

Master Plan for Karaikudi

LPA 2041

GIS-Based Plan Under AMRUT Guidelines

Master Plan

March 2024

VOL.
2/2



Directorate of Town & Country Planning
Government of Tamil Nadu



GIS – Based Master Plan Karaikudi LPA - 2041

Draft Master Plan



Directorate of Town and Country Planning
March 2024



Master Plan for Karaikudi Composite Local Planning Area – 2041

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Master Plan for

: Karaikudi Composite Local
Planning Area

Karaikudi Local Planning Area



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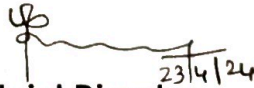
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PROFORMA

Name of the Office

Directorate Town and Country
Planning Office
Sivagangai District

Name of the LPA

Karaikudi Local Planning Authority

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Proposals submitted to Government

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IV. CONSENT

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10. Letter no: and date in which Director of Town and Country Planning has given advice on O & S under section 26 (2)
11. Resolution no. and date in which the Karaikudi approved the Draft Master plan

VI. APPROVAL :

12. Submission of Master plan to Government for final approval Under Section 28
13. The G.O details in which Government accorded its approval Under section 28

VII. PER PUBLICATION OF APPROVAL IN

14. The Tamil Nadu Government gazette under Section 30
15. The notice Board of the Local Body
16. One more leading daily newspaper circulation in the Karaikudi Local Planning.

 22/2/24

Assistant Director (FAC)
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Karaikudi Composite Local Planning Area Master Plan – 2041

CERTIFICATE

It is certified that,

- All the procedures prescribed in the Master Plan are prepared, published, and sanctioned.
- The boundary of Karaikudi Composite Local Planning Area is reframed.
- Reports with the Master Plan are annexed and authenticated.
- The categorization in the zoning map and the categorization in zoning regulation are tallied and found correct.
- The numbers found missing are duly acknowledged and verified by the concerned department.

Assistant Director (FAC)
Karaikudi Local Planning Authority
Sivagangai District.

Master Plan for Karaikudi LPA 2041

GIS-Based Plan Under AMRUT Guidelines

Master Plan

Volume 2 of 2

March 2024

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12 LAND USE



12.1 Evaluation Of Karaikudi Master Plan 2021

Karaikudi master plan 2021 envisaged the Planning Area of Karaikudi municipal area. The area under different land uses was 13.51 Sq.km. Table 12.1 reveals that the development of land use categories was quite satisfactory.

Karaikudi Master Plan 2021 envisaged that proposed residential use in 2021 is 7.07 sq. km which is 52.27% of the total area of the town. The reason for predicting a higher concentration of residential use is because of the increase the residential density within the town which is 250 persons per hectares. The land which was identified as vacant and dry land properly utilised, around 1.12 sq. km of land is planned through a Detailed Development Plan. The higher concentration of residential use about 7.43 sq. km (mixed residential is 1.12 Sq.km) which is 54.96 %. The land reserved for Commercial was about 0.64 sq. km of total municipal area whereas in existing development of commercial use is only 0.53 sq. km. This shows town has had less commercial development in past two decades. However, Karaikudi CLPA has a high potential for general business that is trade and commerce activities can be increased and can have higher growth.

The reserved area under industrial use was about 0.11 sq. km whereas in the existing land use (2021) only 0.30% of the total area is utilized for the same use. As Karaikudi is an agriculture-rich area Agro-based industries can be proposed and there is a good scope.

As Karaikudi is the only municipality has above 1 lakh population in the district. Therefore, Public and Semi-Public use is must in the municipality to cater needs of surroundings. Public and Semi-Public use was proposed about 0.78 Sq.km of total municipal area. The area developed under this use is also 0.62 Sq.km. Due to educational hub and central government research institute, there came many educational institutions and government offices which increases Public and Semi-public use

The land allocated for agriculture; wet land and water body was about 2.35 sq. km which is high as 2.09 sq. km is under agriculture, wetland and water body use which shows that the area classified under Agriculture, Wetland

and Water body have been converted for transportation or residential development. Karaikudi has high potential for commercial and educational developments so large parcel of land required for trade & commerce and institutional development so land conversion will have major effect in future. The concentration of vacant land is higher on the south side of the railway track where the railway track and water bodies act as a barrier for developments.

The reserved area under Transportation use was about 1.24 sq. km whereas in the existing land use (2021) high as 18.79 % of the total area. As road infrastructure is backbone for proper planned development, the existing Karaikudi Municipality has utilised vacant land for planned development.

The above analysis shows that there is well planned development in the town over the past two decades. As there are 1.21 sq. km (9.32 % of total area) of Dry and vacant land it was well utilised. In the existing land use dry and vacant land has 0.14 sq. km. It has less potential for development as it is located along the railway line.

S. No.	Land Use	Proposed land use-2021 (in sq.km)	Existing landuse-2021 (in sq.km)
1	Residential	7.07	7.43
2	Commercial	0.64	0.53
3	Industrial	0.11	0.04
4	Educational	0.11	0.13
5	Public and semipublic	0.78	0.62
6	Agriculture (include Wetland, Water Bodies)	2.08	2.08
7	Dry land and Vacant land	1.51	0.14
8	Transportation (Road & Railways)	1.21	2.54
	Total	13.51	13.51

Table 12.1 Evaluation of proposed land use 2021 and Existing land use 2021 Karaikudi Municipality

12.2 Existing Land Use 2021

The Existing Land Use is the important input in devising the future growth strategy of any city/town, formulating alternatives and proposals in the Master plan. The existing land use maps show various current land uses indicating Residential, Commercial, Industrial, Special and Hazardous, Institution, Transportation and Agriculture. The existing land use map for Karaikudi CLPA has been prepared through a field survey across the CLPA (Refer existing land use map figure 12.2). From the existing land use map, the growth potential for the town and suitable locations for future developments can be identified. The total extent of the existing land use is 115.78 sq.km.

12.2.1 Residential

The concentration of residential area in Karaikudi CLPA is about 24.41 sq.km which is about 21.08% of Total area of the CLPA. As per URDPFI guidelines, Karaikudi CLPA falls under the medium town category so it can have 43-48% of residential use.

The concentration of Residential area is high in the municipal area about 7.43 sq. km which is 6.10% of the total residential area. The second highest concentration of residential area 3.24 sq. km is in Kottaiyur town panchayat which is 2.88% of the total residential area. Kalanivasal village and Illuppaikkudi Village has moderate residential concentration (2.89 Sq.km that is 2.49% of total area) and (2.17 Sq.km that is 1.87 % of total area) respectively. The residential growth in Karaikudi CLPA is more towards north east directions i.e.) from Karaikudi core town to Kottaiyur. Kariakudi Railway lines act as a barrier for the growth on the south side, however proper connectivity Railway crossing which provide opportunity for development in the Illuppaikkudi Village, Ariyakkudi village and Amaravathi village.

12.2.2 Commercial

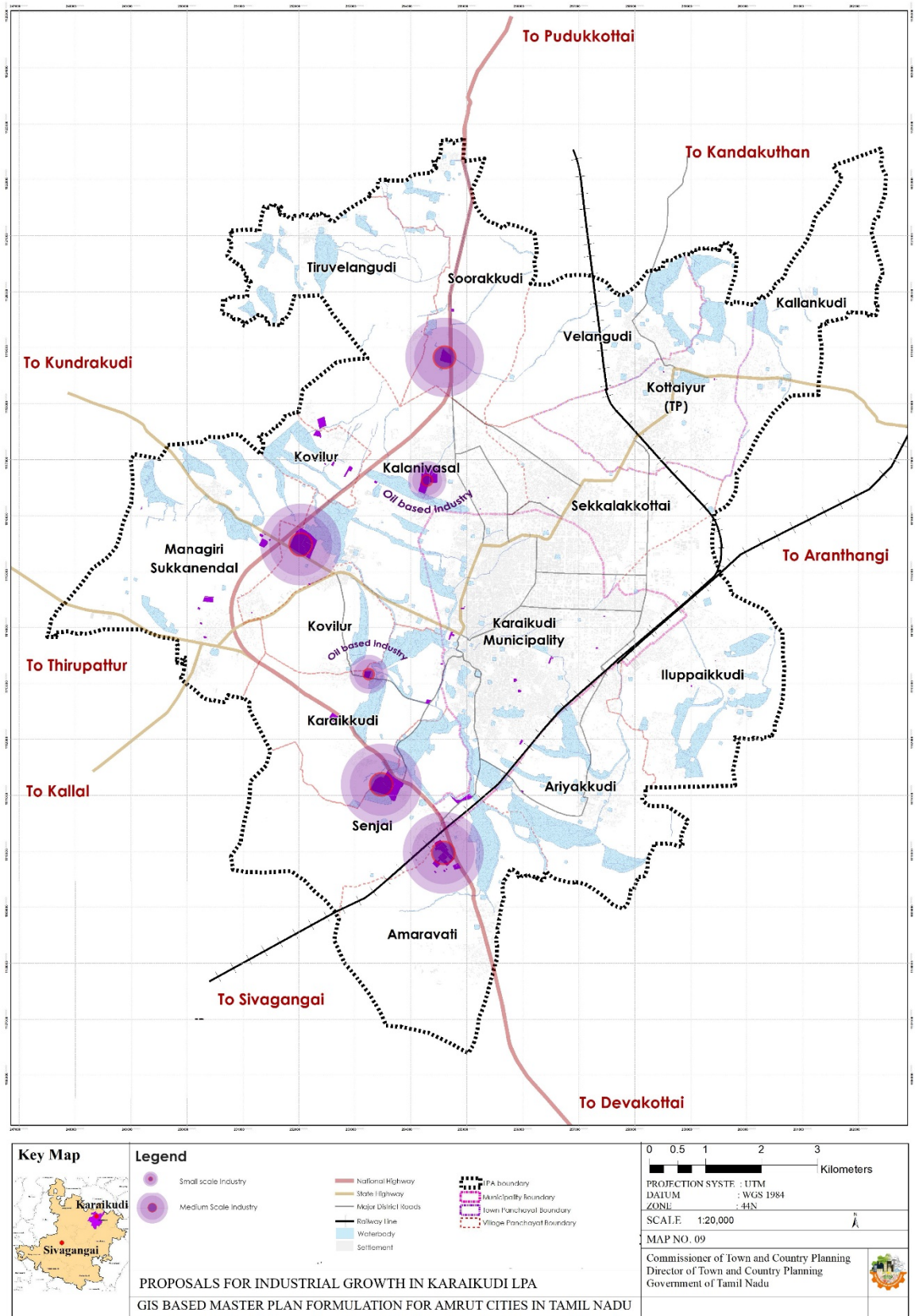
The share of commercial use in Karaikudi CLPA is only 0.99 Sq.km which is adequate as per the URDPFI guidelines. The existing commercial areas are concentrated in two locations. One in Kallukatti area has weekly market

near the Sri Koppudaiya Nayagi Amman Temple and Other one in Puthu Chanthai Patti has a daily market. Other important commercial area is Periyar statue junction and daily market in Kalanivasal road. Previous master plan had a strategy for commercial area planning that is intensifying the linear developments along the major corridors to provide easy access to the local residents to satisfy their daily commercial demands. The existing development took place as planned, the major transport corridors in Karaikudi municipal area, VOC road, Muthupattinam road, Kallukatti road, Sekalai road, 100 Feet road, College road. The growth of the core area towards North, North east and east direction from Kallukatti weekly market area. The commercial development goes beyond the municipal boundary along the Kalanivasal road, Aranthangi road as residential area developed. As Karaikudi, is a noted centre for trade and commerce in Sivagangai District. There are wholesale traders, groceries, paddy, rice, pulses, sugar building materials, home appliances, automobiles etc. The town acts as marketing centre for the surrounding towns and villages. Karaikudi has a high potential for general business that is trade and commerce activities can be increased and can have higher growth.

To support Commercial activities can be encouraged in the other areas of the CLPA also. As per URDPFI guidelines, 0.24 to 0.32ha/1000 persons of the area is required for commercial activities. The existing commercial area of 0.99 sq. km is sufficient for the present population but it is all concentrated in the municipality and immediate surrounding, commercial development required other parts of CLPA where residential growth is high.

12.2.3 Industrial

The share of Industrial use in Karaikudi CLPA is about 0.60 Sq.km which is only 0.52% of total area of the CLPA. Major industries in Karaikudi town are explained in detailed in Economic Chapter.



Maps 12.1 Scale of Industries

12.2.4 Special and Hazardous Industries

The share of Special and Hazardous Industries is about 0.16 Sq. km which is only 0.14% of total area of the CLPA. The Karaikudi CLPA has one Tamil Nadu Petro Chemical Industries are located in Kalanivasal Village along Kovilur road

12.2.5 Institutional

The share of Institution is about 6.64 Sq. km which is 5.73% of total Karaikudi CLPA. Education, Public & Semi-public and Recreational uses are classified under institutional use.

12.2.5.1 Public and Semi-Public

The share of Public and Semi-Public use is 2.58 Sq.km which is 2.23% of the overall planning area. The concentration of Public and Semi-Public use is more in the Karaikudi municipality. Karaikudi, being the taluk headquarters About one third of the land in the town is owned by government or local body. Karaikudi Municipality has Public and Semi-Public uses such as Hospitals, State government offices and Central Government offices, Religious buildings, and Public use buildings etc. Karakudi government hospital is located along Kila Korattaiyar Street which is located 2 kms from Karikudi Railway Station, 1.5 Kms from New Bus Stand.

Major Hospitals in Karaikudi CLPA is District Govt. Hospitals in Karaikudi municipality and T.Soorakudi, In private, Apollo hospital is located in Managiri. The total number of hospital and bed available details are explained in Social Infrastructure Chapter

State government offices such as Taluk headquarters, Karaikudi surveyor office, Tourist office, VAO office, Head post office, RTO office are located in Sekalai area, which is 0.5 Km distance from new bus stand of Karikudi Municipality. Police headquarters and police housing colony located in Thilagar nagar along Tamil Thai Kovil Road. Tamil Nadu State Transport corporation located in Kovilur.

The Public and Semi-Public use within CLPA heritage buildings and Ayaram Jannal veedu, Kaviarasu Kannadhasan Manimandapam in Karaikudi and Pilgrim centres such as famous tourist spots Arulmihu Mennakshi Thirukovil, Arulmihu Periya Muthumariamman Temple, Koppudai Koppudaiya Nayagi Amman temple, Venkatamudayan Perumal Temple (then tirupati) in Ariyakkudi and Srikotravaleeswar temple in Kovilur.

12.2.5.2 Educational

As Karaikudi is an educational hub for surrounding village. The major educational institutions of Alagappa University and Central Electro Chemical Research Institute are located in the north-eastern side of Illuppaikkudi village and South side Sekkalakottai village about 1.06 Sq.km. The share of Educational institutional use is 3.35 Sq.km which is 2.89% of the overall planning area.

Primary, Secondary and Highers Secondary schools are located wide spread in the municipality. School education wide spread across CLPA. All the villages have primary education, Middle schools and Major village settlements have high school and higher secondary schools. College education of Alagappa university, Nachiappa Swamigal Arts And Science College in Kovilur, Sri Raaja Raajan College Of Engineering And Technology in Amaravathi and Sri Sarada Niketan College for Women in Amaravathi are the main colleges in the Karaikudi CLPA.

Central government uses such as CECRI and Central Industrial Security Force at Amaravathi and Railway institute at Railway station area.

12.2.5.3 Public utilities

The share of Public Utilities use in Karaikudi CLPA is about 0.39 Sq.km which is only 0.34% of total area of the CLPA. Major Public utilities infrastructures in Karaikudi town are explained in detailed in physical infrastructure chapter.

12.2.5.4 Recreation

Recreational use includes open spaces, Parks and playgrounds. The existing recreation use in Karaikudi CLPA is 0.31 sq. km which is 0.27 % of total area of the CLPA. Recreational uses are concentrated in Karaikudi municipality and Kottiyur town Panchayat other parts of CLPA has less recreational facilities.

Following are the Parks in Karaikudi Municipality,

1. Kodeswaran Nagar,
2. Aruna Nagar
3. Thillai Nagar
4. Anand Nagar at 100 feet road
5. Police Colony road
6. Ariyabhavan road
7. Near Taluk Office
8. Abdul Kalam road
9. Kurunji and mullai street
10. Railway main road

Following are the Parks in Other Parts of CLPA

1. Kottaiyur - College Road and Alagapuri near Kottaiyur lake.
2. Kalanivasal – State high way 28 towards Pudukkottai, NGO colony
3. Sekkalakottai – Periyar nagar
4. Ariyakudi main road
5. College road within the Alagappa University Campus

Following are the Playgrounds in Karaikudi Municipality

1. Aruna nagar
2. Sekkalai area
3. Meenakshipuram opposite to Police colony

Following are the Playground in Other Parts of CLPA

1. Kottiyur – Alagapuri area
2. Kalanivasal – Near junction of Thiruvelangudi road and Thiruvanmaiur road
3. Kovilur – near Nachiappa Swamigal Arts And Science College

4. Sankarapuram along Sekkalai road
5. Velangudi – Junction of State high way 26 with Chithambaram Ambalam Street beside Football Stadium also there.

Old town does not have any recreational spaces nearby. Open spaces can enhance the quality of life and reduce the impact of heat so recreational spaces need to be enhanced within Karaikudi old town. In this old town educational institute playgrounds area used as recreational space.

12.2.6 Transportation

Transport corridors play an important role in developments within Karaikudi CLPA. The existing land use map of Karaikudi CLPA reveals that the Planned development growth took place in the Karaikudi municipality, Kottaiyur town panchayat, Kovilur, Kalanivasal, Managiri and Illuppaikudi area.

The area under Transportation use in Karaikudi CLPA is about 6.64 Sq.km which is 5.73% of the CLPA Total area and roads cover an area of about 5.4 sq. km that is 0.27 % of total area of the CLPA. Transportation in existing land use comprises major road networks, railway lines, bus stands and Railway station. Karaikudi municipality, has 2 bus stands, old bus stand called as Rajaji bus stand located in north west of municipality near Muthupattinam Junction with 2 large bus bays. A new bus stand of 2.67 acres B Grade bus stand has 5 Bays located along 100 Feet Road eastern side of municipality. New bus stand constructed under the Tamil Nadu Urban Development Program. Stairway facilities have been made at the bus stand for 33 buses. Karaikudi has a railway station which is located south east of municipality at Ananda Nagar. TNSC bus body building unit located in Sekkalai, Karaikudi. Also, Karaikudi has TNSC regional office under Kumbagonam Division, this office located in Nesvalar colony Kovilur Road. CLPA has National Highway 536 and State Highway 28, 29 and 35. The existing situation of road and traffic are explained in the Traffic and Transportation Chapter.

12.2.7 Agriculture use

The share of agriculture use will be higher in the village area. Karaikudi CLPA has about 22.91 Sq.km of agriculture use which is 19.79% of total area of the

CLPA. Agriculture use in Municipal area is only 0.49 Sq.km which is 0.42% of the total agriculture use in Karaikudi CLPA. Villages have a higher concentration of agriculture use. Managiri Sukkenendal has 4.56 Sq.km of agriculture use which is 3.94% of the total agriculture use. Ariyakkudi Village has a higher concentration (3.31 Sq.km) of agriculture use which is 2.86 % of the total agriculture use in CLPA. Next T.Soorakudi (3.26 Sq.km) and Karaikudi (2.82 Sq.km) villages have a higher concentration of agriculture use. While preparing a land-use plan the existing agriculture cropped area needs to be retained and strategies should be given to protect from urban development.

12.2.7.1 Water Bodies

Water bodies are an important environmental asset for an urban area. Karaikudi CLPA has an extent of 14.18 sq. km under Water Bodies which is 12.24 % of the overall CLPA area. As the cities expand in the area with more population growth the waterbodies getting replaced by concrete structures and black-topped roads. This situation needs to be avoided, water bodies need to be conserved and protected from urban development to maintain an ecological balance.

12.2.7.2 Green area

Green area use includes Reserved Forest and Tree Glad area. Karaikudi CLPA has an extent of 19.20 sq. km under Water Bodies which is 16.43 % of the overall CLPA area. As the urbanisation succumbs vegetative areas such as forest and tree glad. This situation needs to be avoided, Forest and Tree Glad need to be conserved and protected from urban development to maintain an ecological balance. Safe guarding or increasing green space reduce negative impact of climate (urban heat island affect)

12.2.7.3 Wasteland

The share of wasteland in Karaikudi CLPA is about 12.07 Sq.km which is 10.42 % of total area of the CLPA. The land which is not put in use or not being used due to no potential or less potential. National wastelands development board classifies wastelands into two categories that are 1.

Cultivable land and 2. Uncultivable land. Karaikudi CLPA has cultivable lands such as Barren land and Scrub land. The wasteland in Karaikudi CLPA is wide spread across the town, Kalanivasal has highest concentration of Scrub land that is 3.39 (O.Siruvayal, and along Kovilur road).

12.2.7.4 Vacant land

S. No.	Land Use	Area under each use as per Existing land use 2021	% Share in Total area
1	Residential use	24.41	21.08
2	Commercial use	0.99	0.86
3	Industrial use	0.60	0.52
4	Special and Hazardous Industries use	0.16	0.14
5	Institutional use	6.64	5.74
6	Transportation use	6.64	5.73
7	Agriculture use	76.34	65.93
	Total	115.78	100.00

Source: Existing land use map 2021

Table 12.2 Existing land use in Karaikudi CLPA 2021

The share of vacant land in Karaikudi CLPA is about 7.95 Sq.km which is 6.87 % of total area of the CLPA. The municipal area has a low vacant land is about 0.14 Sq.km which is 0.12 % of the total CLPA area. Soorakudi village has highest concentration of vacant land about 2.0 Sq.Km, Next Amaravaiithi village has higher concentration of vacant land about 1.35 Sq.km, Managiri Sukkanendal has 1.35 sq.km, Kottaiyur town panchayat has 0.80 Sq.km And Ariyakkudi has 0.62 Sq.km. The above-mentioned villages have higher potential for lots of urban development proposals URDPFI Guidelines Standards for Land Use Structure

As per the URDPFI guideline, Karaikudi falls under the category of medium town. Table 12.3 Represents the Existing land use and URDPFI set standards. The share of each land use in Karaikudi CLPA is not up to the standards given by URDPFI guidelines. After identifying the suitable areas for urban development land use proposals will be given to boost the growth

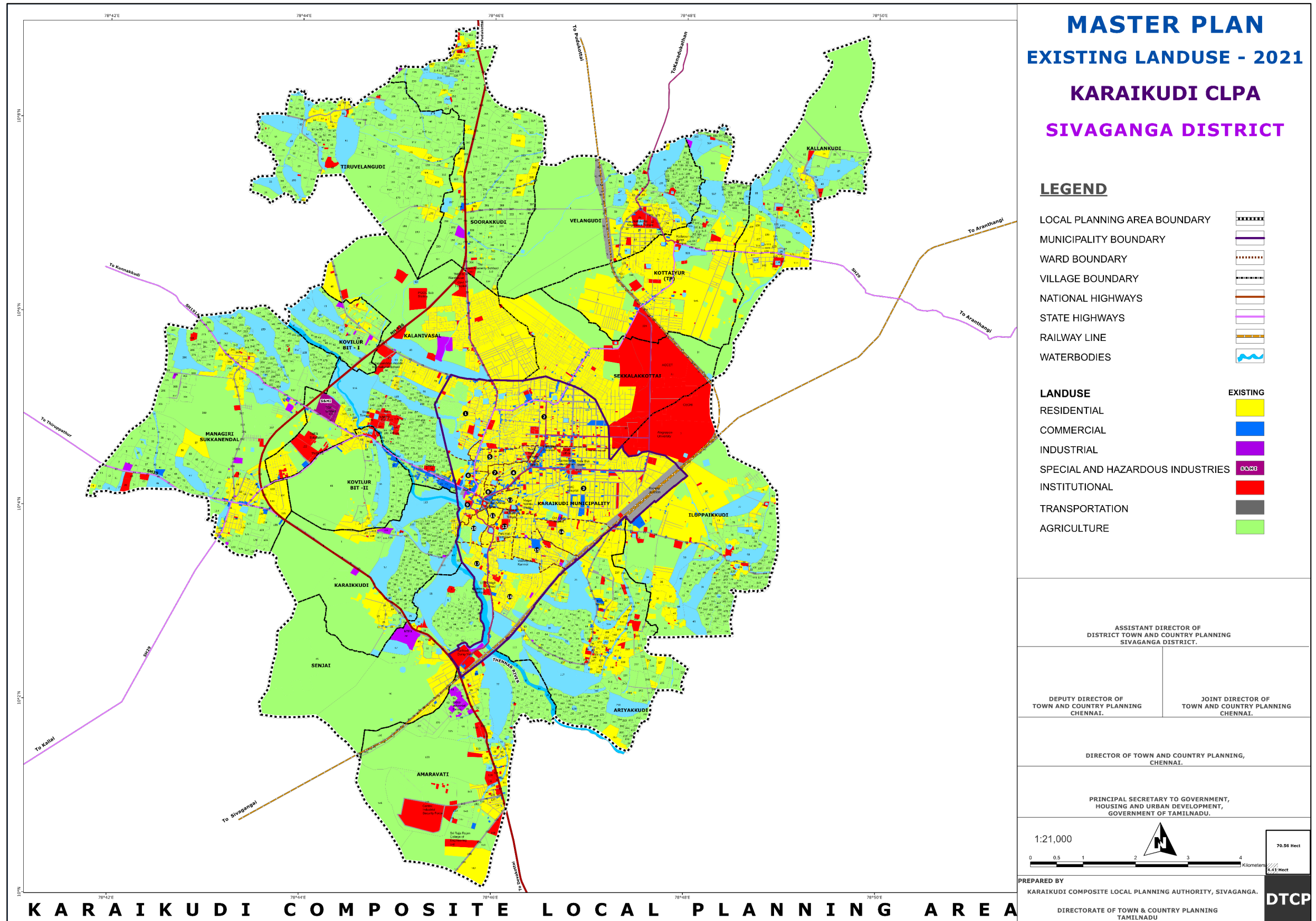
opportunities in the town and the existing land use structure will be increased as per URDPFI guidelines. (Refer Table 12.3)

S. No.	Land Use	Area under each use as per Existing land use 2021	% Share in Existing land Use	As per URDPFI guidelines
1	Residential	24.41	21.08	43-48 %
2	Commercial	0.99	0.86	4-6 %
3	Industrial	0.76	0.66	7-9 %
4	Institutional Use (include Public and semi-public, Services and Utilities)	6.33	5.47	6-8 %
5	Transportation	6.64	5.74	10-12%
6	Recreational	0.31	0.27	12-14 %
7	Agriculture	22.91	19.79	3-18 %
8	Vacant land	7.95	6.87	
9	Water Bodies	14.18	12.25	
10	Others (Green area)	19.2	16.58	
11	Waste land	12.07	10.42	
12	Others	0.03	0.03	
	Total	115.78	100.00	

Table 12.3: Land use standards as per URDPFI guidelines

12.3 Summary

Karaikudi Master Plan 2021 envisaged increasing the residential density within the town which is 250 persons per hectare. The land which was identified as vacant and dry land properly utilised, and planned through Detailed Development Plans. Due to this more than 2.7% of residential use has been achieved. Similar Transportation use is higher than proposed, as road infrastructure is the backbone for proper planned development, the existing Karaikudi Municipality has utilised vacant land for planned development. On the other hand commercial and industrial development were less achieved.



Maps 12.2 Existing Land Use of Karaikudi CLPA

13 DEVELOPMENT PROPOSAL

13

13.1 Development Concept

As focal point of the region Karaikudi has been grown intensively over the year. The nodal points for education, public and semi-public institution, tourism and commercial activities because of which Karaikudi municipality experiences high density. The eight-planning scheme through which Detail Development Plan prepared, and implemented for 10.3 Sq. km. Through which planned development took place in north eastern side.

The growth of the town is affected by the railway line in the south, linear waterbodies and forest area in the west. However, railway road crossings provided opportunities for development in southside. Western side beyond the waterbodies Kovilur, Managiri north west and Amaravathi in the southwest growing faster. Because of NH 365 runs north to south in the western side. Also, SH runs east to west, it is providing quicker access to the Karaikudi Municipality. In the south Amaravathi village has SIDCO Industrial development and educational and socio infrastructure development it is providing both employment opportunity and better living space.

Karaikudi CLPA has more green cover which indicates that the quality of the environment is fairly good. Since the area has several networks of irrigation natural streams and waterbodies, the place is known for paddy, rice, pulses, sugar cultivation and also several other crops. These water bodies, forest area and high yield form land need to be further protected to maintain an ecological balance.

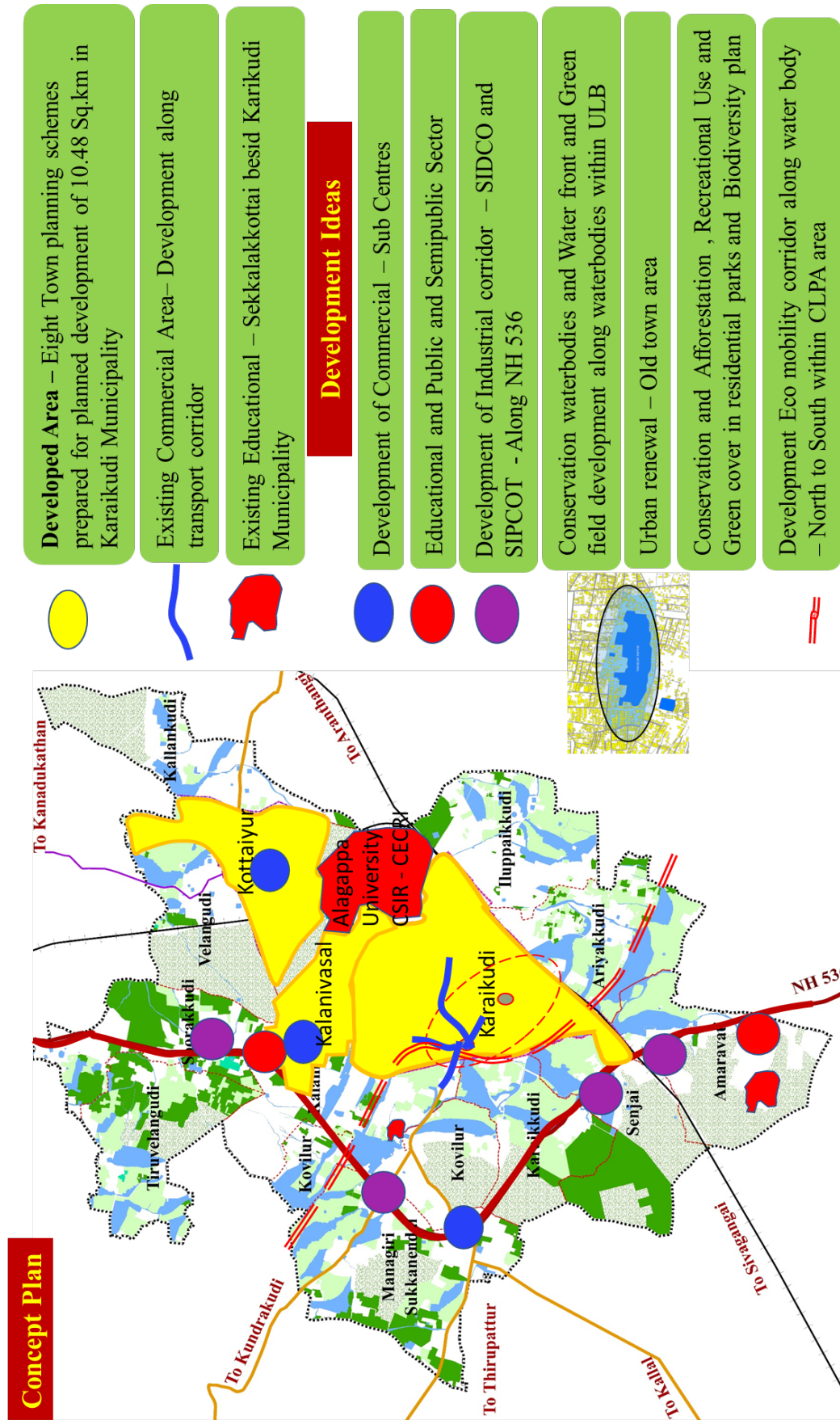


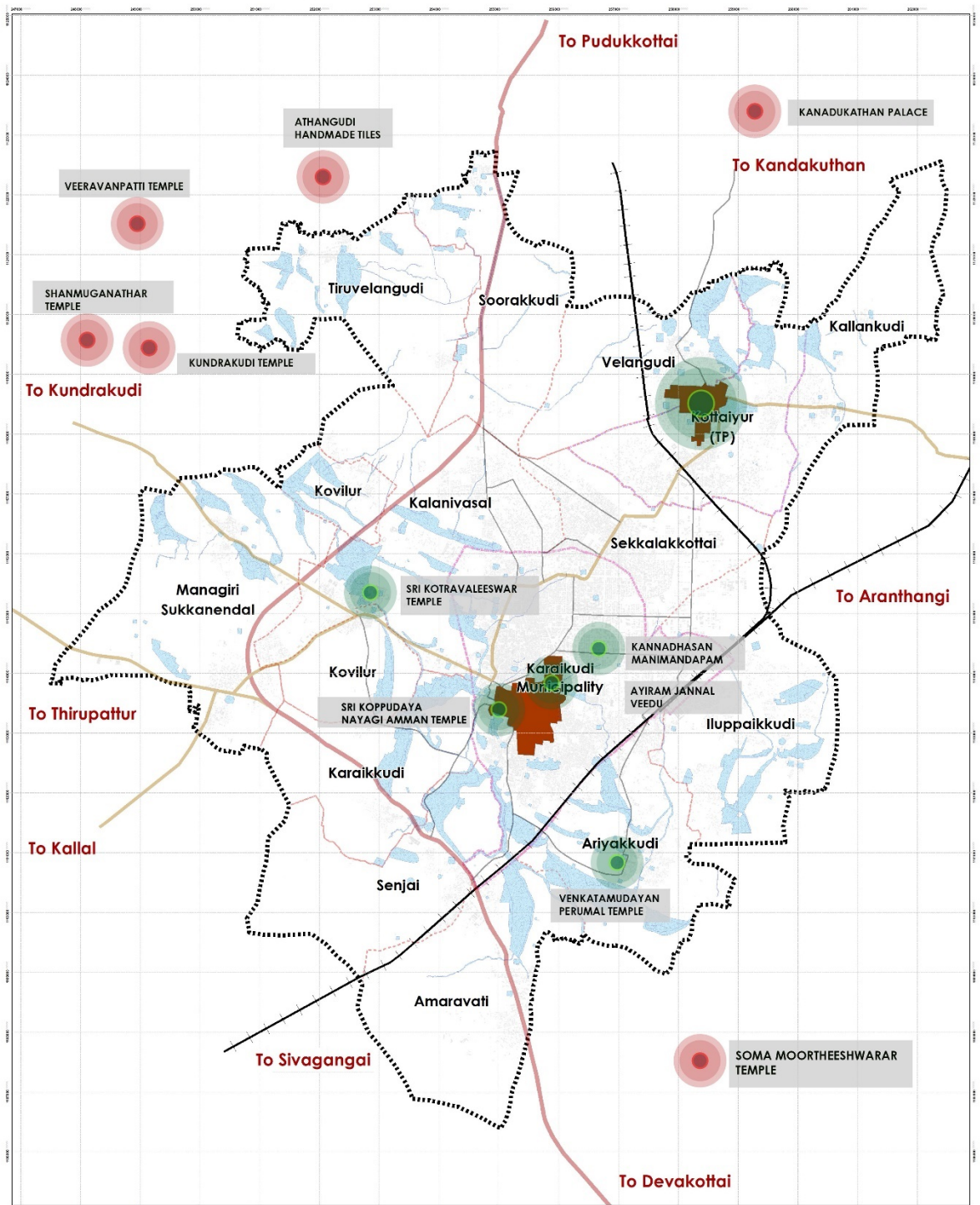
Figure 13.1 Development Concept

13.1.1 Residential

As discussed, previous paragraph Sankarapuram CT, (Kalanivasal, Sekkalakottai) Kovillur, Kottaiyur town panchayat will be the emerging residential areas due to the proximity and road connectivity. The eastern side of the Karaikudi Municipality has high potential for accommodate residential unite. However, municipality does not have space for residential development within jurisdiction. It can be achieved only through increasing FSI, by increasing FSI in residential area can protect environmental resources. Also, Illuppaikkudi, Amaravathi and Ariyakkudi, Managiri, and T.Soorakudi villages to be promoted for equitable growth all over the planning area. Promotion of equitable growth in the villages is important but at same time it has to be ensured protection of environmental assets. Masterplan is intent to promote regulated development in surrounding villages. Managiri, Amaravathi and T.Soorakudi likely to grow faster because of its connectivity and proximity to the National Highway. Illuppaikkudi and Ariyakkudi has both advantage and disadvantage, advantage is closure proximity to the town, disadvantage is railway line crossing and surrounded by environmentally sensitive area.

13.1.2 Commercial

Commercial activities are agglomerated within the Karaikudi Municipality along the major corridor. Karaikudi Municipality already experience severe land constrains considering future development envisaged outside the municipality along major road corridors of Kovillur road, Kalanivasal road, Sekkalakkottai or Kottaiyur road. The commercial activities that complement tourism needs to be given thrust to have balanced development commercial subcentres to be created in the Kalanivasal, Kottaiyur, Managiri and development envisaged area of T. Soorakudi. Also, uniqueness of art and handicrafts and handlooms needs specific market to



<p>Key Map</p>	<p>Legend</p> <ul style="list-style-type: none"> Old Settlement Tourist Spots within LPA Tourist Spots Outside LPA (Acos in Revenue) National Highway State Highway Major District Roads Railway Line Waterbody Settlement LPA boundary Municipality Boundary Town Panchayat Boundary Village Panchayat Boundary 	<p>0 0.5 1 2 3 Kilometers</p> <p>PROJECTION SYSTEM : UTM DATUM : WGS 1984 ZONE : 48N SCALE : 1:20,000</p> <p>MAP NO. 09</p> <p>Commissioner of Town and Country Planning Director of Town and Country Planning Government of Tamil Nadu</p>
<p>PROPOSALS FOR TOURISM IN KARAIKUDI LPA</p> <p>GIS BASED MASTER PLAN FORMULATION FOR AMRUT CITIES IN TAMIL NADU</p>		

Maps 13.1 Tourism zones within and outside of LPA boundary

13.1.3 Residential

As discussed, previous paragraph Sankarapuram CT, (Kalanivasal, Sekkalakottai) Kovillur, Kottaiyur town panchayat will be the emerging residential areas due to the proximity and road connectivity. The eastern side of the Karaikudi Municipality has high potential for accommodate residential unite. However, municipality does not have space for residential development within jurisdiction. It can be achieved only through increasing FSI, by increasing FSI in residential area can protect environmental resources. Also, Illuppaikkudi, Amaravathi and Ariyakkudi, Managiri, and T.Soorakudi villages to be promoted for equitable growth all over the planning area. Promotion of equitable growth in the villages is important but at same time it has to be ensured protection of environmental assets. Masterplan is intent to promote regulated development in surrounding villages. Managiri, Amaravathi and T.Soorakudi likely to grow faster because of its connectivity and proximity to the National Highway. Illuppaikkudi and Ariyakkudi has both advantage and disadvantage, advantage is closure proximity to the town, disadvantage is railway line crossing and surrounded by environmentally sensitive area.

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support indigenous workers of Ariyakkudi and Nesevallar colony in Kalanivasal.

13.1.5 industrialIndustrial

Karaikudi has oil, food Products, Metal works, wood works, furniture works, and auto works and large power loom and chemical industries. The cottage industries such as manufacturing of art and handicrafts such as temple products made up of bronze and brass materials. handloom. These cottage industries are uniqueness to Karaikudi area.

The existing SIDCO Industrial estate situated in Amaravathi puthur near Devakottai Rastha Station along the NH 365, and Power loom industries at Sankarapuram along NH 365 and few industries pocket along this road. This industrial area has to be strengthened and reserve the land for industrial development along the NH 365. Karaikudi is one of the influenced areas in the Industrial development corridor of Sivagangai District. Therefore, Tamil Nadu Government has initiated upgrading the existing link road of Karaikudi to Melur via Tirupattur. Extension of this road connects with 536 and NH 45C (an alternative trunk route for CKIC at the Karaikudi town). This road serves tourist traffic to Vettangudi Bird Sanctuary and pilgrim centers Pillaiyarpatti and heritage town of Karaikudi.

The additional area proposed for Industrial use is 1.29 sq.km, and around 75% of the area will be used for constructing Industries. An estimated 15,588 additional jobs are to be created in the industrial sector. The expected total number of employees working in the industrial sector is approximately 30,937 which is about 16.71% of total workers. As per URDPFI guidelines, 100 Industrial Employments can be created in one hectare. Through the proposed Industrial area, the employment that can be generated in the Area will meet the requirements as projected above.

13.1.6 Heritage and Tourism

In terms of Tourism, Karaikudi and Kottaiyur town panchayat has many heritage buildings called chettinad house (Kari veedu). Also, Karaikudi CLPA has historic temple and old unique historic buildings, which are under possession of private and government entity and these structures are added value for heritage and cultural tourism of Karaikudi CLPA. The majority of heritage buildings are private owned. It is to be ensured that the development objective should include amelioration of these value by appropriate measure development strategy.

The Karaikudi one of the UNESCO declared Heritage site “Chettinadu Region” has high potential for tourism development Karai veedu one of the unique identities for Karaikudi. The surrounding region have numerous tourists' attractive sites, Karaikudi town has advantage of its location characteristic connecting all tourism spots, so it acts as nodal area. Therefore, considering regional connectivity it is necessary to provide more Hotels and Lodges at the Karaikudi Municipality.

Also, Karaikudi is internationally recognized site the promotion of tourism by integrating the road and air transport by providing 2 days tourism package will attract more international tourists. Promoting helicopter tourism is added advantage Tamil Nadu Tourism Department has proposed site at Kanadukathan.

13.1.7 Transportation

The Karaikudi is well connected with surrounding region and larger cities. It has good road network NH 536 connecting north to south and SHs connecting east to west across the planning area. NH 536 function as bypass arrangements for Karaikudi town. Since, Karaikudi CLPA has planned grid-iron pattern roads and fair connectivity to villages. However, improper hierarchy road network system and narrow major roads hindering smooth flow of traffic. Hence, Grid of Roads Plan has been prepared for identifying new road proposal and wedding of existing roads. Also, identified following infrastructure improvement projects for strengthening of existing roads, such as new railway over bridge, flyovers, railway under

bridge, redesign of intersection pedestrian walk ways and new parking facility.

13.1.8 Environment

Karaikudi has the large number of water bodies and streams protection of these water bodies and streams is out most important in the environmental perspective. Encroachment of unauthorised building is seen to be cause for damage. Hence, profusely attempt require to protect water bodies. To propose measure for relocate required encroached settlement and conservations. Also, lake front development along the water bodies such as Bio parks which include the trees plantation, the small plants of flora with flower for insect pollinators (Bees and Butterfly's etc.), Bio Infiltration Basin, Path way, Community parks, Paly area, Rain Gardens, Infiltration Strip and Bio Fence also aid in purification of the environment through absorption of pollutants. It is vital that improving aesthetics as well as conserve lakes adopting water facilities such as sponge parks (include leisure and recreational) and that helps prevent flood in surrounding area. leisure and recreational to conserve lakes.

Similarly, conservation of forest and tree clad area from encroachment and anthropogenic activities compulsory and plan for safe guarding and improving biodiversity is essential. Reservation of green spaces in future land-use will provide spaces that can fulfil mitigation and adaptation purposes and that will ensure higher level of biodiversity within urbanised parts of Karaikudi. Afforestation of vacant land and OSR areas through various organization under CSR funding on a sponsorship or adoption basis. Unique feature of Thenar river and its linked water bodies are the major source of irrigation. The adjoining areas are the highly fertile and these agriculture lands are known for paddy, pulses, oil seeds cultivation. Therefore, master plan intent to protect the highly fertile agricultural land, and plantation continue with the present use and become prey to the adverse impacts of urbanization. These agricultural product storage and market facilities already established in the Karaikudi Municipality.

The recommendation for water pollution, air pollution and noise pollution dealt in details in the environmental chapter in the issues and potential report.

13.2 Proposal For Municipality Extension

As Karaikudi is an educational hub for the surrounding village. The major educational institutions of Alagappa University and Central Electro Chemical Research Institute are located on the eastern side of Karaikudi municipality, the north-eastern side of Illuppaikkudi village, and the South side of Sekkalakottai village about 1.06 Sq.km. The Precinct of educational institutions is situated in the center of the proposed corporation. The proposed Corporation will gain more importance in the education of the location of these two institutions, besides the development of tourism, trade and commerce, and transportation activities. Karaikudi and Kottaiyur core areas of rich cultural heritage Chettinad settlements and surrounding areas within 15 km distance (average travel time 30 minutes) have numerous sites with cultural, religious, and heritage significance. Karaikudi Municipality acts as a core center for visiting surrounding tourist sites.

The dairy development is also significant in this town, Food processing industries, and Engineering and Automobile services. The proposed master plan will focus on developing Karaikudi with a robust economy by utilizing its, trade and commerce, tourism, education, and industrial development in the peripheral area, and the development area will be part of the proposed corporation.

Public and Semi-public use such as sociocultural infrastructures, recreational and public infrastructures increase the better quality of living. Karaikudi has sufficient educational intuitions and healthcare facilities. Also, other facilities such as a Fire station, Police station, Burial grounds and 3 Judicial magistrate units, Principal District Munisif, Additional District Munisif, and Fast track court.

Karaikudi has well connected with two systems of public transport namely Bus service and Railways. Karaikudi municipality, has 2 bus stands, from the new bus stand TNSTC bus operated to Coimbatore, Tirupur, Erode, Salam,

Tiruchirappalli, Pudukkottai, Tiruvannamalai, Madurai, Ramanathapuram, Tirunelveli and Tirupathi in Andhra Pradesh. TNSTC intra-city buses and private service operators through mini-buses between various localities in and around the town.

Karaikudi is a vibrant junction in south Tamil Nadu. It connects Tiruchirappalli in the north via Pudukkottai, Madurai in the west, and Ramnathapuram in the south via Sivagangai and Manamadurai. Karaikudi railway line is well connected to Chennai most of the train comes from Rameswaram, Kanniyakumari via Manamadurai, and stops here.

The next important junction is Kottaiyur town panchayat is about 6.2 km from the Karaikudi junction around 7 minutes travel time. This railway connectivity boosts the development in Kottaiyur which is act as sub urban of Karaikudi municipality. Also, State Highway 29 connects Karaikudi municipality with adjoining Kottaiyur, Kandanur, and Puduvayal Town Panchayats. These three town panchayats are situated along the major land transport route between Karaikudi municipality and Aranthangi municipality from Pudukkottai District.

Though the town is characterized as a medium town, the population density of the town attained the desired range mentioned in URDPFI guidelines for a medium-sized town. Being a heritage town with several tourism destinations (Chettinad heritage tourism hub) an educational hub and recent industrial development, Karaikudi has many opportunities for education, employment, and better facilities attracting large migration of people to Karaikudi. This is associated with high population density. Furthermore, the exponential increase of population in rural areas particularly has an impact on the widespread distribution of population increasing in demand for the provision of services in the rural areas. Effective planning strategy, employment opportunities, and provision of other facilities will enhance the quality of life in villages government has proposed Karaikudi municipality be extended by adjoining 3 Town Panchayats and 5 villages and proposed as Karaikudi Corporation.

The current adjoining physical development does not have a disparity between rural and urban. The planning concept of Urban fringe and urban

periphery in this contest extended the village boundary which means these villages are already urbanized.

Hence, the census of India declares Sankarapuram Census Town (CT) by merging Kalanivasal, Karaikudi part, Senjai part, and Sekkalaikottai villages. Since Karaikudi is the largest urban area and Special Grade Municipality in the Sivagangai District having an annual income of above 37 crores. The following proposal has been made to increase visibility, effective strategic planning, and improved service provision.

The development of above said 3 town panchayats, and the surrounding 5 villages (Sankarapuram CT, Kovilur, Ariyakkudi, Illuppaikudi, and Managiri) was influenced by the Karaikudi municipality. The furthest distance of the extended local body is Pudevayal town panchayat which is located around 10km from the Karaikudi municipality. The proposed corporation area, population, and annual income details are given in Figure 13.2 and Table 13.1

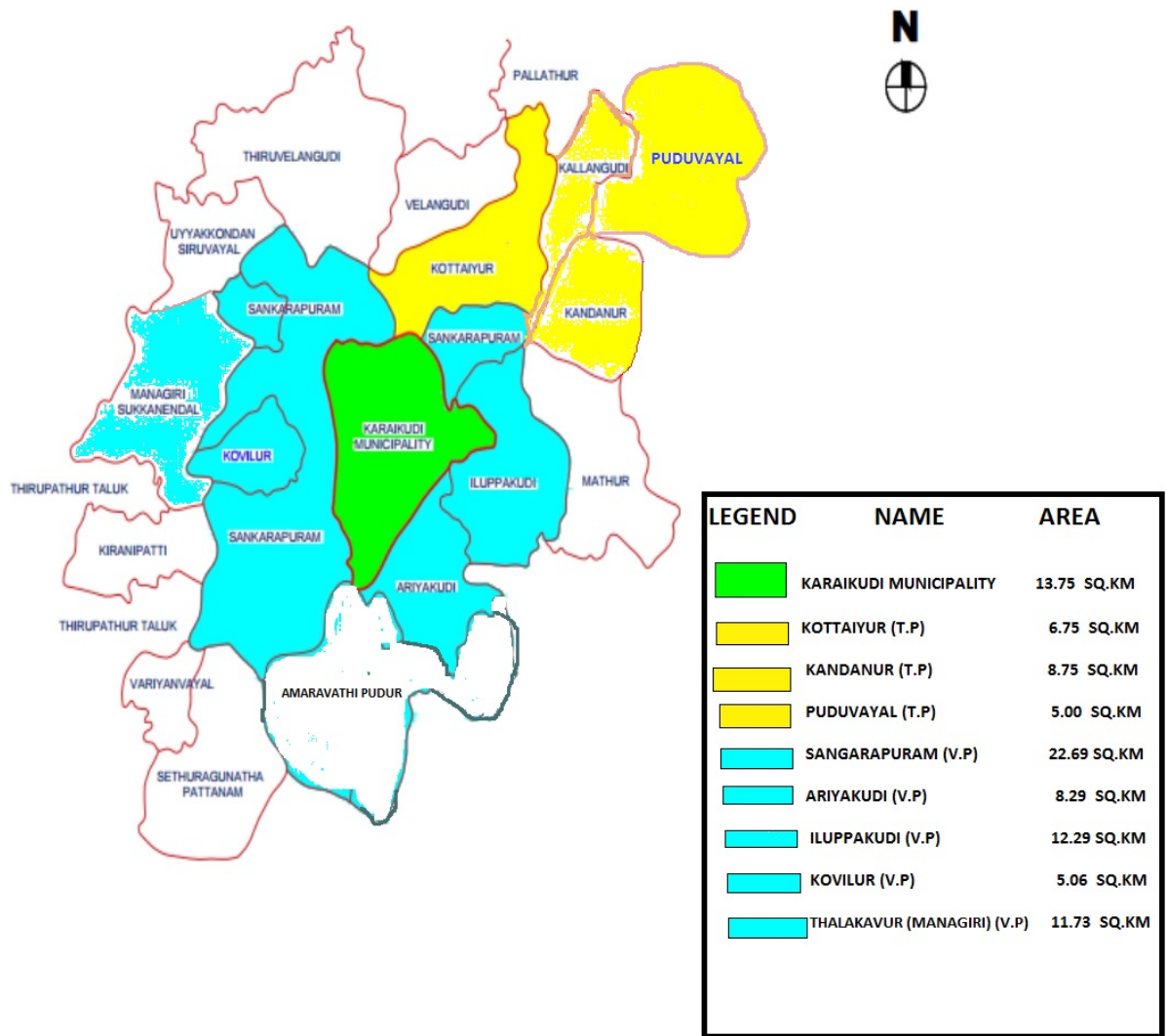


Figure 13.2 Proposed Extension of Karaikudi Municipality Limits

S · N o	Urban Local Bodies	Name	Area (Sq.K m)	Population			Income (Rs.in Crore)			Remarks
				2001	2011	2023	2019 -20	2020- 21	2021 -22	
1	Municipality-1	Karaikudi Municipality	13.75	86,422	1,06,714	1,31,120	32.6	34.6	37.0	Manifesto
2	Town Panchayat-3	Kottaiyur	6.75	1,633	14,766	50,164	5.03	3.2	4.8	
3		Kandanur	8.75	6,455	7,696	12,430	0.95	1.6	2.15	
4		Puduvayal	5.00	9,464	11,284	20,164	0.58	0.67	0.87	
5	Village Panchayat-5	Sankarapuram	22.69	24,422	30,188	53,476	1.53	4.27	6.04	
6		Kovilur	5.06	2,054	4,825	5,496	0.13	0.15	0.22	
7		Iluppakudi	12.29	5,112	6,399	9,768	0.88	0.89	1.33	
8		Ariyakkudi	8.29	5,102	5,538	10,532	0.42	0.55	0.82	
9		Thalakavur (Managiri)	11.73	3,800	4,440	10,141	0.4	0.75	1.21	
		Total	94.31	1,44,464	1,91,850	3,03,291	42.52	46.68	54.44	

Note: Certified that 3 Town Panchayat and 5 Village Panchayats which are proposed to include Karaikudi Municipality are located within Sivagangai District

Source: **Karaikudi Municipality**

Table 13.1 Proposed Extension Local Bodies Population and Income details

13.3 Proposal For Urban Renewal

13.3.1 Continuous Building Area

The core area of old city is congested, roads are very narrow, inadequate green and open space. Being a heritage town, the unique urban traditional buildings contributing to the city identity, however heritage buildings the front road facing was rebuilt and converted as commercial space. This leads to diminishing value of heritage building and also, heritage value of the town. Modern development planning did not consider tradition value of settlements because of that considerable number of old traditional houses completely demolished. Karaikudi old area has both traditional building (Karai veedu) and modern buildings. The traditional heritage settlements areas are demarcated based satellite imagery. Master plan proposed to conduct a study for preserve heritage value of the area, based on which declaring heritage zone and propose a heritage walk. The details regarding heritage building conservation are delt in detail in the proposed for conservation heritage building section.

Since, the old city area is rich in heritage value, it is challenging to carry down urban renewal project. According Karaikudi Master Plan 2001. the most populous and busy town Karaikudi in Sivaganga District, previously part of Pasumpon Muthuramalanga Thevar District 1972. Karaikudi does not have any historical background of interest like Sivaganga or Ramanathapuram. The origin of the town is not exactly known. But the settlement must have existed from Early 19th century as Sri Koppudaiya Nayagi Amman Temple, the oldest structure in the town tracks its history free 1800. The origin and growth of Karaikudi settlement is found around Sri Koppudaiya Nayagi Amman Temple. Therefore, Karaikudi Municipality old city area around is Sri Koppudaiya Nayagi Amman Temple considered for proposal for urban renewal. The oldest structure in the town tracks its history from Gazetteers 1972 and referred from the previous master plan 2001, the Continuous Building Areas (CBA) identified around temple. The specific urban renewal projects required to upgrade the CBA.

13.3.2 Administrative Setup of CBA

The Sri Koppudaiya Nayagi Amman Temple is the landmark for the CBA area. CBA has a total 5 wards, which are partially covered 8 to 12 wards. Ward 8 comprises 1 to 3 Blocks, Ward 9 has 4 to 5 wards, Ward 10 has 1 to 3 Blocks, and Ward 11 and 12 each have 1 Block. The combined area of CBA is 0.107 sq. km, with Ward 8 having the largest share, covering 26.42% which is equivalent to 0.028 sq. km. Meanwhile, Ward 11 and 12 occupy 23.14% (0.025 sq. km) and 21.71% (0.023 sq. km) of the total area, respectively. Ward 9 has a total area of 0.019 sq. km, which is 17.56 the total area. Ward 12 has the least share, covering only 11.16% of the total area at 0.012 Sq. km. Identified CBA buildings have no setback or less than a meter setback. CBA consists of old heritage buildings and modified new structures. The front portion of the heritage buildings has been converted into commercial shops. The major road-facing buildings are commercial in use.

13.3.3 Existing Land Use

13.3.3.1 Residential

The existing land use of CBA, the concentration of residential area is about 0.066 sq. km which is about 62.07% of the total area of the CBA. Among the residential area, the mixed residential use such as commercial cum residential accounts for 0.043 sq. km, representing 40.65% of the total residential area.

13.3.3.2 Commercial

The next highest land use is Commercial use is 0.025 sq. km which is 23.45% of the total area of CBA. Commercial development concentrated around Sri Koppudaiya Nayagi Amman Temple and intensified the linear developments along the major radial corridor from the temple. The unique commercial activity of selling antique products from heritage buildings is

located behind the Temple tank. This business has to be retained from the urban renewal process.

13.3.3.3 Institution

The share of the Institution is about 0.003 Sq. km which is 2.77% of total CBA. Religious buildings have a major contribution to institutional use.

13.3.3.4 Transportation

The area under Transportation use in CBA is about 0.004 Sq.km which is 3.46% of the CBA total area. The roads cover 100 % of total transportation use of the CBA. Transportation in existing land use comprises major road networks as follows.

1. 2nd Beat Road, the backside of Sri Koppudai Nayagi Amman Temple Pond has an 18-21m width (visible only 9 m)
2. Kovilur Road (2nd beat) to AR.A. Street has an 18 to 21m width
3. Sekkalai Road from the 2nd beat has a 9 to 12m width
4. Devokkottai Rastha via Sri Koppudai Nayagi Amman Temple has 9.2m width
5. AR.A. Street has a 6m width
6. Amman Sannathi Street has a 7.2m width
7. Kallukatti Road from Malaoorani road towards Sri Koppudai Nayagi Amman Temple has a 6m width
8. All other residential streets have a minimum 1 m to maximum 5 m width

13.3.3.5 Water Body

CBA has an extent of 0.009 sq. km under Water Bodies which is 8.25% of the overall CBA area. The major waterbody is the Sri Koppudaiya Nayagi Amman Temple tank and another stream that divides the north-south of the

CBA. There are some commercial constructions built on top of the stream. This situation needs to be avoided, the water bodies need to be conserved and protected from urban development.

13.3.4 Proposed Land use

1. There are no changes in the areas of water bodies and institutional use.
2. The land reserved for Commercial is about 0.073 sq. km which is 68.56% of the total CBA. This CBA has a high potential for general business that is trade and commerce activities.
3. The Master Plan 2041 envisaged that the greater number of buildings will have a greater chance of commercial conversion. The mixed-use of 0.043 sq. km area has been proposed for commercial use.

Table 13.2 Represents the Existing and proposed land use. The share of each land use in the CBA area is as follows.

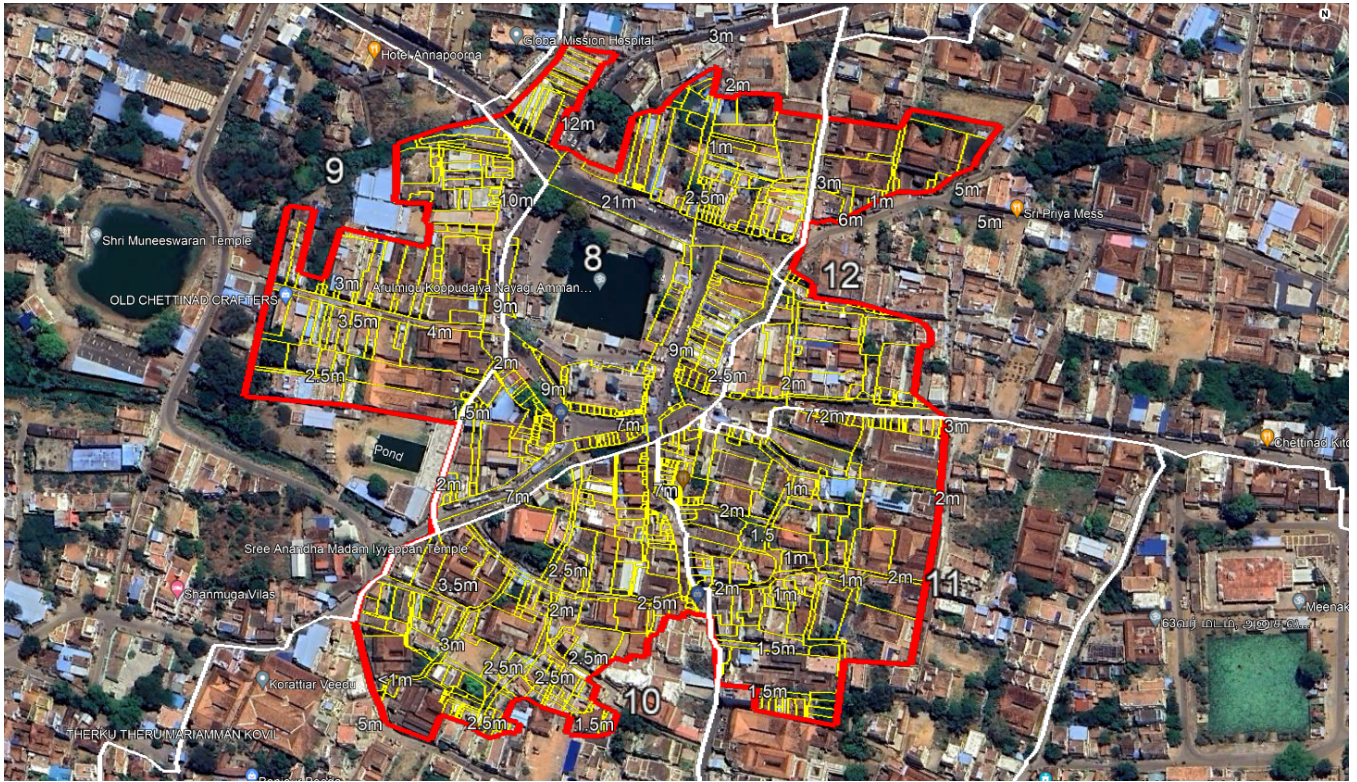
S.No.	Land Use	Area under each use as per Existing land use 2021 in Sq. Km	% Share in Total area in 2021	Area under each use as proposed land use 2041 in Sq.Km	% Share in Total area in 2041
1	Residential	0.066	62.07	0.018	16.66
2	Commercial	0.025	23.45	0.073	68.56
3	Institutional	0.003	2.77	0.003	2.77
4	Transportation	0.004	3.46	0.004	3.76
5	Water Bodies	0.009	8.25	0.009	8.25
		0.107	100.00	0.107	100.00

Source: Land use survey 2021 and Analysed

Table 13.2 Proposed Land Use Karaikudi CBA 2041

13.3.5 Schedule of CBA

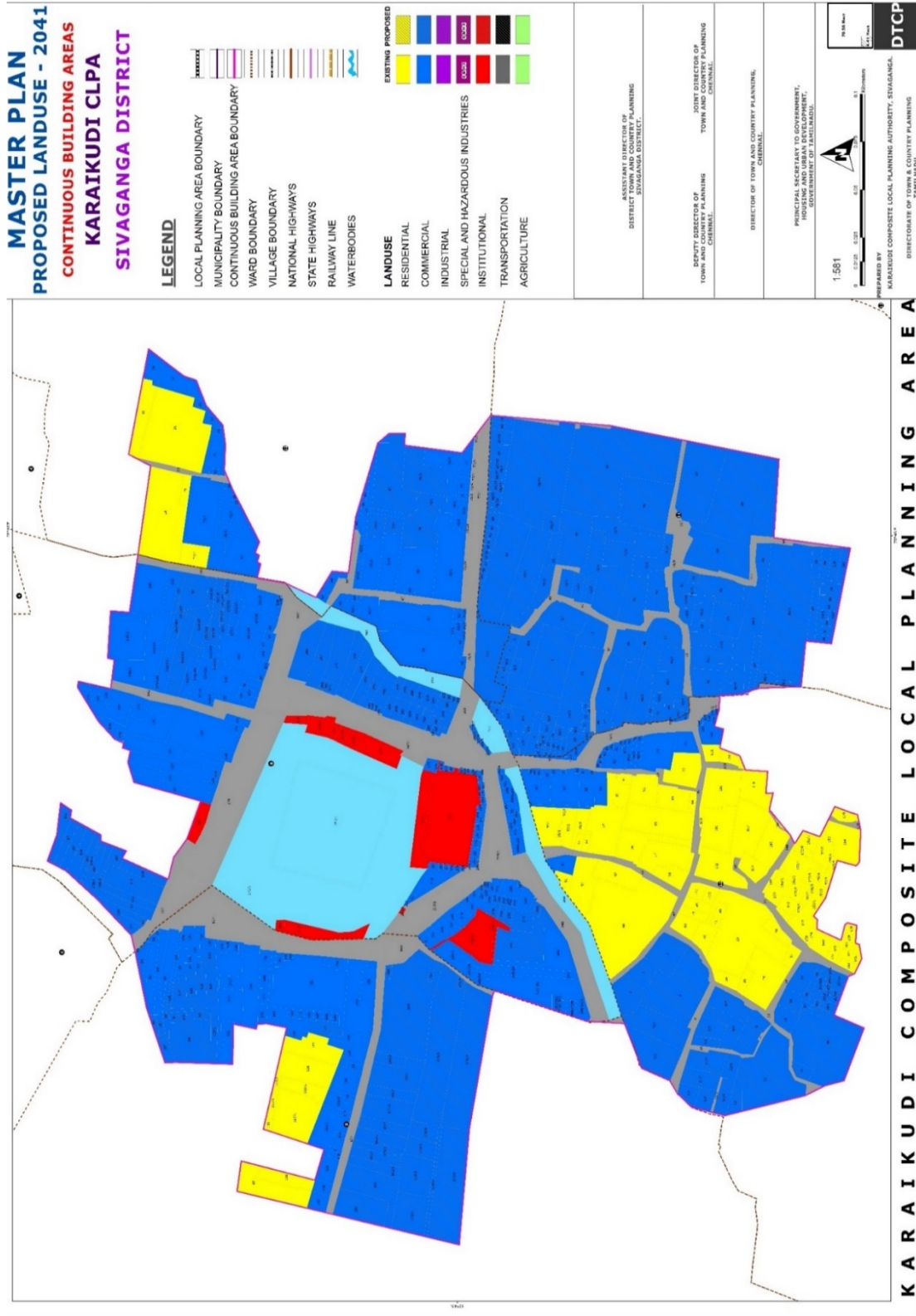
Proposed land use requirements of the CBA are worked out based on the proposed standards assumed on the lines of existing conditions and prospects of future development of CBA. The different land uses are combined and classified into 3 predominant land use classes. These proposed 3 land use classes exhibit in the land parcels in the tables (Refer Continues Building Area Schedule Volume 2). The schedule table is arranged based administrative setup. Karaikudi municipality Wards and Blocks.



- Karaikudi CBA boundary
- Ward boundary
- Major road
- Town survey boundary

The following Figures 13.3 and Map 13.2 show the CBA area boundary with Road width details and CBA area proposed land use map.

Figure 13.3 Karaikudi Municipality Continuous Building Area



Maps 13.2 Continuous Building Area Proposed Land Use Maps

Note: The draft stage of the Continuous Building Area is shown above. The details of CBA will be written in a separate chapter after approval from the concerned authority.



Narrow street with concrete road

Narrow Road with improper drainage

Old Heritage Building with less maintenance

Less than meter setback

Figure 13.4 Ground Surveyed Photos Showing Continues Building and Narrow Roads



Antique Shop



Narrow commercial street



Mixed use along Amman Sannathi Road



Front portion of heritage building converted for commercial shops

Figure 13.5 Ground Surveyed Photos showing Commercial Activities

14 PROPOSALS FOR INFRASTRUCTURE

14

14.1 Proposal For Economic Development

Karaikudi falls under influenced area of Industrial development corridor. The land allocation for Agro based food processing industries at Sanganthidal area in Sankarapuram CT. Engineering works and Auto works, Metal roofing manufacturing units expansion of Amaravathi SIDCO industrial estate, T.Soorakudi and Managiri area. TN govt. proposed extension of Aavin Dairy in Sankarapuram CT. Strengthening Tamil Nadu Petro Chemical Industries by product through promoting Textiles, Paper, Ceramics and in the production of jaggery manufacture industrial units along the NH 536 at intersection of SH191A. Also, Textile and Power loom industries along NH 536 at Senjai in Sankarapuram CT. These secondary manufacturing industrial sector will strengthen economy and provide lot of employment opportunities in this region.

To strengthen traditional handloom and art and handicraft household industries. Stablising specific market to support indigenious workers of Ariyakkudi and Nesevallar colony in Kalanivasal. At the same time city economy revolving around the trade and commerce related activities.

Commercial development, Master plan identify major roads which has sufficient width for commercial activities and same time regulate the conversion of the land use along the narrow roads. Also, adopts decentralised commercial developments by identifying the commercial subcentres at Kalanivasal, Kottaiyur, Managiri and T. Soorakudi.

14.2 Traffic And Transportation Proposal

1. Karaikudi municipality high priory to be given for pedestrians, to create pedestrian friendly environment. Provision of Pedestrian walk way (foot path) clear sidewalks of 1.5 meters and clear signed board for pedestrian walk, the major elements our streets need to incorporate to environment Clearly defined, safe pedestrian crossing at intersection and other elements in appropriate locations.

2. Comprehensive pedestrian network plan to be prepared to identify potential pedestrian only zones and also develop guidelines for overall safe and comfortable facilities to walk
3. Parking Management Plan: Congested commercial corridors and Market area, Bus stand and Railway station area for develop off street parking lots with public private partnership. Typically, in Karaikudi city needs Off street parking facility at Old Bus Stand. The part of old bus stand premises suitable for multi storied two-wheeler parking and unorganised parking space for regulated ground parking arrangements.
4. Managing on-street parking through Parking Zones: On-street parking is a crucial element of urban streets. Convenient on-street parking on commercial streets helps attract customers. On street parking to be regularised by alternative parking lanes, creating pull in -Pull out parking arrangements in wherever have adequate road width. on-street parking is organized and enforced well.
5. All new or strengthening of existing routes must be designed as complete street to accommodate all modes of transport.
6. Recognition and provision of specific area for informal shops within the market area and near temple surroundings and transit nodes.
7. Providing bituminous payment for all bus routes and all required city roads.
8. Redesigning, improving intersections, widening skewed junctions and connecting roads to and to reduce congestion in the network. (Refer figure 14.1)

9. New bridges/ROBs/RUBs are proposed at intersections of road and railway line. Bridges, flyovers /Grade Separators, RUB and ROBs are the treatments provided on the network at major junctions or at level crossings to provide uninterrupted flow to the traffic. (Refer figure 14.2)
10. Widening of carriage way of major roads which have more vehicular traffic and bus routes is to be carried out. Expanding ROW. It is proposed to enhance the road width to the next level of road hierarchy, improving linkages network follows required.
11. Strengthening of Ring and Radial roads which allows for the expansion of urban areas in a contiguous and compact manner. It also provides easy connections in both directions, with radials connecting with city's central areas and rings connecting with the surrounding villages. Some of these radials extend to connect with the Growth Centers.
12. In the Northern direction NH act as ring road and its half circle. On the southern side strengthening existing network is must. Proposed intermediate ring road T.Soorakudi (NH Junction) to Devakottai Rastha via Kottaiyur, SH29, College road, Railway station road and Ariyakkudi Road. Connectivity of these roads act as ring road in southern direction. (Refer figure 14.2) and Road
13. Cycling is the second most efficient, healthy and sustainable mode of travel for short to moderate distance up to 1 Km. Currently this mode is being used by a very limited user group within the city.
14. Proposed to develop Eco mobility corridor along Thenar river and chain of water bodies.

15. Karaikudi has grid and radial pattern of road networks and some major roads functioning as one-way streets. It creates absolute confusion and hazardous traffic movements. To avoid such a situation Road Markings and Signage's are mandatory. The road markings should be provided on all the primary network of the study area. All four categories of mandatory, cautionary, regulatory and informative signs should be provided at appropriate locations on the city road network.
16. During night time the visibility is poor. It is proposed to provide street lights on the major road sections. The heights of the street lights should vary between 12 to 15 mts. and should be spaced at 30 to 40 mts. intervals. Depending on the luminance and lux requirements, fluorescent or mercury lamps may be provided as the source of street lighting. High Mast lights should be provided at important and grade separated junctions
17. The public transportation facilities, city bus service can be provided by linking the major locations, Old Bus stand, new bus stand, Alagappa university and Koppudai Koppudaiya Nayagi Amman temple, Market area and other important locations. Increasing quality and quantity of public transport services attracts for a major shift from private modes.
18. Road widening Proposal by NHAI: National High Way Authority of India has plan to augment existing road Karaikudi to Ramanathapuram Section within Karaikudi. State High Way 35 Madurai Road also planned to improve about 500 m road length. NH 536 has a plan to widen a road width by augmenting 2 lane paved shoulders.
19. Proposal for widening existing roads and alignments new roads is given in Figure 14.4. The Grid of Road concept has been applied to propose a widening of existing roads and Propose New roads. The grid of road network plan is formulated for Karaikudi CLPA based on the function and capacity, the roads of Karaikudi CLPA four categories of roads

ensure a smooth flow of traffic. The identified based on the functional hierarchy are Arterials 18 to 24m, Sub-arterials 15 to 18 m, Collector Roads 12 to 15m, and Local Streets 9 to 12m. The widening of road cross-section of existing links can be improved through marginal land acquisition. And also, while widening of existing road, road straight alignment needs to be considered. The redevelopment of existing roads is proposed to be confined to alignments where improvements within the existing right-of-way are possible, or where additional right-of-way is available.

14.2.1 Road Development Proposals

There are 2 new Arterial roads, 4 new Sub Arterial Roads, 5 new collector roads, and 9 local roads. A total of 20 new road development proposals were identified as part of the formulation of the grid of road network plan. The proposed new Arterial roads cover villages like Ariyakkudi, Iluppaikkudi, Amaravathi within CLPA and vettaikaranpatti, Thottakkadu, and Mathur villages and Kandapur TP outside CLPA. The proposed new Sub arterial roads cover villages like Velangudi, Avidaipoigai in T.Soorakkudi, Amaravathi, and Managiri Within CLPA K. Nerpugapatti and Kallupatti villages outside CLPA. The proposed new Collector roads cover villages like Karaikudi, Managiri, Kalanivasal, T.Soorakudi, Thiruvelangudi, and Velangudi Within CLPA Koothalur and K. Nerpugapatti villages outside CLPA. The proposed new local roads connect villages like Sanganthidal in Kovilur, T.Soorakudi, Thiruvelangudi, Iluppaikkudi, and Kallankudi with major roads.

The total length of the proposed new roads is 83.00 km. of these, the total length of the Arterial Road is 33.1 km, Sub Arterial Road is 9.16 km, Collector Road is 30.88 km and Local Road is 9.86 km. Table 14.1 gives details about the proposed new roads in Karaikudi CLPA. Road widening is proposed to ensure the smooth flow of traffic and to cater to the volume of traffic in the future. There are 20 roads identified in Karaikudi CLPA for road widening and the total length of these roads is 79.19 km. Of these, 2 is an Arterial

Road, 3 roads are Sub Arterial roads, 11 roads are collector roads and 4 is a local road. Table 14.2 gives details about the proposal for road widening and proposed new roads in Karaikudi CLPA. (Refer figure 14.3)

S.No.	Road Description	Road Annotation	Proposed Road Width (m)	Length of the Road (Kms)
1	Amaravathi Pudur PS to Amaravathi Samathuvapuram	A1-A1	30	33.10
2	Ariyakudi Arch to TN warehouse - T Soorakudi Jn	B2-B2	24	9.16
3	Near NTEX Pvt to Varivayal	C2-C2	18	2.63
4	Annamalaipuram to Near Sub Register office	C5-C5	18	1.44
5	Sub Register office to Athankudi Perivu Road	C6-C6	18	4.90
6	Maruthi nagar to Nerupugapatti	C8-C8	18	5.16
7	Kottaiyur RS to Devaripatti Link Road	C11-C11	18	4.00
8	Alagapuri Link Road	C14-C14	18	2.11
9	Sekkalakottai Railway Feedar link Road	C15-C15	18	2.09
10	Ariyakudi to Thottakadu	C18-C18	18	3.54
11	Vaithiyalingapuram to Shakthi Nagar Ariyakudi	C19-C19	18	1.29
12	Thenathu Palam to Vettaikaranpatti link Road	C20-C20	18	3.73
13	Kovilur Near MRFTyres to Sankarapuram Link Road	D1-D1	12	2.66
14	Aruna Nagar to Kovilur Link Road	D2-D2	12	3.71
15	Aranmanaipatti to Saibaba Nagar Link Road	D3-D3	12	2.37
16	Vettiyur Kanmoi Link Road	D8-D8	12	1.12
			Total	83.00

Table 14.1 Proposed New Roads for Karaikudi CLPA

S.No	Road Name	Road Annotation	Road Type	Existing Road Width (m)	Length of the Road (Kms)	Proposed Road Width (m)
1	Amaravathi Pudur PS to Amaravathi Samathuvapuram	A1-A1	Arterial Road	7	9.72	30
2	Pandiyan Nagar Jn to O Siruvayal	A2-A2	Arterial Road	14	4.19	30
3	Palavankudi to Pallathur	B1-B1	Sub Arterial Road	7	9.92	24
4	Ariyakudi Arch to TN warehouse - T Soorakudi Jn	B2-B2	Sub Arterial Road	7	7.05	24
5	T Surakudi to Kottaiyur Katturani	B3-B3	Sub Arterial Road	7	4.23	24
6	Rastha to Nagavayal Road	C1-C1	Collector Road	7	2.69	18
7	Senjai kattamman kovil to Ayyappan Temple	C3-C3	Collector Road	5	2.88	18
8	Karaikudi Manjuvirattu thidal to Koviloor	C4-C4	Collector Road	7	3.61	18
9	Malaiettan Kanmoi to O Siruvayal X Road	C7-C7	Collector Road	9	5.61	18
10	Maruthi Nagar to Burma Colony	C9-C9	Collector Road	5	1.93	18
11	Kottiyur to Pallathur	C10-C10	Collector Road	11	3.61	18
12	College Road	C12-C12	Collector Road	16	3.67	18
13	CECRI to Kandamur	C13-C13	Collector Road	7	3.38	18
14	Alagappapuram to Mathur	C16-C16	Collector Road	4.5	3.66	18
15	Palaniyappa Arch to Thottakudi Link Road	C17-C17	Collector Road	7	3.92	18
16	Vaithiyalingapuram to Shakthi Nagar Ariyakudi	C19-C19	Collector Road	3.5	1.20	18
17	Ariyakudi railway Gate to Ariyakudi Link Road	D4-D4	Local Road	7	2.97	12
18	Ariyakudi to Unjankudi Link Road	D5-D5	Local Road	7	2.53	12
19	Shakthi nagar to Narasimman Nagar link Road	D6-D6	Local Road	4.5	1.04	12
20	Shakthi nagar to Kandamur Road link Road	D7-D7	Local Road	7	1.38	12
			Total		79.19	

Table 14.2 Road Widening Proposals

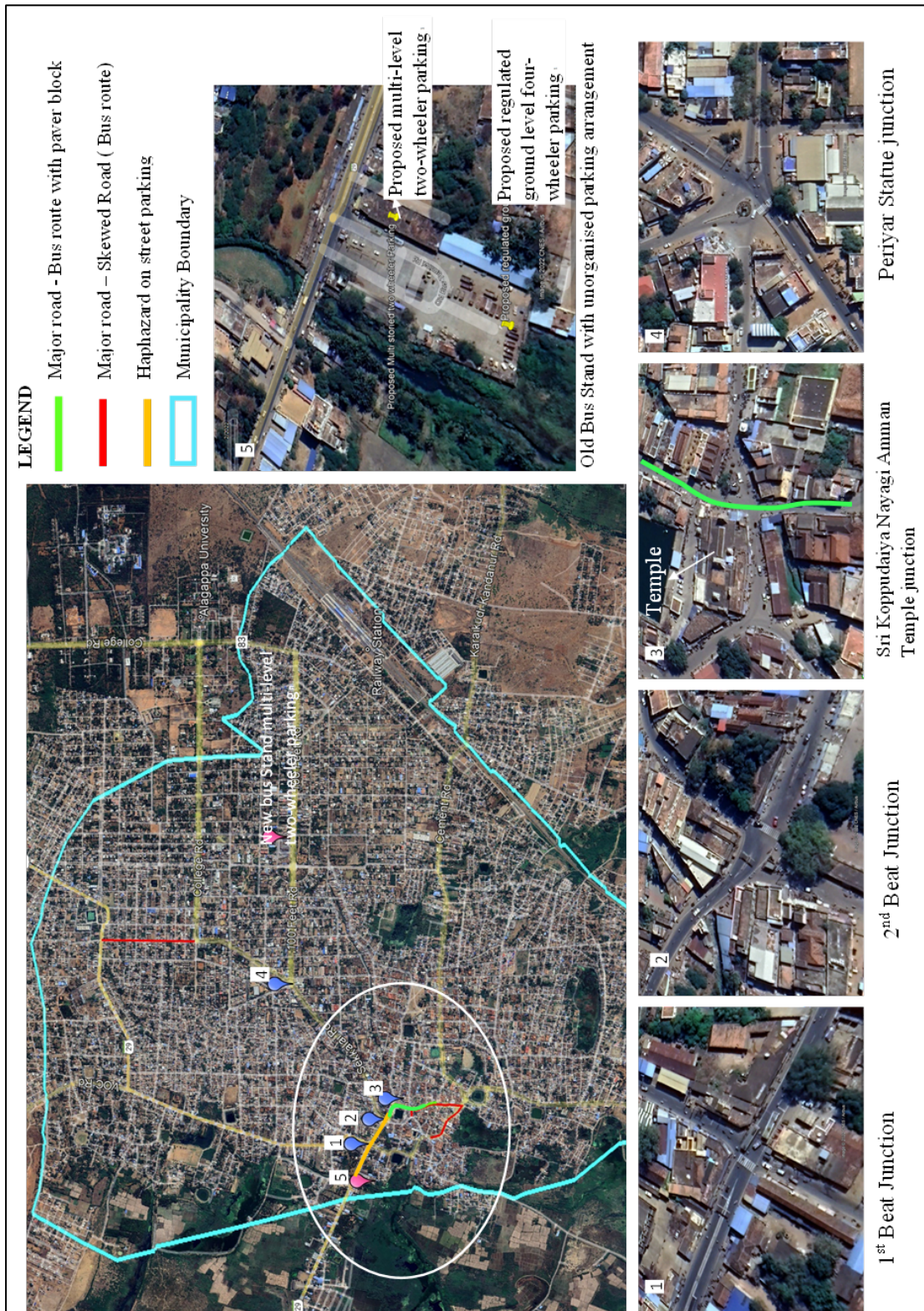


Figure 14.1 Redesigning, Improving Intersections, Widening Skewed Junctions and Connecting Roads

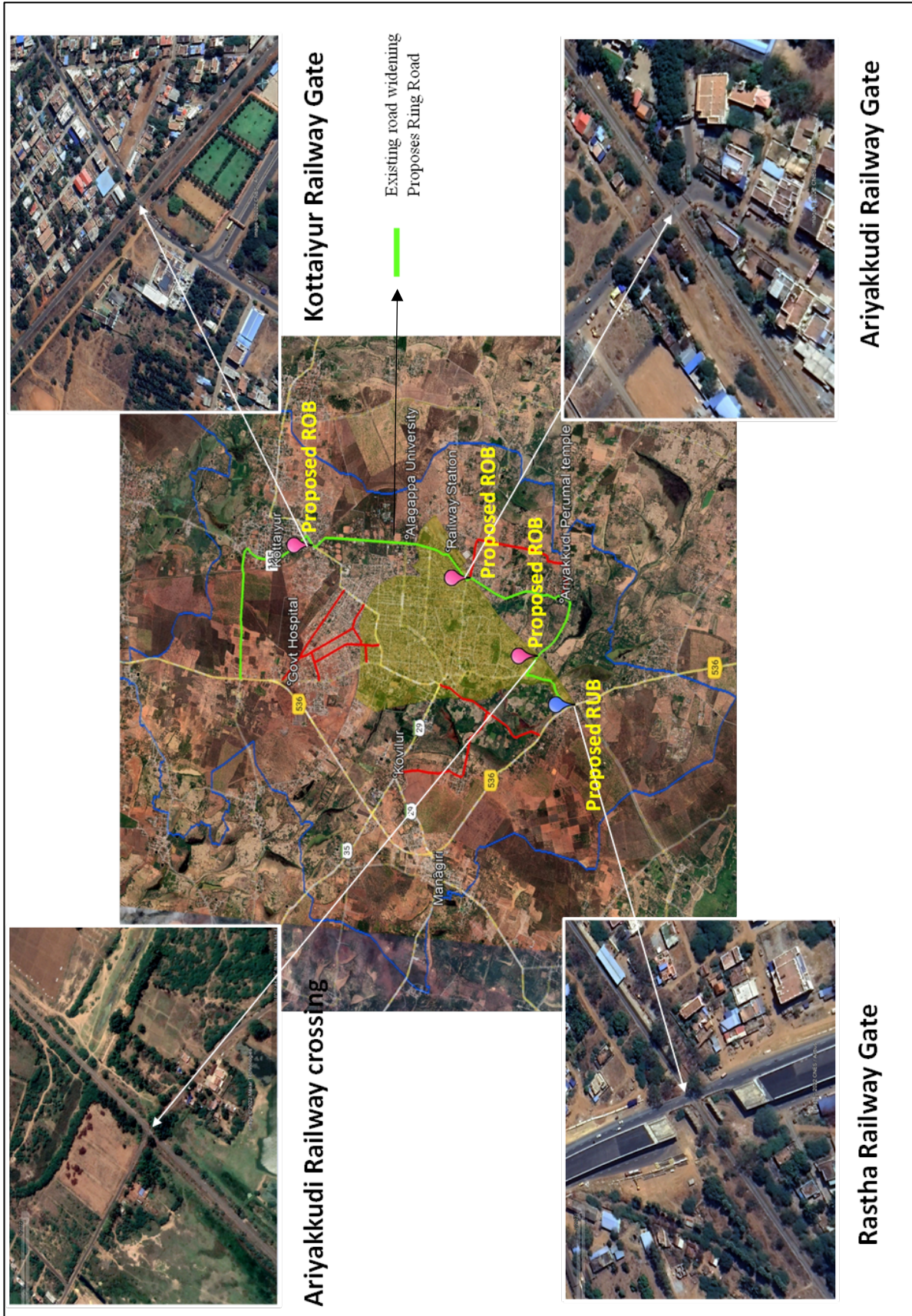


Figure 14.2 Proposed New bridges/ROBs/RUBs on the railway line

MASTER PLAN PROPOSED LANDUSE WITH PROPOSED ROAD NETWORK MAP

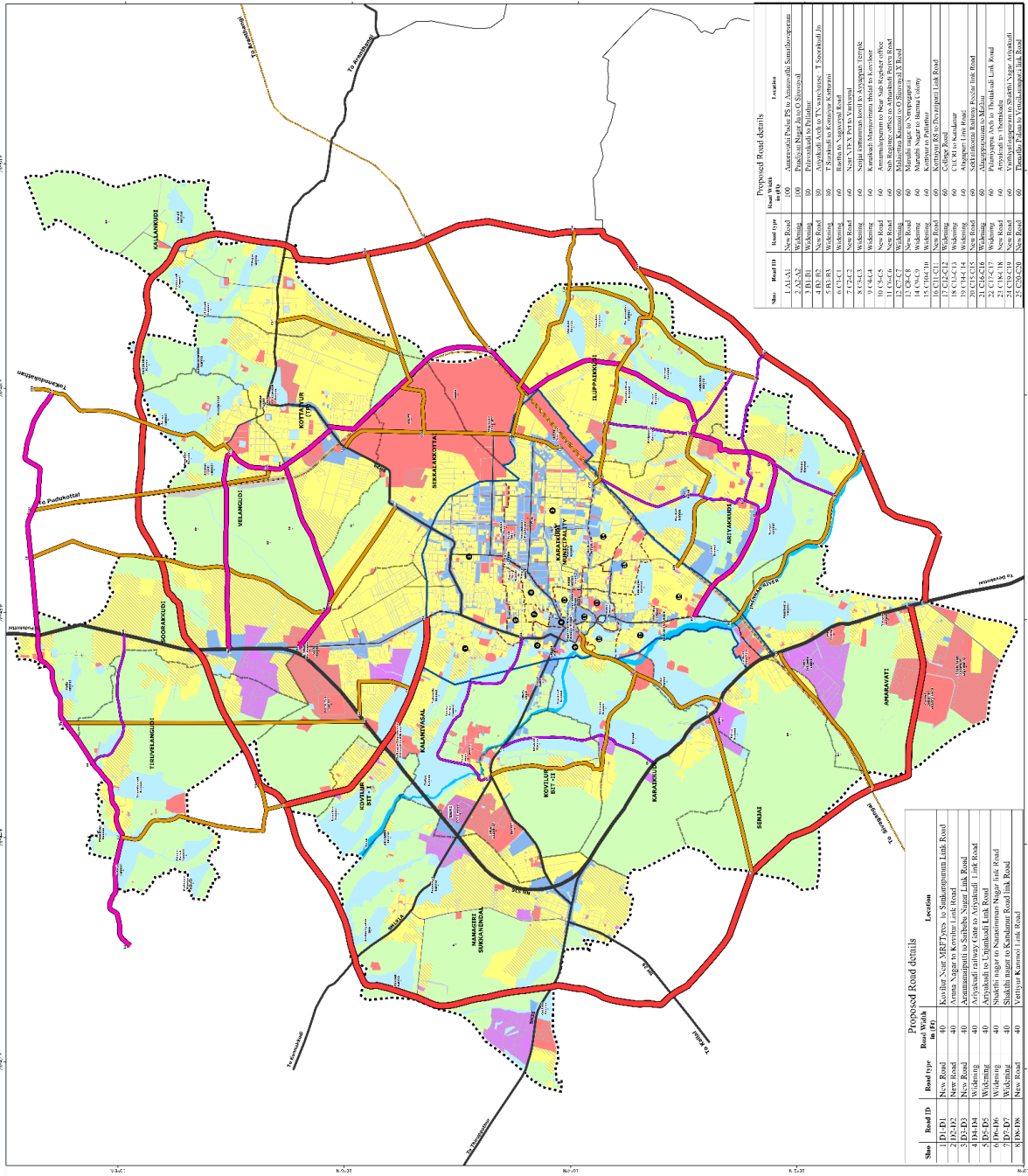
KARAIKUDI CLPA SIVAGANGA DISTRICT

LEGEND

- LOCAL PLANNING AREA BOUNDARY
- MUNICIPALITY BOUNDARY
- WARD BOUNDARY
- VILLAGE BOUNDARY
- EXISTING ROADS
- RAILWAY LINE
- WATERBODIES

EXISTING PROPOSED

- LANDUSE
 - RESIDENTIAL
 - COMMERCIAL
 - INDUSTRIAL
 - SPECIAL AND HAZARDOUS INDUSTRIES
 - INSTITUTIONAL
- TRANSPORTATION
- AGRICULTURE
- PROPOSED ROADS
 - 100 FEET ROAD
 - 80 FEET ROAD
 - 60 FEET ROAD
 - 40 FEET ROAD



Slno	Road ID	Road Type	Width in FT	Location
1	1-D1	New Road	100	Aravindan Nagar PS to Vinnangudi Sankarapattinam
2	1-D2	Widening	60	Aravindan Nagar to Vinnangudi Sankarapattinam
3	1-D3	New Road	60	Aravindan Nagar to Pallathurai
4	1-D4	New Road	60	Aravindan Nagar to V. Vinnangudi, T. Theerthakudi, J.
5	1-D5	New Road	60	Aravindan Nagar to Vinnangudi Sankarapattinam
6	1-D6	New Road	60	Aravindan Nagar to Vinnangudi Sankarapattinam
7	2-D1	New Road	60	N.S.R. V.P.S. to V. Vinnangudi
8	2-D2	Widening	60	Sankarapattinam to V. Vinnangudi
9	2-D3	New Road	60	Aravindan Nagar to Vinnangudi Sankarapattinam
10	2-D4	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
11	2-D5	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
12	2-D6	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
13	2-D7	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
14	2-D8	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
15	2-D9	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
16	2-D10	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
17	2-D11	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
18	2-D12	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
19	2-D13	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
20	2-D14	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
21	2-D15	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
22	2-D16	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
23	2-D17	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
24	2-D18	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
25	2-D19	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam
26	2-D20	New Road	60	Sankarapattinam to Vinnangudi Sankarapattinam

Slno	Road ID	Road Type	Width in FT	Location
1	1-D1	New Road	40	Kovilar Nagar MRF Jyoti to Sankarapattinam Link Road
2	1-D2	New Road	40	Kovilar Nagar to Vinnangudi Sankarapattinam Link Road
3	1-D3	New Road	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road
4	1-D4	Widening	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road
5	1-D5	Widening	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road
6	1-D6	Widening	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road
7	1-D7	New Road	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road
8	1-D8	New Road	40	Aravindan Nagar to Vinnangudi Sankarapattinam Link Road

ASSISTANT DIRECTOR OF PLANNING
DISTRICT OF SIVAGANGA DISTRICT

JOINT DIRECTOR OF PLANNING
TOWN AND CHERNAL

DIRECTOR OF TOWN AND COUNTRY PLANNING,
CHERNAI

PRINCIPAL SECRETARY TO GOVERNMENT,
HOUSING AND URBAN DEVELOPMENT,
GOVERNMENT OF TAMILNADU.

1:21,000

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Prepared by: [Signature]

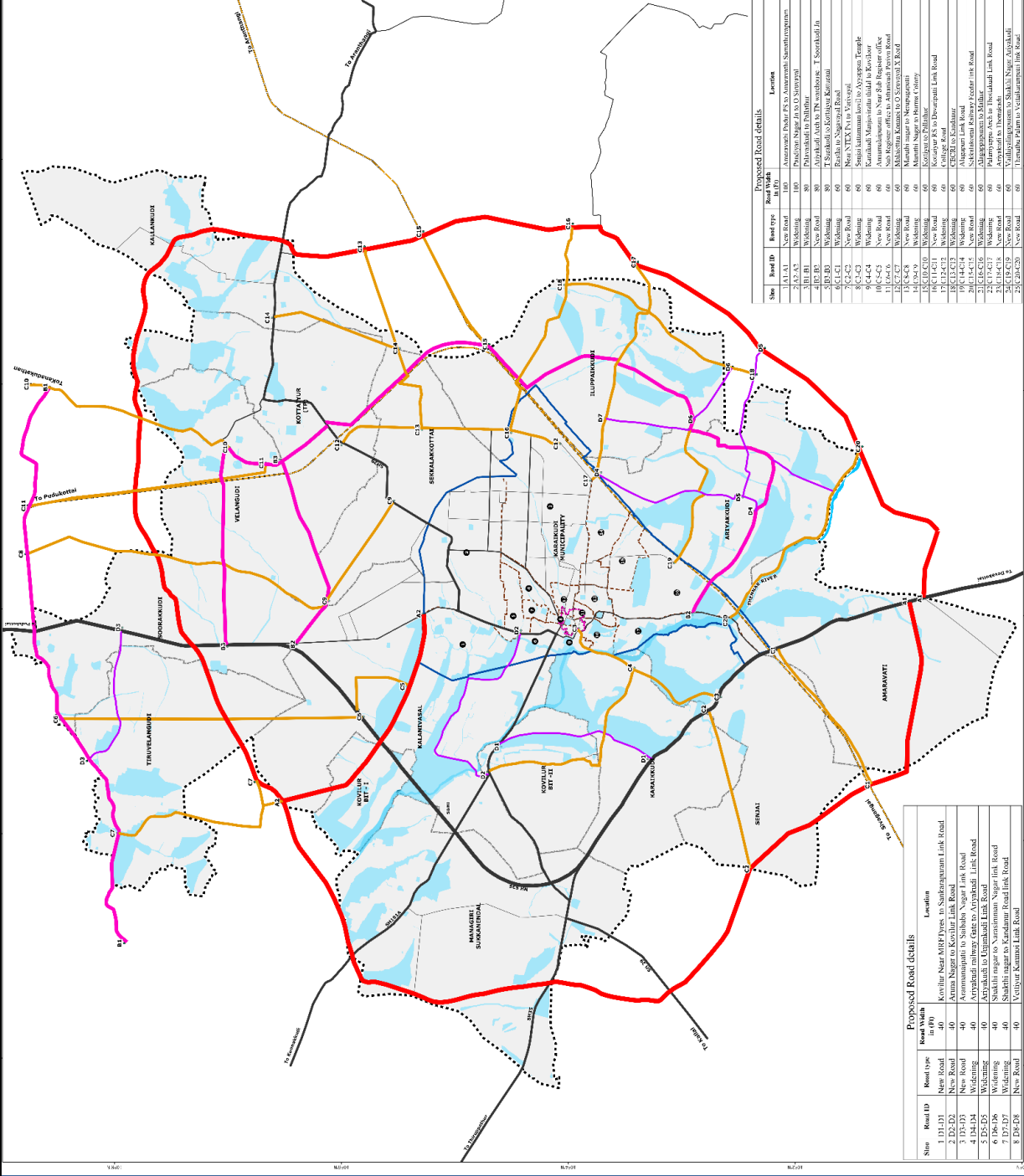
KARAIKUDI COMPOSITE LOCAL PLANNING AREA
 DIRECTORATE OF TOWN & COUNTRY PLANNING
 TAMILNADU
 DTCP

Maps 14.1 Proposed Widening of Existing Road and Proposed New Road

MASTER PLAN PROPOSED GRID OF ROAD NETWORK MAP KARAIKUDI CLPA SIVAGANGA DISTRICT

LEGEND

- LOCAL PLANNING AREA BOUNDARY
 - MUNICIPALITY BOUNDARY
 - WARD BOUNDARY
 - VILLAGE BOUNDARY
 - EXISTING ROAD
 - RAILWAY LINE
 - WATERBODIES
-
- PROPOSED ROADS
 - 100 FEET ROAD
 - 80 FEET ROAD
 - 60 FEET ROAD
 - 40 FEET ROAD



Sl. No.	Road ID	Road type	Road Width in FT	Location
1	1 D1-03	New Road	40	Kovilar Near MBF Types to Sankaranagar Link Road
2	2 D2-02	New Road	40	Arana Nagar to Kovilar Link Road
3	3 D3-03	New Road	40	Arannanpatti to Sathibohi Nagar Link Road
4	4 D4-04	Widening	40	Arannanpatti to Sathibohi Nagar Link Road
5	5 D5-05	Widening	40	Arannanpatti to Sathibohi Nagar Link Road
6	6 D6-06	Widening	40	Shahin Nagar to Sankaranagar Link Road
7	7 D7-07	Widening	40	Shahin Nagar to Sankaranagar Link Road
8	8 D8-08	New Road	40	Vethiyur Kannaal Link Road

Sl. No.	Road ID	Road type	Road Width in FT	Location
1	1 D1-01	New Road	100	Arannanpatti to Sathibohi Nagar
2	2 D2-02	Widening	80	Arannanpatti to Sathibohi Nagar
3	3 D3-03	New Road	80	Arannanpatti to Sathibohi Nagar
4	4 D4-04	New Road	80	Arannanpatti to Sathibohi Nagar
5	5 D5-05	Widening	80	Arannanpatti to Sathibohi Nagar
6	6 D6-06	New Road	80	Arannanpatti to Sathibohi Nagar
7	7 D7-07	Widening	80	Arannanpatti to Sathibohi Nagar
8	8 D8-08	New Road	80	Arannanpatti to Sathibohi Nagar
9	9 D9-09	Widening	80	Arannanpatti to Sathibohi Nagar
10	10 D10-10	New Road	80	Arannanpatti to Sathibohi Nagar
11	11 D11-11	New Road	80	Arannanpatti to Sathibohi Nagar
12	12 D12-12	Widening	80	Arannanpatti to Sathibohi Nagar
13	13 D13-13	New Road	80	Arannanpatti to Sathibohi Nagar
14	14 D14-14	Widening	80	Arannanpatti to Sathibohi Nagar
15	15 D15-15	New Road	80	Arannanpatti to Sathibohi Nagar
16	16 D16-16	Widening	80	Arannanpatti to Sathibohi Nagar
17	17 D17-17	New Road	80	Arannanpatti to Sathibohi Nagar
18	18 D18-18	Widening	80	Arannanpatti to Sathibohi Nagar
19	19 D19-19	New Road	80	Arannanpatti to Sathibohi Nagar
20	20 D20-20	New Road	80	Arannanpatti to Sathibohi Nagar

1:21,000

ASSISTANT DIRECTOR OF DISTRICT TOWN AND COUNTRY PLANNING, SIVAGANGA DISTRICT.

CHIEF ENGINEER OF TOWN AND COUNTRY PLANNING, CHENNAI.

DIRECTOR OF TOWN AND COUNTRY PLANNING, CHENNAI.

PRINCIPAL SECRETARY TO GOVERNMENT, HOUSING AND URBAN DEVELOPMENT, GOVERNMENT OF TAMILNADU.

PREPARED BY: KARAIKUDI COMPOSITE LOCAL PLANNING AUTHORITY, SIVAGANGA. DIRECTORATE OF TOWN & COUNTRY PLANNING, TAMILNADU.

Maps 14.2 Proposed Widening of Existing Road and Proposed New Road

KARAIKUDI COMPOSITE LOCAL PLANNING AREA

14.3 Proposal For Street Lighting

Street lights in the city spaced at an average distance of 40 m. As per URDPFI guideline street lights has to be kept in 30m interval. So present street light systems need improvement. The total street lights in the Karaikudi town the Tube lights and CFL lights contributes 89.41%, Kottaiyur town 92.69 % of total street lights, Villages like Illuppaikkudi and Sankarapuram CT has around 47% of the total street lights. This is cost intensive compared to LED light and Solar lamp. So, present street light systems need improvement. High Mast Lamp has to be placed at the strategic location in the important junctions and wherever necessary.

14.4 Proposal For Housing

The existing housing demand in Karaikudi CLPA is about 4,463 and proposed housing requirement is 45,566 in the 2041. The existing housing demand and future requirement in Karaikudi CLPA can be catered through various government schemes and encouraging private sector contribution. The housing schemes and projects are Tamil Nadu Urban Development Program (TNUDP)- for EWS, PMAY and Mass Housing Program. The government intuitions supporting housing project implementation are Housing and Urban Development Corporation Limited (HUDCO), Tamil Nadu Housing Board (TNHB), Tamil Nadu Urban Habitat Development Board (TNUHDB), Tamil Nadu Urban Habitat Development Board (TNUHDB) and Other intuitional setups are Co-operative Housing and Co-operative Housing.

14.4.1 Proposal for Rental Housing

The share of rental ownership is high in urban areas, Karaikudi Municipality, Kottaiyur and immediate surroundings Sankarapuram CT, Iluppaikkudi, Kovilur, Managiri villages. and the need of rental housing demand is catered by private house owners. The local body can tap this opportunity by providing rental accommodations. Also, promote rental apartments in the Karaikudi municipality and immediate surroundings.

14.5 Proposal For Physical Infrastructure

14.5.1 Water Supply

To enhance the coverage of safe drinking water supply, the following strategies are recommended. It is suggested that declaring the Sambai Ootru and its catchments as protected wet land. To meet the current water demand TWAD board has proposed augment the water source from Kaveri River at Kulithalai through Combined Water Supply System (CWSS). The proposed CWSS is for entire district; the projected quantity will not meet the required quantity of CLPA. It is proposed to augment the existing ground water source, water bodies need to rejuvenated and improved rainwater water harvesting system to be developed. The details regarding ground water recharge and surface water protection has been delt in details separate chapter. In Karaikudi Municipality, projected quantity requirement is 14.63 MLD, for immediate demand proposed CWSS Project water supply will be supplied is 3.39 MLD in the year of 2023. Remaining exiting demand of 2.64 MLD should be fulfilled by borewells. In future 8.60 MLD can be augmented through groundwater resource development, Rainwater harvesting and increase intake from CWSS project. 1.69 MLD in Kottaiyur. And, in villages is 5.27 MD and over all Karaikudi CLPA total required quantity is 21.18 MLD.

Proposed to have effective water management system within the local bodies. It ensures that the improved quality and quantity of water supply to user. The city's existing old water supply distribution networks should be replaced new larger network. Wastage and spillage in public supply line required measures to be taken to reduce the losses. Additional storage reservoir capacity should be built as per the projected requirement. Groundwater recharge and Rainwater harvesting can significantly improve the ground water level and can reduce the water demand from the direct source to a larger extend, proper measures should be taken to make them mandatory.

14.5.2 Sewerage

As per TWAD board reports in Karaikudi Municipality, The STP is originally designed and sanctioned for ultimate requirement of 20.24 MLD in the original estimate. The present demand of 16 MLD has been satisfied. Additional 0.77 MLD required for population 2041, this can be augmented by utilising ultimate the excess capacity planned by the TWAD board. It is proposed to have co-treatment system that is septage disposal arrangements in the existing STP.

Separate Faecal Sludge Treatment System FSTP at Kottaiyur town panchayat with cluster approach by clustering adjacent villages into treatment coverage. Sankarapuram CT is part of Karaikudi urban agglomeration where next level amenities being concentrated this area must be considered for individual centralised treatment arrangement (STP) at Survey number 55, present RRP location in Kalanivasal village, Sankarapuram CT. Decentralised sewage treatment for individual establishments and large apartments shall be made mandatory as per combined building and development regulation.

It is proposed to ensure proper coverage of community toilet and public toilets in terms of connectivity and sufficient number of seats. Provision of sufficient number IWSC through SBM rural at Sankarapuram CT is mandatory.

Proposed arrest and convert all insanitary toilets from HHs and establishment long the water channel sanitary and ensure all toilets are connected with UGSS network or other proper decentralised treatment coverage.

Sewage water treatment and management related NGT recommendation and EIA report delt in details in the environmental chapter in the issues and potential report.

14.5.3 Solid Waste Management

All local bodies must ensure 100% Door to Door collection of waste on daily basis. Households must be educated for segregation of waste at source. The street sweeping activities can be given to private contractors for all

wards in the municipality, Kottaitur TP and Sankarapuram CT. The collection and transportation of garbage must be mechanized and safe disposal of waste is to be ensured. Decentralising solid waste disposals for large private apartments and establishments made mandatory as per SWM rule 2016 and CPHEEO Bulk Waste Generator implementation guideline.

According to NEERI standards, Karaikudi municipality only needs a composting unit of 56.4 MT per day by 2041, as the average biodegradable waste is around 58%. The current 13.7-acre land is sufficient to handle a total of 68.5 MT per day, so no additional land is required. The focus for Karaikudi municipality should be on managing legacy waste at landfill sites to reduce dumping. Kottaiyur town panchayat requires an additional 2.15 acres of land, which is available closer to the existing RRP. Kalanivasal and Managiri villages will need additional land areas of 3.11 and 1.29 acres, respectively, for solid waste management in 2041. Meanwhile, Arriyakkudi and Illuppaikkudi villages have excessive land areas of 3.48 and 2.54 acres, respectively. The village-wise land area availability and requirements are given in Table 10.17.

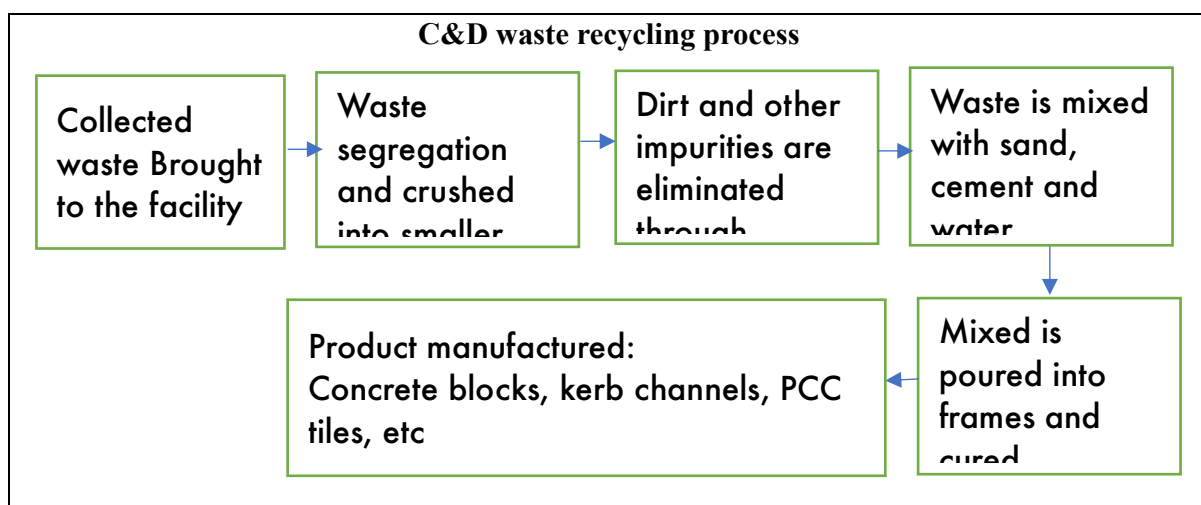
The present SWM area available in CLPA is 30.7 acres. Projected solid waste management area requirement in 2041 is 5.75 acres in Karaikudi Municipality (it includes Avg. 10,000 population). Karaikudi is proposed as a corporation by merging nearby local body. An additional area of 6.02 acres from Arriyakkudi and Illuppaikkudi can be tapped for additional requirements. The present Karaikudi has only a 13.75 Sq.km area and, Karaikudi ensures 100% door-to-door collection of waste daily so collection vehicle requirements may not be appropriate to calculate on a household basis. Since, the collection vehicle's additional requirement for the present Karaikudi in 2041 is Truck 1, Auto Tipper 4, and compactor vehicle 1. Similarly, Kottaiyur town panchayat's additional requirement for SWM vehicle is 14 primary collection vehicles and 1 compactor, 1 tipper lorry, one mini BOV for secondary collection.

Managiri needs to improve its collection efficiency to ensure 100% door-to-door collection of waste on a daily basis. In the village of Kalanivasal, households should be encouraged to segregate waste at the source.

Currently, 87.5% of the waste collected is mixed and dumped in landfill sites, indicating a lack of source segregation at the household level. To achieve 100% collection and segregation, massive IEC awareness campaign “Peoples movement for clean cities” to be in all local bodies. To reduce the land required for landfills, it is possible to propose MCC and OCC in the existing available land area of Kalanivasal and Managiri villages. As suggested by Tamil Nadu Swatchh Bharath Mission, Micro Composting Centre (MCC) based solid waste management can process upto 5 Tonne of organic waste per day. Onsite Composting Centers (OCC) can be established in parks / gardens / Markets and wherever space is available. OCC can process upto 0.5 Tonne of organic waste per day.

The collection of C&D wastes operationalised in the Karaikudi municipality whereas recycling and reusing is to be adopted. Master plan intent to utilise Senjai burial ground for Combined C&D waste processing unit. The following process can be considered.

In villages is Karaikudi CLPA, Introducing and enhancing Community bio-gas or recycle of waste for productive use. In villages many of the solid wastes having economic values and this can be recycled for reuse. For example, food, cow dung, leaves, vegetable, etc. Decomposition of these bio solids, bio-gas could be produced under favourable conditions.



14.5.4 Storm Water Drainage

The existing natural drains (Odai's) are flowing between potable water bodies in and around the town. It is proposed to convert all kutchra or natural drain flowing within the towns into pucca lined drains estimated length is 85.31 km. To prevent uncontrolled garbage dumping in the storm water drains closed construction drains needs to be built in all parts of dense settlements areas. Open natural drainage water must be treated before being released into the water bodies. Nature based wastewater treatment plants must be established at inlet location at water bodies.

Silting, disposal of construction waste, solid waste dumping on the banks of Odai and Urani's and connecting flowing channels which have either got encroached upon or choked over the years of negligence and no maintenance. Local bodies, PWD and TNPCB can initiate measures like desilting of lakes, fencing and creation of buffer zones should be taken up for protection of water bodies.

Major source of drinking water is from subsurface, to increase the ground water recharge it is proposed to providing infiltration tanks or pits at an interval of 20m. It would increase the recharge of ground water table and improves the quantity of water supply.

Proposed to strengthen the primary drains of North Urani Street, Pillayar Coodam Street, Alagappan Street, Pugazhendhi Street, Marudhuapandiar Street, Sekkalai Thiyagarajan Chettiyar street, Arunachalam Chettiyar street, Pillayar Koil Street, Swaminathan Achari Street, Srinivasan Street, North Lane 1,2,3, Middle Lane, South Lane etc.

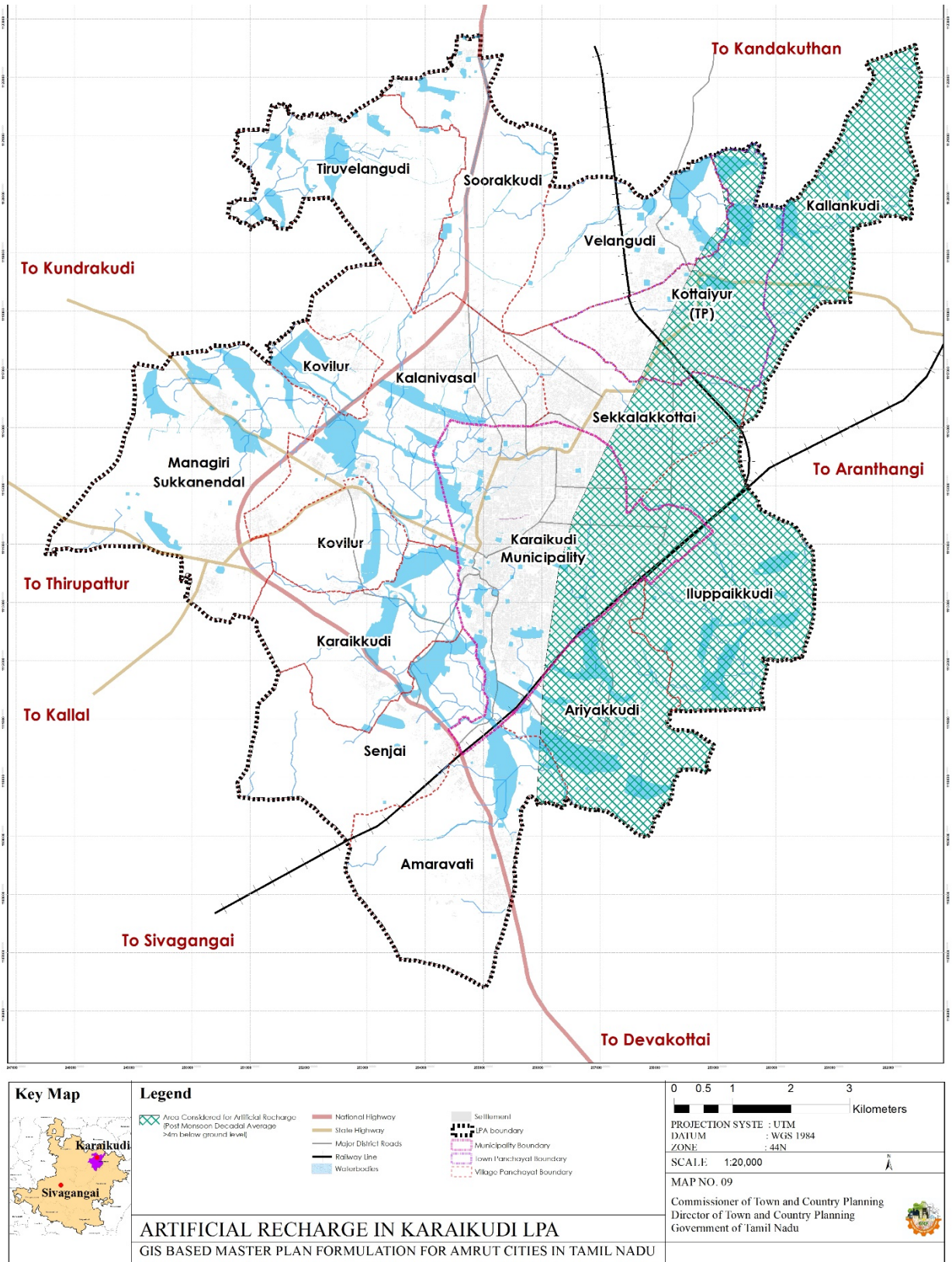
14.6 Proposals For Groundwater Recharge

The proper artificial recharge structures have to be constructed based on local geological conditions in the areas of existing infrastructure for recharging groundwater according to their extraction needs. Increasing the artificial recharge structures in the proper areas may avoid the depletion of groundwater. The unused dug wells and bore wells can be used as artificial recharge structures will be good concept in recharging the

ground water. It proposes to strengthen the regulating powers of Panchayat and Municipal bodies related to Ground water in line with articles 243G and 243W of the constitution. The master plan proposed to have detailed study to improve groundwater resources in terms of quantitative and qualitative aspects. Feasibility study must include following the CGWB suggestions, data pertaining to a period of at least 10 years is recommended for examining the trend of ground water levels in an area. Contour maps prepared from the average post-monsoon water level data with suitable contour intervals can be used for assessment of available storage space. The cut-off water level is so selected to ensure that the recharge does not result in water logging conditions in the area. Groundwater recharge plans has to be strictly followed by with of implementing the groundwater laws to combat adversaries. Reforms undertaken/being undertaken/proposed if any. Road Map of activities/tasks proposed for better governance with timelines and agencies responsible for each task/activity. Installation of Automatic water level recorders in the sensitive and more water level fluctuation in the bore wells will be helpful to monitor the extensive depletion of groundwater areas.

14.6.1 Identification of the area for Artificial Recharge

The CGWB has prepared Master Plan for Artificial Recharge to Groundwater in India (2019). Along with State agency the suitable areas have been identified at Tamil Nadu level, the area for recharge is 91,224 Sq.km. The area characterized by depth to water level more than 4 m during the post monsoon period (Jan 2019) coupled with declining decadal long term water level trend (Jan 2010 – Jan 2019) of more than 0.1m/yr, is considered as area requiring intervention through artificial recharge. In addition, the localized pockets of intensive agriculture and industrial activity identified by state agencies and select locations of sedimentary aquifers of multi layered aquifer system requiring special intervention have also been considered. The southeast of Karaikudi CLPA identified for recharge, the total area is 35.66 Sq.km and given in Figure 14.5.



Source: **CGWB - Artificial Recharge Master Plan 2020**

Maps 14.3 Area considered for Artificial Recharge

It is imperative to increase the density of suitable artificial recharge structures across the identified areas of the Karaikudi CLPA in order to further rise the status of groundwater storage without compromising the current developmental level. The Govt. Department / Agencies have involved in construction of artificial recharge structures under various schemes like MGNREGA and renovated water bodies under Kudimarammathu scheme. The District Rural Development Agency (DRDA) is major contributor for Artificial Recharge structure and Kudimarammathu from last 5 years, other State Agencies such as Agricultural Engineering Department, Public Works Department, Tamil Nadu Water Supply & Drainage Board and Forest Department. A Tamil Nadu case study, Gangavalli Block, Salem District was the best example for the highest groundwater development (221%) in 2004. The proposals include structure for augmenting water supply points and for augmenting the irrigation sources. A total of 41 structures, which include, check dams, percolation ponds, injection wells and revitalization of existing structures, etc. were constructed to augment the groundwater resources. Observation wells were established adjacent to the structures to study the impact. The assessment study showed positive impacts in terms of cropping area, well yield, water level rise etc. (Suresh & Subburaj, 2008).

14.6.2 Artificial Recharge

Karaikudi CLPA planning of artificial recharge to augment the natural ground water recharge. The planning area may be a watershed, a limited area covering an urban, rural or industrial centre. Design aspects provided in the Manual on Artificial Recharge of Ground Water, Central Groundwater Development Board. The selection of a suitable technique for artificial recharge of ground water depends on various factors, it includes Quantum of non-committed surface run-off available, Rainfall pattern, Land use and vegetation, Topography and terrain profile, Soil type and soil depth, Thickness of weathered / granular zones, Hydrological and

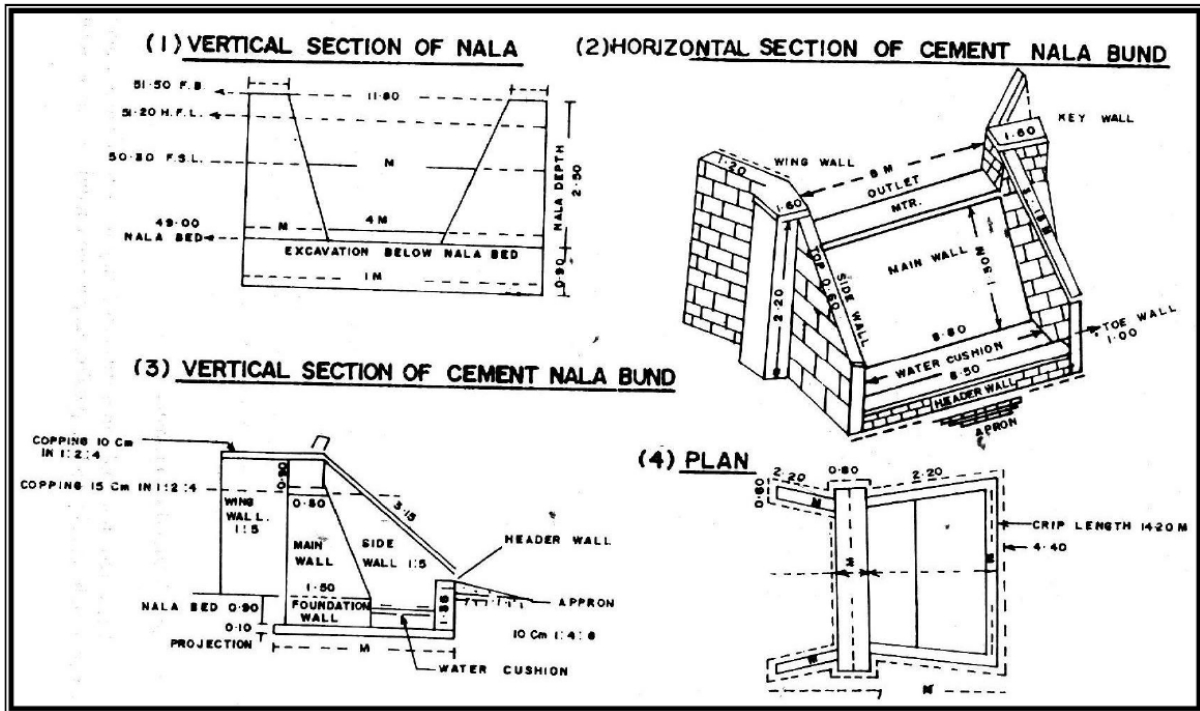
hydrogeological characteristics, Socio-economic conditions, and infrastructural facilities available, Environmental and ecological impacts.

In Karaikudi CLPA primary important is modification of existing tanks as recharge structure. And other Runoff Conservation Structures, such as, Nalah Bunds, check dams and percolation ponds. Subsurface techniques such as Injection wells or recharge wells and Gravity head recharge wells. Modification of existing tanks as recharge structure

In Karaikudi CLPA, the existing tanks are silted and damaged, can be modified to serve as recharge structures. Removing Juliflora, water hyacinths like Aagaya Thamarai, Elephant Grasses, Amanakku (Castor bean plant) and Desilting of existing tanks together with proper provision of waste weirs and cut off trenches on the upstream side can facilitate their use as recharge structures. As such tanks could be converted into cost-effective structures for augmenting ground water recharge with minor modifications.

14.6.3 Nalah Bunds and Check Dams

These structures are constructed across nalahs or streams to check the flow of surface water in the stream channel and to retain water for longer durations in the pervious soil or rock surface. The nalah bunds and check dams are constructed across bigger streams and in areas having gentler slopes. These may be temporary structures such as brush wood dams, loose / dry stone masonry check dams, Gabion check dams and woven wire dams constructed with locally available material or permanent structures constructed using stones, brick and cement. The following Figure 14.6 shown Design Aspects of a Cement Nalah Bund.

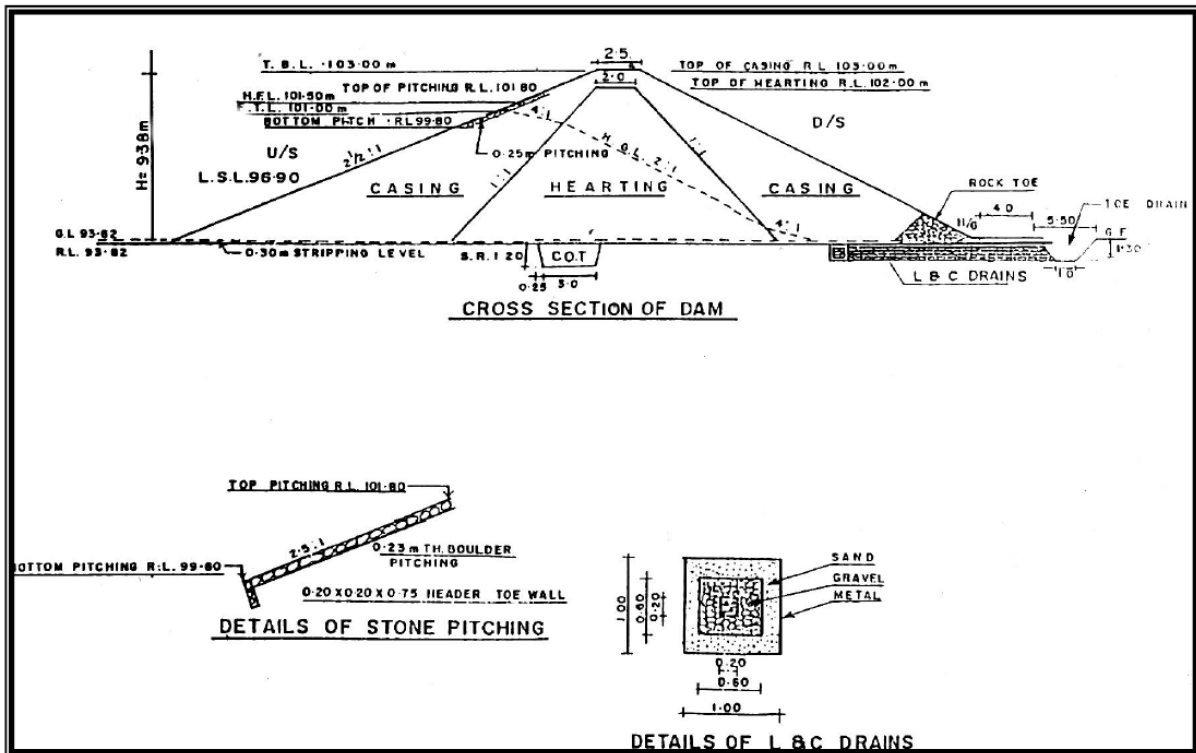


Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.3 Design Aspects of a Cement Nalah Bund

14.6.4 Percolation Tanks

Percolation tanks, which are based on principles similar to those of nalah bunds. A percolation tank can be defined as an artificially created surface water body submerging a highly permeable land area so that the surface runoff is made to percolate and recharge the ground water storage. They differ from nalah bunds in having larger reservoir areas. Percolation tanks are to be normally constructed on second or third order streams, as the catchment area of such streams would be of optimum size. The plains and valleys having sufficient weathered zone / loose material / fracture. Steps should be taken to prevent severe soil erosion through appropriate soil conservation measures in the catchment. This will keep the tank free from siltation which otherwise reduces the percolation efficiency and life of the structure (CGWB-2019). The typical design aspect of a percolation pond is shown in Figure 14.7



Source: **Manual on Artificial Recharge of Ground Water**

Figure 14.4 Design Aspects of a Typical Percolation Pond

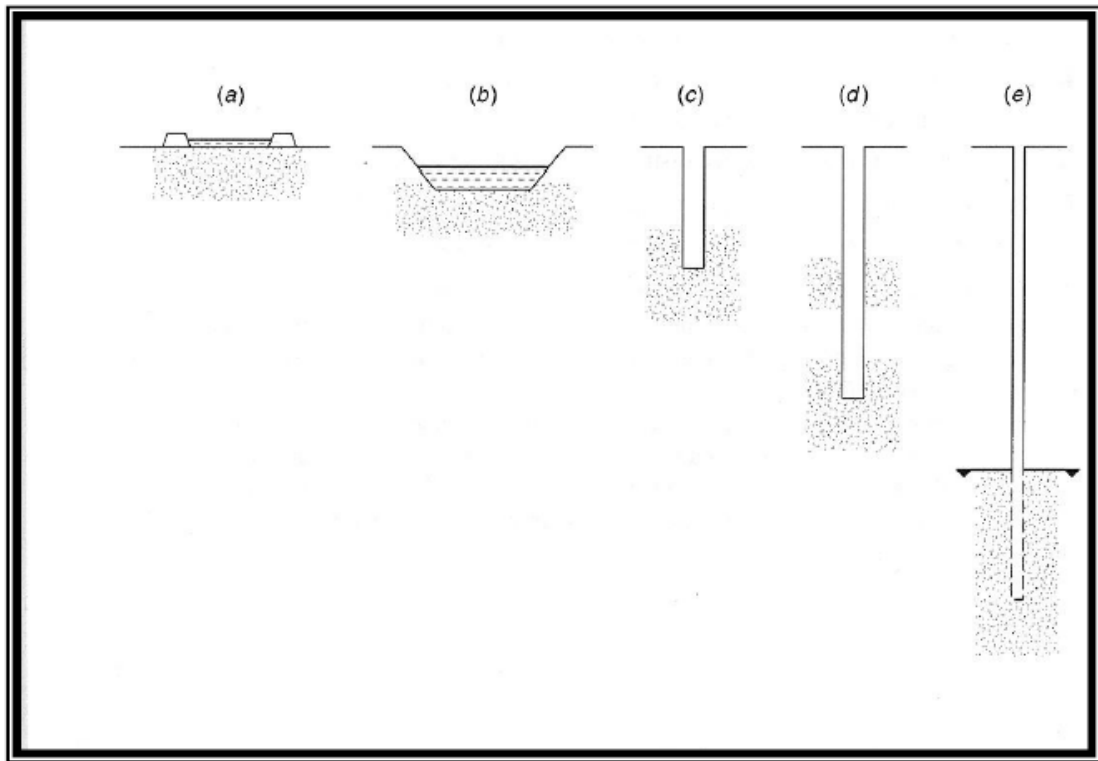
The percolation ponds can be 1.5:1 slope will generally be adopted for the upstream face and 2:1 slope for downstream face. There are thousands of tanks in Tamil Nadu with slopes of 1.5:1 and failure by slipping of this slope is rare. Hence, the prevailing practice can be easily adopted in Karaikudi CLPA. The commonly used dimensions of bunds of percolation tanks are given in table 14.3

S. No.	Maximum Water Depth (m)	Free Board (m)	Width of Top of Bund (m)
1	1.5 to 3.0	0.9	1.2
2	3.0 to 4.5	1.2	1.5
3	4.5 to 6.0	1.5	1.8
4	Over 6.0	1.8	2.7

Source: **CGWB-2019**

Table 14.3: Common Dimensions of Bunds of Percolation Tanks

14.6.5 Subsurface Techniques



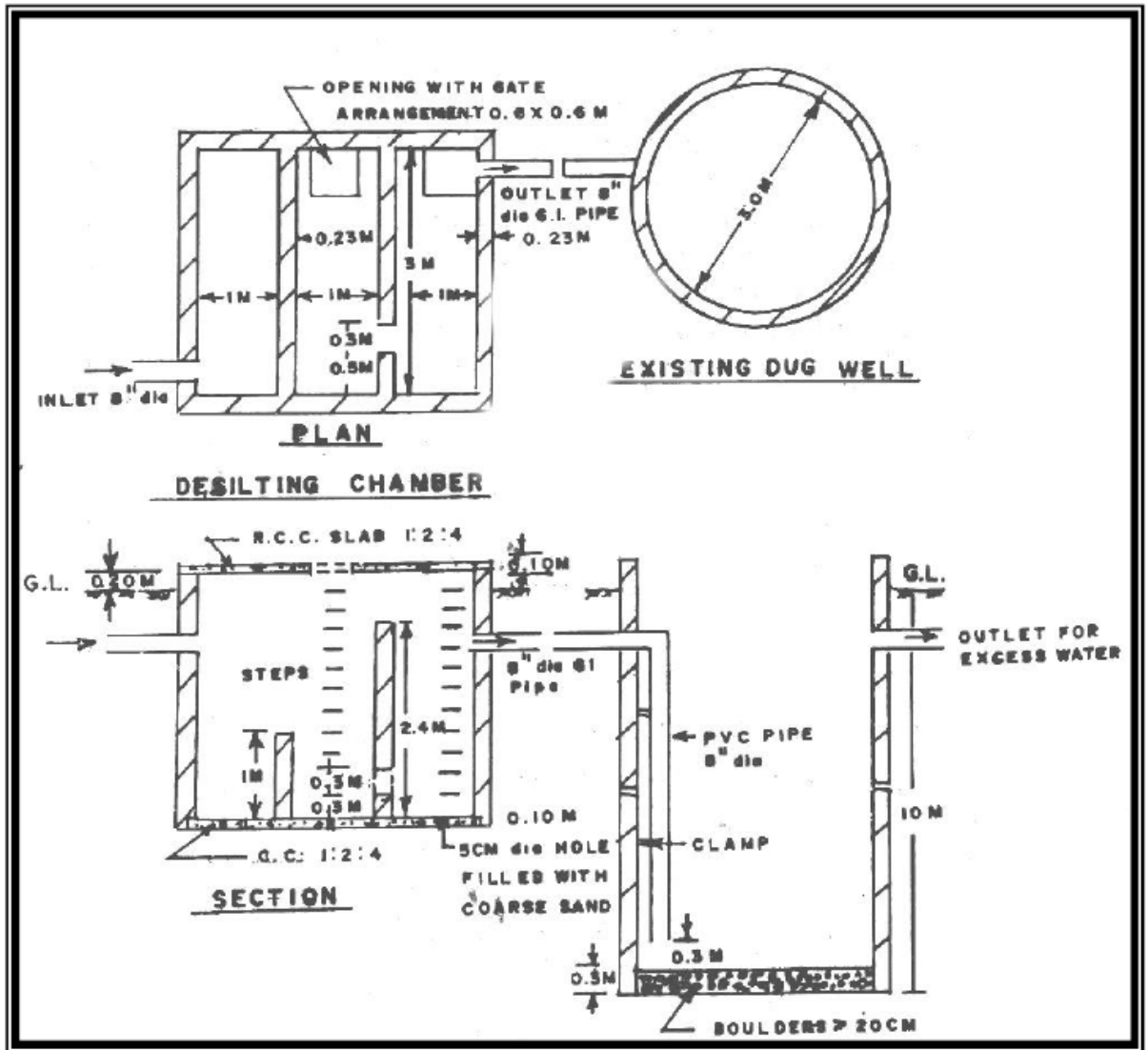
Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.5 Recharge Systems for Increasingly Deep permeable materials

Subsurface techniques used in impermeable earth surface where there are difficulties in infiltration of surface water to recharge the deeper aquifer in natural condition. There are different methods adopted subsurface recharge a) Injection wells or recharge wells, b) Recharge pits and shafts, c) Dug well recharge, d) Borehole flooding and e) Recharge through natural openings and Cavities (CGWB-2019).

Aquifer disposition plays a decisive role in choosing the appropriate technique of artificial recharge of ground water (Todd and Mays, 2005) as illustrated in the Figure 14.8.

a) Surface Basin, b) Excavated Basin, c) Trench, d) Shaft or Vadose Zone Well and e) Aquifer Well

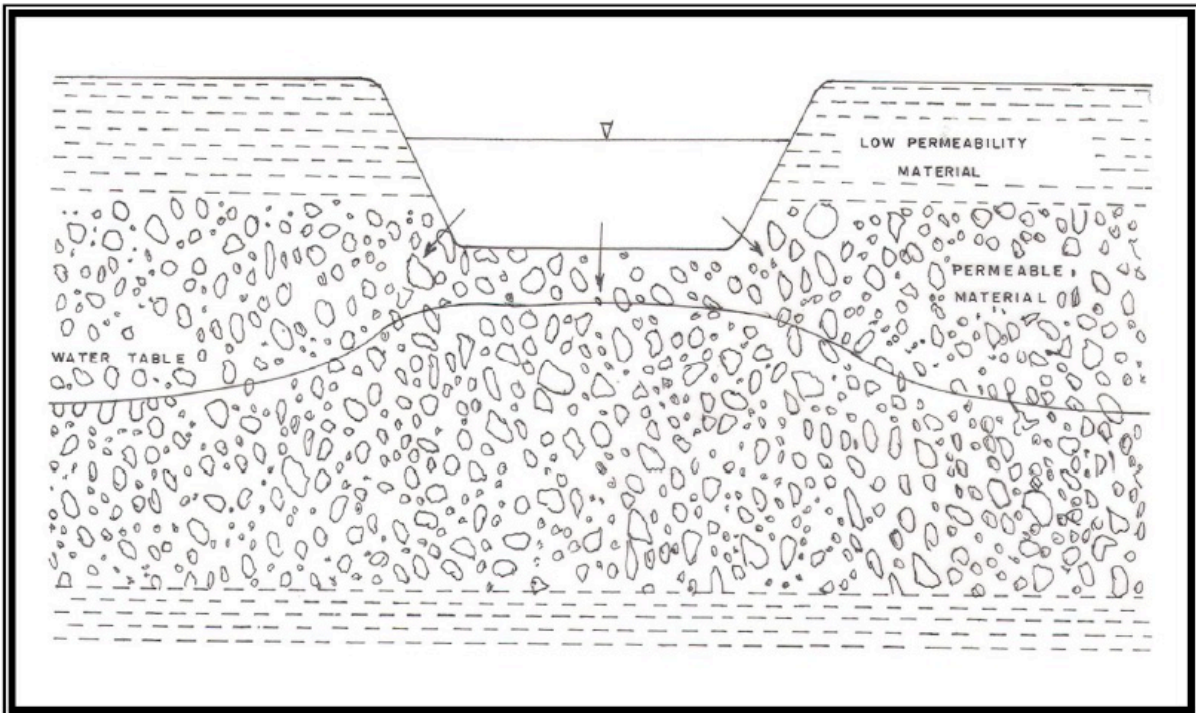


Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.7 Schematics of a Typical System for Artificial Recharge through Dug Well.

14.6.8 Recharge Pits and Shafts

Karaikudi CLPA within the Thenar river and its interlinked waterbodies has low permeable layers which are overlaid unconfined aquifers, excavating of pits, which are sufficiently deep to reach to unconfined permeable layers (Figure 14.11).



Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.8 Schematics of a Recharge Pit.

14.6.9 Roof Top Rainwater Harvesting and Aquifer Recharge

In urban areas where open land is not commonly available, roof top rainwater can be conserved and used for recharge of ground water. Urban housing complexes, historical forts and institutional buildings generally have large roof area and can be utilised for harvesting roof top rainwater to recharge the depleted aquifers.

14.6.10 Roof Top Rainwater Harvesting

Karaikudi CLPA, majority of the drinking water supply is from ground water sources. As the population density and usage levels are comparatively high Karaikudi municipality and adjoining villages. In earlier days, open wells and ponds that belonged to the community were the source of drinking water supply. Bore wells are drilled and water from overhead tanks is distributed through supply mains. Statistics reveal that more

than 100% of villages water supply is from the ground water sources at present. TWAD Board and Local bodies indent to provide protected water supply to the Karaikudi municipality, Kottaiyur town panchayat and villages through Combined Water Supply Schemes (CWSS).

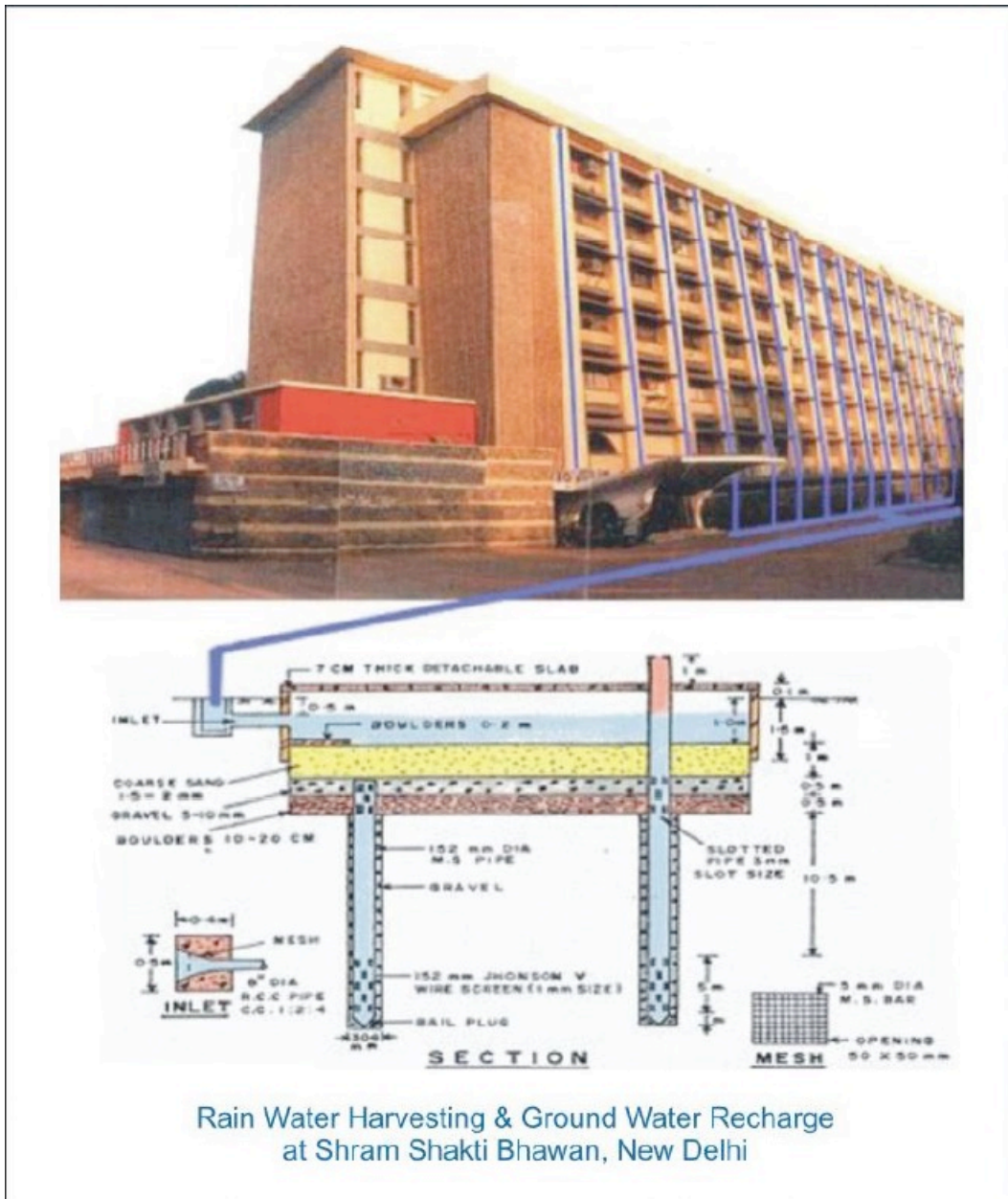
Indiscriminate exploitation of ground water and the decline in ground water levels, often tapping ground water from deep aquifers. Discharge of untreated effluents into surface water streams and lakes by industries has resulted not only in contaminating the surface water resources, but also the ground water bodies.

Tamil Nadu Government has policy and guideline for promotion of simple, reliable and environmentally friendly technologies, the traditional practices of rainwater harvesting along scientific lines. It is necessary to overcome the above problems and to ensure the long-term sustainability of our precious ground water resources.

14.6.10.1 Proposal for Roof Top Rainwater Harvesting

An average of 8-12 percent of the total rainfall recharge only is considered to recharge the aquifers (CGWB 2019). Majority of the rain falls on the surface, flows through storm drains and sewer and is wasted from directly consume with minor purification. So, Roof top rainwater harvesting is one of the appropriate options for augmenting ground water recharge/storage in urban areas and direct consumption. Roof top rainwater harvesting can supplement the domestic requirements of urban area and adjoining rural area. In the Karaikudi Municipality and Kottaiyur Town Panchayat and adjoining villages not much land is available for implementing any other artificial recharge measure. The master plan indent to propose Rainwater harvesting in all Government and Institutional buildings in Local Bodies (LBs), since large Roop top catchment area available in one Institutional building it is easy to implement and maintain. Karaikudi CLPA has large roof top space in State and Central Government Office and Quarter buildings that total is approximately 0.17 Sq.km (Central Government has 0.05 Sq.km and State Government has 0.12 Sq.km). This

building roof top space has potential for large quantity rainwater harvesting. Rainwater harvesting in urban areas helps not only in meeting at least a part of the water requirement but also prevents storm runoff and flooding of roads during heavy rains. It also reduces the pumping costs and reduces the stress on ground water resources. A typical intuitional building rainwater harvesting system shown in the Figure 14.12.



Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.9 Institutional Roof Top Rainwater Harvesting Map

14.6.10.2 Size of Storage Tanks

Size of the storage tank needs to be carefully selected considering various factors such as number of persons in the household, water use, duration of water scarcity, rainfall, type and size of house roof and the status of existing water sources in the area.

Size of Storage tank (in litres) =	No. of persons in the household x Period of water scarcity (in days) x Per capita water requirement (in liters per day)
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Water available (in litres) =	Annual rainfall (in mm) x Roof area (in sq.m) x Runoff Coefficient
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S. No.	Roof type	Runoff Coefficients
1	GI Sheet	0.9
2	Asbestos	0.8
3	Tiled	0.75
4	Concrete	0.7

Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Table 14.4 Runoff Coefficients of Common Types of Roofs

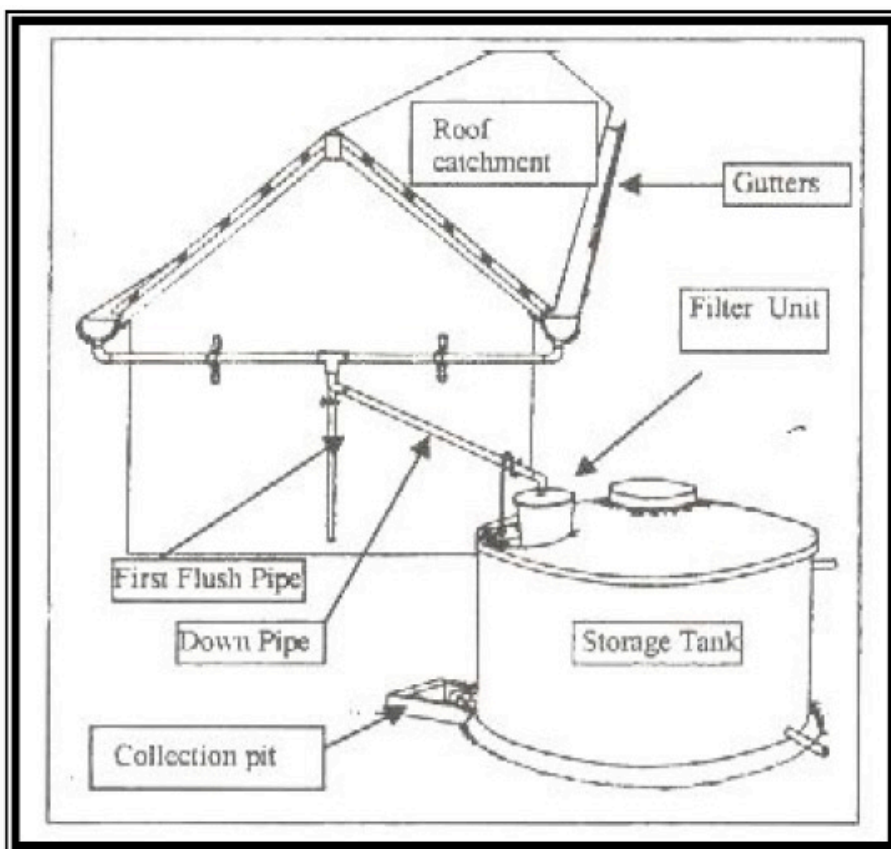
14.6.10.3 Size of Storage Tank for Urban Area

In Karaikudi Municipality and Kottaiyur Town Panchayat, is challenging to create enough storage space due to space and various constraints. In such a situation, it is ideal to create the storage space to

collect the rainfall per spell and utilize the same before the next spell. In this case

Water available from roof =	Annual rainfall (in mm) X Area of roof (in sq m) X Runoff coefficient for the roof
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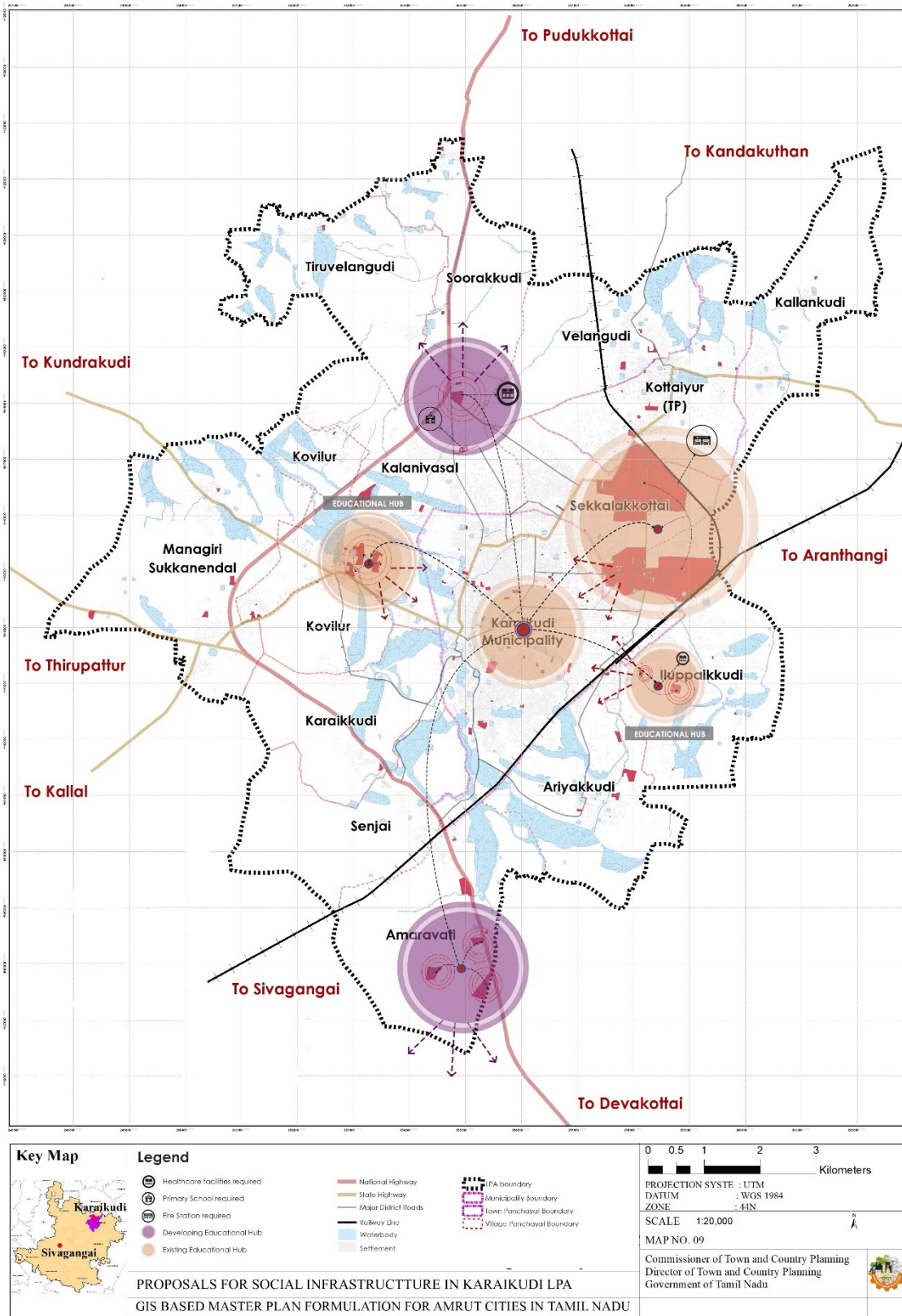
Water available per spell of rainfall =	Rainfall per spell X Area of roof (in sq m) X Runoff coefficient for the roof
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Source: **Manual on Artificial Recharge of Groundwater, Sept 2007**

Figure 14.10 A Typical Rainwater Harvesting System

14.7 Proposal For Social Infrastructure



Maps 14.4 Proposals For Social Infrastructure

14.7.1 Education

The existing school education and higher education intuitions are sufficient for present and future population. As per Tamil Nadu School Education Distance Criteria Norms for Schools, Primary school has to be provided at T.Soorakudi settlements which is part of Thiruvelangudi village. As per URDPFI guideline, T.Soorakudi may not have threshold population to provide primary school. However, it is necessary to provide primary school about 0.4 ha area to avoid children's long travel.

14.7.2 Healthcare facilities

Illuppaikkudi and T.Soorakudi villages proposed to have sub-health centres in these villages. In the recent pandemic period number of beds have increased in the certain hospitals. One of them is TB Sanitorium hospital in the Amaravathi. Amaravathi is growing faster it is necessary to have additional general healthcare facility. Hence, TB sanitorium hospital space can be utilised for current and future needs.

14.7.3 Recreational facilities

Open space and parks can enhance the quality of life and reduce the impact of heat so recreational spaces need to be enhanced within Karaikudi old town. In the old town slum rehabilitated space should be reserved for parks and playground. According to the According to NBC rules, 0.481 sq.km area required for present population and in future for 0.884 Sq.km area required for 2041 population. The open space reserved for recreational activities at any layout must not be less than 100 Sq.m with a minimum dimension of 10 meters as recommended in TNCDBR 2019. Based on URDPFI guidelines, neighborhood-level parks of area 1 hectare along with playgrounds have to be developed in all proposed residential areas.

14.7.4 Miscellaneous

14.7.4.1 Burial Ground

As per requirement number of burial ground and area is sufficient. It is proposed upgrade the infrastructure facilities at all burial grounds.

14.7.4.2 Fire Station

As per projected population in 2041 no additional fire station is required. However, next level urban local body is Kottaiyur TP, it is located beyond 5 km radius from existing fire station and only partially covered. So, it is proposed to have 1 Fire station at Kottaiyur town panchayat.

14.7.4.3 Police Station

As per URDPFI safety standards, It is proposed to have 1 more civil police stations for future 2041 population. The land area required for police station is 1.5 ha, it include residential accommodation. It may be located strategically one at Kalainivasal or Kottaiyur.

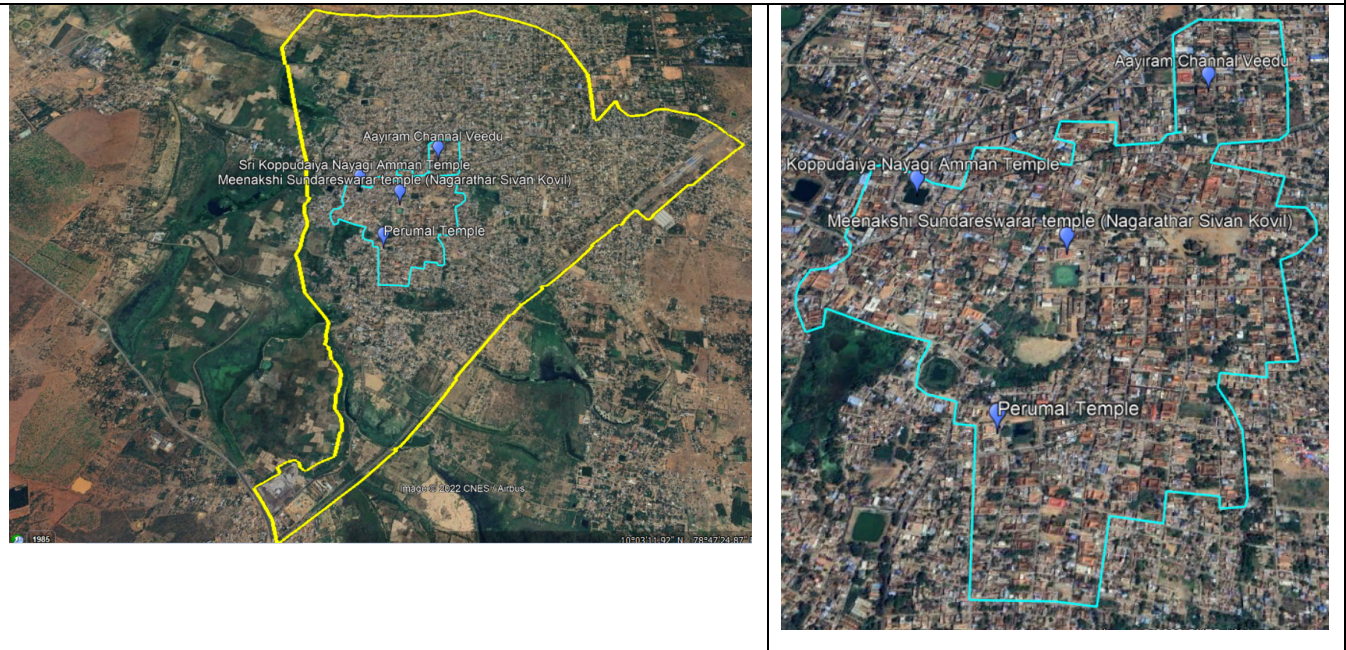
14.8 Proposal For Conservation Of Heritage Buildings

14.8.1 Heritage zone

Karaikudi and Kottaiyur core area of grid pattern showcases the Chettiar community understanding of physical features, urban and land-use planning, which create a unique architectural ensemble with thousands of Karai veedu and clan temples. This ensemble reflects the way the Hindu Tamil community of Chettiars lived. As foremost trading knowledge and travels influences design of settlements and architectural built, it depicts the cultural interchange all over the world and combination of the vibrant Tamil tradition. These settlements and the architecture, built from 1850's to 1940's, are directly associated with the rich living heritage specific to the Chettiar community. The historic core, and its surrounds, hold into its folds rich, living culture, the heart of the city. They testify about the architectural quality,

beauty and Tamil tradition of the life in historic Karaikudi. This blend represents the uniqueness of Chettinad. They had a vision of land-use planning which has connected the different urban to landscape elements, particularly for rainwater harvesting and storage system. The architectural features of the houses comprised of series of courtyards organized along a longitudinal axis as well as the use of material is taking into consideration the semi-arid and hot climate. Chettinad architecture is also closely linked to the lifecycle rituals of the Chettiar community. The mansions were conceived to perform the different functions, rituals and family celebrations during the course of life from birth to death. In addition to the lifecycle rituals, the temple and village festivals are part of the Chettiar culture forming a large set of rituals all over the Tamil year (Arche-S for UNESCO, 2007).

Karaikudi Municipality – Chettinad Settlement



Kottaiyur Town Panchayat – Chettinad Settlement

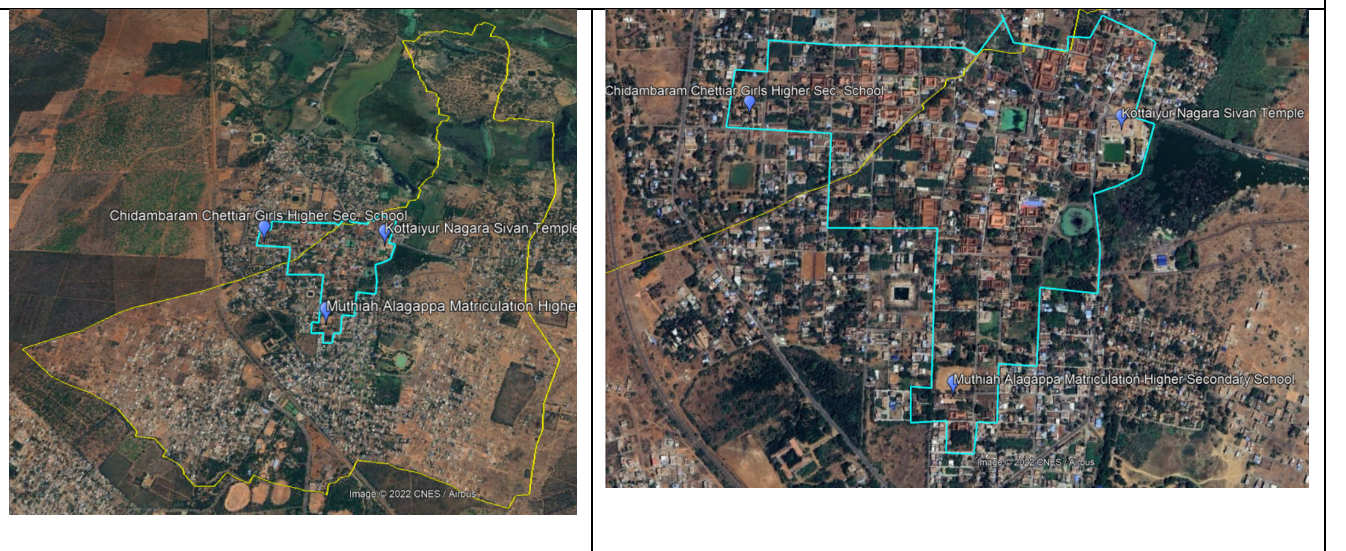


Figure 14.11 Chettinadu Settlement

Karaikudi and Kottaiyur core area of rich cultural heritage Chettinad settlements has demarcated as heritage zone. Promoting heritage walk tourism. However, further research and survey required for clear demarcation, identification of uniqueness and conservation of the built forms.

Master plan intent to propose to conduct a survey, research and analysis of the heritage territory. The survey to be conducted in close collaboration with local body, specialised architectures and urban planners to identify heritage elements, evaluation of places, urban structure and architectures study. In following detailed analysis required 1. map of the landscape, description and classification of the spaces (structure, entities) 2. View of monuments and urban shape vegetation (gardens, hedges, alignment of trees, unusual trees). 2. Urban heritage includes evolution, structure, height of the constructions, composition, sequences, public areas, private areas, courtyards and gardens 3. Architectural heritage, buildings that have an extraordinary historical, archaeological and architectural value (typology, structure, exceptional architectural details, materials).

The Government of Tamil Nadu consideration of UNESCO "Heritage Passport" Programme for Chettinad region. Government supports the implementation of a plan for the preservation of Chettinad heritage and is supportive of initiatives for developing cultural tourism.

15 LAND SUITABILITY ANALYSIS

Identification of land use suitable for urban development is more important for preparing the proposed land use plan. Land Suitability analysis is worked out by the weighted index method. Land Suitability analysis helps in the identification of suitable land for urban development and reduces the impact on Urban Environment.



15.1 Parameters Considered For Suitability

For land Suitability analysis the following 5 parameters have been taken into considerations

- Existing land use
- Distance from Reserved Forest
- Elevation
- Distance to Roads
- Distance from Water Body

Weightages are given to five physical parameters by comparing the relative importance of each parameter concerning other parameters.

15.1.1 Existing land use

Land use plays an important role in suitability analysis as it comprises of many classes out of which we analyze the priority of the most suitable and the least suitable class. While giving the weightage preference waterbody and built up are considered as not suitable classes while vacant land and agricultural land are considered as highly suitable classes for urban development.

15.1.2 Distance from Reserved Forest

To improve Biodiversity of forest area should be protected from urban development. So, the areas nearest to the forest are to be conserved hence considered least suitable for urban development. 100m buffer Zone has been maintained and this buffer zone is considered to be not suitable for urban development.

15.1.3 Elevation

The elevation is considered as an important element in land suitability. From the elevation map, a low-lying area has been identified and considered as

not suitable and other areas as highly suitable for urban development to prevent waterlogging.

15.1.4 Distance to Roads

Proximity to roads is also an important parameter in urban development. The area nearest to the roads is considered highly suitable for urban development. The priority descends as the distance between the road and plot increases.

15.1.5 Distance from Water Body

To improve Biodiversity Water Bodies should be protected from urban development. So, the areas nearest to the waterbodies are to be conserved hence considered least suitable for urban development. 50m buffer Zone has been maintained and this buffer zone is considered to be not suitable for urban development.

15.2 Weightage Index For Suitability

Weightage index is given to the above themes and classes for suitability analysis. In this land suitability model high priority is given to existing land use, CRZ, and Distance to roads, to find out the land suitable based on these factors.

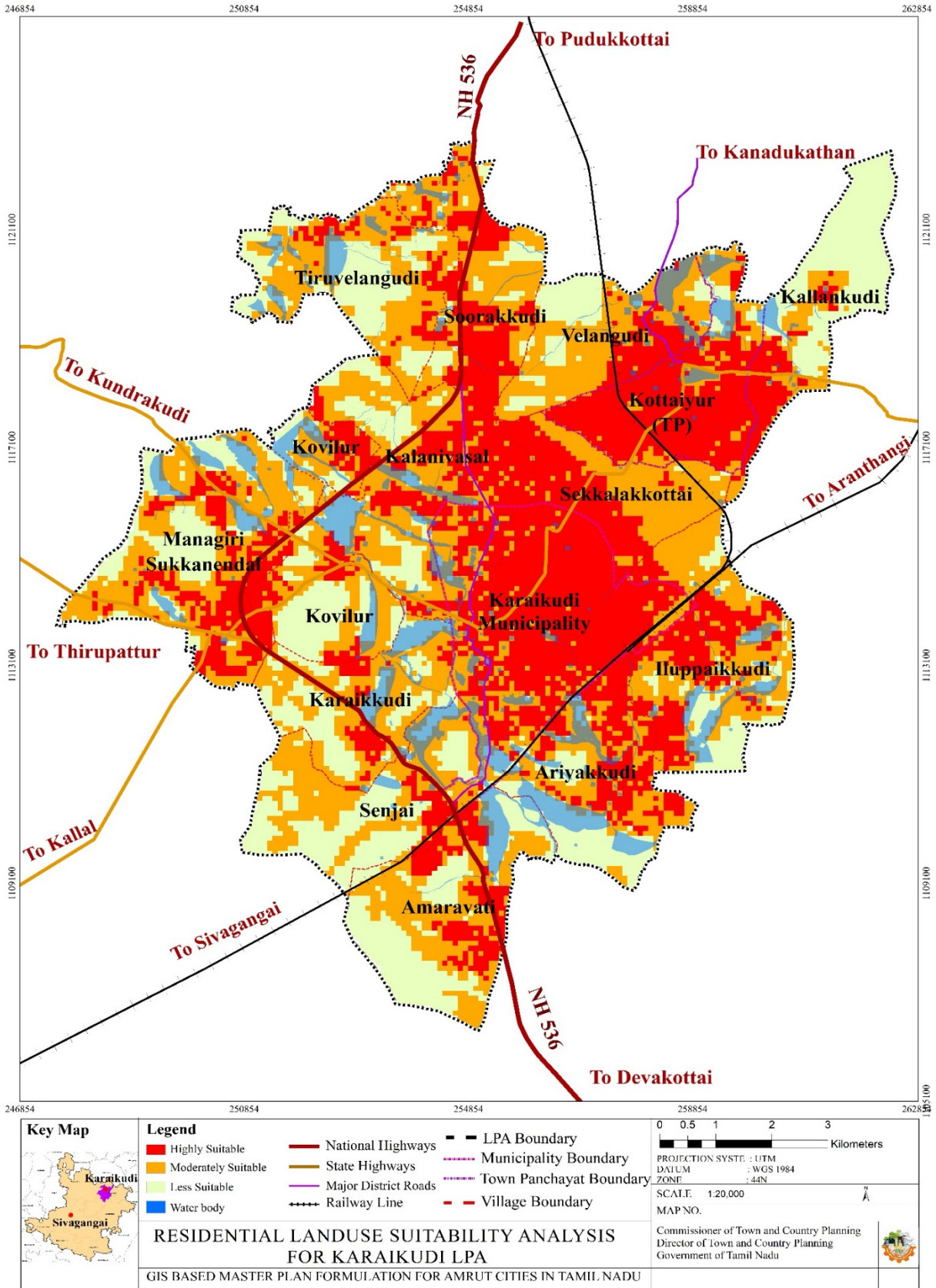
The same procedure with different parameters is followed for the identification of suitable land for different uses that are 1. Residential use, 2. Commercial use, 3. Industrial use and 4. Recreational use. (Refer flowing maps, Figure 15.1 – 15.4)

Theme	Weightage	Class	Rank Weight
Existing Land Use	30	Vacant	5
		Agriculture	3
		Built-up & Water Bodies	0
Distance from Reserved Forest	10	Above 100 m	5
		0-100 m	0
Elevation	10	More than 0 m	5
		Less than 0 m	0
Distance to road	30	0-500 m	5
		500-1000	4
		1000-1500 m	3
		1500-2000 m	2
		More than 2000 m	1
Distance from Water Body	10	Above 50m	5
		0-50 m	0

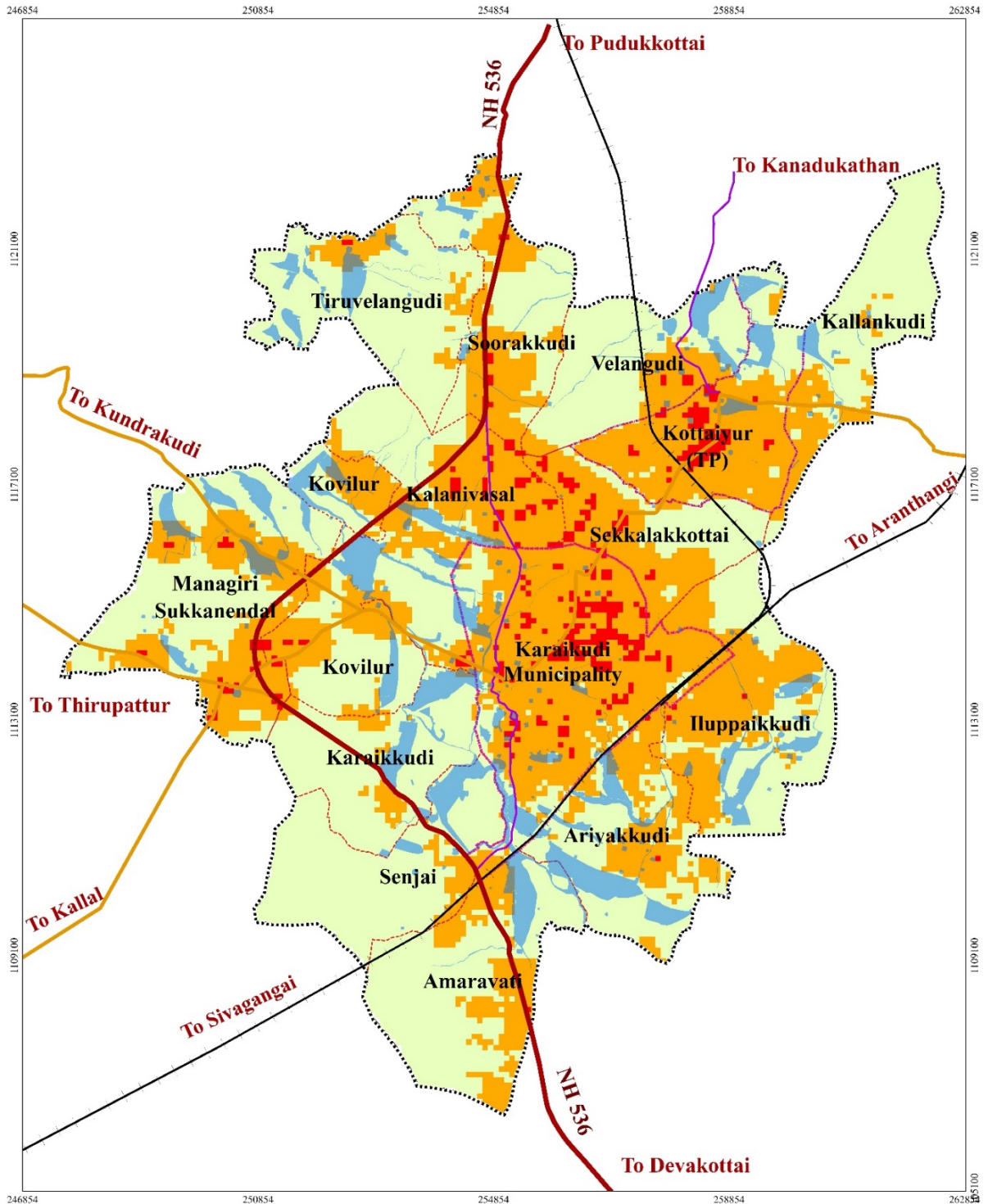
Table 15.1 Weightage Index for land suitability analysis

S.No.	Parameters	Highly Suitable	Moderately suitable	Less suitable
1	Existing land use	Vacant	Agriculture	All Other uses
5	Distance from Reserved Forest	More than 50m	Nil	0-50m
3	Elevation	More than 0 m	Nil	Less than 0 m
4	Distance to road	0-500 m	500-1500 m	More than 1500m
5	Distance from Water Body	More than 50m	Nil	0-50m

Table 15.2 Categorization of parameters



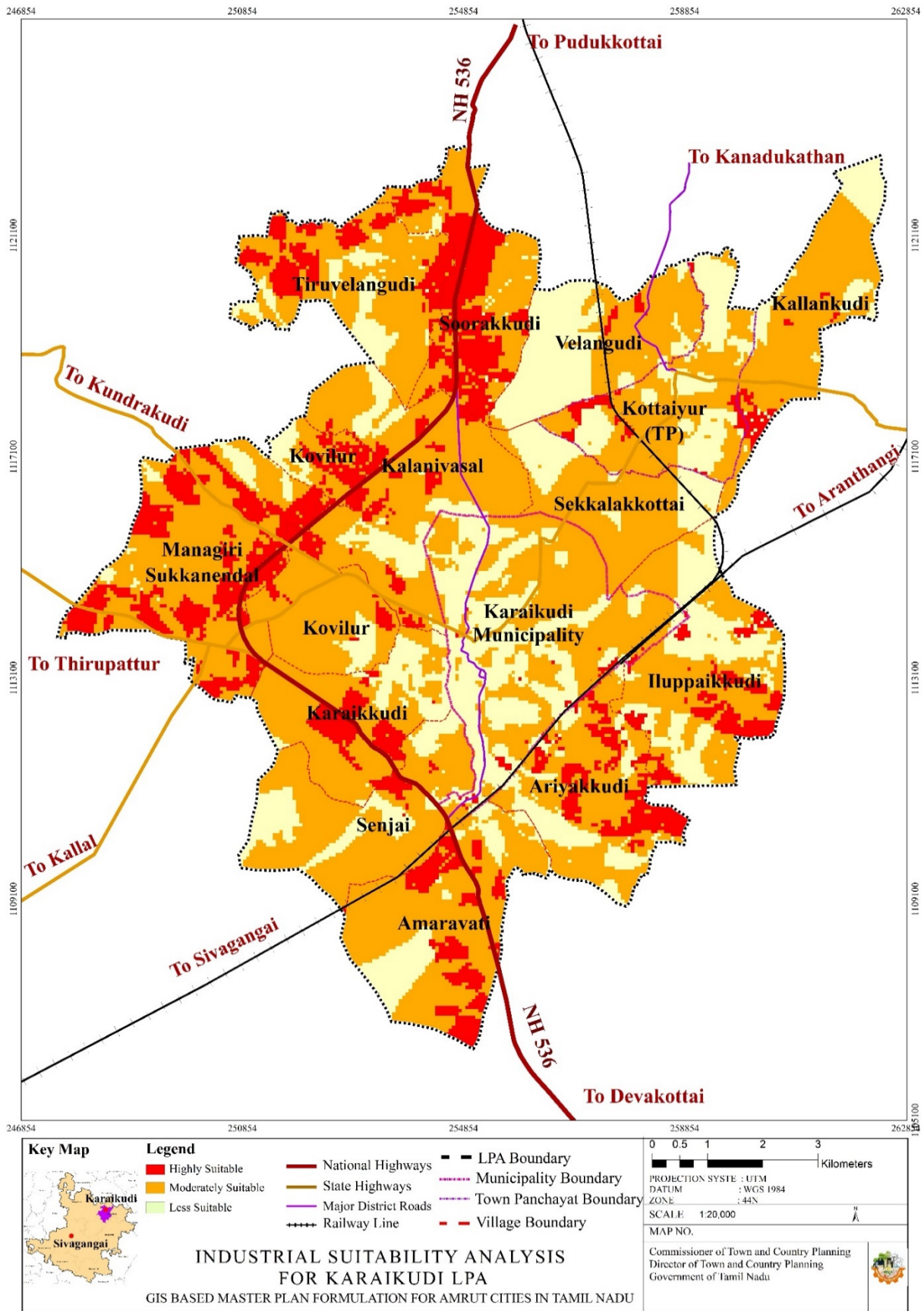
Maps 15.1 Residential Land Use Suitability



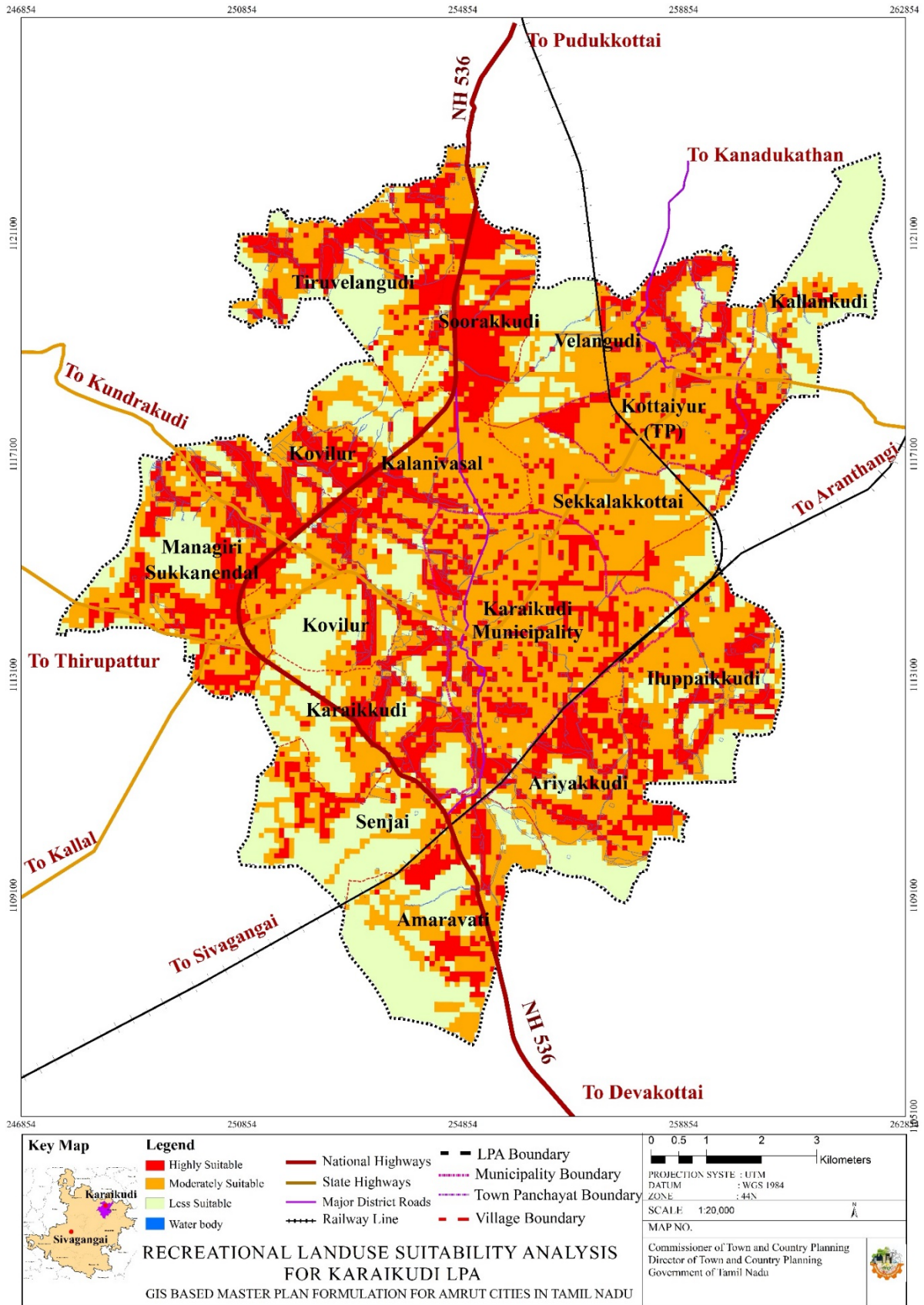
Key Map 	Legend <ul style="list-style-type: none"> ■ Highly Suitable ■ Moderately Suitable ■ Less Suitable ■ Water body National Highways State Highways Major District Roads Railway Line LPA Boundary Municipality Boundary Town Panchayat Boundary Village Boundary 	
		<p>PROJECTION SYSTE : UTM DATUM : WGS 1984 ZONE : 44N SCALE : 1:20,000 MAP NO. _____</p> <p>Commissioner of Town and Country Planning Director of Town and Country Planning Government of Tamil Nadu</p>

COMMERCIAL LANDUSE SUITABILITY ANALYSIS FOR KARAISKUDI LPA
 GIS BASED MASTER PLAN FORMULATION FOR AMRUT CITIES IN TAMIL NADU

Maps 15.2 Commercial Land Use Suitability



Maps 15.3 Industrial Land Use Suitability



Maps 15.4 Recreational Land Use Suitability

15.3 Summary

Land Suitability is the most important criterion for proposing any kind of development. The potential of the land is important for any land-use proposal. Land suitability analysis categorizes the total planning area in three categories of highly suitable, Moderately Suitable, and less suitable areas. The proposed land 2041 for Karaikudi CLPA is based on the suitability assessment giving priority to natural features like slope, topography, Land use, road networks, and Water Bodies, etc. While land-use allocation the areas identified as highly suitable for developments are given more priority

16 LAND USE PROPOSAL



16.1 Proposed Land Use 2041

Karaikudi master plan 2041 envisioning the proposed residential use in 2041 is 35.14 sq. km which is 30.35 % of the total area of CLPA. As per growth management strategy and planned regulated development, current low-density sprawl of residential use will be restricted to conserve the environmental resources. The increasing residential density within the existing development by providing higher FSI. If present low-density pattern continues land area required for proposed residential use is 15.02 sq. km. However, land allocated for residential development is only 10.73 sq. km rest 4.29 sq. km achieved through increasing FSI in the Karaikudi municipality, Sankarapuram CT (Kalanivasal, Sekkalakottai) and Kottaiyur town panchayat. The reason for predicting a higher concentration of residential use is because of increase the residential density within the CLPA. The residential density will increase 21 person per hectares in 2021 to 34 person per hectares in 2041. If existing low-density sprawl continues 101 persons per hectare will live in residential area. It is just matches the URDPFI prescribed standards. The Medium Town should have density of 100 to 150 person /ha. Whereas applying growth management strategy 113 person per hectare will live in residential area. In Karaikudi Municipality, the present population density is 98 person /ha this will increase up to 141 person /ha in 2041. It is imperative for providing infrastructure facilities and optimum utilisation of resources.

The commercial areas, industrial areas, and amenity areas have been spatially distributed across different areas, along major transport corridors and potential areas for balancing the growth at the Karaikudi CLPA Level. The land reserved for Commercial is about 2.97 sq. km of total CLPA area. Karaikudi CLPA has a high potential for general business that is trade and commerce activities. The Master plan 2041 envisaged that major roads have above 13 meter width will have more chance of commercial conversion. Also, it is essential that creating commercial subcentres at Kalanivasal, Kottaiyur, Managiri and proposed development area of T. Soorakudi.

The reserved area under industrial use is about 1.89 sq. km, the additional 1.29 sq.km land is allocated for industrial development. Since, it is CKIC corridor influenced area so slightly high land area allocated for this use. Land identified for industrial development based on existing industrial use and proximity to the NH 536. Industrial area proposed locations are SIDCO Amravathi puthur, Near Power loom industry, Managiri along State highway 35 apposite to Apollo hospital, Beside TCP junction of NH 536 and Kovilur road, near Aavin dairy and T.Soorakudi. No additional area has been allocated for Special and Hazardous Industries.

The institutional use such as public & semi-public and public utilities land reserved is 10.71 sq. km. The major social infrastructure facilities satisfactory for the future population, however Outside LPA surrounding villages are depends on Karaikudi, it is envisaged that more land required for this use. So, additional 4.07 sq.km land is allocated under public & semi-public and public utility categories. Master plan intent to propose 1 Primary school in T. Soorakudi, 2 Health Sub Centre at Illuppaikkudi and T.Soorakudi, 1 Fire station at Kottaiyur town panchayat and 2 civil police station at Kalainivasal and Kottaiyur. Karaikudi Municipality has 3 Urban Primary Health Centre proposal at New UPHC at Muthupattinam, New UPHC at Senjai, New UPHC at Dhivan Bhagathur Chidambaram Street.

The reserved area under Transportation use is about 7.87 sq. km whereas in the existing land use (2021) has total area was 6.64 sq.km. As road infrastructure is backbone for proper planned development, so additional land area allocated for proposed new roads based on Grid of Road network plan is 0.63 sq.km. Also, strengthening of existing road network and transportation infrastructure total land area allocated is 0.60 sq.km. Over all land area allocated for transportation use is 1.23 sq.km.

The land reserved for recreational use, according to NBC rules, 3 Sq. m/person is the minimum norm for open space in a built-up area. So, for projected population in 2041 land requirement will be 0.884 sq. km. This include URDPFI guidelines, neighborhood-level parks of area 1 hectare along with playgrounds proposed in the residential area. Master plan intent to

propose park and playground 3.1 ha at Kottaiyur town panchayat. The old town slum rehabilitated space (non-objectionable locations) should be reserved for waterfront development the permissible land use is parks and playground.

Waterbodies land area identified to reclaim from the existing development around 0.66 sq.km. and minor changes has been made in the water body boundary, the land area 0.54 sq. km were allocated for new road development. Reserved Forest land areas 1.23 sq. km and Tree Glad 0.12 Sq. km land areas were allocated for development of public purpose. The agricultural use includes Plantation 3.22 Sq.km and 7.77 sq. agricultural dry land and 7.95 sq. km vacant land, the total area of 20.29 sq. km will be converted another use. Also, wasteland will be utilised for urban development. Table 16.1 reveals that the development of land use categories.

S.No	Land Use	Area under each use as per Existing land use 2021 in Sq. Km	% Share in Total area in 2021	Area under each use as proposed land use 2041 in Sq.Km	% Share in Total area in 2041
1	Residential	24.41	21.08	35.14	30.35
2	Commercial	0.99	0.86	3.96	3.42
3	Industrial	0.60	0.52	1.89	1.63
4	Special and Hazards Industrial	0.16	0.14	0.16	0.14
5	Institutional Use (include Public and semi-public, Services and Utilities)	6.64	5.73	10.71	9.25
6	Transportation	6.64	5.73	7.87	6.80
7	Agricultural	62.16	53.69	41.21	35.59
8	Water Bodies	14.18	12.25	14.84	12.82
	Total	115.78	100.00	115.78	100.00

Table 16.1 Proposed Land Use Karaikudi CLPA 2041

As per the URDPFI guideline, Karaikudi falls under the medium town category. Table 15.2 represents the Existing and Proposed land use URDPFI set standards. The share of each land use in Karaikudi CLPA is not up to the standards given by URDPFI guidelines.

After identified the suitable areas for urban development land use proposals are given to boost the growth opportunities in the town and the existing land use structure has been increased as per URDPFI guidelines. The draft proposed land use map is given in the figure 16.2. Table 16.2 and 16.3 provide information about the proposed land use standards according to the URDPFI guidelines, including percentage (%) to total area and percentage (%) to developed area. The proposed land uses map and area are subject to change for further improvise.

S. No.	Land Use	% Share in Existing Land Use 2021	% Share in Proposed Land Use 2041	As per URDPFI Guidelines
1	Residential	21.08	30.35	43-48 %
2	Commercial	0.86	3.42	4-6 %
3	Industrial	0.52	1.63	7-9 %
4	Special and Hazards Industrial	0.14	0.14	
5	Institutional Use (include Public and semi-public, Services and Utilities)	5.73	9.25	6-8 %
6	Transportation	5.73	6.80	10-12 %
7	Agricultural	53.69	35.59	3-18 %
8	Water Bodies	12.25	12.82	
	Total	100.00	100.00	

Table 16.2 Proposed Land use standards as per URDPFI guidelines (% to Total Area)

S · N o ·	Land Use	Area under each use as per Existing land use 2021 in Sq. Km	% Share in Total area in 2021	Developed Area % of Share in 2021	Area under each use as proposed land use 2041 in Sq. Km	% Share in Total area in 2041	Developed Area % of Share in 2041	As per URDPFI Guidelines
1	Residential	24.41	21.08	61.89	35.14	30.35	58.83	43-48 %
2	Commercial	0.99	0.86	2.51	3.96	3.42	6.63	4-6 %
3	Industrial	0.6	0.52	1.52	1.89	1.63	3.16	7-9 %
4	Special and Hazards Industrial	0.16	0.14	0.41	0.16	0.14	0.27	
5	Institutional Use (include Public and semi-public, Services and Utilities)	6.64	5.74	16.84	10.71	9.25	17.93	6-8 %
6	Transportation	6.64	5.74	16.84	7.87	6.80	13.18	10-12 %
7	Agricultural	62.16	53.69		41.21	35.59		3-18 %
8	Water Bodies	14.18	12.25		14.84	12.82		
	Total	115.78	100.00	100.00	115.78	100.00	100.00	

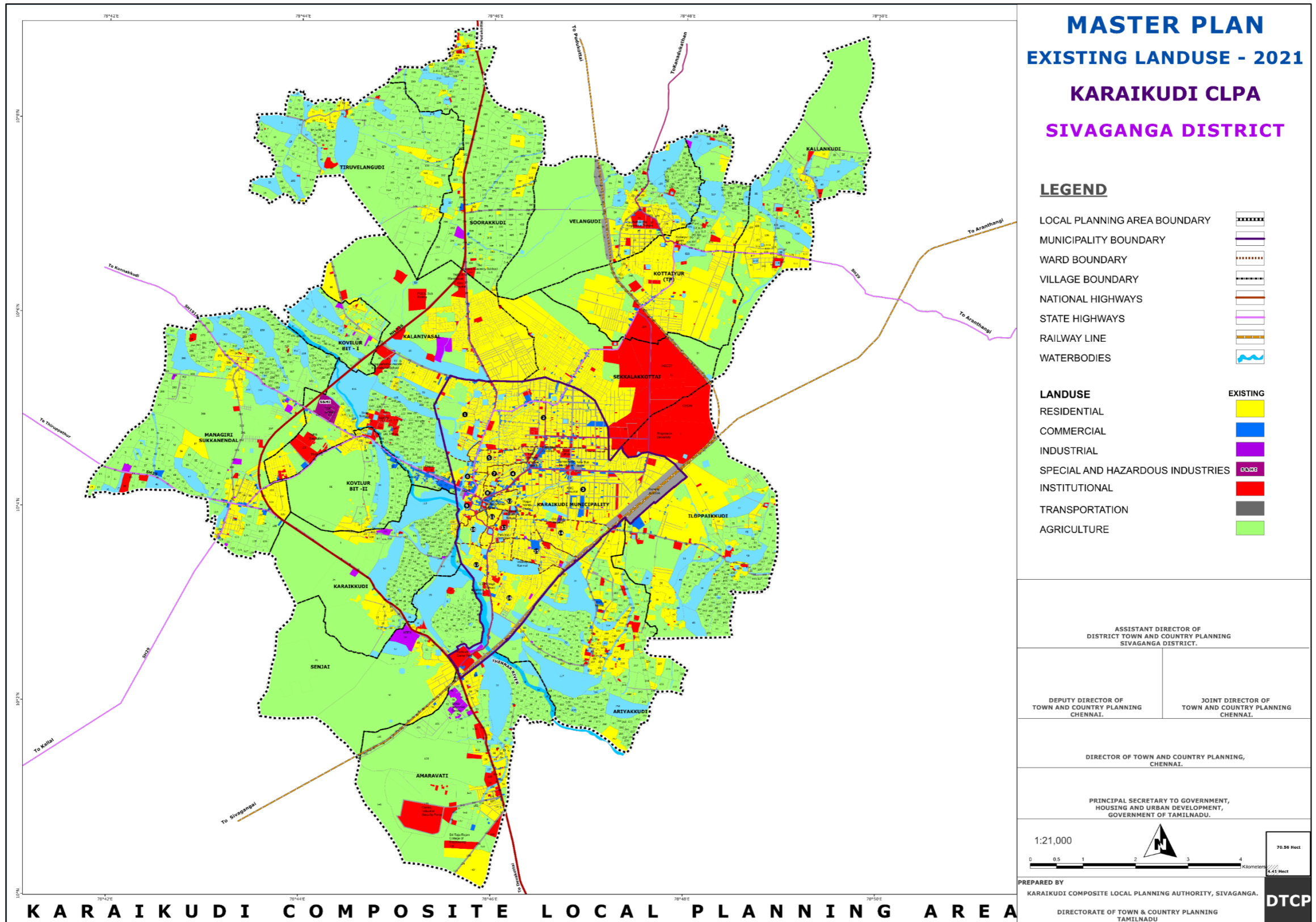
Table 16.3 Proposed Land use standards as per URDPFI guidelines for CLPA (% to Developed Area)

16.2 Summary

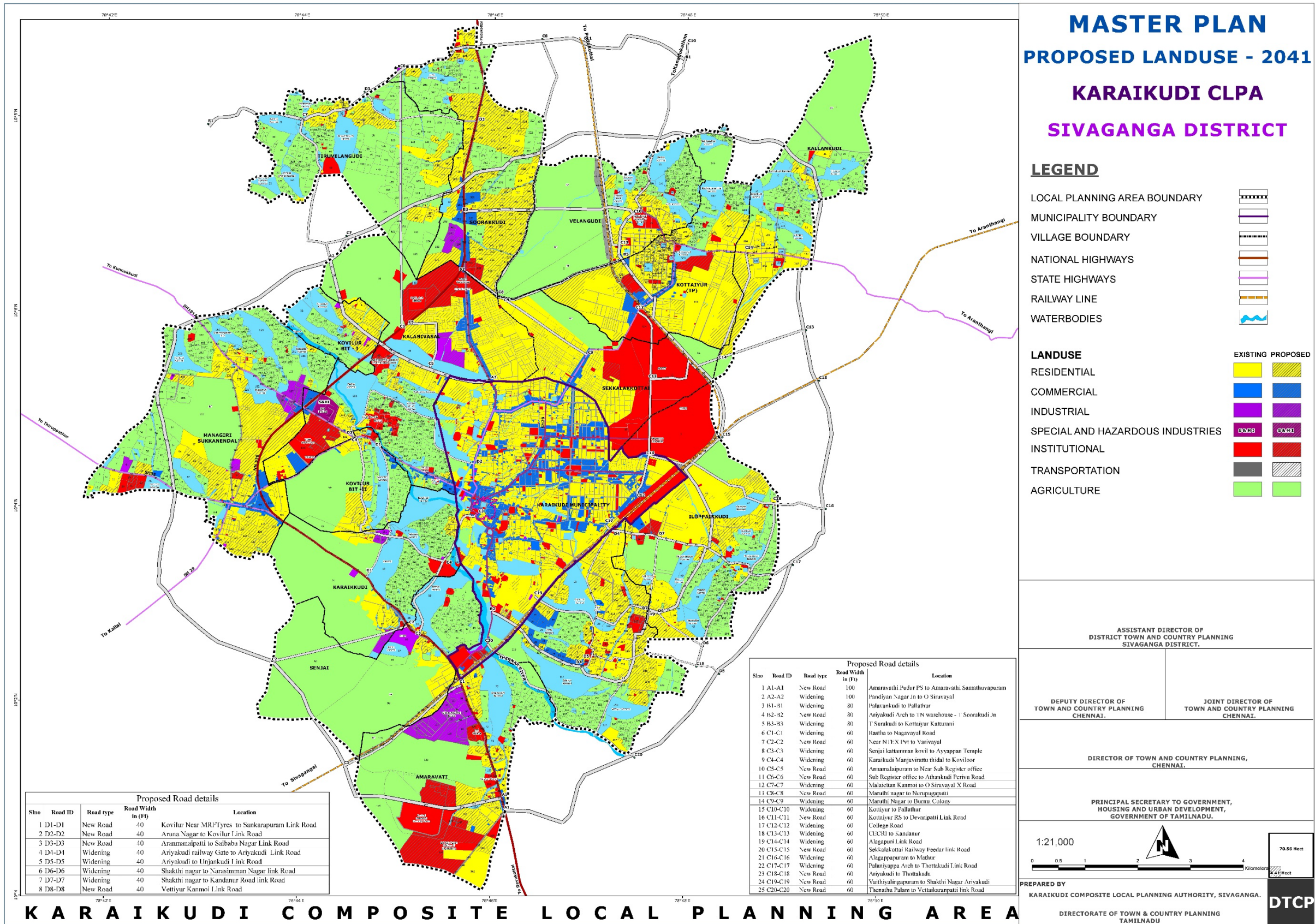
In the proposed land use given priority for trade and commerce, Industrial developments. In view of major industries such as SIDCO in Amaravathi puthur, TCP in Kovilur road, and Food production industries in Kalanivasal. TNSTC body buildings and Engineering and auto services. Karaikudi is an educational hub it must provide employment opportunities by promoting industrial development.

Public and Semi-public use such as socio-cultural infrastructures, recreational and public infrastructures increase the better quality of living. Karaikudi has sufficient educational intuitions and health care facilities. Also, other facilities such as Fire station, Police station, Burial grounds are sufficient in numbers. However, for future needs certain facilities are proposed. Though the share of recreational facilities such as parks and playgrounds insufficient as per URDPFI standards, So, additional 1.29 sq.km land area allocated for recreational use.

Commercial, Industrial, Socio-cultural infrastructure development is providing both employment opportunity and better living space. The faster outer growth succumbs the environmental resources. Safeguarding or increasing green space reduce negative impact of climate (urban heat island effect in town). Karaikudi CLPA has more green cover which indicates that the quality of the environment is fairly good. Since the area has thenar river and several networks of irrigation natural streams and chain of waterbodies. These green spaces and water bodies need to be protected to maintain an ecological balance.



Maps 16.1 Existing Land Use of Karaikudi CLPA



Maps 16.2 Proposed Land Use of Karaikudi CLPA

17 PROPOSED LAND USE SCHEDULE



17.1 Schedule

Proposed land use requirements of the town are worked out based on the proposed standards assumed on the lines of existing conditions and prospects of future growth of Karaikudi CLPA. The different land uses are combined and classified into nine predominant land use classes. These proposed nine land use classes exhibit in the land parcels in the following schedule tables. The schedule table is arranged based on urban and rural classification and administrative setup. Karaikudi municipality comprises 17 wards, the Kottaiyur town panchayat contains 3 villages, and rural areas compile 10 villages. (Refer Draft Master Plan Report - Volume 2)