"> Competition from other Indian and Developing Country cities in terms of better quality of life at lower real estate and housing prices Inability to convert economic momentum into investment in infrastructure Inability to improve business environment.

The noteworthy features of the Vision are that it covers the entire Metropolitan region going beyond the boundaries of Mumbai city and refers to inclusive growth covering all the citizens.

While adopting this vision it is also noted that in the roster of World Cities Mumbai does not find a direct entry but is recognized as having “relatively strong evidence” of world city formation. Similarly it is noted that in an international comparison of Global Financial Centres Mumbai is ranked 39 out of 46. It is also observed that cities that are economically very vibrant do not rank amongst the top in terms of quality of living.

The Strategic Objective

The basic strategy to attain the vision is to sustain MMR in a virtuous cycle of **Economic Growth**, **Resource Mobilisation**, and **Investment in infrastructure** and **Improved quality of life** with recognition that good governance plays a crucial role in implementing such a strategy.

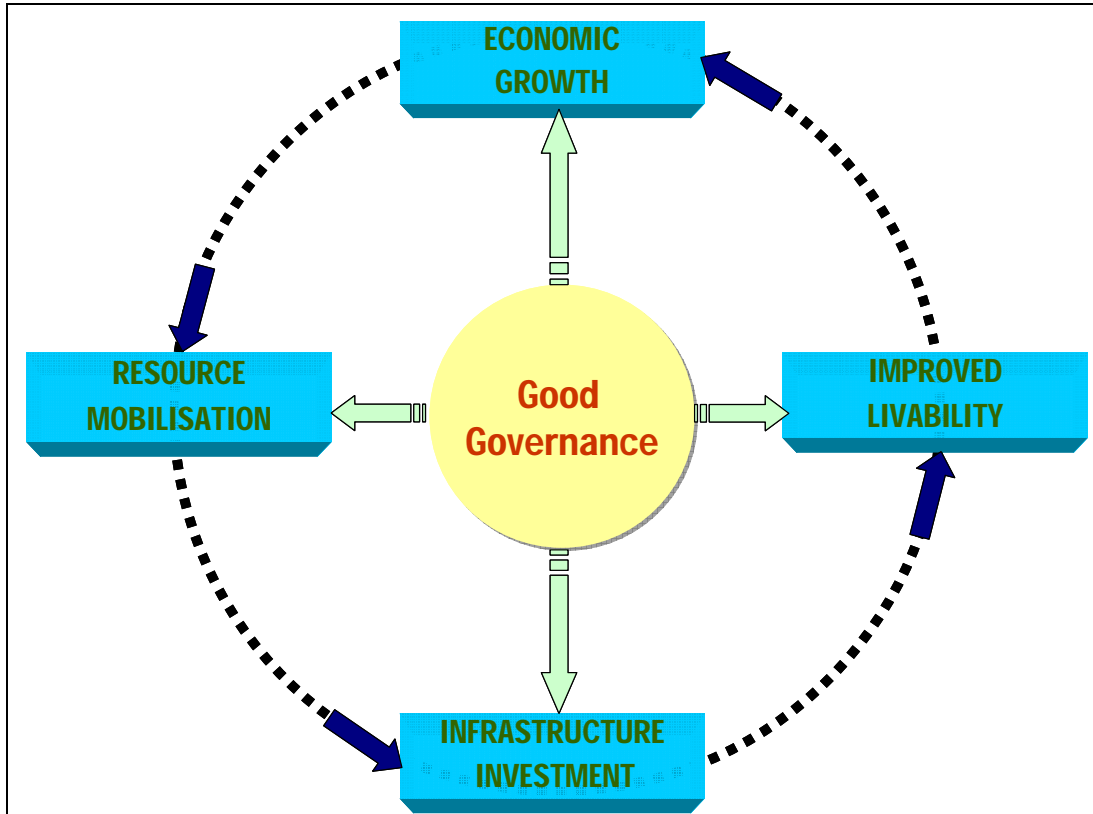


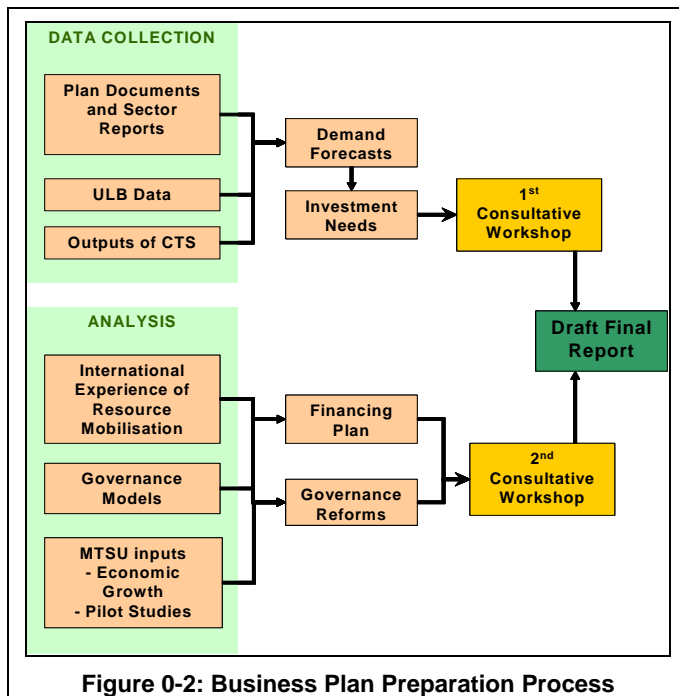
Figure 0-1: The Virtuous Cycle

In order to sustain the MMR in a virtuous cycle the basic strategy proposed is to ensure

- Competitive MMR;
- Livable MMR;
- Bankable MMR; and
- Well governed MMR

Process of Preparing Business Plan

The process followed in preparing business plan is depicted in Figure 0.2.



0.2 THE SCOPE AND LIMITATIONS OF BUSINESS PLAN

To achieve the above strategic objectives, the business plan has developed a package of actions that help ensure economic growth, improved operation of land, real estate and housing market, and resource mobilization plan to finance the required scale of investment in infrastructure services. The business plan has also suggested the Governance reforms covering institutional restructuring, adoption of new planning and management practices, capacity building, legal reforms along with priority infrastructure projects.

BOX 0-3: GOALS FOR ATTAINING VISION

Economic Growth

- GDP growth rate of 12-15% per annum with financial services, IT, ITES and Media/Entertainment growing at 15-18%
- MMR improving its rank in 'ease of doing business' among Indian cities to top 3
- Enhancing the work force participation rate to 40% by 2021 with significant increase in formal employment

Land, Real Estate and Housing

- Bring down the office rentals to comparable cities in Asia
- Reduce ratio of Median House Price to Median Annual Income to 5
- Reduce proportion of Slum Dwellers to 20%

Infrastructure

- 24/7 power supply in entire MMR
- Water supply of 240 lpcd in Greater Mumbai and 200 lpcd in rest of MMR on 24/7 basis
- 100% coverage by sewerage and slum sanitation
- No loss of life and property and disturbance to traffic due to flooding
- Daily 100% collection of solid waste and its environmentally compliant disposal
- Maximum Density of passengers in trans-7/sq.m. average bus speeds to be 20 km/hour and vehicular speed to be 30 km/hour

Resource Mobilization and ULB Finance

- Operating Ratio i.e. Revenue Expenditure/Revenue Income should not exceed 0.9
- Private investment in infrastructure (billable services) to be at least 50% of requirement
- New real estate development to contribute at least 8% of its value to finance infrastructure development
- ULBs to improve debt servicing capacity to be able to meet capital investment needs after allowing for inter-governmental transfers and own resources.

Finally the business plan has emphasized the monitoring and evaluation of outcomes to periodically revise and fine-tune the initial business and investment plan.

The business plan has proposed an investment plan considering available project specific details and detailed estimated carried out by CTS for transport sector. However where such details are not available, broad sectoral assessments and order of magnitude investments have been worked out. Thus the investment plan is not fully translated into projects. Similarly the business plan does not propose a detailed spatial strategy, but makes a strong case to develop it through revision of Regional Plan and Development Plans of Greater Mumbai and Navi Mumbai on priority, with revision of development Plans of other cities being taken up in due course.

0.3 MMR ECONOMY AND DEVELOPMENT SCENARIO

Greater Mumbai's per capita GDP has been significantly higher than that of Maharashtra or India. In 2004-05 (at 1993-94 prices), per capita gross domestic product (GDP) of Greater Mumbai, Maharashtra and India were Rs.46,010, 20,384 and 15,422 respectively (Figure 0.3).

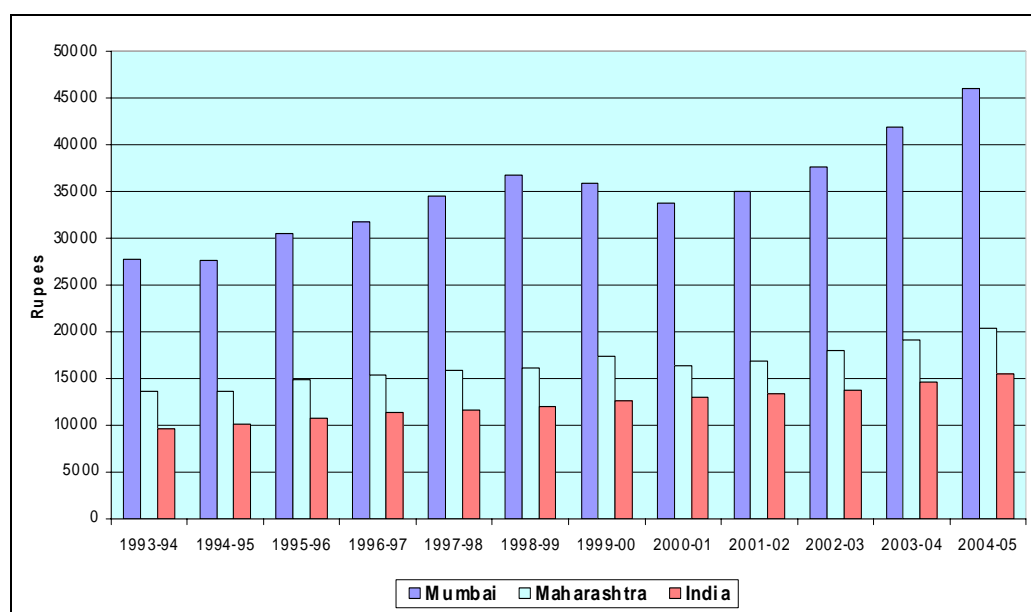


Figure 0-3: Per capita GDP of Greater Mumbai, Maharashtra and India (at 1993-94 Constant Prices)

The long term (1993-94 to 2004-05) CAGR of GDP of Greater Mumbai, Maharashtra and India is 6.5%, 5.7% and 6.3% respectively. It however obscures the volatility of growth rate of Mumbai. Indian growth rate has remained within a range of 4% to 9%. However, Greater Mumbai's growth rate has been more volatile, i.e., -5 % in 2001 to 13% in 2004. Given the share of Mumbai's GDP in Maharashtra (27%), volatility of Mumbai's growth affects that of Maharashtra as well.

During this period Mumbai also experienced substantial structural changes in its economy. Mumbai's transformation from being an **industrial city** to a **services city** that began in 1980s further strengthened during early years of this century.

MMR comprises Greater Mumbai and parts of Thane and Raigad districts. Share of Greater Mumbai in Maharashtra's GDP is 27% and that of Thane

and Raigad districts together is around 13% thus making MMR share as 40%.

Economic data in terms of gross domestic product (GDP) is not adequate to identify growth drivers at a finer scale. However, general trends indicate that certain activities are likely to drive MMR's economy over the next few decades.

- Financial services including banking and insurance;
- IT and ITES;
- Communications;
- Biotechnology;
- Media and entertainment;
- Retail;
- Logistics and warehousing near the ports; and,
- High end export oriented manufacturing particularly in SEZs.

Mumbai historically developed as a mono-centric city with port, government, banking and insurance, stock exchange and wholesale trade all being concentrated in and around Fort. Development of Navi Mumbai that began in 1970 was the first attempt to create a new centre of growth. Now with diversification of economic growth, conversion of manufacturing sites and expansion of transit facilities, a clear pattern of spatial clustering is emerging. The spatial clustering is described in Table 0-1 and depicted on the Figure 0.4.

Table 0-1: Spatial Clustering

Sr.No.	Key Driver	Location
1	Financial services including banking and insurance	Fort, Nariman Point, Bandra Kurla Complex
2	IT and ITES	Andheri-Kurla Road, Thane, Malad, Navi Mumbai
3	Biotechnology	Navi Mumbai
4	Media and entertainment	Malad - Link Road, Goregaon
5	Retail	Mill district, Malad, Mulund, Thane, NaviMumbai
6	Logistics and warehousing	JNPT, Navi Mumbai
7	High end export oriented manufacturing	SEZs at Mumbai Suburbs, Navi Mumbai, Kopta, Kalyan, Panvel, Gorai-Manori etc.

Greater Mumbai and MMR have maintained a growth rate of over 10 % since 2002. However it occurred after a negative growth in 2001. In the 11th Five Year Plan Indian economy is expected to grow at a rate of 9% p.a. With agriculture not expected to grow at more than 4.1%, secondary and tertiary sectors will have to grow at a higher rate of 10.5 and 9.9% respectively¹. In that context MMR will have to grow at 12 to 15 % p.a. and sustaining such growth rate is therefore the challenge.

The threats to economic growth, apart from the general deficiency of infrastructure and resultant quality of life, are expected from

- The regulatory constraints on “doing business”
- High real estate prices at low quality of life in international comparison
- Mismatch between the required skill profile and available manpower
- Absence of an institution at metropolitan level responsible for economic growth
- Absence of data system that provide information to monitor specific performance of MMR.



Figure 0-4: Spatial Distribution of Emerging Growth Clusters

0.4 LAND, REAL ESTATE AND HOUSING

The way in which the Land, Real Estate and Housing sector currently functions adversely affects MMR's competitiveness for attracting economic growth and its livability by denying affordable shelter to the majority. The average percentage of households living in One-Room dwellings in urban MMR is 59. It ranges between 28 % in Badlapur (minimum) to 68 % in Bhiwandi and 67 % in the Island City. The proportion of households living in one-room dwellings in urban MMR is thus distinctly higher than that in urban India. In urban India the proportion of households living in one-room dwellings is only 35 %.

¹ “Towards Faster and More Inclusive Growth, An Approach to the 11th Five Year Plan” Planning Commission , Government of India June 14, 2006

Given the present household income profile and prevailing housing prices, nearly 90 % of the households cannot afford a minimum legal house in Greater Mumbai and have to seek shelter in distant suburbs or slums of Mumbai. The increasing prices have caused very low income elasticity of housing consumption.

The policies so far have concentrated on the symptoms like slums and dilapidated buildings without recognizing that slums and housing are a subset of larger real estate and land market. Many well-intentioned market interventions have had an unintended outcome. Moreover these interventions have been too deep rooted to be quickly remedied. Many of these policies have resulted in muddling of property rights, which in turn has had an adverse impact on the land and real estate market. Clearly establishing the property rights shall be one of the objectives of shelter sector reforms, as this will enable increased flow of mortgage based finance in the land and housing market.

Land use plans including use, density and FSI zoning and plans for expanding infrastructure determine the supply of land and development rights available for urban use (apart from the legislative constraints discussed in the next section). The Regional Plan 1996-2011 sanctioned in 1999, Development Plan of Greater Mumbai prepared for 1981-2001 and sanctioned in 1993 and Development Plan of Navi Mumbai sanctioned in 1979 have all become dated though they have been amended from time to time on *ad hoc* basis. It is necessary that comprehensive revision of these plans be undertaken at the earliest.

In most development plans a uniform FSI has been proposed. Central locations and high accessibility particularly through transit availability can

sustain higher FSI. In case of Island City where already consumed FSI in many parts is in excess of 3.0, FSI of 1.33 has been prescribed. In Navi Mumbai too which is a planned city a uniform FSI of 1 (except 1.5 in the vicinity of railways stations) has been used. Such uniformly low FSI restricts the development rights available in the market. Their market prices increase and consequently housing and property prices too increase particularly when incomes are rising and housing finance is easily available. Development Plans have usually overlooked this impact of uniformly low FSI on the housing prices and the affordability. One of the

BOX 0-4: New Transportation Links and opportunities of Land use Changes

- **Versova Andheri Ghatkopar** mass transit corridor. Apart from Andheri and Ghatkopar which are at the intersection Western Railway and Central Railway respectively, DN Nagar station is at the intersection of proposed north south corridor of Charkop-Bandra MRT. All the three locations are candidates for major Transit Oriented Development (TOD). Besides these, intermediate stations could also be redeveloped as TODs.
- **Charkop-Bandra-Kurla-Mankhurd** mass transit corridor. The northern section at Malad passes through an area that is transforming itself as an area for retail, entertainment and ITES. Provision of transit would accentuate the potential for such development. Similarly the section passing through Bandra Kurla Complex could be exploited for mixed use, high density development.
- **MTHL (Sewree – Nhava) bridge** if extended up to Worli would offer opportunities for re-planning the entire mill district and northern part of port land at Sewree

rationales for lower FSI has been limited infrastructure or inability to augment

it. However low and uniform FSI itself did not help improve the infrastructure. In older neighbourhoods where prescribed FSI is lower than the consumed, it has prevented investment in redevelopment and perpetuated the status quo. Along with preparation of city wide Development Plan, there is a need to prepare detailed plans for redevelopment of older neighbourhoods and areas near transit stations. Detailed plan for redevelopment and Transit Oriented Development (TOD) must explore possibilities of development at higher FSI with planned infrastructure.

Ensuring affordable housing or obtaining land for affordable housing is the most critical issue in planning of MMR. This is particularly the case where compulsory acquisition of land or obtaining land through measures like Urban Land Ceiling Act has not been particularly successful. Following inclusionary provisions therefore deserve consideration.

- Mandatory allocation of (say) 30 % of the net plot area for dwelling units not exceeding 30 sq.m. in area in layout or subdivision of land of 3000 sq.m. or more;
- In case of apartment buildings requiring construction of one 25sq.m. dwelling unit for every 10 apartments; and
- Retaining 10% of net plot area by planning authority for affordable housing in every TP Scheme.

Such provisions should be seen as a part of overall reform in the land and real estate market. Otherwise in a scarcity-ridden market such provisions may invite misuse.

Sectoral reforms would increase the supply of land and development rights, increase supply of rental housing, improve access to housing finance, and promote redevelopment of old neighborhoods and slums. The reach of private formal market may thus begin to go down the income scale. At present the market seems to serve the top 40 to 50% of the households, the reforms may increase this proportion to about 60 to 70 %. An additional 10 to 15% could be helped through interest subsidies and guarantee mechanism. (NHB, it is learnt, is working out such a scheme.) The poorer households will have to be helped by public housing programmes largely in the form of sites and services schemes.

It would also be desirable to have a modern iconic visual image of Mumbai. This could be achieved by development on the waterfront in Mumbai and Navi Mumbai.

0.5 INFRASTRUCTURE AND INVESTMENT NEEDS

The livability depends upon the availability of basic infrastructure services such as water supply, sewerage, solid waste management, storm water drainage, roads and transport services, electricity and basic education and health care. Demand for these services depends upon the norms targeted for the service delivery and population to be served. In some of the services there are chronic backlogs that need to be cleared.

Total population of MMR is estimated to be 29.64 million by 2021. Its distribution it is anticipated may follow four scenarios-Mumbai concentration (P1) Trend (P2), Dispersal (P3) and Accelerated dispersal (P4). P2 and P3 are considered to be more likely. In these scenarios, population of Greater Mumbai ranges between 15.7 million and 16.3 million with MMR total remaining constant.

The total infrastructure demand is estimated for 2021 at generally acceptable standards along with the current backlog. The total demand thus arrived at is then translated into investment needs. For this purpose, available project details have been used and unit costs derived from such details have been used to estimate the investment needs where projects have not been worked out.

Provision of infrastructure is considered in four categories. (i) National – Ports and Airports; (ii) Metropolitan – Water source development, Mass Transit, Metropolitan Road Network; Regional Drainage and Electricity; (iii) Municipal-local infrastructure like water distribution, sewerage, roads and transport, solid waste management, storm water drainage, etc.; and (iv) Land and Housing

The estimated investment needs are given below for each of the above referred categories of infrastructure.

Table 0-2: Summary of Capital Investment Needs of National Level Infrastructure in MMR, 2007 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
PORT DEVELOPMENT				
MbPT	2,079	554	0	2,633
JNPT	9,984	1,820	0	11,804
Rewas-Aware Port	600	1,200	2,700	4,500
Sub-Total	12,663	3,574	2,700	18,937
AIRPORT DEVELOPMENT				
Chattarpati Shivaji International Airport	3800	3100	3000	9900
Navi Mumbai Airport	2500	2000		4500
Sub-Total	6,300	5,100	3,000	14,400
TOTAL	18,963	8,674	5,700	33,337

Table 0-3: Capital Investment Needs of Metropolitan Level Infrastructure in MMR, 2007 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
WATER SOURCE DEVELOPMENT	2822	8466	2822	14110
TRANSIT INFRASTRUCTURE	50117	36073	27100	113291
Metro System	38211	24918	20569	83698
Sub-Urban Rail Improvement	11426	11155	6531	29113
Water Transport	480	0	0	480
HIGHWAY SYSTEM	21759	17764	9484	49007
TERMINALS	450	676	912	2038
DRAINAGE	900	800	300	2000

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
POWER	4759	12527	37235	54521
TOTAL(with Power)	80,808	76,306	77,853	2,34,967
TOTAL(without Power)	76,049	63,779	40,618	1,80,446

Table 0-4: Summary of Capital Investment Needs of Municipal Infrastructure in MMR, 2007 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
MUNICIPAL INFRASTRUCTURE(ULB LEVEL)				
Water Supply	327	307	231	865
Sewerage	2259	5096	576	7931
Solid Waste Management	586	13	13	612
Storm Water Drainage	1349	1349	674	3372
Transportation	8113	766	667	9546
Health and Education	802	1633	303	2738
Others	1409	1004	71	2484
TOTAL	14,043	8,535	2,232	27,548

Table 0-5: Summary of Capital Investment Needs of Land, Real Estate and Housing in MMR, 2007 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
Interest Subsidy towards Housing	196	176	122	493
Affordable Public Housing	983	516	486	1985
MIDC-Land Development	175	175		350
Green-field Development	854	4056	4482	9392
TOTAL	2,208	4,923	5,090	12,221

The total investment needs are summarized below for scenarios P2 and P3. As may be seen from these estimates the investment needs are not very sensitive to geographical distribution of population that is within a realistic range

Table 0-6: Summary of Capital Investment Needs in MMR, 2007 – 2021 (Rs. Crores)

Area/Sector	Rs Crores	%
P-2 Scenario		
National level infrastructure	33,337	10.82
Metropolitan level infrastructure	2,34,967	76.27
Municipal infrastructure (ULB Level)	27,548	8.94
Land, real estate and housing	12,221	3.97
Total P-2	3,08,072	100
P-3 Scenario		
National level infrastructure	33,337	10.82
Metropolitan level infrastructure	2,34,967	76.28
Municipal infrastructure (ULB Level)	27,473	8.92
Land, real estate and housing	12,245	3.98
Total P-3	3,08,022	100

Some of the key projects that need to be initiated immediately are given in Table 0-7.

Table 0-7: Priority Investment Programme

S.No.	Sector/Project	Investment Needs	
		Rs.Crores	US \$ Billion
1	Water Source Development	4140	0.8
	<i>Pinjal</i>	2038	0.41
	<i>Gargai</i>	262	0.05
	<i>Poshir</i>	1536	0.31
	<i>Susari</i>	304	0.06
2	Metropolitan Sub-Urban Rail Transport	7096	1.4
	<i>MUTP II and III</i>	4690	0.94
	<i>Diva-Vasai Road</i>	2406	0.48
3	Metropolitan Transit	5153	1.0
	<i>Mankhurd-Mahim-Charkop</i>	5153	1.03
4	Metropolitan Road Transport	2135	0.4
	<i>Eastern Freeway</i>	1350	0.27
	<i>Elevated Link(Sewri to Worli-Bandra Sea Link)</i>	336	0.07
	<i>Thane-Ghodbunder Road</i>	289	0.06
	<i>Exclusive Bus System</i>	160	0.03
5	Greenfield Land Development	3416	0.7
	<i>Thane-Bhiwandi</i>	3416	0.68
	Total	21940	4.4

0.6 RESOURCE MOBILIZATION AND FINANCING PLAN

The MMR economy is likely to grow at 12% per annum. In that case, the total NDDP of MMR from 2007-08 to 2020-21 would be Rs 58,91,653 crores in 2004-05 prices. The total infrastructure needs of MMR during that period have been estimated to be Rs. 3,08,072 crores (61.6 billion USD) or 5% of NDDP. It is generally expected that up to 8% of the domestic product could be invested in infrastructure. From that perspective, the required scale of investment appears feasible.

To realize the potential new financial instruments have to be designed. So far as investment needs of national level infrastructure and electricity are concerned the resources could come from national state budgets and also from the private sector as in case of Rewas-Aware Port. Designing resource mobilization instruments for those sectors is therefore not considered in the business plan. For municipal infrastructure investment, detailed FOPs have been developed. From such FOPs it is seen that with modest reforms in revision of tax base and improved collection efficiency, ability to sustain the required investment needs would range between 1 % and 82%.

The main challenge is to find financial resources for the metropolitan infrastructure, which has a requirement that is five to six times the investment needs of municipal infrastructure. Expanding real estate appears to be most promising tax base to mobilize resources for such infrastructure. There

appear to be four alternative ways of taxing this base. A summary evaluation of these is presented in Table 0-8.

Table 0-8: Using Real Estate as the Tax Base

Measures	Betterment Charge	Impact Fees	Area based development charge	Value based development charge
Legal feasibility	Provided for in MMRDA Act, 1974; but generally not available to ULBs	New legislative provisions would be necessary.	Provided for in MR & TP Act 1966	Can be introduced by through suitable amendments to MR & TP Act 1966
Tax base	Increase in land value attributable to provision of infrastructure.	Cost of providing infrastructure to new development.	Area of land and buildings in different uses.	Value of property at the time of completion of development.
Administrative complexity	Difficult to measure the tax base. Likely to be contested by owners not transacting property.	In the absence of a well-established practice of preparing and publicly adopting Capital Improvement Plans, it would be administratively complex to establish "rational nexus" between the cost and new development.	Administratively the least complex as area of land and construction can be indisputably determined while granting building permission.	Valuation of properties could have been a problem but due existence of well-settled practice of preparing ready reckoner for Stamp Duty purposes, the complexity could be minimized.
Revenue potential	Revenue potential is limited to 50% of the betterment.	Limited to cost of development, but recovery depends upon rate of new development.	Due to difficulties of periodic adjustment of rate the revenue cannot keep pace with inflation.	Buoyancy is reasonably assured, as property value is the base.

Based on this evaluation tax linked to market value of the new development (or redevelopment) is proposed. The total revenue generation over a 15 year period is optimistically estimated as over Rs.100,000 crores.

Other important sources for financing metropolitan infrastructure are

- Inter-Governmental Transfers;
- Borrowings; and
- Private investment in PPP format.

It is not possible to estimate their contribution with high degree of certainty over a long-term period. Nevertheless table below shows a possible funding plan for capital investment up to 2021.

Table 0-8: Financing Mechanism for Metropolitan & Municipal Infrastructure

Sectors/Macro Projects	Investment Requirement: 2005-2021 (in Crores INR)	Financing Mechanism(in Crores INR)			
		Public Investment			Private/PPP
		Inter-Governmental Transfers	Own Resources and Development Charges	Borrowing	
METROPOLITAN INFRASTRUCTURE					
WATER SOURCE DEVELOPMENT	14110	4233	4233	5644	0
TRANSIT INFRASTRUCTURE	113291	22406	31414	11722	47749
MMR Metro System	83698	13615	22622	0	47461
Sub-Urban Railways	29113	8734	8734	11645	0
Water Transport	480	58	58	77	288
HIGHWAY SYSTEM	49007	11323	12053	14867	10764
TERMINALS	2038	428	428	571	611
DRAINAGE	2000	600	600	800	0
POWER	54521				
TOTAL(with Power)	2,34,967				
TOTAL(without Power)	1,80,446	38,990	48,728	33,604	59,125
%		21.6	27.0	18.6	32.8
MUNICIPAL INFRASTRUCTURE(ULB LEVEL)					
Water Supply	865	216	346	303	
Sewerage	7931	1983	3172	2776	
Solid Waste Management	612	153	245	214	
Storm Water Drainage	3372	843	1349	1180	
Transportation	9546	2387	3818	3341	
Health and Education	2738	685	1095	958	
Others	2484	621	993	869	
TOTAL	27,548	6,887	11,019	9,642	0
%		25.0	40.0	35.0	0.0
LAND, REAL ESTATE AND HOUSING					
Interest Subsidy towards Housing	493	247	247	0	0
Affordable Public Housing	1986	477	477	635	397
MIDC-Land Development	350	0	105	245	0
Green-field Development	9392	939	3757	1878	2818
TOTAL	12,221	1,662	4,585	2,759	3,215
%		14	38	23	26
TOTAL(with Power)	2,74,735				
TOTAL(without Power)	2,20,214	47,539	64,332	46,004	62,339
TOTAL %		21.6	29.2	20.9	28.3

If inter-governmental transfers and private investment are not realized on the scale required, development charges and borrowings may have to be pursued more vigorously. Borrowings also need to be seen as a way of spreading cost of lumpy infrastructure investments over next generations that are going to be benefited by such investments. ULBs and metropolitan

agency will have to build revenue surpluses and improve their debt servicing capacity. The ability of the ULBs and metropolitan agency to access the capital including bond market should be enhanced by MUIF. MUIF could also extend credit enhancement facilities to borrowers in MMR.

0.7 GOVERNANCE

Governance structure in MMR is quite complex. There are ULBs that range from MCGM to “C” class municipal councils like Alibag; metropolitan agencies like MMRDA and the proposed MPC; GOM departments like Housing and their para statals like MHADA; GOI Ministries like Railways and their functional agencies like zonal railways and MRVC. However despite such complex institutional set-up certain functions are not adequately addressed with metropolitan focus. These are;

- Planning for economic growth;
- Planning and development of water resources;
- Transit and metropolitan highway network – planning and development;
- Planning and development of Greenfield areas;
- Inter-municipal solid waste disposal;
- Hand holding of smaller ULBs; and
- Resource mobilization for metropolitan infrastructure.

In order to address these governance issues institutional restructuring, improved planning management practices, capacity building and legal reforms are proposed. Strengthened and restructured MMRDA seems to be the optimal option. Office of the MMRDA could be organized along five major themes viz. Development Planning, Water Resource Planning and Development, Transport, Economic growth and Infrastructure Finance. The non statutory institutional arrangement introduced by GOM for Mumbai Transformation could be integrated with the structure of MMRDA as shown in the Figure 0-5.

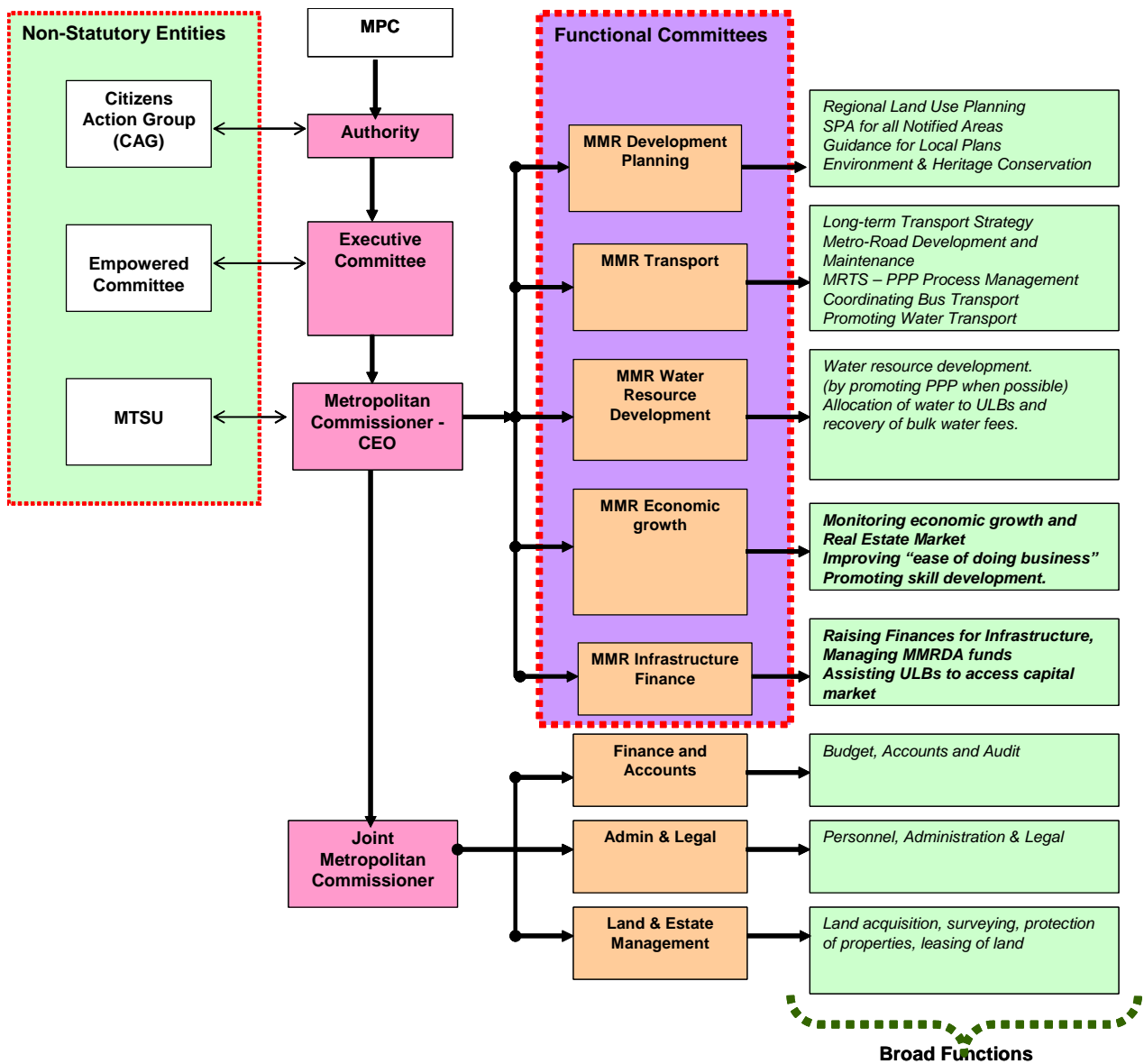


Figure 0-5: Suggested Organization Structure of MMRDA

Along with the institutional strengthening, adoption of improved planning and management practices is also proposed. Long term Regional and Development Plans are a statutory requirement. Strategic plans - CDPs including CIPs have been made mandatory for seeking assistance under the JNNRUM and UIDSSMT. Similar practice is proposed to be made a statutory requirement linking it up with the development plan to be prepared by the MPC. The way the integrated planning process shall work is illustrated in Figure 0-6.

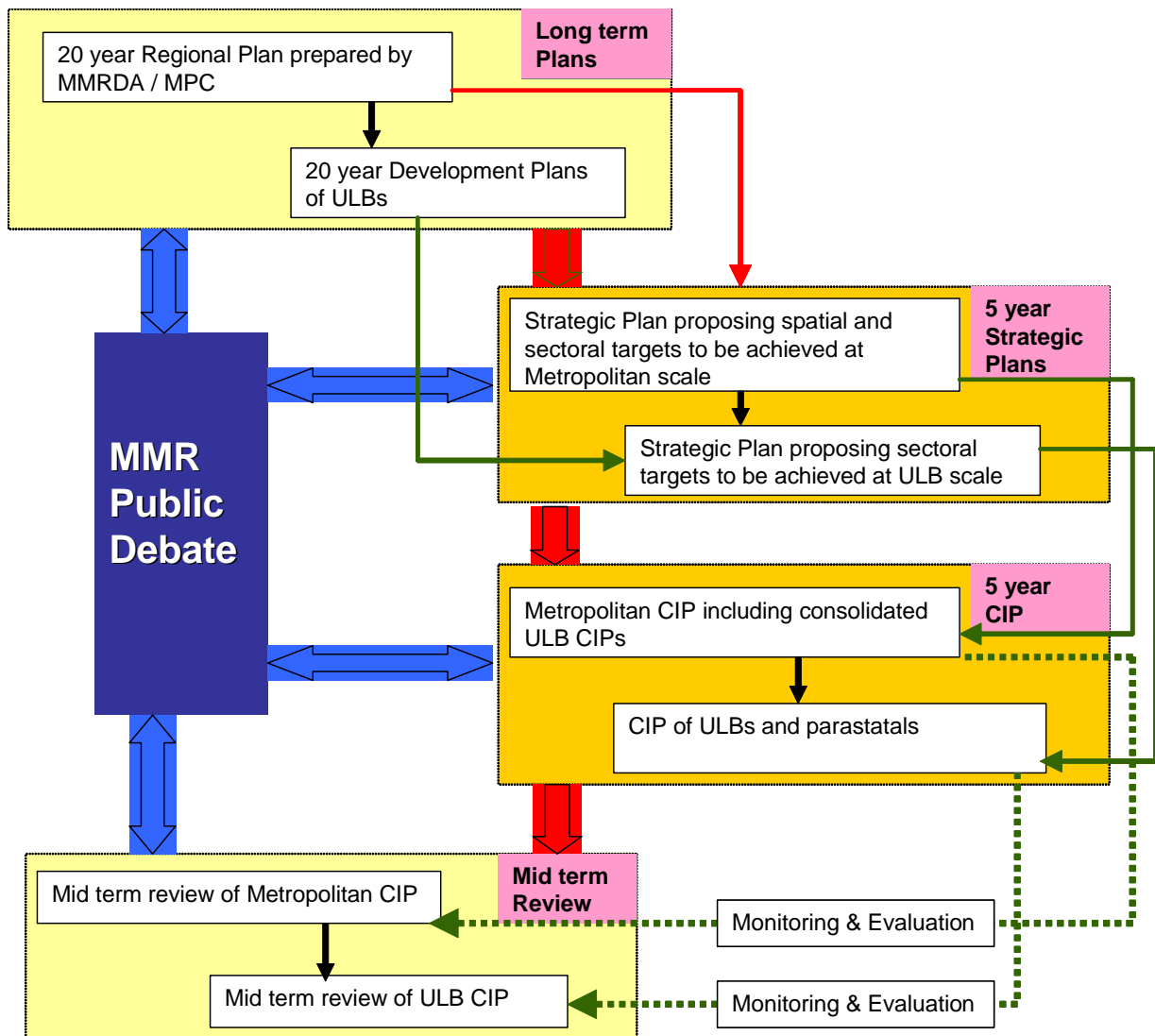


Figure 0-6: Integrated Planning Process

The other important technology proposed to be adopted as an effective tool for managing urban growth is the GIS. It is proposed that apart from producing good quality maps GIS should be used as a way of organizing data for effective integrated planning. Substantial capacity building is necessary at both metropolitan and ULB level. At the MMRDA, capacity needs to be developed particularly in following fields;

- Capacity to monitor economic growth and promoting LED;
- Capacity to manage funds and raise resources from the capital market;
- Capacity to structure projects for private investment;
- Capacity to assist ULBs in project preparation and financing; and
- Capacity to extend technical assistance to ULBs.

In case of ULBs the requirement of capacity building varies considerably amongst different ULBs. However the capacity building needs are generally identified as

- Using accrual based accounting system;
- Preparing CDP including CIP;
- Project formulation including financing;

- Local land use planning and development control;
- E-governance;
- Use of GIS in planning and management of growth; and
- Municipal engineering – water supply, sewerage, storm water drainage, road construction and maintenance

Legal reforms and disclosure and participation

Legal reforms are proposed to enable institutions to perform the functions identified above.

To enable MMRDA to play a wider pan-MMR Role, MMRDA Act is proposed to be amended to specifically include following functions in section 12;

- Planning for economic growth;
- Water resource development;
- Transit and metropolitan highway network - planning and development;
- Raising resources for metropolitan development; and

Similarly the act may provide for constituting advisory committees as listed below;

- MMR Development Planning Committee;
- MMR Water Resource Planning and Development committee;
- MMR Transport Planning and Development Committee;
- MMR Economic Growth Committee; and
- MMR Infrastructure Finance Committee.

To ingrain the practice of making CDP /CIPs on a firmer footing it is proposed to make suitable provisions in the Municipal legislation. MMRDA Act is proposed to be amended to require MMRDA to prepare a 5 yearly strategic plan along with Metropolitan CIP that integrates plans of ULBs, parastatals and its own along with metropolitan CIP. MMRDA is proposed to be empowered to issue guidance on preparation of CDP/CIPs to ULBs as well as the parastatals. The MPC Act is proposed to be amended to enlarge the scope of “development plan” to include the Metropolitan Strategic Plan and the CIP.

For enabling levy of development charge based on the value of property by Planning Authorities (including Special Planning Authorities) Chapter IV A of MR & TP Act, 1966 will need amendments. More particularly section 124-B and the second schedule that prescribes the area based scale of development charge will have to be amended. Such an amendment would benefit all ULBs with resources for municipal infrastructure.

For using similar source for generating financial resources at metropolitan level, Chapter IV of MMRDA Act, 1974 may have to be amended. Section 25 enables state Government to levy a cess on property tax for MMRDA. Similar provision may be inserted to enable State Government to levy a cess on development charge upto three times the scale of development charge levied by Planning Authorities under MR & TP Act, 1966.

To further the cause of disclosure and participation it is proposed to require MMRDA to prepare a progress report on implementation of the Strategic Plan and the outcome of such implementation once a year and hold a public debate on the MMR Plans.

0.8 MONITORING AND EVALUATION

Monitoring progress of project implementation by measuring inputs in terms of expenditure incurred and physical outputs is common for tracking time and cost over-runs in case of execution of projects. However in case of a business plan that incorporates policies, legal and institutional reforms, infrastructure investments and various other interventions, monitoring outcomes is more important. For example monitoring expenditure on public housing and consequent number of dwelling units constructed is not adequate, monitoring changes in affordability of housing and proportion of slum dwellers is necessary. Such monitoring could best be done through indicators. Indicators, sources of data to build such indicators and their target values are identified in following critical areas;

- Economic growth and Competitiveness;
- Livability and infrastructure provision;
- Bankability and resource mobilization; and
- Governance.

Wherever existing data sources are inadequate, the need to bridge data gap through surveys is also identified. For this purpose specific staff resources have to be designated.

0.9 THE ACTION PLAN

The Action Plan for implementation of business plan would begin by considering, approving and adopting the business plan. The first step would be to setup a business plan implementation unit in MMRDA (this could collaborate with the MTSU for which assistance of Cities Alliance is currently available). Principal actions for the main themes of the business plan are listed below.

Planning for economic growth

- Assign the responsibility of planning for economic growth to MMRDA and strengthen MMRDA to play that role
- MMRDA to develop necessary data systems in collaboration with Director of Economics and Statistics to have geographic coverage co-terminus with MMR, to distinctly capture the income of newly emerging economic activities and to track the employment growth.
- Using “Doing Business 2007” as the benchmark, carry out further surveys if required and propose legal, regulatory and procedural reforms that improves MMR’s ranking in ease of doing business to top 3 Indian cities.
- MMRDA to prepare plans for Local Economic Development (LED), recognising the role of small manufacturing units in matching the job creation with the skill profile, develop a policy for unregistered industrial units and estates.

- Mediate between industry, government and educational institutions for developing required skills.

Land, Real Estate and Housing

- Remove legislative constraints on supply of land and development rights – repeal ULCAR, modify CRZ II provisions.
- Expand supply of land by developing saltpan lands and opening greenfield sites along transit network.
- Undertake revision of Regional Plan and Development Plans in conjunction with the road and transit network proposed in the CTS. This should include rationalizing FSI patterns that respond to accessibility including Transit Oriented Development (TOD), floor space demand of population and redevelopment needs of old neighbourhoods and slums.
- Bring about simplification of DC Regulations and adoption of procedures that reduce the time required for building permits by deploying information technology.
- Develop GIS based information system that monitors growth of commercial floor space and housing with overlays of property prices in a geographically disaggregate manner.

Infrastructure improvement and finance

- As already described above, action on certain infrastructure projects – transit development and water resource development – of metropolitan significance must begin immediately.
- ULBs have to improve their collection efficiency and user fee setting practices to enhance their debt servicing capacity. This should be matched by CIP that includes well prepared projects.

Governance

Legal reforms

- Repeal of ULCAR
- Amendment of Rent Control Act
- Amendment of Maharashtra Regional and Town Planning Act, 1966
 - For enabling town planning schemes to be undertaken following regional plans and to make their implementation expeditious
- Amendment of MR & TP Act 1966 to enable levy of price linked Development Charge for Planning Authorities and amending MMRDA Act, 1974 to enable Government to levy additional development charge to finance metropolitan infrastructure.
- Amendment of Municipal legislation to make it mandatory for the ULBs to prepare CDP including CIP and Financing plan every five years.
- Amendment of Maharashtra MPC Act 1999 to prepare metropolitan draft plan based on CDPs of ULBs and MMRDA to assist the MPC in that regard. (This may be in addition to MMRDA's obligation to assist MPC in preparing Regional Plan as provided for in the MR & TP Act 1966.)

Institutional Restructuring

- Restructuring MMRDA to enable it to address the problem of economic growth, infrastructure finance, water resource development and monitoring and evaluation of plan implementation
- Make MUIF as an effective financial intermediary to enable access to capital market

Procedural reforms

- Adopting the practice of preparing 5 yearly strategic plan (CDP) including CIP for MMR that incorporates the plans of ULBs and the parastatals
- Promoting and adopting use of GIS for planning and monitoring
- E-governance

Capacity building

- Undertake capacity building at MMRDA by retraining existing staff, strengthening existing staff, infusing new skills and outsourcing certain activities.
- MMRDA may assist smaller ULBs in similar capacity building actions.

Monitoring and Evaluation

For monitoring and evaluation of the outcomes of the implementation of business plan specific indicators have to be designed. Some of them can be built on the basis of available data and some would need specifically developed data system. The action points therefore are identifying indicators, designing data systems and beginning annual reports that could provide feedbacks for fine-tuning the business plan.

0.10 BUSINESS PLAN –PHASE 1 (2008-13) TIMELINES

Figure 0.7 graphically shows the timelines for actions under Business Plan Phase 1 up to 2010. At the end of this period the monitoring and evaluation should help mid-term appraisal and fine-tuning of the Business Plan.

Figure 0.3: Action Plans: Immediate Project Implementation and Governance

ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10
Consideration, approval and adoption of Plan														
Establishing and staffing Plan implementation unit														
Immediate Project Implementation														
Water Resources														
Planning and development of Pinjal			Project preparation			Obtain Clearances	LA and R & R		Project execution >>>					
Planning and development of Gargai			Project preparation			Obtain Clearances	LA and R & R		Project execution >>>					
Planning and development of Poshir			Project preparation			Obtain Clearances	LA and R & R		Project execution >>>					
Planning and development of Susari			Project preparation			Obtain Clearances	LA and R & R		Project execution >>>					
Transit Development														
Charkop-Bandra-Mankhurd	Selection of Concessionaire		LA & R & R			Project Execution >>>								
Metropolitan Roads														
MTHL	Selection of Concessionaire		LA & R & R			Project Execution >>>>								
Eastern Freeway	Selection of Concessionaire		LA & R & R			Project Execution >>>>								
Elevated Link(Sewri to Worli)			Surveys & Feasibility			LA & R & R			Project Execution >>>>					
Governance														
Legal and Institutional Reforms														
MMRDA Act			Draft amendments		Obtain legislative sanction									
MR & TP Act			Draft amendments		Obtain legislative sanction									
Municipal Legislation			Draft amendments		Obtain legislative sanction									
MPC Act			Draft amendments		Obtain legislative sanction									
Rent Control Act			Draft amendments			Obtain legislative sanction								
Restructuring MMRDA				Proposals for Composition of Committees			Appoint							
Strengthening MMRDA				Proposals for creating posts		Obtain Approval		Appoint						
Economic growth														
Establish Economic Development Unit				Obtain Approval		Appoint								
Monitoring Economic Growth				Dialogue with Dir. Eco Stat		Design system		Begin Reporting >>>						
Improve ease of doing business			Carry out detailed study			Propose procedural reforms			Accept and implement >>>>					
Improve skills	MTSU/MEDC facilitate ind. Edu dialogue		Syllabi		Begin courses									
Policy for small manufacturing			Formulate Draft Policy		Sanction/Consent		Projects/Programs Implementation >>>>>							
												MMRDA - Review Ind. Edu Syllabi		New Courses

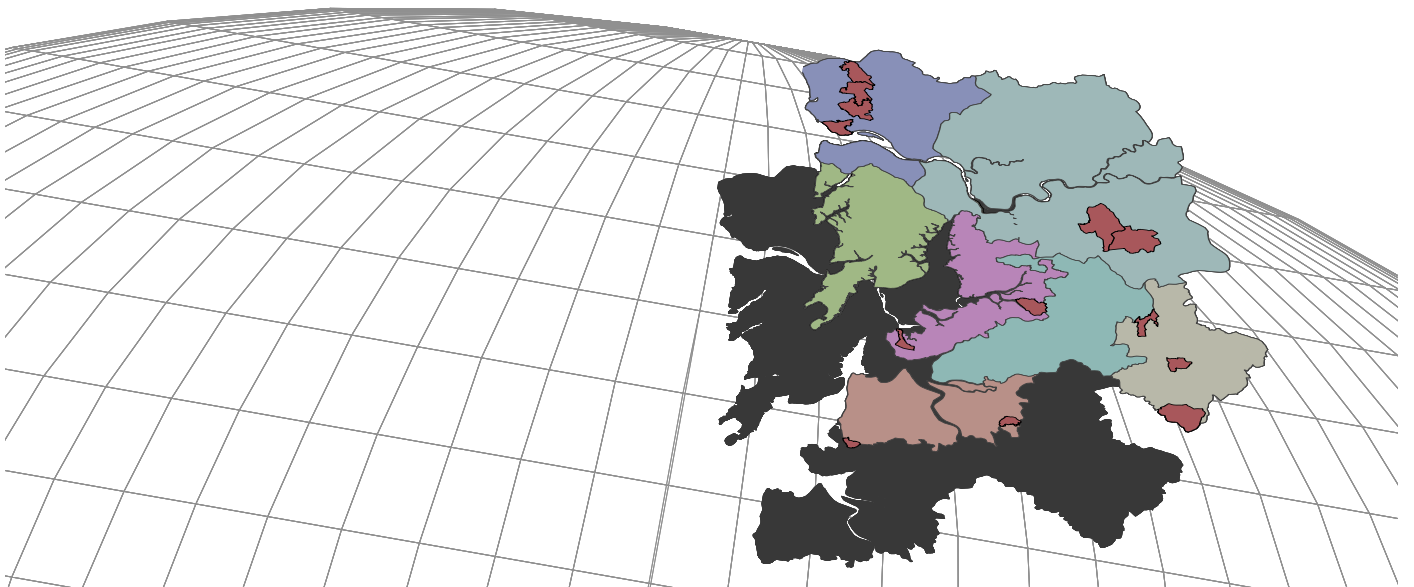
Figure 0.3: Action Plans: Land, Real Estate, Metropolitan Infrastructure and Strategic Planning

ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10		
Land, Real Estate & Housing																
Revise Regional Plan		Intention	Draft Plan preparation				Government Sanction									
Revise Greater Mumbai DP			Intention	Draft Plan preparation				Government Sanction								
Revise NaviMumbai DP			Intention	Draft Plan preparation				Government Sanction								
Planning for Old Neighbourhoods						Plan preparation		Government Sanction								
Planning for larger slums						Draft Plan preparation		Government Sanction								
Greenfield Development -TPS								Prepare & begin implementation of priority TPS								
Transit Oriented Development						Draft Plan preparation		Prepare & begin implementation of priority TOD								
Public Housing for EWS								Obtain land & plan		Implementation						
Interest subsidies for LIG Housing			Prepare a scheme		Sanction / consent		Commence disbursement									
Infrastructure Development - Metropolitan																
Water Resources																
Planning and Development of Kalu						Project preparation			Obtain Clearances		LA and R & R		Implementation >>			
Planning and Development of Shai						Project preparation			Obtain Clearances		LA and R&R		Implementation >			
Planning and Development of other sources								Project preparation			LA and R & R		>>>>>			
Transportation																
Suburban Rail (including MUTPII)			Project preparation			Project implementation >>>>>										
Metro Transit Network	Consideration & Approval of CTS		Project preparation and prioritisation				LA and R & R Phase I			Implementation Phase I						
Strategic Plan CIP (2009-14)																
ULB CDP/ CIP			Plan formulation						Plan implementation 2009-14				>>>>>>			
Para statal CDP /CIP			Plan formulation						Plan implementation 2009-14				>>>>>>			
MMR Strategic Plan/CIP			Plan formulation				MPC / GOM Approval		Plan implementation 2009-14				>>>>>>			
GIS Development			Design		Map generation			Attribute data, updating routines				Management Reports				
Monitoring & Evaluation																
Monitoring & Evaluation			Design data systems		Develop indicators		Begin reporting		First Mid-Term Review							

>>>>> a continuing activity or implementation that may go beyond the period indicated.

Chapter One

Envisioning MMR: Goals and Strategies



Envisioning MMR, Goals and Strategies

1

1.1 INTRODUCTION

Mumbai has experienced many planning initiatives like the Modak-Meyer Plan of 1948, the Study Group on Problems of Mumbai (Barve study group), 1958 and the Development Plan of Greater Mumbai, 1964. However by 1965 it was recognized that Mumbai's growth impulses would transcend the Municipal boundaries into a much larger region. A committee appointed under the Chairmanship of Dr. D.R. Gadgil for planning of Mumbai and Pune metropolitan regions proposed planning at the metropolitan scale and recommended a legislative provision for preparing statutory regional plans. The first statutory regional plan for Mumbai Metropolitan Region (MMR) was undertaken during 1967-70 and was sanctioned in 1973.

1.2 REGIONAL PLAN 1973

The Regional Plan, 1973 diagnosed that in the absence of planned intervention;

- Industrial development in terms of value added and growth in employment will continue to be the basic activity, which will cause growth in other sectors as well as immigration to the Region;
- In addition to industries, tertiary employment particularly in offices including Government offices will also become a major economic activity causing concomitant growth in other sectors;
- Industries, offices and commercial activities will continue to concentrate in south Mumbai which will make provisions of infrastructure, particularly transport very costly;
- Private land ownership and speculation in land market would restrict access to land of the poor and prevent land value gains being recouped for infrastructure investment; and
- There would be urban sprawl with hotch-potch development invading good agricultural land leading to infrastructure demands which will be expensive to meet.

Based on the above diagnosis the Regional Plan adopted the following framework for its proposals;

- Supporting inter regional dispersal of industries to reduce immigration to MMR;
- Promoting growth of Navi Mumbai and other growth centres like Kalyan by restricting growth of industries and offices in Mumbai, as such decentralised pattern of growth would be cost effective in terms of investment requirement for infrastructure;
- Bulk land acquisition is the only option available for controlling speculation and recouping land value gains for financing infrastructure improvements; and

- Urban growth needs to be physically confined to well defined areas based on the desirable densities and population distribution and rest of the region be conserved as agricultural/rural area.

1.3 REGIONAL PLAN 1999

The Regional Planning Board that prepared the Regional Plan, 1973 was wound up according to the scheme of the Maharashtra Regional and Town Planning Act 1966. As a follow up of Regional Plan, CIDCO was appointed as the New Town Development Authority for Navi Mumbai in 1970. However soon it was felt necessary to have an agency for ensuring development of the region according to the plan having a perpetual existence. Accordingly MMRDA was established under the MMRD Act that was enacted in 1974. The region was also expanded to include parts of Pen and Alibag Tehsils. MMRDA was empowered to undertake revision of regional plan under the MR & TP Act 1966. Mumbai Metropolitan Region Development Authority (MMRDA) undertook the revision of Regional Plan during 1989 to 1995. The revised Regional Plan was sanctioned in 1999. This Regional Plan made following observations on the diagnosis of the earlier Regional Plan.

- Industrial growth in MMR has been sluggish both in terms of value added and employment. There has been an absolute decline in industrial employment in the post 1980 period. This cannot however be solely attributed to the regional policies. Restrictions on the modernisation and expansion, labour laws and general obsolescence particularly in the textile industry have been the major causes;

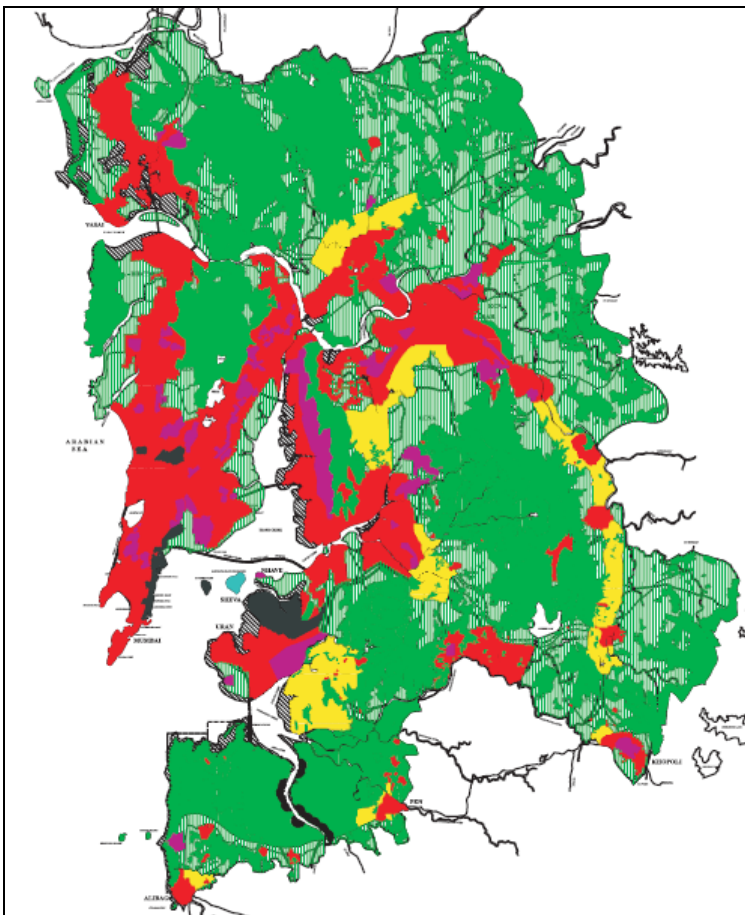


Figure 1-1: Regional Plan 1999

- Employment in large establishments including public sector establishments has not grown. In fact some sectors have suffered a decline. The employment growth has largely been in small establishments and in the informal sector;
- Resources for infrastructure investment required for supporting and promoting poly-centric pattern of development have not been coming about easily. Major infrastructure bottlenecks are experienced in terms of water supply in Vasai-Virar, Thane-Kalyan and Navi Mumbai. Efficient transport and communication infrastructure which is critical for poly-centric pattern for development has not developed not to speak of advanced sophisticated communication facilities;

- The resident population of Island City has begun to decline. But growth of Navi Mumbai after twenty years of efforts has been modest and the population is only a fraction of what was targeted in the 1973. Major growth has occurred along the rail corridors, Mira-Bhayandar to Virar on the western railway and in Thane-Kalyan- Bhiwandi sub region. But the overwhelming problem is that the poor do not have access to serviced land with the result that illegal and unserviced settlements continue to proliferate; and
- Strategy of bulk land acquisition has succeeded in Navi Mumbai but similar efforts in Kalyan had to be given up. There is now a general consensus that bulk land acquisition will not be a feasible proposition in MMR as the main plank of land policy.

The plans prepared prior to this Regional Plan were prepared within the inward looking national economic framework. Infrastructure services were supposed to be provided by public sector by deploying public finances. But during the preparation of Regional Plan, on account of economic liberalization of 1991 and the 74th Constitutional amendment of 1992 the policy context of metropolitan planning had substantially changed. The revised Regional Plan therefore emphasised “management of growth “as distinct from planned and controlled growth.

The strategic goal of such regional development management was proposed to be “to promote and sustain growth with social justice in a resource efficient manner and in consonance with the goals of national development planning’.

This basic goal was translated into following specific objectives;

- to facilitate and promote economic growth of the region taking into account its role in the process of national development;
- to improve quality of life particularly of the poor and the deprived;
- to minimise the impact of negative externalities - particularly the adverse environmental impacts - that may occur in the process of economic growth;
- to achieve these objectives improve the efficiency of existing methods of resource mobilisation, adopt innovative methods of resource mobilisation and facilitate, attract and guide private investment in the desired direction; and
- to achieve these objectives, promote effective citizen participation in the process of development through decentralisation of institutions.

The Regional Plan further observed that policies, programmes, procedures and projects would have to be evaluated with reference to these basic objectives on a continuing basis, requiring a drastic change in metropolitan planning - moving away from land use planning to truly comprehensive development planning.

1.4 MUMBAI VISION: TRANSFORMING MUMBAI INTO A WORLD-CLASS CITY

Mumbai, the engine of economic growth, seemed to be slowing down by the turn of the Century; firstly due to loss of manufacturing and secondly by losing

competitive edge on account of infrastructure lag.¹ This prompted **Bombay First**² to commission McKinsey & Company Inc. to prepare a strategic plan of Mumbai. Bombay First – McKinsey Report entitled “Mumbai Vision: Transforming Mumbai into a world-class city”³ put forward the following as Mumbai’s aspirations for 2013.

- **Economic growth:** To illustrate, real growth needs to jump from the 2.4 percent between 1997-98 to 2001-02 to 8-10 per cent over the next decade, thus creating more than 0.5 million additional jobs;
- **Transportation:** Significant improvement is required in both mass and private transportation. In mass transportation, it is imperative to ensure that the traveling population per rail car is kept down to 220 people and there is at least one bus for every thousand people. At present, suburban rail congestion is such that during peak hours there are more than 570 people per rail car in certain sectors. For private transportation, increasing the average speed of travel, tripling the freeways/expressways and increasing the number of public parking places by order of magnitude is essential;
- **Housing:** Some of the aspirations with respect to housing include bringing down the number of people living in the slums from current 50-60 percent to 10-20 per cent. Mumbai also needs to increase housing affordability by, for instance, bringing down housing rental costs from their current 140 per cent of per capita income to about 50 per cent;
- **Other infrastructure (Safety, environment, water, sanitation, education and healthcare):** Mumbai needs to upgrade the performance in all these areas. For example, despite the healthy statistics on crime, it needs to further improve the law and order environment. Besides, it must drastically reduce air pollution from the unsafe 1000 microgram per cubic meter (mcm) to that it currently is to 50-100 mcm;
- **Financing:** Reaching one of the benchmarks would involve reducing the percentage of administrative expenditure from its current 50 to less than 25 thereby enabling increased fund availability for development and maintenance; and
- **Governance:** An immense improvement is needed in governance. For instance, the time required for the key process of building approvals should be reduced from 90-180 to less than 45 days.

The report concentrated on city of Greater Mumbai and did not cover the entire Metropolitan Region.

1.5 THE TASK FORCE

As a sequel to the Bombay First-McKinsey Report the Chief Minister appointed a Task Force⁴ under the Chairmanship of the Chief Secretary to Government of Maharashtra to study the proposals of the Bombay First –

1 This was anticipated in the Draft Regional Plan prepared by Mumbai Metropolitan Region Development Authority in 1995.

2 Bombay First is an initiative of the Bombay Chamber of Commerce and Industry which has its mission to make the city a better place to live, work and invest in.

3 Vision Mumbai: Transforming Mumbai into a World Class City, A summary of recommendations A Bombay First – McKinsey Report 2003.

4 Government of Maharashtra by its Government Resolution No.CS-2003/20/1 dated the 16th October 2003 constituted the Task Force “To prepare an Action Plan for transforming Mumbai into a World Class City by scrutinising the report ‘Vision Mumbai’ submitted by the Bombay First”



McKinsey Report and make final recommendations. The Task Force in its first report⁵ proposed the following as the vision statement:

“Transforming Mumbai into a world class city with a vibrant economy and globally comparable quality of life for its citizens.”

The Task Force echoed the six-pronged strategy proposed by the Bombay First – McKinsey Report to achieve the vision. The Task Force also made recommendations in respect of delivery and accountability mechanisms including setting up of CAG. The Task Force apart from recommendations in respect of housing, transport and governance recommended creation of ring-fenced **Mumbai development fund (MDF)** to finance infrastructure projects and conversion of the Task Force into an Empowered Committee (EC). The EC has since been appointed.⁶

Later the Chief Minister of Maharashtra constituted a Citizens Action Group (CAG)⁷ under his Chairmanship with representatives of Government agencies as well as of civil society. The CAG appointed various subgroups on subjects like economic growth, infrastructure, housing, governance etc.

1.6 THE WORLD BANK MISSIONS

The first World Bank Mission in March 2005 recorded that “the Government of India (GoI) has asked the World Bank to assist it with the preparation of a strategy designed to reverse the decline of the city, helping it to assure, in particular, that this strategy be based on a rigorous and sustainable **business plan** approach. At the same time, a major concern of both the World Bank and GoI is that the plan assures that this more market-friendly growth-inducing environment is both equitable and inclusive”. The World Bank Mission identified following key policy areas:

-
- 5 Transforming Mumbai into a World Class City First Report of The Chief Minister’s Task Force, Government of Maharashtra, February 2004
 - 6 The Empowered Committee was constituted by Government on the 27th March 2006 with following Terms of Reference
 - i) The Empowered Committee shall create a comprehensive multi-year plan for the transformation of Mumbai and Mumbai Metropolitan region. This plan should include all major development projects and policy changes (including those recommended by the Task Force); it should also include the timelines for major milestones and final completion of these projects.
 - ii) The Empowered Committee will take all the key policy and other decisions related to the plan of transformation of Mumbai.
 - iii) The Empowered Committee will monitor all key initiatives for Mumbai’s transformation. The Committee will be empowered to decide on the financing model for key capital projects (e.g. roads, Mumbai metro).
 - iv) It is also authorized to decide on the selection of projects and funding under the Mumbai Development Fund.
In case of (ii), (iii) & (iv) if the power of taking decision rests with the Cabinet or the Cabinet Sub Committee, the decision of the Empowered Committee will be recommendatory in nature.
 - v) The Empowered Committee will meet at least once a month on the date and time decided by the Chief Secretary.
 - vi) Within 6 weeks of its constitution, the Committee should present a 12 month action agenda along with timelines and milestones (derived from the overall plan) to the Chief Minister and the Citizens’ action Group for approval. The Committee shall also regularly update the Chief Minister and the Citizen’s Action Group on the progress made against this agenda.
 - 7 Government in General Administration Department by its Resolution No. Mumbai Vikas-2004/Pra Kra 12/2004/SpecialProjects decided the following as the terms of reference of the Citizens Action Group
 1. Follow up of the implementation of the recommendations of the Task Force.
 2. To be present at the meeting convened once in three months with the Chief Minister
 3. Attract private investment fro the city.
 4. Obtain finances for the beautification of the city from the large businesses houses of Mumbai.

- Strategic planning and financing;
- Land, Real Estate and Housing;
- Economic Growth;
- Infrastructure; and
- Governance.

The World Bank has also been keen on having a business plan prepared that integrates various policy and investment decisions in a time bound manner to achieve Vision for MMR.

1.7 THE PROCESS OF PREPARING BUSINESS PLAN

Following this recommendation of the World Bank, the Government of Maharashtra (GOM) directed MMRDA to prepare a business plan for MMR. Accordingly MMRDA enlarged the scope of work of LEA International who were already engaged for preparing Comprehensive Transportation Study (CTS) of MMR to include preparation of Business Plan for MMR. Prior to this, Mumbai Transformation Support Unit (MTSU) was created in the All India Institute of Local Self Government (AIILSG) with the assistance of Cities Alliance. MTSU had begun and continued to work in parallel on some aspects of business plan preparation.⁸ To start with, the LEA Team reviewed the past planning efforts and collected the data compiled by MTSU. It then contacted the ULBs to help appreciate the ground realities. Using the

forecasts made by CTS the sector specialists associated with the LEA business plan team projected the infrastructure demand and translated it into investment needs. After identifying the main issues that need to be addressed in the business plan, first consultative workshop was held. The LEA Team then considered the financing and governance aspects in further details including relevant international experiences. After this the second consultative workshop was conducted. The details of consultative workshops are given in **Appendix I-1**. This draft final report is thus an outcome of analyses carried out by business plan team, outputs of CTS, work of MTSU and the feedback received from the

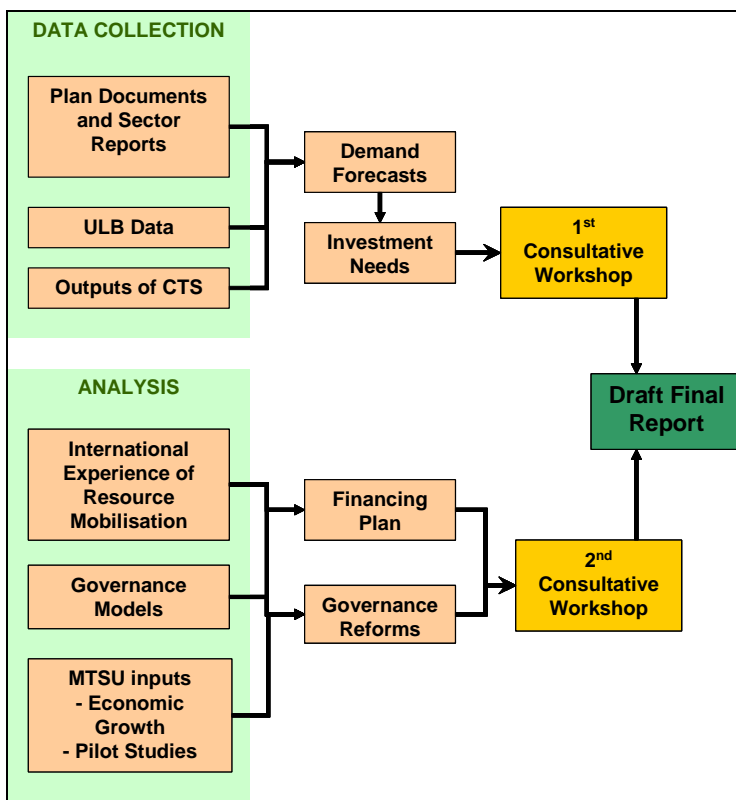


Figure 1-2: Business Plan Preparation Process

⁸ The Cities Alliance grant funds were to be used by the MTSU to obtain specialist advice in areas of (1) Housing (2) Governance (3) Economic Development (4) Physical Infrastructure (5) Strategic Planning and Finance (6) Social Infrastructure and to support the Mumbai Task Force to implement a major City Development Strategy.

consultative workshops. The process is depicted in Figure 1-2.

1.8 VISION FOR MMR

A brief analysis of MMR would suggest the following strengths, weaknesses, opportunities and threats (SWOT).

BOX 1-1: SWOT of MMR	
<p>STRENGTHS</p> <ul style="list-style-type: none"> Presence of two sea ports and airport Long history of international trade and financial services Presence of reputed research and educational institutions Large talent pool, good work culture Good power supply in Mumbai (though now under stress) Efficient public transport with a successful PPP in MRT Barely satisfactory water supply in Mumbai Citizens that pay user fees and taxes. Presence of MMRDA – A metropolitan planning and development authority 	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> The presence of ports and airport offer opportunities for improved external trade under the new WTO regime GOI policy of SEZs to boost export Possibilities of setting up of off-shore banking units and international financial services centre in SEZs Growing demand for IT and ITES Growth of high end manufacturing – Gems and Jewellery, Fashion Goods etc. Potential for growth of media and entertainment
<p>WEAKNESS</p> <ul style="list-style-type: none"> Topographic constraints, limited land supply. High real estate and housing prices Large proportion of slum dwellers Inadequate power supply Extremely overcrowded trains and slow moving buses on congested roads Water supply on the brink of turning into weakness in Mumbai and already a weakness in parts of MMR Generally poor solid waste management Vulnerability to flooding and disruption to traffic Mumbai ranked 150 in quality of life index in international comparison. Mumbai ranked 11th amongst 12 Indian cities in “ease of doing business” 	<p>THREATS</p> <ul style="list-style-type: none"> Competition from other Indian and Developing Country cities in terms of better quality of life at lower real estate and housing prices Inability to convert economic momentum into investment in infrastructure Inability to improve business environment.

The earlier exercise of envisioning was limited to Greater Mumbai (i.e. the jurisdiction of Municipal Corporation of Greater Mumbai (MCGM)). However considering the growth and expansion of Mumbai beyond the municipal boundaries and the economic interdependence of the local jurisdictions it is considered more appropriate to have a vision for the entire metropolis. There is also a consensus on this position. The vision proposed therefore is;

“Transforming MMR into a world class metropolis with a vibrant economy and globally comparable quality of life for all its citizens”.

The noteworthy features of this vision statement are that geographically it covers the entire metropolitan region and incorporates the notion of inclusive growth for all its citizens. Considering the SWOT of MMR the vision needs to be further translated into its economic, social and environmental dimensions.

BOX 1-2: Dimensions of Vision for MMR**Economic Growth**

- Mumbai will continue to be the financial capital of India with a leading position in stock exchange, mutual funds, insurance, banking and other financial services. Mumbai will also emerge as the regional financial centre exploiting its strategic location between London and Tokyo.
- MMR will strengthen its position in information technology (IT) and information technology enabled services (ITES) and emerges as the centre for high-end outsourcing such as engineering design.
- Manufacturing like apparel and fashion goods, gems and jewellery, electronics, printing and publishing and repair services could still prosper in MMR.
- Mumbai will maintain and technologically enhance its standing as the major film producing and entertainment centre in the South and Southeast Asia.
- MMR will also emerge as an important logistic and export hub through synergy between ports, airports and the special economic zones (SEZs).
- MMR will improve its rank in “ease of doing business” in terms of reducing time and cost of regulatory compliances.

Social and Environmental Dimension

- All citizens of MMR will have access to basic civic services like safe drinking water, sanitation, public transport, education, health care and recreation facilities.
- All sections of the citizens will have access to affordable housing with substantial increase in average space per person.
- The development will be environmentally sustainable and conserving built and cultural heritage.

In the vision the phrase world - class city has been used and then interpreted to imply vibrant economy and globally comparable quality of life. In this the context of strong globalizing trends and the concept of world cities also needs to be noted. The phrase world cities was perhaps used for the first time by Prof. Peter Hall when he identified seven cities viz. London, New York, Tokyo, Moscow, Paris, Randstadt Holland, and Rheine Ruhr region as the world cities.⁹ Whereas more recently, Sassen popularized the phrase global cities and identified London, New York and Tokyo as the global cities.¹⁰ A roster of World Cities was prepared in 1999 where presence of Global Accountancy Services, Global Advertising Services, Global Banking Services and Global Legal Services was used as the criteria to determine world city-ness. Mumbai did not find a direct entry into the roster but was identified as having “relatively strong evidence” of world city formation.¹¹ The details of classification given in footnote indicates that there is a considerable variation in cities in the same world city class in terms of population size, income and quality of life. But it is

9 *World Cities* Peter Hall, Heinemann, London 1966.

10 *The Global City* Saskia Sassen Princeton University Press 1991 and other works.

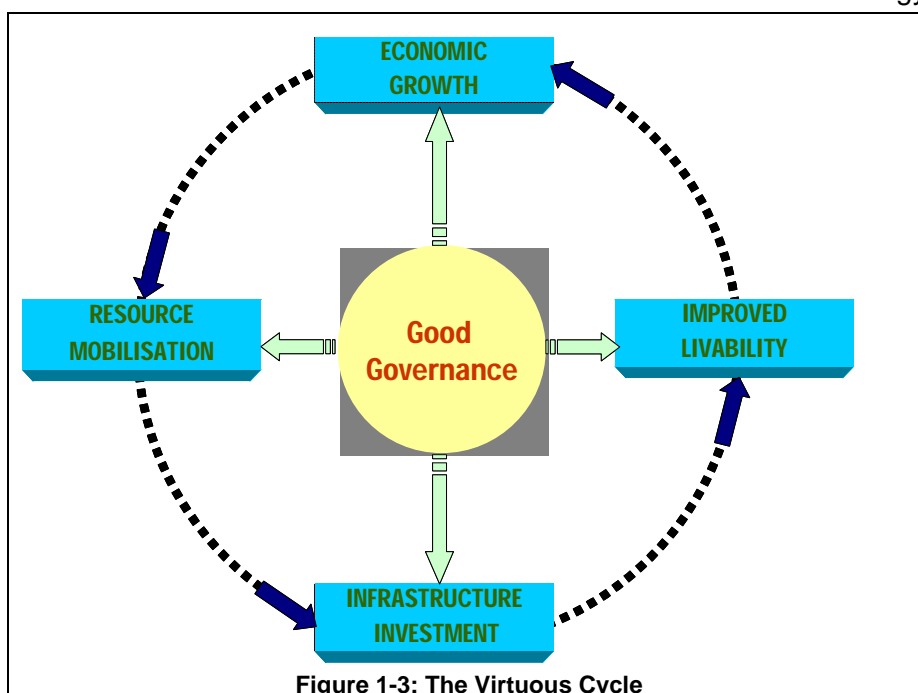
11 *A Roster of World Cities* Beaverstock *et al* in *Cities* 16(6) 1999. The “Alpha World Cities” include London, Paris, New York, Tokyo in the top rung with Chicago, Frankfurt, Hong Kong, Los Angeles, Milan and Singapore in the lower rung. The “Beta World Cities” include San Francisco, Sydney, Toronto, Zurich, Brussels, Madrid, Mexico City, Sao Paulo, Moscow and Seoul. The “Gamma World Cities” include Amsterdam, Boston, Caracas, Dusseldorf, Geneva, Houston, Jakarta, Johannesburg, Melbourne, Osaka, Prague, Santiago, Taipei, Washington, Bangkok, Beijing, Montreal, Rome, Stockholm, Warsaw, Atlanta, Barcelona, Berlin, Buenos Aires, Budapest, Copenhagen, Hamburg, Istanbul, Kuala Lumpur, Manila, Miami, Minneapolis, Munich and Shanghai. Other cities relatively strong evidence of world city formation are Athens, Auckland, Dublin, Helsinki, Luxembourg, Lyon, New Delhi, Philadelphia, Rio De Janeiro, Tel Aviv and Vienna.



indicative of the competition that Mumbai has to face in the globalizing context.

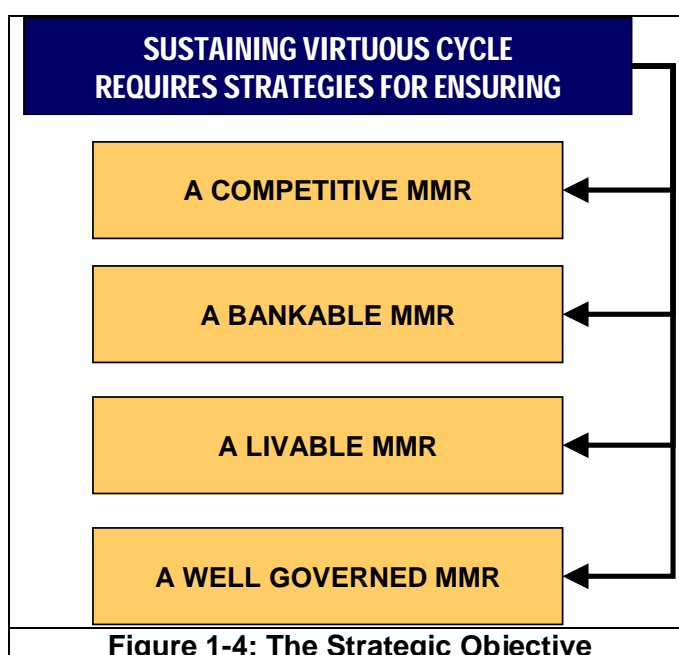
1.9 GOALS AND STRATEGIES

The basic strategy to achieve the vision of MMR is to ensure that MMR remains in a **Virtuous Cycle** in a sustained manner. Economic growth, mobilizing resources from such growth for investment in infrastructure, improving delivery of services and thereby leading to improved quality of life and environment are the key elements of the virtuous cycle. Shortfall in any one of them can adversely affect the others and push MMR into a vicious cycle. Good Governance therefore has to be at the core of such a strategy.



In order to sustain MMR in the virtuous cycle it would be necessary to develop strategies that ensure the MMR becomes competitive, livable, bankable and well governed as depicted in Figure 1.4.

Some of the above goals are shown in quantitative terms in Box 1.3.



BOX 1-3: Goals for attaining Vision**Economic Growth**

- GDP growth rate of 12-15% per annum with financial services, IT, ITES and Media/Entertainment growing at 15-18%
- MMR improving its rank in 'ease of doing business' among Indian cities to top 3
- Enhancing the work force participation rate to 40% by 2021 with significant increase in formal employment

Land, Real Estate and Housing

- Bring down the office rentals to comparable cities in Asia
- Reduce ratio of Median House Price to Median Annual Income to 5
- Reduce proportion of Slum Dwellers to 20%

Infrastructure

- 24/7 power supply in entire MMR
- Water supply of 240 lpcd in Greater Mumbai and 200 lpcd in rest of MMR on 24/7 basis
- 100% coverage by sewerage and slum sanitation
- No loss of life and property and disturbance to traffic due to flooding
- Daily 100% collection of solid waste and its environmentally compliant disposal
- Maximum Density of passengers in train-7/sq.m . Bus speeds to be 20 km/hour and vehicular speed to be 30 km/hour

Resource Mobilization and ULB Finance

- Operating Ratio i.e. Revenue Expenditure/Revenue Income should not exceed 0.9
- Private investment in infrastructure (billable services) to be at least 50% of requirement
- New real estate development to contribute at least 8% of its value to finance infrastructure development
- ULBs to improve debt servicing capacity to be able to meet capital investment needs after allowing for inter-governmental transfers and own resources.

1.10 THE BUSINESS PLAN - LIMITATIONS

The business plan for MMR translates the goals and strategies designed to attain the vision into a series of action plans. These action plans cover governance and legal reforms, estimates of order of magnitude of investment for infrastructure improvement, identification of key regional infrastructure projects, methods of resource mobilization, an indicative capital investment plan for 2007-2021 including corresponding financing plan and a monitoring and evaluation process that would help evaluate outcomes to help periodically revise the business plan. The business plan however does not include any engineering investigations and designs and the assessment of investment needs are based purely on secondary sources. Similarly business plan does not pretend to be a detailed regional or development plan. It also does not attempt a detailed yearly investment plan with corresponding financing plan.

Chapter Two

MMR Economy and Development Scenario



MMR Economy and Development Scenario

2

2.1 ECONOMY OF GREATER MUMBAI

The economic data (national accounts) are available for administrative districts. MMR comprises the districts of Greater Mumbai and parts of Thane and Raigad. Data for precisely defined MMR are therefore not available. Consequently the economy of Greater Mumbai is first described and then MMR including whole of Thane and Raigad districts.

Mumbai's per capita GDP has been significantly higher than that of Maharashtra or India. In 2004-05 (at 1993-94 prices), per capita gross domestic product (GDP) of Greater Mumbai, Maharashtra and India were Rs.46,010, 20,384 and 15,422 respectively (Figure 2-1).

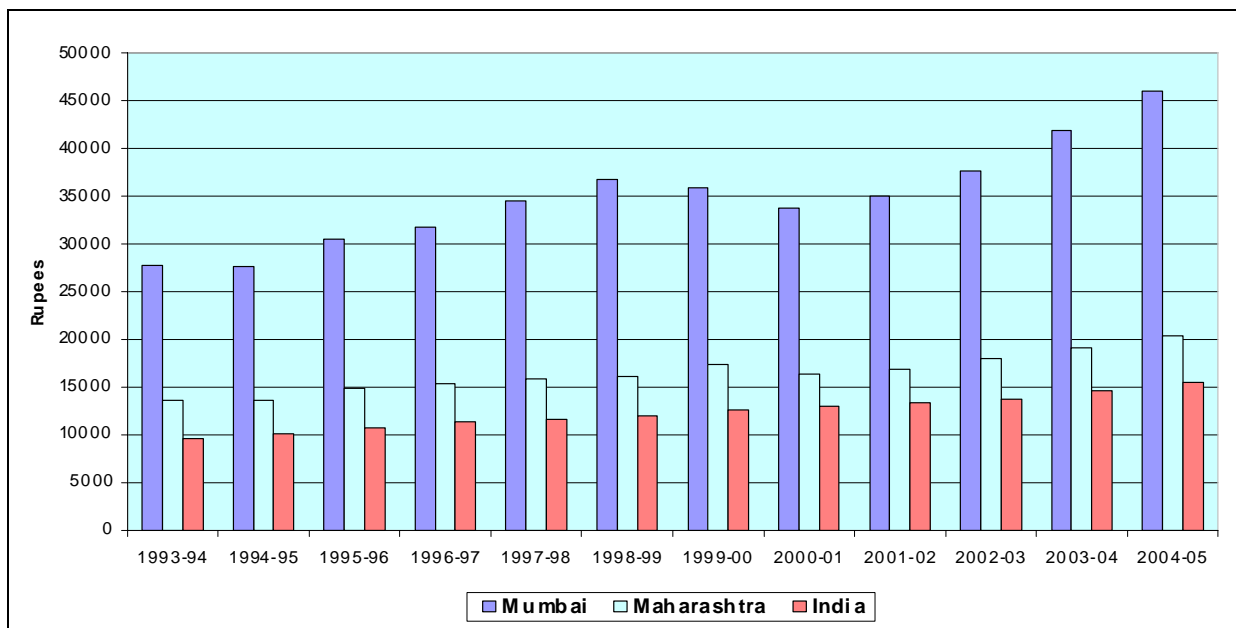


Figure 2-1: Per capita GDP of Greater Mumbai, Maharashtra and India (at 1993-94 Constant Prices)

The long term (1993-94 to 2004-05) CAGR of GDP of Greater Mumbai, Maharashtra and India is 6.5%, 5.7% and 6.3% respectively. It however obscures the volatility of growth rate of Mumbai. As evident from Figure 2-2, during 1995-2005, Indian growth rate has remained within a range of 4% to 9%. However, Greater Mumbai's growth rate has been more volatile, i.e., -5% in 2001 to 13% in 2004. Given the share of Mumbai's GDP in Maharashtra (27%), volatility of Mumbai's growth affects that of Maharashtra as well.

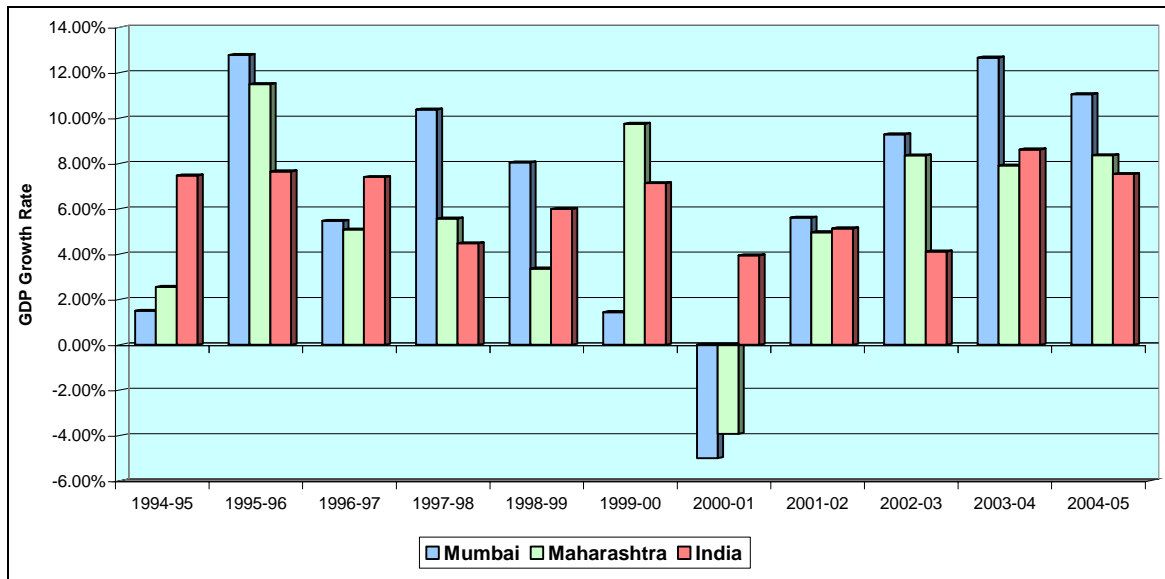


Figure 2-2: GDP Growth Rates of Greater Mumbai, Maharashtra and India

2.2 SECTORAL COMPOSITION OF GDP OF GREATER MUMBAI

The volatility of growth rate of Mumbai could be traced to structural changes in its economy. Figure 2-3 shows that during 1996 to 1999 the share of registered manufacturing and banking and insurance in Mumbai's GDP was almost similar. After 1999 up to 2001 the GDP originating in registered manufacturing declined sharply. Unregistered manufacturing too declined but not as sharply. Banking and insurance increased during 2000 but declined in 2001, the year in which Mumbai recorded a negative growth. After 2001, banking and insurance, trade, communications and other services have surged. Manufacturing has also grown but did not reach its level of 1999. Thus Mumbai's transformation from being an *industrial city* to a *services city* that began in 1980s further strengthened during early years of this century.

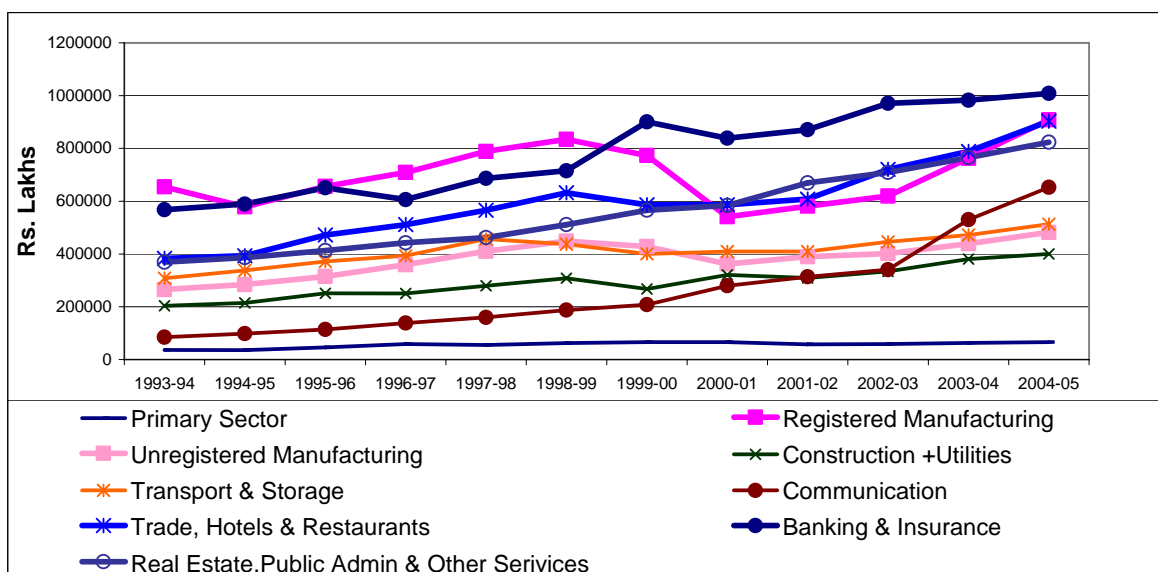


Figure 2-3: Greater Mumbai GDP: Sectoral Growth Rates

2.3 ECONOMY OF MMR

Figure 2-4 shows the share of Mumbai (Greater Mumbai), Thane and Raigad in the total GDP of Maharashtra. Share of Greater Mumbai in Maharashtra's GDP is 27% and that of Thane and Raigad districts together is around 13% thus making MMR share as 40%.

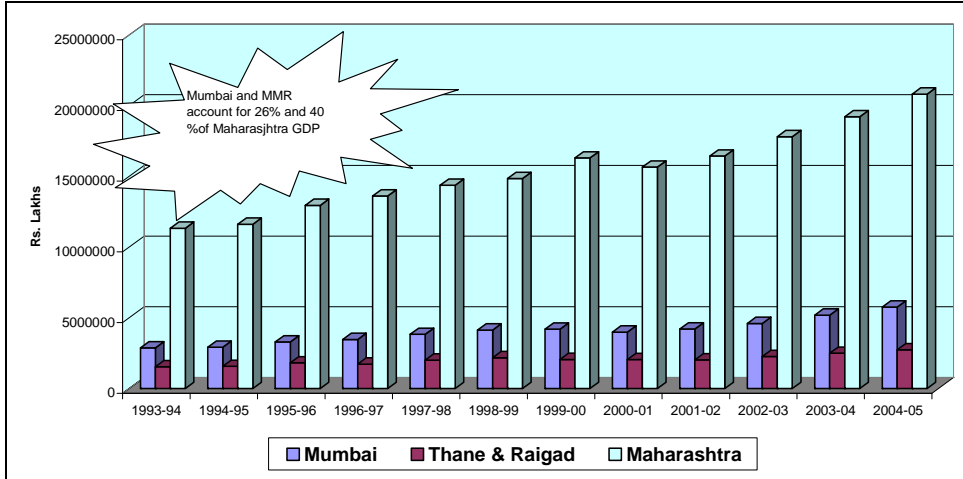


Figure 2-4: Share of Mumbai GDP in the State, 1993-94 to 2004-05

2.4 EMPLOYMENT

Unlike GDP, yearly data on employment are not available. Economic Census is the comprehensive source of establishment and employment data. Comparison of sectoral employment in 1980, 1990 and 1998 for Greater Mumbai, as shown in Figure 2-5, indicates that the changes in GDP have also reflected in employment. However the growth rate of employment during 1990 to 1998 has been less than 1% per annum. This when compared to the long term GDP growth rate of about 6% is indicative of increasing productivity of labour in formal sector and also informalisation of employment. Mumbai's population grew at an annual rate of 1.84% during 1991-2001 but number of workers grew at a rate of 2.61% during the same period.

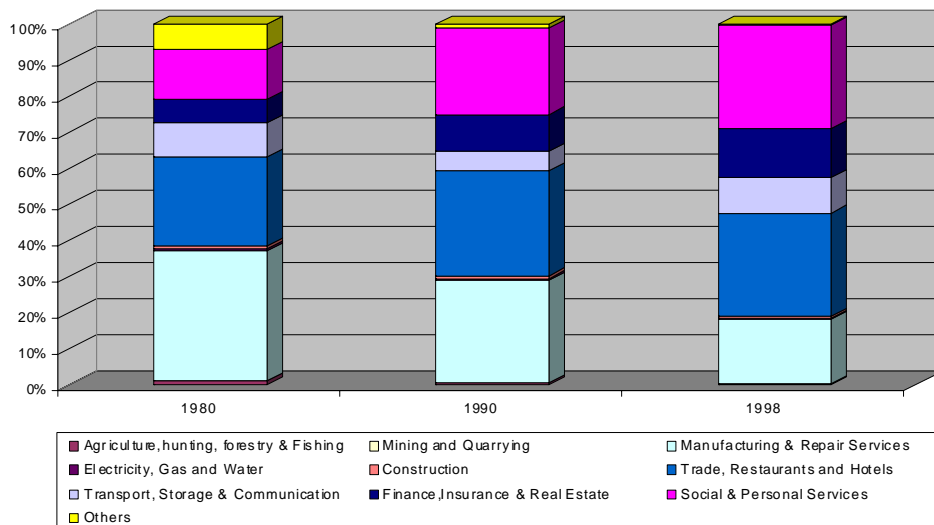


Figure 2-5: Sectoral Employment in Mumbai

2.5 INFORMAL SECTOR

Based on the data from National Sample Survey Organization (NSSO) 55th Round, it is estimated that 56 % of Indian urban labour force is in informal sector.¹ Though estimate for MMR have not been attempted, from the analysis of the Economic census, it is clear that the share of employment of large establishments has been declining in Mumbai and the number of small establishments is growing. The workers reported in population census are the most inclusive number of workers. Employment reported in the economic census is less inclusive as it excludes workers that have no fixed establishment and data collected by Director of Employment refers only to all public sector establishments and private sector establishments employing more than 10 employees in Mumbai and 24 elsewhere. Depending upon what measure of total employment and formal employment is used the proportion of informal sector employment varies between 30 to 60%.²

The contribution of informal sector to economy in terms of net domestic product (NDP) has been estimated to be 47.7% in 2000-01. However the share of agriculture, forestry and fishing is as high as 25%. Amongst the predominantly urban sector the share varies from 0.1% in electricity, gas and water supply to 9.3% in trade, hotels and restaurants³. No specific estimates of share of informal sector in MMR NDP have been attempted. Nevertheless, it could be inferred that in MMR though participation of informal employment is rather large, its contribution to economy is modest.

2.6 KEY GROWTH DRIVERS

Economic data in terms of gross domestic product (GDP) is not adequate to identify growth drivers at a finer scale. However, general trends indicate that certain activities are likely to drive MMR's economy over the next few decades.⁴

- Financial services including banking and insurance;
- IT and ITES;
- Communications;
- Biotechnology;
- Media and entertainment;
- Retail;
- Logistics and warehousing near the ports; and,
- High end export oriented manufacturing particularly in SEZs.

1 Testing the Conceptual Framework of Informal Employment: A Case Study of India by Dr.G.Raveendran and G.C.Manna a paper presented at the Sixth Meeting of the Expert Group on Informal Sector Statistics.

2 Regional Plan for Mumbai Metropolitan Region 1996-2011 Mumbai Metropolitan Region Development Authority (MMRDA)

3 Estimation Of Informal Sector Contribution In The Net Domestic Product - Indian Experience by Ramesh Kolli and Suvendu Hazra, National Accounts Division, Central Statistical Organisation, India. A paper presented to the Expert Group on Informal Sector Statistics (Delhi Group) 29 – 31 March 2005.

4 This is corroborated by the study "Economic Growth of the Mumbai Metropolitan Region" by The Urban Institute (in association of ICRA Management Consulting Services and ICMA South Asia) 2006. The study was funded by USAID.



2.7 SPATIAL CLUSTERING OF EMERGING ECONOMIC ACTIVITIES

Mumbai historically developed as a mono-centric city with port, government, banking and insurance, stock exchange and wholesale trade all being concentrated in and around Fort. Development of Navi Mumbai that began in 1970 was the first attempt to create a new centre of growth. In 1977, in its paper on Optimal Regional Structure MMRDA argued for a polycentric pattern of growth. Now with diversification of economic growth, conversion of manufacturing sites and expansion of transit facilities planned, a clear pattern of spatial clustering is emerging.

The spatial clustering is described in Table 2-1 and depicted on the Figure 2-6.

Table 2-1: Spatial Clustering

Sr.No.	Key Driver	Location
1	Financial services including banking and insurance	Fort, Nariman Point, Bandra Kurla Complex
2	IT and ITES	Andheri-Kurla Road, Thane, Malad, Navi Mumbai
3	Biotechnology	Navi Mumbai
4	Media and entertainment	Malad - Link Road, Goregaon
5	Retail	Mill district, Malad, Mulund, Thane, NaviMumbai
6	Logistics and warehousing	JNPT, Navi Mumbai
7	High end export oriented manufacturing	SEZs at Mumbai Suburbs, Navi Mumbai, Khopda, Kalyan, Panvel, Gorai-Manori etc.

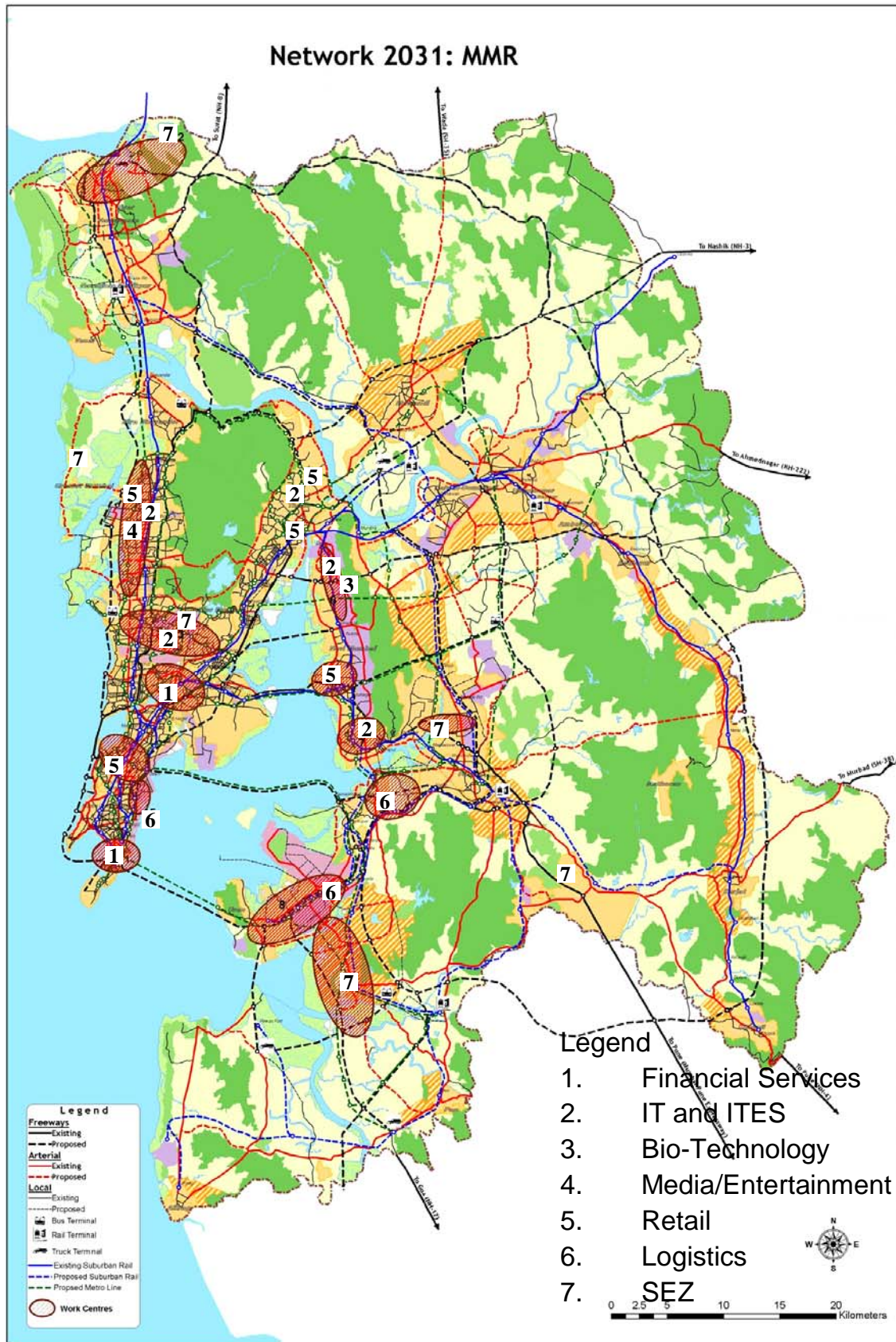


Figure 2-6: Emerging Clusters of Growth

2.8 THE CHALLENGE OF SUSTAINING HIGH GROWTH RATE

Greater Mumbai and MMR have maintained a growth rate of over 10 % since 2002. However it occurred after a negative growth in 2001. In the 11th Five Year Plan Indian economy is expected to grow at a rate of 9% p.a. With agriculture not expected to grow at more than 4.1%, secondary and tertiary sectors will have to grow at a higher rate of 10.5 and 9.9% respectively⁵. In that context MMR will have to grow at 12 to 15 % p.a. and sustaining such growth rate is therefore the challenge.

BOX 2-1: Main Threats to sustain high growth rate:

- The regulatory constraints on “doing business”
- High real estate prices at low quality of life in international comparison
- Mismatch between the required skill profile and available manpower
- Absence of an institution at the metropolitan level responsible for economic growth
- Absence of data system that provide information to monitor specific performance of MMR.

2.8.1 Doing Business

“Doing Business in South Asia 2007”⁶- A survey carried out by the World Bank has compared the time and cost involved in complying with following 10 parameters;

- Starting a business
- Dealing with licenses
- Employing workers
- Registering property
- Getting credit
- Protecting investors
- Paying taxes
- Trading across borders
- Enforcing contracts
- Closing business

Amongst the 12 Indian cities studied, Mumbai ranks 11th and India (based on Mumbai’s score) ranks 134th among 175 countries. The details of ranking of cities are given in **Appendix II-1**. Many of the problems stem from National and State legal and regulatory system. The city wise variation essentially occurs on account of time and cost involved in compliance of these legal requirements. While it would be desirable to reform the legal system to help India achieve a better rank in terms of “doing business” it would be necessary to improve MMR’s rank by improving the administrative efficiencies.

⁵ “Towards Faster and More Inclusive Growth, An Approach to the 11th Five Year Plan” Planning Commission, Government of India June 14, 2006

⁶ “Doing Business in South Asia 2007” The World Bank, Washington DC 2007. Some doubts persist about the methodology – particularly the sample size. However assuming that the same methodology is used across all cities the comparison is considered to be valid.

The ease of doing business is also linked to proportion of informal sector. An improvement in the ease of doing business may also help reduce the proportion of informal sector.

2.8.2 Real Estate Prices and Quality of Life

An international comparison of office rents and Quality of Life (QoL) Rank is shown in the Figure 2-7 below.

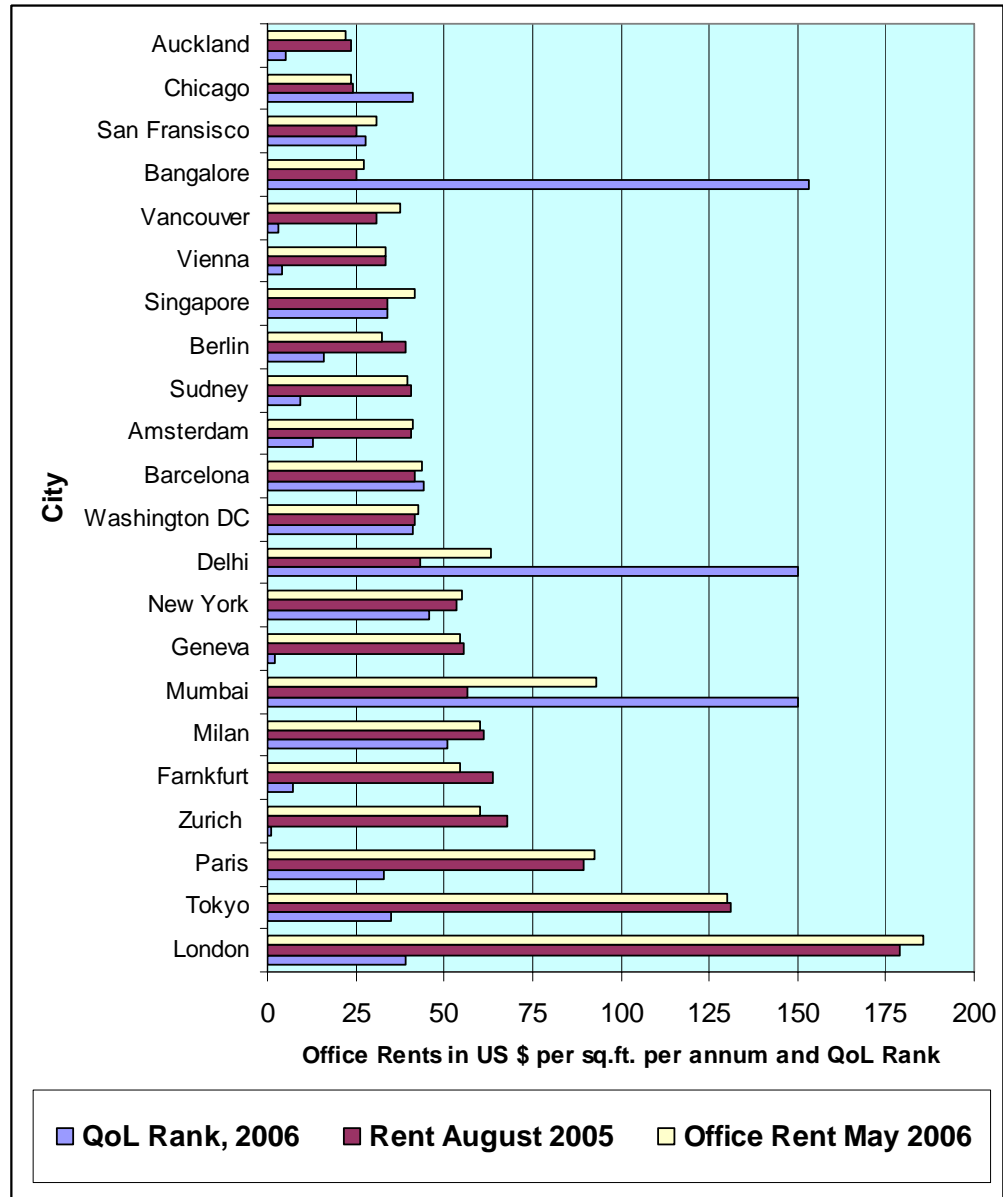


Figure 2-7: Office Rents and Quality of Living Rank

Mumbai's office rents are higher than those in many cities like Geneva, New York, Washington DC, Amsterdam and Singapore⁷ but its quality of life rank is 150 whereas cities mentioned have ranks of 2, 46, 41, 13 and 34 respectively. Furthermore during 2005-2006 Mumbai's office rents have increased substantially as compared to other international cities. This would

⁷ Office rents are as reported in "Global Market Rents, August 2005 and May 2006" by CB Richard Ellis. These rents are of A grade office premises. It does not therefore imply that lower quality office space is not available at lower rent.

certainly affect the competitive advantage of Mumbai in attracting economic growth. A city that aspires to become world class will have to pay attention to both prices of commercial real estate and quality of life.⁸

2.8.3 Skilled Manpower

There is a general perception that trained and skilled manpower required for newly emerging economic growth sectors, having high growth potential, suffer from lack of trained manpower. These sectors are IT and ITES, financial services, media and entertainment etc. Projections at national level show that the country will need 230 lakh professionals to meet IT industry's \$60-billion export revenue target by 2010. However, given the current capacity of higher education, the system will be able to produce only 7,00,000 qualified professionals.¹⁰

MMR also faces shortage of skilled manpower in most sectors that are expected to act as the key drivers such as financial services, IT and ITES, media and entertainment, gems and jewellery, larger format retail etc. Moreover the skill shortage is acute at vocational undergraduate level. The GOM department of vocational training has initiated many vocational training programmes at the undergraduate and school level. In many cases, industry has also initiated skill development programmes. Synergy between user industry, institutions imparting training and authorities deciding syllabi and certifying students and training institutions has to be harnessed. This could be facilitated by the institutions responsible for economic development of MMR.

BOX 2-2: The Emerging Skill Shortage⁹

While India's young demographic profile has the country favorably placed in terms of manpower availability, talent supply shortages are emerging. This is extremely disconcerting especially for the knowledge services sector, which, over the last few years has emerged as a significant growth engine with demonstrated gains in terms of exports, employment and very visibly in urban development across several cities in the country. Research has shown that so far, only a tenth of the global addressable market for these services has been tapped. With its early lead and strong fundamentals (demographics, economics, and expertise), India is best positioned to take advantage of this opportunity. Yet the unsuitability of a large proportion of the talent pool in the country could lead to significant lost opportunities. The NASSCOM-McKinsey Report 2005 projections indicate that these will fall short by about 500,000 suitable professionals (representing an opportunity cost of US\$ 10bn) by the end of the decade and in the absence of corrective action, this gap will continue to grow. However, if current trends are maintained, the IT-ITES sector (IT-ITES alone of the knowledge sector) will need an additional 1 million plus qualified people in the next 5 years and will generate exports of US \$ 86 billion in FY 2012. If the country is to capitalize on the huge opportunity in this and other areas of knowledge services, what is needed is a major thrust at all levels of education. Clearly, substantial expansion and radical reform of the education sector are called for to ensure that we are able to meet the quality and quantity of professionals needed by the country.

⁸ Quality of Living Index is as reported in Times of India, April 11, 2006 based on the report of Mercer Human Resource Consulting. These indices are prepared as guidance to MNCs for devising the compensation package for posting expatriate employees. The index is based on Political and social environment, Economic environment, Socio-cultural environment, Medical and health considerations, Schools and education, Public services and transportation, Recreation, Consumer goods, Housing, Natural environment.

⁹ 'Towards Faster and More Inclusive Economic Growth-An Approach to the 11th Five Year Plan'-Planning Commission, 2006

¹⁰ "Skill development the mission" Times News Network [Wednesday, February 21, 2007]

2.8.4 Local Economic Development (LED)

Large scale manufacturing activity in MMR has declined. Such industrial growth is now taking place in other parts of the state. Key driver of Mumbai's economy are now the services sector. Despite such a trend, small scale industries still seem to have potential for growth and for creation of employment. MMRDA therefore needs to prepare plans for LED including policy for supporting growth of small scale manufacturing.

2.8.5 Absence of Institutional Response

“Planning for social and economic development” is one of the functions in Twelfth Schedule of the Constitution that can be assigned to local authorities. According to the legislative amendments carried out following the constitutional amendment, planning for social and economic development has also been made an obligatory duty of the local authorities. However, precious little is being done in that regard. Industries Department of the state government has prepared an “Industrial, Investment and Infrastructure Policy, Government of Maharashtra, 2006”. The objective of the policy is “*to achieve higher and sustainable economic growth with emphasis on balanced regional development and employment generation through greater private and public investment in industrial and infrastructure development*”. The policy targets are industrial growth rate of 10% per annum, service sector growth rate of 12 % and additional employment generation of 2 million by 2010. For non-viable sick units, one time settlement of government dues without interest and penal charges is offered. Further, single window clearance and reforms of labour laws are proposed for reducing start-up cost and time. For infrastructure expansion aggressive Public Private Ventures are sought and broadband connectivity across the state is emphasized. A new special purpose vehicle (SPV) is proposed to conceptualise, plan and implement the Mumbai-Pune-Nashik-Aurangabad quadrangle infrastructure development project. The policy thus recognizes the need for facilitating “doing business” and supporting the urban axis of the state through infrastructure development. Nevertheless for MMR an agency responsible for economic development will be necessary, given the complexity of managing growth with infrastructure development and quality of life.

2.8.6 Inadequacies of Data System

Since no agency is responsible for planning for economic growth, data systems necessary for monitoring economic growth of MMR have not developed. Director of Economics and Statistics, Government of Maharashtra provides district wise estimates of GDP and NDP as a part of the national accounts. However these are inadequate both in terms of geographic coverage and sectoral details. MMR boundaries do not coincide with district boundaries. Consequently MMR specific data are not available. Similarly sectoral details are available at coarse level. For example GDP contribution of IT and ITES or Media and Entertainment are not distinctly available. Data systems on employment are also weak. Economic census carried out once in

about 7 years is a comprehensive source but its frequency is not adequate for monitoring MMR's economic growth.

2.9 GOVERNANCE REFORMS

Most of the issues discussed above can be addressed through comprehensive governance reforms and are proposed in chapter 7.

2.10 ACTION PLAN

In view of the above action plan (refer Figure 2.8) in respect of ensuring vibrant economic growth includes

- Improving environment for “doing business”
- Improving skill profiles to match requirements of key economic drivers
- Improving data systems to help monitor economic growth
- Monitoring supply and prices of commercial real estate
- Preparing Local Economic Development (LED) plans

ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10
Consideration, approval and adoption of Plan														
Establishing and staffing Plan implementation unit														
Economic growth														
Strengthening MMRDA						Proposals for creating posts	Obtain Approval	Appoint						
Establish Economic Development Unit					Obtain Approval	Appoint								
Monitoring Economic Growth						Dialogue with Dir. Eco Stat	Design sysytem						Begin Reporting >>>	
Improve ease of doing business				Carry out detailed study			Propose procedural reforms			Accept and implement >>>>				
Improve skills	MTSU/MEDC facilitate ind. Edu dialogue		Syllabi				Begin courses							
Policy for small manufacturing			Formulate Draft Policy		Sanction/Consent		Projects/Programs Implementation >>>>>						MMRDA - Review Ind. Edu Syllabi	New Courses

>>>>> a continuing activity or implementation that may go beyond the period indicated.

Figure 2-8: Action Plan for Economic Growth

Chapter Three

Land, Real Estate and Housing



Land, Real Estate and Housing

3

3.1 INTRODUCTION

The real estate sector at present adversely affects the competitiveness of MMR by high prices of commercial real estate and also the livability by denying affordable housing to the majority. As noted in the previous chapter the office rents in Mumbai are extremely high in international comparison. A comparison of residential property prices in Indian cities is shown in Figure 3.1.

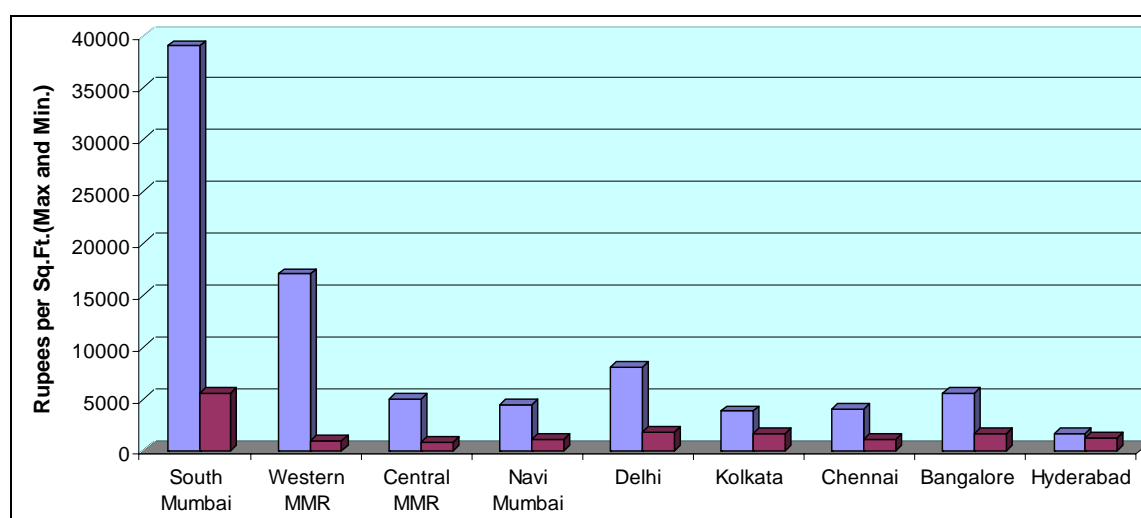


Figure 3-1: Residential Property Prices, December 2006

Source: Accommodation Times – Archives available at www.accommodationtimes.com

The data for cities other than Mumbai refers largely to core cities. In case of Mumbai the data includes prices in the MMR (Western MMR refers to Western Suburbs of Mumbai and Mira-Bhayandar to Virar and Central MMR refers to the Eastern Suburbs of Mumbai and the area from Thane to Badlapur) as well. Mumbai and MMR prices are distinctly higher than those in other Indian cities.

The price differential has reflected in the housing space consumption as shown in the room wise distribution of households of Greater Mumbai and Urban India (Figure 3.2). While urban India has only 35% households living in one-room dwellings, Mumbai has 64% living in such dwellings and majority of them are in slums and rent controlled *chawls*. Housing space available per person in Mumbai is less than 4 sq.m.

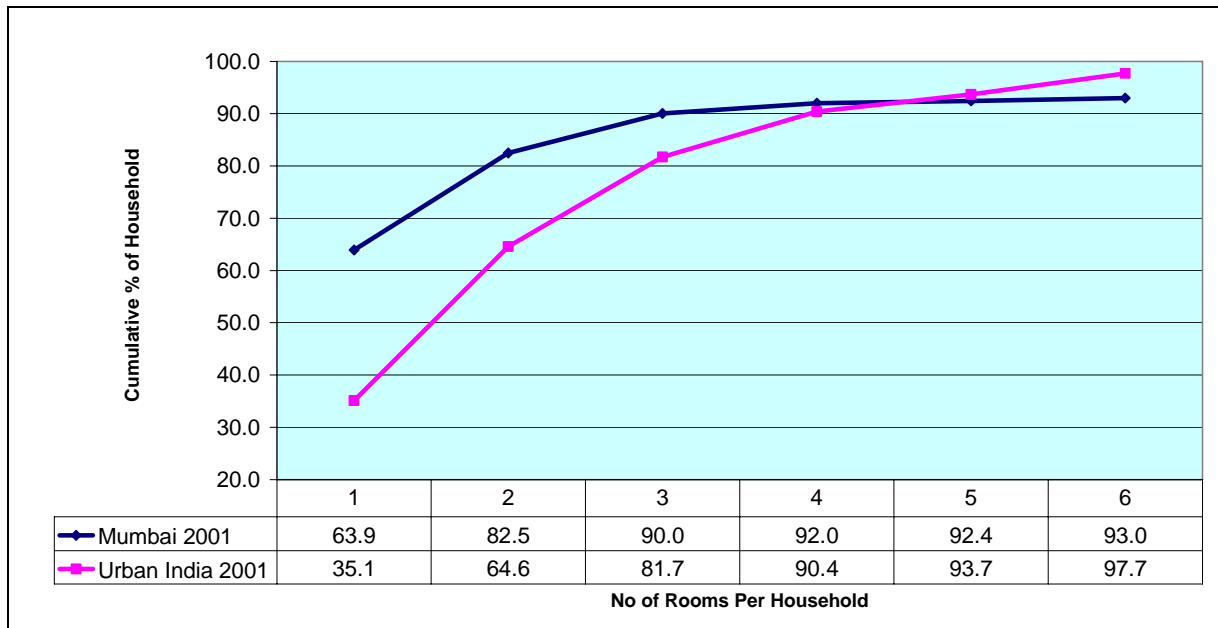


Figure 3-2: Room wise distribution of Households, Greater Mumbai and Urban India 2001.

Source: Census 2001.

Data for Greater Mumbai is used in the above illustration as Greater Mumbai accounts for 67 % of urban MMR for which data are available. Available data for other cities in MMR is given in Table 3-1.

Table 3-1: MMR Room Wise Distribution of Households (Cumulative %)

Urban Centres in MMR	No exclusive room	One room	Two rooms	Three rooms	Four rooms	Five rooms	Six rooms +
Island City	7%	75%	89%	96%	99%	99%	100%
Mumbai suburbs	7%	69%	90%	97%	99%	99%	100%
Greater Mumbai	7%	71%	90%	97%	99%	99%	100%
Thane (M Corp.)	3%	59%	87%	97%	99%	99%	100%
Navi Mumbai (M Corp.)	3%	52%	79%	95%	99%	99%	100%
Kalyan-Dombivali	2%	52%	88%	97%	99%	99%	100%
Ulhasnagar (M Corp.)	3%	51%	85%	96%	99%	99%	100%
Ambarnath(M Cl.)	2%	46%	83%	95%	99%	99%	100%
Badlapur (M Cl.)	1%	28%	69%	94%	98%	99%	100%
Bhiwandi (M Cl.)	4%	72%	91%	97%	99%	99%	100%
Mira-Bhayandar (M Cl.)	1%	48%	88%	98%	99%	99%	100%
Virar (M Cl.)	4%	41%	79%	97%	99%	99%	100%
Nalasopara (M Cl.)	1%	56%	92%	99%	99%	99%	100%
Navghar-Manikpur (M Cl.)	1%	29%	78%	95%	98%	99%	100%
Panvel (M Cl.)	1%	31%	62%	90%	97%	98%	100%
MMR Total	6%	65%	88%	97%	99%	99%	100%

Source: Census 2001

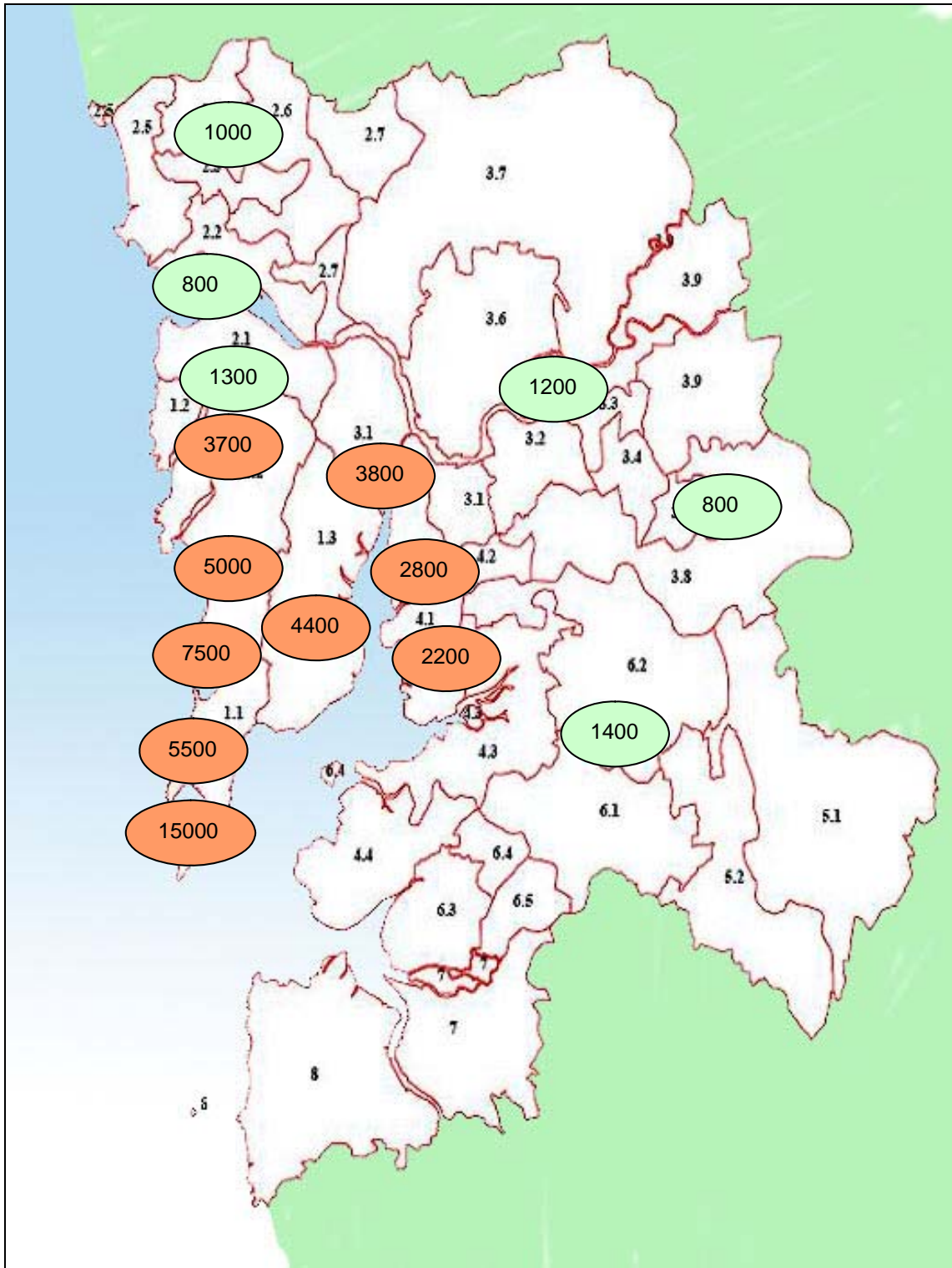
The average percentage of households living in One-Room dwellings in urban MMR is 59. It ranges between 28 % in Badlapur (minimum) to 68 % in Bhiwandi and 67 % in the Island City. The proportion of households living in one-room dwellings in urban MMR is thus distinctly higher than that in urban India.

3.2 HOUSING PRICES AND AFFORDABILITY

Residential property prices as they prevailed in MMR in December 2006¹ are shown in Figure 3.3. It would be seen that price at a distance of over 1.5 hour train journey from Mumbai CBD is around Rs. 1000 per sq.ft. A 300 sq.ft. house (having 225 sq.ft. carpet area - currently considered minimum) would cost Rs. 300,000, and such a house to be affordable, minimum household income would have to be Rs. 5000 per month (1/60th of the price). Reading from the Figure 3.4 that shows the income distribution, it is clear that nearly 40% of the household would not afford such a house. Within Greater Mumbai, the lowest residential price is Rs. 3700 per sq.ft. and at this rate, price of 300 sq.ft. house is Rs.11,10,000. Minimum income required to afford the house would be Rs.18500 implying that nearly 90% would not afford such a house in Mumbai. No wonder that Mumbai has the distinction of the highest concentration of slums.

The impact of price rise has reflected in unusually low income-elasticity of housing space consumption. Normally income elasticity of housing space consumption is observed to be 0.8 to 0.9 but in case of Mumbai it is observed to be lower than 0.3.

¹ Accommodation Times Website www.accommodationtimes.com, updated up to 18th December 2006



1.	Island City	1.2 & 1.3	Suburbs of Mumbai
2	Western Region (Mira-Bhayander, Vasai-Virar)	3	North Eastern Region (Thane, Bhiwandi, Kalyan-Dombivali, Ulahsnagar etc)
4	Navi Mumbai Region	5	Neral-Karjat Region
6	Panvel-Uran Region	7	Pen Region
8	Alibag Region		

Figure 3-3: Residential Property Prices (in Rs /Sq.ft.) in MMR, December 2006

Source: Accommodation Times

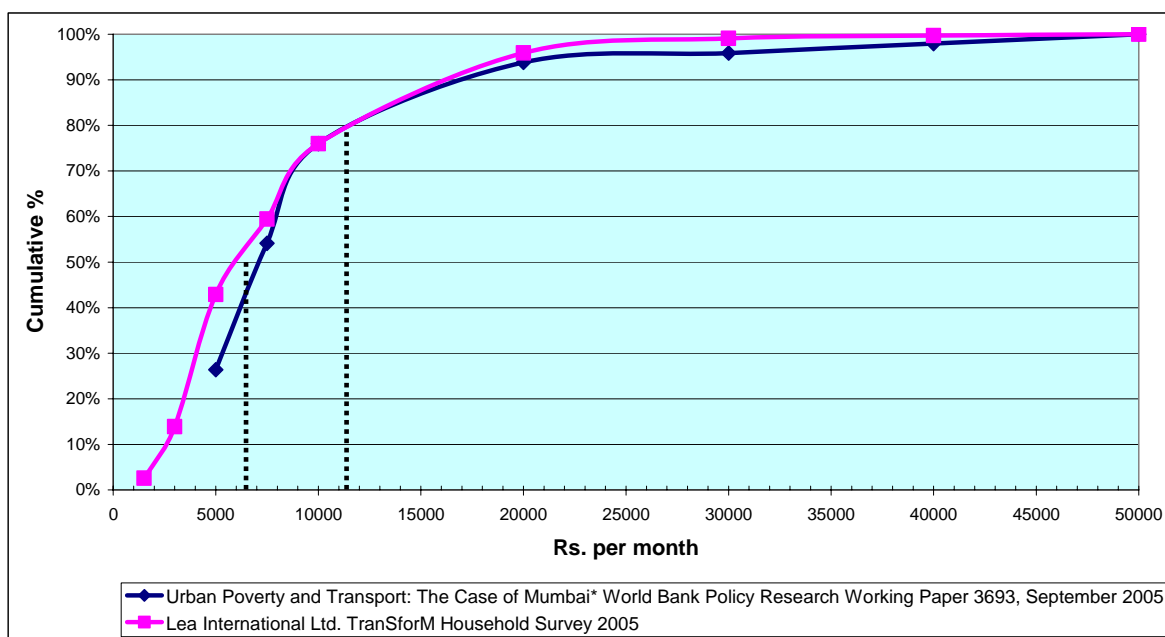


Figure 3-4: Household Income Distribution-MMR

3.3 HOUSING: STOCK AND FLOWS

Current housing situation has to be seen from the present **stock** and trends of **flows**. Present data systems are deficient in both respects. Following interpretation is therefore based on multiple sources and surveys.

Census 2001 compiled some data about slums and published data for million+ cities i.e. Greater Mumbai, Thane and Kalyan. The household survey carried out in 2005 for CTS also identified the type of house of the sampled household. City Development Plans (CDPs) prepared for Jawaharlal Nehru National Urban Renewal Mission (JNNURM) give some estimates of slum population. The assessment of slum households based on these sources is presented in Table 3-2.

Table 3-2: Status of slum population in MMR

Name of Corporation/Council	Slum Population	Year of Estimation and Source
Municipal Corporations		
MCGM	60% of total population, 1959 settlements having population of 6.5 million	2003 (Environment Status Report 2004-05)
TMC	35% of total population, 211 slums with population of 549775	2006-(CDP,Thane)
KDMC	11.7% of total population, total number in slums 123509	2006(CDP, KDMC)
MBMC	7.28% population, total number in slums 38137	2006 (CDP, MBMC)
NMMC	19.69% of total population,	Census 2001 (Population and Employment Profile of MMR, MMRDA,2002)
BNMC	About 19% of total population.	2003(Environment Status Report 2004-05)
UMC	11.36% of total population	Census2001 (Population and Employment Profile of MMR, MMRDA,2002)

Name of Corporation/Council	Slum Population	Year of Estimation and Source
Municipal Councils		
Vasai	10% of total population	2005(CTS Study)
Virar	15% of total population	2001 (Population and Employment Profile of MMR, MMRDA,2002)
Navghar Manikpur	7% of total population	2005(CTS Study)
Nallasopara	1.7 % of total population	2001 (Population and Employment Profile of MMR, MMRDA,2002)
Panvel	7.54% population with total number of 9280	2001 (Population and Employment Profile of MMR, MMRDA,2002)
Karjat	4.4% of total population	2001 (SWM Report, AILSG,2003)
Khopoli	4% of total population	2005(CTS Study)
Alibag	2% of total population	2005(CTS Study)
Matheran	1% of total population	2005(CTS Study)
Pen	2% of total population	2005(CTS Study)
Ambernath	38% population with total number of 78670	2005 (CDP-AMC)
Badlapur	7.67% of total population	2001 (Population and Employment Profile of MMR, MMRDA,2002)
Uran	5% of total population	2001 (SWM Report, AILSG,2003)
Total MMR – Slum Population	8947643*	* Calculated from the above data and also includes CIDCO area outside NMMC for which the slum percentage has been assumed as 20%
Total MMR – Urban Population	19958649	(Source- Report on Demography, CTS, 2005)
MMR - % of Slum Population	45%**	** This percentage does not include the structures under cessed building category.

Source: Compiled.

Assessment of the stock in terms of structural conditions, status of repairs, access to water and sanitation facilities is not systematically carried out. In case of the Island City there are about 19000 rent controlled buildings constructed prior to 1960, sheltering about 400,000 households. Out of these, about 16000 buildings are constructed prior to 1940. Some of these buildings may still be structurally sound but most are in need of reconstruction. The housing stock in MMR –Urban may thus be broadly classified as given in Table 3-3. Though no quantification is possible; certain proportion of non-slum housing stock in suburbs of Mumbai, Thane and Kalyan-Dombivli would be unsatisfactory in terms of its repairs and structural safety.

Table 3-3: Status of Housing Stock in Urban MMR

Sub-region	Total Households	Slums (% of Pop.)	Non-Slums Stock	
			Unsatisfactory %	Satisfactory %
MCGM	2662967	60	16	24
TMC	310815	35	Data not available	65
KDMC	313055	12		88
BNMC	116796	19		81
Ulhasnagar	103656	11		89
Mira Bhayander	142561	7.5		92.5
NMMC	210079	19		81
All Councils	390620*	9		91
Total Urban MMR	4250549	45	10	45

Source: Compiled * Note: also includes rest of CIDCO area outside NMMC

In terms of flows, no systematic data of housing accretion exists in the public domain though building permission mechanism intrinsically has the potential

to generate such data at least for the formal housing. The Regional Plan for MMR, 2011 attempted some estimates of housing flows.

- Annual Need for incremental housing in MMR was around 66,000 during 1981-91 and plan projected an accretion of 1,03,329 households for year 2001;
- In terms of supply, plan noted that formal housing supply was about 47400 units per annum during 1984-91, which also include slum improvement component;
- Annual private supply in MMR is 31,000 units; and
- Only 47% of total need for new housing was met by formal supply and plan noted an annual deficit of about 45,000 units in Greater Mumbai.

CDP of Greater Mumbai (2006) notes the following about housing supply.

- Formal household tenements in Greater Mumbai are close to 16,20,000 catering to a population of 61,40,000 only (about 49%); and
- Estimated supply is only about 20,000-30,000, as against 40,000 houses per annum for additional population of 2,00,000.

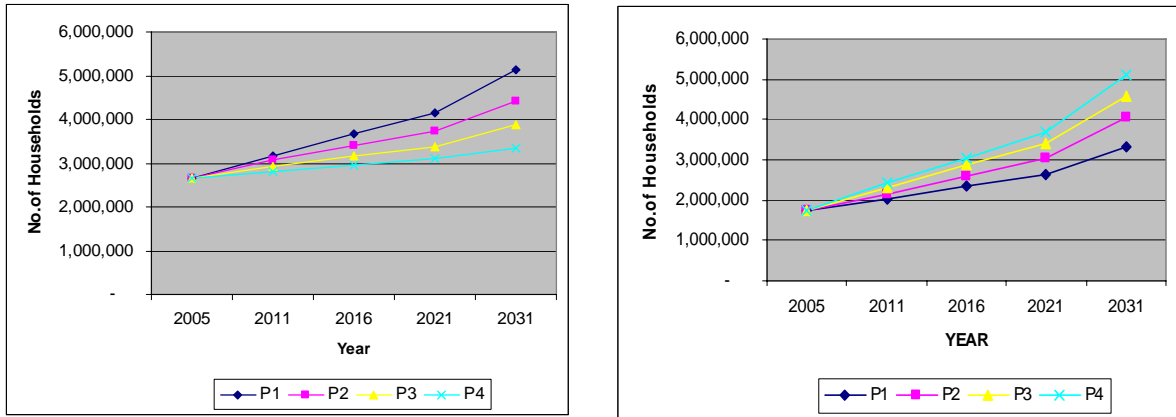
According to population forecast carried out by CTS, population of MMR is estimated to be 29 million and 34 million in 2021 and 2031 respectively (Refer Table 4.3 for details). Table 3-4 connects the population estimates into number of households and annual demand. As evident from the table, demand for housing will be more in the first five years of the plan period in all the scenarios till 2021. In terms of geographical distribution the CTS has envisaged four possible scenarios. P1 represents Mumbai-centric growth, P2 represents continuation of trend where share of growth of rest of MMR continues to increase, P3 represents dispersal of population and P4 represents accelerated dispersal, particularly towards SEZ in South East of Navi Mumbai. Table 3-5 and Figure 3-5 shows changes in number of households in different scenarios for Greater Mumbai and Rest of MMR. As evident for the figure, moving from P1 to P4 scenarios the demand for houses increases in rest of MMR and correspondingly reduces in Greater Mumbai.

Table 3-4: Total Households and Annual Incremental Demand in MMR

Year	Housing Demand	
	Total No. of HHS	Annual Demand
2005	4,408,687	
2011	5,212,584	160,779
2016	6,010,564	159,596
2021	6,798,156	157,518
2031	8,445,519	164,736

Table 3-5: Number of Households in Different Growth Scenarios

Region	Growth Scenario	Year				
		2005	2011	2016	2021	2031
Greater Mumbai	P1	2,662,967	3,178,499	3,678,192	4,161,467	5,120,862
	P2	2,662,967	3,060,239	3,409,212	3,741,243	4,406,862
	P3	2,662,967	2,921,392	3,150,772	3,376,529	3,868,230
	P4	2,662,967	2,800,107	2,953,570	3,114,482	3,331,388
Rest of MMR	P1	1,745,720	2,034,085	2,332,372	2,636,689	3,324,658
	P2	1,745,720	2,152,390	2,601,231	3,057,084	4,038,767
	P3	1,745,720	2,291,187	2,859,717	3,421,835	4,577,399
	P4	1,745,720	2,412,364	3,056,987	3,683,857	5,114,241



Greater Mumbai

Rest of MMR

Figure 3-5: Number of Households in Different Scenarios

3.4 REASONS FOR PRESENT HOUSING SITUATION

The policies so far have concentrated on the symptoms like slums and dilapidated buildings without recognizing that slums and housing are a subset of larger real estate and land market. Many well-intentioned market interventions have had an unintended outcome. Moreover these interventions have been too deep rooted to be quickly remedied. The key interventions and their impacts are presented in Table 3.6.

Table 3-6: Policy Interventions and their impact on real estate market in MMR

Intervention	Avowed Objective	Sector-level Impacts
Rent Control Act 1948 (till revised in 1999)	To protect the poor tenants from exploitative increases in the rent in the post war period.	Owners neglected upkeep of buildings. New investment in rental housing dried up Tax base of property tax got frozen Tenants became virtual owners as tenancy rights could be inherited and sold. – Muddling of property rights.
Development Control Rules 1964-67 (till revision in 1991)	Density & FSI for better quality of life.	FSI of 1 and density of 100 units per acre meant average unit size of 40 sq.m. which majority could not afford. This linter alia caused proliferation of slums. Prescribed FSI being lower than the consumed FSI in south Mumbai, prevented redevelopment of old buildings.
Bombay Building Repairs & Reconstruction Act 1969	Prevent collapse of buildings and loss of life	FSI had to be increased to 2.4 times the permissible FSI. Government accepted the responsibility of reconstructing properties that were essentially private. Since reconstructed buildings were also on rent, problems of private landlords became those of the Govt.
Urban Land (Ceiling & Regulation) Act 1976.	To prevent concentration of urban land in the hands of a few persons and speculation and profiteering therein	Land ownership in effect became more oligopolist.



Intervention	Avowed Objective	Sector-level Impacts
	To bring about an equitable distribution of land to subserve the common good.	Various schemes of exempting land from ULCRA for low-income housing was introduced but without any significant increase in supply of affordable housing.
DC Regulations 1991	FSI of Island City reduced to 1.33 and of suburbs retained at 1 for quality of life.	Lower FSI made development rights scarce and hence expensive.
	Concept of TDR introduced as an alternative to monetary compensation for acquisition of land for public reservations.	Scarcity was attempted to be used to achieve public purpose by using incentive FSI and TDR. Brought about market distortions
	To promote smaller houses, minimum density was introduced in areas reserved for public housing.	Minimum density provisions did not improve supply of affordable houses
Coastal Zone Regulations 1991	Protect coastal ecology particularly the wetlands with mangroves.	In CRZ II (already developed and located beyond the high tide line) in terms of change of land uses, FSI and density could be developed according norms prevailing prior to 1991. Thus constraining the renewal and development of land in CRZ II at increased FSI or density.
Slum Rehabilitation Policy 1995	To provide free houses to slum dwellers by using incentive development rights	Scarcity of development rights used to help limited number of slum dwellers Brought about further distortions in the market. Construction cost of non- slum houses doubled. Worsened problems in areas where TDR were used in an unplanned manner. Incapable of meeting the needs in a time bound manner – not financially sustainable.
Cessed Building Reconstruction Policy 1999	To provide free houses in reconstructed buildings to tenants in cessed buildings by granting incentive FSI at the same site.	Building by building approach overlooked the infrastructure needs at the block level. Free houses to tenants made construction cost of new housing three times the normal cost. Provided perverse incentives for creating fictitious tenants
Maharashtra Rent Control Act 1999	To encourage construction of new houses by assuring a fair return.	Apart from residences and education it also applies to “business, trade and storage”. Standard Rent does not apply to newly constructed building or premises not let for one year. But it does apply in case of accommodating existing tenants in reconstructed building. – Not a great encouragement to reconstruction. No summary provisions made for recovery of premises in case of default in rent payment. Recourse to courts is still time consuming.
Planning of new mass transit network 2004	To provide improved accessibility to transit in areas distant from existing rail network.	Improved accessibility can support higher densities. But FSI land use adjustments not considered.

Intervention	Avowed Objective	Sector-level Impacts
	To provide faster and more comfortable transit.	An opportunity for expanding supply of development rights is not being seized.
Policy for Special Townships 2006	To promote private investment in housing to facilitate housing at reasonable prices To create hassle free atmosphere for investors	Impacts yet to be seen. But locations chosen by investors are likely to be away from the mass transit routes and may lead to gated communities not necessarily at affordable prices for the majority.

Source: Compiled

All these policies have resulted in muddling of property rights, which in turn has had an adverse impact on the land and real estate market. This is illustrated below:

- A landowner subjected to ULCRA can be exempted from ULCRA on the grounds of hardship or public interest - both of these are not clearly defined;
- A property owner not having a surplus land as of now cannot reconstruct his property without government approval if on demolition of existing property his land is to exceed ceiling limit;
- Property owner who has let out his property cannot charge or revise rent, cannot summarily evict tenant even if he does not pay rent, cannot redevelop property unless he agrees to re-accommodate existing tenant at twice the present rent;
- Conversely, a tenant can sell his tenancy rights, or can pass it on to his heirs by right; and
- Land owner whose land is encroached cannot evict the squatters but the squatter can rent or sell the hut. But in the absence of formal tenure, the slum dweller cannot legally develop his house.

Clearly establishing the property rights shall be one of the objectives of shelter sector reforms as this will enable increased flow of mortgage based finance in the land and housing market.

3.5 ROLE OF PUBLIC HOUSING

Public Housing in MMR is provided by two constituent boards of MHADA viz. Mumbai Housing and Area Development Board and Konkan Housing and Area Development Board. Mumbai Board operates within Greater Mumbai, but Konkan Board's jurisdiction goes beyond MMR and covers four districts of Maharashtra viz. Thane, Raigad, Sindhudurg and Ratnagiri. The total supply of housing units by these Boards during 1997-2002 was about 12,600 and 1,700 respectively- an insignificant contribution to the supply considering the demand particularly of the poor in MMR.

3.6 COMPONENTS OF BUSINESS PLAN

3.6.1 Land use planning

As discussed earlier, land market is at the core of the sector. Increasing the supply of land and development rights in a planned manner is therefore the crux of the strategy

Land use plans including use, density and FSI zoning and plans for expanding infrastructure determine the supply of land available for urban use (apart from the legislative constraints discussed in the next section). The Regional Plan 1996-2011 sanctioned in 1999, Development Plan of Greater Mumbai prepared for 1981-2001 and sanctioned in 1993 and Development Plan of Navi Mumbai sanctioned in 1979 have all become dated though they have been amended from time to time on *ad hoc* basis. It is necessary that comprehensive revision of these plans is undertaken at the earliest.²

Regional Plan

Since the sanction of Regional Plan in 1999, substantial changes in policies have occurred. Government of India has decided to promote Special Economic Zones (SEZs) and many SEZs are being proposed in MMR. Similarly Government of Maharashtra has adopted a Special Township Policy under which many special townships could be expected in MMR. Regional Plan had proposed U2 zones to accommodate urban growth along rail and road transport corridors but not much growth seems to be occurring in these zones perhaps on account of absence of land assembly framework and other infrastructure. The Regional Plan till 2011 had not proposed extensive transit network and had relied largely on the existing suburban rail corridor. The Comprehensive Transport Study of MMR has now proposed an extensive transit and highway network for 2031. The study has also brought out a need for additional green field development to cater to the population of 2031. The existing built-up areas (2005), Urbanizable areas according to Regional Plan (2011) and additional green-field areas identified for development by CTS (2031) are given in Table 3-7.

Table 3-7: Urbanizable land area by sub regions of MMR (sq.km.)

Name of Sub Region	Existing Developed Area (2001) (Sq.km)	Developable Land within Municipal Boundaries	Urbanizable Areas (Regional Plan 1999)		Areas Yet to be developed (Sq.km.)	Additional Area proposed by 2021 as per CTS
			Remaining U1 Land (Sq. km)	Remaining U2 Land (Sq. km)		
	1	2	3	4	5 (including 2,3 and 4)	
Greater Mumbai	265.04	9.47	0.00	0.00	9.47	
Western Region	35.45	25.52	36.81	0.00	62.34	
North Eastern Region	126.53	96.45	11.19	59.74	167.38	48.7
Navi Mumbai Region	111.50	20.95	85.51	6.45	112.91	
Neral Karjat Region	11.69	12.16	6.77	60.70	79.64	
Panvel Uran Region	12.83	0.00	75.96	62.89	138.84	13.89
Pen Alibag Region	25.52	2.97	35.85	37.38	76.21	
Total MMR	588.57	167.53	252.09	227.17	646.78	62.61

Source: Compiled from Comprehensive Transport Study (CTS) for MMR, MMRDA and Regional Plan for MMR, MMRDA

It would be seen that to accommodate growth by 2031 built up area has to be more than doubled. CTS has also proposed corresponding expansion of

² DPs of other Municipal Corporations and SPA areas like Vasai Virar and Ambarnath-Kulgaon-Badlapur have been prepared later. Their revision could be undertaken in due course. (Refer Appendix III-1 for status of development plans of all the ULBs of MMR)

transit and highway network. This would create a varying terrain of accessibility. The intersections of two transit corridors will be most accessible followed by individual transit stations. Hierarchy of road network will similarly influence accessibility. Land use, density and FSI must respond to such varying accessibility pattern. Revision of Regional Plan could pay explicit attention to these aspects. Other infrastructure should also be planned to support such high densities.

Powers to revise Regional Plan now vests with the MPC. MMRDA can only assist MPC in doing so. However since MPC has not been constituted so far there is an institutional vacuum at present. The legal aspects are elaborated in next section.

Development Plan of Greater Mumbai

The present Development Plan (DP) of Greater Mumbai was originally prepared for a period 1981-2001. The basic surveys and studies were carried out during 1978 to 1982 and the draft Plan was published in mid 80s. The process of hearing suggestions and objections and examination by government was long drawn. The Development Control Regulations (DCR) were approved in 1991 and the Development Plan as such was sanctioned in 1993. The DP was essentially formulated during the pre-liberalization period and its basic tenets were;

- Growth of Mumbai particularly of the Island City be restrained;
- In consonance with state and MMRDA policies, no new industries and offices be permitted in Island City;
- Uniform FSI of 1.33 and 1 be prescribed for Island City and Suburbs respectively,
- Land for public purposes be obtained by Transfer of Development rights instead of monetary compensation; and
- *In Situ* slum redevelopment be promoted by granting FSI up to 2.5.

However, since 1991, many macro-economic changes occurred. The economic policy became more market oriented, large-scale manufacturing continued to decline, financial services, IT and ITES grew, with improved housing finance demand for housing too increased and in the recent past new infrastructure initiatives took roots. Responses to these have been incremental and largely in terms of changing DCR and not the DP itself. Some of the major developments that have occurred since 1991 are;

- Bandra Kurla Complex instead of being an instrument of decongesting Fort, emerged as a new financial district;
- Industrial areas converted on a large scale into IT and ITES activities e.g. Andheri Kurla Road by exploiting the DCR provisions that perhaps anticipated such changeover only as an exception;
- The DCR regulations that was introduced at the time of finalizing DCRs without changing the DP in respect of textile mills and its amendment in 2001 is likely to trigger significant new development by way of malls, high income residential and office development;

- 1995 DCR regarding slum rehabilitation has generated significant TDR, which has been used in attractive suburban locations like Bandra West and JVPD. Its continued use is going to spread in the areas earlier prohibited for receiving TDR; and
- 1999 changes in DCR allowing bonus FSI for redeveloping cessed buildings has led to sporadic high-rise structures.

The cumulative impact of all the above initiatives is very complex in terms of infrastructure demand – water, sewerage, roads, parking, open spaces, schools and health care facilities and real estate prices. The DP, when it was prepared, had not anticipated these impacts. If not attended to at the earliest the impacts would be irreversible and deleterious to development. At the same time some new initiatives in transport sector present opportunities for significant changes in the structure of development by adjusting land use and density (FSI) and some of these are highlighted in Box 3.1.

BOX 3-1: NEW TRANSPORTATION LINKS AND OPPORTUNITIES OF LAND USE CHANGES

- **Versova Andheri Ghatkopar** mass transit corridor. Apart from Andheri and Ghatkopar which are at the intersection Western Railway and Central Railway respectively, DN Nagar station is at the intersection of proposed north south corridor of Charkop-Bandra MRT. All the three locations are candidates for major Transit Oriented Development (TOD). Besides these, intermediate stations could also be redeveloped as TODs.
- **Charkop-Bandra-Kurla-Mankhurd** mass transit corridor. The northern section at Malad passes through an area that is transforming itself as an area for retail, entertainment and ITES. Provision of transit would accentuate the potential for such development. Similarly the section passing through Bandra Kurla Complex could be exploited for mixed use, high density development.
- **MTHL (Sewree – Nhava) bridge** if extended up to Worli would offer opportunities for re-planning the entire mill district and northern part of port land at Sewree

BOX 3-2: DP PREPARATION TIME CAN BE REDUCED BY

- Effective **use of high-resolution satellite imageries** (e.g. Quick Bird or Ikonos) and the technology of GIS and GPS.
- Use of **exhaustive socio economic and travel pattern data base** generated by the Comprehensive Transport Study (CTS) undertaken by MMRDA.
- **Effective participation of all stakeholders** throughout the process of plan making i.e. identification of issues and problems, goals to be pursued and consideration of proposals to deal with the issues and not by way of suggestions and objections to the draft DP prepared in secrecy as is the current practice.
- **Two Tier Planning:** DP can be limited to land use zoning and areterial transport networks. Local plans could be separately prepared under section 33 of MR&TP Act.

The cumulative impact of responses to changing circumstances and the opportunities presented by transport initiatives provide compelling reasons for undertaking revision of Development Plan without any delay. There is a general impression that a DP is to be revised after 20 years of its sanction. It is therefore believed that the present DP is to be

revised by 2013. However that is not the case. Section 38 of the Maharashtra Regional and Town Planning Act 1966 (MR&TP Act) that deals with revision of DP clarifies that the DP has to be revised at least once in twenty years from the date on which the DP has come into operation and further states that a Planning Authority may and shall at any time when so directed by the State Government, revise the DP.

It must, however, be noted with concern that previous DP took almost 17 years consuming 13 years of plan period. Mumbai can ill afford to repeat the same story again. Box 3.2 presents the ways in which DP preparation time could be kept within reasonable limits

The old style DP which emphasizes zoning and public purpose reservations is most suited for green-field development. In Mumbai hardly any area is left for green-field development. Most areas crave for redevelopment. In such a case a single broad-brush DP for the entire city is inappropriate. The MR&TP Act had anticipated such a situation and thus provided for plans for areas of comprehensive development (section 33) in parallel with preparation of city wide DP.

A two tier planning is needed that includes city wide DP covering broad zoning, arterial road and rail network, areas for environmentally sensitive uses like land fill sites for solid waste disposal etc. and plans for comprehensive development. The planning must therefore start as DP for entire Greater Mumbai and plans for comprehensive development for areas like;

- Precincts of concentration of dilapidated buildings like Null Bazaar, Bhendi Bazaar, Kalbadevi, Girgaum etc;
- Mill district broadly spread between Mahalaxmi and Dadar;
- TODs at Andheri, Kurla, Ghatkopar, Bandra, DN Nagar etc; and
- Redevelopment of large slum areas like Dharavi, Golibar (Santacruz), Shivaji Nagar (Mankhurd) etc.

Both the DPs of Greater Mumbai lacked any in-built evaluation system. It was therefore impossible to evaluate the outputs and outcomes of the implementation of DP. Monitoring and Evaluation (M&E) system must therefore become an integral part of the plan. The results of M&E must be transparently available to citizens.

Development Plan of Navi Mumbai

Following the recommendations of the draft Regional Plan in 1970, CIDCO the New Town Development Authority prepared the Development Plan for Navi Mumbai that was sanctioned in 1973. The economic and employment base of Navi Mumbai would be manufacturing located at TTC and Talaja Industrial Area, Port and Port-based industries near Nhava-Shewa and office sector led by government offices located near Belapur and around Waghivali Lake. However over the years, the manufacturing has stagnated, port was delayed, port based industries have not grown and office sector did not grow as expected. It is only now that some revival is occurring in TTC through telecom, IT and life sciences. Similarly SEZ would infuse some employment near Port. But government is unlikely to be the leader in office growth at Belapur CBD. On the other hand external inputs like MTHL, Maha Mumbai SEZ and the Airport will have significant impact on growth and structure of Navi Mumbai. All these factors demand that comprehensive revision of DP of Navi Mumbai is undertaken.



Part of Navi Mumbai is now within the jurisdiction of Navi Mumbai Municipal Corporation (NMMC) where NMMC is the Planning Authority whereas for the remaining area CIDCO continues to be the Planning Authority. The DP revision however needs to be undertaken as an integrated exercise taking into account the changing economic inputs and the regional road and transit network proposed in the CTS.

Common Theme of Density, FSI and Inclusionary Regulations

In most development plans a uniform FSI has been proposed. Central locations and high accessibility particularly through transit availability can sustain higher FSI. In case of Island City where already consumed FSI in many parts is in excess of 3.0, FSI of 1.33 has been prescribed. In Navi Mumbai too which is a planned city a uniform FSI of 1 (except 1.5 in the vicinity of railways stations) has been used. Such uniformly low FSI restricts the development rights available in the market. Their market prices increase and consequently housing and property prices too increase particularly when incomes are rising and housing finance is easily available. Development Plans have usually overlooked this impact of uniformly low FSI on the housing prices and the affordability. One of the rationales for lower FSI has been limited infrastructure or inability to augment it. However low and uniform FSI itself did not help improve the infrastructure. In older neighbourhoods where prescribed FSI is lower than the consumed, it has prevented investment in redevelopment and perpetuated the status quo. Along with preparation of city wide Development Plan, there is a need to prepare detailed plans for redevelopment of older neighbourhoods and areas near transit stations. Detailed plan for redevelopment and Transit Oriented Development (TOD) must explore possibilities of development at higher FSI with planned infrastructure. With the decision to introduce mass rapid transit in BKC, MMRDA, it is learnt, has proposed to increase the FSI from 2 to 4. (Pilot studies undertaken by MTSU should help in that direction). Ensuring affordable housing or obtaining land for affordable housing is the most critical issue in planning of MMR. This is particularly the case where compulsory acquisition of land or obtaining land through measures like Urban Land Ceiling Act has not been particularly successful. Following inclusionary provisions therefore deserve consideration.

- Mandatory allocation of (say) 30 % of the net plot area for dwelling units not exceeding 30 sq.m. in area in layout or subdivision of land of 3000 sq.m. or more;
- In case of apartment buildings requiring construction of one 25sq.m. dwelling unit for every 10 apartments; and
- Retaining 10% of net plot area by planning authority for affordable housing in every TP Scheme.

Such provisions should be seen as a part of overall reform in the land and real estate market. Otherwise in a scarcity-ridden market such provisions may invite misuse.

3.6.2 Legal reforms

Apart from the regulations controlling development of land that emanate from the plans, there are other legislative provisions that control the ownership and use of land. Reforms of these legal provisions are necessary to promote supply of land and development rights.

Urban Land (Ceiling and Regulation) Act, 1976

Although the Act continues to remain in force as of now, GOM has already agreed to repeal it in compliance of the condition of JNNURM.

Maharashtra Rent Control Act, 1999

This Act is a result of reforming earlier legislation and consolidating multiple laws present in Maharashtra. However the amendments do not seem to have achieved intended objective of attracting investment in rental housing. There are certain features of the act that need to be considered for further reform as highlighted in Box 3.3.

BOX 3-3: KEY FEATURES OF RENT CONTROL ACT AND POSSIBLE REFORMS

- Although the provisions of standard rent do not apply to properties let after the Act has come into force, other provisions such “permitted increases” are still applicable. Thus periodic revision of rent does not seem to be possible. The ambiguity if any in this regard need to be cleared and periodic revision of rents may be made permissible.
- Summary procedures for eviction of defaulting licensee are available, but similar provisions are not available in case tenants. It is necessary to consider how such provisions could be introduced.
- Increase in rent of five percent initially and then four percent per annum has been permitted. But since these are on the 1948 base they are meager. A system of bringing rents closer to market rents within reasonable time needs to be considered.
- Reconstruction as the reason for asking the tenant to vacate the premises has been recognized, but it is subject to the condition that existing tenants are re-accommodated in the reconstructed building at twice the present rent. This is not an attraction for investment in reconstruction particularly when FSI is also restricted.

The act recognizes the tenant’s right to transact his tenancy rights through sharing of key money with the landlord. However there need to be more effective provisions to ensure that owner and tenant together are responsible for the upkeep of the building as well.

Coastal Regulation Zone Notification, 1991 of the Ministry of Environment and Forest

Ministry of Environment and Forests, Government of India in exercise of the powers conferred by Clause (d) of sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986, declared the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (in the landward side) upto 500 metres from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as Coastal Regulation Zone; and imposed restrictions on the setting up and expansion of industries, operations or processes, etc. in the said Coastal Regulation Zone (CRZ) by a notification dated 19 February 1991. Box 3.4 provides CRZ classification as per the above notification.

BOX 3-4: CRZ CLASSIFICATION AND ITS RELEVANCE TO MMR

- CRZ I: Area between the high tide line and low tide line. This is the most restrictive zone where no reclamation is permissible and mangroves are to be scrupulously protected.
- CRZ II: The areas that have already been developed upto or close to the shoreline. For this purpose, “developed area” is referred to as that area within the municipal limits or in other legally designated urban areas, which are already substantially built up and which have been provided with drainage and approach roads and other infrastructural facilities, such as water supply and sewerage mains.
- In this zone building construction is permitted on the landward side of existing road or road approved under the Coastal zone Management Plan according to the town planning regulations including FSI as prevailing on 19 February 1991.
- CRZ III: Areas that are relatively undisturbed and those, which do not belong to either Category-I or II. These will include coastal zone in the rural areas (developed and undeveloped) and also areas within Municipal limits or in other legally designated urban areas, which are not substantially built up.
- In CRZ III 200 m from the HTL is to be treated as no development zone and between 200 to 500 m construction according to traditional rights and customary uses is permissible not exceeding two storeys.

The ecological rationale for protecting CRZ I is strong, but that does not seem to be the case with restrictions imposed on development in CRZ II. Once recognized as “already developed”, the development control regulations such as density, FSI or number of storeys could be guided more by town planning and urban design considerations and not by consideration of coastal ecology. The environmental considerations should be to prevent pollution of coastal waters and wetlands. In MMR which is land starved such restrictions are preventing redevelopment of old neighbourhoods near the coast and development of Greenfield sites near the coast. Reconsideration of these regulations in the context of revision of Regional Plan and obtaining consent of Government of India would be appropriate.

Maharashtra Regional and Town Planning Act, 1966

MR & TP Act 1966 provides for preparing three types of plan – Regional Plans, Development Plans and Town Planning Schemes. Procedural reforms in each of these need consideration.

Regional Planning Boards can prepare or revise regional plans. In case of MMR this power was vested in MMRDA. However by MPC Act 2000 this power now vests in MPC and MMRDA has to assist MPC in this task. Though revision of Regional Plan 1996-2011 must begin early, there is a legal infirmity as MPC has not yet been constituted and MMRDA has lost its substantive mandate. Either the MPC needs to be constituted quickly or government can use its power (section 20) to modify Regional Plan to bring about comprehensive revision.

Development Plans are to be prepared for the municipal jurisdiction where ULB acts as the Planning Authority. In a large city like Greater Mumbai, while Development Plan turns out to be a broad-brush plan, it cannot do justice to requirements of detailed local plans particularly for redevelopment of already

built-up areas. MR & TP Act by section 33 provides for preparation of such detailed local plans. The section states that such plans can be prepared after

the declaration of intention to prepare the DP has been made. This is interpreted to imply that the local plans cannot be prepared once the DP is sanctioned. However it should be possible to prepare local plans simultaneously with DP or even after the DP is sanctioned. In fact DP can indicate the areas for which detailed local plans will be prepared. MTSU has undertaken pilot studies for renewal of Null Bazaar, Bora Bazaar, Dadar Parsi Colony and Girgaum and of TOD at DN Nagar. In fact it would be imperative to provide for effective legal framework for such planning initiatives.

BOX 3-5: REFORMS FOR REVIVAL OF TP SCHEMES

- According to present provisions TP Schemes can be undertaken for implementation of Development Plan. In case of MMR however areas outside municipal limits are proposed for urban development. In such cases, it should be possible to proceed with preparation of TP Schemes as a substantive planning exercise without the intermediation of DP.
- Gujarat has brought about many changes in TP Scheme procedure to make it quicker. All those reforms may be adapted in the MR & TP Act.
- Deciding the final plot values and betterment is the most contentious aspect of TP Scheme. Instead of recouping the so-called “unearned income” cost recovery could be a modest objective.
- Provisions could be incorporated to retain certain land with planning agency for sale in the market to recover the cost. Similarly provisions for land for low-income housing could also be made.

MR & TP Act, 1966 provides for Town Planning Schemes that are an effective tool of assembling land and recovering the betterment (increase in land value) that accrues on reconstitution of plots in regular shapes and provision of infrastructure. However this has fallen in disuse in the recent past. Major reforms for revival of TP Schemes are presented in Box 3.5.

With these reforms TP Schemes can be used to bring about planned expansion of urban areas in MMR as an alternative to large-scale acquisition of land. As seen from the recent experience of the SEZ and the

reaction of the government, it would be prudent to consider alternatives that allow the benefit of urban expansion to accrue to landowners.

Legal reforms proposed in the draft Housing Policy

In addition to the above the draft State Housing Policy has proposed some legal reforms. Key proposals in this regard are listed below;

- Amending the provisions of Maharashtra Land Revenue Code, 1966 to streamline the provisions of grant of non-agricultural (NA) permission and levy of NA assessment where building permission are granted by local authorities.
- Setting up of a Housing Sector Regulatory Commission to safeguard the interest of various stake holders. It will be an independent statutory body and will have jurisdiction over the entire State of Maharashtra.

3.6.3 Comprehensive slum policy

The predominant slum policy today promises a 225 sq.ft. house free of cost to every slum dweller of 1995 (being extended to 2000) by offering incentive FSI. To subsidize two slum dwellers it requires sale of one 450 sq.ft. house or one 775 sq.ft. house can subsidize three slum dwellers. According to Census

2001, Population of Greater Mumbai was 11,914,398 at an average household size of 4.63 the total number of households were 2,575,589. 54% of these households i.e. 1,258,894 were slum dwellers. If all of these are to be given free houses under the policy in 10 years, 1.25 lakh slum dwellings will have to be constructed every year. To subsidize them, 41600 houses of 775 sq.ft. each (or 62500 houses of 450 sq.ft. each) will have to be constructed. However there is no demand for houses on that scale in Greater Mumbai. Population of Greater Mumbai has grown at 1.84 % p.a. during 1991-2001. Even if this growth rate is assumed to prevail after 2001 and household size is assumed to reduce, the annual increase in households is likely to be only about 59000. Thus virtually all new households will have to buy houses at prices that can subsidize the slum dwellers. Given the income profile of the households this is obviously not possible. The current rate of house construction of about 20000-30000 dwelling units per year is reflective of both the income and formal demand. A more sustainable model that does not promise a free house but still enables substantial improvement is therefore necessary.

Furthermore the present model is essentially suitable for *in situ* redevelopment where land is not required for other public use and the location is environmentally safe. This model has been extended to obtain houses for resettlement of slums where the land is required for “vital public purpose.” However there are slums located on vulnerable land such as unstable hill slopes susceptible to land slides, flood prone areas, below the high-tension power supply lines etc. These slums have to be resettled and vacated land protected from re-encroachment. Similarly there are slums on land designated for public purposes in the Development Plan where *in situ* redevelopment of slums is possible only by compromising the requirement of public purposes like open spaces, schools, health care facilities etc.

In addition the land ownership (50% slums are on private lands) and property (including TDR) prices would have bearing on redevelopment policy. A stronger data base on GIS platform that captures, slums with overlays of infrastructure right of ways, environmentally vulnerable locations, public purpose designations in DP, ownership and property prices is necessary to fine tune and develop more comprehensive slum policy.

3.6.4 Renewal of old Neighborhoods

There are many old neighborhoods in MMR where housing stock has been deteriorating, infrastructure like roads and parking have become inadequate with increased vehicular ownership, water supply, sewerage, storm water drainage are also under strain. In case of Island City, the deterioration of rent controlled housing stock is most acute. There in 1969 State accepted the responsibility of carrying out structural repairs and reconstruction of about 19000 buildings. The State levied a repair cess on these buildings to partly finance the repair and reconstruction. The policy of converting private tenants into state tenants in reconstructed buildings was not very successful in terms of coverage of buildings or upkeep of reconstructed buildings. Efforts to

transfer the ownership of buildings to tenants at subsidized prices have also not been very successful. Finally in 1999, a policy that promised free houses equal to the existing area subject to a minimum of 225 sq.ft and maximum of 700 sq.ft. was adopted with subsidies raised from bonus FSI of 50 to 70 % of the FSI required for rehabilitation of existing tenants. This has led to individual high rise buildings in a neighbourhood of four storied buildings without corresponding improvements in infrastructure being planned. Worse still it has provided perverse incentives for creating fictitious tenancies to get advantage of bonus FSI.

Based on the pilot studies carried out by the MTSU, a new policy needs to be worked out to deal with redevelopment of old neighbourhoods in Island City as well as other old neighbourhoods in MMR that includes

- Detailed local planning for the entire neighbourhood as described earlier;
- Plot assembly and built-form definition;
- Infrastructure improvement plan;
- Cost sharing between landlord and tenants;
- A transparent subsidy scheme only for deserving tenants; and
- Suitable amendments in the rent control act to compel the landlord and tenants to choose suitable options in a time bound manner to reconstruct a dilapidated building.

3.6.5 Transit Oriented Development

An extensive transit network is being proposed in the CTS. The transit stations and particularly the stations at which two transit routes intersect would represent places of high accessibility. They would also attract high volume of pedestrian movement and be places of modal changes. Given the chaotic experience of suburban stations today, it is essential that detailed plans are prepared for transit station areas and more so on priority for transit nodes. These in first instance will be Andheri, Ghatkopar, DN Nagar, Bandra, Kurla and Mankhurd. The station on Charkop-Bandra-Mankhurd corridors located within BKC would also present opportunities of high FSI development in a green field context. The TOD plan may cover at least the following:

- An area within walking distance of the station, say about 1 to 2 km radius;
- Zoning for land use, density and FSI;
- Segregation of pedestrian traffic;
- Road improvement and parking; and
- Plot reconfiguration including amalgamation with built form regulation.

3.6.6 Common theme in redevelopment of slums and old neighbourhoods

Present policies of redeveloping slums and cessed buildings both intend to exploit high real estate prices. But real estate prices are high because of the scarcity of development rights. This scarcity is created by lack of opening land for development through expansion of infrastructure and also the restrictive

FSI. Scarcity based policies will not be sustainable to help over 60% of the population by way of free houses. The thrust of the policy should be to reduce the scarcity of development rights and thereby help reduce the prices. This would be beneficial to housing as well as other real estate like office where other cities are becoming more competitive.

3.6.7 Housing finance

In the last two decades housing finance has established and expanded as an important financial service. Modest interest rates and tax concessions have allowed younger middle income population to build housing assets. Penetration of housing finance has largely remained confined to middle and high-income salaried borrowers. The challenge is to enable penetration to lower income, self-employed households. The recent changes in monetary policy have led to increased interest rates for housing finance. The challenge would be more daunting in such interest rate regime. One of the ways to achieve this is to have improved land and property titles and effective foreclosure laws.

3.6.8 The Role of Subsidies and Public housing

Above reforms would increase the supply of land and development rights, increase supply of rental housing, improve access to housing finance, and promote redevelopment of old neighborhoods and slums. The reach of private formal market may thus begin to go down the income scale. At present the market seems to serve the top 40 to 50% of the households, the reforms may increase this proportion to about 60 to 70 %. An additional 10 to 15% could be helped through interest subsidies and guarantee mechanism. (NHB, it is learnt, is working out such a scheme.) The poorer households will have to be helped by public housing programmes largely in the form of sites and services schemes.

However in the absence of adequate data about the present housing market, it is difficult to estimate the impact of reforms in quantitative terms. Nevertheless a broad estimate is attempted and presented in Table 3-8 and Table 3-9 for two scenarios.

Table 3-8: Housing Profile for Different Regions in MMR for P2 Growth Scenario

Region	Housing Characteristics	Year				
		2005	2011	2016	2021	2031
MCGM	Slum HHs	1597780	1517579	1346210	1175543	866874
	Non-Slum HHs	1065187	1584192	2118139	2623864	3594152
	%age of Slums	60	49	39	31	19
Urban Agglomeration(MCGM, TMC, NMMC, UMC, KDMC, BNMC, MBMC, CIDCO Area, Ambernath and Badlapur)	Slum HHs	1855328	1764813	1572896	1370206	1010423
	Non-Slum HHs	2126887	2551005	3758952	4577977	6027527
	%age of Slums	47	41	30	23	14
Other Settlements	Slum HHs	12879	19251	18210	15637	13881
	Non-Slum HHs	181308	280286	338225	405210	414869
	%age of Slums	7	6	5	4	3
Total Urban MMR	Slum HHs	1868207	1784064	1591106	1385844	1024304
	Non-Slum HHs	2308194	2831291	4097176	4983187	6442396
	%age of Slums	45	39	28	22	14

Table 3-9: Housing Profile for Different Regions in MMR for P3 Growth Scenario

Region	Housing Characteristics	Year				
		2005	2011	2016	2021	2031
MCGM	Slum HHs	1597780	1515364	1339607	1165072	859152
	Non-Slum HHs	1065187	1575333	2066656	2480236	3064242
	%age of Slums	60	49	39	32	22
Urban Agglomeration(MCGM, TMC, NMMC, UMC, KDMC, BNMC, MBMC, CIDCO Area, Ambernath and Badlapur)	Slum HHs	1855328	1769468	1572794	1365318	1006818
	Non-Slum HHs	2126887	2603971	3781697	4541548	5527341
	%age of Slums	47	40	29	23	15
Other Settlements	Slum HHs	12879	22946	22355	19197	16507
	Non-Slum HHs	181308	313865	396813	492624	894718
	%age of Slums	7	7	5	4	2
Total Urban MMR	Slum HHs	1868207	1792414	1595149	1384515	1023325
	Non-Slum HHs	2308194	2917836	4178510	5034172	6422060
	%age of Slums	45	38	28	22	14

In the above case, two areas need direct public investment, one, in terms of interest subsidy and two, in terms of affordable housing. A broad estimate shows that for the 15 year plan period, about Rs. 493³ crores will be required in term of subsidy and about Rs. 1,941⁴ crores will be required for affordable

³ Assuming borrowing of Rs. 180000 for a unit of 225 sq.ft., interest subsidy of Rs. 900/month has been assumed for each household for a period of 10 years. During 2006-11, 2011-16 and 2016-21 7%, 7% and 5% of the incremental households are assumed to be the beneficiaries of the subsidies.

⁴ Cost of one housing unit has been taken as Rs. 180000 for a unit of 225 sq.ft. In case of MCGM, cost of construction has been provided as government support, whereas in case of Rest of MMR, only the cost of

housing category in P2 scenario. This total amount of Rs. 2,434 crores will cater to 0.3 million households in the plan period till 2021. This amount works out to be about Rs. 2,403 crores for the P3 scenario with similar assumptions and rates. Part of affordable housing investment can be recovered from the beneficiaries through appropriate mechanism. This would also imply a significant increase in the current levels of operations of MHADA.

3.6.9 Information system for monitoring and evaluation

This sector singularly lacks data systems that meaningfully track the performance of the sector. Simple questions like “How many houses were built in each ward last year?” Or “How many sq.m. of office space was constructed in each ward during the last year?” go begging for answers. Basic data about all formal development (which includes change of use, demolition and new construction) is available in the records of planning authorities. This needs to be brought into a GIS framework to link real estate development, housing and price data (compiled for Stamp Duty ready reckoner). This in conjunction with data on housing finance and income distribution begin to provide meaningful information for fine tuning policies and designing public programmes. Designing and instituting such an information system should become an important component of implementation of business plan.



3.7 BRANDING MMR, URBAN DESIGN AND AESTHETICS

Visual images of a city make lasting impact on particularly international business travelers. World Trade Centre (prior to its destruction) in Manhattan, New York; Millennium Dome and Canary Wharf in London, Minato Merai in Yokohama and Burj in Dubai or Petronas Towers in Kuala Lumpur are some of the recent examples. After Gateway of India and Marine Drive, Mumbai or Navi Mumbai has not been able to create similar landmark that in the recent past connotes modern Mumbai. Individually some of the buildings in BKC are distinctly modern but they do not create a brand image.

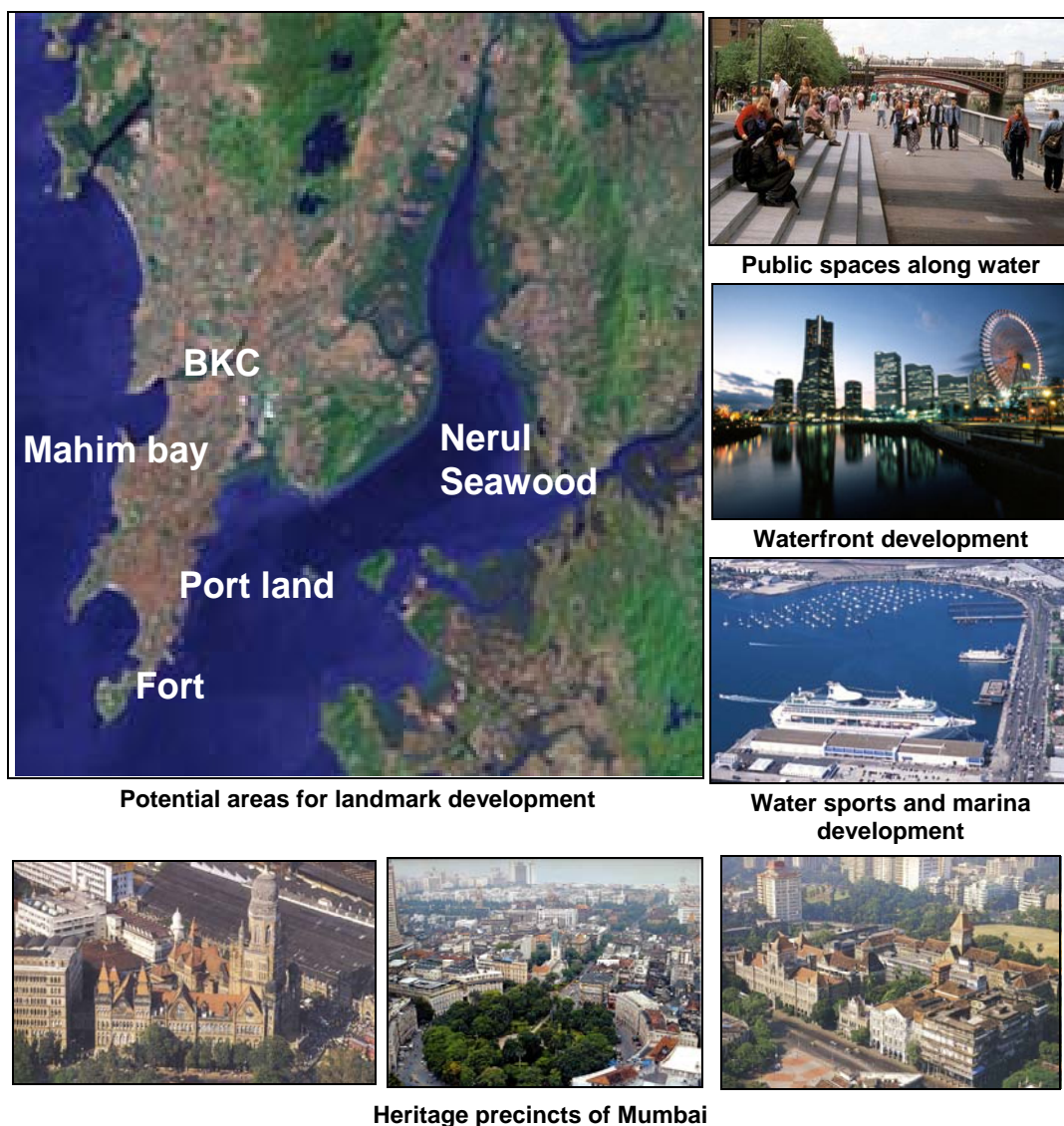
Buildings on the waterfront seem to be more suited to create such brand images. Nariman Point at the end of Marine Drive had a potential in that direction. In the context of emerging structure of MMR there are some more opportunities for creating a brand image;

- Development near the Mahim Bay: With the completion of Bandra Worli Sea link, there would be some spare capacity available on the Veer Savarkar Marg, which can be utilized to redevelop Mill Land into an iconic building on the waterfront.

serviced land (Rs.75000/unit) has been taken into consideration for calculation. In both the cases land is assumed to be obtained from the inclusionary zoning, TP Schemes and acquisition if necessary.

- Sewree: With the proposed Sewree-Nhava Trans Harbour Link Sewree, where MbPT land is available, would become an ideal location to create a distinctive landmark on the harbour.
- Nerul, Navi Mumbai: Across the harbour in Navi Mumbai too there is a potential to develop a landmark that offers a distinctive image to Navi Mumbai. The likely locations could be Nerul or Belapur on the waterfront.
- Near the proposed airport in Navi Mumbai
- In addition Mumbai's built heritage, protected, conserved and spruced up can also create a distinctive image.

BOX 3-6: POTENTIAL AREAS AND CHARACTERISTICS OF MMR FOR DEVELOPING PUBLIC REALM AND DISTINCT URBAN IMAGE



In order to achieve such results, conscious efforts at urban design particularly of public places – streetscapes, plazas, parks and gardens is necessary. Business Plan for transforming MMR into a World Class city will have to pay attention to these concerns.

3.8 ACTION PLANS

Figure 3.6 presents the action plan for this sector of the Business Plan up to 2010.



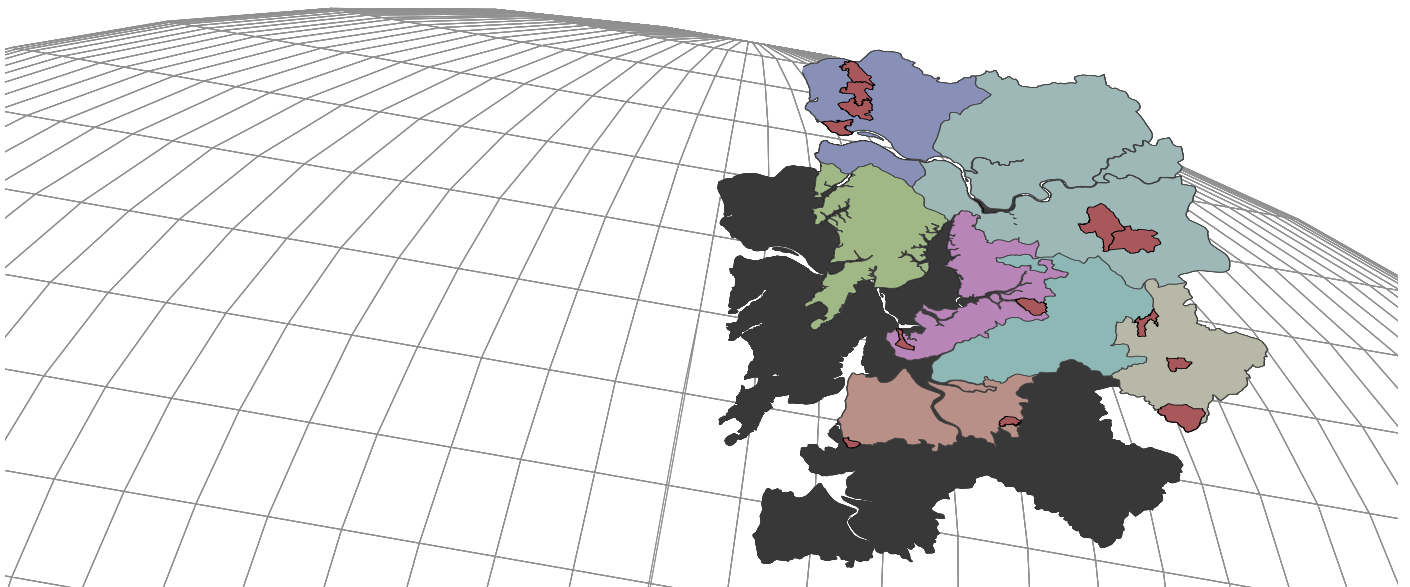
ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10
Consideration, approval and adoption of Plan														
Establishing and staffing Plan implementation unit														
Land, Real Estate & Housing														
Revise Regional Plan		Intention	Draft Plan preparation				Government Sanction							
Revise Greater Mumbai DP			Intention	Draft Plan preparation				Government Sanction						
Revise NaviMumbai DP			Intention	Draft Plan preparation				Government Sanction						
Planning for Old Neighbourhoods				Plan preparation				Government Sanction						
Planning for larger slums				Draft Plan preparation				Government Sanction						
Greenfield Development -TPS									Prepare & begin implementation of priority TPS					
Transit Oriented Development							Draft Plan preparation		Prepare & begin implementation of priority TOD					
Public Housing for EWS									Obtain land & plan			Implementation		
Interest subsidies for LIG Housing				Prepare a scheme		Sanction / consent		Commence disbursement						

>>>>>> a continuing activity or implementation that may go beyond the period indicated.

Figure 3-6: Action Plan of Land, Real Estate and Housing Sector

Chapter Four

Alternative Scenarios and Implications on Infrastructure



Alternative Scenarios and Implications on Infrastructure

4

4.1 ALTERNATIVE GROWTH SCENARIOS

The growth of MMR has witnessed significant changes over the years. For instance, the manufacturing has significantly declined and may never be the mainstay of MMR's economy. Within the tertiary sector, financial services, IT and ITES, media and entertainment, hospitality and tourism have emerged as the growth drivers. The spatial manifestation of these has been in Bandra - Kurla Complex emerging as the new finance district, Andheri - Kurla Road, an old manufacturing area emerging as the hub of IT and ITES, Malad as centre of ITES and large format retail in Greater Mumbai. Navi Mumbai, which lost manufacturing activities, started gaining in IT, BT and warehousing. Besides, major Special Economic Zones (SEZs) have been proposed¹ in Navi Mumbai and adjoining areas. SEZ is also proposed at Virar and many other parts of MMR. However policies of SEZ are still evolving in terms of maximum area, proportion of processing areas and use of compulsory acquisition etc. Furthermore, Government of Maharashtra has adopted a policy of "special townships", where foreign direct investment (FDI) will also be permitted.

4.1.1 Possible Alternatives Scenarios

Given the changing trends of economy, long-term forecasting of economy, population and spatial distribution within MMR can be attempted with limited degree of certainty. However, growth scenarios that capture the extremes of **concentration and densification** of Greater Mumbai on one hand and **vigorous and rapid growth of rest of the region** on the other can be envisaged. The former may include growth of financial services at Bandra Kurla Complex (BKC), and IT & ITES at Andheri Kurla Road, Malad and redeveloped textile mills whereas the latter may include very rapid growth of Navi Mumbai, SEZs and special townships.

The Comprehensive Transportation Study (CTS) of MMR² has attempted to capture this range by envisaging four population distribution alternatives- P1 to P4 (Table 4-1) and four employment distribution possibilities- E1 to E4 (Table 4-2) giving rise to 16 possible combinations as shown in Figure 4-1. P1 to P4 and E1 to E4 indicate increasing scale of dispersal away from Greater Mumbai. Thus, P1,E1 represents extreme concentration in Greater Mumbai whereas P4, E4 represents accelerated dispersal to the Region particularly to SEZ near Navi Mumbai. However, in all the scenarios, the total population (34 million by 2031) and employment (15.3 million by 2031) are considered to be constant.

¹ As a result of Government of India's policy in 2004 promoting SEZs for export oriented growth.

² A study initiated by MMRDA and financed by the World Bank.

Table 4-1: Alternative growth scenarios for population distribution for the year 2031

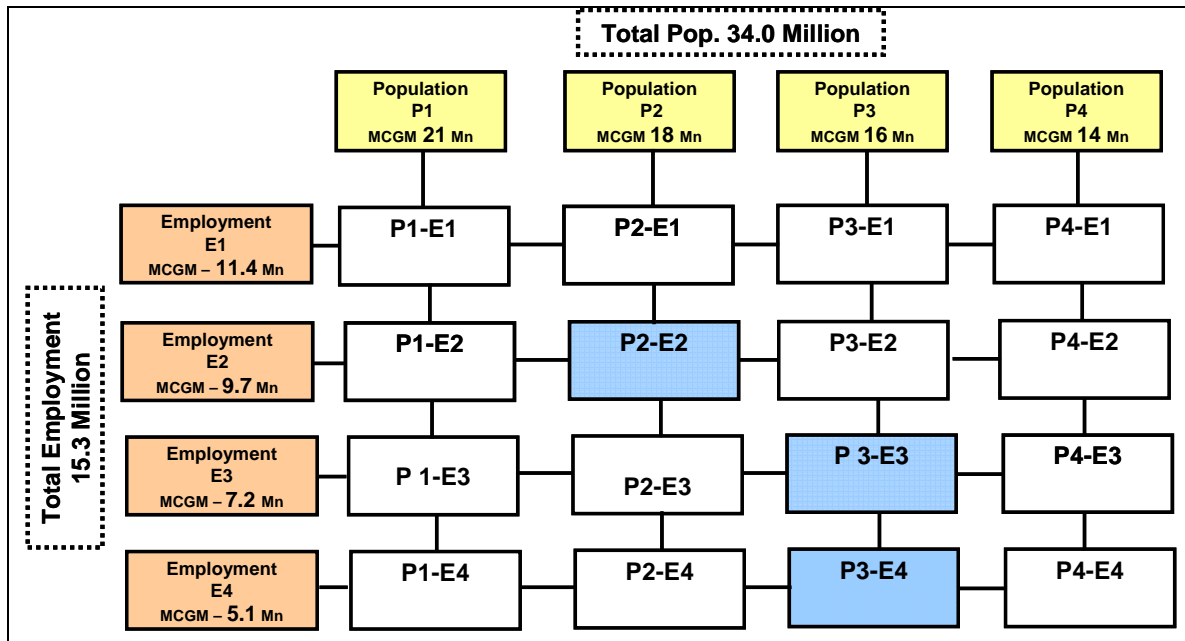
Alternative Scenario	Strategy
P-1 Scenario-I MCGM: RoR 61%: 39%	Population for the year 2031 is distributed as per the 2001 population share of total MMR and that supremacy of MCGM is retained. The present share of population in MCGM continues to be around 61% of total. This will result in high intensification of MCGM, and may reach about 20.74 million.
P-2 Scenario-II MCGM: RoR 53%: 47%	Assumes population in MCGM will be 18 million – about 3 million short of P-1 Scenario and that the region will get this share. In this scenario, Greater Mumbai reaches 53% of the total population.
P-3 Scenario-III MCGM: RoR 47%: 53%	Assumes population in MCGM will be about 16 million following the past growth trends. This approximates “business as usual scenario”.
P-4 Scenario-IV MCGM: RoR 41%: 59%	This scenario assumes an additional population of 1.98 million in MCGM over the next 25 years. In other words, population of MCGM will fall short of P-1 Scenario by about 6.79 million. This is considered to represent a low intensification of MCGM and high intensification of region. In this scenario, MCGM accommodates a population of 14 million.

Note: MCGM- Municipal Corporation of Greater Mumbai; RoR – Rest of Region
Source: *Comprehensive Transportation Study for MMR, MMRDA, 2007.*

Table 4-2: Alternative growth scenarios for Employment distribution for the year 2031

Alternative Scenario	Strategy
E-1 Scenario-I MCGM: RoR 72%: 28%	The MCGM continues to offer higher employment opportunities reaching a total employment of around 11.4 million.
E-2 Scenario-II MCGM: RoR 63%: 37%	The MCGM will have 9.7 million employment opportunities.
E-3 Scenario-III MCGM: RoR 48%: 52%	The employment in MCGM may reach about 7.35 million from the present level of 5.7 million.
E-4 Scenario-IV MCGM: RoR 33%: 67%	This assumes reversal of the present trend of employment distribution. By the year 2031, the employment in MCGM is restricted to a level of 5.1 million.

Note: MCGM- Municipal Corporation of Greater Mumbai; RoR – Rest of Region
Source: *Comprehensive Transportation Study for MMR, MMRDA, 2007.*



Source: Comprehensive Transportation Study for MMR, MMRDA, 2007.

Figure 4-1: Population & Employment Distribution

It must be emphasized that these scenarios are not mutually exclusive “alternatives” from which the optimum could be chosen. The idea behind visualizing such a range of spatial growth is to arrive at a package of priority infrastructure investment projects that is resilient over the entire range of likely spatial distributions. Such package can then be easily fine tuned to adjust to the emerging growth pattern over time.

Realistic Alternatives

The CTS for MMR though explored 4 alternative scenarios each for population and employment distribution within MMR, upon evaluation and subsequent detailed deliberation by the Technical Advisory Committee (appointed to review CTS project in MMRDA), 3 alternative population-employment scenarios, P2-E2, P2-E3 and P3-E3 were agreed upon. In terms of population distribution two alternatives scenarios were felt realistic and decided for all planning purposes in MMR. They are: (a) P-2 scenario; and (b) P-3 scenario. **Accordingly, the population distribution of both P-2 and P-3 scenarios (see Table 4-3 and Table 4-4 are considered for assessing their implications on other regional infrastructure sectors.**

Table 4-3: Population Distribution in MMR under P-2 and P-3 Alternative Scenarios, 2005-2031 (Millions)

Areas	2005	2011	2016	2021	2026	2031
P- 2 Scenario						
MCGM	12.86	14.22	15.36	16.33	17.21	18.02
Rest of Region	7.96	9.6	11.14	12.66	14.24	15.98
P- 3 Scenario						
MCGM	12.86	14.17	15.13	15.71	15.89	15.99
Rest of Region	7.96	10.22	12.01	13.93	16.03	18.01

Source: Comprehensive Transportation Study for MMR, MMRDA, 2007.

Table 4-4 : Population Distribution in MMR under P-2 and P-3 Alternative Scenarios, 2005-2021 (in thousand)

Municipal Corporation / Municipal Council	Total Projected Population (thousand)						
	2005	P2 Scenario			P3 Scenario		
		2011	2016	2021	2011	2016	2021
GREATER MUMBAI	12,861	14,217	15,365	16,330	14,170	15,127	15,714
Island City	3,391	3,730	4,018	4,265	3,719	3,947	4,027
Western Suburb	5,628	6,245	6,777	7,212	6,227	6,675	6,981
Eastern Suburb	3,843	4,242	4,570	4,854	4,225	4,505	4,707
WESTERN REGION	1,345	1,870	2,180	2,457	2,180	2,618	3,030
Mira-Bhayander	632	750	897	1,040	800	939	1,083
Vasai	57	86	98	108	105	127	146
Navghar-Manikpur	132	193	217	237	232	276	316
Nallasopara	210	285	316	340	333	389	439
Virar	143	206	231	252	246	292	334
(included in proposed M Corp)	172	350	421	480	464	595	712
NORTH EASTERN REGION	4,445	5,289	6,056	6,740	5,433	6,273	7,132
Thane	1,465	1,583	1,784	1,949	1,688	1,884	2,059
(Thane-Bhiwandi Road-Urban)	54	77	118	151	99	138	174
Bhiwandi-Nizampur	632	752	886	1,012	775	902	1,009
(Bhiwandi expansion)	47	78	113	146	84	118	145
Ulhasnagar	495	522	539	556	521	543	569
Kalyan-Dombivli	1,353	1,599	1,757	1,903	1,594	1,792	2,021
Badlapur	121	156	179	200	156	184	217
Ambernath	244	318	366	410	317	376	445
(New Urban Area)	35	204	313	413	200	336	494
NAVI MUMBAI	1,310	1,509	1,843	2,159	1,649	1,985	2,324
Navi Mumbai	899	1,008	1,132	1,249	1,060	1,184	1,310
Navi Mumbai excl NMMC	347	391	549	698	457	616	776
NMMC 15 villages	64	110	162	212	132	185	238
PANVEL-URAN	155	271	298	323	283	309	336
Panvel	128	241	262	282	250	271	293
Uran	27	31	36	40	33	38	43
NERAL-KARJAT REGION	480	412	411	411	428	444	456
Karjat	28	28	29	29	29	29	29
Khopoli	65	66	66	66	66	66	66
Matheran	6	6	6	6	6	6	6
N-K Rural	381	312	311	310	328	344	355
PEN-ALIBAG	224	249	352	573	252	388	648
Alibag	21	21	22	22	22	22	22
Pen	33	38	50	75	38	53	83
Rural	82	68	67	67	71	75	77
Maha Mumbai SEZ	88	122	213	409	121	239	466
TOTAL MMR	20,821	23,817	26,505	28,994	24,395	27,145	29,639

Source: Comprehensive Transportation Study for MMR, MMRDA, 2007

4.2 ALTERNATIVE SCENARIOS AND IMPLICATIONS FOR INFRASTRUCTURE INVESTMENT

The infrastructure investment will depend upon the existing backlog and the future demand. The demand for water supply, sewerage, solid waste, education, healthcare and power supply depends upon the population and would therefore be same for scenarios at MMR level. The travel demand would however depend upon the population-employment distribution. Storm water drainage would depend upon the extent of land brought under development. To reflect the above-mentioned sector specific variations, different criteria have been adopted to calculate the demand and investment in each sector (Refer Table 4-5) .A brief discussion on each of the infrastructure sector including the scenario-specific deviation is presented in the subsequent sections.

Table 4-5: Norms for Estimating Demand and Unit Costs for Estimating Capital Investment Requirements

Sector	Norms and Unit Costs used for Demand Projection and Capital Investment Needs
Water Supply Distribution	Water supply assumed as 240 lpcd and 200 lpcd for MCGM and rest of municipal towns respectively. As per discussions with MJP officials, distribution cost varies with the population size of towns- Rs. 800, Rs. 1000 and Rs. 1500 per capita for council towns, corporations with 2-3 million population and metro cities respectively. Same criteria has been used with minor variations of adopting a unit rate of Rs. 1000 per capita for all corporations irrespective of their population size.
Sewerage	Sewage generation assumed as 80% of the total water supply in respective ULBs. For capital investment needs in MCGM and NMMC, respective DPR cost has been taken. For other ULBs average per capita cost has been calculated from the available CDP estimates of six municipal corporation/councils (which work out to be about Rs. 2435 per capita) and thus a unit rate of Rs. 2500 per capita adopted for estimating capital investment needs in 2021.
Solid Waste Management	Demand and Capital Investment Needs have been separately worked out for primary collection, secondary collection and composting/disposal. The waste generation rates range from 600 grams/capita (in case of Greater Mumbai) to 250 grams/capita for smaller council towns. The required solid waste infrastructure has been projected by assuming 2% annual increase in the per capita generation. Primary Collection Cost includes Litter bin costs, House-hold bin costs, Wheel borrow costs Secondary Collection Costs includes cost of Mechanized containers, tippers, dumpers, and civil works at transfer station. Disposal/composting costs includes Plant Machinery, JCB, infrastructure, and Environmental costs.
Municipal Transport infrastructure	Municipal Infrastructure includes following: 1. New/Upgradation of local roads, 2. Intersection Improvements, 3. Parking, 4. Transport Terminals, 5. Bus Fleet and 6. Street lighting. For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai, Kalyan-Dombivali and Ambernath, respective CDP per capita cost for the plan period has been used to estimate the total investment requirements. For other Municipal Corporations, an average per capita cost of Rs. 3700 (derived from the CDP estimates of the above ULBs) has been used. For other Municipal Councils, an average per capita cost of Rs. 1500 has been used to estimate the total cost.

Sector	Norms and Unit Costs used for Demand Projection and Capital Investment Needs
Education Infrastructure	Student population for primary schools has been taken as 15% of population and strength of each school as 500 students. Student population for secondary schools has been taken as 7.5% of the total population and strength of each school as 1000 students. (as per GoM Norms). For Greater Mumbai, 2.51 sq.m./student is taken for calculation purposes in primary and secondary schools as per Greater Mumbai DP norms. For rest of Urban MMR, 4 sq.m/student and 3 sq.m/student is taken for primary and secondary schools respectively as per GoM. Unit cost of construction is taken as Rs. 5000/sq.mt.
Health Infrastructure	Number of beds have been considered as 4 beds/1000 population as per GoM Norms and Mumbai Development Plan. For Greater Mumbai-Island City and Suburbs, 41.8 sq.m./bed and 83.6 sq.m./bed respectively has been taken for calculation purpose. For rest of MMR, 83.6 sq.m./bed is taken for calculation purpose. Unit cost of construction is taken as Rs. 8000/sq.mt.to address requirements of large hospitals.
Storm Water Drainage	For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai and Ambernath CDP estimates are considered as the total cost for this sector. For Other Municipal Corporations, an average unit cost of Rs. 2.5 Crores/sq.km has been adopted based on the CDP estimates of Thane and Mira-Bhayander Corporation. For rest of Municipal Councils, unit cost of Rs. 1.2 Crores/sq.km. has been used, based on the CDP estimates of Ambernath Municipal Council.
Water Supply-Source Development	As per Chitale Committee Report unit cost of source development is about Rs. 2 crores/million cum of water storage. However, for capital investment requirement for MMR, this has been assumed as Rs. 3.3. crores/cum based on the Middle Vaitarna Dam cost estimates. As per the Chitale Committee Report, average unit cost for the conveyance system is approximately 5.8 lakhs lakhs/mld(based on the unit cost of Pinjal water supply scheme, Bhiwandi water supply scheme and Barvi scheme) . Same (6lakhs/mld) has been adopted for capital investment requirements in the Business Plan estimates.
Metropolitan Transport Infrastructure	Network has been identified for the year 2021 based on the selected population-employment scenarios. Unit rates for individual transportation systems has been worked out and adopted for projecting the capital investment requirements for 2021(refer table 4-29)
Electricity	Total Demand for the Maharashtra state has been worked out for 2021 based on per capita consumption and number of users. Proposed/Committed projects and their likely generation by all the energy providers have been computed and additional supply required to be provided for the state has been worked out. A unit cost of 8 crores/MW has been adopted for generation, transmission and distribution (for additional supply) and 40% of the state energy has been considered for MMR.

4.2.1 Water Supply

Situation Assessment

Supply of water is an obligatory duty of ULBs under respective legislations and also under Schedule 12 of the Constitution. However in addition to ULBs, Maharashtra Jeevan Pradhikaran (MJP), Maharashtra Industrial Development Corporation (MIDC) and Water Resources Department are also involved in storage, transmission and bulk supply to ULBs.

MMR falls within what is known as **Mumbai hydrometric area** comprising the valleys of rivers Vaitarana, Ulhas, Patalganga and Amba. The total water demand for MMR by 2031 is estimated³ to be to the tune of 3520 million cum. As against, an estimated 7870 million cum of water is available at 95% dependability from these river valleys (as estimated by Water and Irrigation Commission, Government of Maharashtra). Thus, there is no intrinsic problem of surface water availability for MMR. Table 4-6 and Table 4-7 present existing and potential water sources for MMR respectively.

Table 4-6: Existing Water Sources for MMR

Regions	Name of the Dam / Source	Available Water (million litres/day)
Greater Mumbai	Total	2893.0
	Modak Sagar	490.0
	Tansa	408.0
	Upper Vaitarna	544.0
	Bhatsa	1365.0
	Vihar	68.0
	Tulsi	18.0
Western Region	Total	119.0
	Usgaon	10.0
	Tansa River (Shirgaon Bandhara),	10.0
	Pelhar	10.0
	Ulhas River (Bhivpuri Tailrace)	89.0
North Eastern Region	Total	1550.0
	Ulhas River (Bhivpuri Tailrace)	719.0
	Barvi	825.0
	Chikhloli	6.0
Navi Mumbai	Total	479.0
	Patalganga	211.0
	Ransai	26.0
	Hetawane	110.0
	Barvi	132.0
Panvel-Uran	Total	474.0
	Ulhas River (Bhivpuri Tailrace)	13.0
	Morbe	450.0
	Dehrang	11.0
Pen-Alibag	Total	208.0
	Hetawane,	40.0
	Amba (Nagothane)	168.0
TOTAL MMR		5723.0

Source: Compiled from Dr. Chitale Committee Report, 2003.

³ Dr. Chitale Committee Report, 2003

Table 4-7: Potential Water Sources for MMR

Name of the Dam / Source	Water storage (million cum)	Available Water (mld)	Potential areas of coverage
Middle Vaitarna	174.0	476.7	MCGM
Pinjal	401.55	1230.0	MCGM (697mld), Western Region (533mld) (Mira- Bhayander, Vasai, Navghar-Manikpur, Nallasopara, Virar)
Damanganga		1600.0	For wider region
Gargai	179.7	452.0	MCGM
Shai	362.04	940.0	MCGM
Kalu	401.24	570.0	MCGM
Susari	57.0	200.0	Western Region: (Mira- Bhayander, Vasai, Navghar-Manikpur, Nallasopara, Virar)
Poshir	338.93	720.0	North Eastern Region: Thane-Bhiwandi-Kalyan-Ulhasnagar-Ambernath-Badlapur
Extension of Barvi Dam	270.0	739.73	
Gadhi	38.19	300.0	Navi Mumbai-Panvel-Uran-Neral Karjat Region-Pen-Alibag
Balganga	120.67	354.0	Navi Mumbai-Panvel-Uran-Neral Karjat Region-Pen-Alibag(now mainly for SEZ)
Total MMR	2343.0	7582.0	

Source: Compiled from Dr. Chitale Committee Report, 2003.

Notwithstanding the abundance of exploitable water, in 2003, the supply of 5723 mld did not meet the demand of 8316 mld. The major deficit is in the sub-regions of Greater Mumbai (1441 mld), Mira-Bhayander and Vasai-Virar (45 mld). The deficit is being addressed by developing source at Middle Vaitarna, which is being developed by MCGM, has a capacity of 477 mld.

By the time Middle Vaitarna gets completed, the growth and consequent increase in demand would overtake the increased supply and cause increased deficit in supply to Greater Mumbai. Pinjal, where no action has apparently begun, would provide 697 mld of water to Greater Mumbai and 533 mld of water to Mira-Bhayander and Vasai-Virar. However, this additional water will not be available until 2016. The existing deficit will therefore persist and may increase. Water demand is likely to be 8356 mld by 2016 and 9160 mld by 2021⁴. Given the long gestation period for source development, it is necessary to begin the source development immediately for meeting the demand of 2016. The required programme of source development is shown in Table 4-8.

The critical problem faced by the water supply sector is timely development of sources. The factors affecting the timely completion are the following:

⁴ As estimated by Dr. Chitale Committee, 2003

- The process of project designing -- requiring detailed surveys; assessment of forest submergence and planning for resettlement and rehabilitation- is long drawn and needs co-operation of the projected-affected people;
- The process of obtaining forest and environmental clearance, including resettlement and rehabilitation, is also time consuming;
- The construction period too is long – around 6 years;
- Long-term funds with reasonable moratorium are necessary in such a situation but are difficult to mobilize; and
- There is no single agency devoted to the development of sources.

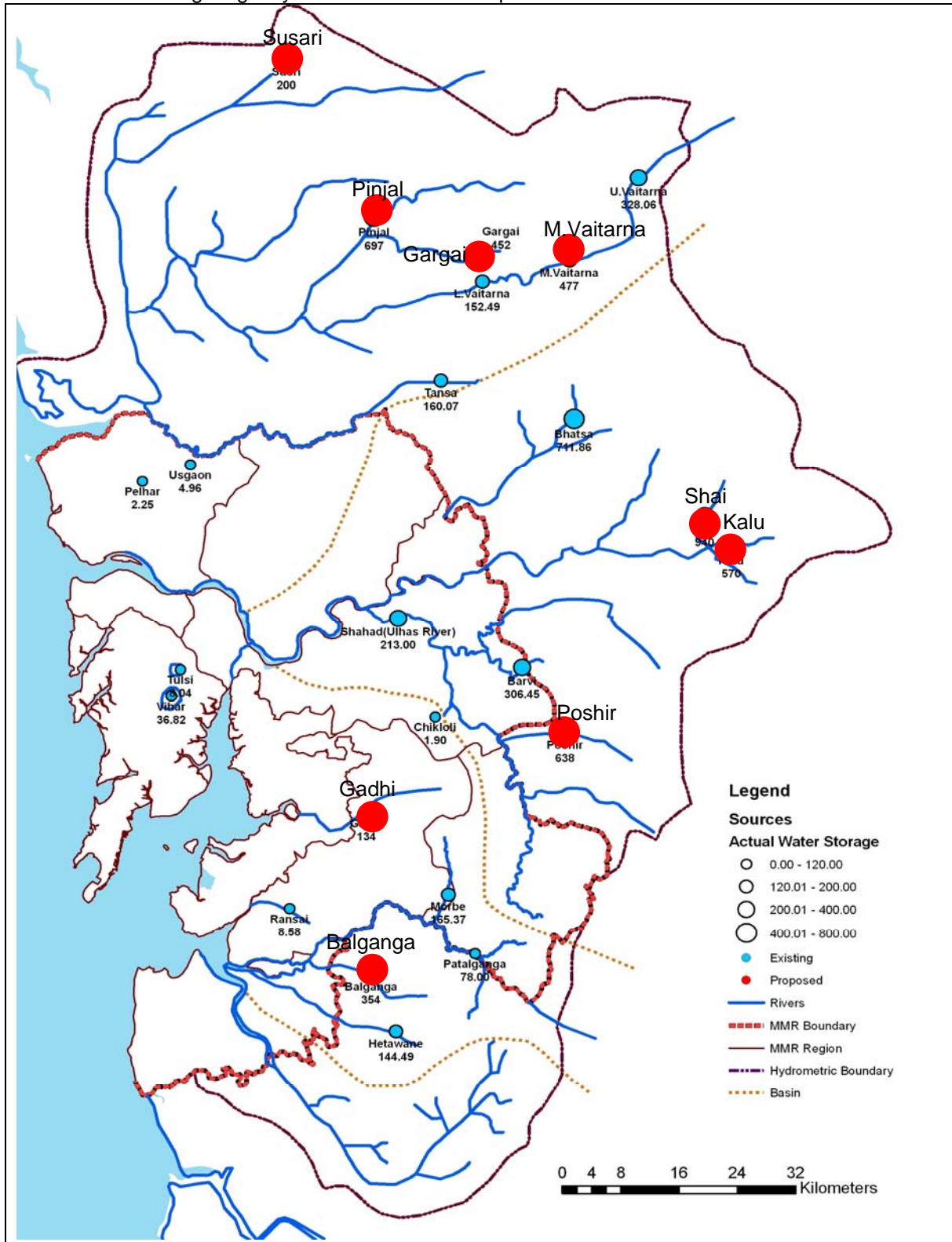


Figure 4-2: Map showing existing and potential water sources of MMR

Implications on Demand

The existing water demand, supply coverage and gap and implications of alternative growth scenarios with respect to water supply demand (including domestic, industrial and UFW) have been estimated. For the purpose of clarity, besides estimating quantum of existing gap, five yearly incremental demand has also been worked out.

The norms for estimating water supply demand have been considered as 240 lpcd for Greater Mumbai and 200 lpcd for Rest of Region (as against 150lpcd proposed by Dr. Chitale Committee) in view of the world class aspiration.

Table 4-8 presents a summary of water supply demand (including industrial) under P-2 and P-3 scenarios for 2011 to 2021. The details of the same by sub-region and ULBs are given in **Appendices IV.1 and IV.2**. A comparison of two alternative scenarios suggest that an estimated 6813 to 6885 mld water supply is needed to meet the demand of MMR by 2021. A substantial share (57 to 62%) of the total demand is needed exclusively for MCGM by 2021.

Table 4-8: Existing and Additional Water Supply Demand in MMR – 2005 to 2021 (mld)

Scenario	Existing Supply, Demand and Gap			Additional Cumulative Demand		
	2005 Supply	2005	2005 Gap	2011	2016	2021
P-2 Scenario						
MCGM	3,025	5,928	2,903	3,398	3,816	4,169
Rest of Region	1,308	2,388	1,080	1,597	2,059	2,517
Total MMR	4333	8,316.	3,983	4,995	5,875	6,686
P-3 Scenario						
MCGM	3,025	5,928	2,903	3,381	3,729	3,944
Rest of Region	1,308	2,388	1,080	1,769	2,302	2,870
Total MMR	4333	8,316.	3,983	5,150	6,031	6,814

Source: Estimated, 2007.

Implications on Capital Investment

The capital cost for developing regional water sources and transmission in MMR have been estimated separately and given in Table 4-9. The unit cost for estimation is provided as a note below the table. The details are given in **Appendix IV.3**. An estimated Rs. 14,110 crores is needed for developing regional water sources including conveyance by the year 2021.

Table 4-9: Capital Investment Needs for Regional Water Source Development in MMR (Rs. Crores)

Name of the Dam / Source	Estimated Cost for development of source (Rs.Crores)	Estimated Cost of Conveyance system	Total (Rs.Crores)
Middle Vaitarna	574	276	851
Pinjal	1325	713	2038
Gargai		262	262
Shai	1195	545	1740
Kalu	1324	330	1655
Susari	188	116	304
Damanganga #			3500
Poshir	1118	418	1536
Extension of Barvi Dam	891	429	1320
Gadhi	126	174	300
Balganga	398	205	603
Total	7,140	3,469	14,110

Source: Estimated, 2007.

Note: i) Unit cost for the development of the sources is considered as Rs 20 million (Rs. 2 crores) for 1 million cum of the water storage (as per Chitale Committee report) However based on Middle Vaitarna cost of construction of dam, this can be assumed as Rs 33 million/cum

ii) Unit cost for the conveyance system for 1 mld of the water supply is taken as approx Rs 6 million (Rs.5.8 lakhs) (the average of the unit cost (in millions) of Pinjal water supply scheme, Bhiwandi water supply scheme and Barvi scheme) (Source: Chitale Committee Report, 2003).

iii) * Cost of Damanganga for 1600mld water is considered as Rs. 3500 crores for Pinjal-Damanganga linking

In addition, capital investment needs have been estimated for water supply system in all sub-regions including ULBs under both P-2 and P-3 scenarios (Table 4-10). It is estimated that a total of Rs. 1,022 to 1,031 crores is needed to meet the distribution cost in various sub-regions in MMR. The unit costs considered for estimation is given below the table. **Appendices IV.4 and IV.5** provides details by sub-region and ULBs.

Table 4-10: Capital Investment Needs for Water supply Distribution System in MMR (Rs. Crores)

Scenario	Cost for 2005 Gap	Cumulative Capital Cost		
		2011	2016	2021
P-2 Scenario				
MCGM	19	208	395	550
Rest of Region	55	166	346	482
Total MMR	74	374	741	1,022
P-3 Scenario				
MCGM	19	201	359	447
Rest of Region	55	216	416	583
Total MMR	74	417	775	1,030

Source: Estimated, 2007.

Note: 1) As per the discussions with the MJP officials the cost of water supply distribution for councils may be taken as Rs 800 per person, for municipal corporations with a population of around 20 to 30 lakhs, the water supply distribution cost may be considered as Rs 1000 per person and that for metropolis like Mumbai, Delhi etc Rs 1500 per person. 2) 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016.

Table 4-11: Programme of Water Source Development

SUB-REGION	Existing Sources	Time Frame														
	Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
MCGM	Demand Including Back log (mld)	5,930	6,054	6,178	6,301	6,425	6,509	6,593	6,677	6,761	6,845	6,915	6,985	7,055	7,125	7,195
	Current Supply	3100														6971
	Proposed Dam Sources															
	Middle Vaitarna								480							
	Pinjal(Total yeild 1230 mld)									697						
	Shai									942						
	Gargai									452						
	Kalu									570						
	Damanganga															730
	Total		3100	3100	3100	3100	3100	3100	3100	3580	6241	6241	6241	6241	6241	6241
Western Region (Vasai, Virar,Nallasopara, Navgarh Manik Pur, Mira-Bhayander)	Demand (mld)	404	443	483	522	561	580	598	617	635	654	671	688	704	721	738
	Current Supply	167														
	Proposed Dam Sources															
	Pinjal								533							
	Susari(phase-I)*									200						
	Total (mld)								700	800						
North East Region (Thane, Bhiwandi, Kalyan, Ambemath, Ulhasnagar, Badlapur)	Demand (mld)	1,334	1,397	1,461	1,524	1,587	1,633	1,679	1,725	1,771	1,817	1,858	1,899	1,941	1,982	2,023
	Current Supply	1106														
	Proposed Dam Sources															
	Poshir							720								
	Total (mld)		1106	1106	1106	1106	1106	1826	1826	1826	1826	1826	1826	1826	1826	1,826



SUB-REGION	Existing Sources	Time Frame															
	Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Navi Mumbai-Neral Karjat Region (Navi Mumbai, Neral, Karjat, Khopoli, Rasayani, Panvel, Uran)	Demand (mld)	608	616	624	632	640	657	674	690	707	724	742	760	778	796	814	
	Current Supply	715															
	Proposed Dam Sources																
	Gadhi(Phase-I)																300
	Balganga(Phase-I)																354
	Total (mld)	715	715	715	715	715	715	715	715	715	715	715	715	715	715	715	1,369
Pen - Alibaug Region	Demand (mld)	43	50	56	63	70	75	80	85	90	95	106	117	128	139	150	
	Current Supply	30															
	Hetawane(130)																
	Amba (Nagothane)																973
	Total (mld)																1,003
	Total Region Demand	8,319	8,560	8,801	9,042	9,283	9,453	9,624	9,794	9,965	10,135	10,292	10,449	10,606	10,763	10,920	
	Grand Total Supply (mld)	5,118	4,921	4,921	4,921	4,921	4,921	5,641	6,821	9,582	8,782	8,782	8,782	8,782	8,782	8,782	11,169
	Indicates the Initiation in Construction of Proposed dam on priority basis																
	Indicates the option for the developemnet resources by the private developers/SEZ																

Notes:

Present water supply to MCGM from different resources is 3100 Mld. Where as the current requirement is 5930 Mld. To meet the backlog demands, Middle Vaitarna, Pinjal, Gargai, Kalu and Shai are to be taken up immediately on priority basis. Even after development of resources, a deficit of 956 mld is observed and has to be met from the other resources (Damanaganga).

For Western Region the current supply is only 167 MLd and the demand is 404 Mld, to meet the current demand 533 mld of Pinjal has to be made available to the region. The supply of 100 mld available from Surya is for a limited period and has to be replaced by Susari. Therefore, though Susari has total capacity of 200 mld, effective increase in supply will be only 100 mld.

For North Eastern Region the current supply is 1106 mld where as the demand is 1334, to meet the demand Poshir dam development should be taken up and the source should be made available by 2013. Even after the development of Poshir dam the region is left with a backlog of 200mld.

For Navi Mumbai Region, available resources are 715mld, where as the demand is 608 mld, and as such the region is already water surplus and does not require the immediate construction of proposed dams in the plan period. However for the development of new townships and green field development, Gadhi and Balaganga can be developed by SEZ developers.

Water demands of the Pen Ali-bag Region are currently met by Hetwane dam resources. For SEZs and green field developments, future water requirements of the region can be met by the development of Amba dam, which can be taken up by the real estate and SEZ developers.

4.2.2 Sewerage and Sanitation

Situation Assessment

The coverage of sewerage system in urban local bodies of MMR indicates coverage up to 60% of Greater Mumbai, 70% of Ulhasnagar and Ambernath, 25% of Kalyan-Dombivili and Bhiwandi–Nizampur, 17% of Thane and 57% of Navi Mumbai (Table 4-12). An underground sewerage system is totally absent in the rest of the ULBs.

Table 4-12: Status of Sewerage /Sanitation in MMR

S. No.	ULB	Status of Sewerage/Sanitation						Sewage Quantity MLD
		Sewered Area sq.km	Unsewered Area sq.km	Length of sewers km.	Coverage on Gross area %	Public toilet seats existing	Public toilet seats needed	Total
1	MCGM	261	175	1500	60%	63610	39278	2671
2	TMC	22	106	NA	17%	8691	3461	176
3	KDMC	17	51	NA	25%	NA	1325	162
4	Ulhasnagar	9	4	NA	70%	5908	-	90
5	NMMC	77	58	NA	57%	2978	5046	191
6	Mira Bhyander	13	75	NA	15%	632	4428	65
7	Panvel	NA	NA	NA	NA	NA	1024	NA
8	Uran	NA	NA	NA	NA	NA	216	NA
9	Karjat	NA	NA	NA	NA	NA	224	NA
10	Khopoli	NA	NA	NA	NA	NA	520	NA
11	Pen	NA	NA	NA	NA	NA	264	NA
12	Alibaug	NA	NA	NA	42	42	126	NA
13	Matheran	NA	NA	NA	NA	NA	48	NA
14	Bhiwandi Nizampur	7	20	NA	25%	NA	5430	90
15	Badlapur	NA	NA	NA	NA	NA	311	14
16	Ambarnath	27	11	47.8	70%	1600	-	33
17	Vasai	NA	NA	NA	NA	NA	455	NA
18	Navghar Manikpur	NA	NA	NA	NA	NA	1057	14.4
19	Nallasopara	NA	NA	NA	NA	NA	1677	NA
20	Virar	NA	NA	NA	NA	NA	NA	NA

Source: Compiled from data collected from Municipal Corporations/Municipal Councils in MMR, 2006

With respect to treatment facility, apart from MCGM, only 5 other corporations and one council have some kind of treatment or disposal facility as presented in Table 4-13.

Table 4-13: Status of Sewage Treatment and disposal Facilities in MMR

Name of Corporation/Council	Description of Treatment and Disposal Facilities
Greater Mumbai	<ul style="list-style-type: none"> Sewage treatment and disposal in zone I(Colaba), II(Worli) and III(Bandra) appears to be reasonably working well. Zone I has 6 pumping stations and preliminary treatment facility and 1.2 km outfall to the harbour. Zone II has 16 pumping stations, preliminary treatment plant and 3 km long sea outfall. Zone III has 16 pumping stations, preliminary treatment facility and 3 km long sea outfall. Zone IV(Versova) has 1 pumping station, preliminary treatment and aerated lagoon treatment facility with disposal at Malad Creek. Zone V(Malad) has one large pumping station, preliminary treatment facility and disposal at Malad Creek. Zone VI(Bhandup) has 3 pumping stations and sewer leading to preliminary and aerated lagoon treatment discharging to Thane Creek. Zone VII(Ghatkopar) has primary treatment with aerated

Name of Corporation/Council	Description of Treatment and Disposal Facilities
	lagoon and disposal in Thane creek.
Thane	<ul style="list-style-type: none"> Sewage Treatment Plant of 54 MLD capacity but various units of the STP are not in working condition and need to be replaced.
Kalyan-Dombivali	<ul style="list-style-type: none"> One primary treatment plant of 30 MLD. Final disposal in Ulhas river.
Bhivandi-Nizampur	<ul style="list-style-type: none"> The sewage with sludge is pumped to the oxidation ponds constructed at Katai village for further treatment and final disposal. Conventional STP of 17 MLD capacity constructed at Katai Khomi village near Bhiwindi. The sewage is disposed off into Kamwadi river.
Navi Mumbai	<ul style="list-style-type: none"> 8 STPs of total 184.65 MLD capacities. Presently only 167.15 MLD(74% of sewage) is being used. These treatment plants mostly use aerated/facultative lagoons for treatment.
Ulhasnagar	<ul style="list-style-type: none"> 28 MLD capacity STP. Final disposal in Ulhas River.
Mira-Bhayandar	<ul style="list-style-type: none"> No treatment facility by corporation. Few private STPs of primary and secondary treatment with aeration. Final disposal in the sea.
Ambarnath	<ul style="list-style-type: none"> 28 MLD capacity STP and final disposal in Ulhas river.
Rest of Council Towns	<ul style="list-style-type: none"> No sewerage treatment facility.

Source: Compiled from data collected from Municipal Corporations/Municipal Councils in MMR, 2006

The total quantity of sewage generated in the region based on water supply and population is estimated as 3922 mld, of which, 2930 mld is provided with treatment, 1960 mld with primary treatment, and 973 mld with secondary treatment.

Implications on Demand

Following targets are proposed in consultation with ULBs

- 100% coverage of the region through an underground sewerage system is the long-term aim, towards which a phased approach is to be undertaken; and
- Alternative approaches will be worked out to address immediate needs and existing facilities will be upgraded.

The investment program to achieve above target has been worked out by estimating the existing quantity of domestic and industrial sewage based on water supply and standard methods and incremental demand by 2021. Table 4-14 presents the quantum of sewage generated in MMR under two alternative growth scenarios by 2021. **Appendices IV.6 and IV.7** presents the details by sub-region and ULB.

Table 4-14: Existing and Cumulative Sewage Generated in MMR (mld)

Scenario/ Area	2005 (Backlog)	Additional Cumulative Demand		
		2011	2016	2021
P2 Scenario				
Greater Mumbai	1831	396	731	1012
Rest of MMR	1394	419	794	1165
Total MMR	3,225	815	1,525	2,177
P3 Scenario				
Greater Mumbai	1831	382	661	833
Rest of MMR	1394	559	985	1,439
Total MMR	3,225	941	1,646	2,272

Source: Estimated, 2007.

Note: Sewage generation has been taken as 80% of the total water supply in respective ULBs.

Above table implies that the total backlog is higher than the cumulative additional demand for the horizon year in both the scenarios.

Implications on Capital Investment

The capital investment needs for development of sewerage and sanitation facility in MMR have been estimated under both alternative scenarios for 2021. It is estimated to be in the range of Rs. 8,645 to 8,747 crores by 2021 (Table 4-15). Of which, a substantial (over 60%) share of investment is needed for MCGM. **Appendices IV.8 and IV.9** presents the details by sub-region and ULB.

Table 4-15: Capital Investment Needs for Sewerage and Sanitation Development in MMR (Rs. Crores)

Scenario/ Area	Total Backlog Cost	Additional Cumulative Cost		
		2011	2016	2021
P2 Scenario				
Greater Mumbai	4,387	1,559	5,241	5,570
Rest of MMR	1,820	903	2,674	3,075
Total MMR	6,207	2,462	7,915	8,645
P3 Scenario				
Greater Mumbai	4,387	1,543	5,159	5,360
Rest of MMR	1,820	1,063	2,892	3,386
Total MMR	6,207	2,606	8,052	8,746

Source: Estimated, 2007.

Note: The total cost of BSDP II is Rs 5570 crores. Out of this Rs 3941 crores is sewerage component and Rs 1625 crores is slum sanitation. This for a total population of 16.33 million works out to Rs.3411 per capita.

Average per capita cost, as calculated from the CDP estimates of 6 municipal corporations/municipal council is about 2435. Hence for the above calculations the unit cost of sewage collection, sewage treatment and disposal is taken as Rs. 2500 per capita for all the other ULBs. With respect to Greater Mumbai and Navi Mumbai the cost is considered as given in CDP.

25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016

4.2.3 Solid Waste Management

(a) Situation Assessment

MMR, at present, generates an average municipal solid waste of about 11,000 TPD, of which, MCGM alone accounts for about 8000 TPD (73%). The Municipal Solid Waste (Management and Handling Rules 2000), under the Environment Protection Act, set December 2003 as the deadline for all municipalities for upgrading solid waste management systems, especially pertaining to 100% collection, transportation, scientific processing and disposal of city waste into the sanitary landfills. To ensure compliance, the GoM has set up a solid waste management (SWM) cell within the AILSG to guide the ULBs in the implementation of these rules. As a result, action plans for implementing the MSW rules have been drawn up for each of the ULBs.

MMR, as on date, does not have an efficient solid waste management (SWM) system. There exists a wide variation in the management of the municipal solid waste amongst the 20 ULBs. **Appendix IV.10** summarizes the present situation, in terms of waste generated and collection and disposal practices. The collection efficiencies are improving in all the ULBs and sites for sanitary landfills are either identified or are being finalized. Capacity building of the ULBs is underway through the SWM cell of the AILSG in addressing these and effectively implementing the action plans.

Discussions with the various ULBs identified constraints in identification of appropriate land for landfill sites⁵ as a major issue towards development of landfill sites. Discussions with the ULBs indicate the following:

- No site is identified, as no suitable lands for the same are available;
- Sites have been identified, but the clearance from the MPCB is yet to be obtained; and
- Sites have been identified and clearance from MPCB obtained, but the possession of the site has not been possible, largely associated with the land acquisition and objections by the communities in location of landfills in their areas.

The extent of progress made by the various ULBs in the identification of suitable landfill sites is provided in **Appendix IV.11**. All the ULBs have identified projects towards conformance to the MSW Rules as part of the action plans. The Municipal Corporations have included the same in the City Development Plans (CDPs). For projects identified, the funding is envisaged under the JNNURM and other state sources of funding.

In terms of management of other special types of solid waste, such as the bio-medical and hazardous waste, the present practices do not conform to the regulatory requirements of the MoEF. All ULBs have prepared a documentation of the biomedical waste generators. Notices have been issued towards conformance to the biomedical waste handling rules. However, the implementation of these suggested activities are yet to gain momentum.

The local bodies are responsible for solid waste management in MMR. Besides, innovative waste collection approaches such as slum adoption system and Advanced Locality Management (ALM) systems have been successfully working in Mumbai. Replication of these approaches in other constituents of MMR is also envisaged.

- **Slum adoption system:** Presently implemented through involvement of registered local community based organizations (CBOs), which are provided a monthly honorarium (for three years) for waste collection and cleaning of small *nallahs* and drains in identified slum pockets. The concept of this scheme is to encourage the community (from the 4th year onwards) to 'own' local initiatives in planning and execution at the grassroots level. The CBO is authorized to collect a nominal charge from each household. 100% coverage of slums was envisaged by 2007.
- However till date, 50% of the slums have been covered. The key issue pertaining to slum adoption system has been that CBOs discontinue after three years. This results in new CBOs that take up the task for the next three years, for which honorarium is to be paid. This system can be replicated in other slums in MMR once such issues are resolved and appropriate mechanisms are worked out.

⁵ Development plans do not generally identify/earmark site for solid waste disposal or landfills. The identification of these in the DPs shall ensure avoidance of non-conforming uses around these sites.

- **Advanced Locality Management (ALM):** This is a cooperative approach (presently operating in Mumbai and Kalyan) between the local populace and the officials of MCGM and entails forming Street Committees that coordinate with the Ward Officers for better management of civic road related issues, especially garbage management. This process facilitates separation of wet and dry garbage 'at source'. It enables wet garbage to be vermin-cultured in the gardens of local area or given to private organizations for composting. Dry garbage such as plastic, rubber, metal and glass is handed over to rag pickers who sell to scrap dealers for recycling. At present, there are about 584 such ALM Street Committees in the 24 wards of the city, aiming for 'Zero Garbage'. The focus is on reduction of waste, storage and disposal, involving rag pickers for collection and disposal of dry waste. Several wards adopt wet disposal, vermi- composting and composting.
- Consultations indicate that the effectiveness of the ALMs varies. There are ALMs, which move away from their focus on the garbage management and tend to concentrate on other civic issues such as encroachment etc.

(b) Implications of Demand

The key assumptions in assessing the requirements of the system are:

- A 2% annual increase in the waste generation characteristics across the MMR; and
- 100% collection system, and transportation and an environmentally safe disposal of collected waste;

The assessment of municipal waste generated and the area requirements of the disposal sites are identified based on the assessment of the following key factors: (i) per capita solid waste generated and total waste generated (TPD); and (ii) landfill Input per day in TPD and load per annum in MT. Accordingly, land fill capacity required for the disposal site for the next 15 years has been assessed, and presented in Table 4-16 (**see Appendices IV. 12 & IV.13 for sub-region and ULB wise details**). An estimated 17000 tonnes of municipal waste will be generated in MMR by 2021, 65% of which will be generated in Greater Mumbai. Accordingly, a total of 629 hectares of land fill area would be needed to meet the demand. Of which, MCGM would need an area of 397 hectares (64% of the total area).

Table 4-16: Estimated Solid Waste Generated and Land Fill Area Needs in MMR – 2005 to 2021

Scenario	Municipal Waste Generated (Tones per day)				Land Fill Area Needs (Ha)			
	2005	2011	2016	2021	2005	2011	2016	2021
P-2 Scenario								
MCGM	7893	9263	10391	11431	76	169	283	397
Rest of Region	3626	4354	5072	5776	37	97	161	231
Total MMR	11,519	13,617	15,462	17,207	113	266	444	628
P-3 Scenario								
MCGM	7,893	9233	10230	11000	76	169	283	397.
Rest of Region	3,626	4597	5399	6244	37	97	162	232
Total MMR	11,519	13,799	15,569	17,127	113	266	445	629

Source: Estimated, 2007.

Similar assessment has been made for bio-medical waste and hazardous waste generated in MMR. Details of biomedical waste and hazardous waste

generated from each of the ULBs in the Region were collected from the respective council and corporations. From the deliberations with the ULB staff and field visits it is understood that except Mumbai other ULBs are disposing the biomedical wastes to common treatment plant (Incinerator), which are operated by the private agencies. The available facilities for the disposal of medical waste are highly inadequate and there is a need to establish more common incineration plants on sub regional basis. Regarding hazardous waste the ULBs are disposing the waste to the common disposal sites available at Taloja and Mahape. It is also observed that some of the industrial units are disposing these wastes on to the nearby open lands, as the common disposal sites are far off. Hence, there is an immediate requirement to identify and develop scientific common disposal sites for hazardous waste on sub regional basis. The details of waste generated by each category and the status of disposal sites are listed in **Appendix IV.14**. The estimated demand of bio-medical waste under P-2 and P-3 scenarios is given in Table 4-17. The details of the same by sub-region is provided in **Appendices IV.15 and IV.16**.

Table 4-17: Estimated Bio-Medical Waste Generated in MMR- 2005 to 2021 (Tonnes per day)

Scenario	2005	2011	2016	2021
P-2 Scenario				
MCGM	10	12.09	14.07	16.11
Rest of Region	3.05	4.01	5.03	6.15
Total MMR	13.05	16.09	19.11	22.26
P-3 Scenario				
MCGM	10	12.05	13.85	15.50
Rest of Region	3.05	4.23	5.33	6.61
Total MMR	13.05	16.28	19.19	22.12

Source: Estimated, 2007.

Note: Data on bio medical waste for most of the municipal corporations is provided by the respective authorities. For municipal council, the data is provided by the Maharashtra Pollution Control Board (MPCB). For estimation of Bio medical waste by ULB, per capita waste in gm/person/day is taken. For the Sub regions where the bio medical waste data is not available, Maharashtra State urban average values provided by MPCB is adopted. For future projections, a moderate growth rate of 1.0 % per annum is assumed.

Projections for Hazardous waste generation have not been attempted due to lack of adequate data. Hazardous waste is not linked with the population per se and is more dependent on the nature of manufacturing industries. In case of Mumbai, with the decline in heavy industry and rise of service sectors past trends are also not useful in projecting the quantum of hazardous waste for year 2021.

(c) Implications of Capital Investment

The implications of alternative scenarios with respect to capital investment needs have been estimated for solid waste management in MMR for 2021. Table 4-18 summarizes estimated cost for the two scenarios. The details of capital investment by sub-region and ULB are given in **Appendices IV.17 and IV.18**

Table 4-18: Capital Investment Needs for Solid Waste Management in MMR (Rs. Crores)

Scenario	Cumulative Capital Cost		
	2011	2016	2021
P-2 Scenario			
MCGM	310	317	323
Rest of Region	315	324	335
Total MMR	625	641	658
P-3 Scenario			
MCGM	309	314	320
Rest of Region	299	310	322
Total MMR	608	624	641

Source: *Estimated, 2007.*

Note: Total cost includes primary collection, secondary collection and composting and disposal costs. Primary Collection Cost: Includes Litter bin costs, House-hold bin costs, Wheel borrow costs. Secondary Collection Costs: Includes cost of Mechanized containers, tippers, dumpers, and civil works at transfer station. Disposal composting costs: Includes Plant Machinery, JCB, infrastructure, and Environmental costs. Land Cost is not estimated in the above.

(d) Conclusions

Availability of appropriate land for landfills is the critical problem in several of the ULBs. Application of the concept of regional landfill sites needs to be appropriated, at least for the smaller councils, based on proximity of these settlements. This would not only address the site related issues, but also use economies of scale to maximize the efficiencies of the treatment facilities. For isolated settlements, individual sites would be necessary – for Alibag, Matheran, Karjat, Khopoli, Pen etc. While the sharing of common landfill sites shall be based on consultations amongst the respective ULBs, based on geographical assessment and feasibilities, the following options for regional sites can be considered: (i) Vasai – Virar region could have one common site to cater to the ULBs of Virar, Vasai, Navghar Manikpur and Nalasapora (ii) Ulhasnagar, Ambernath and Badlapur could be catered through a common site (iii) Mira-Bhayender, either one site or sharing with Vasai Virar, (iv) Uran and Panvel, either one site each or sharing with Navi Mumbai/CIDCO. Such common dispersal sites could in fact be considered as Metropolitan infrastructure. However due to lack of adequate information the estimated cost is included in Municipal infrastructure.

4.2.4 Municipal Transport Infrastructure

Capital investment for municipal level transportation infrastructure comprising local/DP roads, intersection, parking facilities, transport terminals, bus fleet and street lighting has been worked out on the per capita basis. Summary of this investment is presented in Table 4-19 and details given in **Appendices IV.19 & IV.20.**

Table 4-19: Capital Investment Needs for Municipal Transport Infrastructure in MMR (Rs. Crores)

Region	Cumulative Cost		
	2011	2016	2021
P2 Scenario			
Greater Mumbai	5,260	5,685	6,042
Rest of MMR	3,109	3,534	3,936
Total MMR	8,370	9,219	9,979
P3 scenario			
Greater Mumbai	5,243	5,597	5,814
Rest of MMR	3,249	3,728	4,228
Total MMR	8,492	9,325	10,042

Source: *Estimated, 2007*

Note: For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai, Kalyan-Dombivali and Ambarnath, respective CDP per capita cost for the plan period has been used to estimate the total investment requirements. For other Municipal Corporations, an average per capita cost of Rs. 3700 (derived from the CDP estimates of the above ULBs) has been used. For other Municipal Councils, an average per capita cost of Rs. 1500, has been used to estimate the total cost.

4.2.5 Education and Health

Situation Assessment

Provision of primary education facilities and imparting education through them is an obligatory function of municipal corporations and councils. ULBs also provide secondary education as a discretionary duty. In the past two decades, this sector has also seen gradual increase of private institutions (both aided and unaided) regulated by the government. The provision of health services-preventive and medical- is again an obligatory duty of ULBs. This sector is also supported by State Government, public trusts and private institutions.

Assessment of existing Health and Educational Infrastructure in various constituents of MMR suffers from data limitations. This limitation is particularly acute in case of private facilities in both the sectors and quality of infrastructure. Table 4-20 provides summary of Health and Education Facilities in urban local bodies of MMR as compiled from past studies/reports. In education sector the description is restricted till secondary level only.

Table 4-20: Existing Scenario of Health and Educational Infrastructure in ULBs of MMR

S. No	Corporation/ Council	Educational Infrastructure	Health Infrastructure	Source
1.	Greater Mumbai	About 1188 and 975 municipal and recognized private primary schools respectively. About 484431 and 456000 students are provided education through municipal and private primary schools respectively. At secondary level, MCGM operates 51 schools catering to about 55576 students.	Municipal health infrastructure consists of 3 major hospitals, one dental hospital, 16 peripheral hospitals in suburbs and 5 specialized hospitals with total bed capacity of about 10600. Private and other government hospitals cater to about 30000 bed spaces.	CDP -2006

S. No	Corporation/ Council	Educational Infrastructure	Health Infrastructure	Source
2.	Thane	133 primary schools and 8 secondary municipal schools. In addition corporation also runs school for handicapped.	One 500 bed hospital, one pediatric hospital, 4 maternity homes, one diagnostic center and 24 dispensaries/primary health centers run by corporation.	CDP-2006
3.	Kalyan-Dombivali	74 schools and 324 private and panchayat samiti primary schools. Total number of students in these schools is about 138769. At secondary level, KDMC runs two secondary schools and private/panchayat samiti operates about 220 schools. Total number of students in these schools is about 74000.	Municipal health infrastructure consists of 2 hospitals (150 bed each), two maternity homes, 13 urban health centers and 3 dispensaries. Private and other government infrastructure has an additional capacity of about 2750 beds.	CDP-2006
4.	Bhivandi-Nizampur	75 municipal and 55 private primary schools catering to about 75000 students. Secondary education infrastructure comprises of 42 schools catering to about 36000 students.	Health infrastructure consists of one hospital and one maternity home run by civic authorities. In addition 15 private hospitals with total capacity of 200 beds.	Env. Status report, 2003-04
5.	Navi Mumbai	NMMC runs 52 primary schools and 52 secondary schools.	Municipal medical infrastructure consists of 6 hospitals, 13 dispensaries and 2 mobile dispensaries. In addition, area is served by 2 government hospitals, 69 private hospitals and about 600 private dispensaries. .	CDP-2006
6.	Ulhasnagar	There are 63 primary and 33 secondary schools catering to about 45903 and 47604 students respectively.	3 government hospitals (350 bed capacity), three charitable hospitals (160 beds capacity) and one dispensary. About 38 private hospitals of 500 bed capacity also exist in the area.	Draft DP UAKBNA 1996-2016
7.	Mira-Bhayandar	33 primary schools and 13 secondary schools catering to about 12000 and 20000 students respectively.	Medical infrastructure comprises of one government hospital and 22 private hospitals.	CDP-2006
8.	Ambernath	19 primary and 1 secondary municipal schools catering to 5545 and 517 students respectively. In addition to these there are 52 private schools catering to about 17500 students.	One public hospital with 65 bed capacity. Other private hospitals and nursing homes with total bed capacity of 414 also serve the area.	CDP-2006
9.	Badlapur	34 primary schools catering to 3546 students. 13 secondary schools providing education to 13464 students.	Municipal infrastructure constitutes one hospital (35 beds), one primary health center and few maternity homes. In addition to these about 15 hospitals and 49 dispensaries are run privately.	Draft DP UAKBNA 1996-2016

S. No	Corporation/ Council	Educational Infrastructure	Health Infrastructure	Source
10.	Panvel	There are eleven primary schools catering 4013 students and six secondary schools serving 3452 students.	There is one regular hospital run by the municipal council and fourteen regular hospitals run by private institutions. And there are 38 dispensaries. The total no of beds are 265.	DP, 1990-2010
11.	Uran	One primary school, five partial secondary schools (up to VIIIth) and three secondary schools.	No public hospital except a dispensary with 6 beds.	Draft DP
12.	Karjat	5 primary schools run by Zilla Parishad Board catering to about 1595 students. 4 private primary schools providing education to 1567 students.	one hospital run by Zilla Parishad, with 30 beds. Private infrastructure comprises of about twelve dispensaries, one hospital and maternity home.	Draft DP 2001-2021
13	Khopoli	17 primary schools run by Municipal Council providing education to 5246 students. 3 primary schools run by private institutions providing education to 1089 students and three private secondary schools providing education to 4593 students.	20 bed municipal hospital, 13 small hospitals and seven private dispensaries.	Revised DP, 1996
14	Matheran	Two primary schools and two secondary schools.	One hospital with 14 beds and maternity ward run by the municipal council.	DP
15	Alibag	There are eight primary schools providing education to 2247 students and out of this one school is run by private institute. Two secondary schools one for boys and the other for girls providing education for about 1810 students.	One municipal dispensary where only out patients are treated, one state government run hospital provided with 150 beds. There is another hospital run by a trust provided with 50 beds, there is one private maternity home provided with 6 beds and eleven private dispensaries.	Draft DP Revised, 1985
16	Pen	Seven primary schools run by municipal council providing education to 2067 students and one primary school run privately providing education to 316 students. There are three secondary schools run by private institutes providing education to 2091 students.	One dispensary and hospital with 30 beds run by the municipal council. There is one hospital with 8 beds, one maternity hospital included with infant welfare centre with a capacity of 25 beds, one nursing home included with maternity home with a capacity of 10 beds and about 17 run by private institutions.	Draft DP, 1988
17.	Vasai-Virar Sub-Region	No data available		

Source: Compiled, 2007



Implications on Demand

Deficiencies in Educational Infrastructure: Total literacy rates of three districts, Mumbai, Thane and Raigad(part of MMR) are 86%, 81% and 76% respectively. Other deficiencies and related issues highlighted by past studies are:

- poor maintenance of schools;
- poor standard of education; and,
- Rationalizing the provision of schools and coverage/capacity of uncovered area.

Deficiencies in Health Infrastructure: Total number of bed spaces in Greater Mumbai and rest of MMR is about 40,000 and 10,000 respectively. This again establishes demand-supply gap in rest of MMR and higher concentration of facilities in Greater Mumbai. Comparing the existing bed capacity of MMR provides a ratio of 1 bed per 400 people. This is well within the range of WHO figure of 1 bed per 550 people. It may however be noted that hospitals of MCGM cater to patients not only from Mumbai but also from MMR and beyond. A closer look at the sub-regional availability reveals the following :

- Total municipal infrastructure in MMR provides about 13000 bed spaces, which brings the ratio to 1 bed per 1400 people for MMR. Out of these 10000 bed spaces are in Greater Mumbai. The resultant ratios are 1 bed per 1300 people in Greater Mumbai and 1 bed per 2250 people in rest of the region. This establishes the inadequacy of existing municipal infrastructure for primary and secondary health care. most of the private facilities provide tertiary level (specialized) services at higher fees.
- Another issue is access to these services by the poor. As municipal infrastructure is limited in nature (and, most of the private infrastructure is expensive), access to medical facilities by economically weaker sections is limited.

For projecting the demand of educational and health infrastructure GoM/Mumbai Development Plan norms are applied (refer **Appendix IV.21** for the norms). Table 4-21 and Table 4-22 presents the summary of total demand in education and health sector respectively. The details of the same by sub-region and ULBs are given in **Appendices IV.22 and IV.23**. A comparison of two alternative scenarios suggests that an estimated 1987 to 2013 additional primary schools and 497 to 503 additional secondary schools are needed to meet the demand of MMR by 2021.

Table 4-21: Present and Additional Demand of Educational Infrastructure in two Scenarios (In Number of schools)

Region	Existing Infrastructure	2005(Backlog)	Cumulative Demand		
			2011	2016	2021
P2 Scenario					
Primary Schools					
Greater Mumbai	2163	1695	407	751	1041
Rest of Urban MMR	1204	855	326	600	852
TOTAL	3,367	2,550	733	1,352	1,893
Secondary Schools					
Greater Mumbai	276	689	102	188	260
Rest of Urban MMR	502	140	82	150	213
TOTAL	778	829	183	338	473
P3 Scenario					
Primary Schools					
Greater Mumbai	2163	1695	393	680	856

Region	Existing Infrastructure	2005(Backlog)	Cumulative Demand		
			2011	2016	2021
Rest of Urban MMR	1204	855	441	746	1050
TOTAL	3,367	2,550	834	1,426	1,906
Secondary Schools					
Greater Mumbai	276	689	98	170	214
Rest of Urban MMR	502	140	110	187	263
TOTAL	778	829	209	356	476

Source: Estimated, 2007.

Note: Student population for primary schools has been taken as 15% of population and strength of each school as 500 students. Student population for secondary schools has been taken as 7.5% of the total population and strength of each school as 1000 students. For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection. Sukthankar Committee Report⁶(prepared for GOM in 2001) on the Planning Standards recommends about 18% of the population belonging to the age group of 6-14 and the minimum norm of 500 students for primary school site.

In Health Infrastructure, comparison across the two scenarios suggests that an estimated number of additional beds required are 26,050 to 28,033 to meet the demand by year 2021. Share of MCGM ranges from 40 to 50% in both the scenarios.

Table 4-22: Present and Additional Demand of Hospital Beds in MMR, 2005-2021

Region	Existing Infrastructure	2005(Backlog)	Cumulative Demand		
			2011	2016	2021
P2 Scenario					
Greater Mumbai	40000	11444	5423	10016	13877
Rest of Urban MMR	5654	21525	4,790	8,726	12,345
TOTAL	45654	32969	10,214	18,741	26,222
P3 Scenario					
Greater Mumbai	40000	11444	5237	9063	11412
Rest of Urban MMR	5654	21525	6,312	10,729	15,190
TOTAL	45,654	32,969	11,549	19,792	26,602

Source: Estimated, 2007.

Note: Number of beds have been considered as 4 beds/1000 population as per GoM and Mumbai Development Plan. For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection.

Implications of Capital Investment Needs

Analysis of past trends shows that private sector has emerged as a major player in provision of education and health infrastructure and above projected infrastructure is not impossible for horizon year. Looking at the economic profile of large majority of population in MMR, direct involvement of local and state governments is still a pre-requisite for provision of affordable education and health facilities. Thus, to address the issue of affordability and accessibility, share of municipal/government in primary education infrastructure and health infrastructure cost has been assumed as 40% of the total demand. Similarly, in secondary education infrastructure, 20% of the total demand has been taken as the share of municipal/government infrastructure. Table 4-23 and Table 4-24 provide the summary of capital investment requirements for the municipal infrastructure in both these sectors. The detail cost estimation is provided in **Appendices IV-24 and IV-25**

⁶ Report of the Committee on Planning Standards, UDD, GoM, 2001. This report has not yet been accepted by the GoM.

Table 4-23: Capital Cost for meeting the Present and Additional Demand of Educational Infrastructure (Rs. Crores)

Region	Additional Cumulative Cost			
	2005(Backlog)	2011	2016	2021
P2 Scenario				
Primary Schools				
Greater Mumbai	425	479	614	687
Rest of Urban MMR	415	419	715	841
Total	840	475	1278	1528
Secondary Schools				
Greater Mumbai	84	46	131	149
Rest of Urban MMR	56	47	117	142
Total	140	93	248	291
P3 Scenario				
Primary Schools				
Greater Mumbai	425	205	596	640
Rest of Urban MMR	415	324	788	940
Total	840	529	1384	1580
Secondary Schools				
Greater Mumbai	84	45	127	138
Rest of Urban MMR	56	58	131	162
Total	140	103	258	300

Source: Estimated, 2007.

Note: In primary school infrastructure, only 40% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. In secondary school infrastructure, only 20% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. Above cost only includes the building cost and does not take into account the cost of land or the playground area. For Greater Mumbai, 2.51 sq.m./student is taken for calculation purposes in primary and secondary schools as per Greater Mumbai DP norms. For rest of Urban MMR, 5 sq.m/student and 4 sq.m./student is taken for primary and secondary schools respectively as per GoM norms. Unit cost of construction is taken as Rs. 5000/sq.mt. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016. Sukthankar Committee Report recommends site area of 3 and 4 Sq.m. for each student in primary and secondary schools respectively.

Table 4-24: Capital Cost for Present and Additional Demand of Hospital Beds in two Scenarios (in Crores INR)

Region	Cumulative Cost			
	2005 (Backlog)	2011	2016	2021
P2 Scenario				
Greater Mumbai	354	93	362	365
Rest of Urban MMR	533	141	547	553
Total	887	234	909	919
P3 Scenario				
Greater Mumbai	354	93	361	363
Rest of Urban MMR	533	144	550	558
Total	887	237	912	921

Source: Estimated, 2007.

Note: For above calculations, only 40% of the total demand has been considered as municipal infrastructure and capital investment projected for the same. Above cost only includes the building cost and does not take into account the cost of land. For Greater Mumbai-Island City and Suburbs, 41.8 sq.m./bed has been taken for calculation purpose. For rest of MMR, 83.6 sq.m./bed is taken for calculation purpose. Unit cost of construction is taken as Rs. 8000/sq.mt. to address requirements of large hospitals. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016. Sukthankar Committee Report recommends an area of 50 sq.m. per bed in hospitals and 0.15 ha land per 40000 population for dispensary/maternity homes (about 10 sq.m. per bed).

Above investment requirements only reflect the physical infrastructure in terms of buildings of health and education sectors for 40% population of the region. Beside this, emerging economic sectors will generate a huge demand of skilled workforce requiring attention towards vocational and professional programs to minimize the skill gap in immediate future.

4.2.6 Storm Water Drainage

Situation Assessment

The entire MMR receives a high rainfall of more than 2000 mm per annum with Matheran receiving the highest rainfall of 5200 mm per annum. Most of the rainfall occurs due to the south west monsoon during June to September. Based on the 50 year data, it is observed that about 40% of rain fall is in the month of July and about 94% of the total rainfall occurs in the months spread between June to September. As the urban development has expanded during last two decades, runoff of rainwater has increased. Moreover, natural drainage courses have been restricted or encroached upon. Mumbai, Navi Mumbai, Kalyan, Thane etc, being coastal cities are vulnerable to coincidence of heavy rainfall and high tide when discharge of storm water in the sea or creek is not possible

Purposively designed storm water drainage system exists in MCGM and Navi Mumbai Municipal Corporations. In other ULBs of MMR, there is no systematic storm water drainage arrangement. Table 4-25 provides a summary of the existing situation of Storm Water Drainage in ULBs of MMR.

Table 4-25: Summary of Storm Water Drainage Scenario in ULBs of MMR

Name of Corporation/Council	Description of Storm Water Drainage Situation	New Initiatives/Projects
Greater Mumbai	<ul style="list-style-type: none"> SWD system comprises roadside surface drains-about 2000 km mainly in suburbs, underground drains-about 440 km in island city, and major/minor nallahs – about 287 km in length. Storm water is discharged into the sea and creeks through 186 outfalls in Mumbai. Most of the outfalls discharge below mean sea level and only three outfalls are managed through gates. Separate Department of SWD, headed by a Chief Engineer in the corporation. 	<ul style="list-style-type: none"> BRIMSTOWAD Report,1992-works amounting to Rs. 260 crores(out of Rs. 616 crores) have been completed. Constitution of MRPDA. Updating of BRIMSTOWAD based on Chitlae Committee Report, 2005. Total cost of project-Rs. 1800 crores.
Thane	<ul style="list-style-type: none"> SWD system comprises 31 km of nallahs in main city, 240 km of nallahs and storm water surface drains in Mumbra and 13.5 km of nallahs in Kalwa Storm water drains along the roads exist only in the developed areas of the corporation. Final discharge into natural water bodies. Pollution of natural water bodies due to mixing of sullage/sewage with storm water. No proper record or study of existing nallas. 	<ul style="list-style-type: none"> Formulation of Integrated Nallah improvement project costing Rs. 319 crores

Name of Corporation/Council	Description of Storm Water Drainage Situation	New Initiatives/Projects
	<ul style="list-style-type: none"> No separate Department of SWD. 	
Kalyan-Dombivali	<ul style="list-style-type: none"> About 36 nallahs running through KDMC area and acting as SWD system. Pollution of natural water bodies due to mixing of sullage/sewage with storm water No separate SWD department, one executive engineer in sewerage department looks after the sector. 	<ul style="list-style-type: none"> Ulhas river study done through MERI.
Bhivandi-Nizampur	<ul style="list-style-type: none"> About 36 nallahs running through corporation and acting as SWD system. Nallahs carry sullage and sewage and final discharge in Kamwadi river. No separate department. Sector looked after by City Engineer with the help of Deputy Engineer 	
Navi Mumbai	<ul style="list-style-type: none"> Well planned system with 18 major nallahs(78 km long) and RCC storm water drains(35.6 km long) Ratio of length of storm water drain to length of roads is 90%. Disposal through rain water holding ponds (9 in number) connected with Thane Creek. 	<ul style="list-style-type: none">
Ulhasnagar	<ul style="list-style-type: none"> Roadside drains exist in Ulhasnagar but its percentage is not available. Waste water is discharged in Waldhuni Nallah at number of places. 	<ul style="list-style-type: none"> Ulhas river study done through MERI.
Mira-Bhayandar	<ul style="list-style-type: none"> About 5.6 km of major nallahs, 20.4 km of minor nallahs and 14.8 km of covered drains exist in MBMC. Discharge into the sea. No separate department. City Engineer looks after the sector with the help of Deputy Engineer and Jr. Engineer 	<ul style="list-style-type: none"> Integrated Nallah Development Project costing Rs. 222 crores
Ambernath	<ul style="list-style-type: none"> About 27% of road length provided with storm water drains(37 km long). Length of major drains is about 22 km. Discharge in Waldhuni Nalla near Ulhasnagar and final discharge in Ulhas creek. No separate department/division. 	<ul style="list-style-type: none"> Ulhas river study done through MERI.
Rest of Council Towns	<ul style="list-style-type: none"> No systematic records of road side drains and nallahs. Municipal Engineer looks after this sector and road side drains cleaning are carried out by health department. 	

Source: Compiled, 2007.

Implications on Demand and Capital Investment

Storm water drainage is not very sensitive to regional growth scenarios except the run-off coefficient that increases with urban development. Thus, the demand and associated cost of the SWD across the two selected scenarios has been based on the area of Municipal Corporation/municipal Council and presented in Table 4-26. **Appendix IV.26** presents the details by sub-region and ULB.

Table 4-26: Capital Investment Needs for Storm Water Drainage in MMR (Rs. Crores)

Region	Cumulative Cost		
	2011	2016	2021
Greater Mumbai	720	1440	1800
Rest of MMR	2,084	4,168	5,210
Total MMR	2,804	5,608	7,010

Source: Estimated, 2007.

Note: For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai and Ambernath CDP estimates are considered as the total cost for this sector. For Other Municipal Corporations, an average unit cost of Rs. 2.5 Crores/sq.km has been used based on the CDP estimates of Thane and Mira-Bhayander Corporation. For rest of Municipal Councils, unit cost of Rs. 1.2 Crores/sq.km. has been used, based on the CDP estimates of Ambernath Municipal Council. For Matheran ULB, only 20% of the municipal area is considered for calculation purposes as rest of the area lies in ecologically sensitive/no development zone. Above also include the areas under urban expansion, green-field areas and special planning areas.

Regional Storm Water Drainage:

The natural drainage system that exists today in MMR is not adequate in the event of extreme rainfall and increased run-off coinciding with high tide. The deluge of July 2005 has heightened the awareness about the importance of storm water drainage. The causative factors for the flooding are spread of development, low river capacity, occupation of flood plains by the population, obstruction of flow due to service utility works and inefficient drainage systems. Thus, apart from the ULB level SWD, three regional level projects are recommended as part of Business Plan capital investment to address long-term requirements of MMR. Details and cost of these regional SWD projects is provided in Table 4-27.

Table 4-27: Capital Investment Needs for Regional Level Storm Water Drainage Projects (Rs.Crores)

Project/ Area	Brief Description	Total Estimated Cost
Mithi River	<ul style="list-style-type: none"> To carry out the proposed deepening and widening, training and remodeling of culverts and bridges along Mithi River and Vakola Nalla. The construction of sluice gates and the pumping station at Mahim causeway is also under consideration. All these works will have to be carried out in the next 5 to 10 years. 	1000
Ulhas River	<ul style="list-style-type: none"> Covering Kalyan- Dombivali- Ulhasnagar- Ambernath- Badlapur Region. Widening of Ulhas river at various sections from 40 m to 80 m. Widening of Badlapur nallah, Shivnallah and Khadgolan Nallah Restructuring of Road, railway and foot-over bridges. 	500
Thane Creek	<ul style="list-style-type: none"> Widening, developing and training of Nallahs meeting Thane Creek 	500

4.2.7 Metropolitan Transport

Background

MMRDA has undertaken CTS for MMR (TranSforM). The scope of the study includes:

- Identification of travel pattern of residents of MMR;
- Selecting, developing and operationalising an Urban Transport Planning model;
- identifying the consequences of pursuing alternative transport strategies, and recommending a long-term comprehensive transport strategy for MMR up to 2031;
- Identifying a phased program of investments and policy proposals up to 2016; and

- Helping to strengthen transport-planning skills of MMRDA and other agencies

Surveys and Studies

Table 4-28 lists various surveys conducted as part of the study along with the number of locations and extent of coverage.

Table 4-28: Primary Surveys Conducted During TranSforM Preparation

Sl. No.	Primary Survey	Locations	Extent
1	Home Interview Survey (HIS)	All Region	66,000 Households
2	Classified Volume count at Outer Cordon Locations (OCs)	9	24 Hr
	Road Side Interviews (including OD) at Outer Cordon Locations (OCs)	9	24 Hr
3	Classified Volume count at Sub-Region Cordon Locations (SRCs)	20	24 Hr
	Road Side Interviews (including OD) at Sub Region Cordon Locations (SRCs)	20	24 Hr
4	Classified Volume count at Inner Cordon Locations (ICs)	33	16/24 Hr
	Road Side Interviews (including OD) at Inner Cordon Locations (ICs)	3	24 Hr
5	Screen Line Points (SLPs)	3	16 Hr
6	Mid-Block Locations	11	16 Hr
7	Level Crossing Locations	5	16 Hr
8	Sub-urban Rail Passenger Surveys, Boarding & Alighting Survey: Train Trips	All Region	6.17%
9	Sub-urban Rail Passenger Surveys, Alighting Survey: Stations	Various Stations	16%
10	Operational Characteristics of Bus and Rail Transport Networks		5700 Bus Routes and 1767 Train Services
11	IPT (Auto and Taxi) Surveys	50	
12	Bus Terminal Surveys	13	13
13	Airport Terminal Surveys	2	2000 passengers at two terminals of International and Domestic airports
14	Goods Terminal Surveys	20	Goods Terminals
15	Speed-Flow Studies	16	Carriageway Types
16	Journey Speed and Delay Studies	All Region	550 km
17	Network Inventory	All Region	2,300 km
18	Pedestrian Surveys	50	Locations
19	Parking Surveys	50	Stretches
20	Workplace Based Surveys	All Region	4000 respondents

Principal Findings

Based on these surveys existing travel demand is assessed. A total of about 20 million people in MMR make about 28.5 million journeys (trips) every day, (counting going-to and coming-back separately.). More than half of these journeys, about 15 million are made entirely on-foot. Another 13.5 million are made by a combination of modes, at least one of which is motorised. It has been estimated that all these journeys total to about 250 million kilometres of travel every day.

Almost 7.0 million journeys are made by rail. It is the most important mode of travel after walk. Equally important are public bus services on which another 3.5 million trips are made. In addition, these buses also double up as an access mode for people who use suburban railways. Out of 7.0 million journeys made by rail, about 1.5 to 2.0 million use buses to reach their railway

station of choice. Thus, Buses in total carry a total of about 5.5 million passengers. Journeys made by IPT modes i.e. Auto and Taxi are about 1.0 million and 0.23 million respectively. About 1.0 million journeys are made by Two Wheelers and about 0.63 million journeys are made by cars. In spite of each of these modes having share less than one-fifth of either train or bus, their high per capita road coverage creates insurmountable congestion. Mode wise demand for base year is presented in Figure 4-3. The share of trips by Public transport modes (Train and Bus), IPT modes (Auto and Taxi) and Private vehicle modes (Two wheelers and cars) is 10.5, 1.3 and 1.7 million i.e. 78.1%, 9.5% and 12.4% respectively (Figure 4-3)

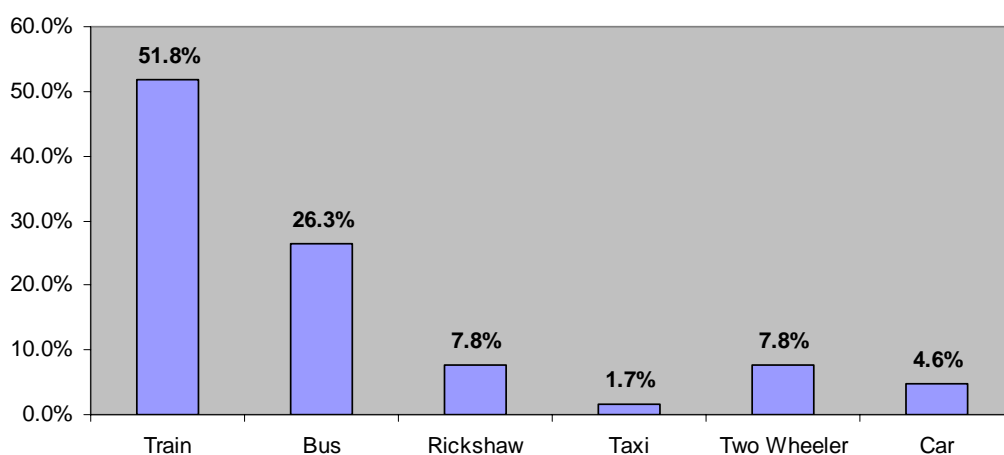


Figure 4-3: Demand for Various Modes (excluding walk), Base Year (2005)

Road

On road, the peak hour flow varies from location to location and the range is 5.0% to 12.0% of the daily traffic flow. Hourly distribution of sub-urban rail passenger flows indicate that, the morning peak hour flow is 9.4% of daily passenger flows (9:00 to 10:00 AM) and the evening peak hour flow is 7.7% of the daily passenger flows (6:00 to 7:00 PM).

The traffic movement within MMR and between its sub- as revealed from traffic volume counts and roadside interviews is shown in Table 4-29

Table 4-29: Traffic between MMR sub-regions (vehicle trips)

Origin \ Destination								Total
	Mumbai	Thane	Navi Mumbai	Kalyan & surrounds	Vasai-Virar	Pen-Alibag	Rural	
Mumbai	-	51 911	50 561	8 933	30 790	1 868	12 946	157 010
Thane	45 936	-	29 377	8 071	5 904	777	8 064	98 130
Navi Mumbai	49 778	30 569	-	9 330	1 720	3 088	14 942	109 428
Kalyan & surr.	12 026	7 802	9 903	-	1 459	472	2 507	34 167
Vasai-Virar	27 155	3 516	2 654	1 273	-	215	1 427	36 240
Pen-Alibag	3 205	776	2 159	388	28	-	597	7 152
Rural	11 872	11 752	15 265	2 437	2 101	582	-	44 011
Total	149 972	106 326	109 920	30 432	42 003	7 004	40 484	486 140

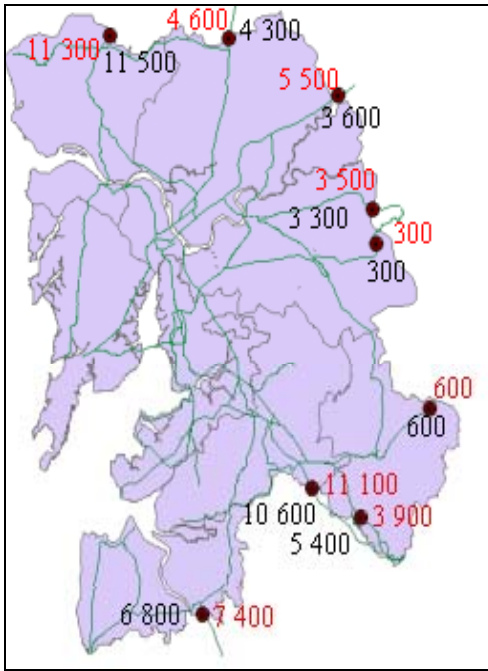


Figure 4-4: Traffic on the periphery of MMR (Vehicles per day)

Analysis of traffic counts on the outer periphery (cordon) shows that the National Highways carry the most traffic, namely 55,000veh/day or 59% of the total traffic, followed by Mumbai-Pune Expressway (23%) and State Highways (18%). Traffic movement in and out of MMR is shown diagrammatically in Figure 4.4. Personal passenger-vehicle movement in and out of MMR is dominated by Greater Mumbai, where 63% of vehicle movements either originate or terminate. Kalyan (9%), Thane (7%) and Navi Mumbai (4%) are also significant. Most trips are work-related. Average occupancy is 3.9 persons for cars and 3.7 for taxis. The highest average trip lengths occur on Mumbai-Pune Expressway and NH-17, namely 160km for cars and 110km for taxis. About 116,000 bus passengers arrive in and depart from MMR daily. Greater Mumbai accounts for one-third. Kalyan-Dombivali and Thane are also important. Through-traffic, traversing the region, accounts for about 4% of passenger movements. Many buses travel on Mumbai-Pune Expressway. Average bus occupancy ranges from 16 to 43.

Sub-Urban Rail

Based on the home interview surveys, weekday suburban rail travel demand is estimated to be 15 million passenger-km in 2005, at an average rail journey length of 26 km. The number of weekday passenger trips by rail is estimated at 6 million. Morning peak period loading and the total daily loading is shown in Figure 4-5.

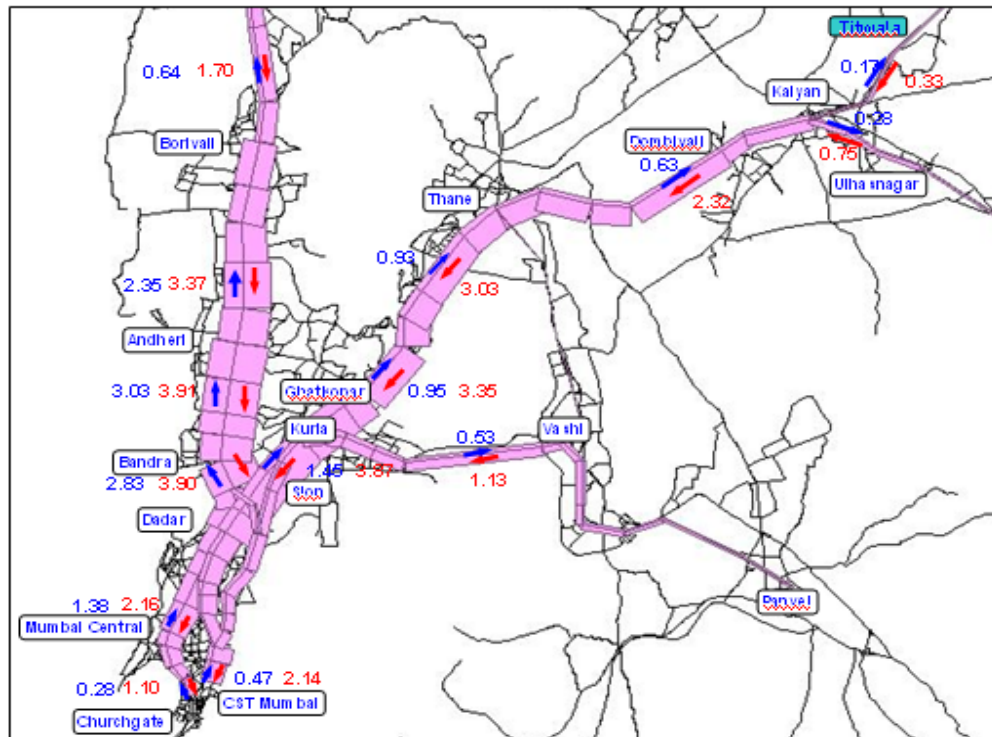


Figure 4-5: Morning peak (0600-1100 hrs) rail passengers, person-trips in lakhs



On the Western Railway Corridor, from Bandra to Borivali, the Down direction passenger flow is 75-80% of the Up direction flow. On the Central Railway Main Line and Harbour Line, the Down direction flow is 30-40% of Up direction passenger flow.

HIGHEST PASSENGER DENSITY. The highest *average* commuter density in Second Class General was observed on Dahisar-Borivali segment with 9 persons/m². However, overall, it varies from 6-16 persons/m² within various parts of the coach.

PEAK PERIOD DEMANDS. In Up direction, the Morning Peak Period and Evening Peak Period comprise 44.2% and 22.6% of the total daily traffic. For the Down direction the figures are 20.0% and 50.4%.

PASSENGER FLOWS. The maximum passenger flow is across Mahim. Number of passengers crossing Mahim during *morning peak period* (0600-1100 hrs) is 8.9 lakh and 5.0 lakh in the Up and Down directions respectively. For the *morning peak hour* (0900-1000 hrs) the figures are 2.3 lakh and 1.8 lakh. Number of passengers crossing Mahim during *evening peak period* (1700-2300 hrs) is 4.9 lakh and 10.0 lakh in the Up and Down directions respectively. For the *evening peak hour* (1800-1900 hrs.) the figures are 1.0 lakh and 2.2 lakh.

Scenarios

Travel demand models (Trip generation models, Trip distribution models, mode-split models and assignment models) have been calibrated and validated using the primary and secondary data collected as stated above. Using these travel demand models, horizon year travel demand has been estimated for the short-listed growth scenario i.e. P2E2, P3E3 and P3E4. Travel demand for year 2031 is estimated only for AM peak period (6 AM to 11 AM) and motorized modes. A total demand of about a million person trips in this peak period is divided among various purposes. There is almost 100% increase from base year demand for the same period at about 4.75 million trips. A total of 80% demand is for commute to work. It is divided into three components viz. home to office, home to industry and home to other work places. Education accounts for another 16% of demand and 5% for home based other purposes. Mode wise demand for horizon year is presented in Figure 4-6. By mode, more than about 74% of demand is predicted to be by public transport (Suburban train, Metro and Bus). Compared to the base year, a reduction of about 4% in public transport is estimated.

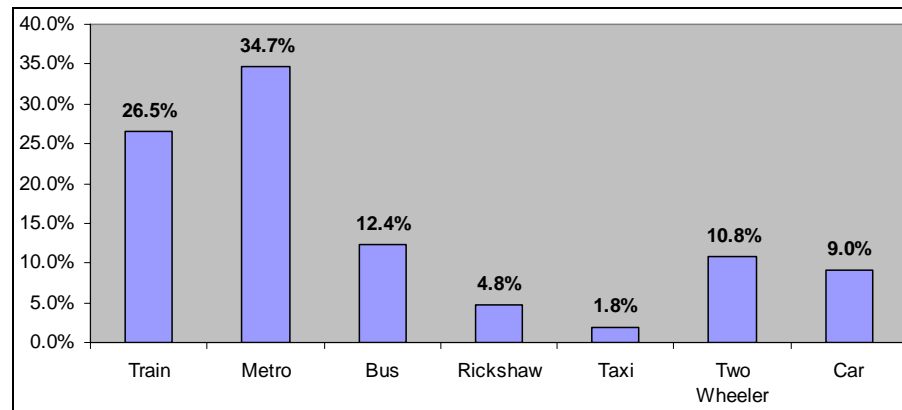


Figure 4-6: Demand for Various Modes(excluding walk), Horizon Year (2031)

A single and comprehensive transport network for year 2031 was prepared considering the varied travel requirements of the study area for the horizon year and sufficiency to cater to the travel desires forecasted for all population/employment scenarios. Thereafter, the detailed analysis of the transit and highway flows, specific to each growth scenario necessitated for removal of some of the facilities on which the flows were observed to be significantly low. The capacity criteria adopted for transit evaluation under this process was as follows:

- Capacity of single track on Western Railway is 85,000 PHPDPT⁷ by assuming capacity of 12 car rake with 7 persons/m² with 3 minute headway train operations;
- Capacity of single track on Central Railway is 70,000 PHPDPT by assuming capacity of 12 car rake with 7 persons/m² with 3.5 minute headway train operations; and
- Capacity of single track on Metro is 75,000 PHPDPT by assuming capacity of 8 car rake with 6 persons/m² with 2 minute headway metro operations.

Horizon Year Transport Network

As part of CTS study, additional transport network has been proposed which include, extension of metro system in rest of MMR, new sub-urban train corridors in rest of MMR, higher order highway corridors (fully access controlled with interchange facilities), new arterial corridors, etc. While planning the corridors the following aspects have been actively considered:

- Inter sub-regional connectivity by all modes of transport
- Upcoming/ upgrading airport terminals
- Connectivity to existing ports (Mumbai Port and JN Port) and proposed ports (Rewas)
- Connectivity to SEZs proposed in the region (Navi Mumbai, Maha Mumbai, Gorai, Hiranandani, Goregaon etc.)
- Open-up the green field areas
- Capacity enhancements to existing sub-urban system and few new lines
- Bypass highways/ roads to some of the sub-regions of the regions

The proposed transport network for the horizon year, 2031 is presented in Figure 4-7 and Figure 4-8.

⁷ Persons per hour per direction per track.

Investment Summary for Scenarios

Committed Transport Network: The major projects which are under active implementation/ under progress are as follows:

- Capacity enhancements to Mumbai sub-urban railway system under Mumbai Urban Transport Project: Rail Component (Phase I and Phase II);
- Metro system proposals in Thane (MRTS for Thane) and MCGM (Master Plan for Mumbai Metro);
- Mumbai Urban Transport Project: Road Component;
- MUIP Improvements.

The details on the above projects are presented in **Appendix IV.27**.

Transport Network Cost: Horizon Year 2031

The capital cost of transport network is one of the major criteria for evaluating the growth scenarios. The cost of horizon year transport network has been estimated based on the unit rates compiled from the recent detailed project reports for metro projects carried out by MMRDA, detailed feasibility studies carried out for major freeway corridors carried out by MSRDC and MMRDA, Consultants experience in similar projects, etc. The cost of sub-urban capacity enhancement works has been compiled from MTR study initiated by MRVC. The unit rates adopted for cost estimates are presented in Table 4-30.

Table 4-30: Unit Rates Adopted for Broad Cost Estimates for Horizon Year Transport Network

Sl. No	Description	Unit	Amount (Rs. Crores) @ 2005-06 Prices
1	Metro Line (Twin Track) without Rolling Stock-At Grade	km	108
2	Metro Line (Twin Track) without Rolling Stock-Elevated	km	138
3	Metro Line (Twin Track) without Rolling Stock-Underground	km	462
4	Metro Line (Twin Track) without Rolling Stock-Underground, Below Seabed	km	540
5	Rolling Cost/km of Metro lines (twin track)		36
6	Sub-urban Line (Twin Track) without Rolling Stock-At Grade	km	60
7	Rolling Cost/km of Sub-urban lines (twin track) based on a 12 coach rake for each 1.5 km twin track		16
10	Higher Order Access Controlled Expressway-At grade 4 + 4 Lanes		18
11	Elevated Road (3 + 3 Lanes) on existing road surrounded with built-up area	km	60
12	Arterial Roads: 3+3 Lanes with adequate footpath facilities	km	14.5
13	Short Sea Links (less than 10 kms length): Road (3 + 3 Lanes)	km	90
14	Long Sea Links (more than 20 kms length): Road (4 + 4 Lanes)	km	240

Source: Estimated, 2007.

Note: The above costs include taxes (Custom Duty, Works tax, Excise duty, sales tax, etc.) which is approximately 12% and administrative expenses for implementation of the project (8%)

The details of broad cost estimate for the horizon transport network (2031) for Metro System, Sub-Urban Train System and Highway System are presented in Table 4-31. The total cost of horizon transport network is Rs. 2,07,956 crores at 2005-06 prices. This cost include the taxes (custom duty, works tax,

excise duty, sales tax, etc. which is @12%) and cost of feasibility studies & construction supervision (@8%).

Table 4-31: Summary of the Broad Cost Estimate for Horizon Year Transport Network, 2031

Sl. No.	Transport System	Length (kms)	Estimated Total Cost (Rs. Crores) @ 2005-06 Prices	Estimated Total Cost in % of Total
I	Metro System	435	108373	52.1%
II	Sub-Urban Railway System	248	31418	15.1%
III	Highway System	1740	60364	30.0%
IV	Bus System		428	2.1%
V	Passenger Water Transport		4,80	0.2%
VI	Truck Terminals, Inter City-Bus and Rail Terminals		30,40	1.5%
Total		2422	207956	100.0%

Source: Comprehensive Transportation Study for MMR, MMRDA, 2007

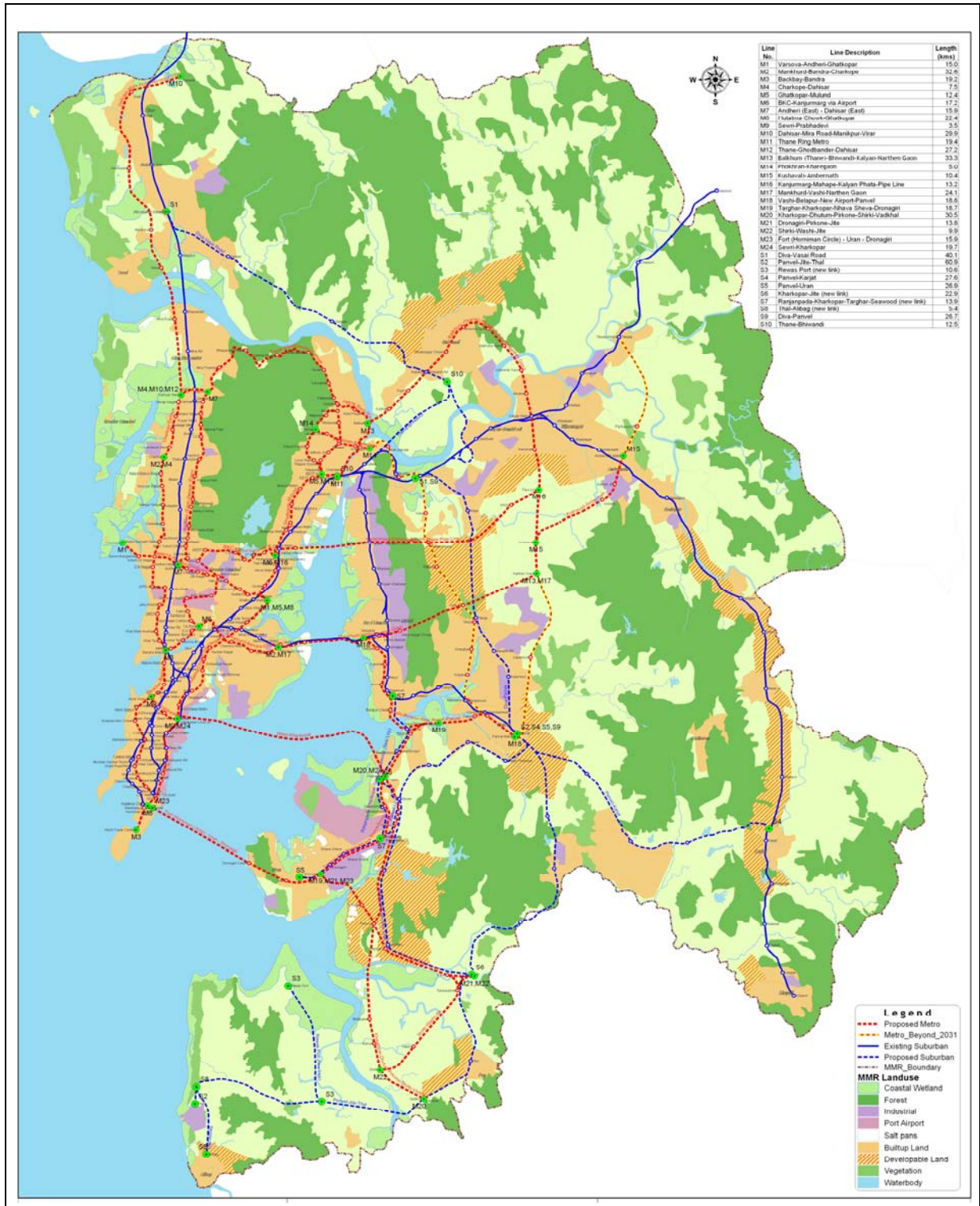


Figure 4-7: MMR Transit Network 2031

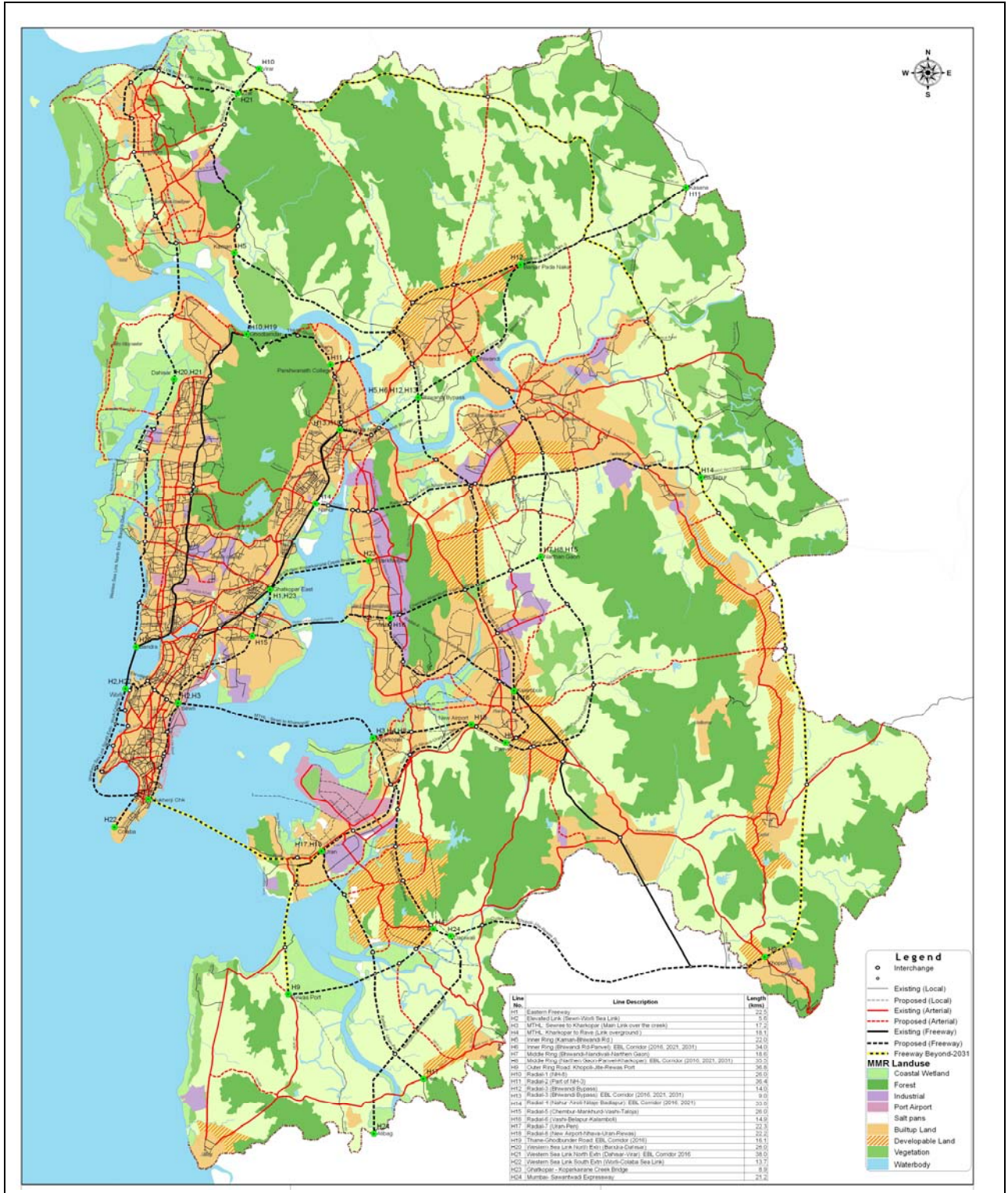


Figure 4-8: MMR Road Network 2031

Main Transport Network and Costs for year 2021

In CTS MMR, based on the preliminary travel demand analysis carried out for the horizon year 2021 for the short-listed growth scenarios i.e. P2E2, P3E3 and P3E4, the transport network has been identified for 2021 travel demand. The proposed transit system and road system for 2021 is presented in Figure 4-9 and Figure 4-10 respectively. Summary of the total cost estimate is presented in Table 4-32.



Table 4-32: Summary of the Broad Cost estimate for Horizon Year Transport Network, 2021

Sl. No.	Transport System	Length (kms)	Estimated Total Cost (Rs. Crores) @ 2005-06 Prices	Estimated Total Cost in % of Total
I	Metro System	318	83700	50.9%
II	Sub-Urban Railway System	237	29311	17.7%
III	Highway System	1229	46857	28.5%
IV	Bus System		2150	1.3%
V	Passenger Water Transport		480	0.3%
VI	Truck Terminals, Inter-Bus and Rail Terminals		2038	1.2%
Total		1784	164338	100.0%

Source: Comprehensive Transportation Study for MMR, MMRDA, 2007

Detail of network links, their cost and period of implementation is presented in Table 4-33 and Table 4-34 for Metro System, Sub-Urban Train System and Highways respectively.

Table 4-33: Broad Cost Estimate for Transport Network, 2021: Metro System

Location	Line No.	Line Description	Length (kms)	Estimated Total Cost (Rs. Crore)	Proposed Period of Implementation
MCGM	1	Varsova-Andheri-Ghatkopar	15.00	2070	2005-11
	2	Mankhurd-Mahim-Charkope	32.60	5153	2005-11
	3	Backbay-Bandra	19.20	8870	2005-11
	4	Charkope-Dahisar	7.50	1035	2011-16
	5	Ghatkopar-Mulund	12.40	1711	2011-16
	6	BKC-Kanjurmarg via Airport	8.50	3927	2016-21
	7	Andheri (East) - Dahisar (East)	15.90	2194	2016-21
	8	Hutatma Chowk-Ghatkopar	22.40	10349	2016-21
	9	Sewri-Prabhadevi	3.50	1617	2011-16
Rest of MMR	10	Dahisar-Mira Road-Manikpur-Virar	29.90	5618	2016-21
	11	Thane-Bhiwandi	15.00	2199	2016-21
	12	thane-Ghodbunder-Dahisar	27.20	3182	2016-21
	13	Mankhurd-Vashi-Narthen Gaon-Kalyan	37.10	6573	2016-21
	14	Vashi-Belapur-New Airport-Panvel	18.80	3525	2016-21
	15	Targhar-Kharkopar-Nhava Sheva-Dronagiri	18.70	2299	2016-21
	16	Kharkopar-Dhutum-Pirkone	14.50	2300	2016-21
	17	Sewri-Kharkopar	19.70	9633	2011-16
Rolling Stock				11443	
Total				83700	

Source: Comprehensive Transportation Study for MMR, MMRDA, 2008

Table 4-34: Broad Cost Estimate for Transport Network, 2021: Sub-Urban Train System

Location	Line No.	Line Description	Length (kms)	Estimated Total Cost (Rs. Crore)	Proposed Period of Implementation
New Sub-urban Railway Lines/ Additional Tracks	1	Diva-Vasai Road	40.10	2406	2005-11
	2	Panvel-Jite-Thal	60.90	3655	2016-21
	3	Panvel-Karjat	27.60	1655	2011-16
	4	Panvel-Uran	26.90	1614	2011-16
	5	Kharkopar-Jite (new link)	22.90	1374	2016-21
	6	Ranjanpada-Kharkopar-Targhar-Seawood (new link)	13.90	834	2016-21
	7	Thal-Alibag (new link)	5.40	324	2016-21
Sub-Urban Rail Improvements	8	Capacity Enhancements of Existing Mubai Suburban System			
		8.1 Headway Improvement by installation of ATC system		1698	2005-11
		8.2 Procurement of additional rakes (114 No.)		4010	2005-11
		8.3 Conversion of 9 Car to 12 Car rakes		1143	2005-11
	9	Sub-urban Rail Improvements			
	9.1 Station Area Improvements (WR)		588	2011-16	

Location	Line No.	Line Description	Length (kms)	Estimated Total Cost (Rs. Crore)	Proposed Period of Implementation
		9.2 Station Area Improvements (CR)		1512	2011-16
		9.3 New Depots (WR)		768	2011-16
		9.4 New Depots (CR)		768	2011-16
		9.5 New Workshop and Equipment (WR)		384	2011-16
		9.6 New Workshop and Equipment (CR)		384	2011-16
		9.7 Safety Measures	LS	480	2005-11
		Rolling Stock (for new lines)		3163	
		Total		29113	

Source: Comprehensive Transportation Study for MMR, MMRDA, 2008

Table 4-35: Broad Cost Estimate for Transport Network, 2021: Highway System

Transit/ Highway	Line No.	Line Description	Length (kms)	Estimated Total Cost (Rs. Crore)	Proposed Period of Implementation
Higher Order Highway Corridors	1	Eastern Freeway	22.50	1346	2005-11
	2	Elevated Link (Sewri-Worli Sea Link)	5.60	338	2005-11
	3	MTHL: Sewree to Kharkopar (Main Link over the creek)	17.40	4187	2011-16
	4	MTHL: Kharkopar to Rave (Link overground)	17.90	2169	2011-16
	5	Inner Ring (Kaman-Bhiwandi Rd-Nilaje-Taloja-Kalamboli-Panvel-Dronagiri)	34.00	1209	2011-16
	6	Middle Ring (Bhiwandi-Nandivali-Narthen Gaon-Panvel-Kharkopar)	54.10	974	2011-16
	7	Outer Ring Road: Rewas Port-Jite	14.80	266	2011-16
	8	Radial-1 (NH-8)	26.00	467	2011-16
	9	Radial-2 (Part of NH-3)	36.40	655	2011-16
	10	Radial-3 (Bhiwandi Bypass)	23.00	415	2011-16
	11	Radial-4 (Nahur-Airoli-Nilaje-Badlapur)	33.80	608	2011-16
	12	Radial-5 (Chembur-Mankhurd-Vashi-Taloja)	26.00	468	2011-16
	13	Radial-6 (Vashi-Belapur-Kalamboli)	14.90	268	2011-16
	14	Radial-7 (Uran-Pen)	22.30	401	2011-16
	15	Radial-8 (New Airport-Nhava-Uran-Rewas)	22.20	399	2011-16
	16	Thane-Ghodbunder Road	16.00	289	2005-11
	17	Western Sea Link North Extn (Bandra-Dahisar-Virar)	64.00	15355	2016-21
	18	Western Sea Link South Extn (Worli-Haji Ali)	6.00	1450	2016-21
	19	Ghatkopar - Koparkairane Creek Bridge	8.90	801	2016-21
	20	Mumbai- Sawantwadi Expressway	21.20	458	2016-21
Arterial Corridors	1	Upgradation	468.83	6060	2005-11
	2	New Links	251.4	2413	2011-16
Road Safety and Traffic Management		Road Safety Measures		1106	2011-21
		Traffic Management Measures		4980	2011-21
Total				47640	

Source: Comprehensive Transportation Study for MMR, MMRDA, 2008

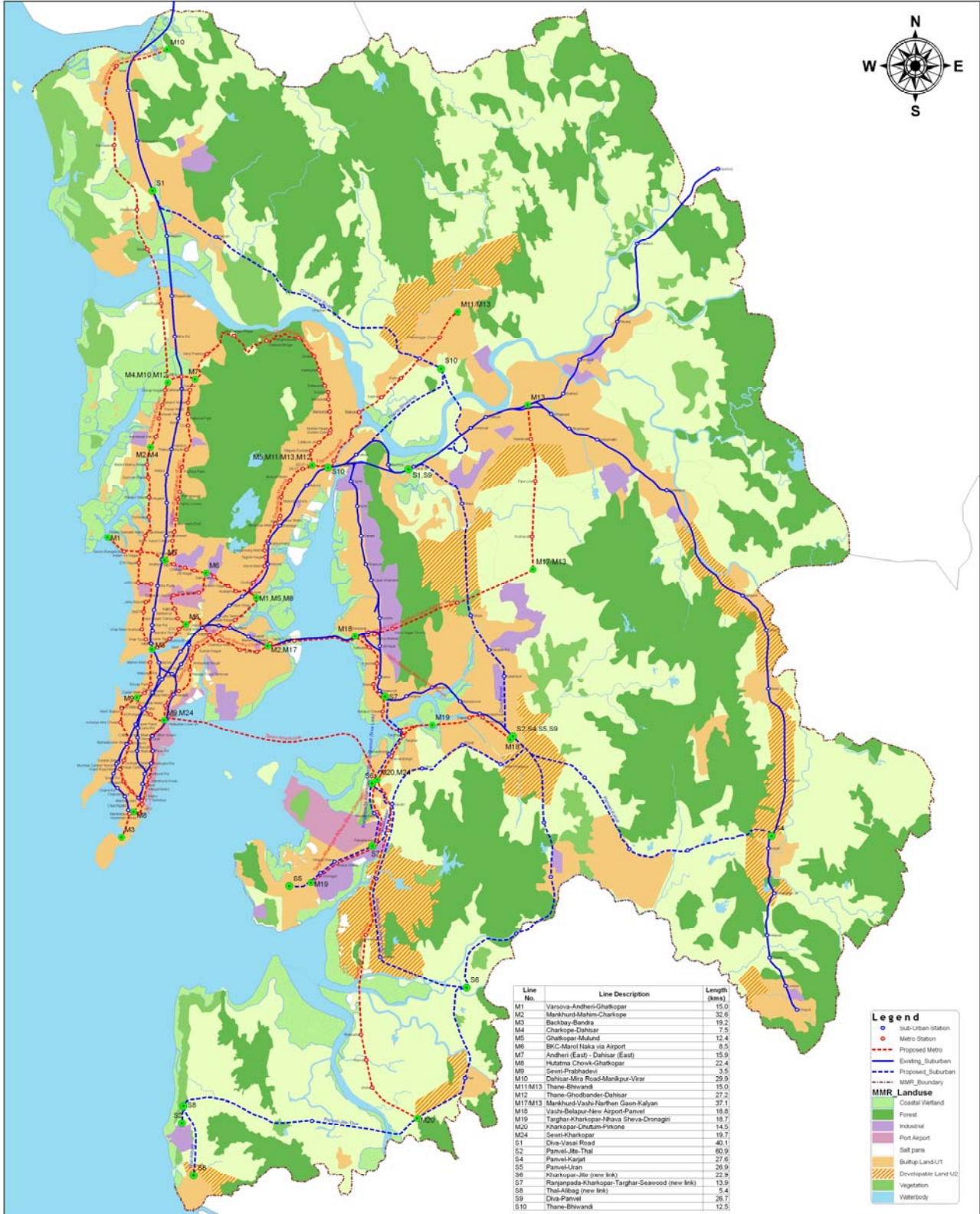


Figure 4-9: MMR Transit Network 2021



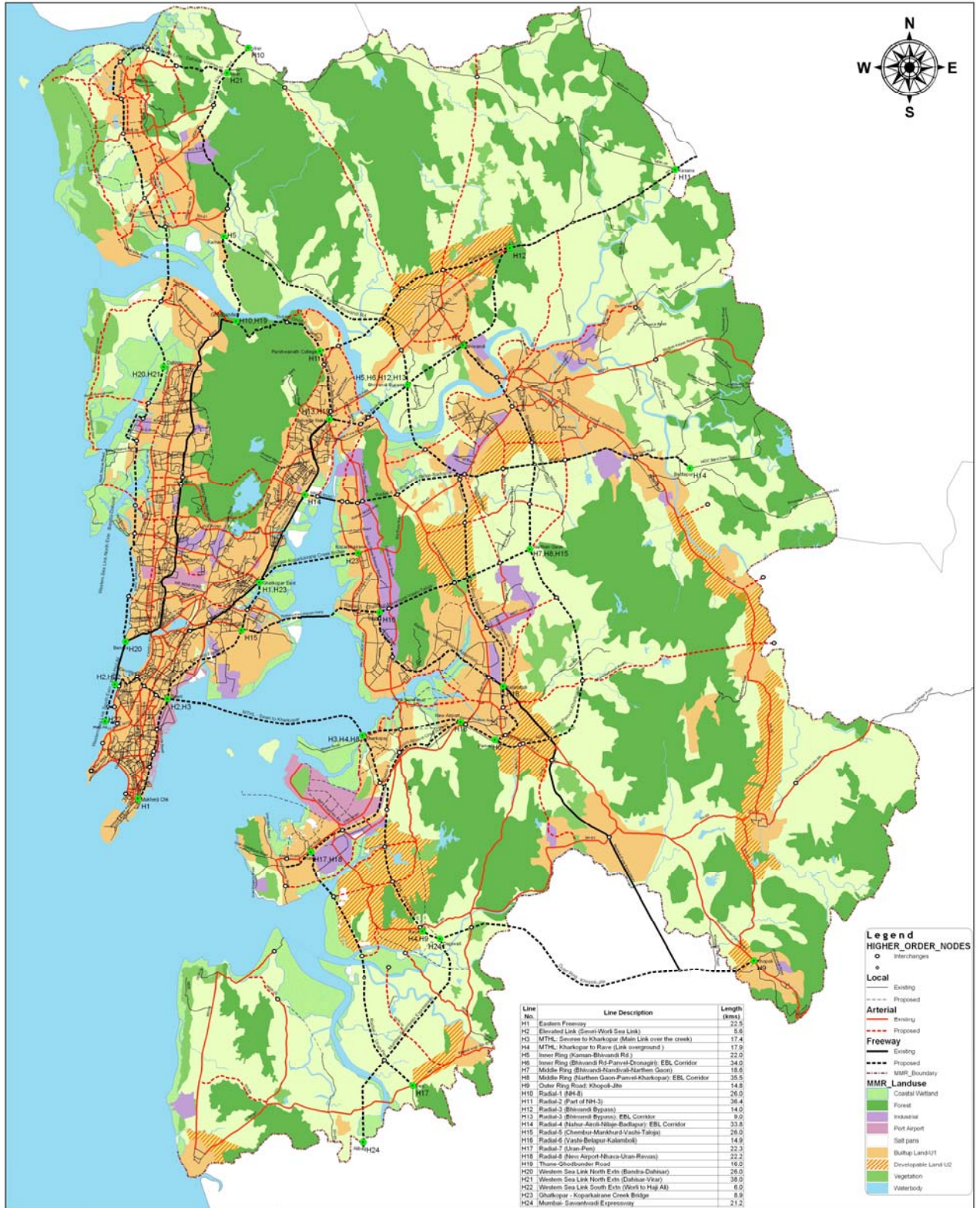


Figure 4-10: MMR Road Network 2021

Other Modes and Policies

As part of CTS study, detailed review of primary and secondary data was carried out on Water Transport in MMR, Inter-city Rail Terminals, Inter-City Bus Terminals, Airport Terminals, Goods/ Truck Terminal studies, Parking, etc. and the following recommendations have been made:



- **Water Transport in MMR:** The commuter patronage expected for PWT mode on east and west coasts, although marginal in relation to rail and road modes, they have different roles to play especially in serving local needs of coastal areas. Moreover, these projects would attract traffic from tourism, fishing activities and recreational trips. Hence, the proposed PWT projects undertaken by MSRDC have been treated as committed projects in CTS study.
- **Inter-city Rail Terminals:** Based on the detailed analysis of secondary data on inter-city rail ticketing information, estimated growth of inter-city rail passengers, etc. new rail terminal have been proposed Near Vasai-Virar, Near Kalyan, Near Bhiwandi (Near Vasai Road-Diva Line), Near Khandeshwar sub-urban railway station and retaining the Panvel as en-route station, Intersection of MTHL Metro corridor and Belapur-Uran Railway Line and Near Jite on Panvel-Thane Railway Line.

Inter-city Bus Terminals: Detailed analysis of secondary data, primary surveys on inter-city bus terminals in MMR indicated the requirements of additional inter-state bus terminals in the region. The proposed locations were, Near Wadala Truck Terminal, Greater Mumbai, Near Mira-Bhayandar, Kalyan area and Panvel area. Based on the estimated population growth and UDPFI guidelines, it is suggested that, the inter-state bus terminals near Wadala and near Mira-Bhayander are required to be developed immediately. While the terminals at Kalyan and Panvel are recommended to be developed during 2016-21 and 2021-31 respectively. Approximate area proposed for each of these terminals is 20 Ha. In addition, 13 *inter-city bus terminals have been proposed at the following locations.*

- | | |
|---|---|
| (a) Western Suburbs of Greater Mumbai: In between Bandra and Borivali | (g) Pen-SEZ area |
| (b) Eastern suburbs of Greater Mumbai: In between Kurla and Mulund | (h) Bhiwandi-Nizampur MC area |
| (c) Western part of Thane Municipal Corporation area | (i) Mira-Bhayandar MC area |
| (d) Nerul in NMMC | (j) Navgarh-Manikpur Municipal Council area |
| (e) Kalyan Dombivali Municipal Corporation area | (k) Alibag Municipal Council area |
| (f) Vasai/ Virar area | (l) Karjat Municipal Council area |
| | (m) Badlapur Municipal Council area |

Based on the estimated population growth and UDPFI guidelines, it is suggested that, the inter-city bus terminals in Western suburbs between Bandra and Borivili , and the other in Kalyan-Dombivili corporation limits are required by 2016 . While the terminals at Vasai Virar, Pen SEZ and Bhivandi-Nizampur areas should be developed during the period 2016-21 and the remaining during 2021-31. Approximate area proposed for each of these terminals is 3 Ha.

- **Airport Terminals:** Based on the secondary data and primary data collected at the airport terminals, air passenger growth was estimated to be around 21 million for International airport and 54 million for domestic airport by 2024. CTS stressed the need for, either increasing the capacity of the existing airport or planning of new airport in the region.

1. **Goods/Truck Terminals:** Based on the detailed analysis undertaken and forecasts made of goods traffic, five (5) major truck terminals and 10 mini truck terminals have been proposed for the horizon year 2031. The major truck terminal locations are as follows:

- Near boundary of MMR on NH-8 (Mumbai-Ahmedabad);
- Near boundary of MMR on Mumbai Pune Expressway;
- Near JNPT/NMSEZ/MMSEZ;



- Near the proposed international airport in Navi Mumbai; and
- Near boundary of MMR on NH-3 (Mumbai-Nashik).

2. Based on the estimated population growth, other economic and industrial activities and UDPFI guidelines, it is suggested that two terminals, with one on NH-8 and the other on Mumbai – Pune Expressway Corridor, at MMR limits to be developed as they are required by 2016. While the terminal at JNPT/NMSEZ/MMSEZ is required during 2016-21. While rest of terminals are recommended to be implemented during 2021-31. Approximate are proposed for each of the major and minor truck terminals is 200 ha and 10 ha respectively.

- **Parking Policy for MMR:** Separate parking policy for municipal corporation areas and council areas/ CIDCO area has been formulated and recommended. Parking norms for upcoming landuses like, shopping malls, multiplex theatres, etc. have been proposed. Establishment of Municipal Parking Authority (MPA) in all the Municipal Corporations of MMR has been recommended which was originally proposed by MVA Consultants to Municipal Corporation of Greater Mumbai.
- **Proposals for Pedestrian movements in MMR:** Considering the major share of pedestrians in travel demand and the fact access mode to public transport has to be on foot, the CTS includes proposals for adequate foot-paths, grade separated pedestrian facilities at busy intersections and facilities at the railway stations as a part of the integrated station area management schemes. The costs for these are included in the highway network and transit development including sub-urban rail improvement.

4.2.8 Electricity

Situation Assessment

Greater Mumbai: At present, Mumbai's maximum demand is around 2512 MW and connected load is around 4000 MW with a 60% load factor as per Reliance Energy estimation. A shortfall of around 350 MW is prevailing in the Mumbai area. The per capita maximum demand is estimated to be around 0.73 KW with connected load of 1.2 KW. The average number of consumers in Greater Mumbai is about 3.5 million in the year 2005-06. Average growth rate of consumers is 2.11% over the past four years with rate of growth of industrial consumers showing a declining trend in past two years. Maximum power consumption is by household consumers - about 42%, followed by commercial sector-25%, industrial sector-25% and others as 7%.

Rest of MMR: The maximum demand recorded in all the circles in Rest of the MMR excluding Greater Mumbai in the year 2006 is 3628 MW against 3239 MW in the year 2005. Significantly, the demand of rest of the MMR is around 25% of the total maximum demand of the state. The shortfall in this area is around 1000 MW. Number of consumers in the year 2005-06 was around 3.7 million. Most of the commercial as well as the industrial consumers are concentrated in the MMR area. **Appendix IV.28** provides detailed analysis on the above two sub- regions.

As the generation capacity is not available for a particular place and the sector relies on the entire regional electricity grid, situation assessment of



Maharashtra state has also been carried out and summarized in Table 4-36 and presented in **Appendix IV.29**.

Table 4-36: Summary of Existing Situation-Electricity Sector

Characteristics	Area/Region		
	Greater Mumbai	Rest of MMR	Rest of Maharashtra
Max Demand (2005-06)	2512 MW	3628 MW	13000 MW (includes rest of MMR also)
Consumer	3.43 million with 2.11% annual growth rate in past 4 years.	3.7 million	13.9 million, average growth rate of 2.71% with commercial consumers showing a growth rate of 4.4%
Consumption Pattern	Maximum by household consumers-42%, followed by Commercial and Industrial Sector-25% each.	Proportionate to rest of Maharashtra with concentration of commercial and industrial consumers.	72% domestic consumers followed by 17% agricultural consumers. About 36% of power consumed by industrial sector followed by 25%, 21% and 9% in domestic, agricultural and commercial sectors respectively.
Shortfall	350 MW	1000 MW	4000 MW
Service Provider	BEST, Reliance Energy and Tata Power Company.	MSEB	MSEB

Source: MSEB, Tata Power, Reliance Energy and BEST

Implications of Demand

Many new factors including rapid economic growth, increase in household income and demand for additional housing would lead to substantial demand of power in Mumbai and MMR. In MMR, SEZ and special townships are being proposed. The cumulative effect of all the above will result in substantial growth of demand for power over next 15 years and unless matching addition in generation capacity is resorted to, the state may have to undergo severe load shedding and resultant power crisis.

Given the past trends of maximum demand and after subsequent discussions with Maharashtra State Electricity Board, for estimation of future demand, the growth rate of maximum demand per year has been taken as 7% and 3.75% for Rest of Maharashtra and Greater Mumbai respectively (Table 4-37).

Table 4-37: Maximum Demand Estimation in MMR (MW)

Sl no	Area	2011	2016	2021
A.	Greater Mumbai	3019	3498	4363
B.	Rest of MMR ⁸	5088	7136	10009
C.	Rest of Maharashtra ⁹ (including B)	19077	26757	37528
	Total Maharashtra demand (A+C)	22096	30255	41891

Source: Estimated, 2007

The generation capacities likely to be available with the state are given in Table 4-38. The likely deficit that the state is going to face by the end of each year according to the estimated demand is presented in Table 4-39.

⁸ Rest of MMR means MMR area other than Greater Mumbai area. The figure forecasted for the rest of the MMR area is also included in the Total forecast for the rest of the Maharashtra area. The forecasted figure for the rest of the MMR area other than Mumbai is based on the present actual maximum demand for that particular region

⁹ Rest of Maharashtra means Maharashtra state other than Greater Mumbai.

Table 4-38: Generation capacity to be added in MMR (in MW)

Year	2011	2016	2021
MSEB	2000	3800	Estimates Not Available
Dabhol Power	740	2184	
Tata Power	1500	2500	
Reliance Energy	4000	4000	
Total	8,240	12,484	12,484

Source: Maharashtra State Electricity Board.

Table 4-39: Future demand and short fall in MMR (in MW)

Item	2011	2016	2021
Total Demand for the State	22097	30255	41891
Total Generation likely to be available with addition to the existing capacity	20610	24854	Estimate not available
Likely Shortfall	1,487	5,402	17,038

Source: Estimated, 2007.

Implications of Capital Investment

Capital Investment needs for the above shortage in Maharashtra State is about Rs, 136,303 crores ¹⁰. Table 4-40 provides capital investment needs for MMR area.

Table 4-40: Capital investment Needs of Electricity Infrastructure in MMR (Rs. Crores)

Item (40% of the total investment for Maharashtra state)	2011	2016	2021
Generation	2379	8643	27260
Transmission	1190	4321	13630
Distribution	1190	4321	13630
Total	4,759	17,285	54,520

Source: Estimated, 2007

The current level of estimation of investment in the power sector is limited to meet the demand by the year 2021 and to avoid load shedding. Considering the past growth, it is estimated that the per capita consumption per year for Maharashtra state is likely to go from 550 KWH up to 1000 KWH by the year 2021. The Greater Mumbai area has the highest the per capita consumption of electricity in the country. However, compared to the other cities in the world, the consumption level is much less even in case of Greater Mumbai. For example, the per capita consumption of electricity in Hong Kong is around 5600 Kwh per year. In Japan, this figure is much higher (**see Appendix IV.30**). This implies that for achieving the present consumption level of any of the global cities, the demand would be the maximum and capital investment needs would be much higher than the figures quoted in Table 4-40.

4.3 ENVIRONMENTAL MANAGEMENT

MMR faces the typical set of environmental problems faced by most metropolitan cities in the developing world.

- Air pollution: As the manufacturing industry has declined over the years and as the number of vehicles has increased the auto-exhaust has emerged as the major source of air pollution. With the cleaner fuels and better engines though the

¹⁰ Estimated with unit cost of 8 Crores/MW. The generation, transmission and distribution have been assumed as 50%, 25% and 25% respectively of the unit cost.

emissions per vehicle have begun to reduce with increasing number of vehicles and congestion the SPM and RSPM are currently the major concern.

- Noise Pollution: Traffic both vehicular and railway is the source of noise too. In addition, noise due to festival celebrations; indiscriminate honking is also a serious source.
- Land: Insanitary and inadequate solid waste disposal is the themajor source of land pollution accentuated by unregulated industrial and bio-medical waste.
- Water and Coastal Water: The quality of coastal water and other water courses is adversely affected by the disposal of effluents of unregulated industrial units, slum settlements and also the discharge of untreated (or inadequately treated) municipal sewage. Contamination of drinking water supplies is also a concern.
- Forests and Coastal Ecology: A large proportion of MMR is under 'protected forests' but suffers from serious denudation. MMR also has coastal wetlands with mangroves constantly under threats by development pressure.

The Ministry of Environment and Forests have pursued many legal and regulatory initiatives. Some of the initiatives relevant for MMR are listed below;

(a) Water (Prevention and Control of Pollution) Act 1974

(b) The Air (Prevention and Control of Pollution) Act 1981

(c) The Environment (Protection) Act 1986

(d) Rules made under the Environment (Protection) Act 1986

- Hazardous Waste (Management and Handling) Rules 1989, amended till 2003
- Environmental Impact Assessment Notification 1994 amended in 2006
- Coastal Regulation Zones 1991 amended from time to time
- Municipal Solid Waste (Management and Handling) Rules 2000
- Noise Pollution (Regulation and Control) Rules 2000
- Bio-Medical Waste (Management and Handling) Rules 1998 amended in 2003
- Matheran Eco-Sensitive Zone Notification 2003

Amendment to Environmental Impact Assessment Notification in 2006 has brought large urban development projects also within the ambit of Environmental Clearance.

In addition the Central Pollution Control Board has specified environmental standards viz.

- National Ambient Air Quality Standards
- Water quality criteria under the Monitoring Indian National Aquatic Resources
- Noise standrads

Maharashtra Pollution Control Board (MPCB) enforces the environmental legislation in Maharashtra, mainly including Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, Water (Cess) Act, 1977 and some of the provisions under Environmental



(Protection) Act, 1986 and the rules framed there under like, Biomedical Waste (M&H) Rules, 1998, Hazardous Waste (M&H) Rules, 2000, Municipal Solid Waste Rules, 2000 etc. MPCB is functioning under the administrative control of Environment Department of Government of Maharashtra.

The Municipal Corporations and A class municipal councils are required to prepare an annual Environmental Status Report.

MMRDA in the context of MUTP has pursued many initiatives such as

- Incorporation of environmentally appropriate construction practices in road building
- Study of air quality monitoring
- PM10 Abatement Strategy and Action Plan
- Noise mapping

This sector is dominated by legislation and regulations. But environmental concerns are not yet fully ingrained in planning. The environmental problems that are attributable to lack of infrastructure like safe drinking water, lack of sanitation and sewerage, inadequacies of storm water drainage and solid waste management and inadequate capacity of road network causing road congestion have been considered and translated into metropolitan or ULB investment programmes. However problems of natural resource conservation like protection of forests and wetlands have not been specifically translated into investment programmes. The practice of preparing annual Environmental Status Report needs to be linked with identification of local mitigation measures and allocating adequate resources for that in the CDP / CIP described in Chapter 6 and 7.

4.4 ACTION PLAN

Action plan concerning the priority Metropolitan infrastructure is presented in Figure 4-11.

ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10	
Consideration, approval and adoption of Plan															
Establishing and staffing Plan implementation unit															
Immediate Project Implementation															
Water Resources															
Planning and development of Pinjal			Project preparation				Obtain Clearances		LA and R & R		Project execution >>>				
Planning and development of Gargai			Project preparation				Obtain Clearances		LA and R & R		Project execution >>>				
Planning and development of Poshir			Project preparation				Obtain Clearances		LA and R & R		Project execution >>>				
Planning and development of Susari			Project preparation				Obtain Clearances		LA and R & R		Project execution >>>				
Transit Development															
Charkop-Bandra-Mankhurd	Selection of Concessionaire		LA & R & R			Project Execution >>>									
Metropolitan Roads															
MTHL	Selection of Concessionaire		LA & R & R			Project Execution >>>>									
Eastern Freeway	Selection of Concessionaire		LA & R & R			Project Execution >>>>									
Elevated Link(Sewri to Worli)		Surveys & Feasibility			LA & R & R				Project Execution >>>>						
Infrastructure Development - Metropolitan															
Water Resources															
Planning and Development of Kalu				Project preparation				Obtain Clearances		LA and R & R		Implementation >>			
Planning and Development of Shai				Project preparation				Obtain Clearances		LA and R&R		Implementation >>			
Planning and Development of other sources				Project preparation						LA and R & R		>>>>			
Transportation															
Suburban Rail (including MUTPII)	Project preparation				Project implementation >>>>										
Metro Transit Network	Consideration & Approval of CTS		Project preparation and prioritisation				LA and R & R Phase I		Implementation Phase I						
Metropolitan Road Network															

>>>>> a continuing activity or implementation that may go beyond the period indicated.

Figure 4-11: Action Plan for Metropolitan Infrastructure

Chapter Five

Programs and Capital Investment Needs



Programs and Capital Investment Needs

5

5.1 INTRODUCTION

Demand for infrastructure services and capital investment needs to meet the demand were presented in Chapter 4. In this chapter investment needs are recapitulated as infrastructure services to be provided at the national level, metropolitan level and at the individual ULB level. In addition, investment needs of ports and airports to be financed by national agencies are also identified. Public investments in land, real estate and housing not covered by ULBs are also separately identified.

5.2 CAPITAL INVESTMENT NEEDS

Table 5.1 recapitulates the total investment needs for the two growth scenarios P2 and P3 as Rs.3,08,072 crores (USD 61.6 Billion¹) and Rs. 3,08,022 crores respectively till 2021. The variation on account of scenarios is marginal 0.02%.

The investments required to a large extent are metropolitan, especially in terms of water resources development, transport and drainage (76% of the investment need). The estimates, for municipal infrastructure investment, account for 9 % of the total need. **The details of capital investments under P-2 and P-3 growth scenarios with the methodology adopted for estimation are given in Appendix V.1 & V.2.**

Table 5.1: Summary of Capital Investment Needs in MMR, 2005 – 2021

Area/Sector	Rs Crores	%
P-2 Scenario		
National level infrastructure	33,337	10.82
Metropolitan level infrastructure	2,34,967	76.27
Municipal infrastructure (ULB Level)	27,548	8.94
Land, real estate and housing	12,221	3.97
Total P-2	3,08,072	100
P-3 Scenario		
National level infrastructure	33,337	10.82
Metropolitan level infrastructure	2,34,967	76.28
Municipal infrastructure (ULB Level)	27,473	8.92
Land, real estate and housing	12,245	3.98
Total P-3	3,08,022	100

Source: Estimated, 2007

¹ At Exchange rate of 1 USD = 50 Indian Rupees

5.2.1 National Level Infrastructure

The national level infrastructure facilities like ports and airports are required irrespective of alternative growth scenarios. The break up by projects and by three phases is given in Table 5.2. The investment in port and airport development is Rs.18937 crores and Rs. 14,400 crores respectively. Port at Rewas-Aware is being planned as privately financed port at an estimated investment of Rs.4500 crores. Total investment in the sector is estimated to be Rs. 33,337 Crores (USD 7.94 Billion).

Table 5.2: Summary of Capital Investment Needs of National Level Infrastructure in MMR, 2005 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
NATIONAL LEVEL INFRASTRUCTURE				
<i>PORT DEVELOPMENT</i>				
MbPT	2,079	554	0	2,633
JNPT	9,984	1,820	0	11,804
Rewas-Aware Port	600	1,200	2,700	4,500
<i>Sub-Total</i>	<i>12,663</i>	<i>3,574</i>	<i>2,700</i>	<i>18,937</i>
AIRPORT DEVELOPMENT				
Chattarpati Shivaji International Airport	3800	3100	3000	9900
Navi Mumbai Airport	2500	2000		4500
<i>Sub-Total</i>	<i>6,300</i>	<i>5,100</i>	<i>3,000</i>	<i>14,400</i>
TOTAL	18,963	8,674	5,700	33,337

Source: Respective Agencies as provided by MTSU

5.2.2 Metropolitan Level Infrastructure

Infrastructure investment requirements at the metropolitan level do not materially vary for alternative growth scenarios. Total Investment required is Rs. 2,34,967 Crores (USD 47 Billion). Investment needs according to sub-sectors and by three phases is given in Table 5.3. Over 34% of total investment is needed up to 2011 and another over 32% is needed during the period 2011-2016. Besides 48% of the total capital investment is needed for improving transit infrastructure and another 23% is needed for developing electricity. Metropolitan roads and metropolitan water source development need nearly 21% and 6% respectively.

Table 5.3: Capital Investment Needs of Metropolitan Level Infrastructure in MMR, 2005 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
WATER SOURCE DEVELOPMENT	2822	8466	2822	14110
TRANSIT INFRASTRUCTURE	50117	36073	27100	113291
Metro System	38211	24918	20569	83698

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
Sub-Urban Rail Improvement	11426	11155	6531	29113
Water Transport	480	0	0	480
Highway System	21759	17764	9484	49007
Terminals	450	676	912	2038
Drainage	900	800	300	2000
Power	4759	12527	37235	54521
TOTAL(with Power)	80,808	76,306	77,853	2,34,967
TOTAL(without Power)	76,049	63,779	40,618	1,80,446

Source: Estimated, 2007

5.2.3 Municipal Infrastructure

The capital investments at municipal level as described in Chapter 4 are estimated on the basis of: (a) the capital investments envisaged as a part of city development plans wherever available; and (b) detailed project reports of core urban services wherever available. For instance, Table 5.4 presents the capital investment needs as envisaged in CDPs available for certain ULBs in MMR.

Table 5.4: Capital Investment Needs on Municipal Infrastructure envisaged in CDPs (Rs. Crores)

Sectors	Municipal Corporation/Councils					
	MCGM	TMC	KDMC	NMMC	MBMC	AMC
A. Core Municipal Services						
Water Supply	1852	154	159	530	230	136
Sewerage and Sanitation	6684	438	245	515	343	90
Solid Waste Management	-	59	-	29	17	7
Storm Water Drainage	1800	305	-	427	222	41
Transportation Infrastructure	-	872	1078	613	251	172
Others*	100	231	450	78	40	10
Sub-Total (A)	10436	2058	1933	2192	1104	456
B. Special Projects / Miscellaneous Projects**	43485	2779	7181	3119	44	-
Total (A+B)	53921	4837	9114	5311	1148	456
Average Per Capita Investment (in Rs.)***	6957	10788	9418	13384	6131	10663

Source: Compiled from City Development Plans.

* Include projects concerned with primary education infrastructure, health infrastructure, open spaces, other social infrastructure like community halls, libraries etc and city beautification projects.

**Include special projects like higher-order transportation infrastructure (metro, expressways etc.), Urban Governance, heritage/environmental conservation, fire services, housing, poverty alleviation etc.

*** Average per capita investment has been calculated for the core municipal services only

The summary of capital investment needs of municipal infrastructure is presented in Table 5.5 and total investment requirement is Rs. 27,548 Crores (USD 6.6 Billion). Over 31% of total investment is needed up to 2011 and another over 59% is needed during the period 2011-2016. These investments include 25% of investment required to remove backlog up to 2011 and the remaining 75% during 2011-2016. The sector wise investment needs are, 34% for improving transport infrastructure at municipal areas (local roads, parking, terminals, intersection improvement and bus transport system) and another 30% for developing sewerage system and 12% for storm water drainage within municipal areas.

Table 5.5: Summary of Capital Investment Needs of Municipal Infrastructure in MMR, 2005 – 2021(P2) (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
MUNICIPAL INFRASTRUCTURE(ULB LEVEL)				
Water Supply	327	307	231	865
Sewerage	2259	5096	576	7931
Solid Waste Management	586	13	13	612
Storm Water Drainage	1349	1349	674	3372
Transportation	8113	766	667	9546
Health and Education	802	1633	303	2738
Others	1409	1004	71	2484
TOTAL	14,043	8,535	2,232	27,548

Source: Estimated, 2007

Given the estimates of capital investment needs, the annual investment till 2021 works out to be Rs. 1856 crores as against Rs.1274 crores in FY 2005-06 (Table 5.6 and Figure 5-1). In terms of the additional effort to make investments, the increase in investment levels in municipal corporations will be one and half times the current levels and two times in the smaller urban local bodies.

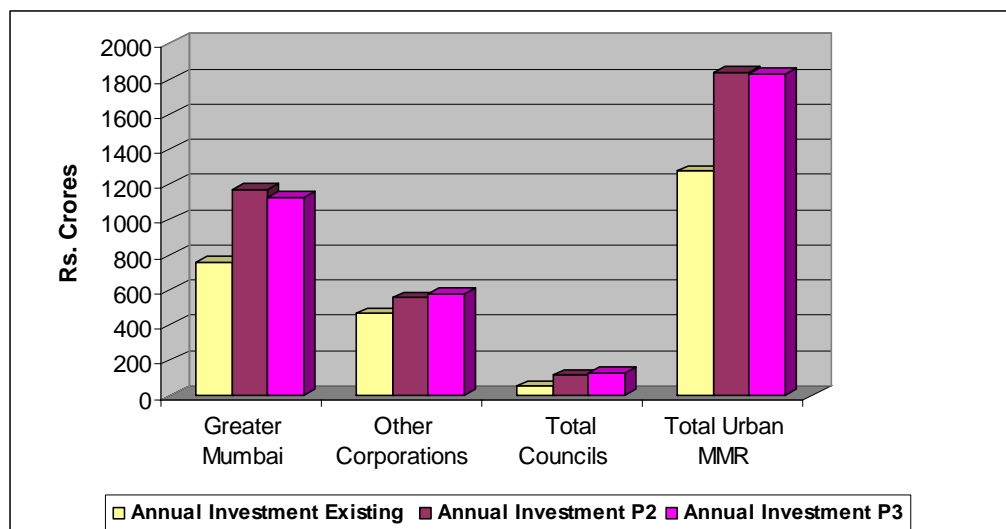


Figure 5-1: Average Annual Investment Needs on Municipal Infrastructure in MMR, 2005 – 2021 (Rs. Crores)

Table 5.6: Average Annual Investment Needs of Municipal Infrastructure in MMR, 2005 – 2021 (Rs. Crores)

Areas/Region	Annual Investment		
	Existing	P2	P3
Corporations			
Greater Mumbai	757	1169	1126
Other Corporations	466	554	575
Total Councils	51	113	128
Total Urban MMR	1,274	1,837	1,829

Source: Estimated, 2007

5.2.4 Land, Real Estate and Housing

The summary of capital investments in land, real estate and housing sector in three phases is given in Table 5.7. Over 18% of total investment is needed up to 2011 and another over 40% is needed during the period 2011-2016. Total 16% of the capital investment is needed towards affordable housing and another 77% is needed for green field development and 4% for interest subsidy towards housing.

Table 5.7: Summary of Capital Investment Needs of Land, Real Estate and Housing in MMR, 2005 – 2021 (Rs. Crores)

Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)
	2005-11	2011-16	2016-21	
Interest Subsidy towards Housing	196	176	122	493
Affordable Public Housing	983	516	486	1986
MIDC-Land Development	175	175		350
Green-field Development	854	4056	4482	9392
TOTAL	2,208	4,923	5,090	12,221

Source: Estimated, 2007

5.3 SUSTAINABILITY OF INVESTMENT

The Net District Domestic Product (NDDP) of MMR at current prices in 2004-05 is given in Table 5.8.

Table 5.8: Net District Domestic Product of three districts of MMR

District	@2004-05 prices (Rs. Crores)
Greater Mumbai	87,162
Thane	33,585
Raigad	8,713
MMR Total	1,29,460

Source: Compiled from Economics and Statistics Tables.

The MMR economy is likely to grow at 12% per annum. In that case, the total NDDP of MMR from 2007-08 to 2020-21 would be Rs 58,91,653 crores in 2004-05 prices. The total infrastructure needs of MMR during that period have been estimated to be Rs. 3,08,072 crores or 5% of NDDP. It is generally expected that up to 8% of the domestic product could be invested in infrastructure. From that perspective, the proposed investment plan looks

feasible provided resource mobilization and implementation capacity is considerably improved.

The implementation of the business plan will largely be governed by the ability of the metropolitan and local bodies to financially sustain the investments in terms of ability to service debts and absorb additional operation and maintenance costs, and capacity to implement the projects.

The additional revenues are forecasted based on revenue improvement measures such as revision of base, collection performance and implicit growth rates with respect to certain sources. The expenditures including O&M (Table 5.9) are forecasted for current levels of services (inflated) as well as the proposed investments. As there are metropolitan costs with regard to water source development, the model has incorporated bulk purchase of water from the proposed metropolitan water arrangement. The distribution of costs is based on the proportional share of costs to each local body. Further it is assumed that the local bodies will be charged for full costs of O&M and debt servicing for 40% of the cost, which is proposed to be financed by borrowing.. The rate of O&M will be same as in Table 5.9

Table 5.9: Adopted O& M Cost for various Municipal Infrastructure

Sector	O&M cost as % to capital cost
Water Supply	5%
Sewerage	5%
Roads	3%
Drains	2%
Street Lights	8%
SWM	12%
Others	3%

Source: Assumed.

The FOP also incorporates support for capital investment through a variety of sources such as grants, loans and own contribution. The debt burden due to borrowing is also factored as part of the forecast. The FOP is run using the total investment and iterated to the point when the local body is in a position to sustain the additional burden due to new investments in the form of debt servicing and Operation and Maintenance expenses².

The first option is to contribute own sources beyond the grants likely to be provided as part of state and National programs. Given the fact that the investments will continue beyond the stated terms of the current ongoing national programs such as JNNURM, for the purpose of this analysis the grants have been kept at half the level as outlined by these. If there exists a gap beyond grants and own sources, the amount of debt is automatically assessed by the model. The point when the local bodies reflect a positive closing balance in the last year and no negative balance for 3-4 years reflects the level of sustainability of investments in relation to total demand. There are times when the ULB might have a positive balance towards the terminal year

² The base capital cost is adjusted for inflation at 6% and physical contingencies have been provided for at the rate of 10% per annum.

and a lower sustainability, the point is that any further investments would mean a deficit in the long run. The process chart is presented in Figure 5-2.

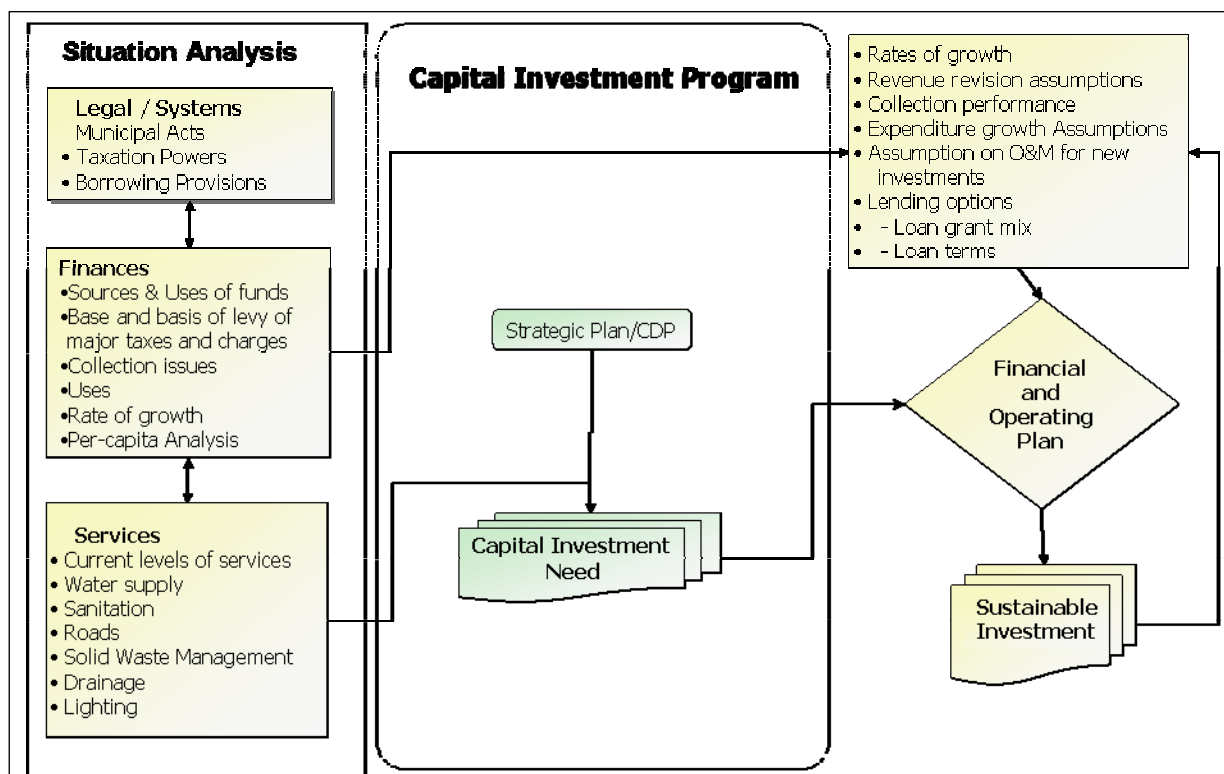


Figure 5-2: CIP - FOP Framework

The forecast carried out for the 15 priority ULBs is based on the assumption that the property tax performance will be improved by way of basic adjustments to the rate³ for new properties and improved collection performance in the short run. It is expected that ULBs will reach a collection efficiency of 85% on current demand and 45% for arrears. It is assumed that increments will be made to user charges by at least 15-25% immediately. In terms of cost of capital, the business plan for the moment is based on possible JNNURM support for municipal corporations at the rate of 30 % of the costs coming in as grants from Government of India (GoI) and Maharashtra and the balance is in the form of own contribution and debt.

While the assumption of sustained grant funding is a major risk of this analysis, it is expected that the ULBs will be in a position to absorb additional contribution⁴ in the event of the grants not accruing on time. However, with respect to planning and phasing of investments especially for the municipal corporations, it is assumed that support will be at half the UIDSSMT guidelines (40 % will be from GoI as grants and 10% from GoM, the balance is in the form of debt⁵ or own contribution). As outlined earlier, the demand for debt is assumed beyond a level of own contribution only. The risk of grants accruing is the same as with corporations. Essentially, the ULBs to mitigate such risks will need to rework the finances in terms of re scheduling

³ As per the Act revision to the base is not possible unless amended.

⁴ Although GoI now expects that part of the contribution may be recovered on terms to be decided by the state governments.

⁵ Debt is assumed at 8.5% and a 10 year repayment period.

projects , allocation of own sources based on need and support by the state in terms of additional resources by way of cost based development charges (See section on resource mobilization).

At the outset, the differences in terms of investment need and sustainability between the growth scenarios P-2 and P-3 is marginal and the forecasts are based on P3 investment needs. The level of sustainability by ULB is presented in Table 5.10.

Table 5.10: Sustainability levels of ULBs in MMR, 2021 (Rs. Crores)

Name of ULB	Investment Demand	Sustainability	GOI	GOM	ULB	Debt
	(Rs.Crores)	(% to Demand)	(Rs.Crores)			
MCGM	16884	67%	1479	1479	2308	5484
NMMC	1797	70%	288	288	422	225
Bhiwandi	905	41%	107	71	178	0
Mira Bhayander	940	22%	43	43	78	30
Thane	2155	82%	234	234	810	414
Kalyan-Dombivili	2323	63%	314	314	473	155
Ulhasnagar	511	74%	53	53	37	331
Vasai	111	1%	0.4	0.1	0.5	0.0
Virar	237	1%	0.9	0.5	0.9	0.0
Navgarh-manikpur	233	1%	0.8	0.2	0.9	0.0
Nallasopora	311	1%	1	0	0	5
Panvel	207	1%	1	0	1	0
Karjat	28	1%	0.1	0.0	0.1	0.0
Khopoli	79	1%	0.2	0.1	0.3	0.0
Alibag	20	1%	0.1	0.0	0.1	0.0
Matheran	7.4	1%	0.0	0.0	0.0	0.0
Pen	66	1%	0.2	0.1	0.3	0.0
Ambarnath	440	15%	16	2	2	24
Badlapur	182	41%	29	7	28	8
Uran	36	100%	13	3	14	3
Total	27,473	62 %	2,581	2,497	4,353	6,680
Share by Sources(%)			16	16	27	41

Source: Estimated, 2007

The investment needs at municipal level is Rs. 27, 473 Crores. As against this the sustainable level of investment even after reasonable improvements in tax and user fee management is only Rs. 16,172 Crores (62%). It is therefore imperative that additional sources of revenue by way of development charge as explained in Chapter 6 are made available to ULBs.

Appendices V.3 and V.4 present the capital investment needs by municipal infrastructure in ULBs of MMR. The summary Financial Operating Plans are given in **Appendix V. 5**. Detailed ULB-wise Financial Operating Plans are presented as part of **Appendix V.6 to V-20**.

5.3.1 Immediate Investment Program

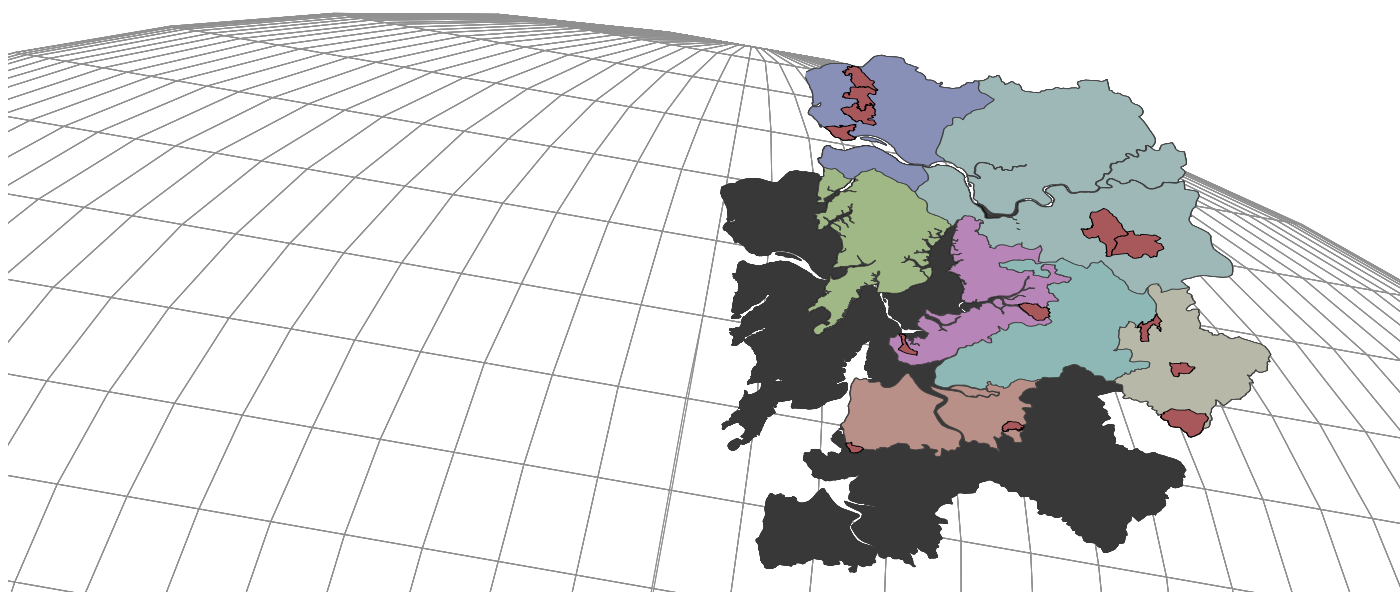
Some of the key metropolitan projects that need to be initiated immediately without the reform agenda being completed are given in Table 5.11.

Table 5.11: Sustainability levels of ULBs in MMR, 2021 (Rs. Crores)

S.No.	Sector/Project	Investment Needs	
		Rs.Crores	US \$ Billion
1	Water Source Development	4140	0.8
	<i>Pinjal</i>	2038	0.41
	<i>Gargai</i>	262	0.05
	<i>Poshir</i>	1536	0.31
	<i>Susari</i>	304	0.06
2	Metropolitan Sub-Urban Rail Transport	7096	1.4
	<i>MUTP II and III</i>	4690	0.94
	<i>Diva-Vasai Road</i>	2406	0.48
3	Metropolitan Transit	5153	1.0
	<i>Mankhurd-Mahim-Charkop</i>	5153	1.03
4	Metropolitan Road Transport	2135	0.4
	<i>Eastern Freeway</i>	1350	0.27
	<i>Elevated Link(Sewri to Worli-Bandra Sea Link)</i>	336	0.07
	<i>Thane-Ghodbunder Road</i>	289	0.06
	<i>Exclusive Bus System</i>	160	0.03
5	Greenfield Land Development	3416	0.7
	<i>Thane-Bhiwandi</i>	3416	0.68
	Total	21940	4.4

Chapter Six

Resource Mobilisation and Financing Plan



Resource Mobilisation & Financing Plan

6

6.1 INTRODUCTION

The capital investment needs identified in Chapter 4 and 5 can be funded through a combination of private capital, GOI and GOM contributions, loans and development charges. However extensive reforms, forceful and timely implementation are required to achieve the funding targets since the magnitude of investment presents a major institutional challenge for all the public sector entities involved.

National infrastructure would be financed by national government agencies through budgetary resources or by attracting private investments as in case of Rewas Aware Port or Airport. ULBs have distinct powers of taxation and levy of user fees for financing local infrastructure, and have access to some intergovernmental transfer of funds. However for metropolitan investment there are no established financing patterns though some budgetary support could be explored and private investment in PPP format may have to be vigorously pursued as in case of Versova-Ghatkopar MRT Corridor.

As part of the rapid appraisal of the financing needs and capacities, a separate assessment has been carried out for ULBs in this regard and presented in Chapter 5. Accordingly, the purpose of this Chapter is mainly to identify potential sources of finance for the metropolitan infrastructure requirements and augmenting finances of ULBs to meet financing targets proposed.

The financing plan assumes that certain fundamental principles will form the basis of the required reforms both at the metropolitan and municipal level. These principles are as follows:

User Charges

- For those investments that provide direct measurable benefits to users, the user will pay;
- Cost recovery efforts will balance efficiency and sustainability with affordability and equity¹;
- User charges will be set at levels that recover both O&M costs and capital costs (the latter including debt service, depreciation and return on equity);and
- A regulatory authority will be in place to ensure that tariffs reflect the above principles

¹ These will need to be fine-tuned as part of sub project design due to non availability of complete information on the users by category in most cases.

Local Taxes (Property and Octroi)

- Investments that do not provide directly measurable benefits will be financed by general taxes

Development Charges

Development charges will be levied according to one of the options described below.

- **Option 1:** Development Charge will be levied more as a benefit tax on value of all new development without restricting the application of proceeds to servicing new development.
- **Option 2:** Development will pay for development i.e. the costs of servicing a new development will be funded by the development itself; Development charges will not exceed the cost of the related infrastructure investment

Land Leasing

- Revenues generated from long term leasing of municipally owned land will be earmarked for capital expenditures
- All land leasing will take place at market values and subject to competitive bidding

Grants

- Grants provided for infrastructure will be predictable by the recipient

Private Sector Participation (PPP)

- Private sector participation in infrastructure projects is to be encouraged, with appropriate risk sharing, and

Transparency

- Financial arrangements, including tariffs, whether for services or development charges and other levies, must be determined and made available with maximum transparency;

Adoption of the above principles, particularly on user charges or tariffs, is critical to the provision of sufficient funding for the business plan proposals. Funds in the amount required are not going to be forthcoming from the State or National Governments and infrastructure investments must generate positive returns if they are to attract the necessary financing from the private sector. These principles reflect a significant shift in approach to infrastructure financing which is summarized in the Table 6-1.

Financing of the proposed infrastructure investments is believed to be entirely feasible given the expected economic growth and sufficient commitment and leadership. It does however require adherence to the above principles in order to ensure that projects are bankable.

6.2 RESOURCE MOBILISATION- REGIONAL INFRASTRUCTURE

As regard to regional infrastructure, assuming a regional authority manages these services, the annual burden will be of the order of Rs. 12,030, crore³. There is a variety of sector specific options. While the regional roads component can be financed to a large extent based on levies on fuel, as being adopted by the National Highway Authority of India through a dedicated road fund, the other components such as regional water sources or transit network have a larger set of beneficiaries and may have to be financed by mechanisms such as development charges.

From	To
Rents to form the principal basis for estimating annual rateable value and property taxation	Area characteristics or capital valuation to form the basis for the property taxation
Grant financing of local/municipal infrastructure	Debt financing of local/municipal infrastructure
Finances and functioning of municipalities based on directions of the higher tier of government	Incentive funds for municipal governments to undertake reforms for improving finances and functioning
Municipal provision of services	Public-private partnership in the provision of municipal services and infrastructure
Land treated as fixed assets	Sale of land-use rights for raising resources
Other municipal assets held on books	Assets to be leveraged for mobilizing resources
Negotiated intergovernmental transfers	Rule of formulae based intergovernmental transfer to allow financial stability and predictability to local governments
Subsidized prices of basic municipal infrastructure and services on grounds of externality	Application of the principle of cost recovery by pricing municipal infrastructure and services

6.2.1 Development Charges

The idea of development charges needs to be seen as a part of the larger genre of taxes and charges related to real estate. They can be designed: (a) to capture the land value gains on account of infrastructure (called **betterment or land value increment tax (LVIT)**); (b) to recover the cost of infrastructure required to be provided for servicing new growth (impact fees); and (c) as a tax levied on value of all new construction as a benefit tax. All three are distinct from the property tax in that they are one-time taxes (though recovered over a period of time in some cases). The appropriateness of these for MMR is discussed in the following section.

Betterment Levy

The notion that unearned income accrues to land owners on account of provision of infrastructure and such unearned income must be recouped is deeply rooted in Indian planning and legislative thinking. It is one of the fundamental premises of Town Planning Schemes provided for in the Town Planning Act.

² Adapted from Urbanization and Sustainability: Asian Development Bank, 2006

³ This amount excludes the power sector investment.

More specific provisions are included in the MMRDA Act 1974 enabling MMRDA to levy a betterment charge in respect of the increase in value of land resulting from execution of development project or scheme by MMRDA (Section 26). The betterment charge can be levied up to 50 % of the increase in land value alone on completion of development estimated “as if land were clear of buildings”

Similar provisions exist in BMC Act in case of redevelopment schemes and also in Highway Act. However, betterment levies have not been used in the recent past. This could be on account of the following difficulties:

- **Measurement:** It is difficult to conclusively measure the land value gain that is attributable to infrastructure – particularly when real estate market is generally rising as of now or generally falling as in 1995.
- **Event of Levy:** Even if land value increase is recognized, landowners argue that it is notional till transaction takes place. However, levying charge at the time of transaction reduces the utility of the charge as a financing instrument.

Impact Fees

The practice of financing capital improvement prevalent in US cities till 1980s was to raise capital resources through municipal bonds - revenue and general obligation – and service the bonds through property tax and user fees. During 1980s, however, state and federal assistance to cities reduced while some cities were expanding rapidly. Following the then prevailing practice meant existing population would have to pay higher taxes to pay for new growth. This was naturally resisted and notion that “growth should help for itself” became stronger. State legislation enabling charging impact fees for financing off-site infrastructure was enacted first in California and Florida and then followed by many states.

US Courts have held “rational nexus” between the cost of providing infrastructure and the fees charged as the cardinal principle of judging the legal validity of impact fees⁴. Although this type of development charges have now been well established in US and in Ontario, Canada their adoption in MMR has several limitations.

- (a) The principle “growth pays for itself” implies that impact fees do not cover the cost of augmenting existing infrastructure necessary to clear the backlog. However in case of MMR in the absence of a practice of preparing “capital improvement plans” it is difficult to differentiate or even allocate the cost between the two types of developments. The US legislation highlights the critical role of capital improvement plan in devising Impact Fee regime;
- (b) The requirement of upgrading existing infrastructure (like old water mains in Greater Mumbai) and creating new infrastructure for existing development (like sewerage in most ULBs) is so large that Impact Fees that help “growth pay for itself” would not be adequate; and

⁴ Development Exactions: Process and Planning Issues by Jennifer Evans-Cowley, Lincoln Institute of Land Policy, 2006

- (c) The requirement of preparing capital improvement plans as the basis of designing Impact Fees and then using them as the basis of convincing the taxpayers or then withstanding the judicial scrutiny would make the system administratively complex.

Development Charge linked to area of new development

Realizing the necessity of augmenting financial resources of ULBs for implementing the development plans (including provision of infrastructure) Government of Maharashtra in 1992 amended the MR&TP Act 1966 to provide for “Levy, Assessment and Recovery of Development Charge”⁵. The development charge according to these provisions is related to the area of land and buildings, minimum and maximum rates of development charge per sq.m. are laid down separately for Greater Mumbai, other municipal corporations and municipal councils and it is stipulated that the development charge is recoverable in installments from grant of Commencement Certificate to completion of development.

Development Charge as provided for in the MR & TP Act 1966 has severe limitations as a resource mobilization measure in MMR.

- (a) The rates prescribed for MCGM are minimum-Rs.140 and maximum Rs.350 per sq.m. of land and building where FSI is 1 (currently applicable rate is Rs.175). In case of other Municipal Corporations the corresponding rates are Rs. 60 and Rs.120. After 15 years of initial prescription, these rates appear to be extremely low both compared to current property prices and resource requirements for infrastructure provision. Considering an average property price of Rs.40,000 per sq.m. in Greater Mumbai the development charge may account for only 0.44% and for average price of Rs.15,000 per sq.m. in other corporations the rate of development charge turns out to be only 0.4%;
- (b) On account of fixed rates the development charge revenues have not been buoyant;
- (c) The Act requires the proceeds of Development Charge are credited to a separate “Development Fund” and the fund is applied for providing public amenities and maintenance and improvement of the area. In spite of such provisions hardly any ULB in MMR has maintained a separate Development Fund. Moreover, unlike the Impact Fees the application of fund covers maintenance and improvement as well. This dilutes the use of Development Charge as a source for expanding infrastructure services; and
- (d) There is no provision for sharing the proceeds with other agencies for provision regional infrastructure

Development Charge based on value of new property

Despite the limitations of development charge based on area of development mentioned above, the basic advantage is the administrative ease. By linking the development charge to the property value as determined for the levy of Stamp Duty in the ready reckoner, the administrative ease could be retained at the same time buoyancy of revenue could also be achieved. To introduce value based development charge and take care of some of the other limitations of the present system, necessary legal amendments will have to be carried. (These are spelt out in Chapter 7)

⁵ Chapter VI-A of MR&TP Act, 1966

Summary of Development Charge Options

Various methods of resource mobilization through real estate development described above and their strengths and weaknesses are summarized in Table 6-2.

Table 6-2: Various Methods of Resource Mobilisation Measures

Measures	Betterment Charge	Impact Fees	Area based development charge	Value based development charge
Legal feasibility	Provided for in MMRDA Act, 1974; but generally not available to ULBs	New legislative provisions would be necessary.	Provided for in MR & TP Act 1966	Can be introduced by through suitable amendments to MR & TP Act 1966
Tax base	Increase in land value attributable to provision of infrastructure.	Cost of providing infrastructure to new development.	Area of land and buildings in different uses.	Value of property at the time of completion of development.
Administrative complexity	Difficult to measure the tax base. Likely to be contested by owners not transacting property.	In the absence of a well-established practice of preparing and publicly adopting Capital Improvement Plans, it would be administratively complex to establish "rational nexus" between the cost and new development.	Administratively the least complex as area of land and construction can be indisputably determined while granting building permission.	Valuation of properties could have been a problem but due existence of well-settled practice of preparing ready reckoner for Stamp Duty purposes, the complexity could be minimized.
Revenue potential	Revenue potential is limited to 50% of the betterment.	Limited to cost of development, but recovery depends upon rate of new development.	Due to difficulties of periodic adjustment of rate the revenue cannot keep pace with inflation.	Buoyancy is reasonably assured as property value is the base.

Source: Compiled

It would be seen from the above summary that in the prevailing circumstances in MMR using development charges linked to the value of property appear to be the most promising avenue of additional resource mobilization. The most serious objections to introduction of such development charges would be;

- (a) The high Stamp Duty rate of nearly 10% of transaction cost was seen as an hindrance to housing market and has now been reduced to 3 to 5%. Adding development charge would be resisted as a backdoor entry of higher Stamp Duty. This will have to be contested by explaining that Stamp Duty is a transaction tax levied on every transaction, whereas development charge is a one time tax levied for financing infrastructure development. It is thus a benefit tax with a transparent use of tax proceeds for development that would benefit the taxpayer.

- (b) The burden of development charge will be passed on to the final consumer thereby increasing the housing prices, which are already unaffordable. The verdict on incidence of development charges is not very clear. The incidence of exactions could fall upon the landowner, developer or home buyer. In a tight housing market, the developer would pass the cost on to the home buyer. In an over supplied market, the developer would pass the exaction back to the raw land owner through a lower purchase price. In an in between market, the developer would absorb the cost of the exaction.⁶ In the present situation of MMR real estate market it is likely that the burden will be passed on to the final purchaser. But with the reforms proposed elsewhere in the report the incidence of development charge should begin to be on raw landowners or the developers.

Recommendations

Potential of mobilizing resources through development charges linked to the value of property are estimated in **Appendix VI.1**. As seen from the appendix over the next 15 years about Rs. 60,000 crores could be raised from the development charges.

6.2.2 Private Investment Options

Ministry of Finance, Department of Economic Affairs, GoI promotes public private partnerships in infrastructure. In order to guide formulation and implementation of PPP projects, DEA has formulated a number of guidelines. Important amongst these are:

- Guidelines for financial support to Public Private Partnerships in infrastructure
- Project risk assessment for PPP Projects sponsored by Government / Government Agencies / PSUs prior to bid

In addition GOI has set up India Infrastructure Finance Company Limited (IIFCL) with a authorized capital Rs.10000 million and paid capital of Rs. 1000 million. IIFCL is an apex financial intermediary for the purpose of development and financing of infrastructure projects and facilities in the country. This is to be effected by developing and disseminating appropriate financial instruments and negotiating loans and advances as per the given mandate. The Company renders financial assistance through:

- Direct lending to eligible projects
- Refinance to banks and FIs for loans with tenor of five years or more
- Any other method approved by GOI

MMRDA has successfully structured a PPP project for mass transit viz. Versova –Andheri-Ghatkopar corridor and has begun the process of selecting private partner for Charkop-Bandra-Mankhurd corridor. The PPP route may be more vigorously pursued in other infrastructure projects like urban

⁶ ibid

expressways, water source development. Navi Mumbai Municipal Corporation has successfully bid out an annuity based contract for water supply source development.

6.2.3 MMRDA's Resources

MMRDA through development and disposal of land at Bandra Kurla Complex (BKC) has generated substantial financial resources. These are likely to be further enhanced by the proposed doubling of the FSI. These resources can be effectively leverage investments metropolitan infrastructure as well as used to provide loan funds to ULBs for municipal infrastructure.

6.3 RESOURCE MOBILISATION-MUNICIPAL INFRASTRUCTURE

With improvements in revenue collections, management measures, grant programmes from the centre and expanded borrowings, it is estimated that ULBs could finance investments of Rs. 16,172 crores over the next fifteen years. In this estimate, the implied share of various sources are, own resources-27%, Intergovernmental transfers- 32% and debt-41%.

The options with regard to financing municipal infrastructure are:

Tax and fee based options

- Net revenues generated by ULBs (drawing on ULBs' revenues from octroi, property taxes, development charge, betterment levies, etc)
- User fees: For measurable services like water supply

Borrowings

- From MMRDA and its funds; and
- Commercial borrowings by ULBs and others;

Private investment options

- Public Private Partnerships and other sources of private equity

Inter-governmental transfers:

- National grant programs such as JNNURM and UIDSSMT; and
- Devolution according to recommendation of State Finance Commission (SFC)

Explanatory notes and recommendations for each of the above four sources are provided in the following section.

Tax Based Options

Virtually, all ULBs in MMR generate surpluses on their revenue account and use these surpluses to fund their capital expenditures; few manage to leverage their surpluses by commercial borrowings.

The main sources of revenue are:

- **Octroi:** A levy on commodity entering the city, this is a significant contributor. While many other states have abolished Octroi, shifting to property taxes and user fees for revenue generation.

- **Property taxes:** Property taxes are levied on the rental value of property and under rent control the effective rate of tax on market value is extremely low (0.17%) and highly variable from property to property; assessed values lag market values considerably. Nevertheless it is estimated that property taxes even at the current low rate could generate about Rs 17857 Crores over the period 2008-2020.

Recommendations

Short term mechanisms to augment own sources include:

(a) Improving collections of octroi through measures such as:

- Outsourcing collection;
- Formation of units to monitor the octroi check posts;
- Creation of a data bank on the prices of goods subject to octroi;
- Establishment of a market research wing to continually update the data bank on prices; and
- Induction of professionals for checking the valuation of goods at major octroi collection points.

(b) Improving collections of property tax through measures such as:

- Linking basic service delivery with payment of property tax;
- Advertising names of major property tax defaulters in newspapers;
- Attachment of property of major defaulters;
- Restructuring and strengthening of the property tax administration;
- Reorganization of the data bank on property taxes, particularly with respect to tax demand and collection of individual properties; using GIS for assessment and database management
- Use of incentives; and
- Regular monitoring of tax collection.

From a long term perspective, as recommended by the committee on review of abolition of Octroi and compensation by way of additional VAT would be an option. A decision in this regard will be critical for implementation of the business plan. Similarly, reforming the property tax system is essential so that the assessment method better reflects the value of properties. The current legislation, except with regard to municipalities constraints general revision of property tax base. Decision in this regard would, apart from amendments to the Rent Control Act (RCA), require a specific provision in the MMC, BPMC Acts to revise the assessment periodically and the formulation of the rules to the effect including method of assessment. The other option, given the constraints with RCA is shift to Capital Value based assessment of property tax. MCGM has already proposed such a system.

(c) Adopting new taxes, levies and user fees (see Appendix VI.2 for a potential list)

Development charges are a major potential source of funding and are addressed in section 6.2.1, mainly for financing regional infrastructure.

Borrowings



These measures are critical for the ULBs both in terms of contributing own capital and borrowing from the market and financial institutions (**Appendix VI.3** for issues and options). In order for ULBs to increase their borrowings they must:

- Be able to quantify the benefits of these investments so as to demonstrate their cost-effectiveness;
- Achieve a track record of financial sustainability and sound financial management;
- Adopt accrual accounting methods and prepare balance sheets, capital budgets and capital improvement plans; and
- Obtain a credit rating.

ULBs must also take steps to improve their creditworthiness including:

- increase transparency and reduce corruption;
- commission independent audits of city finances; and
- demonstrate consistent governance despite changes in political leadership.

Once ULBs can demonstrate their credit worthiness, they will be able to borrow without collateral and at reasonable rates.

The newly formed Maharashtra Urban Infrastructure Fund (MUIF), in the process of being operational is expected to help ULBs in terms of project development and access to the market through the following components:

- Project Development Fund
- Debt Service Fund
- Partial Direct Loan Fund

Inter-governmental transfers

Typically, these programs require financing from all three levels of Government, such as JNNURM under which the sources are 35 % as GOI contribution, 15 % as state contribution and 50% as ULB resources or borrowings and funds are provided on the basis of project reporting. In 2007, Mumbai is to receive Rs 1,100 crores under JNNURM, that is, 80% of the funds allocated to the entire state under JNNURM. While this is also seen as a risk (see Chapter 5), predictability will be an issue.

Recommendations: The State Finance Commission is supposed to propose five yearly devolutions, thereby assuring more general predictability of its funding. This practice must be followed so that recipients can plan their cash flows and make the financial commitments necessary for infrastructure financing. Wherever possible grant programs should be formula based to maximize transparency.

6.4 RESOURCE MOBILISATION-LAND AND AFFORDABLE HOUSING

Interest subsidies for housing, public sector affordable housing for the poor and greenfield land development are the main components of this sector. The resources for interest subsidies will have to come from public sources, including probably Government of India. Affordable public housing if organised in the form of sites and services may need short term borrowing during construction phase Greenfield land development could be commercially financed except for the affordable housing component that may be included.

6.5 THE WAY FORWARD FOR INFRASTRUCTURE FINANCING

Based on above consideration the total Capital Investment Plan of Rs. 2,20,214 Crores could be financed through Intergovernmental Transfers (22%) Own resources and Development Charge (29%) Borrowing (20%) and Private investment in PPP format (28%) as proposed in Table 6.3. The cost allocation to different sources of revenue thus appears to be balanced. This may allow adequate flexibility to adjust resource planning in case a particular source does not yield expended revenues.

While sufficient funding is available to finance the Business Plan investments from the sources listed above, the challenge is the attraction and deployment of the funds in a timely and cost-effective manner across so many disparate entities and projects.

Over the term of the Business Plan, financial markets will continue to develop, making new sources of funds available. For example, several private sector equity infrastructure funds have been formed in recent years in other countries (notably the UK, Australia and Singapore⁷) while in India the Infrastructure Fund of India, and the India Infrastructure Fund have been created with similar objectives. However, only infrastructure which generates positive returns will qualify for such investments.

⁷ Singapore's Government Investment Company is investing some of the country's Foreign Exchange Reserves in infrastructure including several hundred millions dollars in real estate in Mumbai. A similar proposal, using reserves to pay for foreign currency components of infrastructure investments, was made in the GOI February 2007 budget.

Table 6-3: Financing Mechanism for Metropolitan & Municipal Infrastructure

Sectors/Macro Projects	Investment Requirement: 2005-2021 (in Crores INR)	Financing Mechanism(in Crores INR)			
		Public Investment			Private/PPP
		Inter-Governmental Transfers	Own Resources and Development Charges	Borrowing	
METROPOLITAN INFRASTRUCTURE					
WATER SOURCE DEVELOPMENT	14110	4233	4233	5644	0
TRANSIT INFRASTRUCTURE	113291	22406	31414	11722	47749
MMR Metro System	83698	13615	22622	0	47461
Sub-Urban Railways	29113	8734	8734	11645	0
Water Transport	480	58	58	77	288
HIGHWAY SYSTEM	49007	11323	12053	14867	10764
TERMINALS	2038	428	428	571	611
DRAINAGE	2000	600	600	800	0
POWER	54521				
TOTAL(with Power)	2,34,967				
TOTAL(without Power)	1,80,446	38,990	48,728	33,604	59,125
%		21.6	27.0	18.6	32.8
MUNICIPAL INFRASTRUCTURE(ULB LEVEL)					
Water Supply	865	216	346	303	
Sewerage	7931	1983	3172	2776	
Solid Waste Management	612	153	245	214	
Storm Water Drainage	3372	843	1349	1180	
Transportation	9546	2387	3818	3341	
Health and Education	2738	685	1095	958	
Others	2484	621	993	869	
TOTAL	27,548	6,887	11,019	9,642	0
%		25.0	40.0	35.0	0.0
LAND, REAL ESTATE AND HOUSING					
Interest Subsidy towards Housing	493	247	247	0	0
Affordable Public Housing	1986	477	477	635	397
MIDC-Land Development	350	0	105	245	0
Green-field Development	9392	939	3757	1878	2818
TOTAL	12,221	1,662	4,585	2,759	3,215
%		14	38	23	26
TOTAL(with Power)	2,74,735				
TOTAL(without Power)	2,20,214	47,539	64,332	46,004	62,339
TOTAL %		21.6	29.2	20.9	28.3

Some projects identified in the Plan will have to be undertaken by government owned or statutory corporations which are not currently profitable (because of inappropriate tariffs, inefficiencies or government-imposed requirements) but which have the potential to become viable. It is therefore possible to envisage an evolution in infrastructure financing as presented in Table 6.4.

Table 6-4: Envisaged Stages in Infrastructure Financing

Phase	Characteristics	Funding Sources
Phase 1: Subsidies, and limited debt financing by ULBs	<ul style="list-style-type: none"> Poor financial management by ULBs; Low capital expenditures by ULBs Limited ULB borrowing Lack of explicit long-term capital improvement planning. No planned attention to resource mobilization. Politically motivated tariff setting Only limited use of development charges, little change to property tax base Infrastructure investments made by state owned companies with private sector participation; 	<ul style="list-style-type: none"> Variable GOI, GOM subsidies Limited debt financing Limited use of FIs' Pooled Debt Facility Early experience with PPPs Limited use of tax free bonds
Phase 2: Reduced subsidies, increased debt financing and some private equity	<ul style="list-style-type: none"> Improved financial management by ULBs and PSUs; Deliberate CIP Increasing capital expenditures by ULBs; Expanded use of development charges and improvements to tax base Tariffs set to recover full costs, including cost of capital Some privatization of state owned infrastructure companies 	<ul style="list-style-type: none"> Expanded use of specialized debt funds as ULBs become viable and project preparation skills improve Expanded use of tax free bonds Expanded experience with PPPs Selective acquisition of state owned infrastructure by private equity
Phase 3: Diversified funding sources	<ul style="list-style-type: none"> Development charges routinely used to finance growth ULBs exploiting additional revenue sources ULBs routinely preparing CIPs and attracting debt financing on their own merits Limited state ownership of infrastructure Sound regulation and supervision by the public sector of private sector involvement in infrastructure 	<ul style="list-style-type: none"> Full suite of financial instruments being used widely including debt, tax free bonds, institutional and retail infrastructure funds Establishment of bond bank or Municipal Finance Authority Extensive investment by private infrastructure funds

In order to accelerate the transition to Phase 3, the areas outlined in Table 6.5 are required. The overall objective of all these measures is to make infrastructure investments viable and to expedite the mobilization of funding.

Table 6-5: Reforms for Accelerating the Diversified Funding Sources

Subject	Principal Components	Note
Improve the financial management of ULBs	<ul style="list-style-type: none"> Adopt accrual accounting Prepare balance sheets Prepare Capital Expenditure Budgets Prepare Capital Investment Programs Improve information systems Improve collections of existing revenue sources 	
Improve the viability of ULBs	<ul style="list-style-type: none"> Expand use of development charges Revise property tax base Update regularly property tax base 	1
	<ul style="list-style-type: none"> Exploit access to additional revenue sources Improve project preparation 	2

Subject	Principal Components	Note
	<ul style="list-style-type: none"> Revise limits on ULB borrowings and eliminate need for State approval 	
Improve credit worthiness of ULBs	<ul style="list-style-type: none"> Establish expanded "MUIF" including SPFE Improve transparency (eg of tariffs, financial reporting etc) 	3
Expand use of debt and bonds	<ul style="list-style-type: none"> Establish specialized fund controlled by banks Improve marketing of bonds Establish bond bank or Finance Authority 	
Recover service costs through appropriate tariffs and user charges	<ul style="list-style-type: none"> Improve cost accounting to identify full costs of services (including capital costs) Improve regulation of non-competitive services 	
Improve viability of PSUs	<ul style="list-style-type: none"> Improve governance and price setting on selective basis 	
Package and market infrastructure projects to financial markets	<ul style="list-style-type: none"> Appoint a Fund Raising/Treasury "Czar" to package and market projects, and facilitate contacts between infrastructure sponsors and the financial market 	4

Notes:

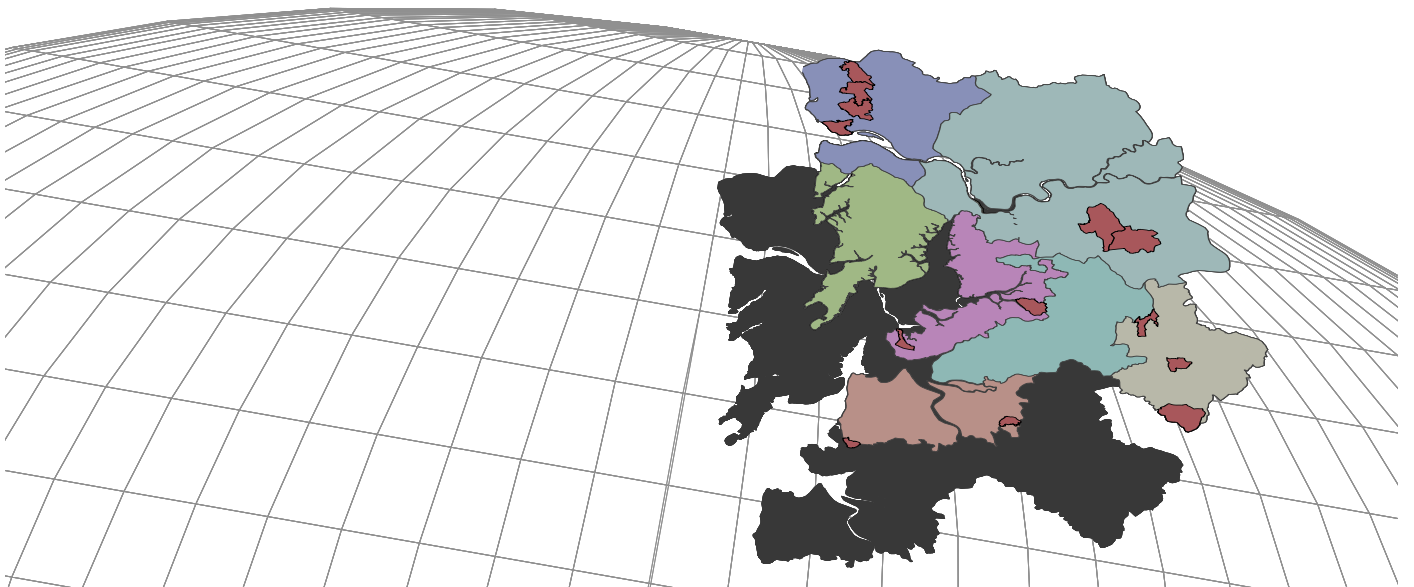
- Expanded use of development charges will require the measures outlined in **Appendix VI.4.**
- Improved project preparation would be one of the goals of the enhanced "MUIF"
- Credit enhancement will be one of the goals of the enhanced "MUIF"
- The appointment of a Fund Raising/Treasury "Czar" would have the objective of match-making between infrastructure sponsors (ULBs, MMRDA, PSUs) and financial markets, and being the catalyst for innovation in infrastructure financing in the state. Some sponsors are not familiar with the requirements of financial institutions, and may not be experienced at negotiating financing and at marketing themselves to financial institutions. Similarly, financial institutions may need assistance in identifying and working with viable ULBs. In some cases it may be fruitful to group viable and non-viable projects or entities so that the entire package can be funded. All of these situations require forceful leadership and aggressive promotion, which would be the responsibility of this position which might be placed in an enhanced "MUIF".

A separate fund, MMR Development Fund (MMRDF) must be established at the MMRDA level, to be the custodian for development charges assigned to the Metropolitan level. Similar funds must be established at ULBs receiving development charges as already provided for in the MR&TP Act 1966.

However availability of finances is not the only constraint for achieving the targets delivering infrastructure services in a timely manner. Experience in the past shows that even when funds are assured, land acquisition, resettlement of project affected persons, environmental clearance, delays in selection of contractors and finally delays in execution of contracts due to disputes of contracts give rise to considerable time and cost overruns in project implementation. Improving project implementation capacity will therefore be as important as mobilizing financial resources.

Chapter Seven

Governance



7.1 INTRODUCTION

As noted earlier, good governance is at the root of the strategy of ushering MMR into a virtuous cycle of economic growth, infrastructure investment and improved quality of life. Governance could be seen to encompass institutions, capacity building, legal reforms and management practices. Substantial reforms are necessary in each of these spheres.

7.2 INSTITUTIONS

7.2.1 Constitutional obligations

Constitutional Amendment Act 1992 (74th Amendment) furthered the principle of “democratic decentralization” and confirmed municipalities as the third tier of government which should act as agents of social and economic development. The constitution directed the state legislature to endow:

“the Municipalities with such powers and authority as may be necessary to enable them to function as institutions of self-government and such law may contain provisions for the devolution of powers and responsibilities upon Municipalities, subject to such conditions as may be specified therein, with respect to:

- The preparation of plans for economic development and social justice; and
- The performance of functions and the implementation of schemes as may be entrusted to them including those in relation to the matters listed in the Twelfth Schedule.

The Twelfth Schedule to the Constitutions lists the functions that may be performed by the municipalities as given in BOX 7-1.

Government of Maharashtra has amended the state municipal legislation for being in conformity with the Constitutional provisions except that the functions related to physical planning have not been assigned to municipalities as a part of the municipal legislation since they were already assigned to them under MR & TP Act 1966. In addition to the

BOX 7-1: FUNCTION OF MUNICIPALITIES AS PER TWELFTH SCHEDULE OF THE CONSTITUTION

Physical Planning

- Urban planning including town planning.
- Regulation of land-use and construction of buildings.

Economic and Social Planning

- Planning for economic and social development.
- Slum improvement and upgradation.
- Urban poverty alleviation.
- Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded.
- Provision of urban amenities and facilities such as parks, gardens, playgrounds.
- Promotion of cultural, educational and aesthetic aspects.

Provision of Infrastructure Services

- Roads and bridges.
- Water supply for domestic, industrial and commercial purposes.
- Public health, sanitation conservancy and solid waste management.
- Fire services.
- Public amenities including street lighting, parking lots, bus stops and public conveniences.

Environment and Public Health

- Urban forestry, protection of the environment and promotion of ecological aspects.
- Burials and burial grounds - cremations, cremation grounds; and electric crematoriums
- Cattle pounds; prevention of cruelty to animals.

Constitutional compliance, the state municipal legislation made it mandatory to Corporations and A Class municipal councils to prepare Annual Environmental Status Report and statement of subsidies involved in rendering municipal services.

7.2.2 Institutional Scene: ULBs

The institutional scene as it exists in MMR at the third tier of government is described Table 7-1.

Table 7-1: Urban Local Bodies in MMR

Local Government	Governing Legislation
1. Municipal Corporation of Greater Mumbai	The Mumbai Municipal Corporation Act 1888
1. Thane Municipal Corporation	The Bombay Provincial Municipal Corporation Act 1949
2. Kalyan-Dombivali Municipal Corporation	
3. Ulhasnagar Municipal Corporation	
4. Bhiwandi Nizampur Municipal Corporation	
5. Mira Bhayander Municipal Corporation	
6. Navi Mumbai Municipal Corporation	
1. Vasai Municipal Council	Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act 1965
2. Navghar Manikpur Municipal Council	
3. Nala Sopara Municipal Council	
4. Virar Municipal Council	
5. Amabrnath Municipal Council	
6. Kulgaon-Badlapur Municipal Council	
7. Karjat Municipal Council	
8. Khopoli Municipal Council	
9. Panvel Municipal Council	
10. Uran Municipal Council	
11. Pen Municipal Council	
12. Alibag Municipal Council	
13. Matheran Municipal Council	

Besides these municipalities, there are about 900 villages governed by gram (village) panchayats whereas, at the district level two Zilla Parishads viz. Thane and Raigad also exist. For these districts and Mumbai City and Mumbai Suburban Districts there are District Planning Committees as provided by the Constitution. In addition, CIDCO acts as the New Town Development Authority for Navi Mumbai and Special Planning Authority for Vasai-Virar sub-region.

7.2.3 Institutions at the Metropolitan Level

Greater Mumbai, the six municipal corporations (except Bhiwandi-Nizampur) and Ambarnath and Kulgaon-Badlapur Municipal councils form a contiguous urban area. Census 2001 also identified this as the Greater Mumbai Urban Agglomeration. Taking cognizance of the intense interaction in such agglomerations the Constitution provided for planning at the metropolitan level by establishing Metropolitan Planning Committee (MPC) (Article 243 ZE). BOX 7-2 presents the envisaged planning role of MPC as per the Constitution.

The State legislature has enacted the Maharashtra Metropolitan Planning Committee Act 2000 but has not yet constituted the MPC. The Act has envisaged that the draft development plan to be prepared by the MPC to be

equivalent to the Regional Plan under the MR&TP Act as prepared by the MMRDA. The powers of MMRDA to prepare such a plan have been withdrawn and MMRDA is to assist MPC in preparing such a plan. There are many ambiguities about the contents of the plan and its enforcement and frequency of plan preparation. More particularly:

- The plans to be prepared by the ULBs are envisaged to be the plans for social and economic development and not just the land use or physical plans envisaged in the MR&TP Act 1966. The plans of MPC cannot therefore be only confined to land use plans;
- Such plans therefore have to contain investment plans which are more frequently drawn than the 20 year cycle followed in case of land use plans;
- What happens to the draft development plan after its submission to the state government is not clear. Even if approval of Government is implicitly included. The implications of such approval in terms of enforcement of plan are not very clear; and
- In case of MMR, besides MPC, there are four DPCs too; the relative jurisdiction of DPCs and MPC is not clarified.

It would be useful to clarify these ambiguities and establish MPC on clear footings.

BOX 7-2: Role of MPC as per the Constitution (Article 243ZE)

“Every Metropolitan Planning Committee shall, in preparing the draft development plan,

(a) have regard to—

- The plans prepared by the Municipalities and the Panchayats in the Metropolitan area;
- Matters of common interest between the Municipalities and the Panchayats, including co-ordinated spatial planning of the area, sharing of water and other physical and natural resources, the integrated development of infrastructure and environmental conservation;
- The overall objectives and priorities set by the Government of India and the Government of the State; and
- The extent and nature of investments likely to be made in the Metropolitan area by agencies of the Government of India and of the Government of the State and other available resources whether financial or otherwise.

(b) Consult such institutions and organizations as the Governor may, by order, specify.

The Chairperson of every Metropolitan Planning Committee shall forward the development plan, as recommended by such Committee, to the Government of the State.”

BOX 7-3: Functions of MMRDA as per the Schedule 12 of MMRDA Act

- review any physical, financial and economical plan;
- review any project or scheme for development which may be proposed or may be in the course of execution or may be completed in the Metropolitan Region;
- formulate and sanction for the development of the Metropolitan Region or any part thereof;
- execute projects and schemes ;
- recommend to the State Government any matter or proposal requiring action by the State Government or any other authority for the overall development of the Metropolitan Region;
- participate with any other authority for inter-regional development;
- finance any project or scheme for the development of the Metropolitan Region;
- Co-ordinate execution of the projects or schemes for the development of the Metropolitan Region.
- supervise or otherwise ensure adequate supervision over the planning and execution of any project or scheme, the expenses of which, in whole or in part, are to be met from the Mumbai Metropolitan Region Development Fund;
- Prepare schemes and advise the concerned authorities in formulating and undertaking schemes for development of agriculture, horticulture, floriculture, forestry, dairy development, poultry farming, piggery, cattle breeding, fisheries and other similar activities.
- prepare and implement schemes for providing alternative accommodation and for rehabilitation of persons displaced by projects and schemes which provide for such requirements;
- do all such other acts and things as may be necessary for, or incidental or conducive to, any matters which arise on account of its activity and which are necessary for furtherance of the objects for which the Authority is established.

7.2.4 Role of MMRDA

The need for planning at the regional scale in addition to planning at city level was recognized in 1965. Accordingly MR&TP Act 1966 was enacted enabling Regional Plan. The first Regional Plan for MMR was prepared during 1967-1970 by the Regional Planning Board constituted under the Act. The Board however became *functus officio* on publication of the draft regional plan according to the scheme of the Act. On approval of the Regional Plan in 1973 the need of regional planning and coordinating agency with continued existence was perceived. Accordingly, MMRDA Act 1974 was enacted and MMRDA came to exist in 1975. BOX 7-3 provides the functions of MMRDA as listed in Section 12 of the Act and Figure 7-1 presents organizational structure of MMRDA.

However, MMRDA was initially restrained from providing for the obligatory and discretionary functions of BMC in Greater Mumbai (section 17 of MMRDA Act 1974). MMRDA Act was amended in 2003 to empower it to undertake infrastructure works in Greater Mumbai area as well. Similarly it was granted powers of the Slum Rehabilitation Authority to rehabilitate slums affected by the infrastructure projects. Thereafter, MMRDA's role of developer of road infrastructure has become more dominant. MMRDA has also actively pursued and successfully closed a transit proposal (Versova-Andheri-Ghatkopar) in PPP format.

Despite a very wide mandate, MMRDA has not evolved into a true metropolitan authority. BOX 7-4 presents the inhibiting factors in functioning of MMRDA as identified in the Regional Plan 1999. Most of these inhibiting factors are still valid. However in terms of expanding the stakeholder participation, Secretaries of Industries and Environment Department are invited to the meetings of the Executive Committee and representatives of ULBs are invited to the meetings of the Authority. Apart from being a metropolitan authority, MMRDA also acts as Special Planning Authority (SPA) for projects like Bandra Kurla Complex, Wadala Truck Terminal where it also carries out land development and disposal of land. In addition it acts as SPA

for planning of Backbay Reclamation, Oshiwara District Centre, Ambarnath, Kulgaon-Badlapur notified area, 27 villages deleted from the jurisdiction of Kalyan-Dombivli Municipal Corporation and 50 villages on the periphery of Bhiwandi.

MMRDA's Role in Financing Infrastructure

MMRDA that began mainly as a planning and coordinating agency, dependent for its finances on GOM in 1975, has emerged as a financially independent agency capable of making significant contribution to infrastructure financing in MMR. Its balance sheets for 2003 to 2006 are summarised in Table 7-2.

BOX 7-4: Inhibiting factors in functioning of MMRDA as identified in RP 1999

- Under representation of Executive Committee in terms of key sectors like Industries, Energy and Environment Department and other local bodies of MMR except Greater Mumbai, thus retarding its potential of becoming inter-sectoral coordinating agency.
- Non-evolution of adequate procedures for use of its power especially in review of physical, financial and economic plans. This situation is further aggravated by the absence of suitable information flows for MMR.
- Lack of investment programming for effective coordination has hindered the implementation of planning. Also, need for alternate resource generation is not fully felt by state government.
- ULB's practice of annual budget cycles and non-adherence to five year capital investment plans has led to ineffective coordination of investment programmes. Also, state line agencies have no separate investment plans for MMR.
- MMRDA had played an effective role of implementing and coordinating agency in case of externally funded projects.
- MMRDA has started playing role of infrastructure development financing more actively but at a modest scale. This has potential of strengthening its role as a coordinating agency.

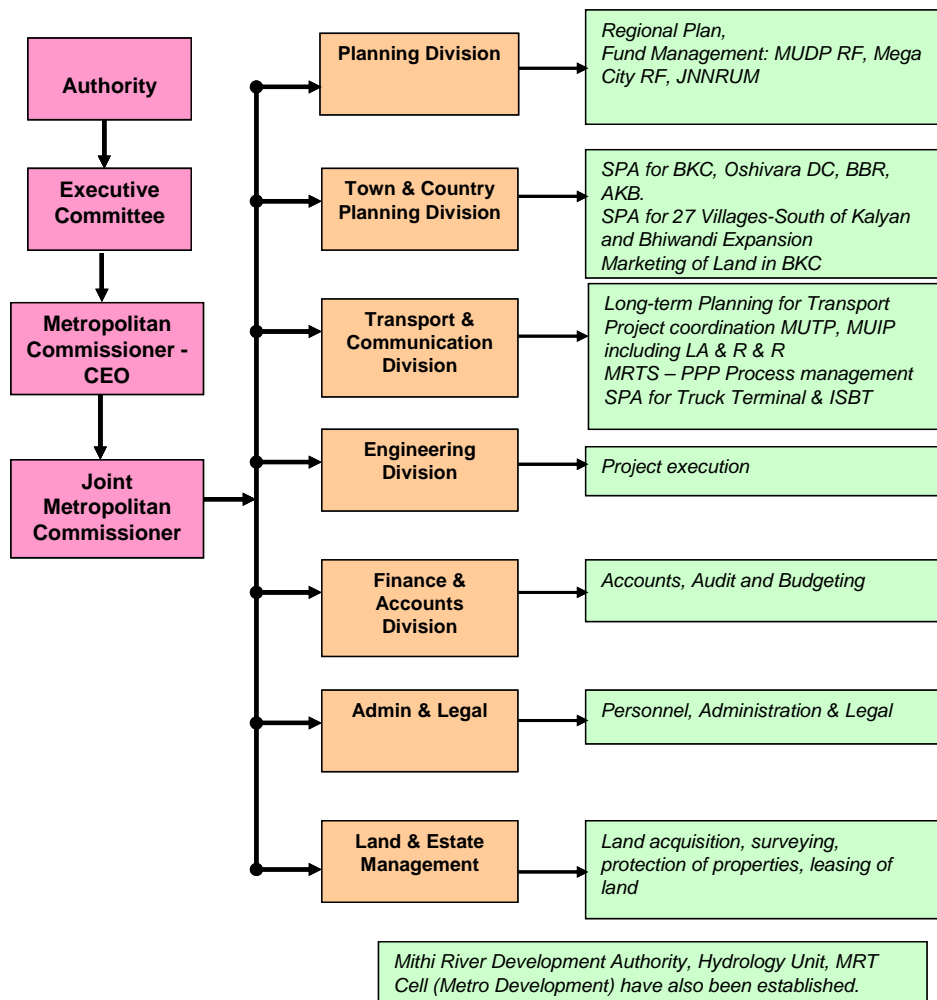


Figure 7-1: MMRDA: Present Organisation Structure



Table 7-2: MMRDA Balance Sheet(in Rs. Crores)

Heads	YEAR(as on 31 March)			
	2003	2004	2005	2006
Sources				
Lease premia	2173.28	2384.07	2646.08	3889.80
Development Charge	0.16	1.57	19.25	36.39
Loans form Mega City Fund for MUIP	0.00	20.28	120.64	226.43
Deposits	8.61	20.15	56.11	112.27
Contribution from Government	14.69	14.69	11.27	11.27
Backbay Maintenance Fund			6.87	6.87
Other Payables	60.44	261.40	404.01	466.95
Income and Expenditure Account	2703.69	2900.14	3118.90	3316.04
Total Sources	4960.87	5602.30	6383.13	8066.02
Applications				
Fixed Office Assets	6.58	6.61	6.68	7.32
Cost of Land	253.67	293.91	311.28	342.05
Works (& Studies) Completed	23.24	20.72	18.20	15.68
Works in Progress	390.22	683.07	861.76	1097.57
Loans and Advances	818.55	849.68	818.77	846.15
Investment in GOM & PSUs	1632.36	1089.37	891.25	847.57
Bank deposits	1148.85	1976.70	2881.30	4211.09
Accrued interest and receivables	687.40	682.24	593.89	698.59
Total Applications	4960.87	5602.30	6383.13	8066.02

Source: MMRDA Annual Reports 2003-04 to 2005-06.

Looking at the sources, it is observed that MMRDA's NOF (Net Owned Funds) account for 98% (2003) to 90%(2006) with Lease premia and surplus transferred from income and expenditure account forming the major share of NOF. This suggests strength to leverage funds for expanding investment in infrastructure that has remained untapped. Borrowings form an insignificant part of the sources. In case of application of funds, Bank deposits and investments in PSUs and GOM accounted for 56% in 2003. This has increased to 66% in 2006. Fortunately however the investment in PSUs and GOM has reduces from 33% to 11% and in absolute terms from Rs.1632 crores to Rs.847 crores during the same period. The loans and advances for infrastructure works in MMR have only marginally increased and reduced significantly as a percentage of total applications. (from 17% to 10%). Most of the increase in applications has occurred in works directly carried out by MMRDA (Rs.667 crores to Rs.1455 crores) accounting for an increased share from 13 % to 18%.

Main source of capital receipts of MMRDA has been the lease premia from the land leased in Bandra Kurla Complex. This is subject to fluctuations in real estate prices and confined by the availability of land at Bandra Kurla Complex. MMRDA's recent proposal to increase the FSI would partially help remove this constraint. MMRDA does not have any revenue source of sustained income. Development Charge proposed elsewhere would be very

useful in ensuring such a source. MMRDA's spending on MUIP in the recent past though adds to the stock of useful infrastructure of MMR, would not add to the assets owned by MMRDA that can earn a revenue stream. In order to play the role of a catalyst in increasing the scale of infrastructure investments in MMR, MMRDA may have to explore the following avenues more aggressively,

- Invest in equity of infrastructure projects in PPP format that in turn raise debt funds for infrastructure.
- Use available resources as debt funds to support infrastructure investments by ULBs and para statals. This would need support for project formulation and resource mobilization efforts by the ULBs as well.
- Introduction of development charges that are shared between ULBs and MMRDA.

MMRDA at present manages its lending operations through a number of funds. The total sources available in these funds as on 31 March 2006 are given in Table 7-3.

Table 7-3 Funds in MMRDA (in Rs. Crores)

Name of the Fund	Sources on 31 st March 2006	Amount in Bank
Reserve Fund	680.21	343.95
MMRDA Revolving Fund	465.40	328.72
Mega City Revolving Fund	898.80	396.82
Total	2044.41	1069.49

Main objective of these funds have been to provide debt funds for infrastructure development. However the fact that over 50% of the sources remaining in the bank deposits is indicative of the limitations of lending for infrastructure. The limitations could be due to lack of bankable projects, limited debt servicing capacity of ULBs, unwillingness of ULBs to levy and collect user fees and general reluctance amongst ULBs to "borrow". MMRDA may have to work on all these fronts to significantly improve investment in infrastructure.

Major risk that MMRDA faces in respect of its income by way of treasury operations is that it may be subjected to Income Tax. This will cause major dent in the income, which could be avoided by following the strategy described above.

7.2.5 Role of state level parastatals

Although the Constitution has recognized municipalities as the third tier of government and had assigned wide-ranging powers and responsibilities, many functional agencies at the state and union level exist. Some of them like Railways have an exclusive role whereas some like slum improvement board may have overlapping jurisdiction. Administratively the Urban Local Bodies (ULBs) are under the Urban Development Department (II), but many of their functions are dealt with by other departments and their quasi-government agencies. These are illustrated in Table 7-4.

Table 7-4: State Level Agencies and their functions

S. No.	GOM Dept.	Quasi Government Agencies	Functions
1	Housing Department	Maharashtra Housing and Area Development Authority and its regional Boards for Mumbai and Konkan	State level agency for Public housing operating with regional Boards. Two of which have jurisdiction in MMR
		Mumbai Slum Improvement Board	Environmental improvement of slums in Greater Mumbai
		Mumbai Building Repairs and Reconstruction Board	Repair and Reconstruction of cessed buildings in the Island City
		Slum Rehabilitation Authority	Regulating authority for slum rehabilitation
2	Water Supply and Sanitation Department.	Maharashtra Jeevan Pradhikaran	State level agency for water supply and sewerage development.
3	Water Resource Department	Various river valley development agencies	Development and management of water resources (dams) and irrigation system
		Water Resource Regulatory Authority	An independent statutory regulatory authority
4	Public Works Department	Maharashtra State Road Development Corporation	State level agency for development of roads, flyovers and privately financed bridges
5	Environment Department	Maharashtra Pollution Control Board	Enforcing environmental legislation and rules and monitoring environment
6	Home (Transport) Department	Maharashtra State Road Transport Corporation	Intercity bus services.
		Maharashtra Maritime Board	Developing and regulating minor ports
		Road Transport Authority	Registration of vehicles and drivers
7	Industries and Energy Department		Formulating state wide policies for industrial growth (manufacturing and services), attracting FDI, promoting SEZ etc
		Directorate of Industries	Regulating industries
		Maharashtra Industrial Development Corporation	Developing industrial estates, along with water resources.
		Maharashtra State Electricity Board	Power sector policies and generation, Transmission and Distribution
8	Urban Development Department (I)	Directorate of Town Planning	Technical advice to department and preparing development plans of cities
		Mumbai Metropolitan Region Development Authority	Planning, coordinating and executive agency for MMR
		City & Industrial Development Corporation of Maharashtra	NTDA for Navi Mumbai and SPA for Vasai Virar
9	Urban Development Department (II)	Directorate of Municipal Administration (Municipal Councils)	Controlling and regulating affairs of municipal councils
		Municipal Corporations	Wide-ranging civic functions
10	Tourism Department	Maharashtra Tourism Development Corporation	Promoting tourism and hospitality industry.

Similarly in the Union Government there are ministries and quasi-government agencies that have a developmental or regulatory role to play. Important amongst these are shown in Table 7-5.

Table 7-5: Central Level Agencies and their Functions

S. No.	GOI Ministry	Quasi Government Agencies	Functions
1	Ministry of Urban Development		Ministry implements JNNURM
		Central Public Works Department	Development of GOI land and buildings
		National Building Organization	Research and deciding norms for building construction
		Town and Country Planning Organization	Technical advice to Ministry
		National Institute of Urban Affairs	Research and Training arm of Ministry
2	Ministry of Housing and Poverty Alleviation		Ministry implements UIDSSMT and poverty related schemes such as VAMBAY, SJSRY
		Housing and Urban Development Corporation	Financing housing and urban infrastructure
3	Ministry of Civil Aviation	Airports Authority of India	Development and management of airports
4	Ministry of Shipping, Road Transport and Highway	National Highway Authority of India	Development of national highways
		Major Port Trusts	Development and management of major ports
5	Ministry of Railways	Railway Board and the Zonal Railways	Development and operations of railways including suburban railways
		Mumbai Railway Vikas Corporation	Planning and coordination of development of suburban railways and commercial development of railway land
6	Ministry of Environment and Forest		Stipulating environmental regulations and granting environmental clearance.
		Central Pollution Control Board	Prescribing environmental norms and their monitoring
7	Ministry of Commerce		Promoting development of SEZs
8	Ministry of Finance	National Housing Bank	Providing refinance facility to Housing Finance Companies, Regulating housing finance and financing rural housing and slum redevelopment.
		India Infrastructure Finance Company Limited (IIFCL)	Supporting private investment in infrastructure through PPP.

7.2.6 Areas of planning and development not attended

In this complex institutional scene, it would be observed that there is no strong metropolitan agency. MPC is yet to be constituted and MMRDA has over the years found its niche in following functions:

- Land - planning, development and marketing as in case of BKC and Truck Terminal;
- Project formulation and coordination where external funding is available like in World Bank funded MUDP and MUTP or Centrally funded projects like Mega Cities and JNNURM;
- Project execution like in MUIP;
- Development finance by way of loan assistance to ULBs in MMR through MUDP Revolving Fund and other funds; and
- Promoting and structuring PPP as in case of Versova-Ghatkopar transit.

BOX 7-5: PRIORITY AREAS REQUIRING INSTITUTIONAL SUPPORT

- Planning for economic growth
- Water resource development
- Transit and metropolitan highway network planning and development
- Planning and development of Greenfield areas in conjunction with transit expansion
- Solid waste disposal
- Hand holding of smaller Urban Local Bodies
- Raising resources for metropolitan development

This may not resemble a comprehensive menu of what needs to be done at the metropolitan level. However this is a classical problem of achieving coordination between regional (geographic) developmental agencies and sectoral (functional) agencies operating at the higher levels of government. There does not seem to be a standard institutional solution to address this problem. It has to be found in the local political milieu driven by the felt need of

metropolitan functions. In case of MMR, areas listed in Box 7.5 appear to be of priority requiring attention at the metropolitan level.

(a) Planning for economic growth

During the last decade, MMR has seen much volatility in economic growth—from negative growth in 2001 to 13 % in 2004. As Indian economy gets integrated with world economy, MMR economy too would become sensitive to changes in the world economy; but other threats could be more local such as poor infrastructure and expensive real estate. There is need to closely monitor economy and take steps to achieve sustained growth rate. As of now Industries Department formulates state level economic growth policies as in case of IT and ITES, BT, Retail, Industries etc. Planning for social and economic development is now an obligatory duty of ULBs. However in case of MMR planning for economic growth cannot be undertaken individually for each ULB. It would be more appropriate to organize it as a metropolitan function. This may also require marketing MMR both nationally and internationally.

(b) Water resource development

So far, water resources (dams) have been constructed at the behest of a Municipal agency or a group of municipalities. Water resources that need to be developed for MMR over the next decade have been identified. Water from these may have to be allocated to multiple municipalities depending upon the need. Given the long gestation period for developing such resources it is necessary that action on developing them must start urgently. However no single agency seems to be actively pursuing this metropolitan level function.

(c) Transit and Metropolitan Highway Network planning and development

CTS will be proposing extensive road and transit network. For development of road network there are many agencies but there is no agency for developing transit. MMRDA has successfully closed a transit project in PPP format. However whether the entire network could be developed through PPP or some routes required for opening up green field sites will require different

methods of financing would need further examination and sustained institutional commitment.

Similarly CTS will be proposing an extensive access controlled highway network transcending ULB boundaries. Planning, development and maintenance of such a network too could advantageously be dealt with as metropolitan function.

(d) Planning and development of Greenfield areas in conjunction with transit expansion.

CTS has identified significant requirement for green field development along with transit expansion. Being outside the present municipal limits this too needs to be seen as metropolitan function.

(e) Solid waste disposal

Solid waste disposal is going to increasingly become a problem of inter-municipal coordination as Individual municipalities would find it impossible to find land and develop and manage landfill sites. Creating facilities (through PPP) will have to be therefore seen as metropolitan function.

(f) Hand holding of smaller ULBs

Some of the smaller ULBs for their local functions too require technical assistance e.g. storm water drainage. Almost all ULBs require some help in accessing institutional finance or the capital market through bonds. This function can be performed by the recently established Maharashtra Urban Infrastructure Fund (MUIF)¹

(g) Raising resources for metropolitan development.

Although ULBs have constitutional rights to levy taxes and user fees they are inadequate to support major metropolitan investment. Raising resources for major infrastructure investment, through development charges and impact fees, would need attention at the metropolitan level.

7.2.7 Metropolitan Institutions: International experience.

The international experience of metropolitan governments in terms of structure, authority and functions is quite diverse. At one extreme is the unitary local government or metropolitan municipality as in case of Seoul or Tokyo and at the other total lack of any metropolitan agency with the state or national governments performing the coordinating role. (e.g. Brisbane and Perth). In most other context with strong democratic traditions a two-tier system has evolved where the metropolitan governments performs the planning function and/or provides services that can best be provided at the

¹ MUIF is the initiative of MMRDA which may act as financial intermediary that provides technical assistance to ULBs in Maharashtra in project development and capacity building, assists in accessing capital markets through bonds (and also act as pool finance agency) and as partial direct funding agency on a modest scale. MUIF as trust fund with an asset management company has now been incorporated.

metropolitan level. In terms of style of functioning they are either “governing” or “coordinating”.

It would be interesting to see the London experience in some details as it comes closest to MMR context. Metropolitan Area of London presents a two-tier governance system. At the lower tier, Local Councils are comprised of elected representatives of the political parties and the single largest party determines policy. At council level, this kind of **parliamentary system** is serviced by a hierarchy of civil service officers whose role it is to implement the policy. Professional, non-partisan officials are appointed by the council and continue in post even when the council changes. These officials service all council committees (housing, transport, planning etc.) and run the city on a daily basis. The key power broker in the case of city councils is not the mayor, who presides over the council and whose duties are largely ceremonial, but the council leader.

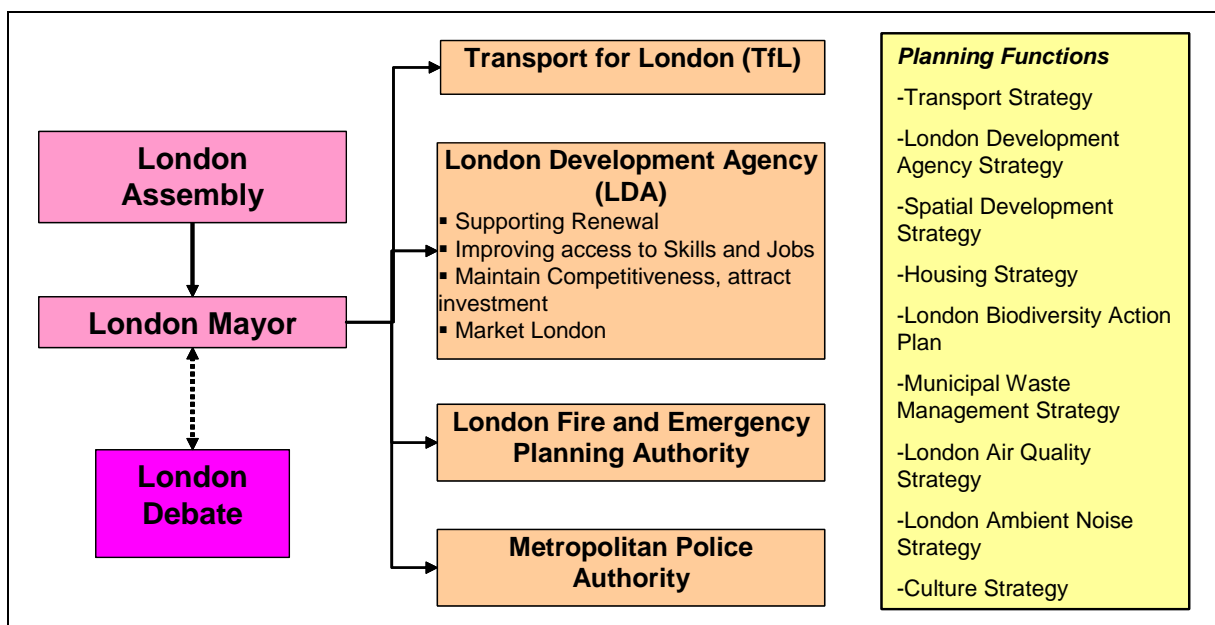


Figure 7-2: Organisational Structure of GLA

The latter is elected from among the councilors of the majority party. Councils exercise a range of powers at the borough or city level, but are bound by the national laws laid down by Parliament.² At Upper tier, GLA’s organizational structure comprises of the Mayor, the Assembly and the Functional Bodies. Of these, the Mayor and the Assembly are directly elected: Mayor by a vote for a named person: and Assembly through two sets of votes, one for the 14 constituency members and one for the 11 numbers from a list, a system designed to achieve some degree of proportionality in the make-up of the Assembly. The four functional bodies of GLA, run pan-London services, namely:

² 32 boroughs and the Corporation of City of London

- **Transport for London:** which provides bus, river and some light rail services, maintains London's main roads, regulates London's licensed taxi services and runs the Tube (London Underground Metro Rail System);
- **The London Development Agency:** the London equivalent of the Regional Development Agencies, responsible for economic promotion, urban regeneration budgets and some important sites previously owned by LDDC/English Partnerships. Major themes covered by LDA are (i) supporting areas in need of renewal, address needs for homes, jobs, business spaces and community facilities in them; (ii) improving the access to skills and jobs and attacking skills shortage; (iii) attracting investment in selected business sectors to maintain competitiveness; and, (iv) marketing and Promotion of the city;
- **The London Fire and Emergency Planning Authority:** This responds to fires and promotes fire prevention; and
- **The Metropolitan Police Authority:** responsible for maintaining an effective and efficient police service for London.

All these functional bodies are effectively under the direction of the Mayor. In each case he formally appoints the member of Boards (including those that have to be drawn from the Assembly) and sets their annual budgets which are subject to Assembly approval.

Further to it, the directly elected elements are supported by two bureaucracies: the Mayor's Office of some 30 staff (about a dozen of whom are policy advisors), and the GLA bureaucracy, comprising about 400 staff. This bureaucracy incorporates certain pre-existing bodies (before the formation of GLA), like London Ecology Unit, London Planning Advisory Committee, and the London Research Centre, thus extending the scope of GLA to include sectors like Environment, Culture and Planning. In addition to these, there are number of ad hoc bodies, such as Policy Commissions, which have been set up by the Mayor to investigate specific issues and report to him.

In 2006, after the review of strategic delivery of public services, British Government has drawn new proposals for extending the powers of GLA, as presented in BOX 7-6.

BOX 7-6: EXTENDED POWERS OF GLA

- **Housing:** including (i) the transfer of responsibilities of London Housing Board to Mayor; (ii) Preparation of a statutory Housing Strategy for London and strategic Housing Investment Plan; and
- (iii) Decision about broad distribution of affordable housing part of the Regional Housing pot in Line with the strategy.
- **Learning and Skills:** (i) Creation of a new London Skills and Employment Board chaired by Mayor. This board will be constituted with the partnership of London's key business leaders; (ii) Preparation of a new Adult Skills Strategy for London; and
- (iii) single Learning and Skills Council for London within the national structure and will be responsible for spending the skills budget according to the strategy.
- **Planning:** (i) Power to Mayor in directing changes in borough's programmes for the local development plans; (ii) Stronger say of Mayor on whether local development plans are in general conformity with GLA's London Plan; and
- (iii) Discretionary Powers with Mayor in determining planning applications of strategic importance.
- **Waste:** (i) Waste Planning Authorities need to deliver functions in 'general conformity' with the Mayor's Municipal Waste Management Strategy; (ii) New London-wide Waste and Recycling Forum
- to bring stakeholders together to deliver improved performance on waste minimization and recycling
- promote collaborative action and link waste with other London priorities around climate change
- transport and employment; (iii) establishment of a new London waste and recycling Fund administered by the above body; and
- (iv) establishment of a dedicated London Waste Infrastructure Development Programme to get new waste facilities on ground led by DEFRA and strong GLA involvement.
- Further to it stronger roles for the Mayor of GLA has been envisaged in culture
- Sports
- public health
- energy
- climate change and water sector by the Government.

It would be noted that the functions of the GLA (other than police and fire) are similar to the functions noted in section 7.2.6.

It would also be relevant to note the processes followed by the GLA in its activities. The mayor is required to prepare and periodically revise following development strategies as laid down in the Greater London Authority Act, 1999.

- the transport strategy
- the London Development Agency strategy
- the spatial development strategy
- the London Biodiversity Action Plan
- the municipal waste management strategy
- the London air quality strategy
- the London ambient noise strategy
- the culture strategy

The mayor also has powers to issue instructions and guidance to various agencies and local authorities to ensure compliance with the strategies.

The mayor is required to consult the concerned authorities and general public in formulation of such strategies. The mayor has to include in his annual report to the assembly the progress achieved in implementing the strategies. Further the Mayor is required once in every financial year to hold and attend a meeting called "State of London debate" which has to be open to all members of the public. Similarly The Mayor and the Assembly are required twice in every financial year to hold and attend a meeting called "People's Question Time" which shall be open to all members of the public.

7.2.8 Institutional restructuring at metropolitan scale.

Institutional strengthening and restructuring has to be considered in the light of the planning and development areas currently not being addressed as identified above.

In addition to MPC and MMRDA two other non-statutory institutions have come to be established viz. CAG and Empowered Committee. These have emerged as coordinating and monitoring mechanisms across various departments and government agencies with industry and citizens'

participation. This was probably the result of MMRDA (its Authority and the Executive Committee) becoming more inward looking as it accepted more executive responsibilities. In the long run it may be desirable to strengthen and restructure MPC and MMRDA to address the concerns that led to creation of CAG and Empowered Committee. A possible structure is illustrated in Figure 7-3.

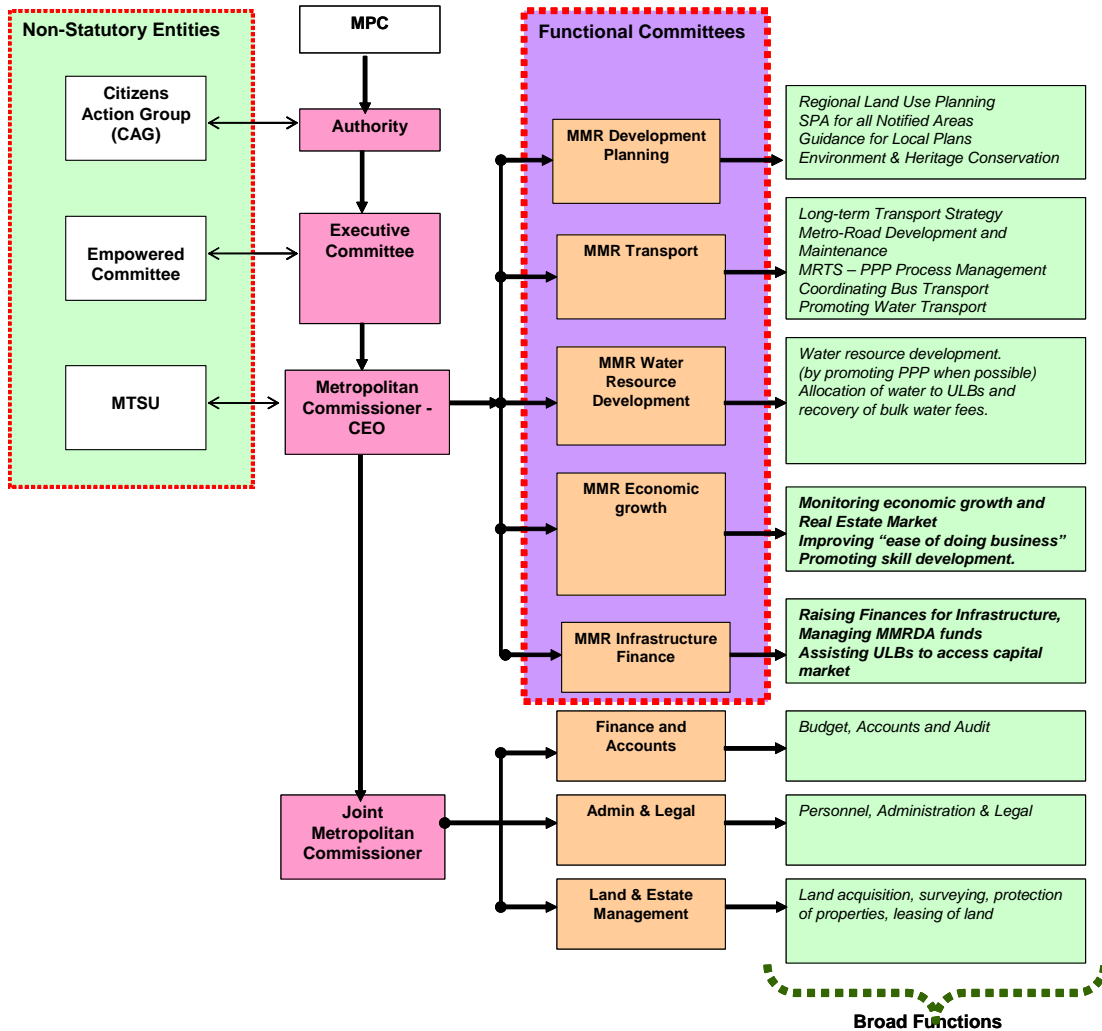


Figure 7-3: Suggested Organization Structure of MMRDA

The suggested structure proposes that

- MPC and the Authority be merged as per the Constitution and Maharashtra MPC Act 2000;
- The Executive Committee be assisted by four functional committees with members from among the MPC and also non-governmental professionals;
- The functions could also be grouped and consolidated. At present SPA function occurs in three divisions this is consolidated under one committee; and
- MMRDA at present has urban planners, transport planners and civil engineers. But it lacks economists and fund managers. These disciplines will need to be inducted with adequate numbers and seniority.
- Whether transport could be retained within the umbrella of MMRDA as is the case with Transport for London which is a part of Greater London Authority or it could be patterned as Mumbai Unified Metropolitan Transport Authority (MUMTA) could be considered after the recommendations of CTS are received in this regard.

7.2.9 Alternative approach to Institutional Restructuring

In the above approach the planning and governance is retained at the metropolitan level. The actual delivery of services required to be rendered at the metropolitan level like bulk water supply or transit (metro) services is retained at the metropolitan level with an option to deliver such services through PPP. Services that are traditionally delivered by the ULBs like distribution of water, sewerage, storm water drainage, local roads and traffic management and bus services are kept undisturbed. There is scope for considering reforms in these structures as well particularly where services are priced like water supply, bus transport or curative healthcare.

In such delivery of services there are three main components **Governance**, **Management of Delivery** and **Consumption of Services**. When delivered by ULBs the distinction between the three is obscured (Refer Table 7-4)

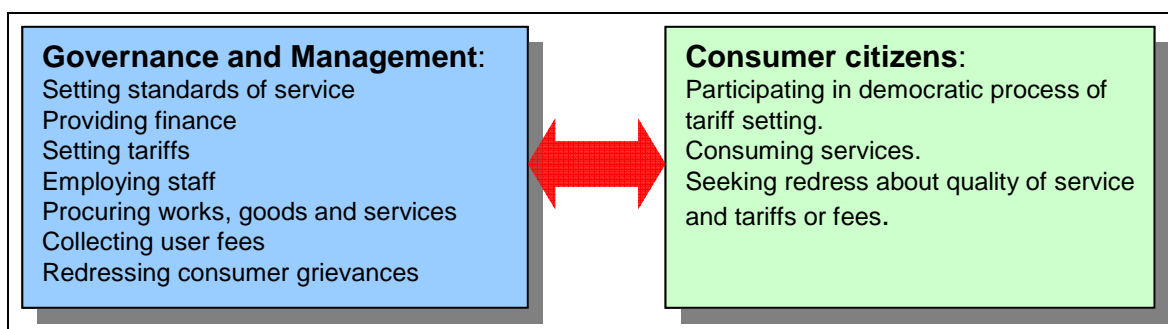


Figure 7-4: Present System of Service Delivery

Keeping the three functions at “arm’s length” has distinct advantages. The functions can be conceived as given in Fig 7.5.

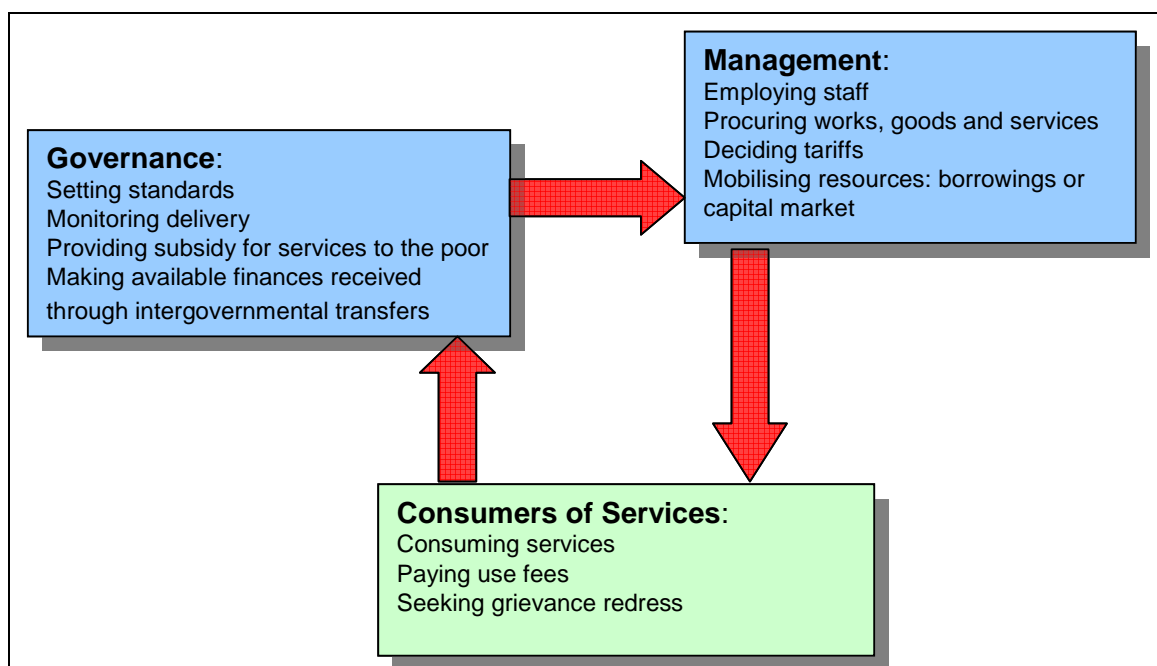


Figure 7-5: Three Components of Service Delivery

In this case the management could be more professionally organized. Within MCGM, BEST comes a step closer to this model as it has its own budget, electricity tariffs are decided by it subject to MERC surveillance, decides bus tariffs and it negotiates its own wage accord with its employees. Similar arrangements could be considered for water supply and sewerage, large hospitals etc. The next step could be full-fledged corporatisation of these services where the service provider is organized as a company with equity owned by ULB.

International experience of Johannesburg could be noted in this regard. The service providers are categorized into three categories as given in BOX 7-7. Amongst the utilities **JOHANNESBURG Water** is the City's water and sanitation utility, a self-contained business operating at "arm's length" from the City Council, with its own management and staff. The City is the sole shareholder in the new utility, and acts as the "client" to Johannesburg Water, setting requirements and monitoring performance and customer care. Johannesburg Water has entered

BOX 7-7: JOHANNESBURG CITY SERVICE PROVIDERS

Utilities

There are 10 utilities, including electricity (City Power), water and sanitation, and solid waste management, also known as Pikitup. Utilities are registered companies, run on business lines. They must be self-funding, receiving no annual grants from the city. They provide billable services direct to individual households.

Agencies

Agencies include Johannesburg Roads, City Parks and Johannesburg Development Agency. Each of these performs a service to the public at large - there are no direct charges to individual consumers. These are also structured as separate companies, but they are reliant on the council for funding.

Enterprises

The zoo, Civic Theatre, bus service, fresh produce market and property company each compete in the open market to "sell" their wares to individual consumers who choose to pay for their services. These departments have been "corporatised" into separate businesses, run by new managements on performance contracts, and tasked to cut their subsidy levels by R100-million in the next five years.

into a consortium led by a French-based company, known as Jowam, or the Johannesburg Water Management Company. Jowam has been set targets, and if these are reached it will be paid R25-million over five years.

How do consumers relate to Johannesburg Water? The city has been divided into 11 regions. In each region there is a "People's Centre", which local residents can use to pay accounts, apply for new services, make queries or lodge complaints about any council utility, including water and sanitation.

Considering such a model in case of MMR is more complex on account of presence of 20 ULBs, which was not the case in Johannesburg. The basic question that arises is whether such utilities be created at metropolitan level to serve all ULBs or separately for individual corporations and smaller council allowed to function as at present. Table 7-6 summarizes some of the relevant options.

Table 7-6: Institutional Options of Service Delivery

Service	Scope	Institutional Options	Development Delivery
Water supply	Source development Treatment & Transmission Bulk supply Distribution Billing & Collection	Metropolitan utility to cover entire scope Metropolitan utility for 1 to 3 ULB level utilities for 4 & 5 One utility for Greater Mumbai and One for Rest of MMR	Publicly financed and operated. PPP Franchised serviced providers
Sewerage	Collection Treatment and Disposal	Combined with above institutional options	Same as above.
Storm water drainage	Development Maintenance	Combined with above institutional options.	Pricing for water may cover this or Publicly financed through general revenues
Bus Transport	Intra City bus Transport Inter-City Intra Metropolitan Services Unified metropolitan service	Present pattern of 5 separate municipal bus services New pattern with seamless services across the entire metropolis	Subsidies form general revenue or power surplus Non subsidized, commercial operation with targeted subsidies provided by ULBs for students or new routes.
Transit	Metropolitan Transit Services	Metropolitan Transit Authority (could cover bus transport also)	PPP Franchise
Metropolitan Roads	Development and maintenance metropolitan access controlled road network	Above authority	Public finance PPP

If many services are to be provided under multiple PPP formats an Urban Services Regulatory Authority may be required. This could be created at the state level on the lines of MERC or TRAI. It is however not possible to recommend a particular institutional structure at this stage. The Business Plan Implementation Unit may have to carry out further studies and decide the institutional structure through a consultative process.

7.3 MANAGEMENT PRACTICES

7.3.1 CIP at ULB

Infrastructure projects have long lead times and require significant planning and preparation if they are to lead, not lag, growth. Project identification, preparation, procurement and funding all take time to put in place and accordingly all cities must prepare Capital Investment Plans (CIPs) if they wish to anticipate and meet the needs of their citizens. JNNURM guidelines

too require preparation of strategic CDP including a 5 year CIP. CDP is expected to which is expected to cover the followings:

1. In-depth analysis of the existing situation covering the demographic, economic, financial, infrastructure, physical, environmental and institutional aspects;
2. Development of a perspective and vision of the city in consultation with stakeholders and civic society;
3. Formulating a strategy for bridging the gap between where the city is and where it wishes to go, with strategies supported by programmes and projects; and
4. Preparing a Capital Investment Plan and financing strategy.

The preparation of CDPs and CIPs are a good practice regardless of whether or not a JNNURM grant is being applied for. Regional Plan or Development Plans have a 20 year time frame whereas CDPs (including CIP) have a 5-year time frame and will be updated more frequently in the light of changing conditions and needs. Some broad guidelines for the preparation of CIPs and Capital Expenditure Budgets at ULB are given in **Appendix VII.1**

In case of MMR, as noted earlier apart from the ULBs, certain parastatals attend to specific sectoral planning and development functions. Moreover there are certain functions that are not being adequately attended to at present. It would be useful to prepare a consolidated CIP for MMR incorporating the CIPs of ULBs, CIPs of parastatals for MMR and CIP of MMRDA. Such a metropolitan CIP can then form the draft Plan to be considered by the MPC and submitted to Government. The procedure for formulation of metropolitan CIP could be similar to the one described in Appendix VII.1. The planning process integrating long-term plans, 5 year strategic plans, CIPs, monitoring and evaluation that leads to mid-term appraisal and revision carried out to strategic plans and long term plans through a consultative process is illustrated in Table 7-6.

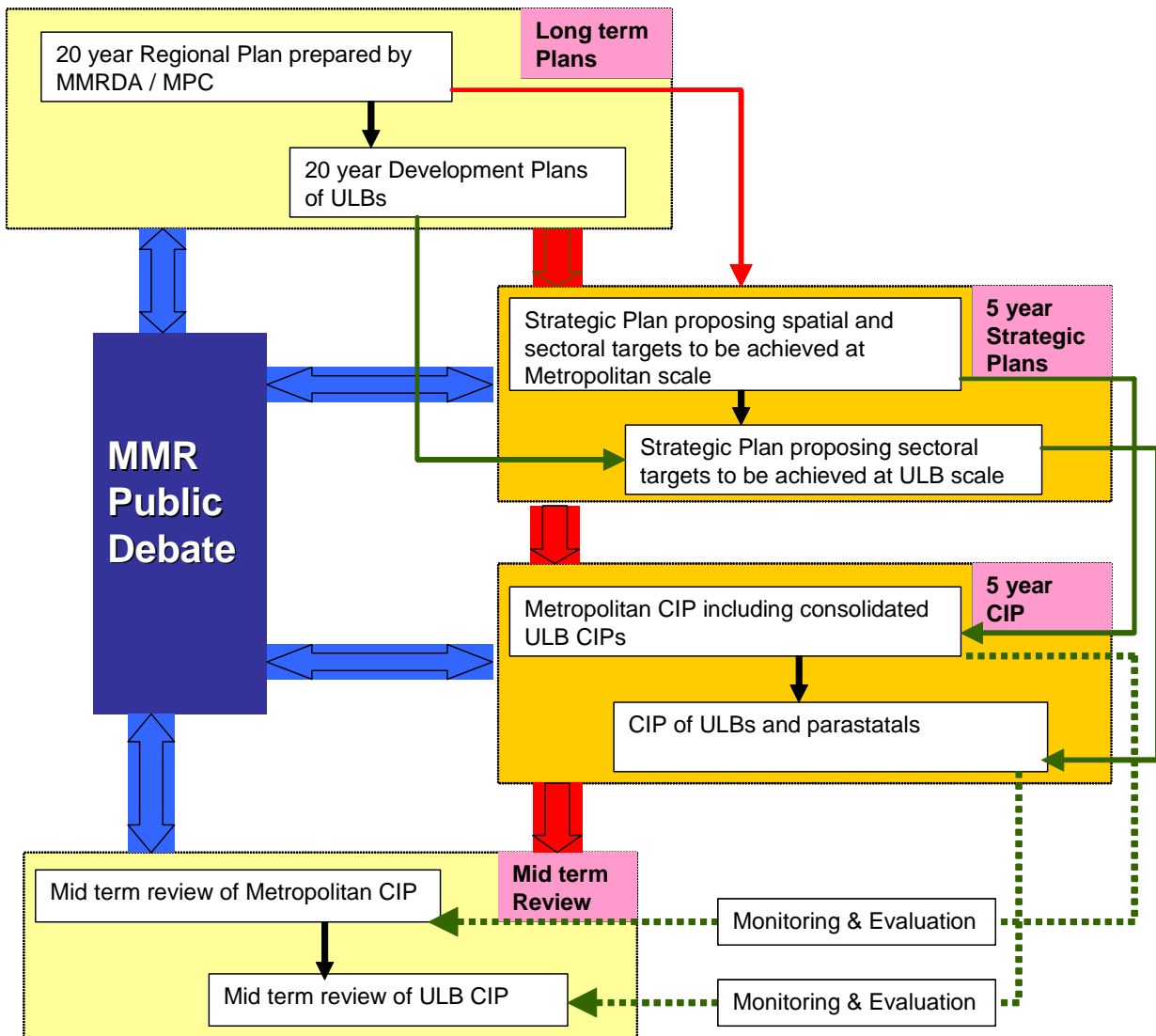


Figure 7-6: Integrated Planning Process

7.3.2 GIS database

There has been considerable improvement in GIS technology in the recent past. High resolution (less than 1m) satellite imageries are available, Total station survey and GPS has made ground checking quicker and high capacity high speed computers have virtually eliminated the constraints on data handling and analysis. Despite all these advances the use of GIS technology is extremely limited and confined to cartographic uses and not covering urban planning and management applications. It is therefore important to organizing data on variables for monitoring urban growth and managing and evaluating performance of civic services in a geographically disaggregate manner for storage, updating, retrieval and analysis using GIS technology. Satellite imageries (or for that matter Aerial Photographs) will not be directly useful for cadastral purposes as the map projection methods used in currently available maps and maps available through satellite imageries are different and cannot be reconciled. A broad outline of how GIS technology could be established for urban planning and management purposes is outlined below.

Figure 7-7 illustrates how GIS could be useful in city planning and management by using three geographic entities viz. an individual building, a link in utility network and an area unit like ward.

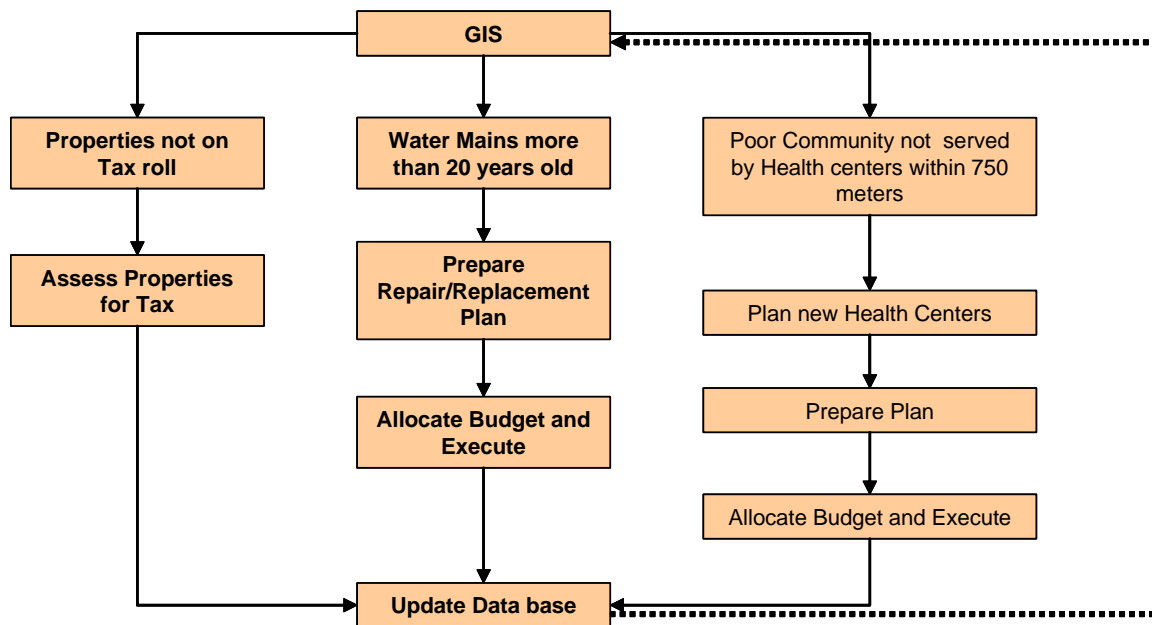


Figure 7-7: Usefulness of GIS in City Planning and Management

The process of GIS development should therefore simultaneously include the acquisition and preparation of maps, generating attribute database, procedures for data flows necessary for updating map and attribute data base, standard routines for analyzing the data and generating reports and installing necessary hardware and software and training of manpower to use the GIS in a sustained manner.

The building blocks of such a process are listed below.

- Procurement of satellite imageries and their vectorisation
- Generation of Contour Overlay
- Procuring various maps and data from municipal and government agencies to develop relevant overlays such as
 - a) _Master Plan (by whatever name called) showing proposed land use zoning, transport network and sites designated for various public purposes.
 - b) Maps showing administrative boundaries of ULB jurisdiction, administrative and electoral wards, area units used by census.
 - c) Maps of utilities like water supply, sewerage, storm water drainage, roads and street lights along with the data available
 - d) ULBs provide services like Fire Protection, Cremation and Burial Grounds, Slaughter Houses, Cattle Ponds, Primary Schools, Primary Health Centres, Parks, Gardens and Swimming Pools etc. These need to be located on the map and attribute data collected.
 - e) Locations of facilities provided by state and central governments like railways and highways, post and telegraph offices, police stations, universities, hospitals etc. also need to be located on the maps and available data collected.

- f) Existing land uses in broad categories like residential including slums, industrial, commercial and healthcare, educational, sports and sports and recreation facilities.
- g) Property tax data identifying properties with their area, use and assessed values
- Developing standard set of map layers and attribute data
 - a) Property or Assessment Roll
 - b) Network Infrastructure (like roads, drains, sewers, water pipes etc)
 - c) Other Infrastructure (like schools, playgrounds, hospitals, fire stations etc)
 - d) Area level data (population and economic census etc.)
- Installation of hardware and software
- Developing standard routines for analyzing the data and generating management reports
- Developing administrative systems to ensure timely updating of maps and attribute data.
- Training of staff

In case of MMR isolated efforts of making digital maps particularly of utilities have been made but an organized comprehensive effort at GIS that covers all the aspects mentioned above is not known to have undertaken so far. It may be useful for MMRDA to lead such an effort in a decentralised form that allows ULBs the freedom to design the attribute data and report generation but still provides data and reports necessary at the metropolitan scale.

7.4 CAPACITY BUILDING

In view of the complexity of managing metropolitan growth and the scale of investment required substantial improvement in capacity is necessary. Capacity building will be necessary both by way of infusing new disciplines and training of existing staff. Such an activity to be undertaken on a sustained basis it would be necessary to set up Human Resource Development (HRD) unit in MMRDA that not only caters to MMRDA's own needs but also of the ULBs in MMR. Capacity building at metropolitan scale at MMRDA and at individual ULBs discussed below.

7.4.1 MMRDA

The issues currently not addressed and restructuring of MMRDA desired for more comprehensively dealing with metropolitan growth are discussed above. The capacity building needs are outlined below in that context. These are identified taking account current strengths in preparing Regional Plans (including sectoral analysis and plans), preparing local plans for SPAs, use of GIS, project co-ordination and monitoring, structuring projects for private investment, project appraisal and development finance. Some of these functions have emerged by "learning by doing" without creating specialized manpower or training existing manpower in specialized skills. Following capacity building areas may therefore involve imparting specialized skills to existing staff, recruiting new staff with specialized skills, expanding the

manpower available to effectively deal with the required tasks. Detailed proposals in this regard may have to be prepared by MMRDA.

(a) Capacity to monitor economic growth and promoting LED.

At present MMRDA has no capacity to monitor economic growth and promoting Local Economic Development (LED). For monitoring economic and employment growth it may be appropriate to coordinate with the Directorate of Economics and Statistics. For developing the strategies for LED, MMRDA may have its own staff of urban economists.

(b) Capacity to manage funds and raises resources from the capital market.

MMRDA has about Rs.5000 crores divided in different funds. However it does seem to have expertise to leverage the fund to secure resources from the capital market at competitive rates to increase the rate of investment in infrastructure. The capacity could be built in MUIF or MMRDA or could be obtained from the existing financial institutions.

(c) Capacity to structure projects for private investment

MMRDA has acquired experience in structuring real estate projects for private investment that have public facility elements like parking or convention centre. MMRDA has also acquired experience in structuring MRT projects in BOT format. These experiences need to be converted in generic strength to cover other infrastructure. Such expertise could then be extended to other ULBs in MMR.

(d) Capacity to assist ULBs in project preparation and financing.

Most in ULBs in MMR are not focused on capital investment in infrastructure projects. The preparation of CIPs will help them focus projects and their financing. MMRDA in such a context assist ULBs in formulating and financing projects.

(e) Capacity to extend technical assistance to ULBs.

ULBs in MMR need technical assistance in managing urban growth. MMRDA can extend such assistance in following areas;

- Development and use of GIS in urban management
- Water supply and sewerage planning and maintenance
- Road construction and maintenance
- Urban hydrology and storm water drainage design

7.4.2 ULBs

At the individual ULB the capacity building requirements vary considerably. The corporations have better capacities as compared to smaller ULBs. Nevertheless certain generic areas are identified below;

- Using accrual based accounting system
- Preparing CDP including CIP
- Project formulation including financing
- Local land use planning and development control,
- E-governance
- Use of GIS in planning and management of growth

7.5 LEGAL REFORMS

Legal reforms necessary to implement the governance agenda are listed below.

7.5.1 Metropolitan functions

Certain metropolitan functions that are currently not being attended to have been identified in section 7.2.6. Section 12 identifies MMRDA's functions in generic terms. It would be useful to more explicitly include the following functions;

- a) Planning for economic growth
- b) Water resource development
- c) Transit and metropolitan highway network - planning and development
- d) Raising resources for metropolitan development.

In addition a provision may be made to designate metropolitan or "MMR Roads" though passing through ULBs. The responsibility of development and maintenance of such roads should then be of MMRDA.

7.5.2 Restructuring institutions

Corresponding to the functions mentioned above, suitable provisions may be made in MMRDA Act to establish functional committees in respect of following subjects

- MMR Development Planning Committee
- MMR Water Resource Planning and Development committee
- MMR Transport Planning and Development Committee
- MMR Economic Growth and Infrastructure Finance Committee

7.5.3 Management practices

For effective adoption of CDP/CIP practices following legislative changes will be necessary.

- Explicit provisions may be made in Municipal legislation to make it mandatory for the ULBs to prepare 5 yearly strategic plans and the Capital Investment Plans. The content and process of preparing such plans including the requirements of

participation may also be included. These ULB plans may then be submitted to MPC through MMRDA.

- MMRDA Act may also be amended to provide MMR strategic Plan and CIP that incorporates plans of ULBs and sub plans of state level functional agencies. Such a draft plan may then be submitted to MPC for its consideration and onward submission to Government.
- MMRDA may be empowered to issue guidance to ULBs and para stats on preparation of Strategic Plans and CIPs
- Section 9 of the MPC Act 1999 refers to the draft development plan for the metropolitan area. Schedule attached to the Act equates this plan with the Regional Plan prepared under the MR & TP Act. It would be necessary, in addition, to consider the CDP/CIP prepared at the metropolitan level as the draft development plan referred to in section 9 of the MPC Act.

7.5.4 Development Charge

At present Chapter VI A of the MR & TP Act, 1966 provides for “Levy Assessment and Recovery of Development Charge”. Section 124 B read with Second Schedule to the Act prescribes the scale of development charge for various use categories in different types of local/planning authorities. A minimum and maximum scale related to area of land and building construction is laid down. As argued in Chapter 6 the tax base needs to be changed from area to value of development. This may be brought about through appropriate amendment. Since market value will vary according to the use of property distinction in the rate of charge according to use may not be necessary.

Such an amendment would become effective on a statewide basis. However as seen in Chapter 6, the resource requirements of metropolitan infrastructure are nearly 5 times the need of municipal infrastructure. It would therefore be necessary make provisions for levy of additional development charge in MMR (or more generally in all metropolitan areas that may be declared according to the provisions of the Constitution). The local planning authorities (including Special Planning Authorities) may collect and contribute such additional development charge to MMRD Fund constituted in MMRDA (or more generally in Metropolitan Development Funds).

The basic scale of development charge may be 2.5 % of the property values and that of the metropolitan development charge may be 7.5% of the property value.

Alternatively, amendment of MMRDA Act may be resorted to give effect to metropolitan development charge. Chapter VI of MMRDA Act 1974 covers the “Powers of Taxation”. Section 25 enables the State Government to levy a cess on properties at the request of MMRDA at a rate not exceeding 5% of the rateable value of the properties. This power has not however been used so far.

A new section on similar lines may be introduced to enable the state government to levy a metropolitan development charge at a rate not

exceeding three times the development charge levied under MR&TP Act, 1966.

7.5.5 Disclosure and Participatory Process

Provision may be made in MMRDA Act to require MMRDA and MPC to hold a meeting at least once in a financial year called '**MMR Public Debate**'. In this meeting MMRDA may present the progress of implementing CDP/CIP in the previous year and the targets of the current year.

MMRDA should also be required to prepare a report on implementation of CDP/CIP and discuss the results of monitoring and present them to Authority/MPC and also upload it to the website.

7.6 ACTION PLAN

Figure 7-8 presents the action plan with regard to Governance.

ACTIONS/TIME	Q3 -07	Q4 -07	Q1 -08	Q2 -08	Q3 -08	Q4 -08	Q1 -09	Q2 -09	Q3 -09	Q4 -09	Q1 -10	Q2 -10	Q3-10	Q4-10
Consideration, approval and adoption of Plan														
Establishing and staffing Plan implementation unit														
Governance														
Legal and Institutional Reforms														
MMRDA Act					Draft amendments		Obtain legislative sanction							
MR & TP Act					Draft amendments		Obtain legislative sanction							
Municipal Legislation					Draft amendments		Obtain legislative sanction							
MPC Act					Draft amendments		Obtain legislative sanction							
Rent Control Act					Draft amendments		Obtain legislative sanction							
Restructuring MMRDA					Proposals for Composition of Committees			Appoint						
Strengthening MMRDA					Proposals for creating posts		Obtain Approval	Appoint						
Economic growth														
Establish Economic Development Unit					Obtain Approval	Appoint								
Monitoring Economic Growth						Dialogue with Dir. Eco Stat	Design system			Begin Reporting >>>				
Improve ease of doing business					Carry out detailed study		Propose procedural reforms			Accept and implement >>>>				
Improve skills		MTSU/MEDC facilitate ind. Edu dialogue		Syllabi	Begin courses									
Policy for small manufacturing				Formulate Draft Policy	Sanction/Consent			Projects/Programs Implementation >>>>>						
										MMRDA - Review Ind. Edu Syllabi		New Courses		
Strategic Plan CIP (2009-14)														
ULB CDP/ CIP					Plan formulation					Plan implementation 2009-14 >>>>>>				
Para statal CDP /CIP				Plan formulation	Plan implementation 2009-14 >>>>>>									
MMR Strategic Plan/CIP				Plan formulation	MPC / GOM Approval					Plan implementation 2009-14 >>>>>>				
GIS Development				Design	Map generation			Attribute data, updating routines			Management Reports			
Monitoring & Evaluation														
Monitoring & Evaluation					Design data systems	Develop indicators	Begin reporting		First Mid-Term Review					

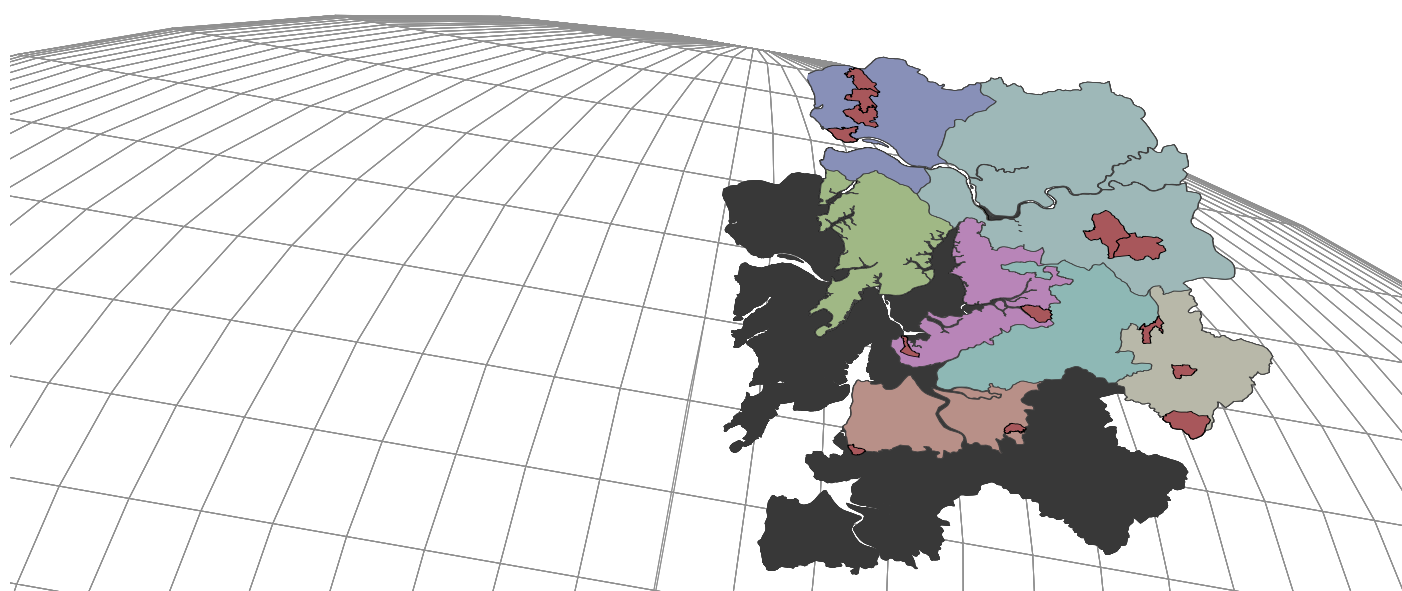
>>>>> a continuing activity or implementation that may go beyond the period indicated.

Figure 7-8:: Action Plan of Institutional and Governance Aspects



Chapter Eight

Monitoring and Evaluation



Monitoring and Evaluation



8.1 INTRODUCTION

The Regional Plans and Development Plans are characterized by the absence of monitoring and evaluation system. Consequently it is difficult to evaluate the extent to which objectives of such plans are achieved. Since the practice of preparing Capital Investment Plans is non-existent, monitoring of resource inputs and outputs is also not available. At project level like in case of MUTP, monitoring and evaluation system is designed as part of project preparation. A fifteen-year business plan unlike a project includes investments in infrastructure, policy changes, institutional and legal reforms etc. The expected outcomes are a combined result of all these measures within the globalizing macroeconomic framework. This makes it imperative that a formal monitoring and evaluation system is put in place with adequate resources. This alone would make it possible to track the progress in achieving the goal and fine-tuning the policies, institutions and projects on a sustained basis.

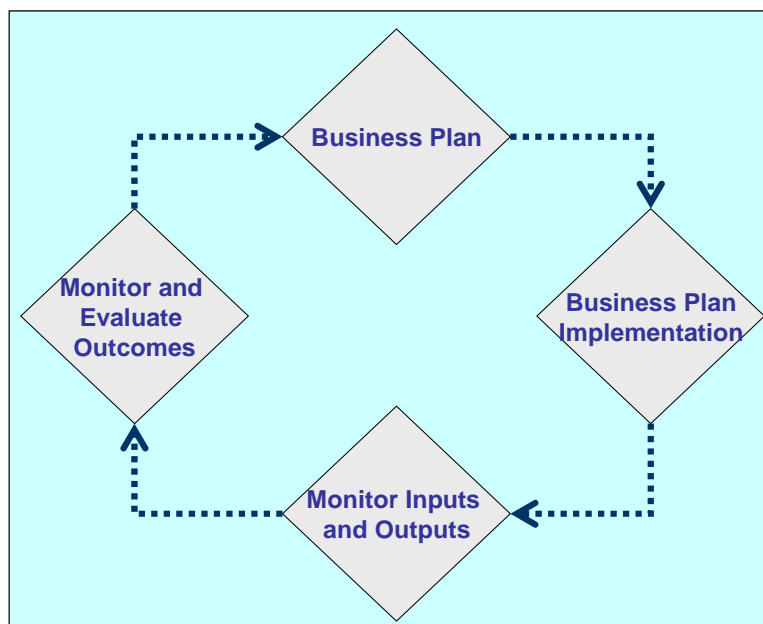


Figure 8-1: Cyclic Nature of Monitoring and Evaluation

8.2 KEY INDICATORS

Key indicators have to be identified for monitoring the achievement of following objectives of the business plan.

- Economic growth and Competitiveness
- Livability and infrastructure provision
- Bankability and resource mobilization
- Governance

For each of these objectives, key indicators, data sources for computing the indicators and target value of indicator wherever possible are presented in succeeding paragraphs.

8.3 ECONOMY AND COMPETITIVENESS

Key Indicators	Sources of Data	Target value
MMR GDP Composition and Growth rate	District wise GDP available as part of National Accounts. MMR specific estimates necessary.	Minimum 12 %
GDP Growth rate of Finance, IT, Media etc	Improved National Accounts to provide GDP estimates for IT, ITES, Media etc.	Growth rate of these sectors will have to be more than 15%
Proportion of Formal Employment	Lack of clear definition, long distance commutation across administrative boundaries and infrequent surveys makes tracking these indicators difficult.	Proportion should reduce over years based on consistent definition
Growth rate of formal employment		Growth rate should exceed growth of work force.
Office rent as per cent of office rent in London, Tokyo, New York	International real estate agencies like CB Richard Ellis	Qualitative interpretation would indicate competitiveness
Office rents as multiple of office rents in Bangalore, Hyderabad	International real estate agencies like CB Richard Ellis	
Quality of Living Rank	International surveys like "Quality of Living" by MERCER Human Resource Consulting	Mumbai should be amongst top 3 of Asian Cities
Ease of Doing Business Rank amongst Indian Cities	Doing Business Surveys by the World Bank	The rank based on cost and time involved in various business procedures indicates direction of reforms.

8.4 REAL ESTATE AND HOUSING

In the present circumstances land, real estate and housing affects both competitiveness and livability of MMR.

Key Indicators	Sources of Data	Target value
Office space per employee	Data does not exist, needs to be developed from building permit records	10 sq.m./employee
Growth rate of office space/ Growth rate of office employee	Data does not exist source needs to be developed	Should be more than 1 on a sustained basis.
No of houses constructed every year location, size price attributes	Data system does not exist. Should be developed based on building permit procedures	Should be more than rate of household formation
Housing space per person or Rooms wise distribution of households	Decennial Census covers room wise distribution, better data on space consumption needs to be developed.	Present per capita space of 4 m ² must increase to over 15m ² .
Median House price / Median Income	Data not available. Needs to be developed. Periodic surveys necessary.	Should not exceed 5.
Number and proportion of slum dwellers	Census covers once in 10 years. Periodic surveys necessary	Proportion must consistently reduce .

8.5 LIVABILITY AND INFRASTRUCTURE PROVISION

The performance of infrastructure provision could be judged by monitoring following indicators.

Key Indicators	Sources of Data	Target value
<u>Water supply</u>		
Availability	Improved measurement of consumption and UFW. Environmental Status Report (ESR) should provide data	240 lpcd in Greater Mumbai and 200 lpcd elsewhere is the target
Supply hours and duration	Intermittent supply is the norm. Duration and hours of supply should be monitored. ESR should be the source of data.	24/7 supply should be the target
<u>Sewerage</u>		
Coverage	ESR should report the facts.	Target should be 100%.
Disposal	Monitoring of coastal and river water should be correlated with effluent quality	Natural water quality should comply the CPCB Norms.
Slum Sanitation	Number and standard of maintenance of public toilets.	1 seat per 4 households could be the target
<u>Solid Waste Management</u>		
Collection	Surveys	100% collection with separation of bio-degradable waste every day should be the target
Disposal	Survey data to be reported in ESR.	All disposal to be environmentally compliant.
<u>Storm water drainage</u>	Days of disturbance to traffic – rail and road.	'None' should be the target
	Areas (number and extent) remaining flooded for more than 4 hours. GIS based data systems need to be developed.	'None' should be the target.
<u>Transport - Public</u>		
Percentage of public transport in modal split	Periodic surveys	Should be retained at over 70%
Passenger density - trains	Periodic surveys	7 passengers per sq.m. should be the target
Average bus speed	Periodic surveys	20 km./ hour
<u>Transport – Private</u>		
Average speed	Periodic surveys	30 km/hour
<u>Power supply</u>		
Hours of supply	Data from distribution agencies	24/7 without any load shedding should be the target
Stable voltage	Data from distribution agencies	No fluctuation in voltage

8.6 BANKABILITY AND RESOURCE MOBILISATION

For monitoring bankability and resource mobilization following indicators may be monitored.

Key Indicators	Sources of Data	Target value
Municipal finance		
<u>Operating Ratio</u>		
Revenue expenditure/revenue Income	Data form accrual based accounting system	Operating ratio < 0.9
Collection efficiency Increase user fees to cover O&M Costs and Debt service		More than 85% of current dues
Build Debt servicing capacity to meet		DSCR > 1.5

Key Indicators	Sources of Data	Target value
60 % of capital investment needs		
<u>Resource mobilization</u>		
Buoyancy of Revenue		Municipal Account>1
Development charge revenue	Building Permission in proportion to new construction	

8.7 GOVERNANCE

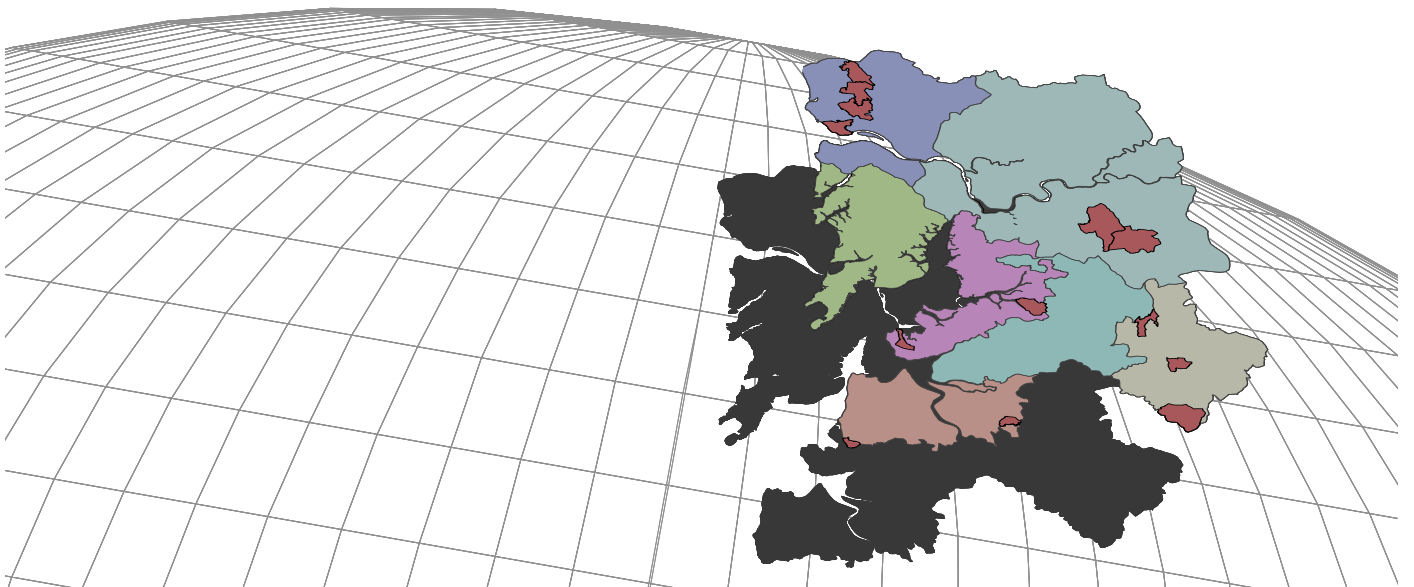
Most of the monitoring mentioned above would need governance support and the results of the monitoring could also be used only when governance in terms of institutional structure, legal framework and management practices are in place as outlined below.

Key Indicators	Sources of Data	Target value
<u>Institutional structure</u>		
governance institutions		In compliance with Constitutional Provisions
MMRDA to establish unit for monitoring and planning economic growth	MMRDA annual report	Within six months of adoption of Business Plan
Restructured MMRDA and strengthened ULBs	MMRDA Annual Report	Within nine months of adoption of Business Plan
<u>Legal Framework and Management Practices</u>		
Consolidate CDP/CIP incorporating plans of ULBs, Parastatals and MMRDA	MMRDA	Proposals to be prepared within six months of adoption of Business Plan
ULBs to adopt accrual based accounting		Corporations within one year, councils within 18 months
Develop GIS with map and attribute data as a city management tool in each ULB		Within one year by corporations and 18 months by councils.
ULBs to adopt E-Governance practices for improved citizen interface	Citizens services brought under E-Governance	Within one year

8.8 EVALUATION AND BUSINESS PLAN REVISION

It would be seen from the above that for monitoring many aspects of the metropolitan growth existing data systems have to be revised, new systems have to be devised, results from these systems have to be interpreted with reference to the vision and then revision of business plan proposals have to be worked out wherever necessary. Adequate manpower and resources have to be therefore devoted to this function.

Appendices



Appendix I.1 Stakeholder Consultations

Consultative process has been an integral part of preparation of business plan for MMR. The purpose of the consultation was to ascertain the views, aspirations of all the relevant institutions, urban local bodies and NGOs and to take their cognisance in the process of preparation of business plan . The process involved three stages: meetings with individual ULBs, 1st consultative workshop and 2nd consultative workshop.

STAGE 1: INDIVIDUAL MEETINGS

At the start of Business Plan study, a questionnaire was designed to seek information from ULBs and other para statals.

In subsequent months, the Business Plan Team visited the ULBs and held meetings with Commissioner/Chief Officer, City Engineer/Executive Engineer and representative of Accounts departments on following subjects:

- Physical Infrastructure:
 - Water Supply: Current Demand and Installed Capacity, present sources, committed/proposed projects, existing tariffs and operating income & expenditure of last five years
 - Sewerage: Current collection and disposal system, envisage demand, ongoing/committed projects and operating expenditure.
 - Storm Water Drainage: existing network by type and coverage, ongoing/committed projects and operating expenditure.
 - Solid Waste Management: collection coverage and composition of waste, disposal sites and their capacity, proposed/committed projects, financing mechanism for new projects.
 - Roads and Traffic Management: Current Expenditure on maintenance and management, proposed/committed projects
- Development Plan, Housing and Slums: Population growth, level of development plan enforcement and deviations if any, average annual expenditure on plan implementation, sources of funds, housing supply, proportion of population living in slums and vision towards improving the liveability of their area.
- Economic Growth: Major economic activities of the area, any new economic activities which have come up in the area in recent past, propose/committed growth centers like SEZ, IT parks, Industrial belts etc.
- Resource Mobilization and Allocation: Sources of funds and their break-up, nature of user charges/levies etc, accounting system type, use of computers if any in accounting, production of monitoring reports etc.

- Legal and Institutional Aspects: Current staff/divisions for different sectors, extent of citizen participation, and private sector participation in project execution/maintenance if any.

Attachment - A provides list of the meeting held with officials of the urban local bodies.

Outcome:

In case of some of the above listed items, no formal quantitative data was available but in some cases opinion of senior staff was available. During the discussions, various issues related to the city development, current infrastructure status, back-logs, future needs and environmental status were being brought out by the individual representatives. Besides, issues related to finance and resource mobilization for key infrastructure projects was also pointed by the officials.

Further to the deliberations, individual meetings with the officials of infrastructure sectors and sector-specialists of Business Plan team were organized covering major ULBs to generate focused discussion.

Individual meetings and deliberations provided ground situation of key sectors and problems faced by ULBs in meeting the demand. The feedback from these individual meetings was suitably incorporated in the consultative workshop framework. This also provided an opportunity to share ULB's concerns with other line agencies and organizations engaged in MMR at a bigger forum of consultative workshop.

STAGE 2: FIRST CONSULTATIVE WORKSHOP

Objective:

To put forward the identified sector-specific issues among various stakeholders and generate possible strategies to attain Vision of MMR

Proceedings:

Second Stage consultation process was in the form of a one day workshop. This was held on the 27th December 2006, at the AILSG, Andheri. A list of participants is enclosed in Attachment-B. The study team in consultation with MMRDA identified six discussion themes for deliberations during the workshop. The identified themes are:

Economic growth and its spatial structure;
Land, real estate and housing;
Managing infrastructure and environment;
Institutional and legal aspects;
Finances and resource mobilization; and
Delivering the vision – branding MMR

To ensure effective participation and to generate a focused discussion on each of the themes, a background note providing an overview of each of the six themes and the critical issues for discussion was prepared and circulated in advance to the participants. Attachment C provides the Workshop note.

Workshop was broadly divided into three sessions. Session one began with the introduction of workshop and context of the present study by key speakers. This session began with brief introductions by the Chief Guest, Joint Metropolitan Commissioner, MMRDA and Project

Director, MTSU. Both the speakers highlighted the urgent need of addressing the economic and urban development issues of MMR. Session two was dedicated to the presentation by consultants on the study and identification of broad areas of discussions. Discussions among the smaller groups on six themes formed the session three followed by a plenary session focusing on the summary of group discussions. Workshop ended with the vote of Thanks by the Chief, planning Division, MMRDA.

Outcome:

The workshop proceedings followed the pattern of sector-specific discussion among stakeholders. Following are the significant points highlighted by each sector group.



Economic Development:

Economic Growth Strategy:

- Setting up of a dedicated institution to facilitate economic development of the MMR
- Economic policy to focus on attracting investment rather than on directing investment through incentives
- Identify, allocate and facilitate development of special activity zones in the region in order to attract investments from private sector including FDI. These may include Education Enclaves, Research & Development Enclaves, etc.
- Taking advantage of major ports like JNPT, develop enclaves for facilitating port based industrial development particularly for stock and sale of internationally traded goods and for re-export to other nations that will enhance the competitiveness and trade potential of the region.
- Encourage revitalising and retaining industries through abolition of Octroi and relaxation of stamp duties for registration of land and while partnership is changed. ULBs to consider relaxing tax-holidays and relaxing tax structure on the municipal taxation to industries.
- Although license raj is over, inspectors raj is hampering the productivity of industries, which needs to be revisited.
- In order to enhance the availability of skilled labour, a specialised institution is recommended for offering training to local communities in the region.
- MMRDA should focus on developing growth centres that will attract investment, create employment and enhance the competitiveness of the region for which CIDCOs technical knowledge and success can be utilized
- Good governance and supportive infrastructure are paramount for achieving desire growth and for attracting investment and these needs to be taken on urgent basis in order to prevent flight of capital and manpower to other cities/ states

Spatial Growth Strategy:

- Regionally significant locations that have critical connectivity already available and potential to become “hot-spots” in future needs to be identified and reserved for use at a later date. For example, South of Dronagiri near JN port that has huge potential for developing warehousing-hub for the region.
- MMR industrial policy need to be revisited in relation to environmental problems caused due to urban sprawl that is encroaching the already established industries (like chemical industries)
- Spatial planning to facilitate the economic growth strategy, like developing specialized enclaves and growth poles of the region.

Land, Real Estate and Housing

Land Supply:

- Increasing supply by extending infrastructure
- Using Public Lands – Port Trust, Salt Pan Lands, Railway Lands etc
- Constrained laws- and need to look at changing/abolishing ULCRA & Rent Control

Role of Public Sector

- Infrastructure provision

- Zoning
- Transfer of tenure particularly to slums
- Finance
- Simplification of regulatory regime
- Provider of Low Income Housing

Green Field Vs Brown Field Development

- Green field Development in MMR needs to be promoted by expansion of infrastructure
- Private sector town ship development with internal infrastructure being developed by private sector (Trunk Infrastructure provided by public)
- Land owners participation as equity holders
- Infrastructure cost to be recovered through development charges/ Impact fees
- Planned development on fringe of Urban centers
- In Mumbai and built up areas of other towns need planned redevelopment
- Urban renewal through land assembly, provision of improved infrastructure – physical and social with increased FSI
- Separate policies need to be evolved for different types of slums.

FSI Regime

- FSI must respond to accessibility patterns and need not be uniform
- New transport corridors must be undertaken with corresponding changes in land use and FSI
- FSI should not create scarcity of Development Rights thereby distorting markets
- FSI as a function of key infrastructure services such as Roads, Water supply, sewerage and power

Managing Infrastructure and Environment

Water Supply

- For optimum utilization and allocation of these sources – need of a dedicated cell with legal status for planning and developing strategy for implementation of source development in MMRDA. This would avoid duplication of efforts by individual agencies.
- Various options were discussed towards creation of a regional infrastructure agency. The need was expressed for developing a region-centric agency. In the creation of these, the existing legal provisions, for eg, the Maharashtra Water Act entrusts the ownership of water with the water resources department. There could be a board which could function at a regional level, with the representations from the various ULBs. The role of the agency could be in planning and allocation of water resources.
- Models based on the Shahad- Temghar (STEM) Water Authority , Thane, where the board comprises elected representatives, MJP etc could be emulated.
- Rate of water supply cannot be uniform for MMR. Adoption of different per capita standards across the region. There could be probably a graded system, which can be used for establishing benchmarks.
- Water supply for 24x7 supplies is welcome to avoid wastage of resources. The participants felt that this system could be successful only after a 100% metering of the connections. Installation of water meters to control consumption and also telescopic water tariff charging was felt necessary.



Sewerage and Sanitation

- To achieve 100% coverage of under ground sewerage for all the urban local bodies in MMR;
- Technological improvements to be assessed in the treatment of sewage. Presently no effort to reuse water, disposal of sewage into creeks is a major concern.
- Several ULBs within MMR, with the exception of Mumbai dispose into the Thane creek. The participants mentioned that hardly 40% of the samples are compliant to the discharge standards. There are cases within MMR, wherein even after 3.7km marine outfalls, the compliance standards are not achieved, especially at high tides.
- Treatment of sewerage to improve the assimilation capacity of receiving waters;
- Options for Alternate technologies and also adoption of septic tanks/small bore systems in case of small ULBS.

Storm Water Drainage

- It was agreed that storm water drainage has been, till date, accorded the least priority.

- It was mentioned that CIDCO, in areas where it has been the SPA, takes cognizance of storm water drainage, based on standards from Nathu Committee recommendations. This, was attributed as the reason for non-flooding during the 2005 floods.
- Need to develop master plan for storm water drainage for entire MMR area and also preparation of Contour maps, establishing reduced levels of water courses;
- Design criteria – return period and rainfall intensities will vary – depending on severity of problems, topography and location
- DC rules must include the prescription of development levels and plinth levels in individual areas

Solid Waste Management

- As Land availability for disposal is an issue, wherever possible, common disposal sites – catering to number of ULBs (especially smaller ones) to be developed
- Segregation of wastes and 100% collection must be required to achieved immediately.
- DPs do not identify definite land parcels for SW Disposal and identification of disposal sites by the respective urban local bodies through DP's is a necessity.
- To recycle the waste, practice of segregation of wastes – at the source. Need for active community participation initiatives for the same are required.
- Alternative eco-friendly technologies for disposal exist but feasible and appropriate technologies are to be identified.

Environmental management

- MMR needs a different scale for environmental clearances. The environmental clearance requirements due to the presence of the national park with the city etc, act as a deterrent delaying the approval and implementation of projects.
- Scaling up of efforts towards continuous monitoring of Ambient air quality in the region.
- Sharing of information on environmental data, capacity building and thus a partnership approach with the involvement of stakeholders – on environmental aspects – (can be on other aspects on infrastructure management too) is required.

Capacity Building for Infrastructure

- Need for restructuring of the local bodies – staffing and specialization to meet the new emerging functions
- Capacity building of agencies at various levels

Health and Education

- Health to continue to be the responsibility of ULBs
- In MMR, education need not be the sole responsibility of local bodies except for provision to the urban poor

Legal and Institutional Aspects & Finances and Resource Mobilization

Legal and Institutional

- Should Metropolitan planning Committee (MPC) play a key role in the Region, if so what are its roles and responsibilities while implementation?
- Role of MMRDA/CIDCO, the two spatial planning agencies in the region.
- Under Constitution ULB's are empowered to do planning implementation and coordination with in their jurisdictions. But as they are not having the capacity to perform their duties it is opined that out sourcing to the consultants is one of the options.
- For implementation of Regional level infrastructure services like, water supply, common sewerage treatment plants, common disposals land fill sites, it is debated that an Institution, which can perform as a collective Local Body among the ULBs is needed. Further it is debated that organizational structure of the Regional Planning Body should be on the lines of Corporate set up.
- Accountability and transparency are the two important aspects of urban local body governance which should be given attention for better performance.



End of the Consultative Workshop with Plenary Session

Finances

- At present ULBs depend on state devolution, and they should be given powers to raise

their resources.

- Ways to raise the finances of ULBs through various alternative sources
- Octoroi is one of the sources of revenue to the ULBs its collection efficiency can be improved by privatization of collection.
- Other ways of improving revenue is revision of User charges, improving the collection efficiency,
- Implementation of State Finance Commission recommendation, raising Municipal Bond, also other ways of raising the municipal resources
- It is agreed among participants that Amendments to Rent Control Act will also improve tax collection.

Delivering the vision – branding MMR

Make Mumbaikar Comfortable: all the participants highlighted the infrastructure and housing issues of MMR and reached a consensus that first priority in any vision shall be making the existing conditions more livable for citizens by improvements in transportation, housing and physical environment.

Concentrate on Existing Strengths of the City also to achieve world-class facilities: various existing features of the city highlighted by participants are:

- Vibrant, agile society of Mumbai
- Presence of Water- which can be harnessed for creating public environment.
- Presence of National Park- Inside a metropolis
- Heritage Precincts
- Film Industry
- Bandra-Kurla Complex- having the potential of attracting business houses
- Higher Education Opportunities
- Super-Specialty Hospitals- for citizens and medical tourism
- New Airport Proposal at Navi Mumbai
- JNPT- and its increasing share of cargo in India
- Proposed Park at New Mumbai
- Old Industrial Areas undergoing recycling and turning themselves into Knowledge based industries, for e.g. Thane-Belapur Chemical Factories
- Proposed SEZ at Ulwe.

All the participants agreed that Mumbai already has many features which can be harnessed to achieve a distinct Image of the City. They also stressed that instead of focusing on, mere icons of development, there is a need to develop characteristics/qualities of the city life which majority of citizens can relate with.

Constraints on Vision: Two major constraints pointed out were, i) CRZ regulations affecting any kind of physical environment improvements along the coast; and, ii) insensitivity of the top order of government towards improvements

Need for spatial understanding for delivering Vision: Participants agreed that MMR shall be seen in three broad categories for the purpose of physical improvements. One, High-End Areas, like portions of Island City which already have unique features, two, Low-End Areas, like suburbs which are mainly housing areas, and three, New Areas like Kopta, Karjat, parts of Navi Mumbai etc where new set of facilities can be provided in MMR. Understanding of such physical characteristics shall be taken into consideration for specific policy initiatives for addressing the regional diversity.

Public Participation: Group highlighted the need of sensitizing people of MMR towards their city. Few tools identified are, i) Essay Competition on the vision of citizens towards the future of the city, ii) Photograph Competition on various aspects of urban life of Mumbai, iii) Logo Competition and others.

Implementation: Participants agreed that a strong leadership is required for achieving vision and recommended a CEO for the city. They also emphasized stronger participation of Ward/Town Committees in generating solutions for specific area level issues.

STAGE 3: SECOND CONSULTATIVE WORKSHOP

Objective:

To deliberate on the goals and strategies designated to attain the VISION of MMR and finalize recommendations.

Proceedings:

The second one-day consultative workshop was held on the 5th March 2007 at the AILSG, Andheri. The consultative work shop was planned for one day. The agenda for discussion and the themes for discussion were finalized in consultation with the client.

- Economic Growth
- Land real estate housing
- Resource Mobilization
- Infrastructure and Environment of the region
- Good Governance

To ensure effective participation and also to generate a focused discussion on the listed agenda, a background note providing an overview of each of the agenda and critical issues therein for discussion was prepared and circulated well in advance to the participants(Refer Attachment D for the workshop note) A list of participants is provided as Attachment-E.

The workshop was broadly divided into three sessions. Session one was concerned with the introduction of workshop by key speakers- Chief Guest, Joint Metropolitan Commissioner, followed by the opening remarks by Secretary Special Projects, Government of Maharashtra. Session two was dedicated to the presentation by consultants on the study and identification of broad areas of discussions. And the session three is meant for discussions by a plenary session involving the stake holders, MMRDA and the client, focusing on the proposed recommendations for each of the agenda.



Proceedings of the Second Consultative Workshop

Outcome:

After the presentation by the consultants, a plenary session was organized to portray the opinion of the stake holders. The session was chaired by Secretary, Special Projects, GoM. From the deliberations following significant strategies came into focus:

- Incorporate measures to improve the existing institutional set-up, like the e-governance to avoid delays in project designing, planning and implementation and also for better delivery of the services to the citizens of MMR.
- City Engineers from each of the corporation and council of MMR reemphasized the existing backlogs in the civic infrastructure and the improvements needed. All the city engineers unanimously raised the issue of need of improved transportation facility and augmentation of inter and intra transportation infrastructure facilities within the ULB area and its linkages with other ULBs in the region.
- The chief officers/ Chief account officers of the corporations and councils expressed their concern on inadequacy of funds/resources for implementation the city/council infrastructure projects.
- The Chair and the consultants finally opined that the additional resources can be raised through green field development and also by levying extra tax on building and land development.
- Skyrocketing of real estate prices, proliferation of slums, shortage of housing were discussed and it was agreed that housing supply should be increased and prices should be controlled with government interventions through policy measures, extra FSI, developmental rights and green field developments.
- The plenary also debated on environment of the region, preservation of coastal lands, saltpan lands and raising pollution levels in the water, soil and air.
- Participants also proposed inclusion of many road links in the proposed plan.

Attachment-A: List of individual Stakeholders Consulted by the Team

S. No	Date of visit	Name of the Corporation/Council	Persons met
1	6/10/2006	Thane Municipal Corporation	City Engineer, Executive Engineer
2	16/10/2006	Kalyan-Dombivli Municipal Corporation	Commissioner, Deputy Commissioner, City Engineer, Executive Engineer, Chief Accounts Officer
3	1/11/2006	Navi Mumbai Municipal Corporation	City Engineer, Executive Engineer, Chief Accounts Officer
4	16/10/2006	Bhiwandi-Nizampur Municipal Corporation	City Engineer, Executive Engineer
5	14/11/06	Navghar-Manikpur Municipal Council	Administrative Officer, Accounts Officer
6	14/11/06	Nallasopara Municipal Council	Junior Engineer, Accounts Officer
7	15/11/06	Ulhasnagar Municipal Corporation	City Engineer, Accounts Officer
8	15/11/06	Kalyan-Dombivli Municipal Corporation	Executive Engineer, Executive Engineer
9	15/11/06	Bhiwandi-Nizampur Municipal Corporation	City Engineer, Junior Engineer, Accounts Officer
10	16/11/06	Uran Municipal Council	Construction Engineer, Accounts Officer
11	16/11/06	Navi Mumbai Municipal Corporation	Town Planning Officer
12	23/11/06	Navi Mumbai Municipal Corporation	City Engineer, Executive Engineer
13	23/11/06	Panvel Municipal Council	Executive Engineer
14	27/11/06	Thane Municipal Council	Executive Engineer, Executive Engineer, Deputy City Engineer.
15	27/11/06	Bhiwandi-Nizampur Municipal Corporation	City Engineer, Junior Engineer, Sub Engineer, Accounts Officer
16	29/11/06	Kalyan-Dombivli Municipal Corporation	Deputy Commissioner, City Engineer, Ex Engineer(storm water), Ex Engineer(sewerage), Ex Engineer(water supply)
17	29/11/06	Ulhasnagar Municipal Corporation	City Engineer, Engineer (water supply & Sewerage)
18	04/12/06	Badlapur Municipal Council, Maharashtra Jeevan Pradhikaran (MJP)	President, Chief Officer, Jr.Engineer, MJP Officer.
19	04/12/06	Ambernath Municipal Council	Chief Officer, Deputy Engineer(water supply & sewerage), Jr. Engineers
20	14/12/06	Mira-Bhayander Municipal Corporation	Deputy Engineer

Attachment-B: List of Participating Agencies in First Consultative Workshop

Sr No	Department / Agency / Organization
Group: Economic and Spatial Growth	
1.	MMRDA
2.	Mira-Bhayander Municipal Corporation
3.	Virar Municipal Council
4.	Navghar Manikpur Municipal Council
5.	Ambernath Municipal Council
6.	Alibag Municipal Council
7.	Mumbai Transformation Project, AILSG
8.	Maharashtra Economic Development Council
9.	CIDCO
10.	TSMG
11.	Bombay Chamber of Commerce & Industry
12.	Nallasopara Municipal Council
13.	Kalyan Ambernath Manufacturers Association
Group: Land and Real Estate	
1.	CIDCO
2.	Maharashtra Chamber of Housing Industries
3.	UDRI
4.	SRS
5.	TISS
6.	Institute of Town Planner
7.	MTSU, AILSG
Group: Managing Infrastructure and Environment	
1.	USAID Fire Project
2.	Thane Municipal Corporation
3.	MCGM
4.	MPCB
5.	Ambernath Municipal Council
6.	Kulgaon-Badlapur Municipal Council
7.	Karjat Municipal Council
8.	Matheran Municipal Council
9.	Alibag Municipal Council
10.	Mira-Bhayander Municipal Council
11.	Bhiwandi-Nizampur Municipal Corporation
12.	Kalyan-Dombivli Municipal Corporation
13.	CIDCO
Group: Legal , Institutional and Financial Aspects	
1	CIDCO
2	Mira-Bhayander Municipal Corporation
4	Ulhasnagar Municipal Corporation
5	Kalyan-Dombivli Municipal Corporation
6	Bhiwandi-Nizampur Municipal Corporation
7	Loksatta Movement
8	Karjat Municipal Council
9	IIPA
10	MMRDA
Group: Delivering the Vision- Branding MMR	
1	Mumbai Port Trust
2	Bombay First
3	CIDCO
4	University of Mumbai
5	MMRDA

Attachment-C: First Workshop Background Note

Mumbai that has been an engine of economic growth appeared to slow down around 2001. Its GDP has however been growing at about 12 % p.a. consistently over last three years. A deliberate plan is necessary to ensure that Mumbai and MMR retain their premium position and continue to significantly contribute to the State and National economy.

The long-term vision for MMR is

**“to transform MMR into
a world class metropolis
with a vibrant economy &
globally comparable quality of life
for all its citizens”**

Regional planning and development of MMR is an effort in this direction. The GoM has further directed that a business plan for MMR be prepared to identify multi-sectoral infrastructure investment needs of the region for the next 15 years. The business plan is being prepared by MMRDA in coordination with MTSU and with LEA International Ltd as the Consultants.

The preparation of business plan needs to be a coordinated and consultative exercise taking into view the aspiration and needs of the constituent areas and institutions of MMR.

In this direction, a consultative workshop is scheduled on 27.12.2006 at the AILSG, Andheri on the following themes:

1. Economic growth and its spatial structure
2. Land Real Estate and Housing
3. Managing Infrastructure and environment
4. Institutional and Legal Aspects
5. Finances and Resource Mobilisation
6. Delivering the Vision – Branding MMR

Following brief notes on each of the above themes indicate the issues identified and the possible course of action to address them for the purposes of debate and discussion.

1 ECONOMIC AND SPATIAL GROWTH

GROWTH TRENDS & PRESENT SITUATION:

- (a) MMR is the engine of Maharashtra's economic growth. It contributes 40% of State net domestic product. MMR's income has increased from Rs. 39000 crores in 1994 to Rs. 73000 crores in 2005, thus registering a growth rate of 5.9% pa, which is slightly higher than the State average of 5.4% pa., but less than the national average of 6.3%pa. During this period, Mumbai's economy suffered a negative growth rate in 2001 but has resurged at a consistent growth rate of nearly 12 % p.a.
- (b) Manufacturing that dominated Mumbai's economy has been steadily declining in its importance. Financial and other services have firmly emerged as the growth drivers. With promotion of SEZs, export oriented manufacturing is likely to receive further fillip.
- (c) With a total of 7.75 million employment (2005 estimates), the work force participation rate (WFPR) over the last three decades has remained constant at approx. 35%. Of the total employment in

MMR, nearly 55% is in formal sector, of which, office employment accounts for 2.36 million followed by industrial workers (1.53 million). The *formal* employment in MMR has declined from 70% to 50% during the last three years

KEY ISSUES:

- (a) Key growth drivers: To help improving competitive MMR economy, key drivers of economic growth are essential. The emerging trends indicate that Financial services, IT, ITES, media and entertainment, biotechnology, hospitality and tourism and export oriented manufacturing have potential to play such a role. However given the demographic compulsions, some labour absorbing sectors would also be necessary. These could be retail and wholesale trade, logistics, transport and storage and construction. Are there any other sectors suitable for the metropolis?
- (b) Sustained growth: The experience of the last decade shows that Mumbai's growth is highly susceptible to external and internal forces. The question therefore is how to ensure sustained growth. There seem to be two policy approaches. One approach relates to help Mumbai its competitive advantage by offer infrastructure services and quality of life including good governance in general at prices competitive to other cities – both Indian and international. The other approach is to “pick winners” by offering incentives. Which approach is more appropriate for globalising MMR?
- (c) Spatial growth strategy: Spatial growth strategy of MMR has emphasised restraining growth of Greater Mumbai in general and Island City in particular and promoting growth of Navi Mumbai across the harbour with limited success. The spatial growth strategy in the new emerging context will have to respond to location requirements, economic drivers and the proposed transport networks. For example;
 - Mumbai Trans Harbour Link could promote growth of SEZ in Navi Mumbai and beyond, it could when extended westward, promote redevelopment of textile mills for retail, entertainment and hospitality.
 - Proposed Versova –Ghatopar MRT corridor could accentuate the potential of Andheri west for IT and ITES services.
 - Charkop-Bandra-Kurla-Makhurd MRT Corridor could give a further fillip to Bandra Kurla Complex as the centre of Financial and Business services.
 - Areas near key railway stations in Navi Mumbai such as Vashi, Nerul, Belapur and in other urban centres in MMR could also be considered with necessary densification for IT, ITES and other service functions.

The question is how to develop land use and transport and other infrastructure in a flexible and responsive manner.

2 LAND, REAL ESTATE AND HOUSING

PRESENT SITUATION:

- (a) One of the critical factors that is adversely affecting the competitive advantages of Mumbai is its real estate prices - both for carrying out business as well as for living. International comparisons show that office rents in Mumbai, though lower than those in Tokyo and London, are considerably higher than those in most European cities. When considered along with quality of life, these prices are obviously excessive.
- (b) Housing prices in Mumbai are several times those in other competing cities such as Bengaluru, Hyderabad, Chennai, Ahmedabad and Pune. This has certainly affected Mumbai's ability to attract and retain IT and ITES services.
- (c) At Mumbai's income levels, the implication is that the lower 50% of the population can afford a formal house only on the fringe of commuting zone - Virar, Badlapur, Panvel, etc. Absence of affordable housing on a scale that can provide environmentally appropriate shelter to all new households is reflected in continued growth of slums.
- (d) On the contrary, the sub-regions other than Greater Mumbai have a relatively abundant land supply. Several *green-field developments* are underway in the suburbs.
- (e) Rent control has adversely affected new investment in rental housing stock and caused dilapidation of about 19000 buildings accommodating 4 lakhs households in the Island City alone.

- (f) Insufficient housing and slum policies have only compounded the problem.

KEY ISSUES:

- (a) Past policies have had mixed success. For instance, rent control, ceiling on owning urban land, and tightly controlling FSI and densities. Similarly, using the scarcity of development rights and artificially high prices to provide free houses to slum dwellers and rent controlled tenants have further distorted the market without helping the poor. Given the situation, what could be the realistic policies to address affordable housing issues in MMR.?
- (b) Uniformly low prescription of FSI – 1.33 in Island City and 1.0 in suburbs and other cities including Navi Mumbai, has made redevelopment of areas already developed at higher FSI difficult. By not allowing higher FSI at more accessible locations it has also created artificial scarcity of development rights. Such scarcity and resultant high prices are then sought to be used to help the redevelopment of slums and old buildings. Therefore, the question is how to rationalise FSI that does not create scarcity of development rights and distorts market and at the same time is environmentally sustainable given the infrastructure situation.
- (c) Given the peninsular geography, supply of land in Mumbai has remained as one of the major constraints. Mill lands will now come in the market. Whether other lands – port land, salt pans could be brought under urban use and restriction on land in CRZ II could be relaxed for increasing supply of land?
- (d) Given the income levels in MMR housing and urban growth has taken place along the suburban rail corridors. Large Greenfield sites could be opened up for development only if mass transit facilities are extended. Could investments in region wide transit network be used as a catalyst for increasing supply of land as against (c) above or in addition?
- (e) Slums. There too, are free houses through market mechanism and using TDR is the best approach? And what could be done in case of other slums that require resettlement? Slums are broadly on four types of locations – (i) on right of way of infrastructure, (ii) on environmentally vulnerable sites, (iii) on lands reserved for public purposes in Development Plans and (iv) in residential zones. In situ transfer tenure and redevelopment is possible for category

3 MANAGING INFRASTRUCTURE AND ENVIRONMENT

PRESENT SITUATION:

The infrastructure services include water supply, sewerage, storm water drainage, solid waste management, healthcare and education. Transport is not considered here as it is a subject matter of another detailed study – Comprehensive Transportation Strategy for MMR. Power supply is also a critical infrastructure service but as it is independently managed and regulated at the state level, it is not considered in this workshop.

Present water supply varies considerably in sub-regions and is under pressure due to delays in development of additional sources. Sewerage is available in Greater Mumbai, Navi Mumbai and core areas of Thane, Kalyan etc. Other cities rely on septic tanks with effluents and sullage being carried by storm drains. Sanitation in slums is a major problem. Storm water drainage has not been a well-planned activity and has not received the priority it deserved. Solid waste collection is relatively satisfactory but disposal has not been compliant with the MSW Rules. Preventive health care, some curative health care and primary education are provided by ULBs.

KEY ISSUES:

Water sources: MMR is situated in Mumbai Hydrometric area that comprises four river valleys viz. Vaitarna, Ulhas, Patalganaga and Amba. Water potentially available (provided that the dams are constructed in a timely manner) is more than adequate to meet the MMR needs. How to develop potential resources in a timely manner?

Water supply: The per capita consumption varies considerably. Even where the overall availability is satisfactory there are areas of scarcity. The consumption norms proposed vary from 240 lpcd for

Greater Mumbai to 150 lpcd for other cities. What should then be the norm for world class metropolis – 240, 200 or 150 lpcd supplied on 24x7 basis?

Sewerage: Can water-borne underground sewerage with environmentally sound treatment and disposal be the model to be followed in the entire MMR? Or are there more cost effective solutions – well maintained septic tanks and/or small bore shallow sewer?

Storm water drainage: Should storm water drainage planning be more scientifically organized with detailed contour maps and hydrological monitoring? What should be the design norm – return period of 25, 50 or 100 years, rainfall intensity of 25mm, 50mm or 100mm per hour?

Solid waste management: How to organize sanitary land fill sites that comply with MSW Rules? Can such landfill sites be provided for multiple ULBs to function as regional sites? How to promote segregation of dry and wet garbage? How to promote decentralized systems?

Non Conventional approaches: What is the role of non conventional approaches such as waste water recycling, rain water harvesting, desalination, small bore shallow sewers, community participation in river valley management in urban areas and in disaster management, promoting 'reduce, reuse and recycle waste' etc?

Capacity building: ULBs lack technical capacity in terms of skilled manpower, technological support like GIS for designing and managing utilities. How could the capacity be strengthened?

Institutional arrangements. Urban service delivery is a function of the ULBs. MMR comprises 7 municipal corporations and 13 municipal councils. Constitutionally, they are mandated to deliver the above-mentioned key infrastructure within their area of jurisdiction. On the contrary, the asset creation is carried out by state level institutions – for instance, with respect to water supply, Water Resource Department, Maharashtra Jeevan Pradhikaran (on behalf of ULBs). Is there a need to create an autonomous regional water institution similar to "water authorities" concept practised in many developed economies. Say for water supply, creation of a central agency responsible for source development, conveying water, treating it and transmitting it to the boundary of ULB. What could be the possible arrangements in different sectors?

Environmental Management: Ambient air quality particularly concentration of PM10 & PM 2.5, noise levels in cities, quality of natural waters are the matter of concern. What can be done to improve the present monitoring and enforcement mechanisms?

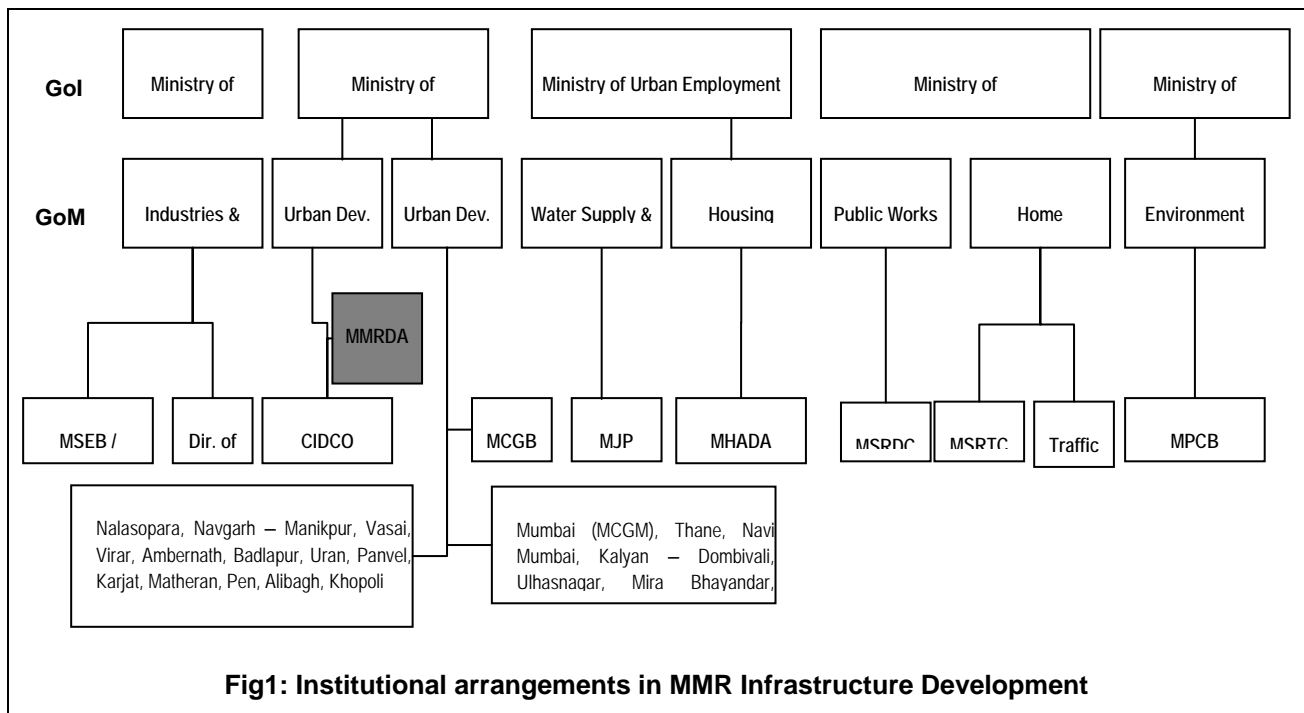
Environmental Clearance requirements: New Environmental clearance requirements of GoI – EIA triggers - > Rs.50 crores, more than 20000 sq.m etc. Does Mumbai require a different scale? Role of ULBs in environmental management: mandated by 74th Amendment. ULBs are now required to prepare annual status report. The questions of relevance are how to technically equip them to monitor environment how to integrate the environmental considerations emerging from such reports in their planning and investment programmes?

4 INSTITUTIONAL AND LEGAL ASPECTS

PRESENT SITUATION:

(a) Present institutional situation in MMR is very complex and is characterised by multiplicity of institutions at central, state and local levels (see Fig. 1):

(i) MMRDA (spatial planning & coordination within MMR); (ii) MHADA (for housing and redevelopments) and SRA (for slum rehabilitation within MCGM) and CIDCO for new housing projects in new towns; (iii) NHAI, Indian Railways, PWD, MSRDC, MMRDA, MRVC, CIDCO, ZPs and ULBs for roads and transit services; (iv) MbPT, JNPT, Maritime Board, MSRDC, MMRDA and CIDCO for transport terminals; (v) Water supply and sanitation department, Water Resource Department, Maharashtra Jeevan Pradhikaran (MJP), CIDCO and ULBs for water supply; (vi) MJP and ULBs for sewerage; (vii) ULBs and CIDCO for storm water drainage and solid waste management; (viii) MSEB's successors, BEST (Island city) and Reliance (Suburbs) for power supply with MERC as the regulatory agency; (ix) ULBs and Directorate of Health and Directorate of Education for health and educational facilities; and (x) Environment Department, MPCB and Coastal Zone Management Authority for environment.



(b) MMRDA has been mandated to prepare regional plan for MMR and to act as development coordinating agency. The other roles that MMRDA has been playing include acting as SPA for Bandra-Kurla complex, nodal agency for MUTP and MUIP projects, nodal agency for ULBs and infrastructure agencies within seeking funding under JNNURM scheme, Megacities, MUDP and so forth.

(c) Many non-statutory bodies constituted by GoM also play vital role towards monitoring infrastructure development in Mumbai. For instance, Citizen Action Group and Empowered Committee.

At local level, ULBs (7 municipal corporations and 13 municipal councils) are mandated to function as per their respective State Acts and the 74th Constitutional Amendment Act, 1992. By and large, due to varied reasons including (i) inadequate capacity to

(d) implement capital intensive infrastructure projects, (ii) over dependency of state funding, (iii) inability to raise adequate internal resources, (iv) poor inter-ULB interactions, (v) absence of Metropolitan Planning Committee (MPC), the performance of ULBs in improvement of infrastructure at local level has been less than satisfactory.

(e) On legal and regulatory front, the trend indicates the following:

(i) Rent Control Act 1948 muddled property rights, froze the tax base and discouraged upkeep of buildings; (ii) FSI and minimum density rules of Development Control Rules of 1964-67 accelerated proliferation of slums and prevented redevelopment of old buildings; (iii) Urban Land (Ceiling & Regulation) Act 1976 perversely constrained market supply of land; (iv) Coastal Zone Regulations of 1991 froze land uses & returned FSI to pre-1991 DP provisions in CRZ II; (v) Slum Rehabilitation Policy 1995 distorted the market and stressed infrastructure through unintended use of TDRs; (vi) Cessed Building Reconstruction Policy 1999 produced fictitious tenants and gave rise to extremely tall buildings in otherwise low-rise communities; (vii) Together, these two policies (v and vi) promised *free houses* to 70% of Greater Mumbai households; (viii) Maharashtra Rent Control Act 1999, did not provide for recovery of premises when rent payment is in default. It retained rent control even after building reconstruction. It continued rent control for business, trade and storage land uses. It made tenancy rights transferable by legalizing the practice of 'key money'.

KEY ISSUES:

(a) One of the key issues is multiplicity of **institutions** in **infrastructure delivery**. While 20 ULBs in MMR concentrate on delivery of services within their jurisdiction, many regional level services are not adequately provided (regional transport network, transit services, water source development, sewage disposal and treatment sites, solid waste landfill sites and so forth). However, given the

existing inadequate level of services and the importance of regional services, what level of effective institutional arrangement is needed?

- (b) International examples suggest that creating an **autonomous regional infrastructure agency**, which can act as service provider, operator, manager of a given infrastructure is one of the efficient means to address this issue (for instance, Water Authority). How appropriate would it be in MMR context? What would be its institutional structure? Who would play such role – existing institutions or a new institution?
- (c) One of the success stories of the past is to establish a “**regulator**” to permit healthy competition among service providers, which would in turn provide quality of services to the consumers/citizens. Establishment of Telephone Regulatory Authority of India (TRAI) is the most prominent example. How feasible is to replicate such model for urban infrastructure facilities?
- (d) **Project conceptualisation and implementation capacity** – The present system of annual budgeting, in the absence of mid-term capital investment plans overlooks the importance of major capital improvement projects. How to address these issues? Further present procurement practices and lengthy procedures, lead to delay in commissioning and completion of many capital intensive projects.

5 FINANCE AND RESOURCE MOBILISATION

PRESENT SITUATION:

- (a) **Various estimates** indicate huge capital expenditure requirement for infrastructure development in MMR. “Mumbai Vision” estimated a requirement of about USD 40 billion (Rs.200,000 crores approx) for Mumbai and recommended setting up of Mumbai Development Fund (MDF). The city development plan (CDP) of MCGM, prepared to access JNNURM funding, estimates an investment need of Rs.57,000 crore.
- (b) **Initial estimates** reveal that the following are MMR level investment needs. An estimated Rs. 1.7 lakh crore (USD 37 billion) is needed up to 2021. This excludes investment in power, ports, airports and railways.

Sub-sector	Investment needs (Rs. Crore)
Transport (roads and transit) – as per initial estimates of Comprehensive Transportation Study for MMR.	94000
Water source development and conveyance	9000
Municipal Infrastructure (estimated using CDP estimates)	50000
Greenfield land development	20000
Total	173000

- (c) **Municipal finance** data has been assessed. The analysis of municipal corporations’ annual budget for the last 5 years indicates that there is significant variation in expenditure pattern. Current expenditure ranges from Rs.1069/person in Mira- Bhayander to Rs.4539/person in Greater Mumbai. Capital expenditure ranges from Rs.413/person in Greater Mumbai to Rs.1190/per person in Navi Mumbai. Greater Mumbai, Thane, Kalyan-Dombivali and Ulhasnagar (the four largest corporations population-wise) have managed to improve per capita current expenditure in real terms, but at the cost of per capita capital expenditure. The annual capex of 7 Municipal Corporations in MMR (2005) was Rs.1586 crores.
- (d) This seems to have been possible because of octroi, which is the main source of revenue and that automatically increases with inflation. As regards capital expenditure, only Mira-Bhayander has

succeeded in maintaining a sustained growth. Bhiwandi-Nizampur and Navi Mumbai show considerable fluctuations in yearly per capita capital expenditure.

- (e) At present, the corporations depend on octroi for 85% of their own income. Property tax accounts for about another 8%. While octroi is dependent on the buoyancy of the economy, buoyancy of property tax revenues is linked to periodic revision of the base (the rateable value) and the tax rates. MCGM has been revising tax rates but the practice is limited by the Bombay Municipal Corporation Act 1888.
- (f) For the remaining municipal corporations, revision of tax base is limited by the Bombay Provincial Municipal Corporation Act 1949 (BPMC Act). Revision of the base is constrained by the Rent Control Act also. While the BMC and BPMC Acts place a cap on general tax and cess, there is no limit on service-related taxes or charges. Income is also linked to collection performance. MCGM collects 75% of the rated demands. Other corporations collect around 70%.

KEY ISSUES:

- (a) The initial capital investment figure of Rs. 1.7 lakhs crore works out to nearly 5.8% of total MMR net domestic product, if it continues to grow at 12 % pa. This appears to be feasible provided current levels of investments, particularly by ULBs, are substantially increased.
- (b) With respect to mobilising such resources, the following measures could be discussed. There is need to explore other ways of resource mobilisation as well.
- (i) **Intergovernmental transfers** - although devolution according to State Finance Commission recommendations has not yet been settled, following JNNURM it is reasonable to expect about 25-30 % of resource requirements to come from State and Central governments.
 - (ii) **Development charges** based on the value of new properties developed, and impact fees in the case of major developments, may yield about 20-25% of the needs.
 - (iii) **PPP** - considering the successful closure of Versova-Ghatkopar MRTS in PPP mode, it may be possible to use PPP to raise about 20% of resources required.
 - (iv) **Raising from institutional finance** - The remaining resources could be raised as institutional finance from domestic and institutional agencies. For projects that are clearly based on user charges, resources could also be raised in the bond market as non-recourse financing. However, for this to happen, a track record of independence in tariff setting and high efficiency in collection will have to be established at the earliest.
- (c) Revision of the base is critical to a ULB's ability to borrow. For example, the borrowing limit for MCGM, as part of its general budget, is thrice the total assessed value of properties. In the event of limited internal surpluses it becomes necessary to borrow to fund investment. Under the Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act borrowing is constrained by the extent to which the base is revised, unless the Act is amended to allow borrowing to be based on the balance sheet of the local body, rather than the assessed value. Such an amendment would also require ULBs to move to an accrual system of accounting to reflect their real status. At present, a current positive balance is mandated by the BMC and BPMC Acts.
- (d) With respect to ULB finance, clearly, four areas emerge as being critical in terms of design and implementation of the business plan for MMR. These relate to: (i) the ability of local bodies to raise resources, which is governed by legislative provisions; (ii) the ability of the ULBs to raise debt, which is subject to legislative provisions and the State Guarantee protocols; (iii) the ability of the ULBs to implement investment plans; and (iv) the predictability of transfers of monies from the state, especially to municipal councils that have abolished octroi. There is an urgent need to address these issues to enable ULBs in MMR sustainable.
- (e) Following reforms could also be considered for helping in additional resource mobilisation.
- User charges set to recover all O & M costs and at least a part of debt servicing.
 - Property tax freed from the pernicious effect of rent control.
 - Corporatisation of municipal services (at regional level if necessary) to ensure professional management, transparency and independence in tariff setting.
 - Independent regulator for PPP projects.

6 DELIVERING THE VISION – BRANDING MMR

Is it possible to attain a status of “world class metropolis” in a foreseeable future across the entire MMR?

- We could spend a billion dollars a year—and not fully fix MMR’s civic services.
- We could double rail capacity—and not cure over-crowding.

A fully “world class metropolis” would be unaffordable (to all but the very wealthy) so what does “world class metropolis” *really* mean? To start discussion, some suggestions ...

Citizens

have services (trains, water, schools, ...) of a standard they want, and can afford
are proud to say “I am from Mumbai” (regardless of their own living conditions).

Foreigners

associate MMR with things that are distinctive, interesting, glamorous, ... world class!
on hearing “Mumbai”, think “oh, that interesting city in India...I’d like to visit Mumbai”.

Domestic businesses/investors

identify MMR as the best place in India in which to set up business/invest
think a MMR address adds credibility in the eyes of foreign clients/associates.

Foreign businesses/investors

rank MMR high on the list of places to set up a business/invest
red tape will not strangle the business at birth
there is good infrastructure (electricity, water,...)
serviced land is available
transport and communications are good (airports, ports, roads,...)
are confident their business interests will be well managed— because some senior managers will be happy to take their families to Mumbai for a period
housing, schools, shopping, entertainment,... equal Western standards
there is a full complement of recreational facilities
personal security can be taken for granted.

Transforming MMR into a world class metropolis means making it:

a place that people want to visit

a place where people want to live, work and do business

a place the world instantly recognises... has a ‘brand image’.

Where can it be done

Select other ‘hot spots’ of world class quality locations to make MMR a city on the water front – Mahim bay –, Eastern water front, palm beach road, Nerul – Seawoods in Navi Mumbai, to raise citizen’s sights and change aspirations?

- ♦ Develop districts with quality housing, recreation facilities, clean environment, good schools, good transport access, close to employment,?
- ♦ Develop industrial areas of international standard, near ports and airports?

In the Island City – Fort, exploit stunning colonial buildings & maidans? Convert colonial buildings to new uses?

Integrate Island City with its harbour. Develop the harbour waterfront (parks - walkways and cycleways - sports arenas - recreation & entertainment - conference and exhibition centres - a casino - international hotels,)?

Build a boat marina (with facilities for luxury yachts) and a cruise ship terminal?

Attachment-D: Second Workshop Background Note

BUSINESS PLAN FOR MUMBAI METROPOLITAN REGION (MMR)

Key Issues and Recommendations for discussion

1. BUSINESS PLAN FOR MMR

The business plan for MMR translates the goals and strategies designed to attain the **VISION** into a series of actions. Actions cover institutional and legal reforms, methods of resource mobilization, infrastructure improvement and the monitoring process.

2. ENVISIONING MMR

Vision for MMR

There is a consensus on the vision of MMR that has been proposed as:

“Transforming MMR into a world class metropolis with a vibrant economy and globally comparable quality of life for all its citizens”.

3. GOALS AND STRATEGIES

Comprehensive Transportation Study Assumptions

Comprehensive Transportation Study (CTS) initiated by MMRDA envisage certain growth in demography, housing and economy to plan transportation facilities for the horizon year 2031. To support the future population and employment the Region requires infrastructure in sectors other than transportation also. The assumptions made in CTS are listed below:

Base Year – 2005	Horizon Year - 2031 (Strategy)	2005-31
Population – 20.8 million	Population – 34 million	▲
Slum Population – around 47%	Slum Population – around 14%	▼
Average Household Size – 4.22	Average Household Size – 3.80	▼
Workforce participation rate – 0.37	Workforce participation rate – 0.45	▲
Total employment - 7.75 million	Total employment-15.3 million	▲
2.36 million working in Offices (30.4%)	6.43 million working in Offices (42%)	▲
1.53 million working in Industries (19.7%)	4.51 million working in Industries (30%)	▲
Around 55% formal employment	70 – 80 % formal employment	▲

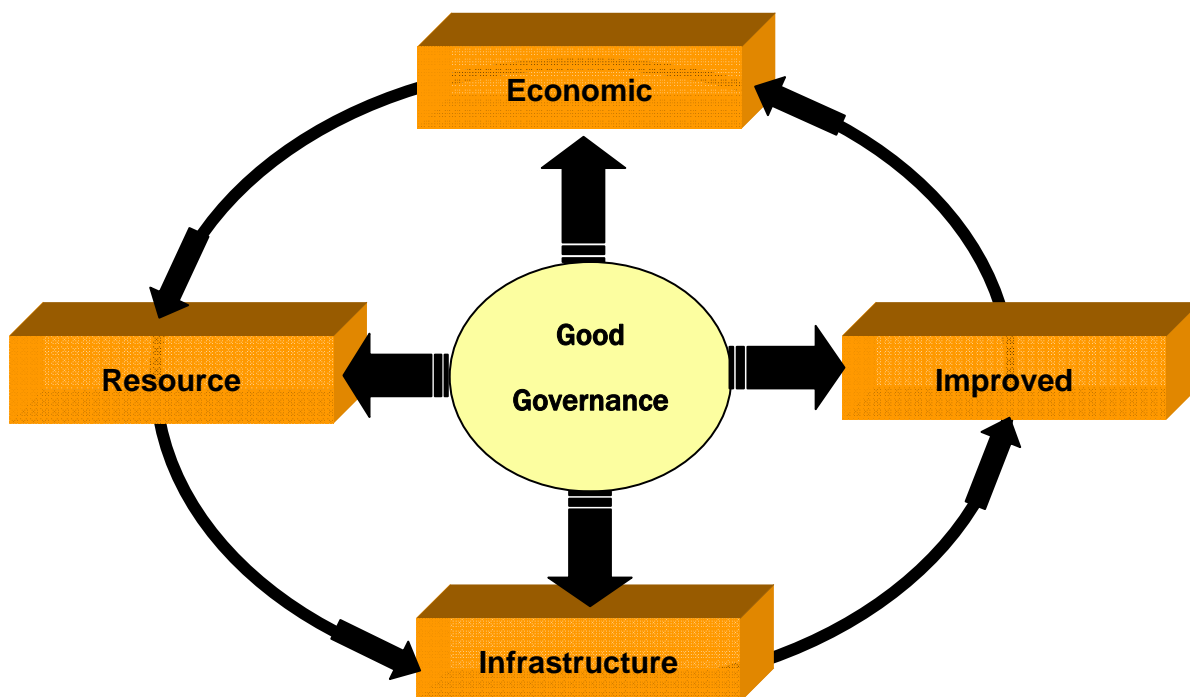
The above estimates form the basis for the preparation of infrastructure capital investment plan

Infrastructure investments:

The capital infrastructure investment required is estimated to be Rs 322, 000 Crores. The details are given para 6.1.

Virtuous cycle

To achieve this vision MMR must be placed in a **environmentally sustained** virtuous cycle. Economic growth, resource mobilization for infrastructure investment, improved delivery of environmental and infrastructure services leading to improved quality of life are the key elements of the virtuous cycle. Short fall in any one of them can affect the others.



Strategies

The virtuous cycle can be attained and then sustained through good governance that ensures;

- Competitive MMR
- Livable MMR
- Bankable MMR

4. COMPETITIVE MMR

The present rate of economic growth is very healthy. But, it has experienced volatility during the last decade. The threats to growth are:

- (a) Competition from other Indian cities as well as from the other international cities – particularly in terms of high real estate prices. This can be improved by increasing the supply of land and policies to reduce the real estate prices.
- (b) Quality of business and residential infrastructure: Thane, Navi Mumbai that are potential candidates for growth of IT and ITES suffer from power shortage. Transport, water supply, schools and healthcare facilities are not at their competitive best.
- (c) The general perception is that there is a mismatch between available skills and those demanded by fast growing services sector.
- (d) The traditional economic base of manufacturing has eroded. Financial services, IT and ITES, Media and Entertainment, Hospitality and Tourism have emerged as growth sectors.
- (e) The World Bank report on “Doing Business 2007” has ranked Mumbai 11th among 12 Indian cities by measuring ease of doing business along following parameters. For sustaining economic growth it is obvious that ease of doing business must significantly improve. Though most of the reforms are in the domain of Union Government, those within the domain of State and Local Government must improve.

- ❖ Starting a business
- ❖ Registering property
- ❖ Paying taxes
- ❖ Closing business

- ❖ Dealing with licenses
- ❖ Getting credit
- ❖ Trading across borders

- ❖ Employing workers
- ❖ Protecting investors
- ❖ Enforcing contracts

- (f) But there is inadequate knowledge of the MMR's economy and employment. Intelligence in terms of problems faced by entrepreneurs intending to start new businesses is also lacking. **Improved data systems need to be designed and implemented.** No MMR centric institution is currently responsible for "planning for social and economic development" though Constitution envisages to be a local function and municipal legislation makes it an obligatory duty of the ULB. **Institutional responsibility therefore needs to be clearly assigned.**

Land, Real Estate and Housing Market

The way in which the land, real estate and housing market is presently functioning adversely affects all three competitiveness, ability to mobilise resources and quality of life due to large proportion of population forced to seek shelter in slums. Reforms that need to be pursued in a time bound manner are;

(a) Legal and regulatory

- Increase supply affordable shelter to the poor.
- Adopt alternative ways of making available land for the poor such as inclusionary zoning
- Reform rent control act to increase investment in rental housing, promote redevelopment, improve property tax
- Simplification of DCR and building permission process
- Improved tracking of development permissions to build a data base that helps monitor the sector performance
- Improved provisions for land assembly (Town Planning Schemes) in the Town Planning Act.

(b) Financial

The booming real estate prices do not contribute to resources for infrastructure. Introducing price linked one time development charge on all construction appears to be a promising avenue. Other alternatives are summarized below.

Measure	Area linked DC	Value linked DC	Impact Fee/ DC	Betterment levy
Legal feasibility	Already provided in MRTP Act	MRTP Act needs amendment	New legislative provisions may be necessary	Provided for in MMRDA Act
Deciding tax base	Easy	Could be linked to Stamp Duty Ready Reckoner	Nexus between charge and investment needs to established - difficult	Project specific. Complex process. Not used so far in MMR
Deciding tax rate	Difficult, affects buoyancy despite the provision for min.-max rates.	Not frequently required.		
Revenue potential	Extremely limited	Substantial and buoyant.	Limited	Limited
Impact on property prices	Difficult to ascertain. Would depend upon the market. In competitive market the incidence would be more on land prices and land owners.			

Necessary legal amendments to enable levy of price linked development charge need to be made.

In addition a percentage of stamp duty revenue collected from MMR could be assigned to infrastructure investment.

(c) Land Use Planning and Management

The regional land use plan (1999) and Mumbai city land use plan (1993) are both dated. Many *ad hoc* adjustments have been made at regional level like SEZs and Special Townships and also at city level like TDR based free houses to slum dwellers (1995), incentive FSI based free houses to tenants in cessed buildings, reduction in public land while redeveloping mill lands etc.

In addition a master plan of metro network has been prepared for Greater Mumbai and one for entire MMR is being developed in CTS.

A quick and comprehensive revision of land-use plans as included in the Development Plans of Mumbai, Navi Mumbai, Thane, Kalyan Dombivali and the Regional Plan (RP) is necessary. The Comprehensive Transportation Study (CTS) and the Business Plan (BP) will have implications for RP. Therefore the present RP will be reviewed for immediate changes and the next RP will take more comprehensive view.

(d) The FSI

One of the key features of the land use plans is the uniform (and low) FSI. This has created scarcity of development rights in the market and caused rise in the prices (amongst other reasons). Such scarcity values are sought to be used to promise free houses to slums and chawl dwellers. Such measures are not sustainable in achieving the targets in timely manner. FSI must be decided as planned exercise at the city level and should vary in response to accessibility patterns – particularly created by transit corridors. Higher FSIs in such areas could be linked to obtaining land and finance for improved infrastructure under a planned framework.

(e) Land Assembly

Considerable green-field development needs to be brought about particularly in conjunction with some of the transit corridors. Alternative to large-scale compulsory acquisition need to be available. Town Planning Scheme provided in the MRTP Act 1966 with necessary amendments is a promising alternative. The principal amendments would refer to;

- TP Schemes at present are seen as way of implementing DP. Instead they need to seen as implementing Regional Plan implying that TP Schemes are local planning tools in their own right.
- The procedure of preparing TP Scheme needs to be simplified and expedited. Gujarat could be model to be followed. ***MRTP Act needs to be expeditiously amended.***

(f) The Slums

The four categories of slums described below require distinctly different policy package. The current policy is applicable essentially to category 4 slums and extended to category 1 slums. ***A GIS based inventory of slums that helps quantification of slums according to these categories need to be undertaken immediately. Thereafter the policies will have to be refined to have time bound programmes.(It may be noted that rationalization of FSI may limit the use of TDR for slum redevelopment.)***

The present policy of providing free houses to slum dwellers relies on high property prices that are a result of low and uniform FSI. The high prices have pushed “not so poor” to seek shelter in slums. The policy is therefore not sustainable in the long run.

Category	Category of Slums
1.	Slums situated on the right of way of existing or proposed infrastructure..
2.	Slums on environmentally unsafe locations.
3.	Slums located on the land reserved for public purposes in Development Plan (Master Plan).
4.	Slums on unreserved lands – not covered by any of the categories mentioned above.

5. LIVABLE MMR

The improved livability of MMR is at the core of being in the virtuous cycle and achieving inclusive growth. The critical infrastructure inputs to achieve livability goals could be understood by appreciating the scale of growth MMR is likely to experience by 2031.

Power supply



As of now this is the most critical infrastructure at least outside Greater Mumbai for both economic growth and livability. However action for improvement must be at the state level and not MMR level

Water and Sanitation

Source development

Timely development of sources is of crucial importance. Unless immediate action is taken, in next ten years serious water shortages will be experienced.

- Improved distribution – 24/7 supply, reduction in UFW, improved billing and collections are all necessary.
- Coverage of sewerage is limited to Greater Mumbai, Navi Mumbai and parts of core cities. Substantial expansion of coverage is necessary. In some cities master plans are ready in some others they need to be undertaken immediately.
- In case of slums extending conventional sewerage may be expensive / difficult. In such case community based slum sanitation programme need to be implemented.

Storm Water Drainage

July 2005 deluge has exposed the lacunae in planning and provision of this service. As highlighted by the Fact Finding Committee (Dr.Chitale Committee), developing the data base for planning of storm water drainage must be undertaken. This would include preparation of contour maps and monitoring urban hydrology. Thereafter master plans for storm water drainage could be prepared. Water, sanitation and storm water drainage could be considered for some institutional reform as described later.

Transport

This is being separately studied under CTS. The CTS has carried out various studies and developed a model to estimate travel demand in 2031. It has also examined likely scenarios of population employment distribution. It has then developed a master network of transit routes and access controlled highways. It is currently developing a prioritized investment programme for 2021.

Solid Waste management

Apart from general aspects SWM requiring improvement, the critical problem is of finding environmentally appropriate sites for disposal.

Social Infrastructure :Education and Healthcare

These sectors are significant both from welfare and economic growth perspective. In case of education on one hand the objective is to achieve universal primary education with reduced dropout rates and on the other **develop human resources for the emerging economy**. In case of healthcare too though the primary objective would be to provide preventive healthcare at affordable prices, the potential of the sector to attract medical tourism also needs support.

Environment

Economic growth and infrastructure provisions may adversely effect environment. Such growth therefore has to be guided in an environmentally sustainable manner. For that purpose fundamental natural resources like air, water, land, forests, coastal wet lands etc have to be protected.

6. BANKABLE MMR

From a macro-economic perspective it appears that if MMR economy has a sustained growth of 12 % per annum it should be feasible to finance the required infrastructure investment. What is required is the mechanism to mobilise the financial resources to make MMR bankable. ***In essence it means levying user fees and taxes that cover both O&M costs and debt servicing.*** This should build annual streams of revenue that can support debt or attract private investment. This is illustrated in table below:

Taxes and User Fees

Share in Union Taxes	<ul style="list-style-type: none"> • Service Tax • Income and Corporate Tax • Fuel cess for Road Development
Share of state taxes	<ul style="list-style-type: none"> • Stamp duty • Entertainment duty
Property based tax and charges	<ul style="list-style-type: none"> • On capital value basis for improved buoyancy • Price linked development charge • Impact fees on special townships SEZs
User fees	<ul style="list-style-type: none"> • Electricity • Water and sewerage • Solid Waste • Municipal bus transport • Education and Healthcare services
Mobilizing Resources for Capital expenditure	<ul style="list-style-type: none"> •
Inter-governmental transfers	<ul style="list-style-type: none"> • Centrally Sponsored Schemes e.g. JNNURM • Devolution by SFC
Raising debt	<ul style="list-style-type: none"> • From World Bank / ADB / JBIC etc • From Financial Institutions • As municipal bonds
Private investment	<ul style="list-style-type: none"> • Private investment through annuity payments • PPP • BOOT

The method of financing capital expenditure will have to be designed for each discrete project. Some projects like Storm Water Drainage may not be suitable for levying a direct user fee and may have to be financed through general revenues like property tax for development charge or through general obligation bonds as distinct from revenue bonds. Water supply or transit could be financed through private investment by annuity payments or PPP and BOOT depending upon risk perception and appetite for risk by the private investors. The process must begin by preparing five-year CIP by all ULBs and an integrated MMR CIP as described below.

Investment needs

Investment needs of MMR by 2021 have been assessed to Rs.322,359 crores as given in table below. National projects like ports and airports are not included in this assessment. In power sector though the investment needs to be financed at the state level, investment needs are indicated.

MMR Infrastructure Investment Needs (Rs. Crores)

SI.No	Component	Agencies Responsible	Investment (Rupees in Crores)
A. REGIONAL INFRASTRUCTURE INVESTMENT NEEDS			
1	Road Transport Infrastructure	MSRDC/MSRTC/BEST/CIDCO	48,211
2	Rail Transport Infrastructure	MRVC/CIDCO	11,561
3	Water Transport Infrastructure	MSRDC	539
4	Comprehensive transportation investments(Road & Transport)	MMRDA /Metropolitan Transport Authority	83,873
5	Water Supply	WSSD/MJP/CIDCO	6,719
6	Sewerage Infrastructure	CIDCO	202
7	Storm Drainage Infrastructure	MMRDA/River Water Authority	2,092
8	Electricity Infrastructure	TATA/BEST/MSEB/Reliance	54,521
Total regional infrastructure investment needs			207,718
B. INFRA STRUCTURE INVESTMENTS AT URBAN LOCAL BODIES			
SI.No	Infrastructure Component	Agencies Responsible	Investment (Rupees in Crores)

SI.No	Component	Agencies Responsible	Investment (Rupees in Crores)
1	Water Supply	ULB	4,991
2	Sewerage	ULB	9,195
3	Storm Water Drainage	ULB	3,689
4	Solid Waste Management	ULB	2,162
5	Roads and Transportation	ULB	59,145
6	Others	ULB	2,926
Total ULB Infrastructure Investment Needs			82,108
C. INFRASTRUCTURE INVESTMENT IN LAND REAL ESTATE AND HOUSING ACROSS MMR			
SI.No	Infrastructure Component	Agencies Responsible	Investment (Rupees in Crores)
1	Interest Subsidy	MHADA	1,084
2	Affordable Housing	MHADA	1,888
3	MIDC-Land Development	MIDC	2,812
4	Green-field Development		20,000
5	CIDCO-Special Projects	CIDCO	1,110
6	Slum Upgradation-By ULBs	Individual ULB	5,639
Total Land and Housing Investment Needs			32,533
GRAND TOTAL (A+B+C)			322,359

The above infrastructure needs will have to be financed by increased levels of borrowings – either from financial institutions or through debt instruments like municipal bonds. This would however require substantial improvement in tax efforts and recovery of user fees. Development charges should also be an important source to help sustain borrowings. JNNURM has also improved the prospects of intergovernmental transfers. The way in which investment needs could be financed is indicated in table below.

Financing Infrastructure Investments (Rs. Crores)

Total investment Needs		322359
Sources of finance		
• Intergovernmental transfers e.g. JNNURM		96707
• Borrowings - sustained by improved user charges and Development Charges		161180
• Public Private Partnership		64472

7. WELL GOVERNED MMR

Good governance of MMR has four components.

- ❖ Institutions
- ❖ Procedures
- ❖ Capacity building
- ❖ Monitoring and Evaluation

Institutions

Constitutionally MPC and ULBs are the key institutions. Since the MPC is not yet constituted and MMRDA is expected to assist the MPC in its planning role and is responsible for implementing the regional plan, MMRDA too acquires a key importance as the metropolitan authority. The functions that are important at the metropolitan level but not adequately attended to are:

- ❖ Social and economic development
- ❖ Water resource development,
- ❖ Flood Control
- ❖ Transit development (outside Greater Mumbai)
- ❖ Land development in conjunction with transit development
- ❖ Integrated capital investment planning
- ❖ Monitoring and Evaluation of metropolitan development.

MMRDA's present structure is designed to deal with

- ❖ Transport in terms of long term planning, construction of road network and structuring selected transit corridors for private investment.
- ❖ Regional land use planning, development finance to ULBs and acting as nodal agency for GOI financing schemes (Mega City Scheme or JNNURM)
- ❖ Planning and disposal of land and development control.

MMRDA's structure therefore needs to be expanded and restructured to deal with the metropolitan functions currently not attended.

In addition there seems to be merit in organizing regional corporate utility for transport, water supply, sewerage and storm water drainage. This could be owned by the ULBs and MMRDA in terms of equity holders but day-to-day management could vest in the Board of Directors. The company could be empowered to decide tariffs, outsource management, enter into PPP or BOT arrangements etc.

In addition there may be a need of financial intermediary to assist ULBs in accessing capital market. The MUIF initiative is in the right direction.

Procedures

Along with institutional strengthening there is a need to adopt new procedures that are necessary for improved planning and development of MMR.

Capital improvement plan.

ULBs as well as MMRDA follow a practice of annual budgets for resource allocation. This is inadequate for planning of large capital improvements. A five yearly capital improvement plan has to be adopted as legally required procedure. This will relate city's long-term infrastructure needs with the resources required, impel elected representatives to think about mobilizing resources, citizens to understand tax and other proposals and advocate intergovernmental transfers. The CIP may be prepared by ULBs dealing with local issues, by MMRDA dealing with metropolitan issues including those of parastatals like MHADA and CIDCO and these may be consolidated / integrated in the metropolitan plan to be prepared by the MPC. (This could be a more relevant interpretation of metropolitan plan mentioned in the Constitution than the land use plan envisaged in the MRTP Act as currently provided in the MPC Act 2000)

CIPs need to be translated into financing plans which may include private sources on the basis of annuity payments, PPP or BOT, borrowings from financial institutions or bonds raised in the capital market, inter governmental transfers and own resources.

With JNNURM preparation of CIP and FOP has become mandatory as a part of CDP. However in most cases it has been as one time exercise to be done by consultants. Instead it should become regular feature preferably mandated by law.

The MMRDA Act,1974 the municipal legislation and the MPC Act 2000 may be amended to provide legal mandate and obligation to prepare CIP.

Data systems

There is a serious lacuna in data systems that should provide useful information not only for planning but also for monitoring the outcomes.

(a) Economic and employment growth

The Directorate of Economics and Statistics, GOM as a part of National Accounts does carry out district wise estimates of GSDP and NSDP. However geographically this does not match the MMR boundaries. More seriously the industry wise estimation does not clearly indicate the contribution of sunrise industries such as IT and ITES.

Similarly the Directorate carries out sample surveys on many aspects as a part to National Sample Surveys. But the sample size is not adequate to provide reliable estimates at MMR level. It would be useful to support and strengthen these efforts (instead of carrying out fresh and independent exercises) to get useful data.

(b) Housing accretion (addition and deletions on account of demolition and redevelopment)

Housing and particularly growing slums is one of the most critical problems. But very little is known about housing. Information that is **not** generated includes

- ❖ Ward wise and room wise distribution of new dwelling units constructed every year.
- ❖ Similar data on dwelling units demolished for redevelopment
- ❖ Above data overlaid with housing price data
- ❖ Housing finance extended every year

Data for first two exists in the building permission records but needs to be analysed and presented in the form that is useful for sector monitoring.

(c) Similar accretion of non residential floor space

Commercial office space is known to be very expensive in Mumbai, but the annual addition to office space is not monitored.

(d) Infrastructure

Data systems to measure and monitor delivery of infrastructure services like, water supply, sewerage, storm water drainage, solid waste management, roads and transport are not available in an integrated fashion.

(e) Environment

Although annual environmental status reports are prepared, the data systems need to be improved to get a comprehensive picture of environment, its impact on human health and indicators for planning actions.

(f) GIS providing map linked attribute data including network information

GIS has to be developed as a tool for organizing data and carrying out geo-specific analysis. (apart from producing accurate and attractive maps) Land information system like, unauthorized development, conversion of land use, ownership, permissions granted etc

MMRDA with the assistance of Directorate of Economics and Statistics, GOM should undertake the task to design data systems that are required for planning and monitoring the outcomes.

Capacity building

In view of the above, at ULB level capacity needs to be built in respect of:

- ❖ Using accrual based accounting system
- ❖ Preparing capital improvement plans
- ❖ Local land use planning and development control, review and monitoring development plans, including use of technology
- ❖ Use of GIS

And at metropolitan level

- ❖ Capacity to monitor economic growth and devise appropriate policies
- ❖ Capacity to structure projects for non-recourse financing
- ❖ Capacity to structure projects for private investment
- ❖ Capacity to assist ULBs in project preparation and financing
- ❖ Capacity to develop and guide use of GIS in urban planning, land development, Water management, SWM in an integrated manner across ULBs.

Monitoring and Evaluation

The outcome of policies and projects (as distinct from financial inputs and physical outputs) need to be closely monitored. This is necessary to periodically fine tune policies and devise new projects. Data systems have to be designed to develop indicators that help assess the outcomes.

Such a system is illustrated below:

1. Economy

- (a) GDP, NDP according to sectors of origin, particularly sectors like IT, ITES, Media and Entertainment
- (b) Employment according to economic sectors
- (c) Estimates of informal employment and economy.

2. Land, Real Estate, Housing and Slums

- (a) Amount of land brought under development
- (b) Non Residential floor space built up
- (c) Residential floor space built. Size wise distribution of dwelling units built and number of dwelling unit demolished.
- (d) Distribution of new dwelling units according to price zones
- (e) Amount of housing finance lent and number of borrowers

3. Infrastructure

- (a) Capital investment incurred (according of type of infrastructure service)
- (b) Outcome parameters of service – e.g. per capita water supplied in different parts of MMR
- (c) Incidence of water borne diseases
- (d) Number of passengers carried by public transport – degree of overcrowding.

4. Regulatory functions

- (a) Number of building permissions granted
- (b) Average time taken for grant of permission
- (c) Number of trade licenses granted
- (d) Number and types of vehicles registered and driving licenses issued

5. Environmental parameters

- (a) Ambient air quality
- (b) Ambient noise levels
- (c) Quality of natural water bodies – seas, creeks, rivers and lakes
- (d) Waste collection and disposal – municipal, bio-medical, hazardous and toxic

The responsibility of monitoring, evaluating and taking corrective action needs to be specifically assigned to an independent unit located in MMRDA (or in GOM department).

Attachment E: List of Participants in Second Consultative Workshop

S. No	Department / Agency / Organization
1	MMRDA
2	AIIILSG
3	Mantralaya
4	MCGM
5	Mira-Bhayander Municipal Corporation
6	Bhiwandi Nizampur Municipal Corporation
7	Ulhasnagar Municipal Corporation
8	Kalyan-Dombivli Municipal Corporation
9	Nallasopara Municipal Council
10	Virar Municipal Council
11	Khopoli Municipal Council
12	Ambarnath Municipal Council
13	CIDCO
14	SPARC
15	The FIRE
16	IL&FS
17	SRS
18	MbPT
19	Mumbai
20	Godbole Associates
21	MEDC
22	Bombay Chambers of Commerce and Industry

Appendix II-1:

Doing Business: Details of Ranking of Indian Cities*

SUB-NATIONAL INDICATORS	BANGALORE	BHUBANESHWAR	CALCUTTA	CHANDIGARH	CHENNAI	HYDERABAD
STARTING BUSINESS						
Procedures(Numbers)	11	11	11	11	11	11
Time (Days)	45	52	51	45	41	43
Cost (% of income per capita)	55.6	41.3	48.5	48.8	44.0	44.0
Minimum Capital (% of income for per capita)	0	0	0	0	0	0
DEALING WITH LICENCES						
Procedueres (number)	20	16	24	22	21	24
Time (days)	165	159	386	195	219	168
Cost(% of Income per capita)	1363	413.5	1999	646.5	483.0	500.1
EMPLOYING WORKERS						
Difficulty of Hiring Index (0-100)	33	33	33	33	33	33
Rigidity of Hours index (0-100)	20	20	20	20	20	20
Difficulty of Firing Index (0-100)	70	70	70	70	70	70
Rigidity of Employment Index (0-100)	41	41	41	41	41	41
Non wage labor cost (% of salary)	17	17	17	17	17	17
Firing cost (weeks of wages)	56	56	56	56	56	56
REGISTERING PROPERTY						
Procedures (Number)	6	7	5	6	8	5
Time (Days)	35	123	155	132	63	35
Cost (% of property value)	11	13.5	12.3	9.8	10.6	10.6
GETTING CREDIT						
Credit Information Index	3	3	3	3	3	3
Legal Rights Index	5	5	5	5	5	5
Public Registry Coverage (% of Adults)	0.0	0.0	0.0	0.0	0.0	0.0
Private Bureau Coverage (% of Adults)	6.1	6.1	6.1	6.1	6.1	6.1

SUB-NATIONAL INDICATORS	BANGALORE	BHUBANESHWAR	CALCUTTA	CHANDIGARH	CHENNAI	HYDERABAD
PROTECTING INVESTORS						
Disclosure Index (0-10)	7	7	7	7	7	7
Director Liability Index (0-10)	4	4	4	4	4	4
Shareholder Suits Index (0-10)	7	7	7	7	7	7
Investor Protection Index (0-10)	6.0	6.0	6.0	6.0	6.0	6.0
PAYING TAXES						
Payments (Number)	60	59	60	59	63	60
Time (hours)	264	264	264	264	264	264
Total Tax Rate (% of Profit)	81.0	79.6	80.8	79.6	81.1	82.0
TRADING ACROSS BORDERS						
Documents for Export (Number)	9	11	11	10	7	9
Time for Export (Days)	22	20	18	27	17	20
Cost to Export (USD per Container)	755	996	505	1029	580	706
Documents for Import (number)	9	11	11	10	5	9
Time for Import (Days)	23	28	22	27	22	24
Cost to Import (USD per Container)	962	1166	1000	1154	892	850
ENFORCNG A CONTRACT						
Procedures (Number)	56	56	56	56	56	56
Time (Days)	800	610	942	915	683	770
Cost (% of Claim)	16.5	14.5	18.6	25.1	25.4	21
CLOSING A BUSINESS						
Time (years)	7.3	10.2	19.6	8	9.5	8
Cost(% of Estate)	4	4	4	4	4	4
Recovery Rate (Cents on Dollar)	19.5	14.1	5.5	18.1	15.5	18.1

SUB-NATIONAL INDICATORS	JAIPUR	LUCKNOW	MUMBAI	NEW DELHI	PATNA	RANCHI
STARTING BUSINESS						
Procedures(Numbers)	10	11	11	11	11	11
Time (Days)	42	42	35	52	41	46
Cost (% of income per capita)	50.1	43.5	73.7	43.6	44.1	59.3
Minimum Capital (% of income for per capita)	0	0	0	0	0	0
DEALING WITH LICENCES						
Procedueres (number)	20	22	20	21	25	25
Time (days)	240	231	270	208	377	522
Cost(% of Income per capita)	515.0	470.8	606.0	331.4	277.0	354.5
EMPLOYING WORKERS						
Difficulty of Hiring Index (0-100)	33	33	33	33	33	33
Rigidity of Hours index (0-100)	20	20	20	20	20	20
Difficulty of Firing Index (0-100)	70	70	70	70	70	70
Rigidity of Employment Index (0-100)	41	41	41	41	41	41
Nonwage labor cost (% of salary)	17	17	17	17	17	17
Firing cost (weeks of wages)	56	56	56	56	56	56
REGISTERING PROPERTY						
Procedures (Number)	5	5	6	6	5	6
Time (Days)	56	43	62	138	119	86
Cost (% of property value)	9.9	11.6	7.8	10.1	12.8	5.6
GETTING CREDIT						
Credit Information Index	3	3	3	3	3	3
Legal Rights Index	5	5	5	5	5	5
Public Registry Coverage (% of Adults)	0	0	0	0	0	0
Private Bureau Coverage (% of Adults)	6.1	6.1	6.1	6.1	6.1	6.1

SUB-NATIONAL INDICATORS	JAIPUR	LUCKNOW	MUMBAI	NEW DELHI	PATNA	RANCHI
PROTECTING INVESTORS						
Disclosure Index (0-10)	7	7	7	7	7	7
Director Liability Index (0-10)	4	4	4	4	4	4
Shareholder Suits Index (0-10)	7	7	7	7	7	7
Investor Protection Index (0-10)	6.0	6.0	6.0	6.0	6.0	6.0
PAYING TAXES						
Payments (Number)	60	59	59	60	63	60
Time (hours)	264	264	264	264	264	264
Total Tax Rate (% of Profit)	83.4	81.7	81.1	82.0	83.3	87.7
TRADING ACROSS BORDERS						
Documents for Export (Number)	10	9	10	11	11	11
Time for Export (Days)	21	27	07	22	21	26
Cost to Export (USD per Container)	950	875	864	1030	875	827
Documents for Import (number)	10	6	15	11	11	11
Time for Import (Days)	28	29	41	24	25	28
Cost to Import (USD per Container)	1163	1035	1244	1135	1175	1105
ENFORCNG A CONTRACT						
Procedures (Number)	56	56	56	56	56	56
Time (Days)	754	950	1420	900	792	1165
Cost (% of Claim)	16.3	18.4	35.7	33.7	22.1	23.5
CLOSING A BUSINESS						
Time (years)	9.3	15.2	10	7.9	9.3	8.5
Cost(% of Estate)	4	4	9	4	4	4
Recovery Rate (Cents on Dollar)	15.9	8.7	13	18.3	15.9	17.2

* Source: 'Doing Business', World Bank, 2007

Appendix III.1

STATUS OF REGIONAL AND DEVELOPMENT PLANS IN MMR

Name of ULB/Region	Planning Authority	Sanction Year
Mumbai Metropolitan Region	MMRDA	1999
Greater Mumbai	MCGM	1993
Thane	TMC	1999
Kalyan Dombivali	KDMC	2003
Bhiwandi-Nizampur	BNMC	2003
Mira-Bhayander	MBMC	1997
Navi Mumbai	CIDCO	1979
Ulhasnagar	UMC	1999
Ambernath	MMRDA as SPA	2005
Kulgaon-Badlapur		
Nallasopara	CIDCO as SPA	2007
Vasai		
Virar		
Navgarh-Manikpur		
Panvel	Respective Municipal Councils	1993
Uran		1988
Karjat		1986
Khopoli		2003
Matheran		1987
Pen		1988
Alibag		2004

Appendix IV-1

Existing and Additional Water Supply Demand in MMR – 2005 to 2021 (mld) (P-2 SCENARIO)

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Present Scenario (2005)			Future Supply Norm (lpcd)	Present Domestic Demand (mld)	Present Demand including Industrial and Leakages (mld)	Present gap (2005) mld	Incremental Demand (mld)		
		2005	2011	2016	2021	Supply (mld)	Coverage (%)	Backlog (%)					2005-2011	2011-2016	2016-2021
	GREATER MUMBAI	12,861	14,162	15,246	16,330	3,025.0				3,900.0	5,928.0	2,903.0	494.6	418.8	352.2
1	Island City	3,391	3,730	4,018	4,265		99	1	240				123.6	105.1	90.1
2	Western Suburb	5,628	6,245	6,777	7,212		99	1	240				225.2	194.3	158.4
3	Eastern Suburb	3,843	4,242	4,570	4,854		99	1	240				145.8	119.4	103.7
	WESTERN REGION	1,345	1,870	2,180	2,457	167.1				269.1	403.6	236.5	157.3	93.0	83.1
4	Mira-Bhayander	632	750	897	1,040	101.9	80	20	200	126.5	189.7	87.8	35.3	44.1	42.9
5	Vasai	57	86	98	108	2.5	80	20	200	11.4	17.1	14.6	8.8	3.6	2.9
6	Navghar-Manikpur	132	193	217	237	13.5	80	20	200	26.4	39.6	26.1	18.2	7.3	6.0
7	Nallasopara	210	285	316	340	16.5	80	20	200	41.9	62.9	46.4	22.7	9.1	7.4
8	Virar	143	206	231	252	15.5	80	20	200	28.5	42.8	27.3	18.9	7.6	6.2
9	(included in proposed M Corp)	172	350	421	480	17.2	80	20	200	34.3	51.5	34.3	53.5	21.3	17.7
	NORTH EASTERN REGION	4,445	5,289	6,056	6,740	902.5				889.1	1,333.6	431.1	253.2	229.9	205.3
10	Thane	1,465	1,583	1,784	1,949	362.0	99	1	200	293.0	439.5	77.5	35.2	60.5	49.4
11	(Thane-Bhiwandi Road- Urabn)	54	77	118	151	5.4	80	20	200	10.7	16.1	10.7	7.0	12.3	9.9
12	Bhiwandi-Nizampur	632	752	886	1,012	112.0	92	8	200	126.4	189.7	77.7	35.9	40.2	37.8
13	(Bhiwandi expansion)	47	78	113	146	4.7	80	20	200	9.3	14.0	9.3	9.4	10.5	9.9
14	Ulhasnagar	495	522	539	556	115.0	99	1	200	98.9	148.4	33.4	8.2	5.2	4.9
15	Kalyan-Dombivli	1,353	1,599	1,757	1,903	239.0	99	1	200	270.6	406.0	167.0	73.9	47.3	43.9
16	Badlapur	121	156	179	200	22.0	100	0	200	24.1	36.2	14.2	10.7	6.9	6.4
17	Ambarnath	244	318	366	410	39.0	90	10	200	48.9	73.3	34.3	22.2	14.2	13.2
18	(New Urban Area)	35	204	313	413	3.5	80	20	200	7.0	10.5	7.0	50.7	32.7	30.0
	NAVI MUMBAI	1,310	1,509	1,843	2,159	151.1				262.0	393.0	241.9	59.6	100.3	94.9
19	Navi Mumbai	899	1,008	1,132	1,249	110.0	100	0	200	179.8	269.7	159.7	32.6	37.3	35.2
20	Navi Mumbai excl NMMC	347	391	549	698	34.7	80	20	200	69.4	104.1	69.4	13.2	47.4	44.7
21	NMMC 15 villages	64	110	162	212	6.4	80	20	200	12.8	19.2	12.8	13.8	15.6	15.0
	PANVEL-URAN	155	271	298	323	16.7				30.9	46.4	29.7	35.0	7.9	7.5
22	Panvel	128	241	262	282	14.0	100	0	200	25.6	38.4	24.4	33.8	6.5	6.1
23	Uran	27	31	36	40	2.7	80	20	200	5.3	8.0	5.3	1.3	1.5	1.4
	NERAL-KARJAT REGION	480	412	411	411	48.0				96.0	144.1	96.0	0.1	0.2	0.1
24	Karjat	28	28	29	29	2.8	80	20	200	5.6	8.4	5.6	0.1	0.1	0.1
25	Khopoli	65	66	66	66	6.5	80	20	200	13.1	19.6	13.1	0.1	0.1	0.1
26	Matheran	6	6	6	6	0.6	80	20	200	1.2	1.8	1.2	-	-	-
27	N-K Rural	381	312	311	310	38.1	80	20	200	76.2	114.3	76.2	-	-	-
	PEN-ALIBAG	224	249	352	573	22				45	67	45	12	31	66
28	Alibag	21	21	22	22	2.1	80	20	200	4.2	6.4	4.2	0.1	0.1	0.1
29	Pen	33	38	50	75	3.3	80	20	200	6.6	9.9	6.6	1.5	3.6	7.6
30	Rural	82	68	67	67	8.2	80	20	200	16.4	24.6	16.4	-	-	-
31	(Maha Mumbai SEZ)	88	122	213	409	8.8	80	20	200	17.6	26.4	17.6	10.2	27.3	58.8
	TOTAL MMR	20821	23762	26386	28994	4,332.8				5,492.0	8,316.0	3,983.1	1,011.7	881.2	809.6

Source: Estimated, 2007

Appendix IV-2

Existing and Additional Water Supply Demand in MMR – 2005 to 2021 (mld) (P-3 SCENARIO)

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Present Scenario (2005)			Future Supply Norm (lpcd)	Present Demand (mld)	Present Demand including Industrial and Leakages (mld)	Present gap (2005) mld	Incremental Demand (mld)		
		2005	2011	2016	2021	Supply (mld)	Coverage (%)	Backlog (%)					2005-2011	2011-2016	2016-2021
	GREATER MUMBAI	12,861	14,162	15,246	15,714	3,025.0				3,900.0	5,928.0	2,903.0	477.6	348.9	214.2
1	Island City	3,391	3,719	3,947	4,027		99	1	240				119.6	83.4	29.0
2	Western Suburb	5,628	6,227	6,675	6,981		99	1	240				218.5	163.5	111.6
3	Eastern Suburb	3,843	4,225	4,505	4,707		99	1	240				139.5	102.0	73.6
	WESTERN REGION	1,345	2,180	2,618	3,030	167.1				269.1	403.6	236.5	250.5	131.3	123.5
4	Mira-Bhayander	632	800	939	1,083	101.9	80	20	200	126.5	189.7	87.8	50.3	41.6	43.3
5	Vasai	57	105	127	146	2.5	80	20	200	11.4	17.1	14.6	14.5	6.5	5.8
6	Navghar-Manikpur	132	232	276	316	13.5	80	20	200	26.4	39.6	26.1	29.8	13.4	12.0
7	Nallasopara	210	333	389	439	16.5	80	20	200	41.9	62.9	46.4	37.2	16.7	14.9
8	Virar	143	246	292	334	15.5	80	20	200	28.5	42.8	27.3	31.0	13.9	12.4
9	(included in proposed M Corp)	172	464	595	712	17.2	80	20	200	34.3	51.5	34.3	87.7	39.3	35.1
	NORTH EASTERN REGION	4,445	5,433	6,273	7,132	902.5				889.1	1,333.6	431.1	296.4	252.0	257.7
10	Thane	1,465	1,688	1,884	2,059	362.0	99	1	200	293.0	439.5	77.5	67.0	58.6	52.5
11	(Thane-Bhiwandi Road- Urabn)	54	99	138	174	5.4	80	20	200	10.7	16.1	10.7	13.6	11.7	10.8
12	Bhiwandi-Nizampur	632	775	902	1,009	112.0	92	8	200	126.4	189.7	77.7	42.8	38.3	31.8
13	(Bhiwandi expansion)	47	84	118	145	4.7	80	20	200	9.3	14.0	9.3	11.2	10.2	8.1
14	Ulhasnagar	495	521	543	569	115.0	99	1	200	98.9	148.4	33.4	8.0	6.6	7.6
15	Kalyan-Dombivli	1,353	1,594	1,792	2,021	239.0	99	1	200	270.6	406.0	167.0	72.2	59.3	68.8
16	Badlapur	121	156	184	217	22.0	100	0	200	24.1	36.2	14.2	10.5	8.6	10.0
17	Ambemath	244	317	376	445	39.0	90	10	200	48.9	73.3	34.3	21.7	17.8	20.7
18	(New Urban Area)	35	200	336	494	3.5	80	20	200	7.0	10.5	7.0	49.5	40.8	47.4
	NAVI MUMBAI	1,310	1,649	1,985	2,324	151.1				262.0	393.0	241.9	101.6	101.0	101.6
19	Navi Mumbai	899	1,060	1,184	1,310	110.0	100	0	200	179.8	269.7	159.7	48.2	37.4	37.7
20	Navi Mumbai excl NMMC	347	457	616	776	34.7	80	20	200	69.4	104.1	69.4	33.0	47.7	48.0
21	NMMC 15 villages	64	132	185	238	6.4	80	20	200	12.8	19.2	12.8	20.4	15.9	15.9
	PANVEL-URAN	155	283	309	336	16.7				30.9	46.4	29.7	38.4	7.9	8.0
22	Panvel	128	250	271	293	14.0	100	0	200	25.6	38.4	24.4	36.5	6.5	6.5
23	Uran	27	33	38	43	2.7	80	20	200	5.3	8.0	5.3	1.9	1.5	1.5
	NERAL-KARJAT REGION	480	428	444	456	48.0				96.0	144.1	96.0	0.3	0.1	0.1
24	Karjat	28	29	29	29	2.8	80	20	200	5.6	8.4	5.6	0.1	0.0	0.0
25	Khopoli	65	66	66	66	6.5	80	20	200	13.1	19.6	13.1	0.1	0.0	0.0
26	Matheran	6	6	6	6	0.6	80	20	200	1.2	1.8	1.2	-	-	-
27	N-K Rural	381	328	344	355	38.1	80	20	200	76.2	114.3	76.2	-	-	-
	PEN-ALIBAG	224	252	388	648	22				45	67	45	2	40	77
28	Alibag	21	22	22	22	2.1	80	20	200	4.2	6.4	4.2	0.1	0.0	0.0
29	Pen	33	38	53	83	3.3	80	20	200	6.6	9.9	6.6	1.5	4.5	9.0
30	Rural	82	71	75	77	8.2	80	20	200	16.4	24.6	16.4	-	-	-
31	(Maha Mumbai SEZ)	88	121	239	466	8.8	80	20	201	17.7	26.5	17.7	0.3	35.6	68.4
	TOTAL MMR	20821	24387	27265	29639	4,332.8				5,492.1	8,316.1	3,983.3	1,166.7	881.3	782.6

Source: Estimated, 2007.

Appendix IV-3

Capital Investment Needs for Regional Water Sources in MMR (Rs. Crores)

Name of the Dam / Source	Water storage (million cum)	Available Water (mld)	Unit Cost / million cum for source development (Rs. Crores)	Estimated Cost for development of source (Rs. Crores)	Unit cost /mld for conveyance (Rs. Crores)	Estimated Cost of Conveyance system	Total (Rs. Crores)	Name of the ULBs served
Middle Vaitarna	174.0	476.7	3.3	574.2	0.6	276.5	850.7	MCGM
Pinjal	401.6	1230.0	3.3	1325.1	0.6	713.4	2038.5	MCGM (697mld), Western Region (533mld) (Mira- Bhayander, Vasai, Navghar-Manikpur, Nallasopara, Virar)
Gargai	179.7	452.0	3.3		0.6	262.2	262.2	MCGM
Shai	362.0	940.0	3.3	1194.7	0.6	545.2	1739.9	MCGM
Kalu	401.2	570.0	3.3	1324.1	0.6	330.6	1654.7	MCGM
Susari	57.0	200.0	3.3	188.1	0.6	116.0	304.1	Western Region : (Mira- Bhayander, Vasai, Navghar-Manikpur, Nallasopara, Virar)
Damanganga #		1600.0	3.3		0.6		3500.0	
Poshir	338.9	720.0	3.3	1118.5	0.6	417.6	1536.1	North Eastern Region : Thane-Bhiwandi-Kalyan-Ulhasnagar-Ambernath-Badlapur
Extension of Barvi Dam	270.0	739.7	3.3	891.0	0.6	429.0	1320.0	
Gadhi	38.2	300.0	3.3	126.0	0.6	174.0	300.0	Navi Mumbai-Panvel-Uran-Neral Karjat Region-Pen-Alibag
Balganga	120.7	354.0	3.3	398.2	0.6	205.3	603.5	Navi Mumbai-Panvel-Uran-Neral Karjat Region-Pen-Alibag
Total	2343.3	7582.4		7139.9		3469.8	14109.8	

Notes

- Unit cost for the development of the sources is considered as Rs 20 million (2 crores) for 1 million cum of the water storage (as per Chitale Committee report) However based on Middle Vaitarna cost of construction of dam, this can be assumed as Rs 3.3 Crores/Cu.m
- ii) Unit cost for the conveyance system for 1 mld of the water supply is taken as approx Rs 0.6 Crores(5.8 lakhs) /mld (the average of the unit cost (in millions) of Pinjal water supply scheme, Bhiwandi water supply scheme and Barvi scheme) (source: Chitale Committee report)
- iii) # Cost of Damanganga for 1600 mld of water is considered 3500 Crores for Damanganga-Pinjal linking

Source: Estimated, 2007.

Appendix IV-4

Capital Investment Needs for Water supply Distribution System in MMR (Rs.Crores) - P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Per Capita Cost (Rs.)	Cost for meeting backlog (2005) (Rs.Crores)	Cost for Incremental Demand (Rs.Crores)			Cumulative Capital Cost (Rs.Crores)		
				2005-2011	2011-2016	2016-2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI		19.3	203.4	172.2	144.8	208.2	394.9	539.7
1	Island City	1500	5.1	50.8	43.2	37.0	52.1	99.1	136.2
2	Western Suburb	1500	8.4	92.6	79.9	65.1	94.7	180.9	246.1
3	Eastern Suburb	1500	5.8	59.9	49.1	42.6	61.4	114.8	157.4
	WESTERN REGION		24.1	44.3	27.7	25.0	50.3	96.1	121.1
4	Mira-Bhayander	1000	12.6	11.8	14.7	14.3	14.9	39.1	53.4
5	Vasai	800	0.9	2.4	0.9	0.8	2.6	4.2	5.0
6	Navghar-Manikpur	800	2.1	4.9	2.0	1.6	5.4	8.9	10.5
7	Nallasopara	800	3.4	6.0	2.4	2.0	6.9	11.8	13.8
8	Virar	800	2.3	5.0	2.0	1.7	5.6	9.4	11.0
9	(included in proposed M Corp)	800	2.7	14.3	5.7	4.7	14.9	22.7	27.4
	NORTH EASTERN REGION		12.5	77.7	71.5	63.8	80.9	161.8	225.6
10	Thane	1000	1.5	11.7	20.2	16.5	12.1	33.4	49.9
11	(Thane-Bhiwandi Road- Urabn)	800	0.9	1.9	3.3	2.6	2.1	6.0	8.6
12	Bhiwandi-Nizampur	1000	5.1	12.0	13.4	12.6	13.2	30.4	43.1
13	(Bhiwandi expansion)	800	0.7	2.5	2.8	2.6	2.7	6.1	8.7
14	Ulhasnagar	1000	0.5	2.7	1.7	1.6	2.9	5.0	6.6
15	Kalyan-Dombivli	1000	1.4	24.6	15.8	14.6	25.0	41.7	56.4
16	Badlapur	800	0.0	2.9	1.8	1.7	2.9	4.7	6.4
17	Ambernath	800	2.0	5.9	3.8	3.5	6.4	11.7	15.2
18	(New Urban Area)	800	0.6	13.5	8.7	8.0	13.7	22.8	30.8
	NAVI MUMBAI		6.6	18.1	29.2	27.7	19.7	53.9	81.5
19	Navi Mumbai	1000	0.0	10.9	12.4	11.7	10.9	23.3	35.0
20	Navi Mumbai excl NMMC	800	5.6	3.5	12.6	11.9	4.9	21.7	33.6
21	NMMC 15 villages	800	1.0	3.7	4.2	4.0	3.9	8.9	12.9
	PANVEL-URAN		0.4	9.3	2.1	2.0	9.5	11.9	13.9
22	Panvel	800	0.0	9.0	1.7	1.6	9.0	10.7	12.4
23	Uran	800	0.4	0.3	0.4	0.4	0.4	1.2	1.5
	NERAL-KARJAT REGION		7.7	0.0	0.1	0.0	2.0	7.8	7.8
24	Karjat	800	0.4	0.01	0.03	0.02	0.1	0.5	0.5
25	Khopoli	800	1.0	0.02	0.03	0.02	0.3	1.1	1.1
26	Matheran	800	0.1	-	-	-	0.0	0.1	0.1
27	N-K Rural	800	6.1	-	-	-	1.5	6.1	6.1
	PEN-ALIBAG		3.59	3	8	18	4	15	33
28	Alibag	800	0.3	0.02	0.03	0.02	0.1	0.4	0.4
29	Pen	800	0.5	0.40	0.96	2.01	0.5	1.9	3.9
30	Rural	800	1.3	0.00	0.00	-	0.3	1.3	1.3
31	(Maha Mumbai SEZ)	800	1.41	2.72	7.28	15.68	3.1	11.4	27.1
	TOTAL MMR		74.11	356.0	311.2	281.1	374.5	741.3	1,022.3

Source: Estimated, 2007

Note: 1) As per the discussions with the MJP officials the cost of water supply distribution for councils may be taken as Rs 800 per person, for municipal corporations with a population of around 20 to 30 lakhs, the water supply distribution cost may be considered as Rs 1000 per person and that for metropolis like Mumbai, Delhi etc Rs 1500 per person.
2) 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016.

Appendix IV-5

Capital Investment Needs for Water supply Distribution System in MMR (Rs.Crores) - P-3 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Per Capita Cost (Rs.)	Cost for meeting backlog (2005) (Rs.Crores)	Cost for Incremental Demand (Rs.Crores)			Cumulative Capital Cost (Rs.Crores)		
				2005-2011	2011-2016	2016-2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI		19.3	196.4	143.5	88.1	201.2	359.2	447.2
1	Island City	1500	5.1	49.2	34.3	11.9	50.4	88.5	100.5
2	Western Suburb	1500	8.4	89.8	67.2	45.9	92.0	165.5	211.4
3	Eastern Suburb	1500	5.8	57.4	41.9	30.3	58.8	105.1	135.4
	WESTERN REGION		24.1	70.2	37.8	35.8	76.2	132.0	167.8
4	Mira-Bhayander	1000	12.6	16.8	13.9	14.4	19.9	43.3	57.7
5	Vasai	800	0.9	3.9	1.7	1.5	4.1	6.5	8.0
6	Navghar-Manikpur	800	2.1	8.0	3.6	3.2	8.5	13.6	16.8
7	Nallasopara	800	3.4	9.9	4.4	4.0	10.7	17.7	21.7
8	Virar	800	2.3	8.3	3.7	3.3	8.8	14.3	17.6
9	(included in proposed M Corp)	800	2.7	23.4	10.5	9.4	24.1	36.6	46.0
	NORTH EASTERN REGION		12.5	91.7	78.0	79.4	94.8	182.3	261.7
10	Thane	1000	1.5	22.3	19.5	17.5	22.7	43.3	60.8
11	(Thane-Bhiwandi Road- Urabn)	800	0.9	3.6	3.1	2.9	3.8	7.6	10.5
12	Bhiwandi-Nizampur	1000	5.1	14.3	12.8	10.6	15.5	32.1	42.7
13	(Bhiwandi expansion)	800	0.7	3.0	2.7	2.2	3.2	6.5	8.6
14	Ulhasnagar	1000	0.5	2.7	2.2	2.5	2.8	5.4	7.9
15	Kalyan-Dombivli	1000	1.4	24.1	19.8	22.9	24.4	45.2	68.1
16	Badlapur	800	0.0	2.8	2.3	2.7	2.8	5.1	7.7
17	Ambarnath	800	2.0	5.8	4.8	5.5	6.3	12.5	18.0
18	(New Urban Area)	800	0.6	13.2	10.9	12.6	13.3	24.6	37.3
	NAVI MUMBAI		6.6	30.3	29.4	29.6	31.9	66.3	95.9
19	Navi Mumbai	1000	0.0	16.1	12.5	12.6	16.1	28.5	41.1
20	Navi Mumbai excl NMMC	800	5.6	8.8	12.7	12.8	10.2	27.1	39.9
21	NMMC 15 villages	800	1.0	5.4	4.2	4.2	5.7	10.7	14.9
	PANVEL-URAN		0.4	10.2	2.1	2.1	10.3	12.8	14.9
22	Panvel	800	0.0	9.7	1.7	1.7	9.7	11.5	13.2
23	Uran	800	0.4	0.5	0.4	0.4	0.6	1.3	1.7
	NERAL-KARJAT REGION		7.7	0.1	0.0	0.0	2.0	7.8	7.8
24	Karjat	800	0.4	0.0	0.0	0.0	0.2	0.5	0.5
25	Khopoli	800	1.0	0.0	0.0	0.0	0.3	1.1	1.1
26	Matheran	800	0.1	-	-	-	0.0	0.1	0.1
27	N-K Rural	800	6.1	-	-	-	1.5	6.1	6.1
	PEN-ALIBAG		3.59	1	11	21	1	15	35
28	Alibag	800	0.3	0.0	0.0	0.0	0.1	0.4	0.4
29	Pen	800	0.5	0.4	1.2	2.4	0.5	2.1	4.5
30	Rural	800	1.3	-	-	-	0.3	1.3	1.3
31	(Maha Mumbai SEZ)	800	1.41	0.1	9.4	18.2	0.4	10.9	29.1
	TOTAL MMR		74.11	399.4	301.5	255.7	417.9	775.0	1,030.7

Source: Estimated, 2007.

Note: 1) As per the discussions with the MJP officials the cost of water supply distribution for councils may be taken as Rs 800 per person, for municipal corporations with a population of around 20 to 30 lakhs, the water supply distribution cost may be considered as Rs 1000 per person and that for metropolis like Mumbai, Delhi etc Rs 1500 per person.
2) 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016.

Appendix IV-6

Existing and Additional Sewage Demand in MMR – 2005 to 2021 (mld)- P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Present Scenario (2005)		Population covered (2005)	Population to be covered- Gap (2005)	Present Domestic Gap(2005)(MLD)	Present Gap including Industrial and Demand(MLD)	Incremental Population			Additional Demand(MLD)		
		2005	2011	2016	2021	Coverage (%)	Backlog (%)					2005-2011	2011-2016	2016-2021	2005-2011	2011-2016	2016-2021
	GREATER MUMBAI	12,861	14,162	15,246	16,330			6,588	6,273	1,204	1,831	1,356	1,148	965	396	731	1,012
1	Island City	3,391	3,730	4,018	4,265	69	31	2,340	1,051	202	307	339	288	247	99	183	255
2	Western Suburb	5,628	6,245	6,777	7,212	55	45	3,095	2,532	486	739	617	532	434	180	336	462
3	Eastern Suburb	3,843	4,242	4,570	4,854	30	70	1,153	2,690	516	785	400	327	284	117	212	295
	WESTERN REGION	1,345	1,672	1,945	2,457			83	1,262	202	303	524	310	277	128	203	270
4	Mira-Bhayander	632	750	897	1,040	10	90	63	569	91	137	118	147	143	29	64	99
5	Vasai	57	86	98	108	10	90	6	51	8	12	29	12	10	7	10	12
6	Navghar-Manikpur	132	193	217	237	-	100	-	132	21	32	61	24	20	15	21	26
7	Nallasopara	210	285	316	340	-	100	-	210	34	50	76	30	25	18	26	32
8	Virar	143	206	231	252	10	90	14	128	21	31	63	25	21	15	22	27
9	(included in proposed M Corp)	172	350	421	480	-	100	-	172	27	41	178	71	59	43	61	75
	NORTH EASTERN REGION	4,445	5,427	6,200	6,740			1,060	3,385	542	812	844	766	684	205	392	558
10	Thane	1,465	1,583	1,784	1,949	40	60	586	879	141	211	117	202	165	29	78	118
11	(Thane-Bhiwandi Road- Urabn)	54	77	118	151	-	100	-	54	9	13	23	41	33	6	16	24
12	Bhiwandi-Nizampur	632	752	886	1,012	40	60	253	379	61	91	120	134	126	29	62	92
13	(Bhiwandi expansion)	47	78	113	146	-	100	-	47	7	11	31	35	33	8	16	24
14	Ulhasnagar	495	522	539	556	10	90	49	445	71	107	27	17	16	7	11	15
15	Kalyan-Dombivli	1,353	1,599	1,757	1,903	10	90	135	1,218	195	292	246	158	146	60	98	134
16	Badlapur	121	156	179	200	10	90	12	109	17	26	36	23	21	9	14	19
17	Ambemath	244	318	366	410	10	90	24	220	35	53	74	47	44	18	29	40
18	(New Urban Area)	35	204	313	413	-	100	-	35	6	8	169	109	100	41	68	92
	NAVI MUMBAI	1,310	1,733	2,053	2,159			994	316	51	76	199	334	316	48	130	207
19	Navi Mumbai	899	1,008	1,132	1,249	99	1	890	9	1	2	109	124	117	26	57	85
20	Navi Mumbai excl NMMC	347	391	549	698	30	70	104	243	39	58	44	158	149	11	49	85
21	NMMC 15 villages	64	110	162	212	-	100	-	64	10	15	46	52	50	11	24	36
	PANVEL-URAN	155	221	276	323			13	142	23	34	117	26	25	28	35	41
22	Panvel	128	241	262	282	10	90	13	115	18	28	113	22	20	27	33	38
23	Uran	27	31	36	40	-	100	-	27	4	6	4	5	5	1	2	3
	NERAL-KARJAT REGION	480	485	498	411			-	480	77	115	0.4	0.8	0.5	0.10	0.30	0.42
24	Karjat	28	28	29	29	-	100	-	28	4	7	0.2	0.4	0.3	0.05	0.14	0.22
25	Khopoli	65	66	66	66	-	100	-	65	10	16	0.2	0.4	0.2	0.06	0.15	0.20
26	Matheran	6	6	6	6	-	100	-	6	1	1	0.0	0.0	0.0	0.00	0.00	0.00
27	N-K Rural	381	312	311	310	-	100	-	381	61	91				0.00	0.00	0.00
	PEN-ALIBAG	224	249	352	573			-	224	36	54	39	103	221	10	35	89
28	Alibag	21	21	22	22	-	100	-	21	3	5	0.2	0.4	0.3	0.05	0.15	0.22
29	Pen	33	38	50	75	-	100	-	33	5	8	5	12	25	1	4	10
30	Rural	82	68	67	67	-	100	-	82	13	20				0	0	0
31	(Maha Mumbai SEZ)	88	122	213	409	-	100	-	88	14	21	34	91	196	8	30	78
	TOTAL MMR	20821	23964	26582	28994			8738	12083	2134	3225	3079	2689	2490	815	1525	2177

Appendix IV-7

Existing and Additional Sewage Demand in MMR – 2005 to 2021 (mld) - P-3 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Present Scenario (2005)		Population covered (2005)	Population to be covered- Gap (2005)	Present Domestic Gap(2005)(MLD)	Present Gap including Industrial and Demand(MLD)	Incremental Population			Additional Demand(MLD)		
		2005	2011	2016	2021	Coverage (%)	Backlog (%)					2005-2011	2011-2016	2016-2021	2005-2011	2011-2016	2016-2021
	GREATER MUMBAI	12,861	14,162	15,246	15,714			6,588	6,273	1,204	1,831	1,309	956	587	382	661	833
1	Island City	3,391	3,719	3,947	4,027	69	31	2,340	1,051	202	307	328	229	80	96	162	186
2	Western Suburb	5,628	6,227	6,675	6,981	55	45	3,095	2,532	486	739	599	448	306	175	306	395
3	Eastern Suburb	3,843	4,225	4,505	4,707	30	70	1,153	2,690	516	785	383	280	202	112	193	252
	WESTERN REGION	1,345	1,672	1,945	3,030			83	1,262	202	303	835	438	412	200	305	404
4	Mira-Bhayander	632	800	939	1,083	10	90	63	569	91	137	168	139	144	40	74	108
5	Vasai	57	105	127	146	10	90	6	51	8	12	48	22	19	12	17	21
6	Navghar-Manikpur	132	232	276	316	-	100	-	132	21	32	99	45	40	24	35	44
7	Nallasopara	210	333	389	439	-	100	-	210	34	50	124	56	50	30	43	55
8	Virar	143	246	292	334	10	90	14	128	21	31	103	46	41	25	36	46
9	(included in proposed M Corp)	172	464	595	712	-	100	-	172	27	41	292	131	117	70	102	130
	NORTH EASTERN REGION	4,445	5,427	6,200	7,132			1,060	3,385	542	812	988	840	859	237	439	645
10	Thane	1,465	1,688	1,884	2,059	40	60	586	879	141	211	223	195	175	54	101	143
11	(Thane-Bhiwandi Road- Urabn)	54	99	138	174	-	100	-	54	9	13	45	39	36	11	20	29
12	Bhiwandi-Nizampur	632	775	902	1,009	40	60	253	379	61	91	143	128	106	34	65	90
13	(Bhiwandi expansion)	47	84	118	145	-	100	-	47	7	11	37	34	27	9	17	24
14	Ulhasnagar	495	521	543	569	10	90	49	445	71	107	27	22	25	6	12	18
15	Kalyan-Dombivli	1,353	1,594	1,792	2,021	10	90	135	1,218	195	292	241	198	229	58	105	160
16	Badlapur	121	156	184	217	10	90	12	109	17	26	35	29	33	8	15	23
17	Ambernath	244	317	376	445	10	90	24	220	35	53	72	59	69	17	32	48
18	(New Urban Area)	35	200	336	494	-	100	-	35	6	8	165	136	158	40	72	110
	NAVI MUMBAI	1,310	1,733	2,053	2,324			994	316	51	76	339	337	339	81	162	243
19	Navi Mumbai	899	1,060	1,184	1,310	99	1	890	9	1	2	161	125	126	39	68	99
20	Navi Mumbai excl NMMC	347	457	616	776	30	70	104	243	39	58	110	159	160	26	65	103
21	NMMC 15 villages	64	132	185	238	-	100	-	64	10	15	68	53	53	16	29	42
	PANVEL-URAN	155	221	276	336			13	142	23	34	128	26	27	31	37	43
22	Panvel	128	250	271	293	10	90	13	115	18	28	122	22	22	29	34	40
23	Uran	27	33	38	43	-	100	-	27	4	6	6	5	5	2	3	4
	NERAL-KARJAT REGION	480	485	498	456			-	480	77	115	1	0	0	0.22	0.27	0.32
24	Karjat	28	29	29	29	-	100	-	28	4	7	0.5	0.1	0.1	0.12	0.14	0.17
25	Khopoli	65	66	66	66	-	100	-	65	10	16	0.4	0.1	0.1	0.11	0.13	0.15
26	Matheran	6	6	6	6	-	100	-	6	1	1	-	-	-	-	-	-
27	N-K Rural	381	328	344	355	-	100	-	381	61	91	-	-	-	-	-	-
	PEN-ALIBAG	224	252	388	648			-	224	36	54	38	133	257	9	41	103
28	Alibag	21	22	22	22	-	100	-	21	3	5	0	0	0	0.12	0.15	0.17
29	Pen	33	38	53	83	-	100	-	33	5	8	5	15	30	1	5	12
30	Rural	82	71	75	77	-	100	-	82	13	20	-	-	-	-	-	-
31	(Maha Mumbai SEZ)	88	121	239	466	-	100	-	88	14	21	33	118	227	8	36	91
	TOTAL MMR	20821	23964	26582	29639			8738	12083	2134	3225	3638	2731	2481	941	1646	2272

Appendix IV.8

Capital Investment Needs for Sewage Conveyance and Treatment System in MMR (Rs. Crores) - (P-2 SCENARIO)

Sl.No	Municipal Corporation / Municipal Council	Per Capita Cost (Rs)	Cost for meeting backlog (Rs.Crores)	Cost for Incremental Population (Rs.Crores)			Cumulative Capital Cost (Rs.Crores)		
				2005-2011	2011-2016	2016-2021	2011	2016	2021
	GREATER MUMBAI		4,386.9	462.5	391.6	329.3	1,559.2	5,241.0	5,570.3
1	Island City	3411	1,156.6	115.6	98.3	84.2	404.7	1,370.5	1,454.7
2	Western Suburb	3411	1,919.6	210.6	181.6	148.1	690.5	2,311.8	2,459.9
3	Eastern Suburb	3411	1,310.7	136.3	111.7	97.0	464.0	1,558.7	1,655.7
	WESTERN REGION		315.6	131.1	77.5	69.2	210.0	524.2	593.4
4	Mira-Bhayander	2500	142.3	29.4	36.8	35.7	65.0	208.4	244.2
5	Vasai	2500	12.8	7.4	3.0	2.4	10.6	23.1	25.5
6	Navghar-Manikpur	2500	33.0	15.2	6.1	5.0	23.4	54.3	59.3
7	Nallasopara	2500	52.4	18.9	7.6	6.2	32.0	78.9	85.1
8	Virar	2500	32.1	15.8	6.3	5.2	23.8	54.2	59.4
9	(included in proposed M Corp)	2500	42.9	44.6	17.8	14.8	55.3	105.3	120.0
	NORTH EASTERN REGION		846.3	211.0	191.6	171.1	422.6	1,248.9	1,420.0
10	Thane	2500	219.8	29.4	50.5	41.2	84.3	299.6	340.8
11	(Thane-Bhiwandi Road- Urabn)	2500	13.4	5.8	10.3	8.3	9.2	29.5	37.8
12	Bhiwandi-Nizampur	2500	94.8	29.9	33.5	31.5	53.6	158.3	189.8
13	(Bhiwandi expansion)	2500	11.6	7.9	8.8	8.3	10.8	28.3	36.5
14	Ulhasnagar	2500	111.3	6.8	4.4	4.1	34.7	122.5	126.6
15	Kalyan-Dombivli	2500	304.5	61.5	39.4	36.6	137.7	405.4	442.0
16	Badlapur	2500	27.1	8.9	5.7	5.3	15.7	41.8	47.1
17	Ambarnath	2500	55.0	18.5	11.8	11.0	32.2	85.3	96.3
18	(New Urban Area)	2500	8.8	42.3	27.3	25.0	44.4	78.3	103.3
	NAVI MUMBAI		447.3	67.2	103.7	98.1	179.1	618.3	716.4
19	Navi Mumbai	4122	370.6	44.7	51.2	48.4	137.4	466.5	514.9
20	Navi Mumbai excl NMMC	2500	60.7	11.0	39.5	37.3	26.2	111.2	148.5
21	NMMC 15 villages	2500	16.0	11.5	13.0	12.5	15.5	40.5	53.0
	PANVEL-URAN		35.5	29.2	6.6	6.2	38.1	71.3	77.5
22	Panvel	2500	28.8	28.1	5.4	5.1	35.3	62.3	67.4
23	Uran	2500	6.7	1.1	1.2	1.1	2.7	8.9	10.1
	NERAL-KARJAT REGION		120.0	0.1	0.2	0.1	30.1	120.4	120.5
24	Karjat	2500	7.0	0.0	0.1	0.1	1.8	7.2	7.2
25	Khopoli	2500	16.3	0.1	0.1	0.0	4.1	16.5	16.5
26	Matheran	2500	1.5	-	-	-	0.4	1.5	1.5
27	N-K Rural	2500	95.3	-	-	-	23.8	95.3	95.3
	PEN-ALIBAG		56.1	9.8	25.9	55.4	23.8	91.7	147.1
28	Alibag	2500	5.3	0.0	0.1	0.1	1.4	5.5	5.5
29	Pen	2500	8.3	1.3	3.0	6.3	3.3	12.5	18.8
30	Rural	2500	20.5	-	-	-	5.1	20.5	20.5
31	(Maha Mumbai SEZ)	2500	22.0	8.5	22.8	49.0	14.0	53.3	102.3
	TOTAL MMR		6,207.6	911.0	797.0	729.5	2,462.9	7,915.6	8,645.1

Source: Estimated, 2007.

Note: The total cost of BSDP II is Rs 5570 crores. Out of this Rs 3941 crores is sewerage component and Rs 1625 crores is slum sanitation. This for a total population of 16.33 million works out to Rs.3411 per capita.

Average per capita cost, as calculated from the CDP estimates of 6 municipal corporations/municipal council is about 2435. Hence for the above calculations the unit cost of sewage collection, sewage treatment and disposal is taken as Rs. 2500 per capita for all the other ULBs. With respect to Greater Mumbai and Navi Mumbai the cost is considered as given in CDP.

25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016

Appendix IV.9

Capital Investment Needs for Sewage Conveyance and Treatment System in MMR (Rs. Crores) - (P-3 SCENARIO)

Sl.No	Municipal Corporation / Municipal Council	Per Capita Cost (Rs)	Cost for meeting backlog (Rs.Crores)	Cost for Incremental Population (Rs.Crores)			Cumulative Capital Cost (Rs.Crores)		
				2005-2011	2011-2016	2016-2021	2011	2016	2021
	GREATER MUMBAI		4,386.9	446.6	326.2	200.3	1,543.3	5,159.7	5,360.0
1	Island City	3411	1,156.6	111.8	78.0	27.1	401.0	1,346.3	1,373.5
2	Western Suburb	3411	1,919.6	204.3	152.9	104.3	684.2	2,276.8	2,381.1
3	Eastern Suburb	3411	1,310.7	130.5	95.4	68.8	458.2	1,536.6	1,605.5
	WESTERN REGION		315.6	208.7	109.4	102.9	287.6	633.7	736.6
4	Mira-Bhayander	2500	142.3	42.0	34.7	36.1	77.5	219.0	255.0
5	Vasai	2500	12.8	12.1	5.4	4.8	15.3	30.3	35.1
6	Navghar-Manikpur	2500	33.0	24.9	11.1	10.0	33.1	69.0	79.0
7	Nallasopara	2500	52.4	31.0	13.9	12.4	44.1	97.2	109.7
8	Virar	2500	32.1	25.8	11.6	10.4	33.9	69.5	79.9
9	(included in proposed M Corp)	2500	42.9	73.1	32.8	29.3	83.8	148.8	178.0
	NORTH EASTERN REGION		846.3	247.0	210.0	214.8	458.6	1,303.3	1,518.1
10	Thane	2500	219.8	55.8	48.8	43.8	110.8	324.5	368.2
11	(Thane-Bhiwandi Road- Urabn)	2500	13.4	11.3	9.8	9.0	14.7	34.5	43.5
12	Bhiwandi-Nizampur	2500	94.8	35.6	31.9	26.5	59.4	162.4	188.9
13	(Bhiwandi expansion)	2500	11.6	9.4	8.5	6.8	12.3	29.5	36.3
14	Ulhasnagar	2500	111.3	6.7	5.5	6.4	34.5	123.5	129.8
15	Kalyan-Dombivli	2500	304.5	60.1	49.4	57.3	136.3	414.1	471.4
16	Badlapur	2500	27.1	8.7	7.2	8.3	15.5	43.0	51.4
17	Ambernath	2500	55.0	18.1	14.9	17.2	31.8	87.9	105.1
18	(New Urban Area)	2500	8.8	41.3	34.0	39.5	43.4	84.0	123.5
	NAVI MUMBAI		447.3	110.7	104.4	105.1	222.5	662.4	767.5
19	Navi Mumbai	4122	370.6	66.2	51.4	51.8	158.8	488.2	540.0
20	Navi Mumbai excl NMMC	2500	60.7	27.5	39.8	40.0	42.7	128.0	168.0
21	NMMC 15 villages	2500	16.0	17.0	13.3	13.3	21.0	46.3	59.5
	PANVEL-URAN		35.5	32.0	6.6	6.7	40.8	74.1	80.7
22	Panvel	2500	28.8	30.4	5.4	5.4	37.6	64.6	70.0
23	Uran	2500	6.7	1.6	1.2	1.2	3.2	9.5	10.7
	NERAL-KARJAT REGION		120.0	0.2	0.0	0.1	30.2	120.3	120.4
24	Karjat	2500	7.0	0.1	0.0	0.0	1.9	7.2	7.2
25	Khopoli	2500	16.3	0.1	0.0	0.0	4.2	16.5	16.5
26	Matheran	2500	1.5	-	-	-	0.4	1.5	1.5
27	N-K Rural	2500	95.3	-	-	-	23.8	95.3	95.3
	PEN-ALIBAG		56	10	33	64	24	99	163
28	Alibag	2500	5.3	0.1	0.0	0.0	1.4	5.5	5.5
29	Pen	2500	8.3	1.3	3.8	7.5	3.3	13.3	20.8
30	Rural	2500	20.5	-	-	-	5.1	20.5	20.5
31	(Maha Mumbai SEZ)	2500	22.0	8.3	29.5	56.8	13.8	59.8	116.5
	TOTAL MMR		6,207.6	1,054.9	790.0	694.0	2,606.8	8,052.5	8,746.6

Source: Estimated, 2007.

Note: The total cost of BSDP II is Rs 5570 crores. Out of this Rs 3941 crores is sewerage component and Rs 1625 crores is slum sanitation. This for a total population of 16.33 million works out to Rs.3411 per capita.

Average per capita cost, as calculated from the CDP estimates of 6 municipal corporations/municipal council is about 2435. Hence for the above calculations the unit cost of sewage collection, sewage treatment and disposal is taken as Rs. 2500 per capita for all the other ULBs. With respect to Greater Mumbai and Navi Mumbai the cost is considered as given in CDP.

25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016

Appendix IV.10

Waste Generated and Status of Landfill Sites in MMR

Municipal Corporation/ Council	Population (000) 2005	kg/day/person 2005	Waste generated Mt/d (2005)	Collection & transport practices	Disposal
Greater Mumbai	12861	0.63	8000	13% H to H collection, community bins 83% of waste collected. Advance Locality Management (ALM) Systems, Slum Adoption Schemes and community collection systems.	Three dumping sites (viz Deonar, Mulund, and Gorai). All sites reaching their capacity.
Thane	1465	0.31	450	H to H is about 128 number of Ghantagadis of solid waste, 20% - H-H collection	
Navi Mumbai	899	0.489	440	187 Ghanta gadis of waste – 90%	10 ha. Land exists at Koperkhairane and 47 ha.new allotted at Turbhe.
Kalyan	1353	0.51	686	20% H to H	Land (30ha.) identified. Authorization not yet obtained
Bhiwandi	632	0.56	354	100% H to H through ghantagadis	26 ha land available. Compost plant proposed on 10 ha, remainder kept for the land filling. Authorization awaited.
Ulhasnagar	495	0.55	272	10% H to H collection	47 ha govt land near village Khamba identified. Collector yet to grant the land and give possession.
Mira Bhyander	632	0.49	308	100% H to H through ghantagadis	26 ha land available, acquired from CRZ. MPCB authorization has been obtained
Vasai (Council)	57	0.30	20	100% of 13 tricycles, 4 trucks	
Navagarh Manikpur (Council)	132	0.33	44	60% H to H	2.7 ha govt land acquired but is partially affected by tidal action in a nala that cuts into this land. Alternative 16 ha proposed to be acquired through TDR.
Nallaspora(Council)	210	0.36	75	20-30% H to H	10 ha land is available for dumping.
Virar (Council)	143	0.46	66	40% H-to H, 8 dumpers (2.5-3 T)	Govt. land granted and possession is given by Collector. Awaiting NOC from UDD and MMRDA for CRZ rules and DP. MPCB authorization also pending. Need to identify an alternative site.
Badlapur (Council)	121	0.30	36	5% H-H through two-wheelers	
Ambarnath (Council)	244	0.39	95	10% H to H. Planning collection H to H by autorickshaw	13 ha land already available. MPCB authorization obtained

Municipal Corporation/ Council	Population (000) 2005	kg/day/person 2005	Waste generated Mt/d (2005)	Collection & transport practices	Disposal
Panvel (Council)	128	0.19	24	70% H to H through ghantagadis	Alternative site being developed by CIDCO at Karanjale. CIDCO not yet applied for MPCB authorization. CIDCO considering other alternative sites also.
Uran (Council)	27	0.30	8	No h-H collection,	2 ha. Land is available. Existing dumping site is at Bori pakadi. It is open dumping.
Karjat (Council)	28	0.30	8	80% H-H collection	2 ha. land is available and existing site is situated at Gundage (5 km away from city)
Khapoli (Council)	65	0.30	20	55% H-H collection using 10 handcarts and 1 Ghantagadi	3.25 ha land is available.
Matheran (Council)	6	0.30	5	100% H-H collection,	4.93 ha. Land is available. Compost plant is functional, as well as vermin-composting
Alibag (Council)	21	0.30	6	25% H-H collection using 2 ghantagadis	3.76 ha land is available and it is open dumping
Pen (Council)	33	0.30	10	100% H-H collection through 3 ghantagadis twice a day	2.4 ha land is available.
<p>Notes: H to H means house-to-house. A ghantagadi is a vehicle with a bell.</p>					

Source: Compiled.

Appendix IV.11

Status of Landfill Establishment in the MMR Constituents

S.No	Municipal corporation / Council	Present position	Site identified, MPCB clearance obtained	Site identified, MPCB clearance awaited	No site identified/ site yet to be finalized
1	Greater Mumbai	Three dumping sites (viz Deonar, Mulund, and Gorai). All sites reaching their capacity.			Present land fill sites are having a minimum life (Deonar-8 years , Gorai-2 years, Mulund-3years) to reach its capacity. Site at Kanjurmarg salt-pan lands is identified. Permission yet to be obtained from Salt Commissioner New sites are to be identified
2	Thane	Currently the solid waste is disposed in the dumping grounds, creeks and water bodies,. 300 MTPD biological composting plant is not working due to complaints from local residents.			
3	Navi Mumbai	10 ha. Land exists at Koperkhairane and a new site of 47 ha. is allotted at Turbhe.			New land fill site is constructed and commissioned from May 2005. Additional 400MTPD composting plant and 100MPTD MSW processing plants are under construction. Another site at Turbe (30ha) is identified
	CIDCO	Current site is near Khargar Railway station.	At village Chawl near Taloja MIDC.		
4	Kalyan	Open dumping at Adharwadi		Land (30ha.) is identified at Umbarjde village.	
5	Bhiwandi	Katai village near STP, Tal. Bhiwandi, Dist. Thane		26 ha land available. Compost plant proposed on 10 ha, Remaining is disposed on to land filling.	
6	Ulhasnagar	At present two disposal sites each with 3 acres are in operation at Rana Trading, Ulhasnagar -2, and the second at Khad machine, Ulhasnagar -3,			47 ha govt land near village Khamba identified. Collector yet to grant the land and give possession.
7	Mira Bhyander		26 ha land available, acquired from CRZ. MPCB authorization has been obtained		
8	Vasai (Council)	Pachubunder		Council Survey .No.30A, 31 & 32, Village . Gokhivare, Vasai	
9	Navghar Manikpur (Council)	At present MSW are disposed off at Survey .No. 32A- 1/A1/A1, in Village Sopara, Vasai Taluka			2.7 ha Govt land acquired but is partially affected by tidal action in a nala that cuts into this land. Alternative 16 ha proposed to be acquired through TDR.
10	Nallasapura (Council)	Current disposal site is at S.No. 55A, Navgarh (E), Taluka. Vasai, Dist. Thane		25.66 Ha of land in Sur.No.30A, 31 & 32, at	

S.No	Municipal corporation / Council	Present position	Site identified, MPCB clearance obtained	Site identified, MPCB clearance awaited	No site identified/ site yet to be finalized
				Village. Gokhivare, Vasai, Dist. Thane	
11	Virar (Council)	Current disposal site is at Survey.No.1A/1, Village Dongre (old Narangi), Taluka Vasai, Dist. Thane.	Survey. No. 63, Village. Dongre, Taluka. Vasai. And another site at survey no S.No.156 to 162,Vill-Chikhhal-Dongre	Applied for establishing a combined site for Vasai, Virar and Nalasapora. Govt. land granted and possession is given by Collector. Awaiting NOC from UDD and MMRDA for CRZ rules and DP. MPCB authorization awaited.	
12	Badlapur (Council)	Land filling at Vadavali Survey No. 102		Survey nos 188 and 216 at village Waliwali (14ha) identified.	
13	Ambarnath (Council)	Out of 75 MT of waste, 25 MT is processed By Vermiculture at Sur. No. 132, and the balance . 50 MTT/M is disposed at Gut No. 73.	13ha land identified at site Sr No.62 Bawapada	13ha land identified at Chikhhaloli village survey no. 132. NOC needs to be obtained.	
14	Panvel (Council)	Present disposal site is located at Village Karagale, in Panvel council.	2 acres of land at village Chawl, near Taloja MIDC is acquired, and work is under progress.		Alternative site being developed by CIDCO at Ghoatchala. CIDCO not yet applied for MPCB authorization. CIDCO considering other alternative sites also.
15	Uran (Council)	2 ha. Land is available. Existing dumping site is at Boripakadi.			
16	Karjat (Council)	2 ha.land is available and existing site is situated at Gundage (5 km away from city)			
17	Khapoli (Council)	Of the Total MSW 15MTPD, 3MTPD is disposed in vermin composting and remaining is disposed off on to the land filling sites located at Shilphata			New Site of 5 acres at Village Mill Is available for disposal with in the municipal council premises.
18	Matheran (Council)	Plot no.114,Matheran,Talulka, Karjat and a vermi composting plant is also in operation.			
19	Alibag (Council)	Near Raigad Bazar in Alibag Town		Village Bhadane, Group Grampanchayat Khanav, Alibag	
20	Pen (Council)	At the bank of Bhogawati River and one composting plant is also proposed,			

Source: Compiled.

Appendix IV.12

Existing and Estimated Municipal Solid Waste Generated and Land Fill Area in MMR (2005 to 2021) - P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Norms of Waste Generated (kg)				Present Scenario (2005)			Waste Generated (tpd)			Cumulative Land fill Demand (Ha)			
		2005	2011	2016	2021	2005	2011	2016	2021	Present Waste Generated (tpd) - 2005	H to H Coverage (%)	Present Demand of land fill - 2005 (Ha)	2011	2016	2021	2005	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	12861	14162	15246	16330					7893		76.00	9263	10391	11431	76.00	169.00	283.00	397.00
1	Island City	3391	3730	4018	4265	0.60	0.64	0.67	0.70	2034	About 13% through		2375	2690	2985				
2	Western Suburb	5628	6245	6777	7212	0.65	0.68	0.70	0.70	3630	H to H and 83%		4276	4744	5048				
3	Eastern Suburb	3843	4242	4570	4854	0.58	0.62	0.65	0.70	2229	through Bins		2612	2957	3398				
	WESTERN REGION	1345	1672	1945	2457					555		5.69	742	866	978	5.68	14.90	26.13	37.62
4	Mira-Bhayander	632	750	897	1040	0.49	0.49	0.49	0.49	310	100	3.14	367	440	510	3.14	8.38	14.73	21.29
5	Vasai	57	86	98	108	0.30	0.30	0.30	0.30	17	10	0.17	26	29	32	0.17	0.46	0.80	1.15
6	Navghar-Manikpur	132	193	217	237	0.33	0.33	0.33	0.33	44	60	0.44	64	72	78	0.44	1.19	2.10	3.02
7	Nallasopara	210	285	316	340	0.36	0.36	0.36	0.36	75	30	0.75	103	114	123	0.75	1.94	3.38	4.85
8	Virar	143	206	231	252	0.46	0.46	0.46	0.46	66	10	0.68	95	106	116	0.68	1.88	3.33	4.81
9	(included in proposed M Corp)	172	350	421	480	0.25	0.25	0.25	0.25	43	0	0.50	88	105	120	0.49	1.05	1.80	2.50
	NORTH EASTERN REGION	4445	5427	6200	6740					2230		22.12	2586	2923	3223	22.12	59.63	96.15	137.50
10	Thane	1465	1583	1784	1949	0.55	0.55	0.55	0.55	806	20	7.74	870	981	1072	7.74	18.75	33.00	47.00
11	(Thane-Bhiwandi Road- Urabn)	54	77	118	151	0.25	0.25	0.25	0.25	13	0	0.16	19	30	38	0.16	5.00	9.00	13.00
12	Bhiwandi-Nizampur	632	752	886	1012	0.49	0.49	0.49	0.49	310	100	3.45	368	434	496	3.45	9.20	16.04	23.04
13	(Bhiwandi expansion)	47	78	113	146	0.25	0.25	0.25	0.25	12	0	0.14	20	28	37	0.14	0.40	0.76	1.12
14	Ulhasnagar	495	522	539	556	0.55	0.55	0.55	0.55	272	10	2.54	287	297	306	2.54	5.85	9.87	13.94
15	Kalyan-Dombivli	1353	1599	1757	1903	0.50	0.50	0.50	0.50	677	20	6.51	800	878	952	6.51	15.85	27.16	38.69
16	Badlapur	121	156	179	200	0.30	0.30	0.30	0.30	36		0.37	47	54	60	0.37	0.98	1.73	2.49
17	Ambarnath	244	318	366	410	0.39	0.39	0.39	0.39	95	10	0.96	124	143	160	0.96	2.51	4.39	6.32
18	(New Urban Area)	35	204	313	413	0.25	0.25	0.25	0.25	9	0	0.25	51	78	103	0.25	1.09	2.30	3.60
	NAVI MUMBAI	1310	1733	2053	2159					624		6.63	783	994	1222	6.63	16.24	28.08	40.14
19	Navi Mumbai	899	1008	1132	1249	0.58	0.65	0.72	0.80	521	90	5.13	658	816	995	5.13	13.01	22.53	32.24
20	Navi Mumbai excl NMMC	347	391	549	698	0.25	0.25	0.25	0.25	87	0	1.00	98	137	175	1.00	2.23	3.80	5.30
21	NMMC 15 villages	64	110	162	212	0.25	0.25	0.25	0.25	16	0	0.50	28	41	53	0.50	1.00	1.75	2.60
	PANVEL-URAN	155	221	276	323					34		0.36	69	89	97	0.36	1.14	1.94	2.76
22	Panvel	128	241	262	282	0.20	0.25	0.30	0.30	26	70	0.28	60	79	85	0.28	0.93	1.58	2.23
23	Uran	27	31	36	40	0.30	0.30	0.30	0.30	8	0	0.08	9	11	12	0.08	0.21	0.37	0.53
	NERAL-KARJAT REGION	480	485	498	411					125		1.34	108	108	108	1.34	2.34	3.49	4.36
24	Karjat	28	28	29	29	0.30	0.30	0.30	0.30	8	80	0.08	8	9	9	0.08	0.18	0.31	0.44
25	Khopoli	65	66	66	66	0.30	0.30	0.30	0.30	20	55	0.18	20	20	20	0.18	0.42	0.70	0.99
26	Matheran	6	6	6	6	0.30	0.30	0.30	0.30	2	100	0.02	2	2	2	0.02	0.04	0.06	0.08
27	N-K Rural	381	312	311	310	0.25	0.25	0.25	0.25	95	0	1.06	78	78	78	1.06	1.70	2.41	2.84
	PEN-ALIBAG	224	249	352	573					59		1	65	92	148	1	3	6	9
28	Alibag	21	21	22	22	0.30	0.30	0.30	0.30	6	25	0.06	6	7	7	0.06	0.13	0.22	0.31
29	Pen	33	38	50	75	0.30	0.30	0.30	0.30	10	100	0.22	11	15	23	0.22	1.13	2.19	3.32
30	Rural	82	68	67	67	0.25	0.25	0.25	0.25	21	0	0.25	17	17	17	0.25	0.89	1.80	2.80
31	Maha Mumbai SEZ	88	122	213	409	0.25	0.25	0.25	0.25	22	0	0.25	31	53	102	0.25	0.73	1.41	2.27
	TOTAL MMR	20821	23950	26570	28994					11519		113	13617	15462	17207	112.91	266.14	444.42	628.09

Source: Estimated, 2007.



Appendix IV.13

Existing and Estimated Municipal Solid Waste Generated and Land Fill Area in MMR (2005 to 2021) - P-3 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Norms of Waste Generated (kg)				Present Scenario (2005)			Waste Generated (tpd)			Cumulative Land fill Demand (Ha)			
		2005	2011	2016	2021	2005	2011	2016	2021	Present Waste Generated (tpd) - 2005	H to H Coverage (%)	Present Demand of land fill - 2005 (Ha)	2011	2016	2021	2005	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	12861	14170	15127	15714					7893		76.00	9233	10230	11000	76.00	169.00	283.00	397.00
1	Island City	3391	3719	3947	4027	0.60	0.64	0.67	0.70	2034	About 13% through H to H and 83%		2368	2642	2819				
2	Western Suburb	5628	6227	6675	6981	0.65	0.68	0.70	0.70	3630			4263	4672	4886				
3	Eastern Suburb	3843	4225	4505	4707	0.58	0.62	0.65	0.70	2229			2601	2915	3295				
	WESTERN REGION	1345	2180	2618	3030					555		5.69	849	1013	1168	5.53	14.90	26.13	34.91
4	Mira-Bhayander	632	800	939	1083	0.49	0.49	0.49	0.49	310	100	3.14	392	460	531	3.14	8.38	14.73	21.29
5	Vasai	57	105	127	146	0.30	0.30	0.30	0.30	17	10	0.17	32	38	44	0.02	0.46	0.80	1.15
6	Navghar-Manikpur	132	232	276	316	0.33	0.33	0.33	0.33	44	60	0.44	76	91	104	0.44	1.19	2.10	0.30
7	Nallasopara	210	333	389	439	0.36	0.36	0.36	0.36	75	30	0.75	120	140	158	0.75	1.94	3.38	4.85
8	Virar	143	246	292	334	0.46	0.46	0.46	0.46	66	10	0.68	113	134	154	0.68	1.88	3.33	4.81
9	(included in proposed M Corp)	172	464	595	712	0.25	0.25	0.25	0.25	43	0	0.50	116	149	178	0.49	1.05	1.80	2.50
	NORTH EASTERN REGION	4445	5433	6273	7132					2230		22.12	2658	3023	3392	22.12	59.63	96.15	137.50
10	Thane	1465	1688	1884	2059	0.55	0.55	0.55	0.55	806	20	7.74	929	1036	1132	7.74	18.75	33.00	47.00
11	(Thane-Bhiwandi Road- Urabn)	54	99	138	174	0.25	0.25	0.25	0.25	13	0	0.16	25	35	44	0.16	5.00	9.00	1.30
12	Bhiwandi-Nizampur	632	775	902	1009	0.49	0.49	0.49	0.49	310	100	3.45	380	442	494	3.45	9.20	16.04	23.04
13	(Bhiwandi expansion)	47	84	118	145	0.25	0.25	0.25	0.25	12	0	0.14	21	30	36	0.14	0.40	0.76	1.12
14	Ulhasnagar	495	521	543	569	0.55	0.55	0.55	0.55	272	10	2.54	287	299	313	2.54	5.85	9.87	13.94
15	Kalyan-Dombivli	1353	1594	1792	2021	0.50	0.50	0.50	0.50	677	20	6.51	797	896	1010	6.51	15.85	27.16	38.69
16	Badlapur	121	156	184	217	0.30	0.30	0.30	0.30	36		0.37	47	55	65	0.37	0.98	1.73	2.49
17	Ambarnath	244	317	376	445	0.39	0.39	0.39	0.39	95	10	0.96	123	147	174	0.96	2.51	4.39	6.32
18	(New Urban Area)	35	200	336	494	0.25	0.25	0.25	0.25	9	0	0.25	50	84	124	0.25	1.09	2.30	3.60
	NAVI MUMBAI	1310	1649	1985	2324					624		6.63	839	1054	1297	6.63	16.24	28.08	40.14
19	Navi Mumbai	899	1060	1184	1310	0.58	0.65	0.72	0.80	521	90	5.13	692	854	1043	5.13	13.01	22.53	32.24
20	Navi Mumbai excl NMMC	347	457	616	776	0.25	0.25	0.25	0.25	87	0	1.00	114	154	194	1.00	2.23	3.80	5.30
21	NMMC 15 villages	64	132	185	238	0.25	0.25	0.25	0.25	16	0	0.50	33	46	60	0.50	1.00	1.75	2.60
	PANVEL-URAN	155	283	309	336					34		0.36	72	93	101	0.36	1.14	1.94	2.76
22	Panvel	128	250	271	293	0.20	0.25	0.30	0.30	26	70	0.28	62	81	88	0.28	0.93	1.58	2.23
23	Uran	27	33	38	43	0.30	0.30	0.30	0.30	8	0	0.08	10	11	13	0.08	0.21	0.37	0.53
	NERAL-KARJAT REGION	480	428	444	456					125		1.34	112	116	119	1.34	2.34	3.49	4.36
24	Karjat	28	29	29	29	0.30	0.30	0.30	0.30	8	80	0.08	9	9	9	0.08	0.18	0.31	0.44
25	Khopoli	65	66	66	66	0.30	0.30	0.30	0.30	20	55	0.18	20	20	20	0.18	0.42	0.70	0.99
26	Matheran	6	6	6	6	0.30	0.30	0.30	0.30	2	100	0.02	2	2	2	0.02	0.04	0.06	0.08
27	N-K Rural	381	328	344	355	0.25	0.25	0.25	0.25	95	0	1.06	82	86	89	1.06	1.70	2.41	2.84
	PEN-ALIBAG	224	252	388	648					37		1	66	101	167	0.84	3.18	6.24	9.55
28	Alibag	21	22	22	22	0.30	0.30	0.30	0.30	6	25	0.06	7	7	7	0.06	0.13	0.22	0.31
29	Pen	33	38	53	83	0.30	0.30	0.30	0.30	10	100	0.22	11	16	25	0.22	1.13	2.19	3.32
30	Rural	82	71	75	77	0.25	0.25	0.25	0.25	21	0	0.25	18	19	19	0.25	0.89	1.80	2.80
31	Maha Mumbai SEZ	88	121	239	466	0.25	0.25	0.25	0.25	22	0	0.25	30	60	117	0.31	1.02	2.02	3.11
	TOTAL MMR	20821	24395	27145	29639					11497		113	13830	15629	17243	112.81	266.43	445.03	626.22

Source: Estimated, 2007.

Appendix IV.14

Status of Bio-medical and Hazardous waste at each ULB in MMR, 2005

S.No	Municipal corporation / Council	Biomedical waste		Hazardous / Industrial waste(MT/year)	
		Quantity	Disposal and projects/plans proposed	Quantity MT/Year	Disposal and projects/plans proposed
1	Greater Mumbai	10MTPD ¹	3MT is disposed at Taloja and the plant at Sheveeri is not in operation.	284700	113150 is secured disposable 156950 is recyclable and 14600 is incinerable
2	Thane	800Kg ²	Two incinerator facilities are available one at Shivaji hospital and other at Palghar	730	183 is disposed off to secured disposable site and 511 is recyclable and 36 incinerable.
3	Navi Mumbai	860kg	Incinerator facility at Taloja with 200kg/Hr capacity	111996	47047 is disposed off to secured disposable sites, 13958 is recyclable and 50991 is incinerable
	CIDCO	615Kg	Common BMW plant operated by M/s. PRS Enterprises developed by KDMC on the BOOT basis. The capacity of incinerator is 90 Kg/hour.	9537	Earlier the hazardous wastes are disposed off on to MIDC area spread across the region. At present all the dumping grounds are closed and about 1500MT of waste is dumped in Taloja. At Mahape another secured disposal filling site with Physical and chemical treatment facilities with 25000MT is available
4	Kalyan	65Kg	Common BMW plant operated by M/s. PRS Enterprises developed by KDMC on the BOOT basis. The capacity of incinerator is 90 Kg/hour.		
5	Bhiwandi	80Kg	Common BMW plant operated by M/s. PRS Enterprises developed by KDMC on the BOOT basis. The capacity of incinerator is 90 Kg/hour.		
6	Ulhasnagar	30Kg	Common treatment facility by M/s. PRS Enterprises developed by KDMC on BOOT basis, with a capacity of 90kg/hr is available.		
7	Mira Bhyander	25Kg	Common treatment facility by M/s. PRS Enterprises developed by KDMC on BOOT basis, with a capacity of 90kg/hr is available.		
8	Vasai	65Kg	Due to non availability of space in Mira-Bhayander, Vasai, Virar, Nallasopara and	142MT	The hazardous waste generated in the region is disposed off on to the common hazardous waste disposal and treatment Plants at MWM
9	Navghar	42Kg			

¹ Out of 10 MPTD, 3MTPD is generated from Government Medical institutions and rest is from private institutions.

² Out of 800 Kg/day 185kg/day is from Government Medical institutions and rest is from private institutions.

S.No	Municipal corporation / Council	Biomedical waste		Hazardous / Industrial waste(MT/year)	
		Quantity	Disposal and projects/plans proposed	Quantity MT/Year	Disposal and projects/plans proposed
	Manikpur		Navghar – Manikpur, it is not possible to develop common facilities at these towns. M.P.C. Board facilitated all the healthcare units in the region to join facilities the common facility at Thane.		Taloja, TTC, Bayer and Clariant.
10	Nallasapura	-			
11	Virar	29Kg			
12	Badlapur	27Kg	Common treatment facility by M/s. PRS Enterprises developed by KDMC on BOOT basis, with a capacity of 90kg/hr is available.		
13	Ambernath		Common treatment facility by M/s. PRS Enterprises developed by KDMC on BOOT basis, with a capacity of 90kg/hr is available.	184555	103450 is disposed to secured disposable sites and 59027 is recyclable and 22078is incinerable
14	Panvel	350kg	Deep burial facility is available. Which is permitted under BMSWD rules 2000		
15	Uran	-			
16	Karjat	-			
17	Khapoli	-			
18	Matheran	2-5 kg			
19	Alibag	-			
20	Pen				

Source: Compiled, 2007.

Appendix IV.15

Existing Sceanrio and Estimated Bio-Medical Solid Waste Generated in MMR – 2005 to 2021- P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Adopted Norms of Bio medical Waste Generation (g/Capita/day)				Present Scenario (2005)		Bio Medical Waste Generated (tpd)			Demand for Incenerator		
		2005	2011	2016	2021	2005	2011	2016	2021	Present Bio Medical Waste Generated (tpd) - 2005	Present Collection coverage	2011	2016	2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	12861	14217	15365	16330					10	0	12.09	14.07	16.11			
1	Island City	3391	3,730	4,018	4265	0.78	0.85	0.92	0.99	2.64		3.17	3.68	4.21	One additional incenerator of 200kg/hr capacity is required to meet the backlog. Two Additional incenerators are required to meet the future demands		
2	Western Suburb	5628	6,245	6,777	7212	0.78	0.85	0.92	0.99	4.38	Out of 10t, 3T is disposed at Talaja	5.31	6.21	7.12			
3	Eastern Suburb	3843	4,242	4,570	4854	0.78	0.85	0.92	0.99	2.99		3.61	4.19	4.79			
	WESTERN REGION	1345	1870	2180	2457					0.16	0	0.24	0.31	0.37			
4	Mira-Bhayander	632	750	897	1,040	0.12	0.13	0.14	0.15	0.08		0.10	0.13	0.16	One incenerator of 200kg/hr capacity is required to meet the backlog as well as the future demands. This Plant will serve the entire western region.		
5	Vasai	57	86	98	108	0.12	0.13	0.14	0.15	0.01		0.01	0.01	0.02			
6	Navghar-Manikpur	132	193	217	237	0.12	0.13	0.14	0.15	0.02	Common Incenerator tratment Plant is available at KDMC	0.03	0.03	0.04			
7	Nallasopara	210	285	316	340	0.12	0.13	0.14	0.15	0.03		0.04	0.04	0.05			
8	Virar	143	206	231	252	0.12	0.13	0.14	0.15	0.02		0.03	0.03	0.04			
9	(included in proposed M Corp)	172	350	421	480	0.12	0.13	0.14	0.15	0.02		0.05	0.06	0.07			
	NORTH EASTERN REGION	4445	5289	6056	6740					1.78		0	2.31	2.85	3.42		
10	Thane	1,465	1,583	1,784	1,949	0.4	0.44	0.47	0.51	0.59	50Kg/hour Plant is available	0.69	0.84	0.99	One additional incenerator of 200kg/hr capacity is required to meet the demands of the Thane-Bhiwandi complex region.		
11	(Thane-Bhiwandi Road- Urabr)	54	77	118	151	0.4	0.44	0.47	0.51	0.02	No Inceneration Facility	0.03	0.06	0.08			
12	Bhiwandi-Nizampur	632	752	886	1,012	0.4	0.44	0.47	0.51	0.22	Sharing Common inenerator at Kalyan Dombivili	0.33	0.42	0.51			
13	(Bhiwandi expansion)	47	78	113	146	0.4	0.44	0.47	0.51	0.02	0	0.03	0.05	0.07	Except Kalyan Dombivili rest of the ULB are sharing the common facility and an additional incenerator plant is required to meet the demands of Kalyan-Ulhasnaga-Ambemath - Badlapur Coplex		
14	Ulhasnagar	495	522	539	556	0.4	0.44	0.47	0.51	0.20	No Disposal Facilities	0.23	0.25	0.28			
15	Kalyan-Dombivili	1,353	1,599	1,757	1,903	0.4	0.44	0.47	0.51	0.54	Sharing Common inenerator at Kalyan Dombivili	0.70	0.83	0.97			
16	Badlapur	121	156	179	200	0.4	0.44	0.47	0.51	0.05	Sharing Common inenerator at Kalyan Dombivili	0.07	0.08	0.10			
17	Ambemath	244	318	366	410	0.4	0.44	0.47	0.51	0.10	Sharing Common inenerator at Kalyan Dombivili	0.14	0.17	0.21			
18	(New Urban Area)	35	204	313	413	0.4	0.44	0.47	0.51	0.01	No Disposal Facilities	0.09	0.15	0.21			
	NAVI MUMBAI	1310	1509	1843	2159					0.92	0	1.15	1.52	1.92			
19	Navi Mumbai	899	1,008	1,132	1,249	0.7	0.77	0.82	0.89	0.63	200kg/Hr incenerator is available at Talaja.	0.77	0.93	1.11	One additional incenerator of 200kg/hr capacity is required to meet the demands of the Navimumbai CIDCO complex region.		
20	Navi Mumbai excl NMMC	347	391	549	698	0.7	0.77	0.82	0.89	0.24	Common Incenerator developed by KDMC	0.30	0.45	0.62			
21	NMMC 15 villages	64	110	162	212	0.7	0.77	0.82	0.89	0.04	No Disposal Facility	0.08	0.13	0.19			
	PANVEL-URAN	155	271	298	323					0.11	0	0.21	0.25	0.29			
22	Panvel	128	241	262	282	0.7	0.77	0.82	0.89	0.09	No Incinerator facility	0.18	0.22	0.25	As the waste generated is not significant, it is suggested medical unit should take care of their waste disposal through local measures.		
23	Uran	27	31	36	40	0.7	0.77	0.82	0.89	0.02	No Incinerator facility	0.02	0.03	0.04			
	NERAL-KARJAT REGION	480	412	411	411					0.06	0	0.05	0.06	0.06			
24	Karjat	28	28	29	29	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.004	0.004	0.004	As the waste generated is not significant, it is suggested medical unit should take care of their waste disposal through local measures.		
25	Khopoli	65	66	66	66	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.009	0.009	0.010			
26	Matheran	6	6	6	6	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.001	0.001	0.001			
27	N-K Rural	381	312	311	310	0.12	0.13	0.14	0.15	0.05	No Incinerator facility	0.041	0.044	0.047			
	PEN-ALIBAG	224	249	352	573					0.03	0	0.03	0.05	0.09			
28	Alibag	21	21	22	22	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.003	0.003	0.003	As the waste generated is not significant, it is suggested medical unit should take care of their waste disposal through local measures.		
29	Pen	33	38	50	75	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.005	0.007	0.011			
30	Rural	82	68	67	67	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.009	0.009	0.010			
31	Maha Mumbai SEZ	88	122	213	409	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.016	0.030	0.062			
	TOTAL MMR	20821	23817	26505	28994					13.05	0	16.09	19.11	22.26			

Source: Estimated, 2007.



Appendix IV.16

Existing Scenario and Estimated Bio-Medical Solid Waste Generated in MMR – 2005 to 2021- P-3 SCENARIO

Total Projected Population (thousand)				Adopted Norms of Bio medical Waste Generation (g/Capita/day)				Present Scenario (2005)		Bio Medical Waste Generated (tpd)			Demand for Incenerator		
2005	2011	2016	2021	2005	2011	2016	2021	Present Bio Medical Waste Generated (tpd) - 2005	Present Collection coverage	2011	2016	2021	Upto 2011	Upto 2016	Upto 2021
12861	14170	15127	15714					10.0	0	12	14	16			
3,391	3,719	3,947	4,027	0.78	0.85	0.92	0.99	2.64		3.16	3.62	3.97	One additional incenerator of 200kg/hr capacity is required to meet the backlog.		
5,628	6,227	6,675	6,981	0.78	0.85	0.92	0.99	4.38	Out of 10t, 3T is disposed at Taloja	5.29	6.11	6.89	Two Additional incinerators are required to meet the future demands		
3,843	4,225	4,505	4,707	0.78	0.85	0.92	0.99	2.99		3.59	4.13	4.64			
1345	2180	2618	3030					0.16	0	0.29	0.37	0.46			
632	800	939	1083	0.12	0.13	0.14	0.15	0.076		0.10	0.13	0.16			
57	105	127	146	0.12	0.13	0.14	0.15	0.01		0.01	0.02	0.02	One incenerator of 200kg/hr capacity is required to meet the backlog as well as the future demands. This Plant will serve the entire western region.		
132	232	276	316	0.12	0.13	0.14	0.15	0.02	Common Incenerator treatment Plant is available at KDMC	0.03	0.04	0.05			
210	333	389	439	0.12	0.13	0.14	0.15	0.03		0.04	0.05	0.07			
143	246	292	334	0.12	0.13	0.14	0.15	0.02		0.03	0.04	0.05			
172	464	595	712	0.12	0.13	0.14	0.15	0.02		0.06	0.08	0.11			
4445	5433	6273	7132					1.78	0	2.38	2.96	3.62			
1465	1688	1884	2059	0.4	0.44	0.47	0.51	0.59	50Kg /hour Plant is available	0.74	0.89	1.05			
54	99	138	174	0.4	0.44	0.47	0.51	0.02	No Incineration Facility	0.04	0.07	0.09	One additional incenerator of 200kg/hr capacity is required to the demands of the Thane-Bhiwandi complex region.		
632	775	902	1009	0.4	0.44	0.47	0.51	0.25	Sharing Common incenerator at Kalyan Dombivli	0.34	0.43	0.51			
47	84	118	145	0.4	0.44	0.47	0.51	0.02	0	0.04	0.06	0.07			
495	521	543	569	0.4	0.44	0.47	0.51	0.20	No Disposal Facilities	0.23	0.26	0.25			
1353	1594	1792	2021	0.4	0.44	0.47	0.51	0.54	Sharing Common incenerator at Kalyan Dombivli	0.70	0.84	1.03	Except Kalyan Dombivli rest of the ULB are sharing the common facility and an additional incenerator plant is required to meet the demands of Kalyan-Ulhasnaga-Ambemath -Badiapur Coplex		
121	156	184	217	0.4	0.44	0.47	0.51	0.05	Sharing Common incenerator at Kalyan Dombivli	0.07	0.09	0.11			
244	317	376	445	0.4	0.44	0.47	0.51	0.10	Sharing Common incenerator at Kalyan Dombivli	0.14	0.18	0.23			
35	200	336	494	0.4	0.44	0.47	0.51	0.01	No Disposal Facilities	0.09	0.16	0.25			
1310	1649	1985	2324					0.92	0	1.26	1.64	2.06			
899	1060	1184	1310	0.7	0.77	0.82	0.89	0.63	200kg/Hr incenerator is available at Taloja.	0.81	0.98	1.16			
347	457	616	776	0.7	0.77	0.82	0.89	0.24	Common Incenerator developed by KDMC	0.35	0.51	0.69	One additional incenerator of 200kg/hr capacity is required to meet the demands of the Navimumbai CIDCO complex region.		
64	132	185	238	0.7	0.77	0.82	0.89	0.04	No Disposal Facility	0.10	0.15	0.21			
155	283	309	336					0.11	0	0.22	0.25	0.30			
128	250	271	293	0.7	0.77	0.82	0.89	0.09	No Incinerator facility	0.19	0.22	0.26			
27	33	38	43	0.7	0.77	0.82	0.89	0.02	No Incinerator facility	0.03	0.03	0.04			
480	428	444	456					0.06	0	0.06	0.06	0.07			
28	29	29	29	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.004	0.004	0.004			
65	66	66	66	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.009	0.009	0.010	As the waste generated is not significant. It is suggested medical unit should take care of their waste disposal through local measures.		
6	6	6	6	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.001	0.001	0.001			
381	328	344	355	0.12	0.13	0.14	0.15	0.05	No Incinerator facility	0.043	0.049	0.054			
224	252	388	648					0.03		0.033	0.055	0.098			
21	22	22	22	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.003	0.003	0.003			
33	38	53	83	0.12	0.13	0.14	0.15	0.00	No Incinerator facility	0.005	0.007	0.013	As the waste generated is not significant. It is suggested medical unit should take care of their waste disposal through local measures.		
82	71	75	77	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.009	0.011	0.012			
88	121	239	466	0.12	0.13	0.14	0.15	0.01	No Incinerator facility	0.016	0.034	0.071			
20821	24395	27145	29639					13.05		16.28	19.19	22.12			

Source: Estimated, 2007.

Appendix IV.17

Capital Investment Needs for Solid Waste Management in MMR (Rs. Crores) - P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Cumulative Primary Collection Cost (Rs.Crores)			Cumulative Secondary Collection Cost (Rs.Crores)			Cumulative Disposal & Composting Cost + IEC (Rs.Crores)			Total Cost Including Vehicle Machinery for Collection and Disposal (Rs.Crores)		
		Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	167	173	180	121	121	121	23	23	23	310	317	323
1	Island City												
2	Western Suburb												
3	Eastern Suburb												
	WESTERN REGION	18	20	21	17	17	17	18	18	18	53	55	56
4	Mira-Bhayander	10.7	11.7	12.6	8.5	8.5	8.5	5.7	5.7	5.7	24.9	25.9	26.8
5	Vasai	0.8	0.8	0.9	1.1	1.1	1.1	1.7	1.7	1.7	3.6	3.6	3.7
6	Navghar-Manikpur	1.1	1.3	1.4	1.8	1.8	1.8	2.7	2.7	2.7	5.7	5.8	5.9
7	Nallasopara	2.0	2.1	2.2	2.6	2.6	2.6	2.8	2.8	2.8	7.3	7.4	7.5
8	Virar	1.4	1.6	1.7	2.4	2.4	2.4	2.7	2.7	2.7	6.6	6.7	6.8
9	(included in proposed M Corp)	2.0	2.3	2.6	1.0	1.0	1.0	2.2	2.2	2.2	5.1	5.4	5.7
	NORTH EASTERN REGION	76	82	89	58	58	58	46	46	46	149	154	159
10	Thane	23	24	26	16	16	16	7	7	7	46	47	48
11	(Thane-Bhiwandi Road- Urabn)	1.2	1.4	1.6	0.9	0.9	0.9	1.6	1.6	1.6	3.7	3.9	4.1
12	Bhiwandi-Nizampur	9.6	10.5	11.3	9.1	9.1	9.1	4.4	4.4	4.4	23.1	23.9	24.7
13	(Bhiwandi expansion)	11.0	13.0	15.0	8.6	8.6	8.6	15.0	15.0	15.0	3.5	3.7	3.9
14	Ulhasnagar	5.4	5.5	5.6	5.9	5.9	5.9	4.3	4.3	4.3	15.6	15.7	15.8
15	Kalyan-Dombivli	19.9	20.9	21.8	12.4	12.4	12.4	7.3	7.3	7.3	39.6	40.6	41.5
16	Badlapur	1.2	1.3	1.5	1.8	1.8	1.8	2.5	2.5	2.5	5.4	5.6	5.7
17	Ambernath	2.5	2.8	3.1	2.6	2.6	2.6	2.8	2.8	2.8	7.9	8.2	8.4
18	(New Urban Area)	2.0	2.8	3.6	1.2	1.2	1.2	1.2	1.2	1.2	4.4	5.2	6.0
	NAVI MUMBAI	22	24	27	41	41	41	17	17	17	80	82	85
19	Navi Mumbai	17.1	18.1	19.0	38.3	38.3	38.3	12.4	12.4	12.4	67.8	68.8	69.7
20	Navi Mumbai excl NMMC	3.2	4.0	5.2	1.5	1.5	1.5	2.5	2.5	2.5	7.2	8.0	9.2
21	NMMC 15 villages	1.9	2.3	2.8	1.0	1.0	1.0	2.0	2.0	2.0	4.9	5.3	5.8
	PANVEL-URAN	2	2	3	3	3	3	4	4	4	8	9	9
22	Panvel	1.7	2.0	2.3	1.8	1.8	1.8	2.2	2.2	2.2	5.7	6.0	6.3
23	Uran	0.3	0.3	0.3	0.8	0.8	0.8	1.4	1.4	1.4	2.5	2.5	2.6
	NERAL-KARJAT REGION	3	3	3	3	3	3	6	6	6	12	12	12
24	Karjat	0.3	0.4	0.4	0.6	0.6	0.6	1.5	1.5	1.5	2.4	2.4	2.5
25	Khopoli	0.7	0.7	0.7	1.0	1.0	1.0	1.7	1.7	1.7	3.4	3.4	3.4
26	Matheran	0.1	0.1	0.1	0.4	0.4	0.4	1.2	1.2	1.2	1.6	1.6	1.6
27	N-K Rural	1.6	1.7	1.8	1.0	1.0	1.0	2.0	2.0	2.0	4.6	4.7	4.8
	PEN-ALIBAG	2	3	4	3	3	3	6	6	6	12	12	13
28	Alibag	0.2	0.2	0.2	0.5	0.5	0.5	1.6	1.6	1.6	2.3	2.3	2.3
29	Pen	0.6	0.7	0.7	1.5	1.5	1.5	2.7	2.7	2.7	4.8	4.8	4.9
30	Rural	1.6	2.1	2.8	1.0	1.0	1.0	2.0	2.0	2.0	4.6	5.1	5.8
	TOTAL MMR	290	308	326	246	246	246	120	120	120	624	640	657

Source: Estimated, 2007.

Note: Total cost includes primary collection, secondary collection and composting and disposal costs. Primary Collection Cost: Includes Litter bin costs, House-hold bin costs, Wheel borrow costs. Secondary Collection Costs: Includes cost of Mechanized containers, tippers, dumpers, and civil works at transfer station. Disposal composting costs: Includes Plant Machinery, JCB, infrastructure, and Environmental costs

Appendix IV.18

Capital Investment Needs for Solid Waste Management in MMR (Rs. Crores) - P-3 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Cumulative Primary Collection Cost (Rs.Crores)			Cumulative Secondary Collection Cost (Rs.Crores)			Cumulative Disposal & Composting Cost + IEC (Rs. Crores)			Total Cost Including Vehicle Machinery for Collection and Disposal (Rs.Crores)		
		Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	165.0	170.5	176.0	120.9	120.9	120.9	22.7	22.7	22.7	308.6	314.1	319.6
1	Island City												
2	Western Suburb												
3	Eastern Suburb												
	WESTERN REGION	18.3	20.4	21.4	17.4	17.4	17.4	17.4	17.4	17.4	53.1	55.2	56.2
4	Mira-Bhayander	10.6	11.4	12.3	8.5	8.5	8.5	5.7	5.7	5.7	24.8	25.6	26.5
5	Vasai	0.8	0.9	0.1	1.1	1.1	1.1	1.4	1.4	1.4	3.3	3.4	2.6
6	Navghar-Manikpur	1.2	1.4	1.6	1.8	1.8	1.8	2.7	2.7	2.7	5.7	5.9	6.1
7	Nallasopara	2.0	2.3	2.5	2.6	2.6	2.6	2.7	2.7	2.7	7.3	7.6	7.8
8	Virar	1.4	1.6	1.6	2.4	2.4	2.4	2.7	2.7	2.7	6.5	6.7	6.7
9	(included in proposed M Corp)	2.3	2.8	3.3	1.0	1.0	1.0	2.2	2.2	2.2	5.5	6.0	6.5
	NORTH EASTERN REGION	66.3	71.3	76.4	50.3	50.3	50.3	43.3	43.3	43.3	159.9	164.9	170.0
10	Thane	23.0	24.0	25.2	15.5	15.5	15.5	17.2	17.2	17.2	55.7	56.7	57.9
11	(Thane-Bhiwandi Road- Urabn)	1.2	1.4	1.6	0.9	0.9	0.9	1.6	1.6	1.6	3.7	3.9	4.1
12	Bhiwandi-Nizampur	9.5	10.2	10.9	9.0	9.0	9.0	4.4	4.4	4.4	22.9	23.6	24.3
13	(Bhiwandi expansion)	1.1	1.3	1.5	0.9	0.9	0.9	1.5	1.5	1.5	3.5	3.7	3.9
14	Ulhasnagar	5.4	5.5	5.7	5.8	5.8	5.8	4.3	4.3	4.3	15.5	15.6	15.8
15	Kalyan-Dombivli	20.1	21.3	22.4	12.7	12.7	12.7	7.2	7.2	7.2	40.0	41.2	42.3
16	Badlapur	1.2	1.4	1.6	1.7	1.7	1.7	2.4	2.4	2.4	5.3	5.5	5.7
17	Ambernath	2.5	2.9	3.2	2.6	2.6	2.6	2.7	2.7	2.7	7.8	8.2	8.5
18	(New Urban Area)	2.3	3.3	4.3	1.2	1.2	1.2	2.0	2.0	2.0	5.5	6.5	7.5
	NAVI MUMBAI	21.9	23.8	26.2	14.7	14.7	14.7	16.8	16.8	16.8	53.4	55.3	57.7
19	Navi Mumbai	16.8	17.5	18.2	12.2	12.2	12.2	12.3	12.3	12.3	41.3	42.0	42.7
20	Navi Mumbai excl NMMC	3.2	4.0	5.2	1.5	1.5	1.5	2.5	2.5	2.5	7.2	8.0	9.2
21	NMMC 15 villages	1.9	2.3	2.8	1.0	1.0	1.0	2.0	2.0	2.0	4.9	5.3	5.8
	PANVEL-URAN	2.0	2.4	2.7	2.5	2.5	2.5	3.4	3.4	3.4	7.9	8.3	8.6
22	Panvel	1.7	2.0	2.3	1.7	1.7	1.7	2.1	2.1	2.1	5.5	5.8	6.1
23	Uran	0.3	0.4	0.4	0.8	0.8	0.8	1.3	1.3	1.3	2.4	2.5	2.5
	NERAL-KARJAT REGION	2.8	3.9	4.2	2.9	2.9	2.9	6.4	6.4	6.4	12.1	13.2	13.5
24	Karjat	0.4	0.4	0.4	0.5	0.5	0.5	1.5	1.5	1.5	2.4	2.4	2.4
25	Khopoli	0.7	0.8	1.0	1.0	1.0	1.0	1.7	1.7	1.7	3.4	3.5	3.7
26	Matheran	0.1	1.0	1.0	0.4	0.4	0.4	1.2	1.2	1.2	1.7	2.6	2.6
27	N-K Rural	1.6	1.7	1.8	1.0	1.0	1.0	2.0	2.0	2.0	4.6	4.7	4.8
	PEN-ALIBAG	3.7	5.0	6.7	3.0	3.0	3.0	6.1	6.1	6.1	12.8	14.1	15.8
28	Alibag	0.2	0.2	0.2	0.5	0.5	0.5	1.5	1.5	1.5	2.2	2.2	2.2
29	Pen	0.8	0.9	1.0	1.5	1.5	1.5	2.6	2.6	2.6	4.9	5.0	5.1
30	Rural	2.7	3.9	5.5	1.0	1.0	1.0	2.0	2.0	2.0	5.7	6.9	8.5
31	Maha Mumbai SEZ										0.0	0.0	0.0
	TOTAL MMR	280	297	314	212	212	212	116	116	116	608	625	641

Source: Estimated, 2007.

Note: Total cost includes primary collection, secondary collection and composting and disposal costs. Primary Collection Cost: Includes Litter bin costs, House-hold bin costs, Wheel borrow costs. Secondary Collection Costs: Includes cost of Mechanized containers, tippers, dumpers, and civil works at transfer station. Disposal composting costs: Includes Plant Machinery, JCB, infrastructure, and Environmental costs

Appendix IV.19

Capital Investment Needs for Municipal Transport Infrastructure (Rs. Crores) - P-2 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Incremental Population			Per Capita Cost (Rs.)	Cumulative Capital Cost (Rs.Crores)		
		2005	2011	2016	2021	2005-2011	2011-2016	2016-2021		Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	12,861	14,162	15,246	16,330	1,356	1,148	965		5260	5685	6042
1	Island City	3,391	3,730	4,018	4,265	339	288	247	3700	1380	1487	1578
2	Western Suburb	5,628	6,245	6,777	7,212	617	532	434	3700	2311	2508	2668
3	Eastern Suburb	3,843	4,242	4,570	4,854	400	327	284	3700	1570	1691	1796
	WESTERN REGION	1,345	1,672	1,945	2,457	524	310	277		280	327	369
4	Mira-Bhayander	632	750	897	1,040	118	147	143	1500	112	135	156
5	Vasai	57	86	98	108	29	12	10	1500	13	15	16
6	Navghar-Manikpur	132	193	217	237	61	24	20	1500	29	33	36
7	Nallasopara	210	285	316	340	76	30	25	1500	43	47	51
8	Virar	143	206	231	252	63	25	21	1500	31	35	38
9	(included in proposed M Corp)	172	350	421	480	178	71	59	1500	53	63	72
	NORTH EASTERN REGION	4,445	5,427	6,200	6,740	844	766	684		2241	2523	2773
10	Thane	1,465	1,583	1,784	1,949	117	202	165	4575	724	816	892
11	(Thane-Bhiwandi Road- Urabn)	54	77	118	151	23	41	33	1500	12	18	23
12	Bhiwandi-Nizampur	632	752	886	1,012	120	134	126	3700	278	328	374
13	(Bhiwandi expansion)	47	78	113	146	31	35	33	1500	12	17	22
14	Ulhasnagar	495	522	539	556	27	17	16	3700	193	200	206
15	Kalyan-Dombivli	1,353	1,599	1,757	1,903	246	158	146	5255	840	923	1000
16	Badlapur	121	156	179	200	36	23	21	1500	23	27	30
17	Ambarnath	244	318	366	410	74	47	44	4020	128	147	165
18	(New Urban Area)	35	204	313	413	169	109	100	1500	31	47	62
	NAVI MUMBAI	1,310	1,733	2,053	2,159	199	334	316		448	525	599
19	Navi Mumbai	899	1,008	1,132	1,249	109	124	117	3700	373	419	462
20	Navi Mumbai excl NMMC	347	391	549	698	44	158	149	1500	59	82	105
21	NMMC 15 villages	64	110	162	212	46	52	50	1500	17	24	32
	PANVEL-URAN	155	221	276	323	117	26	25		41	45	48
22	Panvel	128	241	262	282	113	22	20	1500	36	39	42
23	Uran	27	31	36	40	4	5	5	1500	5	5	6
	NERAL-KARJAT REGION	480	485	498	411	0	1	0		62	62	62
24	Karjat	28	28	29	29	0	0	0	1500	4	4	4
25	Khopoli	65	66	66	66	0	0	0	1500	10	10	10
26	Matheran	6	6	6	6	0	0	0	1500	1	1	1
27	N-K Rural	381	312	311	310	0	0	0	1500	47	47	47
	PEN-ALIBAG	224	249	352	573	39	103	221		37	53	86
28	Alibag	21	21	22	22	0	0	0	1500	3	3	3
29	Pen	33	38	50	75	5	12	25	1500	6	8	11
30	Rural	82	68	67	67	0	0	0	1500	10	10	10
31	Maha Mumbai SEZ	88	122	213	409	34	91	196	1500	18	32	61
	TOTAL MMR	20821	23964	26582	28994	3079	2689	2490		8370	9219	9979

Source: Estimated, 2007.

Notes

Transport Infrastructure Cost includes following: 1. New/Upgradation of local roads, 2. Intersection Improvements, 3. Parking, 4. Transport Terminals, 5. Bus Fleet and 6. Street lighting . For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai, Kalyan-Dombivli and Ambarnath, respective CDP per capita cost for the plan period has been used to estimate the total investment requirements. For other Municipal Corporations, an average per capita cost of Rs. 3700(derived from the CDP estimates of the above ULBs) has been used . For other Municipal Councils, an average per capita cost of Rs. 1500 has been used to estimate the total cost.

Appendix IV.20

Capital Investment Needs for Municipal Transport Infrastructure(Rs. Crores) - P-3 SCENARIO

Sl.No	Municipal Corporation / Municipal Council	Total Projected Population (thousand)				Incremental Population			Per Capita Cost (Rs.)	Cumulative Capital Cost (Rs.Crores)		
		2005	2011	2016	2021	2005-2011	2011-2016	2016-2021		Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	12,861	14,162	15,246	15,714	1,309	956	587		5,243.0	5,596.9	5,814.2
1	Island City	3,391	3,719	3,947	4,027	328	229	80	3700	1,375.9	1,460.4	1,489.9
2	Western Suburb	5,628	6,227	6,675	6,981	599	448	306	3700	2,303.8	2,469.7	2,582.8
3	Eastern Suburb	3,843	4,225	4,505	4,707	383	280	202	3700	1,563.3	1,666.8	1,741.5
	WESTERN REGION	1,345	1,672	1,945	3,030	835	438	412		327.1	392.7	454.5
4	Mira-Bhayander	632	800	939	1,083	168	139	144	1500	120.0	140.9	162.5
5	Vasai	57	105	127	146	48	22	19	1500	15.8	19.0	21.9
6	Navghar-Manikpur	132	232	276	316	99	45	40	1500	34.7	41.4	47.4
7	Nallasopara	210	333	389	439	124	56	50	1500	50.0	58.3	65.8
8	Virar	143	246	292	334	103	46	41	1500	36.9	43.8	50.1
9	(included in proposed M Corp)	172	464	595	712	292	131	117	1500	69.6	89.3	106.8
	NORTH EASTERN REGION	4,445	5,427	6,200	7,132	988	840	859		2,297.6	2,605.8	2,920.9
10	Thane	1,465	1,688	1,884	2,059	223	195	175	4575	772.5	861.9	942.0
11	(Thane-Bhiwandi Road- Urabn)	54	99	138	174	45	39	36	1500	14.9	20.7	26.1
12	Bhiwandi-Nizampur	632	775	902	1,009	143	128	106	3700	286.7	333.9	373.2
13	(Bhiwandi expansion)	47	84	118	145	37	34	27	1500	12.6	17.7	21.8
14	Ulhasnagar	495	521	543	569	27	22	25	3700	192.9	201.0	210.4
15	Kalyan-Dombivli	1,353	1,594	1,792	2,021	241	198	229	5255	837.5	941.5	1,061.9
16	Badlapur	121	156	184	217	35	29	33	1500	23.3	27.6	32.6
17	Ambernath	244	317	376	445	72	59	69	4020	127.3	151.2	178.9
18	(New Urban Area)	35	200	336	494	165	136	158	1500	30.0	50.4	74.1
	NAVI MUMBAI	1,310	1,733	2,053	2,324	339	337	339		480.4	558.4	636.8
19	Navi Mumbai	899	1,060	1,184	1,310	161	125	126	3700	392.1	438.2	484.7
20	Navi Mumbai excl NMMC	347	457	616	776	110	159	160	1500	68.6	92.4	116.4
21	NMMC 15 villages	64	132	185	238	68	53	53	1500	19.8	27.8	35.7
	PANVEL-URAN	155	221	276	336	128	26	27		42.4	46.4	50.4
22	Panvel	128	250	271	293	122	22	22	1500	37.4	40.7	43.9
23	Uran	27	33	38	43	6	5	5	1500	4.9	5.7	6.4
	NERAL-KARJAT REGION	480	485	498	456	1	16	11		64.2	66.7	68.4
24	Karjat	28	29	29	29	0	0	0	1500	4.3	4.3	4.3
25	Khopoli	65	66	66	66	0	0	0	1500	9.9	9.9	9.9
26	Matheran	6	6	6	6	0	0	0	1500	0.9	0.9	0.9
27	N-K Rural	381	328	344	355		16	11	1500	49.2	51.6	53.3
	PEN-ALIBAG	224	252	388	648	38	137	259		38	58	97
28	Alibag	21	22	22	22	0	0	0	1500	3.3	3.3	3.3
29	Pen	33	38	53	83	5	15	30	1500	5.7	8.0	12.5
30	Rural	82	71	75	77		4	2	1500	10.7	11.2	11.5
31	Maha Mumbai SEZ	88	121	239	466	33	118	227	1500	18.2	35.9	69.9
	TOTAL MMR	20821	23964	26582	29639	3638	2750	2494		8,492.4	9,325.1	10,042.3

Source: Estimated, 2007.

Notes

Transport Infrastructure Cost includes following: 1. New/Upgradation of local roads, 2. Intersection Improvements, 3. Parking, 4. Transport Terminals, 5. Bus Fleet and 6. Street lighting . For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai, Kalyan-Dombivli and Ambernath, respective CDP per capita cost for the plan period has been used to estimate the total investment requirements. For other Municipal Corporations, an average per capita cost of Rs. 3700(derived from the CDP estimates of the above ULBs) has been used . For other Municipal Councils, an average per capita cost of Rs. 1500 has been used to estimate the total cost.

Appendix IV-21

GOVT. OF MAHARASHTRA (GoM) and Mumbai Development Plan Norms

Public Purpose	Revised Standards of Government of Maharashtra	Standards recommended for revised Development Plan of Greater Mumbai
Primary Schools	Area of each school site to be @ 5 sq.m. per student and playground area @ 3 sq.m. per student. Student population from I to VII standards @ 15% of population and strength of each school to be from 400 to 500 students	<p>i) Area of each school site to be @ 1.67 sq.m. and 2.51 sq.m. per pupil in the City and suburbs respectively where separate playground site is available for the school.</p> <p>ii) Playgrounds for the schools to be provided @2.09 sq.m. per pupil in city and suburbs respectively.</p> <p>iii) Where no site for playground is available for school, the standard of 2.09 per pupil in the city is to be adopted.</p>
Secondary Schools	Area of each school site to be @ 4 sq.m./student, and playground site @ 11 sq.m./student. Playground site to be within a distance of 0.3 km from school building. Student population to be considered 7.5% of the population from VIII TO X and school strength from 750 to 1000 students.	<p>i) Area of school site to be @ 1.67 sq.m. and 2.51 sq.m. per pupil in the city and suburbs respectively where separate play ground site is available for the school.</p> <p>ii) Playgrounds for eh schools to be provided @ 2.09 sq.m. and 3.01 sq.m. per pupil in the city and suburbs respectively.</p> <p>iii) Where no site is available for school the standard of 2.09 sq.m. pep pupil in the city is to be adopted.</p>
Health and Medical Facilities	Areas of Dispensary-cum-Maternity Homes to be @ 0.25 ha per 10,000 population. In addition to above, hospital site to be provided @ 4 to 5 beds per 1000 population, with 41.8 sq.m. per bed in congested area and 83.61 sq.m. per bed in other areas.	<p>i) One dispensary site of size 668.9 sq.m. to be provided for 50,000 population covering an area of 1.5 km radius</p> <p>ii) Each 50 bedded maternity home to be provided for population of 1,00,000 considering one bed for 60 confinements. The maternity home site to be provided with 41.8 sq.m./bed in city areas and 83.61 sq.m /bed in the suburbs.</p> <p>iii) Considering 4 beds/1000 population, hospital sites to be provided for 300 to 500 beds with 41.8 sq.m. and 83.61 sq.m. per bed in city and suburbs respectively.</p>

Source: David, M.D.(1996), "Urban explosion of Mumbai: Restructuring of growth", Himalayan Publishing House, Mumbai

Appendix IV.22

Existing and Additional Demand of Educational Infrastructure in MMR - P-2 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Primary Schools			Secondary Schools			Required No.of Primary Schools(Municipal)			Required No.of Secondary Schools(Municipal)		
	2005	2011	2016	2021	Required No.of Primary Schools	Existing Primary Schools	Existing Gap	Required No.of Secondary Schools	Existing Secondary Schools	Existing Gap	2005-2011	2011-16	2016-21	2005-2011	2011-16	2016-21
GREATER MUMBAI	12,861	14,217	15,365	16,330	3,858	2,163	1,695	965	276	689	407	751	1,041	102	188	260
Island City	3391	3730	4018	4265	1,017			254			102	188	262	25	47	66
Western Suburb	5,628	6,245	6,777	7,212	1,688			422			185	345	475	46	86	119
Eastern Suburb	3,843	4,242	4,570	4,854	1,153			288			120	218	303	30	55	76
WESTERN REGION	1,174	1,520	1,759	1,977	352	189	179	88	32	57	104	176	241	26	44	60
Mira-Bhayander	632	750	897	1,040	190	66	124	47	12	35	35	79	122	9	20	31
Vasai	57	86	98	108	17	33		4	5		9	12	15	2	3	4
Navghar-Manikpur	132	193	217	237	40	30	10	10	5	5	18	26	31	5	6	8
Nallasopara	210	285	316	340	63	30	33	16	5	11	23	32	39	6	8	10
Virar	143	206	231	252	43	30	13	11	5	6	19	27	33	5	7	8
NORTH EASTERN REGION	4,310	4,930	5,512	6,030	1,293	808	518	323	365	91	153	307	443	38	77	111
Thane	1,465	1,583	1,784	1,949	440	133	307	110	28	82	35	96	145	9	24	36
Bhiwandi-Nizampur	632	752	886	1,012	190	130	60	47	42	5	36	76	114	9	19	28
Ulhasnagar	495	522	539	556	148	126	22	37	33	4	8	13	18	2	3	5
Kalyan-Dombivilli	1,353	1,599	1,757	1,903	406	305	101	101	222		74	121	165	18	30	41
Badlapur	121	156	179	200	36	69		9	13		11	18	24	3	4	6
Ambernath	244	318	366	410	73	45	28	18	27		22	36	50	6	9	12
NAVI MUMBAI	899	1,008	1,132	1,249	270	133	133	67	82	(15)	33	70	105	8	17	26
Navi Mumbai	899	1,008	1,132	1,249	270	133	137	67	62	5	33	70	105	8	17	26
PANVEL-URAN	155	271	298	323	46	23	23	12	12	4	35	43	50	9	11	13
Panvel	128	241	262	282	38	22	16	10	6	4	34	40	46	8	10	12
Uran	27	31	36	40	8	1	7	2	6		1	3	4	0	1	1
NERAL-KARJAT REGION	99	100	100	101	30	35	-	7	6	3	0.13	0.31	0.49	0.03	0.08	0.12
Karjat	28	28	29	29	8	13		2	1	1	0.06	0.15	0.24	0.01	0.04	0.06
Khopoli	65	66	66	66	20	20		5	3	2	0.07	0.16	0.25	0.02	0.04	0.06
Matheran	6	6	6	6	2	2		0	2		0.00	0.00	0.00	0.00	0.00	0.00
PEN-ALIBAG	54	59	72	97	16	16	2	4	5	-	2	5	13	0	1	3
Alibag	21	21	22	22	6	8		2	2		0.06	0.15	0.27	0.01	0.04	0.07
Pen	33	38	50	75	10	8	2	2	3		2	5	13	0	1	3
TOTAL URBAN MMR	19,552	22,105	24,237	26,107	5,866	3,367	2,550	1,466	778	829	733	1352	1893	183	338	473

Source: Estimated, 2007.

Note: Student population for primary schools has been taken as 15% of population and strength of each school as 500 students. Student population for secondary schools has been taken as 7.5% of the total population and strength of each school as 1000 students.

For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection.

Appendix IV.22

Existing and Additional Demand of Educational Infrastructure in MMR - P-3 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Primary Schools			Secondary Schools			Required No. of Primary Schools(Municipal)			Required No. of Secondary Schools(Municipal)		
	2005	2011	2016	2021	Required No. of Primary Schools	Existing Primary Schools	Existing Gap	Required No. of Secondary Schools	Existing Secondary Schools	Existing Gap	2005-2011	2011-16	2016-21	2005-2011	2011-16	2016-21
GREATER MUMBAI	12,861	14,170	15,127	15,714	3,858	2,163	1,695	965	276	689	393	680	856	98	170	214
Island City	3391	3719	3947	4027	1,017			254			98	167	191	25	42	48
Western Suburb	5,628	6,227	6,675	6,981	1,688			422			180	314	406	45	79	101
Eastern Suburb	3,843	4,225	4,505	4,707	1,153			288			115	199	259	29	50	65
WESTERN REGION	1,174	1,716	2,023	2,318	352	189	179	88	32	57	163	255	343	41	64	86
Mira-Bhayander	632	800	939	1,083	190	66	124	47	12	35	50	92	135	13	23	34
Vasai	57	105	127	146	17	33		4	5		14	21	27	4	5	7
Navghar-Manikpur	132	232	276	316	40	30	10	10	5	5	30	43	55	7	11	14
Nallasopara	210	333	389	439	63	30	33	16	5	11	37	54	69	9	13	17
Virar	143	246	292	334	43	30	13	11	5	6	31	45	57	8	11	14
NORTH EASTERN REGION	4,310	5,050	5,681	6,319	1,293	808	518	323	365	91	190	353	514	47	88	128
Thane	1,465	1,688	1,884	2,059	440	133	307	110	28	82	67	126	178	17	31	45
Bhiwandi-Nizampur	632	775	902	1,009	190	130	60	47	42	5	43	81	113	11	20	28
Ulhasnagar	495	521	543	569	148	126	22	37	33	4	8	15	22	2	4	6
Kalyan-Dombivilli	1,353	1,594	1,792	2,021	406	305	101	101	222		72	132	200	18	33	50
Badlapur	121	156	184	217	36	69		9	13		10	19	29	3	5	7
Ambemath	244	317	376	445	73	45	28	18	27		22	40	60	5	10	15
NAVI MUMBAI	899	1,060	1,184	1,310	270	133	133	67	62	5	48	86	123	12	21	31
Navi Mumbai	899	1,060	1,184	1,310	270	133	137	67	62	5	48	86	123	12	21	31
PANVEL-URAN	155	283	309	336	46	23	23	12	12	4	38	46	54	10	12	14
Panvel	128	250	271	293	38	22	16	10	6	4	36	43	49	9	11	12
Uran	27	33	38	43	8	1	7	2	6		2	3	5	0	1	1
NERAL-KARJAT REGION	99	100	100	101	30	35	-	7	6	3	0	0	0	0	0	0
Karjat	28	29	29	29	8	13		2	1	1	0	0	0	0	0	0
Khopoli	65	66	66	66	20	20		5	3	2	0	0	0	0	0	0
Matheran	6	6	6	6	2	2		0	2		-	-	-	0	0	0
PEN-ALIBAG	54	60	75	105	16	16	2	4	5	-	2	6	15	0	2	4
Alibag	21	22	22	22	6	8		2	2		0	0	0	0	0	0
Pen	33	38	53	83	10	8	2	2	3		2	6	15	0	2	4
TOTAL URBAN MMR	19,552	22,439	24,500	26,202	5,866	3,367	2,550	1,466	758	849	834	1426	1906	209	356	476

Source: Estimated, 2007.

Note: Student population for primary schools has been taken as 15% of population and strength of each school as 500 students. Student population for secondary schools has been taken as 7.5% of the total population and strength of each school as 1000 students.

For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection.

Appendix IV.23

Existing and Additional Demand of Health Infrastructure in MMR - P-2 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Gap in Total Health Infrastructure			Incremental Population			Cumulative Demand(No.of Bed Spaces)		
	2005	2011	2016	2021	Required No.of Bed Spaces	Existing Bed Spaces	Existing Gap	2005-11	2011-16	2016-21	2005-11	2011-16	2016-21
GREATER MUMBAI	12,861	14,217	15,365	16,330	51,444	40,000	11,444	1,356	1,148	965	5,423	10,016	13,877
Island City	3,391	3,730	4,018	4,265	13563			339	288	247	1355	2508	3496
Western Suburb	5,628	6,245	6,777	7,212	22510			617	532	434	2469	4599	6337
Eastern Suburb	3,843	4,242	4,570	4,854	15371			400	327	284	1599	2908	4045
WESTERN REGION	1,174	1,716	2,023	1,977	4,695	500	4,195	346	239	218	1,385	2,341	3,213
Mira-Bhayander	632	750	897	1,040	2530	300	2230	118	147	143	470	1058	1630
Vasai	57	86	98	108	227	50	177	29	12	10	118	165	204
Navghar-Manikpur	132	193	217	237	529	50	479	61	24	20	243	340	420
Nallasopara	210	285	316	340	838	50	788	76	30	25	302	424	523
Virar	143	206	231	252	571	50	521	63	25	21	252	354	437
NORTH EASTERN REGION	4,310	4,930	5,512	6,030	17,240	1,710	15,530	620	581	518	2,482	4,807	6,880
Thane	1,465	1,583	1,784	1,949	5860	500	5360	117	202	165	470	1277	1936
Bhiwandi-Nizampur	632	752	886	1,012	2529	300	2229	120	134	126	479	1016	1520
Ulhasnagar	495	522	539	556	1978	510	1468	27	17	16	109	179	244
Kalyan-Dombivilli	1,353	1,599	1,757	1,903	5413	300	5113	246	158	146	985	1615	2200
Badlapur	121	156	179	200	482	35	447	36	23	21	143	234	319
Ambemath	244	318	366	410	977	65	912	74	47	44	296	485	661
NAVI MUMBAI	899	1,008	1,132	1,249	3,596	3,000	896	109	124	117	434	931	1,401
Navi Mumbai	899	1,008	1,132	1,249	3596	2700	896	109	124	117	434	931	1401
PANVEL-URAN	155	271	298	323	619	150	469	117	26	25	467	573	672
Panvel	128	241	262	282	512	100	412	113	22	20	450	536	618
Uran	27	31	36	40	107	50	57	4	5	5	17	36	55
NERAL-KARJAT REGION	99	100	100	101	397	64	333	0.42	1	1	2	4	6
Karjat	28	28	29	29	112	30	82	0.19	0.30	0.30	1	2	3
Khopoli	65	66	66	66	261	20	241	0.24	0.30	0.30	1	2	3
Matheran	6	6	6	6	24	14	10	0.00	0.00	0.00	0.00	0.00	0.00
PEN-ALIBAG	54	59	72	97	217	230	102	5	12	26	21	70	172
Alibag	21	21	22	22	85	200		0.20	0.30	0.40	1	2	4
Pen	33	38	50	75	132	30	102	5	12	25	20	68	169
TOTAL URBAN MMR	19,552	22,439	24,500	26,202	78,207	45,654	32,969	2,553	2,132	1,870	10,214	18,741	26,222

Source: Estimated, 2007.

Note: Number of beds have been considered as 4 beds/1000 population as per GoM and Mumbai Development Plan.
For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection

Appendix IV.23

Existing and Additional Demand of Health Infrastructure in MMR - P-3 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Gap in Total Health Infrastructure			Incremental Population			Cumulative Demand(no.of Bed Spaces)		
	2005	2011	2016	2021	Required No.of Bed Spaces	Existing Bed Spaces	Existing Gap	2005-11	2011-16	2016-21	2005-11	2011-16	2016-21
GREATER MUMBAI	12,861	14,170	15,127	15,714	51,444	40,000	11,444	1,309	956	587	5,237	9,063	11,412
Island City	3,391	3,719	3,947	4,027	13563			328	229	80	1311	2225	2544
Western Suburb	5,628	6,227	6,675	6,981	22510			599	448	306	2396	4189	5412
Eastern Suburb	3,843	4,225	4,505	4,707	15371			383	280	202	1530	2649	3456
WESTERN REGION	1,174	1,716	2,023	2,318	4,695	500	4,195	543	307	295	2,171	3,398	4,576
Mira-Bhayander	632	800	939	1,083	2530	300	2230	168	139	144	671	1226	1804
Vasai	57	105	127	146	227	50	177	48	22	19	193	279	357
Navghar-Manikpur	132	232	276	316	529	50	479	99	45	40	398	576	735
Nallasopara	210	333	389	439	838	50	788	124	56	50	495	717	916
Virar	143	246	292	334	571	50	521	103	46	41	413	599	764
NORTH EASTERN REGION	4,310	5,050	5,681	6,319	17,240	1,710	15,530	740	631	638	2,962	5,485	8,038
Thane	1,465	1,688	1,884	2,059	5860	500	5360	223	195	175	893	1675	2375
Bhiwandi-Nizampur	632	775	902	1,009	2529	300	2229	143	128	106	570	1081	1505
Ulhasnagar	495	521	543	569	1978	510	1468	27	22	25	107	195	296
Kalyan-Dombivilli	1,353	1,594	1,792	2,021	5413	300	5113	241	198	229	962	1754	2671
Badlapur	121	156	184	217	482	35	447	35	29	33	140	254	387
Ambarnath	244	317	376	445	977	65	912	72	59	69	289	527	802
NAVI MUMBAI	899	1,060	1,184	1,310	3,596	2,700	896	161	125	126	642	1,141	1,644
Navi Mumbai	899	1,060	1,184	1,310	3596	2700	896	161	125	126	642	1141	1644
PANVEL-URAN	155	283	309	336	619	150	469	128	26	27	511	617	724
Panvel	128	250	271	293	512	100	412	122	22	22	486	573	660
Uran	27	33	38	43	107	50	57	6	5	5	25	45	64
NERAL-KARJAT REGION	99	100	100	101	397	64	333	0.92	0.20	0.20	4	4	5
Karjat	28	29	29	29	112	30	82	0.49	0.10	0.10	1.95	2.35	2.75
Khopoli	65	66	66	66	261	20	241	0.44	0.10	0.10	1.75	2.15	2.55
Matheran	6	6	6	6	24	14	10	0.00	0.00	0.00	0.00	0.00	0.00
PEN-ALIBAG	54	60	75	105	217	230	102	5	15	30	22	82	203
Alibag	21	22	22	22	85	200		0.50	0.10	0.10	2	2	3
Pen	33	38	53	83	132	30	102	5	15	30	20	80	200
TOTAL URBAN MMR	19,552	22,439	24,500	26,202	78,207	45,354	32,969	2,887	2,061	1,703	11,549	19,792	26,602

Source: Estimated, 2007.

Note: Number of beds have been considered as 4 beds/1000 population as per GoM and Mumbai Development Plan.
For Vasai-Virar Sub-region, due to lack of data on existing infrastructure, proportionate numbers from other similar ULBs have been assumed for demand projection

Appendix IV.24

Capital Investment Needs for Educational Infrastructure in MMR (Rs. Crores) - P-2 SCENARIO

Details of Municipal Corporations and Councils	Required No.of Primary Schools(Municipal)			Primary Schools-Cost(In Crores INR)				Required No.of Secondary Schools(Municipal)			Secondary Schools-Cost(In Crores INR)			
	2005-2011	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21	2005-2011	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21
GREATER MUMBAI	407	751	1,041	426	479	614	687	102	188	260	84	47	131	149
Island City	102	188	262		26	47	66	25	47	66		6	12	16
Western Suburb	185	345	475		46	87	119	46	86	119		12	22	30
Eastern Suburb	120	218	303		301	55	76	30	55	76		8	14	19
WESTERN REGION	104	176	241	90	74	177	210	26	44	60	5	12	22	29
Mira-Bhayander	35	79	122	62	33	102	123	9	20	31	2	4	10	14
Vasai	9	12	15	-	4	6	8	2	3	4	0.2	1	1	2
Navghar-Manikpur	18	26	31	5	10	18	21	5	6	8	1	2	3	4
Nallasopara	23	32	39	16	15	32	36	6	8	10	1	3	5	5
Virar	19	27	33	6	11	20	23	5	7	8	1	2	3	4
NORTH EASTERN REGION	153	307	443	245	138	398	466	38	77	111	27	22	58	71
Thane	35	96	145	153	56	201	226	9	24	36	9	6	19	24
Bhiwandi-Nizampur	36	76	114	30	25	68	87	9	19	28	5	5	12	16
Ulhasnagar	8	13	18	11	7	18	20	2	3	5	4	2	5	6
Kalyan-Dombivilli	74	121	165	50	50	111	133	18	30	41	10	10	22	26
Badlapur	11	18	24	-	5	9	12	3	4	6	1	1	3	3
Ambemath	22	36	50	14	15	32	39	6	9	12	2	3	5	7
NAVI MUMBAI	33	70	105	68	33	103	121	8	17	26	2	4	9	12
Navi Mumbai	33	70	105	68	33	103	121	8	17	26	2	4	9	12
PANVEL-URAN	35	43	50	12	172	33	37	9	11	13	1	4	5	6
Panvel	34	40	46	8	171	28	31	8	10	12	1	4	5	6
Uran	1	3	4	4	2	5	6	0	1	1	-	0	0	0
NERAL-KARJAT REGION	0.13	0.31	0.49	0.00	0.06	0.15	0.24	0.03	0.08	0.12	1	0.2	1	1
Karjat	0.06	0.15	0.24	-	0.03	0.07	0.12	0.01	0.04	0.06	0.2	0.1	0	0
Khopoli	0.07	0.16	0.25	-	0.04	0.08	0.13	0.02	0.04	0.06	0.5	0.1	1	1
Matheran	0.00	0.00	0.00					0.00	0.00	0.00	-	-	-	-
PEN-ALIBAG	2	5	13	1	1	4	7	0	1	3	0.2	0.2	1	2
Alibag	0.06	0.15	0.27	0.0	0.03	0.07	0.13	0.01	0.04	0.07	0.0	0.0	0	0
Pen	2	5	13	1.0	0.99	3.50	7.28	0	1	3	0.2	0.2	1	2
TOTAL URBAN MMR	733	1352	1893	841	898	1330	1528	183	338	473	120	88	227	270

Source: Estimated, 2007.

Note: In primary school infrastructure only 40% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. In secondary school infrastructure, only 20% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. For Greater Mumbai, 2.51 sq.m./student is taken for calculation purposes in primary and secondary schools. For rest of Urban MMR, 4 sq.m./student and 3 sq.m./student is taken for primary and secondary schools respectively

Above cost only includes the building cost and does not take into account the cost of land or the playground area. Unit cost of construction is taken as Rs. 5000/sq.mt. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016

Appendix IV.24

Capital Investment Needs for Educational Infrastructure in MMR (Rs. Crores) - P-3 SCENARIO

Details of Municipal Corporations and Councils	Required No.of Primary Schools(Municipal)			Primary Schools-Cost(Rs.Crores)				Required No.of Secondary Schools(Municipal)			Secondary Schools-Cost(Rs. Crores)			
	2005-2011	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21	2005-2011	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21
GREATER MUMBAI	393	680	856	426	205	596	640	98	170	214	84	46	127	138
Island City	98	167	191		25	42	48	25	42	48		6	10	12
Western Suburb	180	314	406		45	79	102	45	79	101		11	20	25
Eastern Suburb	115	199	259		29	50	65	29	50	65		7	12	16
WESTERN REGION	163	255	343	90	104	217	261	41	64	86	8	18	33	42
Mira-Bhayander	50	92	135	62	41	108	130	13	23	34	2.8	6	12	16
Vasai	14	21	27	-	7	10	13	4	5	7	0.3	2	2	3
Navghar-Manikpur	30	43	55	5	16	26	32	7	11	14	1.2	3	6	7
Nallasopara	37	54	69	16	23	43	51	9	13	17	2.1	4	7	9
Virar	31	45	57	6	17	29	35	8	11	14	1.3	3	6	7
NORTH EASTERN REGION	190	353	514	245	156	421	502	47	88	128	43	30	79	95
Thane	67	126	178	153	72	216	242	17	31	45	14.4	10	27	32
Bhiwandi-Nizampur	43	81	113	30	29	70	86	11	20	28	7.6	6	16	19
Ulhasnagar	8	15	22	11	7	18	22	2	4	6	5.9	2	7	8
Kalyan-Dombivilli	72	132	200	50	49	116	151	18	33	50	15.4	11	29	35
Badlapur	10	19	29	-	5	10	15	3	5	7	1.4	1	3	4
Ambernath	22	40	60	14	14	34	44	5	10	15	2.5	3	6	9
NAVI MUMBAI	48	86	123	68	41	111	130	12	21	31	2.8	6	11	15
Navi Mumbai	48	86	123	68	41	111	130	12	21	31	2.8	6	11	15
PANVEL-URAN	38	46	54	12	22	35	39	10	12	14	1.5	4	6	7
Panvel	36	43	49	8	20	30	33	9	11	12	1.5	4	6	6
Uran	2	3	5	4	2	5	6	0	1	1	-	0	0	0
NERAL-KARJAT REGION	0	0	0	-	0	0	0	0	0	0	1	0	1	1
Karjat	0	0	0	-	0.07	0.09	0.10	0	0	0	0.3	0.10	0.35	0.36
Khopoli	0	0	0	-	0.07	0.08	0.10	0	0	0	0.8	0.21	0.80	0.80
Matheran	-	-	-	-	-	-	-	0	0	0	-	-	-	-
PEN-ALIBAG	2	6	15	1	1	4	9	0	2	4	0.4	0	1	2
Alibag	0	0	0	-	0.07	0.09	0.10	0	0	0	-	0.01	0.02	0.02
Pen	2	6	15	1	1	4	8	0	2	4	0.4	0.25	1.00	1.90
TOTAL URBAN MMR	834	1426	1906	841	529	1384	1581	209	356	476	140.9	104	258	300

Source: Estimated, 2007.

Note: In primary school infrastructure only 40% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. In secondary school infrastructure, only 20% of the demand is considered as municipal infrastructure and capital investment needs are projected for the same. For Greater Mumbai, 2.51 sq.m./student is taken for calculation purposes in primary and secondary schools. For rest of Urban MMR, 4 sq.m./student and 3 sq.m./student is taken for primary and secondary schools respectively

Above cost only includes the building cost and does not take into account the cost of land or the playground area. Unit cost of construction is taken as Rs. 5000/sq.mt. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016

Appendix IV.25

Capital Investment Needs for Health Infrastructure in MMR (Rs. Crores)- P-2 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Gap in Total Health Infrastructure			Incremental Population			Cumulative Demand(No.of Bed Spaces)			Capital Cost(In Crores INR)			
	2005	2011	2016	2021	Required No.of Bed Spaces	Existing Bed Spaces	Existing Gap	2005-11	2011-16	2016-21	2005-11	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21
GREATER MUMBAI	12,861	14,217	15,365	16,330	51,444	40,000	11,444	1,356	1,148	965	5,423	10,016	13,877	354	93	362	365
Island City	3,391	3,730	4,018	4,265	13563			339	288	247	1355	2508	3496		1	1	1
Western Suburb	5,628	6,245	6,777	7,212	22510			617	532	434	2469	4599	6337		2	2	1
Eastern Suburb	3,843	4,242	4,570	4,854	15371			400	327	284	1599	2908	4045		1	1	1
WESTERN REGION	1,174	1,716	2,023	1,977	4,695	500	4,195	346	239	218	1,385	2,341	3,213	92	25	96	98
Mira-Bhayander	632	750	897	1,040	2530	300	2230	118	147	143	470	1058	1630	48	13	49	50
Vasai	57	86	98	108	227	50	177	29	12	10	118	165	204	3	1	3	3
Navghar-Manikpur	132	193	217	237	529	50	479	61	24	20	243	340	420	11	3	11	11
Nallasopara	210	285	316	340	838	50	788	76	30	25	302	424	523	19	5	20	20
Virar	143	206	231	252	571	50	521	63	25	21	252	354	437	12	3	13	13
NORTH EASTERN REGION	4,310	4,930	5,512	6,030	17,240	1,710	15,530	620	581	518	2,482	4,807	6,880	378	99	386	389
Thane	1,465	1,583	1,784	1,949	5860	500	5360	117	202	165	470	1277	1936	123	32	125	127
Bhiwandi-Nizampur	632	752	886	1,012	2529	300	2229	120	134	126	479	1016	1520	61	16	63	64
Ulhasnagar	495	522	539	556	1978	510	1468	27	17	16	109	179	244	36	9	37	37
Kalyan-Dombivilli	1,353	1,599	1,757	1,903	5413	300	5113	246	158	146	985	1615	2200	125	33	127	128
Badlapur	121	156	179	200	482	35	447	36	23	21	143	234	319	11	3	11	11
Ambernath	244	318	366	410	977	65	912	74	47	44	296	485	661	22	6	23	23
NAVI MUMBAI	899	1,008	1,132	1,249	3,596	3,000	896	109	124	117	434	931	1,401	43	11	44	45
Navi Mumbai	899	1,008	1,132	1,249	3596	2700	896	109	124	117	434	931	1401	43	11	44	45
PANVEL-URAN	155	271	298	323	619	150	469	117	26	25	467	573	672	12	4	13	13
Panvel	128	241	262	282	512	100	412	113	22	20	450	536	618	10	3	11	11
Uran	27	31	36	40	107	50	57	4	5	5	17	36	55	2	0.4	2	2
NERAL-KARJAT REGION	99	100	100	101	397	64	333	0.42	1	1	2	4	6	7	7	7	7
Karjat	28	28	29	29	112	30	82	0.19	0.30	0.30	1	2	3	1	0.2	1	1
Khopoli	65	66	66	66	261	20	241	0.24	0.30	0.30	1	2	3	6	1	6	6
Matheran	6	6	6	6	24	14	10	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
PEN-ALIBAG	54	59	72	97	217	230	102	5	12	26	21	70	172	2	0	2	2
Alibag	21	21	22	22	85	200		0.20	0.30	0.40	1	2	4	-	0.0	0.00	0
Pen	33	38	50	75	132	30	102	5	12	25	20	68	169	2	0.4	2	2
TOTAL URBAN MMR	19,552	22,439	24,500	26,202	78,207	45,654	32,969	2,553	2,132	1,870	10,214	18,741	26,222	886	234	909	919

Source: Estimated, 2007.

Note: For above calculations only 40% of the total demand has been considered as municipal infrastructure and capital investment projected for the same. Above cost only includes the building cost and does not take into account the cost of land. For Greater Mumbai-Island City and Suburbs, 41.8 sq.m./bed and 83.6 sq.m./bed respectively has been taken for calculation purpose. For rest of MMR, 83.6 sq.m./bed is taken for calculation purpose. Unit cost of construction is taken as Rs. 8000/sq.mt.to address requirements of large hospitals. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016.

Appendix IV.25

Capital Investment Needs for Health Infrastructure in MMR (Rs. Million)- P-3 SCENARIO

Details of Municipal Corporations and Councils	Total Projected Population (thousand)				Gap in Total Health Infrastructure			Incremental Population			Cumulative Demand(no.of Bed Spaces)			Capital Cost(In Crores INR)			
	2005	2011	2016	2021	Required No.of Bed Spaces	Existing Bed Spaces	Existing Gap	2005-11	2011-16	2016-21	2005-11	2011-16	2016-21	Backlog	2005-11	2011-16	2016-21
GREATER MUMBAI	12,861	14,170	15,127	15,714	51,444	40,000	11,444	1,309	956	587	5,237	9,063	11,412	354	93	361	363
Island City	3,391	3,719	3,947	4,027	13563			328	229	80	1311	2225	2544		1	1	0
Western Suburb	5,628	6,227	6,675	6,981	22510			599	448	306	2396	4189	5412		2	1	1
Eastern Suburb	3,843	4,225	4,505	4,707	15371			383	280	202	1530	2649	3456		1	1	1
WESTERN REGION	1,174	1,716	2,023	2,318	4,695	500	4,195	543	307	295	2,171	3,398	4,576	92	27	98	100
Mira-Bhayander	632	800	939	1,083	2530	300	2230	168	139	144	671	1226	1804	48	13	50	51
Vasai	57	105	127	146	227	50	177	48	22	19	193	279	357	3	1	3	3
Navghar-Manikpur	132	232	276	316	529	50	479	99	45	40	398	576	735	11	3	12	12
Nallasopara	210	333	389	439	838	50	788	124	56	50	495	717	916	19	6	20	21
Virar	143	246	292	334	571	50	521	103	46	41	413	599	764	12	4	13	13
NORTH EASTERN REGION	4,310	5,050	5,681	6,319	17,240	1,710	15,530	740	631	638	2,962	5,485	8,038	378	99	387	391
Thane	1,465	1,688	1,884	2,059	5860	500	5360	223	195	175	893	1675	2375	123	32	126	127
Bhiwandi-Nizampur	632	775	902	1,009	2529	300	2229	143	128	106	570	1081	1505	61	16	63	63
Ulhasnagar	495	521	543	569	1978	510	1468	27	22	25	107	195	296	36	9	37	37
Kalyan-Dombivilli	1,353	1,594	1,792	2,021	5413	300	5113	241	198	229	962	1754	2671	125	33	128	129
Badlapur	121	156	184	217	482	35	447	35	29	33	140	254	387	11	3	11	11
Ambarnath	244	317	376	445	977	65	912	72	59	69	289	527	802	22	6	23	23
NAVI MUMBAI	899	1,060	1,184	1,310	3,596	2,700	896	161	125	126	642	1,141	1,644	43	12	45	45
Navi Mumbai	899	1,060	1,184	1,310	3596	2700	896	161	125	126	642	1141	1644	43	12	45	45
PANVEL-URAN	155	283	309	336	619	150	469	128	26	27	511	617	724	12	4	13	13
Panvel	128	250	271	293	512	100	412	122	22	22	486	573	660	10	3	11	11
Uran	27	33	38	43	107	50	57	6	5	5	25	45	64	2	0	2	2
NERAL-KARJAT REGION	99	100	100	101	397	64	333	0.92	0.20	0.20	4	4	5	7	2	7	7
Karjat	28	29	29	29	112	30	82	0.49	0.10	0.10	1.95	2.35	2.75	1	0	1	1
Khopoli	65	66	66	66	261	20	241	0.44	0.10	0.10	1.75	2.15	2.55	6	1	6	6
Matheran	6	6	6	6	24	14	10	0.00	0.00	0.00	0.00	0.00	0.00	-			
PEN-ALIBAG	54	60	75	105	217	230	102	5	15	30	22	82	203	2	0	2	2
Alibag	21	22	22	22	85	200	102	0.50	0.10	0.10	2	2	3	-	0	0	0
Pen	33	38	53	83	132	30	102	5	15	30	20	80	200	2	0	2	2
TOTAL URBAN MMR	19,552	22,439	24,500	26,202	78,207	45,354	32,969	2,887	2,061	1,703	11,549	19,792	26,602	886	237	912	921

Source: Estimated, 2007.

Note: For above calculations only 40% of the total demand has been considered as municipal infrastructure and capital investment projected for the same. Above cost only includes the building cost and does not take into account the cost of land. For Greater Mumbai-Island City and Suburbs, 41.8 sq.m./bed and 83.6 sq.m./bed respectively has been taken for calculation purpose. For rest of MMR, 83.6 sq.m./bed is taken for calculation purpose. Unit cost of construction is taken as Rs. 8000/sq.mt. to address requirements of large hospitals. 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016.

Appendix IV.26

Capital Investment Needs Storm Water Drainage in MMR (Rs. Million)

Sl.No	Municipal Corporation / Municipal Council	Area(in sq.km.)	Unit Cost(Crores Rs/sq.km.)	Cost for Incremental Demand			Cumulative Capital Cost (Rs.Crores)		
				2005-2011	2011-2016	2016-2021	Upto 2011	Upto 2016	Upto 2021
	GREATER MUMBAI	438	4.1	720.0	720.0	360.0	720.0	1,440.0	1,800.0
1	Island City			-	-	-	-	-	-
2	Western Suburb			-	-	-	-	-	-
3	Eastern Suburb			-	-	-	-	-	-
	WESTERN REGION	349		213.9	213.9	107.0	213.9	427.9	534.8
4	Mira-Bhayander	88	2.5	88.8	88.8	44.4	88.8	177.6	222.0
5	Vasai	10	1.2	5.0	5.0	2.5	5.0	10.0	12.5
6	Navghar-Manikpur	17	1.2	8.3	8.3	4.2	8.3	16.6	20.8
7	Nallasopara	15	1.2	7.3	7.3	3.6	7.3	14.5	18.1
8	Virar	13	1.2	6.5	6.5	3.2	6.5	13.0	16.2
9	(included in proposed M Corp)	204	1.2	98.1	98.1	49.0	98.1	196.2	245.2
	NORTH EASTERN REGION	843		549.0	549.0	274.5	549.0	1,097.9	1,372.4
10	Thane	126	2.5	125.8	125.8	62.9	125.8	251.6	314.5
11	(Thane-Bhiwandi Road- Urabn)	53	1.2	25.5	25.5	12.8	25.5	51.1	63.9
12	Bhiwandi-Nizampur	30	2.5	29.8	29.8	14.9	29.8	59.5	74.4
13	(Bhiwandi expansion)	25	1.2	12.1	12.1	6.0	12.1	24.2	30.2
14	Ulhasnagar	13	2.5	13.4	13.4	6.7	13.4	26.7	33.4
15	Kalyan-Dombivli	110	2.5	110.0	110.0	55.0	110.0	220.0	275.0
16	Badlapur	34	1.2	16.4	16.4	8.2	16.4	32.9	41.1
17	Ambernath	36	1.2	16.4	16.4	8.2	16.4	32.8	41.0
18	(New Urban Area)	416	1.2	199.6	199.6	99.8	199.6	399.1	498.9
	NAVI MUMBAI	720		453.3	453.3	226.7	453.3	906.6	1,133.3
19	Navi Mumbai	131	3.3	170.4	170.4	85.2	170.4	340.8	426.0
20	Navi Mumbai excl NMMC	213	1.2	102.4	102.4	51.2	102.4	204.9	256.1
21	NMMC 15 villages	376	1.2	180.5	180.5	90.2	180.5	361.0	451.2
	PANVEL-URAN	18		8.4	8.4	4.2	8.4	16.8	21.0
22	Panvel	13	1.2	6.0	6.0	3.0	6.0	12.0	15.1
23	Uran	5	1.2	2.4	2.4	1.2	2.4	4.8	6.0
	NERAL-KARJAT REGION	1,536		733.8	733.8	366.9	733.8	1,467.7	1,834.6
24	Karjat	7	1.2	3.2	3.2	1.6	3.2	6.5	8.1
25	Khopoli	29	1.2	13.9	13.9	7.0	13.9	27.9	34.8
26	Matheran	9	1.2	0.8	0.8	0.4	0.8	1.7	2.1
27	N-K Rural	1,491	1.2	715.8	715.8	357.9	715.8	1,431.6	1,789.6
	PEN-ALIBAG	262		126	126	63	126	251	314
28	Alibag	4	1.2	1.7	1.7	0.9	1.7	3.5	4.3
29	Pen	5	1.2	2.5	2.5	1.3	2.5	5.1	6.4
30	Rural	253	1.2	121.4	121.4	60.7	121.4	242.9	303.6
	TOTAL MMR	4166		2,804.2	2,804.2	1,402.1	2,804.2	5,608.3	7,010.4

Source: Estimated, 2007.

For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai and Ambernath CDP estimates are considered as the total cost for this sector. For Other Municipal Corporations, an average unit cost of Rs. 25 million/sq.km has been used based on the CDP estimates of Thane and Mira-Bhayander corporation

For rest of Municipal Councils, unit cost of Rs. 12 million/sq.km. has been used, based on the CDP estimates of Ambernath Municipal Council. For Matheran ULB, only 20% of the municipal area is considered for calculation purposes as rest of the area lies in ecologically sensitive/no development zone

Appendix IV-27 Metropolitan Transportation - Committed Projects

Suburban Rail Improvements

In Mumbai Metropolitan Region, the planning authorities are active in planning the required transport network for the future demands. Several studies have been carried out for identifying, prioritizing the transport corridors in MMR. The major projects which are under active implementation/ under progress are as follows:

- Capacity enhancements to Mumbai sub-urban railway system under Mumbai Urban Transport Project: Rail Component (Phase I and Phase II)
- Metro system proposals in Thane (MRTS for Thane) and MCGM (Master Plan for Mumbai Metro)
- Mumbai Urban Transport Project: Road Component
- MUIP Improvements

Improvements to the Existing Sub-urban Rail System:

As a sequel to the Bombay Urban Transport Project (BUTP) which was completed in the year 1984 at a cost of about Rs. 390 million, the MMRDA has formulated a multi modal project viz Mumbai Urban Transport Project (MUTP) to bring about improvement in traffic and transportation situation in the MMR with the World Bank assistance. MUTP envisages investment in suburban railway projects, local bus transport, new roads, bridges, pedestrian subways and traffic management activities. To enable the Mumbai Suburban Railway to meet the demands of the ever-growing passenger traffic, Ministry of Railways and the Government of Maharashtra joined hands to face the challenge. Mumbai Rail Vikas Corporation Ltd. (MRVC Ltd.), a PSU of Govt. of India under Ministry of Railways was



incorporated under Companies Act, 1956 to implement the Rail Component of an integrated rail-cum-road urban transport project called Mumbai Urban Transport Project (MUTP).

The total cost of MUTP: Rail component was Rs. 56,180 million (1998-99 prices) and it was bifurcated in two phases (Phase I and Phase II) for the purpose of World Bank funding. Phase I includes works planned during 2001-2006, the cost of which is Rs. 40,000 million (2001 Prices). Phase II includes works planned during 2006-2011, the cost of which is Rs. 37,000 million (April 2005 Prices).

The capacity augmentation works proposed under Phase I and Phase II are as follows:

Phase I: (Cost is @ 2001 prices)

- Quadrupling of Borivali-Virar Section: Rs. 5,090 million
- Provision of 5th Line Western Railway: Rs. 590 “
- Kurla-Thane Additional Pair of Lines: Rs. 1,660 “
- Extension of Harbour Line to Goregaon: Rs. 590 “
- Optimisation of Western Railway: Rs. 501 “
- Optimisation of Central Railway: Rs. 995 “
- Optimisation of Harbour Railway: Rs. 197 “
- DC to AC Conversion: Rs. 3,804 “
- Resettlement & Rehabilitation: Rs. 2,900 “
- EMU Procurement and Manufacture: Rs.13,592 “
- Maintenance Facilities for EMUs: Rs. 643 “
- Stabling Lines for EMUs: Rs. 485 “
- Track Machines: Rs. 313 “
- Institutional Strengthening & Studies: Rs. 482 “

Phase II: (Cost is @ 2005 prices)

- 5th & 6th Lines (Long Distance Corridor) between CSTM and Kurla: Rs. 4,640 million
- 5th & 6th Lines (Long Distance Corridor) between Thane and Diwa: Rs. 990 “
- 6th line between Borivali and Mumbai Central (LDC): Rs. 3,720 “
- Extension of Harbour Line from Andheri to Goregaon: Rs. 760 “
- DC to AC Conversion (CSTM-Thane Section): Rs. 2,050 “
- EMU Procurement & Manufacture: Rs. 20,090 “
- Station Improvement: Rs. 960 “
- Resettlement & Rehabilitation: Rs. 940 “
- Other Facilities for EMUs and Studies: Rs. 2,850 “

Recently, capacity augmentation works have been identified for Phase III and the estimated cost is Rs. 25,500 million (April 2005 Prices). The details are as follows:

Phase III: (Cost is @ 2005 prices)

- Rolling Stock: Rs. 9,900 million
- Reduction in Headway through improved signalling to around 2.5 minutes: Rs. 12,000 million
- Bandra-Kurla (East-West Link): Rs. 3,600 million

Proposed Sub-urban Rail System: Outside MCGM

Outside Municipal Corporation area of Greater Mumbai, CIDCO has planned the following corridors:

- Mankhurd-Belapur-Panvel (29 kms) commissioned in 1992
- Thane-Juinagar-Nerul (20 kms) commissioned in 2005 from Thane to Vashi
- Thane-Vashi-Juinagar-Uran (50 kms)
- Ring Railway around CBD Belapur (15 kms)
- Mansarovar-Taloja (11 kms)
- Panvel-Ulwe-Uran (32 kms)

All the above discussed sub-urban rail links and other aspects have been considered while preparing the horizon year (2031) transport network.

Metro System:

Thane MRTS: The Government of Maharashtra and Thane Municipal Corporation (TMC) have envisaged the need for an efficient, economical, equitable and environment friendly MRT system for Thane city considering the increasing traffic related problems in Thane city. Accordingly, GOM and Thane Municipal Corporation (TMC) had carried out preliminary studies through RITES (1989) and CIDCO (1994) in the past and reservation for the proposed ring railway was made in the development plan of Thane city. Considering the urgency of implementation of the proposed MRT system, Government of Maharashtra has appointed Maharashtra State Road Development Corporation Ltd. (MSRDC) as the nodal agency for carrying out necessary studies and implementing the MRT system in



public - private partnership. As a prelude to implementation, a detailed project report is being prepared with financial assistance from Ministry of Urban Development (MUD), Thane Municipal Corporation (TMC) and MSRDC, to examine the technical and financial viability of constructing and operating an efficient MRT system in Thane, connecting major land uses including the growing residential and industrial areas and give access to Thane railway station. MSRDC, in consultation with Government of Maharashtra and TMC, has appointed a Consortium of consultants consisting of M/s Consulting Engineering Services (India) Limited (CES), PB Kennedy and Donkin Ltd., UTI Securities Exchange Limited, LPT Consultant (Malaysia) Sdn Bhd and Architects and Engineers Pvt Ltd., to prepare a bankable Detailed Project Report (DPR) for Thane MRT system project. The study is being guided by a Technical Advisory Committee (TAC) having members from MSRDC, TMC, MUD, GOM and IIT.

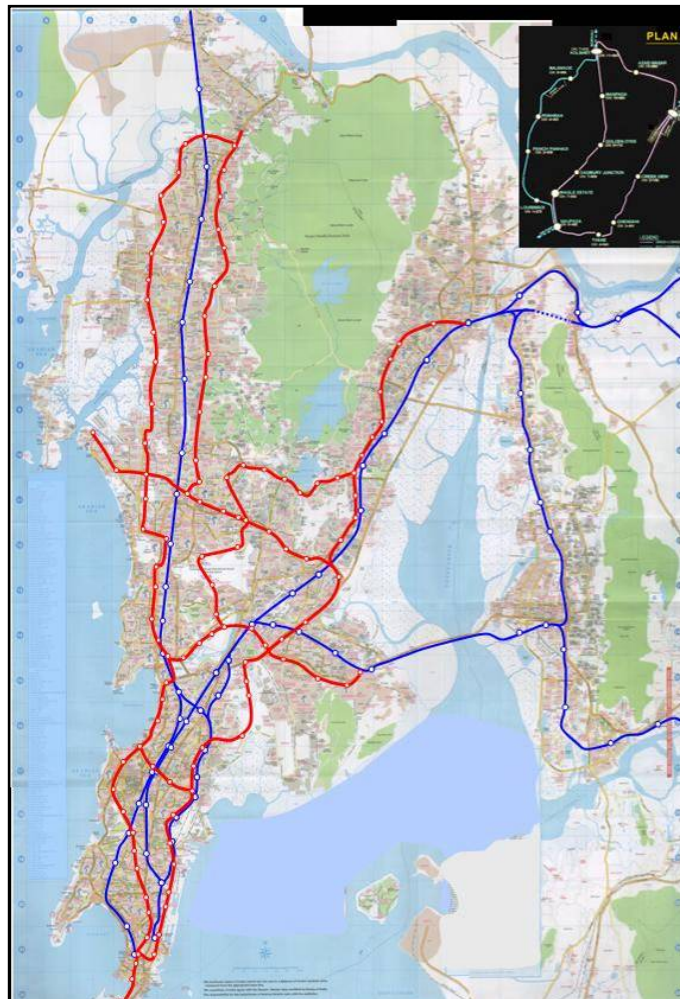
Based on the earlier studies, Thane Development Plan provides for the development of a MRT system along a ring corridor, over a length of 21 kms comprising 11 stations. To cover the period up to 2031, an Integrated Land Use Transport System Plan of Thane - 2031 has been prepared. This plan envisages the population size of Thane 2031 at 3.04 million; estimates employment size and occupational pattern; spatially distributes population and employment by sectors; develop a conceptual urban structure; estimates the land use by sectors; and identifies the transport network system by 2031, comprising the road network, the MRT system network, regional rail linkages and the suburban rail lines. The Master Plan for the MRT system networks forms the guidelines for development of the system over the next 30 - year period. Accordingly, to meet the future travel demand generated as a result of the growth of population and economic activities in Thane city, the MRT system Network Master Plan covering 60 kms on four corridors is envisaged for implementation in phases for the entire Municipal Corporation and adjoining areas. Considering the immediate needs, the

16.2 kms Green Corridor is proposed to be implemented in Phase I. Plan I indicates the networks of MRT system corridors for development as a part of Master Plan.

The basic cost of implementing the Green Corridor of MRT system covering the Civil Engineering works, Electrical works, S & T works and works related to ticketing system and also including the R & R costs, pre - construction planning and design cost, legal and financial charges, SPV charges and SPV contingency works out to Rs. 8,500 million approximately at 2001 prices.

Master Plan for Mumbai Metro:

MMRDA commissioned DMRC to prepare a Master Plan for Metro System and to prepare Detailed Project Report for the selected priority corridor (up to a maximum length of 25 kms) in 2004. DMRC has identified the likely corridors to be included in Master Plan based on several meetings with the Sub-committee nominated by MMRDA, review of past studies and site reconnaissance visits. A total of seven corridors have been identified with aggregate length of 146.5 kms. Peak hour sectional loads and peak hour boardings/ alightings were estimated for the entire metro network based on detailed travel demand forecast and travel demand modelling procedure. For phasing of Master Plan corridors, the network was reconfigured into suitable sections. The prioritization of the sections has been carryout based on weightages assigned to



passenger-kms/kms, passenger-kms/unit investment, sectional traffic loads during peak hours and environmental impact of various corridors as 40%, 25%, 25% and 10% respectively. The proposed phasing of the Master Plan network as follows:

Phase I: 2005-11

- Colaba (Backbay)-Mahim-Charkop (38.1 kms)
- Versova-Andheri-Ghaotkopar (15.0 kms)
- Mahim-Manhkurd (12.8 kms)

Phase II: 2011-16

- Charkop-Dahisar (7.5 kms)
- Ghatkopar-Mulund (12.4 kms)

Phase III: 2016-21

- BKC – Kanjur Marg via Airport (19.5 kms)
- Andheri (East) – Dahisar (East) (18.0 kms)
- Hutatma Chowk – Ghatkopar (21.8 kms)
- Sewri - Prabhadevi (3.5 kms)

Approximate capital cost of the Mumbai Metro Master Plan network was Rs. 1,95,250 million at 2003 price level. This was based on the assumption that the Central Government and State Government will give exemption from taxes & duties and Government land is free for the project. Subsequently, some modifications have been made to the proposed alignments and phasing by MMRDA and cost have been updated to the year 2005-06 and some changes in phasing also have been made. The details are presented in Table IV.22-1. The total cost of proposed metro system in MCGM is Rs.335,480 million.

Table IV-22-1: Phasing of Mumbai Metro Master Plan Corridors

Line No.	Metro Line Name	Length (km)	Length Elevated (km)	Length Underground (km)	Total Cost (Rs. Million)	Proposed Period of Implementation
1	Varsova-Andheri-Ghatkopar	15.00	15.00	0.00	20,700	2005-11
2	Mahim-Charkop	20.65	20.65	0.00	28,490	2005-11
3	Colaba-Mahim	17.59	0.00	17.59	81,280	2011-16
4	Mahim-Mankhurd	12.80	10.70	2.10	24,470	2005-11
5	Charkop-Dahisar	7.50	7.50	0.00	10,350	2011-16
6	Ghatkopar-Mulund	12.40	12.40	0.00	17,110	2011-16
7	BKC-Kanjurmarg via Airport	19.50	11.00	8.50	54,450	2026-31
8	Andheri (East) - Dahisar (East)	18.00	18.00	0.00	24,840	2026-31
9	Hutatma Chowk-Ghatkopar	21.80	13.30	8.50	57,620	2016-21
10	Sewri-Prabhadevi	3.50	0.00	3.50	16,170	2011-16
Total		148.74	108.55	40.19	335,480	

Source: *Comprehensive Transportation Study for MMR, MMRDA, 2007*

MUTP: Road Component: Under MUTP: Road Component, major east-west links have been proposed in addition to other road based projects and brief details are as follows:

- Jogeshwari-Vikroli Link Road (JVLR): Rs. 1,680 million
- Santacruz-Chembur Link Road (SCLR): Rs. 1,870 “
- ROB at Jogeshwari (South): Rs. 800 “
- ROB at Jogeshwari (North): Rs. 540 “
- ROB at Vikroli : Rs. 370 “
- Purchase of 500 Eco friendly Buses: Rs. 1,130 “
- Pedestrian Grade Separation Schemes: Rs. 730 “
- Area Traffic Control (ATC) in Island city: Rs. 720 “
- Station Area Traffic Improvement Scheme for 6 stations: Rs. 730 “
- Other Traffic Management and Safety Schemes: Rs. 550 “
- Environment and Air Quality Monitoring: Rs. 130 “
- Different Studies and Technical Assistance: Rs. 910 “

The total cost of road component of MUTP is approximately Rs.10,160 million at 2001 prices. Construction of JVLR and SCLR are in progress. Feasibilities studies for rest of the

projects are nearing completion. In the horizon year transport network of the present CTS study, improvements to JVLR and SCLR have been considered.

MUIP Improvements: To supplement the efforts under MUTP, MMRDA embarked upon an ambitious program titled Mumbai Urban Infrastructure Project (MUIP) in 2003. MMRDA developed a Master Plan (2001-2021) for integrated road development with the objective of strengthening and augmenting the capacity of the existing road network, mainly in suburbs where the intensity and demand for traffic has been increased significantly. The proposed road network improvements under MUIP were mostly as per Sanctioned Development Plan (SDP), provide connectivity to the north-south and east-west arterial roads in suburbs and Island city, construction of missing links, flyovers at critical junctions, elevated roads, ROBs, RUBs, vehicular underpasses, pedestrian subways and foot over bridges.

In Eastern suburbs, there are 52 roads proposed for improvements which includes the existing as well as missing links. These proposals include 6 elevated roads, 10 flyovers, 1ROB, 14 pedestrian subways and 8 vehicular subways. Some of the important links are Andheri-Ghatkopar Link Road, Western Express Highway, Eastern Express Highway, Goregaon Mulund Link Road, Missing DP links, Aarey Colony Road, etc.

In Western suburbs, there are 60 roads proposed for improvements. These proposals include 17 flyovers, 7 ROBs, 5 pedestrian subways and 1 vehicular subway. Some of the important links are Main Linking Road, S V Road, J P Road, Barfiwala Lane, JVLR Extension, extension of GMLR from SV Road to Main Linking Road, etc.

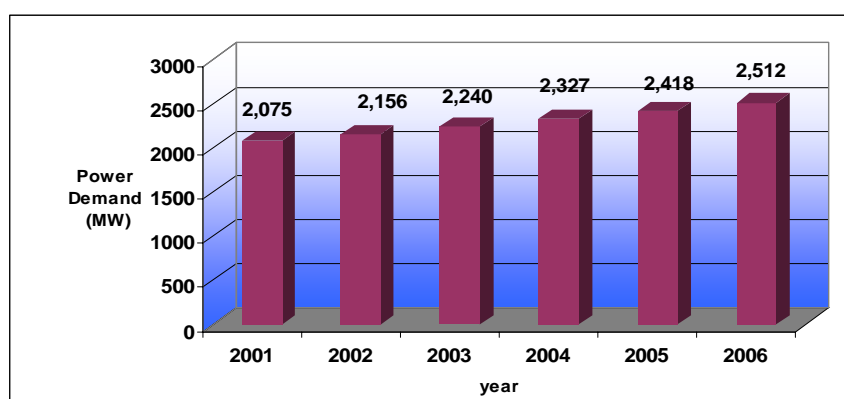
In Island city, there are 22 roads proposed for improvements. These include, 14 flyovers, 4 elevated roads, 7 ROBs, 24 pedestrian subways and 1 vehicular subway. Some of the important links are B R Ambedkar Road, Jacob Circle and the connecting radial roads, Drainage Channel Road, Eastern Freeway, etc. The estimated cost of the proposed improvements in Eastern suburbs, Western Suburbs and Island city is Rs.13,168 million, Rs.6,743 million and Rs.5,655 million respectively at 2003 prices. The total cost of the proposed improvements is Rs.26,476 million at 2003 prices. In the horizon year transport network of the present CTS study, the major proposed improvements under MUIP have been considered.

Freeways: The major freeway standard roads under active consideration in MMR are Western Freeway from Wori to Nariman Point (WFSL), Mumbai Trans Harbour Link (MTHL) and Eastern Freeway (from Mukherjee Chowk in Island city to Panjarpole on V N Purav Marg in Eastern suburbs). These freeways have been included in the proposed horizon year transport network of the present CTS study.

Appendix IV.28 Overview of Electricity Situation in MMR

GREATER MUMBAI

Today Mumbai's Maximum demand is around **2512 MW** and connected load is around 4000 MW with a 60% load factor as per reliance energy estimation. A shortfall of around **350 MW** is prevailing in the Mumbai area. As per estimation, the per capita maximum demand in this area is around 0.73 KW with connected load of 1.2 KW. The increase in maximum demand in the Greater Mumbai area over the years is shown in **Figure 1**



Source: Tata Power and Reliance energy

Figure 1: Growth in Maximum Demand in Greater Mumbai

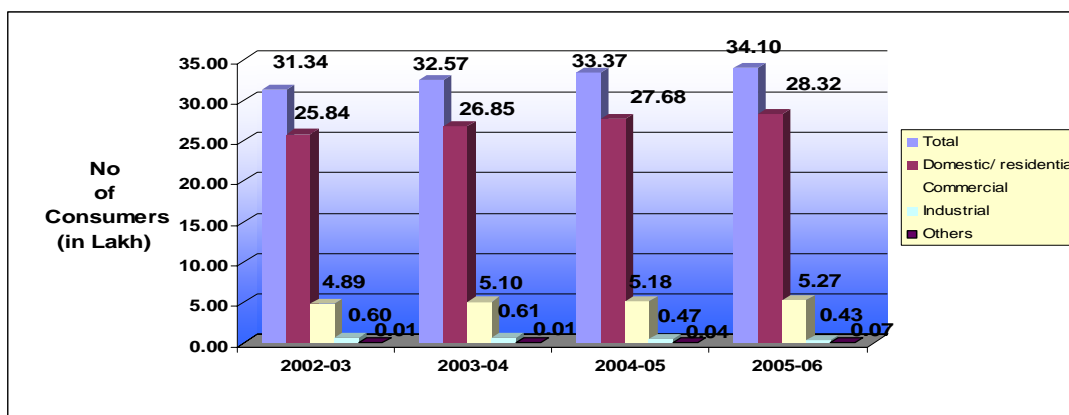
Consumer Profile:

Table 1 No of consumers in Greater Mumbai and average annual growth rate.

Category name	2002-03	2003-04	2004-05	2005-06	CAGR (%)
Domestic/ residential	2583937	2685340	2768458	2832783	2.33
Commercial	489388	509708	517737	527537	1.89
Industrial	59751	61017	46734	43062	-7.86
Others	538	599	3696	7022	90.07
Total	3133614	3256664	3336625	3407106	2.11

Source: Tata power, Reliance energy and BEST

The avg. annual growth rate of no of consumer is 2.11% over the past four years. The growth rate of Industrial consumers shows a declining growth rate over the past two years.



Source: Tata power, Reliance energy and BEST

Figure 2 Growth of consumer by category

The total no of consumers includes Reliance, Tata and also BEST consumers. Among the consumers domestic consumers are almost 82.7% followed by commercial 15.6%, industrial 1.6% and 0.1% other customers. The other consumers include railways, street lighting etc.

Greater Mumbai has a consumer base of 3.43 Million. As per CTS study estimation the total no of households in greater Mumbai area is around 2.8 Million. Commercial consumers have a significant base in Mumbai city.

Consumption pattern in Greater Mumbai:

In Greater Mumbai area maximum percentage of the consumption of power is by the household consumers. Household consumers consume about 42% of the power in the Greater Mumbai area followed by Commercial sector 25%, Industrial Sector 25% and other 7%. The consumption by others includes street lighting, railways and a very less fraction of agricultural consumption.

REST OF MUMBAI METROPOLITAN REGION

Demand and shortfall:

The maximum demand recorded in all the circles in Rest of the MMR area excluding Greater Mumbai in the year 2006 is 3628 MW against **3239 MW** in the year 2005. Significantly rest of the MMR area excluding Greater Mumbai is only 1.2 % of the entire Maharashtra area but the maximum demand in this area is around **25%** of the total maximum demand for the state. The shortfall in this area is around **1000 MW**. The total maximum demand circle wise in the rest of MMR area is given below in Table 2.

Table 2 Maximum demand in the rest of MMR area

Name of Division	Non Shadable load	Shadable Load		
	Total Average Load	Total Average load of Urban Feeder	Total Average load of rural feeder	Total Load
Goregaon (Raigar)	121	14	50	184
Panval (R)	623	23	57	703
Pen Circle	744	37	107	887

Name of Division	Non Shadable load	Shadable Load		
	Total Average Load	Total Average load of Urban Feeder	Total Average load of rural feeder	Total Load
Dombivali	24	74	0	98
Kalyan (W)	2	70	0	72
Kalyan (E)	50	44	0	94
Kalyan Circle-I	76	188	0	264
Kalyan (R)	84	18	47	149
Ulhasnagar(I)	31	57	0	87
Ulhasnagar (II)	49	55	0	104
Kalyan Circle-II	164	129	47	339
Vasai	119	25	0	144
Virar	5	45	0	50
Palghar	279	23	39	341
Vasai Circle	403	93	39	535
Kalyan Zone	1387	447	192	2026
Panval	60	65	3	128
Vashi	101	82	0	183
Nerul	12	65	0	77
Vashi Circle	173	212	3	388
Walagle Estate	14	68	0	82
Thane	3	51	0	54
Mulund	8	60	0	68
Bhandup	12	59	0	71
Kalwa	7	48	0	55
RST	105	0	0	105
Thane Circle	149	286	0	435
Bhiwandi-I	0	349	0	349
Bhiwandi-II	10	387	34	431
Bhiwandi Circle	10	736	34	780
BNDUZ	332	1234	37	1602
Grand Total	1719	1681	229	3628

Source: Maharashtra State Electricity Board

Consumer Profile

In rest of the MMR area Maharashtra State Electricity Board is the energy service provider. The no of consumer in the year 2005-06 was around 37 Lakhs. The distributions of consumers in the MMR area are proportionate as per the entire Maharashtra state. But most of the commercial as well as the industrial consumers are concentrated in the MMR area.

Appendix IV.29 Overview of Electricity Situation in Maharashtra

Maharashtra is the largest power generating state in the country with the largest electricity system capacity. The power scenario has two parts in Maharashtra. One is Rest of the Maharashtra area other than Greater Mumbai and the other is the Greater Mumbai area. Maharashtra State Electricity Board is responsible for the Rest of Maharashtra area and two private companies Tata Power and reliance Energy are responsible for the greater Mumbai Area. The rest of the Mumbai Metropolitan Area except greater Mumbai falls under the jurisdiction of MSEB. This chapter will discuss the overview of the state's Generation, Transmission and Distribution.

Generation

In Maharashtra the main generation of power is through MSEB power Stations. Tata power, Reliance energy also has its own power generating stations. Some part of the power it gets from the central share and also from the Independent power producers.

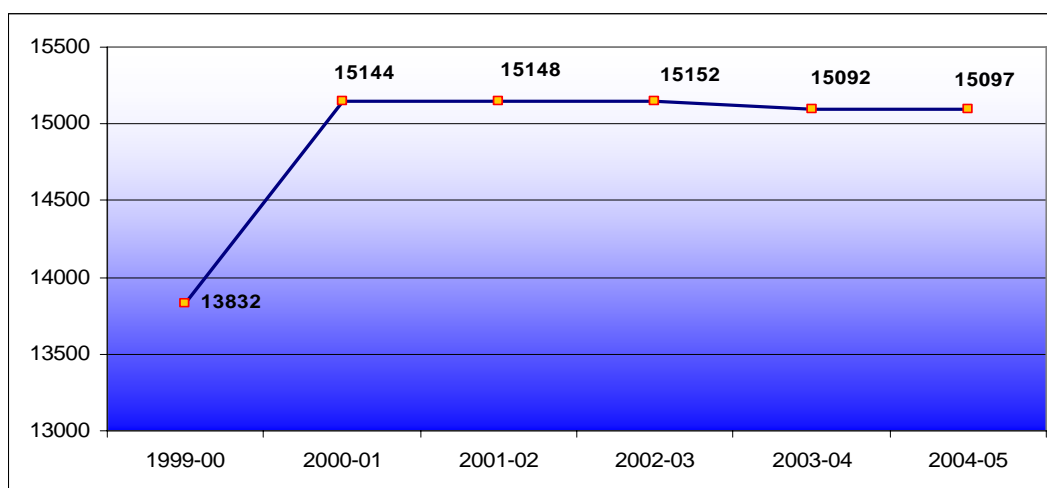


Fig-1: Total installed capacity of the state (MW)

Fig 1 shows that there is a substantial increase in the total installed capacity from the year 1999-00 to the year 2000-01. From 2000-01 there is a steady growth in the total installed capacity up to year 2002-03 but in the year 2003-04 there is a slight drop down of the installed capacity due to decrease in capacity of MSEB. Table 1 and Figure 2 gives us the share of total installed capacity of the State.

Table 1: Share of Total Installed Capacity of the State (MW)

Agency	MSEB (MW)	Tata(MW)	Reliance(MW)	TAPS(MW)	IPP(MW)	central share(MW)
1999-00	9097	1774	500	190	728	1543
2000-01	9767	1774	500	190	728	2185
2001-02	9771	1774	500	190	728	2185
2002-03	9771	1774	500	190	728	2189
2003-04	9711	1774	500	190	728	2189
2004-05	9716	1777	500	190	728	2185

* 728 MW from Dabhol Power Corporation is not available since 2001.

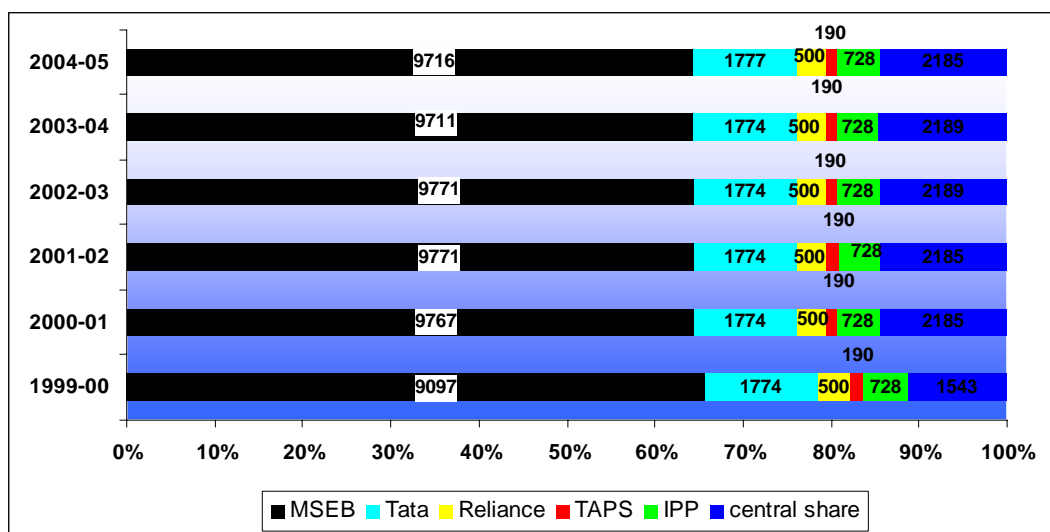


Figure 2: Share of Total Installed Capacity of the State (MW)

Maharashtra State Electricity Generation Company.

Maharashtra Generation Company (MAHAGENCO) under MSEB is the largest producer of power in the state. It sells power to Tata power as well as it gives power for distribution within the Maharashtra region. MAHAGENCO's own generating capacity is 9716 MW in the year 2005-06. The details of its installed capacities in various power plants is given in Table-2

Table 2- Details of MSEB Hydro power station

Sl no	Name of Power station	Capacity (NoxMW)	Installed Capacity(MW)
1	MSEB HYDRO		
1	Bhandardara	1x34	34
2	Bhatghar	1x16	16
3	Bhira Tail Race	2x40	80
4	Bhatsa	1x15	15
5	Dhom	2x1	2
6	Dimbhe	1x5	5
7	Dudhganga	2x12	24
8	Eldari	7x7.5	22.5
9	Kanher	1x4	4
10	Koyna I & II	4x70, 4x80	600

SI no	Name of Power station	Capacity	Installed Capacity(MW)
11	Koyna III	4x80	320
12	Koyna IV	4x250	1000
13	Koyna Dam Power Station	2x20	40
14	Manikdoh	1x6	6
15	Paithan	1x12	12
16	Panshel	1x8	8
17	Pawana	1x10	10
18	Surya	1x6	6
19	Surya R. B.	3x0.25	0.75
20	Radhanagari	4x1.2	4.8
21	Tillari	1x66	66
22	Terwanmedhe	1x0.2	0.2
23	Ujani	1x12	12
24	Vaitarana	1x60	60
25	Vaitarana Toe of Dam	1x1.5	1.5
26	Varasgaon	1x8	8
27	Veer	2x4.5	9
28	Yeoleshwar	1x0.075	0.075
29	Warna	2x8	16
30	Pench I & II (Maharashtra share 53 MW)	2x80	53
31	Karanjvan	1x3	3
32	Majalgaon	1x0.75	0.75
	Total MSEB Hydro		2439.575

Table 3- Details of MSEB Thermal Power Station

	MSEB THERMAL		
1	Bhusawal Unit 1	1x62.5	62.5
2	Bhusawal Unit 2& 3	2x210	420
3	Chandrapur Unit 1 to 4	4x210	840
4	Chandrapur Unit 5, 6 &7	3x500	1500
5	Khaperkheda Unit 1 to 4	4x210	840
6	Koradi Unit 1 to 4	4x120	480
7	Koradi Unit 5	1x200	200
8	Koradi Units 6 & 7	2x210	420
9	Nasik Units 1& 2	2x140	280
10	Nasik Units 3,4 & 5	3x210	630
11	Paras Units 2	1x62.5	62.5
12	Parli Units 1 & 2	2x30	60
13	Parli Units 3, 4 & 5	3x210	630
14	Uran Gas turbaine unit 2 to 4	3x60	180
15	Uran Gas turbine Units 5 to 8	4x108	432
16	Waste Heat Recovery Unit 1 &2	2x120	240
	Total Thermal		7277

Tata Power Company

Tata Power Company has a total installed capacity of 1777 MW. They have a 25% of Hydro capacity and 75% of thermal capacity. They use their generation to supply only in the greater Mumbai region.

Tata Power			
		Capacity	Installed Capacity(MW)
	Hydro Power Station	(NoxMW)	
1	Bhira	3x25+3x25	150
2	Bhira P.S.S	1x150	150
3	Bhivpuri	6x15	75
4	Khopoli	6x12	72
	Total		447
	Thermal Power Station		
1	Trombay Unit-4	1x150	150
2	Trombay Unit-5 & 6	2x500	1000
3	Trombay Unit 7A (Gas Turbine)	1x120	120
4	Trombay Unit 7 B (Waste Heat Recovery)	1x60	60
	Total		1330

Reliance Energy Ltd.

Although this company is mainly into distribution but it has got its thermal power station at Dahanu which is Reliance's single largest power station in the country. It is a 500 MW (2*250 MW) coal based thermal power station.

Tarapur Atomic Power Station

Tarapur atomic power station is a centrally owned power station situated near Boisar, Dist-Thane, Maharashtra. It has got four units of production. Unit-3 has just started from August, 2006. It has got a capacity of 380 MW (2*180) where Maharashtra's share is 190 MW.

Transmission

Like generation transmission is also controlled by three entities in Maharashtra. Maharashtra Transmission Company is for the entire Maharashtra state other than greater Mumbai region. For Greater Mumbai Region Tata Power and Reliance Energy has its own Transmission Network.

Reliance has its own 220 KV transmission network to supply power from the Dahanu Thermal Power Station to the company's area of supply in Mumbai Suburban areas. It is operating three modern 220/33 kV receiving stations at Versova, Aarey and Ghodbunder. There are two 220kV Lines also connected to Tata Borivili at Aarey R/S from where extra power flows as and when required.

Distribution

The distribution function in the entire Maharashtra state region is controlled by Maharashtra Distribution Company. Especially in Mumbai region the distribution function is entrusted to Tata Power Company, Reliance Energy Ltd and Brihanmumbai Electric Supply and Transport.

Maharashtra Distribution Company

Maharashtra Distribution Company is responsible for the distribution of power in the entire Maharashtra region. All the thirty districts of Maharashtra is covered by MahaDiscom. The area covered by Mahadiscom is shown in the Figure 3.



Figure 3: Area Covered by MahaDiscom in Maharashtra

Reliance Energy Ltd

The main function of electricity supply in Mumbai is controlled by Reliance Energy Ltd. In the north zone Borivali to Bhayander, in the central zone Goregaon to Kandivali, in south central zone (Anheri, MIDC, Marol & SEEPZ and Jogeshwari), south zone Bandra to Vile Parle and in the Eastern zone chunabhatti to vikhroli & Mankhurd. Reliance Energy licensed area of supply is 384 sq kms, equivalent to 70 per cent of Mumbai's total distribution area and is presently distributing primarily in suburban Mumbai.

Reliance Energy holds exclusive licence for distribution of power in the suburban Mumbai licensed area, which is valid until 2011. Reliance Energy distributes 1,100 MW of power, of which 500 MW is from own generation at Dahanu and the balance 600 MW is sourced from TPC.

Tata Power Company Ltd.

Tata Power has a 935 km HT and LT cable distribution network connecting 17 major receiving stations and over 85 sub-stations in its Mumbai License area. In Mumbai and entire Maharashtra region Tata power is mainly in to generation and distribution. Almost

22000 consumers are served by Tata Power Company. Almost 2% area is served by TATA power in Mumbai.

Brihanmumbai Electric Supply and Transport

BEST Undertaking covers South Mumbai from Colaba to Mahim/Sion and supplies electricity in that area. BEST is the licensee for the distribution of electric power within the City Limits of Mumbai. BEST gets its power for distribution from TATA power.

The Tata Power Companies (TPC) and the Maharashtra State Electricity Board (MSEB) have their generating stations located in different parts of Maharashtra State and form an interconnected transmission system grid in the Mumbai-Pune region. Electric Power from this system is transmitted at 220/110kV through overhead conductors and underground cables amongst others to TPC's sub-stations at Carnac, Parel, Dharavi, Backbay & Mahalaxmi. From here power is made available to BEST at 110/33/22kV.

The BEST Undertaking on behalf of BrihanMumbai Municipal Corporation (who are the licensees for the distribution of electric power within the City Limits of Mumbai) receives power in bulk from the TPCs. At 110/33/22kV, 3 Phase 50Hz.

BEST has two kinds of distribution networks: 110/33/22 kV primary distribution system and also secondary distribution system.

Appendix IV-30

BENCHMARKING

The consumption of electricity in India is very less in comparison to the world average. India's average per capita consumption per year is around 450 KWH where world average is around 2200 KWH. Some of the high power consuming countries are listed in the table below.

Country wise per capita consumption of energy

Sl. No	Name of the country	Per capita consumption per year of electricity (KWH)
1	Iceland	28,787
2	Norway	22,859
3	Canada	16,047
4	Finland	14,872
5	Sweden	14,685
6	United states	12,187
7	UAE	10500
8	Australia	10,035
9	Japan	8200
10	France	7142
11	Germany	6189
12	United Kingdom	5784
13	Russia	5679
14	Denmark	5624
15	Italy	5143
16	South Korea	4303
17	Brazil	1975
18	China	1662
19	India	450

Source: World Development Indicators

The average per capita consumption of power is very less compared to the other developed nations of the world. Even the figure is very less than the world average. In Maharashtra according to the economic survey of Maharashtra the per capita consumption is around 550 KWH. While in Mumbai per capita consumption per year is around 1250 KWH (almost three times the all India average). In Greater Mumbai area the per capita consumption of electricity is the highest in the country. But comparing to the other cities in the world, the consumption level is much lesser even in case of greater Mumbai. For ex the per capita consumption of electricity in Hong Kong is around 5600 Kwh per year. In Japan also this figure is much higher than Mumbai (Table-5.1).

In a growing economy the energy consumption increases along with the economic growth. But in Maharashtra the energy consumption rate is much lower than the rate of growth in GDP.

The current level of estimation of investment in the power sector is only to meet the demand by the year 2021 and to avoid load shedding. By considering the past growth factor it is estimated that the per capita consumption per year for Maharashtra state is likely to go from 550 KWH up to 1000 KWH by the year 2021

If we want to reach the present consumption level of Hong Kong (5600 KWH per capita per year) by the year 2020-21 we will be having a maximum demand of around 190000 MW for the entire Maharashtra state. And for MMR area this figure will be around 76000 MW.

An investment of rupees 1500 billion will require to meet the demand for the entire state. And for the MMR area the investment will be around 600 Billion rupees.

Appendix V-1
P-2 SCENARIO: CAPITAL INVESTMENT PLAN - Mumbai Metropolitan Region (2005-2021)

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
1	NATIONAL LEVEL INFRASTRUCTURE					
1.1.1	PORT DEVELOPMENT					From respective Port Trusts as provided by MTSU
	MbPT	2,079	554	0	2,633	
	JNPT	9,984	1,820	0	11,804	
	Rewas-Aware Port	600	1,200	2,700	4,500	
	Sub-Total	12,663	3,574	2,700	18,937	
1.1.2	AIRPORT DEVELOPMENT					From respective Agencies as provided by MTSU
	Chattarpati Shivaji International Airport	3800	3100	3000	9900	
	Navi Mumbai Airport	2500	2000		4500	
	Sub-Total	6,300	5,100	3,000	14,400	
	TOTAL	18,963	8,674	5,700	33,337	
2	METROPOLITAN INFRASTRUCTURE					
2.1.1	WATER SOURCE DEVELOPMENT					Estimated. Refer A-2.1.1 for the criteria adopted.
	Regional Water Source Development	2128	6384	2128	10640	
	Water Conveyence Network	694	2082	694	3470	
	TOTAL	2822	8466	2822	14110	
2.1.2	TRANSIT INFRASTRUCTURE					Estimated as per the CTS Network. Refer A-2.1.2 for unit costs adopted.
	MMR Metro System					
Mumbai Metro	Varsova-Andheri-Ghatkopar	2070			2070	
	Mankhurd-Mahim-Charkop	5153			5153	
	Backbay-Bandra	8870			8870	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Charkop-Dahisar	1035			1035	
	Ghatkopar-Mulund	1711			1711	
	BKC-Marol Naka via Airport		3927		3927	
	Andheri(E)-Dahisar(E)	2194			2194	
	Hutatma Chowk-Ghatkopar		10349		10349	
	Sewri-Prabhadevi		1617		1617	
	Dahisar-Mira Road-Manikpur-Virar		5618		5618	
	Thane-Bhiwandi	2199			2199	
	Thane-Ghodbunder-Dahisar	3182			3182	
	Mankhurd-Vashi-Narthen Gaon-Kalyan	6573			6573	
	Vashi-Belapur-New Airport-Panvel			3525	3525	
	Targhar-Kharkopar-Nhava Sheva-Dronagiri			2299	2299	
	Kharkopar-Dhutum-Pirkone			2300	2300	
	Sewri-Kharkopar			9633	9633	
	Rolling Stock	5224	3407	2812	11443	
	Sub-Total	38211	24918	20569	83698	
	Sub-Urban Railways					Estimated as per the CTS Network. Refer A-2.1.2 for unit costs adopted.
	New Sub-Urban Railway System/Additional Tracks					
	Diva-Vasai Road	2406			2406	
	Panvel-Jite-Thal			3655	3655	
	Panvel-Karjat		1656		1656	
	Diva-Panvel		1602		1602	
	Panvel-Uran	1614			1614	
	Kharkopar-Jite(New link)		1374		1374	
	Sub-Urban Railway System					

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Ranjanpada-Kharkopar-Targhar-Seawood (new link)	834			834	
	Thane-Bhiwandi			750	750	
	Thal-Alibag(new link)			324	324	
	Sub-Urban Rail Improvement					
	<i>Sub-Urban Rail Improvements</i>				0	
	Headway Improvement by installation of ATC system	849	849		1698	
	Procurement of additional rakes (114 No.)	2005	2005		4010	
	Conversion of 9 Car to 12 Car rakes	572	572		1143	
	Station Area Improvements (WR)	189	189	210	588	
	Station Area Improvements (CR)	486	486	540	1512	
	New Depots (WR)	384	384		768	
	New Depots (CR)	384	384		768	
	New Workshop and Equipment (WR)	192	192		384	
	New Workshop and Equipment (CR)	192	192		384	
	Safety Measures	240	240		480	
	<i>Rolling Stock</i>	1080	1031	1052	3163	
	Sub-total	11426	11155	6531	29113	
Water Transport Infrastructure	Water Transport					As per CTS estimates.
	West Coast Passenger Water Transport	360			360	
	East Coast Passenger Water Transport	60			60	
	Others	60			60	
	Sub-total	480	0	0	480	
	TOTAL	50117	36073	27100	113291	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
2.1.3	HIGHWAY SYSTEM					Estimated as per the CTS Network. Refer A-2.1.3 for unit costs adopted.
Higher Order Highway Corridors	Eastern Freeway	1350			1350	
	Elevated Link (Sewri-Worli Sea Link)	336			336	
	MTHL: Sewree to Kharkopar (Main Link over the creek)	4187.04			4187	
	Western Sea Link South Extn (Worli to Haji Ali)	1450			1450	
	Inner Ring (Bhiwandi Rd-Panvel):	612			612	
	Inner Ring (Kaman-Bhiwandi Rd.)	396			396	
	Thane-Ghodbunder Road	289			289	
	Radial-3 (Bhiwandi Bypass)	162			162	
	Radial-5 (Chembur-Mankhurd-Vashi-Taloja)	468			468	
	Radial-3 (Bhiwandi Bypass)	253			253	
	Radial-4 (Nahur-Airoli-Nilaje-Badlapur)	608			608	
	Middle Ring (Narthen Gaon-Panvel)	639			639	
	Ghatkopar - Koparkairane Creek Bridge	801			801	
	Western Sea Link North Extn (Bandra - Versova)	2639			2639	
	Western Sea Link North Extn (Versova - Dahisar)		3599		3599	
	Western Sea Link North Extn (Dahisar - Virar)		9117		9117	
	Radial-6 (Vashi-Belapur-Kalamboli)			268	268	
	Radial-1 (NH-8)			467	467	
	Middle Ring (Bhiwandi-Nandivali-Narthen Gaon)			335	335	
	Radial-2 (Part of NH-3)			655	655	
	Radial-8 (New Airport-Nhava-Uran-Rewas)			399	399	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost	
		2005-11	2011-16	2016-21			
	Outer Ring Road: Khopoli-Jite			266	266		
	Radial-7 (Uran-Pen)			401	401		
	Mumbai- Sawantwadi Expressway			458	458		
	MTHL: Kharkopar to Rave (Link overground)			2142	2142		
Arterial Corridors	Upgradation and New Links	3389	2260	2825	8474		
Road Safety and Traffic Management	Road Safety Measures	3518	2346	222	6086		
Bus System	Bus Fleet and Depots	662	442	1046	2150		
	TOTAL	21759.04	17764	9484	49007		
2.1.4	TERMINALS						CTS Estimates.Refer A-2.1.4 for criteria.
	Major and Minor Truck Terminals	108	162	270	540		
	Inter-City Bus Terminals and Bus Stations	169.6	254.4	318	742		
	Inter-City Rail Terminals	172.8	259.2	324	756		
	TOTAL	450.4	675.6	912	2038		
	DRAINAGE					As per existing/past studies of respective agencies.	
	Mithi River	500	400	100	1000		
	Ulhas River	100	300	100	500		
	Thane Creek	300	100	100	500		
2.1.5	TOTAL	900	800	300	2000		
	POWER					Estimated. Refer A-2.1.6 for the criteria adopted.	
	Generation	2379	6264	18618	27261		
	Transmission	1190	3132	9309	13630		
	Distribution	1190	3132	9309	13630		
2.1.6	TOTAL	4759	12527	37235	54521		

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	TOTAL(with Power)	80808	76306	77853	234967	
	TOTAL(without Power)	76049	63779	40618	180446	
3	MUNICIPAL INFRASTRUCTURE(ULB LEVEL)					
3.1.1	Water Supply	355	288	193	837	Estimated. Refer A-3.1.1 for the criteria adopted.
3.1.2	Sewerage	2346	5060	500	7906	Estimated. Refer A-3.1.2 for the criteria adopted.
3.1.3	Solid Waste Management	567	13	11	591	Estimated. Refer A-3.1.3 for the criteria adopted.
3.1.4	Storm Water Drainage	1349	1349	674	3372	Estimated. Refer A-3.1.4 for the criteria adopted.
3.1.5	Transportation	8199	729	598	9527	Estimated. Refer A-3.1.5 for the criteria adopted.
3.1.6	Health and Education	870	1684	247	2801	Estimated. Refer A-3.1.6 for the criteria adopted.
	Others	1374	972	93	2439	
	TOTAL	14191	8410	2070	27473	
4	LAND, REAL ESTATE AND HOUSING					
4.1.1	Interest Subsidy towards Housing	217.7	209.2	180.3	607	Estimated. Refer A-4.1.1 for the criteria adopted.
4.1.2	Affordable Public Housing	985.7	488	422.5	1896	Estimated. Refer A-4.1.2 for the criteria adopted.
4.1.3	MIDC-Land Development	175	175		350	From MIDC as provided by MTSU
4.1.4	Green-field Development	854	4056	4482	9392	Estimated. Refer A-4.1.4 for the criteria adopted.
	TOTAL	2232.4	4928.2	5084.8	12245.4	
	TOTAL(with Power)	116194	98319	90708	308022	
	TOTAL(without Power)	111435	85792	53473	253501	

Source: Estimated, 2009

A-2.1.1 (Water Source and Conveyance)	i) Unit cost for the development of the sources is considered as Rs 20 million (2 crores) for 1 million cum of the water storage (as per Chitale Committee report) However based on Middle Vaitarna cost of construction of dam, this can be assumed as Rs 33 m	
	ii) Unit cost for the conveyance system for 1 mld of the water supply is taken as approx Rs 6 million(5.8 lakhs) /mld (the average of the unit cost (in millions) of Pinjal water supply scheme, Bhiwandi water supply scheme and Barvi scheme) (source: Chit	
	iii) # Cost of Damanganga for 1600 mld of water is considered 35000 millions for Damanganga-Pinjal linking	
A-2.1.2 (Transit Infrastructure)	Metro System	
	At-Grade Metro Line(twin-track) without Rolling Stock- Rs. 108 crores/Km	Elevated Metro Line(twin-track) without Rolling Stock- Rs. 138 crores/Km
	Underground Metro Line(twin-track) without Rolling Stock- Rs. 462 crores/Km	Underground(below sea-bed) Metro Line(twin-track) without Rolling Stock- Rs. 540 crores/Km
	Rolling Cost/km of Metro lines (twin track) - Rs. 36 Crore	Above Unit Cost also include the cost of stations
	Sub-Urban System	
	At grade sub-urban Line (Twin Track) without Rolling Stock- Rs. 60 crore/Km	Rolling Cost/km of Sub-urban lines (twin track) - Rs. 16 crores
	Sub-urban Station Improvements- Rs. 26 crores/No.	Sub-urban Railways, New Workshop & Equipment- Rs. 192 crores /No.
Sub-urban Railway New depots - Rs. 384 crores/No.	Above Cost also includes the cost of stations	
A-2.1.3(Roads)	At grad Higher Order Access Controlled Expressway-(4 + 4 Lanes)- Rs. 18 crores/km	Elevated Road (3 + 3 Lanes) on existing road surrounded with built-up area- Rs. 60 crores/Km
	Short Sea Links (less than 10 kms length): Road (3 + 3 Lanes) - Rs. 90 crores/Km	Long Sea Links (more than 20 kms length): Road (4 + 4 Lanes) - Rs. 240 crores/Km
	For long sea links, the unit costs include cost of traffic surveillance system	Arterial Roads: 3+3 Lanes with adequate footpath facilities - Rs. 14.5 Crores/Km
	In Sub-component 2.1.2 and 2.1.3, Cost includes the taxes(Custom Duty, Works tax, Excise duty, sales tax, etc.) which is approximately 12% and administrative expenses for implementation of the project (8%)	
A-2.1.4 (Terminals)	For Reginal Bus System, a total route length of 330 km has been proposed as part of CTS with average route of 10 Km	
	5 major truck terminals and 10 minor truck terminals of size 100 ha and 25 ha respectively are proposed as part of CTS for horizon year 2031. 60% of this facility is assumed to be constructed by year 2021	
	4 inter-city bus terminals and 13 bus-stations of size 100 ha and 20 ha respectively are proposed as part of CTS for horizon year 2031. 70% of this facility is assumed to be constructed by 2021.	
	6 inter-city rail terminals of 150 ha are proposed as part of CTS for horizon year 2031. 70% of this facility is assumed to be constructed by 2021.	
A-2.1.5 (Power)	Unit Cost of Rs. 8 crores/MW has been taken as capital investment for power sector. This cost include cost of generation (50% of unit cost), Transmission(25% of unit cost) and distribution (25% of unit cost).	
	Capitall demand estimation of MMR has been taken as 40% of total investment of Maharashtra state	

Appendix V-2
P-3 SCENARIO: CAPITAL INVESTMENT PLAN - Mumbai Metropolitan Region (2005-2021)

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
1	NATIONAL LEVEL INFRASTRUCTURE					
1.1.1	PORT DEVELOPMENT					From respective Port Trusts as provided by MTSU
	MbPT	2,079	554	0	2,633	
	JNPT	9,984	1,820	0	11,804	
	Rewas-Aware Port	600	1,200	2,700	4,500	
	Sub-Total	12,663	3,574	2,700	18,937	
1.1.2	AIRPORT DEVELOPMENT					From respective Agencies as provided by MTSU
	Chattarpati Shivaji International Airport	3800	3100	3000	9900	
	Navi Mumbai Airport	2500	2000		4500	
	Sub-Total	6,300	5,100	3,000	14,400	
	TOTAL	18,963	8,674	5,700	33,337	
2	METROPOLITAN INFRASTRUCTURE					
2.1.1	WATER SOURCE DEVELOPMENT					Estimated. Refer A-2.1.1 for the criteria adopted.
	Regional Water Source Development	2128	6384	2128	10640	
	Water Conveyence Network	694	2082	694	3470	
	TOTAL	2822	8466	2822	14110	
2.1.2	TRANSIT INFRASTRUCTURE					Estimated as per the CTS Network. Refer A-2.1.2 for unit costs adopted.
	MMR Metro System					
Mumbai	Varsova-Andheri-Ghatkopar	2070			2070	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
Metro	Mankhurd-Mahim-Charkop	5153			5153	Estimated as per the CTS Network. Refer A-2.1.2 for unit costs adopted.
	Backbay-Bandra	8870			8870	
	Charkop-Dahisar	1035			1035	
	Ghatkopar-Mulund	1711			1711	
	BKC-Marol Naka via Airport		3927		3927	
	Andheri(E)-Dahisar(E)	2194			2194	
	Hutatma Chowk-Ghatkopar		10349		10349	
	Sewri-Prabhadevi		1617		1617	
MMR Metro	Dahisar-Mira Road-Manikpur-Virar		5618		5618	
	Thane-Bhiwandi	2199			2199	
	Thane-Ghodbunder-Dahisar	3182			3182	
	Mankhurd-Vashi-Narthen Gaon-Kalyan	6573			6573	
	Vashi-Belapur-New Airport-Panvel			3525	3525	
	Targhar-Kharkopar-Nhava Sheva-Dronagiri			2299	2299	
	Kharkopar-Dhutum-Pirkone			2300	2300	
	Sewri-Kharkopar			9633	9633	
	Rolling Stock	5224	3407	2812	11443	
	Sub-Total	38211	24918	20569	83698	
Sub-Urban Railway System	Sub-Urban Railways					
	New Sub-Urban Railway System/Additonal Tracks					
	Divi-Vasai Road	2406			2406	
	Panvel-Jite-Thal			3655	3655	
	Panvel-Karjat		1656		1656	
	Divi-Panvel		1602		1602	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Panvel-Uran	1614			1614	
	Kharkopar-Jite(New link)		1374		1374	
	Ranjanpada-Kharkopar-Targhar-Seawood (new link)	834			834	
	Thane-Bhiwandi			750	750	
	Thal-Alibag(new link)			324	324	
	Sub-Urban Rail Improvement					
	<i>Sub-Urban Rail Improvements</i>				0	
	Headway Improvement by installation of ATC system	849	849		1698	
	Procurement of additional rakes (114 No.)	2005	2005		4010	
	Conversion of 9 Car to 12 Car rakes	572	572		1143	
	Station Area Improvements (WR)	189	189	210	588	
	Station Area Improvements (CR)	486	486	540	1512	
	New Depots (WR)	384	384		768	
	New Depots (CR)	384	384		768	
	New Workshop and Equipment (WR)	192	192		384	
	New Workshop and Equipment (CR)	192	192		384	
	Safety Measures	240	240		480	
	<i>Rolling Stock</i>	1080	1031	1052	3163	
	Sub-total	11426	11155	6531	29113	
Water Transport Infrastructure	Water Transport					As per CTS estimates.
	West Coast Passenger Water Transport	360			360	
	East Coast Passenger Water Transport	60			60	
	Others	60			60	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Sub-total	480	0	0	480	
	TOTAL	50117	36073	27100	113291	
2.1.3	HIGHWAY SYSTEM					Estimated as per the CTS Network. Refer A-2.1.3 for unit costs adopted.
Higher Order Highway Corridors	Eastern Freeway	1350			1350	
	Elevated Link (Sewri-Worli Sea Link)	336			336	
	MTHL: Sewree to Kharkopar (Main Link over the creek)	4187.04			4187	
	Western Sea Link South Extn (Worli to Haji Ali)	1450			1450	
	Inner Ring (Bhiwandi Rd-Panvel):	612			612	
	Inner Ring (Kaman-Bhiwandi Rd.)	396			396	
	Thane-Ghodbunder Road	289			289	
	Radial-3 (Bhiwandi Bypass)	162			162	
	Radial-5 (Chembur-Mankhurd-Vashi-Taloja)	468			468	
	Radial-3 (Bhiwandi Bypass)	253			253	
	Radial-4 (Nahur-Airoli-Nilaje-Badlapur)	608			608	
	Middle Ring (Narthen Gaon-Panvel)	639			639	
	Ghatkopar - Koparkairane Creek Bridge	801			801	
	Western Sea Link North Extn (Bandra - Versova)	2639			2639	
	Western Sea Link North Extn (Versova - Dahisar)		3599		3599	
	Western Sea Link North Extn (Dahisar - Virar)		9117		9117	
	Radial-6 (Vashi-Belapur-Kalamboli)			268	268	
	Radial-1 (NH-8)			467	467	
	Middle Ring (Bhiwandi-Nandivali-Narthen Gaon)			335	335	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Radial-2 (Part of NH-3)			655	655	
	Radial-8 (New Airport-Nhava-Uran-Rewas)			399	399	
	Outer Ring Road: Khopoli-Jite			266	266	
	Radial-7 (Uran-Pen)			401	401	
	Mumbai- Sawantwadi Expressway			458	458	
	MTHL: Kharkopar to Rave (Link overground)			2142	2142	
Arterial Corridors	Upgradation and New Links	3389	2260	2825	8474	
Road Safety and Traffic Management	Road Safety Measures	3518	2346	222	6086	
Bus System	Bus Fleet and Depots	662	442	1046	2150	
	TOTAL	21759.04	17764	9484	49007	
2.1.4	TERMINALS					CTS Estimates.Refer A-2.1.4 for criteria.
	Major and Minor Truck Terminals	108	162	270	540	
	Inter-City Bus Terminals and Bus Stations	169.6	254.4	318	742	
	Inter-City Rail Terminals	172.8	259.2	324	756	
	TOTAL	450.4	675.6	912	2038	
2.1.5	DRAINAGE					As per existing/past studies of respective agencies.
	Mithi River	500	400	100	1000	
	Ulhas River	100	300	100	500	
	Thane Creek	300	100	100	500	
	TOTAL	900	800	300	2000	
2.1.6	POWER					Estimated. Refer A-2.1.6 for the criteria adopted.
	Generation	2379	6264	18618	27261	
	Transmission	1190	3132	9309	13630	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	Distribution	1190	3132	9309	13630	
	TOTAL	4759	12527	37235	54521	
	TOTAL(with Power)	80808	76306	77853	234967	
	TOTAL(without Power)	76049	63779	40618	180446	
3	MUNICIPAL INFRASTRUCTURE(ULB LEVEL)					
3.1.1	Water Supply	327	307	231	865	Estimated. Refer A-3.1.1 for the criteria adopted.
3.1.2	Sewerage	2259	5096	576	7931	Estimated. Refer A-3.1.2 for the criteria adopted.
3.1.3	Solid Waste Management	586	13	13	612	Estimated. Refer A-3.1.3 for the criteria adopted.
3.1.4	Storm Water Drainage	1349	1349	674	3372	Estimated. Refer A-3.1.4 for the criteria adopted.
3.1.5	Transportation	8113	766	667	9546	Estimated. Refer A-3.1.5 for the criteria adopted.
3.1.6	Health and Education	802	1633	303	2738	Estimated. Refer A-3.1.6 for the criteria adopted.
	Others	1409	1004	71	2484	
	TOTAL	14043	8535	2232	27548	
4	LAND, REAL ESTATE AND HOUSING					
4.1.1	Interest Subsidy towards Housing	196.1	175.7	121.6	493	Estimated. Refer A-4.1.1 for the criteria adopted.
4.1.2	Affordable Public Housing	983	516.3	486.3	1986	Estimated. Refer A-4.1.2 for the criteria adopted.
4.1.3	MIDC-Land Development	175	175		350	From MIDC as provided by MTSU
4.1.4	Green-field Development	854	4056	4482	9392	Estimated. Refer A-4.1.4 for the criteria adopted.
	TOTAL	2208.1	4923	5089.9	12221	

S.No.	Sectors/Macro Projects	Investment Requirement			Investment Requirement: 2005-2021 (in Crores INR)	Source/Criteria/Assumptions for Unit Cost
		2005-11	2011-16	2016-21		
	TOTAL(with Power)	116021	98438	90875	308072	
	TOTAL(without Power)	111262	85911	53640	253551	

Source: Estimated, 2009

A-2.1.1 (Water Source and Conveyance)	i) Unit cost for the development of the sources is considered as Rs 20 million (2 crores) for 1 million cum of the water storage (as per Chitale Committee report) However based on Middle Vaitarna cost of construction of dam, this can be assumed as Rs 33 m	
	ii) Unit cost for the conveyance system for 1 mld of the water supply is taken as approx Rs 6 million(5.8 lakhs) /mld (the average of the unit cost (in millions) of Pinjal water supply scheme, Bhiwandi water supply scheme and Barvi scheme) (source: Chit	
	iii) # Cost of Damanganga for 1600 mld of water is considered 35000 millions for Damanganga-Pinjal linking	
A-2.1.2 (Transit Infrastructure)	Metro System	
	At-Grade Metro Line(twin-track) without Rolling Stock- Rs. 108 crores/Km	Elevated Metro Line(twin-track) without Rolling Stock- Rs. 138 crores/Km
	Underground Metro Line(twin-track) without Rolling Stock- Rs. 462 crores/Km	Underground(below sea-bed) Metro Line(twin-track) without Rolling Stock- Rs. 540 crores/Km
	Rolling Cost/km of Metro lines (twin track) - Rs. 36 Crore	Above Unit Cost also include the cost of stations
	Sub-Urban System	
	At grade sub-urban Line (Twin Track) without Rolling Stock- Rs. 60 crore/Km	Rolling Cost/km of Sub-urban lines (twin track) - Rs. 16 crores
	Sub-urban Station Improvements- Rs. 26 crores/No.	Sub-urban Railways, New Workshop & Equipment- Rs. 192 crores /No.
	Sub-urban Railway New depots - Rs. 384 crores/No.	Above Cost also includes the cost of stations
A-2.1.3(Roads)	At grad Higher Order Access Controlled Expressway-(4 + 4 Lanes)- Rs. 18 crores/km	Elevated Road (3 + 3 Lanes) on existing road surrounded with built-up area- Rs. 60 crores/Km
	Short Sea Links (less than 10 kms length): Road (3 + 3 Lanes) - Rs. 90 crores/Km	Long Sea Links (more than 20 kms length): Road (4 + 4 Lanes) - Rs. 240 crores/Km
	For long sea links, the unit costs include cost of traffic surveillance system	Arterial Roads: 3+3 Lanes with adequate footpath facilities - Rs. 14.5 Crores/Km
	In Sub-component 2.1.2 and 2.1.3, Cost includes the taxes(Custom Duty, Works tax, Excise duty, sales tax, etc.) which is approximately 12% and administrative expenses for implementation of the project (8%)	

	For Reginal Bus System, a total route length of 330 km has been proposed as part of CTS with average route of 10 Km				
A-2.1.4 (Terminals)	5 major truck terminals and 10 minor truck terminals of size 100 ha and 25 ha respectively are proposed as part of CTS for horizon year 2031. 60% of this facility is assumed to be constructed by year 2021				
	4 inter-city bus terminals and 13 bus-stations of size 100 ha and 20 ha respectively are proposed as part of CTS for horizon year 2031. 70% of this facility is assumed to be constructed by 2021.				
	6 inter-city rail terminals of 150 ha are proposed as part of CTS for horizon year 2031. 70% of this facility is assumed to be constructed by 2021.				
A-2.1.5 (Power)	Unit Cost of Rs. 8 crores/MW has been taken as capital investment for power sector. This cost include cost of generation (50% of unit cost), Transmission(25% of unit cost) and distribution (25% of unit cost). Capitla demand estimation of MMR has been taken as 40% of total investment of Maharashtra state				
A-3.1.1 (Water Supply Distribution)	As per the discussions with the MJP officials the cost of water supply distribution for councils may be taken as Rs 800 per person, for corporations with a population of around 20 to 30 lakhs, the water supply distribution cost may be considered as Rs 100 # 25% of the cost for meeting the backlog is considered in the investment from 2005-2011 and balance 75% is considered in the investment from 2011-2016				
A-3.1.2 (Sewerage)	The total cost of BSDP II is Rs 5570 crores. Out of this Rs 3941 crores is sewerage component and Rs 1625 crores is slum sanitation. This for a total population of 16.33 million works out to Rs.3411 per capita. Average per capita cost, as calculated from the CDP estimates of 6 municipal corporations/council is about 2435. Hence for the above calculations the unit cost of sewage collection, sewage treatment and disposal is taken as Rs. 2500 per capita for all the				
A-3.1.3 (SWM)	This does not include the capital cost for facilities includeing MSW processing facility etc. In particular such costs are not included for Navi Mumbai(Rs 6000 million) and Thane(Rs. 700 million for bio-medical, waste to energy projects)				
	Unit Rates Adopted are:				
	Primary Collection:				
	Litter Dustbin(30L) - Rs.3000/No.				Household bin(20L) -Rs. 300/No
	Wheel Barrow - Rs. 6000/No.				
	Secondary Collection:				
	4.5m3 container - Rs. 8000 /No.				Medium tipper truck - 0.7 million/No.]
	Civil works for tranfer station- Rs.38500/MT				Dumper placer - Rs. 2.5 million/No.
	Disposal and Composting				
					Excavator for composting - Rs. 0.2 million/No.
				Front End Loader -Rs. 0.15 million/No.	
				Truck Tippers - Rs. 1 million/No.	
				JCB -Rs. 2.3 million/No.	
	Civil Infrastructure-Disposal Site: Upto 1.5 ha - Rs. 6.5 million, Upto 7 ha -Rs. 10.3 million, Above 15 ha - Rs 23.7 million and Above 25 ha - Rs. 47.4 million				
A-3.1.4 (Storm Water Drainage)	For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai and Ambernath CDP estimates are considered as the total cost for this sector For Other Municipal Corporations, an average unit cost of Rs. 25 million/sq.km has been used based on the CDP estimates of Thane and Mira-Bhayander corporation For rest of Municipal Councils, unit cost of Rs. 12 million/sq.km. has been used, based on the CDP estimates of Ambernath Municipal Council For Matheran ULB, only 20% of the municipal area is considered for calculation purposes as rest of the area lies in ecologically sensitive/no development zone				
A-3.1.5 (Transport)	Transport Infrastructure Cost includes following: 1. New/Upgradation of local roads, 2. Intersection Improvements, 3. Parking, 4. Transport Terminals, 5. Bus Fleet and 6. Street lighting For Greater Mumbai, Thane, Mira-Bhayander, Navi Mumbai, Kalyan-Dombivali and Ambernath, respective CDP per capita cost for the plan period has been used to estimate the total investment requirements. For other Municipal Corporations, an average per capita cost of Rs. 3700(derived from the CDP estimates of the above ULBs) has been used . For other Muncipal Councils, an average per capita cost of Rs. 1500 has been used to estimate the total cost.				
A-3.1.6	Other Projects includes the following: Education, Health infrastructure, city beaufication projects and other miscellaneous projects as identified in respective CDPs.				

(Others)	Cost of this component is based on average cost of Rs. 2000 per capita as derived from the CDPs of 6 ULBs.
A-4.1.1 (Interest Subsidy)	Assuming borrowing of Rs. 180000 for a unit of 225 sq.ft., interest subsidy of Rs. 900/month has been assumed for each household for a period of 10 years. Total number of households considered in this sub-component are about 152200(7% of incremental housi
A-4.1.2 (Affordable Housing)	Cost of one housing unit has been taken as Rs. 180000 for a unit of 225 sq.ft. In case of MCGM, cost of construction has been provided as government support, whereas in case of Rest of MMR, only the cost of serviced land (Rs.75000/unit) has been taken int
A-4.1.4 (Greenfield Dev.)	A unit cost of Rs. 1500 per sq.m. of land has been used based on CIDCO's experience of Navi Mumbai. Total area envisaged as part of greenfield development is taken as about 6000 ha in the Thane-Bhiwandi Road Stretch, South of Kalyan and Panvel(along the N

Appendix V.3
P- 2 SCENARIO - DEMAND
CAPITAL INVESTMENT PLAN FOR MUNICIPAL INFRASTRUCTURE, 2005-2021 (Rs. Crores)

Sector	Water Supply	Sewerage & Sanitation	Transport	Storm Water Drainage	Solid Waste Management	Others	Total
MCGM	540	5570.3	6042.2	1800.0	323	3266.1	17541.6
NMMC	35	514.9	462.2	426.0	70	249.8	1757.7
Bhiwandi	43	189.8	374.5	74.4	25	202.4	908.9
Mira Bhayander	53	244.2	156.0	222.0	27	208.0	910.3
Thane	50	340.8	891.7	314.5	48	389.8	2035.2
Kalyan-Dombivali	56	442.0	1000.1	275.0	42	380.6	2195.6
Ulhasnagar	7	126.6	205.6	33.4	16	111.1	499.1
Vasai	5	25.5	16.2	12.5	4	21.6	84.4
Virar	11.0	59.4	37.8	16.2	7	50.4	181.5
Navghar-manikpur	10.5	59.3	35.6	20.8	6	47.4	179.5
Nallasopora	13.8	85.1	51.1	18.1	8	68.1	243.7
Panvel	12.4	67.4	42.4	15.1	6	56.5	199.9
Karjat	0.5	10.1	4.3	8.1	2	5.8	31.2
Khopoli	1.1	16.5	9.9	34.8	3	13.2	79.0
Alibag	0.4	5.5	3.3	4.3	2	4.4	20.3
Matheran	0.1	1.5	0.9	2.1	2	1.2	7.4
Pen	3.9	18.8	11.3	6.4	5	15.0	60.2
Ambernath	15.2	96.3	164.6	41.0	8	81.9	407.5
Badlapur	6.4	47.1	30.1	41.1	6	40.1	170.4
Uran	1.5	10.1	6.1	6.0	3	8.1	34.3
Total	866	7931	9546	3372	323	5222	27547.8

Source: Estimated, 2007

Appendix V.4
P- 3 SCENARIO - DEMAND
CAPITAL INVESTMENT PLAN FOR MUNICIPAL INFRASTRUCTURE, 2005-2021 (Rs. Crores)

Sector	Water Supply	Sewerage & Sanitation	Transport	Storm Water Drainage	Solid Waste Management	Others	Total
MCGM	447	5360.0	5814.2	1800.0	320	3142.8	16883.8
NMMC	41	540.0	484.7	426.0	43	262.0	1796.6
Bhiwandi	43	188.9	373.2	74.4	24	201.7	905.2
Mira Bhayander	58	255.0	162.5	222.0	27	216.7	940.4
Thane	61	368.2	942.0	314.5	58	411.8	2155.2
Kalyan-Dombivali	68	471.4	1061.9	275.0	42	404.2	2322.9
Ulhasnagar	8	129.8	210.4	33.4	16	113.7	511.1
Vasai	8	35.1	21.9	12.5	3	29.2	109.4
Virar	17.6	79.9	50.1	16.2	7	66.7	237.1
Navghar-manikpur	16.8	79.0	47.4	20.8	6	63.2	233.3
Nallasopora	21.7	109.7	65.8	18.1	8	87.7	310.8
Panvel	13.2	70.0	43.9	15.1	6	58.6	206.9
Karjat	0.5	7.2	4.3	8.1	2	5.7	28.2
Khopoli	1.1	16.5	9.9	34.8	4	13.2	79.2
Alibag	0.4	5.5	3.3	4.3	2	4.4	20.1
Matheran	0.1	1.5	0.9	2.1	3	1.2	8.3
Pen	4.5	20.8	12.5	6.4	5	16.6	65.8
Ambernath	18.0	105.1	178.9	41.0	9	89.0	440.4
Badlapur	7.7	51.4	32.6	41.1	6	43.5	182.0
Uran	1.7	10.7	6.4	6.0	3	8.5	35.8
Total	837	7906	9527	3372	591	5240	27472.7

Source: Estimated, 2007

Appendix V.5:
Summary of FOPs for ULBs in MMR, Rs. Lakhs (P- 3 SCENARIO)

Municipal Corporation of Greater Mumbai

Summary Sheet		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
Receipts		573913	623904	678409	737656	802140	872019	948118	1030872	1121004	1218939	1325450	1441306	1567333	1704428	1853569	2015819
Expenditure		512619	557580	607405	678274	772638	856267	978395	1063212	1158644	1265780	1378731	1513512	1643769	1787534	1943561	2114739
Status		61294	66325	71004	59382	29502	15752	-30277	-32340	-37641	-46841	-53280	-72206	-76436	-83106	-89992	-98920
Operating Ratio		0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0
Capital																	
Sources		72711	41875	44387	112289	205219	206403	94935	107771	128222	132884	167493	119030	123529	128299	118783	117376
Uses		75730	76488	77253	232826	280027	257762	95872	98701	104623	99299	97890	45296	45422	45561	31142	24543
Status		-3019	-34613	-32865	-120537	-74808	-51359	-937	9071	23599	33586	69603	73733	78107	82738	87641	92833
Capital Increase Over base year		3.0															
Investment Need	Rs Crore	16883.8															
Sustainability	%	67%															

Navi Mumbai Municipal Corporation

Summary Sheet		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
Receipts		30950	34242	37893	41944	46440	51430	56971	63125	69962	77559	86003	95392	105834	117450	130376	144763
Expenditure		23522	25845	28634	32988	44235	45930	53426	57496	63047	69057	75631	82752	89587	97088	105081	107968
Status		7428	8397	9259	8957	2205	5500	3545	5629	6915	8502	10373	12640	16247	20362	25295	36795
Operating Ratio		0.8	0.8	0.8	0.8	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7
Capital																	
Sources		313	117	124	23383	27771	28396	8535	6133	6501	6262	6186	3009	3022	3035	2082	2956
Uses		14044	14184	14326	23253	27634	28250	11501	11936	12653	12153	11980	5602	5602	5602	3669	2694
Status		-13731	-14068	-14202	130	138	146	-2966	-5803	-6152	-5891	-5794	-2593	-2580	-2567	-1586	262
Capital Increase Over base year		1.6															
Investment Need	Rs Crore	1796.9															
Sustainability	%	70%															

Mira-Bhander Municipal Corporation

Summary Sheet		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
Receipts		15242	15235	16393	18161	20360	22697	25359	28311	32078	35955	40262	45115	50607	56831	63897	71930
Expenditure		9825	10742	12499	15779	17912	19620	27669	29723	31884	34250	36811	40984	43992	47292	50826	54694
Status		5417	4493	3894	2382	2448	3078	-2310	-1412	194	1705	3451	4131	6615	9539	13071	17237
Operating Ratio		0.6	0.7	0.8	0.9	0.9	0.9	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8
Capital																	
Sources		7500	0	0	2218	3060	4253	2124	2743	2013	1732	1905	896	896	896	617	424
Uses		6910	7600	8360	2787	3738	5471	2650	2743	2013	3789	3918	3110	3331	3575	3564	3665
Status		591	-7600	-8360	-569	-678	-1218	-526	0	0	-2057	-2013	-2214	-2435	-2679	-2947	-3241
Capital Increase Over base year		0.3															
Investment Need	Rs Crore	940.44															
Sustainability	%	22%															

Bhiwandi Municipal Corporation

Summary Sheet		2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Receipts		15801	17112	18854	20776	23050	25315	27997	31231	34823	38595	42777	47441	52652	58481	65008	72320	77143
Expenditure		11792	15352	16043	19084	23715	24705	30901	33292	36202	39385	42684	47668	51320	55388	59667	64446	67135
Status		4009	1760	2811	1692	-665	610	-2904	-2061	-1379	-791	93	-227	1332	3093	5340	7874	10008
Operating Ratio		0.7	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
Capital																		
Sources		1517	1802	1910	10361	12264	11200	5054	5243	5557	5495	5586	4697	4890	5095	4884	4860	4318
Uses		5718	6290	6919	8539	10333	9153	2884	2943	3119	5756	5989	5262	5641	6058	6087	6337	6106
Status		-4201	-4489	-5010	1822	1931	2047	2170	2300	2438	-262	-403	-565	-750	-962	-1203	-1478	-1788
Capital Increase Over base year		1.2																
Investment Need	Rs Crore	905.2																
Sustainability	%	41%																

Ulhasnagar Municipal Corporation

Summary Sheet		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
Receipts		9539	18047	17691	18248	19542	20639	22180	24682	27133	29311	31623	34131	36869	39868	43158	46771
Expenditure		8449	11273	13038	14446	17145	18418	20080	21713	23618	25717	27863	30379	32954	35546	38637	42023
Status		1089	6775	4653	3802	2397	2221	2100	2969	3515	3595	3760	3752	3915	4322	4521	4748
Operating Ratio		0.9	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Capital																	
Sources		287	342	362	3507	5035	3586	1544	1579	1673	1704	1711	992	1029	1068	1002	914
Uses		1339	1473	1620	8525	10226	9048	2832	2885	3058	6086	6365	5451	5851	6292	6332	6602
Status		-1052	-1131	-1258	-5019	-5191	-5462	-1288	-1307	-1385	-4382	-4654	-4459	-4823	-5224	-5331	-5688
Capital Increase Over base year		5.2															
Investment Need	Rs Crore	511.18															
Sustainability	%	74%															

Kalyan Municipal Corporation

Summary Sheet		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
Receipts		18992	23608	26370	28784	31714	35104	38475	43402	48987	54037	59607	65904	73080	81292	90717
Expenditure		14494	15618	17754	21637	30315	30394	39178	40913	44240	47958	51095	54669	57477	60811	64159
Status		4498	7990	8616	7147	1399	4710	-703	2489	4747	6079	8513	11235	15603	20481	26558
Operating Ratio		0.8	0.7	0.7	0.8	1.0	0.9	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7
Capital																
Sources		586	550	583	18241	23954	27293	13573	15454	15922	16673	15626	10497	8586	8241	4633
Uses		4030	4433	4876	23459	25775	29038	15004	15904	16858	35229	20299	22329	24561	27018	29719
Status		-3444	-3883	-4293	-5217	-1821	-1745	-1431	-450	-936	-18556	-4672	-11832	-15975	-18776	-25087
Capital Increase Over base year		4.8														
Investment Need	Rs Crore	2322.64														
Sustainability	%	63%														

Thane Municipal Corporation

Summary Sheet		2005-06	2006-07	2007-08	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Receipts		45705	54841	59737	64655	70521	76858	83336	92133	101426	110187	119603	129883	141160	153556	167198	182227
Expenditure		35215	38682	44052	50534	63502	70506	81127	85839	94827	103523	113162	124833	135167	146455	146424	159945
Status		10491	16159	15685	14121	7018	6352	2208	6294	6599	6665	6441	5050	5993	7100	20774	22283
Operating Ratio		0.8	0.7	0.7	0.8	0.9	0.9	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.9
Capital																	
Sources		3100	928	984	35450	43514	33516	7667	7669	7344	1480	1569	1663	1763	1868	1980	2099
Uses		14521	15973	17570	41296	48645	42218	12204	12468	13216	12017	11879	7371	7389	7407	5018	4164
Status		-11421	-15044	-16586	-5846	-5131	-8702	-4537	-4799	-5872	-10537	-10311	-5708	-5626	-5539	-3037	-2065
Capital Increase Over base year		2.3															
Investment Need	Rs Crore	2155.23															
Sustainability	%	82%															

Ambarnath Municipal Council

Summary Sheet		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
Receipts		3207	3470.7	4026.0	4454.5	4925.9	5463.5	6021.9	6733.8	7571.9	8374.0	9258.4	10248.6	11362.7	12618.6	14036.9	15640.2
Expenditure		2529	2769.9	3055.9	1737.7	1993.0	5068.2	7428.7	7878.2	8470.9	9111.6	9704.9	11061.2	11808.9	12626.8	13526.6	14508.4
Status		677	700.7	970.1	2716.8	2932.9	395.3	-1406.8	-1144.4	-899.0	-737.6	-446.5	-812.6	-446.2	-8.1	510.2	1131.8
Operating Ratio		0.8	0.8	0.8	0.4	0.4	0.9	1.2	1.2	1.1	1.1	1.0	1.1	1.0	1.0	1.0	0.9
Capital																	
Sources		0.0	0.0	0.0	1268.3	1309.9	840.3	187.8	189.8	298.5	349.6	484.7	260.7	260.7	260.7	179.9	140.0
Uses		355.7	391.3	430.4	1461.0	1757.1	1546.3	494.4	505.5	535.9	496.4	484.7	260.7	260.7	260.7	179.9	140.0
Status		-355.7	-391.3	-430.4	-192.6	-447.2	-705.9	-306.6	-315.7	-237.4	-146.8	0.0	0.0	0.0	0.0	0.0	0.0
Capital Increase Over base year		3.4															
Investment Need	Rs Crore	440.45															
Sustainability	%	15%															

Nallosopara Municipal Council

Summary Sheet		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
Receipts		1826	1875	2350	2587	2830	3056	3312	3767	4150	4521	4925	5373	5875	6438	7073	7787
Expenditure		1309	1440	1798	2771	2977	3186	5858	6165	6501	6867	7264	8417	8877	9403	9972	10597
Status		518	435	552	-184	-147	-130	-2546	-2398	-2351	-2346	-2339	-3044	-3002	-2964	-2899	-2810
Operating Ratio		0.7	0.8	0.8	1.1	1.1	1.0	1.8	1.6	1.6	1.5	1.5	1.6	1.5	1.5	1.4	1.4
Capital																	
Sources		0	0	0	18	26	33	27	28	29	28	27	11	11	11	8	6
Uses		563	619	681	58	76	78	27	28	29	28	27	11	11	11	8	6
Status		-563	-619	-681	-40	-49	-45	0	0	0	0	0	0	0	0	0	0
Capital Increase Over base year		0.1															
Investment Need	Rs Crore	310.77															
Sustainability	%	1%															

Navghar-Manikpur Municipal Council

Summary Sheet		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
Receipts		2043.0	2144.2	2419.3	2702.4	3027.7	3373.4	3771.2	4331.6	4901.4	5518.0	6228.6	7054.4	8019.3	9150.6	10482.0	12054.7
Expenditure		1342.7	1477.0	2241.5	3037.3	3239.0	3452.3	5582.8	5879.6	6206.6	6560.4	6947.3	8000.3	8438.9	8952.4	9508.8	10018.4
Status		700.2	667.2	177.8	-335.0	-211.3	-78.9	-1811.6	-1548.0	-1305.2	-1042.4	-718.8	-945.9	-419.6	198.3	973.3	2036.3
Operating Ratio		0.7	0.7	0.9	1.1	1.1	1.0	1.5	1.4	1.3	1.2	1.1	1.1	1.1	1.0	0.9	0.8
Capital																	
Sources		0.0	0.0	0.0	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9
Uses		962.1	971.7	981.4	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9
Status		-962.1	-971.7	-981.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital Increase Over base year		0.0															
Investment Need	Rs Crore	233.33															
Sustainability	%	1%															

Panvel Municipal Council

Summary Sheet		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
Receipts		2003	2326	2735	3134	3602	4072	4655	5412	6266	7204	8295	9573	11074	12843	14930	17399
Expenditure		2141	2337	2690	3421	3693	3988	5804	6197	6626	7095	7607	8662	9188	9866	10611	11415
Status		-138	-11	44	-287	-92	84	-1149	-785	-361	110	688	911	1886	2977	4319	5984
Operating Ratio		1.1	1.0	1.0	1.1	1.0	1.0	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7
Capital																	
Sources		1407	326	346	19	26	29	28	30	27	54	55	50	48	50	50	42
Uses		1489	1504	1519	19	26	29	28	30	27	27	27	20	16	16	13	4
Status		-82	-1177	-1173	0	0	0	0	0	0	27	29	30	32	34	36	38
Capital Increase Over base year		0.0															
Investment Need	Rs Crore	465.99															
Sustainability	%	15%															

Uran Municipal Council

Summary Sheet		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
Receipts		606.0	754.7	850.6	953.4	1077.7	1198.4	1349.5	1541.2	1755.6	1984.6	2244.5	2541.3	2880.9	3269.9	3715.4	4226.1
Expenditure		528.8	580.3	662.5	805.4	1105.5	1154.7	1373.5	1464.9	1599.7	1739.3	1892.0	2074.3	2237.0	2413.3	2593.5	2791.4
Status		77.2	174.5	188.0	148.0	-27.8	43.8	-24.0	76.4	155.8	245.2	352.5	467.0	643.9	856.6	1121.9	1434.7
Operating Ratio		0.9	0.8	0.8	0.8	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7
Capital																	
Sources		0.0	0.0	0.0	574.0	758.6	834.9	286.9	284.1	276.6	227.8	327.6	155.8	155.8	155.8	113.1	69.6
Uses		123.5	135.8	149.4	623.3	798.6	882.3	322.2	329.7	349.4	340.0	327.6	155.8	155.8	155.8	113.1	69.6
Status		-123.5	-135.8	-149.4	-49.4	-39.9	-47.4	-35.3	-45.5	-72.8	-112.2	0.0	0.0	0.0	0.0	0.0	0.0
Capital Increase Over base year		4.2															
Investment Need	Rs Crore	35.81															
Sustainability	%	100%															

Vasai Municipal Corporation

Summary Sheet		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
Receipts		664	744	875	988	1113	1236	1376	1560	1766	1975	2212	2482	2792	3150	3562	4038
Expenditure		744	811	2803	3188	3291	3394	4415	4560	4718	4890	5077	5583	5810	6057	6326	6618
Status		-80	-67	-1928	-2200	-2178	-2159	-3039	-3000	-2953	-2915	-2866	-3100	-3018	-2908	-2764	-2580
Operating Ratio		1.1	1.1	3.2	3.2	3.0	2.7	3.2	2.9	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.6
Capital																	
Sources		0	0	0	20	26	28	10	10	11	10	10	4	4	4	3	2
Uses		112	0	0	20	26	28	10	10	11	10	10	4	4	4	3	2
Status		-112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Capital Increase Over base year		#DIV/0!															
Investment Need	Rs Crore	110.69															
Sustainability	%	1%															

Virar Municipal Council

Summary Sheet		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
Receipts		2208	2425	2917	3341	3823	4333	4935	5724	6585	7532	8626	9897	11380	13112	15138	17513
Expenditure		1601	1756	3169	4017	4256	4495	6739	7074	7443	7844	8281	9417	9928	10510	11143	11838
Status		608	669	-252	-675	-433	-161	-1804	-1350	-858	-312	344	480	1451	2601	3995	5676
Operating Ratio		0.7	0.7	1.1	1.2	1.1	1.0	1.4	1.2	1.1	1.0	1.0	1.0	0.9	0.8	0.7	0.7
Capital																	
Sources		255	215	228	286	315	332	309	326	346	365	385	394	418	442	466	492
Uses		971	1069	1175	69	84	87	49	51	54	56	57	47	49	52	52	53
Status		-716	-853	-947	218	231	245	260	275	292	309	328	347	368	390	414	438
Capital Increase Over base year		0.0															
Investment Need	Rs Crore	237.20															
Sustainability	%	1%															

Badlapur Municipal Council

Summary Sheet		2005-06	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
Receipts		1732	1750	2256	2541	2835	3017	3288	3665	4074	4449	4856	5305	5802	6353	6966	7648	8408
Expenditure		1194	1310	1484	1933	2423	2648	3837	3922	4171	4487	4837	5518	5839	6237	6654	7117	7238
Status		539	440	773	608	412	369	-549	-258	-97	-38	20	-214	-37	116	312	531	1169
Operating Ratio		0.7	0.7	0.7	0.8	0.9	0.9	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
Capital																		
Sources		0	75	80	618	1371	1709	2014	606	680	700	828	820	461	469	378	316	181
Uses		550	605	666	665	1393	1769	2015	715	732	733	714	698	332	333	233	163	18
Status		-550	-530	-586	-47	-23	-59	-2	-109	-52	-33	115	122	129	137	145	153	163
Capital Increase Over base year		1.0																
Investment Need	Rs Crore	182.01																
Sustainability	%	41%																

Appendix VI.1

Revenue Potential of Development Charge as Tax on Value of Property

For estimating the revenue potential of development charge, it would have been useful to have data on construction in various price zones. However such data is not readily available. The revenue potential has therefore been estimated in two different ways.

By arriving at real estate value form from the capital formation in construction, it is observed that gross fixed capital formation in Indian economy is about 33 % of NDP. Of this, "construction" from private corporate and household sectors accounts for about 33% (This would exclude construction Government which is mainly for infrastructure). Thus construction accounts for about 11% of NDP. However this is measured in terms of construction inputs and not as market value of "Real Estate". Suitable assumption about land price would convert it into Real Estate value. Such real estate value at its first sale or use is used as the tax base. An estimate of revenue generation based on this method is illustrated below:

Development Charge on Real Estate (Rs.in Crores)

		2005	2010	2015	2020	Total
NDDP	12.00%	129,480	228189	402147	708720	
Five year total of NDDP			921278	1623607	2861350	5406235
Construction	11.00%		101341	178597	314749	594686
Real estate value	2		202681	357194	629497	1189372
Development Charge	8%		16214	28575	50360	95150
Development Charge	10%		20268	35719	62950	118937

Estimated revenue generation over a fifteen-year period is Rs. 119 thousand crores. Alternative estimates of development charge could be derived by estimating household income and value of housing from the estimated NDDP.

Development charge revenue can be estimated based on the following assumptions.

- Total household income is about 60 % of NDDP
- The value of housing stock is 4 to 5 times the household income.
- Value of non residential real estate is about 15% of the residential real estate
- Development charge is levied on the value of the incremental real estate.

Estimates based on these assumptions are presented below:

Alternative estimates of Development Charge (Rs. in Crores)

		2005	2010	2015	2020	Total
NDDP	12.00%	129,480	228,189	402,147	708,720	
Household Income	60.00%	77,688	136,913	241,288	425,232	
Value of Housing Stock	4.5	349,597	616,110	1,085,796	1,913,544	
Value of non-residential real estate	15.00%	52,440	92,416	162,869	287,032	
Total Value of Real Estate		402,037	708,526	1,248,666	2,200,576	
Incremental value of real estate			306,490	540,139	951,910	1,798,539
Development Charge at @	8.00%		24,519	43,211	76,153	143,883
Development Charge at @	10.00%		30,649	54,014	95,191	179,854

The revenue from Development Charge according to this estimate varies between Rs. 143 thousand crores and Rs.179 thousand crores. However these need to be considered as very broad estimates of the potential. In practical terms, the legislative changes required

will a time consuming process. Revenue generation may start only by 2011. Moreover the rate of taxation could also be uncertain. Furthermore some construction may continue to be in informal sector and outside the tax net. Considering these uncertainties the revenue from development charge could be considered as about Rs. 60,000 crores. Out of this about Rs. 15,000 crores could be retained by ULBs and rest Rs. 45,000 crores could be made available for metropolitan infrastructure.

Appendix VI.2

Potential Revenue Sources¹

Source	Note
1. Development charges	1
2. Public benefits planning.	2
3. Give city the authority to levy new taxes	3
4. Adopt tax increment financing	4
5. Levy road tolls	5
6. Gas tax	6
7. Exemption of cities from Federal service tax and state VAT	
8. City and state contribute to transit budget	
9. Being considered:	
<ul style="list-style-type: none"> • Carbon tax on SUVs • Parking tax on commercial lots • Municipal surcharge on vehicle licenses • Municipal surcharge on land transfer tax • Road tolls for non-city residents • Excess garbage bag fees • Tax on billboard advertising • Leasing of air rights over publicly owned lands for mixed use development (especially at transit nodes/stations) • Transfer of development rights from one site to another • Betterment tax 	7 8
10. Create a single purpose Development Corporation	
Levy a City Planning Tax	9 10
11. Measures from Missouri	11
12. Community Amenity Contributions (Vancouver)	12
13. Property Endowment Fund (Vancouver)	13

Note 1. In Canada development charges are levied on new residential developments (per house and per apartment). These fees cover per unit costs for roads, water, sanitary, storm, fire and police services in addition to per unit costs for childcare, subsidized housing, ambulance, recreation, parkland development, urban development and libraries.

Note 2. Negotiate community benefits from developers in exchange for exceeding height or density limits. Money can be secured for additions or improvements to community facilities on or adjacent to the development site. Typical examples have included new public parks, streetscape enhancement, day care, subway station improvements, affordable housing and community amenities. Given the robust development market in Toronto, it is common for almost all projects to exceed permitted height and density limits by substantial amounts. As such, there is a real opportunity to lever funds from each project to help pay for the additional impact created by the development and to address longstanding deficiencies within existing communities.

¹ Extract from Paul Bedford's Paper on Financing Growth and Infrastructure, Interim Report, January, 2007.

Note 3. Essentially, the province gave the City the authority to levy any new taxes that did not conflict with Provincial jurisdiction with a specific prohibition on income, sales or a hotel tax. The ability to levy an entertainment tax, a liquor tax, parking fees and vehicle licence fees form typical examples that the City can now utilize. Collectively, these powers would generate approximately \$55 million per year. The newly elected Mayor and City Council will have to decide whether to exercise this new authority and be held accountable to the voters. Far more important is the ability to levy road tolls, subject to provincial regulation.

Note 4. Under tax increment financing the anticipated tax from development of brownfields or abandoned industrial lands are determined and, based on that, a bond is issued to raise capital to use to service the land.

Note 5. The greatest potential for significant revenue generation in Toronto would require the entire regional expressway network to be tolled. This would generate over \$1 billion per year which could be devoted to the maintenance and substantial expansion of transportation infrastructure. Funding for the acquisition of new buses, streetcars and additional subway cars could be obtained from funds borrowed against the revenue stream of the tolls so that the public would be able to visibly see and experience an immediate improvement in public transit service on the first day of tolling. Imposition of road tolls on a regional basis would require strong political will.

Note 6. While such funding is welcome there is an irony in that the growth of this revenue stream is tied to increased consumption of gasoline, which implies an increase in car usage. This of course is the opposite of much needed transit expansion.

Note 7. Transfer of development rights from one site to a receiving site is another planning strategy that has the potential to unlock value or be a catalyst for the achievement of public sector goals associated with affordable housing or other municipal purposes

Note 8. Where new subways or transit lines are proposed, the concept of a betterment tax to recapture a portion of the increased land value created at key stations and for properties along the actual transit line is currently being debated.

Note 9. Create a single purpose Development Corporation that would be empowered to facilitate redevelopment of up to 40,000 people living and /or working around each strategic new station.

Note 10. Japanese cities impose a minimal tax on development that is devoted to enhancing urban design.

Note 11. Missouri levies a 1% tax on income for all those working in the city regardless of residence, a personal property tax on the value of all vehicles, a retail sales tax, a demolition tax, an affordable housing tax, a utility tax and a hotel tax.

Note 12. Community Amenity Contributions are a voluntary payment by developers whose projects go through the rezoning process. They are used for community amenities.

Note 13. The Property Endowment Fund (PEF) is a mechanism Vancouver uses to buy land and sell property that is primarily used for the development of non market housing. The PEF fund holds over 130 sites with approximately 8,500 units of non market housing. Generally, these sites are leased to non market housing sponsors who raise funds for construction and operation of the buildings. At the end of the lease, land and improvements revert back to the PEF.

Appendix VI.3 Borrowings by ULBs

Bank borrowings and bond issues are reviewed below.

Bank borrowings

ULBs in MMR do not borrow significant amounts from commercial sources. The reasons for this include:

- Resistance to increasing the taxes, user fees and tariffs needed to service the debt;
- ULBs do not prepare capital budgets or capital improvement plans and perhaps as a result they do not have large backlogs of infrastructure projects awaiting financing; and
- Many ULBs are not currently credit worthy for various reasons including poor collection performance.

Provided that ULBs can demonstrate the benefits to flow from infrastructure investments, can improve their capacity for capital budgeting and project preparation and strengthen their financial management and performance, they will be able to increase the funds available for infrastructure financing by borrowing from commercial sources or issuing bonds. While the powers of municipalities to borrow are somewhat limited (they are subject to certain borrowing limits, need the permission of the state government, require sinking funds etc) few ULBs have taken advantage of the existing provisions, which include the ability to issue tax-free bonds for financing their infrastructure.

Bonds

Municipal bonds are typically used to pay for water, sewerage, bridges, roads, etc., and are often secured by a pledge of gross revenues, making payment of debt service senior to payment of operating expenses. Bangalore Municipal Corporation was the first to issue such bonds (Rs 1250 million in 1997) but the Ahmedabad Municipal Corporation (AMC) was the first ULB to issue a bond without government guarantee (Rs 1000 million in 1998). Credit enhancement measures included the establishment of an escrow account for octroi revenues, a sinking fund for principal payment, and a debt service ratio of 1.5 for principal repayment. The funds were utilized to implement a bulk water supply project and helped 60% of the city's population (including low-income settlements)

Since then, several cities have issued taxable municipal bonds without state government guarantees including: Nashik (Rs. 1000 million), Nagpur (Rs. 500 million), Ludhiana (Rs. 100 million), and Madurai (Rs. 300 million). In most cases, bond proceeds were used to fund water and sewerage schemes. Ahmedabad was also the first to issue a tax-free bond (Rs. 1000 million). Other cities have also used this vehicle including: Hyderabad (Rs. 82 crore), Vizag (Rs. 500 million), Nasik (Rs. 500 million), and HMWSSB (Rs. 500 million) .

Generally though there have been few bond issues. Quite apart from ULBs' credit worthiness and high transaction costs for all but the largest ULBs, financial institutions view bonds as less than ideal for ULBs because of the following concerns:

- ULBs tend to be slow in starting projects, so the bond proceeds are also slow to be used, making the funds costly to the ULBs;
- Use of sinking funds also make the funds costly;
- The market is not confident that ULBs will invariably use the bond proceeds for the designated purpose;

- Often the best project revenues are escrowed leaving the ULB with impaired credit worthiness; and
- The typical tenor has been 5-7 years which is not long enough for infrastructure projects.

The February 28, 2007 GOI Budget announced the establishment of a Pooled Finance Development Scheme (PFDS) which is intended to facilitate development of bankable urban infrastructure projects and enhance the credit worthiness of bond issues so that they can be used to finance ULBs' investments in urban infrastructure. The main features of this scheme are as follows:

- Each state will be required to designate an existing entity or create a new State Pooled Finance Entity (SPFE) which will issue debt securities on behalf of ULBs without state guarantees;
- SPFEs must incorporate market based lending practices and procedures and are encouraged to include participation of professional Trustees or Directors so as to increase investor confidence;
- SPFEs may also provide sub-loans to ULBs or purchase bonds of ULBs;
- Priority will be given to water and sanitation services – other services will only be funded if ULBs can demonstrate that water and sanitation services are adequate;
- GOI funds will be allocated as follows: 5% for project development assistance, and 95% for a Credit Rating Enhancement Fund to be used as a third tier of security after escrow of ULB resources and any other mechanism such as state intercept of revenues. The CREF must be kept separated from other SPFE funds and invested in designated securities;
- ULBs must maintain a Debt Service Coverage Ratio of 1.25; and
- There must be a State level Sanctioning and Monitoring Committee to approve proposals for accessing the PFDF and the Committee is to include certain designated officials

The State should move quickly to establish an SPFE which will need to be supported by reforms at ULBs in order to overcome the above concerns.

Pooled funds

Only financially strong, large municipal corporations are in a position to directly access capital markets. Most small and medium ULBs are not able to access capital markets simply on the strength of their balance sheets as the cost of the transaction is a significant barrier. Because of this the USAID/FIRE project assisted the Tamil Nadu Water and Sanitation Pooled Fund (WSPF) to structure a bond issue. It issued a tax-free bond (Rs. 300 million) by pooling 14 municipalities' proposals for infrastructure projects. The interest rate was 9.2% with 15-year tenure. Credit enhancements measures included: escrow accounts funded by municipal revenues, state-funded debt service reserve service fund, and USAID guarantee of 50% of principal

Karnataka has also been active in this market: its UIDFC issued pooled bonds for 8 municipalities around Bangalore. And the Karnataka Water and Sanitation Pooled Fund (KWSPF) Trust borrows from capital market and lends to ULBs with the benefit of a USAID guarantee.

As mentioned above, the recent GOI budget proposed setting up a Pooled Finance Development Fund (PFDF) to facilitate small and medium size ULBs' access to capital markets and to enhance ULB's credit worthiness.

Last year IL&FS established a Pooled Municipal Debt Facility which involved 15 banks, each of which will make available up to Rs 30000 million. This fund is to provide ULBs with infrastructure loans of tenor up to 15 years and will be available to the 60 cities qualifying for JNNURM grants. It would appear from this that the availability of funding for the ULBs in MMR should not be a constraint to the extent that they are creditworthy.

Appendix VI.4

Design and Implementation of Development Charges as Impact Fees

1. Introduction

Development charges are a levy on the first sale of newly developed residential and non-residential space assessed on the sales value and paid by the developer from development profits. Development charges are widely used in developed countries and are consistent with the philosophy that “growth should finance growth”, that is that the costs of new infrastructure associated with new development should be financed by that development.

In North America development charges are designed to recover the costs of development and thus their determination requires not only a long term development forecast (including the projection of demand for services) but also a projection of infrastructure costs and the allocation of these costs to various types of residential and non-residential properties. This process is complex and accordingly in this paper we also raise the possibility of levying development charges as a percentage of market value, rather than on the basis of costs. The process followed in North America for the development and implementation of development charges is described and then options presented for its implementation in Mumbai. The attached exhibit outlines the main steps in calculating cost-based Development Charges.

2. Develop a Development Charge Policy

The following issues must be addressed in developing the policy:

Scope of services - What categories of service will be covered by development Charges?²

It is an important principle that development charges are only used to finance infrastructure costs, not operating expenses. In MMR development charges may be used for infrastructure and management costs, leaving the opportunity for development charges to be used to fund operating expenses. Accordingly changes are required in the legislation to restrict the use of development charges for infrastructure costs.

Allocation between new and existing development - Will the development charge reflect the differences between (i) the costs related to bringing services up to a reasonable standard for the existing population being served and (ii) the costs related to bringing services to a new development?

In North America this distinction is made, and in essence development charges are used only for bringing services to a new development. In MMR much of the projected development is intensification, not Greenfield, so such a distinction might make it difficult to finance needed improvements in existing developments.

² Development charges for the Regional Municipality of Halton, Ontario, Canada cover all or part of the following: Services related to a Highway; Other Transportation Services; Storm Water Drainage; Fire Protection; Outdoor Recreation Services; Indoor Recreation Services; Library Services; Waste Water Services; Water Supply; Police Services; Homes for the Aged; Day Care; Health Department space; Social Service space; and Ambulance.

Application – Who will receive the development charges?

The entity undertaking the development is typically the entity which receives the charge. In MMR the regional entity charged with for example the responsibility for regional roads might receive a regional development charge. Some of this might be allocated to a ULB (for development projects within its responsibility) or the ULB might levy its own development charge for such projects.

Exemptions - What exemptions will be granted? (eg specific projects undertaken by a developer)

In North America the costs to be recovered are reduced by any infrastructure development which a developer agrees to undertake. Similarly the development charge might not be levied on certain types of properties. The MRTP Act exempts certain properties (land and buildings owned by the Central or State Governments or any local authority; exemptions may also be granted to educational, medical or charitable institutions.

Update - How frequently will development charges be reviewed? In between updates, how will charges be adjusted?

Costs to be included - What costs will be included in the costs to be recovered through the development charges?

Typically these include the costs to acquire and improve land, carry out infrastructure works, construct buildings, acquire furniture and equipment, undertake studies etc.

Communications – How will the Development Charge Policy and related details be communicated to developers and the general public and at what stages in their development?

In North America the communication process includes public consultations and publication of the regulations, calculations etc.

Earmarking - How will the development charges be earmarked, safeguarded, accounted for and reported on?

Separate funds should be established for each type of development charge; each type of charge should be used only for that designated purpose. Annual reports of each fund's status and continuity should be provided.

Competition –How will the Development Charges of other States/ULBs be monitored? How will Development Charges be phased in?

Development Charges can act as a disincentive to development and thus should be monitored in relation to other jurisdictions.

Encouraging business - Will Development Charges be discounted to encourage businesses?

This practice is adopted in some North American regions

Affordable housing - Although the principle of “growth finances growth” is central to the application of Development Charges, will special treatment be given to make housing more affordable for some people?

This practice is adopted in some North American regions.

3. Define the Institutional Arrangements

For example:

- (a) **Beneficiaries** - As indicated above, regional entities might levy regional development charges and ULBs might levy their own development charges. Or one level might levy a combined fee and allocate to others.
- (b) **Responsibilities** – For cost based development charges the preparation is complex and must be properly staffed, supported by external assistance or completely outsourced. Responsibilities for preparing, reviewing, approving, managing and auditing must be defined.
- (c) **Appeal** - In Ontario there is a body – the Ontario Municipal Board – to which appeals can be brought.

4. Amend the legislation

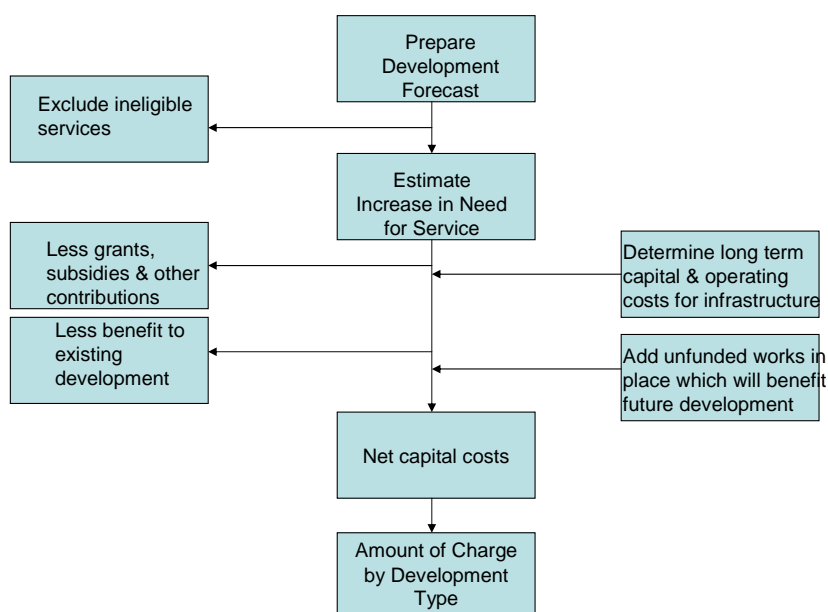
Changes to the MRTPA will be required to implement development charges.

5. Implement a pilot project

The first instance of using development charges in the manner proposed above will require considerable support, particularly in establishing the policy and institutional arrangements, determining the levy and communicating the policy and its results to the development community.

A simplified schematic of the process for calculating cost-based development charges is shown below:

Overview of Process of Calculating a Development Charge



6. Expand the program

Drawing on the lessons learned from the pilot project, expand the program to all appropriate Regional bodies and ULBs. In practical terms, levying and collecting these development charges will be challenging but given the total infrastructure need of \$70 billion over the same period, and bearing in mind that a significant proportion of investments will be financed by user charges, it is evident that development charges can fund a significant portion of the costs projected in the Business Plan.

Appendix VII.1

Preparing Capital Investment Plans for ULBs

1. City Development Plans, Capital Investment Plans and Capital Expenditure Budgets

CIP should ideally be a part of the CDP which is a strategic plan. CDP may take into account a more long-term statutory Development Plan typically having a 20 year time frame. CIP has a 5-year time frame and will be updated more frequently in the light of changing conditions and needs and when appropriate provide feedbacks for revising the CDP. The CIP preparation may proceed in four stages as outlined below¹;



An annual capital expenditure budget should be prepared within the context of the 5-year CIP and its related financing strategy. Typically the annual capital budget lists only the projects to be undertaken and equipment to be purchased during the budget year, together with their sources of funding. The capital budget does not typically list projects that are planned to begin more than a year in the future.

A CIP by contrast, lists projects and equipment purchases that are anticipated and scheduled over a period of five years or more. It forces local governments to look ahead, see what their needs will be, and plan for future projects. A CIP also forces decision makers to review, compare and assign priorities to projects. The first year of the plan is then included as the capital portion of the budget.

2. Timeframe

The typical CIP reflects a five-year projection. As long as the priorities are not treated as fixed, it is sometimes appropriate to plan for a longer period. For example, acquiring land for parks, airports and affordable housing is much less expensive when population density has yet to become a problem and the land can be held in a relatively undeveloped state until needed. Similarly water and sewer projects may often require more than a five-year planning horizon.

3. Inclusiveness

The scope of the CIP and Capital Expenditure Budget will be affected by the definition of capital items. Such a definition should be stated explicitly in a capital budget policy. Classifications might be based on the size of the expenditure, the useful life of the investment or whether they are routine or occasional.

¹ Adapted from FIRE-D UPDATE "City Development Plans"

Property tax and other constraints create pressure to put ambiguous items in the capital budget. But debt constraints may create pressure to put capital items in the operating budget. An inappropriate classification can cause problems, particularly if long-term debt is used to acquire short-lived assets, so that citizens are still paying for the project or equipment when it is no longer in use. Sometimes capital items may be placed in the operating budget to escape the scrutiny of the capital planning process. For all these reasons a definition of capital items is essential; another useful policy to prevent abuses is to require that the duration of loans match the longevity of the projects funded by them.

Another distinction sometimes made to handle ambiguities is to divide capital outlays into two types: departmental capital (furniture, office equipment etc) and large capital projects

Most capital projects involve some operating expenditures and when considering the feasibility and funding of capital projects, the total capital and operating expenses should be considered regardless of where they are placed in the budget.

4. A CIP Policy

The city should prepare a Capital Investment Policy which will set out such issues as:

- i. Definition of what is included in the plan;
- ii. Description of the goals and purpose of the CIP;
- iii. Assignment of responsibility for each CIP project;
- iv. Responsibility and process for reviewing project proposals, setting priorities, approving the budget, monitoring projects including public participation etc
- v. Definition of the project cycle; and
- vi. Funding approval process.

5. Organizing the Capital Budgeting Process

Oversight

Several options exist for placing the responsibility for capital budgeting:

- i. In the budget office;
- ii. In the planning office; and
- iii. In a dedicated capital budgeting office.

The choice amongst these options should take into account the state of the budgeting process: if capital budgeting has become routine, then placing it in the budget office may be appropriate, ensuring close co-ordination with the operating budget and drawing on the budgeting expertise in that office. If however capital budgeting has been ignored and is just being established, locating it in the planning office will be more appropriate. Placing the responsibility in a separate office is rarely a good idea as it can lead to isolation of the capital budgeting process from the mainstream budgeting work and from planning.

Timing

The usual practice is to prepare the operating and capital budgets at the same time, thereby ensuring close co-ordination, particularly with respect to the impact of the capital budget on the operating budget. However some municipalities may choose to prepare them separately in order to distribute the work load more evenly throughout the year.

Priority Setting

In a planning process managed by the planning department priorities may be set by reference to technical standards but in some cities priorities are set with input from citizens and council members. Involving citizens in the evaluation and priority setting provides an opportunity for genuine participation and may provide the foundation for public support if a bond issue is necessary.

A common approach is the formation of an interdepartmental capital budgeting committee which reviews and ranks all proposals for inclusion in the capital budget. Such a committee might be broadened to include citizens.

Identifying Projects

The identification of projects is necessarily both a technical process and a political process. Service standards can and should be the basis for technical input (eg frequency of road repair) but political considerations will always be present. A good starting point is the taking of an inventory of existing assets and an assessment of their condition.

Developing Priorities

The capital investment planning cycle often begins with a call for project proposals but at the same time the Chief Executive should provide broad priorities for capital allocation. Both technical and political issues should be taken into account in setting priorities.

Conducting a Needs Assessment

There are many benefits to starting the planning process with the inventorying of the current capital stock and determining its condition. It helps to demonstrate that previous investments in maintenance and repair is paying off which in turn reinforces and demonstrates the need to invest in maintenance and repair. Because a comprehensive appraisal of the condition of capital assets allows the relative merits of new proposals to be judged in relation to the condition of current assets, it can help build consensus on spending priorities. And it helps provide a rational basis for countering proposals that reflect demands and the persuasiveness of special interests rather than technical need.

Collecting and Ranking Requests

Proposals for capital projects to be included in the CIP may come from city departments, citizen requests, special interest groups or the campaign promises of elected officials. All projects should be documented in a standard format (box ? shows the main components of a possible format).

Request Form for Capital Investment Project	
1.	Identifier
	a. Name of project
	b. Submitted by
	c. Date
	d. Departmental priority
2.	Project Description
	a. Name
	b. Description
	c. Location
	d. Purpose
	e. New or repeat of previous request
3.	Need
	a. What are the needs to be met by this project?

<ul style="list-style-type: none"> b. Who will derive the greatest benefit from this project? c. What will be the geographic scope of services provided by this project? d. How are needs currently being met?
<ul style="list-style-type: none"> 4. Cost <ul style="list-style-type: none"> a. Approximate total cost b. Cost already incurred c. Balance d. Detailed cost estimate broken down by: <ul style="list-style-type: none"> - Planning - Land - Construction - Equipment - Other - Total
5. Proposed Expenditures by Years
6. Construction Data <ul style="list-style-type: none"> a. Estimated construction period b. Proposed manner of construction c. Status of plans and specifications
7. Estimated Effect of Completed Project on Operating Budget of Department
8. Estimated Effect of Project on Operating Budgets of Other Departments
9. Relation to Other Projects <ul style="list-style-type: none"> a. Name of project b. How related
10. Priority <ul style="list-style-type: none"> a. Priority assigned b. Justification
11. Recommended Financing

Since funding will not be available for all projects a rational ranking method must be used to establish priorities. Criteria for ranking project proposals are suggested below. Once proposals are ranked, but before the plan is finalized, citizens should be given an opportunity to also make recommendations. It is recommended that the plan then be submitted to the governing body; even if this is not a legislated requirements it is nevertheless advisable as it adds credibility to the planning process and will facilitate approval of the funding for the plan.

Developing and Applying Selection Criteria

Selection criteria should be developed. These might be the same for all projects or might be different for each sector (i.e. criteria for housing projects might be specific to that sector and different from other sectors). It might be appropriate to weight criteria so that for example, economic development criteria might be accorded more importance than criteria related to conserving heritage buildings.

Suggested criteria are provided below.

<p>Criteria for selecting capital projects</p> <ul style="list-style-type: none"> 2. Economic impact (eg impact on property values, employment, revitalization of neighbourhoods) and economic rate of return; 3. Financial rate of return (for projects with associated revenues); 4. Impact on costs (for projects without associated revenues or operating at net losses); 5. Health and safety effects (impact on traffic accidents, injuries, illness due to poor water quality, sewage etc); 6. Environmental effects (aesthetic effects, impact on noise, air and water pollution, impact on households, consumers, recreational opportunities); 7. Disruption and inconvenience (impact on public while project is in progress) 8. Distributional effects (impact on various geographical areas, low-moderate income areas or disadvantaged groups in the community) 9. Feasibility, extent of public support for the project, compatibility with the master plan; 10. Implications if the project is deferred (eg impact on public, impact on future operating and maintenance costs); 11. Risk and uncertainty associated with the project; 12. Impact on other capital projects

Funding Policy

Whatever the mix of funding sources available for a project there should be an explicit funding policy to protect the operating budget from excessive debt service costs and financial risks. The policy might address such topics as:

- What combination of current revenues and debt issues are to be used – when paying from revenues, current taxpayers bear the burden of financing improvements, and future residents reap the benefits. Funding by debt may be more equitable but the complexity, cost, need for sinking funds and approval process may be a deterrent.
- What type of secured lending to enter into – if bonds are to be used, a policy should be established on the use of general obligation bonds (that is, bonds secured by the general credit worthiness of the ULB and on its taxing powers) or revenue bonds (that is, bonds secured by the revenues earned from revenues derived from projects such as toll roads, water etc). The latter is often attractive but by pledging the best available revenues, the ULB leaves itself vulnerable to not being able to secure other bonds;
- How much borrowing to allow – the ULB may wish to establish guidelines as to the percentage of the operating budget to be committed to the servicing of debts. In the case of revenue bonds, clearly the debt service requirement must not exceed the incremental revenues that can with confidence be generated from the project;
- Matching of terms of projects and financing – long term debt should only be used to finance long-lived assets, not for operating expenses or to cover an operating deficit.
- Contingency measures in the event that actual expenditures vary from the funding established for the project – the policy should address under what circumstances inter-fund loans are permissible (in the event of a project's costs exceeding budget) and how unused funds may be used (in the event of a project's costs being less than budgeted).

Preparing the Capital Budget

While the CIP provides a rolling, 5-year inventory of proposed projects and financing sources, the capital budget – the first year of the CIP – provides detailed information on the design, cost and financing of improvements recommended for the forthcoming year. If a CIP is maintained, the work required to update the plan and prepare a capital budget include:

- Preparing a capital budget manual and calendar that contains instructions and forms for departments to use when preparing their budget requests;
- Determining the costs of each project as precisely as possible;
- Providing a detailed estimate of the sources of funds, both recurring and from one-time debt issues that will be available for the period;
- Bundling debt needs and obtaining approval for bond sales if required;
- Holding public consultations on the proposed capital budget; and
- Approving the capital budget.

Conclusion

The foundation of the capital budgeting process is the creation of a capital improvements plan, prepared within the context of the City Development Plan. The CIP typically covers a five-year period, and the first year of the CIP becomes the annual capital budget – the financing plan for those projects that will be carried out in the next fiscal year. Each year, the CIP is updated, revenue and expenditure estimates are revised for the remaining years in the planning period, and a new (fifth) year of projects is added. This “rolling” process forces public officials to evaluate projects more than once and to judge the merits and urgency of new proposals against those already in the CIP.

In addition to providing a year-by-year inventory of proposed projects, the CIP provides policy makers with a plan for financing those projects. To successfully establish a market for bonds, governments must assure investors of the security of their investment by paying debt obligations promptly, creating a separate debt service fund for current year payments of principal and interest, restricting long term debt to long term assets, and adopting a policy statement that clearly describes the standards and procedures for issuing debt.

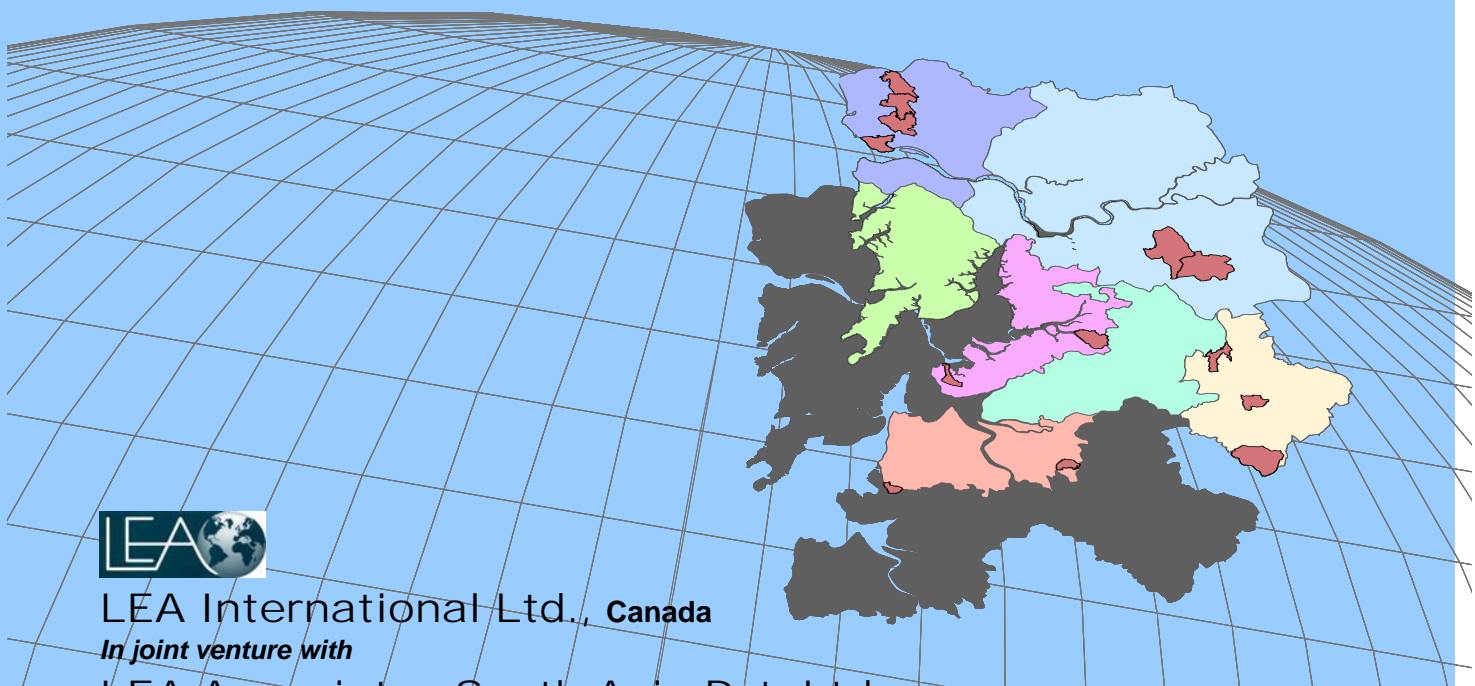


MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

Business Plan for Mumbai Metropolitan Region

FINAL REPORT

APPENDICES V-6 TO V-20



LEA International Ltd., Canada

In joint venture with

LEA Associates South Asia Pvt. Ltd., India

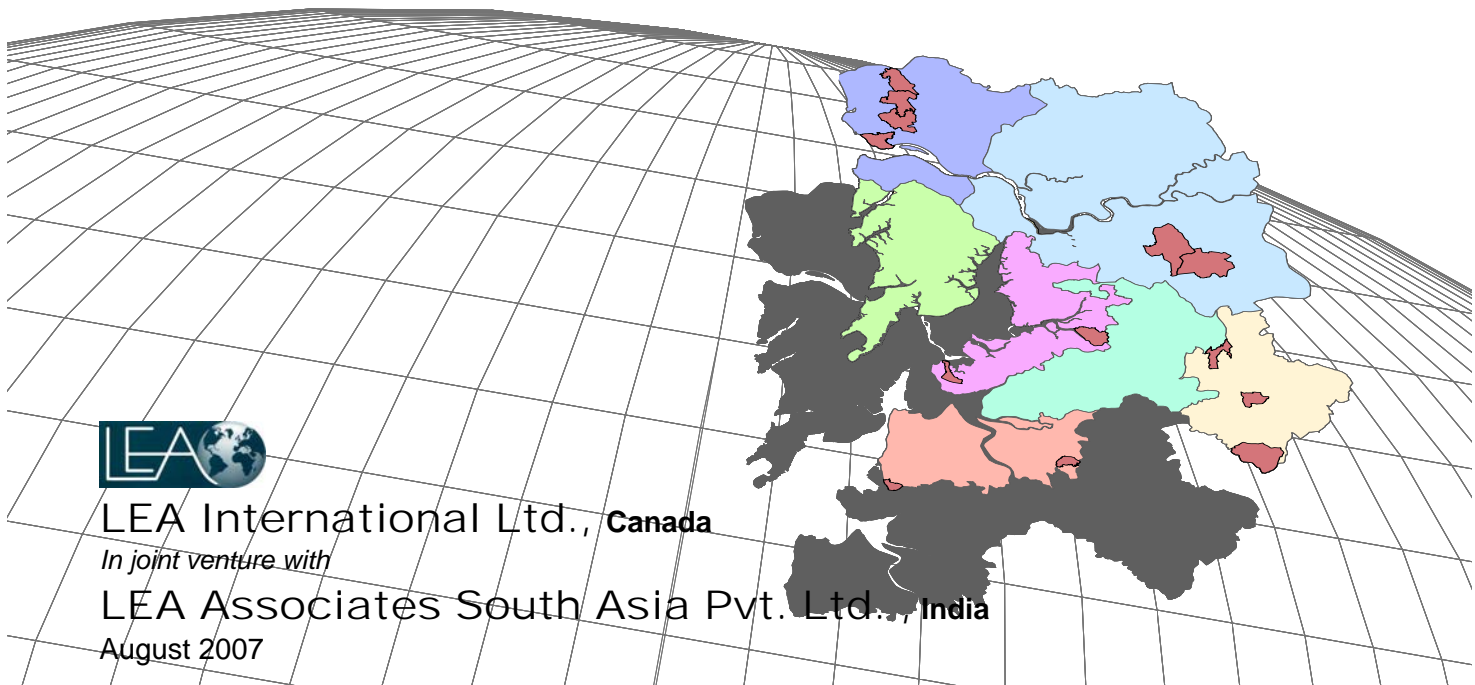
MARCH 2009



MUMBAI METROPOLITAN REGION DEVELOPMENT AUTHORITY

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**DRAFT FINAL REPORT
APPENDICES V-6 TO V-20**



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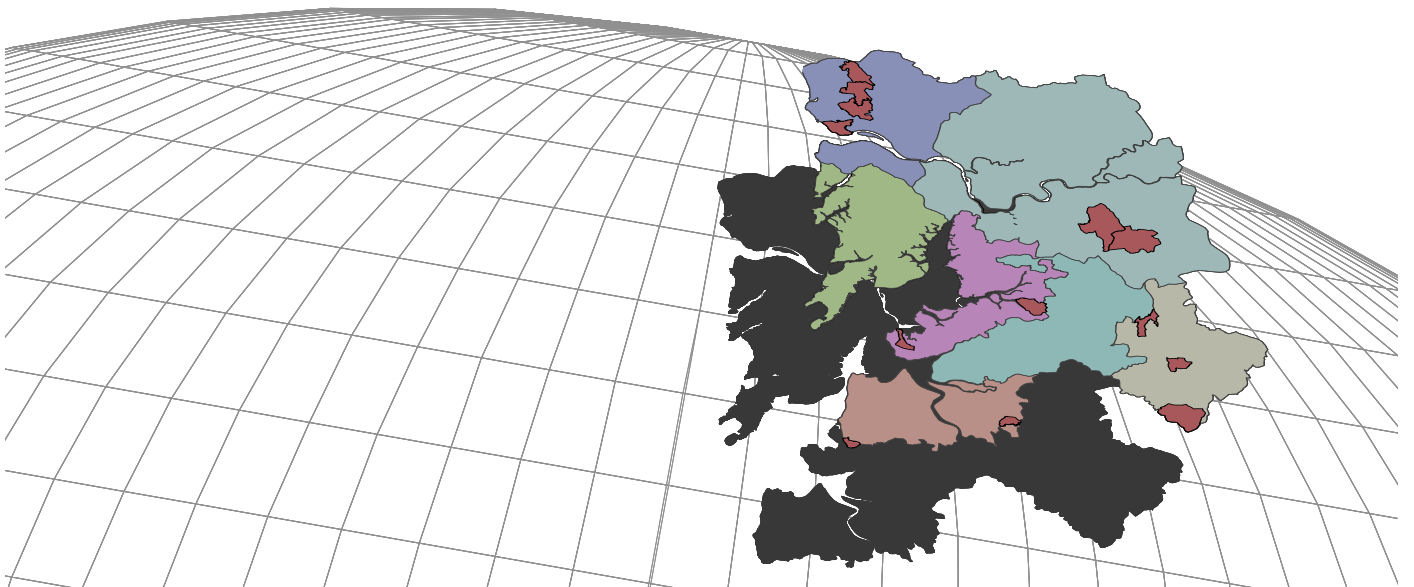
August 2007



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Appendix V.6 NAVI MUMBAI

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	4,111	2,877	2%	5%	% of Capital Cost
2	Sewerage	54,002	37,801	30%	5%	% of Capital Cost
3	Roads	48,473	33,931	27%	3%	% of Capital Cost
	LA For Roads	-	-	0%	0%	% of Capital Cost
4	Drains	42,600	29,820	24%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	4,300	3,010	2%	12%	% of Capital Cost
	LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation	-	-	0%	0%	% of Capital Cost
8	Others- JNNURM	26,202	18,341	15%	3%	% of Capital Cost
9	Others- Non-JNNURM	-	-	0%	2%	% of Capital Cost
	Total	179,687	125,781			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B Investment Phasing		Total	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
Percentage			%												
1	Water Supply	96%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	99%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	98%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	98%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	98%	10%	10%	20%	8%	8%	8%	8%	5%	5%	5%	5%	3%	2%
5	Street Lights	98%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	98%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	98%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	96%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	96%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
Sustainable Investment (Current Prices)		Total	Rs. Lakhs												
1	Water Supply	2,374	317	671	427	302	320	339	339	254	169	169	169	169	169
2	Sewerage	33,066	4,158	4,848	5,139	5,943	6,299	6,677	6,677	6,677	1,113	1,113	1,113	556	556
3	Roads	33,183	11,197	11,869	5,871	1,334	1,414	1,498	999	999	1,498	1,498	1,498	999	999
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	24,079	3,280	3,477	7,371	3,125	3,313	3,512	3,512	2,195	2,195	2,195	2,195	1,317	878
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	1,992	265	351	372	315	334	354	354	266	354	354	354	354	89
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	20,524	4,035	6,416	9,068	481	255	270	270	270	270	270	270	270	-
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	115,218	23,252	27,632	28,248	11,500	11,935	12,651	12,151	11,978	5,600	5,600	5,600	3,666	2,691

C	Additional O&M	Total	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
	Sustainable Investment (Current Prices)		Rs. Lakhs												
1	Water Supply	119	16	34	21	15	16	17	17	13	8	8	8	8	
2	Sewerage	1,653	208	242	257	297	315	334	334	334	56	56	56	28	
3	Roads	996	336	356	176	40	42	45	30	30	45	45	45	30	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	482	66	70	147	63	66	70	70	70	44	44	44	26	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	239	32	42	45	38	40	43	43	32	43	43	43	43	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	616	121	192	272	14	8	8	8	8	8	8	8	8	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	4,104	-	778	936	919	467	487	517	502	487	204	204	204	143

D	Funding Pattern	JNNURM	Total	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
	Capital Grants' Framework															
1	Sustainable Investment (Current)		115,218	23,252	27,632	28,248	11,500	11,935	12,651	12,151	11,978	5,600	5,600	5,600	3,666	2,691
2	Funding under JNNURM framework		115,218	23,252	27,632	28,248	11,500	11,935	12,651	12,151	11,978	5,600	5,600	5,600	3,666	2,691
3	Available Capital Grants under JNNURM	GoI	0													
		GoM	0													
4	Creation of Revolving fund under JNNURM		0													
	Grant Funding	Grant	Total	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
1	Water Supply	50%	1,187	158	336	213	151	160	169	169	127	85	85	85	85	85
2	Sewerage	50%	16,533	2,079	2,424	2,570	2,971	3,150	3,339	3,339	3,339	556	556	556	278	278
3	Roads	50%	16,592	5,599	5,935	2,936	667	707	749	499	499	749	749	749	499	499
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	12,039	1,640	1,739	3,686	1,563	1,656	1,756	1,756	1,097	1,097	1,097	1,097	658	439
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	996	132	175	186	158	167	177	177	133	177	177	177	177	44
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	10,262	2,018	3,208	4,534	240	127	135	135	135	135	135	135	135	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		57,609	11,626	13,816	14,124	5,750	5,967	6,325	6,076	5,989	2,800	2,800	2,800	1,833	1,346
	Availability of Own Resources against Resource Gap															
1	Resource Gap after accounting for Grants			11,626	13,816	14,124	5,750	5,967	6,325	6,076	5,989	2,800	2,800	2,800	1,833	1,346
2	Available Own resources			(6,046)	(16,680)	(6,046)	4,458	8,408	15,875	18,518	20,685	24,103	29,723	37,716	51,637	69,698

D Funding Pattern																
Capital Grants' Framework		JNNURM														
Capital Funding		Total	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	
3	Contribution from available own sources		0	0	0	1	1	1	1	1	1	1	1	1	-	
4	Contribution from Own sources		-	-	-	3,121	6,727	12,700	14,815	16,548	19,282	23,779	30,173	41,309	-	
Own sources' Funding		Total	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	
1	Water Supply	602	-	-	-	82	180	340	413	351	583	719	913	1,909	-	
2	Sewerage	11,867	-	-	-	1,613	3,550	6,703	8,141	9,225	3,832	4,726	5,996	6,270	-	
3	Roads	2,663	-	-	-	362	797	1,504	1,218	1,380	5,159	6,363	8,074	11,256	-	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	6,241	-	-	-	848	1,867	3,525	4,281	4,852	7,557	9,319	11,826	14,838	-	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	630	-	-	-	86	188	356	432	367	1,221	1,505	1,910	3,994	-	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	545	-	-	-	130	144	271	329	373	930	1,146	1,455	3,042	-	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	22,548	-	-	-	3,121	6,727	12,700	14,815	16,548	19,282	23,779	30,173	41,309	-	
Debt Funding		Total	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	
Resource Gap for Debt Funding			11,626	13,816	14,124	2,629	-	-	-	-	-	-	-	-	1,346	
1	Water Supply	776	158	336	213	69	-	-	-	-	-	-	-	-	85	
2	Sewerage	8,432	2,079	2,424	2,570	1,359	-	-	-	-	-	-	-	-	278	
3	Roads	14,774	5,599	5,935	2,936	305	-	-	-	-	-	-	-	-	499	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	7,779	1,640	1,739	3,686	715	-	-	-	-	-	-	-	-	439	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	566	132	175	186	72	-	-	-	-	-	-	-	-	44	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	9,869	2,018	3,208	4,534	110	-	-	-	-	-	-	-	-	-	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	42,195	11,626	13,816	14,124	2,629	-	-	-	-	-	-	-	-	1,346	
Total Investment		122,352	23,252	27,632	28,248	11,500	12,694	19,026	20,890	22,537	22,082	26,579	32,973	43,142	2,691	

Sustainability

Navi Mumbai Municipal Corporation					P2	175746
					P3	179687
A	Output				Difference	-3942
	1	Investment Need (Constant Prices)	Rs. Cr	1796.87		
	2	% Sustainable	%	70.00%	% of Investment Need	
	3	Sustainable Investment (SI)				
		Constant Prices	Rs. Cr	1257.81		
		Current Prices	Rs. Cr	1152.18		
	4	Investment proposed under JNNURM	Rs. Cr	1152.18	100% of SI	
	5	Overall Funding Pattern (Current Prices)				
		JNNURM Grants - GoI	Rs. Cr	288.05	25% of SI	
		JNNURM Grants - GoM	Rs. Cr	288.05	25% of SI	
		Debt Funding	Rs. Cr	421.95	37% of SI	
		ULB Share	Rs. Cr	225.48	20% of SI	

B Funding Pattern Assumptions														
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	
3	Utilisation of Own resources	40%	40%	40%	70%	80%	80%	80%	80%	80%	80%	80%	80%	
C	Sustainability Check	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	
1	Surplus-CB	-7,829	-5,486	161	739	566	1,329	3,940	8,519	18,566	32,233	50,028	73,737	

Financial Operating Plan

Proposed Growth		Income																		
		Minimum	8%																	
		Maximum	10%																	
		<i>All Figures in Rs. Lakhs</i>																		
Head of Account		Current	Proposed Growth	Unit	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
Opening Balance					0	-6302	-11972	-16915	-7829	-5486	161	739	566	1329	3940	8519	18566	32233	50028	73737
I Revenue Receipts																				
A Cess																				
Sub Total A		22.35	10.00	%	12,550	13,805	15,186	16,704	18,374	20,212	22,233	24,456	26,902	29,592	32,551	35,807	39,387	43,326	47,659	52,424
B Taxes																				
1	Property Tax/ General Tax		10.00		5,357	5,892	6,482	7,130	7,843	8,627	9,490	10,439	11,483	12,631	13,894	15,283	16,812	18,493	20,342	22,376
2	Water and sewerage Taxes	7.74	11.00	%	1,089	1,209	1,342	1,489	1,653	1,835	2,037	2,261	2,509	2,785	3,092	3,432	3,809	4,229	4,694	5,210
3	Other Taxes	23.51	15.00	%	924	1,062	1,222	1,405	1,616	1,858	2,137	2,457	2,826	3,249	3,737	4,297	4,942	5,683	6,536	7,516
Sub Total B					7,369	8,163	9,045	10,024	11,111	12,320	13,663	15,157	16,818	18,666	20,723	23,013	25,563	28,405	31,572	35,103
C Non Taxes																				



	1	Betterment/ Development Charges	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	Income from properties/ building permission/ regularisation etc	28.47	13.00	%	7,160	8,091	9,143	10,332	11,675	13,192	14,907	16,845	19,035	21,510	24,306	27,466	31,037	35,071	39,631	44,783
	3	Water Charges		8.00		3,835	4,142	4,473	4,831	5,218	5,635	6,086	6,573	7,098	7,666	8,280	8,942	9,657	10,430	11,264	12,165
	4	Water Connection Fee				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	Sewer Charges				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	Sewerage Connection Fee				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7	Others	41.69	15.00	%	35	41	47	54	62	71	82	94	108	125	143	165	190	218	251	288
		Sub Total C				11,031	12,274	13,663	15,217	16,954	18,899	21,075	23,512	26,242	29,301	32,729	36,573	40,884	45,719	51,146	57,236
	D	Assigned Revenues/ Grants																			
	1	Assigned revenues	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	State Government grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	Gol grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4	NSDP grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5	SJSRY grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6	Other grants/ contributions	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Sub Total D				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Grand Total Revenue Receipts				30,950	34,242	37,893	41,944	46,440	51,430	56,971	63,125	69,962	77,559	86,003	95,392	105,834	117,450	130,376	144,763
	II	Revenue Expenditure																			
	A	Establishment																			
	1	Pay and Allowance to Municipal Staff	16.47	10.00	%	2,548	2,803	3,083	3,391	3,730	4,103	4,513	4,965	5,461	6,007	6,608	7,269	7,996	8,795	9,675	10,643
	2	Pension Benefits	NA	8.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Sub Total A				2,548	2,803	3,083	3,391	3,730	4,103	4,513	4,965	5,461	6,007	6,608	7,269	7,996	8,795	9,675	10,643
	B	Operation & Maintenance																			
	1	Administration & Recovery of taxes	23.67	10.00	%	5,306	5,837	6,421	7,063	7,769	8,546	9,401	10,341	11,375	12,512	13,764	15,140	16,654	18,319	20,151	22,166
	2	Water Supply	13.88	10.00	%	6,941	7,635	8,399	9,238	10,162	11,178	12,296	13,526	14,879	16,366	18,003	19,803	21,784	23,962	26,358	28,994
	3	Sewerage & drainage	22.10	10.00	%	862	948	1,042	1,147	1,261	1,387	1,526	1,679	1,847	2,031	2,235	2,458	2,704	2,974	3,272	3,599
	4	Public health/ safety	42.31	10.00	%	1,483	1,631	1,794	1,974	2,171	2,388	2,627	2,890	3,179	3,496	3,846	4,231	4,654	5,119	5,631	6,194
	5	Construction works/ PWD	-3.03	8.00	%	1,117	1,206	1,302	1,407	1,519	1,641	1,772	1,914	2,067	2,232	2,411	2,604	2,812	3,037	3,280	3,542
	6	Street lighting	21.66	10.00	%	601	662	728	801	881	969	1,066	1,172	1,289	1,418	1,560	1,716	1,888	2,076	2,284	2,512
	7	Sanitation/ Solid waste management	22.10	10.00	%	2,272	2,500	2,750	3,024	3,327	3,660	4,026	4,428	4,871	5,358	5,894	6,483	7,132	7,845	8,629	9,492
	8	Others	50.31	10.00	%	2,324	2,556	2,812	3,093	3,402	3,742	4,117	4,528	4,981	5,479	6,027	6,630	7,293	8,022	8,825	9,707
	9	Phasing of Non debt Liabilities						0	0	0	0	0									
	10	Additional O&M for new CAPEX		6.00	%		0	0	0	778	936	919	467	487	517	548	580	615	652	691	733
	10a	Bulk Purchase of Water		5.00					1,547	1,581	1,618	6,296	6,440	6,591	6,750	6,917	8,639	8,857	9,087	9,328	9,580
	11	Contribution to Revolving Fund						0	6,361	3,531	1,437	1,492	1,581	1,519	1,497	700	700	700	458	336	
		Sub Total B				20,906	22,974	25,248	29,293	39,213	39,597	45,482	48,876	53,147	57,680	62,701	68,984	75,092	81,794	88,907	96,857

C Debt Servicing																			
1	Loan Repayment- Old Loans	Refer Annex	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
2	Loan Repayment- New Loans	Refer Annex		0	0	0	988	2,163	3,363	3,587	4,370	5,302	6,254	6,431	6,431	6,431	6,431	6,431	401
3	MMRDA Loan Repayments				236	236	236	236	60	39	39	39	0						
Sub Total C			68	68	304	304	1,292	2,231	3,431	3,655	4,438	5,370	6,322	6,499	6,499	6,499	6,499	6,499	469
Grand Total Revenue Expenditure			23,522	25,845	28,634	32,988	44,235	45,930	53,426	57,496	63,047	69,057	75,631	82,752	89,587	97,088	105,081	107,968	
Revenue Account Status-Surplus/Deficit			7,428	8,397	9,259	8,957	2,205	5,500	3,545	5,629	6,915	8,502	10,373	12,640	16,247	20,362	25,295	36,795	
I Capital Receipts																			
1	Loans- Existing		157																
2	Regular Grants	6.00 %	156	117	124	131	139	148	156	166	176	186	197	209	222	235	249	264	
3	New Loans	Refer Annex		0	0	11,626	13,816	14,124	2,629	0	0	0	0	0	0	0	0	0	1,346
4	New Grants	Refer Annex		0	0	11,626	13,816	14,124	5,750	5,967	6,325	6,076	5,989	2,800	2,800	2,800	1,833	1,346	
Grand Total Capital Receipts			313	117	124	23,383	27,771	28,396	8,535	6,133	6,501	6,262	6,186	3,009	3,022	3,035	2,082	2,956	
II Capital Expenditure																			
1	Regular Municipal Capital Works	1.00 % of Regular Grants	14,044	14,184	14,326	1	1	1	2	2	2	2	2	2	2	2	2	2	3
2	CIP related CAPEX					23,252	27,632	28,248	11,500	11,935	12,651	12,151	11,978	5,600	5,600	5,600	3,666	2,691	
Grand Total Capital Expenditure			14,044	14,184	14,326	23,253	27,634	28,250	11,501	11,936	12,653	12,153	11,980	5,602	5,602	5,602	3,669	2,694	
Capital Account Status-Surplus/Deficit			-13,731	-14,068	-14,202	130	138	146	-2,966	-5,803	-6,152	-5,891	-5,794	-2,593	-2,580	-2,567	-1,586	262	
Overall Municipal Account Status			-6,302	-5,670	-4,943	9,087	2,343	5,646	579	-174	764	2,611	4,579	10,047	13,667	17,795	23,709	37,057	
Closing Balance			-6,302	-11,972	-16,915	-7,829	-5,486	161	739	566	1,329	3,940	8,519	18,566	32,233	50,028	73,737	110,794	
Financial Indicators																			
1	Operating Ratio		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Capital Utilisation Ratio		45	121	116	1	1	1	1	2	2	2	2	2	2	2	2	2	1
3	Share of Estab.Cost including Terminal Benefits		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Share of Revenue Spent on Establishment		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Debt Servicing Cost as % of Revenue Income		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Annual Status of Accounts																		
	General Account		7,428	8,397	9,259	8,957	2,205	5,500	3,545	5,629	6,915	8,502	10,373	12,640	16,247	20,362	25,295	36,795	
	Capital Deficit		-13,731	-14,068	-14,202	130	138	146	-2,966	-5,803	-6,152	-5,891	-5,794	-2,593	-2,580	-2,567	-1,586	262	
7	Overall Municipal Account Status		-6,302	-5,670	-4,943	9,087	2,343	5,646	579	-174	764	2,611	4,579	10,047	13,667	17,795	23,709	37,057	
8	Closing Balance		-6,302	-11,972	-16,915	-7,829	-5,486	161	739	566	1,329	3,940	8,519	18,566	32,233	50,028	73,737	110,794	

Appendix V.7 MIRA BHAYANDER

II. CAPEX

A		CIP - Sector wise (Rs. Lakhs)						
		Sector	Investment Need by 2021	Sustainable Base Cost (200-07 Prices)	% Investment	O&M on New CAPEX		
	1	Water Supply	5,774	1,270	6%	5%	% of Capital Cost	
	2	Sewerage	25,503	5,611	27%	5%	% of Capital Cost	
	3	Roads	16,250	3,575	17%	3%	% of Capital Cost	
		LA For Roads	-	-	0%	0%	% of Capital Cost	
	4	Drains	22,200	4,884	24%	2%	% of Capital Cost	
	5	Street Lights	-	-	0%	8%	% of Capital Cost	
	6	SWM	2,650	583	3%	12%	% of Capital Cost	
		LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost	
	7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost	
		LA For Slum Rehabilitation	-	-	0%	0%	% of Capital Cost	
	8	Others- General	21,667	4,767	23%	3%	% of Capital Cost	
	9	Others- Non-General	-	-	0%	2%	% of Capital Cost	
		Total	94,044	20,690				
	1	Physical Contingency & Technical Assistance	10%	of Base Project Cost				
	2	Cost Escalation Factor	6%	% p.a				

B		Investment Phasing	Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Percentage	%													
	1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
	3	Roads	100%	10%	10%	20%	20%	20%	3%	2%	2%	3%	3%	3%	2%	2%
		LA For Roads	100%	10%	10%	20%	20%	20%	3%	2%	2%	3%	3%	3%	2%	2%
	4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
	5	Street Lights	100%	10%	10%	20%	20%	20%	3%	2%	2%	3%	3%	3%	2%	2%
	6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
		LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
		LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	8	Others- General	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	9	Others- Non-General	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%

		Rs. Lakhs															
Sustainable Investment (Current Prices)		Total															
1	Water Supply	1,048	140	296	188	133	141	150	150	112	75	75	75	75	75		
2	Sewerage	4,908	617	720	763	882	935	991	991	991	165	165	165	83	83		
3	Roads	3,781	393	417	884	937	993	158	105	105	158	158	158	105	105		
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4	Drains	3,944	537	569	1,207	512	543	575	575	575	359	359	359	216	144		
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
6	SWM	386	51	68	72	61	65	69	69	51	69	69	69	69	17		
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
8	Others- General	5,334	1,049	1,667	2,357	125	66	70	70	70	70	70	70	70	-		
9	Others- Non-General	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Total	19,401	2,787	3,738	5,471	2,650	2,743	2,013	1,960	1,905	896	896	896	617	424		
C	Additional O&M	Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21		
Sustainable Investment (Current Prices)		Rs. Lakhs															
1	Water Supply	52		7	15	9	7	7	7	7	6	4	4	4	4		
2	Sewerage	245		31	36	38	44	47	50	50	50	8	8	8	4		
3	Roads	113		12	13	27	28	30	5	3	3	5	5	5	3		
	LA For Roads	-		-	-	-	-	-	-	-	-	-	-	-	-		
4	Drains	79		11	11	24	10	11	12	12	12	7	7	7	4		
5	Street Lights	-		-	-	-	-	-	-	-	-	-	-	-	-		
6	SWM	46		6	8	9	7	8	8	8	6	8	8	8	8		
	LA For SWM Disposal Site	-		-	-	-	-	-	-	-	-	-	-	-	-		
7	Slums/ Urban poor	-		-	-	-	-	-	-	-	-	-	-	-	-		
	LA For Slum Rehabilitation	-		-	-	-	-	-	-	-	-	-	-	-	-		
8	Others- General	160		31	50	71	4	2	2	2	2	2	2	2	2		
9	Others- Non-General	-		-	-	-	-	-	-	-	-	-	-	-	-		
	Total	2,555		98	231	408	509	613	696	778	857	891	925	959	985		
D	Funding Pattern																
	Capital Grants' Framework	General															
	Capital Funding	Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21		
1	Sustainable Investment (Current)	19,401	2,787	3,738	5,471	2,650	2,743	2,013	1,960	1,905	896	896	896	617	424		
2	Funding under General framework	19,401	2,787	3,738	5,471	2,650	2,743	2,013	1,960	1,905	896	896	896	617	424		

			GoI	0	of Eligible Investment												
3	Available Capital Grants under General		GoM	0	of Eligible Investment												
4	Creation of Revolving fund under General			0	of Grants												
Grant Funding		Grant	Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
1	Water Supply	50%	524	70	148	94	67	71	75	75	56	37	37	37	37	37	
2	Sewerage	50%	2,454	309	360	381	441	467	496	496	496	83	83	83	41	41	
3	Roads	50%	1,891	197	208	442	468	496	79	53	53	79	79	79	53	53	
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	50%	1,972	269	285	604	256	271	288	288	288	180	180	180	108	72	
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	50%	193	26	34	36	31	32	34	34	26	34	34	34	34	9	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	30%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- General	30%	1,600	315	500	707	37	20	21	21	21	21	21	21	21	-	
9	Others- Non-General	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		8,634	1,184	1,535	2,264	1,300	1,358	992	966	939	434	434	434	295	212	
Availability of Own Resources against Resource Gap																	
1	<i>Resource Gap after accounting for Grants</i>			1,603	2,202	3,207	1,350	1,385	1,020	994	967	462	462	462	323	212	
2	Available Own resources			1,422	3,389	6,088	2,630	810	1,160	1,138	2,482	3,745	7,978	14,907	25,032	39,027	
3	Contribution from available own sources			0	0	0	0	-	-	0	-	-	-	-	-	-	
4	Contribution from Own sources			569	678	1,218	526	-	-	228	-	-	-	-	-	-	
Own sources' Funding			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
1	Water Supply		151	29	54	42	26	-	-	17	-	-	-	-	-	-	
2	Sewerage		601	126	131	170	175	-	-	115	-	-	-	-	-	-	
3	Roads		539	80	76	197	186	-	-	12	-	-	-	-	-	-	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		583	110	103	269	102	-	-	67	-	-	-	-	-	-	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		51	10	12	16	12	-	-	8	-	-	-	-	-	-	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- General		1,066	214	302	524	25	-	-	8	-	-	-	-	-	-	
9	Others- Non-General		-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Total		2,990	569	678	1,218	526	-	-	228	-	-	-	-	-	-	-
Debt Funding		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	
Resource Gap for Debt Funding			1,035	1,524	1,989	824	1,385	1,020	766	967	462	462	462	323	212	
1	Water Supply	430	52	121	68	41	71	76	58	57	39	39	39	39	37	
2	Sewerage	2,049	229	293	277	274	472	502	388	503	85	85	85	43	41	
3	Roads	1,510	146	170	321	291	501	80	41	53	81	81	81	55	53	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	1,595	199	232	439	159	274	292	225	292	185	185	185	113	72	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	159	19	28	26	19	33	35	27	26	35	35	35	36	9	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- General	2,034	389	680	857	39	33	36	27	36	36	36	36	37	-	
9	Others- Non-General	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total		7,777	1,035	1,524	1,989	824	1,385	1,020	766	967	462	462	462	323	212	
Total Investment		19,401	2,787	3,738	5,471	2,650	2,743	2,013	1,960	1,905	896	896	896	617	424	

Sustainability

Mira-Bhainder Municipal Council					
Option		2			P2 92,616 Lakhs
A Output					P3 94,044
1 Investment Need (Constant Prices)	Rs. Cr	940			Difference 1,428
2 % Sustainable	%	0	% of Investment Need		
3 Sustainable Investment (SI)					
	Constant Prices	Rs. Cr	207		
	Current Prices	Rs. Cr	194		
4 Investment proposed under JNNURM	Rs. Cr	194	100% of SI		
5 Overall Funding Pattern (Current Prices)					
	JNNURM Grants - GoI	Rs. Cr	43	22% of SI	
	JNNURM Grants - GoM	Rs. Cr	43	22% of SI	
	Debt Funding	Rs. Cr	78	40% of SI	
	ULB Share	Rs. Cr	30	15% of SI	

B Funding Pattern Assumptions															
1 Funding Program	JNNURM														



	2	Contribution to Revolving Fund	25%																
			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				
	3	Utilisation of Own resources	40%	20%	20%	20%	0%	0%	20%	0%	40%	40%	40%	40%	40%				
		C Sustainability Check	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	Counter			
	1	Surplus-CB	103	1,874	3,734	898	(515)	(321)	(673)	765	2,682	6,862	13,722	23,847	37,842	3			

Financial Operating Plan

Proposed Growth		Income		Expense																
		Minimum	5%	8%																
		Maximum	15%	10%																
					All Figures in Rs. Lakhs															
					Actuals				Forecasts											
Head of Account		Current	Proposed	Unit	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
Opening Balance					(143)	5,865	2,757	(1,709)	103	1,874	3,734	898	(515)	(321)	(673)	765	2,682	6,862	13,722	23,847
I Revenue Receipts																				
A Octroi																				
Sub Total A		22.63	10.00	%	5,444	5,988	6,587	7,246	7,970	8,767	9,644	10,609	11,670	12,836	14,120	15,532	17,085	18,794	20,673	22,741
B Taxes																				
1	Property Tax/ General Tax				3,850	2,759	2,755	2,853	2,997	3,165	3,351	3,550	3,763	3,988	4,227	4,481	4,750	5,035	5,337	5,657
2	Water and sewerage Taxes	-1.36	15.00	%	10	11	13	15	17	19	22	26	29	34	39	45	51	59	68	78
3	Other Taxes	69.03	15.00	%	482	554	637	733	843	969	1,115	1,282	1,474	1,696	1,950	2,242	2,579	2,966	3,410	3,922
Sub Total B					4,342	3,325	3,405	3,600	3,856	4,154	4,488	4,858	5,267	5,718	6,216	6,768	7,380	8,060	8,815	9,657
C Non Taxes																				
1	Betterment/ Development Charges	45.66	20.00	%	800	960	1,152	1,382	1,659	1,991	2,389	2,867	3,440	4,128	4,953	5,944	7,133	8,559	10,271	12,326
2	Income from properties/ building permission/ regularisation etc	61.65	14.00	%	936	1,067	1,216	1,386	1,580	1,802	2,054	2,341	2,669	3,043	3,469	3,954	4,508	5,139	5,858	6,679
3	Water Charges				1,655	1,507	1,058	1,001	1,045	1,292	1,436	1,561	1,948	2,170	2,360	2,552	2,758	2,978	3,217	3,474
4	Water Connection Fee				-	55	131	141	153	198	214	231	299	323	349	377	407	440	475	513
5	Sewer Charges				-	-	58	171	347	506	625	744	976	1,164	1,355	1,564	1,797	2,058	2,348	2,671
6	Sewerage Connection Fee				-	-	150	255	383	181	205	230	298	334	375	419	469	523	584	650
7	Others	62.71	11.00	%	1,071	1,189	1,320	1,465	1,626	1,805	2,003	2,223	2,468	2,740	3,041	3,375	3,747	4,159	4,616	5,124
Sub Total C					4,462	4,778	5,085	5,802	6,793	7,774	8,925	10,197	12,098	13,901	15,901	18,187	20,818	23,856	27,369	31,437
D Assigned Revenues/ Grants																				
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	State Government grants	99.18	15.00	%	995	1,144	1,316	1,513	1,740	2,001	2,301	2,646	3,043	3,500	4,025	4,629	5,323	6,121	7,040	8,096
3	GoI grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total D					995	1,144	1,316	1,513	1,740	2,001	2,301	2,646	3,043	3,500	4,025	4,629	5,323	6,121	7,040	8,096
Grand Total Revenue Receipts					15,242	15,235	16,393	18,161	20,360	22,697	25,359	28,311	32,078	35,955	40,262	45,115	50,607	56,831	63,897	71,930
II Revenue Expenditure																				
A Establishment																				
1	Pay and Allowance to Municipal Staff	27.72	10.00	%	1,909	2,099	2,309	2,540	2,794	3,074	3,381	3,719	4,091	4,500	4,950	5,445	5,990	6,589	7,248	7,973
2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total A					1,909	2,099	2,309	2,540	2,794	3,074	3,381	3,719	4,091	4,500	4,950	5,445	5,990	6,589	7,248	7,973
B Operation & Maintenance																				
1	Administration & Recovery of taxes	56.79	10.00	%	261	287	316	347	382	420	462	508	559	615	677	744	819	901	991	1,090
2	Water Supply	151.14	10.00	%	1,515	1,666	1,833	2,016	2,218	2,440	2,683	2,952	3,247	3,572	3,929	4,322	4,754	5,229	5,752	6,327
3	Sewerage & drainage	68.80	10.00	%	51	56	62	68	75	82	90	99	109	120	132	146	160	176	194	213
4	Public health/ safety	28.75	10.00	%	1,271	1,398	1,538	1,692	1,861	2,047	2,252	2,477	2,725	2,998	3,298	3,627	3,990	4,389	4,828	5,311
5	Construction works/ PWD	17.42	10.00	%	2,391	2,631	2,894	3,183	3,501	3,851	4,236	4,660	5,126	5,639	6,203	6,823	7,505	8,256	9,081	9,989
6	Street lighting	8.50	8.50	%	438	475	516	559	607	659	715	775	841	913	991	1,075	1,166	1,265	1,373	1,490
7	Sanitation/ Conservancy	68.80	10.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others	45.74	10.00	%	1,396	1,536	1,689	1,858	2,044	2,248	2,473	2,720	2,992	3,292	3,621	3,983	4,381	4,819	5,301	5,831
9	Phasing of Non debt Liabilities																			
10	Additional O&M for new CAPEX		6.00	%	-	-	-	-	98	231	408	509	613	696	738	783	829	879	932	988
	Bulk Purchase of Water		5.00					2,172	2,221	2,272	8,843	9,045	9,257	9,481	9,715	12,133	12,440	12,762	13,100	13,455
11	Contribution to Revolving Fund							680	566	325	340	248	248	248	248	248	248	248	248	248
Sub Total B					7,323	8,049	8,847	11,896	13,686	14,816	22,489	24,086	25,719	27,573	29,550	33,883	36,293	38,925	41,800	44,943
C Debt Servicing																				
1	Loan Repayment- Old Loans	Refer Annex			593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593
2	Loan Repayment- New Loans	Refer Annex			-	-	-	88	387	457	574	731	834	968	1,023	1,116	1,185	1,185	1,185	1,185
3	Loan Repayment- MMRDA						750	750	750	750	750	750	750	750	750	40	-	-	-	-
Sub Total C					593	593	1,343	1,343	1,431	1,729	1,799	1,917	2,074	2,176	2,310	1,656	1,709	1,778	1,778	1,778
Grand Total Revenue Expenditure					9,825	10,742	12,499	15,779	17,912	19,620	27,669	29,723	31,884	34,250	36,811	40,984	43,992	47,292	50,826	54,694
Revenue Account Status-Surplus/Deficit					5,417	4,493	3,894	2,382	2,448	3,078	(2,310)	(1,412)	194	1,705	3,451	4,131	6,615	9,539	13,071	17,237
Capital Receipts																				

1	Loans- Existing				7,500															
2	Regular Grants		6.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	New Loans	Refer Annex						1,035	1,524	1,989	824	1,385	1,020	766	967	462	462	462	323	212
4	New Grants	Refer Annex						1,184	1,535	2,264	1,300	1,358	992	966	939	434	434	434	295	212
	Grand Total Capital Receipts				7,500			2,218	3,060	4,253	2,124	2,743	2,013	1,732	1,905	896	896	896	617	424
II Capital Expenditure																				
1	Regular Municipal Capital Works		10.00	% of Regular Grants	6,910	7,600	8,360	-	-	-	-	-	-	1,830	2,013	2,214	2,435	2,679	2,947	3,241
2	CIP related CAPEX							2,787	3,738	5,471	2,650	2,743	2,013	1,960	1,905	896	896	896	617	424
	Grand Total Capital Expenditure				6,910	7,600	8,360	2,787	3,738	5,471	2,650	2,743	2,013	3,789	3,918	3,110	3,331	3,575	3,564	3,665
	Capital Account Status-Surplus/Deficit				591	(7,600)	(8,360)	(569)	(678)	(1,218)	(526)			(2,057)	(2,013)	(2,214)	(2,435)	(2,679)	(2,947)	(3,241)
	Overall Municipal Account Status				6,008	(3,107)	(4,467)	1,813	1,770	1,860	(2,836)	(1,412)	194	(353)	1,438	1,917	4,179	6,861	10,124	13,995
	Closing Balance				5,865	2,757	(1,709)	103	1,874	3,734	898	(515)	(321)	(673)	765	2,682	6,862	13,722	23,847	37,842
Financial Indicators																				
1	Operating Ratio				0.6	0.7	0.8	0.9	0.9	0.9	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8
2	Capital Utilisation Ratio				0.9	NA	NA	1.3	1.2	1.3	1.2	1.0	1.0	2.2	2.1	3.5	3.7	4.0	5.8	8.7
3	Share of Estab.Cost including Terminal Benefits				0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	Share of Revenue Spent on Establishment				0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	Debt Servicing Cost as % of Revenue Income				0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
6	Annual Status of Accounts																			
	General Account				5,417	4,493	3,894	2,382	2,448	3,078	(2,310)	(1,412)	194	1,705	3,451	4,131	6,615	9,539	13,071	17,237
	Capital Deficit				591	(7,600)	(8,360)	(569)	(678)	(1,218)	(526)	-	-	(2,057)	(2,013)	(2,214)	(2,435)	(2,679)	(2,947)	(3,241)
7	Overall Municipal Account Status				6,008	(3,107)	(4,467)	1,813	1,770	1,860	(2,836)	(1,412)	194	(353)	1,438	1,917	4,179	6,861	10,124	13,995
8	Closing Balance				5,865	2,757	(1,709)	103	1,874	3,734	898	(515)	(321)	(673)	765	2,682	6,862	13,722	23,847	37,842

Appendix V.8 MUMBAI

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2021	Sustainable Base Cost (200-07 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	44,724	29,965	3%	5%	% of Capital Cost
2	Sewerage	536,004	359,122	32%	5%	% of Capital Cost
3	Roads	581,417	389,549	34%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	180,000	120,600	11%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	31,960	21,413	2%	12%	% of Capital Cost
	LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- General	314,279	210,567	19%	3%	% of Capital Cost
9	Others- Non-General		-	0%	2%	% of Capital Cost
	Total	1,688,384	1,131,217			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B Investment Phasing		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Percentage		%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- General	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-General	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
Sustainable Investment (Current Prices)		Total	Rs. Lakhs												

1	Water Supply		24,727	3,296	6,988	4,444	3,141	3,329	3,529	3,529	2,647	1,764	1,764	1,764	1,764	1,764
2	Sewerage		314,132	39,503	46,061	48,825	56,459	59,847	63,437	63,437	63,437	10,573	10,573	10,573	5,286	5,286
3	Roads		380,964	128,551	136,264	67,405	15,311	16,229	17,203	11,469	11,469	17,203	17,203	17,203	11,469	11,469
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		97,380	13,266	14,062	29,811	12,640	13,398	14,202	14,202	14,202	8,876	8,876	8,876	5,326	3,551
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		14,173	1,884	2,497	2,647	2,244	2,379	2,522	2,522	1,891	2,522	2,522	2,522	2,522	630
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- General		235,623	46,325	73,656	104,101	5,517	2,924	3,100	3,100	3,100	3,100	3,100	3,100	3,100	-
9	Others- Non-General		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		1,066,999	232,826	279,528	257,233	95,312	98,107	103,993	98,259	96,746	44,038	44,038	44,038	29,467	22,701
C Additional O&M			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Sustainable Investment (Current Prices)			Rs. Lakhs													
1	Water Supply		1,236	165	349	222	157	166	176	176	132	88	88	88	88	
2	Sewerage		15,707	1,975	2,303	2,441	2,823	2,992	3,172	3,172	3,172	529	529	529	264	
3	Roads		11,429	3,857	4,088	2,022	459	487	516	344	344	516	516	516	344	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		1,948	265	281	596	253	268	284	284	284	178	178	178	107	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		1,701	226	300	318	269	285	303	303	227	303	303	303	303	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- General		7,069	1,390	2,210	3,123	166	88	93	93	93	93	93	93	93	
9	Others- Non-General		-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		155,309	7,878	17,409	26,131	30,258	34,545	39,089	43,461	47,713	49,419	51,125	52,831	54,030	
D Funding Pattern																
Capital Grants' Framework			General													
Capital Funding			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Sustainable Investment (Current)		1,066,999	232,826	279,528	257,233	95,312	98,107	103,993	98,259	96,746	44,038	44,038	44,038	29,467	22,701
2	Funding under General framework		1,066,999	232,826	279,528	257,233	95,312	98,107	103,993	98,259	96,746	44,038	44,038	44,038	29,467	22,701
3	Available Capital Grants under General	GoI	15%	of Eligible Investment												
		GoM	15%	of Eligible Investment												
4	Creation of Revolving fund under General		25%	of Grants												

Grant Funding		Grant	Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Water Supply	50%	12,363.3	1,648.1	3,493.9	2,222.1	1,570.3	1,664.5	1,764.4	1,764.4	1,323.3	882.2	882.2	882.2	882.2	882.2
2	Sewerage	50%	157,066.2	19,751.7	23,030.5	24,412.3	28,229.6	29,923.3	31,718.7	31,718.7	31,718.7	5,286.5	5,286.5	5,286.5	2,643.2	2,643.2
3	Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	48,690.0	6,633.0	7,031.0	14,905.7	6,320.0	6,699.2	7,101.2	7,101.2	7,101.2	4,438.2	4,438.2	4,438.2	2,662.9	1,775.3
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	7,086.3	942.2	1,248.4	1,323.3	1,122.2	1,189.5	1,260.9	1,260.9	945.6	1,260.9	1,260.9	1,260.9	1,260.9	315.2
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	30%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- General	30%	70,687.0	13,897.4	22,096.9	31,230.3	1,655.2	877.3	929.9	929.9	929.9	929.9	929.9	929.9	929.9	-
9	Others- Non-General	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		295,892.9	42,872.4	56,900.7	74,093.8	38,897.2	40,353.8	42,775.0	42,775.0	42,018.7	12,797.6	12,797.6	12,797.6	8,379.1	5,615.9
Availability of Own Resources against Resource Gap																
1	<i>Resource Gap after accounting for Grants</i>			189,954	222,628	183,140	56,415	57,753	61,218	55,484	54,727	31,241	31,241	31,241	21,088	17,085
2	Available Own resources			335,175	248,365	207,392	128,897	99,471	77,471	64,233	53,794	55,321	57,532	58,680	56,329	50,243
3	Contribution from available own sources			1	1	1	1	1	1	1	-	-	-	-	-	-
4	Contribution from Own sources			167,587	124,183	103,696	64,449	49,736	38,735	32,116	-	-	-	-	-	-
	Own sources' Funding		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	Water Supply		12,394	2,373	3,104	1,792	2,124	1,688	1,314	1,153	-	-	-	-	-	-
2	Sewerage		160,725	28,434	20,463	19,682	38,177	30,339	23,629	20,735	-	-	-	-	-	-
3	Roads		205,228	92,531	60,536	27,173	10,353	8,228	6,408	3,749	-	-	-	-	-	-
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		48,443	9,549	6,247	12,018	8,547	6,792	5,290	4,642	-	-	-	-	-	-
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		7,195	1,356	1,109	1,067	1,518	1,206	939	824	-	-	-	-	-	-
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- General		114,400	33,344	32,722	41,965	3,731	1,482	1,155	1,013	-	-	-	-	-	-
9	Others- Non-General		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		548,386	167,587	124,183	103,696	64,449	49,736	38,735	32,116	-	-	-	-	-	-
	Debt Funding		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21



	<i>Resource Gap for Debt Funding</i>			22,366	98,445	79,443	-	8,017	22,483	23,367	54,727	31,241	31,241	31,241	21,088	17,085
1	Water Supply		5,185	317	2,461	1,373	-	272	763	839	1,497	1,252	1,252	1,252	1,263	1,328
2	Sewerage		53,701	3,795	16,222	15,079	-	4,891	13,715	15,086	35,885	7,500	7,500	7,500	3,783	3,979
3	Roads		86,202	12,349	47,990	20,817	-	1,326	3,719	2,727	6,488	12,204	12,204	12,204	8,207	8,631
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		19,599	1,274	4,952	9,207	-	1,095	3,070	3,377	8,034	6,297	6,297	6,297	3,811	2,672
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		2,617	181	879	817	-	194	545	600	1,070	1,789	1,789	1,789	1,805	474
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- General		63,450	4,450	25,941	32,150	-	239	670	737	1,753	2,199	2,199	2,199	2,218	-
9	Others- Non-General		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		230,755	22,366	98,445	79,443	-	8,017	22,483	23,367	54,727	31,241	31,241	31,241	21,088	17,085
	Total Investment		1,075,033	232,826	279,528	257,233	103,346	98,107	103,993	98,259	96,746	44,038	44,038	44,038	29,467	22,701

Sustainability

Brihan Mumbai Mahanagar Palika					
	Option		2.00		P2 1,754,159
A	Output				P3 1,688,384
1	Investment Need (Constant Prices)	Rs. Cr	16,884		Difference 65,776
2	% Sustainable	%	67.00%	% of Investment Need	
3	Sustainable Investment (SI)				
	Constant Prices	Rs. Cr	11,312		
	Current Prices	Rs. Cr	10,670		
4	Investment proposed under JNNURM	Rs. Cr	10,670	100% of SI	
5	Overall Funding Pattern (Current Prices)				
	JNNURM Grants - GoI	Rs. Cr	1,479	14% of SI	
	JNNURM Grants - GoM	Rs. Cr	1,479	14% of SI	
	Debt Funding	Rs. Cr	2,308	22% of SI	
	ULB Share	Rs. Cr	5,484	51% of SI	

B Funding Pattern Assumptions					
1	Funding Program	JNNURM			
2	Contribution to Revolving Fund	25%			

		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	
3	Utilisation of Own resources	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
C Sustainability Check		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	Counter
1	Surplus-CB	167,051	121,745	86,138	54,924	31,655	17,614	4,359	20,681	22,208	23,879	23,511	21,160	15,074	-

Financial Operating Plan

Brihan Mumbai Mahanagar Palika																																	
Proposed Growth	Minimum	Income	Expense																														
	Maximum	5%	8%																														
<i>All Figures in Rs. Lakhs</i>																																	
				Actuals															Forecasts														
Head of Account	Current	Proposed	Unit	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														
Opening Balance				100,081	158,355	190,067	228,206	167,051	121,745	86,138	54,924	31,655	17,614	4,359	20,681	22,208	23,879	23,511	21,160														
I Revenue Receipts																																	
A Octroi																																	
Sub Total A	13.18	9.00	%	275,983	300,821	327,895	357,405	389,572	424,633	462,850	504,507	549,913	599,405	653,351	712,153	776,247	846,109	922,259	1,005,262														
B Taxes																																	
1 Property Tax/ General Tax				37,789	41,190	44,897	48,938	53,342	58,143	63,376	69,080	75,297	82,074	89,460	97,512	106,288	115,854	126,281	137,646														
2 Water and sewerage Taxes	6.52	8.00	%	51,498	55,618	60,067	64,873	70,062	75,667	81,721	88,259	95,319	102,945	111,180	120,075	129,681	140,055	151,260	163,360														
3 Other Taxes	15.76	8.00	%	30,477	32,915	35,549	38,393	41,464	44,781	48,364	52,233	56,411	60,924	65,798	71,062	76,747	82,887	89,518	96,679														
Sub Total B				119,764	129,723	140,513	152,203	164,869	178,592	193,461	209,571	227,028	245,943	266,439	288,649	312,716	338,796	367,058	397,685														
C Non Taxes																																	
1 Betterment/ Development Charges	NA	15.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
2 Income from properties/ building permission/ regularisation etc	20.40	10.00	%	44,945	49,439	54,383	59,822	65,804	72,384	79,622	87,585	96,343	105,978	116,575	128,233	141,056	155,162	170,678	187,746														
3 Water Charges		8.00		45,644	49,296	53,239	57,498	62,098	67,066	72,431	78,226	84,484	91,243	98,542	106,425	114,939	124,135	134,065	144,790														
4 Water Connection Fee				-	42	69	73	77	94	100	106	129	137	145	154	163	173	183	194														
5 Sewer Charges				-	-	56	162	323	463	561	656	845	988	1,130	1,280	1,444	1,622	1,817	2,029														
6 Sewerage Connection Fee				-	-	103	171	249	107	118	129	163	178	195	214	233	255	278	303														
7 Others	22.59	8.00	%	87,403	94,395	101,947	110,103	118,911	128,424	138,697	149,793	161,777	174,719	188,696	203,792	220,095	237,703	256,719	277,257														
Sub Total C				177,992	193,172	209,797	227,828	247,461	268,538	291,530	316,495	343,740	373,242	405,284	440,098	477,931	519,049	563,740	612,319														
D Assigned Revenues/ Grants																																	
1 Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
2 State Government grants	-27.36	8.00	%	174	188	204	220	237	256	277	299	323	349	377	407	439	475	513	554														
3 Gol grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
4 NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
5 SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														
6 Other grants/	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-														



Appendix V.9 BHIWANDI

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
Sector		Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	4,269	1,750	5%	5%	% of Capital Cost
2	Sewerage	18,892	7,746	21%	5%	% of Capital Cost
3	Roads	37,317	15,300	41%	3%	% of Capital Cost
	LA For Roads	-	-	0%	0%	% of Capital Cost
4	Drains	7,440	3,050	8%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	2,430	996	3%	12%	% of Capital Cost
	LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	20,172	8,270	22%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	90,520	37,113			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B Investment Phasing		Total	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
Percentage		%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%

	LA For Slum Rehabilitation		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	Sustainable Investment (Current Prices)		Total	Rs. Lakhs												
1	Water Supply		1,444	193	408	260	183	194	206	206	155	103	103	103	103	103
2	Sewerage		6,775	852	993	1,053	1,218	1,291	1,368	1,368	1,368	228	228	228	114	114
3	Roads		14,963	5,049	5,352	2,647	601	637	676	450	450	676	676	676	450	450
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		2,463	336	356	754	320	339	359	359	359	225	225	225	135	90
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		659	88	116	123	104	111	117	117	88	117	117	117	117	29
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		9,254	1,819	2,893	4,089	217	115	122	122	122	122	122	122	122	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		35,560	8,336	10,118	8,926	2,643	2,687	2,848	2,623	2,542	1,470	1,470	1,470	1,041	787
C	Additional O&M		Total	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
	Sustainable Investment (Current Prices)			Rs. Lakhs												
1	Water Supply		83	10	20	13	9	10	10	10	8	5	5	5	5	5
2	Sewerage		407	43	50	53	61	65	68	68	68	11	11	11	6	6
3	Roads		462	151	161	79	18	19	20	14	14	20	20	20	14	14
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		56	7	7	15	6	7	7	7	7	4	4	4	3	2
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		93	11	14	15	13	13	14	14	11	14	14	14	14	4
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		281	55	87	123	7	3	4	4	4	4	4	4	4	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		1,383	276	338	298	114	117	124	117	111	59	59	59	45	30

D Funding Pattern																
Capital Grants' Framework		JNNURM														
Capital Funding			Total	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
1	Sustainable Investment (Current)		35,560	8,336	10,118	8,926	2,643	2,687	2,848	2,623	2,542	1,470	1,470	1,470	1,041	787
2	Funding under JNNURM framework		35,560	8,336	10,118	8,926	2,643	2,687	2,848	2,623	2,542	1,470	1,470	1,470	1,041	787
3	Available Capital Grants under JNNURM	GoI	30%	of Eligible Investment												
		GoM	20%	of Eligible Investment												
4	Creation of Revolving fund under JNNURM		25%	of Grants												
Grant Funding																
		Grant	Total	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
1	Water Supply	50%	722	96	204	130	92	97	103	103	77	52	52	52	52	52
2	Sewerage	50%	3,388	426	497	527	609	645	684	684	684	114	114	114	57	57
3	Roads	50%	7,481	2,525	2,676	1,324	301	319	338	225	225	338	338	338	225	225
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	1,232	168	178	377	160	169	180	180	180	112	112	112	67	45
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	330	44	58	62	52	55	59	59	44	59	59	59	59	15
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	4,627	910	1,446	2,044	108	57	61	61	61	61	61	61	61	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		17,780	4,168	5,059	4,463	1,322	1,344	1,424	1,312	1,271	735	735	735	521	393
Availability of Own Resources against Resource Gap																
1	<i>Resource Gap after accounting for Grants</i>			4,168	5,059	4,463	1,322	1,344	1,424	1,312	1,271	735	735	735	521	393
2	Available Own resources			(1,855)	(5,352)	(248)	4,053	5,946	9,480	9,990	11,628	11,196	11,367	12,461	13,289	15,742
3	Contribution from available own sources			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	Contribution from Own sources			-	-	-	-	-	-	-	-	-	-	-	-	-
Own sources' Funding																
			Total	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
1	Water Supply		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Sewerage		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3	Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Street Lights		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For SWM Disposal Site		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Others- Non-JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt Funding			Total	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
<i>Resource Gap for Debt Funding</i>				4168	5059	4463	1322	1344	1424	1312	1271	735	735	735	521	393
1	Water Supply		722	96	204	130	92	97	103	103	77	52	52	52	52	52
2	Sewerage		3388	426	497	527	609	645	684	684	684	114	114	114	57	57
3	Roads		7481	2525	2676	1324	301	319	338	225	225	338	338	338	225	225
	LA For Roads		0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Drains		1232	168	178	377	160	169	180	180	180	112	112	112	67	45
5	Street Lights		0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	SWM		330	44	58	62	52	55	59	59	44	59	59	59	59	15
	LA For SWM Disposal Site		0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Slums/ Urban poor		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	LA For Slum Rehabilitation		0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Others- JNNURM		4627	910	1446	2044	108	57	61	61	61	61	61	61	61	0
9	Others- Non-JNNURM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total		17780	4168	5059	4463	1322	1344	1424	1312	1271	735	735	735	521	393
Total Investment			35560	8336	10118	8926	2643	2687	2848	2623	2542	1470	1470	1470	1041	787

Sustainability

Bhiwandi Municipal Corporation				
Option		2		P2 94,805
A Output				P3 90,520
1 Investment Need (Constant Prices)	Rs. Cr	905		
2 % Sustainable	%	41.00%	% of Investment Need	
3 Sustainable Investment (SI)				
Constant Prices	Rs. Cr	371		
Current Prices	Rs. Cr	356		
4 Investment proposed under JNNURM	Rs. Cr	356	100% of SI	
5 Overall Funding Pattern (Current Prices)				
JNNURM Grants - GoI	Rs. Cr	107	30% of SI	
JNNURM Grants - GoM	Rs. Cr	71	20% of SI	
Debt Funding	Rs. Cr	178	50% of SI	
ULB Share	Rs. Cr	-	0% of SI	

B Funding Pattern Assumptions															
1 Funding Program	JNNURM														
2 Contribution to Revolving Fund	25%														
		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	
3 Utilisation of Own resources				0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
C Sustainability Check		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	Counter
1 Surplus-CB		(2,163)	(897)	1,760	1,026	1,265	2,323	1,271	961	169	751	2,882	7,019	13,416	2

Financial Operating Plan

Bhiwandi Municipal Corporation																				
Proposed Growth	Income		Expense																	
	Minimum	5%	8%																	
	Maximum	15%	10%																	
				All Figures in Rs. Lakhs																
Head of Account	Current	Proposed Growth	Unit	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Opening Balance				(557)	(749)	(3,478)	(5,677)	(2,163)	(897)	1,760	1,026	1,265	2,323	1,271	961	169	751	2,882	7,019	13,416
I Revenue Receipts																				
A Octroi																				
Sub Total A		10.00	%	10,002	11,003	12,103	13,313	14,645	16,109	17,720	19,492	21,441	23,585	25,944	28,538	31,392	34,531	37,984	41,783	45,961
B Taxes																				



1	Property Tax/ General Tax				1,965	1,547	1,533	1,464	1,462	1,487	1,525	1,820	1,912	1,984	2,049	2,113	2,177	2,243	2,310	2,380	2,499
2	Water and sewerage Taxes	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Other Taxes	37.58	15.00	%	120	183	210	241	278	319	367	422	486	558	642	739	849	977	1,123	1,292	1,486
	Sub Total B				2,085	1,729	1,743	1,705	1,739	1,807	1,892	2,243	2,397	2,542	2,691	2,852	3,027	3,220	3,434	3,672	3,984
	C Non Taxes																				
1	Betterment/ Development Charges	30.57	20.00	%	61	106	127	152	182	219	263	315	378	454	545	653	784	941	1,129	1,355	1,626
2	Income from properties/ building permission/ regularisation etc	31.31	15.00	%	187	284	327	376	432	497	572	657	756	869	1,000	1,150	1,322	1,520	1,748	2,011	2,312
3	Water Charges				1,251	701	597	592	613	724	771	812	963	1,026	1,081	1,136	1,193	1,252	1,315	1,381	-
4	Water Connection Fee				-	73	96	100	106	127	134	140	170	178	187	196	206	216	227	239	-
5	Sewer Charges				-	-	40	112	216	300	355	409	527	604	682	765	855	951	1,054	1,166	-
6	Sewerage Connection Fee				-	-	171	278	399	162	176	191	238	257	278	300	324	350	377	406	-
7	Others	339.22	15.00	%	1,799	2,736	3,146	3,618	4,161	4,785	5,502	6,328	7,277	8,369	9,624	11,067	12,728	14,637	16,832	19,357	22,261
	Sub Total C				3,297	3,899	4,504	5,228	6,109	6,815	7,772	8,852	10,308	11,757	13,396	15,268	17,411	19,867	22,683	25,914	26,199
	D Assigned Revenues/ Grants																				
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	State Government grants	-21.19	5.00	%	415	481	505	530	557	584	614	644	677	710	746	783	822	864	907	952	1,000
3	Gol grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total D				415	481	505	530	557	584	614	644	677	710	746	783	822	864	907	952	1,000
	Grand Total Revenue Receipts				15,801	17,112	18,854	20,776	23,050	25,315	27,997	31,231	34,823	38,595	42,777	47,441	52,652	58,481	65,008	72,320	77,143
	III Revenue Expenditure																				
	A Establishment																				
1	Pay and Allowance to Municipal Staff	11.50	10.00	%	3,379	4,497	4,947	5,441	5,986	6,584	7,243	7,967	8,764	9,640	10,604	11,664	12,831	14,114	15,525	17,078	18,785
2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total A				3,379	4,497	4,947	5,441	5,986	6,584	7,243	7,967	8,764	9,640	10,604	11,664	12,831	14,114	15,525	17,078	18,785
	B Operation & Maintenance																				
1	Administration & Recovery of taxes	50.21	10.00	%	104	139	152	168	184	203	223	245	270	297	327	359	395	435	478	526	579
2	Water Supply	17.75	10.00	%	1,454	1,935	2,129	2,342	2,576	2,834	3,117	3,429	3,771	4,149	4,563	5,020	5,522	6,074	6,681	7,350	8,084
3	Sewerage & drainage	-15.64	8.00	%	144	182	196	212	229	247	267	288	311	336	363	392	423	457	494	533	576
4	Public health/ safety	10.04	10.00	%	581	773	851	936	1,029	1,132	1,245	1,370	1,507	1,658	1,823	2,006	2,206	2,427	2,670	2,937	3,230
5	Construction works/ PWD	74.97	10.00	%	1,935	2,575	2,833	3,116	3,428	3,771	4,148	4,563	5,019	5,521	6,073	6,680	7,348	8,083	8,891	9,780	10,758
6	Street lighting	10.30	10.00	%	424	565	621	683	751	827	909	1,000	1,100	1,210	1,331	1,464	1,611	1,772	1,949	2,144	2,358
7	Sanitation/ Conservancy	-15.64	8.00	%	220	277	300	324	349	377	408	440	475	513	555	599	647	699	754	815	880
8	Others	27.87	10.00	%	1,761	2,344	2,578	2,836	3,120	3,432	3,775	4,152	4,567	5,024	5,527	6,079	6,687	7,356	8,091	8,901	9,791
9	Phasing of Non debt Liabilities				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Additional O&M for new CAPEX		6.00	%		276	-	-	338	298	114	117	124	117	124	132	140	148	157	166	176
	Bulk Purchase of Water		5.00					1,607	1,643	1,680	6,539	6,689	6,846	7,011	7,184	8,973	9,200	9,438	9,688	9,951	10,448
11	Contribution to Revolving Fund							-	2,307	1,116	330	336	356	356	356	356	356	356	356	356	356

	Sub Total B				6,624	9,066	9,660	12,223	15,955	15,916	21,075	22,629	24,347	26,192	28,226	32,060	34,535	37,244	40,210	43,458	47,237
C	Debt Servicing																				
	1	Loan Repayment- Old Loans	Refer Annex		1,789	1,789	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112
	2	Loan Repayment- New Loans	Refer Annex		-	-	-	354	784	1,164	1,276	1,671	2,133	2,434	2,523	2,614	2,710	2,710	2,710	2,710	-
	3	Loan Repayment- MMRDA					324	308	308	308	308	308	308	308	308	308	228	208	110	88	
		Sub Total C			1,789	1,789	1,437	1,420	1,775	2,205	2,584	2,696	3,092	3,554	3,855	3,944	3,955	4,030	3,932	3,910	1,112
		Grand Total Revenue			11,792	15,352	16,043	19,084	23,715	24,705	30,901	33,292	36,202	39,385	42,684	47,668	51,320	55,388	59,667	64,446	67,135
		Expenditure																			
		Revenue Account Status- Surplus/Deficit			4,009	1,760	2,811	1,692	(665)	610	(2,904)	(2,061)	(1,379)	(791)	93	(227)	1,332	3,093	5,340	7,874	10,008
I	Capital Receipts																				
	1	Loans- Existing			5																
	2	Regular Grants	6.00 %	1,513	1,802	1,910	2,024	2,146	2,274	2,411	2,556	2,709	2,871	3,044	3,226	3,420	3,625	3,843	4,073	4,318	
	3	New Loans	Refer Annex		-	-	4,168	5,059	4,463	1,322	1,344	1,424	1,312	1,271	735	735	735	521	393	-	
	4	New Grants	Refer Annex		-	-	4,168	5,059	4,463	1,322	1,344	1,424	1,312	1,271	735	735	735	521	393	-	
		Grand Total Capital Receipts			1,517	1,802	1,910	10,361	12,264	11,200	5,054	5,243	5,557	5,495	5,586	4,697	4,890	5,095	4,884	4,860	4,318
II	Capital Expenditure																				
	1	Regular Municipal Capital Works	10.00 % of Regular Grants	5,718	6,290	6,919	202	215	227	241	256	271	3,133	3,447	3,791	4,170	4,587	5,046	5,551	6,106	
	2	CIP related CAPEX					8,336	10,118	8,926	2,643	2,687	2,848	2,623	2,542	1,470	1,470	1,470	1,041	787	-	
		Grand Total Capital Expenditure		5,718	6,290	6,919	8,539	10,333	9,153	2,884	2,943	3,119	5,756	5,989	5,262	5,641	6,058	6,087	6,337	6,106	
		Capital Account Status- Surplus/Deficit			(4,201)	(4,489)	(5,010)	1,822	1,931	2,047	2,170	2,300	2,438	(262)	(403)	(565)	(750)	(962)	(1,203)	(1,478)	(1,788)
		Overall Municipal Account Status			(192)	(2,729)	(2,199)	3,514	1,266	2,657	(734)	239	1,059	(1,052)	(310)	(791)	582	2,131	4,137	6,397	8,220
		Closing Balance			(749)	(3,478)	(5,677)	(2,163)	(897)	1,760	1,026	1,265	2,323	1,271	961	169	751	2,882	7,019	13,416	21,636
		Financial Indicators																			
	1	Operating Ratio		0.7	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
	2	Capital Utilisation Ratio		3.8	3.5	3.6	0.8	0.8	0.8	0.6	0.6	0.6	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.4	
	3	Share of Estab.Cost including Terminal Benefits		0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	
	4	Share of Revenue Spent on Establishment		0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
	5	Debt Servicing Cost as % of Revenue Income		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	6	Annual Status of Accounts																			
		General Account		4,009	1,760	2,811	1,692	(665)	610	(2,904)	(2,061)	(1,379)	(791)	93	(227)	1,332	3,093	5,340	7,874	10,008	
		Capital Deficit		(4,201)	(4,489)	(5,010)	1,822	1,931	2,047	2,170	2,300	2,438	(262)	(403)	(565)	(750)	(962)	(1,203)	(1,478)	(1,788)	
	7	Overall Municipal Account Status		(192)	(2,729)	(2,199)	3,514	1,266	2,657	(734)	239	1,059	(1,052)	(310)	(791)	582	2,131	4,137	6,397	8,220	
	8	Closing Balance		(749)	(3,478)	(5,677)	(2,163)	(897)	1,760	1,026	1,265	2,323	1,271	961	169	751	2,882	7,019	13,416	21,636	

Appendix V.10 ULHASNAGAR

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX		
1 Water Supply	791	585	2%	5%	% of Capital Cost	
2 Sewerage	12,989	9,612	25%	5%	% of Capital Cost	
3 Roads	21,044	15,572	41%	3%	% of Capital Cost	
LA For Roads	-	-	0%	0%	% of Capital Cost	
4 Drains	3,340	2,472	7%	2%	% of Capital Cost	
5 Street Lights	-	-	0%	8%	% of Capital Cost	
6 SWM	1,580	1,169	3%	12%	% of Capital Cost	
LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost	
7 Slums/ Urban poor	-	-	0%	2%	% of Capital Cost	
LA For Slum Rehabilitation	-	-	0%	0%	% of Capital Cost	
8 Others- JNNURM	11,375	8,417	22%	3%	% of Capital Cost	
9 Others- Non-JNNURM	-	-	0%	2%	% of Capital Cost	
Total	51,118	37,827				
1 Physical Contingency & Technical Assistance	10%	of Base Project Cost				
2 Cost Escalation Factor	6%	% p.a				

B Investment Phasing		Total	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
Percentage		%													
1 Water Supply		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2 Sewerage		100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3 Roads		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
LA For Roads		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4 Drains		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5 Street Lights		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6 SWM		100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
LA For SWM Disposal Site		100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7 Slums/ Urban poor		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
LA For Slum Rehabilitation		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8 Others- JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9 Others- Non-JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
Sustainable Investment (Current Prices)		Total	Rs. Lakhs												

1	Water Supply		483	64	136	87	61	65	69	69	52	34	34	34	34	34	
2	Sewerage		8,408	1,057	1,233	1,307	1,511	1,602	1,698	1,698	1,698	283	283	283	141	141	
3	Roads		15,229	5,139	5,447	2,695	612	649	688	458	458	688	688	688	458	458	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		1,996	272	288	611	259	275	291	291	291	182	182	182	109	73	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		774	103	136	145	123	130	138	138	103	138	138	138	138	34	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM		9,419	1,852	2,944	4,161	221	117	124	124	124	124	124	124	124	-	
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		36,308	8,487	10,185	9,005	2,787	2,837	3,007	2,778	2,726	1,449	1,449	1,449	1,005	742	
C Additional O&M			Total	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	
Sustainable Investment (Current Prices)			Rs. Lakhs														
1	Water Supply		28	3	7	4	3	3	3	3	3	2	2	2	2	2	
2	Sewerage		505	53	62	65	76	80	85	85	85	14	14	14	7	7	
3	Roads		471	154	163	81	18	19	21	14	14	21	21	21	14	14	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		46	5	6	12	5	5	6	6	6	4	4	4	2	1	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		109	12	16	17	15	16	17	17	12	17	17	17	17	4	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM		286	56	88	125	7	4	4	4	4	4	4	4	4	-	
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		1,445	284	342	305	123	127	135	128	123	60	60	60	45	28	
D Funding Pattern																	
Capital Grants' Framework			JNNURM														
Capital Funding			Total	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	
1	Sustainable Investment (Current)		36,308	8,487	10,185	9,005	2,787	2,837	3,007	2,778	2,726	1,449	1,449	1,449	1,005	742	
2	Funding under JNNURM framework		36,308	8,487	10,185	9,005	2,787	2,837	3,007	2,778	2,726	1,449	1,449	1,449	1,005	742	
3	Available Capital Grants under JNNURM	GoI	0	of Eligible Investment													
		GoM	0	of Eligible Investment													
4	Creation of Revolving fund under JNNURM		0	of Grants													
Grant Funding			Grant	Total	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
1	Water Supply	50%	241	32	68	43	31	33	34	34	26	17	17	17	17	17	

2	Sewerage	50%	4,204	529	616	653	756	801	849	849	849	141	141	141	71	71
3	Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	998	136	144	305	130	137	146	146	146	91	91	91	55	36
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	387	51	68	72	61	65	69	69	52	69	69	69	69	17
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	4,710	926	1,472	2,081	110	58	62	62	62	62	62	62	62	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		10,540	1,674	2,369	3,155	1,087	1,094	1,160	1,160	1,134	380	380	380	273	142
Availability of Own Resources against Resource Gap																
1	<i>Resource Gap after accounting for Grants</i>			6,813	7,816	5,850	1,699	1,743	1,847	1,618	1,592	1,068	1,068	1,068	732	600
2	Available Own resources			13,410	9,262	13,707	12,589	9,581	6,444	8,183	10,568	9,728	8,848	7,823	6,960	5,875
3	Contribution from available own sources			0	1	1	1	0	0	0	0	0	0	0	0	0
4	Contribution from Own sources			5,364	5,557	8,224	7,554	3,832	2,578	3,273	4,227	3,891	2,654	3,129	2,784	2,350
Own sources' Funding			Total	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
1	Water Supply		507	41	74	79	166	88	59	81	80	93	63	74	95	109
2	Sewerage		10,250	668	673	1,193	4,096	2,164	1,455	2,001	2,633	760	518	611	392	448
3	Roads		11,806	3,248	2,972	2,461	1,659	876	589	540	711	1,847	1,260	1,485	1,270	1,453
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		2,210	172	157	558	702	371	249	343	451	489	333	393	302	231
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		897	65	74	132	332	175	118	162	160	370	252	297	381	109
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		7,440	1,170	1,607	3,801	598	158	106	146	192	333	227	268	343	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		33,109	5,364	5,557	8,224	7,554	3,832	2,578	3,273	4,227	3,891	2,654	3,129	2,784	2,350
Debt Funding			Total	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
<i>Resource Gap for Debt Funding</i>				1,449	2,259	-	-	-	-	-	-	-	-	-	-	-
1	Water Supply		41	11	30	-	-	-	-	-	-	-	-	-	-	-
2	Sewerage		454	181	273	-	-	-	-	-	-	-	-	-	-	-
3	Roads		2,085	877	1,208	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-

4	Drains		110	46	64	-	-	-	-	-	-	-	-	-	-	-	-
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		48	18	30	-	-	-	-	-	-	-	-	-	-	-	-
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		969	316	653	-	-	-	-	-	-	-	-	-	-	-	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		3,708	1,449	2,259	-	-	-	-	-	-	-	-	-	-	-	-
	Total Investment		47,357	8,487	10,185	11,380	8,641	4,926	3,737	4,433	5,361	4,272	3,035	3,510	3,057	2,492	

Sustainability

Ulasnagar Municipal Corporation						
	Option		1.00		P2	50,453
A	Output				P3	51,118
1	Investment Need (Constant Prices)	Rs. Cr	511		Difference	(665)
2	% Sustainable	%	74.00%	% of Investment Need		
3	Sustainable Investment (SI)					
	Constant Prices	Rs. Cr	378			
	Current Prices	Rs. Cr	363			
4	Investment proposed under JNNURM	Rs. Cr	363	100% of SI		
5	Overall Funding Pattern (Current Prices)					
	JNNURM Grants - Gol	Rs. Cr	53	15% of SI		
	JNNURM Grants - GoM	Rs. Cr	53	15% of SI		
	Debt Funding	Rs. Cr	37	10% of SI		
	ULB Share	Rs. Cr	331	91% of SI		

B Funding Pattern Assumptions															
1	Funding Program	JNNURM													
2	Contribution to Revolving Fund	25%													
		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	
3	Utilisation of Own resources	40%	60%	60%	60%	40%	40%	40%	40%	40%	30%	40%	40%	40%	
C Sustainability Check		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	Counter
1	Surplus-CB	7,817	5,023	1,783	2,595	4,257	6,386	5,600	4,706	3,999	3,092	2,190	1,380	441	-

Financial Operating Plan

Ulasnagar Municipal Corporation																					
Proposed Growth	Income		Expense																		
	Minimum	5%	8%																		
	Maximum	15%	10%																		
<i>All Figures n Rs. Lakhs</i>																					
Head of Account	Current	Proposed Growth	Unit	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	
	Opening Balance			(41)	(4)	5,639	9,034	7,817	5,023	1,783	2,595	4,257	6,386	5,600	4,706	3,999	3,092	2,190	1,380		
Revenue Receipts																					
A	Octroi																				
	Sub Total A	7.80	9.00	%	6,506	7,091	7,729	8,425	9,183	10,010	10,910	11,892	12,963	14,129	15,401	16,787	18,298	19,945	21,740	23,696	
B	Taxes																				
	1	Property Tax/ General Tax			865	7,756	6,065	5,263	4,999	4,951	4,991	5,881	6,111	6,278	6,422	6,558	6,692	6,827	6,964	7,103	
	2	Water and sewerage Taxes	42.30	12.00	%	36	50	56	63	70	79	88	99	110	124	138	155	174	195	218	244
	3	Other Taxes	42.21	12.00	%	751	1,054	1,181	1,323	1,481	1,659	1,858	2,081	2,331	2,611	2,924	3,275	3,668	4,108	4,601	5,153
	Sub Total B				1,651	8,861	7,301	6,648	6,551	6,689	6,938	8,061	8,553	9,013	9,484	9,988	10,533	11,129	11,782	12,500	
C	Non Taxes																				
	1	Betterment/ Development Charges	28.41	20.00	%	59	102	122	147	176	211	253	304	365	438	525	630	756	908	1,089	1,307
	2	Income from properties/ building permission/ regularisation etc	138.06	10.00	%	228	303	334	367	404	444	488	537	591	650	715	786	865	952	1,047	1,151
	3	Water Charges			900	1,286	1,300	1,343	1,394	1,635	1,725	1,800	2,115	2,231	2,329	2,424	2,521	2,622	2,727	2,836	
	4	Water Connection Fee			-	115	150	156	162	194	201	210	251	261	271	282	293	305	317	330	
	5	Sewer Charges			-	-	93	255	490	673	788	899	1,148	1,305	1,459	1,621	1,793	1,976	2,170	2,377	
	6	Sewerage Connection Fee			-	-	331	530	750	288	308	330	405	432	461	491	523	557	593	631	
	7	Others	100.16	15.00	%	177	269	309	355	408	470	540	621	714	821	945	1,086	1,249	1,437	1,652	1,900
	Sub Total C				1,363	2,075	2,638	3,152	3,784	3,915	4,304	4,701	5,588	6,138	6,705	7,322	8,002	8,756	9,596	10,533	
D	Assigned Revenues/ Grants																				
	1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	State Government grants	2.98	5.00	%	18	21	22	23	25	26	27	28	30	31	33	35	36	38	40	42
	3	Gov grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sub Total D				18	21	22	23	25	26	27	28	30	31	33	35	36	38	40	42	
Grand Total Revenue					9,539	18,047	17,691	18,248	19,542	20,639	22,180	24,682	27,133	29,311	31,623	34,131	36,869	39,868	43,158	46,771	



Receipts																					
Revenue																					
Expenditure																					
A	Establishment																				
1	Pay and Allowance to Municipal Staff	10.74	10.00	%	3,364	4,477	4,925	5,418	5,960	6,556	7,211	7,932	8,725	9,598	10,558	11,613	12,775	14,052	15,458	17,003	
2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total A			%	3,364	4,477	4,925	5,418	5,960	6,556	7,211	7,932	8,725	9,598	10,558	11,613	12,775	14,052	15,458	17,003	
B	Operation & Maintenance																				
1	Administration & Recovery of taxes	18.78	10.00	%	202	268	295	325	357	393	432	476	523	575	633	696	766	843	927	1,019	
2	Water Supply	2.08	8.00	%	2,103	2,649	2,861	3,090	3,337	3,604	3,892	4,204	4,540	4,903	5,296	5,719	6,177	6,671	7,205	7,781	
3	Sewerage & drainage	13.10	10.00	%	203	270	297	327	359	395	435	478	526	578	636	700	770	847	932	1,025	
4	Public health/ safety	16.80	10.00	%	614	818	900	990	1,089	1,197	1,317	1,449	1,594	1,753	1,928	2,121	2,333	2,567	2,823	3,106	
5	Construction works/ PWD	77.91	10.00	%	209	278	306	337	371	408	448	493	542	597	656	722	794	874	961	1,057	
6	Street lighting	9.57	9.57	%	373	490	537	588	645	706	774	848	929	1,018	1,115	1,222	1,339	1,467	1,607	1,761	
7	Sanitation/ Conservancy	13.10	10.00	%	47	63	69	76	84	92	101	112	123	135	148	163	180	198	217	239	
8	Others	31.91	10.00	%	1,029	1,370	1,507	1,657	1,823	2,005	2,206	2,426	2,669	2,936	3,230	3,553	3,908	4,299	4,729	5,201	
9	Phasing of Non debt Liabilities																				
10	Additional O&M for new CAPEX		6.00	%		284	-	-	342	305	123	127	135	128	136	144	153	162	171	182	
	Bulk Purchase of Water		5.00					297	304	311	1,211	1,239	1,268	1,298	1,330	1,528	1,563	1,601	1,640	1,680	
11	Contribution to Revolving Fund								1,011	789	272	274	290	290	290	290	290	290	290	290	
	Sub Total B				4,780	6,490	6,772	7,687	9,721	10,206	11,212	12,125	13,139	14,212	15,399	16,859	18,273	19,816	21,502	23,342	
C	Debt Servicing																				
1	Loan Repayment- Old Loans		Refer Annex		305	305	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	1,112	
2	Loan Repayment- New Loans		Refer Annex			-	-	-	123	315	315	315	413	565	565	565	565	565	565	565	
3	Loan Repayment- MMRDA						229	229	229	229	229	229	229	229	229	229	229	229	229	-	
	Sub Total C				305	305	1,341	1,341	1,464	1,656	1,656	1,656	1,754	1,906	1,906	1,906	1,906	1,906	1,678	1,678	1,678
	Grand Total Revenue Expenditure				8,449	11,273	13,038	14,446	17,145	18,418	20,080	21,713	23,618	25,717	27,863	30,379	32,954	35,546	38,637	42,023	
	Revenue Account Status- Surplus/Deficit				1,089	6,775	4,653	3,802	2,397	2,221	2,100	2,969	3,515	3,595	3,760	3,752	3,915	4,322	4,521	4,748	
Capital Receipts																					
1	Loans- Existing																				
2	Regular Grants		6.00	%	287	342	362	384	407	431	457	485	514	544	577	612	648	687	729	772	
3	New Loans		Refer Annex					1,449	2,259												



	4	New Grants		Refer Annex					-	-	1,674	2,369	3,155	1,087	1,094	1,160	1,160	1,134	380	380	380	273	142
		Grand Total Capital Receipts				287	342	362	3,507	5,035	3,586	1,544	1,579	1,673	1,704	1,711	992	1,029	1,068	1,002	914		
Capital Expenditure																							
	1	Regular Municipal Capital Works		10.00	% of Regular Grants	1,339	1,473	1,620	38	41	43	46	48	51	3,308	3,639	4,002	4,403	4,843	5,327	5,860		
	2	CIP related CAPEX							8,487	10,185	9,005	2,787	2,837	3,007	2,778	2,726	1,449	1,449	1,449	1,005	742		
		Grand Total Capital Expenditure				1,339	1,473	1,620	8,525	10,226	9,048	2,832	2,885	3,058	6,086	6,365	5,451	5,851	6,292	6,332	6,602		
		Capital Account Status-Surplus/Deficit				(1,052)	(1,131)	(1,258)	(5,019)	(5,191)	(5,462)	(1,288)	(1,307)	(1,385)	(4,382)	(4,654)	(4,459)	(4,823)	(5,224)	(5,331)	(5,688)		
		Overall Municipal Account Status				37	5,643	3,395	(1,216)	(2,794)	(3,240)	812	1,662	2,129	(787)	(894)	(707)	(907)	(902)	(809)	(940)		
		Closing Balance				(4)	5,639	9,034	7,817	5,023	1,783	2,595	4,257	6,386	5,600	4,706	3,999	3,092	2,190	1,380	441		
Financial Indicators																							
	1	Operating Ratio				0.9	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	2	Capital Utilisation Ratio				4.7	4.3	4.5	2.4	2.0	2.5	1.8	1.8	1.8	3.6	3.7	5.5	5.7	5.9	6.3	7.2		
	3	Share of Estab.Cost including Terminal Benefits				0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	4	Share of Revenue Spent on Establishment				0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	5	Debt Servicing Cost as % of Revenue Income				0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	6	Annual Status of Accounts																					
		General Account				1,089	6,775	4,653	3,802	2,397	2,221	2,100	2,969	3,515	3,595	3,760	3,752	3,915	4,322	4,521	4,748		
		Capital Deficit				(1,052)	(1,131)	(1,258)	(5,019)	(5,191)	(5,462)	(1,288)	(1,307)	(1,385)	(4,382)	(4,654)	(4,459)	(4,823)	(5,224)	(5,331)	(5,688)		
	7	Overall Municipal Account Status				37	5,643	3,395	(1,216)	(2,794)	(3,240)	812	1,662	2,129	(787)	(894)	(707)	(907)	(902)	(809)	(940)		
	8	Closing Balance				(4)	5,639	9,034	7,817	5,023	1,783	2,595	4,257	6,386	5,600	4,706	3,999	3,092	2,190	1,380	441		

Appendix V.11 KALYAN

II. CAPEX

A		CIP - Sector wise (Rs. Lakhs)				
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	6,812	4,291	3%	5%	% of Capital Cost
2	Sewerage	47,141	29,699	20%	5%	% of Capital Cost
3	Roads	106,194	66,903	46%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	27,500	17,325	12%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	4,200	2,646	2%	12%	% of Capital Cost
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	40,417	25,462	17%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	232,264	146,326			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B		Investment Phasing	Total	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
		Percentage	%													
1	Water Supply	100%	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	100%	20%	20%	20%	5%	5%	5%	5%	5%	5%	3%	3%	2%	2%
	LA For Roads	100%	100%	20%	20%	20%	5%	5%	5%	5%	5%	5%	3%	3%	2%	2%
4	Drains	100%	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	100%	20%	20%	20%	5%	5%	5%	5%	5%	5%	3%	3%	2%	2%
6	SWM	100%	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	100%	10%	20%	12%	8%	8%	8%	6%	4%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	100%	10%	10%	10%	10%	10%	10%	10%	5%	5%	5%	5%	5%	5%
9	Others- Non-JNNURM	100%	100%	10%	10%	10%	10%	10%	10%	10%	5%	5%	5%	5%	5%	5%
		Sustainable Investment (Current Prices)	Total	Rs. Lakhs												
1	Water Supply		3,541	472	1,001	636	450	477	505	505	379	253	253	253	253	253
2	Sewerage		25,978	3,267	3,809	4,038	4,669	4,949	5,246	5,246	5,246	874	874	874	437	437
3	Roads		60,810	14,719	15,602	16,538	4,383	4,645	4,924	4,924	4,924	4,924	2,955	2,955	1,970	1,970
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		13,989	1,906	2,020	4,283	1,816	1,925	2,040	2,040	2,040	1,275	1,275	1,275	765	510
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		1,751	233	309	327	277	294	312	312	234	312	312	312	312	78
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		19,537	2,801	2,969	3,147	3,336	3,536	3,748	3,748	1,874	1,874	1,874	1,874	1,874	1,874

	9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	
		Total		125,607	23,397	25,709	28,969	14,930	15,826	16,776	16,776	14,697	9,512	7,542	7,542	5,610	5,122
C		Additional O&M		Total	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
		Sustainable Investment (Current Prices)		Rs. Lakhs													
	1	Water Supply		177		24	50	32	22	24	25	25	19	13	13	13	13
	2	Sewerage		1,299		163	190	202	233	247	262	262	262	44	44	44	22
	3	Roads		1,824		442	468	496	131	139	148	148	148	148	89	89	59
		LA For Roads		-		-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains		280		38	40	86	36	38	41	41	41	26	26	26	15
	5	Street Lights		-		-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM		210		28	37	39	33	35	37	37	28	37	37	37	37
		LA For SWM Disposal Site		-		-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor		-		-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation		-		-	-	-	-	-	-	-	-	-	-	-	-
	8	Others- JNNURM		586		84	89	94	100	106	112	112	56	56	56	56	56
	9	Others- Non-JNNURM		-		-	-	-	-	-	-	-	-	-	-	-	-
		Total		4,376	-	779	875	949	557	591	626	626	554	323	264	264	203
D		Funding Pattern															
		Capital Grants' Framework	JNNURM														
		Capital Funding		Total	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
	1	Sustainable Investment (Current)		125,607	23,397	25,709	28,969	14,930	15,826	16,776	16,776	14,697	9,512	7,542	7,542	5,610	5,122
	2	Funding under JNNURM framework		125,607	23,397	25,709	28,969	14,930	15,826	16,776	16,776	14,697	9,512	7,542	7,542	5,610	5,122
	3	Available Capital Grants under JNNURM	GoI	0	of Eligible Investment												
			GoM	0	of Eligible Investment												
	4	Creation of Revolving fund under JNNURM		0	of Grants												
		Grant Funding	Grant	Total	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
	1	Water Supply	50%	1,771	236	500	318	225	238	253	253	190	126	126	126	126	126
	2	Sewerage	50%	12,989	1,633	1,905	2,019	2,335	2,475	2,623	2,623	2,623	437	437	437	219	219
	3	Roads	50%	30,405	7,359	7,801	8,269	2,191	2,323	2,462	2,462	2,462	2,462	1,477	1,477	985	985
		LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains	50%	6,995	953	1,010	2,141	908	962	1,020	1,020	1,020	638	638	638	383	255
	5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM	50%	876	116	154	164	139	147	156	156	117	156	156	156	156	39
		LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	Others- JNNURM	50%	9,768	1,400	1,484	1,574	1,668	1,768	1,874	1,874	937	937	937	937	937	937
	9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total		62,804	11,698	12,855	14,484	7,465	7,913	8,388	8,388	7,349	4,756	3,771	3,771	2,805	2,561
		Availability of Own Resources against Resource Gap															
	1	Resource Gap after accounting for Grants			11,698	12,855	14,484	7,465	7,913	8,388	8,388	7,349	4,756	3,771	3,771	2,805	2,561
	2	Available Own resources			11,547	8,034	11,847	10,466	11,516	16,800	4,896	(6,185)	(1,643)	(76)	2,036	7,167	-
	3	Contribution from available own sources			1	0	0	0	0	0	0	0	0	0	0	0	-
	4	Contribution from Own sources			5,773	2,410	2,369	2,093	1,152	1,680	979	-	-	-	407	2,150	-
		Own sources' Funding		Total	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
	1	Water Supply		411	116	94	52	63	35	51	30	-	-	-	14	97	-

2	Sewerage	3,034	806	357	330	655	360	525	306	-	-	-	47	168	-
3	Roads	7,893	3,632	1,463	1,353	614	338	493	287	-	-	-	159	755	-
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	1,609	470	189	350	255	140	204	119	-	-	-	69	293	-
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	205	57	29	27	39	21	31	18	-	-	-	17	119	-
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	2,327	691	278	257	468	257	375	219	-	-	-	101	718	-
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	15,478	5,773	2,410	2,369	2,093	1,152	1,680	979	-	-	-	407	2,150	-
	Debt Funding														
	Total	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	
	<i>Resource Gap for Debt Funding</i>	5,925	10,444	12,115	5,372	6,762	6,708	7,409	7,349	4,756	3,771	3,364	655	2,561	
1	Water Supply	1,360	120	407	266	162	204	202	223	190	126	126	113	30	126
2	Sewerage	9,955	827	1,547	1,689	1,680	2,114	2,098	2,317	2,623	437	437	390	51	219
3	Roads	22,512	3,727	6,338	6,916	1,577	1,985	1,969	2,175	2,462	2,462	1,477	1,318	230	985
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	5,386	483	821	1,791	653	822	816	901	1,020	638	638	569	89	255
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	671	59	125	137	100	126	125	138	117	156	156	139	36	39
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	7,441	709	1,206	1,316	1,200	1,511	1,499	1,655	937	937	937	836	219	937
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	47,326	5,925	10,444	12,115	5,372	6,762	6,708	7,409	7,349	4,756	3,771	3,364	655	2,561
	Total Investment	125,607	23,397	25,709	28,969	14,930	15,826	16,776	16,776	14,697	9,512	7,542	7,542	5,610	5,122

Sustainability

Kalyan Municipal Corporation			
	Option		2.00
A	Output		
1	Investment Need (Constant Prices)	Rs. Cr	2,323
2	% Sustainable	%	63.00%
3	Sustainable Investment (SI)		
	Constant Prices	Rs. Cr	1,463
	Current Prices	Rs. Cr	1,256
4	Investment proposed under JNNURM	Rs. Cr	1,256
			100% of SI
5	Overall Funding Pattern (Current Prices)		
	JNNURM Grants - Gol	Rs. Cr	314
			25% of SI
	JNNURM Grants - GoM	Rs. Cr	314
			25% of SI
	Debt Funding	Rs. Cr	473
			38% of SI

P2	208,906
P3	232,264
Difference	(23,358)



	ULB Share	Rs. Cr	155	12% of SI
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B Funding Pattern Assumptions														
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	
3	Utilisation of Own resources	50%	30%	20%	20%	10%	10%	20%	20%	20%	20%	20%	30%	
C Sustainability Check														
1	Surplus-CB	4,855	4,433	7,399	5,264	7,304	11,115	(1,363)	2,477	1,880	1,508	3,213	4,685	Counter 1

Financial Operating Plan

Kalyan Municipal Corporation																			
Proposed Growth		Income		Expense															
		Minimum	5%	8%															
		Maximum	15%	10%															
<i>All Figures in Rs. Lakhs</i>																			
Head of Account		Current	Proposed Growth	Unit	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
Opening Balance					(6,558)	(5,504)	(1,397)	2,925	4,855	4,433	7,399	5,264	7,304	11,115	(1,363)	2,477	1,880	1,508	3,213
I Revenue Receipts																			
A Octroi																			
Sub Total A		3.02	7.00	%	7,508	8,033	8,596	9,198	9,841	10,530	11,267	12,056	12,900	13,803	14,769	15,803	16,909	18,093	19,359
B Taxes																			
1	Property Tax/ General Tax				2,836	6,316	6,748	6,683	6,736	6,839	6,963	8,309	8,602	8,824	9,021	9,209	9,397	9,586	9,778
2	Water and sewerage Taxes	9.29	12.00	%	1,069	1,198	1,341	1,502	1,683	1,884	2,111	2,364	2,647	2,965	3,321	3,720	4,166	4,666	5,226
3	Other Taxes	9.30	11.00	%	770	855	949	1,054	1,170	1,298	1,441	1,600	1,776	1,971	2,188	2,428	2,695	2,992	3,321
Sub Total B					4,675	8,369	9,039	9,239	9,589	10,022	10,515	12,273	13,025	13,760	14,530	15,357	16,258	17,244	18,325
C Non Taxes																			
1	Betterment/ Development Charges	51.58	20.00	%	2,071	2,485	2,982	3,579	4,294	5,153	6,184	7,421	8,905	10,686	12,823	15,387	18,465	22,158	26,589
2	Income from properties/ building permission/ regularisation etc	15.14	15.00	%	239	275	316	363	418	480	552	635	730	840	966	1,111	1,277	1,469	1,689
3	Water Charges				2,757	2,361	2,612	2,755	2,875	3,634	3,864	4,040	5,109	5,434	5,681	5,916	6,154	6,401	6,657
4	Water Connection Fee				-	75	97	101	105	136	142	148	192	200	208	216	224	233	243
5	Sewer Charges				-	-	194	529	1,016	1,396	1,634	1,866	2,382	2,707	3,028	3,364	3,720	4,099	4,503
6	Sewerage Connection Fee				-	-	214	343	486	187	200	214	262	280	299	318	339	361	384
7	Others	31.58	15.00	%	1,039	1,195	1,375	1,581	1,818	2,090	2,404	2,765	3,179	3,656	4,205	4,835	5,561	6,395	7,354
Sub Total C					6,106	6,390	7,789	9,251	11,012	13,076	14,981	17,088	20,759	23,802	27,208	31,147	35,741	41,117	47,420
D Assigned Revenues/ Grants																			
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	State Government grants	147.91	16.00	%	703	815	946	1,097	1,272	1,476	1,712	1,986	2,304	2,672	3,100	3,596	4,171	4,839	5,613
3	GoI grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix V.12

THANE

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector		Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX
1	Water Supply		6,085	4,990	3%	5% % of Capital Cost
2	Sewerage		36,823	30,195	17%	5% % of Capital Cost
3	Roads		94,196	77,241	44%	3% % of Capital Cost
	LA For Roads			-	0%	0% % of Capital Cost
4	Drains		31,450	25,789	15%	2% % of Capital Cost
5	Street Lights		-	-	0%	8% % of Capital Cost
6	SWM		5,790	4,748	3%	12% % of Capital Cost
	LA For SWM Disposal Site			-	0%	0% % of Capital Cost
7	Slums/ Urban poor		-	-	0%	2% % of Capital Cost
	LA For Slum Rehabilitation			-	0%	0% % of Capital Cost
8	Others- JNNURM		41,179	33,766	19%	3% % of Capital Cost
9	Others- Non- JNNURM			-	0%	2% % of Capital Cost
	Total		215,523	176,729		
1	Physical Contingency & Technical Assistance		10%	of Base Project Cost		
2	Cost Escalation Factor		6%	% p.a		

B	Investment Phasing		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
	Percentage			%												
1	Water Supply		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage		100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM		100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For SWM Disposal Site		100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others-		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%

		JNNURM															
	9	Others- Non-JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
		Sustainable Investment (Current Prices)		Total	Rs. Lakhs												
	1	Water Supply		4,117	549	1,164	740	523	554	588	588	441	294	294	294	294	294
	2	Sewerage		26,412	3,321	3,873	4,105	4,747	5,032	5,334	5,334	5,334	889	889	889	444	444
	3	Roads		75,538	25,489	27,019	13,365	3,036	3,218	3,411	2,274	2,274	3,411	3,411	3,411	2,274	2,274
		LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains		20,824	2,837	3,007	6,375	2,703	2,865	3,037	3,037	3,037	1,898	1,898	1,898	1,139	759
	5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM		4,643	1,567	1,661	822	187	198	210	140	140	210	210	210	140	140
		LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	Others-JNNURM		37,784	7,429	11,812	16,694	885	469	497	497	497	497	497	497	497	-
	9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total		169,319	41,192	48,535	42,100	12,080	12,336	13,076	11,869	11,722	7,199	7,199	7,199	4,788	3,911
C	Additional O&M			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		Sustainable Investment (Current Prices)			Rs. Lakhs												
	1	Water Supply		206		27	58	37	26	28	29	29	22	15	15	15	15
	2	Sewerage		1,321		166	194	205	237	252	267	267	267	44	44	44	22
	3	Roads		2,266		765	811	401	91	97	102	68	68	102	102	102	68
		LA For Roads		-		-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains		416		57	60	127	54	57	61	61	61	38	38	38	23
	5	Street Lights		-		-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM		557		188	199	99	22	24	25	17	17	25	25	25	17
		LA For SWM Disposal Site		-		-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor		-		-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation		-		-	-	-	-	-	-	-	-	-	-	-	-
	8	Others-JNNURM		1,134		223	354	501	27	14	15	15	15	15	15	15	15
	9	Others- Non-JNNURM		-		-	-	-	-	-	-	-	-	-	-	-	-
		Total		5,900		1,426	1,676	1,370	458	471	499	457	449	240	240	240	160



D Funding Pattern																	
Capital Grants' Framework		JNNURM															
Capital Funding		Total															
			2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21		
1	Sustainable Investment (Current)	169,319	41,192	48,535	42,100	12,080	12,336	13,076	11,869	11,722	7,199	7,199	7,199	4,788	3,911		
2	Funding under JNNURM framework	169,319	41,192	48,535	42,100	12,080	12,336	13,076	11,869	11,722	7,199	7,199	7,199	4,788	3,911		
3	Available Capital Grants under JNNURM	GoI	0														
		GoM	0														
4	Creation of Revolving fund under JNNURM	0															
Grant Funding		Grant															
		Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21		
1	Water Supply	50%	2,059	274	582	370	261	277	294	294	220	147	147	147	147		
2	Sewerage	50%	13,206	1,661	1,936	2,053	2,374	2,516	2,667	2,667	2,667	444	444	444	222	222	
3	Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	10,412	1,418	1,503	3,187	1,351	1,433	1,519	1,519	1,519	949	949	949	569	380	
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	2,322	783	830	411	93	99	105	70	70	105	105	105	70	70	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	18,892	3,714	5,906	8,347	442	234	249	249	249	249	249	249	249		
9	Others- Non- JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		46,890	7,851	10,758	14,368	4,522	4,559	4,833	4,798	4,724	1,894	1,894	1,894	1,257	819	
Availability of Own Resources against Resource Gap																	
1	Resource Gap after accounting for Grants		33,341	37,777	27,733	7,558	7,777	8,244	7,072	6,998	5,305	5,305	5,305	3,531	3,093		
2	Available Own		16,963	20,420	24,392	18,851	19,947	23,761	26,858	24,053	18,999	19,487	21,123	24,105	43,446		

		resources																
	3	Contribution from available own sources			0	0	0	0	0	0	0	0	-	-	-	-	-	-
	4	Contribution from Own sources			6,785	6,126	9,757	5,655	5,984	7,128	10,743	-	-	-	-	-	-	-
		Own sources' Funding			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
	1	Water Supply		1,243	90	147	172	245	269	320	532	-	-	-	-	-	-	-
	2	Sewerage		9,558	547	489	951	2,222	2,441	2,908	4,828	-	-	-	-	-	-	-
	3	Roads		15,548	4,199	3,410	3,097	1,421	1,561	1,859	2,058	-	-	-	-	-	-	-
		LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains		6,635	467	380	1,477	1,265	1,390	1,656	2,749	-	-	-	-	-	-	-
	5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM		956	258	210	190	87	96	114	127	-	-	-	-	-	-	-
		LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	Others- JNNURM		7,496	1,224	1,491	3,869	414	227	271	450	-	-	-	-	-	-	-
	9	Others- Non- JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total		41,436	6,785	6,126	9,757	5,655	5,984	7,128	10,743	-	-	-	-	-	-	-
		Debt Funding			Total	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
		<i>Resource Gap for Debt Funding</i>			26,555	31,651	17,976	1,903	1,793	1,115	-	6,998	5,305	5,305	5,305	3,531	3,093	
	1	Water Supply		1,642	354	759	316	82	81	50	-	263	217	217	217	217	217	232
	2	Sewerage		8,354	2,141	2,526	1,753	748	731	455	-	3,184	655	655	655	328	351	
	3	Roads		40,996	16,432	17,620	5,707	478	468	291	-	1,358	2,514	2,514	2,514	1,677	1,798	
		LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	Drains		7,613	1,829	1,961	2,722	426	416	259	-	1,813	1,399	1,399	1,399	840	600	
	5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	SWM		2,520	1,010	1,083	351	29	29	18	-	83	155	155	155	103	111	
		LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	Others- JNNURM		19,869	4,789	7,703	7,128	139	68	42	-	297	366	366	366	367	-	-

	9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Total	80,993	26,555	31,651	17,976	1,903	1,793	1,115	-	6,998	5,305	5,305	5,305	3,531	3,093	
		Total Investment	169,319	41,192	48,535	42,100	12,080	12,336	13,076	15,541	11,722	7,199	7,199	7,199	4,788	3,911	

Sustainability

Thane Municipal Corporation					
	Option	2.00			
	A Output				
	1 Investment Need (Constant Prices)	Rs. Cr	2155.23		
	2 % Sustainable	%	82.00%	% of Investment Need	
	3 Sustainable Investment (SI)				
	Constant Prices	Rs. Cr	1767.29		
	Current Prices	Rs. Cr	1693.19		
	4 Investment proposed under JNNURM	Rs. Cr	1693.19	100% of SI	
	5 Overall Funding Pattern (Current Prices)				
	JNNURM Grants - Gol	Rs. Cr	234.45	14% of SI	
	JNNURM Grants - GoM	Rs. Cr	234.45	14% of SI	
	Debt Funding	Rs. Cr	809.93	48% of SI	
	ULB Share	Rs. Cr	414.36	24% of SI	

P2	218,168
P3	215,523
Difference	2,645

B Funding Pattern Assumptions																
	1 Funding Program	JNNURM														
	2 Contribution to Revolving Fund	25%														
		2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21		
	3 Utilisation of Own resources	40%	30%	40%	30%	30%	30%	40%	30%	30%	30%	30%	30%	30%		
C Sustainability Check		2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Counter	
	1 Surplus-CB	8,621	10,509	8,159	5,831	7,326	8,053	4,180	311	-348	19	1,580	19,317	39,535	1	

Financial Operating Plan

Thane Municipal Corporation																
	Proposed Growth		Income	Expense												

		Minimum	0	0																
		Maximum	0	0																
<i>All Figures in Rs. Lakhs</i>																				
Head of Account		Current	Proposed Growth	Unit	2005-06	2006-07	2007-08	2008-9	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Opening Balance					1,062	132	1,247	347	8,621	10,509	8,159	5,831	7,326	8,053	4,180	311	(348)	19	1,580	19,317
I Revenue Receipts																				
A Octroi																				
Sub Total A		12	8 %		25,200	27,216	29,393	31,745	34,284	37,027	39,989	43,188	46,643	50,375	54,405	58,757	63,458	68,535	74,017	79,939
B Taxes																				
1	Property Tax/ General Tax				3,777	9,345	10,036	9,956	10,043	10,200	10,386	12,394	12,830	13,162	13,456	13,737	14,017	14,299	14,586	14,878
2	Water and sewerage Taxes	14	11 %		2,383	2,645	2,936	3,259	3,618	4,015	4,457	4,947	5,492	6,096	6,766	7,511	8,337	9,254	10,272	11,402
3	Other Taxes	16	10 %		1,723	1,895	2,085	2,293	2,522	2,775	3,052	3,357	3,693	4,062	4,469	4,915	5,407	5,948	6,542	7,197
Sub Total B					7,883	13,886	15,057	15,509	16,183	16,990	17,895	20,699	22,015	23,321	24,691	26,163	27,760	29,500	31,400	33,476
C Non Taxes																				
1	Betterment/ Development Charges	39	15 %		3,123	3,591	4,130	4,750	5,462	6,281	7,223	8,307	9,553	10,986	12,634	14,529	16,708	19,215	22,097	25,411
2	Income from properties/ building permission/ regularisation etc	25	10 %		2,807	3,088	3,396	3,736	4,110	4,521	4,973	5,470	6,017	6,619	7,281	8,009	8,810	9,690	10,660	11,725
3	Water Charges				5,000	5,036	4,814	4,900	5,070	5,942	6,268	6,540	7,682	8,107	8,460	8,806	9,160	9,527	9,908	10,305
4	Water Connection Fee				-	100	130	135	141	168	175	182	217	226	235	245	254	265	275	286
5	Sewer Charges				-	-	340	930	1,785	2,453	2,872	3,279	4,185	4,757	5,321	5,912	6,538	7,204	7,913	8,667
6	Sewerage Connection Fee				-	-	287	460	651	250	268	286	351	375	400	426	454	484	515	547
7	Others	81	15 %		979	1,125	1,294	1,488	1,711	1,968	2,263	2,603	2,993	3,442	3,959	4,552	5,235	6,021	6,924	7,962
Sub Total C					11,908	12,940	14,392	16,399	18,929	21,583	24,042	26,667	31,000	34,512	38,290	42,479	47,160	52,405	58,291	64,905
D Assigned Revenues/ Grants																				
1	Assigned revenues	NA	5 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	State Government grants	99	12 %		714	800	896	1,003	1,123	1,258	1,409	1,578	1,768	1,980	2,218	2,484	2,782	3,116	3,489	3,908
3	Gol grants	NA	5 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	NSDP grants	NA	5 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	SJSRY grants	NA	5 %		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

	6	Other grants/ contributions	NA	5	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Sub Total D					714	800	896	1,003	1,123	1,258	1,409	1,578	1,768	1,980	2,218	2,484	2,782	3,116	3,489	3,908	
	Grand Total Revenue Receipts					45,705	54,841	59,737	64,655	70,521	76,858	83,336	92,133	101,426	110,187	119,603	129,883	141,160	153,556	167,198	182,227	
Revenue Expenditure																						
II Establishment																						
A																						
	1	Pay and Allowance to Municipal Staff	23	10	%	16,766	18,443	20,287	22,316	24,548	27,002	29,703	32,673	35,940	39,534	43,488	47,836	52,620	57,882	63,670	70,037	
	2	Pension Benefits	NA	8	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Sub Total A					16,766	18,443	20,287	22,316	24,548	27,002	29,703	32,673	35,940	39,534	43,488	47,836	52,620	57,882	63,670	70,037	
B Operation & Maintenance																						
	1	Administration & Recovery of taxes	14	10	%	1,226	1,349	1,483	1,632	1,795	1,974	2,172	2,389	2,628	2,891	3,180	3,498	3,848	4,232	4,656	5,121	
	2	Water Supply	21	10	%	8,664	9,531	10,484	11,532	12,685	13,954	15,349	16,884	18,573	20,430	22,473	24,720	27,192	29,911	32,902	36,193	
	3	Sewerage & drainage	34	10	%	228	251	276	304	334	367	404	444	489	538	592	651	716	787	866	953	
	4	Public health/ safety	14	10	%	957	1,053	1,158	1,274	1,401	1,541	1,695	1,865	2,051	2,256	2,482	2,730	3,003	3,303	3,634	3,997	
	5	Construction works/ PWD	13	10	%	1,113	1,224	1,347	1,482	1,630	1,793	1,972	2,169	2,386	2,625	2,887	3,176	3,493	3,843	4,227	4,650	
	6	Street lighting	(1)	8	%	898	970	1,047	1,131	1,222	1,319	1,425	1,539	1,662	1,795	1,939	2,094	2,261	2,442	2,637	2,848	
	7	Sanitation/ Conservancy	34	10	%	1,382	1,520	1,672	1,839	2,023	2,226	2,448	2,693	2,962	3,258	3,584	3,943	4,337	4,771	5,248	5,773	
	8	Others	35	10	%	3,620	3,982	4,381	4,819	5,301	5,831	6,414	7,055	7,761	8,537	9,390	10,329	11,362	12,498	13,748	15,123	
	9	Phasing of Non debt Liabilities						-	-	-	-											
	##	Additional O&M for new CAPEX		6	%			-	-	-	1,426	1,676	1,370	458	471	499	529	561	595	630	668	708
		Bulk Water Purchase						2,290	2,341	2,395	9,320	9,533	9,757	9,992	10,239	12,788	13,111	13,451	13,807	14,182		
	##	Contribution to Revolving Fund						-	4,652	3,592	1,131	1,140	1,208	-	-	-	-	-	-	-	-	
	Sub Total B					18,088	19,879	21,848	26,301	34,809	36,668	43,699	46,169	49,947	52,820	57,294	64,489	69,918	75,869	82,394	89,547	
C Debt Servicing																						
	1	Loan Repayment- Old Loans				360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	
	2	Loan Repayment- New Loans								2,257	4,948	6,476	6,637	8,580	10,808	12,020	12,148	12,269	12,344			
	3	Loan Repayment - MMRDA Rel.						1,557	1,557	1,528	1,528	890										

	Sub Total C				360	360	1,917	1,917	4,145	6,836	7,725	6,997	8,940	11,168	12,380	12,508	12,629	12,704	360	360
	Grand Total Revenue Expenditure				35,215	38,682	44,052	50,534	63,502	70,506	81,127	85,839	94,827	103,523	113,162	124,833	135,167	146,455	146,424	159,945
	Revenue Account Status-Surplus/Deficit				10,491	16,159	15,685	14,121	7,018	6,352	2,208	6,294	6,599	6,665	6,441	5,050	5,993	7,100	20,774	22,283
I Capital Receipts																				
	1	Loans- Existing			1,650															
	2	Regular Grants		6 %	1,450	928	984	1,043	1,106	1,172	1,243	1,317	1,396	1,480	1,569	1,663	1,763	1,868	1,980	2,099
	3	New Loans		Refer Annex	-	-	26,555	31,651	17,976	1,903	1,793	1,115	-	-	-	-	-	-	-	-
	4	New Grants		Refer Annex	-	-	7,851	10,758	14,368	4,522	4,559	4,833	-	-	-	-	-	-	-	-
		Grand Total Capital Receipts			3,100	928	984	35,450	43,514	33,516	7,667	7,669	7,344	1,480	1,569	1,663	1,763	1,868	1,980	2,099
Capital Expenditure																				
II																				
	1	Regular Municipal Capital Works		10 % of Regular Grants	14,521	15,973	17,570	104	111	117	124	132	140	148	157	173	190	209	230	253
	2	CIP related CAPEX						41,192	48,535	42,100	12,080	12,336	13,076	11,869	11,722	7,199	7,199	7,199	4,788	3,911
		Grand Total Capital Expenditure			14,521	15,973	17,570	41,296	48,645	42,218	12,204	12,468	13,216	12,017	11,879	7,371	7,389	7,407	5,018	4,164
		Capital Account Status-Surplus/Deficit			(11,421)	(15,044)	(16,586)	(5,846)	(5,131)	(8,702)	(4,537)	(4,799)	(5,872)	(10,537)	(10,311)	(5,708)	(5,626)	(5,539)	(3,037)	(2,065)
		Overall Municipal Account Status			(930)	1,115	(901)	8,274	1,888	(2,349)	(2,329)	1,495	727	(3,873)	(3,869)	(659)	367	1,561	17,736	20,218
		Closing Balance			132	1,247	347	8,621	10,509	8,159	5,831	7,326	8,053	4,180	311	(348)	19	1,580	19,317	39,535
Financial Indicators																				
	1	Operating Ratio			0.8	0.7	0.7	0.8	0.9	0.9	1.0	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.9
	2	Capital Utilisation Ratio			4.7	17.2	17.9	1.2	1.1	1.3	1.6	1.6	1.8	8.1	7.6	4.4	4.2	4.0	2.5	2.0
	3	Share of Estab.Cost including Terminal Benefits			0	0	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	4	Share of Revenue Spent on Establishment			0	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	5	Debt Servicing Cost as % of Revenue Income			0	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	6	Annual Status of Accounts																		
		General Account			10,491	16,159	15,685	14,121	7,018	6,352	2,208	6,294	6,599	6,665	6,441	5,050	5,993	7,100	20,774	22,283
		Capital Deficit			(11,421)	(15,044)	(16,586)	(5,846)	(5,131)	(8,702)	(4,537)	(4,799)	(5,872)	(10,537)	(10,311)	(5,708)	(5,626)	(5,539)	(3,037)	(2,065)
	7	Overall Municipal Account Status			(930)	1,115	(901)	8,274	1,888	(2,349)	(2,329)	1,495	727	(3,873)	(3,869)	(659)	367	1,561	17,736	20,218

	8	Closing Balance				132	1,247	347	8,621	10,509	8,159	5,831	7,326	8,053	4,180	311	(348)	19	1,580	19,317	39,535
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Appendix V.13 AMBERNATH

II. CAPEX

A	CIP - Sector wise (Rs. Lakhs)					
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	1,799.82	269.97	4%	5%	% of Capital Cost
2	Sewerage	10,511.68	1,576.75	24%	5%	% of Capital Cost
3	Roads	17,885.12	2,682.77	41%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	4,100.00	615.00	9%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	850.00	127.50	2%	12%	% of Capital Cost
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	8,898.07	1,334.71	20%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	44,044.70	6,606.70			

B	Investment Phasing	Total	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
			Percentage												
		%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	Sustainable Investment (Current Prices)	Total	Rs. Lakhs												
1	Water Supply	223	30	63	40	28	30	32	32	24	16	16	16	16	16
2	Sewerage	1,379	173	202	214	248	263	279	279	279	46	46	46	23	23
3	Roads	2,624	885	938	464	105	112	118	79	79	118	118	118	79	79
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	497	68	72	152	64	68	72	72	72	45	45	45	27	18
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-

6	SWM		84	11	15	16	13	14	15	15	11	15	15	15	15	4
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		1,494	294	467	660	35	19	20	20	20	20	20	20	20	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		6,300	1,461	1,757	1,546	494	506	536	496	485	261	261	261	180	140
C	Additional O&M		Total	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
	Sustainable Investment (Current Prices)			Rs. Lakhs												
1	Water Supply		11	1	3	2	1	1	2	2	1	1	1	1	1	1
2	Sewerage		69	9	10	11	12	13	14	14	14	14	2	2	2	1
3	Roads		79	27	28	14	3	3	4	2	2	4	4	4	4	2
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		10	1	1	3	1	1	1	1	1	1	1	1	1	1
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		10	1	2	2	2	2	2	2	2	1	2	2	2	2
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		45	9	14	20	1	1	1	1	1	1	1	1	1	1
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		224	-	48	59	51	21	22	23	22	21	10	10	10	7
D	Funding Pattern															
	Capital Grants' Framework	JNNURM														
	Capital Funding		Total	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
1	Sustainable Investment (Current)		6,300	1,461	1,757	1,546	494	506	536	496	485	261	261	261	180	140
2	Funding under JNNURM framework		6,300	1,461	1,757	1,546	494	506	536	496	485	261	261	261	180	140
3	Available Capital Grants under JNNURM	Gol	0	of Eligible Investment												
		GoM	0	of Eligible Investment												
4	Creation of Revolving fund under JNNURM		0	of Grants												
	Grant Funding	Grant	Total	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
1	Water Supply	50%	111	15	31	20	14	15	16	16	12	8	8	8	8	8
2	Sewerage	50%	690	87	101	107	124	131	139	139	139	23	23	23	12	12
3	Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	248	34	36	76	32	34	36	36	36	23	23	23	14	9

5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	747	147	233	330	17	9	10	10	10	10	10	10	10	10	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		1,796	282	402	533	188	190	201	201	197	64	64	64	43	29	
Availability of Own Resources against Resource Gap																	
1	Resource Gap after accounting for Grants			1,179	1,355	1,013	307	316	335	295	287	197	197	197	137	111	
2	Available Own resources			1,926	4,472	7,059	4,973	3,522	2,374	1,468	895	83	(372)	(388)	123	1,254	
3	Contribution from available own sources			0	0	0	0	0	0	0	-	-	-	-	-	-	
4	Contribution from Own sources			193	447	706	497	352	237	147	-	-	-	-	-	-	
Own sources' Funding			Total	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	
1	Water Supply		102	4	16	18	28	21	14	9	-	-	-	-	-	-	
2	Sewerage		728	23	51	98	249	183	123	82	-	-	-	-	-	-	
3	Roads		804	117	239	212	106	78	52	23	-	-	-	-	-	-	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		241	9	18	69	65	48	32	21	-	-	-	-	-	-	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		42	1	4	7	13	10	7	4	-	-	-	-	-	-	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM		516	39	119	301	35	13	9	6	-	-	-	-	-	-	
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		2,433	193	447	706	497	352	237	147	-	-	-	-	-	-	
Debt Funding			Total	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	
Resource Gap for Debt Funding				986	908	307	-	-	97	148	287	197	197	197	137	111	
1	Water Supply		66	20	33	8	-	-	6	10	14	12	12	12	12	13	
2	Sewerage		315	117	105	43	-	-	51	83	165	35	35	35	18	18	
3	Roads		1,196	598	485	92	-	-	22	24	47	90	90	90	60	63	
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		126	46	37	30	-	-	13	22	43	34	34	34	21	14	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		21	8	8	3	-	-	3	4	7	11	11	11	11	3	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	

7	Slums/ Urban poor																	
	LA For Slum Rehabilitation																	
8	Others- JNNURM	574	198	241	131	-	-	4	6	12	15	15	15	15	15	-	-	-
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2,299	986	908	307	-	-	97	148	287	197	197	197	197	137	111		
	Total Investment	6,527	1,461	1,757	1,546	685	542	536	496	485	261	261	261	180	140			

Sustainability

Ambarnath Municipal Council														
	Option		2.00							P2	41,356.53			
A	Output									P3	44,044.70			
1	Investment Need (Constant Prices)	Rs. Cr	440.45							Difference	(2,688.17)			
2	% Sustainable	%	15.00%	% of Investment Need										
3	Sustainable Investment (SI)													
	Constant Prices	Rs. Cr	66.07											
	Current Prices	Rs. Cr	63.00											
4	Investment proposed under JNNURM	Rs. Cr	63.00	100% of SI										
5	Overall Funding Pattern (Current Prices)													
	JNNURM Grants - GoI	Rs. Cr	15.96	25% of SI										
	JNNURM Grants - GoM	Rs. Cr	2.00	3% of SI										
	Debt Funding	Rs. Cr	22.99	36% of SI										
	ULB Share	Rs. Cr	24.33	39% of SI										
B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
C	Sustainability Check	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
1	Surplus-CB	3,995	6,481	6,170	4,457	2,996	1,860	976	529	-284	-730	-738	-228	904

Financial Operating Plan

Amarnath Municipal Council				All Figures in Rs. Lakhs																
Proposed Growth	Minimum Maximum	Income		Expense																
		5%	8%	8%	10%															
		15%	10%																	
Head of Account	Current	Proposed Growth	Unit	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	
Opening Balance				299.7	621.5	931.0	1470.7	3994.9	6480.6	6170.0	4456.6	2996.4	1860.0	975.6	529.1	-283.6	-729.8	-737.9	-227.7	
I Revenue Receipts																				
A Octroi																				
Sub Total A	4.17	8.00	%	1,525	1,647	1,779	1,921	2,074	2,240	2,420	2,613	2,822	3,048	3,292	3,555	3,840	4,147	4,479	4,837	
B Taxes																				
1	Property Tax/ General Tax			325	297	480	507	523	537	548	656	679	697	712	727	742	757	772	788	
2	Water and sewerage Taxes	61.36	15.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Other Taxes	6.75	8.00	%	20	21	23	25	27	29	31	34	36	39	43	46	50	54	58	
Sub Total B				345	318	503	531	550	566	580	689	715	736	755	773	792	811	830	850	
C Non Taxes																				
1	Betterment/ Development Charges	4.82	8.00	%	89	97	104	113	122	131	142	153	165	179	193	208	225	243	262	
2	Income from properties/ building permission/ regularisation etc	21.27	20.00	%	42	51	61	73	88	105	126	151	181	218	261	314	376	452	542	
3	Water Charges				128	123	134	141	147	218	235	247	368	397	417	434	452	470	489	
4	Water Connection Fee				-	6	10	10	11	17	18	18	29	30	31	32	33	35	36	
5	Sewer Charges				-	-	10	27	52	71	84	95	122	138	155	172	190	210	230	
6	Sewerage Connection Fee				-	-	22	35	50	19	21	22	27	29	31	33	35	37	40	
7	Others	-5.57	5.00	%	97	102	107	112	118	123	130	136	143	150	158	165	174	182	192	
Sub Total C				357	378	448	511	586	685	755	823	1,035	1,141	1,245	1,359	1,486	1,629	1,791	1,975	
D Assigned Revenues/ Grants																				
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	State Government grants	56.77	15.00	%	980	1,128	1,297	1,491	1,715	1,972	2,268	2,608	2,999	3,449	3,967	4,561	5,246	6,033	6,937	
3	Gol grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Total D				980	1,128	1,297	1,491	1,715	1,972	2,268	2,608	2,999	3,449	3,967	4,561	5,246	6,033	6,937	7,978	
Grand Total Revenue Receipts				3,207	3,471	4,026	4,454	4,926	5,463	6,022	6,734	7,572	8,374	9,258	10,249	11,363	12,619	14,037	15,640	
II Revenue Expenditure																				
A Establishment																				
1	Pay and Allowance to Municipal Staff	13.34	10.00	%	1,289	1,417	1,559	1,715	1,887	2,075	2,283	2,511	2,762	3,038	3,342	3,676	4,044	4,449	4,893	5,383



	2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Sub Total A			%	1,289	1,417	1,559	1,715	1,887	2,075	2,283	2,511	2,762	3,038	3,342	3,676	4,044	4,449	4,893	5,383
		B Operation & Maintenance																			
	1	Administration & Recovery of taxes	-33.32	8.00	%	20	22	23	25	27	29	32	34	37	40	43	47	50	54	59	63
	2	Water Supply	4.46	8.00	%	353	382	412	445	481	519	561	606	654	706	763	824	890	961	1,038	1,121
	3	Sewerage & drainage	30.06	10.00	%	49	54	59	65	71	78	86	95	104	115	126	139	153	168	185	203
	4	Public health/ safety	34.99	10.00	%	53	58	64	70	77	85	93	102	113	124	136	150	165	181	200	220
	5	Construction works/ PWD	-4.98	8.00	%	258	278	301	325	351	379	409	442	477	515	557	601	649	701	757	818
	6	Street lighting	18.01	10.00	%	140	153	169	186	204	225	247	272	299	329	362	398	438	482	530	583
	7	Sanitation/ Conservancy	30.06	10.00	%	85	93	103	113	124	137	151	166	182	200	220	242	267	293	323	355
	8	Others	10.65	10.00	%	284	313	344	378	416	458	503	554	609	670	737	811	892	981	1,079	1,187
	9	Phasing of Non debt Liabilities						-	-	-	-	-									
	10	Additional O&M for new CAPEX		6.00	%		-	-	-	48	59	51	21	22	23	24	26	27	29	31	32
		Bulk Purchase of Water		5.00					677	692	708	2,756	2,819	2,885	2,955	3,028	3,781	3,877	3,977	4,082	4,193
	11	Contribution to Revolving Fund							-	71	133	47	47	50	50						
		Sub Total B				1,241	1,353	1,474	-	-	2,809	4,936	5,157	5,433	5,728	5,996	7,018	7,407	7,828	8,283	8,775
		C Debt Servicing																			
	1	Loan Repayment- Old Loans		Refer Annex		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	Loan Repayment- New Loans		Refer Annex					-	84	161	187	187	254	323	344	344	344	350	350	350
	3	Loan Repayment- MMRDA						23	23	23	23	23	23	23	23	23	23	14	-	-	-
		Sub Total C				-	-	23	23	106	184	210	210	276	346	366	366	357	350	350	350
		Grand Total Revenue Expenditure				2,530	2,770	3,056	1,738	1,993	5,068	7,429	7,878	8,471	9,112	9,705	11,061	11,809	12,627	13,527	14,508
		Revenue Account Status- Surplus/Deficit				677	701	970	2,717	2,933	395	(1,407)	(1,144)	(899)	(738)	(447)	(813)	(446)	(8)	510	1,132
		I Capital Receipts																			
	1	Loans- Existing				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	Regular Grants		6.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	New Loans		Refer Annex				986	908	307	-	-	97	148	287	197	197	197	137	111	
	4	New Grants		Refer Annex				282	402	533	188	190	201	201	197	64	64	64	43	29	
		Grand Total Capital Receipts				-	-	-	1,268	1,310	840	188	190	299	350	485	261	261	261	180	140
		II Capital Expenditure																			
	1	Regular Municipal Capital Works		10.00	% of Regular Grants	356	391	430	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	CIP related CAPEX						1,461	1,757	1,546	494	506	536	496	485	261	261	261	180	140	
		Grand Total Capital Expenditure				356	391	430	1,461	1,757	1,546	494	506	536	496	485	261	261	261	180	140
		Capital Account Status- Surplus/Deficit				(356)	(391)	(430)	(193)	(447)	(706)	(307)	(316)	(237)	(147)	-	-	-	-	-	-
		Overall Municipal Account				322	309	540	2,524	2,486	(311)	(1,713)	(1,460)	(1,136)	(884)	(447)	(813)	(446)	(8)	510	1,132

	Status																			
	Closing Balance				622	931	1,471	3,995	6,481	6,170	4,457	2,996	1,860	976	529	(284)	(730)	(738)	(228)	904
	Financial Indicators																			
	1	Operating Ratio			0.8	0.8	0.8	0.4	0.4	0.9	1.2	1.2	1.1	1.1	1.0	1.1	1.0	1.0	1.0	0.9
	2	Capital Utilisation Ratio			NA	NA	NA	1.2	1.3	1.8	2.6	2.7	1.8	1.4	1.0	1.0	1.0	1.0	1.0	1.0
	3	Share of Estab.Cost including Terminal Benefits			1	0.5	0.5	0.5	1.0	0.9	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
	4	Share of Revenue Spent on Establishment			0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3
	5	Debt Servicing Cost as % of Revenue Income			-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6	Annual Status of Accounts																		
		General Account			677	701	970	2,717	2,933	395	(1,407)	(1,144)	(899)	(738)	(447)	(813)	(446)	(8)	510	1,132
		Capital Deficit			(356)	(391)	(430)	(193)	(447)	(706)	(307)	(316)	(237)	(147)	-	-	-	-	-	-
	7	Overall Municipal Account Status			322	309	540	2,524	2,486	(311)	(1,713)	(1,460)	(1,136)	(884)	(447)	(813)	(446)	(8)	510	1,132
	8	Closing Balance			622	931	1,471	3,995	6,481	6,170	4,457	2,996	1,860	976	529	(284)	(730)	(738)	(228)	904

Appendix V.14 NALLASOPARA

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	2,167.36	21.67	7%	5%	% of Capital Cost
2	Sewerage	10,965.01	109.65	35%	5%	% of Capital Cost
3	Roads	6,579.01	65.79	21%	3%	% of Capital Cost
	LA For Roads	-	-	0%	0%	% of Capital Cost
4	Drains	1,813.20	18.13	6%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	780.00	7.80	3%	12%	% of Capital Cost
	LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation	-	-	0%	0%	% of Capital Cost
8	Others- JNNURM	8,772.01	87.72	28%	3%	% of Capital Cost
9	Others- Non-JNNURM	-	-	0%	2%	% of Capital Cost
	Total	31,076.59	310.77			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B Investment Phasing		Total	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
	Percentage	%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	Sustainable Investment (Current Prices)	Total	Rs. Lakhs												
1	Water Supply	17.9	2.4	5.1	3.2	2.3	2.4	2.6	2.6	1.9	1.3	1.3	1.3	1.3	1.3

2	Sewerage		95.9	12.1	14.1	14.9	17.2	18.3	19.4	19.4	19.4	3.2	3.2	3.2	1.6	1.6
3	Roads		64.3	21.7	23.0	11.4	2.6	2.7	2.9	1.9	1.9	2.9	2.9	2.9	1.9	1.9
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		14.6	2.0	2.1	4.5	1.9	2.0	2.1	2.1	2.1	1.3	1.3	1.3	0.8	0.5
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		5.2	0.7	0.9	1.0	0.8	0.9	0.9	0.9	0.7	0.9	0.9	0.9	0.9	0.2
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		98.2	19.3	30.7	43.4	2.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		296.1	58.1	75.8	78.3	27.1	27.5	29.2	28.2	27.3	11.0	11.0	11.0	7.8	5.6
C	Additional O&M		Total	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
	Sustainable Investment (Current Prices)			Rs. Lakhs												
1	Water Supply		0.9		0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	Sewerage		4.8		0.6	0.7	0.7	0.9	0.9	1.0	1.0	1.0	0.2	0.2	0.2	0.1
3	Roads		1.9		0.7	0.7	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LA For Roads		-		-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		0.3		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Street Lights		-		-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		0.6		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LA For SWM Disposal Site		-		-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-		-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-		-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		2.9		0.6	0.9	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Others- Non-JNNURM		-		-	-	-	-	-	-	-	-	-	-	-	-
	Total		11.5		2.1	2.7	2.8	1.3	1.3	1.4	1.3	1.3	0.5	0.5	0.5	0.4
D	Funding Pattern															
	Capital Grants' Framework	JNNURM														
	Capital Funding		Total	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
1	Sustainable Investment (Current)		296.1	58.1	75.8	78.3	27.1	27.5	29.2	28.2	27.3	11.0	11.0	11.0	7.8	5.6
2	Funding under JNNURM framework		296.1	58.1	75.8	78.3	27.1	27.5	29.2	28.2	27.3	11.0	11.0	11.0	7.8	5.6
3	Available Capital Grants under JNNURM	GoI	40%	of Eligible Investment												

		GoM	10%	of Eligible Investment												
4	Creation of Revolving fund under JNNURM	25%		of Grants												
	Grant Funding	Grant	Total	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
1	Water Supply	50%	8.9	1.2	2.5	1.6	1.1	1.2	1.3	1.3	1.0	0.6	0.6	0.6	0.6	0.6
2	Sewerage	50%	48.0	6.0	7.0	7.5	8.6	9.1	9.7	9.7	9.7	1.6	1.6	1.6	0.8	0.8
3	Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	7.3	1.0	1.1	2.2	1.0	1.0	1.1	1.1	1.1	0.7	0.7	0.7	0.4	0.3
5	Street Lights	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	2.6	0.3	0.5	0.5	0.4	0.4	0.5	0.5	0.3	0.5	0.5	0.5	0.5	0.1
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	49.1	9.6	15.3	21.7	1.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		115.9	18.2	26.4	33.5	12.3	12.4	13.1	13.1	12.7	4.0	4.0	4.0	3.0	1.8
	Availability of Own Resources against Resource Gap															
1	Resource Gap after accounting for Grants			39.9	49.4	44.9	14.8	15.1	16.0	15.1	14.6	6.9	6.9	6.9	4.9	3.8
2	Available Own resources			495	308	129	-2,462	-4,859	-7,209	-9,554	-11,893	-14,936	-17,963	-20,928	-23,832	-26,642
3	Contribution from available own sources			60%	40%	50%	50%	30%	10%	5%	0%	0%	0%	0%	0%	0%
4	Contribution from Own sources			296.8	123.2	64.3	-	-	-	-	-	-	-	-	-	-
	Own sources' Funding		Total	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
1	Water Supply		23.0	12.2	8.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Sewerage		96.7	61.6	22.8	12.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Roads		157.6	110.9	37.4	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains		17.3	10.2	3.4	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Street Lights		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM		5.8	3.5	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For SWM Disposal Site		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	184.0	98.5	49.8	35.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	484.3	296.8	123.2	64.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Debt Funding	Total	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	
	Resource Gap for Debt Funding		0.0	0.0	0.0	14.8	15.1	16.0	15.1	14.6	6.9	6.9	6.9	4.9	3.8	
1	Water Supply	4.0	0.0	0.0	0.0	1.2	1.3	1.4	1.4	1.0	0.8	0.8	0.8	0.8	0.9	
2	Sewerage	30.1	0.0	0.0	0.0	9.4	10.0	10.6	10.3	10.4	2.0	2.0	2.0	1.0	1.1	
3	Roads	4.5	0.0	0.0	0.0	1.4	1.5	1.6	1.0	1.0	1.8	1.8	1.8	1.2	1.3	
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Drains	3.3	0.0	0.0	0.0	1.0	1.1	1.2	1.1	1.1	0.8	0.8	0.8	0.5	0.4	
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	SWM	1.4	0.0	0.0	0.0	0.4	0.5	0.5	0.5	0.4	0.6	0.6	0.6	0.6	0.2	
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Others- JNNURM	2.6	0.0	0.0	0.0	1.3	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.0	
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total	46.0	0.0	0.0	0.0	14.8	15.1	16.0	15.1	14.6	6.9	6.9	6.9	4.9	3.8	
	Total Investment	646.2	315.1	149.6	97.7	27.1	27.5	29.2	28.2	27.3	11.0	11.0	11.0	7.8	5.6	

Sustainability

Nallosopara Municipal Council														
A	Output													
1	Investment Need (Constant Prices)	Rs. Cr	310.77											
2	% Sustainable	%	1.00%	% of Investment Need										
3	Sustainable Investment (SI)													
	Constant Prices	Rs. Cr	3.11											
	Current Prices	Rs. Cr	2.96											
4	Investment proposed under JNNURM	Rs. Cr	2.96	100% of SI										
5	Overall Funding Pattern (Current Prices)													
	JNNURM Grants - Gol	Rs. Cr	0.93	31% of SI										
	JNNURM Grants - GoM	Rs. Cr	0.23	8% of SI										
	Debt Funding	Rs. Cr	0.46	16% of SI										
	ULB Share	Rs. Cr	4.84	164% of SI										
B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	60%	40%	50%	50%	30%	10%	5%	5%	5%	5%	5%	5%	5%
C	Sustainability Check	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
1	Surplus-CB	240	44	-131	-2,677	-5,075	-7,426	-9,773	-12,112	-15,156	-18,158	-21,122	-24,022	-26,831

Financial Operating Plan

Nallosopara Municipal Council																				
Proposed Growth			Income	Expense																
		Minimum	5%	8%																
		Maximum	15%	10%																
All Figures in Rs. Lakhs																				
Head of Account		Current	Proposed Growth	Unit	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
Opening Balance					823.1	777.8	593.8	464.3	240.4	44.1	-130.7	-2676.8	-5074.8	-7426.3	-9772.6	-12111.5	-15155.6	-18158.0	-21122.4	-24021.8
I Revenue Receipts																				
A Octroi																				
Sub Total A		NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B Taxes																				
1	Property Tax/ General Tax				682	611	921	979	1,014	1,041	1,065	1,262	1,314	1,351	1,382	1,411	1,440	1,469	1,499	1,529
2	Water and sewerage Taxes	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Other Taxes	13.99	5.00	%	26	28	29	30	32	34	35	37	39	41	43	45	47	50	52	55
Sub Total B					708	638	950	1,009	1,046	1,075	1,100	1,299	1,353	1,392	1,425	1,457	1,488	1,519	1,551	1,584
C Non Taxes																				
1	Betterment/ Development Charges	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Income from properties/ building permission/ regularisation etc	-15.15	20.00	%	19	23	27	33	40	47	57	68	82	98	118	142	170	204	245	294
3	Water Charges				116	110	113	118	124	146	156	164	195	208	219	230	241	253	266	279
4	Water Connection Fee				-	9	12	12	13	16	16	17	21	22	23	24	25	27	28	29
5	Sewer Charges				-	-	8	22	44	60	71	82	106	122	137	154	172	191	212	235
6	Sewerage Connection Fee				-	-	21	34	49	20	22	24	29	32	34	37	40	43	46	50
7	Others	40.08	15.00	%	412	473	544	626	720	828	952	1,095	1,259	1,448	1,665	1,915	2,202	2,533	2,913	3,350
Sub Total C					546	616	726	846	989	1,118	1,275	1,451	1,692	1,929	2,197	2,502	2,851	3,251	3,710	4,237
D Assigned Revenues/ Grants																				
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	State Government grants	8.59	8.59	%	572	621	674	732	795	863	937	1,018	1,105	1,200	1,303	1,415	1,536	1,668	1,811	1,967
3	GoI grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total D					572	621	674	732	795	863	937	1,018	1,105	1,200	1,303	1,415	1,536	1,668	1,811	1,967
Grand Total Revenue Receipts					1,826	1,875	2,350	2,587	2,830	3,056	3,312	3,767	4,150	4,521	4,925	5,373	5,875	6,438	7,073	7,787
II Revenue Expenditure																				
A Establishment																				
1	Pay and Allowance to Municipal Staff	20.09	10.00	%	121	133	147	161	177	195	215	236	260	286	314	346	380	419	460	506
2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sub Total A				%	121	133	147	161	177	195	215	236	260	286	314	346	380	419	460	506
B Operation & Maintenance																				



	1	Administration & Recovery of taxes	13.57	10.00	%	118	129	142	156	172	189	208	229	252	277	305	335	369	406	446	491
	2	Water Supply	23.30	10.00	%	237	261	287	316	347	382	420	462	509	559	615	677	745	819	901	991
	3	Sewerage & drainage	112.84	10.00	%	35	38	42	46	51	56	61	67	74	82	90	99	109	119	131	144
	4	Public health/ safety	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	Construction works/ PWD	30.42	10.00	%	94	103	113	125	137	151	166	183	201	221	243	268	294	324	356	392
	6	Street lighting	55.89	10.00	%	75	82	91	100	110	121	133	146	161	177	194	214	235	259	285	313
	7	Sanitation/ Conservancy	112.84	10.00	%	213	234	258	283	312	343	377	415	456	502	552	607	668	735	808	889
	8	Others	79.18	10.00	%	417	458	504	554	610	671	738	812	893	982	1,080	1,188	1,307	1,438	1,582	1,740
	9	Phasing of Non debt Liabilities																			
	10	Additional O&M for new CAPEX		6.00	%	-	-	-	2	3	3	1	1	1	1	2	2	2	2	2	2
		Bulk Purchase of Water		5.00				815	833	853	3,319	3,395	3,475	3,558	3,646	4,461	4,572	4,688	4,810	4,938	
	11	Contribution to Revolving Fund						-	11	8	3	3	3	3	3	1	1	1	1	0	
		Sub Total B				1,187	1,306	1,437	2,396	2,585	2,776	5,428	5,713	6,025	6,363	6,731	7,852	8,301	8,790	9,322	9,901
		C Debt Servicing																			
	1	Loan Repayment- Old Loans			Refer Annex	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	Loan Repayment- New Loans			Refer Annex	-	-	-	-	-	-	1	3	4	4	5	6	7	7	7	7
	3	Loan Repayment- MMRDA						214	214	214	214	214	214	214	214	214	189	187	183	183	
		Sub Total C				-	-	214	214	214	214	214	216	217	218	218	219	195	194	190	190
		Grand Total Revenue Expenditure				1,309	1,440	1,798	2,771	2,977	3,186	5,858	6,165	6,501	6,867	7,264	8,417	8,877	9,403	9,972	10,597
		Revenue Account Status- Surplus/Deficit				518	435	552	(184)	(147)	(130)	(2,546)	(2,398)	(2,351)	(2,346)	(2,339)	(3,044)	(3,002)	(2,964)	(2,899)	(2,810)
		I Capital Receipts																			
	1	Loans- Existing				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	Regular Grants		6.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	New Loans			Refer Annex	-	-	-	-	-	15	15	16	15	15	7	7	7	5	4	4
	4	New Grants			Refer Annex	-	-	18	26	33	12	12	13	13	13	4	4	4	3	2	2
		Grand Total Capital Receipts				-	-	-	18	26	33	27	28	29	28	27	11	11	11	8	6
		II Capital Expenditure																			
	1	Regular Municipal Capital Works		10.00	% of Regular Grants	563	619	681	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	CIP related CAPEX						58	76	78	27	28	29	28	27	11	11	11	8	6	6
		Grand Total Capital Expenditure				563	619	681	58	76	78	27	28	29	28	27	11	11	11	8	6
		Capital Account Status- Surplus/Deficit				(563)	(619)	(681)	(40)	(49)	(45)	-	-	-	-	-	-	-	-	-	-
		Overall Municipal Account Status				(45)	(184)	(129)	(224)	(196)	(175)	(2,546)	(2,398)	(2,351)	(2,346)	(2,339)	(3,044)	(3,002)	(2,964)	(2,899)	(2,810)
		Closing Balance				778	594	464	240	44	(131)	(2,677)	(5,075)	(7,426)	(9,773)	(12,112)	(15,156)	(18,158)	(21,122)	(24,022)	(26,831)
		Financial Indicators																			
	1	Operating Ratio				0.7	0.8	0.8	1.1	1.1	1.0	1.8	1.6	1.6	1.5	1.5	1.6	1.5	1.5	1.4	1.4



	2	Capital Utilisation Ratio				NA	NA	NA	3.2	2.9	2.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
	3	Share of Estab.Cost including Terminal Benefits				0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	4	Share of Revenue Spent on Establishment				0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	5	Debt Servicing Cost as % of Revenue Income				-	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
	6	Annual Status of Accounts																			
		General Account				518	435	552	(184)	(147)	(130)	(2,546)	(2,398)	(2,351)	(2,346)	(2,339)	(3,044)	(3,002)	(2,964)	(2,899)	(2,810)
		Capital Deficit				(563)	(619)	(681)	(40)	(49)	(45)	-	-	-	-	-	-	-	-	-	-
	7	Overall Municipal Account Status				(45)	(184)	(129)	(224)	(196)	(175)	(2,546)	(2,398)	(2,351)	(2,346)	(2,339)	(3,044)	(3,002)	(2,964)	(2,899)	(2,810)
	8	Closing Balance				778	594	464	240	44	(131)	(2,677)	(5,075)	(7,426)	(9,773)	(12,112)	(15,156)	(18,158)	(21,122)	(24,022)	(26,831)

Appendix V.15 NAVGHAR-MANIKPUR

II. CAPEX

A		CIP - Sector wise (Rs. Lakhs)				
Sector		Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	1,682.28	16.82	7%	5%	% of Capital Cost
2	Sewerage	7,899.91	79.00	34%	5%	% of Capital Cost
3	Roads	4,739.95	47.40	20%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	2,080.80	20.81	9%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	610.00	6.10	3%	12%	% of Capital Cost
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	6,319.93	63.20	27%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	23,332.86	233.33			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B		Investment Phasing	Total	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
	Percentage		%													
1	Water Supply		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
2	Sewerage		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
3	Roads		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
	LA For Roads		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
4	Drains		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
6	SWM		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
	LA For SWM Disposal Site		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
7	Slums/ Urban poor		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
	LA For Slum Rehabilitation		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
8	Others- JNNURM		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
9	Others- Non-JNNURM		100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%

Sustainable Investment (Current Prices)		Total	Rs. Lakhs													
1	Water Supply	13.6	1.9	2.0	4.2	1.8	1.9	2.0	2.0	2.0	1.2	1.2	1.2	0.7	0.5	
2	Sewerage	63.8	8.7	9.2	19.5	8.3	8.8	9.3	9.3	9.3	5.8	5.8	5.8	3.5	2.3	
3	Roads	38.3	5.2	5.5	11.7	5.0	5.3	5.6	5.6	5.6	3.5	3.5	3.5	2.1	1.4	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	16.8	2.3	2.4	5.1	2.2	2.3	2.5	2.5	2.5	1.5	1.5	1.5	0.9	0.6	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	4.9	0.7	0.7	1.5	0.6	0.7	0.7	0.7	0.7	0.4	0.4	0.4	0.3	0.2	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	51.0	7.0	7.4	15.6	6.6	7.0	7.4	7.4	7.4	4.7	4.7	4.7	2.8	1.9	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	188.4	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9	
C	Additional O&M	Total	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	
Sustainable Investment (Current Prices)		Rs. Lakhs														
1	Water Supply	0.7	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	
2	Sewerage	3.2	0.4	0.5	1.0	0.4	0.4	0.5	0.5	0.5	0.3	0.3	0.3	0.2	0.2	
3	Roads	1.1	0.2	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	0.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	0.6	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	1.5	0.2	0.2	0.5	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	7.5	1.0	1.1	2.3	1.0	1.0	1.1	1.1	1.1	0.7	0.7	0.7	0.4	0.4	
D	Funding Pattern															
Capital Grants' Framework		JNNURM														
Capital Funding		Total	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	
1	Sustainable Investment (Current)	188.4	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9	
2	Funding under JNNURM framework	188.4	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9	
3	Available Capital Grants under JNNURM	Gol	40%	of Eligible Investment												

		GoM	10%	of Eligible Investment													
4	Creation of Revolving fund under JNNURM		25%	of Grants													
	Grant Funding	Grant	Total	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	
1	Water Supply	50%	6.8	0.9	1.0	2.1	0.9	0.9	1.0	1.0	1.0	0.6	0.6	0.6	0.4	0.2	
2	Sewerage	50%	31.9	4.3	4.6	9.8	4.1	4.4	4.7	4.7	4.7	2.9	2.9	2.9	1.7	1.2	
3	Roads	50%	19.1	2.6	2.8	5.9	2.5	2.6	2.8	2.8	2.8	1.7	1.7	1.7	1.0	0.7	
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	50%	8.4	1.1	1.2	2.6	1.1	1.2	1.2	1.2	1.2	0.8	0.8	0.8	0.5	0.3	
5	Street Lights	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	50%	2.5	0.3	0.4	0.8	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.1	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	50%	25.5	3.5	3.7	7.8	3.3	3.5	3.7	3.7	3.7	2.3	2.3	2.3	1.4	0.9	
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		94.2	12.8	13.6	28.8	12.2	13.0	13.7	13.7	13.7	8.6	8.6	8.6	5.2	3.4	
Availability of Own Resources against Resource Gap																	
1	Resource Gap after accounting for Grants			12.8	13.6	28.8	12.2	13.0	13.7	13.7	13.7	8.6	8.6	8.6	5.2	3.4	
2	Available Own resources			-914	-1,125	-1,202	-3,011	-4,558	-5,860	-6,902	-7,619	-8,564	-9,018	-8,821	-7,853	-5,817	
3	Contribution from available own sources			10%	10%	10%	10%	10%	10%	10%	0%	0%	0%	0%	0%	0%	
4	Contribution from Own sources			-	-	-	-	-	-	-	-	-	-	-	-	-	
Own sources' Funding																	
			Total	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	
1	Water Supply		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Sewerage		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Drains		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	SWM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For SWM Disposal Site		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Slums/ Urban poor		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Slum Rehabilitation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Others- JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Others- Non-JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Debt Funding		Total	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
	Resource Gap for Debt Funding		12.8	13.6	28.8	12.2	13.0	13.7	13.7	13.7	8.6	8.6	8.6	5.2	3.4
1	Water Supply	6.8	0.9	1.0	2.1	0.9	0.9	1.0	1.0	1.0	0.6	0.6	0.6	0.4	0.2
2	Sewerage	31.9	4.3	4.6	9.8	4.1	4.4	4.7	4.7	4.7	2.9	2.9	2.9	1.7	1.2
3	Roads	19.1	2.6	2.8	5.9	2.5	2.6	2.8	2.8	2.8	1.7	1.7	1.7	1.0	0.7
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains	8.4	1.1	1.2	2.6	1.1	1.2	1.2	1.2	1.2	0.8	0.8	0.8	0.5	0.3
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM	2.5	0.3	0.4	0.8	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.1
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	25.5	3.5	3.7	7.8	3.3	3.5	3.7	3.7	3.7	2.3	2.3	2.3	1.4	0.9
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	94.2	12.8	13.6	28.8	12.2	13.0	13.7	13.7	13.7	8.6	8.6	8.6	5.2	3.4
	Total Investment	188.4	25.7	27.2	57.7	24.5	25.9	27.5	27.5	27.5	17.2	17.2	17.2	10.3	6.9

Sustainability

Navghar-Manikpur Municipal Council															
	Option	2.00						P2	17,947						
A	Output							P3	23,333						
1	Investment Need (Constant Prices)	Rs. Cr	233.33					Difference	(5,386)						
2	% Sustainable	%	1.00%	% of Investment Need											
3	Sustainable Investment (SI)														
	Constant Prices	Rs. Cr	2.33												
	Current Prices	Rs. Cr	1.88												
4	Investment proposed under JNNURM	Rs. Cr	1.88	100% of SI											
5	Overall Funding Pattern (Current Prices)														
	JNNURM Grants - Gol	Rs. Cr	0.75	40% of SI											
	JNNURM Grants - GoM	Rs. Cr	0.19	10% of SI											
	Debt Funding	Rs. Cr	0.94	50% of SI											
	ULB Share	Rs. Cr	-	0% of SI											
B	Funding Pattern Assumptions														
1	Funding Program	JNNURM													
2	Contribution to Revolving Fund	25%													
			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
3	Utilisation of Own resources	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	20%	20%	10%	10%
C	Sustainability Check		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
1	Surplus-CB		-1,075	-1,286	-1,365	-3,177	-4,725	-6,030	-7,073	-7,791	-8,737	-9,157	-8,959	-7,985	-5,949

Financial Operating Plan

Navghar-Manikpur Municipal Council																						
Proposed Growth			Income	Expense																		
		Minimum	5%	8%																		
		Maximum	15%	10%																		
		All Figures in Rs. Lakhs																				
Head of Account		Current	Proposed Growth	Unit	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		
Opening Balance					629.9	368.1	63.6	-740.1	-1075.0	-1286.4	-1365.3	-3176.9	-4724.9	-6030.1	-7072.5	-7791.3	-8737.1	-9156.8	-8958.5	-7985.2		
I Revenue Receipts																						
A Octroi																						
Sub Total A		10.27	11.00	%	905	1,005	1,115	1,238	1,374	1,525	1,693	1,879	2,086	2,316	2,570	2,853	3,167	3,515	3,902	4,331		
B Taxes																						
1	Property Tax/ General Tax				545	465	492	505	518	531	544	664	685	703	721	739	758	777	796	816		
2	Water and sewerage Taxes	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	Other Taxes	262.87	15.00	%	8	9	11	13	14	17	19	22	25	29	33	38	44	51	58	67		
Sub Total B					554	474	503	518	532	548	563	686	710	732	754	777	802	827	854	883		
C Non Taxes																						
1	Betterment/ Development Charges	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	Income from properties/ building permission/ regularisation etc	44.20	25.00	%	143	178	223	278	348	435	544	680	850	1,062	1,328	1,660	2,074	2,593	3,241	4,052		
3	Water Charges				108	103	116	123	130	153	162	170	201	213	223	233	244	255	266	278		
4	Water Connection Fee				-	7	9	9	9	11	12	12	15	15	16	17	18	18	19	20		
5	Sewer Charges				-	-	9	24	46	63	74	85	109	125	140	157	174	193	213	234		
6	Sewerage Connection Fee				-	-	17	27	39	15	17	18	22	24	26	27	29	32	34	36		
7	Others	10.77	10.77	%	141	157	173	192	213	236	261	289	320	355	393	435	482	534	592	655		
Sub Total C					392	444	546	654	785	914	1,070	1,255	1,517	1,794	2,126	2,529	3,022	3,625	4,365	5,276		
D Assigned Revenues/ Grants																						
1	Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	State Government grants	32.90	15.00	%	192	221	254	292	336	387	445	512	588	676	778	895	1,029	1,183	1,361	1,565		
3	Gol grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Total D					192	221	254	292	336	387	445	512	588	676	778	895	1,029	1,183	1,361	1,565		
Grand Total Revenue Receipts					2,043	2,144	2,419	2,702	3,028	3,373	3,771	4,332	4,901	5,518	6,229	7,054	8,019	9,151	10,482	12,055		
II Revenue Expenditure																						
A Establishment																						
1	Pay and Allowance to	16.91	10.00	%	297	326	359	395	435	478	526	578	636	700	770	847	931	1,025	1,127	1,240		



		Municipal Staff																			
	2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total A					297	326	359	395	435	478	526	578	636	700	770	847	931	1,025	1,127	1,240
B	Operation & Maintenance																				
	1	Administration & Recovery of taxes	29.12	10.00	%	43	48	53	58	64	70	77	85	93	102	113	124	136	150	165	181
	2	Water Supply	32.70	10.00	%	200	220	242	266	293	322	355	390	429	472	519	571	628	691	760	836
	3	Sewerage & drainage	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	Public health/ safety	34.49	10.00	%	408	448	493	543	597	657	722	794	874	961	1,057	1,163	1,279	1,407	1,548	1,703
	5	Construction works/ PWD	28.98	10.00	%	114	125	138	152	167	183	202	222	244	269	295	325	357	393	432	476
	6	Street lighting	24.27	10.00	%	161	177	195	214	236	259	285	314	345	380	418	460	506	556	612	673
	7	Sanitation/ Conservancy	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	Others	41.57	10.00	%	120	132	145	159	175	193	212	233	257	282	311	342	376	413	455	500
	9	Phasing of Non debt Liabilities						-	-	-	-										
	10	Additional O&M for new CAPEX		6.00	%					1	1	2	1	1	1	1	1	1	1	1	2
		Bulk Purchase of Water		5.00				633	648	662	2,577	2,636	2,698	2,763	2,832	3,537	3,626	3,720	3,819	3,819	
	11	Contribution to Revolving Fund							7	7	3	3	3	3	3	2	2	2	1	1	
	Sub Total B					1,046	1,151	1,266	2,026	2,187	2,355	4,436	4,679	4,945	5,234	5,549	6,524	6,912	7,335	7,794	8,190
C	Debt Servicing																				
	1	Loan Repayment- Old Loans		Refer Annex		-	-	456	456	456	456	456	456	456	456	456	456	456	456	456	456
	2	Loan Repayment- New Loans		Refer Annex						1	2	5	6	9	10	12	13	13	14	14	14
	3	Loan Repayment- MMRDA						161	161	161	161	161	161	161	161	161	126	123	118	118	
	Sub Total C					-	-	617	617	618	619	621	623	626	627	629	629	595	593	588	588
	Grand Total Revenue Expenditure					1,343	1,477	2,242	3,037	3,239	3,452	5,583	5,880	6,207	6,560	6,947	8,000	8,439	8,952	9,509	10,018
	Revenue Account Status- Surplus/Deficit					700	667	178	(335)	(211)	(79)	(1,812)	(1,548)	(1,305)	(1,042)	(719)	(946)	(420)	198	973	2,036
I	Capital Receipts																				
	1	Loans- Existing																			
	2	Regular Grants		6.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	New Loans		Refer Annex				13	14	29	12	13	14	14	14	9	9	9	5	3	
	4	New Grants		Refer Annex				13	14	29	12	13	14	14	14	9	9	9	5	3	
	Grand Total Capital Receipts					-	-	-	26	27	58	24	26	27	27	27	17	17	17	10	7
II	Capital Expenditure																				
	1	Regular Municipal Capital Works		1.00	% of Regular Grants	962	972	981	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	CIP related CAPEX						26	27	58	24	26	27	27	27	17	17	17	10	7	
	Grand Total Capital Expenditure					962	972	981	26	27	58	24	26	27	27	17	17	17	10	7	

	Capital Account Status-Surplus/Deficit			(962)	(972)	(981)	-	-	-	-	-	-	-	-	-	-	-	-	-
	Overall Municipal Account Status			(262)	(305)	(804)	(335)	(211)	(79)	(1,812)	(1,548)	(1,305)	(1,042)	(719)	(946)	(420)	198	973	2,036
	Closing Balance			368	64	(740)	(1,075)	(1,286)	(1,365)	(3,177)	(4,725)	(6,030)	(7,073)	(7,791)	(8,737)	(9,157)	(8,959)	(7,985)	(5,949)
Financial Indicators																			
	1	Operating Ratio		0.7	0.7	0.9	1.1	1.1	1.0	1.5	1.4	1.3	1.2	1.1	1.1	1.1	1.0	0.9	0.8
	2	Capital Utilisation Ratio		NA	NA	NA	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	3	Share of Estab.Cost including Terminal Benefits		0	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	4	Share of Revenue Spent on Establishment		0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	5	Debt Servicing Cost as % of Revenue Income		-	0.0	0.0	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	6	Annual Status of Accounts																	
		General Account		700	667	178	(335)	(211)	(79)	(1,812)	(1,548)	(1,305)	(1,042)	(719)	(946)	(420)	198	973	2,036
		Capital Deficit		(962)	(972)	(981)	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	Overall Municipal Account Status		(262)	(305)	(804)	(335)	(211)	(79)	(1,812)	(1,548)	(1,305)	(1,042)	(719)	(946)	(420)	198	973	2,036
	8	Closing Balance		368	64	(740)	(1,075)	(1,286)	(1,365)	(3,177)	(4,725)	(6,030)	(7,073)	(7,791)	(8,737)	(9,157)	(8,959)	(7,985)	(5,949)

Appendix V.16

PANVEL

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	1,319.71	13.20	6%	5%	% of Capital Cost
2	Sewerage	7,004.00	70.04	34%	5%	% of Capital Cost
3	Roads	4,394.46	43.94	21%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	1,506.00	15.06	7%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	610.00	6.10	3%	12%	% of Capital Cost
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	5,859.28	58.59	28%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	20,693.45	206.93			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B	Investment Phasing	Total	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
	Percentage	%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	10%	10%	10%	10%	10%	10%	10%	10%	10%	3%	3%	2%	2%
	LA For Roads	100%	10%	10%	10%	10%	10%	10%	10%	10%	10%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	10%	10%	10%	10%	10%	10%	10%	10%	10%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%



	LA For Slum Rehabilitation		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM		100%	5%	10%	10%	10%	10%	5%	5%	5%	10%	10%	10%	10%	0%
9	Others- Non-JNNURM		100%	5%	10%	10%	10%	10%	5%	5%	5%	10%	10%	10%	10%	0%
	Sustainable Investment (Current Prices)	Total	Rs. Lakhs													
1	Water Supply	10.9	1.5	3.1	2.0	1.4	1.5	1.6	1.6	1.2	0.8	0.8	0.8	0.8	0.8	
2	Sewerage	61.3	7.7	9.0	9.5	11.0	11.7	12.4	12.4	12.4	2.1	2.1	2.1	1.0	1.0	
3	Roads	33.7	4.8	5.1	5.4	5.8	6.1	6.5	6.5	6.5	6.5	1.9	1.9	1.3	1.3	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	12.2	1.7	1.8	3.7	1.6	1.7	1.8	1.8	1.8	1.1	1.1	1.1	0.7	0.4	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	4.0	0.5	0.7	0.8	0.6	0.7	0.7	0.7	0.5	0.7	0.7	0.7	0.7	0.2	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	37.4	3.2	6.8	7.2	7.7	8.1	4.3	4.3	4.3	8.6	8.6	8.6	8.6	-	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	159.5	19.4	26.5	28.6	28.0	29.7	27.2	27.2	26.6	19.8	15.2	15.2	13.1	3.7	
C	Additional O&M	Total	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	
	Sustainable Investment (Current Prices)		Rs. Lakhs													
1	Water Supply	0.5	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	
2	Sewerage	3.1	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.1	0.1	0.1	0.1	
3	Roads	1.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	1.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.3	0.3	0.3	0.3	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	6.5	-	0.8	1.1	1.1	1.1	1.2	1.1	1.1	1.1	0.7	0.6	0.6	0.5	

D Funding Pattern																	
Capital Grants' Framework		JNNU RM															
Capital Funding			Total	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	
1	Sustainable Investment (Current)		159.5	19.4	26.5	28.6	28.0	29.7	27.2	27.2	26.6	19.8	15.2	15.2	13.1	3.7	
2	Funding under JNNURM framework		159.5	19.4	26.5	28.6	28.0	29.7	27.2	27.2	26.6	19.8	15.2	15.2	13.1	3.7	
3	Available Capital Grants under JNNURM	GoI	40%	of Eligible Investment													
		GoM	10%	of Eligible Investment													
4	Creation of Revolving fund under JNNURM		25%	of Grants													
Grant Funding			Grant	Total	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
1	Water Supply	50%	5.4	0.7	1.5	1.0	0.7	0.7	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4	
2	Sewerage	50%	30.6	3.9	4.5	4.8	5.5	5.8	6.2	6.2	6.2	1.0	1.0	1.0	0.5	0.5	
3	Roads	50%	16.9	2.4	2.6	2.7	2.9	3.1	3.2	3.2	3.2	3.2	1.0	1.0	0.6	0.6	
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	50%	6.1	0.8	0.9	1.9	0.8	0.8	0.9	0.9	0.9	0.6	0.6	0.6	0.3	0.2	
5	Street Lights	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	50%	2.0	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.1	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	50%	18.7	1.6	3.4	3.6	3.8	4.1	2.2	2.2	2.2	4.3	4.3	4.3	4.3	-	
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		79.7	9.7	13.2	14.3	14.0	14.9	13.6	13.6	13.3	9.9	7.6	7.6	6.6	1.9	
Availability of Own Resources against Resource Gap																	
1	Resource Gap after accounting for Grants			9.7	13.2	14.3	14.0	14.9	13.6	13.6	13.3	9.9	7.6	7.6	6.6	1.9	
2	Available Own resources			-2,828	-2,925	-2,842	-3,991	-4,774	-5,133	-4,996	-4,278	-3,336	-1,515	1,493	5,848	11,861	
3	Contribution from available own sources			0%	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%	
4	Contribution from Own			-	-	-	-	-	-	-	-	-	-	-	-	-	

sources																
Own sources' Funding		Total	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	
1	Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Sewerage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Drains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	SWM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Others- JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Debt Funding		Total	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	
	Resource Gap for Debt Funding		9.7	13.2	14.3	14.0	14.9	13.6	13.6	13.3	9.9	7.6	7.6	6.6	1.9	
1	Water Supply	5.4	0.7	1.5	1.0	0.7	0.7	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4	
2	Sewerage	30.6	3.9	4.5	4.8	5.5	5.8	6.2	6.2	6.2	1.0	1.0	1.0	0.5	0.5	
3	Roads	16.9	2.4	2.6	2.7	2.9	3.1	3.2	3.2	3.2	3.2	1.0	1.0	0.6	0.6	
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Drains	6.1	0.8	0.9	1.9	0.8	0.8	0.9	0.9	0.9	0.6	0.6	0.6	0.3	0.2	
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	SWM	2.0	0.3	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.1	
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Others- JNNURM	18.7	1.6	3.4	3.6	3.8	4.1	2.2	2.2	2.2	4.3	4.3	4.3	4.3	0.0	
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total	79.7	9.7	13.2	14.3	14.0	14.9	13.6	13.6	13.3	9.9	7.6	7.6	6.6	1.9	
	Total Investment	159.5	19.4	26.5	28.6	28.0	29.7	27.2	27.2	26.6	19.8	15.2	15.2	13.1	3.7	

Sustainability

Panval Municipal Council														
	Option	1.00				P2	20,314.72							
A	Output					P3	20,693.45							
1	Investment Need (Constant Prices)	Rs. Cr	206.93			Difference	(378.73)							
2	% Sustainable	%	1.00%	% of Investment Need										
3	Sustainable Investment (SI)													
	Constant Prices	Rs. Cr	2.07											
	Current Prices	Rs. Cr	1.59											
4	Investment proposed under JNNURM	Rs. Cr	1.59	100% of SI										
5	Overall Funding Pattern (Current Prices)													
	JNNURM Grants - GoI	Rs. Cr	0.64	40% of SI										
	JNNURM Grants - GoM	Rs. Cr	0.16	10% of SI										
	Debt Funding	Rs. Cr	0.80	50% of SI										
	ULB Share	Rs. Cr	-	0% of SI										
B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	0%	0%	0%	0%	0%	0%	30%	30%	30%	30%	30%	30%	30%
C	Sustainability Check	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
1	Surplus-CB	-2,964	-3,055	-2,971	-4,120	-4,905	-5,266	-5,129	-4,412	-3,472	-1,553	1,457	5,813	11,835

Financial Operating Plan

Panval Municipal Council																						
Proposed Growth			Income	Expense																		
		Minimum	5%	8%																		
		Maximum	15%	10%																		
				All Figures in Rs. Lakhs																		
Head of Account		Current	Proposed Growth	Unit	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		
Opening Balance					-140.8	-360.1	-1548.3	-2677.0	-2963.8	-3055.4	-2971.3	-4120.3	-4905.2	-5265.7	-5129.2	-4412.4	-3471.6	-1553.2	1457.5	5812.8		
I Revenue Receipts																						
A Octroi																						
Sub Total A		NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
B Taxes																						
1	Property Tax/ General Tax				325	383	436	447	460	474	488	584	613	637	658	678	699	720	741	764		
2	Water and sewerage Taxes	12.73	15.00	%	25	29	34	39	44	51	59	68	78	89	103	118	136	156	180	207		
3	Other Taxes	13.07	13.07	%	22	25	28	31	36	40	46	51	58	66	74	84	95	108	122	138		
Sub Total B					372	437	497	517	540	565	592	703	749	792	835	880	930	984	1043	1108		
C Non Taxes																						
1	Betterment/ Development Charges	42.34	25.00	%	155	194	242	303	378	473	591	739	924	1155	1444	1804	2256	2819	3524	4405		
2	Income from properties/ building permission/ regularisation etc	22.05	22.00	%	24	30	36	44	54	66	80	98	120	146	178	217	265	323	394	481		
3	Water Charges				110	110	123	131	138	163	174	183	217	232	244	256	269	283	297	312		
4	Water Connection Fee				0	17	22	23	24	30	31	33	39	41	43	45	48	50	53	55		
5	Sewer Charges				0	0	9	25	49	68	80	92	119	137	154	173	193	215	238	263		
6	Sewerage Connection Fee				0	0	40	64	93	38	41	44	55	60	64	70	75	81	87	94		
7	Others	-2.78	5.00	%	39	41	43	45	47	50	52	55	57	60	63	67	70	73	77	81		
Sub Total C					328	391	515	636	783	887	1050	1244	1532	1830	2191	2633	3176	3845	4671	5692		
D Assigned Revenues/ Grants																						
1	Assigned revenues	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	State Government grants	34.32	15.00	%	1303	1498	1723	1981	2278	2620	3013	3465	3985	4582	5270	6060	6969	8014	9216	10599		
3	Gol grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	NSDP grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	SJSRY grants	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Other grants/ contributions	NA	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sub Total D					1303	1498	1723	1981	2278	2620	3013	3465	3985	4582	5270	6060	6969	8014	9216	10599		
Grand Total Revenue Receipts					2003	2326	2735	3134	3602	4072	4655	5412	6266	7204	8295	9573	11074	12843	14930	17399		
II Revenue Expenditure																						
A Establishment																						

	1	Pay and Allowance to Municipal Staff	9.43	9.43	%	454	497	544	595	651	712	779	853	933	1021	1117	1223	1338	1464	1602	1753
	2	Pension Benefits	NA	8.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Sub Total A			%	454	497	544	595	651	712	779	853	933	1021	1117	1223	1338	1464	1602	1753
B		Operation & Maintenance																			
	1	Administration & Recovery of taxes	17.42	10.00	%	25	28	31	34	37	41	45	50	55	60	66	73	80	88	97	106
	2	Water Supply	135.22	10.00	%	973	1070	1177	1295	1425	1567	1724	1896	2086	2294	2524	2776	3054	3359	3695	4064
	3	Sewerage & drainage	89.78	10.00	%	57	63	69	76	84	92	101	112	123	135	148	163	180	198	217	239
	4	Public health/safety	55.09	10.00	%	15	17	19	21	23	25	27	30	33	37	40	44	49	53	59	65
	5	Construction works/ PWD	21.22	10.00	%	120	132	145	160	176	193	213	234	257	283	311	342	377	414	456	501
	6	Street lighting	13.97	10.00	%	29	32	35	39	43	47	52	57	62	69	75	83	91	100	111	122
	7	Sanitation/ Conservancy	89.78	10.00	%	80	88	96	106	117	128	141	155	171	188	206	227	250	275	302	333
	8	Others	19.33	10.00	%	234	257	283	311	342	376	414	456	501	551	606	667	734	807	888	976
	9	Phasing of Non debt Liabilities						0	0	0	0	0									
	10	Additional O&M for new CAPEX		6.00	%		0	0	0	1	1	1	1	1	1	1	1	1	1	2	2
		Bulk Purchase of Water		5.00					496	507	519	2020	2067	2115	2166	2219	2772	2842	2915	2993	3074
	11	Contribution to Revolving Fund						0	6	4	4	4	4	3	3	3	2	2	2	2	0
		Sub Total B				1534	1687	1856	2537	2759	2994	4742	5060	5407	5787	6202	7151	7658	8213	8820	9482
C		Debt Servicing																			
	1	Loan Repayment-Old Loans		Refer Annex		153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153
	2	Loan Repayment-New Loans		Refer Annex			0	0	1	2	3	4	6	7	8	9	10	11	12	12	12
	3	Loan Repayment-MMRDA						138	135	128	126	125	125	125	125	125	125	27	23	23	14
		Sub Total C				153	153	291	289	283	282	283	284	286	287	287	288	192	189	189	179
		Grand Total Revenue Expenditure				2141	2337	2690	3421	3693	3988	5804	6197	6626	7095	7607	8662	9188	9866	10611	11415
		Revenue Account Status-Surplus/Deficit				-138	-11	44	-287	-92	84	-1149	-785	-361	110	688	911	1886	2977	4319	5984
I		Capital Receipts																			
	1	Loans- Existing				507															
	2	Regular Grants		6.00	%	900	326	346	0	0	0	0	0	0	27	29	31	32	34	36	39
	3	New Loans		Refer Annex					10	13	14	14	15	14	14	13	10	8	8	7	2
	4	New Grants		Refer Annex					10	13	14	14	15	14	14	13	10	8	8	7	2
		Grand Total Capital Receipts				1407	326	346	19	26	29	28	30	27	54	55	50	48	50	50	42
II		Capital Expenditure																			

	1	Regular Municipal Capital Works	1.00	% of Regular Grants	1489	1504	1519	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	CIP related CAPEX						19	26	29	28	30	27	27	27	20	15	15	13	4
		Grand Total Capital Expenditure			1489	1504	1519	19	26	29	28	30	27	27	27	20	16	16	13	4
		Capital Account Status-Surplus/Deficit			-82	-1177	-1173	0	0	0	0	0	0	27	29	30	32	34	36	38
		Overall Municipal Account Status			-219	-1188	-1129	-287	-92	84	-1149	-785	-361	136	717	941	1918	3011	4355	6022
		Closing Balance			-360	-1548	-2677	-2964	-3055	-2971	-4120	-4905	-5266	-5129	-4412	-3472	-1553	1457	5813	11835
		Financial Indicators																		
	1	Operating Ratio			1.1	1.0	1.0	1.1	1.0	1.0	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7
	2	Capital Utilisation Ratio			1.1	4.6	4.4	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.4	0.3	0.3	0.3	0.1
	3	Share of Estab.Cost including Terminal Benefits			0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	4	Share of Revenue Spent on Establishment			0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	5	Debt Servicing Cost as % of Revenue Income			0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6	Annual Status of Accounts																		
		General Account			-138	-11	44	-287	-92	84	-1149	-785	-361	110	688	911	1886	2977	4319	5984
		Capital Deficit			-82	-1177	-1173	0	0	0	0	0	0	27	29	30	32	34	36	38
	7	Overall Municipal Account Status			-219	-1188	-1129	-287	-92	84	-1149	-785	-361	136	717	941	1918	3011	4355	6022
	8	Closing Balance			-360	-1548	-2677	-2964	-3055	-2971	-4120	-4905	-5266	-5129	-4412	-3472	-1553	1457	5813	11835

Appendix V.17

URAN

II. CAPEX

A							CIP - Sector wise (Rs. Lakhs)						
Sector		Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX								
1	Water Supply	170.98	170.98	5%	5%	% of Capital Cost							
2	Sewerage	1,067.76	1,067.76	30%	5%	% of Capital Cost							
3	Roads	640.65	640.65	18%	3%	% of Capital Cost							
	LA For Roads		-	0%	0%	% of Capital Cost							
4	Drains	597.60	597.60	17%	2%	% of Capital Cost							
5	Street Lights	-	-	0%	8%	% of Capital Cost							
6	SWM	250.00	250.00	7%	12%	% of Capital Cost							
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost							
7	Slums/ Urban poor		-	0%	2%	% of Capital Cost							
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost							
8	Others- JNNURM	854.20	854.20	24%	3%	% of Capital Cost							
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost							
	Total	3,581.19	3,581.19										
1	Physical Contingency & Technical Assistance		10%	of Base Project Cost									
2	Cost Escalation Factor		6%	% p.a									

B Investment Phasing		Total	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
Percentage		%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%

	Site																
7	Slums/ Urban poor		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation		100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%	4%
8	Others- JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	Sustainable Investment (Current Prices)		Total	Rs. Lakhs													
1	Water Supply		141.1	18.8	39.9	25.4	17.9	19.0	20.1	20.1	15.1	10.1	10.1	10.1	10.1	10.1	10.1
2	Sewerage		934.0	117.5	137.0	145.2	167.9	177.9	188.6	188.6	188.6	31.4	31.4	31.4	15.7	15.7	
3	Roads		626.5	211.4	224.1	110.9	25.2	26.7	28.3	18.9	18.9	28.3	28.3	28.3	28.3	18.9	18.9
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		482.5	65.7	69.7	147.7	62.6	66.4	70.4	70.4	70.4	44.0	44.0	44.0	26.4	17.6	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		165.5	22.0	29.2	30.9	26.2	27.8	29.4	29.4	22.1	29.4	29.4	29.4	29.4	29.4	7.4
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		955.8	187.9	298.8	422.3	22.4	11.9	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		3,305.5	623.3	798.6	882.3	322.2	329.7	349.4	340.0	327.6	155.8	155.8	155.8	113.1	69.6	
C	Additional O&M		Total	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	
	Sustainable Investment (Current Prices)			Rs. Lakhs													
1	Water Supply		7.1		0.9	2.0	1.3	0.9	0.9	1.0	1.0	0.8	0.5	0.5	0.5	0.5	0.5
2	Sewerage		46.7		5.9	6.8	7.3	8.4	8.9	9.4	9.4	9.4	1.6	1.6	1.6	0.8	
3	Roads		18.8		6.3	6.7	3.3	0.8	0.8	0.8	0.6	0.6	0.8	0.8	0.8	0.6	
	LA For Roads		-		-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		9.7		1.3	1.4	3.0	1.3	1.3	1.4	1.4	1.4	0.9	0.9	0.9	0.5	
5	Street Lights		-		-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		19.9		2.6	3.5	3.7	3.1	3.3	3.5	3.5	2.6	3.5	3.5	3.5	3.5	

	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		28.7	5.6	9.0	12.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		130.7	-	22.7	29.4	31.2	15.1	15.7	16.6	16.3	15.2	7.7	7.7	7.7	6.3	
D Funding Pattern																	
Capital Grants' Framework		JNNURM															
Capital Funding			Total	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	
1	Sustainable Investment (Current)		3,305.5	623.3	798.6	882.3	322.2	329.7	349.4	340.0	327.6	155.8	155.8	155.8	113.1	69.6	
2	Funding under JNNURM framework		3,305.5	623.3	798.6	882.3	322.2	329.7	349.4	340.0	327.6	155.8	155.8	155.8	113.1	69.6	
3	Available Capital Grants under JNNURM	GoI	40%	of Eligible Investment													
		GoM	10%	of Eligible Investment													
4	Creation of Revolving fund under JNNURM		25%	of Grants													
Grant Funding			Grant	Total	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
1	Water Supply	50%	70.5	9.4	19.9	12.7	9.0	9.5	10.1	10.1	7.6	5.0	5.0	5.0	5.0	5.0	
2	Sewerage	50%	467.0	58.7	68.5	72.6	83.9	89.0	94.3	94.3	94.3	15.7	15.7	15.7	7.9	7.9	
3	Roads	50%	313.3	105.7	112.1	55.4	12.6	13.3	14.1	9.4	9.4	14.1	14.1	14.1	9.4	9.4	
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	50%	241.3	32.9	34.8	73.9	31.3	33.2	35.2	35.2	35.2	22.0	22.0	22.0	13.2	8.8	
5	Street Lights	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	50%	82.7	11.0	14.6	15.4	13.1	13.9	14.7	14.7	11.0	14.7	14.7	14.7	14.7	3.7	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	50%	477.9	94.0	149.4	211.2	11.2	5.9	6.3	6.3	6.3	6.3	6.3	6.3	6.3	-	

9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		1,652.7	311.7	399.3	441.2	161.1	164.8	174.7	170.0	163.8	77.9	77.9	77.9	56.5	34.8	
Availability of Own Resources against Resource Gap																	
1	Resource Gap after accounting for Grants			311.7	399.3	441.2	161.1	164.8	174.7	170.0	163.8	77.9	77.9	77.9	56.5	34.8	
2	Available Own resources			247	200	237	176	228	364	561	828	1,294	1,946	2,810	3,932	5,366	
3	Contribution from available own sources			20%	20%	20%	20%	20%	20%	20%	0%	0%	0%	0%	0%	0%	
4	Contribution from Own sources			49.4	39.9	47.4	35.3	45.5	72.8	112.2	-	-	-	-	-	-	
Own sources' Funding																	
			Total	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	
1	Water Supply		13.6	1.5	2.0	1.4	2.0	2.6	4.2	6.6	0.0	0.0	0.0	0.0	0.0	0.0	
2	Sewerage		106.2	9.3	6.8	7.8	18.4	24.6	39.3	62.2	0.0	0.0	0.0	0.0	0.0	0.0	
3	Roads		46.2	16.7	11.2	6.0	2.8	3.7	5.9	6.2	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	Drains		47.3	5.2	3.5	7.9	6.9	9.2	14.7	23.2	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	SWM		17.7	1.7	1.5	1.7	2.9	3.8	6.1	9.7	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For SWM Disposal Site		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	Slums/ Urban poor		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Slum Rehabilitation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	Others- JNNURM		59.2	14.9	14.9	22.7	2.4	1.6	2.6	4.1	0.0	0.0	0.0	0.0	0.0	0.0	
9	Others- Non-JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total		290.3	49.4	39.9	47.4	35.3	45.5	72.8	112.2	0.0	0.0	0.0	0.0	0.0	0.0	
Debt Funding																	
			Total	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	
	Resource Gap for Debt Funding			262.3	359.3	393.8	125.8	119.3	101.9	57.8	163.8	77.9	77.9	77.9	56.5	34.8	
1	Water Supply			56.9	7.9	17.9	11.3	7.0	6.9	5.9	3.4	7.6	5.0	5.0	5.0	5.0	
2	Sewerage			360.8	49.4	61.6	64.8	65.6	64.4	55.0	32.1	94.3	15.7	15.7	15.7	7.9	
3	Roads			267.0	89.0	100.8	49.5	9.8	9.7	8.2	3.2	9.4	14.1	14.1	14.1	9.4	

	LA For Roads		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains		194.0	27.7	31.4	65.9	24.5	24.0	20.5	12.0	35.2	22.0	22.0	22.0	13.2	8.8	
5	Street Lights		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM		65.0	9.3	13.1	13.8	10.2	10.1	8.6	5.0	11.0	14.7	14.7	14.7	14.7	3.7	
	LA For SWM Disposal Site		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM		418.7	79.1	134.5	188.5	8.7	4.3	3.7	2.1	6.3	6.3	6.3	6.3	6.3	0.0	
9	Others- Non-JNNURM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total		1362.4	262.3	359.3	393.8	125.8	119.3	101.9	57.8	163.8	77.9	77.9	77.9	56.5	34.8	
	Total Investment		3305.5	623.3	798.6	882.3	322.2	329.7	349.4	340.0	327.6	155.8	155.8	155.8	113.1	69.6	

Sustainability

Uran Municipal Council						
	Option	2				P2 3,425.99
A	Output					P3 3,581.19
1	Investment Need (Constant Prices)	Rs. Cr	35.81			
2	% Sustainable	%	100.00%	% of Investment Need		
3	Sustainable Investment (SI)					
	Constant Prices	Rs. Cr	35.81			
	Current Prices	Rs. Cr	33.05			
4	Investment proposed under JNNURM	Rs. Cr	33.05	100% of SI		
5	Overall Funding Pattern (Current Prices)					
	JNNURM Grants - GoI	Rs. Cr	13.22	40% of SI		
	JNNURM Grants - GoM	Rs. Cr	3.31	10% of SI		
	Debt Funding	Rs. Cr	3.62	41% of SI		
	ULB Share	Rs. Cr	2.90	9% of SI		

B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
C	Sustainability Check	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
1	Surplus-CB	166	98	94	35	66	149	282	634	1,101	1,745	2,602	3,724	5,159

Financial Operating Plan

Uran Municipal Council																				
Proposed Growth		Income	Expense																	
	Minimum	5%	8%																	
	Maximum	15%	10%																	
All Figures in Rs. Lakhs																				
Head of Account	Current	Proposed Growth	Unit	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	
Opening Balance				36	(10)	28	67	166	98	94	35	66	149	282	634	1,101	1,745	2,602	3,724	
I Revenue Receipts																				
A Octroi																				
Sub Total A	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B Taxes																				
1 Property Tax/ General Tax				82	164	160	155	155	157	160	182	189	194	198	202	206	210	215	219	
2 Water and sewerage Taxes	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3 Other Taxes	7.47	7.47	%	2	2	2	2	3	3	3	3	4	4	4	4	5	5	6	6	
Sub Total B				84	166	162	158	158	160	163	186	192	198	202	207	211	216	220	225	
C Non Taxes																				
1 Betterment/ Development Charges	-50.00	5.00	%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2 Income from properties/ building permission/ regularisation etc	-0.08	5.00	%	13	13	14	15	16	16	17	18	19	20	21	22	23	24	25	27	
3 Water Charges				44	36	38	40	41	49	51	53	63	66	69	72	75	78	81	84	
4 Water Connection Fee				-	4	6	6	6	8	8	8	10	10	11	11	11	12	12	13	
5 Sewer Charges				-	-	3	8	15	20	23	27	34	39	43	48	53	59	65	71	
6 Sewerage Connection Fee				-	-	13	21	29	11	12	13	16	17	18	19	20	22	23	24	
7 Others	110.90	15.00	%	44	50	58	66	76	88	101	116	134	154	177	203	234	269	309	356	
Sub Total C				101	105	132	155	183	192	213	235	275	306	339	375	417	463	515	574	
D Assigned Revenues/ Grants																				
1 Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2 State Government grants	17.10	15.00	%	421	484	557	641	737	847	974	1,120	1,288	1,482	1,704	1,959	2,253	2,591	2,980	3,427	
3 Gol grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4 NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5 SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6 Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Total D				421	484	557	641	737	847	974	1,120	1,288	1,482	1,704	1,959	2,253	2,591	2,980	3,427	
Grand Total Revenue Receipts				606	755	851	953	1,078	1,198	1,350	1,541	1,756	1,985	2,244	2,541	2,881	3,270	3,715	4,226	
II Revenue Expenditure																				
A Establishment																				
1 Pay and Allowance to Municipal Staff	10.46	10.00	%	208	229	252	277	305	335	369	405	446	491	540	594	653	718	790	869	
2 Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



	Sub Total A			%	208	229	252	277	305	335	369	405	446	491	540	594	653	718	790	869
B	Operation & Maintenance																			
	1 Administration & Recovery of taxes	12.96	10.00	%	21	23	26	28	31	34	38	42	46	50	55	61	67	74	81	89
	2 Water Supply	15.07	10.00	%	107	118	130	143	157	173	190	209	230	253	278	306	336	370	407	448
	3 Sewerage & drainage	-3.82	8.00	%	2	2	2	2	2	3	3	3	3	3	4	4	4	5	5	6
	4 Public health/ safety	624.23	10.00	%	3	3	3	4	4	4	5	5	6	6	7	8	9	9	10	11
	5 Construction works/ PWD	5.08	8.00	%	32	35	37	40	44	47	51	55	59	64	69	75	81	87	94	101
	6 Street lighting	15.77	10.00	%	30	33	36	40	44	48	53	59	64	71	78	86	94	104	114	125
	7 Sanitation/ Conservancy	-3.82	8.00	%	26	28	30	32	35	38	41	44	47	51	55	60	64	70	75	81
	8 Others	60.97	10.00	%	98	108	119	131	144	158	174	191	210	231	255	280	308	339	373	410
	9 Phasing of Non debt Liabilities						-	-	-	-	-									
	10 Additional O&M for new CAPEX		6.00	%			-	-	23	29	31	15	16	17	18	19	20	21	22	24
	Bulk Purchase of Water		5.00					65	66	67	262	268	274	280	287	359	368	378	388	398
	11 Contribution to Revolving Fund							-	178	110	40	41	44	43	41	19	19	19	14	9
	Sub Total B				319	349	383	485	727	712	887	931	999	1,070	1,147	1,276	1,371	1,475	1,584	1,703
C	Debt Servicing																			
	1 Loan Repayment- Old Loans		Refer Annex		2	2	12	12	12	12	12	12	12	12	12	12	12	12	12	12
	2 Loan Repayment- New Loans		Refer Annex					22	53	86	97	107	133	158	184	193	201	208	208	208
	3 Loan Repayment- MMRDA						16	10	9	9	9	9	9	9	9	-	-	-	-	-
	Sub Total C				2	2	28	44	74	107	118	128	154	179	205	205	213	220	220	220
	Grand Total Revenue Expenditure				529	580	663	805	1,106	1,155	1,374	1,465	1,600	1,739	1,892	2,074	2,237	2,413	2,594	2,791
	Revenue Account Status- Surplus/Deficit				77	174	188	148	(28)	44	(24)	76	156	245	353	467	644	857	1,122	1,435
I	Capital Receipts																			
	1 Loans- Existing																			
	2 Regular Grants		6.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3 New Loans		Refer Annex					262	359	394	126	119	102	58	164	78	78	78	57	35
	4 New Grants		Refer Annex					312	399	441	161	165	175	170	164	78	78	78	57	35
	Grand Total Capital Receipts				-	-	-	574	759	835	287	284	277	228	328	156	156	156	113	70
II	Capital Expenditure																			
	1 Regular Municipal Capital Works		10.00	% of Regular Grants	123	136	149	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 CIP related CAPEX							623	799	882	322	330	349	340	328	156	156	156	113	70
	Grand Total Capital Expenditure				123	136	149	623	799	882	322	330	349	340	328	156	156	156	113	70
	Capital Account Status- Surplus/Deficit				(123)	(136)	(149)	(49)	(40)	(47)	(35)	(46)	(73)	(112)	-	-	-	-	-	-
	Overall Municipal Account Status				(46)	39	39	99	(68)	(4)	(59)	31	83	133	353	467	644	857	1,122	1,435

	Closing Balance				(10)	28	67	166	98	94	35	66	149	282	634	1,101	1,745	2,602	3,724	5,159
	Financial Indicators																			
	1	Operating Ratio			0.9	0.8	0.8	0.8	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7
	2	Capital Utilisation Ratio			NA	NA	NA	1.1	1.1	1.1	1.1	1.2	1.3	1.5	1.0	1.0	1.0	1.0	1.0	1.0
	3	Share of Estab. Cost including Terminal Benefits			0	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	4	Share of Revenue Spent on Establishment			0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	5	Debt Servicing Cost as % of Revenue Income			0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	6	Annual Status of Accounts																		
		General Account			77	174	188	148	(28)	44	(24)	76	156	245	353	467	644	857	1,122	1,435
		Capital Deficit			(123)	(136)	(149)	(49)	(40)	(47)	(35)	(46)	(73)	(112)	-	-	-	-	-	-
	7	Overall Municipal Account Status			(46)	39	39	99	(68)	(4)	(59)	31	83	133	353	467	644	857	1,122	1,435
	8	Closing Balance			(10)	28	67	166	98	94	35	66	149	282	634	1,101	1,745	2,602	3,724	5,159

Appendix V.18

VASAI

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)							
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX		
1	Water Supply	804.55	8.05	7%	5%	% of Capital Cost	
2	Sewerage	3,551.26	35.51	32%	5%	% of Capital Cost	
3	Roads	2,190.76	21.91	20%	3%	% of Capital Cost	
	LA For Roads		-	0%	0%	% of Capital Cost	
4	Drains	1,251.60	12.52	11%	2%	% of Capital Cost	
5	Street Lights	-	-	0%	8%	% of Capital Cost	
6	SWM	350.00	3.50	3%	12%	% of Capital Cost	
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost	
7	Slums/ Urban poor		-	0%	2%	% of Capital Cost	
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost	
8	Others- JNNURM	2,921.01	29.21	26%	3%	% of Capital Cost	
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost	
	Total	11,069.18	110.69				
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost				
2	Cost Escalation Factor	6%	% p.a				

B Investment Phasing		Total	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
	Percentage	%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%

9	Others- Non-JNNURM		100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
	Sustainable Investment (Current Prices)	Total	Rs. Lakhs													
1	Water Supply	6.6	0.9	1.9	1.2	0.8	0.9	0.9	0.9	0.9	0.7	0.5	0.5	0.5	0.5	0.5
2	Sewerage	31.1	3.9	4.6	4.8	5.6	5.9	6.3	6.3	6.3	1.0	1.0	1.0	0.5	0.5	
3	Roads	21.4	7.2	7.7	3.8	0.9	0.9	1.0	0.6	0.6	1.0	1.0	1.0	0.6	0.6	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	10.1	1.4	1.5	3.1	1.3	1.4	1.5	1.5	1.5	0.9	0.9	0.9	0.6	0.4	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	2.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.1	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	32.7	6.4	10.2	14.4	0.8	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	104.2	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1	
C	Additional O&M	Total	Rs. Lakhs													
	Sustainable Investment (Current Prices)															
1	Water Supply	0.3		0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	Sewerage	1.6		0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.0	
3	Roads	0.6		0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For Roads	-		-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	0.2		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights	-		-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	0.3		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	LA For SWM Disposal Site	-		-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-		-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-		-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	1.0		0.2	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Others- Non-JNNURM	-		-	-	-	-	-	-	-	-	-	-	-	-	
	Total	4.0	-	0.7	0.9	1.0	0.4	0.5	0.5	0.5	0.4	0.2	0.2	0.2	0.1	

D Funding Pattern																
Capital Grants' Framework		JNNURM														
Capital Funding			Total	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
1	Sustainable Investment (Current)		104.2	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1
2	Funding under JNNURM framework		104.2	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1
3	Available Capital Grants under JNNURM	GoI	40%	of Eligible Investment												
		GoM	10%	of Eligible Investment												
4	Creation of Revolving fund under JNNURM		25%	of Grants												
Grant Funding		Grant	Total	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
1	Water Supply	50%	3.3	0.4	0.9	0.6	0.4	0.4	0.5	0.5	0.4	0.2	0.2	0.2	0.2	0.2
2	Sewerage	50%	15.5	2.0	2.3	2.4	2.8	3.0	3.1	3.1	3.1	0.5	0.5	0.5	0.3	0.3
3	Roads	50%	10.7	3.6	3.8	1.9	0.4	0.5	0.5	0.3	0.3	0.5	0.5	0.5	0.3	0.3
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	5.1	0.7	0.7	1.5	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.3	0.2
5	Street Lights	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM	50%	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	16.3	3.2	5.1	7.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		52.1	10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1
Availability of Own Resources against Resource Gap																
1	Resource Gap after accounting for Grants			10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1
2	Available Own resources			-4,207	-6,384	-8,542	-11,580	-14,580	-17,531	-20,445	-23,310	-26,410	-29,427	-32,335	-35,099	-37,679
3	Contribution from available own sources			10%	10%	10%	10%	10%	10%	10%	0%	0%	0%	0%	0%	0%

4	Contribution from Own sources			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Own sources' Funding		Total	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		
1	Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Sewerage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt Funding		Total	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		
Resource Gap for Debt Funding			10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1		
1	Water Supply	3.3	0.4	0.9	0.6	0.4	0.4	0.5	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2
2	Sewerage	15.5	2.0	2.3	2.4	2.8	3.0	3.1	3.1	3.1	0.5	0.5	0.5	0.3	0.3		
3	Roads	10.7	3.6	3.8	1.9	0.4	0.5	0.5	0.3	0.3	0.5	0.5	0.5	0.3	0.3		
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains	5.1	0.7	0.7	1.5	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.5	0.3	0.2		
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	16.3	3.2	5.1	7.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	Total		52.1	10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1
	Total Investment		104.2	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1

Sustainability

Vasai Municipal Corporation														
	Option	1.00						P2	8,585.46					
A	Output							P3	11,069.18					
1	Investment Need (Constant Prices)	Rs. Cr	110.69											
2	% Sustainable	%	1.00%	% of Investment Need										
3	Sustainable Investment (SI)													
	Constant Prices	Rs. Cr	1.11											
	Current Prices	Rs. Cr	1.04											
4	Investment proposed under JNNURM	Rs. Cr	1.04	100% of SI										
5	Overall Funding Pattern (Current Prices)													
	JNNURM Grants - GoI	Rs. Cr	0.42	40% of SI										
	JNNURM Grants - GoM	Rs. Cr	0.10	10% of SI										
	Debt Funding	Rs. Cr	0.52	50% of SI										
	ULB Share	Rs. Cr	-	0% of SI										
B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
C	Sustainability Check	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
1	Surplus-CB	-4,247	-6,426	-8,584	-11,623	-14,623	-17,576	-20,491	-23,356	-26,457	-29,474	-32,382	-35,147	-37,727

Financial Operating Plan

Vasai Municipal Corporation																							
Proposed Growth				Income	Expense																		
				Minimum	5%	8%																	
				Maximum	15%	10%																	
														All Figures in Rs. Lakhs									
Head of Account		Current	Proposed Growth	Unit	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			
Opening Balance					139.0	-52.7	-119.6	-2047.7	-4247.4	-6425.6	-8584.2	-11623.2	-14623.1	-17575.7	-20490.7	-23356.3	-26456.7	-29474.4	-32382.3	-35146.6			
I Revenue Receipts																							
A Octroi																							
Sub Total A		NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
B Taxes																							
1	Property Tax/ General Tax				95.0	99.8	131.8	141.9	147.7	151.9	155.4	185.8	192.5	197.5	201.9	206.1	210.3	214.6	218.9	223.3			
2	Water and sewerage Taxes	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
3	Other Taxes	54.03	15.00	%	10.7	12.3	14.1	16.3	18.7	21.5	24.7	28.4	32.7	37.6	43.2	49.7	57.2	65.8	75.6	87.0			
Sub Total B					105.7	112.0	146.0	158.2	166.4	173.4	180.1	214.2	225.2	235.1	245.2	255.9	267.5	280.3	294.5	310.2			
C Non Taxes																							
1	Betterment/ Development Charges	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
2	Income from properties/ building permission/ regularisation etc	28.85	20.00	%	106.5	127.8	153.3	184.0	220.8	264.9	317.9	381.5	457.8	549.4	659.2	791.1	949.3	1139.2	1367.0	1640.4			
3	Water Charges				55.0	63.4	72.5	77.1	80.6	94.7	99.9	104.3	122.5	129.3	134.9	140.4	146.0	151.9	158.0	164.3			
4	Water Connection Fee				0.0	3.7	4.8	5.0	5.2	6.2	6.4	6.7	8.0	8.3	8.6	9.0	9.4	9.7	10.1	10.5			
5	Sewer Charges				0.0	0.0	5.4	14.9	28.6	39.3	46.0	52.5	67.0	76.1	85.2	94.6	104.6	115.3	126.7	138.7			
6	Sewerage Connection Fee				0.0	0.0	10.6	16.9	23.9	9.2	9.8	10.5	12.9	13.8	14.7	15.7	16.7	17.8	18.9	20.1			
7	Others	23.25	15.00	%	24.8	28.6	32.9	37.8	43.4	50.0	57.5	66.1	76.0	87.4	100.5	115.6	132.9	152.8	175.8	202.1			
Sub Total C					186.3	223.4	279.5	335.6	402.5	464.2	537.6	621.5	744.2	864.2	1003.1	1166.3	1358.9	1586.7	1856.4	2176.2			
D Assigned Revenues/ Grants																							
1	Assigned revenues	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
2	State Government grants	9.16	10.00	%	371.5	408.7	449.5	494.5	543.9	598.3	658.1	723.9	796.3	876.0	963.6	1059.9	1165.9	1282.5	1410.8	1551.8			
3	Govt grants	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
4	NSDP grants	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			



	5	SJSRY grants	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	6	Other grants/ contributions	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Sub Total D				371.5	408.7	449.5	494.5	543.9	598.3	658.1	723.9	796.3	876.0	963.6	1059.9	1165.9	1282.5	1410.8	1551.8
		Grand Total Revenue Receipts				663.5	744.1	875.0	988.2	1112.8	1235.8	1375.8	1559.7	1765.7	1975.3	2211.8	2482.1	2792.4	3149.6	3561.7	4038.3
II Revenue Expenditure																					
A Establishment																					
	1	Pay and Allowance to Municipal Staff	9.89	9.89	%	193.9	213.1	234.2	257.3	282.8	310.8	341.5	375.3	412.4	453.2	498.1	547.3	601.5	661.0	726.4	798.3
	2	Pension Benefits	NA	8.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Sub Total A			%	193.9	213.1	234.2	257.3	282.8	310.8	341.5	375.3	412.4	453.2	498.1	547.3	601.5	661.0	726.4	798.3
B Operation & Maintenance																					
	1	Administration & Recovery of taxes	0.39	8.00	%	8.2	8.8	9.5	10.3	11.1	12.0	13.0	14.0	15.1	16.4	17.7	19.1	20.6	22.2	24.0	25.9
	2	Water Supply	12.92	10.00	%	27.3	30.0	33.0	36.3	40.0	44.0	48.4	53.2	58.5	64.4	70.8	77.9	85.7	94.2	103.7	114.0
	3	Sewerage & drainage	NA	8.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	Public health/ safety	5.83	8.00	%	54.1	58.4	63.1	68.2	73.6	79.5	85.8	92.7	100.1	108.1	116.8	126.1	136.2	147.1	158.9	171.6
	5	Construction works/ PWD	24.28	10.00	%	112.6	123.8	136.2	149.8	164.8	181.3	199.4	219.3	241.3	265.4	292.0	321.1	353.3	388.6	427.4	470.2
	6	Street lighting	79.35	10.00	%	54.3	59.8	65.8	72.3	79.6	87.5	96.3	105.9	116.5	128.1	140.9	155.0	170.5	187.6	206.4	227.0
	7	Sanitation/ Conservancy	NA	8.00	%	119.3	128.9	139.2	150.3	162.3	175.3	189.3	204.5	220.9	238.5	257.6	278.2	300.5	324.5	350.5	378.5
	8	Others	36.35	10.00	%	143.3	157.7	173.4	190.8	209.8	230.8	253.9	279.3	307.2	338.0	371.8	408.9	449.8	494.8	544.3	598.7
	9	Phasing of Non debt Liabilities						0.0	0.0	0.0	0.0	0.0									
	10	Additional O&M for new CAPEX		6.00	%		0.0	0.0	0.0	0.7	0.9	1.0	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7
		Bulk Purchase of Water		5.00					303.1	309.9	317.0	1232.8	1261.0	1290.6	1321.8	1354.4	1691.8	1734.6	1779.6	1826.8	1876.4
	11	Contribution to Revolving Fund							0.0	5.8	3.5	1.2	1.2	1.3	1.3	1.2	0.5	0.5	0.5	0.4	0.3
		Sub Total B				519.1	567.4	620.2	981.1	1057.6	1131.9	2121.1	2231.7	2352.1	2482.4	2623.7	3079.3	3252.4	3439.9	3643.0	3863.3
C Debt Servicing																					
	1	Loan Repayment- Old Loans		Refer Annex		30.5	30.5	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3	1909.3
	2	Loan Repayment- New Loans		Refer Annex					0.9	2.0	3.1	3.6	4.0	5.1	6.0	6.9	7.3	7.6	7.9	7.9	7.9
	3	Loan Repayment- MMRDA						39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38	39.38
		Sub Total C				30.5	30.5	1948.6	1949.5	1950.6	1951.8	1952.2	1952.6	1953.8	1954.6	1955.6	1955.9	1956.2	1956.6	1956.6	1956.6
		Grand Total Revenue Expenditure				743.6	811.0	2803.0	3187.9	3291.0	3394.4	4414.8	4559.6	4718.3	4890.3	5077.3	5582.6	5810.1	6057.5	6326.0	6618.2
		Revenue Account Status- Surplus/Deficit				-80.1	-66.9	-1928.1	-2199.7	-2178.2	-2158.6	-3039.0	-2999.9	-2952.6	-2915.0	-2865.5	-3100.5	-3017.7	-2907.9	-2764.3	-2579.9

I Capital Receipts																				
	1	Loans- Existing			0.0															
	2	Regular Grants	6.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	New Loans	Refer Annex					10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1
	4	New Grants	Refer Annex					10.1	13.1	13.9	4.9	5.0	5.3	5.1	4.9	2.1	2.1	2.1	1.5	1.1
		Grand Total Capital Receipts			0.0	0.0	0.0	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1
II Capital Expenditure																				
	1	Regular Municipal Capital Works	1.00	% of Regular Grants	111.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	CIP related CAPEX						20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1
		Grand Total Capital Expenditure			111.6	0.0	0.0	20.1	26.2	27.8	9.7	9.9	10.5	10.2	9.8	4.3	4.3	4.3	3.0	2.1
		Capital Account Status-Surplus/Deficit			-111.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Overall Municipal Account Status			-191.7	-66.9	-1928.1	-2199.7	-2178.2	-2158.6	-3039.0	-2999.9	-2952.6	-2915.0	-2865.5	-3100.5	-3017.7	-2907.9	-2764.3	-2579.9
		Closing Balance			-52.7	-119.6	-2047.7	-4247.4	-6425.6	-8584.2	-11623.2	-14623.1	-17575.7	-20490.7	-23356.3	-26456.7	-29474.4	-32382.3	-35146.6	-37726.6
Financial Indicators																				
	1	Operating Ratio			1.1	1.1	3.2	3.2	3.0	2.7	3.2	2.9	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.6
	2	Capital Utilisation Ratio			NA	NA	NA	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	3	Share of Estab. Cost including Terminal Benefits			0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	4	Share of Revenue Spent on Establishment			0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	5	Debt Servicing Cost as % of Revenue Income			0.0	0.0	2.2	2.0	1.8	1.6	1.4	1.3	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.5
	6	Annual Status of Accounts																		
		General Account			-80.1	-66.9	-1928.1	-2199.7	-2178.2	-2158.6	-3039.0	-2999.9	-2952.6	-2915.0	-2865.5	-3100.5	-3017.7	-2907.9	-2764.3	-2579.9
		Capital Deficit			-111.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	7	Overall Municipal Account Status			-191.7	-66.9	-1928.1	-2199.7	-2178.2	-2158.6	-3039.0	-2999.9	-2952.6	-2915.0	-2865.5	-3100.5	-3017.7	-2907.9	-2764.3	-2579.9
	8	Closing Balance			-52.7	-119.6	-2047.7	-4247.4	-6425.6	-8584.2	-11623.2	-14623.1	-17575.7	-20490.7	-23356.3	-26456.7	-29474.4	-32382.3	-35146.6	-37726.6

Appendix V.19 VIRAR

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2011-12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	1,757.05	17.57	7%	5%	% of Capital Cost
2	Sewerage	7,993.00	79.93	34%	5%	% of Capital Cost
3	Roads	5,006.00	50.06	21%	3%	% of Capital Cost
	LA For Roads	-	-	0%	0%	% of Capital Cost
4	Drains	1,618.80	16.19	7%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	670.00	6.70	3%	12%	% of Capital Cost
	LA For SWM Disposal Site	-	-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation	-	-	0%	0%	% of Capital Cost
8	Others- JNNURM	6,674.67	66.75	28%	3%	% of Capital Cost
9	Others- Non-JNNURM	-	-	0%	2%	% of Capital Cost
	Total	23,719.52	237.20			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a.			

B Investment Phasing		Total	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
Percentage		%													
1	Water Supply	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
2	Sewerage	100%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	2%	1%	1%
3	Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
	LA For Roads	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
4	Drains	100%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	5%	3%	2%
5	Street Lights	100%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	3%	2%	2%
6	SWM	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	8%	2%
7	Slums/ Urban poor	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
	LA For Slum Rehabilitation	100%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%	4%
8	Others- JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM	100%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	1%	0%
Sustainable Investment (Current Prices)		Total	Rs. Lakhs												
1	Water Supply	14.5	1.9	4.1	2.6	1.8	2.0	2.1	2.1	1.6	1.0	1.0	1.0	1.0	1.0
2	Sewerage	69.9	8.8	10.3	10.9	12.6	13.3	14.1	14.1	14.1	2.4	2.4	2.4	1.2	1.2
3	Roads	49.0	16.5	17.5	8.7	2.0	2.1	2.2	1.5	1.5	2.2	2.2	2.2	1.5	1.5
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-

4	Drains		13.1	1.8	1.9	4.0	1.7	1.8	1.9	1.9	1.9	1.2	1.2	1.2	0.7	0.5	
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		4.4	0.6	0.8	0.8	0.7	0.7	0.8	0.8	0.6	0.8	0.8	0.8	0.8	0.2	
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM		74.7	14.7	23.3	33.0	1.7	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total		225.6	44.3	57.9	60.0	20.5	20.8	22.1	21.3	20.6	8.6	8.6	8.6	6.2	4.4	
C	Additional O&M		Total	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	
	Sustainable Investment (Current Prices)			Rs. Lakhs													
1	Water Supply		0.7		0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
2	Sewerage		3.5		0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.1	0.1	0.1	0.1	
3	Roads		1.5		0.5	0.5	0.3	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	
	LA For Roads		-		-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains		0.3		0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	Street Lights		-		-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM		0.5		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
	LA For SWM Disposal Site		-		-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor		-		-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation		-		-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM		2.2		0.4	0.7	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	Others- Non-JNNURM		-		-	-	-	-	-	-	-	-	-	-	-	-	
	Total		8.7	-	1.6	2.1	2.1	1.0	1.0	1.0	1.0	1.0	0.4	0.4	0.4	0.3	
D	Funding Pattern																
	Capital Grants' Framework		JNNURM														
	Capital Funding		Total	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	
1	Sustainable Investment (Current)		225.6	44.3	57.9	60.0	20.5	20.8	22.1	21.3	20.6	8.6	8.6	8.6	6.2	4.4	
2	Funding under JNNURM framework		225.6	44.3	57.9	60.0	20.5	20.8	22.1	21.3	20.6	8.6	8.6	8.6	6.2	4.4	
3	Available Capital Grants under JNNURM																
		Gol	40%	of Eligible Investment													
		GoM	20%	of Eligible Investment													
4	Creation of Revolving fund under JNNURM		25%	of Grants													
	Grant Funding		Grant	Total	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
1	Water Supply	60%	8.7	1.2	2.5	1.6	1.1	1.2	1.2	1.2	0.9	0.6	0.6	0.6	0.6	0.6	
2	Sewerage	60%	41.9	5.3	6.2	6.5	7.5	8.0	8.5	8.5	8.5	1.4	1.4	1.4	0.7	0.7	
3	Roads	60%	29.4	9.9	10.5	5.2	1.2	1.3	1.3	0.9	0.9	1.3	1.3	1.3	0.9	0.9	
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	60%	7.8	1.1	1.1	2.4	1.0	1.1	1.1	1.1	1.1	0.7	0.7	0.7	0.4	0.3	
5	Street Lights	60%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	60%	2.7	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.1	
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	60%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	60%	44.8	8.8	14.0	19.8	1.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		135.3	26.6	34.7	36.0	12.3	12.5	13.2	12.8	12.4	5.1	5.1	5.1	3.7	2.6
Availability of Own Resources against Resource Gap																
1	Resource Gap after accounting for Grants			17.7	23.2	24.0	8.2	8.3	8.8	8.5	8.3	3.4	3.4	3.4	2.5	1.7
2	Available Own resources			-37	56	259	90	185	636	-378	-878	-811	-66	1,496	3,385	6,473
3	Contribution from available own sources			0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	Contribution from Own sources			-	-	-	-	-	-	-	-	-	-	-	-	-
Own sources' Funding																
		Total	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	
1	Water Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Sewerage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt Funding																
		Total	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	
	Resource Gap for Debt Funding		17.7	23.2	24.0	8.2	8.3	8.8	8.5	8.3	3.4	3.4	3.4	2.5	1.7	
1	Water Supply	5.8	0.8	1.6	1.0	0.7	0.8	0.8	0.8	0.6	0.4	0.4	0.4	0.4	0.4	0.4
2	Sewerage	28.0	3.5	4.1	4.3	5.0	5.3	5.6	5.6	5.6	0.9	0.9	0.9	0.9	0.5	0.5
3	Roads	19.6	6.6	7.0	3.5	0.8	0.8	0.9	0.6	0.6	0.9	0.9	0.9	0.9	0.6	0.6
	LA For Roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Drains	5.2	0.7	0.8	1.6	0.7	0.7	0.8	0.8	0.8	0.5	0.5	0.5	0.3	0.2	
5	Street Lights	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	SWM	1.8	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.1
	LA For SWM Disposal Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	Slums/ Urban poor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LA For Slum Rehabilitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Others- JNNURM	29.9	5.9	9.3	13.2	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.0
9	Others- Non-JNNURM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	90.2	17.7	23.2	24.0	8.2	8.3	8.8	8.5	8.3	3.4	3.4	3.4	2.5	1.7	
	Total Investment	225.6	44.3	57.9	60.0	20.5	20.8	22.1	21.3	20.6	8.6	8.6	8.6	6.2	4.4	

Sustainability

Virar Municipal Council														
	Option	2.00					P2	18,507						
A	Output						P3	23,720						
1	Investment Need (Constant Prices)	Rs. Cr	237.20											
2	% Sustainable	%	1.00%	% of Investment Need										
3	Sustainable Investment (SI)													
	Constant Prices	Rs. Cr	2.37											
	Current Prices	Rs. Cr	2.26											
4	Investment proposed under JNNURM	Rs. Cr	2.26	100% of SI										
5	Overall Funding Pattern (Current Prices)													
	JNNURM Grants - GoI	Rs. Cr	0.90	40% of SI										
	JNNURM Grants - GoM	Rs. Cr	0.45	20% of SI										
	Debt Funding	Rs. Cr	0.90	40% of SI										
	ULB Share	Rs. Cr	-	0% of SI										
B	Funding Pattern Assumptions													
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
C	Sustainability Check	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
1	Surplus-CB	-1,693	-1,236	-1,693	-1,896	-1,812	-3,357	-4,431	-4,998	-5,001	-4,329	-3,501	-1,682	1,310

Financial Operating Plan

Virar Municipal Council																					
Proposed Growth		Income	Expense																		
	Minimum	5%	8%																		
	Maximum	15%	10%																		
Head of Account		Current	Proposed Growth	Unit	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	
	Opening Balance				255.9	147.0	-37.2	-1235.8	-1693.3	-1895.6	-1812.1	-3356.7	-4431.5	-4997.9	-5000.8	-4328.9	-3501.5	-1682.0	1309.7	5718.8	
I	Revenue Receipts																				
	A Octroi																				
	Sub Total A	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	B Taxes																				
	1 Property Tax/ General Tax				400	347	479	505	523	538	553	664	691	712	732	751	770	789	809	829	
	2 Water and sewerage Taxes	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3 Other Taxes	19.48	15.00	%	173	199	229	263	303	348	401	461	530	609	701	806	927	1,066	1,226	1,409	
	Sub Total B				573	546	708	768	826	887	953	1,125	1,221	1,322	1,432	1,556	1,696	1,855	2,034	2,238	
	C Non Taxes																				
	1 Betterment/ Development Charges	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 Income from properties/ building permission/ regularisation etc	25.23	25.00	%	112	140	175	218	273	341	426	533	666	832	1,040	1,300	1,625	2,031	2,539	3,174	
	3 Water Charges				114	109	124	132	139	164	174	182	215	228	239	250	261	273	285	298	
	4 Water Connection Fee				-	10	13	13	14	17	17	18	22	23	24	25	26	27	29	30	
	5 Sewer Charges				-	-	9	25	49	68	80	91	117	134	150	168	186	206	228	251	
	6 Sewerage Connection Fee				-	-	25	40	58	23	25	26	33	35	38	41	44	47	50	53	
	7 Others	42.67	15.00	%	795	914	1,051	1,209	1,390	1,599	1,839	2,115	2,432	2,797	3,216	3,698	4,253	4,891	5,625	6,469	
	Sub Total C				1,021	1,172	1,397	1,638	1,922	2,211	2,560	2,965	3,484	4,048	4,707	5,482	6,396	7,476	8,756	10,275	
	D Assigned Revenues/ Grants																				
	1 Assigned revenues	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2 State Government grants	23.99	15.00	%	614	707	813	935	1,075	1,236	1,421	1,635	1,880	2,162	2,486	2,859	3,288	3,781	4,348	5,000	
	3 GoI grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4 NSDP grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5 SJSRY grants	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6 Other grants/ contributions	NA	5.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total D				614	707	813	935	1,075	1,236	1,421	1,635	1,880	2,162	2,486	2,859	3,288	3,781	4,348	5,000	
	Grand Total Revenue Receipts				2,208	2,425	2,917	3,341	3,823	4,333	4,935	5,724	6,585	7,532	8,626	9,897	11,380	13,112	15,138	17,513	



II	Revenue Expenditure																				
	A	Establishment																			
	1	Pay and Allowance to Municipal Staff	9.77	9.77	%	117	128	141	155	170	186	205	225	247	271	297	326	358	393	431	474
	2	Pension Benefits	NA	8.00	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total A				%	117	128	141	155	170	186	205	225	247	271	297	326	358	393	431	474
	B	Operation & Maintenance																			
	1	Administration & Recovery of taxes	34.82	10.00	%	74	82	90	99	109	120	132	145	160	175	193	212	234	257	283	311
	2	Water Supply	23.40	10.00	%	615	677	744	819	901	991	1,090	1,199	1,319	1,451	1,596	1,755	1,931	2,124	2,336	2,570
	3	Sewerage & drainage	53.54	10.00	%	1	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4
	4	Public health/safety	204.98	10.00	%	15	16	18	19	21	23	26	28	31	34	38	41	46	50	55	61
	5	Construction works/PWD	29.29	10.00	%	76	84	92	101	111	123	135	148	163	179	197	217	239	263	289	318
	6	Street lighting	26.88	10.00	%	87	96	105	116	128	140	154	170	187	205	226	249	273	301	331	364
	7	Sanitation/Conservancy	53.54	10.00	%	203	223	246	270	297	327	360	396	435	479	527	580	638	701	771	849
	8	Others	12.44	10.00	%	363	400	440	484	532	585	644	708	779	857	942	1,036	1,140	1,254	1,380	1,518
	9	Phasing of Non debt Liabilities						-	-	-	-	-									
	10	Additional O&M for new CAPEX		6.00	%		-	-	-	2	2	2	1	1	1	1	1	1	1	1	1
		Bulk Purchase of Water		5.00				661	676	691	2,691	2,753	2,818	2,885	2,957	3,692	3,786	3,884	3,987	4,095	
	11	Contribution to Revolving Fund						-	15	9	3	3	3	3	3	1	1	1	1	1	
	Sub Total B					1,435	1,578	1,736	2,571	2,793	3,013	5,238	5,553	5,897	6,273	6,682	7,789	8,291	8,840	9,438	10,091
	C	Debt Servicing																			
	1	Loan Repayment-Old Loans		Refer Annex		49	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	Loan Repayment-New Loans		Refer Annex				2	3	6	6	7	9	10	12	13	13	14	14	14	
	3	Loan Repayment-MMRDA						1,292	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,290	1,266	1,264	1,260	1,260	
	Sub Total C					49	49	1,292	1,291	1,293	1,295	1,296	1,297	1,299	1,300	1,302	1,302	1,279	1,277	1,273	1,273
	Grand Total Revenue Expenditure					1,601	1,756	3,169	4,017	4,256	4,495	6,739	7,074	7,443	7,844	8,281	9,417	9,928	10,510	11,143	11,838
	Revenue Account Status- Surplus/Deficit					608	669	(252)	(675)	(433)	(161)	(1,804)	(1,350)	(858)	(312)	344	480	1,451	2,601	3,995	5,676
I	Capital Receipts																				
	1	Loans- Existing				-															
	2	Regular Grants		6.00	%	255	215	228	242	257	272	288	306	324	343	364	386	409	434	460	487
	3	New Loans		Refer Annex				18	23	24	8	8	9	9	8	3	3	3	2	2	
	4	New Grants		Refer Annex				27	35	36	12	12	13	13	12	5	5	5	4	3	
	Grand Total Capital Receipts					255	215	228	286	315	332	309	326	346	365	385	394	418	442	466	492

II Capital Expenditure																					
	1	Regular Municipal Capital Works	10.00	% of Regular Grants	971	1,069	1,175	24	26	27	29	31	32	34	36	39	41	43	46	49	
	2	CIP related CAPEX						44	58	60	21	21	22	21	21	9	9	9	6	4	
Grand Total Capital Expenditure					971	1,069	1,175	69	84	87	49	51	54	56	57	47	49	52	52	53	
Capital Account Status-Surplus/Deficit					(716)	(853)	(947)	218	231	245	260	275	292	309	328	347	368	390	414	438	
Overall Municipal Account Status					(109)	(184)	(1,199)	(458)	(202)	83	(1,545)	(1,075)	(566)	(3)	672	827	1,820	2,992	4,409	6,114	
Closing Balance					147	(37)	(1,236)	(1,693)	(1,896)	(1,812)	(3,357)	(4,431)	(4,998)	(5,001)	(4,329)	(3,501)	(1,682)	1,310	5,719	11,833	
Financial Indicators																					
	1	Operating Ratio			0.7	0.7	1.1	1.2	1.1	1.0	1.4	1.2	1.1	1.0	1.0	1.0	0.9	0.8	0.7	0.7	
	2	Capital Utilisation Ratio			3.8	5.0	5.1	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
	3	Share of Estab.Cost including Terminal Benefits			0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	4	Share of Revenue Spent on Establishment			0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	5	Debt Servicing Cost as % of Revenue Income			0	0.0	0.0	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	
	6	Annual Status of Accounts																			
		General Account			608	669	(252)	(675)	(433)	(161)	(1,804)	(1,350)	(858)	(312)	344	480	1,451	2,601	3,995	5,676	
		Capital Deficit			(716)	(853)	(947)	218	231	245	260	275	292	309	328	347	368	390	414	438	
	7	Overall Municipal Account Status			(109)	(184)	(1,199)	(458)	(202)	83	(1,545)	(1,075)	(566)	(3)	672	827	1,820	2,992	4,409	6,114	
	8	Closing Balance			147	(37)	(1,236)	(1,693)	(1,896)	(1,812)	(3,357)	(4,431)	(4,998)	(5,001)	(4,329)	(3,501)	(1,682)	1,310	5,719	11,833	

Appendix V.20 BADLAPUR

II. CAPEX

A CIP - Sector wise (Rs. Lakhs)						
	Sector	Investment Need by 2011- 12	Sustainable Base Cost (2005-06 Prices)	% Investment	O&M on New CAPEX	
1	Water Supply	775	318	4%	5%	% of Capital Cost
2	Sewerage	5,135	2,105	28%	5%	% of Capital Cost
3	Roads	3,262	1,337	18%	3%	% of Capital Cost
	LA For Roads		-	0%	0%	% of Capital Cost
4	Drains	4,109	1,685	23%	2%	% of Capital Cost
5	Street Lights	-	-	0%	8%	% of Capital Cost
6	SWM	570	234	3%	12%	% of Capital Cost
	LA For SWM Disposal Site		-	0%	0%	% of Capital Cost
7	Slums/ Urban poor	-	-	0%	2%	% of Capital Cost
	LA For Slum Rehabilitation		-	0%	0%	% of Capital Cost
8	Others- JNNURM	4,350	1,783	24%	3%	% of Capital Cost
9	Others- Non-JNNURM		-	0%	2%	% of Capital Cost
	Total	18,201	7,462			
1	Physical Contingency & Technical Assistance	10%	of Base Project Cost			
2	Cost Escalation Factor	6%	% p.a			

B Investment Phasing		Total	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
Percentage		%													
1	Water Supply	104%	8%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%
2	Sewerage	106%	8%	10%	11%	11%	12%	12%	12%	12%	12%	2%	2%	1%	1%
3	Roads	105%	8%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	2%	2%
	LA For Roads	105%	8%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	2%	2%
4	Drains	103%	8%	10%	10%	20%	8%	8%	8%	8%	8%	5%	5%	3%	2%
5	Street Lights	105%	8%	30%	30%	14%	3%	3%	3%	2%	2%	3%	3%	2%	2%
6	SWM	100%	8%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	2%
	LA For SWM Disposal Site	100%	8%	8%	10%	10%	8%	8%	8%	8%	6%	8%	8%	8%	2%
7	Slums/ Urban poor	104%	8%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%
	LA For Slum Rehabilitation	104%	8%	10%	20%	12%	8%	8%	8%	8%	6%	4%	4%	4%	4%
8	Others- JNNURM	107%	8%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	0%
9	Others- Non-JNNURM	107%	8%	20%	30%	40%	2%	1%	1%	1%	1%	1%	1%	1%	0%

		Total	Rs. Lakhs													
Sustainable Investment (Current Prices)																
1	Water Supply	266	28	37	79	50	35	37	37	37	28	19	19	19	19	
2	Sewerage	1,743	185	245	286	303	351	372	372	372	372	62	62	31	31	
3	Roads	1,442	118	468	496	245	56	59	59	39	39	59	59	39	39	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	1,380	148	196	208	441	187	198	198	198	198	124	124	74	50	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	155	21	22	29	31	26	28	28	28	21	28	28	28	7	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	2,244	157	416	661	935	50	26	26	26	26	26	26	26	-	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	7,231	657	1,384	1,759	2,005	705	721	721	701	685	318	318	217	146	
C Additional O&M		Total	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	
Sustainable Investment (Current Prices)			Rs. Lakhs													
1	Water Supply	13	1	2	4	2	2	2	2	2	2	1	1	1	1	
2	Sewerage	87	9	12	14	15	18	19	19	19	19	3	3	2	2	
3	Roads	43	4	14	15	7	2	2	2	1	1	2	2	1	1	
	LA For Roads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Drains	28	3	4	4	9	4	4	4	4	4	2	2	2	1	
5	Street Lights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	SWM	19	2	3	3	4	3	3	3	3	3	2	3	3	3	
	LA For SWM Disposal Site	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Slums/ Urban poor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	LA For Slum Rehabilitation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	Others- JNNURM	67	5	12	20	28	1	1	1	1	1	1	1	1	1	
9	Others- Non-JNNURM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total	257	24	47	61	66	29	30	30	30	30	28	12	12	9	
D Funding Pattern																
Capital Grants' Framework		JNNURM														
Capital Funding		Total	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	
1	Sustainable Investment (Current)	7,231	657	1,384	1,759	2,005	705	721	721	701	685	318	318	217	146	
2	Funding under JNNURM framework	7,231	657	1,384	1,759	2,005	705	721	721	701	685	318	318	217	146	
3	Available Capital Grants under JNNURM	0	of Eligible Investment													
		0	of Eligible Investment													
4	Creation of Revolving fund under JNNURM	0	of Grants													
Grant Funding		Grant	Total	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
1	Water Supply	50%	133	14	19	39	25	18	19	19	19	14	9	9	9	9
2	Sewerage	50%	872	93	123	143	152	175	186	186	186	186	31	31	15	15
3	Roads	50%	721	59	234	248	123	28	30	30	20	20	30	30	20	20
	LA For Roads	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains	50%	690	74	98	104	221	94	99	99	99	99	62	62	37	25
5	Street Lights	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-

6	SWM	50%	78	10	11	14	15	13	14	14	14	10	14	14	14	3
	LA For SWM Disposal Site	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor	50%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM	50%	1,122	78	208	331	467	25	13	13	13	13	13	13	13	-
9	Others- Non-JNNURM	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		3,615	328	692	880	1,003	352	360	360	350	342	159	159	109	73
Availability of Own Resources against Resource Gap																
1	Resource Gap after accounting for Grants			328	692	880	1,003	352	360	360	350	342	159	159	109	73
2	Available Own resources			618	1,037	1,451	925	684	515	470	513	482	572	821	1,268	1,945
3	Contribution from available own sources			0	0	0	0	0	0	0	-	-	-	-	-	-
4	Contribution from Own sources			124	104	145	92	205	154	141	-	-	-	-	-	-
Own sources' Funding			Total	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
1	Water Supply		35	5	3	6	2	10	8	7	-	-	-	-	-	-
2	Sewerage		273	35	18	24	14	102	80	73	-	-	-	-	-	-
3	Roads		138	22	35	41	11	16	13	12	-	-	-	-	-	-
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		177	28	15	17	20	54	42	39	-	-	-	-	-	-
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		23	4	2	2	1	8	6	5	-	-	-	-	-	-
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		178	30	31	55	43	14	6	5	-	-	-	-	-	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		824	124	104	145	92	205	154	141	-	-	-	-	-	-
Debt Funding			Total	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
Resource Gap for Debt Funding				205	588	734	910	147	206	219	350	342	159	159	109	73
1	Water Supply		98	9	16	33	23	7	11	11	19	14	9	9	9	9
2	Sewerage		599	58	104	120	138	73	106	113	186	186	31	31	15	15
3	Roads		583	37	199	207	111	12	17	18	20	20	30	30	20	20
	LA For Roads		-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Drains		513	46	83	87	200	39	57	60	99	99	62	62	37	25
5	Street Lights		-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	SWM		55	6	9	12	14	5	8	8	14	10	14	14	14	3
	LA For SWM Disposal Site		-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Slums/ Urban poor		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	LA For Slum Rehabilitation		-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others- JNNURM		944	49	177	276	424	10	8	8	13	13	13	13	13	-
9	Others- Non-JNNURM		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total		2,791	205	588	734	910	147	206	219	350	342	159	159	109	73
Total Investment			7,231	657	1,384	1,759	2,005	705	721	721	701	685	318	318	217	146

Sustainability

Badlapur Municipal Council							
	Option		2.00			P2	17,341.93
A	Output					P3	18,200.51
1	Investment Need (Constant Prices)	Rs. Cr	182.01				
2	% Sustainable	%	41.00%	% of Investment Need			
3	Sustainable Investment (SI)						
	Constant Prices	Rs. Cr	74.62				
	Current Prices	Rs. Cr	72.31				
4	Investment proposed under JNNURM	Rs. Cr	72.31	100% of SI			
5	Overall Funding Pattern (Current Prices)						
	JNNURM Grants - GoI	Rs. Cr	28.92	40% of SI			
	JNNURM Grants - GoM	Rs. Cr	7.23	10% of SI			
	Debt Funding	Rs. Cr	27.91	39% of SI			
	ULB Share	Rs. Cr	8.24	11% of SI			

B Funding Pattern Assumptions														
1	Funding Program	JNNURM												
2	Contribution to Revolving Fund	25%												
		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
3	Utilisation of Own resources	20%	10%	10%	10%	30%	30%	30%	10%	10%	10%	10%	10%	10%
C	Sustainability Check	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
1	Surplus-CB	430	820	1,129	579	212	62	-8	126	34	126	378	835	1,519

	4	NSDP grants	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	5	SJSRY grants	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	6	Other grants/ contributions	NA	5.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Sub Total D					268.9	309.3	355.7	409.0	470.4	540.9	622.1	715.4	822.7	946.1	1088.0	1251.2	1438.8	1654.7	1902.9	2188.3	2516.5
	Grand Total Revenue Receipts					1732.2	1749.7	2256.4	2540.7	2835.2	3017.0	3288.3	3664.9	4074.0	4449.2	4856.2	5304.8	5801.5	6352.9	6965.9	7648.0	8407.9
II	Revenue Expenditure																					
	A Establishment																					
	1	Pay and Allowance to Municipal Staff	20.98	10.00	%	329.3	362.3	398.5	438.3	482.2	530.4	583.4	641.8	705.9	776.5	854.2	939.6	1033.5	1136.9	1250.6	1375.7	1513.2
	2	Pension Benefits	NA	8.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Sub Total A				%	329.3	362.3	398.5	438.3	482.2	530.4	583.4	641.8	705.9	776.5	854.2	939.6	1033.5	1136.9	1250.6	1375.7	1513.2
	B Operation & Maintenance																					
	1	Administration & Recovery of taxes	45.54	10.00	%	108.9	119.7	131.7	144.9	159.4	175.3	192.8	212.1	233.3	256.7	282.3	310.6	341.6	375.8	413.4	454.7	500.2
	2	Water Supply	-12.21	8.00	%	20.1	21.7	23.5	25.3	27.4	29.5	31.9	34.5	37.2	40.2	43.4	46.9	50.6	54.7	59.1	63.8	68.9
	3	Sewerage & drainage	NA	8.00	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	Public health/ safety	27.19	10.00	%	24.1	26.5	29.1	32.0	35.2	38.7	42.6	46.9	51.6	56.7	62.4	68.6	75.5	83.1	91.4	100.5	110.6
	5	Construction works/ PWD	61.34	10.00	%	49.6	54.5	60.0	66.0	72.6	79.9	87.9	96.6	106.3	116.9	128.6	141.5	155.6	171.2	188.3	207.1	227.9
	6	Street lighting	31.28	10.00	%	233.3	256.6	282.3	310.5	341.6	375.7	413.3	454.7	500.1	550.1	605.1	665.7	732.2	805.4	886.0	974.6	1072.1
	7	Sanitation/ Conservancy	NA	8.00	%	141.5	152.8	165.0	178.2	192.5	207.9	224.5	242.5	261.9	282.9	305.5	329.9	356.3	384.8	415.6	448.9	484.8
	8	Others	28.78	10.00	%	286.8	315.4	347.0	381.7	419.8	461.8	508.0	558.8	614.7	676.2	743.8	818.2	900.0	990.0	1089.0	1197.9	1317.7
	9	Phasing of Non debt Liabilities						0.0	0.0	0.0	0.0	0.0										
	10	Additional O&M for new CAPEX		6.00	%		0.0	0.0	0.0	24.3	47.2	60.6	65.6	29.3	30.3	32.1	34.0	36.1	38.2	40.5	43.0	45.6
		Bulk Purchase of Water		5.00				291.9	298.5	305.4	1187.4	1214.6	1243.2	1273.1	1304.6	1629.6	1670.8	1714.1	1759.6	1807.4	1897.7	
	11	Contribution to Revolving Fund						0.0	255.1	219.9	250.7	88.1	90.1	90.1	87.6	85.6	39.7	39.7	27.2	18.2	0.0	
	Sub Total B					864.2	947.4	1038.6	1430.7	1826.5	1941.4	2999.8	3014.3	3167.7	3373.2	3595.5	4130.5	4358.5	4657.1	4970.0	5316.0	5725.2
	C Debt Servicing																					
	1	Loan Repayment- Old Loans			Refer Annex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	Loan Repayment- New Loans			Refer Annex		0.0	0.0	17.4	67.4	129.9	207.2	219.7	251.0	290.7	340.2	401.6	411.5	425.4	425.4	425.4	0.0
	3	Loan Repayment- MMRDA						46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	35.1	17.8	7.8	0.0	
	Sub Total C					0.0	0.0	46.7	64.1	114.1	176.5	253.9	266.4	297.7	337.4	386.9	448.2	446.6	443.1	433.2	425.4	0.0
	Grand Total Revenue Expenditure					1193.5	1309.6	1483.7	1933.0	2422.7	2648.3	3837.1	3922.5	4171.3	4487.1	4836.6	5518.4	5838.7	6237.1	6653.8	7117.0	7238.4

	Revenue Account Status-Surplus/Deficit				538.7	440.1	772.7	607.7	412.5	368.7	-548.8	-257.6	-97.4	-37.8	19.7	-213.6	-37.2	115.8	312.1	531.0	1169.5
I	Capital Receipts																				
	1	Loans- Existing			0.0																
	2	Regular Grants	6.00	%	0.0	75.4	79.9	84.7	89.8	95.2	100.9	107.0	113.4	120.2	127.4	135.0	143.1	151.7	160.8	170.5	180.7
	3	New Loans	Refer Annex		0.0	0.0	204.8	588.5	734.5	910.1	147.2	205.9	219.2	350.4	342.3	158.8	158.8	108.6	72.8	0.0	
	4	New Grants	Refer Annex		0.0	0.0	328.3	692.2	879.5	1002.6	352.3	360.3	360.3	350.4	342.3	158.8	158.8	108.6	72.8	0.0	
		Grand Total Capital Receipts			0.0	75.4	79.9	617.9	1370.5	1709.2	2013.7	606.4	679.6	699.7	828.2	819.7	460.7	469.2	378.1	316.0	180.7
II	Capital Expenditure																				
	1	Regular Municipal Capital Works	10.00	% of Regular Grants	550.1	605.1	665.6	8.5	9.0	9.5	10.1	10.7	11.3	12.0	12.7	13.5	14.3	15.2	16.1	17.0	18.1
	2	CIP related CAPEX						656.7	1384.5	1759.0	2005.2	704.5	720.5	720.5	700.9	684.6	317.5	317.5	217.2	145.6	0.0
		Grand Total Capital Expenditure			550.1	605.1	665.6	665.1	1393.5	1768.6	2015.3	715.2	731.9	732.6	713.6	698.1	331.8	332.7	233.3	162.6	18.1
		Capital Account Status-Surplus/Deficit			-550.1	-529.7	-585.7	-47.3	-22.9	-59.4	-1.7	-108.8	-52.3	-32.9	114.7	121.5	128.8	136.6	144.7	153.4	162.6
		Overall Municipal Account Status			-11.3	-89.6	187.0	560.4	389.6	309.4	-550.5	-366.4	-149.7	-70.7	134.3	-92.1	91.6	252.3	456.9	684.4	1332.1
		Closing Balance			-227.8	-317.4	-130.3	430.1	819.6	1129.0	578.5	212.1	62.5	-8.3	126.0	34.0	125.6	377.9	834.8	1519.2	2851.4
		Financial Indicators																			
	1	Operating Ratio			0.7	0.7	0.7	0.8	0.9	0.9	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
	2	Capital Utilisation Ratio			NA	8.0	8.3	1.1	1.0	1.0	1.0	1.2	1.1	1.0	0.9	0.9	0.7	0.7	0.6	0.5	0.1
	3	Share of Estab.Cost including Terminal Benefits			0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	4	Share of Revenue Spent on Establishment			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	5	Debt Servicing Cost as % of Revenue Income			0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	6	Annual Status of Accounts																			
		General Account			538.7	440.1	772.7	607.7	412.5	368.7	-548.8	-257.6	-97.4	-37.8	19.7	-213.6	-37.2	115.8	312.1	531.0	1169.5
		Capital Deficit			-550.1	-529.7	-585.7	-47.3	-22.9	-59.4	-1.7	-108.8	-52.3	-32.9	114.7	121.5	128.8	136.6	144.7	153.4	162.6
	7	Overall Municipal Account Status			-11.3	-89.6	187.0	560.4	389.6	309.4	-550.5	-366.4	-149.7	-70.7	134.3	-92.1	91.6	252.3	456.9	684.4	1332.1
	8	Closing Balance			-227.8	-317.4	-130.3	430.1	819.6	1129.0	578.5	212.1	62.5	-8.3	126.0	34.0	125.6	377.9	834.8	1519.2	2851.4