Government of Tamil Nadu
Tamil Nadu Urban Development Fund

Business Plan for Sivakasi Municipality

FINAL REPORT

March 2007

Wilbur Smith Associates Private Limited

Abbreviations and Acronyms

BOT	:	Build, Operate and Transfer
BPL	:	Below Poverty Line
BT	:	Bituminous
CAA	:	Constitution Amendment Act
CAGR	:	Compounded Annual Growth Rate
CC	:	Cement Concrete
CCP	:	City Corporate Plan
CMA	:	Chennai Metropolitan Area
CMDA	:	Chennai Metropolitan Development Authority
CMWSSB	:	Chennai Metropolitan Water Supply and Sewerage Board
CPHEEO	:	Central Public Health Environmental Engineering Organization
CSC	:	Community Structure Component
CUA	:	Chennai Urban Agglomeration
DIC	:	District Industries Centre
DPR	:	Detailed Project Report
DWCUA	:	Development of Women and Children in Urban Areas
ELSR	:	Elevated Storage Reservoir
FOP	:	Financial and Operating Plan
FY	:	Financial Year
G.S.T. Road	:	Grand South Trunk Road
gm	:	Grams
GoI	:	Government of India
GoTN	:	Government of Tamil Nadu
gpcd	:	Grams per Capita per Day
GLSR	:	Ground Level Storage Reservoir
ISP	:	Integrated Sanitation Program
Ha	:	Hectares
HH	:	Households
HSC	:	House Service Connection
IPT	:	Intermediate Public Transport
kg	:	Kilograms
LCS	:	Low Cost Sanitation
Lit	:	Litres
LL	:	Lakh Litres
LPA	:	Local Planning Area
lpcd	:	Litres Per Capita Per Day
m	:	Meters
ML	:	Million Litres
MLD	:	Million Litres per Day
MSW	:	Municipal Solid Waste
MT	:	Metric Ton
MTC	:	Metropolitan Transport Corporation
NGO	:	Non-Governmental Organizations
NH	:	National Highway
Nos.	:	Numbers
NSDP	:	National Slum Development Program

O&M	:	Operation and Maintenance
OHT	:	Overhead Tanks
PSP	:	Public Stand Post
PWD	:	Public Works Department
SDBC	:	Semi-Dense Bituminous Concrete
SFC	:	Second Finance Commission
SH	:	State Highway
SI	:	Sanitary Inspector
SJSRY	:	Swarna Jayanti Shehari Rozgaar Yojna
SO	:	Sanitary Officer
Sq. km	:	Square Kilometres
STP	:	Sewage Treatment Plant
SWM	:	Solid Waste Management
TCS	:	Thrift & Credit Societies
TNEB	:	Tamil Nadu Electricity Board
TNRDC	:	Tamil Nadu Road Development Corporation
TNSCB	:	Tamil Nadu Slum Clearance Board
TNUDP	:	Tamil Nadu Urban Development Project
TNUIFSL	:	Tamil Nadu Urban Infrastructure Financial Services Limited
tpd	:	Tons per Day
TWAD	:	Tamil Nadu Water Supply and Drainage Board
UGD	:	Underground Drainage
ULB	:	Urban Local Body
USEP	:	Urban Self Employment Program
UST	:	Urban Skill Training
UWEP	:	Urban Wage Employment Program
VAMBAY	:	Valmiki Ambedkar Awas Yojana
W	:	Watts
WBM	:	Water Bound Macadam

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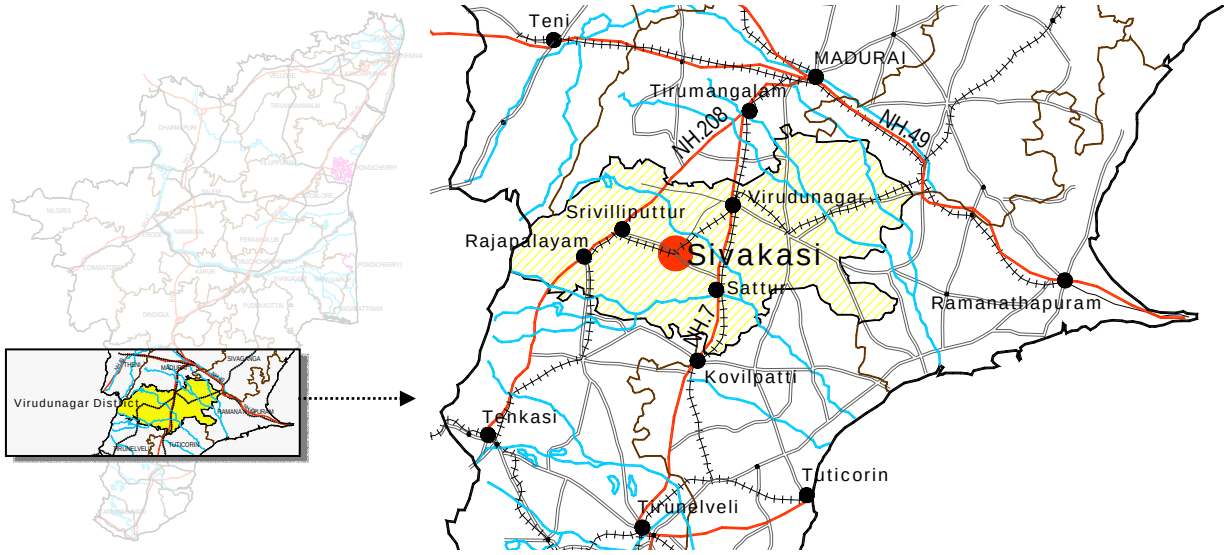
I. BACKGROUND

A. Profile of Sivakasi

1. Sivakasi, one of the oldest settlements in Tamilnadu and it is renowned for its firecrackers and printing industry. The town is located in Virudunagar district and is situated at a distance of 74 Km south of Madurai. Sivakasi is a selection grade municipality with a population of 72,710 as per census 2001. The municipality is spread over an area of 6.89 sq. km. Though the town is not on any of the National Highways, it is connected through State Highways with Madurai, Virudunagar, Srivilliputtur and other important activity canters in Tamilnadu.

2. Firecrackers' manufacture, printing industry and match manufacturing industry led to a spurt in the industrial activities during 1971-1991. The emergence of these activities led to the clustering of the residential neighbourhoods close to the industrial and commercial activities. The linkage and connective shown in **Figure 1.1.**

Figure 1.1: Linkage and connectivity



1. Objectives of the Study

3. The main objective for the City Corporate Plan was emphasizes on issues of priority local concerns for liveability, and the implied requirements in terms of

   (i) Enhancing City Productivity
   (ii) Reducing Poverty
   (iii) Improving Management
   (iv) Enhancing Financial Sustainability

4. The objective of the assignment is to formulate a Business Plan comprising of appropriate policies and actions that are practically implementable to accomplish the objectives of the

City Corporate Plan.

2. Scope of Work

5. The scope of services for converting City Corporate Plan to Business Plan broadly covers the following areas.

(i) Financial Assessment of Urban Local Bodies;
(ii) Assess levels of service, coverage and quality of municipal services in both poor and non-poor localities;
(iii) Outline issues in revenue realisations, quality of existing assets in relation to service levels and coverage, and institutional constraints;
(iv) Prepare a Financial and Operating Plan (FOP);
(v) Indicate and assess areas for expenditure reduction, revenue mobilisation and management;
(vi) Prepare a draft Memorandum of Understanding between Urban Local Body and TNUIFSL for effective implementation and monitoring of the Business Plan;
(vii) Initiate consultations with council and local stakeholders on the priorities;
(viii) Finalise Business Action Plan for the City, with a resolution from the council on the priorities and commitment to implement revenue and management improvement measures;
(ix) Identify the obligations on the part of the Urban Local Body / Tamil Nadu Urban Infrastructure Financial Service Limited / Tamil Nadu Urban Development Fund / Government for successful implementation of the Business Plan;
(x) Prepare a draft Memorandum of Understanding between ULB and TNUIFSL for effective implementation and monitoring of the Business Plan. The MoU will outline the base line (based on the Situation Analysis) and the Performance Benchmarks to be monitored, apart from other financial and loan covenants. The targets will be based on service development targets and outputs of the financial and operating plan.

B. City Corporate cum Business Plan

6. The corporate plan is a strategic plan, which sets out in detail the policy and investment options. The plan sets out baseline for the performance of the municipality, its priorities and aims for future. The Business Plan is the tool to implement projects and reforms to be under taken by the Urban Local Body. In addition, the Business Plan would formulate strength for additional resource mobilization to enhance the credit worthiness of the Urban Local Body.

1. City Corporate cum Business Planning Approach

7. The approach of the Corporate Plan cum Business Plan is iterative in nature and is presented in Figure 1.2

8. For the formulation of the City Corporate Plan, the future vision of the city was developed through a participatory approach, initiated in July 2002. Public Consultations were

conducted at the town level with the Municipal Councillors, officials, and line agencies and identified stakeholders. The process is iterative and would enable the Sivakasi Municipality review its outcomes through a series of indicators so as to make the process dynamic and in tune with the felt needs and requirements

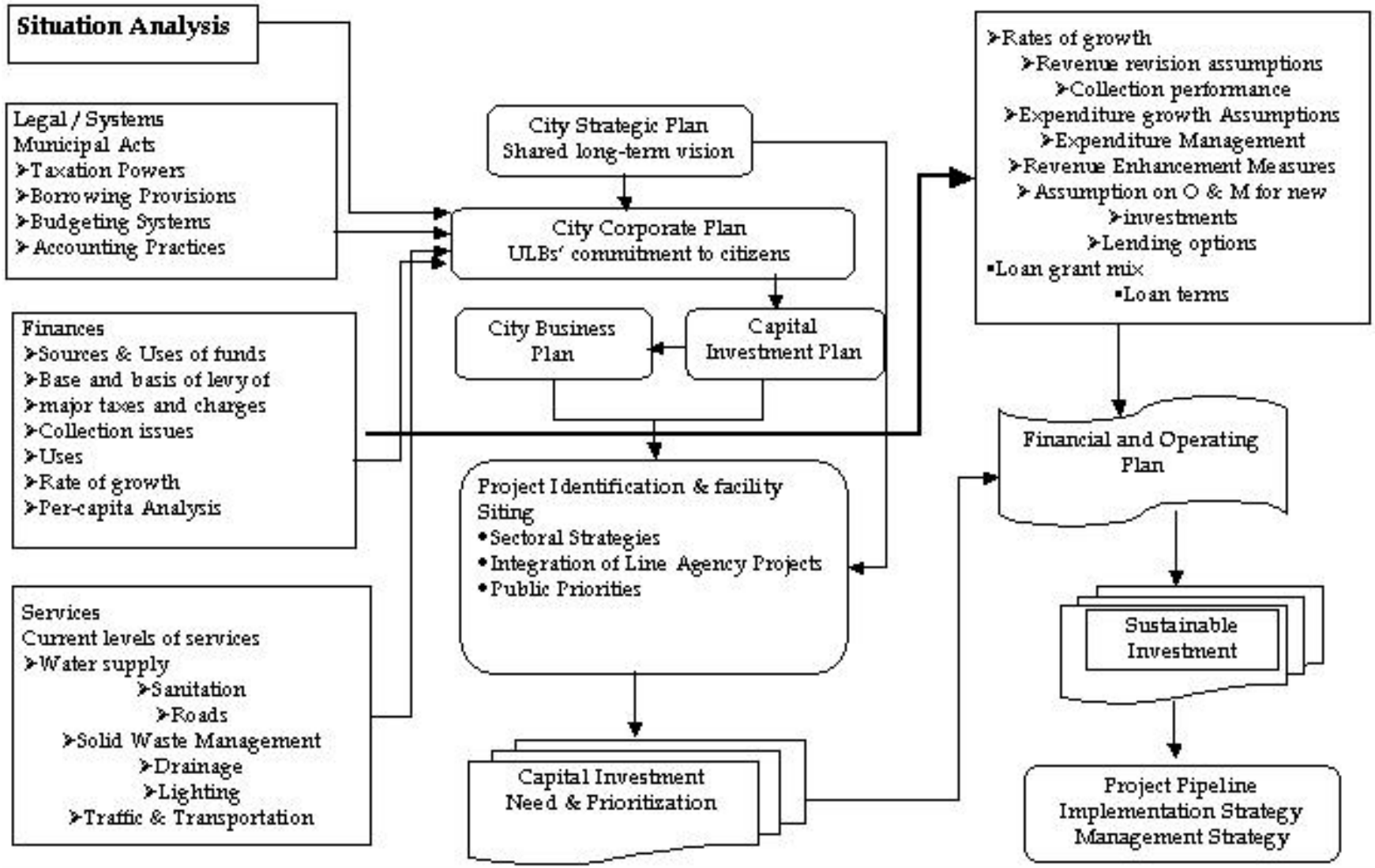
2. Source of Data

9. A varied list of organizations apart from Sivakasi municipality were consulted for putting together the data presented in the report and used for analysis by the consultants through the City Corporate cum Business Plan preparation process.

10. The census data for the town is made available by the Directorate of Census Operations Tamilnadu. Institutions and organizations like Directorate of Town and Country Planning, Directorate of Industries Centre, Tamil Nadu Water and Drainage board, Indian Medical Association, Local Non – Governmental Organizations. Private organizations etc have provided the necessary data for the respective services.

11. The municipality has provided the necessary data with respect to infrastructure at the ward level. This was instrumental in preparation of the Business Plan, which includes Capital Investment Program (CIP) for the municipality and prioritizing the needs at the local level.

Figure 1.2: Approach to Business Plan



C. Vision for Sivakasi Town

12. The vision for the town is to achieve high-class service levels and afforded standard of living for the citizens of Sivakasi. The town development should achieve standards of Japan to become Sivakasi as little Japan. Specific goals and service outcomes have been framed and presented in **Table 1.1** below, with this vision in mind.

Table 1.1: Goals and Service Outcomes

Sr. No	Goal	2011	2016	2026
A. Water Supply				
1	Network cover for general households	100%	100%	100%
2	Network cover for Slum households	100%	100%	100%
3	Per Capita Supply	90 lpcd	130 lpcd	
4	Hours of supply			24 hours / daily
6	Un accounted water	20%	15%	12%
7	O&M Cost Recovery	100%	100%	100%
8	Collection Efficiency	100%	100%	100%
9	Customer Satisfaction	Good	Good	Good
B. Sewerage				
1	Coverage (Access)	100%	100%	100%
2	Treatment and Disposal	100%	100%	100%
3	Recycling and Reuse	25%	40%	50%
4	Customer Satisfaction	Good	Good	Good
C. Storm Water Drain and Water Bodies				
Macro Drainage				
	Flood Alleviation Recommendation	100%		
Micro Drainage				
	Storm Water Drains	100%	100%	100%
D. Solid Waste Management				
1	Collection with in the Town	100%	100%	100%
2	Door to Door Collection - %	100%	100%	100%
3	Source Segregation - %	75%	100%	100%
4	Collection - %	90%	100%	100%
5	Scientific Disposal	80%	100%	100%
6	Waste to Energy Generation		50%	100%
7	Cost Recovery of O & M -%	50%	75%	100%
8	Private Sector Participation	Modest protocols in place	Complete in the Disposal	Complete in the Disposal
E. Traffic and Transportation				
1	Road Network as % of Total Area	12%	15%	15%
2	Average Speed -km/’h with in the town	20	30	35

Sr. No	Goal	2011	2016	2026
3	Sidewalks length to Total road length	Half of the requirement	75% of the requirement	95% of the requirement
4	Road accidents	Reduced by 25%	Reduced by 50%	Reduced by 70%
Roads Coverage				
1	Municipality	80%	100%	100%
Safety				
1	To reduce traffic accidents by traffic management measures With in the Town	100%	100%	100%
Parking				
1	Construction of parking complexes at proposed locations	100%	100%	100%
Decongestion				
1	Development of Outer Ring Road	100%		
F. Street Lighting				
1	Energy saving mechanisms	80%	100%	100%
2	Adequate lighting in Non-lit areas	80%	100%	100%
G. Poverty Alleviation				
1	Network Coverage for slum households	90%	95%	100%
2	UGD coverage for slum households	60%	100%	100%
3	Adequately lit slums	100%	100%	100%
4	Adequate road link for the slums	100%	100%	100%
5	Pucca houses for all slum households	80%	100%	100%
6	Education for all in slums	100%	100%	100%

D. Report Structure

13. This report is the Final Report and comprises of following structure:

(i) Chapter 1 the current section detailing the project objective and the scope of work of the project. Approach to the City Corporate Plan.
(ii) Chapter 2 gives the profile of the ULB and in terms of its demographic characteristics, past trends and growth, population projections and future trends;
(iii) Chapter 3 deals with urban management, the institutions involved structure of ULB -its political and executive wings. The chapter also outlines the reform agenda currently undertaken by the municipality;
(iv) Chapter 4 elaborates planning and land use management and its growth directions of the town.
(v) Chapter 5 detailed on existing situation of infrastructure services, coverage, gaps, and issues confronting the same.

(vi) Chapter 6 presents the fiscal situation of the Sivakasi Municipality

(vii) Chapter 7 deals with urban poverty including slums, demographic and socio-economic characteristics, availability of infrastructure services and gaps in the provision and delivery of services. Housing for urban poor is also discussed in this chapter;

(viii) Chapter 8 describes vision and sectoral strategies for the different infrastructure, facilities for the town along with the proposed interventions and costing for each of the sector.

(ix) Chapter 9 will deal with the elements that are essential in an asset management program for movable and immovable infrastructure. More specifically road networks, sidewalks, water supply networks, pumping, storage, treatment facilities and storm water drains.

(x) Chapter 10 deals with revenue generation through the non-traditional sources with minimum investment s and the enormous scope to control expenditure.

(xi) Chapter 11 describes Capital Investment Plan and Financial Operating Plan and sustainability of the proposed interventions including the suggested reforms to enhance the municipal revenues.

(xii) Chapter 12 outlines the various best practices world over regarding good urban governance. The strategies presented in this chapter, are an integrated whole and none of them can be seen are understood in an isolated section.

II. CITY DEMOGRAPHY

A. Geography and Climate

14. Location & Transport Linkage: Sivakasi is a major manufacturing centre for fireworks and printing works and do not have satisfactory connections with other major centers in the region. The rail link from Kollam in Kerala to Madurai passes through Sivakasi. State highways connect the town with Virudunagar, Srivilliputtur and Sattur. State Highway to Sattur meets the NH 7 about 16 km away.

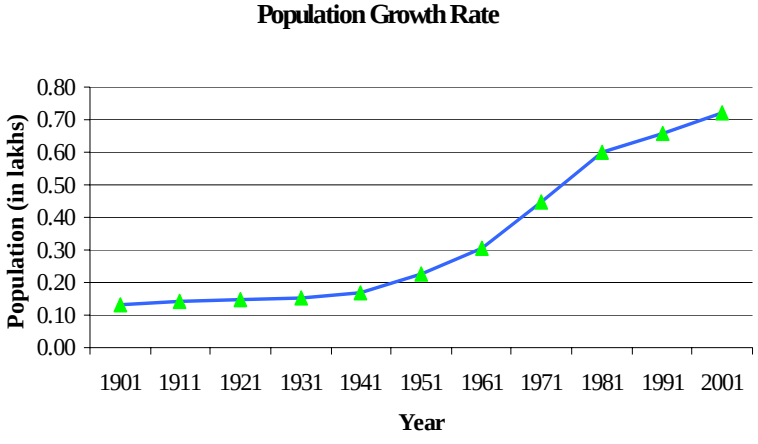
15. Physical & Geographical Character: The town is to the east of the Western Ghats and spreads towards the western side of Sattur. The topography of the town is almost plain and with gentle slope from West towards South-East. No major geological formations are observed in and around the town. Minerals of any specific importance are not available near this town. The town consist of black and red soils and is suited for the cultivation of cotton, chillies and millets. Ground water in the town is found in depths of 200 to 300 ft. The area is poor in ground water resources and hence dry crops like cotton, chillies, millets etc. are only grown. Bore wells and hand pumps in the town draw considerable amount of water but from a depth of 250 ft.

16. Climate & Rainfall: The climate of Sivakasi town is hot and dry and the temperatures range between a maximum of 39 ^{0}C to a minimum of 23 ^{0}C. April to June will be the hottest months and the lowest temperatures are recorded during the months of December and January. Temperatures start rising towards the end of February. The mean annual average rainfall for the district and the town is about 941 mm, which is much less than the state's average of 1008 mm. The town receives majority of the rainfall during the North-East monsoon in the months of October to December and for a short period between December and February.

B. Population Trends and Urbanization

17. Sivakasi is one of the largest municipalities in Virudunagar district and has a total population of 72,170 persons (Census 2001). The town experienced high growth rates in the range of 35 percent to 46 percent during the period 1951-1981. However, the growth rates have come down to around 10

Figure 2.1: Population Growth Rate



percent during the period 1981-2001 indicating stabilization of population growth. The growth rate declined to 9.64 percent during 1981-91 from a high of 46 percent during 1961-71. A marginal increase in growth rate over the previous decade is noticed during 1991-2001 at 10.03 percent. The decadal population growth rate is presented in **Table 2.1.** The population Growth curve is shown in **Figure 2.1**.

Table 2.1: Municipal Population and Growth Rate

Year	Population	Growth Rate
		(Decadal - %)-
1901	13,021	-
1911	14,022	7.69
1921	14,617	4.24
1931	15,212	4.07
1941	16,676	9.62
1951	22,674	35.97
1961	30,690	35.35
1971	44,883	46.25
1981	59,827	33.30
1991	65,593	9.64
2001	72,170	10.03

Source: Census of India

1. Density Pattern

18. The municipality comprises of 33 administrative wards (Presented in Map: 2.1) and the density varies in each of the wards. The overall density of the town increased from 9,646 persons/ sq.km in 1991 to 10,613 persons/ sq.km in 2001. Transport corridors along the state highways and other district roads connecting with Virudunagar, Sattur, Srivilliputtur and Vembakottai to the town guide the density pattern of the town. The wards along these corridors have witnessed an increased residential and commercial activity. The core area of Sivakasi is most dense with densities above 50,000 persons/ sq.km. The area-wise and ward wise density pattern is tabulated in Table: 2.2 and 2.3.

Table 2.2: Town Level Density

Year	Area	Population	Density
	Sq. Km		*Per/ Sq. Km*
1971	2.64	44,883	6,600
1981	6.65	59,827	8,798
1991	6.65	65,593	9,646
2001	6.65	72,170	10,613

Source: Analysis

19. Density patterns for each of the wards are analyzed to understand the incidence of developmental activities. The densities are dependent mainly on the following factors like connectivity and infrastructure. Ward level density is furnished in Appendix I. accordingly. The pattern of population densities within the town is illustrated in Map 2.2. Wards 2 and 4 have the highest densities and can be attributed to the presence of slums viz., Anna Colony in ward 2, Parasakhti colony in ward 4. The densities are above 80,000 persons/ sq.km

Table 2.3: Ward Wise Density Pattern - 2001

Si. No.	Ward Number	Density
		Per/ Sq. Km
1	28,29,2,4	>20,000
2	11,16,17,18,19	15,001 – 20,000
3	30,6,9,10,25,15,23,13,21,32,20,14	10,001 – 15,000
4	12,5,31,27,24	5,001 – 10,000
5	3,8,26,1,7,22	<5,000

Source: Analysis

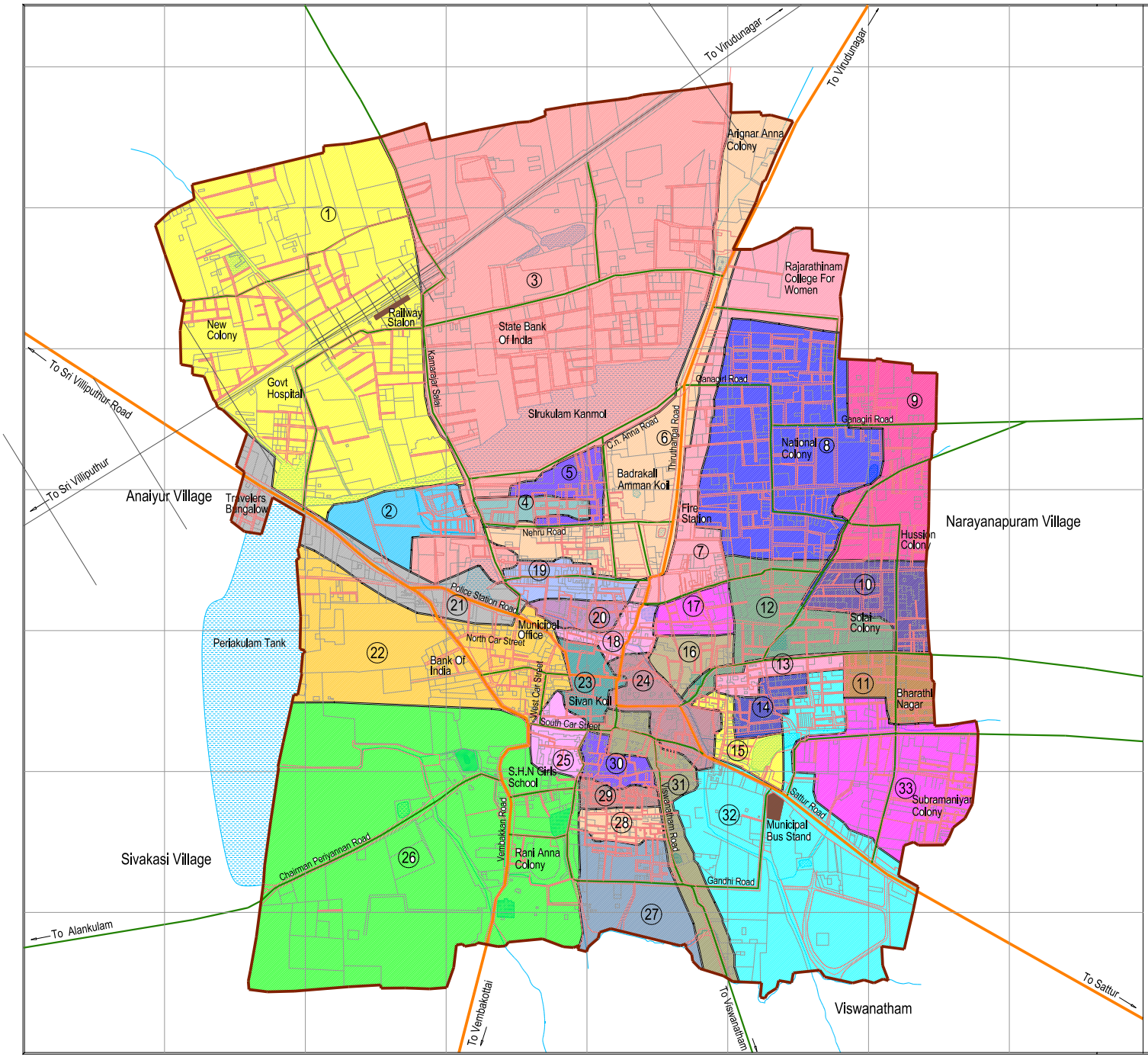
20. Wards 3, 8, 26, 1, 7 and 22 located on the periphery are the newly developing areas and have low densities due to the presence of vacant lands, which are yet to be developed. The densities in these wards are in the range of 2,000 to 10,000 persons per sq.km. There are 14 wards with medium densities ranging from 10,000 to 15,000 persons per sq.km and another 8 wards in the range of 10,000 to 20,000 persons/ sq.km

C. Economic Development

21. The development of firecrackers, match and printing industry since ages and more since post independence has induced tremendous economic opportunities in Sivakasi. These "pull factors" induced rapid development of household industries in the associated industries and catapulted Sivakasi as a major growth engine in the region. These developments have opened investment and employment opportunities, resulting in increased urban productivity and migration from rural areas to urban areas for livelihood.

22. The above developments led to the concentration of economic activities in the core resulting high dense areas and mixed land uses. Important activity locations like bus stand, markets- wholesale and retail, schools and colleges are situated in the area. In addition, a number of household industries associated with printing and fire works, business centers are located in the core, which is attracting mixed residential and commercial developments. The availability of infrastructure, facilities and amenities during the initial development of the town attracted a large population to the core.

23. In the absence of any, coordinated strategy to disperse the economic activities, an unbalanced growth is being witnessed today, which would be far-reaching if appropriate mechanisms and proactive actions are not in place. These uncontrolled growth and developments may become determinants in furthering the sustainable growth of Sivakasi and would be an impediment to the economic and environmental sustainability of the town. The areas outside the core have seen fair orderly development as they have emerged as residential neighbourhoods with medium density.



SIVAKASI CITY CORPORATE PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- ① Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Minor Road
- Railways
- Water Body
- Canal, Nala, Odai

Notes :

Administrative wards

N

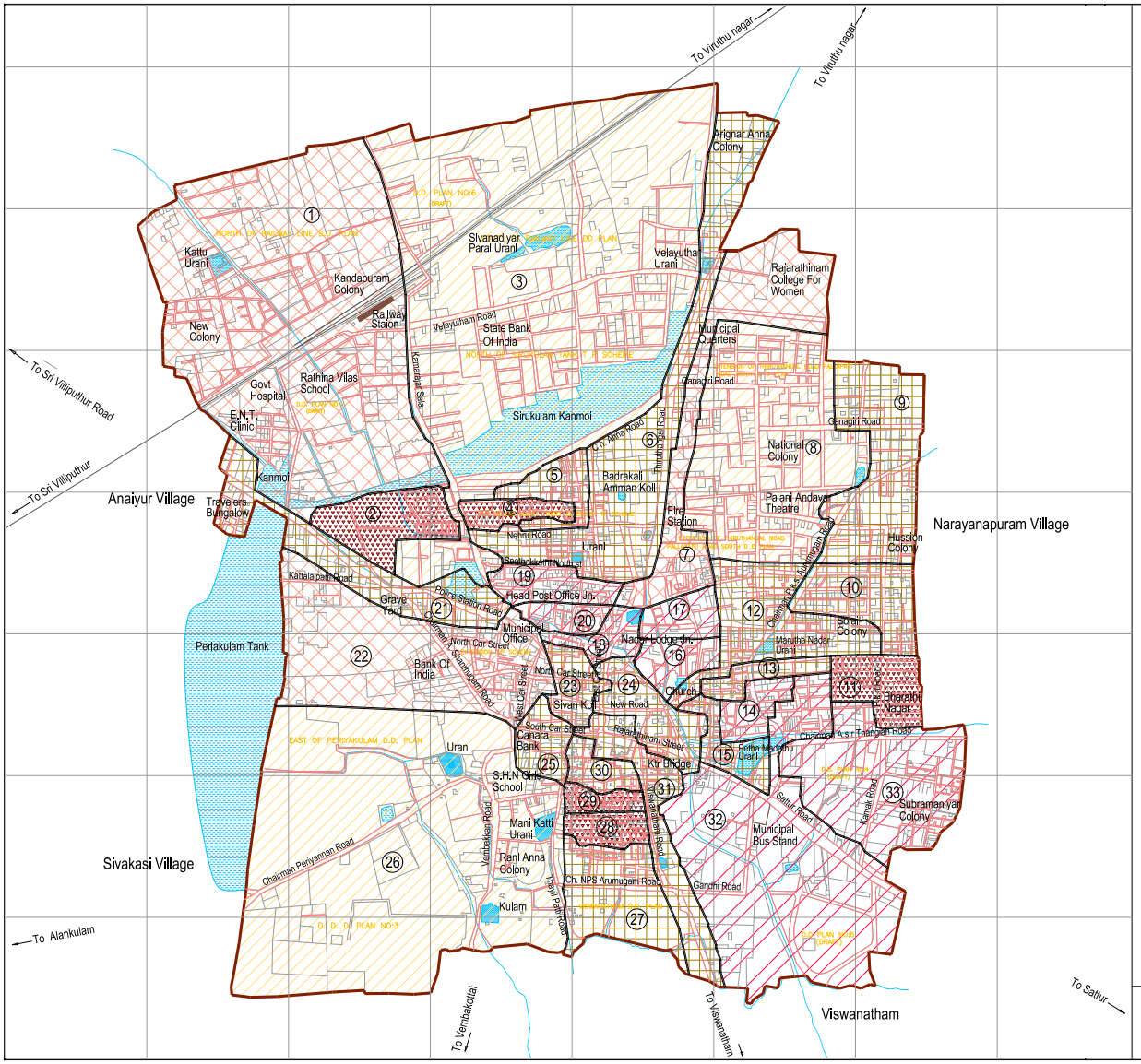
Scale :

0 0,125 0,25 0,50 1 Km

TAMILNADU URBAN INFRASTRUCTURE FINANCIAL SERVICES LIMITED

Wilbur Smith Associates Private Limited
75, 2 nd Floor, 1 st Block
14 th Cross, R.T. Nagar
Bangalore - 560032
Tel : 080 - 2354 3413 / 2354

Map No. 2.1



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- ① Ward No.
- Railways
- Water Body
- Canal, Nala, Odai

- < 5000
- 5000 - 9999
- 10000 - 14999
- 15000 - 19999
- > 20000

DENSITY PATTERN (2001)

N

Scale :

0 0.125 0.25 0.50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
75, 2 nd Floor, 1 st Block
14 th Cross, R.T. Nagar
Bangalore - 560032
Tel : 080 - 2354 3413 / 2354

Map No. **2.2**

1. Sectoral Growth

24. The occupational structure of the town is predominantly secondary indicating the strong manufacturing base due to match works, fireworks and printing industry for the last three decades, but in the year 2001 the tertiary sector has become predominant. The population engaged in agriculture and allied activities declined over the years and only 165 persons are engaged in agriculture. This is due to the non-suitable climatic and soil conditions for the growth of agriculture.

25. As per the provisional totals of census 2001, the work force participation rate in the town is 43.33 percent with 31,271 persons. The working sector is dominated by the tertiary sector followed by secondary sector with 97 percent and 2 percent respectively of the total workforce. The occupational structure of Sivakasi municipality is tabulated in **Table 2.4.**

Table 2.4: Details of Occupational Structure

Sector	**1971**	**1981**	**1991**	**2001**
	No. of Persons			
Primary sector	459	458	223	165
Secondary Sector	11,982	17,979	16,826	575
Tertiary Sector	5558	7,040	8,175	30,531
Marginal Workers	-	2,540	2,088	596
Total Work Force	**17,999**	**28,017**	**27,312**	**31,271**
Non- Workers	26,884	31,810	38281	40,897
Work Force Participation Rate (%)	**40.10**	**46.83**	**41.64**	**43.33**

Source: Census of India

2. Industrial Development

26. Sivakasi is an important town on the industrial map of the region with respect to printing, fireworks and match works manufacture. The town is the nodal centre for wholesale trading of the firecrackers for the entire country, which is driving the economy of the town. The town is dotted with small and medium scale industries providing employment to 25,000 persons. A few large industries with turnover exceeding Rs. 500 crores each are also located within the town.

27. An informal estimate indicates that the total annual turnover from the fire works, match and printing industries is of the order of Rs. 2000 crores. Of the total 618 industries registered with the Inspector of Factories, about 84 percent comprise of printing works followed by match factories and chemical factories (fireworks). Other industries include rice mills, oil mills etc. under the chemical industries category there are 32 chemical manufacturing industries and 7 soda-manufacturing factories. The 53 units manufacturing safety matches are manual and are without any electric power installed. Details of industries are given in **Table 2.5**.

Table 2.5: Details of Industries

Industry	Number of Industries
Rice Mills & Oil Mills	2
Flour Mills	4
Match Factories	53
Chemical Factories	32
Soda Factories	7
Printing works (Offset, Litho, Cutting)	520
Total	**618**

Source*:* Sivakasi Municipality

28. The hot and dry climate of the town and location is advantage for the safety matches and firecrackers industry. Sivakasi has considerable transportation facilities and cheap labour too for the sustenance of this industry. They also have a depot within the town. All these industries provide sufficient employment opportunities for the workers of the town as well as those from the surrounding areas.

29. These manufacturing units attract an average of 10,000 persons of floating population to the town every day. The chief raw material for these units, chemicals and fire powder is acquired from Kerala State. They were earlier being procured from nearby areas like Sattur but it was discontinued due to the closure of these raw materials' processing units owing to high power charges and high production cost

30. While the retail trade comprises 75 percent of the commercial space of the town, the wholesale trade occupies more than 4 percent of the total area of the town. Sivakasi is also the chief trading centre for all the Printing, manufactured firecrackers, matchsticks etc. About 600 provision shops and more than 3000 handloom and art silk cloth stores operate from the town.

3. Health

31. The town has a government hospital with 65 beds and 8 doctors. A maternity home, three health centers and one dispensary are in operation in Sivakasi. There is one doctor for each maternity home and dispensary. The maternity home has 6 beds and receives an average of 60 patients a day. In addition, there are private hospitals managed by private practitioners and other health related institutions within the town. The health facilities of local body are presented in Table: 2.6.

Table 2.6: Health Facilities in Local Body

Type	Numbers	Doctors	Beds
Govt. Hospital	1	8	62
Maternity Homes	1	1	6

Source: Sivakasi Municipality

4. Literacy

32. Literacy rate in Sivakasi has increased from 57.93 percent in 1971 to 86.30 percent in

2001, which is above the district and state average. There has been increase in the literacy rates all over the state during the past decade and the same is observed in case of Sivakasi. The increase can be attributed to the establishment of additional educational institutions by the government and private sector and effectiveness of the awareness programs. Social infrastructure facilities are presented in **Table 2.7**.

Table 2.7: Social Infrastructure in Municipality

Type of Schools	Number	No. of Students	No. of Teachers	No. of Rooms
Pre-Primary	15	3,000	53	62
Primary	13	6,068	136	161
Secondary	7	7,469	169	246
Higher Secondary	11	11,564	290	484
Colleges	1	1,200	65	102

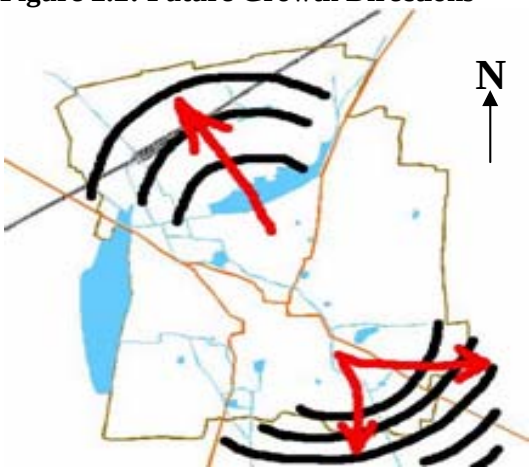
Source: Sivakasi Municipality

E. Growth Trends and Projections

1. Growth Trends

33. The growth patterns indicate towards the Southeast side and northwest side. New developments are observed towards the northwest near the railway station and on either sides of the railway line. The direction of growth is shown in Figure 2.2.

Figure 2.2: Future Growth Directions



34. There is no physical constraint for the growth of the town in any direction except on the western side where the Periakulam Tank exists outside the municipal limits. Towards East Side along the Sattur road, developments are taking place. South side towards Vembakottai road developments are taking with less momentum. North side after the railway track Kottu Urani, New colony, Kandapuram Colony are the new developed and planned layouts residential developments are coming up.

2. Population Projection

35. In this method the increment in arithmetical increase is determined from the past decades and the average of that increment is added to the average increase. **Table 2.8** gives the census population and decadal growth volumes in detail.

Table 2.8: Population & Decadal Growth

Year	Census Population	Increment X	Increment Y
1951	22,674		
1961	30,690	8,016	
1971	44,883	14,193	6,177
1981	59,827	14,944	751
1991	65,593	5,766	- 9,178
2001	72,170	6,577	- 811
	Average	9,899	- 360

Source: Analysis

36. Population in nth year = Population in $(n-1)^{th}$ year + n * X + (n (n+1) * Y)/2

37. Population in 2005 = 72,170 + 0.4 * 9,899 + (0.4(0.4+1) * (-360))/2 = 76,029

38. Population has been projected for the intermediate and the final stages and tabulated below:

39. The population for the future projections has been taken from the Incremental Increase method, which was adopted in the detailed water supply project for Sivakasi. The population adopted for the design period is 103,136 for the Ultimate Stage design period (2035). The forecast population is presented in Table 2.9

Table 2.9: Population Projection

Year	Population Projections
2001	72170
2006	76,985
2011	81,709
2016	86,344
2021	90,889
2026	95,344
2035	103,136

Source: Analysis

III. URBAN GOVERNANCE

A. Institutions and Capacity

1. Institutional Arrangements and Policy Context

40. *Institutional Arrangements*. The State Government's line departments continue to play a crucial role in urban basic service delivery. Sectors and agency involvement include:

(i) Water Supply & Sewerage. The Tamil Nadu Water Supply and Drainage Board (TWAD) is responsible for creation of water and sewerage infrastructure in the state. However, Sivakasi Municipality is responsible for the provision and delivery of services within the town.

(ii) Master Plan. The Town and Country Planning Department (TCPD) prepares the Master Plan and Comprehensive Development Plan (CDP) for the town, and the mandate of implementing the Master Plan /CDP lies with the ULB – growth is generally haphazard and unplanned, the CDP is rarely referred to. However, with a vision to achieve planned growth, revision of CDP is in progress.

(iii) Roads and Highways. Highways and Rural Works maintain the National and State Highways that pass through the town/city. Municipal roads are maintained by the ULB.

(iv) Environmental Protection. The Tamil Nadu Pollution Control Board (TNPCB) is responsible for environmental protection and enforcement of rulings related to the same, passed by competent authorities.

(v) Slum Up gradation. The Tamil Nadu Slum Clearance Board (TNSCB) develops improvement schemes for notified/regularized slum settlements in the city/town. Infrastructure provision is financed partly through loans from the Housing and Development Corporation (HUDCo) and partly through grants from GoTN and GoI.

41. In addition to involvement of various institutions in the development of local-level infrastructure, the Municipal Administration & Water Supply Department controls local-level governance through the Commissionerate of Municipal Administration (CMA).

42. *Policy Framework.* Sivakasi Municipality is governed by the Tamil Nadu District Municipalities Act, 1920. The municipality is classified as a selection grade municipality Amendment to the Corporation Act (1971) and Amendment to the Municipalities Act (1920), provides impetus for environment improvement through Rain Water Harvesting

2. Service Delivery and Performance of Urban Local Body

43. The engineering department is responsible for all public works, and maintenance of civic facilities. This department is responsible for the following works:

(i) Public Works (Construction and maintenance of roads and storm water drains,
(ii) Maintenance of school buildings,
(iii) Construction and Maintenance of Public Conveniences,
(iv) Maintenance of other facilities viz., Bus stand, Markets, etc.
(v) Street Lighting (Maintenance of Street Lights)
(vi) Water Supply and Sewerage (Provision and operation and maintenance of water supply and sewerage system)
(vii) Parks and Gardens (Maintenance of parks and gardens)

B. Organization Structure of Urban Local Body

44. The structure of the Corporation consists of two Wings i.e., the Deliberative Wing and the Executive Wing.

1. Administrative Wing

45. The municipal council, the political arm of the municipality consists of 36 elected councillors, each representing a ward. The chairman (elected from among the councillors) heads the municipal council, which performs its duties as per the provisions of the District Municipalities Act. The political wing provides an overall direction to the municipality and performs its functions through a set of committees constituted for different purposes. The population as per the census being less than three lakhs[1], there is no wards committee in the local body. However, as per the act, three committees viz., taxation appeals committee, appointment committee, contract committee have been formed consisting of the chairman, the commissioner and elected representatives as members.

2. Executive Wing

46. The executive wing is responsible for day-to-day operations of the municipality, and is headed by the municipal commissioner. The commissioner is the administrative head of the municipality and is supported mainly by five departments in the operations. The organisational structure of the municipality comprises of five functional departments.

47. The Sivakasi municipality of executive wing is responsible for day to day operations, and is headed by the municipal commissioner. The commissioner is the administrative head of the municipality and is supported mainly by five departments in the operations. The organisational structure of the municipality comprises of five functional departments.

[1] According to the Act, it is mandatory to have ward committees consisting of the elected councilors if the population of the town is more than 3 lakhs.

48. The municipality consists of a head that reports to the commissioner and functions as per the responsibilities prescribed in the Act and as delegated by the municipal commissioner. The function of clerical staff dealing under each department/ section of the Municipality is coded for the sake of work allocation and standardisation.

49. Various departments under the ULB, share the responsibility of service delivery within the Corporation. The functions of various officials/departments, under the Administrative wing, are elucidated hereunder:

(i) Commissioner. The Commissioner is at the apex of this structure and is responsible for all activities carried out by the ULB. The Commissioner is responsible for preparation and certification of all periodical records, returns and furnishes all information as may from time to time be required by the Municipal Council or the Standing committees. He is also responsible for preparation of accounts. At each general meeting, the Commissioner along with some other key officials, discuss various issues with the elected representatives.

(ii) General Administration Department. The department is headed by the Commissioner and assisted by Assistant Commissioner (Personnel), Administrative officers, Public relation officer, Superintendent and other officers. This department is responsible for establishment, other essential matters relating to office, officers, staff and their welfare like preparation of staff pay bills, maintenance of registers for advances, GPF, pension, PF's etc.

(iii) Engineering and Water Supply Department. The Municipal Engineer heads the engineering department, and is assisted by Assistant Engineer, Junior Engineer and other staff. With regards to fieldwork, Scheme works are delegated to one Junior Engineer who also looks after regular works, related to Public Works, Drains, Street Lighting. The Assistant Engineer looks after the water supply and is assisted by electrician, operators and other staff. The Department is responsible for ensuring the quality and quantity of water supply to the municipality. A major function of the Municipality is formulation and execution of Works- like construction and maintenance of roads, buildings and other infrastructure systems.

(iv) Revenue and Accounts Department**.** Revenue Inspector heads the department and assisted by joiner assistance. The Accounts Section is responsible for supervising all financial transactions related to the CMC, advising the Revenue Officers on all internal financial matters, updating financial receipts and expenditure details in accordance with the utilization of funds, reporting deviations in expenditure of funds in any of the allocated schemes, assisting preparation of the CMC budget, maintenance of accounts regarding stamp duty, SFC Grants, MP Grants, maintenance of petty cash book and general cash book and attending to audit requirements and other such accounts-related duties. Revenue Officer, heading the Revenue Section, is responsible for collecting taxes such as, trade tax, house tax, advertisement tax, and entertainment tax; development charges; transfer of properties (commonly called Khatha transfer); collection of duty; issuing notices for recovery of tax; and monitoring revenue collections of the ULB.

(v) Public Health Department. The department is headed by Sanitary Officer, and is responsible for ULB services such as Solid waste management, public health related works like malaria control, family planning, mother and child health care, birth and death registration etc, and other government assisted programs related to health and poverty reduction and awareness programs. The Sanitary Officer assisted by the Sanitary Inspectors and Sanitary Worker Supervisors, is responsible for services of Solid waste management and Malaria Control activities. Sanitary Worker Supervisors are in-charge of works execution at the field level, which includes monitoring and supervising the work of sanitary laborers in the wards under their charge and attending to specific local complaints. Besides, this department is responsible for the enforcement of the Public Health Act. The Public Health Department is vested with the responsibility of ensuring safe sanitation and cleanliness of the town. The department is also responsible for the maintenance of Municipal Dispensaries, Burial Grounds and slaughterhouses. One of the most crucial services of the municipality is maintenance of sanitation and cleanliness in the town. This involves mainly conservancy works involving sweeping of roads, garbage collection and disposal, cleaning of drains, and disinfecting of drains. Private contract was awarded for Solid Waste Management in certain areas of the town. Markets areas and main roads are cleaned every day

(vi) Town Planning Department. A town-planning officer heads this department, assisted by building inspectors, surveyors and junior assistants and other staff. The major function of this department is issue of building license, preparation and implementation of development plans and eviction of encroachments, urban planning and building regulation. The Town-Planning Department's main function is to implement the master plan proposals, ensure orderly growth in the town and avoid unauthorized constructions and to formulate projects.

IV. PLANNING AND LAND USE MANAGEMENT

A. Planning Efforts in the Past

1. Master Plan Outline

50. Sivakasi municipality was constituted in 1920. It was a second grade municipality from 14.06.1971 and became a first grade municipality from 23.10.1978. As on date Sivakasi is, a selection grade municipality upgraded in 1998 as per G.O.M.S. No: 85 MAWS dated 22.05.1998.

51. Sivakasi municipal area has been declared as “Sivakasi Local Planning Area”, and confirmed under section 10(4) of the Act in G.O. Ms. No.631 RD and LA dated 14.03.1974. Sivakasi local planning authority was constituted under section 11(1) of the Town and Country Planning Act, 1971. The government has appointed the Sivakasi municipal council as the local planning authority and the commissioner of the municipality as the executive authority.

52. Sivakasi Master Plan was then given consent by the government in G.O. Ms. No.357 H and UD, dated 04.03.1986 under section 24(2) of the town and country-planning Act 1971. However, the final approval from the Government, the Master Plan under section 28 of the Act in G.O. Ms. No.212 H and UD, dated 15.02.1991. Between these period from the preparation to the approval the actual developments have completely varied from what was presented in the maser plan, making it ineffective and the developments are happening in irregular manner.

2. Master Plan Implementation and Implications

53. The Town Planning Schemes and the Detailed Development Plans are proposed for the town to assist in effective implementation of the master plan. The total sanctioned/ approved/ draft/ Town Planning schemes and Detailed Development plans are 14 in number and cover 5.419 acres of town area.

54. These town planning schemes and detailed development plans are prepared for the respective identified areas by the Sivakasi local planning authority. Out of the 14 schemes, the Department of Town and Country Planning approved 11 town planning schemes, and the rest of the three schemes are awaiting approval. The details of Town planning schemes are presented in **Table 4.1**.

Table 4.1: Details of Town Planning Schemes

S. No.	Schemes	Status	Area
			Acre
1	North of Sirukulam Tank Town Planning Scheme	Approved	0.3365
2	North Car Street Extension Town Planning Scheme	Approved	0.1231
3	The Muslim North Street Extension Town Planning Scheme	Approved	0.2315
4	South of Railway line Detailed Development Plan	Approved	0.5190
5	Extension of Thiruthangal Road and Pallapatti Road North Detailed Development Plan	Approved	0.4702
6	Extension of Thiruthangal Road and Pallapatti Road South Detailed Development Plan	Approved	0.3450
7	Viswanathan Detailed Development Plan	Approved	0.1162
8	Railway line North Detailed Development Plan	Approved	0.1162
9	East of Periakulam Detailed Development Plan	Approved	0.6430
10	Detailed Development Plan no. 3	Approved	0.4750
11	Detailed Development Plan no. 1	Draft	0.6197
12	Detailed Development Plan no. 4	Draft Submitted to DTCP for approval	0.2552
13	Detailed Development Plan no. 5	Draft Re-submitted to DTCP for Consent	0.4484
14	Detailed Development Plan no. 6	Approved	0.2421
	Total		**5.4119**

Source: Sivakasi Municipality

B. Land Use Management

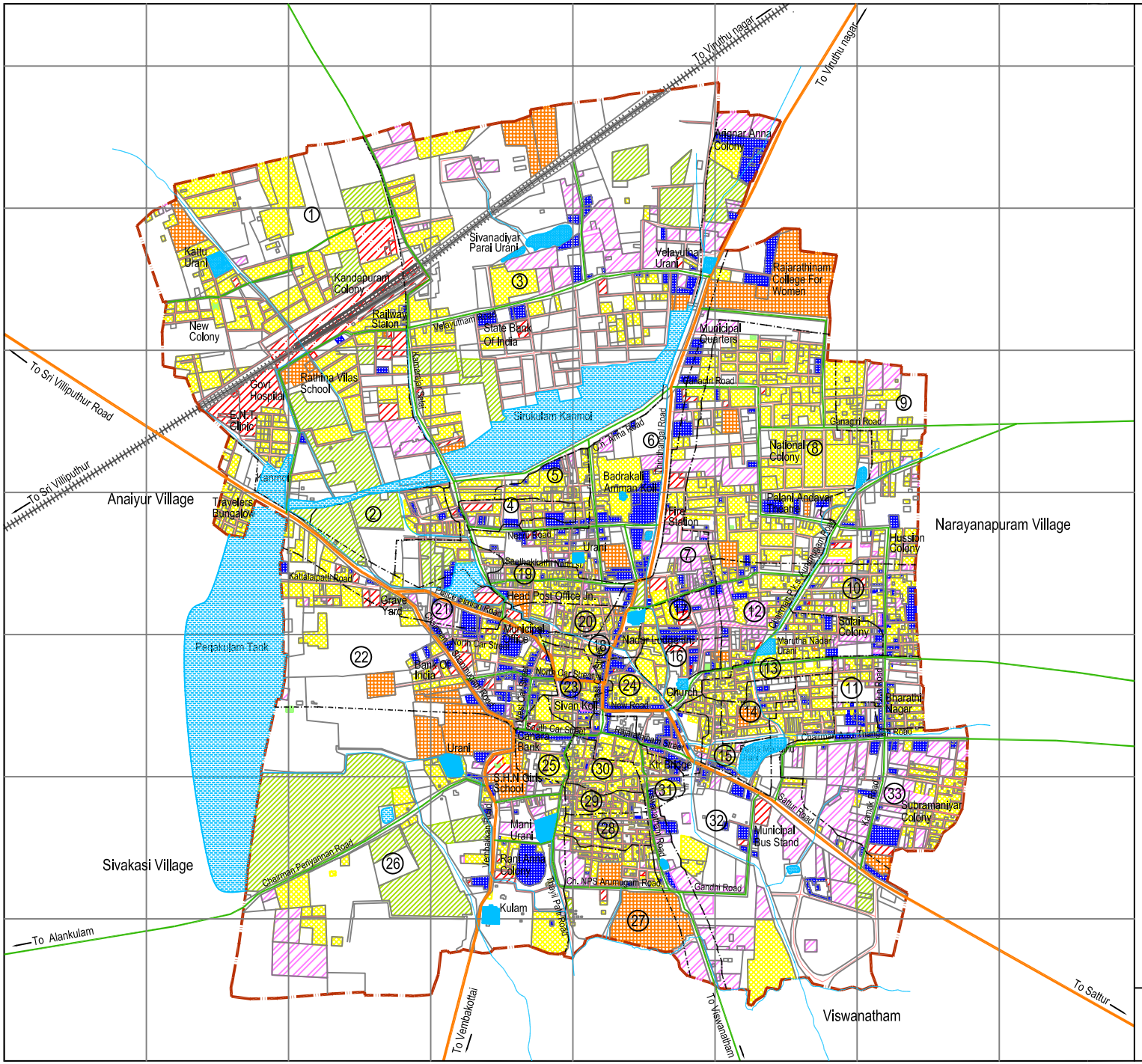
1. Land Use Pattern – Current and Future

55. Review of the land use pattern in Sivakasi local planning area coincides with the municipal area and extends over an area of 6.89 sq. km, it was taken up during 1996-97 by the Sivakasi Master Planning Authority. For this purpose, surveys were conducted and the extents of various prevailing land uses were arrived.

56. The important aspect of significance from the existing land use pattern is the total urbanized area, which was just 33 percent of the total area of the town. The entire population of the town is residing and indulging in various livelihood activities in just 50 percent of the present town area. The present land use pattern is as follows:

57. *Residential:* Residential areas in the town are according to the economic needs of the people. While the central areas of the town are occupied by commercial and trade activities, the south-eastern sides of the town is occupied by household industrial activities (match manufacturing and printing). Match manufacturing and printing occupy the northern areas of the town.

SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN



Legend :

- Municipal Boundary
- Ward Boundary
- Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Minor Road
- Railways
- Water Body
- Canal, Nala, Odai

Land Use :

- Agriculture
- Residential
- Commercial
- Industrial
- Education
- Recreation
- Public

LAND USE (EXISTING)

N

Scale :

0 0,125 0,25 0,50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road,
Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No. **4.1**

Map 4.2: Proposed Land Use

58. The central areas are very dense with narrow lanes and houses here are small. The dense localities of the town have left no space for any major open spaces. Residential area in the town forms 15.3 Percent of the total area of the town. The existing land use details are illustrated in **Table 4.2** and **Map 4.1.**

Table 4.2: Land Use 2001 - Master Plan Proposals

Land use Type	**Area**	**Developed area**	**Total Extent of Town**
	Sq. km	*Percent*	*Percent*
Residential	1.05	31.33	15.31
Commercial	0.27	8.09	3.95
Industrial	0.47	14.02	6.85
Education	0.21	6.26	3.06
Public and Semi- public	0.09	2.72	1.33
Transportation/ Circulation	0.86	25.69	12.56
Water Bodies	0.40	11.89	5.81
Sub-Total (Developed Area)	3.37	100.00	48.87
Other Vacant Land	2.28		33.06
Agriculture (Dry)	1.24		18.07
Sub-Total (Un Developed Area)	3.52		51.13
Total	**6.89**		

Source: Sivakasi Municipality

59. *Commercial:* - Commercial activities are concentrated on both sides of the state highways, Thirumangal Road, Police Station Road and Sattur Road. Commercial activities are also prevalent in the central area along the Kamarajar Salai. Though the household industrial and commercial activities are widely spread across the town, they are not reflected in the land use pattern. The commercial activities are one of the major economic activities of the town. 4 percent of the total area of the town is under commercial use.

60. *Industrial:* - Industrial activities in the town are concentrated on the eastern side of the Thirumangalam Road and the Viswanatham Road. Certain major industries are also present to the south of the Srivilliputtr-Virudunagar Railway line. These industries are engaged in manufacture of fireworks, crackers, safety matches, offset and lithe printing etc. The total area under industrial use is 6.9 percent. Industrial areas are scattered in the town and are surrounded by commercial and residential areas.

61. *Education*: - Educational use in the town constitutes about 3.1 percent of the total area of the town. There are 15 pre-school centres, 13 elementary schools with noon-meal centres, 4 middle schools, 3 high schools and 5 higher secondary schools run by municipality as well as private institutions for Boys and Girls. Raja Rathinam College for women is an Arts college on the northern side of the town. Overall, land under educational use in the town is 0.21 Sq. km.

62. *Public and Semi Public*: - The major Public and Semi-public activities in the town are concentrated in the central area (Post office, Municipal Office, Fire station etc) of the town and near the railway station towards north (ENT Hospital, Government Hospital etc.). These public and semi-public activities occupy 0.09 Sq. km of area.

63. *Undeveloped areas*: - The fact that urbanized area in the town is just 48 percent of the town area is indicative of the extent of vacant lands, agricultural lands and lands under non-agricultural use. The vacant lands in the town constitute 33.10 percent of the town’s

area and agricultural lands constitute 18.10 percent of the town's area. Such undeveloped areas are mainly towards the North and Western sides of the municipality near the Sirukulam Tank on the North and the Periakulam Tank on the West.

64. Water bodies in the town account for almost 6 percent of the total area. The Sirukulam Tank exists within the municipal limits and Periakulam Tank outside the western limits of the municipality. There are certain other small urani's scattered around the town viz., Petha Madathu Urani, Mani Katti Urani, Kattu Urani, Sivanadiyar Parai Urani, Marutha Nadar Urani etc. The proposed Land use is shown in **Map: 4.2**.

2. Growth Constraints and Developmental Potentials

65. The economic growth in the town during the 70s and 80s has led to the concentration of economic activities in the core areas of the town resulting in high densities. A large number of household units involved in printing and fire works and associated business houses are also located in the central area of the town.

66. The outer/ peripheral areas have just started to develop in an orderly manner and still a large number of vacant lands exist in these peripheral areas. However uncoordinated efforts in service delivery has led to inadequate infrastructure. These lacking infrastructure deliveries may become impediments in furthering the sustainable growth of Sivakasi.

C. Key Developmental Issues

(i) *Lack of integrated approach for conservation*: The Periakulam tank and the Sirukulam tank both with considerably large area can actually work as rainwater harvesting. The structures and networking of the two along with other small tanks in the town can actually help the replenish ground water resources in the long run. Moreover the master plan does not give any specific approach for these water bodies and hence they are neglected.

(ii) *Lack of public participation*: Public participation has never been considered a part of the planning process till recently. The master plans and other development plans have never reflected the needs and wishes of the dwellers of the town. There were no sincere efforts on part of the municipality or the Local Planning Authority to involve the public in the plan preparation process.

(iii) *Ineffective Urban Land Management*: Inability to co-ordinate approvals and sanctions among the implementing agencies (Local Planning Authority and Municipality) has added to gross violation of rules and regulations by builders.

(iv) The regulation of land use rests with the Local Planning Authority whereas the municipality does not have any powers thereby leading to conflicts in its implementation. In addition, the powers of the Corporation are curtailed resulting in sanctions and approvals without considering local conditions. Further, a lag in provision of infrastructure to the newly developed areas has resulted in poor environmental conditions in these areas.

V. INFRASTRUCTURE SERVICES

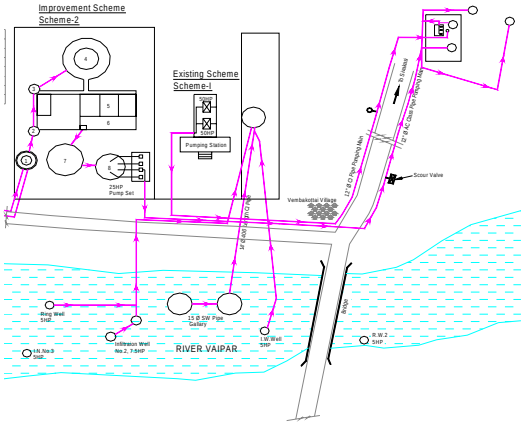
A. Physical Infrastructure

1. *Water Supply*

Existing Situation.

67. *Source Scheme I:* The primary source of water supply to Sivakasi Municipality is the Vaipar River. Scheme I (Original) was commissioned in 1960 and subsequently improvements were performed in 1971. Sub-surface water from Vaipar River is abstracted through a network of galleries, infiltration wells and intake well. Vembakottai Reservoir is situated approximately 14.64 km from Sivakasi. Intake works of Scheme-I was constructed to provide 3.1 MLD of water for a projected population of 130,000 (1991) at a supply rate of 60 lpcd.

Figure 5.1: Details of Head works

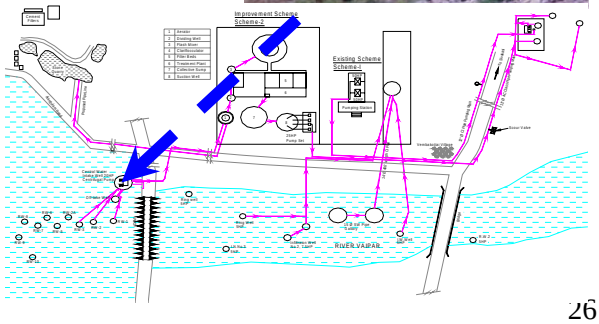


68. Water from the suction well is pumped to the town through a 300-mm Φ Cast Iron transmission main by using centrifugal pumps (2,160-lpm discharge at 60-m head). At Sivakasi, the total quantity is stored in an elevated service reservoir (9.00 lakh liter) and supplied to the residents through a water distribution network laid for a length of approximately 52.49 km.

69. Even though the original scheme was designed to supply 3.10 MLD, due to severe drought conditions prevailing in this region, yield from the infiltration gallery has dwindled resulting in severe drinking water scarcity in the town. **Figure 5.1:** illustrates the headwork details of Sivakasi Municipality.

Figure 5.2: Intake well in Vembakottai

70. Complying with the request of Sivakasi Municipality, an improvement scheme was formulated and completed in 1971. Under this improvement scheme, an additional gallery of 87 m long was laid with a 3.66 m Φ infiltration well about 90 m upstream of the original gallery. **Figure 5.2:** shows the intake well in Vembakottai of Sivakasi Municipality



71. Water drawn from this improvement scheme is presently pumped to the suction well provided in the original scheme. In addition to the above

arrangement, the local body has added two more infiltration wells cum pump house, upstream and downstream of the galleries, at a later stage to augment the supply of water to the town during drought conditions.

72. The total daily water requirement at present is 6.50 MLD with per capita water demand of 90 lpcd as per CPHEEO manual. However, the present water supply is 4.50 MLD during the normal season with good rainfall and 1.80 MLD during the worst season with inadequate rainfall. Presently, water supply to the public is once in 3 days for 2 hours during the normal season and during the summer the supply is given once in 8-10 days for 2 hours.

73. *Scheme II:* In 1990, Water Supply Improvements Scheme II was implemented with abstraction of surface water from within the Vembakottai Dam. This storage reservoir is situated approximately 1 km upstream of the Scheme-I head works. The quantity of water allotted from the dam for water supply to Sivakasi Municipality is 50 mcft./year, which relates to a daily supply of 3.85 ML. Raw water from the dam is drawn through an intake well of 3.60 m Φ with three intake pipes laid at different levels.

74. The bottom of the intake pipe extends well into the deepest portion of the dam ensuring that water can be drawn from the reservoir even during the period of low storage. Figure 5.2 shows Intake well at Vembakottai Dam. Two pumps deliver water through a raw water transmission main of 1.00 km length (315 mm Φ PVC) to the Water Treatment Plant (WTP) located adjacent to the suction well and pump house of Scheme I. Details of the old Scheme and improvement Scheme of water supply are furnished in **Table 5.1.**

Table 5.1: Details of Scheme I and Scheme II

S.No	Item	Description
Vaipar (Old Scheme) – Scheme I		
1	Source	Vaipar River
2	Type of Source	6 Nos. of Infiltration Wells (working condition)
3	No. of Collection Well	1 No.
4	Year of Construction	1960
5	Type of Treatment	Chlorination (at Sivakasi)
6	Pumping Machinery	5 H.P – 4 No, one in each Infiltration well 7.5 H.P – 2 No, one in each Infiltration well
7	Length and size of pumping main	14 km, 300 mm Φ Cast Iron (LA class)
8	Quantity of water supply	Normal season – 15.0 Lakh Liters per day Summer season – 8.0 Lakh Liters per day
Vembakottai Dam (Improvement Scheme) – Scheme – II		
1	Source	Vembakottai dam
2	Type of Source	Surface Water (Intake Well)
3	No. and Diameter of Intake Well	1 No. and 3.66 m Φ
4	Year of Construction	1990
5	Type of Treatment	Full scale treatment with, coagulation, flocculation, rapid sand filters and chlorination at Intake well
6	Pumping Machinery	20 H.P – 2 Nos. at each ring wells
7	Length and Diameter of Transmission Main	14 km. and 400 mm Φ AC (class 10)
8	Quantity of Water Supply	Normal season – 30.0 Lakh Liters per day

S.No	Item	Description
		Summer season – 10.0 Lakh Liters per day
9	Additional Source	(10 Nos. of Ring Wells for drawing water when the dam is dry)

Source: Sivakasi Municipality

75. *Treatment facility:* - Water from Vembakottai Dam is transmitted to the treatment plant. The treatment plant was designed for a capacity of 6.00 MLD in 1991 as part of the Improvement Scheme. Treatment plant having 3 rapid sand filters. Coagulation, flocculation, clarification and filtration treat raw water. However, this treatment facility is provided under Scheme II for water drawn from the reservoir. There is no further augmentation done to enhance the treatment capacities. Water drawn from Scheme I is directly pumped to the town and Chlorination treatment is done before distributed in the town.

76. *Transmission main*: - Two (2) transmission mains, 300 mm Φ Cast Iron and 400 mm Φ AC for Scheme-I and Scheme-II respectively has been installed to pump water to Sivakasi from the respective head works.

77. In the case of Scheme-I, water is directly pumped through the 29.37 km long, Cast Iron transmission main, with 50 HP pump (2,160 lpm / 60-m) to Kamarajar Over Head Tank (9.00 lakh litre).

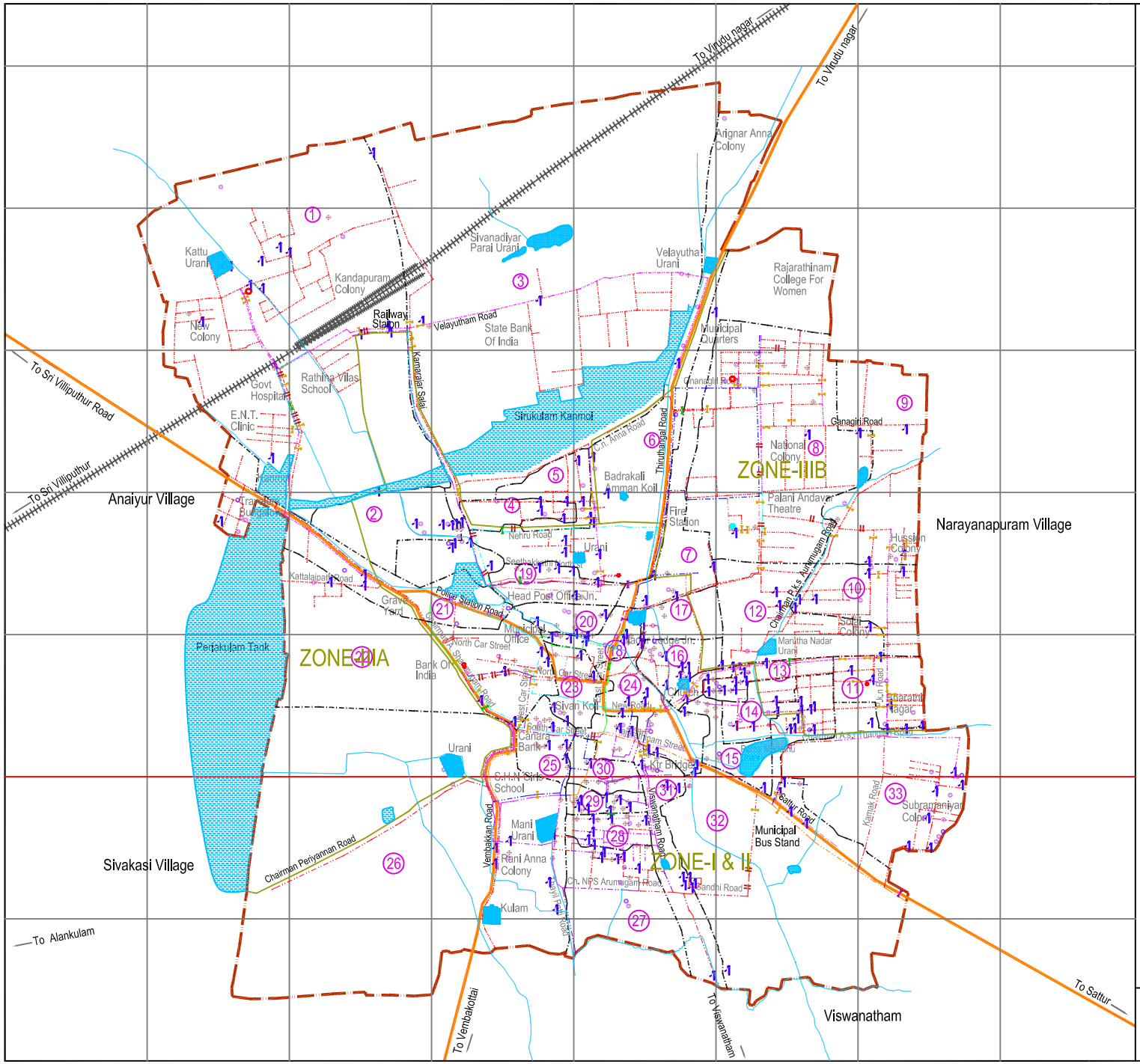
78. In Scheme-II, the AC transmission main was laid in 1994 after abandoning the damaged PVC lines of 315-mm Φ (2 rows). Treated water from the clear water sump of the water treatment plant is pumped to Ground Level sump on Kamarajar Road by four (4) nos. of centrifugal pumps, rated at 25 HP each, with a discharge of 1,582 lpm at 41 m design head. Details of existing transmission main are furnished in **Table 5.2.**

Table.5.2: Details of Existing Transmission Mains

Scheme	Raw Water Transmission Main	Clear Water Transmission Main
	Diameter / Material / Length	*Diameter / Material / Length*
I	150 mm / Cast Iron / 250 m	300 mm / Cast Iron / 14,360 m
II	315 mm / PVC / 1,000 m	400 mm / AC / 14,360 m

Source: Sivakasi Municipality

79. *Feeder Main, Motors and pump:* - From the Ground Level sump, water is pumped to the service reservoirs situated in different zones through two booster stations. Details of Over Head Reservoirs are listed in **Table 5.3** and existing water supply system is shown in **Map 5.1**



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- 1 Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Minor Road
- Railways
- Water Body
- Canal, Nala, Odai

Notes :

- 12 Lakhs Litres Capacity O.h.t
- 9 Lakhs Litres Capacity O.h.t At Kamarajar Water Tank
- 3 Lakhs Litres Capacity O.h.t Gandhi Nagar
- 3 Lakhs Litres Capacity O.h.t Attu Chandai
- 3 Lakhs Litres Capacity O.h.t Municipal Colony
- 3 Lakhs Litres Capacity O.h.t Municipal Colony
- 5 Lakhs Litres Capacity O.h.t Palaniandavar Colony Water Supply Distribution Main

C.i Main (Zone I & II)
Pvc Main
Pvc Main Zone III A
Pvc Main Zone III B

Booster Station
15. H.P Motor
7.5 H.P Motor
7.5 H.P Motor

Pumping Main From Booster Station For

1. Gandhi Nagar Tank
2. Palaniandavar Puram Tank
3. Attu Chandai Tank
4. Cornation Colony Tank
5. M.g.r Thidal Tank

Hand Pumps : 206Nos
Public Fountain : 147Nos
Open Wells : 24Nos
Power Pumps : 89Nos

Pumping Main Existing Scheme From Vembakkottai Head Work
Pumping Main Improvement Scheme From Vembakkottai Head Work
Under Ground Sump Capacity 1.00 Lakhs Litres

3 Inch PVC
4 Inch CI
5Inch CI
5 Inch PVC
6 Inch CI
6 Inch PVC
8 Inch CI
10 Inch PVC
12 Inch CI
12 Inch PVC
Sluice Valve
Air Valve
Scour Valve
Leakage Points

WATER SUPPLY

N

Scale :

0 0,125 0,25 0,50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road,
Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No.

5.1

Table 5.3: Details of Overhead Reservoirs.

Sl. No.	Location of Over Head Tank	Feeding from	Booster Station	Capacity
				ML
A	**Scheme I**			
1	Kamarajar Road	Direct pumping from intake works to OHT		0.90
B	**Scheme II**			
1	Gandhi Nagar	Ground Level Service Reservoir at Town Booster station	I	0.30
2	Kamarajar Road		I	1.20
3	M.G.R Thidal		II	0.30
4	Coronation colony		I	0.30
5	Palaniandavar Colony		I	0.50
6	Cattle Shed		II	0.30
Total				**3.80**

Source: Sivakasi Municipality

80. *Service Reservoir:* - The transmitted water is stored and distributed through the Over Head Tanks (OHTs) located in the town. Currently the water is distributed through seven Over Head Tanks in the town. The total storage capacity of the reservoirs is 3.8 ML, about 84 per cent of the total water supplied. There are two Over Head Tanks at Kamarajar Salai along with a Booster station.

81. Water from Scheme I is pumped directly to the 0.9 ML Tank and water from scheme II is pumped by the booster station to the other Over Head Tanks in the town. There is one Over Head Tank each of capacity 0.3 ML at Gandhi Nagar, Cattle Shed Area, and M.G.R Thidal and Coronation colony respectively. A 0.5-ML capacity Over Head Tank is present at Palaniandavar Colony. The details of storage capacity of Over Head Tanks are illustrated in **Table 5.4.**

Table 5.4: Details of Storage Capacity.

Location of Over Head Tank	Storage Capacity
	ML
Gandhi Nagar	0.3
Kamarajar Salai	2.1
M.G.R Thidal	0.3
Coronation Colony	0.3
Palaniandavar Colony	0.5
Cattle Shed Area	0.3

Source: Sivakasi Municipality

82. *Distribution System:* Total length of the distribution network in the town is approximately 51.485 km. It has been ascertained from the operating staff that the pipelines have not been flushed for many years. Details of the existing distribution system are furnished in **Table 5.5.**

Table 5.5: Details of Existing Distribution System

Items	Description
No. of Service Reservoir	7
Total Storage Capacity (M *Lit)*	3.8
No. of Water Supply Zone	7
Total Length of distribution Network *(km)*	51.485
Total number of Public Fountains	147
Total number of House Connections	8,763
Water Supply through Lorry *(liters)*	2,24,000
Bore wells with hand pump	203

Source: Sivakasi Municipality

83. The tanker water supplies are especially meant for the northern wards diametrically opposite to the Vembakottai Road. Wards like 31, 33, 10, 14 and 22 have slum localities. Water is supplied through tankers to 12 localities in wards 1, 2, 3, 4, 5, 6, 7, 10, 14, 31, 22 and 33.

84. Water is supplied through tankers, each with a capacity of 6,000 to 9,000 litres, making 102 trips per day and supply about 1.18 MLD of water. About 15,000 persons residing in these wards are served through tanker supply i.e., almost 21 percent of the total population. The tankers supply water to the town from the surrounding villages within 10 Km radius of Sivakasi town especially from Malli Village.

85. *Existing distribution zoning*: - As mentioned earlier, the entire water supply system is divided into seven (7) zones and each zone is served by one overhead tank. Wards served by tankers are 21, 22, 26, 32 and part of 3. Details of the existing distribution zones are presented in **Table 5.6**

Table 5.6: Details of Distribution Zones

Zone	Location of Over Head Tank	Population Covered
I	Gandhi Nagar	9,539
II	Kamarajar Over Head Tank	30,260
III	Kamarajar Over Head Tank	
IV	M.G.R. Thidal	8,370
V	Coronation Colony	5,763
VI	Palaniandavar Colony	5,489
VII	Cattle Shed	12,749
	Total	**72,170**

Source: Sivakasi Municipality.

86. *Consumer Connections:* - 8,763 house service connections have been provided of which 7,808 connections are domestic and remaining is commercial/industrial. All non-domestic connections are metered. Details of existing house service connections are presented in **Table: 5.7.**

Table 5.7: Details of Existing House Service Connections.

Head	2002-03	2004-2005	Total Percentage
Residential			
Metered	6286	5783	65.99
Un metered	2062	2025	23.11
Commercial	271	742	8.47
Industrial			
Metered	33	213	
Un-metered	110	-	2.43
Total	**8762**	8763	100.00

Source: Sivakasi Municipality

87. *System Coverage:* - The gross per capita supply in the town is around 59.19 lpcd considering a total supply of 4.5 MLD. Water is supplied once in three days for 2 hours during normal season and once in eight-ten days for 2 hours during summer. The main issue pertaining to the system is the reduced yield from the source over the years. The details of performance indicators are illustrated in **Table 5.8**

Service Adequacy and Key Issues.

Table 5.8: Details of Performance Indicators for Water Supply

Indicator	Current Situation	Benchmark
Per Capita Supply	59.19 lpcd	90.0 lpcd
T & D losses/ Total Supply	20 percent	5 Percent
Supply Frequency	Once in 3/ 10 Days	Daily
Distribution Network Reach (percent of Road Length)	60.29 %	85 %
Treatment capacity/ Total Supply	133.3 %	100 %
Elevated Storage capacity/ Total supply	84.44 %	33 %
% P.T. Assessments with House Service connections	35.25 %	80 %

Source: Analysis

(i) *Source Sustainability*: The head works is located at Vembakottai on Vaipar River. Scanty rainfall conditions have cast a shadow on the long-term sustainability of the source, requiring immediate conservation measures. In addition, large-scale illegal sand mining in the Vaipar River basin has lowered the depth of the aquifer and the water potential.

(ii) *Transmission System & Treatment*: If permission is accorded to draw 4.5 MLD of water when the reservoir maintains sufficient storage (6-8 months in a year), the raw water pumping main to the treatment plant needs replacement with a pipe of higher size. The clariflocculator and filter beds in the plant are reported to be malfunctioning due to sludge accumulation and mud ball formation in the filter beds.

(iii) *Distribution System & Low Pressure*: The water supply zones in the town need to be redistributed for the existing Over Head Tanks to serve adequately. At present except Zone VII, all other zones have excess storage capacity. It is also reported that the pipelines are laden with heavy deposits resulting in frictional losses and reduced

terminal pressures. Complete rehabilitation of the distribution of the distribution system is necessary for at least the existing supply to reach the tail ends with adequate pressure. It is reported that more than 3,000 households with service connections use hand pumps for drawing water from the distribution system, as the residual pressure in the system is not sufficient.

2. Sewerage and Sanitation

88. *Existing situation:* At present there is no under ground sewerage system in the town, but keeping in the interests of the commercial, industrial and trading activities in the town under ground drainage is planned irrespective of SFC II norms of minimum of 1.5 lakh population. The present sanitation facilities in the town include septic tanks, public conveniences, ISP units etc. Disposal of night soil is normally by way of individual facilities and liquid waste (sullage and kitchen waste) is let in to the open drains.

89. *Coverage:* About 9,635 properties have septic tanks in the town and being used by around 48,000 persons. About 24,000 persons use various other methods of disposals including public, pay and use toilets and ISPs in the poor localities. However with respect to the Property Tax Assessments, the service coverage is about 38.8 percent considering the septic tanks alone and not any other form of disposal. Against high population coverage, this rather signifies the very less number of properties assessed by the municipality. The detail of sewerage and sanitation is presented in **Table 5.9**

Table 5.9: Sewerage and Sanitation Details

Description	**2002-03**	**2004-05**
No. of Septic Tanks	9,635	9,635
Number of seats in Units (ISP)	581	581
Number of seats in Units (Others)	214	214
Total	**10,430**	**10,430**

Source: Sivakasi Municipality

90. Certain population mainly those dwelling in slums and other urban poor localities do not have safe disposal facilities and they practice open defecation. The municipality in its efforts to improve upon the system has provided 56 Public Convenience systems with 220 seats to cover the low-income and slum settlements.

91. Of the total units 10 are ISP complexes. Two units are constructed under MP-LAD grant. The Municipality constructs the rest of the units. Of the units constructed by the municipality, five units are under pay and use category. Of the total units, 35 units including three ISPs are located in slums and the total numbers of seats in slums are 597.

92. The municipality/ community through grants from World Bank/ PMU/ Tamil Nadu Urban Development Program - II and Valmiki Ambedkar Awas Yojana funds construct the ten ISP units in the town. Each ISP Unit has 16 seats for majors and six units for minors apart from bathing facilities. The performance indicators are presented in **Table 5.10**

Table 5.10: Performance Indicators for Sewerage and Sanitation

Indicator	Current Situation	Benchmark
% P.T. Assessment Covered with Septic tanks	38.76 %	90.0 %
% P.T. Assessment Covered with Safe Disposal facility-Total	38.76%	100.0 %
Slum Population per seat of Public Convenience	42	60

Source: - Analysis

The absence of sewerage system led to unregulated flows in the drains (Sewage and sullage mix) reaching the Odai's and Urani's and causing pollution to the surrounding environmental conditions. Further, the Odai's and Urani's have silted over the years leading to stagnation of the wastewaters at every odd location in the town

3. Storm Water Drainage and Rejuvenation of Water Bodies

93. The storm water drainage network length in the town is 132.70 km. This is approximately 152.42 percent of the total road length in the town. The entire network in the town is of Pucca Open type. The storm water drains discharge wastewater into the natural channels Odai's running to a length of 10.92 km within the town and finally into the Periakulam Kanmoi's on the western side and the Sirukulam Kanmoi on the northern side of the town.

94. The total length of primary drains in the town is around 10.92 km, which include all major and minor natural channels. Seventy percent of the Odais are encroached upon by the slum dwellers and low-income group house holds in the town. Details of major channels and their lengths are presented in **Table 5.11**

Table 5.11: Details of Existing Channels and Their Lengths

Sl. No	Location of Odai	Length
		m
1	Tanbama to Post Office Bridge	1,014
2	Srivilliputhur Road Chandiragraham Doctors Land to Post office bridge	932
3	Post office Bridge to A.K. Road Church Bridge	581
4	Karanesan Stop to R.C. Church Bridge	1,181
5	R.C. Church Bridge to Old bus stand	212
6	J.C. School to Petha madathu Oorani	735
7	Naranapuram Road to Petha madathu Oorani	800
8	Thatta Oorani to Mani Kattu Oorani	1,900
9	Old bus stand Bridge to Upulppu Odai	925
10	Other small Odai	2,640
	Total	**10,920**

Source: - Sivakasi Municipality

95. The town has a natural topography, sloping from north to southwest. The slope facilitates the storm water run-off and free flow of wastewater from the town. 111.70 km of Pucca Open Drains constitutes the tertiary drains of the town. Details of drains are given in **Table 5.12**

Table 5.12: Details of Drains

Tertiary Drain Type	Length - 2002-03	Length - 2004-05	length
	km	*km*	*Percent*
Open Drains- Pucca	85.70	111.70	84.2
Open Drains- Kutcha	47.00	21.00	15.8
Total	**132.70**	**132.70**	**100.0**

Source: Sivakasi Municipality

96. Key issues/indicators are based on review and discussions, The performance indicators of drains are furnished in **Table: 5.13.**

Table 5.13: Performance Indicators for the Drains

Indicator	Current Situation	Benchmark
Storm Drain network/ Total Road Length	152.42 %	> 150.0 %
% Kutcha Open Drains	15.80 %	100.0 %
% Pucca Open Drains	84.20 %	100.0 %

Source: Analysis

(i) In the absence of sewerage system and less than adequate sanitation facilities in Sivakasi, large quantum of the sewage generated is let out into the storm water drains. This has resulted in polluting the Urani's as the storm water is finally discharged into these water bodies. In addition, the natural drainage channels are also susceptible to uncontrolled garbage dumping resulting in blockage and stagnation.

(ii) Uncontrolled solid waste dumping and encroachments on the banks of Odais and Urani’s has resulted in formation of silt and construction. Even the open storm water drains are easy prey to dumping of waste in the town resulting frequent blocking and over flow.

4. Solid Waste Management

97. E*xisting Situation:-* The town is divided into four sanitary divisions by the Health department, to be used for effective management of Solid waste generated by different sources in the town. About 45.06 tons of waste is generated in the town every day and collection performance around 60.59 percent. The municipality handles 100 percent of waste collection and municipality is planning to give fresh tenders towards primary and secondary collection.

98. Per capita generation in Sivakasi is about 592 gm per day, which is reasonable high for a town of similar size. The major contributors to the solid waste generated in the town are households and commercial areas. The detail of municipal waste generation is illustrated in **Table 5.14.**

Table 5.14: Details of Municipal Solid Waste Generation

Type	**Quantity 2002-03**		**Quantity 2004-05**	
	Tons	*%*	*Tons*	*%*
Domestic	29	64.4	29	64.4
Commercial	12	26.7	12	26.6
Industrial	3.5	7.8	3.5	7.8
Markets	0.5	1.1	0.5	1.1
Hazardous/ Hospital Waste	-	-	0.06	0.1
Total	**45.00**	**100.00**	**45.06**	**100.00**

Source: Sivakasi Municipality

99. *Domestic:* In Sivakasi, thirty houses randomly selected form each group of Low Income Group, Middle Income Group and High Income Group areas were studied by the consultants to assess the quantity and quality of household waste generation. Domestic waste generated varied from area to area and at an average of 400 grams per capita per day. Domestic waste generated in the town is about 29 tons, constituting 64 percent of the total waste generated.

100. *Commercial:* The commercial waste includes the waste from hotels and eating establishments, from shops, trading units, small time street vendors' etc. The daily waste generated is about 12 tons including that generated in the markets and is 27 percent of the total waste generated in the town. It mainly comprises of paper, plastics and other inorganic material.

101. *Industrial:* Industrial waste generated is mainly from the matches, fireworks printing and other ancillary industries in the town. Around 3.5 tons of waste is generated by these industries every day. This is 8 percent of the total waste generated in the town. This waste comprises of matchwood pieces, paper wastes that are inorganic.

102. *Bio-medical waste*: No scientific method of disposal of Bio-Medical waste is followed by the municipality and at present this waste is getting mixed with the other waste collected by the Municipality estimated at 1.1 ton of generation per day.

103. *Primary Collection*: The system of primary collection, which is followed, includes cleaning; sweeping and collection of waste stored in dustbins/ closed containers by trolleys. There are 160 dustbins with a capacity of 0.25 ton each placed across the town at different locations. Waste collected near the kerb sides and street sweepings are collected in a trolley and transferred to the nearest dustbins.

104. Door-to-Door collection and segregation at source is introduced and proposed to extend to the entire town in stages. The municipality has 115 hand push carts for collection of garbage. These handcarts are divided into two compartments one for organic waste indicated by green color and the other is for inorganic waste indicated by red color.

105. Street sweeping and drain cleaning, commercial waste, organic waste generated by the slaughter house, mutton stall, beef stalls, fish stalls, kalyana mandapams etc is collected on a day-to-day basis. Waste from commercial areas is also collected on daily basis in the morning time.

106. *Secondary Collection:* - Waste collected through primary collection is transported to the 16 collection points/ transfer stations. The municipality has 4 tractors of capacity 2.5 tons, one mini truck with a capacity of 3 tons each and three tippers with a capacity of 4 tons which are used for secondary collection as well as transportation to disposal site.

107. Each vehicle will do three to four trips per day form the collection points to the disposal sites. The fleet of vehicles available for the purpose includes tippers, tractors and mini trucks. The details of existing secondary waste transfer are presented in **Table 5.15**

Table 5.15: Details of Secondary Waste Transfer Details

Type of vehicle	Number of vehicle	Age	Total Trips/Day	Capacity of each Vehicle
		Years		*Tons*
Tractors	4	5	3	2.5
Mini Trucks	1	7	4	3.0
Tippers	3	12	3	4.0
FEL/JCB	1	3	3	-

Source: Sivakasi Municipality

108. The frequency of transportation of waste to disposal sites from various collection points is once a day and is conducted during forenoon. The total capacity of the fleet is 27.3 tons, which is 60.59 percent of the waste generation. Adopting a density factor of 0.35[2] and number of trips per vehicle as three, the total vehicle carrying capacity with the municipality is 60.59 percent of the waste being generated. However at present, on an average each vehicle makes more than 3 trips per day to collect and transfer 60 percent of the waste i.e., 27 tons is collected every day and the rest 40 percent of the waste is either left uncollected or not transported for disposal.

109. *Processing and disposal:* - No scientific method of disposal is followed in the municipality. Open Heap system is followed at the disposal sites at Paraipatti Village on Sattur Road (5 Km from the town). The area of the land at Paraipatti is 14.55 Acres. The disposal site is serving since 30 years and is saturated.

110. The total waste generated in Sivakasi will be around 48.61 tons per day in 2011 and around 58.81 tons per day in 2026. The present area available can only cater to the needs of the year 2008. Additional land of about 5 acres needs to be acquired for the long term needs of the year 2026 and the necessary infrastructure for landfill, composting shall be taken up and completed before 2007-08.

111. At present, Sivakasi Municipality is in the process of finding suitable land for compost yard. The Municipality has identified 40 acres of land in Peranayakkanpatti village towards Vembakottai. The Municipality is in the wait for the No-Objection certificate from the Pollution Control Board and Directorate of Town and Country Planning for acquisition of this land and developing the said infrastructure for composting and landfill.

[2] The Solid waste Management studies conducted in several towns of Tamilnadu (Palani, Mamallapuram, Kodaikanal, Rameswaram, Erode etc have put the density factor for un-compacted Waste at an average of 0.18 – 0.2. When compacted the same is observed to be in the range of 0.35 – 0.4.

112. The average spacing of dustbins is 544 m much beyond the accepted norm of 100 m. However, in case of 100 percent door-to-door collection, this need not act as a performance indicator. Road length per conservancy staff at 328 m is near the prescribed norms for a town of its size.

Service Adequacy and Key Issues

113. The collection performance and vehicle capacity adequacy ratio indicates the need to increase the numbers of vehicles and reduce the numbers of trips per vehicle. Details of Performance Indicators for solid waste management are furnished in **Table 5.16**

Table 5.16: Performance Indicators for Solid Waste Management

Indicator	Current Situation	Benchmark
Per Capita Generation (Grams/ Day)	592.67 gm	< 400 gm
Collection Performance (% Collected to Generated)	104.0 %	100.0 %
% Rated vehicle capacity to total waste generated	55.48 %	>= 100.0 %
Area Coverage per Collection Point/ Transfer Station	0.43 Sq. km	0.16 Sq. km

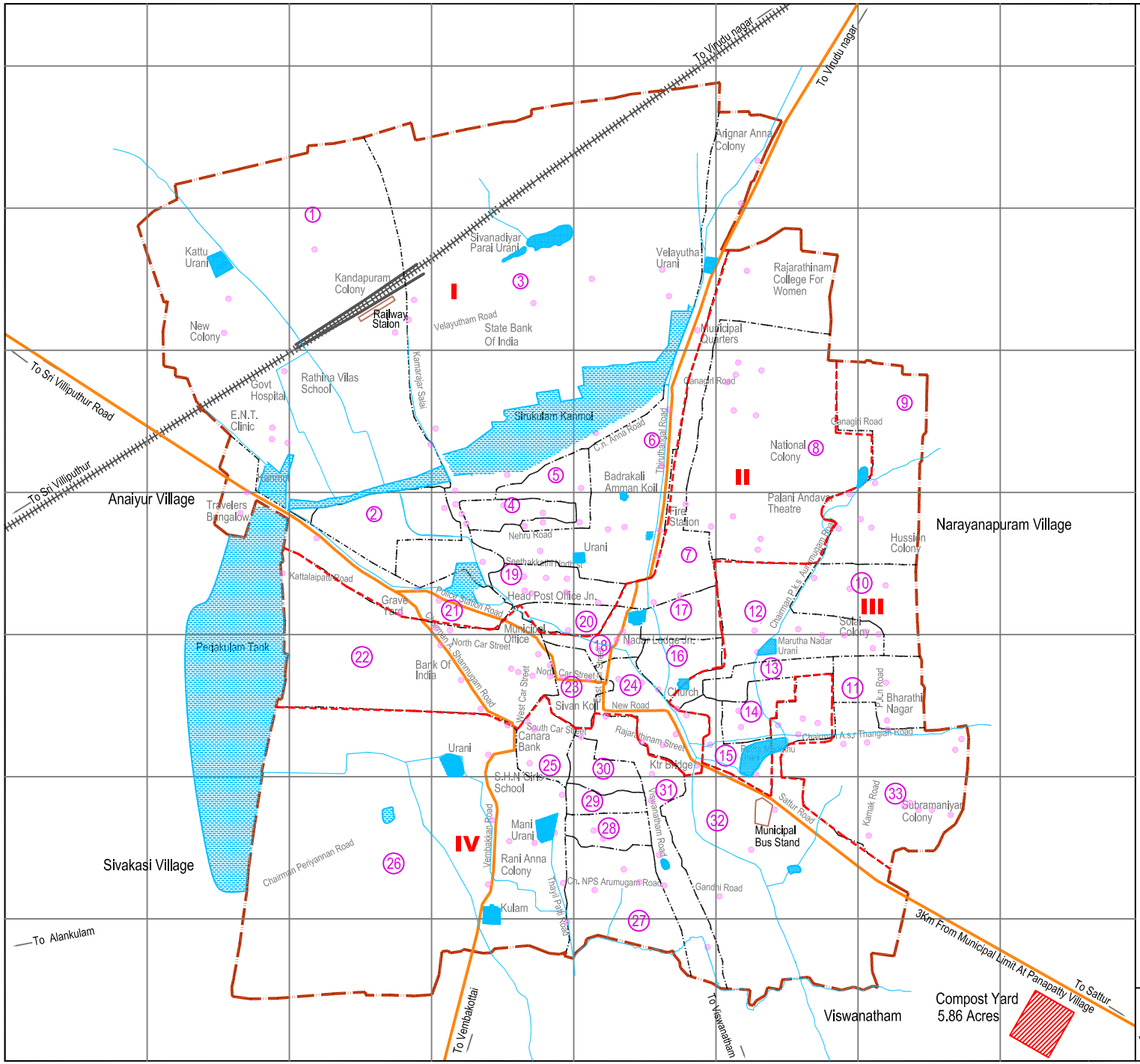
Source: Analysis

(i) *Improper disposal of meat and fish stall wastes:* A major issue is the improper management of these wastes, which are thrown into open drains, grounds etc from illegally set up stalls. They release harmful disease causing pathogens.

(ii) *Open dustbins and loading of waste in transport vehicles*: Though effectively operated the system of open bins is not considered a healthy practice. Moreover, the transportation of the waste right from collection to shifting to the disposal site is exposed inviting a large number of health concerns. It has been often reported that the community bins in the areas under the management of the municipality as well as the transport vehicles are over spilling.

(iii) *Lack of any scientific method for Bio-medical waste disposal*: There has not been any bio-medical waste disposal plant (Incinerator) till now. Though the Medical Practitioners Association agreed to bear a part of the cost of procuring the incinerator, delay in finding a site for the location of the incinerator is compounding the problem.

(iv) *High levels of non-reusable plastics*: Though the awareness levels among the public has been on the rise during the past three years, the need to educate on source segregation and waste minimization is amply felt. The solid waste management system is shown in **Map 5.2**



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- Ward No.
- SH Ways
- Railways
- Water Body
- Canal, Nala, Odai
- Location Of Dust Bins
- Sanitary Division

Notes :

Sanitary Divisions

Division Nos	Ward Nos
I	1, 2, 3, 4, 5, 6, 19, 20, 21
II	7, 8, 16, 17, 18, 22, 23, 24
III	9, 10, 11, 12, 13, 14, 15, 33
IV	25, 26, 27, 28, 29, 30, 31, 32

SOLID WASTE MANAGEMENT

N

Scale :

0 0,125 0,25 0,50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road, Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No. 5.2

5. Roads

114. *Existing Situation:* The total area under roads in the town is 0.86 Sq. km about 13 percent of the total area of the Municipality. So far, 80 percent of the developed area of the town has been well connected by a total length of 87.06 Km of road network and 100 percent of municipal road length are surfaced roads with black top and cement concrete surfacing.

115. The major roads in the town are radial in character and the minor roads follow a radial and circular pattern. All the main roads radiate from the center of the town outwards to the respective regional destinations. The road network comprises of black topped surfacing at 74.70 percent (including State Highways with Bituminous), cement concrete roads at 19.53 percent and water bound macadam roads at 5 percent.

116. Sivakasi Municipality is connected towards state highways of Virudunagar in north, Vembakottai in south, Srivilliputtur in west and Sattur in east directions. The major and minor roads are connected inside the municipality.

117. The total length of the State Highways is 6.16 Km running through the town. These roads are Black topped roads and connect the town with important regional destinations like Srivilliputtur, Sattur, Virudunagar, etc. Details of municipal roads are illustrated in **Table 5.17**

Table 5.17: Details of Municipal Roads

Surface type	**Length (2002-03)**		**Length (2004-05)**	
	Km	*%*	*Km*	*%*
Cement Concrete	13.04	16.90	17.00	19.53
Black Topped	43.92	56.95	58.90	67.65
Water Bound Macadam	14.00	18.16	5.00	5.74
State Highway (BT)	6.16	7.99	6.16	7.08
Total	**77.11**	**100.00**	**87.06**[3]	**100.00**

Source: Sivakasi Municipality

6. Traffic and Transportation.

118. *Traffic and transportation:* - Sivakasi being an industrial, firecracker manufacturing and trading town, heavy traffic prevails and the town is the origin and destination for several transport vehicles across the country. Pedestrian traffic is substantial throughout the central area of the town and at all commercial road stretches like Sattur road, near bus stand, S.H.N School Street, East Car Street (Tana Bazaar point), North car street (Subramanisamy kovil point), south car street (Thilogaraj complex point) etc. The Traffic Operation and Management Plan (TOMP) study reveals that the congestion and mixing of pedestrian and vehicular traffic is high in all these streets.

119. *Travel Pattern*: - The travel pattern in the town is guided by the road network and land use pattern in the town. All the commercial and trading activities are concentrated at the centre

[3] The municipality has extended new formation of roads around 10 km in past two years

of the town bounded by the four major roads from Sattur, Virudharnagar, Srivilliputhur and Vembakottai. The road pattern also makes a lot of thorough traffic to pass through the heart of the town.

120. All the regional traffic from Virudunagar to Srivilliputtur, Virudunagar to Vembakottai and Sattur has to pass through the centre of the town owing to the non-availability of any ring roads/ bye-pass roads.

121. *Intersections*: The important junctions in the town where major roads meet are

(i) Intersection of Thiruthangal road, Virudunagar Road, Coronation road and C.N. Anna Road.
(ii) Intersection of Srivilliputtur Road to be widened to provide 10m wide riding surface.
(iii) Intersection of Thiruthangal road and Velayudham road.
(iv) Junction of Sattur road and Kamak road.
(v) Intersection of Chairman A.S.K.Thangaiah road and Kamak road (Ambalamedu junction)
(vi) Intersection of Chairman Periannan road and SHN School road.
(vii) Junction of North Car Street, East Car Street and Thiruthangal Road.
(viii) Kamarajar Road and Police Station Road Intersection

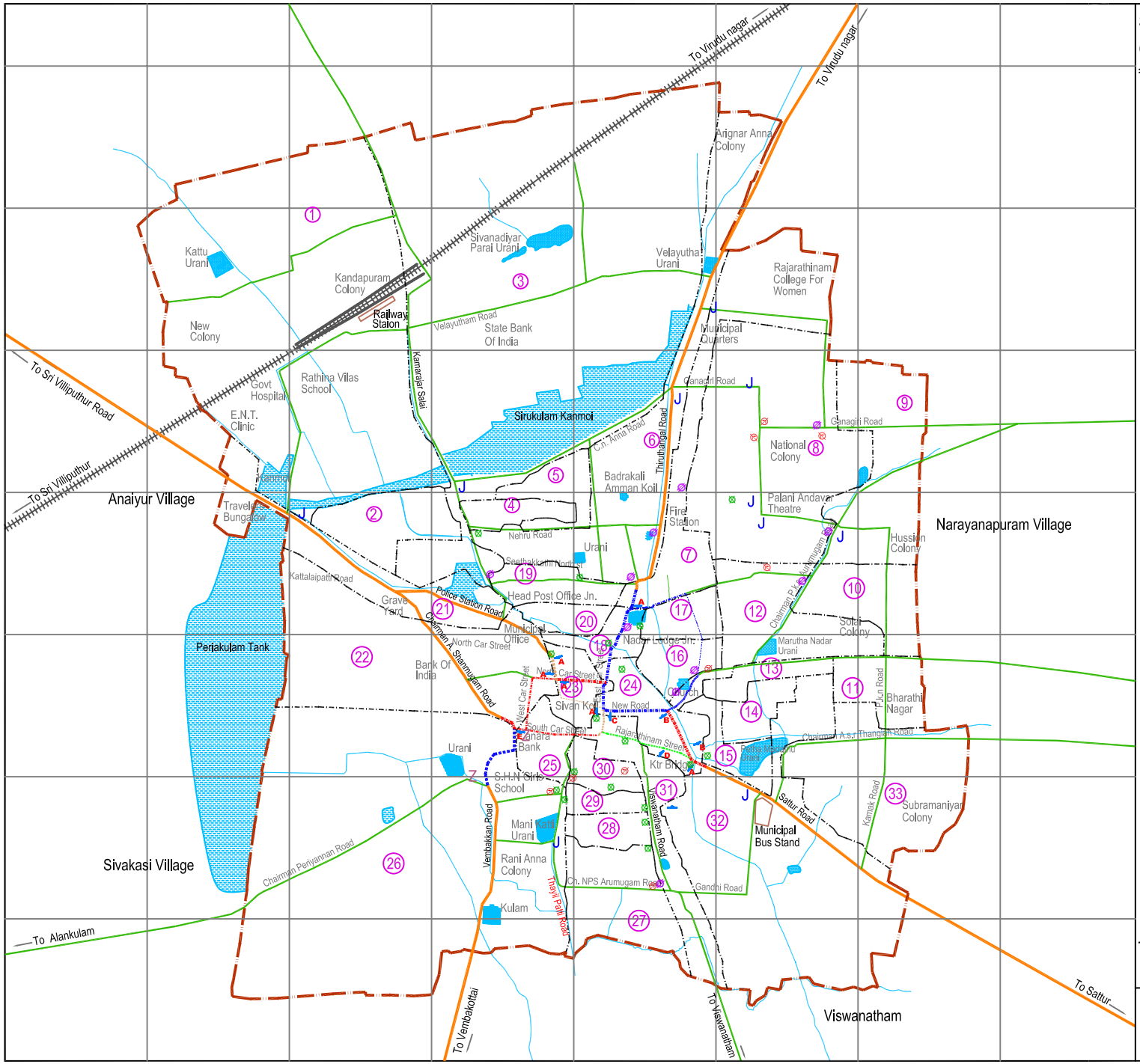
122. All these junctions have been facing the problem of encroachment, poor visibility, lack of turning radius, obstructions in the form of narrow streets, electric and telephone poles/ lines at the edge etc. While the junctions 1, 2, 5 and 7 are four-arm junctions, junction 8 is staggered.

123. *Parking Facilities:* In the absence of any assigned parking facilities in the municipal area, abrupt and indiscriminate roadside parking was noticed. This has led to reduction in the effective carriageway of the roads leading to congested travel and accidents. Major parking problems were observed near the Bus Stand, Sattur Road, In front of Sivan Kovil, and all the commercial stretches

124. In Sivakasi, about 400 to 450 trucks come to town for loading and unloading goods related to printing materials, fire crackers etc. Because of no parking facilities within the municipality, trucks are parked on the roadsides of main commercial roads. This leads to traffic jams and affect the free flow of traffic.

125. Public Transport System in the town is catered to by private service operators plying mini-buses between various localities in and around the town. There are about 10 to 15 such mini buses plying within the municipal limits

126. Apart from these mini-buses there are a number of autos operating in the town. These autos are the most widely used mode of public transport. Pedestrian mode of transport is also significant in the town. The traffic and transportation proposal are shown in **Map 5.3**



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Railways
- Water Body
- Canal, Nala, Odai

- J — Heavy Vehicles Prohibited
- No Entry One Way
- No Entry For Cars Autos And Light Commercial Vehicles
- No Right Turn
- No Left Turn
- Z — Closed For Cars & Other Medium Motar Vehicles During 0800 To 1100 & 1500 To 1800 Hrs

Notes :

- Light Vehicles Two Way
- Light Vehicles One Way
- Bicycles Only
- Bicycles And Two Wheelers Only
- A — Entry Restricted To Bicycles & Two Wheelers
- B — No Right Turn
- C — No Left Turn
- D — Entry Rstricted To Bicycles Only
- E — Cars Light Commercial Vehicles & Three Wheelers
- Prohibited Between 0800 To 1100 & 1500 To HRs

TRAFFIC & TRANSPORTATION

N

Scale :

0 0,125 0,25 0,50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road,
Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No. **5.5**

Service Adequacy and Key Issues

(i) *Several Critical Junctions with Poor Visibility*: The Virudunagar, Srivilliputhur, Vembakottai, Sattur roads pass through the centre of the town and are highly congested at several points due to the commercial activities extending onto the margins of the roads. This has made the road highly susceptible to several accidents. Several other important roads in the town also have sharp turns and encroachments creating poor visibility for riders on these roads.

(ii) *Absence of Organized Traffic lots in the Town*: The town does not have any organized parking facilities and this has added to the already existing congestion on the roads. Irregular parking on the road margins is normally seen on all the roads in the town.

(iii) *Absence of Bye-pass Roads/ Ring Roads for regional Traffic*: The absence of bye-pass road or any ring road makes all the regional traffic like heavy trucks, Regional Transport buses etc. to enter the heart of the city and pass through it.

(iv) *Absence of Truck terminal*: About 400 to 450 trucks come to the town for loading and unloading goods related to Printing materials, Cotton yarns, Fire crackers etc. Lack of a truck terminal for a town of its importance led to uncontrolled parking of trucks by the side of main commercial roads effecting frequent traffic jams and obstruction to free flow of traffic

v) *Traffic Congestion from Head Post Office to KTR Bridge Junction*: Heavy traffic with high PCU in the peak hours is observed on the road from head post office to bus stand route.

7. Street Lighting

127. Existing Situation: - There are 2503 streetlights existing in the town with an average spacing of 34.78 m making the town adequately lit. 83.34 percent of total streetlights are tube lights and 16.66 percent are high power lamps. Of these 125 is mercury vapour lamps and 291 are sodium vapour lamps. The details of street lighting are presented in **Table 5.18**

Table 5.18: Details of Street Lighting

Type of Luminary	**Number (2002-03)**		**Number (2004-05)**	
		%		*%*
High Mast Lamps		-	1	0.04
Mercury Vapour lamps	125	5.18	125	4.99
Sodium Vapour Lamps	220	9.12	291	11.63
Tube Lights	2067	85.70	2086	83.34
Total	**2412**	**100.00**	**2503**	**100.00**

Source: Sivakasi Municipality & Analysis

128. The lighting is adequate except in the peripheral wards of 3, 32, 8 and 2 where the average spacing between lamp posts is more than 40 m and other wards 9, 16 and 4, where the spacing is more than 30 m.

129. While the peripheral wards also need to improve upon the road length along with provision of streetlights, the central areas need more lighting or the dense built-up areas. The percentage high power lamps present a satisfactory picture, though there are no high mast lamps in the town. These are adequate in number and in the right quantum not to let the energy costs go up. The street lighting indicators are presented in **Table 5.19**

Service Adequacy and Key Issues

Table 5.19: Indicators for Street Lighting

Indicator	Current Situation	Benchmark
Spacing between Lamp Posts	34.78 m	< 30.0 m.
% Tube Lights	83.34 %	70.0 – 80.0 %
% High Power Lamps	16.66 %	20.0 – 30.0 %

Source: Sivakasi Municipality & analysis

(i) Lack of adequate lighting in peripheral areas: This is more specific in wards 3, 32 and 8.

VI. FINANCE OF SIVAKASI MUNICIPALITY

1. Municipal Fund

130. *Overview*. Sivakasi Municipality maintains a municipal fund for managing the finances of the Municipality. The accounts of the municipal fund were maintained on a cash based single entry system till the FY 1999-2000. The financial status of the Municipality has been reviewed for the past four years, commencing from the financial year 2000-01. This section contains a description of the municipal finances, the sources and uses of funds, and an assessment of municipal finances based on important financial indicators. Currently the urban local bodies of Tamilnadu maintain three separate funds, namely General Fund (Revenue Fund), Water & Drainage Fund and Education Fund. For the purpose of this analysis, Education fund has clubbed in to General fund. For further analysis, the items of each fund are categorized under the following major heads.

131. *Revenue Account*: All recurring items of income and expenditure are included under this head. These include taxes, charges, salaries, maintenance expenditure, debt servicing etc.

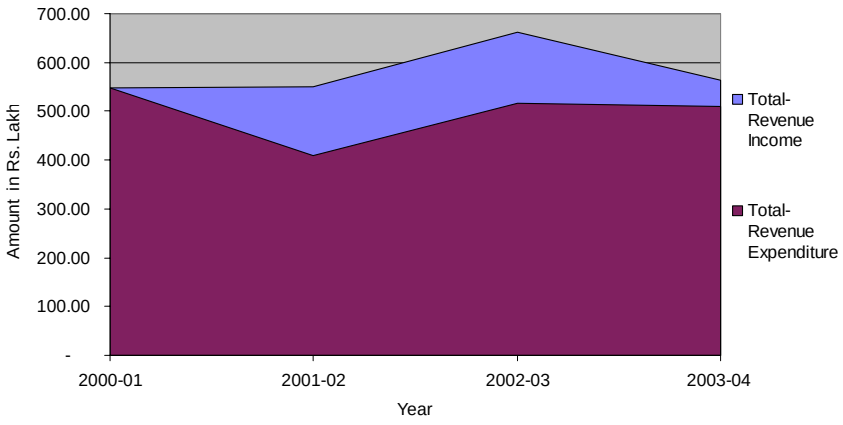
132. *Capital Account*: Income and expenditure items under this account are primarily non-recurring in nature. Income items include loans, contributions by GoTN, other agencies and capital grants under various State and Central Government programs, revenue account transfer for capital works and income from sale of assets. Expenditure items include expenses booked under developmental works and purchase of capital assets.

133. *Deposits and Advances*: Under the municipal accounting system, certain items are compiled under advances and deposits. These items are temporary in nature and are essentially adjustments for the purpose of recoveries and payments. Items under this head include library cess, income tax deductions, pension payments, provident fund, payment and recoveries of advances to employees and contractors, etc.

2. Financial Status

134. Revenue income of Municipality has grown to Rs. 563.54 lakh in the FY 2003-04 from Rs. 548.93 lakh in FY 2000-01, at a low annual growth of 0.88 percent. Revenue expenditure decreasing trend at

Figure 6.1: Total Revenue Income and Expenditure Trend



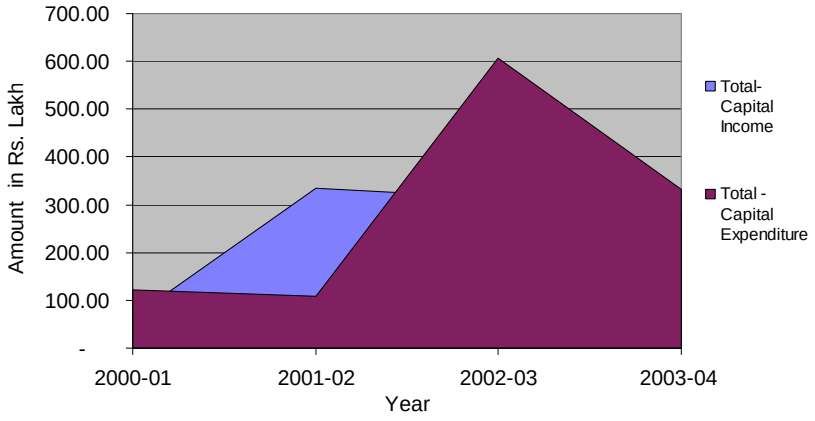
an average annual rate of 2.37 percent from Rs. 548.00 lakh to Rs. 509.14 lakh during the assessment period. The revenue account maintains surplus during the entire assessment period. The trends for the revenue fund are presented in **Table .6.1**

Table 6.1: Summary of Municipal Fund

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Revenue Account				
Revenue Income	548.93	550.91	661.04	563.54
Revenue Expenditure	548.00	408.29	517.54	509.14
Surplus/Deficit	*0.92*	*142.62*	*143.49*	*54.40*
Capital Account				
Capital Income	63.29	334.20	314.46	284.19
Capital Expenditure	120.88	108.17	607.04	332.18
Surplus/Deficit	(57.59)	226.03	(292.58)	(47.99)
Fiscal Status	*(56.67)*	*368.65*	*(165.67)*	*(10.17)*
Advances & Deposits				
Extraordinary Income	31.47	16.98	88.10	86.61
Extraordinary Expenditure	9.83	1.30	103.11	75.86
Surplus/Deficit	21.64	15.68	(15.00)	10.75
Overall Fiscal Status	*(35.03)*	*384.34*	*(180.67)*	*0.58*

Note: Figures in parentheses indicates a deficit

Figure 6.2: Total Capital Income and Expenditure Trend



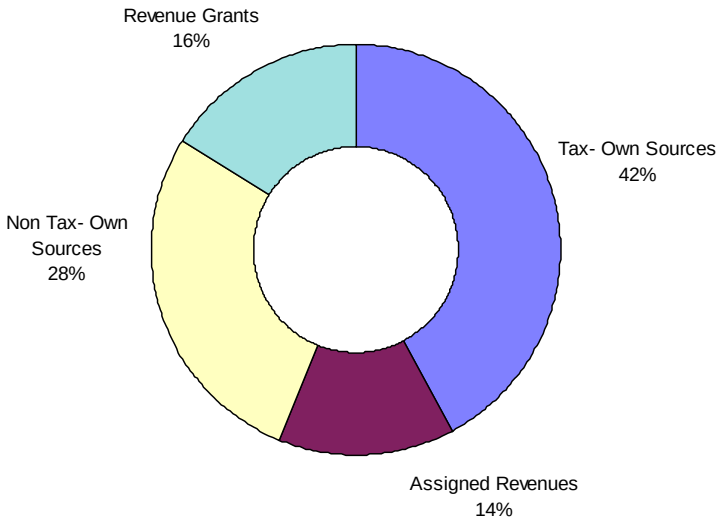
135. Capital income comprises of loans, grants and contribution in the form of initial deposit for water supply connections, revenue account transfer for capital works and sale proceeds of assets. Majority of the capital income is in the form of loans. The capital account has witnessed inconsistent net status during the entire assessment period.

136. The following sections present detailed review of revenue and capital accounts, primarily aimed at assessing the municipal fiscal status and providing a base for determining the ability of Municipality to sustain the planned investments.

3. Revenue Account

137. The revenue account comprises of two components, revenue income and revenue expenditure. Revenue income comprises of internal resources in the form of tax and non-tax items and external resources in the form of shared taxes/ transfers and revenue grants from the State Government. Revenue expenditure comprises of expenditure incurred on establishments, operation & maintenance and debt servicing.

Figure 6.3: Source of Income (2000 to 2004)



138. *Revenue Income*. The revenue sources of Municipality can be broadly categorised as own sources, assigned revenues and grants. The source-wise income generated during the review period is presented in **Table 6.2**. The base and basis of each income source has been further elaborated in the following section. The revenue income of Sivakasi Municipality has increased from Rs. 336.89 lakh in 2000-01 to Rs. 387.19 lakh in 2003-04 – a Compound Annual Growth Rate (CAGR) of about 4.74 percent.

Table 6.2: Sources of Revenue Income

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Own Sources				
Tax	138.23	170.81	164.11	170.40
Non Tax	109.69	104.58	134.20	80.48
Assigned Revenue	55.61	28.56	101.69	36.45
Grants	33.47	49.92	67.44	99.86
Total (excl. W&D A/C)	**336.99**	**353.87**	**467.44**	**387.19**

139. Own-source income includes income from resource mobilization activities of Municipality in the form of taxes, income from municipal properties and markets, building permit fee, trade licences, income from fees and fines, etc. Own revenue sources are further classified as tax revenue and non-tax sources that are generated by various sections of the Municipality. The salient features of this revenue head is detailed below.

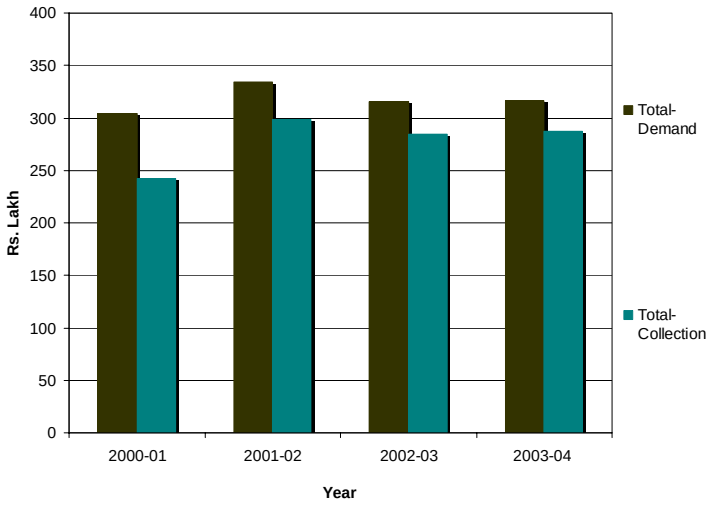
(i) Own Sources/Tax. This item head comprises of income sourced primarily from property tax (General purpose tax, Lighting tax, scavenging tax and Education tax excluding water and drainage tax), professional tax and other taxes. The property tax is the largest revenue-generating item. Own sources of tax income is presented in **Table 6.3**. Average income from own sources constituted 70 percent of the total revenue income during the review period and has increased at an average compounded annual growth rate of just 0.40 percent. Tax sources contributed 42.10 percent of the revenue income and non-tax sources contribute 27.90 percent of the revenue income.

Table 6.3: Own Sources of Revenue Income

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Taxes				
Property Tax (excl. W&D tax)	137.04	169.25	161.32	162.74
Profession Tax	1.11	1.52	2.75	7.66
Other Taxes	0.08	0.04	0.04	-
Non – Taxes				
Income from ULB's. properties	4.57	6.64	30.72	2.15
License Income (Trade, etc.)	9.65	5.99	17.73	33.51
Income from Fees and Fines	28.01	20.99	27.96	2.25
Miscellaneous Income	67.47	70.96	57.78	42.57
Total (excl. W&D A/C)	**247.92**	**275.39**	**298.31**	**250.87**

- *Property Tax*: This is the most important category of own source income to the Municipality. Sivakasi Municipality levies a consolidated property tax of 30 percent of the Annual Rateable Value (ARV). During the assessment period, the numbers of property tax assessments increased at an average growth rate of 1.24 percent per annum. Property tax income, however has increased at a CAGR of about 5.90 percent during the assessment period.

Figure 6.4: Property Tax Collection Performance



The average collection performance of Property Tax for the review period is 88 percent and the same is presented in **Table 6.4Table** . The property tax levied is 30 percent of the Annual Rental Value (ARV) and includes the general tax (12%), water and drainage tax (13%) and education tax (5%). It is observed that the Municipality maintained a high arrear collection of average about 77 percent.

Table 6.4: Property Tax – Demand Collection and Balance Statement

Item	2000-01	2001-02	2002-03	2003-04
Demand (Rs. Lakh)				
Arrear	33.72	49.03	18.42	12.49
Demand	270.14	284.96	296.70	304.05
Total	*303.86*	*333.99*	*315.12*	*316.54*
Collection (Rs. Lakh)				
Arrear	20.53	41.83	13.28	11.17
Demand	221.30	256.84	271.41	276.01
Total	*241.83*	*298.67*	*284.69*	*287.18*
Collection Performance (%)				
Arrear	61%	85%	72%	89%
Demand	82%	90%	91%	91%
Total	***80%***	***89%***	***90%***	***91%***

The average property tax collection performance of the Municipality has increased significantly during the assessment period. The maximum arrear collection was achieved during the FY 01-02 and the same was as low as 61 percent during FY 01. There are a total of 24,558 assessed properties in the Municipality and this has increased at an average growth rate of 1.24 during the review period. The ARV per property during the FY 04 is Rs. 4,127 and the tax per property is Rs. 1,238.

- *Professional Tax*: Professional tax is also collected by the municipality from all registered organizations, companies or firms, public or private, individuals and State & Central Government departments. Currently 2,725 assesses are registered with the Municipality. Based on the demand, the average tax per professional is about Rs. 758/- per annum. Low average current collection of 23 percent observed during the review period and the average current collection is around 23 percent during the same period. The details of Demand Collection and Balance statement are provided in **Table 6.5.**

Table 6.5: Profession Tax – Demand Collection and Balance Statement

Item	2000-01	2001-02	2002-03	2003-04
Demand (Rs. Lakh)				
Arrear	3.04	2.08	1.09	0.19
Demand	6.86	7.57	9.00	20.66
Total	*9.90*	*9.65*	*10.09*	*20.85*
Collection (Rs. Lakh)				
Arrear	0.33	0.35	0.07	0.19
Demand	0.78	1.17	2.68	7.47
Total	*1.11*	*1.52*	*2.75*	*7.66*
Collection Performance (%)				
Arrear	11%	17%	6%	100%
Demand	11%	15%	30%	36%
Total	***11%***	***16%***	***27%***	***37%***

(ii) Own Sources/Non Tax. This item head comprises of income from Municipal properties, fees on Municipal services (building permission, etc.), income from interest on investment and miscellaneous services. On an average, through the assessment period, own source/non tax income constitutes 27.90 percent of the total revenue income. Income from remunerative enterprises, income from fees and fines constitute the major revenue sources under this item head. Income through non-tax own sources of the Municipality has declined over the assessment period at a CAGR of about 9.81 percent.

- *Remunerative Enterprises*: Income from remunerative enterprises is the non-tax income in the form of rentals from assets like shopping complexes, market fee, parking fee and income from other real assets owned by the Municipality. Income from the remunerative assets of the municipality contributed 2.59 percent of the revenue income during the assessment period and registered a negative CAGR of about 22.24 percent. The average revenue mobilized during the review period under this item head is Rs. 11.02 Lakh.

(iii) Assigned Revenues. This item head comprises of income from Government of Tamil Nadu (GoTN)/State transfers of Municipal income collected by the state line department. Transfers are in the form of Municipality's share of taxes levied and collected by GoTN from establishments/operations within the municipal limits. Surcharge on transfer of immovable properties and entertainment tax, are the major items on which these revenues are realized by Municipality.

Table 6.6: Income from Assigned Revenue

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Entertainment Tax	20.01	20.00	37.43	12.70
Surcharge on Stamp Duty	29.57	8.56	64.26	23.08
Other Transfers	6.04	-	-	0.67
Total	**55.61**	**28.56**	**101.69**	**36.45**
Share in total Revenue Income (%)	16.50	8.07	21.75	9.41
Growth (%)		*(48.64)*	*256.09*	*(64.15)*

Income through assigned revenues contributes around 13.93 percent of revenue income and it is declining at an average compounded annual growth rate of 13.13 percent during the review period. It is observed (**Table 6.6**) that the inflow from this account head has been inconsistent due to delays in transfers and deductions at source towards municipality debt repayment commitments and/ or other dues payable to GoTN.

- *Entertainment Tax*: The Commercial Tax (CT) Department collects entertainment tax from three cinema halls (with a total capacity of 1,850 seats) functioning within Municipal limit. The CT Department transfers 90 percent of the total tax collection to Municipality, and retains 10 percent towards management charges. Entertainment tax accounts for around 5.72 percent of total revenue income.

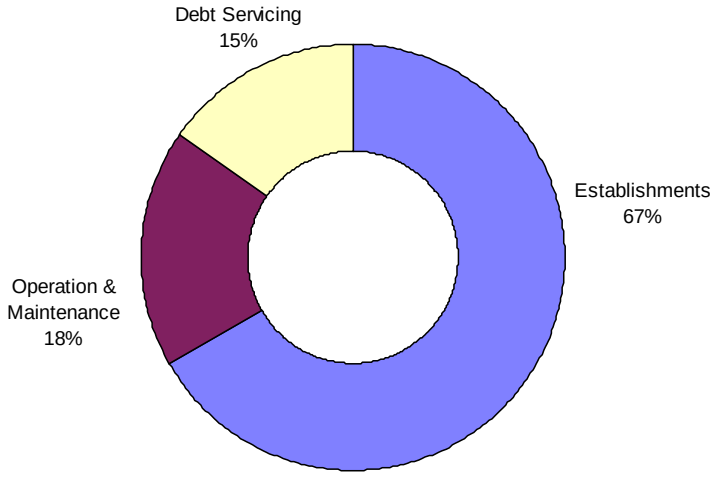
- *Stamp Duty*: Surcharge on stamp duty is another assigned revenue source, accounting for 7.72 percent of revenue income during the assessment period. It is levied in the form of a surcharge on stamp duty applicable on all properties registered or transferred within Municipality limits. The Registration Department collects and 90 percent of the collections are transferred to Municipality.

(iv) Revenue Grants and Contribution. This item mainly comprises revenue grants and compensations from the State Government under various heads. The regular grants include the SFC grants and the others include aid grants, grants for services like roads, buildings, maternity and child welfare, public health, contributions for elementary and secondary schools and etc. Grants which are for specific purposes are ad-hoc in nature. In case of Sivakasi Municipality, revenue grants and contributions constitute about 16.06 percent of the total revenue income and have registered an average annual growth rate of 43.97 percent. SFC Devolution is major item of grants, which is transferred as part SFC recommendation. As per SFC recommendation, 12% of state revenue under pool B is transferred to each local body based on a formula recommended by SFC. The fluctuation in SFC grant is due to delay and deduction at source.

Table 6.7: Income from Revenue Grants

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
State Finance Commission Grant	6.40	-	67.22	99.36
Other Grants	27.07	49.92	0.22	0.50
Total	**33.47**	**49.92**	**67.44**	**99.86**
Share in total Revenue Income (%)	9.93	14.11	14.43	25.79
Growth (%)		*49.17*	*35.09*	*48.07*

Figure 6.5: Items of Revenue Expenditure (2000 to 2004)



140. *Revenue Expenditure*. Revenue expenditure of Municipality has been analyzed based on expenditure heads broadly classified under the following departments- General Administration and Tax collection, Public Works and Roads, Street Lighting, Public Health & Conservancy, Town Planning and Miscellaneous Items. Water supply and drainage revenue expenditure is analysed separately and the same is presented in the following section. Revenue expenditure is further classified under Establishment, Operation & Maintenance and Debt Servicing.

Table 6.8: Sector wise Revenue Expenditure

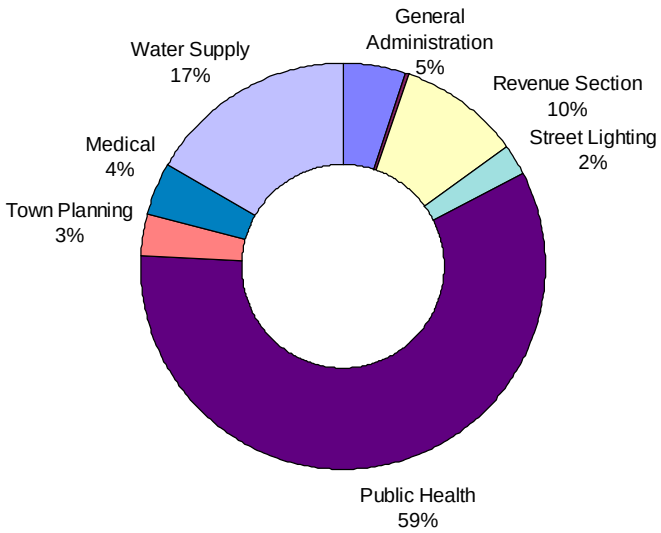
Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Establishment	341.62	198.48	212.01	202.63
Operation & Maintenance	37.88	46.35	89.03	76.25
Debt Servicing	65.44	13.58	63.73	88.13
Total (excl. W&D A/C)	**444.94**	**258.42**	**364.77**	**367.01**
Growth (%)		*(41.92)*	*41.15*	*0.62*

(i) Establishment Expenditure. Establishment expenditure alone accounts for about 66.73 percent of revenue expenditure, excluding water supply and drainage account. About 64 percent of the total revenue income is utilized for establishments excluding water supply and drainage staff salary and other related expenses. Only 15.36 percent of the revenue expenditure was used for debt servicing.

For the assessment period, revenue expenditure grew at an negative average rate of 6.22 percent; while growth in revenue income was 4.74 percent during the same period. This indicates that revenue and education fund of Municipality is in surplus.

Further, while expenditure on establishment grown at annual average rate of 14.04 per cent, expenditure on O&M grew at an average rate of 90.32 percent per annum indicating that the Operations and maintenance expenditure need to be controlled. Public works and Roads O&M increased by almost 1.50 times during the financial year 2002-03 to 2003-04.

Figure 6.6: Sector Wise Salary Composition (2000 to 2004)



The following table presents sector /department wise salary expenditure during the assessment period. Since, the department wise establishment expenditure is not furnished in the account statement (consolidated figures only available in the 2000 series), consultant used the third SFC questionnaires for working out the department wise salary. Over 59 percent spent for conservancy staffs salary and around 17 percent for water supply.

Table 6.9: Sector wise Salary

Item	2000-01	2001-02	2002-03	2003-04
	Amount in Rs. Lakh			
General Administration	9.49	9.49	9.45	9.45
Accounts Department	0.38	0.39	0.48	0.52
Revenue Section	21.43	22.00	18.87	13.64
Water Supply	31.98	33.45	31.37	30.00
Street Lighting	4.37	4.42	4.44	4.50
Public Health	102.07	104.20	112.29	128.45
Town Planning	5.93	6.16	6.18	6.60
Medical	7.40	7.76	8.97	9.65
Total	**183.05**	**187.87**	**192.04**	**202.82**
Growth (%)		*2.63%*	*2.22%*	*5.61%*

Source: SFC Questionnaire Document

Establishment expenditure of all sections (excluding water & drainage account) accounts for an average of 55.80 percent of revenue expenditure. Establishment expenditure of the Municipality has been consistently above 50 percent and there haven't been any major efforts on part of the Municipality towards containing the establishment expenditure. It is necessary that the Municipality goes ahead with privatization initiatives so as to improve upon and allocate more amounts for the O&M and debt servicing.

(ii) Operations & Maintenance. Operation and maintenance expenditure of all sections together accounts for 27.55 percent of revenue expenditure and had increased at an average rate of 23.57 percent per annum.

Street lighting, public works and roads conservancy are the major expenditure items. O&M expenses are dominated by power charges for street lighting, while that for the upkeep of roads has been very minimal. Street lighting sector can be put for privatization and implement energy conservation measures to curtail the costs on repairs, replacements and power charges.

(iii) Debt Servicing. A review of the outstanding loan statement of Municipality, as on March 31, 2005, i.e., at the start of the FY 2004-05 reveals that the net outstanding debt liabilities of Municipality are at Rs. 1,411.13 lakh. **Table 6.10** details out the agency wise outstanding loans.

Table 6.10: Out standing Loan Statement

Item	Loan Amount	Outstanding
	Amount in Rs. Lakh	
Government of Tamil Nadu[4]	827.20	693.93
TUFIDCO (Own Fund)	374.19	355.76
TUFIDCO (MUDF)	63.17	60.61
TUFIDCO (IDSMT)	212.95	206.59
TNUDF (Special Road Works)	94.24	94.24
Total	*1,571.75*	*1,411.13*

[4] Mannur water supply scheme is under execution by TWAD Board. From this municipality will get another 5 MLD water. For this water Municipality shall have to pay Rs.12 crores to the Tamilnadu govt.

The total amount of loans drawn by the Municipality till date is Rs. 1,571.75 lakh, majority of it from Government of Tamilnadu and TUFIDCO. The ratio in terms of ARV (estimated at Rs. 4,127) is 1.35; thereby indicating that the Municipality is capable of leveraging additional debt to finance its projects as this is below the threshold of 2 to 3 (generally considered by Financial institutions).

Debt servicing accounted for around 16.66 percent of revenue expenditure (including all funds) during the review period and the DSR (as % of revenue income) is around 14.32 percent, which is well below the threshold level of 25 percent, as considered by financial institutions. The Municipality has to start to focus upon sustainable debt servicing after having cut down establishment costs to improve its credit rating and capability towards leveraging additional debts.

4. Water Supply and Drainage Account

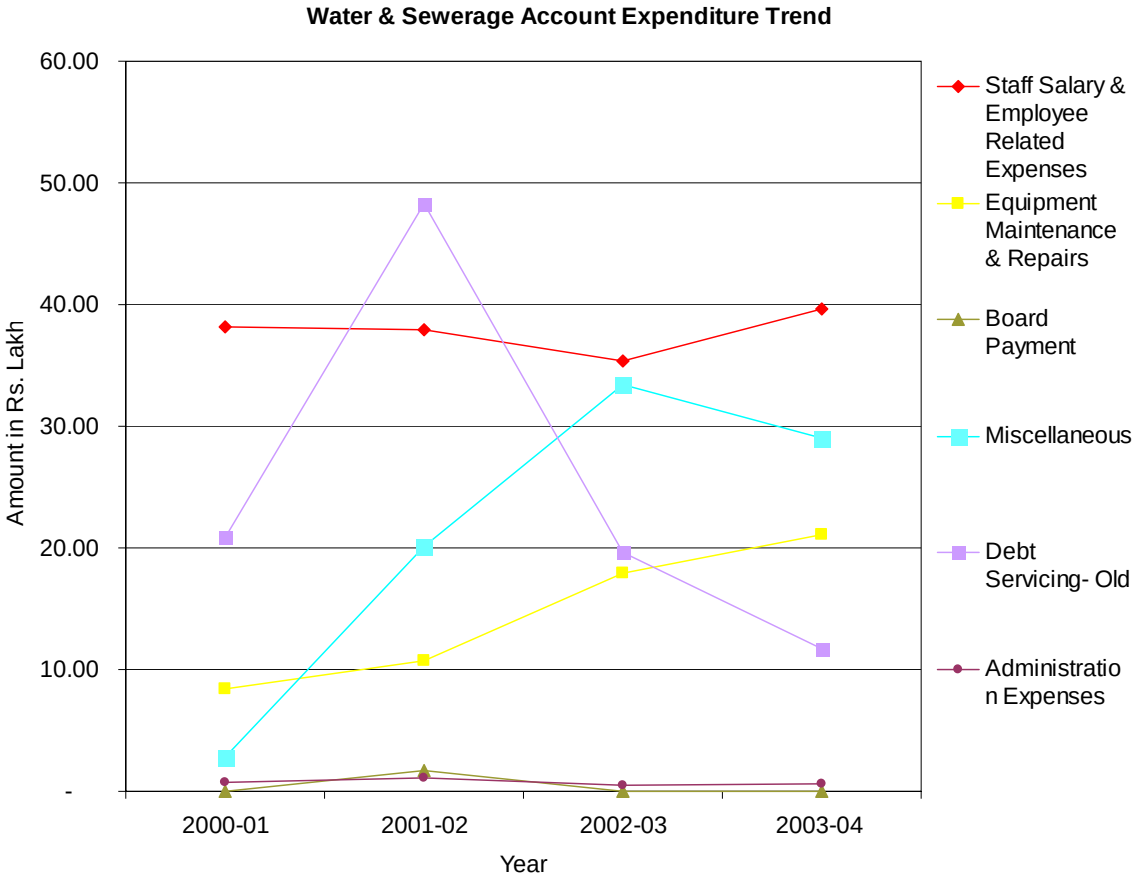
141. As mentioned earlier, local bodies in Tamilnadu maintain a separate water supply and drainage fund. Hence, to maintain the consistency and to assess the cost recovery aspect, the consultants have analyzed the water fund separately. The details are provided in the following table and the water supply and drainage revenue fund expenditure trend is plotted on a graph.

Table 6.11: Revenue Account Status of Water Supply and Drainage Fund

Item	**2000-01**	**2001-02**	**2002-03**	**2003-04**
	Amount in Rs. Lakh			
Revenue Income				
Water & Drainage Tax	104.79	129.42	123.37	124.45
Water Charges	41.24	54.57	55.53	51.40
Water Supply & Sanitation Grant	65.83	13.00	-	-
Other Income	0.07	0.05	14.70	0.50
Total	*211.94*	*197.04*	*193.60*	*176.35*
Revenue Expenditure				
Establishments	38.84	38.96	35.92	40.25
Electricity Charges	21.81	17.64	30.26	27.71
Board Payment	-	1.71	-	-
Miscellaneous	21.60	43.26	66.94	62.41
Debt Servicing- Old	20.82	48.30	19.65	11.76
Total	*103.07*	*149.87*	*152.78*	*142.13*
Surplus/Deficit	**108.87**	**47.17**	**40.82**	**34.23**
Recovery (%) only w/s charges	*40%*	*36%*	*36%*	*36%*

142. Salaries of staff directly working in the water supply department are booked under this head, while salaries of other engineering staff performing administrative functions related to water supply are booked under the engineering section of general fund. Expenditures incurred under this account comprised of 29 percent for establishments, 18 percent power charges and other operation & maintenance expenses accounts around 22 percent. About 18 percent utilized towards debt servicing.

Figure 6.7: Water & Drainage Account Expenditure Trend



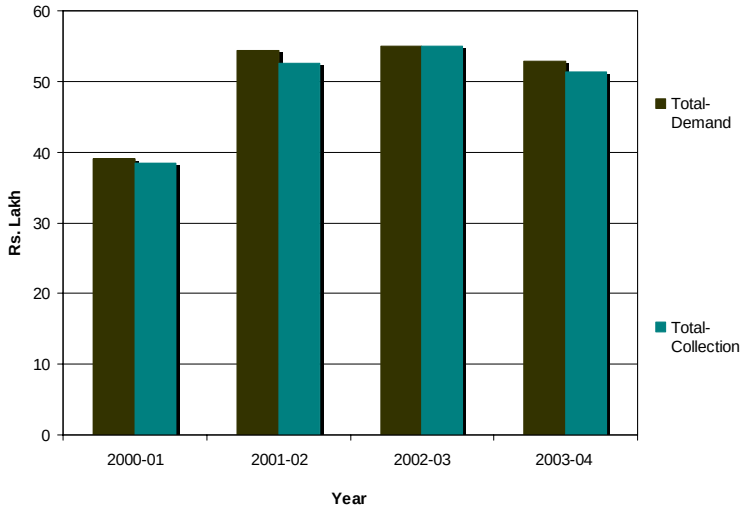
143. The cost recovery incase of excluding water and drainage tax income work out to only 37 percent of the revenue expenditure incurred in the water supply and drainage fund account. Thus, the above analysis indicates that the current tariff is not able to recover even a share of the O & M expenses, when it is compared with only water charges. Major share of water supply income is derived by way of water and drainage taxes, which account for about 62.35 percent of water supply & drainage income.

144. There are a total of 8,763 water supply house service connections as of 2004-05 provided by the Municipality in the town. The average collection performance of water charges for the review period indicated in **Table 6.12**. Owing to the low tariff rate and very low coverage (35 percent PT assessment are having house service connection) result in cost recovery of only 57 percent was achieved during the assessment period.

Table 6.12: Water Charges – Demand Collection and Balance Statement

Item	2000-01	2001-02	2002-03	2003-04
Demand (Rs. Lakh)				
Arrear	-	0.56	1.71	-
Demand	38.99	53.77	53.24	52.92
Total	*38.99*	*54.33*	*54.95*	*52.92*
Collection (Rs. Lakh)				
Arrear	-	0.56	1.71	-
Demand	38.43	52.06	53.24	51.27
Total	*38.43*	*52.62*	*54.95*	*51.27*
Collection Performance (%)				
Arrear	-	100%	100%	-
Demand	99%	97%	100%	97%
Total	***99%***	***97%***	***100%***	***97%***
Total no of Connections (Nos)	8,398	8,398	8,763	8,763

Figure 6.8: Water Charge Collection Performance



145. The numbers of House Service Connections stand at just 35 percent of the PT assessments indicating the large numbers of unauthorised connections in the Municipality. The unauthorised connections and unassessed properties need to be brought under the user charges and municipal tax gambit to effective cost recovery on the investments.

5. Capital Account

146. *Capital Income*. Capital income comprises of loans, grants and contributions. The detailed components of capital income are detailed in **Table 6.13**. An analysis of this account indicates that grants & contributions have contributed the maximum share of income under this account. While on an average 64 percent of the capital income is in the form of loans, around 28 percent of capital income from capital grants and balance from own contribution in the form of transfer from revenue fund. There is also no income realized by the Municipality in the form of sale proceeds.

Table 6.13: Status of Capital Account - General

Item	2000-01	2001-02	2002-03	2003-04
	Amount in Rs. Lakh			
Capital Income				
Capital Loans	36.90	227.42	107.55	167.72
Capital Grants and Contribution	-	94.87	143.62	75.58
Own Sources	-	-	16.58	16.58
Total (excl. W & D a/c)	*36.90*	*322.29*	*267.75*	*259.88*
Capital Expenditure				
General	17.29	13.19	14.75	-
Public Works and Roads	84.02	79.78	361.76	326.87
Street Lighting	4.91	0.00	-	-
Public Health & Conservancy	-	0.01	1.54	-
Education	-	-	7.17	-
Others	4.27	4.70	-	-
Total	**110.49**	**97.68**	**385.22**	**326.87**
Surplus/Deficits (excl. W &D a/c)	*(73.59)*	*224.60*	*(117.47)*	*(67.00)*

147. *Capital Expenditure*. The majority of capital expenditure has been directed towards Public works and roads and general purpose includes all items of works excluding water supply and drainage during the entire assessment period. This is due to fact TNUDF/TUFIDCO had funded most of the municipalities for roads during the assessment period. Hence, there is a sudden major jump in spending on roads.

148. Analysis of capital income and capital expenditure notes that the account was in deficit excluding the FY 01-02.

149. Water supply and drainage capital account status is detailed in **Table 6.14**. Capital income is mainly from water supply connection charges, other than that capital grants were also received during the FY 03 &FY 04. Capital account is surplus except during the FY 03.

Table 6.14: Status of Water Supply and Drainage Capital Account

Item	2000-01	2001-02	2002-03	2003-04
	Amount in Rs. Lakh			
Capital Income				
Capital Loans	-	-	-	-
Capital Grants and Contribution	-	-	45.06	23.00
Own Sources	26.39	11.91	1.65	1.31
Total	*26.39*	*11.91*	*46.71*	*24.31*
Capital Expenditure				
Water supply	-	2.36	80.06	-
Drainage &Sanitation	10.39	8.13	141.76	5.31
Total	**10.39**	**10.49**	**221.82**	**5.31**
Surplus/Deficits	*16.00*	*1.43*	*(175.11)*	*19.01*

6. Assets and Liabilities

150. Current assets and liabilities of Sivakasi Municipality include monies due to Municipality from debtors and monies due from Municipality to creditors, respectively. **Table** presents a summary of the current assets and liabilities of Sivakasi Municipality.

151. The current assets include outstanding arrears in property tax, water charges and profession tax and lease rental (non tax items) dues. The total current assets due to municipality are Rs. 214.42 lakh.

152. Current liabilities include the payment of power charges due to TNEB, Salaries Payable, PF and other contribution due, tax /cess payable to government, other payables and deposits. The net liability of Sivakasi Municipality is Rs. 111.28 lakh. The current ratio is the ratio of total current assets to total current liabilities, which is used to measure short term liquidity of a ULB. The idea behind measuring this ratio is to assess whether the ULB has enough liquid assts to pay off its current obligations when they fall due. Intuitively one would expect that this ratio should be over 1. In case of Sivakasi Municipality the current ratio is 1.93 and this is more than one is comfortable current ratio.

Table 6.15: Summary of Current Assets and Liabilities status

Description	**Amount (Rs. Lakh)**
A. Current Assets	
Property Tax Recoverable	29.36
Profession Tax Recoverable	13.19
Water Charges Recoverable	1.65
License/Lease/Rental/other Recoverable	-
Other Recoverable	100.84
Cash on Hand /Bank	69.38
Total – Current Assets	*214.42*
B. Current Liabilities	
Salaries Payable	-
PF and Other Contribution	5.81
TNEB	-
Library Cess Payable	52.12
Other Payables	1.87
Recoveries from Staff	7.52
Deposits	43.96
Total – Current Liabilities	*111.28*
Net Status	**103.14**

7. Key Financial Indicators and Issues

153. A set of key financial indicators has been derived using the financial data procured from the Municipality for the assessment period. **Table 6.16** present these indicators. These indicators are used to assess the municipal performance with regards resource mobilization, fund utilization, financial performance and collection efficiencies.

Table 6.16: Key Financial Indicators

	Indicators		Value	Unit
A	**Resource Mobilization**			
1	Per Capita Income		800	Rs. p.a
2	Sources of Funds			
	a	Share of Own Sources in Total Revenue Income (RI)	76.35	%
	b	Share of Property Tax in Total Revenue Income	48.07	%
	c	Share of Revenue Grants & Subsidies in Total RI	14.36	%
3	Growth in Revenue Income		0.88	% p.a
4	Growth in Own Sources of Revenue Income		2.63	%
5	Per Capita Own Income		369	Rs. P.a
B	**Fund Application**			
1	Per Capita Expenditure		682	Rs. p.a
2	Uses of Funds			
	a	Share of Establishment Expenditure in Total RE	55.80	%
	b	Share of O&M Expenditure in Total Revenue Expenditure	27.55	%
	c	Share of Establishment Expenditure to Total RI	47.70	%
3	Growth in Establishment Expenditure		(8.80)	%
4	Growth in O&M Expenditure		23.57	%
5	Growth in Total Revenue Expenditure		(0.12)	% p.a
C	**Liability Management**			
1	Per Capita Liability (2004-05 estimated)			
	a	Outstanding Debt per Capita	1,880	Rs.
	b	Outstanding Non-Debt Liability per Capita	61	Rs.
	c	Total Outstanding Liability per Capita	1,941	Rs.
2	As a Proportion of Property Tax Current Demand (2003-04 estimated)			
	a	Outstanding Debt as % of P.T Demand	464.11	%
	b	Outstanding Non-Debt Liability as % of P.T Demand	15.10	%
	c	Total Outstanding Liability as % of P.T Demand	479.20	%
3	As a Proportion of Property Tax Own Revenue Income (2003-04 estimated)			
	a	Outstanding Debt as % of Own Revenue Sources	330.30	%
	b	O/s Non-Debt Liability as % of Own Revenue Sources	10.74	%
	c	Total O/s Liability as % of Own Revenue Sources	341.04	%
4	Non-Debt Liability as % of Total Liability		3.15	%
5	Debt Servicing Ratio (D.S/ Revenue Income)		14.32	%
D	**Performance Indicators**			
1	Operating Ratio		0.86	Ratio
2	Growth in Per Capita Own Income		(0.93)	% p.a
3	Growth in Per Capita Grant		42.07	% p.a
4	Growth in Per Capita Total Revenue Income		(0.45)	% p.a
5	Growth in Per Capita Establishment Expenditure		(15.03)	% p.a

	Indicators	Value	Unit
6	Growth in Per Capita O&M Expenditure	25.29	% p.a
7	Growth in Per Capita Revenue Expenditure	(3.71)	% p.a
8	Capital Utilization Ratio	1.79	Ratio
E	**Efficiency Indicators**		
1	Tax Collection Performance		
a	Property Tax	88%	%
b	Water Charges	98%	%
c	Sewer Charges	NA	%
d	Profession Tax	23%	%
2	No. of P.T Assessments per Tax Collection Staff	2,752	Nos.
3	Property Tax Demand per Assessment	4,127	Rs. p.a
4	No. of Municipal Staff per 1000 Population	2.82	Nos.
5	Annual Revenue (Own Source) per Municipal Staff	11.83	Rs. lakh p.a
6	Population per P.T Assessment	3.03	Persons

154. *Resource Mobilization Indicators*. These indicators summarize the performance of the Municipality with regards sources of funds. Sivakasi Municipality derives about 76.35 percent of its revenue income from own sources, which is a good sign, while grants account for just about 14.36 percent of the revenue income.

155. *Fund Application Indicators*. These indicators are a measure to ascertain the utilization from the municipal fund. Around 55.80 percent of the revenue expenditure is spent on establishment heads, only about 27.55 percent for O&M of municipal assets and services. Leaving 17 percent utilized for debt servicing. Establishment expenditure accounts for about 54 percent of the total revenue generated by the Municipality.

156. *Liability Management Indicators*. These indicators are a measure to ascertain the utilization from the municipal fund regards to debt servicing. The ratio of debt servicing to revenue income is 14.32 percent during the assessment period. The per capita average outstanding debt works out to very high at 1,880 rupees and per capita non debt liability is only 61 rupees. Out standing debt to property demand is around 464 percent and non debt liability is 15 percent times the property tax demand for the current year.

157. *Overall Financial Performance Indicators*. These indicators are a measure to assess the overall financial performance of the Municipality with regards operational performance and effective growth in revenue income and expenditure. The average operating ratio during the assessment period was at 0.86 and the capital utilization ratio was 1.79 indicating frequent utilization of revenue surplus. The indicators of growth in per capita income and expenditure item heads indicate the effective growth, giving a performance measure relative to the growing population. Sivakasi Municipality has demonstrated 0.45 percent negative annual growth in per capita revenue income during the assessment period, while the per capita revenue expenditure has declined at 3.71 percent during the same period. This indicates that as population increases revenue fund will be in surplus, however, both the revenue income and expenditure witnessed negative per capita growth trend, which is a bad sign. Municipality should take necessary action plan to increase its own revenue through various resource mobilization initiatives and expenditure control measures.

158. *Efficiency Indicators*. These indicators are essentially a measure to assess Municipal efficiency with regards revenue base coverage and realization. Sivakasi Municipality has maintained an good collection performance both with regards property tax and water charges (88 percent and 98 percent respectively). The average population per assessment at 3.03 indicates that the property tax base has a wide coverage.

159. Key issues and conclusions are based on the review and assessment municipal finances and discussions with relevant municipal officials.

(i) Maintenance and Reporting of Accounts. The State Government deducts debt due by the ULB and then transfers funds (SFC devolution) the ULB records do not capture such apportionment. ULB's do not maintain department/sector wise salary expenditure as mentioned in the ULB's Accounting Manual.

(ii) Revenue Realization. Taxes and charges are major own sources of revenue income. Being more dynamic in nature and within the control of the ULB, these revenue incomes have potential to contribute more to the municipal fund. Besides low tax rates and charges levied, the actual demand itself is not established. Key issues regarding the above comprise:

- Low water supply coverage witnessed there are chances of illegal or unauthorized connections in the town; and
- High percapita Revenue expenditure witnessed during FY 03-04. Financial transaction trends not commensurate with population growth trends, resulting in reduction in per capita expenditure levels,

(iii) Fund Application. Key issues regarding application from the municipal fund comprise:

(iv) About 54 percent of the total expenditure is on establishment-related heads, leaving relatively lower amounts for expenditure on operation and maintenance of services.

VII URBAN BASIC SERVICES FOR POOR

A. Overview

160. Sivakasi is identified as one of emerging industrial town in Tamilnadu state. Urbanization and urban agglomeration always attracts urban poor. The town presents a range of activities in the industrial and commercial sectors. Growth in such activities, possibilities of absorption in industrial, allied and service sectors, scope of employment in trade and business activities, hawking, retailing, carting etc have attracted rural poor to the town.

161. The percentage of slum population to the total population increased form 42 percent to 47 percent during 1991-2001. The total population residing in the 16 slums is 34,029 persons. The extent of area under the slums is 11.05 acres. Ward wise and location wise details are presented in **Table 7.1.**

Table 7.1 Ward Wise Settlements of Slums

S. No	Ward No.	Street Name	Slum Population	Area
				Sq. Km
1	1	Kandapuram Colony	1,247	0.25
2	2	Anna colony	2,590	0.50
3	3	Sivan Kovil Nandavanam	1,300	0.35
4	4	Parashakthi Colony	5,557	1.70
5	6	Anna Nagar	1,155	0.50
6	6	Thandai periyar colony	958	0.40
7	7	Karupannan Street	858	0.60
8	9	Thondar Thruraichami Nagar	773	0.30
9	9	Swami Puram Colony	938	0.40
10	11	Bharathi Nagar	4,120	1.70
11	21	Ayyappan Colony	1,540	0.45
12	26	Rani Anna Colony	1,721	0.50
13	32	Kaliyamman Kovil Street	1,111	0.60
14	32	Marimuthu Street	1,212	0.20
15	32	Pudutheru	3,122	0.70
16	33	Subramanyapuram Colony	5,827	1.90
		Total	**34,029**	**11.05**

Source: Sivakasi Municipality

1. Water Supply

162. Except for the slums in wards 3, 6, 7, 21, 32 part, 33 part, all the others have piped water supply systems. There are 17 public stand posts and 57 hand pumps for all the slums in town. Ayyappan Colony slum in ward 21 does not have any water supply provisions. For the public fountains provided in the slums, there are at least 168 persons per such facility

2. Sanitation

163. The sanitation facilities in the slums are poor with lack of drainage, un-cleaned filth and garbage. Such conditions can easily make many of these locations easy prey to water borne diseases like malaria, hepatitis B, typhoid, gastro enteritis etc.

164. There are 328 low cost sanitation units and a total of 35 public convenience systems with 304 seats catering to the entire population living in the slums. Of these, one unit with six seats is under pay and use category in Anna Colony slum.

165. Three units are under the ISP category with a total of 16 seats each provided in slums located in wards 2, 4 and 32. The slums located near the commercial core of the town in wards 2, 3, 6, 9, 21, 26 and 32 lacks minimum sanitation facilities.

3. Roads and Street lights

166. The Municipality has laid BT and CC Roads in most parts of the slums forming a good connectivity with other areas of the town. A total of 0.803 km of BT Roads and 1.295 km. of Cement Concrete roads are provided in slum localities.

167. Street lighting facilities are adequately provided in the slum areas. On an average, one lamppost is provided for every 6-m length of roads provided in the slums. There are 368 tube lights, 22 sodium vapour lamps and 12 mercury vapour lamps in the slums. The details of infrastructure facilities available in slums are presented in **Table 7.2.**

Table 7.2: Details on Infrastructure Available in Slums

Ward No.	**Water Supply**		**Sanitation**		**Roads**		**Street Lights**			**Noon Meal Center**
	PSP	**HP**	**Public Toilet**	**LCS**	**CC**	**BT**	**MVL**	**SVL**	**TL**	
	Nos.	*Nos.*		*Units*	*Km*	*Km*	*Nos.*	*Nos.*	*Nos.*	*Nos.*
1	1	2	2	25	0	0	0	0	37	1
2	1	5	3	0	0.006	0	1	0	35	1
3	1	3	1	0	0.004	0	0	0	13	-
4	2	8	4	76	0.128	0.426	1	0	55	1
5	1	4	2	34	0.077	0.213	0	0	3	1
6	0	4	1	0	0	0	1	0	18	0
6	0	1	1	0	0	0	3	8	8	1
7	0	1	2	44	0.06	0.086	0	0	6	0
9	1	1	1	0	0.003	0	0	0	4	0
9	1	2	1	0	0.003	0	0	0	23	0
11	3	9	3	80	0.242	0	2	1	23	0
21	0	0	3	0	0.328	0	0	0	22	1
26	1	0	1	0	0.095	0	0	0	15	1
32	1	1	1	0	0.033	0	0	0	16	0
32	0	1	2	0	0.032	0	0	0	3	0
32	2	4	3	0	0.078	0.078	2	6	26	1
33	2	11	4	69	0.206	0	2	7	61	2
Total	**17**	**57**	**35**	**328**	**1.295**	**0.803**	**12**	**22**	**368**	**10**

Source: Sivakasi Municipality

B. Poverty Alleviation and Community Development

1. Policies, Targets and Programs

168. Given the complexity of the social, economic and physical environment in which a growing number of urban poor seek their livelihoods, it is clear that the formulation of anti-poverty measures and the design of slum improvement programs is a very important issue.

169. A review of Slum Improvement Programs indicates that, by improving basic infrastructure and access to municipal services, there is a significant impact on the quality of life of slum residents. To alleviate the problems of slum dwellers and to reduce urban poverty, a number of programs are initiated and are being implemented by the municipality with assistance from state and central government. The location of slums are shown in **Map 7.1**

170. The major slum improvement programs being implemented in Sivakasi are the Swarna Jayanti Shehri Rojgar Yojna (SJSRY) and National Slum Development Program (NSDP) apart from certain other programs like the Integrated Sanitation Program.

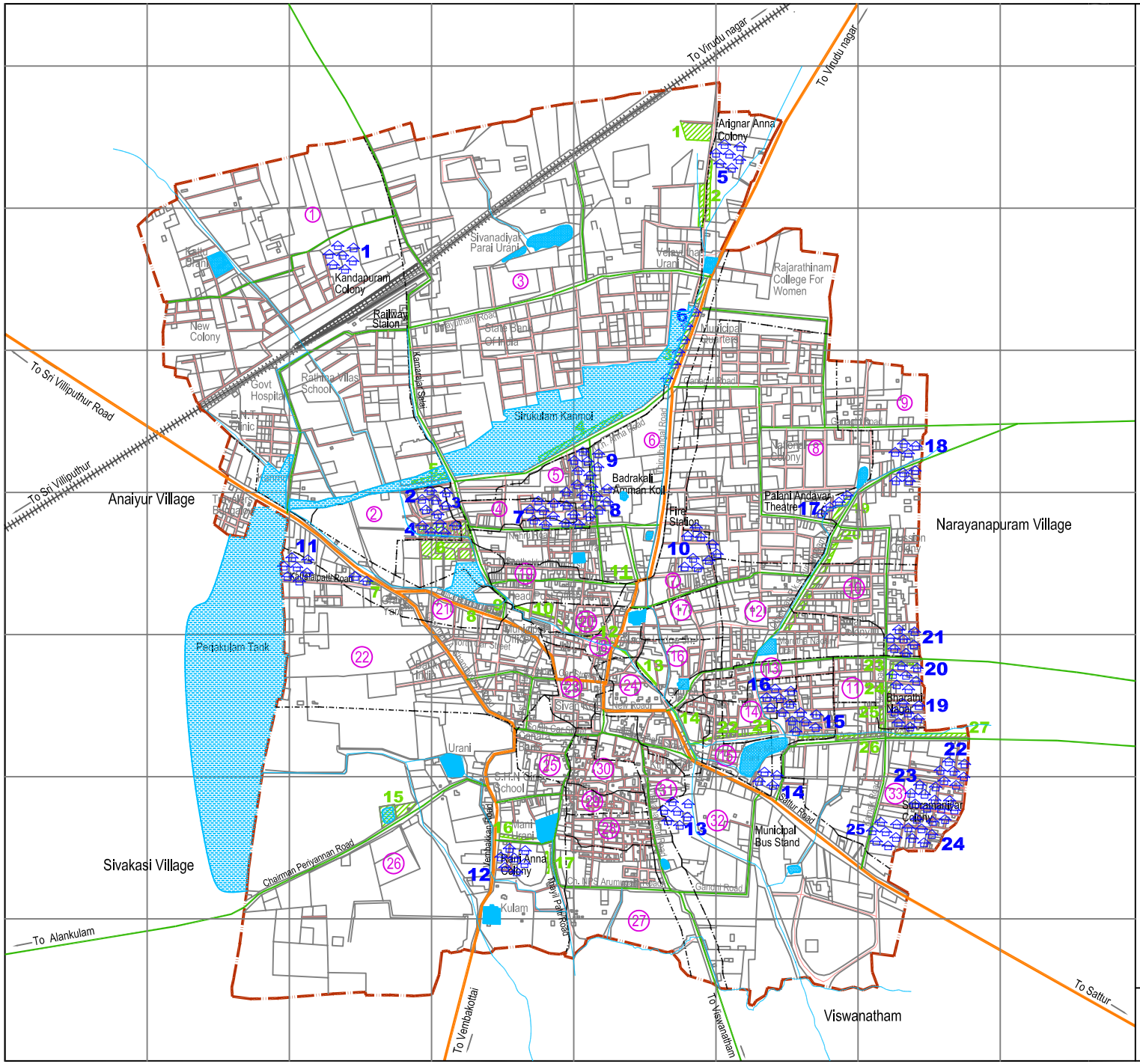
171. The SJSRY is planned to provide employment to the urban poor by helping to provide self-employment or provisions for wage employment. It is funded on a 75 percent and 25 percent basis between centre and state. The Target groups will be a minimum of 30 percent women beneficiaries. The proportion of the Schedule Caste and Schedule Tribe will be the same proportion as in total population of the town. Three percent is reserved for handicaps.

2. Government Assisted Schemes

172. *Urban Self-Employment Program* (USEP): - This is one of the main components of SJSRY and the municipality has been conducting training programs for the Below Poverty Line population under this scheme. This program is decided by the selection of beneficiaries who are finalized by the task force based on the recommendations of the community structures and the UPE cell.

173. In these programs, the council is not involved because of the non-involvement of the Urban Local Body funds. Self-employment Scheme for Urban Poor was initiated and financial assistance is being provided to the beneficiaries.

174. *Urban Skill Training*: - Skill development through appropriate training is another element of this program. It is intended to provide training to urban poor in a variety of service and manufacturing trades as well in local skills crafts so that they can enter salaried employment ventures or secure employment with enhanced remuneration.



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Minor Road
- Railways
- Water Body
- Canal, Nala, Odai
- Slum Area
- Encroachments

Notes :

Wardwise Location Of Slum Area

Sl.No.	Name Of The Slum
1	Kanthapuram Colony
2	Anna Colony
3	Anna Colony
4	Sivankoil Nandavanam
5	Anna Nagar
6	Thanthai Periyar Nagar
7	Parasakthi Colony
8	Parasakthi Colony
9	Parasakthi Colony
10	Karuppanan Street
11	Ayyappan Colony
12	Rani Anna Colony
13	Kaliamman Koil Street
14	Marimuthu Street
15	Puthu Street - I
16	Puthu Street - II
17	Thondar Duraichamy Nagar
18	Samypuram Colony
19	Bharathy Nagar - I
20	Bharathy Nagar - II
21	Bharathy Nagar - III
22	Subramaniyapuram Colony
23	Subramaniyapuram Colony - II
24	Subramaniyapuram Colony - III
25	Subramaniyapuram Colony - IV

Encroachments Area :

1. Anna Nagar
2. Velayutham Road
3. Sirukulam Tank - Tiruthangal Road
4. C,N Anna Road
5. Sirukulam Colony
6. Anna Colony
7. Kattalaipatti Road
8. Police Station Rd, Nr Indushri Kalyana Mandabam
9. Telephone Exchange South
10. From Hpo To Nadar Lodge
11. Tank Adjascent To Muslim North Street
12,13. From Nadar Lodge To Church
14. Pudhu Road Street - Odai
15. Jallsingh Nagar
16. Rani Anna Colony Road North
17. Western Side Of Jakkammal Koil
18. Rani Anna Colony
19. Thondar Duraisamy Nagar
20. Old Olrudhunagar Road
21. Drainage Odai Eastern Side Of A,K Patty
22. Petha Madam Oorani
23,24,25. Perlakaruppan Road
26. Ask Thang'iah Road
27. Narane Puram Road

URBAN POOR SETTLEMENTS

N

Scale :

0 0,125 0,25 0,50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road,
Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No. 6.1

175. The unit cost allowed for training would be Rs 2000 per trainee, including material cost, trainer's fees, other miscellaneous expenses to be incurred by the training institution and the monthly stipend, to be paid to the trainee. The total training period for skill up gradation may vary from two to six months, subject to a minimum of 300 hours.

176. *Development of Women and Children in Urban Areas* (DWCUA):- This scheme is distinguished by the special incentive extended to urban poor women who decide to set up self employment ventures in a group as opposed to individual effort.

177. Groups of poor women shall take up an economic activity suited to their skill, training, aptitude and local conditions. Besides generations of income, their group strategy shall strive to empower to empower the urban poor women by making them independent as also providing a facilitation atmosphere for self-employment.

178. To be eligible for subsidy under this scheme, the Development of Women and Children in Urban Areas group should consist of at least 10 urban poor women. The group shall select an organizer from amongst the members. The group shall select an organizer from amongst the members. The group will also select its own activity.

179. The DWCUA group society shall be entitled to a subsidy of Rs. 1, 25,000 or 50 Percent of the cost of project which ever is less. With the subsidies from the Central and State governments, money was also disbursed as part of the Skill Training Program, Infrastructure development Program, Community Structure program and Thrift and Credit Society Program. This program is active form the past two years, with one group benefited during 2000-01 for Rs 0.4 lakh and two groups formed during 2001-02.

180. *Thrift and Credit Societies* (TCS): - In thrift and credit societies two groups were formed each year during 2000-01 and 2001-02. However funds were allotted in time and the scheme remained on papers.

181. *National Slum Development Program*: - Under this program, the funding of the works is shared between the (Centre+State-50 Percent, Municipality-50 Percent). The works are finalized by the decision of the council. They are inspected by the RDMA through the Regional Engineer.

182. The slums given importance are of 2 types, both permanent and non-permanent. In any case, the Slum Clearance Board should approve them as slums. For permanent Slums, they are to be identified by the quality of roads and drainage. Special Priority is given to the following works:

(i) Improvement of Drinking water Supply system
(ii) Laying/Relaying of roads
(iii) Provision of Street Lights
(iv) Drainage facilities
(v) Improvement and new Public Conveniences with water Supply
(vi) Welfare (education, etc.); and

(vii) Shelter Up gradation (individual water connections)

183. *Integrated Sanitation Program*: - Integrated Sanitation Program is a World Bank funded sanitation program through the PMU/ Tamil Nadu Urban Development Program-II. The program envisages integrating learning of the health and environmental aspects along with the sanitation activities of the slum communities. Priority is given to the below poverty line population.

184. The program is based on demand driven community participation. Under this program, the recipient community is made aware of various environmental and sanitation aspects. For successful implementation, the program is co-ordinated at the local level through the community organizers (COs) of the SJSRY scheme. The program is generally funded by way of grants. Generally, of the identified amount 80 Percent is provided by Tamil Nadu Urban Development Program - II as grant.

185. Generally, of the identified amount 80 percent is provided by Tamil Nadu Urban Development Program -II as grant. However, in case of special and selection grade municipalities, while 50 percent of the amount is provided as grant by Tamil Nadu Urban Development Program-II.

186. The remaining 50 percent is generated by the ULB through 32 percent fund allocation from Sanitation component of VAMBAY scheme and the remaining 18 percent from its own funds. In case of Grade I, II municipalities, the entire 100% of the identified amount for the construction of these complexes is given as grant.

187. The whole program is planned towards community empowerment and sanitation at the Sanitation Complex itself. It is at this place where the community meets as a social group. The major components of the program include:

188. Identification of the recipient Community of Below Poverty Line Population (mostly in slums). Tamil Nadu Urban Development Program takes up this process after an orientation program to the Urban Local Body. The recipient communities are identified in association with the municipality and the community forwarded for approval by PMU/ Tamil Nadu Urban Development Program -II takes up IEC activities for the communities and the proposal.

189. Provision of an Integrated Complex with Toilet, Bathing, Washing and Meeting Room facilities with special provision of sanitation facilities for children. Sixteen seats (10 major +6 minor) are provided for the community. Separate facilities for bathing (10 units) are also provided. A separate platform is also provided for washing clothes as well. Each unit of ISP is constructed at a cost of about Rs. 10 lakh.

190. Awareness programs consisting of information, education and communication activities are also conducted within the same complex to create a strong awareness on the related issues of health, sanitation and environment. These are conducted as discussions with the leaders of community organizations, specialists from the associated fields of health, education in the form of camps etc. These activities are for information dissemination and education. The communication aspect consists of both formal as well as informal type,

where formal events are organized by the communities themselves to propagate their experiences.

191. For the scheme since 2001-02, there was a contribution from Valmiki Ambedkar Awas Yojana funds of 32 Percent, 18 Percent own funds of Urban Local Body and 50 Percent grant from Tamil Nadu Urban Development Program.

192. The municipality has so far constructed ten Integrated Sanitation Program complexes under the program since 2001-02 of which three complexes are constructed in the slum localities and the remaining seven are constructed both close to such slum locations and near public places of importance. The location of these complexes is mainly driven by the availability of land nearby.

193. *Valmiki Ambedkar Awas Yojana* - This is a housing program, where the central government funds 50 Percent of the total subsidy. The rest is expected from the Urban Local Body 20 Percent of the total allotment is designated for Sanitation component and so far, the allotments have been in the field of sanitation only mainly due to the Integrated Sanitation Program scheme. The remaining 80 Percent for shelter up-gradation has never been allotted or utilized.

Service Adequacy and Key Issues

194. *Indicators:* - The following are a set of indicators, for which the current situation and the desired values are presented. The desired values can be used as benchmarks by the municipality to check its performance annually/ periodically and set targets for itself to be achieved in the next financial year. This will also aid in preparation of the Annual CCP Progress Reports by the municipality. The indicators in slums are presented in **Table 7.3.**

Table 7.3: The Performance Indicators in Slums

Indicator	Current Situation	Benchmark
Slum population as Percent to Total Town Population	47.2 %	< 10.0 %
Distribution Network Reach (against Road length) in slums	NA	> 100.0 percent
Slum Population per Public Stand Post.	168 Persons	100 Persons
Slum Population per Seat of Public Convenience.	112 Persons	60 Persons
Spacing between Street Lights in Slums (M.)	6 m.	< 20.0 m.
Monthly Household income of rehabilitated slum dwelling units/ Income before rehabilitation	-	> 1.75

Source: Sivakasi Municipality

(i) The data regards the slums in the town have many discrepancies. Varied data is available with the municipality, Non Governmental Organizations, SJSRY surveys, and certain other studies.

(ii) Uncontrolled growth of slum population in the town against reduced overall population growth is indicative of the fact that the economic livelihood of the slum dwellers has only worsened over the years and more Below Poverty Line population are taking to slum localities in the town.

(iii) Community participation is the key in successful implementation of Slum Improvement Programs. In most of the cases, community is yet to be involved completely resulting in poor performance of the programs against a very high slum population in the town.

(iv) The Slum development programmes in the town till now have not followed a need-based allocation. Due to the present programme specific allocations, the allotments are either delayed are not utilised completely.

(v) The sanitary conditions in the slum localities are very poor with a meagre one seat of public convenience for every 112 persons. The environmental condition of the water bodies, along which the slums are located, is degraded with large quantities of solid waste and sewerage being disposed into them. All these factors have actually deteriorated the living condition in these slums

VIII. INFRASTRUCTURE DEVELOPMENT AND SERVICE PROVISION

A. Rationale, Need and Demand

195. Infrastructure assessment of the town indicates inadequate service levels, for present scenario, which will further enhance given the future growth (i)Per capita water supply is work out to be 59 lpcd instead of 90 lpcd. The coverage of water supply connections with respect to property tax assessments is as low as 35.23 percent. (ii) Sivakasi municipality lacks in safe sanitation disposal facility, Underground drainage system. (iii) Sivakasi lacks scientific municipal solid waste treatment and disposal system catering to the waste collected; waste collection efficiency of the local body based on carrying capacity of the vehicle is a low 60 percent. (iv) Surfaced roads within the Urban Local Body is approximately 94 percent; missing links, network deficiency and lack of traffic management systems causes congestion within the Urban Local Body area and reduces the carrying capacity of the roads. (v) Drainage network of the town covers only 152.24 percent of the total road length; which has been indicated as one of the major causes of flooding and water logging. The abysmal levels of service therefore provide a strong basis and need for the project.

(i) Approach and Design Criteria.

196. *Design Period.* A design period of 20 years, 2005 to 2026 has been considered for designing the proposed improvements to the existing water supply system.

197. *Population.* Considering the population growth rate for previous decades, population for the design year has been projected using available recommended methods of demographic projection. Population projection has been performed for a design period of 20 years in two stages, intermediate stage (2019) and ultimate stage (2026).

198. The incremental increase method is adopted in the population projection for the municipality. Accordingly, population projection was performed using this decadal growth rate. The population projection for Sivakasi Municipality has been used as the basis for design of system improvements in this project. The projected population furnished in **Table 8.1.**

Table 8.1: Water Supply Design Period Population

Year	Population Projections
2001	72,170
2006	76,985
2011	81,709
2016	86,344
2021	90,889
2026	95,344

Source: Analysis

199. *Per Capita demand:* A per capita demand of 90 lpcd is adopted for design of the proposed improvements to the water supply system.

1. Water Supply

200. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.2.**

Table 8.2: Goals and Service Outcomes – Water Supply

S.No	Goal	2011	2016	2026
1	Network cover for general households	100%	100%	100%
2	Network coverage for urban slum households	100%	100%	100%
3	Per capita supply	90 lpcd	130 lpcd	
4	Hours of supply			24 hours / daily
5	Quality of water	Safe & Good	Safe & Good	Safe & Good
6	Un accounted water	20%	15%	12%
7	O&M Cost Recovery	100%	100%	100%
8	Collection Efficiency	100 %	100 %	100 %
9	Customer Satisfaction	Good	Good	Good

201. Sivakasi municipality should increase the supply levels in terms of coverage, to achieve an average gross supply of 90 lpcd and to cater to 100 % of the population. Assuming that distribution network is extended to 85 % of the town roads, all the citizens will enjoy the required supply.

202. The total demand at the source in 2026 for a supply of 90 lpcd is about 9.96 MLD indicating a deficit of 5.46 MLD for year 2026. Considering the new schemes towards augmentation of supply levels to Sivakasi, the per capita levels have been maximized to 90 lpcd against the requirements and the demand for the future is assessed. The details of water supply requirements for future are furnished in **Table 8.3.**

Table 8.3: Requirement until 2026 in Water Supply Sector

Description	Unit	Gaps Up To 2026
Daily Per Capita Supply (Source development till 2026)	MLD	5.37[5]
Feeder mains and Transmission Mains	Km	-
Roads Covered with Distribution Network	Km	50.68
Elevated Storage capacity w.r.t Supply (2026)	ML	-
Rehabilitation for existing Network	Km	26.00
Treatment capacity (2026)	ML	3.87

Source: Analysis

[5] At present TWAD Board is executing Mannur water supply scheme. After the completion of the scheme Sivakasi municipality will be getting another 5 MLD of water in addition to the existing.

203. *Operation & Maintenance Plan*- Adoption of an O & M Plan and Schedule, including options of using the private sector for O & M (e.g. management contract).

204. *Asset Management Plan*- To address the condition assessment and the performance of the water supply assets, it is recommended that an asset management plan be prepared for the assets of water supply in Sivakasi.

205. *Tariff Revision*- Future capital investments on system up-gradation being imminent, the tariff structure shall be revised from time to time to enable cost recovery and to service the additional debt from the capital investments.

206. *Performance Monitoring:* It is important to monitor certain key indicators to assess the performance of the system and also to ensure sustainability of the operations.

207. *Capacity Building Measures:* It is necessary that periodic training be imparted to the operations staff of the municipality, which is available along with training manuals at the Tamil Nadu Water and Drainage Board head office

2. Sewerage and Sanitation

208. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.4.**

Table 8.4: Goals and Service Outcomes - Sewerage

Sl. No	Goal	2011	2016	2026
1	Coverage (Access)	100%	100%	100%
2	Treatment & Disposal	100%	100%	100%
3	Recycle & Reuse	25%	40%	50%
4	Customer Satisfaction	Good	Good	Good

209. The town does not have any sewerage system and the sanitation facilities include the Septic Tanks and other disposal forms. Only 38 percent of the Property Tax Assessments have safe disposal facility in the town in the form of septic tanks. Sewerage and sullage water generally flows into the storm water drains and finally into the Uranis. Under the circumstances and in consideration of the dense and concentrated industrial character of the town, it is felt that putting in a sewerage system in place is of absolute necessity. The requirement for future is tabulated in **Table 8.5.**

Table 8.5: Requirement until 2026 in Sewerage and Sanitation

Description	Unit	Gaps Up To 2026
Under Ground Drainage		
Length of Under Ground Drainage	km.	97.10
STP Capacity	MLD	7.89
Road Rehabilitation due to Water Supply and Sewerage Project	km.	97.10

Source: Analysis

210. Based on-site visits and assessment of the sanitation situation prevalent in the ULBs, sewerage systems were designed to discharge sewage/night soil. The design basis and treatment options are detailed below.

211. The design of the sewerage system shall be made as per the design criteria prescribed by the Manual on Sewerage and Sewage Treatment, published by the Central Public Health & Environmental Engineering Organization (CPHEEO), Ministry of Urban Development and Poverty Alleviation (MoUD& PA), GOI.

212. The design parameters to be adopted for designing a sewerage system are as mentioned below:

213. *Design Period*. The sizing of the components of a sewerage scheme may be done for the design period as under

(a)	Trunk, main and branch sewers and appurtenances.	:	30 years
(b)	Pumping stations		
	i. Civil works	:	30 years
	ii. Mechanical and electrical equipment	:	15 years (Addition or replacement after 15 years).
(c)	Pumping mains	:	30 years (To be also decided on techno - economic analysis for different design periods).
(d)	Treatment units	:	30 years (To be of modular designs to facilitate construction in phases).

214. *Design Sewage Flow.* The sewage flow is generally estimated based on the water supply. 80% of the water supply shall be assumed as the sewage generation from the individual houses.

215. *Ground Water Infiltration.* Infiltration may be allowed at following rates for sewers laid below ground water table.

(i) 5,000 to 50,000 litres per day per hectare, or
(ii) 500 to 5000 litres per day per km length and per centimeter diameter of sewer, and
(iii) 250 to 500 litres per day per manhole.

216. *Peak Factor*. Peak sewage flow shall be the average sewage flow multiplied by the peak factor. Table 2 gives the peak factors as recommended by the Manual on Sewerage and Sewage Treatment shall be adopted.

Peak Factor for Sewage Flow.

Population	**Peak Factor**
Up to 20,000	3.00
20,000 to 50,000	2.50
50,000 to 750,000	2.25
Above 750,000	2.00

217. *Velocities in Sewers.* The minimum self-cleansing velocity of 0.6 m/s at present peak flow and 0.8 m/s at ultimate peak flow shall be maintained. Maximum or non-scouring velocity shall be restricted to 3.0 m/s.

Maximum Permitted Depth of Flow

Maximum Permissible Depth of Flow.

Diameter	**Depth of Flow (d) to Convey Design Flow**
Upto 400 mm	0.50 d
Upto 900 mm	0.67 d
Above 900 mm	0.75 d

218. *Minimum Pipe Diameter*. Minimum pipe diameter for the sewers shall be 200 mm.

219. *Pipe Materials*. The following type of materials shall be generally adopted for the diameters indicated against each:

- Stone ware Pipes: For diameters up to 375 mm and depth up to 3.0 m.
- Non-Pressure RCC pipes NP3 class: For depths > 3.0 m and diameters > 375 mm and up to 1,000 mm.
- GRP or HDPE Pipes: For diameters greater than 1,000 mm.

220. *Institutional Strengthening for Program Implementation*: - Capacity building measures need to be taken in the form of information dissemination among the poor and slum dwellers about the importance of safe disposal facilities. While such mediums like audio-visual communication shall be adopted for the purpose, community gatherings and meetings shall also be given importance.

221. *Stringent Building Permission Mechanism:* - Till now the municipality didn't have any role to play with respect to this service. Its role is more of secondary nature with the Building permission rules of Town Planning Department playing the primary role.

222. Hence, by making the building permissions more stringent, it is necessary that the building use permissions be issued only on ensuring that safe disposal facility is adequately provided. The future plans will be directed towards catering to the town's requirements by the year 2026. The program can be phased in the same way as that of the water supply system so that the investment can be made judiciously.

223. *Sewerage Planning:* - At the juncture it is important to mention that the town has a large number of household units involved in fire crackers' making, match manufacturing and offset printing and the industrial effluents are discharged into the natural drains. Such measures that avoid the discharge of this wastewater into the drains are necessary. It is pertinent that either the discharge of industrial wastewater is checked or the household units are allowed to shift to assigned areas and contemplate the provision of under ground drainage system in the town.

224. *Coverage of Low Income Areas:* Currently, a majority of the low-income areas are devoid of safe sanitation facilities. Though the Slum Improvement Programs have created infrastructure in the form of public conveniences, the operation and maintenance of these facilities is not satisfactory and hence could not be sustainable.

225. Hence, it is recommended that Low Cost Sanitation units and public conveniences be provided under the ISP program for the poor and the slum dwellers. The O and M of the PCs can be given to the local communities to ensure their sustainability. Moreover, certain measures towards effective program implementation are:

(i) User-friendly design of toilet based on community's needs;
(ii) Appointment of caretaker form amongst the community concerned;
(iii) Option of using the caretaker's shelter space for conduction community meetings;
(iv) Use of septic tanks as against aqua privy tanks;
(v) Time bound execution in phases;
(vi) Maintenance of toilet blocks by Non Governmental Organizations of Community Based Organizations for a period of 30 years.

3. Storm Water Drainage and Rejuvenation of Water Bodies

226. Goals and Service Outcomes: The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.6**

Table 8.6: Goals and Service Outcomes – Storm Water Drain and Water Bodies

S.No	Goal	2011	2016	2026
Macro Drainage				
1	Flood Alleviation Recommendation	100%		
Micro Drainage				
1	With in the Town (Preparation and Implementation Plans)	100%	100%	100%

227. Primary Drain Rehabilitation and Improvement: - A significant reduction in depth and width is noticed due to siltation and encroachment of the Odai banks running diagonally across the town from the north-west corner to the south-east corner. To alleviate this, a rehabilitation and improvement program is recommended. The program shall aim at the following:

(i) Improvement measures such as widening and deepening
(ii) Construction of side walls to confirm to uniform cross-section in built up areas
(iii) Diversion of drains at critical sections
(iv) Construction of cross-drainage works

228. *Drainage Rehabilitation:* - As a part of this program, the leading/ connections between secondary and tertiary drains has to be improved and strengthened. In addition, control of weed growth, limiting the dumping of solid and construction waste and controlling the encroachments have to be encouraged to effect a smooth and effective functioning of the drainage system.

229. In accordance with the above, the municipality shall desilt the Odai's on a regular basis before the onset of the monsoon. The construction of new drains and connecting links shall be taken up as a priority. The strengthening of the existing drains with lining and sidewalls are immediate measures. The requirement for future is illustrated in **Table 8.7.**

Table 8.7: Requirement until 2026 in Storm Water Drains

Description	Unit	Gaps Up To 2026
Up gradation of Kutcha to Pucca		
Kutcha to Pucca Open	km.	42.81
Kutcha to Pucca Closed	km.	48.55
Pucca Open to Pucca Closed	km.	-
New Pucca Open Drains	km.	67.60
Lakes conservation /Tanks regeneration and Nalla strengthening		
Water Bodies Conservation	Nos.	13
Desilting and Strengthening of Primary Drains	km.	10.91

Source: Analysis

230. *Improvement Works and Construction of Tertiary Drains:* - Construction of tertiary drains must be taken up along with the new formation of roads on a priority basis. It is proposed to construct leaders and connectors from the tertiary drains to the secondary drains along all the major arterials and important roads to increase the coverage to facilitate proper discharge of storm water. It is expected that areas prone to flooding shall be adequately drained through these roadside drains.

4. Solid Waste Management

231. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.8**

Table 8.8: Goals and Service Outcomes – Solid Waste Management

S.No	Goal	2011	2016	2026
1	Collection with in the Town	100%	100%	100%
2	Door to Door Collection - %	100%	100%	100%
3	Source Segregation - %	75%	100%	100%
4	Collection - %	90%	100%	100%
5	Scientific Disposal	80%	100%	100%
6	Waste to Energy Generation		50%	100%
7	Cost Recovery of O & M -%	50%	75%	100%
8	Private Sector Participation	Modest protocols in place	Complete in the Disposal	Complete in the Disposal

232. *Existing Service Level:* - Storage of waste at source is one of the important recommendations of MoEF. The introduction of door-to-door collection by the municipality has led to implementation of source segregation though on an ad-hoc basis. The system of primary collection is partly privatized and the private contractor covers about 30 percent of the households of the town.

233. The other areas where door-to-door collection is absent, the households store the un-segregated waste in open containers and dispose off the same at the community collection points. Similar to the domestic households, major hotels and restaurants also store waste in open containers. However, it is noticed that the sanitary workers collecting solid waste from households but not by the households do segregation of waste themselves

234. *Improvement Strategies:* - Highest priority has to be accorded for segregation and storage at source irrespective of the area of generation so as to facilitate an organized and environmentally acceptable waste collection, processing and disposal. Source segregation of recyclable and biodegradable (organic waste) will provide efficient ways for resource recovery, and substantially reduce the pressure and pollution at disposal site.

235. In order to achieve the above objective, a **'**Bin system of Solid Waste Storage' at source is being recommended. As per this system, each of the households shall be directed to keep separate bins/ containers for biodegradable and non-biodegradable waste generated within their premises.

236. The bins can be of 10-15 liters capacity made of plastic/ reinforced plastic/ LDPE or metal bins of individual choice, but should be provided with lid. The segregated waste so stored in these bins will have to be transferred to the collection point or to the dumper placer provided for each area. The detail of steps to be taken up for the municipal solid waste is presented in **Table 8.9.**

Table 8.9: Details of Specification of Segregated Waste

Source	**Storage of Segregated waste**	
	Bio-Degradable	**Non-Bio-degradable**
1. Households	10-15 liters capacity plastic/ reinforced plastic/ LDPE/ metal bin with lid	A bin or Bag of suitable size
2. Hotels, Restaurants	60 liters capacity-LDPE/ HDPE	A bin or Bag of suitable size
3. Shops, Offices, Institutions	Suitable container not exceeding 60 liters	A bin or Bag of suitable size
4. Market Stalls	40-60 liters bin-LDPE/ HDPE	A bin or Bag of suitable size
5. Function Halls	Bin/ Skip matching to Municipal collection system	A bin or Bag of suitable size
6. Hospitals, Nursing homes	60 liters capacity bin for non-infectious bio-degradable waste	Store waste as per Bio-medical Waste Management Handling Rules 1998
7. Construction/ Demolition waste	-	Store with in premises and deposit in the notified Site by the local body or to the municipal Vehicle
8. Garden Waste	Store with in premises	Deposit in large community bin or to the municipal vehicle

237. Construction waste has to be stored at the premises of the construction either in skips or suitable containers and has to be directly emptied to the notified disposal site by the generator. Meat and fish markets should store waste in non-corrosive bins of maximum 100-litres capacity each and transfer contents to large container to be kept at the market just before lifting of such large containers.

238. Slaughterhouses should keep separate containers for animal waste and other wastes. It is also being recommended that this system of source segregation and storage is encouraged

through community education and awareness campaigns and hence no capital investments are envisaged in this regard.

239. *Primary Collection and Street Sweeping:* - Waste is generally collected door-to-door by either the municipal or private solid waste workers. This waste collected is deposited at collection points except in areas where door-to-door collection is not implemented. In such areas people dispose the waste into the dustbins located at every odd point on the roads.

240. The community storage facilities comprise of all types of collection bins such as concrete, steel and masonry bins, including the garbage chowks. The average road length per conservancy worker in Sivakasi is about 328 m against part privatization of the service as against the desirable norm of 300 m. However, since there are large chunks of areas yet to be provided with effective road network, the figure could be much above 400 m.

241. Improvement Strategies: - The following measures have been recommended for improving the primary collection practices of Sivakasi.

(i) Implementation of 'Door-to-door collection' through 100 Percent privatization.
(ii) Installation of 'Community Storage Bins' in areas where door-to-door collection could not be implemented.
(iii) Introduction of multi-bin hand carts/ Tri-cycles.
(iv) Placement of dumper containers of sufficient number in markets and ensuring that all the vendors place the waste in the containers.
(v) Introduction of bio-medical waste management facility with support from Indian Medical Association.

242. It is recommended that the community be involved in primary collection through segregation at household level to minimize the number of times of waste handling. Non-biodegradable waste shall be collected separately from premises where door to door collections are organized. Present system of primary collection should be supplemented by introducing multi-bin carts (Push carts / Tricycles) covering the entire area of the town of which 80 Percent will be handled by private contractors and the rest by the municipality. The details of proposed primary collection system are summarized in **Table 8.10**

Table 8.10: Proposed Primary Collection

Mode of collection	**Area of collection**	**Primary Collection Vehicle**	**Secondary storage**
Door to Door	1. Residential colonies of High and Middle income group	Multi-bin cart/ tricycle- with two bins for Biodegradable waste and one for recyclable	1. Bio-degradable in Skips/ wheel containers 2. Non-biodegradable- Sell or hand over to waste collector
	2. Hotels/ Restaurants	Closed vehicle to collect biodegradable	Direct transport to Disposal site
Large Community Bin System	Fruit and Vegetable Markets/ Transfer Stations	Carrying bins to Transfer point	Skip / Dumper Placer
Small Community Bin System	Slums/urban poor colonies	Carrying bins to Transfer point	Transfer contents of biodegradable to community bins

Source: Analysis

243. The existing street sweeping operations in Sivakasi are satisfactory and to ensure operational efficiency of the system, the following measures are suggested.

(i) Markets and other areas of the city shall be swept at least twice a day and sweeping should be done on Sundays and holidays in core areas and denser areas.

(ii) Sweepings shall be collected separately as degradable and non-biodegradable waste and deposit in containers kept at various locations and a separate crew equipped with appropriate implements may do de-silting of larger drains.

244. *Requirements for future:* Presently Sivakasi has 160 dustbins of 0.25 ton capacity. The town has 16 secondary collection centers/ Primary Transfer Points where the community/ sanitary workers deposit the waste. The SWM future requirement is presented in **Table 8.11.**

Table 8.11: Requirement until 2026 in Solid Waste Management

Description	Unit	Gaps Up To 2026
Primary collection		
Hand Carts	Nos.	-
Push Carts	Nos.	145
Secondary collection		
Dumper bins (7 cum)	Nos.	20
Transportation Vehicles		
Dumper Placer	Nos.	5

Source: Analysis

245. In situation where door to door collection system is not being implemented, the desirable spacing of primary collection bins is 100 m. however in the light of recent privatization initiatives of solid waste management, an organized door-to-door collection of waste is recommended for Sivakasi. In view of this, the entire town need not be provided with dustbins at 100m interval. The aim of this process is to achieve,

(i) 100 Percent coverage of door-to-door collection from hotels and restaurants
(ii) 100 Percent coverage of door to door collection from households and Commercial
(iii) The remaining under community bin system.

246. It is envisaged that the entire area of the town is brought under door-to-door collection and hence, no additional dustbins are proposed. This is since after 80 percent coverage of households under door-to-door collection the areas in slums and other areas, which are estimated to be about 20 Percent of the total households in 2026 shall be covered by the existing bins, shifted and relocated.

247. In this scenario, the municipality shall be responsible for the collection. The existing dustbins shall be phased out in an organized manner according to the implementation of the system and will be utilized in the areas where introduction of door-to-door collection is considered practically impossible. This is proposed to be achieved by the year 2007-08.

Based on these assumptions, the following equipment for primary collection is estimated and are presented in **Table 8.7**

248. There are 115 handcarts at present with the Municipality. For the suggested measures in the adopted scenario there will be a requirement of only 71 hand carts with 3 bins of 40 litre capacities each. So the existing handcarts shall be adequately modified to suit to the future requirements and hence there is no additional capital investment suggested.

249. The current availability of dustbins will also cater to the needs till the system is completely implemented. The dustbins should be slowly phased out after the door-to-door collection system is stabilized and integrated with the secondary collection system of the town.

250. *Collection and Transportation:* - There are 16 secondary collection points of 1 ton capacity each, and a fleet of vehicles comprising of tractor trailers and mini trucks numbering 9 in total. On an average, each vehicle makes 3 trips a day and about 60 Percent of the waste is transported to the disposal site.

251. The collection point can cover an area of 0.16 Sq. km, in Sivakasi, on an average one collection point is catering to an area of 0.43 Sq. km. The values are arrived at based on minimum comfortable walking distance and the time required for door-to-door collection by one handcart.

252. Sivakasi has a vehicle capacity adequacy ratio of 68 percent. That is the available vehicle capacity is actually able to transfer only about 70 Percent of the total waste generated considering a bulk density factor of 0.35.

253. Seventy eight percent of the waste is being transported to the disposal site by the vehicles by making more than three trips on an average. In the long term, there would be a gap of about 32 tons capacity by 2026 for achieving 100 percent collection efficiency.

254. *Improvement Strategies:* - In view of the criticality of the information on vehicle movement in assessing the collection and disposal efficiency of the local body, it is recommended that a standard register at the disposal site and transfer station be maintained. The register should contain information on each of the vehicle trips at both the locations and the origin of waste collection. A summary of this information shall be prepared at the end of the day, to be verified by the health officer.

255. In order to reach total collection of 100 Percent, it is recommended to procure 3 new DLDP vehicles. It is also recommended that Dual Loaded Dumper Placers (DLDPs) be introduced to improve the collection efficiency and to cover at least 100 percent area of the town.

256. *Requirements:* 5 Dual Loaded Dumper Placers with 20 numbers of containers will be required for collection of approximately 58 tons of waste that will be generated in Sivakasi by the year 2026. The estimated cost of procuring additional vehicles for collection and transportation of solid waste is estimated at Rs. 71 lakh for 2026, including Rs. 10 lakh per Dual Loaded Dumper Placer unit and the containers at Rs. 25,000 per unit.

257. Processing and Disposal: Major issues of processing and disposal are pertaining to the unscientific methods of disposal of non-biodegradable waste and the associated impacts on the neighbourhood.

258. *Improvement Strategies:* The characteristics and quantity of solid waste generated in the town primarily influence the disposal options. A review of the available solid waste sample results indicates that nearly 65 Percent of the waste generated in Sivakasi is organic in nature. In terms of the quantity, around 45 tons of waste is generated every day and is expected to go up 58.81 tons by the year 2026.

259. Considering these aspects, it is recommended to develop a landfill site for safe disposal of solid waste of Sivakasi. Based on the successful implementation of the door-to-door collection and source segregation practices in the city, the options of waste to energy and composting projects can be developed. The disposal strategies for Sivakasi is

(i) Compost the organic fraction of the waste
(ii) Sanitary land filling of inorganic fraction of waste and the compost rejects
(iii) Educating the community on Reduce, Reuse, Recycle and Recover

260. *Requirements:* Area requirements for the land fill sites are worked out based on the generation trends and sustainable waste management practices. With a per capita generation rate of 593-gm/ capita, the city generates around 45 tons of waste.

261. Following similar trends, Sivakasi shall be generating around 58.8 tons of solid waste by 2026. The base year (2001) waste generation trends when projected to the design year 2026, Sivakasi shall be requiring 9.76 acres (for a generation 58 tons per day) of land fill area. The area requirements for landfill are presented in **Table 8.12.**

Table 8.12: Future Requirements for landfill Site

Year	**Estimates**	
	Waste Generation,	**Land Fill Area [2]**
	Tons/day	*Acres*
2001	45.06	-
2006	45.63	-
2011	48.91	-
2016	55.21	-
2021	55.51	-
2026	58.81	9.76
1. Estimates are based on present per capita generation of 593 gm/ capita/ day		
2. Land fill areas are on cumulative basis		

Source: Analysis

262. The above analysis is based on CPHEEO design assumptions for sanitary landfills, wherein a landfill height of 4.5 m and a bulk density of 0.82 tons/ m3 are assumed. However, the actual height of landfill depends on the geological/ geographical conditions of the site and technology of landfill development.

263. The measures recommended as part of 4R strategies comprise reduction of waste generated by way of reducing use of plastics, composting the organic component, community participation in solid waste management, etc.

5. Roads and Traffic Management

264. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.13**.

Table 8.13: Goals and Service Outcomes –Roads, Traffic and Transportation

S.No	Goal	2011	2016	2026
1	Road Network as % of Total Area	12%	15%	15%
2	Average Speed -km/'h with in the town	20	30	35
3	Sidewalks length to Total road length	Half of the requirement	75% of the requirement	95% of the requirement
4	Road accidents	Reduced by 25%	Reduced by 50%	Reduced by 70%
Roads Coverage				
1	Municipality	80%	100%	100%
Road Safety				
1	To reduce traffic accidents by traffic management measures With in the Town	100%	100%	100%
Parking				
1	Construction of parking complexes at proposed locations	100%	100%	100%
Decongestion				
1	Development of Outer Ring Road	100%		

265. 12.56 percent of the total area of the town is under roads with a total length of about 87.06 Km. 100 percent of the roads in the town are surfaced. Accordingly, strategies are formulated to have 100 percent coverage of surfaced roads including up-gradation of roads. The percentage of concrete roads in the town is at 19.5 percent and since these CC roads are provided with minimum widths in slum localities and core areas.

266. The overall system gets affected with load and pressure on the remaining roads resulting in frequent O and M costs and traffic congestion. The deficiencies in Sivakasi with respect to the road infrastructure pertain mainly to the width of roads and density of roads. The following strategies are hence formulated to enhance the coverage of road network and the level of service in Sivakasi.

267. Roads planning: The current coverage is satisfactory at 12.56 Percent of town's area. However the newly developing areas lack the facility and shall increase to a minimum of 17.42 percent. The road widening projects can provide succour to a certain extent in increasing the area under roads, but is limited to certain commercial corridors only. Roads planning shall also ensure that road, parking and traffic infrastructure provision matches

the city's present and future needs for both private and public transport. The requirement for roads in future is presented in **Table 8.14**

Table 8.14: Requirement until 2026 in Roads and Traffic & Transportation

Description	Unit	Gaps Up To 2026
Up gradation		
Black Top to Concrete	km.	0.00
Water Bound Macadam to Black Top	km.	0.51
Earthen to Black Top	km.	0.00
Relaying of Black top	km.	16.27
New Formation		
Concrete	km.	
Black Top	km.	33.8
Traffic and Transportation		
Widening/ Strengthening	km.	1.5
Junction Improvement	Nos.	8
ROB	km.	1
Construction of Truck Terminal	Nos.	1

Source: Analysis

268. *Asset Rehabilitation:* New formations shall be undertaken to extend and augment the roads. Plans would be phased so as to optimize the cost & surface condition and shall include upgrading earthen roads to Bituminous Topped roads. This phased up-gradation would considerably reduce the costs on new formations.

269. *Widening and Strengthening of Road structures:* - With due consideration to the growing traffic intensity it has been proposed to upgrade all the major roads with specific focus on the State Highways and certain other regional roads.

270. Important proposals noted by Traffic Operation and Management Plan are as follows:

(i) *North Car Street X East Car Street:* - North Car Street, East Car Street and Thiruthangal roads meet at a critical 'T' junction which leads to Virudunagar. This junction is with heavy built up mass and full of commercial establishments. The peak hour traffic at this junction was observed between 8.30 AM to 9.30 AM and during the peak hour 3403 vehicles constituting 2187 PCU's was found to be using the intersection.

(ii) *Kamaraj Road X Police Station Junction:* - Kamaraj road and Police station road forms a 'T' junction. On eastern side of Kamaraj road the Post and Telegraph office is located which attracts heavy traffic. Maximum traffic was observed at this intersection during the peak hour traffic (time 8.30 AM to 9.30 AM) was found to be 1672 PCU's with 2355 Vehicles. The Pallavan Transport Consultancy Services Ltd. did these observations in 1997.

271. Important proposals noted by Traffic Operation and Management Plan are as follows

(i) Improvements at Intersections

- Intersection of Thiruthangal road, Virudunagar Road, Coronation road and

C.N. Anna Road.
- Intersection of Srivilliputtur Road to be widened to provide 10m wide riding surface.
- Intersection of Thiruthangal road and Velayudham road
- Junction of Sattur road and Kamak road.
- Intersection of Chairman A.S.K.Thangaiah road and Kamak road (Ambalamedu junction)
- Intersection of Chairman Periannan road and SHN School road
- Junction of North Car Street, East Car Street and Thiruthangal Road.
- Kamarajar Road and Police Station Road Intersection

(ii) Specific Traffic Management Schemes

- Central area around Sivan Kovil
- Traffic Management in S.H.N.School Road.
- Other Traffic Management Schemes

(iii) Road Improvements

- Railway Feeder Road
- Improvement to Vembakottai Road
- Provision of raised footpaths in Major Roads
- Enforcement Machinery & Manpower

(iv) Medium Term Proposals

- Improvements to Bus terminal
- Proposal for new road Constructions
- Southern bund of Sirukulam tank
- Sattur road to Gandhi road is proposed along the existing channel and Kuttai.
- Improvement to Bund Road
- Off street Parking place for heavy vehicles, Cars and Light Commercial Vehicle

6. Street Lighting

272. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.15**

Table 8.15: Goals and Service Outcomes – Street Lighting

S.No	Goal	2011	2016	2026
1	Energy saving mechanisms	80%	100%	100%
2	Adequate lighting in Non-lit areas	80%	100%	100%

273. The strategic intervention in this sector is in increasing the number of lampposts in the wards identified to reduce the average spacing between lampposts to below 30 m. Further, measures are to be adopted to minimize the power consumption charges that are observed

to be on the higher side. The details of future requirements of street lighting are summarized presented in **Table 8.16**

Table 8.16: Requirement until 2026 in Street Lighting

Description	Unit	Gaps Up To 2026
Tube Light	Nos.	1,178
High Power	Nos.	62
Power Saver Switches	Nos.	3
High Mast Lamps	Nos.	3

Source: Analysis

274. Further, to improve upon the O and M of the street lighting it is recommended to mechanize the system and involve private sector in the same. The mechanization would be towards introducing dimming systems during non-peak hours of operation to reduce the power consumption. The dimming system can be introduced from 11 PM to 4 AM and reduced the LUX by 50 percent.

7. Poverty Alleviation

275. *Goals and Service Outcomes:* The goals and service outcomes based on the proposed strategy for the horizon period is presented in **Table 8.17**

Table 8.17: Goals and Service Outcomes – Poverty Alleviation

S.No	Goal	2011	2016	2026
1	Water Supply Network Coverage for slum households	90%	95%	100%
2	UGD coverage for slum households	60%	100%	100%
3	Adequately lit slums	100%	100%	100%
4	Adequate road link for the slums	100%	100%	100%
5	Pucca houses for all slum households	80%	100%	100%
6	Education for all in slums	100%	100%	100%

276. *Beneficiary Selection:* Identify the target beneficiaries based on a socio-economic survey and initiate efforts to form Community Development Societies (CDSs) covering the target population and implement guidelines on the lines of SJSRY in beneficiary selection. Encourage the community to avail the benefits under the various slum development programs by developing linkages with the lead bankers.

277. Ensure the flow of communication between the various actors and the community structures through a proper reporting procedure. A town level training strategy will be formulated to focus upon the targeted beneficiaries. The strategy will aim at the people to be trained including the policy makers, town officials, community members as well as the beneficiaries.

278. *Programs' Monitoring:* - While implementation of the programs is important the monitoring of the same is more important for continuing of the process. This ensures the success of the programs and hence further participation of the communities over the years, which will only lead to complete poverty alleviation.

B. Project Cost for Service Delivery

1. Water Supply Components in Projects

279. *Source Development.* The availability of water from the existing source during normal and summer months is 4.50 and 1.80 MLD respectively. Water demand for the present and ultimate stage population are 8.45 MLD (2011) and 9.96 MLD (2026) respectively. Therefore, improvements to the existing source through rehabilitation measures only have been recommended to improve the yield and ensure full utilization. On the other hand, Mannur Combined Water Supply Scheme proposes to supply a quantum of 5.00 MLD to Sivakasi. The combined supply will satisfy the ultimate stage water demand for Sivakasi Municipality.

280. *Source Augmentation Proposal of TWAD Board*: - Tamil Nadu Water and Drainage Board has formulated the Mannur Combined Water Supply Improvement Scheme for this region with Thamirabarani River as source. The source is subsurface water from the riverbed. Subsurface water to the extent of 33.70 MLD will be abstracted and supply water to Sivakasi Municipality, Thiruthangal Urban Town Panchayat and 54 wayside villages. The proposed allocation for Sivakasi town is 5.00 MLD. For this project municipal contribution is Rs. 1,200 lakhs to the Tamilnadu Govt. and in future municipality has to pay TWAD Board for bulk water charges.

281. On completion of the aforementioned Combined Water Supply Scheme, the bulk quantity of 5.00 MLD will be delivered to Sivakasi, in a proposed sump to be located on Kamaraj Road. With this additional quantity of 5.00 MLD, the ultimate stage water demand for Sivakasi Municipality (9.96 MLD) will be met.

282. *Rehabilitation for Treatment plant:* - The existing Water Treatment Plant requires rehabilitation measures to ensure optimum performance of the treatment facility. The following components of the water treatment plant will require repair work:

(i) The motor (0.50 HP) for alum mixing is under repair. Hence, a new motor (0.50 HP) for the mixing arrangement is to be provided
(ii) Motor with Gear-Box of the Flash mixer requires thorough servicing
(iii) In clariflocculator, rubber squeezes at the bottom of the scrappers need to be installed
(iv) Gear box for one of motors for paddles of the clariflocculator needs repair
(v) Chlorinators need to be rehabilitated
(vi) Anti-corrosive painting to all MS ladders and epoxy painting to the structural work of the mechanical scraper and rotating bridge of the clariflocculator are to be applied
(vii) All three losses of head flow meters and rate of flow controllers in the filter house require to be rehabilitated/serviced
(viii) The compressor of air blower needs to be replaced to make the blower to good

operational condition

(ix) The motor of back wash water pump (8.00 HP capacities) is to be repaired

(x) Inside the pump room (Scheme I), base of all the four motor units has been corroded and has to be replaced

283. *Observations:* - Scheme I: It is observed that condition of Cast Iron transmission main has been found satisfactory only requiring replacement/renewal of air and sluice/scour valves in specific locations and is covered through this project.

284. *Scheme II:* It is observed that a specific stretch of the AC main has been severely damaged and requires replacement with new pipe. The existing main shall be replaced with a 400-mm diameter PSC main between LS. 11,150 to 13,650 m.

285. *Feeder Mains to Service Reservoirs:* The existing feeder mains to different service reservoirs were checked for their adequacy for the ultimate stage demand of 2035. Feeder mains have been analyzed by considering pumping of water for 23 hours to feed the service reservoirs in the continuous supply system.

286. All existing feeder mains have been found adequate to supply the flow for ultimate demand. The pumps provided to pump water to Gandhi Nagar overhead tank and Palaniandavar Over Head Tank shall be replaced with new pump sets with 32-m and 26-m design head respectively.

287. *Distribution System – Proposed Improvements:* Rezoning / Redistribution of the distribution system in Sivakasi Municipality has been performed based on the following factors:

(i) Ultimate Stage Population and corresponding water demand
(ii) Capacity of the Service Reservoir in existing distribution zones
(iii) Staging Height of the Service Reservoir; and
(iv) Contours / profiles of the zonal area considered

288. As specified earlier, seven existing overhead tanks with a combined capacity of 38.00 LL form the storage facility within the distribution system. The combined storage capacity is adequate to meet the ultimate stage water demand. Therefore, new overhead tank has not been proposed.

289. It has been determined that storage capacity of some of the service reservoirs in the town are not adequate to meet the ultimate stage water demand of the specific zone, that the existing distribution system has been re-zoned to ensure equitable water supply at specified minimum residual pressure.

290. *Re-zoning / Re-distribution:* - Rezoning of the distribution system is considered as essential in order to overcome the unequal distribution of water within the town. This means that even if the supply of water from the head works is increased, without improvement of the distribution system, the desired improvement in supply position within the town could not be ensured. In order to, critically assess the situation, detailed field studies were conducted.

291. In 1960, Sivakasi was provided with one overhead tank at Kamarajar Road with a storage capacity of 9.00 lakh litres. Subsequently in 1990, three Overhead Tanks were constructed at Kamarajar Road (12.00 lakh litres), Gandhi Nagar (3.00 lakh litres) and Palaniandavar Colony (5.00 lakh litres). Further, three additional overhead tanks at Cattle Shed (3.00 lakh litres), Coronation Colony (3.00 lakh litres) and MGR Thidal (3.00 lakh litres) were constructed in the year 2001.

292. The existing Over Head Tanks at Kamarajar Road presently caters to a significantly large area of operation. Apart from this, the presence of longer lengths of old pipes, overdrawal of water in certain segments are in existence. Due to the above factors, the present service level is not uniform and inadequate supply with negligible residual pressure at the tail end areas is a regular phenomenon.

293. The present and ultimate stage population could be served by each of existing service reservoirs have been calculated based on 90-lpcd consumption. The entire water distribution system has been re-zoned into seven (7) zones, with the total water distribution to each zone based on per capita water demand and benefiting population. Drawing 8.3 shows the proposed water distribution zones based on the aforementioned rezoning / redistribution. Details of the proposed water distribution system indicating the population served at the ultimate stage, storage capacity, storage/demand ratio etc

2. Water Supply Cost

294. The capital costs estimated for the proposed interventions are to the tune of Rs. 407.08 lakh. The investment for the water supply sector is based on the requirements and demand for the year 2026. As per the detailed water supply report for Sivakasi, the cost is arrived and the components are identified like storage capacity augmentation, pumping main, and augmentation of distribution network, rehabilitation for existing network etc,. The total investment towards water supply is presented in the **Table 8.18.**

Table 8.18: Details of Identified Investment in Water Supply Sector

Component	**Total investment up to 2026**
	Rs. Lakh
Rehabilitation of existing WTP at Vembakottai	3.52
Rehabilitation for existing 300 mm CI main	2.06
Rehabilitation for existing 400 mm AC main	56.91
Rehabilitation of pumps at in take works and clear water pumps at WTP & proposed modifications per energy audit	21.43
Proposed improvements to feeder mains	26.53
Proposed improvements to distribution mains	296.63
Total	**407.08**

Source: Analysis

3. Sewerage and Sanitation

295. The capital investments under this sector for this corporate plan are towards provision of under ground drainage system for the town and provision of pubic convenience systems in slums.

296. The investment components include sewer length of 98.33 km, STP, land and electrical equipment and public conveniences for slums. The proposed investment is to the tune of Rs. 2,545.92 lakh. The Capital Improvement Program is presented in **Table 8.19**

Table 8.19: The Investments for Sewerage and Sanitation

Component	**Total investment up to 2026**
	Rs. Lakh
Under Ground Drainage	
Under Ground Drainage network (97.10 km)	1,456.50
STP & Land and Electrical equipment (7.89 MLD)	118.42
Road Rehabilitation due to Water Supply and Sewerage Project (97.10 km)	971.00
Total	**2,545.92**

Source: Analysis

4. Storm Water Drainage & Rejuvenation of Water Bodies

297. The investments are in line with the roads sector. The components involved in this sector are up-gradation of kutcha to pucca and new pucca roads with open and closed drains. The estimated cost for extension and augmentation of storm water drainage including the improvement measures to Odai's is about Rs. 260.00 lakh.

298. The upgradation of kutcha to pucca roads with closed and open drains, the estimated cost value is Rs. 1339.10 lakh. Rs. 811.24 lakh is calculated for the construction of new pucca roads with open drains. Rs. 81.83 lakh is proposed for desilting and strengthening of Odai's. The proposed Capital Improvement Program is presented in **Table. 8.20.**

Table 8.20: Investments for Drainage and Lake Development

Component	**Total investment up to 2026**
	Rs. Lakh
Up gradation of Kutcha to Pucca	
Kutcha to Pucca Open (42.81 km)	513.74
Kutcha to Pucca Closed (48.55 km)	825.36
New Pucca Open Drains (67.60 km)	811.24
Total	**2150.34**
Lakes conservation /Tanks regeneration and Nalla strengthening	
Tanks/ Lakes conservation (13 nos)	260.00
Desilting & Strengthening of Primary Drains (10.91 km)	81.83
Total	**341.83**

Source: Analysis

5. Solid Waste Management

299. The total investment identified for this sector is Rs. 413.73 lakh. The requirements at the disposal site are planned for the year 2026. The components of primary and secondary collection are planned for the immediate requirements and demands. Rs. 71.44 lakh of this

amount is proposed for augmentation of the primary and secondary collection system in the town. The rest of the amount Rs. 342.29 lakh is proposed for investment on acquisition of disposal site, creating infrastructure for land fill and composting facilities. The Improvement Program for solid waste management sector is presented in **Table**: **8.21.**

Table 8.21: The Investments for Solid Waste Management

Component	**Total investment up to 2026**
	Rs. Lakh
Solid Waste Management	
Push Carts (145 nos)	10.44
Secondary collection	
Dumper bins -7 cum (20 nos)	11.00
Transportation Vehicles	
Dumper Placer (5 nos)	50.00
Disposal Site	
Cost of Development of Compost	60.00
Cost of Development of Land Fill (9.76 acres)	282.29
Total	**413.73**

Source: Analysis

6. Roads and Traffic Management

300. The investments in the sector are mainly towards new roads formation and up gradation also. Rs. 1,105.62 lakh is the identified investment for new Bituminous. Rs. 10.50 lakh is proposed for widening and strengthening of identified road stretches in the town and Rs. 7.70 lakh for up gradation of Water bound macadam to BT roads. Rs. 16.27 lakh is estimated for relaying the black top roads. Out of total Rs. 2,956.2 lakh, Rs. 1,105.62 lakh is invested for roads sector and Rs. 1, 850.50 lakh for traffic and management sector. Capital Improvement Program is illustrated in **Table: 8.22.**

Table 8.22: The Investments for Roads and Traffic Management

Component	**Total investment up to 2026**
	Rs. Lakh
Up gradation	
Water Bound Macadam to Black Top	7.70
Relaying of Black top	16.27
New Formation	
Black Top (33.8 km)	1,081.65
Total	**1,105.62**
Traffic and Transportation	
Widening/ Strengthening	10.50
Junction Improvement (8 nos)	40.00
ROB	1,000.00
Construction of Truck Terminal	800.00
Total	**1,850.5**

Source: Analysis

7. Street Lighting

301. Rs. 312.44 lakh is identified for the provision of additional street lights in Sivakasi. The requirement of tube lights is 1127 nos. for the horizon year 2026 with an investment of Rs. 281.68 lakh. For procurement of high power lamps, identified investment is Rs. 16.46 lakh. Three high mast lamps are proposed to provide at select junctions at a cost of Rs. 14.16 lakh. The investment for Street lighting is identified in **Table: 8.23**

Table 8.23: The Investments for Street Lighting

Component	**Total investment up to 2026**
	Rs. Lakh
Street Lighting	
Tube Light (1178 nos)	281.68
High Power (62 nos)	16.46
Power Saver Switches (3 nos)	0.14
High Mast Lamps (3 nos)	14.16
Total	**312.44**

Source: - Analysis

8. Other Identified Projects

302. A total investment of Rs. 90.00 lakh is identified for funding various other projects as identified by the municipality. This is towards construction of parks and plays grounds, and construction of electrical crematorium.

303. The Municipality shall take up the parks and playgrounds construction for estimated cost of Rs. 20.00 lakh and Electrical Crematorium shall be constructed on the identified investment of Rs. 70.00 lakh. The proposed Capital Improvement Program is presented in **Table: 8.24**

Table 8.24: The Investments for all Other Project

Component	**Total investment up to 2026**
	Rs. Lakh
Parks and Play Grounds	20.00
Electrical Crematorium	70.00
Total	**90.00**

Source: Analysis

IX. ASSET MANAGEMENT PLAN

A. Overview

304. This asset management has the objective of defining and describing the key elements, and principles of a Municipal Infrastructure Asset Management (MI-AM) System. This chapter will deal with the elements that are essential in an asset management program for movable and immovable infrastructure. More specifically road networks, sidewalks, water supply networks, pumping, storage, treatment facilities and storm water drains.

305. While the need for Asset Management is clearly felt, it is equally important to have appropriate management information on asset condition, infrastructure costs and performance, and the consolidated requirements for repairs and maintenance, as well as appropriate maintenance standards.

1. Asset Inventory

306. The first stage of implementation of an asset management program for municipal infrastructure relies on the essential element of inventory. The locations of available assets are presented in **Map 9.1.** For each element in each category of infrastructure, it is fundamental to know about all as mentioned below:

(i) Available Assets
(ii) Location of Asset
(iii) Age of Asset
(iv) Quantity of Asset
(v) Physical Characteristics of Asset

307. Infrastructure Assets will include all movable and immovable equipment, properties including but not restricted to sectors like water supply drainage, sewerage, solid waste management, roads, street lighting etc. Unlike other assets of the municipality, these assets undergo constant use, wear and tear, addition, repair etc. This correspondingly changes their values and hence a constant value updating is necessary.

2 Information of Municipal Assets.

308. *Water Supply:* The Water Supply Assets comprise of all the assets such as Head Works, Treatment Plant, Sump, Transmission Mains, Pumping mains, Feeder mains, Distribution Mains and sub mains, including all valves, connections, meters and all related facilities owned by the local body for the efficient distribution of water. In case the Urban Local Body owns only the distribution facilities from the OHTs, then the asset is classified accordingly. Sivakasi Municipality looks after the O & M of the Head works, treatment plant as well the transmission network outside the municipal limits and hence are its own assets.

309. *Water Supply Network:* The Sivakasi municipality maintains the protected water supply scheme of since 1970. The network within the town comprises of CI, AC and PVC pipes

for a total length of about 78 km. PVC pipes run to maximum length of about 39 Km, CI pipes run to a length of 24 Km and AC pipes to a length of 14 km. The entire CI network of about 24-Km is laid during the execution of the scheme and is more than 20 years old. 30-Km length of the network is more than 10 years old and another 24 Km of the network is laid during the past ten years.

310. *Pumps & Valves:* The municipality has one pump of 50 HP capacity and four pumps of 25 HP capacity at the head works. These apart there are seven pumps of capacities 15 HP, 10 HP and 7.5 HP within the town for pumping water from the ground level sump at Kamarajar Salai to the Over Head Tanks in the town. There are three types of valves in operation in the town, Scour Valves, Air Valves and Sluices Valves. Out of 173, Scour Valves 20 valves are reported to be not working. All the eight air valves are not functioning and three of the five sluice valves are in working condition. The details are presented in the **Table 9.1**.

Table 9.1: Assets of Water Supply Details

Asset Type	Wards/Locations	Numbers
Bore wells with hand pumps (30-60 mm deep)	-	145
Public Taps	All the wards spread over all the areas of the town	147
Open Wells		7
Over Head Tank	Locations - Kamarajar Salai	1
	GLSR – Locations like Gandhi Nagar, Kamarajar Road, M.G.R. Thidal, Coronation Colony, Palaniandavar Colony and Cattle shed	6
Distribution Pipes 3”, 4” of AC, CI, PVC, type	1, 2, 3	11.8 m
	14, 15, 16, 21-31, 32, 3	8.65 m
	10, 11, 12, 13, 14, 32, 33	5.63 m
	6, 8, 9	8.43 m
	6, 7, 9, 10, 12	3.03 m
	4, 45, 7, 17-20	7.58 m
Valves	Scour Valves Total	173
	Scour Valves Unused	20
	Air Valves Total	8
	Air Valves Unused	0
	Sluice Valves Total	5
	Sluice Valves Unused	2
Pumps	Head works (50 HP, 25 HP)	5
	Others (15 HP, 10 HP, 7.5 HP)	7

Source: Sivakasi Municipality

3. Land and Buildings

311. There are remunerative and non-remunerative assets of the municipality on which the municipality incur considerable expenditure for operation and maintenance. The commercial complexes in the town, Shops in the bus stand, Markets, Slaughterhouse, Pay and Use toilets, etc are all remunerative. Non-remunerative assets of the municipality are the burial ground, public toilets, compost yard, etc, which are listed below in **Table: 9.2 & 9.3.**

Table 9.2 Details of Non-Remunerative Assets

Location	Asset Type	Present Use	Area
			Sq. m.
New Adhi Dravidar Street	RCC Structure	Public Toilet	33.78
New Adhi Dravidar Street Amman koil patti south side	RCC Structure	Public Toilet	33.78
Ayyappan colony	RCC Structure	Public Toilet	33.78
Bharathi nagar main road	RCC Structure	Public Toilet	33.78
P.K.S.A. Arumugam road	RCC Structure	Public Toilet	33.78
Karuppanan Street	RCC Structure	Public Toilet	33.78
Kathan street	RCC Structure	Public Toilet	33.78
Rani Anna Colony	RCC Structure	Public Toilet	33.78
Marimuthu Street - Ladies	RCC Structure	Public Toilet	33.78
Marimuthu Street - Gents	RCC Structure	Public Toilet	33.78
Pallapatti road	RCC Structure	Public Toilet	33.78
Nadar lodge- Thiruthangal	RCC Structure	Public Toilet	33.78
Subramaniapuram colony	RCC Structure	Public Toilet	33.78
A.S.K.T. Thangaiah road	RCC Structure	Public Toilet	33.78
Municipal office	RCC Structure	Public Toilet	40.00
Kamarajar road	RCC Structure	Public Toilet	40.00
Muslim middle street	RCC Structure	Public Toilet	40.00
Perandammal street	RCC Structure	Public Toilet	40.00
Parasakthi colony	RCC Structure	Public Toilet	40.00
Pugalandhi street	RCC Structure	Public Toilet	40.00
Pasumpon Muthuramalingam Rd	RCC Structure	Public Toilet	40.00
Kathan street	RCC Structure	Public Toilet	40.00
Viswanatham road	RCC Structure	Public Toilet	40.00
Manikatti oorani	RCC Structure	Public Toilet	40.00
Kamarajar Road	RCC Structure	Mpl. Maternity Centre	-
Gnanagiri Road	RCC Structure	Municipal Quarters	-
Thiruthangal Road, PKN Rd		Parks	-
Kamarajar Road	RCC Structure	Radio Room	-
P.K.S.A. Arumugam road	RCC Structure	Radio Room	-
Thiruthangal Road, kathan St.	RCC Structure	Cattle Market, Grass Market	-
Thiruthangal Road		Compost Yard	-
AKP South Street	RCC Structure	Municipal School	-

Source: Sivakasi Municipality

312. Remunerative assets have been used to estimate the additional resource that could be mobilized and is presented in the **Chapter X.**

Table 9.3: Details of Remunerative Assets

Location	Type	Asset Name	No. of shops	Annual Income	Market Value
					1 Sq. ft
Anna Market	Building	Shopping complexes	7	1,451,724	200.00
New Market	Building	Shopping complex	1	35,000	
Fish and meat market		-	13	210,000	
Bus stand	Building	Shopping complex	29	345,528	
Kamarajar Salai	Building	Shopping Complex	27	273,224	200.00
Arasar AMS	Building	Shopping complex	19	406,584	
Sivan Madavethi	Building	Shopping complex	39	405,024	

Source: Sivakasi Municipality

4. Other Assets

313. *Parks:* There are eleven Parks in the town catering to the leisure activities of the people. Sivakasi Municipality owns nine parks out of the eleven parks existing in the town. Private owners maintain the park in ward no 8 and children's playground. The total area of these parks is 12764.2-sq. m

314. *Playgrounds:* There are 12 playgrounds existing in Sivakasi municipality. However all these are within the compounds of the schools and such institutions.

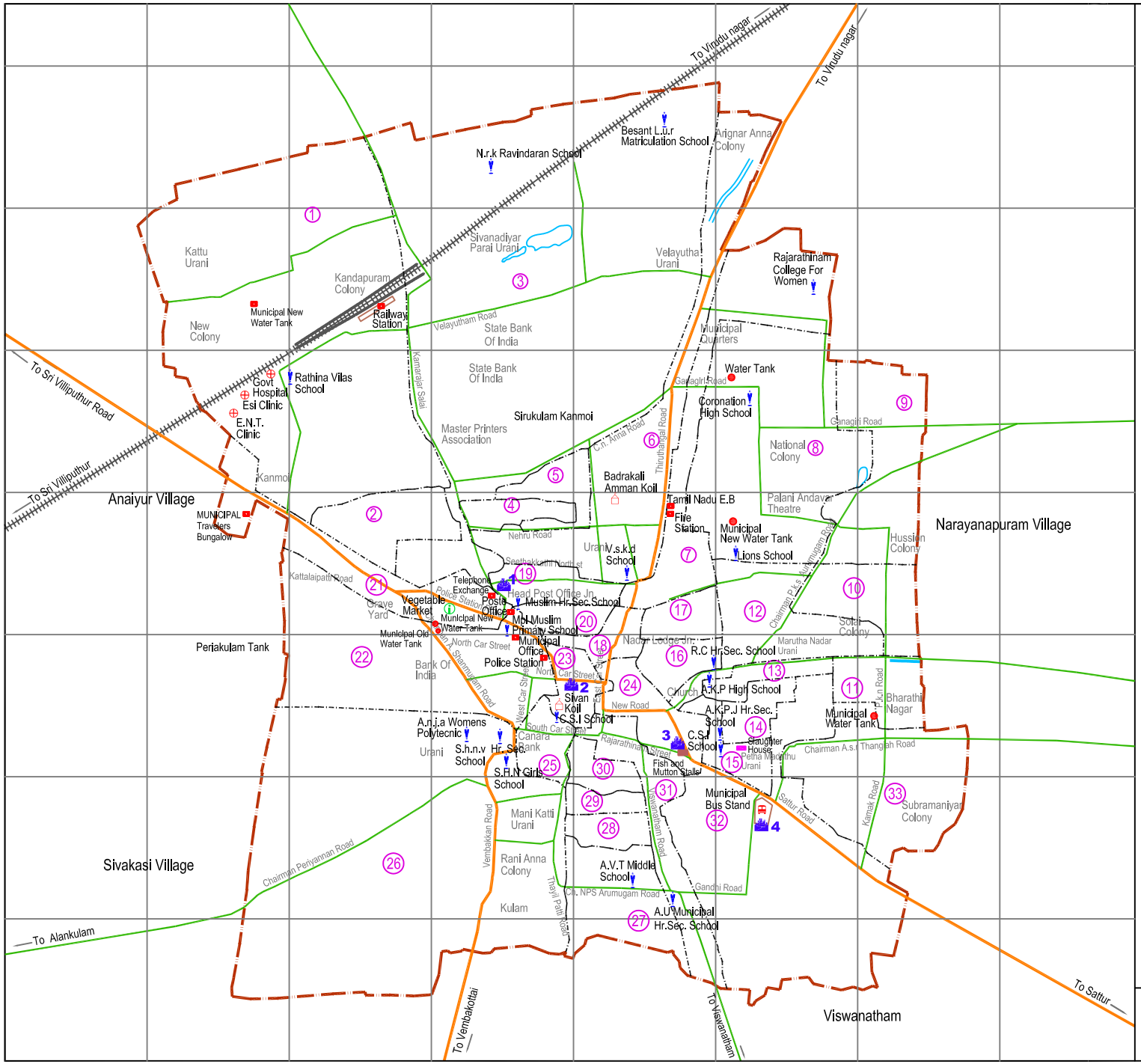
315. *Markets:* There are three markets functioning in the town. One is situated at municipal office, another is a wholesale market and the third is a grass and Cattle market.

316. *Bus Complexes:* There is one Bus Stand on Sattur road to the south-east side of the municipality. There is a shopping complex within the bus stand and owned by the Municipality.

5. Strategies.

317. Condition Assessment Survey (CAS) establishes the existing condition of the asset (IRC, 1994); and hence is a benchmark for comparison, not only between different assets, but also for the same asset at different times. CAS records the deficiencies in a system or component, the extent of the defect, as well as the urgency of the repair work; in some cases the estimated cost of repair is provided at the time of inspection. This type of systematic inspection is essential for asset management as it provides data for the "maintenance management", "service life prediction" and "risk analysis" enabling technologies, mentioned earlier.

318. The data collected in a CAS should reflect the change in the reliability of the system as a whole. This implies that the state or condition of a system being inspected should then be linked to the change in reliability of the system or its components. In this way, programmed maintenance and repair for a given system can be based on updated reliability estimates.



SIVAKASI CITY CORPORATE PLAN CUM BUSINESS PLAN

Legend :

- Municipal Boundary
- Ward Boundary
- Ward No.

ROAD WAYS

- SH Ways
- Major Road
- Railways
- Water Body
- Canal, Nala, Odai

- Vegetable Market
- Fish And Mutton Stalls
- Slaughter House
- Municipal Building
- School
- Shopping Complex
- Hospital
- Temple
- Municipal Bus Stand

Notes :

Remunerative Assets

1. Anna Market Shopping Complex
2. Sivan Madaveethi Shopping Complex
3. New Route Shopping Complex
4. Bus Stand Shopping Complex
5. Arasan Shopping Complex
6. Kamarajar Salai Shopping Complex

MUNICIPAL ASSETS

N

Scale :

0 0.125 0.25 0.50 1 Km

Tamilnadu Urban Infrastructural Financial Services

Wilbur Smith Associates Private Limited
2-B, "NAWAZISH" , 30, Khader Nawaz Khan Road,
Nungambakkam, Chennai - 600 006, Tamil Nadu, India.
Telephone : + 91 (44) 2833 20 94/ 833 03 82 Fax : + 91 (44) 2833 20 96
e-mail : wsa-urban-ch@dlshnetdsl.net

Map No. 8.1

319. While the above mentioned three tools are mostly innovative type there are specific Information technology tools that are necessary for accurate generation of MIS.

320. Computer Aided Facilities Management (CAFM) is the graphical side of the maintenance management. It provides the opportunity to integrate the design information to some of the facilities management data. This graphical interface is invaluable for infrastructure inspection and maintenance.

321. Geographical Information Systems (GIS) relate technical information to geographical information.

322. Global Positioning Systems (GPS) technology assists for rapid and accurate data collection, precise identification of building or service locations, calculations of areas and lengths, estimation of building height, and more importantly the easy, clear and unambiguous documentation of physical location of identified defects and potential problems.

X RESOURCE MOBILIZATION INITIATIVES

A. Scope in Savings and Revenue Generation

1. Infrastructure

The main objective of the Business plan is to generate revenue through the non traditional sources with minimum investments and adopting the policies and strategies. There is enormous scope to control expenditure in Water Supply Sector, Solid Waste Management sector and Street Lighting sector etc,. The analysis will find the options for the replacement of inefficient pumps and, to save the power consumption. By introducing, the private participation in all sectors will result expenditure reduction. Regarding street lighting, the analysis will be towards various options to maintain new technology of street lighting with the help of private participation.

2. Assets

The major assets for the municipalities are the immovable assets. This is one more potential area to develop the asset values and increase the municipal revenue. The analysis includes find out the various options to make use of vacant lands by BOT basis. Revising rents for the remunerative assets up to market values.

B. Sector Wise Savings

1. Water supply

323. *Energy Saving*. A significant number of municipalities in Tamil Nadu rely on motive power for conveying water, either through significantly long distances (typically source to distribution point) or to meet contour gradient requirements within the distribution system. Pump Stations or Booster Stations achieve this objective by providing the necessary motive power to increasing the energy of the fluid to ensure water supply and distribution at required pressure and quantity.

324. Smooth functioning of the pump stations is highly critical, since they operate on a 24 hour basis and virtually form the heart of a system. Such pump stations consume a significant amount of electricity and result in high O&M costs for the Municipality that owns and operates such pumping system. It is common that over time, pumps and motors undergo severe wear and tear resulting in reduced operating efficiencies. This directly translates into higher power consumption for the same amount of output or even reduced output, which further results in a tangible increase in spending.

325. Energy Audit is an effective management tool to combat and control spiraling O&M and Energy costs and to enable the municipalities effectively utilize the system at the optimum cost possible. There is enormous scope to control expenditure with effective energy management, leak detection and unauthorized tap connections.

326. The primary source of water supply to Sivakasi Municipality is the Vaipar River. Scheme I (Original) was commissioned in 1960 and subsequently improvements were performed in 1971. Sub-surface water from Vaipar River is abstracted through a network of galleries, infiltration wells and intake well. In 1990, Water Supply Improvements Scheme II was implemented with abstraction of surface water from within the Vembakkottai Dam. This storage reservoir is situated approximately 1.00 km upstream of the Scheme-I head works. The quantity of water allotted from the dam for water supply to Sivakasi Municipality is 50 mcft./year, which relates to a daily supply of 3.85 ML. Raw water from the dam is drawn through an intake well of 3.60 m dia with three intake pipes laid at different levels. The bottom of the intake pipe extends well into the deepest portion of the dam ensuring that water can be drawn from the reservoir even during the period of low storage. Two pumps deliver water through a raw water transmission main of 1.00 km length (315 mm dia PVC) to the Water Treatment Plant (WTP) located adjacent to the suction well and pump house of Scheme I. Details of the intake works are furnished in **Table 10.1**.

Table 10.1: Details of Pump stations in Sivakasi

Item	**Description**
Head Works at Vaipar River, Vembakottai	
Old Scheme (Year – 1985)	
Pump (2 Nos.)	Kirloskar / HSC Centrifugal
Motor (Type)	Kirloskar
Motor Duty (HP/KW)	50 HP / 37 KW
Pump Duty (Q/TDH)	2,160 lpm x 60 m
Present Condition	Pump No.2 not functional
New Scheme (Year – 1995)	
Raw water Pumps	
Pump (2 Nos.)	Batliboi / Water cooled, Turbine Pump
Motor (Type)	Crompton Greaves
Motor Duty (HP/V/A)	20 HP / 15 kW
Pump Duty (Q/TDH)	3,600 lpm x16 M
Present Condition	Both pumps operational
Clear Water Pumps	
Pump (4 Nos.; 2 running in parallel)	Beacon weir / HSC Centrifugal
Motor (Type)	– Crompton Greaves
Motor Duty (HP/V/A)	25 HP / 18.5 kW
Pump Duty (Q/TDH)	1,584 lpm x 41 m
Present Condition	Pump No.1 not functional as the foundation for the base has sunk Pump No.4 not functional due to misalignment with motor
Town Booster Station No.1 (6 Nos., 2 running in parallel)	
Pump (2 Nos.)	Uniflo
Motor (Type)	Crompton Greaves
Motor Duty (HP/V/A)	15 HP /11 KW
Pump Duty (Q/TDH)	1,980 lpm x 22 m
Present Condition	Functional
Pump (2 Nos.)	Uniflo
Motor (Type)	Crompton Greaves
Motor Duty (HP/V/A)	7.5 HP / 5.5 KW
Pump Duty (Q/TDH)	480 lpm x 26 m
Present Condition	

Item	Description
Pump (2 Nos.)	Uniflo
Motor (Type)	Crompton Greaves
Motor Duty (HP/V/A)	10 HP / 7.5 KW
Pump Duty (Q/TDH)	738 lpm x 26 m
Town Booster Station No.2 (4 Nos.)	
Pump (2 Nos.)	Flow More
Motor (Type)	ABB
Motor Duty (HP/V/A)	20 HP / 15 kW
Pump Duty (Q/TDH)	1,956 lpm x 27 m

327. As per the latest energy audit study prepared for Sivakasi Municipality following details were observed and the same is presented below. Performance test was conducted on the existing equipment in the Head Works and the Town Pump Stations to gauge the present operating condition of the motors and pumps installed. Based on the performance tests conducted and data recorded, results are analyzed for potential savings in the pumping system. Pumps have been tested across the operational range of flow rates and discharge head. Results from the performance tests conducted are furnished in **Table 10.2**.

Table 10.2: Scheme wise efficiency

Pumping Station at Headwork's	Pumps	Operating Range	Efficiency at Operating Point (%)
Scheme – I	1	2,160 lpm @ 60m	56.40
Scheme- II (Raw Water Pumps)	1 & 2	3,600 lpm @ 16m	27.00 / 37.18
Scheme- II (Clear Water Pumps)	1 & 3	1,584 lpm @ 41m	81.37

SCHEME - I

Original Duty Point = 2,160 lpm x 60 m
Observed Maximum Operating Point = 1,928 lpm x 48 m
Observed Efficiency = 56.40 %

- The pump was installed in 1985 and has served its useful life, which is almost 23 years. The second pump has also been out of order for a significant duration. Thus, it is recommended to replace the existing pumps to save considerable amount of energy;

- Priming the pump is another significant obstacle when water level in the collecting sump is below pump level. Hence, it is recommended to provide a vacuum pump, which will not only save energy but also ensure ease of operation; and

- Since the Pump Duty is only 50 HP, it is recommended to go in for LT supply, as eliminating the transformer loss can save energy as well as reduce the kVA cost.

SCHEME -II

328. *Raw Water Pumps* The original pumps installed in 1990 were oil lubricated Turbine Pumps. It was reported that these pumps were replaced in 1998-99 with Clear Water Turbine Pumps by Sivakasi Municipality. No reason was found on any record for this change. It is felt that the use of water cooled turbine pumps in place of oil lubricated raw water turbine pump will result in rapid wear and tear of the line shaft, rubber guide bearings, bushes etc. and consequent early failure of equipment.

Original Duty point	= 3,600 lpm x 16 m
Observed Maximum Operating Point	= 3,207 lpm x 8.45 m
Normal Operating Point	= 2,200 lpm x 12.5 m
Efficiency	= **28.50 % (Pump No.1**)
	= **36.00 % (Pump No.2)**

- Performance is very poor. The pumps are also not energy efficient as observed from the poor efficiencies recorded during testing. Normally, efficiency of pumps for this operating range should be in the order of 80 %. Thus, it is recommended to replace these pumps with energy efficient, oil-cooled, raw water turbine pumps;

- Further, the voltage available at the pump station is approximately 445V against the required 415V. Therefore, it is recommended to install a Voltage Stabilizer to ensure energy savings and equipment safety;

- It is also recommended to install a Capacitor Bank to improve the system Power Factor; and

- During drought conditions or summer months, the Collection well is filled with water by pumping water from the ring wells. The installed pumps (6 nos.) used for this purpose could not be operated during power interruption even though the turbine pumps have generator set for standby power supply. Since these pumps are only rated at 5 HP each, it is recommended to install an additional generator (32 kVA rating).

Clear Water Pumps (25 HP)

Original duty of the pump	= 1,584 lpm x 41 m
Observed duty of the pump	= 1,584 lpm x 40 m

329. Though the aforementioned pumps are comparatively satisfactory in performance, they could not be operated to the full potential due to the following reasons.

- On the suction side, a concentric tape has been provided in place of the recommended eccentric taper. This will result in not only priming problems but also reduced quantum of fluid being pumped;

- Due to leak in the foot-valves, the pumps could not be primed several times;

- Both the above-mentioned drawbacks will increase the energy consumption;
- The average LT supply voltage made available to the system is 445. This high voltage results in unnecessary electrical strain in all electrical equipment, thus reducing the useful service life and also increases the energy consumption;
- Foundations of all the 4 pump sets are in very bad shape. Due to this, Pump No.1 is already out of order; and
- The system/utility Power Factor is also found to be low.

330. Hence, it is recommended to provide new foundations, Top horizontal taper, Vacuum Pump and Voltage Stabilizer to overcome the above listed shortcomings. Additional capacitor must also be provided to improve the Power Factor.

- Replacement of existing pumps with new energy efficient pumps & Installation of new Vacuum Pumps;
- By installation of vacuum pumps & top horizontal tapers, it is expected that a minimum energy savings of 2% can be achieved;
- It is recommended to install capacitors to ensure that the power factor is maintained at 0.98. This measure will not only result in incentives/credits to Sivakasi Municipality, but also result in reduction in line current, which translates into longer service life for electrical equipment. Details of energy savings through installation of capacitors and energy savings that can be generated are furnished in **Table 10.3** and **Table 10.4**.

Table 10.3: Energy Savings through installation of capacitors

Pumping Station	**Motor Rating**	**Average Current**	**kW at observed PF**	**Measured PF**	**Reduction in Current @ 0.98 PF**
	KW	*A*	*KW*		*A*
Raw water	15.00	29.00	14.042	0.78	5.92
Clear water (2 pumps run parallel)	37.30	74.00	26.48	0.78	15.10
Town Booster	39.00	90.40	35.00	0.75	21.22
Total	91.30	193.40	75.522		42.24

Table 10.4: Summary of Recommendation – Energy Audit

Description of Works		Energy saving	Cost Savings	Investment Required
		KWh	*Rs. Lakh*	*Rs. Lakh*
Scheme I	Replacement of existing pumps with new energy efficient pumps	48,224	1.69	3.70
	Installation of Vacuum Pumps	3,958	0.13	1.25
Scheme II - Raw water 20 HP turbine Pump sets	Replacement of existing 20 HP clear water turbine pumps with energy efficient oil lubricated raw water turbine pumps	62,251	0.22	4.00
	Installation of Voltage Stabilizer	23,244	0.81	1.00
Scheme II – Clear water pump, 25 HP	Installation of Vacuum Pumps & Modification to Suction line and Pump Foundations	2,120	0.07	1.25
	Installation of Voltage Stabilizer	16,593	0.58	2.00
Installation of Capacitors to improve Power Factor in the pump station		7,720	0.30	0.2
Total		**164,111**	**3.80**	**13.40**

331. Cost benefit analysis of pumps has been worked out to compare the energy cost of existing pump and energy efficient pump with above recommended modification for a period of 15 years. The net energy saving percentage is more than 10 percent from current level, recommended for undertaking repair and rehabilitation works. The working details are presented in following tables. As per the above recommendations municipality can fetch a minimum of Rs. 9.54 lakh per annum from 2007.

Table 10.5: Estimation of efficiency of pump

Description	Unit	Value
Ideal Condition		
Total Capacity of Pump	HP	148
Power Consumption per HP/hour	KW	0.747
No. of Hours of Pumping	hours	18
Total Power Consumption	KW/annum	587,486
Unit Rate of Power	INR/KW	3.50
Total Energy Charges per annum	INR Lakh	20.56
Current Status		
Total Power Consumption	Kw/annum	695,714
Total Energy Charges per annum	INR Lakh	24.35
Current Efficiency assuming Ideal is 100%	%	84.44
Annual Increment in Energy Cost	%	5
Interest Rate	%	9.5
Continue with the current Pump if net savings is <	%	5.0
Repair the current Pump if net savings is between previous and less than	%	10.0
Replace the current Pump if net savings is >	%	10.0

Table 10.6: Estimation of net energy saving in pump house

Year	Capital cost of Pump	O&M New Pump	O&M old pump	Savings in energy cost	Cost of fund	Net savings	Savings
	Rs. Lakh						*Percent*
2006	13.36	20.56	24.35	3.79	1.27		
2007		21.59	25.57	3.98	1.27	2.71	11%
2008		22.67	26.85	4.18	1.27	2.91	11%
2009		23.80	28.19	4.39	1.27	3.12	11%
2010		24.99	29.60	4.60	1.27	3.34	11%
2011		26.24	31.08	4.83	1.27	3.57	11%
2012		27.56	32.63	5.08	1.27	3.81	12%
2013		28.93	34.26	5.33	1.27	4.06	12%
2014		30.38	35.98	5.60	1.27	4.33	12%
2015		31.90	37.77	5.88	1.27	4.61	12%
2016		33.49	39.66	6.17	1.27	4.90	12%
2017		35.17	41.65	6.48	1.27	5.21	13%
2018		36.93	43.73	6.80	1.27	5.53	13%
2019		38.77	45.92	7.14	1.27	5.87	13%
2020		40.71	48.21	7.50	1.27	6.23	13%

332. Unaccounted for water (UFW) is the difference between the volume of water delivered into the distribution system and the water sold/ billed or accounted for by legitimate consumption. UFW includes losses, physical losses and non-physical or commercial losses.

333. Waste is that water which having been obtained from a source and put into a supply and distribution system and into consumers' installation leaks or is allowed to escape or is taken there from for no useful purpose. Leakage is that part of waste that leaks or escapes other than by deliberate or controllable action. Leakage from reservoir, mains, communication pipes and consumers' supply pipes are of major concern for water managers. The above waste results in the reduction in the revenue to the urban local body. Thus the UFW is also refereed to as non-revenue water. In case of Sivakasi, property tax assessment to water connection is very low coverage (35 %), consequently there are chances of revenue leakages through unauthorized /illegal connections in the town. Which needs to be regularized, this could generate significant revenue for the Municipality. However, this cannot be quantified accurately in the absence of no of illegal connections in the town and hence municipality should take necessary action towards legalizing the illegal connections in the town.

2. Solid Waste Management

Compare to all sections public health division will maintain maximum number of workers and more number of vehicles. The vehicles will exhibits more operation and maintain cost. With respect to solid waste management, the analysis is focused on comparison of manpower with municipal staff to the private operator.

Staff Reduction and Privatisation. There is 141 permanent staff excluding consolidated pay members is working as sanitary workers. The average salary for each sanitary worker is around Rs. 5,000.00 /-. As per the birth, after the age of 58 years number of workers will be retire from the service is calculated. Around 50 percent of workers are going to retire by 2020. Even thought the privatisation introduced 100 there won't be much savings in Sivakasi municipality, because the solid waste production is more in the town and to handle 58 tons in 2026 the expenditure is same which municipality should spend. Rest of staff has to shift to other sectors or proving training programmes in other areas. The saving in SWM is presented in **Table 10.7**.

Table 10.7: Saving in SWM Sector towards Privatization and Staff Reduction

Description	**Value**							
Existing no of filled posts (Sanitary workers)	141							
Average Salary	4,742							
Total salary per annum (Rs.)	8,023,575							
Uniform and stitching allowances per head	700							
Amount for foot ware per head	140							
Amount for soap per head	60							
Total amount per annum	8,024,475							
		2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Waste Handled by Municipality	45.06							
Total Expenditure by Municipality	8,024,475							
Per tone cost handled by Municipality annum	178,084							
Per tone cost handled by Private Contractor annum	164,250							
Savings per annum (Rs.)		13,834	14,664	15,544	16,476	17,465.39	18,513.32	19,624.12

3. Street lighting

334. In street lighting sector, also there is scope to minimize the expenditure towards power consumption and operation & maintenance. Related to street lighting the data has been collected as follows:

(i) Number and types of street lighting and its operation and maintenance
(ii) Expenditure towards salaries and Power charges

335. Energy S*avings*. This section reviews the current level of energy consumption, maintenance and establishment charges incurred in street light maintenance. Sivakasi Municipality maintains 2,503 light fixtures out of which around 83 percent fixtures are tube lights. The energy charges presented in the table are actual payment made during that year, since the non availability of past years actual energy consumption average electricity payment charges has been considered. The average cost of energy consumption per fixture is Rs. 921 per annum and average maintenance expenses of street lighting are Rs. 2.84 lakh per annum. The average maintenance expenditure per light is works out to Rs. 113 per annum. There are three skilled wiremans and 3 helpers to operate and maintain entire street lighting in the town and all of them are permanent employee of the Municipality.

Table 10.8: Expenditure trend in street lighting

Items	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
	Rs. Lakh				
Establishment	4.37	4.42	4.44	4.50	4.43
Energy Charges	14.17	15.09	31.01	32.00	23.07
Maintenance Expenses	4.17	4.27	1.41	1.50	2.84
Total	**22.71**	**23.78**	**36.86**	**38.00**	**30.34**

336. Energy savings in street lighting could be achieved through following ways one by replacing existing conventional tube lights with energy efficient retrofit tube lights, installing power saver devices and privatizing the operation and maintenance of street lighting. There are 2,086 florescent tube light fixtures installed in Sivakasi Municipality. These 40 Watt fluorescent tube lights with ballasts will consume an additional 10-13 watts. To reduce the energy consumption, 28 Watt T-5 retrofit tube lights have to be introduced in place of existing conventional tube lights.

337. Based on the best practices followed in other parts of country, retrofit tube lights are proposed in Sivakasi. The new tube-lights have a higher luminary rating, longer life span, lower failure rate and perform better under the highly fluctuating voltage that plagues the town's electricity supply. The salient features of retrofit tube lights are presented in the following table.

Table 10.9: Salient features of Retro fit tube lights

Description	Value
Tube type	E+28 W
Power consumption	28 W
Power Factor	0.95
Rated life of tube (burning hours)	18,000
Rated life of electronics (burning hours)	50,000
Stroking Voltage	Less than 120 volts

338. The following table presents the comparison of present conventional florescent tube lights with proposed Retrofit tube lights.

Table 10.10: Comparison of conventional tube lights with retrofit lights

Description	40 Watts Tube Light	Retrofit light
Connecting load* (W)	52.5	30
Light output (Lm)	2,450	2,900
Annual energy consumption ** (KWH)	211	120
Energy charges @Rs. 3.50/-	738	422
Life of lamp (Hours)	4,000	18,000

* Including ballast loss of 12.5 W for conventional 40 Watts Tube lights.
** Calculated for 11 hrs daily average burning.

339. The Present Street lighting system in Sivakasi is challenged with poor lighting levels, inappropriate operation timings, poor quality of power and inefficient lighting devises.

(i) Operator switching streetlights require 1 to 1.5 hrs to operate all the switches in an area, resulting in some places lights are switched on/off almost 1 to1.5 hrs prior and after the required time;
(ii) Lighting levels are higher than required standards;
(iii) During off peak hours (after 11 pm in night) lighting levels increase further due to increase in voltage;
(iv) Lighting devises are not mounted properly, thus unnecessarily distributing light to surrounding areas and providing less light on roads and pathways; and
(v) Selection and mounting of lamps is not done in a scientific manner, considering parameters like land use, type of road and illumination required as per Indian Standard Codes.

340. In order to address some of the above issues in the town, power saver devises to be installed. This Power saver devises save energy, by regulating voltage after peak hours. The built in timer automatically reduces voltage from 240V to 180 V after 10 pm. It also can reduce voltage stepwise up to 110 V in different time slots. This action optimized the illumination level after peak hours. The programmable timer switch also controls street lighting operating hours as per desired timings. These power savers also act as protection devises, which increase the life of lamps and luminaries.

341. *Privatization Option.* Government of Tamil Nadu has initiated privatization of street lighting in most of the ULBs in Tamil Nadu. Private contractors have to replace all streetlights by energy efficient lights, installation of power saver devises at necessary

location and maintain the same. The replacement of existing lights proposed to replace in 2006 itself. Separate cash flow for street lighting was prepared to ascertain the savings due to the replacement of new energy efficient lights.

342. The basis for preparing the cash flows are as follows, annual increment in energy cost at 3 percent, rate of interest at 8.5 percent and net energy savings share (profit share) between contractor and ULB with a mutually agreed percentage basis. In this case, it was assumed that the cost of savings in energy utilization was distributed between contractor and ULB at 80 percent and 20 percent. Through street lighting energy consumption ULB can save minimum of Rs. 7.10 lakh in 2007, out of which Rs. 1.42 lakh is transferred to municipality as per the above mentioned profit sharing arrangement, rest with private contractor. Further details are presented in the following table. Existing municipal skilled staffs could be retained for overseeing the private contractors operation and maintenance work and hence no savings envisaged from the manpower reduction during the project implementation period.

Table 10.11: Assumption for calculating energy savings

Description	**Unit**	**Value**
No. of Street Lights in the ULB	Nos.	2,503
Total Annual Energy Cost for Street Lighting	INR Lakh	23.07
Energy Cost per Street light/annum	INR	882
Standard Cost as per Case Studies	INR	617
Annual Increment in Energy Cost	%	3
Transfer of Savings to ULB	%	20
Rate of Interest	%	8.50

Table 10.12: Energy savings in street lighting

Year	Capital Cost	No. of Lights	Actual Energy Cost	Normative Energy Cost	Net Savings	Transfer of Savings to ULB	Net Cash flow
	Rs. Lakh	***Nos.***	*INR Lakh*				
2006	16.90	2,503	22.74	15.91		0.00	-16.90
2007		2,528	23.65	16.56	7.10	1.42	7.10
2008		2,553	24.60	17.22	7.38	1.48	7.38
2009		2,579	25.60	17.92	7.68	1.54	7.68
2010		2,605	26.63	18.64	7.99	1.60	7.99
2011		2,631	27.70	19.39	8.31	1.66	8.31
2012	23.97	2,657	28.82	20.17	8.65	1.73	-15.32
2013		2,684	29.98	20.99	9.00	1.80	9.00
2014		2,711	31.19	21.84	9.36	1.87	9.36
2015		2,738	32.45	22.71	9.73	1.95	9.73
2016		2,765	33.75	23.63	10.13	2.03	10.13
2017	32.07	2,793	35.12	24.58	10.54	2.11	-21.54
2018		2,821	36.53	25.57	10.96	2.19	10.96
2019		2,849	38.00	26.60	11.40	2.28	11.40
2020		2,877	39.53	27.67	11.86	2.37	11.86
						Total	**57.13**
						IRR 12	**34%**
						IRR 15	**32%**
						IRR 20	**36%**

4. Assets

343. Details of remunerative assets owned by Sivakasi Municipality are presented in **Table 10.13**. Current year demands of remunerative assets were collected from municipality and the same were compared with the market rental value. From the following table it is apparent that the municipal remunerative assets are under valued. There is a wide scope of revenue maximization through lease and rentals from remunerative assets of Sivakasi Municipality. The ULB should follow the market value as minimum for lease and rentals of remunerative assets. Through this process municipality can fetch additional revenue of Rs. 1.98 lakh per annum. The rentals and lease amounts have to be revised every 3 year once minimum of 15 percent from FY 2006-07. The collection performance of leases and rentals are inconsistent over the assessment period. Annual account statement reveals very low collection performance, which needs to be attended immediately by municipality.

Table 10.13: Additional Revenue Estimation from Remunerative Assets

Name of the Asset	**No of Shops**	**Annual Income**	**Market value**	**Additional Revenue**
		Rupees/Annum	*Rupees/Annum*	*Rs./Year*
Anna Market	7	451,724	491,400	39,676
New Market	1	35,000	37,800	2,800
Fish and meat market	13	210,000	238,680	28,680
Bus stand	29	345,528	375,840	30,312
Kamarajar Salai	27	273,224	349,920	76,696
Arasar AMS	19	406,584	410,400	3,816
Sivan Madavethi	39	405,024	421,200	16,176
Total	**135**	**2,127,084**	**2,325,240**	**198,156**

C. Additional Resource Mobilization

1. Parking Fees

344. Land-use and economic activity of the town drives the parking demand in Sivakasi. Town attracts significant no of commercial vehicle traffic and personal traffic, which puts up specific parking requirement. Auto-rickshaws parked all major junctions in town cause blockage to the vehicular movement. Based on the field visit two areas were identified for parking of two wheelers. For estimating the parking fee, it was assumed that 40 percent of the total vehicle will be parked less than or equal to one hour and 60 percent of the total vehicle will be parked more than one hour. Vehicles that are parked more than an hour can be charged four rupees per vehicle and for one hour two rupees and an annual vehicle increment of two percent were assumed to calculate the future revenue generation. The estimated parking fee is presented in **Table 10.14**.

Table 10.14: Estimated Parking Fee

Year	Near Municipality	Near Bell Hotel	Total
Approximate No of vehicles./day	300	150	450
	Rs. Lakh		
2007	4.60	1.75	**6.35**
2008	4.69	1.79	**6.48**
2009	4.78	1.82	**6.61**
2010	4.88	1.86	**6.74**
2011	4.98	1.90	**6.87**
2012	5.08	1.93	**7.01**
2013	5.18	1.97	**7.15**
2014	5.28	2.01	**7.30**
2015	5.39	2.05	**7.44**
2016	5.50	2.09	**7.59**
2017	5.61	2.14	**7.74**
2018	5.72	2.18	**7.90**
2019	5.83	2.22	**8.05**
2020	5.95	2.27	**8.22**

2. Advertisement Fee

345. Lease amount collected as fixed by the council for advertising on lamp posts and hoardings erected within the Municipal limit are accounted in advertisement fee. In case of Sivakasi Municipality average revenue generated through the advertisement fee is very low (Rs. 26, 000). Hence, there is a scope to increase the advertisement fee by extending tax /fee coverage net. The following table (**Table 10.15**) presents detailed estimation of advertisement fee for Sivakasi Municipality. The total advertisement fee is Rs. 3.19 lakh per annum. Annual increment of 2 percent on total advertise fee assumed, to accommodate increase in no of advertisement hoardings/ boards.

3. Conservancy Fee

346. Conservancy establishment cost is work out to 59 percent of total establishment cost of Sivakasi Municipality, to meet at least a part of collection expenses conservancy fee introduced. It is proposed to cover at least 70 percent of the residential properties and 100 percent of non domestic properties like hotels, lodges, commercial establishments and etc,. For Residential, properties Rs. 15 per month and non domestic properties Rs. 20 per month have to be charged. Upward revision of 15 percent every 3 years once from 2006-07 proposed. **Table 10.16** presents estimated additional revenue mobilized through conservancy fee for Sivakasi Municipality.

4. Summary

347. Summary of additional revenue mobilization through expenditure control measures and additional revenue generations are presented in **Table 10.17**.

Table 10.15: Estimation of Advertisement fee

Description	Unit	Major Arterial Roads	Other Roads	Markets/ Bus stands	Street Light poles
Average Size of Hoardings	Sq.m	10.00	5.00	10.00	
Average Rate/sq.m/half yearly	Rupees	75.00	50.00	100.00	50.00
Total Length of Road	Km	56.95			
Length of Road	%	20%	50%	-	-
Total Length of Road	Km	11.369	28.48	-	-
Spacing of Hoardings/Boards per km	Nos	5	5	-	-
Total no of Hoardings/Boards	Nos	57	142	50.00	1,252
Total Revenue per annum	**Rs. Lakh**	**0.86**	**0.71**	**1.00**	**0.63**

Table 10.16: Estimation of Conservancy Fee

Description	Coverage	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Domestic (No)	70%	6,078	16,320	16,565	16,813	17,065	17,321	17,580	17,844	18,112	18,383	18,567
Non Domestic (No)	100%	2,042	2,072	2,103	2,135	2,167	2,199	2,232	2,266	2,300	2,334	2,358
Total Revenue (Rs. Lakh)		*29.62*	*33.64*	*35.91*	*47.88*	*50.62*	*52.44*	*65.23*	*68.14*	*70.35*	*84.43*	*87.54*

Table 10.17: Estimated Additional Revenue from Expenditure Control and Resource Mobilization

	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
	Rs. Lakh											
Expenditure Control Measures												
Energy savings – WS	2.71	2.91	3.12	3.34	3.57	3.81	4.06	4.33	4.61	4.90	5.21	5.53
Energy Saving – Street lights	1.42	1.48	1.54	1.60	1.66	1.73	1.80	1.87	1.95	2.03	2.11	2.19
SWM - Privatization					0.10	0.15	0.16	0.16	0.17	0.19	0.20	0.21
Additional Resource Mobilization												
Leases/Rentals from Assets	1.98	1.98	1.98	2.28	2.28	2.28	2.62	2.62	2.62	3.01	3.01	3.01
Parking Fee	6.4	6.5	6.6	6.7	6.9	7.0	7.2	7.3	7.4	7.6	7.7	7.9
Advertisement Fee	3.2	3.3	3.3	3.4	3.5	3.5	3.6	3.7	3.7	3.8	3.9	4.0
Conservancy Fee	29.62	33.64	35.91	47.88	50.62	52.44	65.23	68.14	70.35	84.43	87.54	89.85
Total Revenue	**45.33**	**49.74**	**52.47**	**65.22**	**68.56**	**70.94**	**84.61**	**88.08**	**90.88**	**105.96**	**109.69**	**112.67**

XI. CAPITAL INVESTMENT PLAN & FINANCIAL SUSTAINABILITY

A. Capital Investment Plan

Water Supply and Rejuvenation of Water Bodies

348. *Water Supply*. Under this sector Rs. 407.9 lakh identified for all component, which are provision of rehabilitation of existing WTP at Vembakottai, Rehabilitation for existing 300 mm CI main, Rehabilitation for existing 400 mm AC main, Rehabilitation of pumps at in take works and clear water pumps at WTP & proposed modifications per energy audit, Proposed improvements to feeder mains and Proposed improvements to distribution mains. The investment of lake rejuvenation components also included in water supply sector. The capital costs estimated for the proposed interventions are to the tune of Rs. 341.91 lakh. This is worked out based on the base costs estimated in 2005.

349. The CIP for the Water supply sector is based on the requirements and demand for the year 2026. The priority is given to the rehabilitation to the pumps, feeder main, and extinction of distribution network. However, the detailed project report is available for water supply sector so that the project will be taken up by 2006 financial year. The strengthening Desilting of nallahs and lakes are planed to take up in 2007-11. The phasing of the investment is presented in the **Table 11.1.**

Table 11.1: Investment Phasing for the Water Supply Sector

Component	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**
	Rs. Lakh					
Rehabilitation of existing WTP at Vembakottai	3.52	-	-	-	-	-
Rehabilitation for existing 300 mm CI main	2.06	-	-	-	-	-
Rehabilitation for existing 400 mm AC main	-	56.91	-	-	-	-
Rehabilitation of pumps at in take works and clear water pumps at WTP & proposed modifications per energy audit	21.43	-	-	-	-	-
Proposed improvements to feeder mains	26.53	-	-	-	--	-
Proposed improvements to distribution mains	-	-	100	100	96.63	-
Tanks/ Lakes conservation	21.46	-	-	36.24	53.37	150
Desilting & Strengthening of Primary Drains	-	18.09	50	13.74	-	-
Total	**75**	**75**	**150**	**150**	**150**	**150**

Source: Analysis

Sewerage and Sanitation

350. An investment of Rs. 2,545.92 lakh (base cost) for provision of under ground drainage system is envisaged in lieu with the environmental aspects i.e. Period of implementation for UGD is from 2008-2016 with around 89% of total investment, is estimated Rs. 2,256.00 lakh proposed core area of Sivakasi and treatment plants after detailed study. The CIP is presented in **Table 11.2.**

Table 11.2: Investment Phasing for the Sewerage and Sanitation

Component	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
	Rs. Lakh				
Under Ground Drainage					
Laying of UGD	-	-	387	268.58	300
STP & Land and Electrical equipment	-	-	-	118.42	-
Road Rehabilitation due to Water Supply and Sewerage Project	-	-	-	-	216
Total	**-**	**-**	**387**	**387**	**516**
	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Under Ground Drainage					
Laying of UGD	100	100	-	-	300.92
STP & Land and Electrical equipment	-	-	-	-	-
Road Rehabilitation due to Water Supply and Sewerage Project	93	93	97	97	86.8
Total	**193**	**193**	**97**	**97**	**387**

Source: Analysis

Roads & Traffic and Transportation

351. Rs. 150 lakh sustainable investment is proposed for up-gradation of existing roads to either BT or CC surfacing, majority being up gradation form WBM or earthen roads and new formation. Road widening & strengthening and junction improvements will be taken up by 2009 – 11. Around Rs. 7.7 lakh identified towards earthen to black top roads in 2010 – 11. The new formation of black top roads will be taken up by 2012 - 16. The detail of investment phasing is summarized in **Table 11.3.**

Table 11.3: Investment Phasing for the Road Sector

Component	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
	Rs. Lakh				
Up-gradation					
WBM to Black Top					7.7
Relaying of Black top					
New Formation					
Black Top					
Traffic and Transportation					
Widening/ Strengthening				10.5	

Component	2006-07	2007-08	2008-09	2009-10	2010-11
	Rs. Lakh				
Junction Improvement				18.5	21.5
Total				**29**	**29**
	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Up-gradation					
WBM to Black Top					
Relaying of Black top	12	4.27			
New Formation					
Black Top		8.73	12	17	40
Traffic and Transportation					
ROB					
Construction of Truck Terminal					
Total	**12**	**12**	**12**	**17**	**40**

Source: Analysis

Storm Water Drainage & Natural Drains

352. The investments are in line with up-gradation and new formation of drains. The components involved in this sector are up-gradation of the existing drains and new formations. The estimated cost for extension and augmentation of storm water drainage is about Rs. 377 Lakh. Up-gradation of drains will take up by 2009 – 16 and the new formation will be taken up by 2015 – 16. The investment phasing for storm water drains is presented in **Table 11.4.**

Table 11.4: Investment Phasing for Storm Water Drains

Component	2006-07	2007-08	2008-09	2009-10	2010-11
	Rs. Lakh				
Up-gradation of Kutcha to Pucca					
Kutcha to Pucca Open				55	
Kutcha to Pucca Closed					55
New Pucca Open Drains					
Total				**55**	**55**
	2011-12	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Up-gradation of Kutcha to Pucca					
Kutcha to Pucca Open	33	33	33	33	33
Kutcha to Pucca Closed					
New Pucca Open Drains					100
Total	**33**	**33**	**33**	**33**	**133**

Source: Analysis

Solid Waste Management

353. The total investment identified for this sector is Rs. 62 lakh. The requirements at the disposal site are planned for the horizon year 2026. In addition, the other components of primary and secondary collection are planned for the immediate requirements and demands. Rs. 46.44 lakh of this amount is proposed for augmentation of the primary and secondary collection system in the town. Rs.342.91 lakh is proposed for investment on creating infrastructure for landfill, land acquisition and composting facilities. However,

the municipality can not sustain with the additional investment. The Capital Improvement Program for solid waste management sector is presented in **Table 11.5.**

Table 11.5: Investment Phasing for the Solid Waste Management Sector

Component	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
	Rs. Lakh				
Primary Collection					
Hand Carts required for municipality			10.44		
Secondary Collection					
Dumper bins required (7 cum)			1.56	9.44	
Transportation Vehicles					
Dumper Placer					25
Disposal Site					
Cost of Development of Compost					
Cost of Development for land fill					
Land acquisition					
Total			**12**	**25**	**25**

Source: Analysis

Street Lighting

354. Rs. 86 lakh is identified for the provision of additional streetlights in Sivakasi. Of this, 100 percent of investments is proposed for the plan period 2006-11. Of the total identified investment, Rs. 30.76 lakh is proposed for provision of High Power, Power Saver Switches and High Mast lamps during 2006-08 and 2007-11 investment identified for the Retrofit bulbs instead of tube lights. The Capital Improvement Program for Street lighting is presented in **Table 11.6.**

Table 11.6: Investment Phasing for the Street Lighting Sector

Component	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
	(Rs. Lakh)				
Replacement of Tube Lights With Retro Fit		0.54	17.00		17.00
Retro Fit Tube Light	2.70			17.00	
High Power		16.46			
Power Saver Switches	0.14				
High Mast Lamps	14.16				
Total	**17.00**	**17.00**	**17.00**	**17.00**	**17.00**

Source: Analysis

Other Identified Projects

355. A total investment of Rs. 6 lakh is identified for funding various other projects as identified by the municipality in the end. These investments are towards parks and play grounds.

356. Only 6 lakh is identified for other infrastructure development which can be executed through the municipality. Due to low sustainability there is not much funds to spend towards these other projects. Municipality can develop the parks and playgrounds in the

year 2011-13. The proposed Capital Improvement Program other municipal investments are presented in **Table 11.7.**

Table 11.7: Investment Phasing for the Commercial Complexes, Parks etc.

Component	2008-09	2009-10	2010-11	2011-12	2012-13
	(Rs. Lakh)				
Parks and Play Grounds				2	4
Electrical Crematorium					
Total				**2**	**4**

Source: Analysis

Summary

357. The total estimated base cost of projects for all the sector is Rs. 3,686 lakh. The summary of sustainable investments is in the following **Table 11.8.** Summary of detailed implementation schedule is presented.

Table 11.8: Component wise Sustainable Investments

Sector	Capital Expenditure
Municipal Infrastructure	*Rs. Lakh*
Water Supply & Rejuvenation of Lakes	749.00
Sewerage & Sanitation including slums	2,256.00
Roads & Traffic and Transportation	150.00
Storm Water Drains & Desilting of Natural Drains	377.00
Solid Waste Management	62.00
Street Lighting	86.00
Others	6.00
Sub-total (Municipal Infrastructure)	**3,686.00**
Non-Municipal Infrastructure	
Truck Terminal	800.00
Fly Over	1000.00
Total	**800.00**

Source: Analysis

B. Financial Sustainability

1. Financial Sustainability

358. *Sustainability Analysis*. The sustainability analysis assumes that the municipality will carry out reforms indicated as assumptions for financial projections. A financial and operating plan (FOP) prepared for Sivakasi Municipality then evaluates the municipal fund status for the following scenarios:

(i) Base Case Scenario. In the base case scenario, the finances of the ULB are forecast in a “do nothing” or “without project” scenario. Additional resources mobilized through various initiatives like expenditure control through energy saving, privatization and etc and further resources mobilized through introducing conservancy fee, parking fee and extending advertisement fee coverage are loaded

on to the FOP. The revenue surplus thus generated indicates the ULB's capacity to service capital expenditure.

(ii) Full Project Scenario. The Full project investment scenario is based on investments identified for Sivakasi Municipality and the requirement for upgrading the town's infrastructure is estimated and phased based on the construction activity. Implications of this investment in terms of external borrowings required, resultant debt service commitment, and additional operation and maintenance expenditure are worked out to ascertain sub-project cash flows. Revenue surpluses from the Base Case Scenario are applied to sub-project cash flows emerging from full project investments – the municipal fund net surpluses indicates the ULB's ability to sustain full investments. FY 2020 is assumed as the reference year to determine the net surpluses and whether the Municipality maintains a debt/revenue surplus ratio as an indication of the ULB's ability to sustain investments.

(iii) Sustainable Investment Scenario. The sustainable investment scenario is worked out when the full project investment scenario indicates inability of the municipality to sustain the full identified investment. In this case, the identified investment is sized down to immediate felt need for the municipality to sustain on its own. Implications of this investment in terms of external borrowings required, resultant debt service commitment, and additional operation and maintenance expenditure are worked out to ascertain sub-project cash flows. Revenue surpluses from the Base Case Scenario are applied to sub-project cash flows emerging from sustainable investments – the municipal fund net surpluses indicates the ULB's ability to sustain the investments. FY 2020 is assumed as the reference year to determine the net surpluses and whether the Municipality maintains a debt/revenue surplus ratio as an indication of the ULB's ability to sustain investments. The outcome of this scenario will give an indication of the actual level of investment sustainable by the municipality without any additional external support.

2. Basic Assumptions for Projections

359. The FOP is based on a whole range of assumptions related to income and expenditure. These are critical to ascertain the investment sustenance and would also provide a tool to test certain specific policy decisions regarding revenue and expenditure drivers on the overall municipal fiscal situation. This section elucidates the key assumption adopted for the three FOP scenarios.

360. The FOP is a cash flow stream of the ULB based on the regular municipal revenues, expenditures, and applicability of surplus funds to support project sustainability. The FOP horizon is determined to assess the impact of full debt servicing liability resulting from the borrowings to meet the identified interventions. The proposed capital investments are phased over ten years investment from FY 2006-07 to 2015-16 implying that the last loan draw down would occur in FY 2020-21. Considering a five-year moratorium period, the debt servicing commitment will commence in the FY 2011-12.

361. *Revenue Income*. The assumptions for forecasting revenue income comprise:

(i) Taxes and charges. In cases like property related taxes, water charges and sewerage charges, where the base and basis of revenue realization are known and predictable, the likely revenue is forecast based on certain assumptions regarding growth in number of assessments, revision in ARV (in case of property-related taxes), revision in charges/tariffs and improvement in collection efficiencies. The assumptions with regards basis for forecasting revenue income of taxes and charges are the same for all three scenarios. However, the tax base (number of connections) varies for the three scenarios, assuming that the new investments in water supply and sewerage schemes will result in increased coverage of the infrastructure systems. In the sustainable investment scenario the increase in tax base is scaled down pro rata with the scaled down (sustainable) investment. **Table 11.9, Table** , **Table 11.11** & **Table 11.12** lists the assumptions adopted with regards forecasting income from property tax, water charges and drainage charges respectively under the three FOP scenarios.

Table 11.9: Key assumptions for forecasting income from Property Tax

Description	**Current Level**	**Base Case Scenario**	**Investment Scenarios**
Annual growth in number of assessments (%)	1.24%	3%	3%
Average ARV per Property (Rs. Per Annum)	4,232	4,232	4,232
Tax Rate (% of ARV)	30%	30%	30%
Periodic increase in ARV (%)			
2006-07	-	30.00	30.00
2011-12	-	30.00	30.00
2016-17	-	30.00	30.00
Collection Performance (% of Demand)			
Arrears	77%	60%	60%
Current	89%	85%	85%

Table 11.10: Key assumptions for forecasting income from Water Charges

Description	**Current Level**	**Base Case Scenario**	**Investment Scenarios**
% Water connections to property tax assessments	35.37%	35.37%	80%
Monthly water charge per connection (Rs.)			
Domestic	41.00	41.00	41.00
Non Domestic	81.00	81.00	81.00
Industrial	121.00	121.00	121.00
Periodic revision in water charges			
2006-07	-	15.00	15.00
2009-10	-	15.00	15.00
2011-12	-	15.00	15.00
2015-16	-	15.00	15.00
2018-19	-	15.00	15.00

Description	Current Level	Base Case Scenario	Investment Scenarios
Collection Performance (% of Demand)			
Arrears	100%	70%	70%
Current	98%	90%	90%
One time connection fee (Rs.)			
Domestic	2,000	2,000	2,000
Non Domestic	5,000	5,000	5,000
Industrial	5,000	5,000	5,000
Periodic revision of one time connection fee	-	20 % - 3 yrs once	20 % - 3 yrs once

Table 11.11: Key assumptions for forecasting income from Sewerage Charges

Description	Current Level	Base Case Scenario	Investment Scenarios
% Sewerage connections to PT assessments	-	-	80.00
Monthly sewerage charge per connection (Rs.)			
Domestic	-	-	50.00
Non Domestic	-	-	100.00
Industrial	-	-	200.00
Periodic revision in sewerage charges			
2006-07	-	-	15.00
2009-10	-	-	15.00
2011-12	-	-	15.00
2015-16	-	-	15.00
2018-19	-	-	15.00
Collection Performance (% of Demand)			
Arrears	-	-	50.00
Current	-	-	80.00
One time connection fee (Rs.)			
Domestic	-	-	5,000
Non Domestic	-	-	8,000
Industrial	-	-	10,000
Periodic revision of one time connection fee	-	-	20 % - 3 yrs once

Table 11.12: Key assumptions for forecasting income from Solid Waste conservancy fee

Description	Current Level	Base Case Scenario	Investment Scenarios
% Coverage to PT assessments			
Domestic	-	-	70.00
Non Domestic	-	-	100.00
Monthly conservancy fee per PT assessment (Rs.)			
Domestic	-	-	10.00
Non Domestic	-	-	15.00
Periodic revision in conservancy			

Description	Current Level	Base Case Scenario	Investment Scenarios
fee			
2006-07	-	-	15.00
2009-10	-	-	15.00
2011-12	-	-	15.00
2015-16	-	-	15.00
2018-19	-	-	15.00
Collection Performance (% of Demand)			
Arrears	-	-	60.00
Current	-	-	85.00

(ii) Other revenue income from own sources. All revenue income from own sources other than property-related taxes, and water and sewerage charges, where the base and basis is not clearly defined, are forecast based on the observed trend during the assessment period (2000-01 to 2003-04), subject to minimum and maximum annual growth rates of 5 percent and 15 percent, respectively. Profession tax registered a very high growth rate during the assessment period however it was assumed that it is going to grow at 5 percent only. While the tax net and revisions are very limited. Though the income from the municipal properties and markets past trend witnessed a high growth trend, on a conservative side 15 percent has been adopted.

Table 11.13: Key growth rate assumptions for income from other own sources

Description	Current Level	Assumption
Profession Tax	90.39 %	5.00 %
Other taxes & Charges	11.20 %	10.00 %
Income from Municipal Properties and Markets	59.17 %	15.00 %
License Income (Trade, etc.)	15.14 %	15.00 %
Income from Special Services	(100.00 %)	5.00 %
Income from Sale Proceeds	(26.85 %)	5.00 %
Income from Fees and Fines	9.31 %	5.00 %
Income from Interest on Deposits	(40.80 %)	6.00 %
Income from Investments(Excl. Interest)	--	5.00 %
Miscellaneous Income	(8.58 %)	5.00 %

(iii) Assigned Revenue. Items of assigned revenue such as surcharge on stamp duty, entertainment tax share, etc. are forecast based on the observed trend during the assessment period (2001 to 2003-04), subject to minimum and maximum annual growth rates of 5 percent and 15 percent, respectively. Entertainment tax observed trend during the assessment period was 9.58 percent growth rate, which attributes to inconsistent transfer of ULB share during the review period. Hence a nominal growth rate of 10 percent has been assumed to forecast the revenue. In case of surcharge on stamp duty witnessed a negative growth rate of 15.29 percent during the review period and hence it is assumed that it is going to grow at 15 percent.

Table 11.14: Key growth rate assumptions for income from assigned sources

Description	Current Level	Assumption
Entertainment Tax	9.58 %	10.00 %
Surcharge on Stamp Duty	15.29 %	15.00 %
Other Transfers	(100.00 %)	5.00 %
Total- Assigned Revenue	**8.81 %**	

(iv) Grants and Contributions. Revenue income in the form of grants and contributions are also forecast based on the observed trend during the review period (2000 - 01 to 2003-04), subject to minimum and maximum annual growth rates of 5 percent and 15 percent respectively. Although SFC devolution observed trend was very high, owing to the inconsistent in transfer of grant to ULB. Considering the states tax revenue growth trend forecast, population growth trend and reforms measures initiated by the municipality will fetch more devolution fund. In this perspective a maximum of 15 percent growth per annum adopted.

Table 11.15: Key growth rate assumptions for income from grants & contributions

Description	Current Level	Assumption
State Finance Commission Grant	139.55 %	15.00 %
Other Grants	(58.04 %)	5.00 %
Total- Grants & Contribution	**39.06 %**	

(v) Additional Revenue Income due to Sub-Projects. The sub-projects – in case of water and sewerage projects – are expected to fetch additional revenue by way of increase in number of assessments and levy of user charges (in cases where a new sewerage system is proposed). The sewerage charge is adopted as per **Table 11.16** starting from 2007-08 and a revision of 15 percent is proposed every three years, beginning from 2007-08. The additional revenue income due to water supply and sewerage sub-projects is computed based on the proposed number of new connections, proposed tariffs and assumed collection performance. In addition solid waste conservancy fee also planned to levy on property assessments.

362. *Revenue Expenditure*. Key assumptions for forecasting revenue expenditure comprise:

(i) Expenditure on Municipal Services. Expenditure on municipal services including general administration, revenue collection and service delivery are forecast based on the observed trend during the assessment period (2000-01 to 2003-04), subject to minimum and maximum annual growth rates of 5 percent and 20 percent, respectively. The operation maintenance was grown at 90.32 percent during the assessment period; ULB should take essential action plan towards controlling the expenditure towards operation and maintenance of municipal services. Since most of the item heads are growing at very fast rate, on a conservative side at a maximum of 20 percent has been adopted to forecast the future expenditure trend. However this could be achieved only through expenditure reduction and privatization of municipal services. Although the expenditure trend of staff salary was on the lower side during the assessment period, considering the periodic revision and other increase at a rate of 8 percent has been adopted for future.

Table 11.16: Key growth rate assumptions for forecasting revenue expenditure

Description	Current Level	Assumption
General Administration & revenue Collection		
Staff Salary and Employee Related Expenses	2.79 %	8.00%
Allowances to Elected Representatives	3.02 %	5.00%
General Expenses	196.96 %	10.00%
Pensions and Gratuities	(1.79 %)	5.00%
Education - Staff Salary	--	5.00%
Miscellaneous	7.56 %	8.00%
Total-General Admin. & Revenue Collection	**14.04 %**	
Municipal Services excl. W&D		
General Expenses	15.22 %	15.00%
Public Works and Roads	386.55 %	20.00%
Public Health and Conservancy	118.35 %	20.00%
Street Lighting (including Electricity Charges)	22.24 %	20.00%
Education	--	5.00%
Vehicle and Equipment Maintenance	24.26 %	20.00%
Miscellaneous	227.82 %	15.00%
Total- Municipal Services excl. W&D	**90.32 %**	

Table 11.17: Key growth rate assumptions for forecasting water supply revenue expenditure

Description	Current Level	Assumption
Staff Salary & Employee Related Expenses	(0.99 %)	8.00%
Administration Expenses	13.09 %	5.00%
Equipment Maintenance & Repairs	26.91 %	15.00%
Board Payment	(100.00 %)	5.00%
Electricity Charges	7.38 %	10.00%
Vehicle Maintenance & Repairs	24.08 %	15.00%
Miscellaneous	120.71 %	15.00%
Total- Water Supply & Drainage	**11.69 %**	

(ii) Outstanding Non-debt liabilities. The outstanding non-debt liabilities like payments due to employees, TNEB, TWAD, State Government cess, etc. are assumed to be cleared in equal installments over a 5-year period from 2006-07 to 2010-11. Where data was provided by the ULB, it was considered for preparing the FOP.

(v) Outstanding Debt Liabilities. The outstanding debt liabilities are proposed for clearance over a 10-year period beginning 2006-07 to 2016-17 with the furnished interest rate adopted otherwise at a constant interest of 9.50 percent per annum was assumed.

(iv) Additional O&M Expenditure due to Sub-Projects. While each sector identifies the O&M costs applicable for asset maintenance (manpower, consumables, power charges, etc.), a proportion of the capital cost was derived for projections. **Table** presents the assumptions regarding O&M expenditure on new assets.

Table 11.18: Assumptions for O&M Expenditure

Sector	As % of Capital Cost
Water Supply	6.00
Sewerage & Sanitation	4.00
Roads and Traffic Management	3.00
Storm Water Drainage	2.00
Solid Waste Management	10.00
Street Lighting	10.00
Others	2.00

(v) Additional Debt Servicing Expenditure due to Sustainable Investment. The loans for the sustainable investments are assumed to spread over 20 years, carrying an interest burden as indicated in **Table** , with a five year moratorium on interest and principal repayment – interest during the moratorium period being capitalized. Considering a ten-year loan draw down schedule (2006-07 to 2015-16) and a 20-year tenor, debt servicing will commence from 2011-12 for a period of 15 years. According to the project implementation schedule, the loan drawn and repayment schedule will differ.

Table 11.19: Proposed Financing Pattern

Infrastructure Type	Loan	Grant	ULB + Consumer	Interest Rate
	Percentage			
Water Supply	50	30	20	8.50
Sewerage & Sanitation	50	30	20	8.50
Roads and Traffic Management	60	30	10	8.50
Storm Water Drainage	60	30	10	8.50
Solid Waste Management	60	30	10	8.50
Street Lighting	60	30	10	8.50
Others	10	10	10	8.50

363. *Capital Account.* In case of capital account, only regular capital grant expected during the forecast period based on past trend are considered in the base case scenario, as this scenario is aimed at ascertaining the ULB's capacity to generate internal resources that would be leveraged to undertake identified sub-projects. In the identified investment and sustainable investment scenarios, sub-project cash flows are loaded onto the FOP and their impact on municipal finances in corresponding scenarios are tested. Key assumptions regarding capital account are investment phasing and project financing/funding structures.

364. *Capital Expenditure*. The estimated expenditure for implementing sub-projects is phased over a five-year period beginning 2006-07. Based on the above phasing the actual investment requirement over the five-year period is ascertained adopting a physical contingency of seven percent and a price contingency of six percent per annum. Following tables presents the base full project cost and implementation schedule.

Table 11.20: Summary of estimated investment requirement and phasing schedule

Sector	**Total Investment**	**Investment Phasing (%)**									
	Rs. Lakh	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Water Supply	748.92	10%	10%	20%	20%	20%	20%	0%	0%	0%	0%
Sewerage & Sanitation	2,577.82	0%	0%	15%	15%	20%	10%	10%	5%	5%	20%
Roads	1,154.91	0%	0%	0%	10%	10%	10%	10%	10%	15%	35%
Storm Water Drains	2,218.11	0%	0%	0%	10%	10%	10%	10%	10%	10%	40%
Solid Waste Mgmt	413.73	0%	0%	5%	10%	10%	10%	10%	10%	15%	30%
Street Lighting	343.83	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Others	90.00	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Traffic Management – Other agency investment	1,850.50	30%	30%	40%	-	-	-	-	-	-	-
Grand Total Investment	**9,397.82**										

Table 11.21: Summary of phased investment in full project investment scenario

Sector	**Total Investment**	**Investment Phasing – Rs. Lakh at Current Price**									
	Rs. Lakh	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Water Supply	748.92	75	75	150	150	150	150	-	-	-	-
Sewerage & Sanitation	2,577.82	-	-	387	387	516	258	258	129	129	516
Roads	1,154.91	-	-	-	115	115	115	115	115	173	404
Storm Water Drains	2,218.11	-	-	-	222	222	222	222	222	222	887
Solid Waste Mgmt	413.73	-	-	21	41	41	41	41	41	62	124
Street Lighting	343.83	34	34	34	34	34	34	34	34	34	34
Others	90.00	-	-	9	9	9	27	36	-	-	-
Traffic Management – Other agency investment	1,850.50	555.15	555.15	740.20							
Grand Total Investment	**9,397.82**										

365. *Capital Income*. Capital income is forecast based on actual requirement to meet proposed capital expenditure.

Table 11.22: Financing pattern for proposed projects

Sl	Sector	Government Grant	Financial Institution Loan	ULB Share	Other Department
		Percentage Share			
1	Water Supply	30.00	50.00	20.00	-
2	Sewerage & Sanitation	30.00	50.00	20.00	-
3	Roads and Traffic Management	30.00	60.00	10.00	-
4	Storm Water Drainage	30.00	60.00	10.00	-
5	Solid Waste Management	30.00	60.00	10.00	-
6	Street Lighting	30.00	60.00	10.00	-
7	Others	10.00	80.00	10.00	-
8	Traffic & Transportation	-	-	-	100

Table 11.23: One-time charges for water & sewerage connections

S.No	Description	Water Supply	Sewerage
1	Domestic	2,000	5,000
2	Non Domestic	5,000	8,000
3	Industrial	5,000	10,000

366. In summary, the following key assumptions were made while preparing the cash flows:

(i) Revenue Income.

a. *Property Tax*: projected based on ARV per property; number of assessments to grow at a nominal 3 percent per annum; ARV for all properties revised once in 5 years beginning 2006-07 at 30 percent; and collection performance assumed at 60 percent against arrears demand and 85 percent against current demand.

b. *Water Charges*: At a nominal 3 percent per annum (proportionate to property tax assessment growth rate) regular connections are envisaged in the base case scenario and increase in water connections is a result of the availability of additional water for distribution – it is assumed that 80 percent of the property tax connections would have water connections by FY 2013; the current rate of water charge is maintained till 2005-06, and from 2006-07 a 15 percent increase is assumed every 3 years; collection performance is assumed at 70 percent against arrears demand and 90 percent against current demand; and new (one-time) connection charges are collected as per the current rate till 2005-06, and from 2006-07 a 20 percent increase in every 3 years.

c. *Sewerage Charges*: No new connections envisaged in base case scenario and sewer connections are provided under the Project – it is assumed that 80 percent of the property tax connections would have water connections by FY 2013; monthly flat rate of Rs. 50, Rs, 100 & Rs. 200 per connection for domestic, non domestic and industrial connections respectively, it is assumed for sewerage charge starts from 2008-09, and from then on a 15 percent increase is assumed every 3 years; collection performance is assumed at 50 percent against arrears demand and 80 percent against current demand; and new (one-time) connection charges are adopted as per **Table 11.24**.

d. *Conservancy Fee*: In base case scenario and investment scenarios, it is assumed that 70 percent of the residential property tax assessments and 100 percent of non domestic property assessments would have to be brought under the conservancy fee coverage net. Monthly conservancy fee of Rs. 15 & Rs, 20 per property assessment s has been proposed for residential and non domestic properties respectively. It is assumed for conservancy fee starts from 2006-07, and from then on a 15 percent increase is assumed every 3 years; collection performance is assumed at 60 percent against arrears demand and 85 percent against current demand.

d. *All other revenue income items*. (Including municipal own sources, grants and assigned revenues): past trend is adopted, subject to minimum and maximum ceilings of 5 and 20 percent per annum, respectively.

(ii) Revenue Expenditure.

a. Past trend is adopted, subject to minimum and maximum ceilings of 5 and 20 percent per annum, respectively.
b. Additional O&M expenditure is estimated based on ascertained percentages of capital costs.
c. All outstanding non-debt liabilities are to be cleared off in the next 5 years.
d. All outstanding debt liabilities are to be cleared off in the next 15 years at an interest rate provided by the ULB, otherwise at an average interest rate of 9.50 percent.
e. New loans are to be serviced over a 20-year tenor (including a five-year principal plus interest moratorium) at interest rates indicated in **Table 11.19**

(iii) Capital Expenditure.

a. Capital expenditure is forecast based on the identified investments.
b. The base costs estimated are at 2005-06 prices, which are then indexed by 7 percent for physical contingencies, and 6 percent for price contingencies.

(iv) Capital Income.

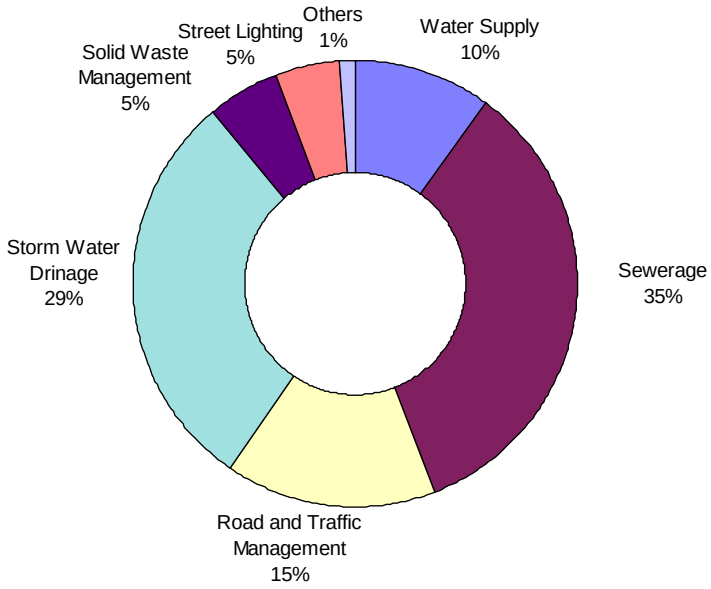
a. Capital Income is ascertained based on assumed project financing patterns as detailed in **Table 11.22.**

3. Project Cash Flows and FOP Results

367. The base case scenario is worked out considering only the revenue account transactions to assess the municipal capacity to generate revenue surpluses that could be leveraged to undertake capital investments. Detailed cash flows are worked out for each of the sub-projects based on the assumptions with regards investment phasing, financing pattern, additional O&M expenditure and additional income due to proposed capital investments, for the Full Project scenarios and Sustainable investment scenarios. The net project cash flows are then loaded onto the base case scenario to test their impact on the overall municipal fiscal situation.

368. *Base Case Scenario*. The base case scenario results indicate that under the past-trend based assumptions adopted, Sivakasi municipality would end up with a positive cumulative surplus of Rs. 7,443 lakh by the end of FY 2019-20 (refer **Table 11.24**). With reforms and additional resource mobilization initiatives like energy saving in street lighting and privatization of solid waste management activity and parking fee, levying of new charges like conservancy fee municipality can reach above said cumulative surplus. Base case with out reforms and with out additional resource mobilization initiatives municipality would end up with a positive closing balance of Rs. 7,162 lakh.

Figure 11.1: Sector wise distribution of full Investment



(i) *Full Project Sustenance Scenario*. **Table 11.25** presents a summary of total project cash flows due to the full project scenario. Detailed sub-project cash flows are presented in **Appendix III**. Sivakasi Municipality would accumulate a negative closing balance of Rs. 7,364 lakh by the end of 2019-20 due exclusively to the full project investment. The total net project cash flows due to full project when loaded onto the base case Scenario FOP indicate that Sivakasi Municipality would end up with a positive closing balance of Rs. 78 lakh by the FOP horizon year 2019-20, however, Debt servicing ratio and operating ratio is more than 30 percent and 1 respectively during forecast period. **Table 11.25** presents a summary of the municipal fiscal status in the Full Project scenario. The full project (municipal share) investment proposed for Sivakasi is to the tune of Rs. 7,547.32 lakh, out of which 35 of the total investment proposed for sewerage and 29 percent for storm water drain construction and improvement. However, the water supply project cost is estimated for Sivakasi is only 10 percent of the total project cost. This clearly indicates that the ULB need of a sewerage system and better storm water drainage facility in future.

Table 11.24: Financial Operating Plan Results - Sivakasi Municipality

Item Heads	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
	Rs. Lakh														
Base Case - Municipal Fund															
Opening Balance	338	662	910	1,179	1,461	1,763	2,072	2,515	2,990	3,476	3,968	4,488	5,188	5,911	6,672
Revenue Income*	821	992	1,069	1,142	1,231	1,314	1,523	1,652	1,769	1,896	2,057	2,388	2,582	2,810	3,036
Additional Revenue Mobilization**	2	16	16	17	17	18	19	19	20	21	22	22	23	24	25
Total Revenue Income	823	1,007	1,085	1,159	1,248	1,332	1,542	1,671	1,789	1,916	2,079	2,411	2,605	2,834	3,060
Revenue expenditure	498	760	815	877	946	1,023	1,100	1,196	1,304	1,424	1,559	1,711	1,881	2,073	2,289
Status	**324**	**248**	**270**	**282**	**302**	**309**	**443**	**475**	**486**	**492**	**520**	**700**	**723**	**761**	**771**
Closing Balance	***662***	***910***	***1,179***	***1,461***	***1,763***	***2,072***	***2,515***	***2,990***	***3,476***	***3,968***	***4,488***	***5,188***	***5,911***	***6,672***	***7,443***
Project Account - Full Project Scenario															
Total Net Project Cash Flow (after deducting ULB equity from cash flow)	0	0	29	270	519	453	236	311	(244)	(997)	(2,466)	(3,646)	(4,892)	(6,098)	(7,365)
Overall Closing Balance	662	910	1,208	1,731	2,282	2,525	2,751	3,301	3,232	2,971	2,022	1,542	1,019	574	78
Project Account - Sustainable Investment Scenario															
Total Net Project Cash Flows (after deducting ULB equity from project cash flow)	0	4	39	295	627	689	721	1,150	1,034	865	495	242	(31)	(220)	(416)
Overall Closing Balance	662	913	1,219	1,756	2,390	2,762	3,236	4,140	4,510	4,833	4,983	5,430	5,880	6,452	7,027

Item Heads	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Rs. Lakh														
Financial Viability Ratios															
Sustainable Investment Scenario															
Debt Equity Ratio- New Projects		3.96	1.44	1.00	1.02	1.55	1.10	0.43	1.73	1.83	-	-	-	-	-
Debt Service Coverage Ratio (DSCR) – Min.150%		438 %	566%	675%	756%	713%	697%	813%	820%	808%	672%	709%	750%	811%	870%
Operating Ratio (<1)		0.93	0.89	0.68	0.67	0.81	0.83	0.72	0.96	0.99	1.00	0.98	1.00	0.97	0.98
DSR (Max. 30%)		25%	24%	26%	27%	30%	30%	29%	29%	30%	30%	30%	29%	26%	25%
Full Project Investment Scenario															
Debt Equity Ratio- New Projects	4.34	1.68	1.06	1.43	2.04	2.09	1.18	4.09	4.41	-	-	-	-	-	4.34
Debt Service Coverage Ratio (DSCR) – Min. 150 %	434%	554 %	651%	652%	560%	464%	466%	397%	311%	149%	109%	70%	38%	5%	434%
Operating Ratio (<1)	0.93	0.89	0.69	0.68	0.82	0.86	0.75	1.01	1.06	1.10	1.09	1.10	1.07	1.08	0.93
DSR (Max. 30%)	25%	24%	26%	30%	35%	39%	40%	43%	47%	61%	55%	53%	49%	47%	25%

Source: Analysis.

Note: * including projected regular capital grant and with out project scenario regular connection deposit fee.

** excluding conservancy fee, since it is loaded on to the SWM sub project cash flow.

Table 11.25: Summary of Full Project Cash Flow.

	Description	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
		Rs. Lakh													
	Full Sub Project Cash Flow														
1	Water Supply *	(5)	22	96	194	297	317	370	360	350	368	377	386	424	462
2	Sewerage	-	-	301	679	851	977	1,406	1,321	1,190	965	672	356	80	(205)
3	Roads and Traffic Management	-	-	-	(11)	(38)	(96)	(185)	(308)	(488)	(792)	(1,133)	(1,489)	(1,861)	(2,255)
4	Storm Water Drainage	-	-	-	(21)	(70)	(150)	(263)	(410)	(604)	(937)	(1,318)	(1,714)	(2,127)	(2,558)
5	Solid Waste Management	30	63	97	137	169	192	215	228	224	202	154	101	57	8
6	Street Lighting	(3)	(12)	(30)	(55)	(90)	(135)	(193)	(263)	(348)	(448)	(560)	(677)	(800)	(930)
7	Slum Up gradations	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Others	-	-	(1)	(3)	(6)	(13)	(25)	(37)	(49)	(62)	(76)	(91)	(107)	(124)
	Total Sub Project Cash Flow	***22***	***73***	***463***	***920***	***1,112***	***1,092***	***1,326***	***890***	***276***	***(703)***	***(1,883)***	***(3,130)***	***(4,335)***	***(5,602)***
	Total Full Project Cash Flow														
	Opening Balance	-	*23*	80	479	978	1,256	1,402	1,903	1,829	1,705	1,523	1,270	996	808
A	**Sources of Fund**														
1	Debt Drawdown	19	21	145	167	215	115	72	42	45	187	-	-	-	-
2	Equity Drawdown	77	82	524	663	836	435	288	182	201	808	-	-	-	-
3	Govt. Grant	11	11	74	92	117	61	40	25	27	111	-	-	-	-
4	User Charges	30	41	92	181	238	284	406	432	450	544	565	581	683	707
5	New Connection Fees	-	36	381	485	323	281	596	63	65	79	65	66	82	83
	Total- Inflow	**137**	**191**	**1,216**	**1,587**	**1,728**	**1,175**	**1,403**	**743**	**788**	**1,729**	**630**	**648**	**764**	**790**
B	**Disposition of**														

	Description	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
		Rs. Lakh													
	Funds														
1	Project Capex	108	114	743	922	1,167	610	400	248	274	1,105	-	-	-	-
2	Operation & Maintenance	-	7	15	52	98	157	194	220	242	266	320	339	359	381
3	Debt Servicing-Principal Repayment	-	-	-	-	-	225	246	271	303	377	564	582	593	606
4	Interest During Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total- Outflow	**7**	**14**	**58**	**114**	**185**	**37**	**61**	**77**	**94**	**163**	**-**	**-**	**-**	**-**
	Net Cash Flow	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Closing Balance	***114***	***135***	***816***	***1,088***	***1,451***	***1,029***	***902***	***817***	***912***	***1,911***	***883***	***921***	***953***	***987***

Source: Analysis.

Note: *Ongoing schemes addition connection deposit and tariff revenue has been considered in sub project cash flow

Table 11.26: Summary of base cost sustainable investment and phasing schedule

Sector	**Total Investment**	**Investment Phasing (%)**									
	Rs. Lakh	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Municipal Infrastructure											
Water Supply	748.92	10%	10%	20%	20%	20%	20%	0%	0%	0%	0%
Sewerage & Sanitation	2,577.82	0%	0%	15%	15%	20%	10%	10%	5%	5%	20%
Roads	1,154.91	0%	0%	0%	10%	10%	10%	10%	10%	15%	35%
Storm Water Drains	2,218.11	0%	0%	0%	10%	10%	10%	10%	10%	10%	40%
Solid Waste Management	413.73	0%	0%	5%	10%	10%	10%	10%	10%	15%	30%
Street Lighting	343.83	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Others	90.00	30%	30%	40%	-	-	-	-	-	-	-
Total – ULB Investment	***7,547.32***										

Source: Analysis

Table 11.27: Summary of sustainable project investment -base cost

Sector	**Total Investment**	**Investment Phasing – Rs. Lakh at Current Price**									
	Rs. Lakh	*2006-07*	*2007-08*	*2008-09*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*	*2014-15*	*2015-16*
Municipal Infrastructure											
Water Supply	749	75	75	150	150	150	150	-	-	-	-
Sewerage & Sanitation	2,256	-	-	387	387	516	193	193	97	97	387
Roads	150	-	-	-	29	29	12	12	12	17	40
Storm Water Drains	377	-	-	-	55	55	33	33	33	33	133
Solid Waste Management	62	-	-	12	25	25	-	-	-	-	-
Street Lighting	86	17	17	17	17	17	-	-	-	-	-
Others	6	-	-	-	-	-	2	4	-	-	-
Total – ULB Investment	***3,686***	**92**	**92**	**566**	**663**	**792**	**391**	**242**	**141**	**147**	**560**

Source: Analysis

Table 11.28: Summary of sustainable investment project cash flow

	Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		Rs. Lakh													
	Sustainable Sub Project Cash Flow														
1	Water Supply	(5.2)	22.5	95.6	194.0	296.8	317.0	370.3	360.3	350.4	368.3	377.4	385.6	423.6	462.3
2	Sewerage	0.0	0.0	300.5	679.0	850.7	988.8	1,446.4	1,401.5	1,321.0	1,178.8	984.6	774.6	609.8	439.2
3	Roads and Traffic Management	0.0	0.0	0.0	(2.7)	(9.6)	(20.2)	(34.1)	(51.6)	(75.4)	(112.5)	(153.5)	(196.0)	(240.3)	(286.9)
4	Storm Water Drainage	0.0	0.0	0.0	(5.2)	(17.6)	(35.2)	(57.8)	(85.7)	(121.6)	(179.3)	(244.3)	(311.7)	(381.7)	(454.5)
5	Solid Waste Management	29.6	63.3	98.1	140.9	180.4	217.7	267.3	318.7	370.8	435.3	502.2	570.6	654.6	741.5
6	Street Lighting	(1.4)	(6.2)	(14.8)	(27.5)	(44.8)	(65.7)	(88.0)	(111.8)	(137.0)	(163.9)	(191.8)	(220.7)	(250.6)	(281.7)
7	Others	0.0	0.0	0.0	0.0	0.0	(0.4)	(1.3)	(2.2)	(3.1)	(4.1)	(5.1)	(6.4)	(7.7)	(9.0)
	Total Sustainable Sub Project Cash Flow	***23.1***	***79.5***	***479.4***	***978.4***	***1,255.9***	***1,402.0***	***1,902.7***	***1,829.3***	***1,705.0***	***1,522.5***	***1,269.5***	***996.0***	***807.6***	***610.9***
	Total Sustainable Project Cash Flow														
	Opening Balance		23	80	479	978	1256	1402	1903	1829	1705	1523	1270	996	808
A	**Sources of Fund**														
1	Debt Drawdown	77	82	524	663	836	435	288	182	201	808	-	-	-	-
2	Equity Drawdown	19	21	145	167	215	115	72	42	45	187	-	-	-	-
3	Govt. Grant	11	11	74	92	117	61	40	25	27	111	-	-	-	-
4	User Charges	30	41	92	181	238	284	406	432	450	544	565	581	683	707
5	New	-	36	381	485	323	281	596	63	65	79	65	66	82	83

	Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		Rs. Lakh													
	Connection Fees														
	Total-Inflow	**137**	**191**	**1,216**	**1,587**	**1,728**	**1,175**	**1,403**	**743**	**788**	**1,729**	**630**	**648**	**764**	**790**
B	**Disposition of Funds**														
1	Project Capex	108	114	743	922	1,167	610	400	248	274	1,105	-	-	-	-
2	Operation & Maintenance	-	7	15	52	98	157	194	220	242	266	320	339	359	381
3	Debt Servicing-Principal Repayment	-	-	-	-	-	225	246	271	303	377	564	582	593	606
4	Interest During Construction	7	14	58	114	185	37	61	77	94	163	-	-	-	-
	Total-Outflow	**114**	**135**	**816**	**1,088**	**1,451**	**1,029**	**902**	**817**	**912**	**1,911**	**883**	**921**	**953**	**987**
	Net Cash Flow	23	56	400	499	278	146	501	(73)	(124)	(183)	(253)	(274)	(188)	(197)
	Closing Balance	*23*	*80*	*479*	*978*	*1256*	*1402*	*1903*	*1829*	*1705*	*1523*	*1270*	*996*	*808*	*611*

Source: Analysis.

Note: *Ongoing schemes addition connection deposit and tariff revenue has been considered in sub project cash flow.

XII. URBAN GOVERNANCE

A. Urban Governance

369. This chapter outlines the various best practices world over regarding good urban governance. The strategies presented in this chapter, are an integrated whole and none of them can be seen are understood in an isolated section. Commitment of the municipality to civic, secure and transparent administration will realize the dream of any city/town where the citizens will be those who govern and the municipality as an institution is one who facilitates and provides the service.

1. Current Initiatives

370. The other initiatives that are being adopted by the municipality to enhance its performance and capacity building are computerization of its activities and involving private sector in the delivery of civic services.

371. *Computerization*. GoTN has initiated steps to computerize municipal administration in the state. The entire process consists of four modules: Revenue and Taxation, Record Maintenance, Personnel Management System, Financial Management System.

372. As a start up, data relating to property tax has been computerized and the assessments are now handled by using computers. The billing and collection system of the property taxes is also computerized in the town. However, the computerization efforts are slow owing to the absence of technical capabilities with the municipality.

373. *Private Sector Participation.* The municipality has initiated the involvement of private sector in service delivery through part privatization of the solid waste collection system. The initiative has received good response from the citizens of the town and further privatization of certain other components of services is in active consideration of the municipality.

2. Strategies

374. *Decentralization*. In conformity to the 74th CAA, the Government of Tamil Nadu has made necessary legislative changes to devolve functional domains of the 18 listed items in the 12th schedule of the constitution. However only seven functions are made obligatory functions of urban local bodies and important functions like urban planning including town planning, regulation of land use and construction of buildings, slum improvement, urban poverty alleviation remain discretionary functions with rather little say for ULB. Consequently, the funds and concerned staff continue to remain under the control of the State Government. Financial powers as envisaged in the 12th Schedule of the Constitution also need to be immediately devolved to urban local bodies.

375. The local bodies should have control over the land in their jurisdiction and other

infrastructure including roads in their area. They should have power to remove encroachment from public land, construct and maintain roads within their respective municipal areas.

376. The municipality shall divide the area into zones/ divisions for better service delivery and management control. Such a mechanism is already being implemented in water supply and public health sectors.

377. *Urban Environmental Management*. The costs of maintaining a healthy urban environment needs to be recovered through various municipal taxes and user charges following the "Polluter Pays" principle. For this, the functional role of the ULB as envisaged in Item 8, 12th Schedule of the Constitution have to be resolved keeping in view the role of Tamil Nadu Pollution Control Board and the organizational and fiscal strength of the ULB.

378. *Access of Urban Services to Poor*. Since "Ability-to-Pay" for the full cost of environmental infrastructure services' provision is the important criterion, cross-subsidization of tariffs, innovative project structuring and user/ community participation are the means towards ensuring access of these services to the poor. Again, the functional and financial role of ULB with respect to the items 10 and 11 of 12th Schedule against those of central and state government agencies need to be resolved.

379. *Streamlining and Strengthening of Revenue Base of Local Bodies*.

(i) The recommendations of the State Finance Commissions must be made mandatory and should be implemented as a matter of course. Law enforcement powers should be given to local bodies to compel payments of taxes and other charges levied by them.
(ii) Property Tax base should be de-linked from rental value method and should be linked to Unit Area or Capital value method.
(iii) Fiscal powers of municipal bodies to fix tax rates, fee structure and user charges should be strengthened through specific guidelines and notifications. Prepare model guidelines for the town to allow greater flexibility in levying taxes, fees and user charges, borrowing funds and incurring expenditures.
(iv) The annual report of the municipality shall devote a section highlighting the amounts of subsidy given to a particular service, how was the subsidy funded and who were its beneficiaries.
(v) Adopting Zero-based budgeting shall be carried out supported by the already computerised accounting system for continual monitoring of budgets and cash flow management.
(vi) Implementation of MIS to provide relevant information on accounts, commercial and operating systems for better decision making and information dissemination to citizens.
(vii) Auditing of Accounts should be carried out effectively and regularly to promote transparency and accountability.
(viii) Application of e-governance is equally important for municipal finance. Adequate software in the financial management is required at different levels.

380. *Transparency and Civic Engagement in Municipal Management*.

(i) Laws/ rules/ regulations specific to town/ local issues should be tried to facilitate effective implementation. These should be lucid and easily understood.
(ii) Participatory mechanisms should be so structured that they have legal entity and administrative power. Local bodies should be responsive and innovative and involve community participation in civic engagement.
(iii) Specific code of conduct for municipal executives and elected representatives.
(iv) Public education, resource mobilisation, good leadership and transparent processes apply in municipal finance and development work.
(v) Closer networking with media and their engagement in creating public awareness and creating demand for good governance. Cautious engagement of private sector with continuous monitoring is necessary.
(vi) Setting in place an active and online public Grievances' Redressal System, with automated department wise complaint loading and monitoring system.
(vii) Instruments to improve the efficiency of local bodies through enhanced technical, administrative, and financial capacities.
(viii) Credit Enhancement options other than state guarantees need to be adopted.
(ix) Preparation of annual Environmental Status Reports through a multi-stakeholder consultation process.

381. *Capacity Building of Local Bodies*.

(i) The municipality shall maintain data to generate indicators as suggested in this document for evaluating their performance.
(ii) Prepare and conduct capacity building programs for elected representatives, especially women representatives with a view to enable them to focus on gender based issues.
(iii) Promote the creation of interactive platforms for sharing municipal innovations, experiences among municipal managers.
(iv) Better Human Resource Management through assessment of the training needs of personnel involved in urban administration to enhance the management and organizational capabilities.
(v) Assessment of fund requirement and resource persons to tackle the training needs of all the personnel.
(vi) Development of Training Material in the local language and Impact and Evaluation Studies of the Training Programs.
(vii) Capacity building to position the ULB in a better place to employ highly qualified staff and seek superior quality of out-sourced services.

Appendix

Appendix I: Ward Level Densities.

Ward No.	Area	Total Population	Density	Households	Literate
	sq.km				
1	0.78	4,823	6,183	1,210	3,911
2	0.03	2,447	81,567	380	1,669
3	0.91	2,269	2,493	754	1,731
4	0.02	2,267	113,350	600	1,592
5	0.18	2,035	11,306	694	1,402
6	0.25	3,324	13,296	990	2,395
7	0.25	1,726	6,904	685	1,392
8	0.50	1,581	3,162	710	1,391
9	0.20	2,713	13,565	980	2,319
10	0.15	2,107	14,047	964	1,733
11	0.13	2,633	20,254	780	1,907
12	0.20	2,023	10,115	840	1,655
13	0.10	1,491	14,910	470	1,302
14	0.10	1,719	17,190	382	1,173
15	0.10	1,433	14,330	585	1,219
16	0.10	1,834	18,340	321	1,273
17	0.10	1,901	19,010	447	1,345
18	0.09	1,643	18,256	678	1,334
19	0.11	1,901	17,282	460	1,423
20	0.10	1,707	17,070	381	1,324
21	0.20	2,984	14,920	610	2,277
22	0.23	2,146	9,330	1,220	1,735
23	0.10	1,453	14,530	694	1,230
24	0.13	1,516	11,662	728	1,239
25	0.10	1,425	14,250	671	1,200
26	0.70	3,057	4,367	985	2,356
27	0.18	2,099	11,661	620	1,748
28	0.08	1,761	22,013	470	1,492
29	0.05	1,366	27,320	501	1,134
30	0.10	1,308	13,080	595	1,161
31	0.15	1,738	11,587	810	1,482
32	0.25	4,031	16,124	1,470	2,552
33	0.22	3,709	16,859	1,394	2,458
Total	6.89	72,170	10,475	24,079	55,554

Appendix II: *Minutes of Meeting on Consultancy Service for Conversion of City Corporate Plan into Business Plan for Sivakasi Municipality held at Council Hall, Sivakasi Municipality on July 27, 2006.*

The Chairman and the Commissioner presided over the meeting in the presence of Councilors, senior Citizens, NGOs and Associations of taxpayers and other line agencies. The details on the discussion held and decision taken are listed below.

1. Water supply improvements within the town should be taken up as per the DPR at the earliest.

2. Councilor recommended installation of windmill, for the additional revenue to the municipality.

3. The town has a perennial problem with the roads as the truckloads are very high and there by result in damage of roads in the town. Hence, in order to avoid this problem the improvements of roads were suggested.

Prioritizations for Municipality

1. Solid Waste Management
2. Improvement of Water supply
3. Construction of new Under Ground Drainage
4. Improvement of Roads

Some of the individual stakeholders suggestions are given below

Commissioner, Chairman and TNUIFSL representative briefing the project to the Stake holders

NGOs and Councilors are expressing their views on Projects

NGOs and Councilors are expressing their views on Projects

TNUIFSL representative clarifying the uncertainties in the Project

Appendix III: Municipal Finance					
17- Sivakasi Municipality - Abstract of Accounts		***1- Income and Expenditure Statement***			
Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**
		Rs. Lakh			
Opening Balance					
	REVENUE ACCOUNT				
I	**Revenue Income**				
A	**Tax- Own Sources**				
1	Property Tax (General Purpose) - 40% of Total PT	96.73	119.47	113.88	114.87
2	Property Tax (Education Purpose) - 17% of Total PT	40.30	49.78	47.45	47.86
3	Profession Tax	1.11	1.52	2.75	7.66
4	Other Taxes & Charges	0.08	0.04	0.04	-
	Tax- Own Sources	*138.23*	*170.81*	*164.11*	*170.40*
B	**Assigned Revenues**				
1	Entertainment Tax	20.01	20.00	37.43	12.70
2	Surcharge on Stamp Duty	29.57	8.56	64.26	23.08
3	Other Transfers	6.04	-	-	0.67
	Assigned Revenues	*55.61*	*28.56*	*101.69*	*36.45*
C	**Non Tax- Own Sources**				
1	Income from Municipal Properties and Markets	4.57	6.64	30.72	2.15
2	License Income (Trade, etc.)	9.65	5.99	17.73	33.51
3	Income from Special Services	2.11	-	-	-
4	Income from Sale Proceeds	0.02	0.03	0.03	-
5	Income from Fees and Fines	28.01	20.99	27.96	2.25
6	Income from Interest on Deposits	6.84	1.12	0.86	1.11
7	Income from Investments(Excl. Interest)	-	-	-	-
8	Miscellaneous Income	58.49	69.82	56.90	41.46
	Non Tax- Own Sources	*109.69*	*104.58*	*134.20*	*80.48*
D	**Revenue Grants**				
1	State Finance Commission Grant	6.40	-	67.22	99.36
2	Other Grants	27.07	49.92	0.22	0.50
	Revenue Grants	*33.47*	*49.92*	*67.44*	*99.86*
	Total- Revenue Income (Excl. W&D Fund)	**336.99**	**353.87**	**467.44**	**387.19**
E	**Water and Drainage Fund**				
1	Water & Drainage Tax - 43% of Total PT	104.79	129.42	123.37	124.45
2	Water Charges	41.24	54.57	55.53	51.40
3	Drainage Charges	-	-	14.56	-
4	Income from Interest on Deposits	0.07	0.05	0.15	0.50
5	Water Supply & Sanitation Grant	65.83	13.00	-	-
6	Other Income	-	-	-	-
	Total- W&D Fund Revenue Income	**211.94**	**197.04**	**193.60**	**176.35**
	Total- Revenue Income	**548.93**	**550.91**	**661.04**	**563.54**

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			***1- Income and Expenditure Statement***			
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**
			Rs. Lakh			
	II	**Revenue Expenditure**				
	A	**General Administration**				
	1	Staff Salary and Employee Related Expenses	311.50	158.00	168.08	151.73
	2	Allowances to Elected Representatives	1.24	0.92	1.22	1.12
	3	General Expenses	3.81	6.59	15.65	5.79
	4	Pensions and Gratuities	22.30	27.23	21.94	38.83
	5	Education - Staff Salary	-	-	-	-
	6	Miscellaneous	2.76	5.75	5.12	5.16
		Establishment	*341.62*	*198.48*	*212.01*	*202.63*
	B	**Operation & Maintenance**				
	1	General Expenses	7.03	9.80	11.15	8.82
	2	Public Works and Roads	1.24	1.57	5.76	3.07
	3	Public Health and Conservancy	2.86	2.85	17.39	13.48
	4	Contractor Payment- Conservancy	-	-	-	-
	5	Street Lighting (including Electricity Charges)	18.34	19.35	32.60	30.21
	6	Education	-	-	-	-
	7	Vehicle and Equipment Maintenance	6.93	9.31	13.58	20.45
	8	Miscellaneous	1.49	3.47	8.54	0.23
		Operation & Maintenance	*37.88*	*46.35*	*89.03*	*76.25*
	C	**Debt Servicing**				
	1	Public Works and Roads	-	-	-	-
	2	Public Health and Conservancy	-	-	-	-
	3	Others	65.44	13.58	63.73	88.13
		Debt Servicing	*65.44*	*13.58*	*63.73*	*88.13*
		Total- Revenue Expenditure (Excl. W&D Fund)	**444.94**	**258.42**	**364.77**	**367.01**
	D	**Water and Sanitation Fund**				
	1	Staff Salary & Employee Related Expenses	38.12	37.92	35.40	39.60
	2	Administration Expenses	0.73	1.04	0.52	0.65
	3	Equipment Maintenance & Repairs	8.37	10.76	17.94	21.05
	4	Board Payment	-	1.71	-	-
	5	Electricity Charges	21.81	17.64	30.26	27.71
	6	Vehicle Maintenance & Repairs	10.47	12.35	15.61	12.37
	7	Miscellaneous	2.76	20.15	33.38	28.99
	8	Debt Servicing- Old	20.82	48.30	19.65	11.76
		Total- W&D Fund Revenue Expenditure	**103.07**	**149.87**	**152.78**	**142.13**
		Total- Revenue Expenditure	**548.00**	**408.29**	**517.54**	**509.14**
		Operating Surplus (W&D Revenue Fund)	108.87	47.17	40.82	34.23
		Operating Surplus (Revenue Account)	0.92	142.62	143.49	54.40
		Closing Balance-(Revenue Account)	0.92	143.54	287.03	341.44
		Transfer to Capital Account	**-**	**-**	**16.58**	**16.58**

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			***1- Income and Expenditure Statement***			
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**
			Rs. Lakh			
		CAPITAL ACCOUNT				
	III	**Capital Income**				
	A	**Capital Loans**				
	1	Public Works and Roads	36.90	227.42	107.55	63.57
	2	Street Lighting	-	-	-	-
	3	Public Health & Conservancy	-	-	-	-
	4	Education	-	-	-	-
	5	Others	-	-	-	104.15
		Capital Loans	*36.90*	*227.42*	*107.55*	*167.72*
	B	**Capital Grants and Contribution**				
	1	Public Works and Roads	-	-	-	-
	2	Education	-	-	-	-
	3	Others	-	94.87	143.62	75.58
	4	Tenth/Eleventh Finance Commission Grants	-	-	-	-
		Capital Grants and Contribution	-	*94.87*	*143.62*	*75.58*
	C	**Own Sources**				
	1	Transfer from Revenue Account	-	-	16.58	16.58
	2	Sale of Municipal Property	-	-	-	-
		Own Sources- Capital	-	-	*16.58*	*16.58*
		Total- Capital Income	**36.90**	**322.29**	**267.75**	**259.88**
		Water and Drainage Fund				
	D	**Capital Loans**				
	1	Water Supply	-	-	-	-
	2	Sewerage & Sanitation	-	-	-	-
		Capital Loans W&D Fund	-	-	-	-
	E	**Capital Grants and Contribution**				
	1	Water Supply	-	-	45.06	23.00
	2	Sewerage & Sanitation	-	-	-	-
		W&D -Capital Grants and Contribution	-	-	*45.06*	*23.00*
	F	**Own Sources**				
	1	Water Connection Charge	26.39	11.91	1.65	1.31
	2	Sewerage Connection Charge	-	-	-	-
		W&D Own Sources- Capital	*26.39*	*11.91*	*1.65*	*1.31*
		Total W&D Fund- Capital Income	**26.39**	**11.91**	**46.71**	**24.31**
		Total- Capital Income	**63.29**	**334.20**	**314.46**	**284.19**

Appendix III: Municipal Finance					
17- Sivakasi Municipality - Abstract of Accounts		***1- Income and Expenditure Statement***			
Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**
		Rs. Lakh			
IV	**Capital Expenditure**				
1	General	17.29	13.19	14.75	-
2	Remunerative Schemes	-	-	-	-
3	Public Works and Roads	84.02	79.78	361.76	326.87
4	Street Lighting	4.91	0.00	-	-
5	Public Health & Conservancy	-	0.01	1.54	-
6	Education	-	-	7.17	-
7	Others	4.27	4.70	-	-
	Total - Capital Expenditure Excl W&D Fund	**110.49**	**97.68**	**385.22**	**326.87**
	Water and Drainage Fund				
8	Water Supply	-	2.36	80.06	-
9	Sewerage & Sanitation	10.39	8.13	141.76	5.31
	Total W&D Fund- Capital Expenditure	**10.39**	**10.49**	**221.82**	**5.31**
	Total - Capital Expenditure	**120.88**	**108.17**	**607.04**	**332.18**
	Operating Surplus (W&D Capital Account)	16.00	1.43	(175.11)	19.01
	Operating Surplus (Capital Account)	(57.59)	226.03	(292.58)	(47.99)
	Operating Surplus (Over all)	(56.67)	368.65	(149.09)	6.41
	Operating Surplus (Over all) - incl O/B	(56.67)	311.98	162.89	169.30
	EXTRAORDINARY ACCOUNT				
V	**EA Income**				
1	Cash at Bank/ in Hand	-	-	34.65	41.89
2	Cess Income	2.98	5.30	5.91	-
3	Cash Deposit	27.11	0.14	7.35	13.93
4	Staff Advance	0.01	-	12.05	1.13
5	Security Deposit	1.37	11.54	28.14	29.66
6	Miscellaneous	-	-	-	-
	Total- EA Income	**31.47**	**16.98**	**88.10**	**86.61**
VI	**EA Expenditure**				
1	Cess Transfers	-	-	22.51	-
2	Other- Deposits	-	-	5.36	-
3	PF and Pension	0.00	-	7.00	67.23
4	Miscellaneous	9.83	1.30	68.24	8.63
	Total- EA Expenditure	**9.83**	**1.30**	**103.11**	**75.86**
	Operating Surplus (Extraordinary Account)	**21.64**	**15.68**	**(15.00)**	**10.75**
	Closing Balance (excl O/B)	**(35.03)**	**384.34**	**(164.09)**	**17.16**

Appendix III: Municipal Finance							
17- Sivakasi Municipality - Abstract of Accounts			***2- Income and Expenditure -Sectoral Contribution***				
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
			Percentage to Total				
	Opening Balance						
		REVENUE ACCOUNT					
	I	**Revenue Income**					
	A	**Tax- Own Sources**					
1		Property Tax (General Purpose) - 40% of Total PT	28.70	33.76	24.36	29.67	**29.12**
2		Property Tax (Education Purpose) - 17% of Total PT	11.96	14.07	10.15	12.36	**12.13**
3		Profession Tax	0.33	0.43	0.59	1.98	**0.83**
4		Other Taxes & Charges	0.02	0.01	0.01	-	**0.01**
		Tax- Own Sources	*41.02*	*48.27*	*35.11*	*44.01*	**42.10**
	B	**Assigned Revenues**					
1		Entertainment Tax	5.94	5.65	8.01	3.28	**5.72**
2		Surcharge on Stamp Duty	8.77	2.42	13.75	5.96	**7.72**
3		Other Transfers	1.79	-	-	0.17	**0.49**
		Assigned Revenues	*16.50*	*8.07*	*21.75*	*9.41*	**13.93**
	C	**Non Tax- Own Sources**					
1		Income from Municipal Properties and Markets	1.36	1.88	6.57	0.55	**2.59**
2		License Income (Trade, etc.)	2.86	1.69	3.79	8.65	**4.25**
3		Income from Special Services	0.63	-	-	-	**0.16**
4		Income from Sale Proceeds	0.01	0.01	0.01	-	**0.00**
5		Income from Fees and Fines	8.31	5.93	5.98	0.58	**5.20**
6		Income from Interest on Deposits	2.03	0.32	0.18	0.29	**0.70**
7		Income from Investments(Excl. Interest)	-	-	-	-	**--**
8		Miscellaneous Income	17.36	19.73	12.17	10.71	**14.99**
		Non Tax- Own Sources	*32.55*	*29.55*	*28.71*	*20.79*	**27.90**
	D	**Revenue Grants**					
1		State Finance Commission Grant	1.90	-	14.38	25.66	**10.49**
2		Other Grants	8.03	14.11	0.05	0.13	**5.58**
		Revenue Grants	*9.93*	*14.11*	*14.43*	*25.79*	**16.06**
		Total- Revenue Income (Excl. W&D Fund)	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	E	**Water and Drainage Fund**					
1		Water & Drainage Tax - 43% of Total PT	49.45	65.68	63.72	70.57	**62.35**
2		Water Charges	19.46	27.70	28.68	29.15	**26.25**
3		Drainage Charges	-	-	7.52	-	**1.88**
4		Income from Interest on Deposits	0.04	0.02	0.08	0.29	**0.11**
5		Water Supply & Sanitation Grant	31.06	6.60	-	-	**9.41**
6		Other Income	-	-	-	-	**--**
		Total- W&D Fund Revenue Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		Total- Revenue Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Appendix III: Municipal Finance							
17- Sivakasi Municipality - Abstract of Accounts			***2- Income and Expenditure -Sectoral Contribution***				
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
			Percentage to Total				
	II	**Revenue Expenditure**					
	A	**General Administration**					
	1	Staff Salary and Employee Related Expenses	70.01	61.14	46.08	41.34	**54.64**
	2	Allowances to Elected Representatives	0.28	0.36	0.34	0.31	**0.32**
	3	General Expenses	0.86	2.55	4.29	1.58	**2.32**
	4	Pensions and Gratuities	5.01	10.54	6.02	10.58	**8.04**
	5	Education - Staff Salary	-	-	-	-	**--**
	6	Miscellaneous	0.62	2.23	1.40	1.41	**1.41**
		Establishment	*76.78*	*76.81*	*58.12*	*55.21*	**66.73**
	B	**Operation & Maintenance**					
	1	General Expenses	1.58	3.79	3.06	2.40	**2.71**
	2	Public Works and Roads	0.28	0.61	1.58	0.84	**0.83**
	3	Public Health and Conservancy	0.64	1.10	4.77	3.67	**2.55**
	4	Contractor Payment- Conservancy	-	-	-	-	**--**
	5	Street Lighting (including Electricity Charges)	4.12	7.49	8.94	8.23	**7.20**
	6	Education	-	-	-	-	**--**
	7	Vehicle and Equipment Maintenance	1.56	3.60	3.72	5.57	**3.61**
	8	Miscellaneous	0.34	1.34	2.34	0.06	**1.02**
		Operation & Maintenance	*8.51*	*17.94*	*24.41*	*20.78*	**17.91**
	C	**Debt Servicing**					
	1	Public Works and Roads	-	-	-	-	**--**
	2	Public Health and Conservancy	-	-	-	-	**--**
	3	Others	14.71	5.26	17.47	24.01	**15.36**
		Debt Servicing	*14.71*	*5.26*	*17.47*	*24.01*	**15.36**
		Total- Revenue Expenditure (Excl. W&D Fund)	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	D	**Water and Sanitation Fund**					
	1	Staff Salary & Employee Related Expenses	36.98	25.30	23.17	27.86	**28.33**
	2	Administration Expenses	0.70	0.69	0.34	0.46	**0.55**
	3	Equipment Maintenance & Repairs	8.12	7.18	11.75	14.81	**10.46**
	4	Board Payment	-	1.14	-	-	**0.29**
	5	Electricity Charges	21.16	11.77	19.81	19.50	**18.06**
	6	Vehicle Maintenance & Repairs	10.16	8.24	10.22	8.70	**9.33**
	7	Miscellaneous	2.68	13.44	21.85	20.40	**14.59**
	8	Debt Servicing- Old	20.20	32.23	12.86	8.27	**18.39**
		Total- W&D Fund Revenue Expenditure	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		Total- Revenue Expenditure	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		Operating Surplus (W&D Revenue Fund)					
		Operating Surplus (Revenue Account)					
		Closing Balance-(Revenue Account)					
		Transfer to Capital Account					

Appendix III: Municipal Finance							
17- Sivakasi Municipality - Abstract of Accounts			***2- Income and Expenditure -Sectoral Contribution***				
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
			Percentage to Total				
		CAPITAL ACCOUNT					
	III	**Capital Income**					
	A	**Capital Loans**					
1		Public Works and Roads	100.00	70.56	40.17	24.46	**58.80**
2		Street Lighting	-	-	-	-	**--**
3		Public Health & Conservancy	-	-	-	-	**--**
4		Education	-	-	-	-	**--**
5		Others	-	-	-	40.08	**10.02**
		Capital Loans	*100.00*	*70.56*	*40.17*	*64.54*	**68.82**
	B	**Capital Grants and Contribution**					
1		Public Works and Roads	-	-	-	-	**--**
2		Education	-	-	-	-	**--**
3		Others	-	29.44	53.64	29.08	**28.04**
4		Tenth/Eleventh Finance Commission Grants	-	-	-	-	**--**
		Capital Grants and Contribution	-	*29.44*	*53.64*	*29.08*	**28.04**
	C	**Own Sources**					
1		Transfer from Revenue Account	-	-	6.19	6.38	**3.14**
2		Sale of Municipal Property	-	-	-	-	**--**
		Own Sources- Capital	-	-	*6.19*	*6.38*	**3.14**
		Total- Capital Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		Water and Drainage Fund					
	D	**Capital Loans**					
1		Water Supply	-	-	-	-	**--**
2		Sewerage & Sanitation	-	-	-	-	**--**
		Capital Loans W&D Fund	-	-	-	-	**--**
	E	**Capital Grants and Contribution**					
1		Water Supply	-	-	96.47	94.60	**47.77**
2		Sewerage & Sanitation	-	-	-	-	**--**
		W&D -Capital Grants and Contribution	-	-	*96.47*	*94.60*	**47.77**
	F	**Own Sources**					
1		Water Connection Charge	100.00	100.00	3.53	5.40	**52.23**
2		Sewerage Connection Charge	-	-	-	-	**--**
		W&D Own Sources- Capital	100.00	100.00	3.53	5.40	**52.23**
		Total W&D Fund- Capital Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		Total- Capital Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts		***2- Income and Expenditure -Sectoral Contribution***				
	Head of Account	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
		Percentage to Total				
IV	**Capital Expenditure**					
1	General	15.64	13.50	3.83	-	**8.24**
2	Remunerative Schemes	-	-	-	-	**--**
3	Public Works and Roads	76.04	81.67	93.91	100.00	**87.91**
4	Street Lighting	4.44	0.00	-	-	**1.11**
5	Public Health & Conservancy	-	0.01	0.40	-	**0.10**
6	Education	-	-	1.86	-	**0.47**
7	Others	3.87	4.81	-	-	**2.17**
	Total - Capital Expenditure Excl W&D Fund	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
	Water and Drainage Fund					
8	Water Supply	-	22.49	36.09	-	**14.65**
9	Sewerage & Sanitation	100.00	77.51	63.91	100.00	**85.35**
	Total W&D Fund- Capital Expenditure	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*
	Total - Capital Expenditure	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Operating Surplus (W&D Capital Account)					
	Operating Surplus (Capital Account)					
	Operating Surplus (Over all)					
	Operating Surplus (Over all) - incl O/B					
	EXTRAORDINARY ACCOUNT					
V	**EA Income**					
1	Cash at Bank/ in Hand	-	-	39.33	48.37	**21.93**
2	Cess Income	9.47	31.23	6.71	-	**11.85**
3	Cash Deposit	86.14	0.82	8.34	16.08	**27.85**
4	Staff Advance	0.04	-	13.68	1.30	**3.76**
5	Security Deposit	4.35	67.96	31.94	34.24	**34.62**
6	Miscellaneous					
	Total- EA Income	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
VI	**EA Expenditure**					
1	Cess Transfers	-	-	21.83	-	**5.46**
2	Other- Deposits	-	-	5.20	-	**1.30**
3	PF and Pension	0.03	-	6.79	88.62	**23.86**
4	Miscellaneous	99.97	100.00	66.18	11.38	**69.38**
	Total- EA Expenditure	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
	Operating Surplus (Extraordinary Account)					
	Closing Balance (excl O/B)					

Appendix III: Municipal Finance							
17- Sivakasi Municipality - Abstract of Accounts			***3- Income and Expenditure -Growth Trends***				
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
			Percentage increase over previous year				
	Opening Balance						
		REVENUE ACCOUNT					
	I	**Revenue Income**					
	A	**Tax- Own Sources**					
	1	Property Tax (General Purpose) - 40% of Total PT	--	23.50	(4.68)	0.87	**6.57**
	2	Property Tax (Education Purpose) - 17% of Total PT	--	23.50	(4.68)	0.87	**6.57**
	3	Profession Tax	--	36.94	80.92	178.56	**98.81**
	4	Other Taxes & Charges	--	(50.00)	(11.18)	--	**(30.59)**
		Tax- Own Sources	--	*23.57*	*(3.92)*	*3.83*	**7.83**
	B	**Assigned Revenues**					
	1	Entertainment Tax	--	(0.02)	87.13	(66.05)	**7.02**
	2	Surcharge on Stamp Duty	--	(71.06)	651.05	(64.09)	**171.97**
	3	Other Transfers	--	--	--	--	**--**
		Assigned Revenues	--	*(48.64)*	*256.09*	*(64.15)*	**47.77**
	C	**Non Tax- Own Sources**					
	1	Income from Municipal Properties and Markets	--	45.42	362.54	(93.01)	**104.98**
	2	License Income (Trade, etc.)	--	(37.90)	195.87	88.99	**82.32**
	3	Income from Special Services	--	--	--	--	**--**
	4	Income from Sale Proceeds	--	28.25	1.75	--	**15.00**
	5	Income from Fees and Fines	--	(25.08)	33.24	(91.94)	**(27.92)**
	6	Income from Interest on Deposits	--	(83.69)	(23.17)	29.64	**(25.74)**
	7	Income from Investments(Excl. Interest)	--	--	--	--	**--**
	8	Miscellaneous Income	--	19.36	(18.51)	(27.14)	**(8.76)**
		Non Tax- Own Sources	--	*(4.66)*	*28.32*	*(40.03)*	**(5.46)**
	D	**Revenue Grants**					
	1	State Finance Commission Grant	--	--	--	47.81	**47.81**
	2	Other Grants	--	84.45	(99.56)	128.31	**37.73**
		Revenue Grants	--	*49.17*	*35.09*	*48.07*	**44.11**
		Total- Revenue Income (Excl. W&D Fund)	**--**	**5.01**	**32.09**	**(17.17)**	**6.64**
	E	**Water and Drainage Fund**					
	1	Water & Drainage Tax - 43% of Total PT	--	23.50	(4.68)	0.87	**6.57**
	2	Water Charges	--	32.34	1.75	(7.43)	**8.89**
	3	Drainage Charges	--	--	--	--	**--**
	4	Income from Interest on Deposits	--	(39.03)	225.61	239.95	**142.17**
	5	Water Supply & Sanitation Grant	--	(80.25)	--	--	**(80.25)**
	6	Other Income	--	--	--	--	**--**
		Total- W&D Fund Revenue Income	**--**	**(7.03)**	**(1.75)**	**(8.91)**	**(5.89)**
							-
		Total- Revenue Income	**--**	**0.36**	**19.99**	**(14.75)**	**1.87**

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts		*3- Income and Expenditure -Growth Trends*				
Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
		Percentage increase over previous year				
II	**Revenue Expenditure**					
A	**General Administration**					
1	Staff Salary and Employee Related Expenses	--	(49.28)	6.38	(9.73)	**(17.54)**
2	Allowances to Elected Representatives	--	(26.21)	33.33	(8.33)	**(0.40)**
3	General Expenses	--	73.12	137.46	(62.98)	**49.20**
4	Pensions and Gratuities	--	22.09	(19.42)	76.97	**26.55**
5	Education - Staff Salary	--	--	--	--	**--**
6	Miscellaneous	--	108.34	(10.94)	0.72	**32.71**
	Establishment	--	*(41.90)*	*6.82*	*(4.43)*	**(13.17)**
B	**Operation & Maintenance**					
1	General Expenses	--	39.41	13.85	(20.92)	**10.78**
2	Public Works and Roads	--	26.84	267.80	(46.76)	**82.63**
3	Public Health and Conservancy	--	(0.00)	508.95	(22.47)	**162.16**
4	Contractor Payment- Conservancy	--	--	--	--	**--**
5	Street Lighting (including Electricity Charges)	--	5.53	68.44	(7.33)	**22.21**
6	Education	--	--	--	--	**--**
7	Vehicle and Equipment Maintenance	--	34.37	45.80	50.56	**43.58**
8	Miscellaneous	--	132.53	146.43	(97.35)	**60.54**
	Operation & Maintenance	--	*22.37*	*92.06*	*(14.35)*	**33.36**
C	**Debt Servicing**					
1	Public Works and Roads	--	--	--	--	**--**
2	Public Health and Conservancy	--	--	--	--	**--**
3	Others	--	(79.25)	369.23	38.30	**109.43**
	Debt Servicing	--	(79.25)	369.23	38.30	**109.43**
	Total- Revenue Expenditure (Excl. W&D Fund)	**--**	**(41.92)**	**41.15**	**0.62**	**(0.05)**
D	**Water and Sanitation Fund**					
1	Staff Salary & Employee Related Expenses	--	(0.51)	(6.65)	11.86	**1.56**
2	Administration Expenses	--	43.30	(49.75)	24.78	**6.11**
3	Equipment Maintenance & Repairs	--	28.65	66.73	17.31	**37.56**
4	Board Payment	--	--	--	--	**--**
5	Electricity Charges	--	(19.12)	71.57	(8.44)	**14.67**
6	Vehicle Maintenance & Repairs	--	17.95	26.45	(20.81)	**7.86**
7	Miscellaneous	--	629.55	65.70	(13.15)	**227.37**
8	Debt Servicing- Old	--	131.99	(59.32)	(40.15)	**10.84**
	Total- W&D Fund Revenue Expenditure	**--**	**45.41**	**1.94**	**(6.97)**	**13.46**
	Total- Revenue Expenditure	**--**	**(25.50)**	**26.76**	**(1.62)**	**(0.12)**
	Operating Surplus (W&D Revenue Fund)					
	Operating Surplus (Revenue Account)					
	Closing Balance-(Revenue Account)					
	Transfer to Capital Account					

Appendix III: Municipal Finance							
17- Sivakasi Municipality - Abstract of Accounts			***3- Income and Expenditure -Growth Trends***				
	Head of Account		**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
			Percentage increase over previous year				
		CAPITAL ACCOUNT					
	III	**Capital Income**					
	A	**Capital Loans**					
1		Public Works and Roads	--	516.31	(52.71)	(40.89)	**140.90**
2		Street Lighting	--	--	--	--	**--**
3		Public Health & Conservancy	--	--	--	--	**--**
4		Education	--	--	--	--	**--**
5		Others	--	--	--	--	**--**
		Capital Loans	--	516.31	(52.71)	55.95	**173.18**
	B	**Capital Grants and Contribution**					
1		Public Works and Roads	--	--	--	--	**--**
2		Education	--	--	--	--	**--**
3		Others	--	--	51.39	(47.38)	**2.01**
4		Tenth/Eleventh Finance Commission Grants	--	--	--	--	**--**
		Capital Grants and Contribution	--	--	*51.39*	*(47.38)*	**2.01**
	C	**Own Sources**					
1		Transfer from Revenue Account	--	--	--	-	**-**
2		Sale of Municipal Property	--	--	--	--	**--**
		Own Sources- Capital	--	--	--	-	**-**
		Total- Capital Income	**--**	**773.41**	**(16.92)**	**(2.94)**	**251.18**
		Water and Drainage Fund					
	D	**Capital Loans**					
1		Water Supply	--	--	--	--	**--**
2		Sewerage & Sanitation	--	--	--	--	**--**
		Capital Loans W&D Fund	--	--	--	--	**--**
	E	**Capital Grants and Contribution**					
1		Water Supply	--	--	--	(48.96)	**(48.96)**
2		Sewerage & Sanitation	--	--	--	--	**--**
		W&D -Capital Grants and Contribution	--	--	--	*(48.96)*	***(48.96)***
	F	**Own Sources**					
1		Water Connection Charge	--	(54.85)	(86.16)	(20.41)	**(53.81)**
2		Sewerage Connection Charge	--	--	--	--	**--**
		W&D Own Sources- Capital	--	(54.85)	(86.16)	(20.41)	**(53.81)**
		Total W&D Fund- Capital Income	**--**	**(54.85)**	**292.10**	**(47.95)**	**63.10**
		Total- Capital Income	**--**	**428.08**	**(5.91)**	**(9.63)**	**137.52**

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts		***3- Income and Expenditure -Growth Trends***				
	Head of Account	**2000-01**	**2001-02**	**2002-03**	**2003-04**	**Average**
		Percentage increase over previous year				
IV	**Capital Expenditure**					
1	General	--	(23.69)	11.83	--	**(5.93)**
2	Remunerative Schemes	--	--	--	--	**--**
3	Public Works and Roads	--	(5.05)	353.44	(9.64)	**112.92**
4	Street Lighting	--	(99.91)	--	--	**(99.91)**
5	Public Health & Conservancy	--	--	29,952.24	--	**29,952.24**
6	Education	--	--	--	--	**--**
7	Others	--	10.01	--	--	**10.01**
	Total - Capital Expenditure Excl W&D Fund	--	*(11.59)*	*294.36*	*(15.15)*	*89.21*
	Water and Drainage Fund					
8	Water Supply	--	--	3,295.34	--	**3,295.34**
9	Sewerage & Sanitation	--	(21.78)	1,644.20	(96.26)	**508.72**
	Total W&D Fund- Capital Expenditure	--	*0.92*	*2,015.53*	*(97.61)*	*639.61*
	Total - Capital Expenditure	--	**(10.52)**	**461.20**	**(45.28)**	**135.14**
	Operating Surplus (W&D Capital Account)					
	Operating Surplus (Capital Account)					
	Operating Surplus (Over all)					
	Operating Surplus (Over all) - incl O/B					
	EXTRAORDINARY ACCOUNT					
V	**EA Income**					
1	Cash at Bank/ in Hand					
2	Cess Income	--	77.88	11.45	--	**44.66**
3	Cash Deposit	--	(99.49)	5,198.44	89.46	**1,729.47**
4	Staff Advance	--	--	--	(90.62)	**(90.62)**
5	Security Deposit	--	743.29	143.87	5.41	**297.52**
6	Miscellaneous					
	Total- EA Income	--	**(46.06)**	**418.92**	**(1.69)**	**123.72**
VI	**EA Expenditure**					
1	Cess Transfers	--	--	--	--	**--**
2	Other- Deposits	--	--	--	--	**--**
3	PF and Pension	--	--	--	860.47	**860.47**
4	Miscellaneous	--	(86.82)	5,168.14	(87.35)	**1,664.66**
	Total- EA Expenditure	--	**(86.82)**	**7,860.29**	**(26.42)**	**2,582.35**
	Operating Surplus (Extraordinary Account)					
	Closing Balance (excl O/B)					

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			*4- FOP Assumptions*			
	Head of Account		**SAGR**	**CAGR**	**CAGR**	**Variable**
			% pa	*% pa*	*Rs. pc/ pa*	*%pa*
	Opening Balance					
		REVENUE ACCOUNT				
	I	**Revenue Income**				
	A	**Tax- Own Sources**				
1		Property Tax (General Purpose) - 40% of Total PT	6.57	5.90	4.50	
2		Property Tax (Education Purpose) - 17% of Total PT	6.57	5.90	4.50	
3		Profession Tax	98.81	90.39	87.88	5.00%
4		Other Taxes & Charges	(30.59)	(100.00)	(100.00)	5.00%
		Tax- Own Sources	*7.83*	*7.22*	*5.81*	
	B	**Assigned Revenues**				
1		Entertainment Tax	7.02	(14.04)	(15.18)	6.00%
2		Surcharge on Stamp Duty	171.97	(7.93)	(9.14)	15.00%
3		Other Transfers	--	(51.85)	(52.49)	5.00%
		Assigned Revenues	*47.77*	*(13.13)*	*(14.27)*	
	C	**Non Tax- Own Sources**				
1		Income from Municipal Properties and Markets	104.98	(22.24)	(23.26)	20.00%
2		License Income (Trade, etc.)	82.32	51.43	49.43	15.00%
3		Income from Special Services	--	(100.00)	(100.00)	5.00%
4		Income from Sale Proceeds	15.00	(100.00)	(100.00)	5.00%
5		Income from Fees and Fines	(27.92)	(56.82)	(57.39)	5.00%
6		Income from Interest on Deposits	(25.74)	(45.44)	(46.16)	6.00%
7		Income from Investments(Excl. Interest)	--	--	--	5.00%
8		Miscellaneous Income	(8.76)	(10.84)	(12.02)	5.00%
		Non Tax- Own Sources	*(5.46)*	*(9.81)*	*(11.00)*	
	D	**Revenue Grants**				
1		State Finance Commission Grant	47.81	149.47	146.18	15.00%
2		Other Grants	37.73	(73.56)	(73.91)	5.00%
		Revenue Grants	*44.11*	*43.97*	*42.07*	
		Total- Revenue Income (Excl. W&D Fund)	**6.64**	**4.74**	**3.36**	
	E	**Water and Drainage Fund**				
1		Water & Drainage Tax - 43% of Total PT	6.57	5.90	4.50	
2		Water Charges	8.89	7.62	6.20	
3		Drainage Charges	--	(100.00)	--	
4		Income from Interest on Deposits	142.17	88.97	--	6.00%
5		Water Supply & Sanitation Grant	(80.25)	(100.00)	(100.00)	5.00%
6		Other Income	--	--	--	5.00%
		Total- W&D Fund Revenue Income	**(5.89)**	**(5.94)**	**(7.18)**	
		Total- Revenue Income	**1.87**	**0.88**	**(0.45)**	

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			***4- FOP Assumptions***			
	Head of Account		**SAGR**	**CAGR**	**CAGR**	**Variable**
			% pa	*% pa*	*Rs. pc/ pa*	*%pa*
	II	**Revenue Expenditure**				
	A	**General Administration**				
	1	Staff Salary and Employee Related Expenses	(17.54)	(21.32)	(22.36)	8.00%
	2	Allowances to Elected Representatives	(0.40)	(3.38)	(4.66)	5.00%
	3	General Expenses	49.20	15.03	13.51	15.00%
	4	Pensions and Gratuities	26.55	20.30	18.72	5.00%
	5	Education - Staff Salary	--	--	--	5.00%
	6	Miscellaneous	32.71	23.18	21.56	8.00%
		Establishment	*(13.17)*	*(15.98)*	*(17.09)*	
	B	**Operation & Maintenance**				
	1	General Expenses	10.78	7.87	6.45	15.00%
	2	Public Works and Roads	82.63	35.43	33.64	15.00%
	3	Public Health and Conservancy	162.16	67.75	65.54	15.00%
	4	Contractor Payment- Conservancy	--	--	--	5.00%
	5	Street Lighting (including Electricity Charges)	22.21	18.10	16.55	15.00%
	6	Education	--	--	--	5.00%
	7	Vehicle and Equipment Maintenance	43.58	43.41	41.52	15.00%
	8	Miscellaneous	60.54	(46.64)	(47.34)	15.00%
		Operation & Maintenance	*33.36*	*26.26*	*24.60*	
	C	**Debt Servicing**				
	1	Public Works and Roads	--	--	--	
	2	Public Health and Conservancy	--	--	--	
	3	Others	109.43	10.43	8.98	
		Debt Servicing	109.43	*10.43*	8.98	
		Total- Revenue Expenditure (Excl. W&D Fund)	**(0.05)**	**(6.22)**	**(7.45)**	
	D	**Water and Sanitation Fund**				
	1	Staff Salary & Employee Related Expenses	1.56	1.28	(0.06)	8.00%
	2	Administration Expenses	6.11	(3.50)	(4.78)	13.00%
	3	Equipment Maintenance & Repairs	37.56	36.01	34.22	15.00%
	4	Board Payment	--	(100.00)	--	10.00%
	5	Electricity Charges	14.67	8.31	6.88	8.00%
	6	Vehicle Maintenance & Repairs	7.86	5.71	4.31	15.00%
	7	Miscellaneous	227.37	118.97	116.08	15.00%
	8	Debt Servicing- Old	10.84	(17.34)	(18.43)	
		Total- W&D Fund Revenue Expenditure	**13.46**	**11.31**	**9.84**	
		Total- Revenue Expenditure	**(0.12)**	**(2.42)**	**(3.71)**	
		Operating Surplus (W&D Revenue Fund)				
		Operating Surplus (Revenue Account)				
		Closing Balance-(Revenue Account)				
		Transfer to Capital Account				

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			***4- FOP Assumptions***			
	Head of Account		**SAGR**	**CAGR**	**CAGR**	**Variable**
			% pa	*% pa*	*Rs. pc/ pa*	*%pa*
		CAPITAL ACCOUNT				
	III	**Capital Income**				
	A	**Capital Loans**				
	1	Public Works and Roads	140.90	*19.88*	--	
	2	Street Lighting	--	--	--	
	3	Public Health & Conservancy	--	--	--	
	4	Education	--	--	--	
	5	Others	--	--	--	
		Capital Loans	173.18	65.65	--	
	B	**Capital Grants and Contribution**				
	1	Public Works and Roads	--	--	--	5.00%
	2	Education	--	--	--	5.00%
	3	Others	2.01	(10.74)	--	5.00%
	4	Tenth/Eleventh Finance Commission Grants	--	--	--	5.00%
		Capital Grants and Contribution	2.01	*(10.74)*	--	
	C	**Own Sources**				
	1	Transfer from Revenue Account	-	-	--	
	2	Sale of Municipal Property	--	--	--	
		Own Sources- Capital	-	-	--	
		Total- Capital Income	**251.18**	**91.68**	**89.16**	
		Water and Drainage Fund				
	D	**Capital Loans**				
	1	Water Supply	--	--	--	
	2	Sewerage & Sanitation	--	--	--	
		Capital Loans W&D Fund	--	--	--	
	E	**Capital Grants and Contribution**				
	1	Water Supply	(48.96)	(48.96)	--	5.00%
	2	Sewerage & Sanitation	--	--	--	5.00%
		W&D -Capital Grants and Contribution	*(48.96)*	*(48.96)*	--	
	F	**Own Sources**				
	1	Water Connection Charge	(53.81)	(63.23)	(63.71)	
	2	Sewerage Connection Charge	--	--	--	
		W&D Own Sources- Capital	*(53.81)*	*(63.23)*	*(63.71)*	
		Total W&D Fund- Capital Income	**63.10**	**(2.69)**	**(3.97)**	
		Total- Capital Income	**137.52**	**64.98**	**62.81**	

Appendix III: Municipal Finance						
17- Sivakasi Municipality - Abstract of Accounts			***4- FOP Assumptions***			
	Head of Account		**SAGR**	**CAGR**	**CAGR**	**Variable**
			% pa	*% pa*	*Rs. pc/ pa*	*%pa*
	IV	**Capital Expenditure**				
	1	General	(5.93)	(100.00)	(100.00)	
	2	Remunerative Schemes	--	--	--	
	3	Public Works and Roads	112.92	57.28	55.20	
	4	Street Lighting	(99.91)	(100.00)	(100.00)	
	5	Public Health & Conservancy	29,952.24	(100.00)	--	
	6	Education	--	(100.00)	--	
	7	Others	10.01	(100.00)	(100.00)	
		Total - Capital Expenditure Excl W&D Fund	*89.21*	*43.56*	*41.66*	
		Water and Drainage Fund				
	8	Water Supply	3,295.34	(100.00)	--	
	9	Sewerage & Sanitation	508.72	(20.07)	(21.12)	
		Total W&D Fund- Capital Expenditure	*639.61*	*(20.07)*	*(21.12)*	
		Total - Capital Expenditure	**135.14**	**40.07**	**38.22**	
		Operating Surplus (W&D Capital Account)				
		Operating Surplus (Capital Account)				
		Operating Surplus (Over all)				
		Operating Surplus (Over all) - incl O/B				
		EXTRAORDINARY ACCOUNT				
	V	**EA Income**				
	1	Cash at Bank/ in Hand				
	2	Cess Income	44.66	(100.00)		
	3	Cash Deposit	1,729.47	(19.91)		
	4	Staff Advance	(90.62)	337.44		
	5	Security Deposit	297.52	178.83		
	6	Miscellaneous				
		Total- EA Income	**123.72**	**40.13**		
	VI	**EA Expenditure**				
	1	Cess Transfers	--	(100.00)		
	2	Other- Deposits	--	(100.00)		
	3	PF and Pension	860.47	2,719.38		
	4	Miscellaneous	1,664.66	(4.23)		
		Total- EA Expenditure	**2,582.35**	**97.62**		
		Operating Surplus (Extraordinary Account)				
		Closing Balance (excl O/B)				

Appendix III: Ward Level Priorities Short Term Projects						
	Sector		**Component**	**Quantity**	**Unit**	**Cost (Rs. Lakhs)**
Ward 1	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	0.36	Km	20.89
		vi	New Formation - BT Roads	4.78	Km	47.77
		vii	New Formation - WBM Roads	0.99	Km	6.71
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	4.06	Km	49.74
		v	New Formation - Pucca Closed	5.96	Km	86.43
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	134	No.s	6.03
		ii	No. of High Power Lamps	56	No.s	5.04
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	20	No.s	12.65
Ward 2	**1**	**CIP-Roads**				
		i	Widening	1.06	Km	2.12
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	1.06	Km	10.60
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	9	No.s	0.41
		ii	No. of High Power Lamps	7	No.s	0.63
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	13	No.s	8.30
Ward 3	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	0.14	Km	1.38
		vii	New Formation - WBM Roads	0.16	Km	1.11
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	1.41	Km	14.06
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	1.40	Km	20.27
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	74	No.s	3.33
		ii	No. of High Power Lamps	23	No.s	2.07
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	20	No.s	12.68

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 4	**1**	**CIP-Roads**				
		i	Widening	0.57	Km	1.13
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.68	Km	6.79
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	6	No.s	0.54
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	2	No.s	1.39
Ward 5	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	0.18	Km	10.60
		vi	New Formation - BT Roads	1.65	Km	16.51
		vii	New Formation - WBM Roads	0.40	Km	2.71
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	0.68	Km	8.29
		v	New Formation - Pucca Closed	2.41	Km	34.99
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	47	No.s	2.12
		ii	No. of High Power Lamps	19	No.s	1.71
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	20	No.s	12.46
Ward 6	**1**	**CIP-Roads**				
		i	Widening	0.61	Km	1.22
		ii	Up-gradation - BT to CC	0.20	Km	0.20
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	0.68	Km	8.28
		v	New Formation - Pucca Closed	2.44	Km	35.44
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	54	No.s	2.43
		ii	No. of High Power Lamps	11	No.s	0.99
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	35	No.s	21.92

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 7	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	1.53	Km	15.25
		vii	New Formation - WBM Roads	0.38	Km	2.59
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	1.75	Km	21.45
		v	New Formation - Pucca Closed	2.13	Km	30.93
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	11	No.s	0.50
		ii	No. of High Power Lamps	6	No.s	0.54
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	1	No.s	0.52
Ward 8	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	0.21	Km	2.59
		v	New Formation - Pucca Closed	1.95	Km	28.33
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	16	No.s	0.72
		ii	No. of High Power Lamps	16	No.s	1.44
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 9	**1**	**CIP-Roads**				
		i	Widening	1.45	Km	2.89
		ii	Up-gradation - BT to CC	0.24	Km	0.24
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	2.04	Km	24.96
		v	New Formation - Pucca Closed	2.89	Km	41.97
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	11	No.s	0.50
		ii	No. of High Power Lamps	16	No.s	1.44
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	18	No.s	10.98

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 10	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.38	Km	3.84
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	0.55	Km	8.03
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	1	No.s	0.09
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	15	No.s	9.62
Ward 11	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	3.84	Km	38.44
		vii	New Formation - WBM Roads	0.35	Km	2.34
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	3.32	Km	40.68
		v	New Formation - Pucca Closed	3.19	Km	46.23
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	94	No.s	4.23
		ii	No. of High Power Lamps	30	No.s	2.70
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	32	No.s	20.27
Ward 12	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	0.11	Km	0.11
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.36	Km	3.58
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	0.97	Km	14.08
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	2	No.s	0.18
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 13	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.76	Km	7.64
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	1	No.s	0.09
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	10	No.s	6.44
Ward 14	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	2.44	Km	24.38
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	1.96	Km	23.98
		v	New Formation - Pucca Closed	2.04	Km	29.56
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	56	No.s	2.52
		ii	No. of High Power Lamps	18	No.s	1.62
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	18	No.s	11.18
Ward 15	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	1.61	Km	16.12
		vii	New Formation - WBM Roads	0.34	Km	2.29
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	1.16	Km	14.20
		v	New Formation - Pucca Closed	1.70	Km	24.64
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	11	No.s	0.50
		ii	No. of High Power Lamps	7	No.s	0.63
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	16	No.s	9.71

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 16	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.66	Km	6.64
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	2	No.s	0.09
		ii	No. of High Power Lamps	4	No.s	0.36
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 17	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	2.62	Km	26.16
		vii	New Formation - WBM Roads	0.50	Km	3.40
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	2.13	Km	26.13
		v	New Formation - Pucca Closed	2.30	Km	33.38
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	69	No.s	3.11
		ii	No. of High Power Lamps	19	No.s	1.71
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 18	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.74	Km	7.43
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	4	No.s	0.36
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 19	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	3.14	Km	31.36
		vii	New Formation - WBM Roads	0.16	Km	1.11
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	2.57	Km	31.52
		v	New Formation - Pucca Closed	2.30	Km	33.38
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	62	No.s	2.79
		ii	No. of High Power Lamps	20	No.s	1.80
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 20	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	0.02	Km	0.02
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.63	Km	6.33
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	4	No.s	0.36
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 21	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	3.87	Km	38.71
		vii	New Formation - WBM Roads	0.72	Km	4.83
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	2.97	Km	36.36
		v	New Formation - Pucca Closed	3.54	Km	51.31
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	80	No.s	3.60
		ii	No. of High Power Lamps	24	No.s	2.16
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	11	No.s	6.65

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 22	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	2.71	Km	27.14
		vii	New Formation - WBM Roads	0.27	Km	1.82
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	1.39	Km	16.99
		v	New Formation - Pucca Closed	2.54	Km	36.90
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	57	No.s	2.57
		ii	No. of High Power Lamps	-	No.s	-
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 23	**1**	**CIP-Roads**				
		i	Widening	0.37	Km	0.74
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	1.11	Km	11.11
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	-	No.s	-
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 24	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.92	Km	9.20
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	-	No.s	-
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 25	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.88	Km	8.78
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	6	No.s	0.54
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 26	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	3.04	Km	30.39
		vii	New Formation - WBM Roads	0.13	Km	0.90
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	0.59	Km	7.20
		v	New Formation - Pucca Closed	3.78	Km	54.78
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	71	No.s	3.20
		ii	No. of High Power Lamps	27	No.s	2.43
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	26	No.s	16.10
Ward 27	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	3.07	Km	30.69
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	2.51	Km	30.70
		v	New Formation - Pucca Closed	2.59	Km	37.62
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	65	No.s	2.93
		ii	No. of High Power Lamps	22	No.s	1.98
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 28	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.56	Km	5.60
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	0.07	Km	1.06
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	5	No.s	0.45
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 29	**1**	**CIP-Roads**				
		i	Widening	0.20	Km	0.39
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	0.59	Km	5.85
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	-	No.s	-
		ii	No. of High Power Lamps	6	No.s	0.54
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-
Ward 30	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	1.94	Km	19.36
		vii	New Formation - WBM Roads	0.05	Km	0.37
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	1.38	Km	16.85
		v	New Formation - Pucca Closed	1.58	Km	22.97
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	8	No.s	0.36
		ii	No. of High Power Lamps	14	No.s	1.26
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	-	No.s	-

	Sector		Component	Quantity	Unit	Cost (Rs. Lakhs)
Ward 31	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	1.91	Km	19.15
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	0.42	Km	5.09
		v	New Formation - Pucca Closed	2.06	Km	29.88
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	1	No.s	0.05
		ii	No. of High Power Lamps	17	No.s	1.53
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	18	No.s	11.18
Ward 32	**1**	**CIP-Roads**				
		i	Widening	2.09	Km	4.18
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	-	Km	-
		vii	New Formation - WBM Roads	-	Km	-
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	3.59	Km	35.86
		iv	New Formation - Pucca Open	-	Km	-
		v	New Formation - Pucca Closed	-	Km	-
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	80	No.s	3.60
		ii	No. of High Power Lamps	20	No.s	1.80
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	35	No.s	21.63
Ward 33	**1**	**CIP-Roads**				
		i	Widening	-	Km	-
		ii	Up-gradation - BT to CC	-	Km	-
		iii	Up-gradation - WBM to BT	-	Km	-
		iv	Up-gradation - Earthen to BT	-	Km	-
		v	New Formation - CC Roads	-	Km	-
		vi	New Formation - BT Roads	5.57	Km	55.67
		vii	New Formation - WBM Roads	0.95	Km	6.43
	2	**CIP-Storm water Drains**				
		i	Upgradation - Kutcha to Pucca Open	-	Km	-
		ii	Upgradation - Kutcha to Pucca Closed	-	Km	-
		iii	Upgradation - Pucca Open to Closed	-	Km	-
		iv	New Formation - Pucca Open	4.67	Km	57.16
		v	New Formation - Pucca Closed	4.58	Km	66.47
	3	**CIP-Street Lights**				
		i	No. of Tube Lights	97	No.s	4.37
		ii	No. of High Power Lamps	6	No.s	0.54
	4	**CIP-Slums**				
		i	Seats of Public Conveniences	36	No.s	22.63

Appendix V: Draft Memorandum of Agreement

DRAFT MEMORANDUM OF AGREEMENT BETWEEN URBAN LOCAL BODY AND TAMILNADU URBAN INFRASTRUCTURE FINANCIAL SERVICES LIMITED

Dated _____

THIS AGREEMENT is made on this _____ day of _____,2006 _____ between the Tamilnadu Urban Infrastructure Financial Services Ltd., and Urban Local Body.

WHEREAS the projects identified in the City Corporate Cum Business Plan seeks financial assistance from the TNUIFSL under the World Bank AID.

WHEREAS the projects identified in the City Corporate Cum Business Plan, in pursuance of the requirements for Comprehensive City Development, fully detailed in the City Corporate Cum Business Plan:

AND WHEREAS the comprehensive infrastructure projects identified in the City Corporate Cum Business Plan has to prepare feasibility and detailed project reports:

AND WHEREAS municipality has to implement the reform agenda, as per the timeline indicated in the reform agenda.

AND WHEREAS the projects identified in the City Corporate Cum Business Plan has considered the City Corporate cum Business Plan Report and found them consistent with the goals and objectives of CCP-BP:

NOW THE PARTIES WITNESSED as follows:

1. That the sustainable prioritize infrastructure projects identified in the City Corporate cum Business Plan report will be taken up as given in the Memorandum of Agreement.

(a) _____

(b) _____

(c) _____

2. The TNUIFSL and the Local Body should engage Third party quality control agency to check quality and audit.

3. Local Body is the responsible agency to see the progress of the projects, progress of the ongoing projects and also the implementation of reforms agenda.

4. That the parties to the agreement further covenant that in case of a dispute between the parties the matter will be resolved to arbitration within the provisions of the arbitration and conciliation Act, 1996 and the rules framed there under and amended from time to time. The matter in dispute shall be referred to _____ (Insert a name of an arbitrator) as arbitrator, however, in case such person refuses to act as arbitrator, or is rendered, unable because of sickness or otherwise, or dies, _____ (name of the second person for arbitrator) shall act as arbitrator between the parties and the dispute shall be referred to such person and still in case this second person is not available for any reason to act as arbitrator between the parties, both parties shall name one person of their choice as arbitrator and decision such arbitration shall be final and binding on the parties.

IN WITNESS HEREOF all the parties have put their hands on these presents of Memorandum of Agreement in the presence of witnesses.

WITTNESES:

1. _____ TNUIFSL

2. _____ Or

Urban Local Body

(Government of Tamilnadu)

Appendix VI: Council Resolution