

FOREWORD

Thrissur, the "Cultural capital of Kerala" has a long history of planned development. Sakthan Thampuran, the ruler of erstwhile Cochin State was the architect of the modern Thrissur and the one who converted it into a commercial center. The intensive urban development without sufficient supporting facilities may lead to degradation of the city. Draft Master plan for Thrissur city under AMRUT scheme was published on 17.04.2023. Based on various suggestions received, draft Master plan has been modified. Master plan envisages the development of Thrissur city into a metropolitan city within the horizon period. It includes policies and proposals which will help to guide day-today decisions on short term as well as long term development issues. Thrissur City has immense potential for industrial development due to the presence of Coimbatore Kochi industrial corridor and availability of resources. It is also connected to national highways, NH66 and NH544. Master plan enables the administration to tap these potentials in order to attract investors. It also envisages to accommodate the contemporary challenges, in terms of fast urban growth and gaps in infrastructure facilities. It considers the aspirations of various stakeholders and foresees a competitive future for the city in terms of attractiveness for investment in view of the fast changing urban landscape within and its surroundings at regional level.

Thrissur is also one of the 77 Asian cities included in the UNESCO Global Network of Learning Cities. Thrissur offers a wide range of choices and opportunities in the field of education, be it fine arts, law, engineering, medicine, agriculture etc. and is home to the best institutions in the state that deals with the respective fields. Thrissur with its unique skills and traditional knowledge coupled with skill development programmes has immense potential to make learning accessible to all sections of the society and hence develop into a learning city with equal opportunities for all.

Land being the most scarce and expensive resource, it is imperative to formulate and implement specific scientific measures in land use planning with a long term vision and comprehensive regional outlook. Besides, provision of urban services, management of ecologically sensitive areas, disaster management, resource mobilization etc. are to be efficiently planned. The Master Plan for Thrissur city, 2039 is an effort towards these. The proposals in various sectors are productive enough to strengthen the economic base of the town. I am sure that it will ensure peaceful and healthy living atmosphere for the inmates of the town.

All the members of the present council have actively participated in the discussions for finalizing the plan. Special acknowledgements to the Standing Committee Chairpersons for their guidance and involvement in the work. Members of the Special Committee and working group members also put in considerable efforts in materializing this Plan. I also appreciate the sincere efforts put in by the officials of the Local Self Government Department Planning wing for materializing this Plan in its present form.

With great pleasure and faith, I present the Master Plan for Thrissur city, 2039 herewith. I actively exhort to implement this Master Plan in its full spirit, which would certainly help Thrissur Municipal Corporation to ascertain its vitality in the region, in the years to come. I also use this opportunity to request the wholehearted cooperation of all the stakeholders, for the successful implementation of this plan.

M.K.Varghese
Mayor
Thrissur Municipal Corporation

PREFACE

Atal Mission for Rejuvenation and Urban Transformation (AMRUT) scheme, launched by Government of India, focuses on infrastructure creation that has a direct link to provision of better services to the urban citizens. The AMRUT mission mandates a set of 11 reforms which are to be implemented by the States during the Mission period. 'Urban Planning and City level Plans' is one among the 11 reforms. For achieving one of the milestones under this reform viz.'Preparation of Geographical Information System (GIS) based Master Plans', Government of India have launched the 'scheme of formulation of GIS based Master Plans for AMRUT cities'. The Local Self Government Department Planning was designated as the State level Nodal Agency of this Scheme. The Scheme has three components viz. Geo-database creation, Preparation of Master Plans and Capacity building. In the State, Thrissur is one of the 9 AMRUT cities included under this sub-scheme.

Urban areas have been the driving force in economic and social development. Cities emerged as a focal point of transport, trade, business, education, religion and governance. Unprecedented urbanisation and migration result in multi-fold growth of urban areas. Adhoc efforts neither result in better environment nor strengthen the economic base. The 74th Constitution Amendment Act envisages empowerment of the Urban Local Bodies (ULBs) with planning functions, which are enshrined in the Twelfth Schedule to Article 243 – W of 74th Amendment. The first three functions under the Twelfth Schedule are Urban planning including town planning; Planning of land-use & construction of buildings; and Planning for economic and social development.

Master Plans are expected to give impetus to the development and economic potential of cities. Essentially in this Master Plan, the issues that are regarded as very crucial in framing the development proposals to achieve better living and economic conditions in the urban areas, have been considered after carefully weighing the opportunities and constraints offered by the city. The comprehensive efforts have established a framework for physical and socio-economic development and upliftment of the city and its constituent elements, and a development policy mechanism by which these goals can be achieved.

I would like to appreciate the leadership provided by the Thrissur Municipal Corporation for this endeavour under the chairmanship of Sri M.K.Varghese. The contributions of the Master Plan Committee constituted for the preparation of the Master Plan as well as the Working Groups were significant in the task. I take this opportunity to appreciate the officials of the Thrissur District office of the Local Self Government Dept Planning, Sri. K.R.Rajeev, District Town Planner and the planning team for their sustained efforts in the time bound preparation of this plan. The contributions of Sri K.M. Gopakumar, former District Town Planner is also to be mentioned at this juncture.

Definitely, the Master Plan for Thrissur City will provide the necessary framework for the development of the cultural capital of the State. I optimistically look forward to effective implementation of this plan. Certainly, the Master Plan will provide guidance for all stakeholders with an interest in the future development of the city.

H Prasanth
16/04/24

H. Prasanth
Chief Town Planner (Planning)
Local Self Government Department Planning.

ACKNOWLEDGEMENT

The master plan delivers a coordinated strategy to guide future development, transport and public utility investments over the next 20 years to ensure our town as safe, attractive and a continued source of pride. The preparation of the Master Plan for Thrissur Municipal Corporation was initiated as per resolution of Municipal Corporation Council (Decision no.30) on 23/02/2019.

I am sincerely acknowledging the valuable guidance and involvement of Municipal Corporation mayor Sri M.K.Varghese, and former Municipal Corporation mayors Smt. Ajitha Jayarajan and Smt. Ajitha Vijayan during the preparation of Master Plan for Thrissur Municipal Corporation. I gratefully acknowledge the contributions of all councilors of the Municipal Corporation for their support. The sincere efforts put in by the Secretary and Municipal Corporation Engineer needs special mention here.

I express my sincere gratitude to Sri. Gigi George, former Chief Town Planner, Smt. K.S.Girija former Chief Town Planner (Planning), Sri C.P.Pramod Kumar, Chief Town Planner, Sri H.Prasanth Chief Town Planner (Planning) for their unmatched support and guidance in bringing out this draft plan. Special thanks also go to all Department persons who gave their valuable support without which the compilation of this vital document would have been difficult to realize. The plan has been prepared in a participatory way having several consultations with Stakeholders at all stages. I offer special thanks to members of Special Committee, Working groups and other stakeholders for offering their views, comments and recommendations in developing the plan. I would like to extend special thanks to the residents and people of Thrissur Municipal Corporation who provided substantial input that helped to shape the Master Plan vision for future generations to enjoy.

Master Plan preparation is the culmination of several months of dedicated work by the Planning team members. I sincerely appreciate hard work and sincerity of the planning team in the District office in completing all the works in a time bound and organized manner and bringing out the plan within the stipulated time. The services of the former District Town Planner, Sri. K.M Gopakumar is remembered with gratitude on this occasion. I sincerely appreciate the dedicated efforts of Smt. K.M.Sumathy, Smt. Jeeva Liza Xavier as Deputy Town Planners who led the planning team during each of their tenure to shape the plan. I extend my sincere gratitude to all the members of the planning team with special mention to Smt. Nimmy Kurian, Sri. Sanu K Thekkath and Sri Pradeep P T as Assistant Town Planners who worked to contribute to this plan along with Smt. Lathika P V, Smt Prabitha P B, Smt Sruthy Vijayan 1st grade surveyors who created the GIS part of the plan. Contributions of Planner Associates Smt. Devika K C , Smt Nighitha V S and Planning Assistants(GIS) Smt. Reshma K Ravindran , Sri Ashwin Kokkat towards the successful preparation of this plan is also acknowledged here

I am also indebted to the all other members both in the technical and non-technical section for all the co-operation and timely action extended.

Finally, but not the least, special thanks to all staff of District office for their tireless efforts without which this plan would not have been completed.



K.R. Rajeev
District Town Planner
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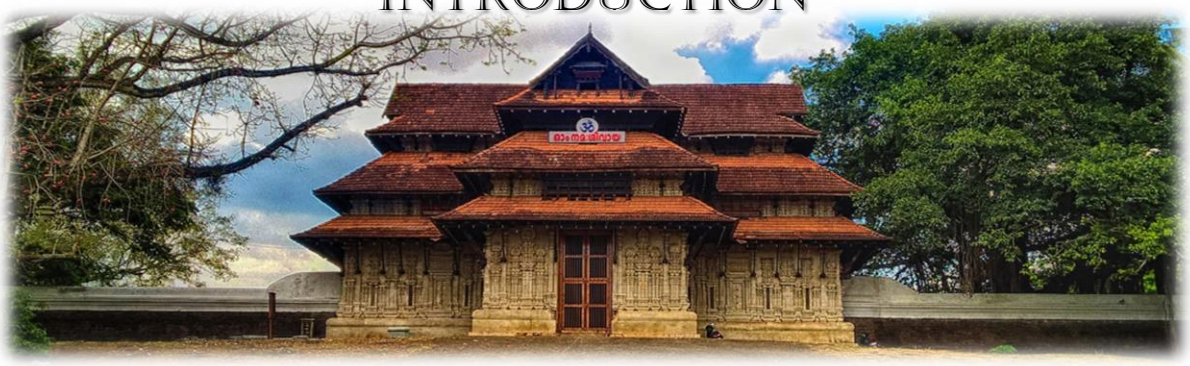
ABBREVIATIONS

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
MoUD	Ministry of Urban Development
GIS	Geographic Information System
LSGI	Local Self Government Institution
ULB	Urban Local Body
SUR	State Urbanisation Report
IDDP	Integrated District Development Plan
WFPR	Work Force Participation Rate
URDPFI	Urban and Regonal Development Plan Formulation and Implementation Guidelines
KSRTC	Kerala State Road Transport Corporation
PWD	Public Works Department
NATPAC	National Transportation Planning and Research Center
PCU	Passenger Car Unit
IRC	Indian Road Congress
KWA	Kerala Water Authority
PMAY	Pradhan Manthri AwasYojana
KMBR	Kerala Municipality Building Rules
BPL	Below Poverty Line
CRZ	Coastal Regulation Zone

CHAPTER 1
INTRODUCTION



This chapter gives an introduction to the various facts related to Thrissur city and explains the general features of the city like its profile, socio-cultural history, history of development and planning, need for a planned intervention for the city and its methodology.

Thrissur, which is located centrally in the state of Kerala, is widely renowned as the 'Cultural capital' of Kerala. Thrissur city, which exhibits a ring and radial pattern of development, has developed around a 65-acre hillock called the Thekkinkadu Maidan which seats the Vadakkumnathan temple dedicated to lord Siva, in its centre. Thekkinkadu Maidan acts as the city's nerve centre, which hosts often a variety of festivals, cultural as well as political events. The whole of the city branches out from Swaraj Round which encircles the Thekkinkadu Maidan through eight major roads and various minor roads. The city is bounded in its west by the lush green Kole lands.

Thrissur Municipality, which came into existence in 1921 as per Cochin Municipal Regulations of 1096(ME), was upgraded to the status of a Municipal Corporation in 2000, by including adjoining Panchayats to the Municipal area. Thrissur Municipal Corporation was formed as the 4th Municipal Corporation of Kerala. The Municipal Corporation is part of Thrissur Parliamentary Constituency and is part of Thrissur & Ollur State Legislative Assembly Constituency.

The central core of the city is depriving its quality due to intensive urban growth and congestion as a result of this. The intensive urban development without sufficient supporting facilities may lead to degradation of the city. The extent and quality of the green kole lands bounding the city is now reducing due to the reclamation activities happened as part of urban outgrowth. In order to accommodate the contemporary challenges and the distribution of spatial activity in a well-organized and efficient manner, a planned intervention with provision of infrastructure and supporting facilities is essential for the city.

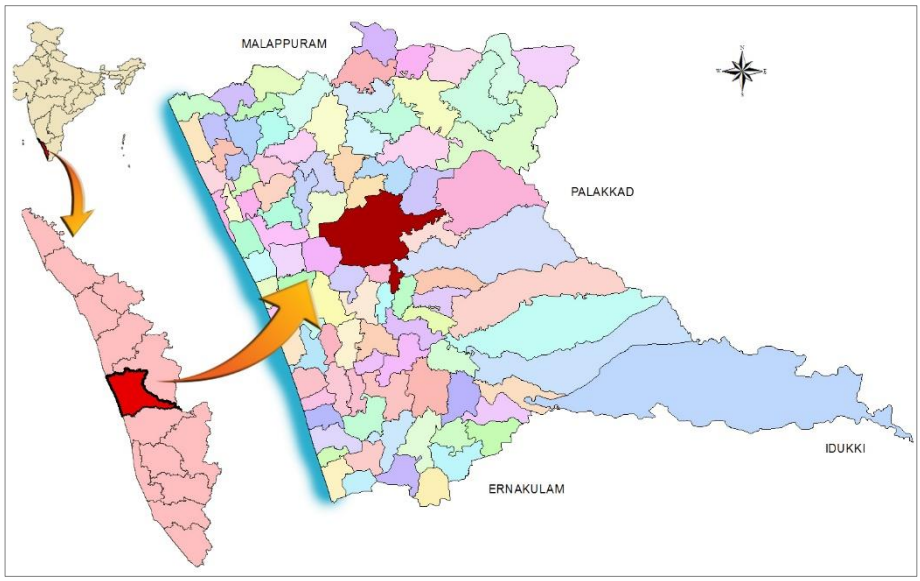


Fig 1.1 Location of Thrissur Municipal Corporation

1.1 PROFILE OF THE CITY

1.1.1 LOCATION

Thrissur district, located almost centrally in the State of Kerala, lies between 10°47'N & 10°15' N latitudesand75°57' E &76°54' E longitudes. Thrissur city serves as the administrative headquarters of Thrissur district, is located almost centrally in the district. The city is located at a distance of about 295 km to the North from the State headquarters, Thiruvananthapuram; about 70 km north of Kochi, the industrial &commercial hub of Kerala and 120 km south of Kozhikode, the commercial capital of Malabar region. The city is bounded by the Panchayats of Kolazhy, Mulankunnathukavu &Madakkathara inthe North; Puthur, Pananchery & Nadathara in the East; Avinissery, Nenmanikkara, Paralam, &Vallachira in the south; and Arimpur & Adat inthe west.

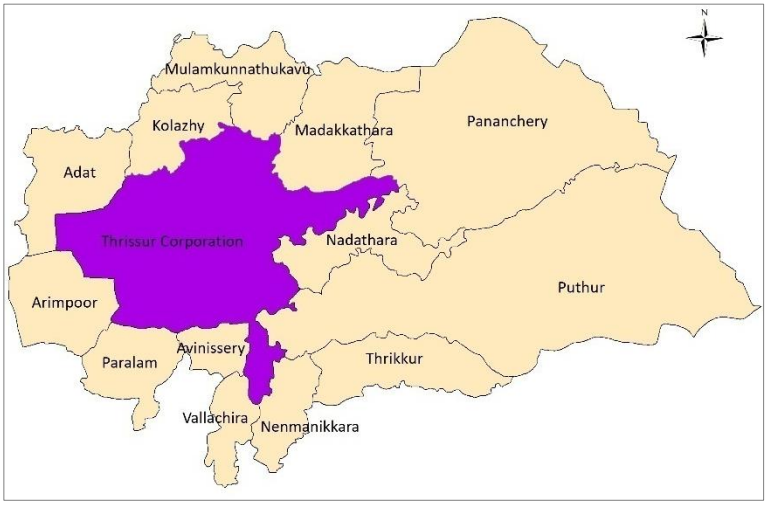


Fig 1.2 Surrounding local bodies of Thrissur Municipal Corporation

1.1.2 AREA & POPULATION

Thrissur Municipality came into existence on 1st July 1949. It was one of the smallest municipalities in the state during 1990s with an extent of 12.65 sq.km. and having a population of about 74,640 as per 1991 census. The city was upgraded to the status of a Municipal Corporation on 2nd October 2000, by merging adjoining Panchayats of Ayyanthole, Ollur,

Ollukkara, Koorkkenchery, Vilvattom and Nadathara (part) to the existing Municipal area, as represented in fig. 1.3.

Thrissur Municipal Corporation is having an extent of 101.42 sq.km. The total population in the Municipal Corporation area as per 2011 census is 3,15,957 with a density of 3115 persons/ sq. km.

Thrissur Municipal Corporation area is comprised of 15revenue villages in full and a part of Nadathara village, as shown in the fig. 1.4. The details of villages are given in table 1.1.

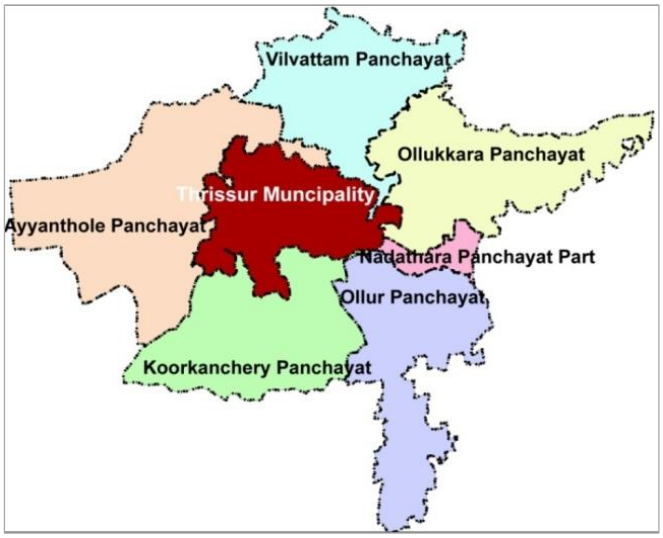


Fig 1.3 Local bodies merged to form Thrissur Municipal Corporation



Fig 1.4 Revenue Villages in Thrissur Municipal Corporation

Table 1.1 Revenue Villages in Thrissur Municipal Corporation

Sl. No.	Revenue Village	Area (sq. km)
1	Aranattukara	6.93
2	Ayyanthole	8.13
3	Chiyyaram	5.59
4	Edakunni	5.54
5	Kanimangalam	8.36
6	Koorkanchery	3.39
7	Nadathara (part)	2.09
8	Nettissery	4.40
9	Ollukkara	13.06
10	Ollur	9.96
11	Peringavu	3.19
12	Poonkunnam	1.57
13	Pullazhi	7.86
14	Thrissur	9.79
15	Vilvattom	6.50
16	Viyyur	5.06
Total		101.42

1.1.3 ADMINISTRATIVE DIVISIONS

Thrissur city serves as the headquarters of Thrissur District as well as Thrissur Taluk. Thrissur city is administered by Thrissur Municipal Corporation, headed by Mayor. The city was divided into 52 administrative wards/divisions, as per 2011 census data, from which the members of the Municipal Corporation Council are elected for a period of five years. Later on 2012, the wards were reshuffled and increased to 55 wards. The administrative wards in Thrissur Municipal Corporation is listed in table 1.2 and shown in fig. 1.5.

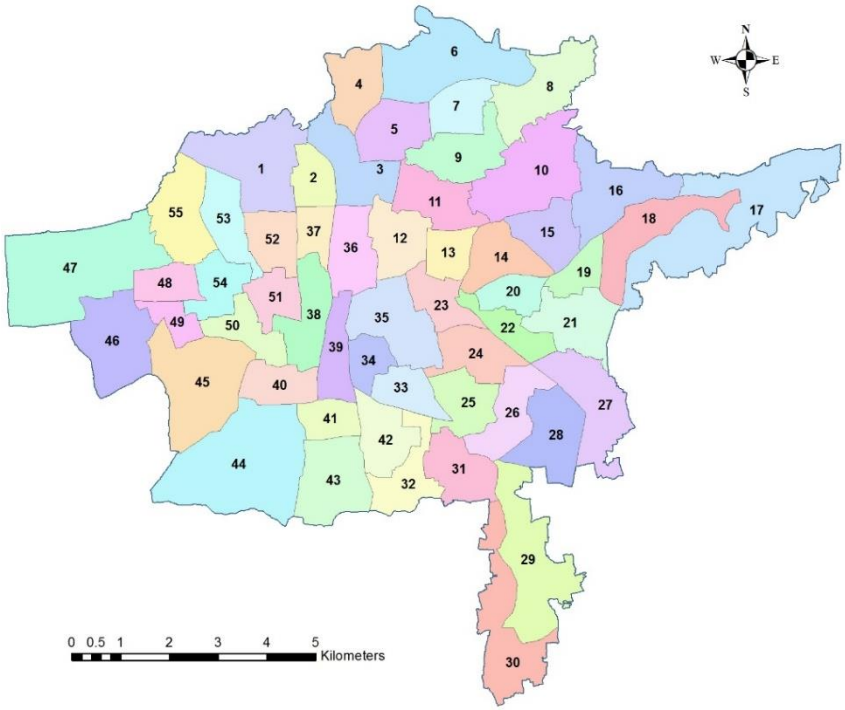


Fig 1.5 Ward map of Thrissur Municipal Corporation

Table 1.2 Administrative Wards in Thrissur Municipal Corporation

1	Poonkunnam	15	Ollukkara	29	Edakkunny	43	Panamukk
2	Kuttankulangara	16	Nettissery	30	Thaikkattussery	44	Nedupuzha
3	Patturaikkal	17	Mullakkara	31	Ollur	45	Karyattukara
4	Viyyur	18	Mannuthy	32	Chiyyaram South	46	Chettupuzha
5	Peringavu	19	Krishnapuram	33	Chiyyaram North	47	Pullazhi
6	Ramavarmapuram	20	Kalathodu	34	Kannamkulangara	48	Olari
7	Kuttumukk	21	Nadathara	35	Pallikkulam	49	Elthuruthu
8	Villadam	22	Chelakkottukara	36	Thekkinkad	50	Laloor
9	Cheroor	23	Mission Quarters	37	Kottappuram	51	Aranattukara
10	Mukkattukara	24	Valarkkavu	38	Poothole	52	Kanattukara
11	Gandinagar	25	Kuriachira	39	Kokkala	53	Ayyanthole
12	Chembookkavu	26	Anchery	40	Vadookkara	54	Civil Station
13	Kizhakkumpattukara	27	Kuttanellore	41	Koorkkanchery	55	Puthoorkkara
14	Paravattani	28	Padavarad	42	Kanimangalam		

1.1.4 PHYSIOGRAPHY

From the central higher area, the city gradually slopes towards the periphery in all directions. ThekkinkaduMaidan and Vadakkumnathan temple are located in the central higher area. Kole Lands occupy the western area of the city whereas other paddy fields are mainly located in northern and western parts of the city. Large hill tracts with rubber plantations are located in eastern part of the city especially in Ollukkara Panchayat area where the ground

level varies from 20 m and 100 m above mean sea level. No major river is passing through Thrissur City but the presence of small rivulets, thodus and ponds makes it rich in water.

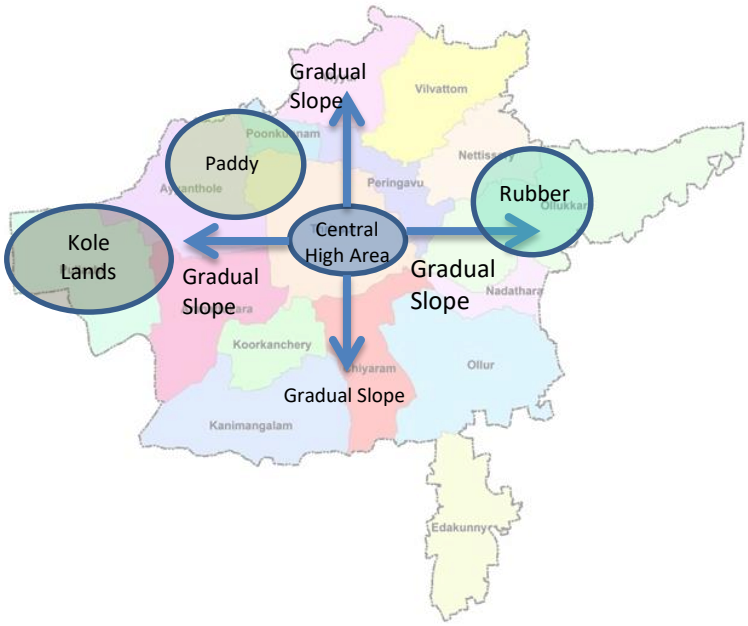


Fig 1.6 Representation of physiographical structure of Thrissur city

1.1.5 GEOLOGY

Thrissur is located in the mid land region and geographically the area is composed mostly of Archean gneisses & crystalline schist's and type of soil seen is laterite. Sandy loam type of soil is also available in some parts. Classification of rock type in Thrissur Municipal Corporation is shown in fig 1.7. The main cultivation is paddy & coconut. Paddy fields are located in almost all parts of the city. Majority of these fields are at present lying vacant. Some rubber and cash crop plantations are there in eastern parts of the city.

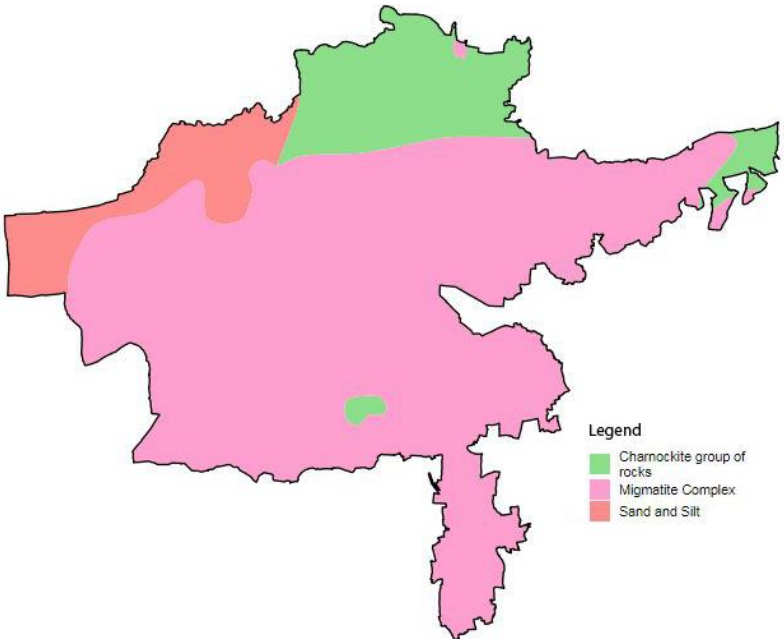


Fig 1.7 Rock types in Thrissur Municipal Corporation area (Source: KSLUB)

1.1.6 CLIMATE

Thrissur city enjoys a tropical and humid climate. Since the region lies in the south western coastal state of Kerala, the climate is tropical, with only minor differences in temperature between day and night, as well as over the year. Summer lasts from March to May, and is followed by the southwest monsoon season from June to September. October and

November form the post monsoon or retreating monsoon season. Winter from December through February is slightly cooler, and windy, due to winds from Palghat Gap of Western Ghats.

The city is drained in the monsoon season by heavy showers. The average annual rainfall is 3,159 mm. The Southwest monsoon generally sets in during the last week of May. After July the rainfall decreases. On an average, there are 124 rainy days in a year. The maximum average temperature of the city in the summer season is 35°C while the minimum temperature recorded is 22.5°C.The winter season records a maximum average of 32.3°C and a minimum average of 20°C. The air is highly humid throughout the year, the relative humidity being generally over 70%. Winds are generally light to moderate and they strengthen in the monsoon season. In the south-west monsoon season mainly the wind blows towards western or south western direction. During the rest of the year wind blow mainly from north-eastern to eastern direction in mornings and blow between south-west and north-west direction in afternoons.

1.1.7 HISTORY

The history of Thrissur dates back to ancient times. The name Thrissur derived from the word Thrissivaperur, which is a combination of Malayalam words Tiru-Siva-Peroor, which collectively means the city bearing the holy name of Lord Shiva. This is referring the famous Siva (Vadakkumnathan) Temple, the abode of Lord Siva. A place of great antiquity, Thrissur was also known as “Vrishabhadripuram” and “Thenkailasam” in ancient days. Thrissur was also named as ‘Trichur’ during the colonial period. From ancient times, Thrissur has played a significant role in the political history of South India. Many rulers and dynasties beginning with the Zamorins of Kozhikode, Tipu Sultan of Mysore and Europeans including the Dutch and the British have had a hand in moulding the destiny of this region. The entire credit for the rise of the modern city of Thrissur goes to Raja Rama Varma IX, who ascended to the throne of the state of Cochin in 1790. He was popularly known as ‘SakthanThampuran’and he is said to be the architect of the present Thrissur City.

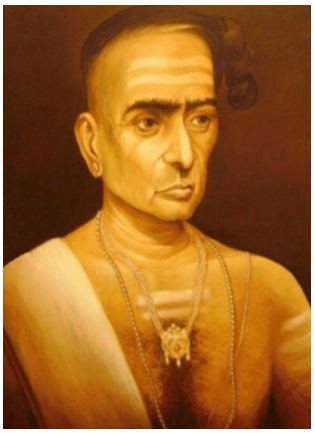


Fig 1.8
SakthanThampuran

1.1.7.1 History of Governance

Thrissur District has played a significant role in the history of South India from the pre-historic period to the modern times. According to Survey Settlement Register, Thrissur city came into existence in 1084 ME (1909 AD). Scholars assign the age of the megalithic monuments found in various parts of the district to a period ranging from the third century B.C to the first century A.D or even earlier.

The whole of the present Thrissur District was included in the early Chera Empire. The District can claim to have played a significant part in fostering the trade relations between Kerala and the outside world in the ancient and medieval period. It can also claim to have

played an important part in fostering cultural relations and in laying the foundation of a cosmopolitan and composite culture in this part of the country. Muziris (Muchiri), an ancient city located near the present Kodungallur town was an important port city in the pre-historic era, was a part of it. It attracted traders from all over the world viz. Assyrians, Babylonians, Phoenicians, Egyptians, Greeks, Romans, Chinese and Arabs.

Later on Medieval Cholas occupied Thrissur after the disintegration of Kulasekhara Dynasty. After the fall of Medieval Cholas, most of the Thrissur has been in the hands of CochinRoyal Family also known as PerumpadapuSwaroopam. But at the same time, another powerful dynasty known as Samoothiri from Kozhikode captured most of the Thrissur in 14th and 15th century. Then came the Portuguese, who ruled Thrissur in 16th century. In the beginning of 17th century, the Portuguese power was diminished and Dutch became the main power. With the help of Dutch, Cochin Royal Family recaptured Thrissur from Samoothiri in 1710.

However, during 1750-60 Hyder Ali from Mysore attacked Thrissur and was forced to become tributary of Mysore kingdom. Tipu Sultan, his son led another invasion in 1786 to Thrissur, where he destroyed the churches of Syrian Malabar Nasrani community and temples also. Tipu's Army set fire to the church at Palayoor and attacked the Ollur church. He plundered Thrissur's economy and even converted Christians and Hindus to Muslims. The economy of Thrissur was totally collapsed because of this invasion. Later he made a retreat from Thrissur, which served as his headquarters of Kerala region, after the Srirangapattanam war with British.

The modern city of Thrissur rose in to importance after Rama VarmaKunhjipillaThampuran or Rama Varma IX or popularly known as SakthanThampuran ascended the throne of Kingdom of Cochin (1790 to 1805). He changed the capital of Cochin Royal Family from Mattancherryto Thrissur and reconstructed the city that was ravaged during Tipu's invasion. He abolished the power of Namboothiri community, which controlled most of the temples of Thrissur district. The maharaja destroyed the forest around the ThekkinkaduMaidan which seats the Vadakkumnathan temple, planned the various activities in the city and also started the most spectacular cultural festival called Thrissur Pooram. SakthanThampuran laid the modern foundation stone of Thrissur and made the city in to a major financial and commercial hub of South India, by inviting Syrian Christian families and Brahmins from adjoining areas. After the reign of SakthanThampuran, the glory and power of the kingdom came to decline. Later on, Rama Varma X, the successor of SakthanThampuran, signed a treaty with East India Company, and made Cochin a subsidiary of the British.

1.1.7.2 History of Development

Thrissur city owes its present glory and importance to SakthanThampuran, who structured an organised pattern of settlement which gave importance to trade and commerce. Hegave leadership in clearing the forest surrounding the Vadakkumnathan Temple and paved way to a vast open space in the centre of the city, the ThekkinkaduMaidan. He encouraged merchants to settle down in the city, demarcating the south east areas for the Syrian Christian

settlement and north western areas for Brahmin settlement which paved the base for textile industry in Thrissur. Plan of Thrissur fort in 1794 with its zone demarcation for various activities are as shown in fig. 1.9.

The political agents of the British government had their temporary headquarters in Thrissur. A sub ordinate court was set up in 1812. Thrissur jail also had its beginning at about this time. During the early part of the 19th century, Thrissur was connected by roads to hinder settlements. The Thrissur – Coimbatore road was inaugurated in 1844. A narrow gauge railway line from Shoranur to Ernakulum through Thrissur was commissioned in 1902. This was later converted into broad gauge in 1944. The civil hospital and the lunatic asylum had their beginning in 1875 and 1892 respectively. The maternity hospital was started in 1915. The existence of the Thrissur public library dates back to the seventies of the 19th century. The museum, zoo and botanical gardens were originally started in 1885 in Viyyur Park and shifted to their present location at Chembukkavu in 1914.

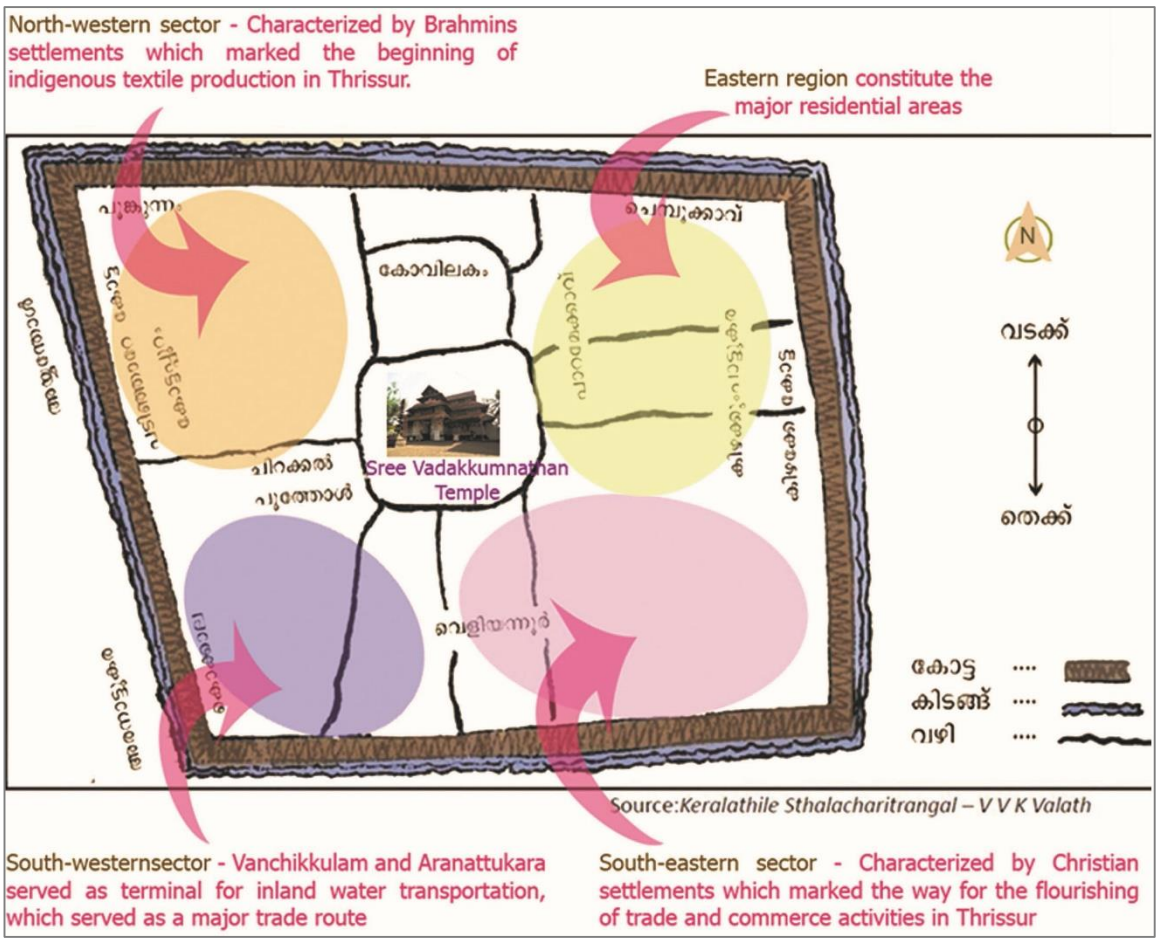


Fig 1.9 Plan of Thrissur fort in 1794

Source: Keralathile Sthala charithrangal – V.V.K.Valath

The central jail for Cochin State was established in Viyyur in 1914. Thrissur Municipality was constituted in 1921 under the Cochin Municipal Regulations of the same year. Prior to the constitution of the Municipality, there was a Sanitary Board functioning in 1910 and a Town Council after 1911. In the field of education, the sabhamadoms were the earliest institutions imparting coaching in Sanskrit. The first vernacular school in Thrissur was established by 1818 and the first English school in 1837. The St. Thomas College was found in 1919.

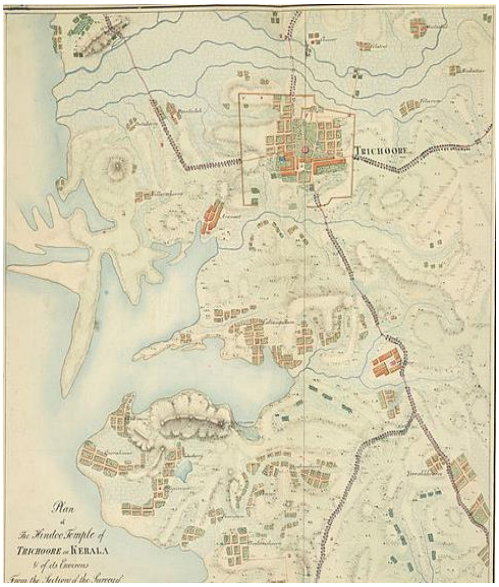


Fig 1.10 Thrissur in 1816

In general, the physical pattern of the city has evolved through centuries by the impact of various social, cultural, political and topographic factors. The western half of the city up to the fort limit formed the Hindu quarters. The southern and eastern portions were inhabited by Christians who dominated the business life of the city. The northern half contained the public institutions of the city situated around the royal palace. The city which was originally a taluk headquarter later became a division headquarter of Vadakkemukhom, the northern region of the Cochin state. With reorganization of the states in 1956, the city became the district headquarters.

The city received various contributions from many renowned personalities of the society. Sir. R.K.ShanmukhamChetty, who was the Diwan of Cochin from 1935 to 1941, developed the city by constructing Ramanilayam and Thrissur Town Hall. Dr. A.R.Menon, also known as the Architect of modern Thrissur; remained instrumental in constructing Municipal Office Building, M.O.Road& Municipal Bus Stand. He paved the way for concreting Swaraj Round &other city roads and also startedPeechi Water Supply Project. Sri. P.S. Rao, then acting Governor of Kerala expanded the city by shifting Collectorate and other Governmental offices to Ayyanthole from Chembukkavu. Sri. K. Karunakaran's efforts gifted us the Thrissur-Guruvayurrailway section and Poonkunnam over bridge. Sri. C. AchuthaMenon, former Chief Minister, gifted Thrissur with Kerala Agricultural Universityin 1971, a university for all agricultural related studies and activities. Prof. Joseph Mundassery's struggles ended up in the construction of Government Engineering College Thrissur, the second college of its kind in Kerala. Sri. VinodRai, former collector of Thrissur, transformed the city by building SakthanThampuran Nagar (S.T.Nagar) and shifted the Municipal stand near the M.O. Road to ShaktanThampuran Nagar.

1.1.7.3 Socio-Cultural History

Thrissur is well known for its cultural and religious panorama. The famous temple trio named as Vadakkumnathan, Paramekkavu and Thiruvambady and the colourful "Thrissur Pooram" an annual festival held in the city,in relation to these temples is renowned throughout the world. The existence of Kerala Kala Mandalam in the district as well asKerala

Sahitya Academy, Kerala SangeethaNataka Academy and Kerala Lalitha Kala Academy in the city centre promotes the cultural dignity of Thrissur City. The city and the area around it have the presence of a variety of museums, art schools, and institutes, which are dedicated to preserve and promote the rich cultural traditions of Kerala.

Thrissur, often hailed as the Cultural Capital of Kerala, is built around a hillock crowned by the famous Vadakkumnathan temple. The temple is believed to have been founded by the legendary saint Parasurama. It is also known as the Rishabhadri or Thenkailasam (Kailash of the South). This Siva temple is a classic example of the traditional Kerala style of architecture. The temple complex also has a number of small shrines within it, dedicated to different deities, apart from the main SivaShrine. The temple is known for its traditional architecture. The richly carved pagoda like wooden rooftop of this temple is an excellent example of the classical architecture of Kerala. Besides this temple, Thrissur city is adorned with a large number of historic temples such as Thiruvambady temple and Paramekkavu temple. These temples participate in the colourful Thrissur pooram. Thrissur pooram is a spectacular religious festival in South India and known as “Mother of all Poorams” which brings thousands of people from around the world. The major cultural attraction is the Thrissur Pooram festival, celebrated during April-May.



Fig 1.11 Vadakkumnathan Temple – an old picture

Thrissur is widely acclaimed as the land of elephant lovers. The formation of gold-caparisoned elephants during Thrissur pooram is a spectacular scene and tourists as well as local people throng the ThekkinkaduMaidan to catch a glimpse of this colourful event. Fireworks display is another attraction of the festival. The Elephant-Umbrella Display competition is spectacular, as richly caparisoned elephants carrying ceremonial umbrellas take the deity around the main temple. The passionate drum concerts as part of pooram celebrations are alsospectacular and are loved by all pooram lovers.

Another attraction of this city is the "Pulikkali" ("Puli" means 'tiger' and "Kali" means 'play') on the fourth day of Onam celebrations (NalaamOnam). It is a procession of different clubs from all over the city. Participants with tiger-striped body paint captivate the onlookers with their energetic dances. The festival attracts thousands to the city.



Fig 1.12 Puthan Pally

Thrissur district was under the control of Dutch and British invaders. During their period they have constructed several beautiful churches, an example is the Lourdes Cathedral. Dedicated to Our Lady of Lourdes, the church is noted for its imposing interior. The main attraction is an underground shrine which is a masterpiece of architectural designing. The exterior of this church features an Indo-European facade with pink spires. The

Cathedral church attracts thousands of pilgrims every month.The Basilica of Our Lady of Dolours (Puthan Pally), whichhas the tallest church tower in Asia, is situated in the heart of the city of Thrissur. It is famous for its Gothic style architecture. The Sacred Heart Latin Church of Latin Catholics and the Martha Mariam Big Church, Indian headquarters of Assyrian Church of the East, are also situated at Thrissur. The district also houses the headquarters of the Malabar Independent Syrian Church in Thozhiyoor.

Kerala SangeethaNataka Academy and Kerala Lalithakala Academy are headquartered at Thrissur. The Kerala Sahitya Academy is an autonomous institution established for the promotion and development of Malayalam language and literature. Kerala SangeethaNataka Academy promotes dance, music, drama and folk arts of Kerala. Kerala Lalithakala Academy was established to promote fine arts and artistic heritage.

The laid-back business culture of Thrissur is well known the rest of Kerala. The multi-hued past of this city comes alive at the Archaeological Museum and the Art Museum as also the Art gallery located within the Town Hall.

1.2 EARLIER PLANNING EFFORTS

Thrissur has a development plan prepared in 1985 for an area 32.28 sq.km. This Development Plan was sanctioned as per G.O. (M.S) No.232/85 dated 31.10.1985. Fig 1.14 shows the proposed land use map of this sanctioned development plan. The area consist of part of 13 revenue villages namely Aranattukara, Ayyanthole, Chiyyaram, Kanimangalam, Koorkanchery, Nadathara, Ollur, Ollukkara, Peringavu, Poonkunnam, Thrissur, Vilvattom and Viyyur. As this development plan covers only the old Municipal area and some surrounding areas, a new Master Plan was envisaged for the whole of the Municipal Corporation area and was prepared in 2012. This 'Development Plan for Thrissur Corporation – 2031' was published in 2012, and Master plan has been sanctioned for Thrissur municipal corporation for the total area of 101.42 sq.km under Section 36(8) of the Kerala Town and Country Planning Act, 2016 vide GO(Ms) No:59/2021/LSGD dated 20-02-2021 and published in the Govt gazette dated 26th February 2021.

Apart from Master Plan for the city, there are 12 sanctioned Detailed Town Planning schemes and 8 published Detailed Town Planning schemes for controlling and regulating urban growth as well as for the implementation of new roads.

1.2.1 EVALUATION OF DEVELOPMENT PLAN SANCTIONED IN 1985

The first development plan laid down policies and programmes for overall development of Thrissur city taking long term view of the requirements. It dealt with distribution of future population in various parts of city, policies for economic growth and future location of economic activities, future physical developments, circulation pattern, programmes for traffic and transportation, developments of land use zoning, requirements of

urban infrastructures for future population, policies and programmes for sectoral developments and zoning regulations with a horizon year 1991.

Table 1.3 Evaluation of Proposed Land Use in Development Plan of Thrissur 1991

Sl. No.	Land use	Proposed Land use for 1991	Percentage %	Existing Land use 2010	Percentage %	Variation
1	Residential	18.61	57.65	16.6	51.43	-6.22
2	Commercial	0.62	1.92	1.16	3.59	+1.67
3	Industrial	1.55	4.8	0.51	1.58	-3.22
4	Public & Semi public	2.65	8.21	4.61	14.28	+6.07
5	Transport and Communication	2.46	7.62	3.17	9.82	+2.2
6	Park& Open space	1.1	3.41	0.45	1.39	-2.02
7	Agriculture	4.67	14.47	3.97	12.3	-2.17
8	Waterbodies	0.64	1.98	0.58	1.8	-0.18
9	Vacant Land	-	-	1.23	3.81	
	Total	32.28	100	32.28	100	

Source: Sanctioned Development Plan for Thrissur 1991, sanctioned Master Plan for Thrissur City- 2031

Table 1.3 explains the variation in achievements of sanctioned Development Plan for Thrissur prepared in 1985. The existing land use classification in the 'Master Plan for Thrissur City -2031' is taken for comparison. The improvement in commercial use is evident from the comparison of land uses of the two years. A huge increase can be found in Public and semi-public areas. This is due to the increase in number of educational institutions and health institutions in Thrissur. Thrissur has grown as a major hub of educational and health facilities of the District. The increase in transportation area is mainly due to the implementation of various sanctioned DTP schemes.

It can be seen that almost all land use have attained the targeted area except that for residential, industrial, agriculture and water bodies. Residential area proposed for 1991 was 57.65% (18.61 sq. km) but only 51.43% (16.6 sq. km) of the total area have been achieved in the sanctioned Development Plan area by 2010. The increased land values at the central area have resulted in migration of people to the fringes for residential purposes. The vertical development in residential area (due to heavy increase in land value) during the years has resulted in a decrease in the expected horizontal development. Also the sanctioned Development Plan area has been converted to major commercial centre of Thrissur District which has resulted in the conversion of residential and agricultural lands for commercial purposes. Lack of major corridors passing through the development plan area and lack of

natural resources have resulted in the decrease of industrial activities. A reduction in park and open spaces can be found which is due to the conversion of open spaces and play grounds for other land uses. Reduction in agricultural area and water bodies are due to the encroachments of other activities. It can be seen that an area of 3.81% (1.23 sq. km) has been recorded to be kept vacant. This is the result of agricultural land holdings which are not under cultivation and are in the process of conversion.

1.3 NEED FOR NEW MASTER PLAN

Thrissur City is one of the fast growing urban areas of Kerala. The city has an imaginative physical form with a large open space in its centre around the Vadakkumnathan temple and fairly wide roads radiating from the centre. The core area of Thrissur City is equally carrying all major land use activities showing the capability of attracting people for various purposes to city centre. As the city is spread out to a larger area, the development also can be directed to the fringe areas without affecting the environment inside the core of the city which is small.

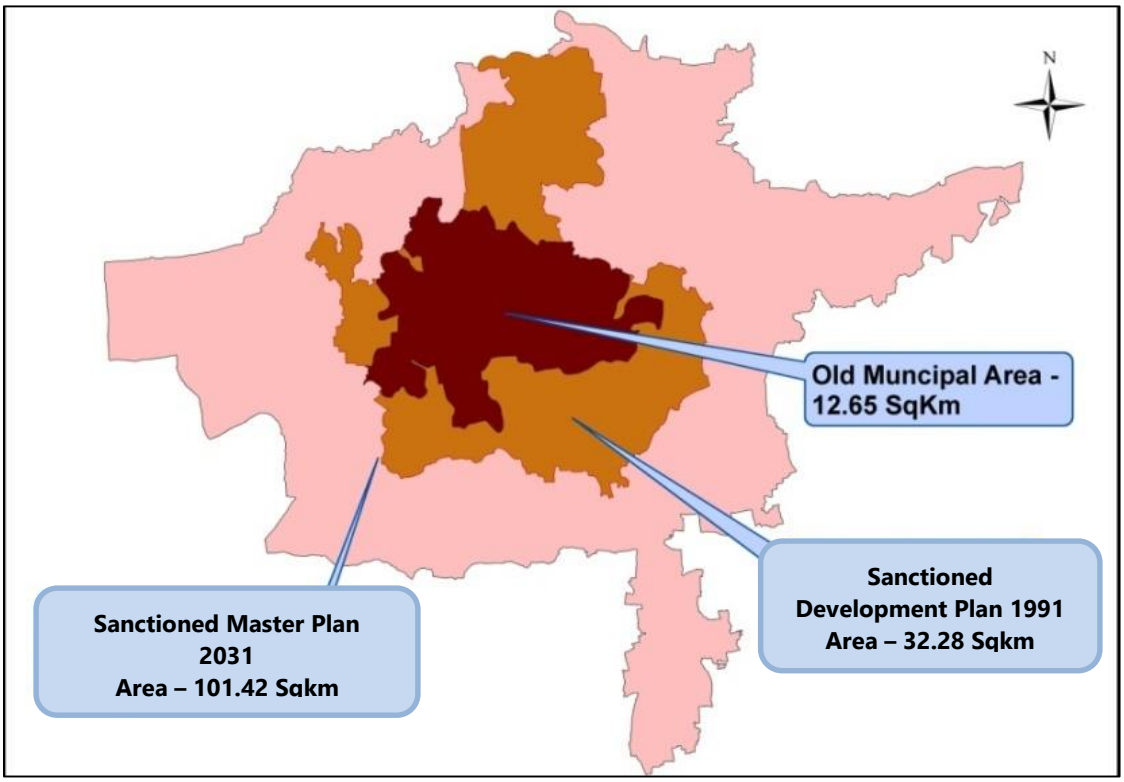


Fig 1.13Map showing boundaries of Old Municipal Area, Sanctioned Development Plan area & Sanctioned Master Plan area

The development plan prepared in 1985, about 35 years back, when Thrissur was a Municipal town. This development plan was made for a population of 1.75 lakhs for the plan year 1991. The area and population along with their requirements have changed drastically from the existing development plan. In view of the changes in area and population, a new master plan was envisaged for the Municipal Corporation area and was prepared as per GO (Rt.) No. 2766/2009/LSGD dated 24.10.2009. This master plan (Development Plan for Thrissur

Corporation - 2031) for an area of 101.42sq.km. was published in 2012 vide G.O. 22 dated 06-11-2012and Master plan has been sanctioned for Thrissur
Municipal corporation for the total area of 101.42 sq.km under Section 36(8) of the Kerala Town and Country Planning Act, 2016 vide GO(Ms) No:59/2021/LSGD dated 20-02-2021 and published in the Govt gazette dated 26th February 2021.

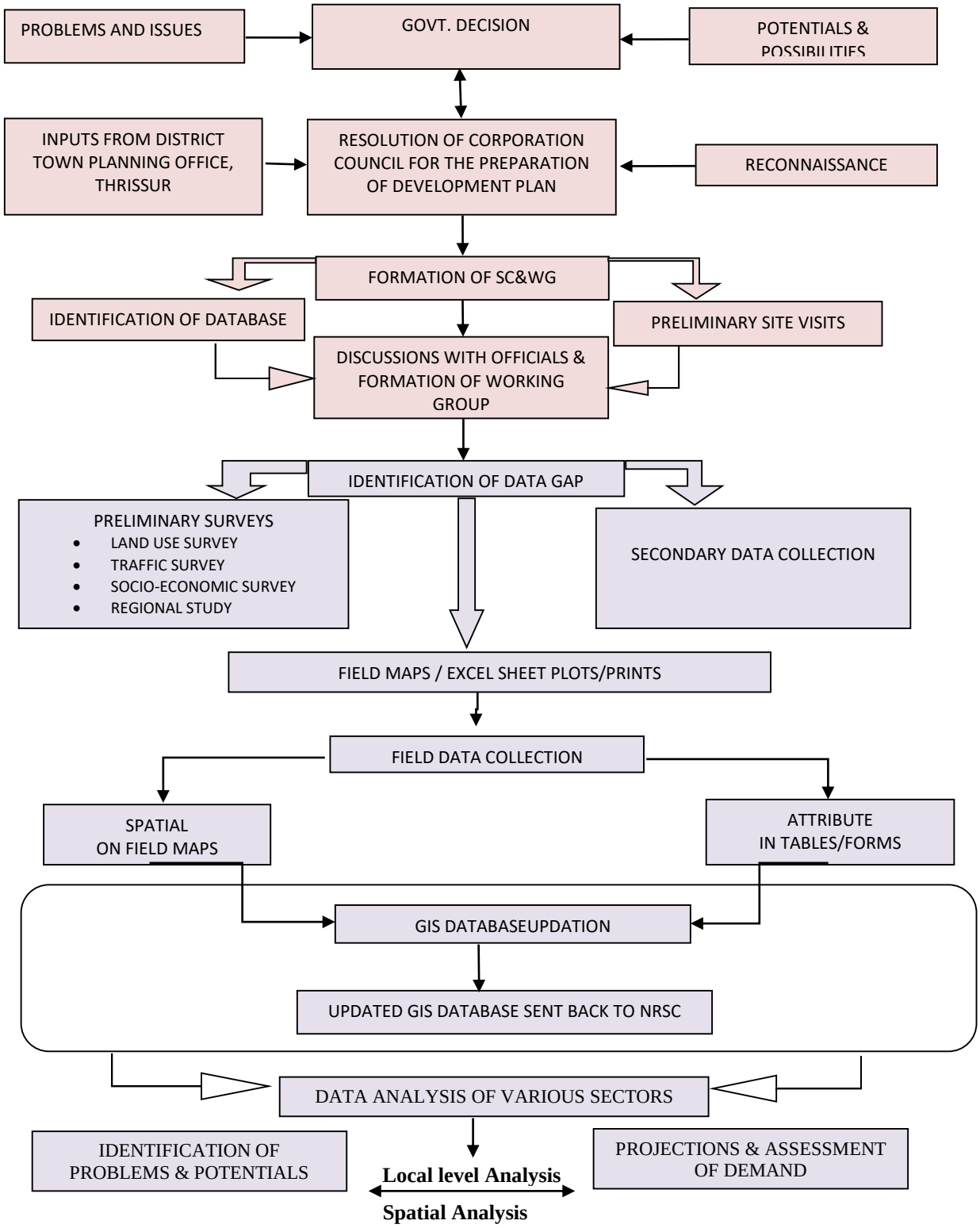
This revision of the development plan of 1985 was essential as the present trends of development are spreading all over the city. New Master Plan for whole city with policies and proposals which will help to guide day-today decisions on short term as well as long term development issues required for the orderly development of the city. A comprehensive master plan with sustainable and long term goals is needed for the development of the fast growing Thrissur city, so that sustainable development is made possible. Land development and infrastructure development in a planned manner may support new economic activities and facilitate public and private actions for better living condition.

Fig 1.15 shows the boundaries of the existing Thrissur city, Sanctioned Development plan area and the old municipal area. From the figure, it is clear that only one-third of the present city was included in the sanctioned Development Plan for Thrissur. The horizon period of sanctioned development plan is already over and this necessitates the preparation of a new Master Plan considering the whole area of Thrissur City so that development can be guided properly in a systematic manner. Master Plan-2031 has provided more infrastructure improvements such as roads, parking, upgradation of civic amenities and modern facilities for commercial development, tourism development, management of traffic flow, beautification of the city, formulation of effective solid waste and liquid waste management system for making an incredible Thrissur.

Meanwhile, Central Government have introduced a scheme called ‘AMRUT (Atal Mission for Rejuvenation & Urban Transformation) aiming at the rejuvenation of urban areas with the main thrust to create infrastructure, to provide basic services to households and to build amenities; so as to improve the quality of life of the people especially the poor and disadvantaged. A total of 500 cities/towns were selected for the project in the whole country. From Kerala, 9 cities/towns were selected and Thrissur city is one among those selected cities. “Formulation of GIS based Master Plan” is a sub-scheme under AMRUT by which master plan for the city is to be prepared as per guidelines prescribed in ‘AMRUT Design & Standards’. This facilitates to have a better control on spatial location of various physical and social infrastructure of the town. This will also serve as a major data backup of various services available in the town with better scope for further analysis and updation of available data spatially. Accordingly, the Council of Thrissur Municipal Corporation had taken resolution numbered 30 on 23.02.2019 for preparation of a GIS based Master Plan for Thrissur Municipal Corporation area.

1.4 METHODOLOGY

Preparation of GIS based Master Plan for Thrissur City having a vast area involves tremendous work load in ground truthing, vetting & attribute data collection, compilation, GIS database updation, collection & analysis of various primary and secondary data to identify problems and potentials and to formulate of detailed sectoral proposals for the horizon period of 2040.



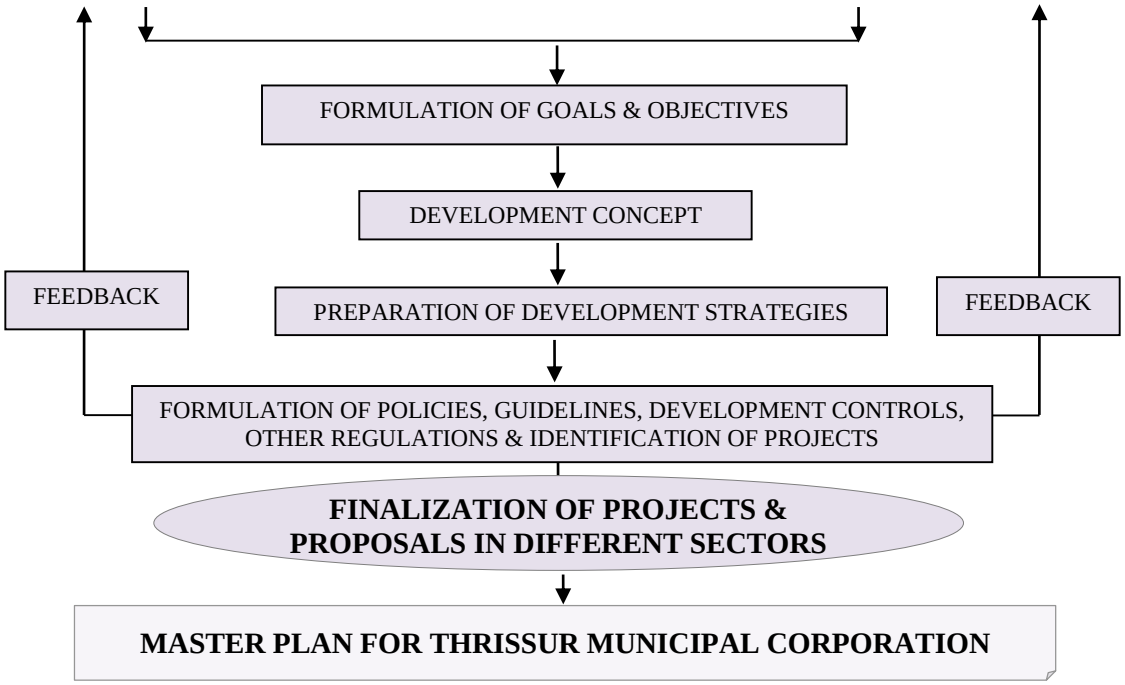
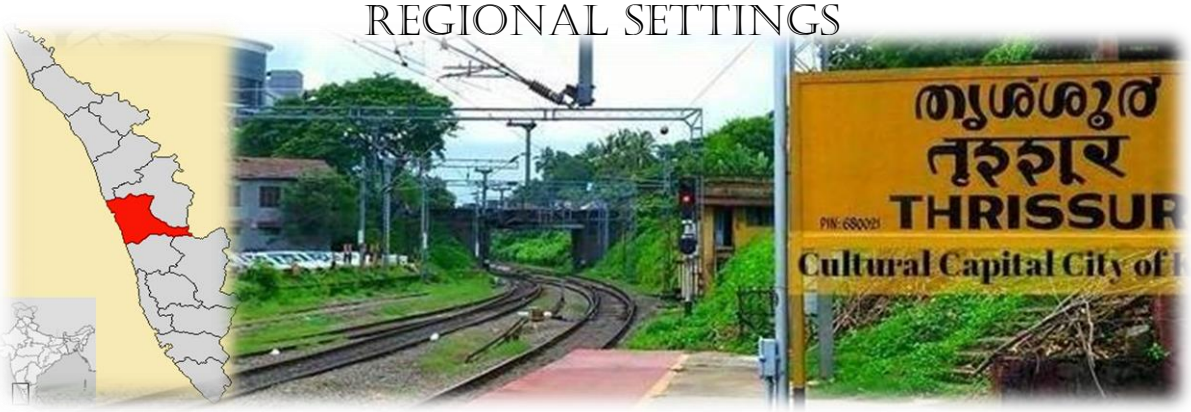


Fig 1.14 Schematic representation of Methodology for preparation of Master Plan

The procedure and various steps involved in the preparation of GIS based Master Plan for Thrissur Municipal Corporation area, under the centrally sponsored scheme of AMRUT is as represented in fig. 1.14.

CHAPTER 2
REGIONAL SETTINGS



The regional setting of a city can be arrived from the Regional Plan which spells out hierarchy of the city in the District Scenario, the activity it has to perform and its connectivity with different settlements. The regional linkage of the city with surrounding areas is described in terms of connectivity and spatial location. The aspect is studied in order to view the developments taking place in the city in a regional context and to evaluate the potentials of the city based on its spatial location.

2.1 LOCATION

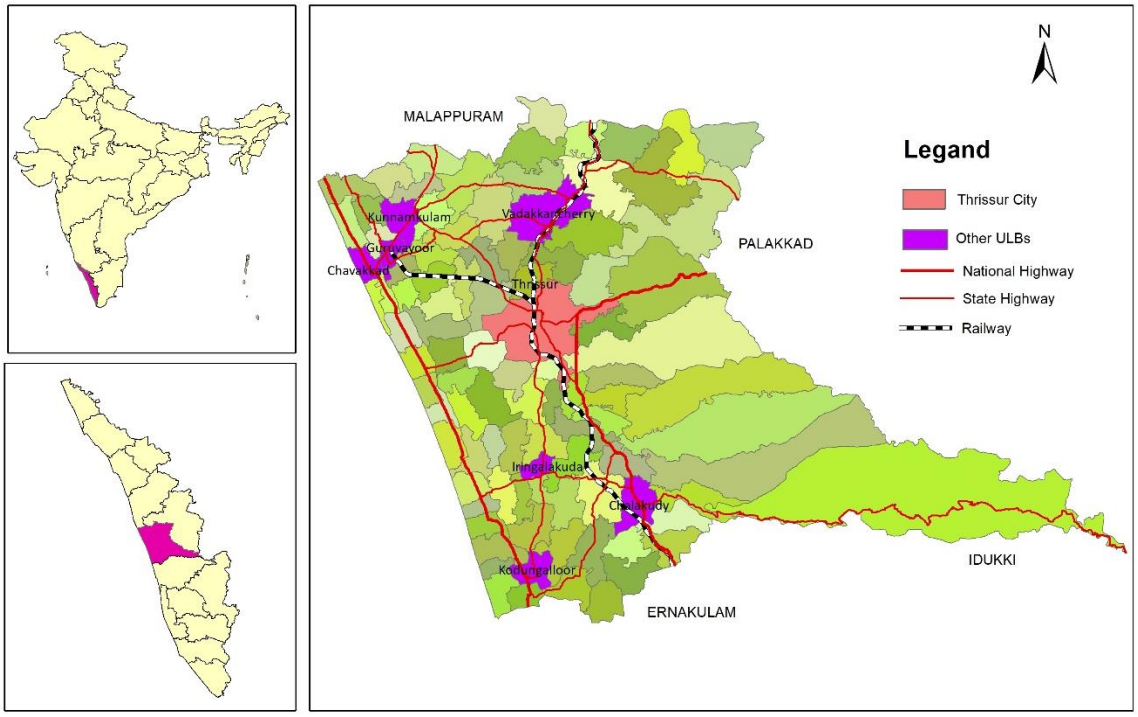


Fig 2.1 Regional settings of Thrissur Municipal Corporation

Thrissur district, which is located centrally in Kerala State, is bordered by Malappuram District in the north, Palakkad District in the northeast, Ernakulam&IdukkiDistricts in the south, Arabian Sea in the west and Western Ghats stretches towards the east. The district is having an area of 3032 sq. km. and is divided in to sevenTaluksnamelyChavakkad,Thalappally,

Thrissur,Kodungallur, Mukundapuram, Chalakudy andKunnamkulam. There exists eight Urban Local Bodies (ULBs) in the district which includes Thrissur Municipal Corporation and the Municipalities ofChalakudy, Chavakkadu, Kunnamkulam, Irinjalakuda, Guruvayur, Kodungallur&Wadakkanchery.

Thrissur city is located at a distance of about 295 km to the North from the State headquarters,Thiruvananthapuram; about 70 km north of Kochi, the industrial & commercial hub of Kerala and 120 km south of Kozhikode, the commercial capital of Malabar region.

2.2 LINKAGES

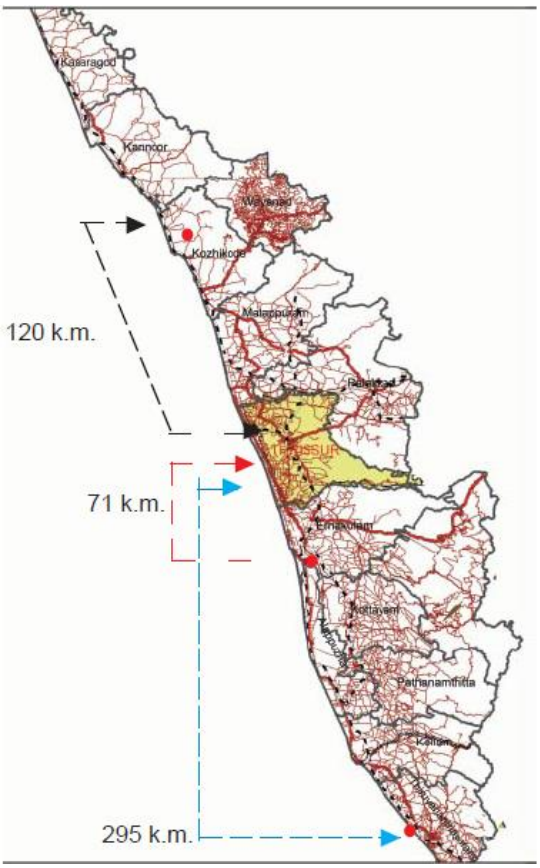


Fig 2.2 Distance to major places in the State

Table 2.1 Distance to Major nearby areas

PLACES	DISTANCE FROM THRISSUR (KM)
Thiruvananthapuram	295
Kollam	213
Kozhikode	125
Calicut Airport	100
Int. Airport Kochi	65
Ernakulam/Cochin	74
Malappuram	93
Palakkad	65
Coimbatore	114
Guruvayur	30
Irinjalakkuda	22
Kodungallur	40

Thrissur City is the third largest city in the state of Kerala in terms of its geographical extent. The city alone accounts for about 44% of the urban population in Thrissur District. Thrissur Municipal Corporation is the only local body and the city in Kerala which directly controls power, water supply and solid waste management system. Based on functional, urban and land use characteristics, Thrissur city comes under the tertiary activity zone. It acts as a connecting place to all its surrounding panchayats and nearby Districts, having good accessibility through a good network of motorable roads and Railways. National Highways NH-544 and NH-66 passes through Thrissur district, but only NH-544 passes through the city. NH-544 traverses the city at different points and gain access to nearby cities and towns like Kochi, Kozhikode, Coimbatore and Palakkad. The state highways Kodungallur – Shornur (SH-22), Thrissur - Kuttippuram (SH-69) and Thrissur–Vadanapally (SH-75) passes through Thrissur City and connect to other local bodies. It has also many arterial roads which connect to other parts of Thrissur district like Chalakudy,

Chavakkad, Irinjalakuda, Kodungallur, Guruvayur, Mala, and Wadakkanchery. The Nearest Airport is Nedumbassery International Airport, Cochin. The distances to major nearby places are as given in table 2.1.

It can be seen that Thrissur City is at a distance of 114 km from Coimbatore. Thrissur City lies in between Coimbatore and Ernakulam. The road traffic connecting Coimbatore and Ernakulam is through the NH-544 passing through Thrissur City. This has a great influence on Thrissur city.

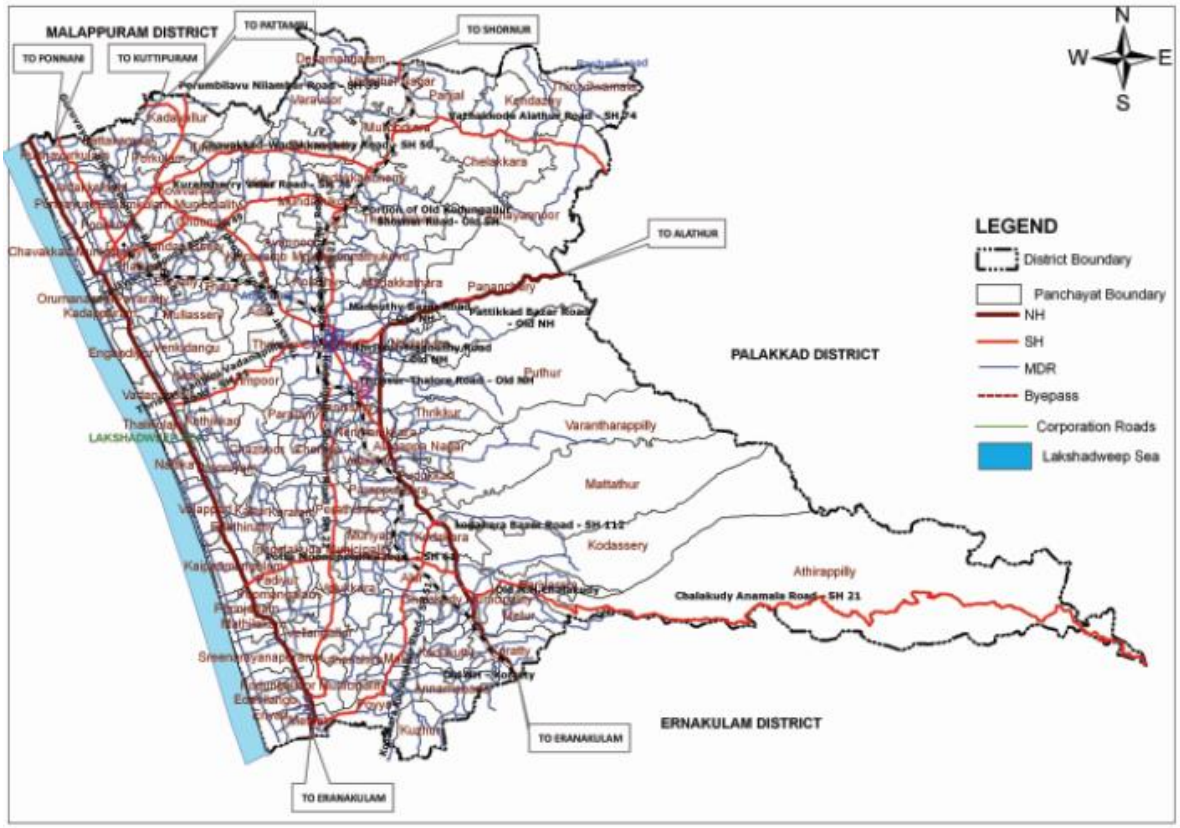


Fig 2.3 Road network of Thrissur district (Source: IDDP)

Map showing the road network of Thrissur district is shown in fig. 2.3. It can be seen that all the major roads passes through Thrissur city and thus the city is well connected with inter/intra state major locations. Map showing all the local bodies in Thrissur District is given in Fig 2.4. Thrissur Municipal Corporation lies almost at the centre of the District and thus it has good connectivity with all surrounding areas. The presence of NH and SH help in the connectivity which helps Thrissur City to grow as an important centre of trade and commerce. Almost all the neighbouring areas depend on the city for commercial purposes due to this existing transportation network. It can be seen that all the towns of Thrissur District are connected to Thrissur City through good road network. It can be seen that the city lies within a 10 km radius from the central area. Hence all the facilities in the central business area can easily be accessed by the whole city. All the neighbouring local bodies depend on the city for services like commercial centres, hospitals, educational institutions, recreational facilities, etc. Other urban local bodies in the district like Wadakkancherry, Kunnamkulam, Chavakkad, Guruvayur and Irinjalakuda are located 20-25 kms away from the Corporation boundary.

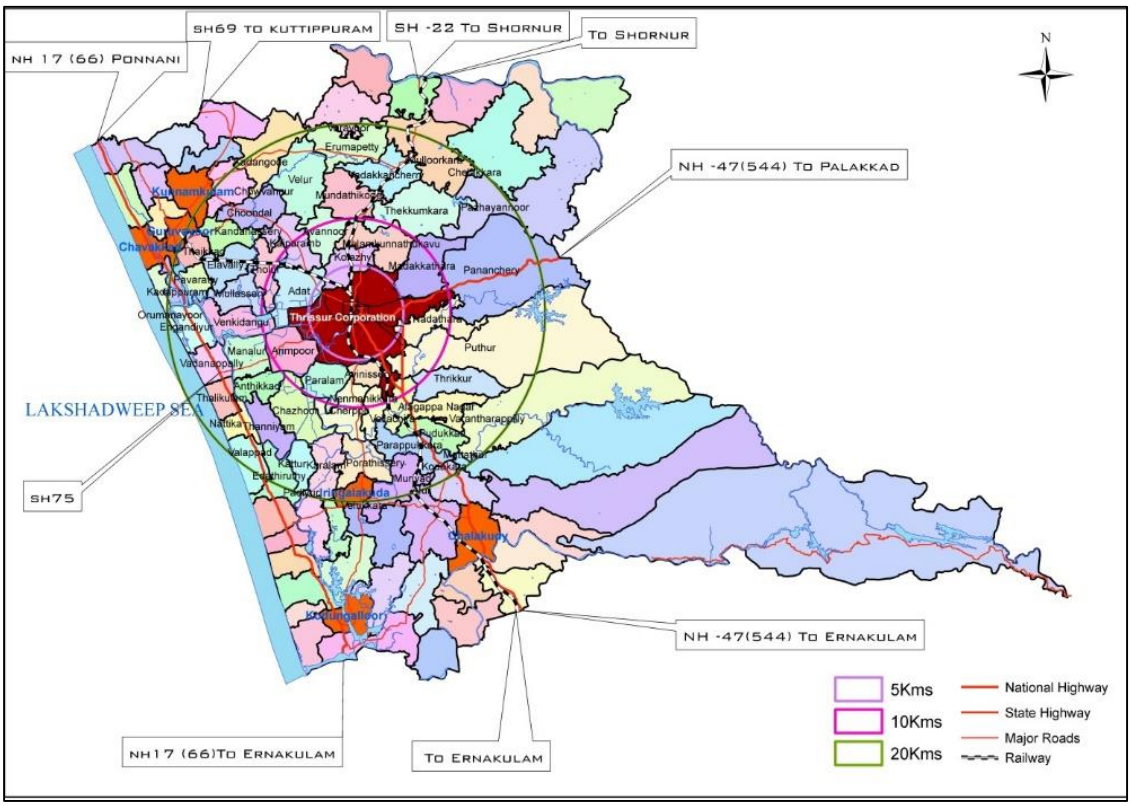


Fig 2.4 Major Surrounding LSGI's of Thrissur Municipal Corporation

Source: IDDP, Thrissur - 2012

2.3 REGIONAL SIGNIFICANCE

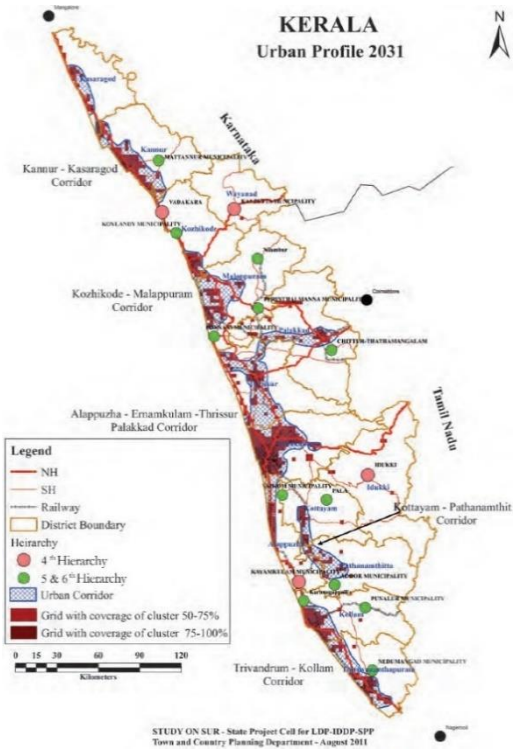


Fig 2.5 Urban Profile of Kerala - 2031

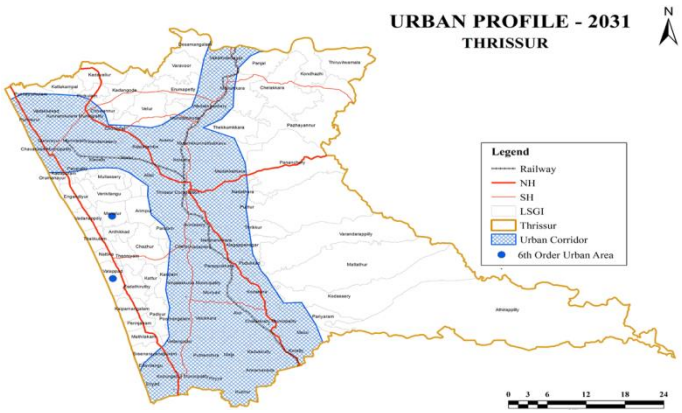


Fig 2.6 Urban Profile of Thrissur District - 2031

Source: State Urbanisation Report, Kerala - 2012

Thrissur Municipal Corporation is one of the six Corporations in the state. The city was also selected as one of the 9 AMRUT Cities/Towns in the state. As per the State Urbanisation Report (SUR) of Kerala – 2011, Thrissur Municipal Corporation is the urban centre which acts as a service provider to the functions of the district. As per the delineated urban profile of Kerala-2031 of SUR, Thrissur MunicipalCorporation falls within'Alappuzha – Ernakulam – Thrissur-Palakkad Urban Development Corridor' and thus forms a part of the thriving urban development corridor of the state. Suggested urban profile of Kerala State and Thrissur district as per State Urbanisation Report is shown in fig. 2.5 and fig.2.6 respectively.

2.3.1 Hierarchy of settlement

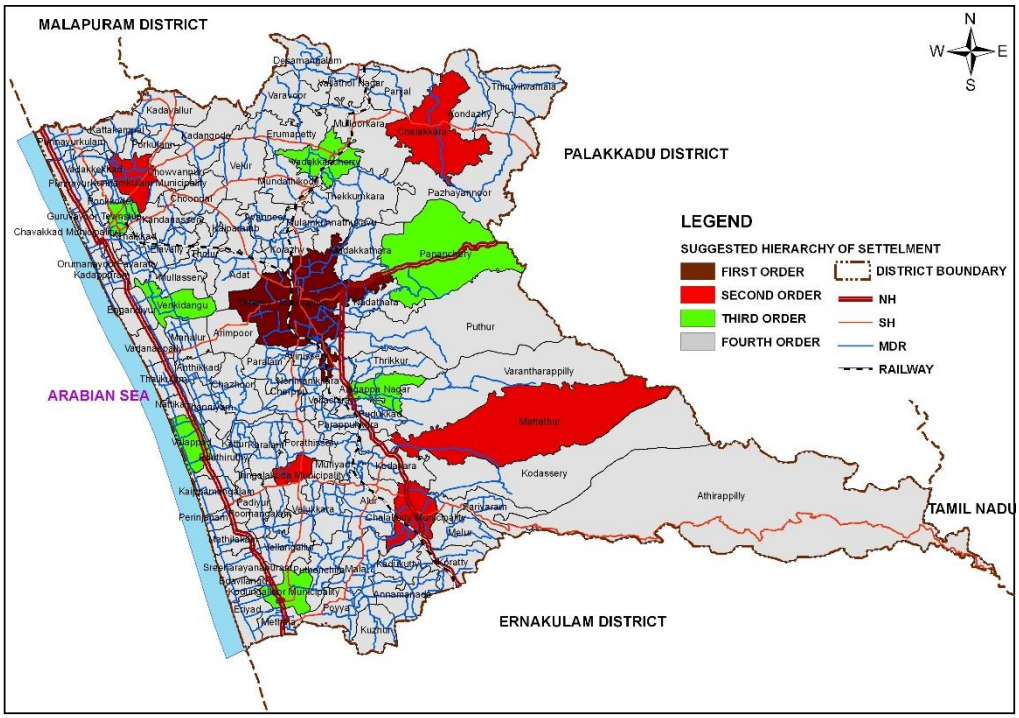


Fig. 2.7 Suggested hierarchy of settlement

Source: District Spatial Plan, Thrissur - 2011

As per the settlement analysis of District Spatial Plan for Thrissur – 2011, the settlement of the district are grouped in four hierarchies. Hierarchy value of a settlement is an indication on the extent of concentration of facilities in a region. Cumulative Functional Index (CFI) method is usedto find out the hierarchy of settlement. The CFI of a settlement is assessed based on the number and hierarchy of the types of facilities in the settlement such as educational facilities, health facilities, markets, physical infrastructure facilities and transportation facilities. The CFI of Thrissur Municipal Corporation is 533.25 which is far higher than that of other local bodies in the district. It is the higher order settlement in the district, which is expected to serve whole of the district for all its higher order functions like education, healthcare, commerce etc. and is generally referred as the first order settlement in the district. Suggested hierarchy of settlements in the district, as specified in the District Spatial Plan is given in fig. 2.7.

2.3.2 Functional character

The function of a settlement is the major activity within the settlement, be it primary sector activities (rural), secondary sector/tertiary sector activities (urban activities) or the combination of above. With the unique settlement pattern existing in Kerala, the function of a settlement cannot be limited to the usual classification of urban or rural. Analysis based on land use and average plot size as per District Spatial Plan shows that there exists semi urban and semi-rural character in settlements in addition to the urban and rural character. The functions of all the settlements in the District as specified in the District Spatial Plan are shown in fig. 2.8. Map shows the importance of urban character of Thrissur Municipal Corporation, which provides higher order urban amenities for surrounding areas.

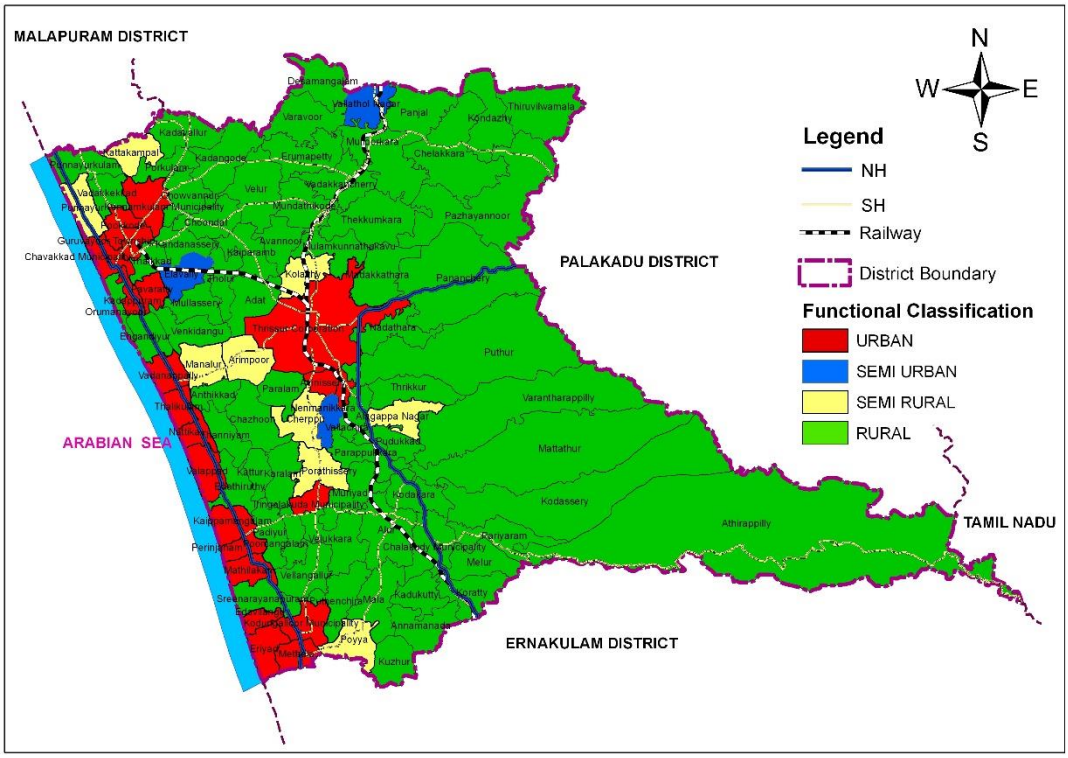


Fig. 2.8 Functional classification of settlement

Source: District Spatial Plan, Thrissur - 2011

2.3.3 Activity pattern

Existing activity pattern within the district is derived based on the study of the spatialdistribution of the aspects such as the land use concentration pattern, functional character and urban profile. Functional character is determined based on population distribution and land use, urban profile is derived taking into account occupational structure and hierarchy of settlements, the land use concentration pattern is studied based on the land use analysis. These are combined to evolve the activity pattern giving due consideration to the real ground scenario.The activity pattern of Thrissur District is categorised into urban, primary sector, secondary sector, Agriculture and allied activity, forest activity. Primary activities are concentrated on midland region secondary activities are concentrated on coastal and near urban areas. Forest activities are concentrated along the eastern region.

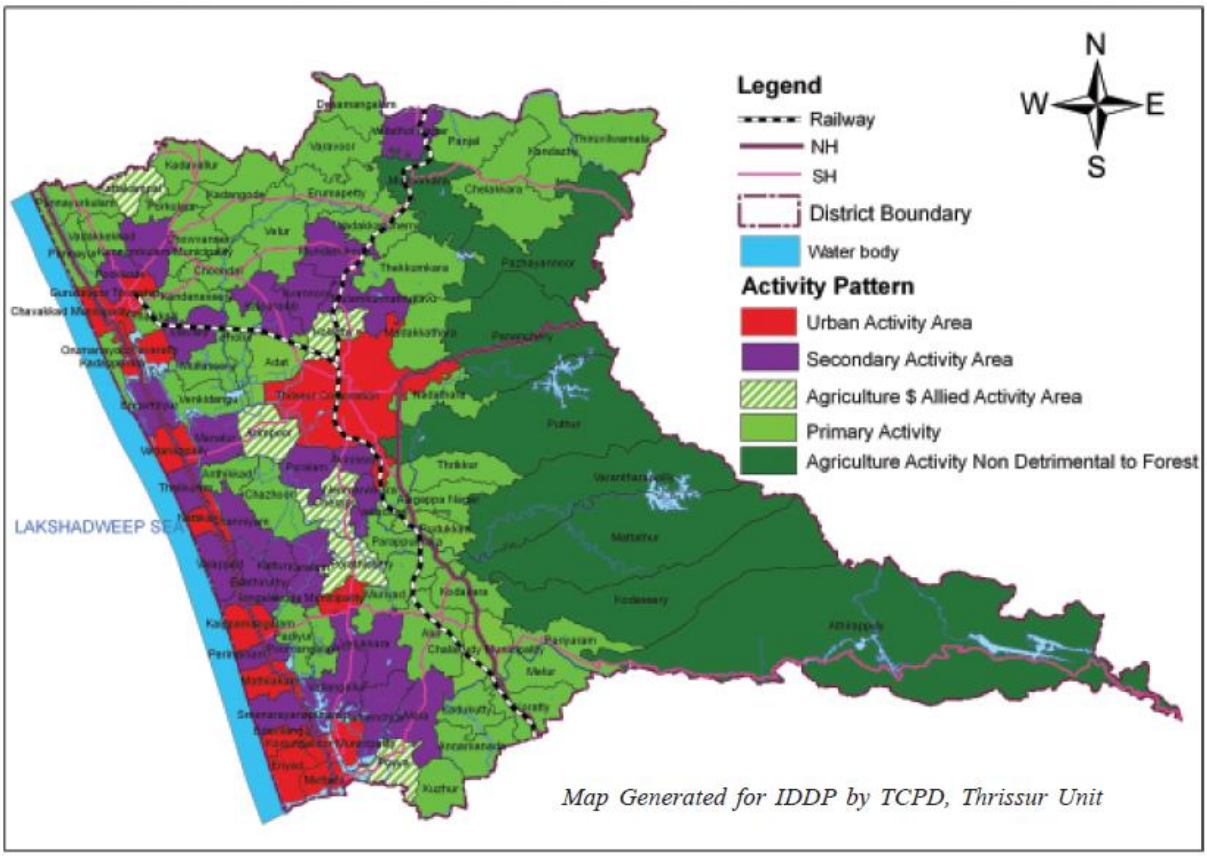


Fig. 2.9Activity Pattern of Thrissur district

Source: Integrated District Development Plan, Thrissur - 2012

Thrissur Municipal Corporation is the prime and higher order urban area in the district. The city acts as a major service provider to the local bodies in its near vicinity as well as higher order service provider to other areas of the district.

2.3.4 Influence areas

All the surrounding local bodies of the Municipal Corporation area belongs to its immediate influence region. Apart from these, being the first order urban settlement with the availability of all the major facilities, the city is depended by people from various parts of the district, even sometimes from neighbouring districts too. Good connectivity of the city area with all parts of the district as well to various parts of the state is advantageous to the city. The characteristic details of Thrissur Municipal Corporation, its surrounding local bodies and other urban local bodies in the district as per the details provided in the Integrated District Development Plan (IDDP) for Thrissur district are given in table 2.2. All the adjoining local bodies except Adat, Nadathara and Nenmanikkara, shows rural nature.Other urban local bodies generally shows an urban nature except Wadakkancherry Municipality. Functional classification shows that out of the 12 surrounding Panchayats, Avinissery shows urban function, Vallachira has semi-urban function, Arimpur & Kolazhy is with semi-rural function and the rest with rural functions. Out of other ULBs in the district, Chalakudy and Wadakkancherry Municipalities generally shows a

rural functional character. Thrissur city with a non-agricultural land use concentration is surrounded by areas having both agricultural as well as non-agricultural concentration. Agricultural areas mainly constituted by paddy fields as well as plantations. The activity pattern of the district shows Thrissur City with urban activity area surrounded by various primary and secondary activity areas shows the potential of Thrissur city and its environs.

Table 2.2Characteristics of Thrissur Municipal Corporation area, its surrounding local bodies and other urban local bodies in the district

NAME OF LSGI	Area	URBAN PROFILE	FUNCTIONAL CLASSIFICATION	LAND USE CONCENTRATION	ACTIVITY PATTERN
Thrissur MC	101.42	Urban	Urban	Non-Agriculture	Urban activity
Surrounding local bodies					
Adat GP	23.02	Urban	Rural	Agriculture	Primary activity
Arimpur GP	22.66	Rural	Semi-rural	Agriculture	Agriculture & Allied activity
Avinissery GP	20.20	Rural	Urban	Agriculture	Secondary activity
Kolazhy GP	16.62	Rural	Semi-rural	Agriculture	Agriculture & Allied activity
Madakkathara GP	21.59	Rural	Rural	Agriculture	Primary activity
Mulankunnathukavu GP	25.22	Rural	Rural	Non-Agriculture	Secondary activity
Nadathara GP	20.91	Urban	Rural	Plantation	Primary activity
Nenmanikkara GP	11.41	Urban	Rural	Agriculture	Primary activity
Pananchery GP	36.70	Rural	Rural	Plantation/Forest	Primary activity Non-Detrimental to forest
Paralam GP	17.04	Rural	Rural	Non-Agriculture	Secondary activity
Puthur GP	39.05	Rural	Rural	Plantation/Forest	Primary activity Non-Detrimental to forest
Vallachira GP	26.36	Rural	Semi-Urban	Agriculture	Secondary activity
Other Urban Local Bodies (ULBs) in the district					
Chalakkudy M	25.23	Urban	Rural	Agriculture	Primary activity
Chavakkad M	12.41	Urban	Urban	Non-Agriculture	Urban activity
Guruvayur M	30.78	Urban	Urban	Non-Agriculture	Urban activity
Irinjalakuda M	33.57	Urban	Urban	Non-Agriculture	Urban activity
Kodungallur M	27.81	Urban	Urban	Non-Agriculture	Urban activity
Kunnamkulam M	27.45	Urban	Urban	Agriculture	Secondary activity
Wadakkancherry M	51.56	Rural	Rural	Plantation/ Non-Agriculture	Primary/Secondary activity

Source: IDDP Report, 2012

2.3.5 Development Zones

Integrated District Development Plan for Thrissur District envisages eight development zones in the district. Thrissur Municipal Corporation falls in the Multifunctional zone-I, which will act as a service centre for the entire district in terms of higher order facilities like educational, health care & transportation facilities. Suitable projects and programs are to be implemented to exploit the urban potential of this zone. This zone plays a crucial role both in service sector and other sectors and also plays a crucial role in creating good link between all sectors in an efficient way. It has intense potential in infrastructure facilities like super specialty hospitals, five star hotels, Health institutions, IT parks, educational facilities etc. This zone is surrounded by intensive agriculture zone. So agro and allied industries like processing units, service workshop, value addition units, etc. also has potential. Thus, Thrissur Municipal Corporation will act as a regional centre of Thrissur District and has a potential to develop as a regional centre in the state next to Cochin. The development of the zone should be in such a way that it should minimize the degradation of nature and other pollution related activities.

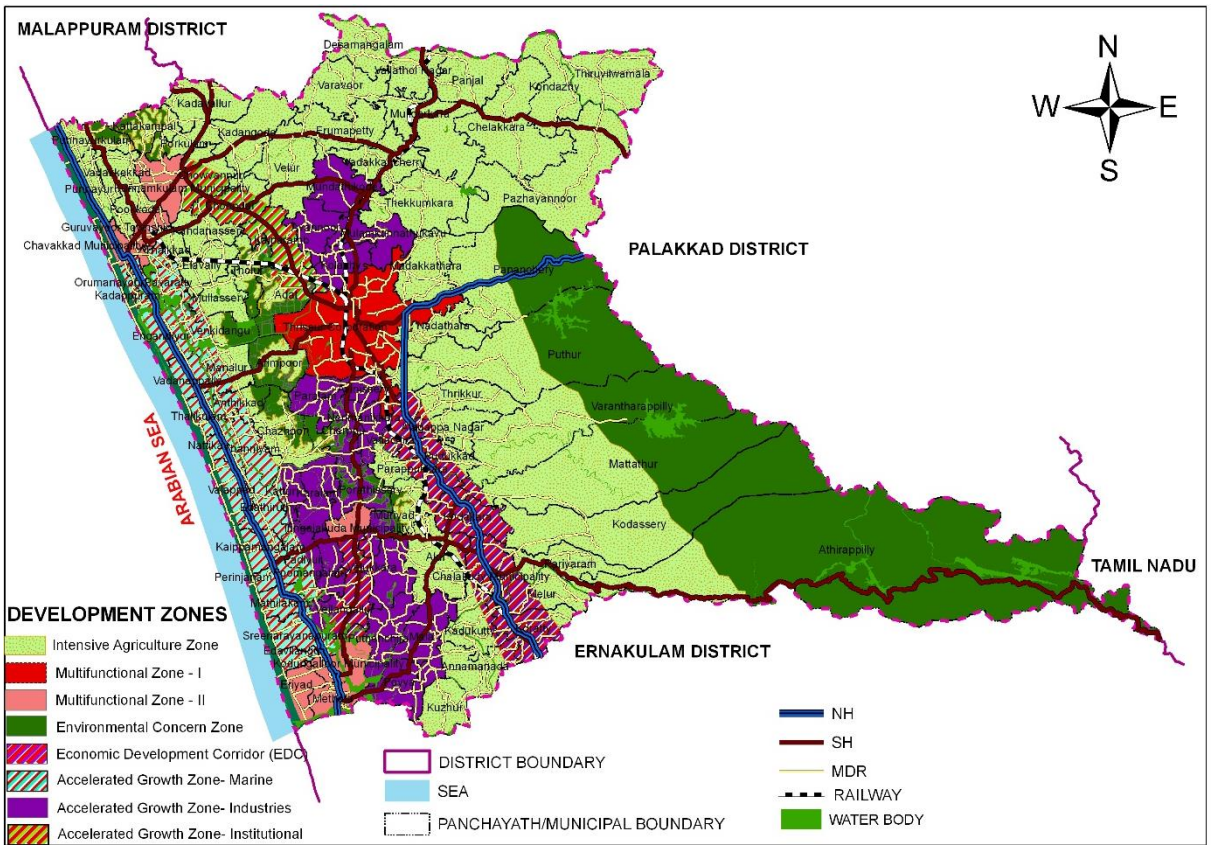


Fig. 2.10Development Zones for Thrissur district

Source: IDDP, Thrissur - 2012

2.4 INFERENCE

Thrissur city is located almost centrally in the state as well as in the district. All the major roads passes through the city and thus the local body is well connected with inter/intra state major areas. Due to its functional character, more people are attracted towards the City. The proximity to the city has resulted in attracting people to the surrounding Panchayats.

Nearness to all facilities, zoning free area, good environmental conditions, job opportunities, land value, etc. have attracted people to the surrounding areas than to the core. It is the only urban higher order settlement in the local bodies in its near vicinity. Hence development with more improved infrastructural facilities and job opportunities are required to satisfy the needs of the increasing population.

The city possess the status of administrative headquarters and is the seat of specialized and regional level facilities, trade and commercial centre as well as the art &cultural centre of the district. Since the city is demarcated as Multifunctional zone-I in the Development Zones for the district as per the Integrated District Development Plan for Thrissur - 2012, it will act as a service centre for the entire district in terms of all higher order facilities. Hence suitable projects and programs could be introduced to exploit the urban and development potential of this area.

CHAPTER 3
DEMOGRAPHY



Demography is the scientific study of human population, primarily with respect to their size, structure and development from quantitative point of view. Understanding the likely long term changes in the characteristics of the population is vital for the effective planning of infrastructure and services. This chapter explains about the population and demographical characteristics of Thrissur City in comparison with Kerala state, Thrissur district, other Municipal Corporations in the state as well as other Local Self-Government Institutions (LSGIs) in the district. The study is mainly based on the 2011 census data.

3.1 POPULATION

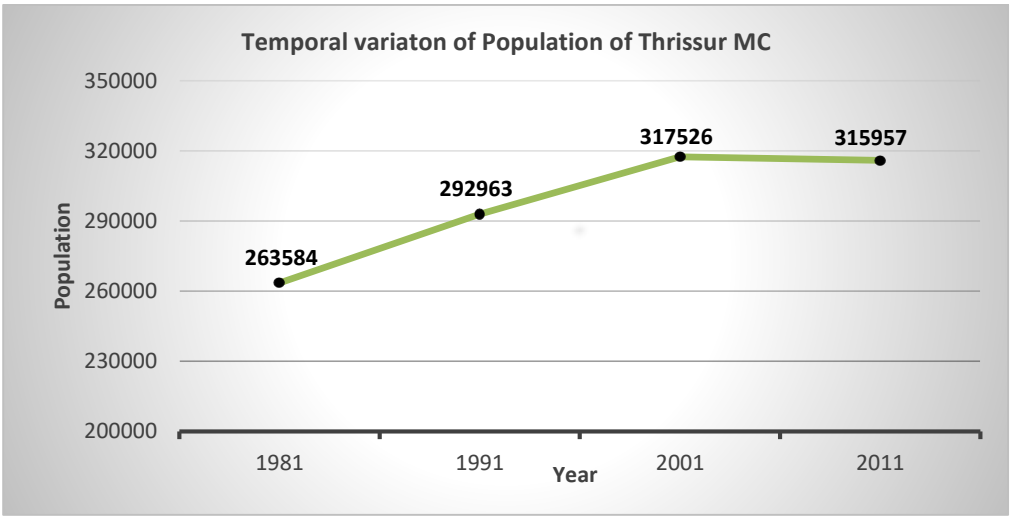
The knowledge of basic demographic trends is essential to sort out the problems and exact needs of the area. It provides ideas regarding the habitation of people and their basic requirements, which the authorities should consider while planning the city.

Comparative study of population of Kerala State, Thrissur Dt. and Thrissur Municipal Corporation is shown in table 3.1.According to 2011 census, the total population of Kerala State, Thrissur District and Thrissur Municipal Corporation are 3.34 crores, 31.21 lakhs and 3,15,957 respectively. Thrissur Municipal Corporation shares 10.12% of population of Thrissur District and the district population shares 9.34% of Kerala state. Thrissur district ranks 4th position in terms of population among other districts of Kerala state.

Table 3.1 Comparative Study of Population

Sl. No.	Description	Area (sq.km)	Population			
			1981	1991	2001	2011
1	Kerala	38863	25453680	29098518	31841374	33406061
2	Thrissur Dt.	3032	2439633	2737311	2974232	3121200
3	ThrissurMC	101.42	263584	292963	317526	315957

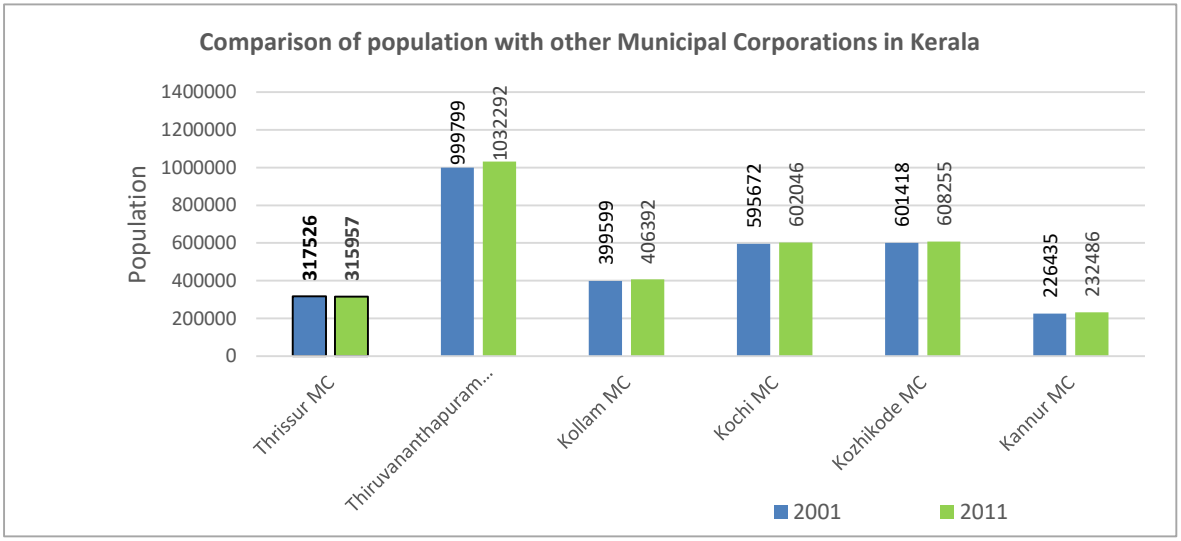
Source: Census Data - 1981, 1991, 2001 and 2011



Source: Census *Data - 1981, 1991, 2001 &2011*

Fig. 3.1 Temporal variation of population of Thrissur Municipal Corporation

Temporal variation of population in Thrissur City, as shown in fig. 3.1 indicates that from 1981 onwards population is seen increasing till 2001 followed by a decline in 2011. This decline in population may be due to the increased land value in the city, as a result of urbanisation and the dominance of land uses other than residential use, in the corporation area.



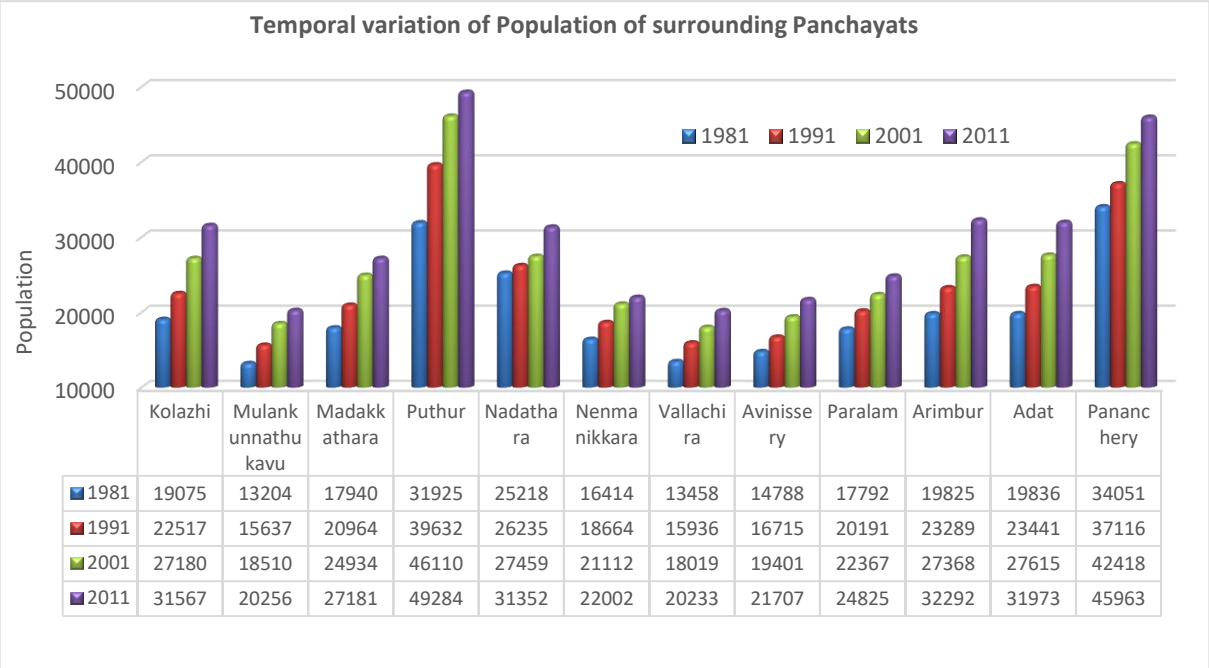
Source: Census Data - 2001 &2011

Fig 3.2 Comparison of Population with other Municipal Corporations in Kerala

Variation of population of Thrissur MC during last decade in comparison with other Municipal Corporations in Kerala is shown in fig. 3.2. From the figure, it can be seen that Thrissur Municipal Corporation holds second last position in terms of population size. Population has increased in all cities except Thrissur, even though their respective rates of growth is very less. This shows the deterioration of urban areas due to the lack of proper planning. Availability of more job opportunities as well as political, commercial and economic

development potential may be the reason for the increase in population of Thiruvananthapuram, Kochi and Kozhikode.

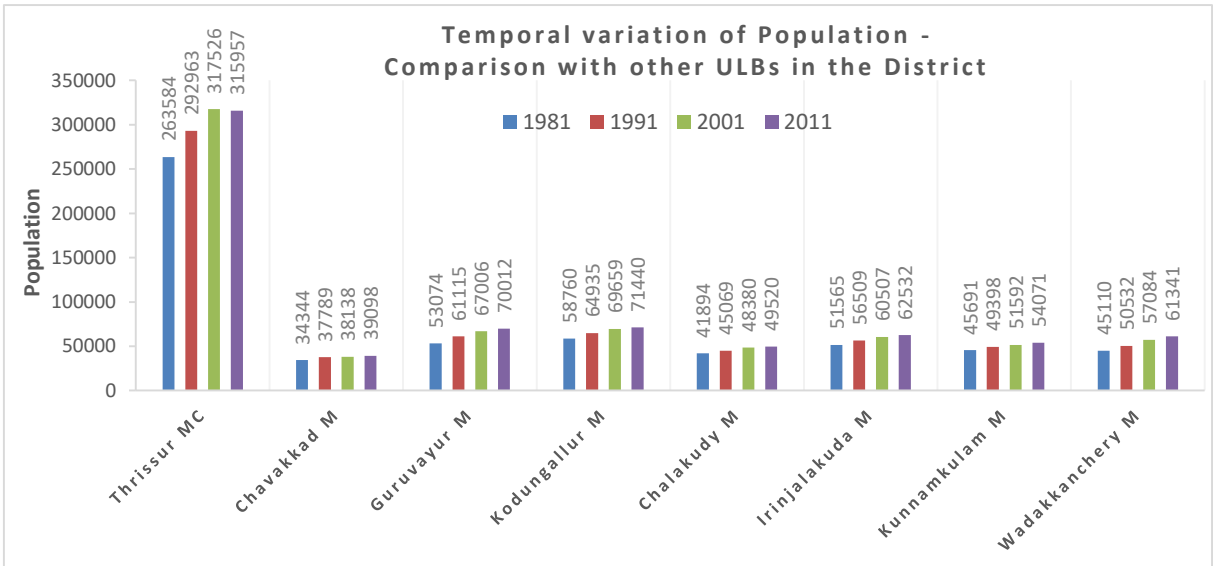
Temporal variation of population of adjacent Panchayats to Thrissur MC during last decade is shown in fig. 3.3. Upon comparing these values with that of Thrissur MC shows that all the surrounding panchayats has showed an increase in population during the last three decades. Urbanization trend of the city has influenced the surrounding panchayats and more people came to settle down in surrounding areas due to its proximity to city area, where land value is more affordable when compared to that in the city.



	Kolazhi	Mulankunnathukavu	Madakkathara	Puthur	Nadathara	Nenmanikkara	Vallachira	Avinisserry	Paralam	Arimbur	Adat	Pananchery
1981	19075	13204	17940	31925	25218	16414	13458	14788	17792	19825	19836	34051
1991	22517	15637	20964	39632	26235	18664	15936	16715	20191	23289	23441	37116
2001	27180	18510	24934	46110	27459	21112	18019	19401	22367	27368	27615	42418
2011	31567	20256	27181	49284	31352	22002	20233	21707	24825	32292	31973	45963

Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.3Temporal variation of population of surrounding Panchayats



Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.4Temporal variation of population – Comparison with other ULBs in the district

Comparison of temporal variation of population with other Urban Local Bodies (ULBs) in the district, as indicated in fig. 3.4, shows the prominence of Thrissur city during the previous decades. Thrissur MC has registered a higher number of population from 1981 onwards, which indicates the developments that happened in Thrissur as well as due its importance as the district headquarters. Kondungallur and Guruvayur Municipalities stands next to Thrissur MC, the population of which is only about 1/4th of the population of Thrissur MC. It can also be seen from the graph that although the population of Thrissur MC has increased during 1981-2001, it shows a decline during the last decade, whereas other ULBs shows an increasing trend from 1981 onwards. Changes in the trend of urbanisation is the reason for the increase in population of these ULBs.

3.2 POPULATION GROWTH RATE

The decadal variation of population Growth Rate of Thrissur Municipal Corporation during 1981-2011, in comparison with that of Kerala State and Thrissur District, as shown in fig.3.5 indicates that the state and district follows almost a linear decrease in growth rate whereas Thrissur MC which showed a gradual decrease during 1981-2001 experienced a sudden decline during 2001-2011 and reached a negative value of -0.49. During the past 3 decades, the population growth rate of Thrissur city is lower than that of the state and the district. Upon comparing the decadal variation in population growth rate with the surrounding panchayats, as shown in fig.3.6, indicates that all the surrounding panchayats shows a decrease in growth rate during 2001-2011 except Nadathara and Arimbur Panchayats Surrounding panchayats witnessed considerable developments during 2001-2011 due to its close proximity to the city area as well as due to its lower land values when compared to the city area. Accordingly, considerable shift of population from the city area towards adjacent panchayats may have occurred.

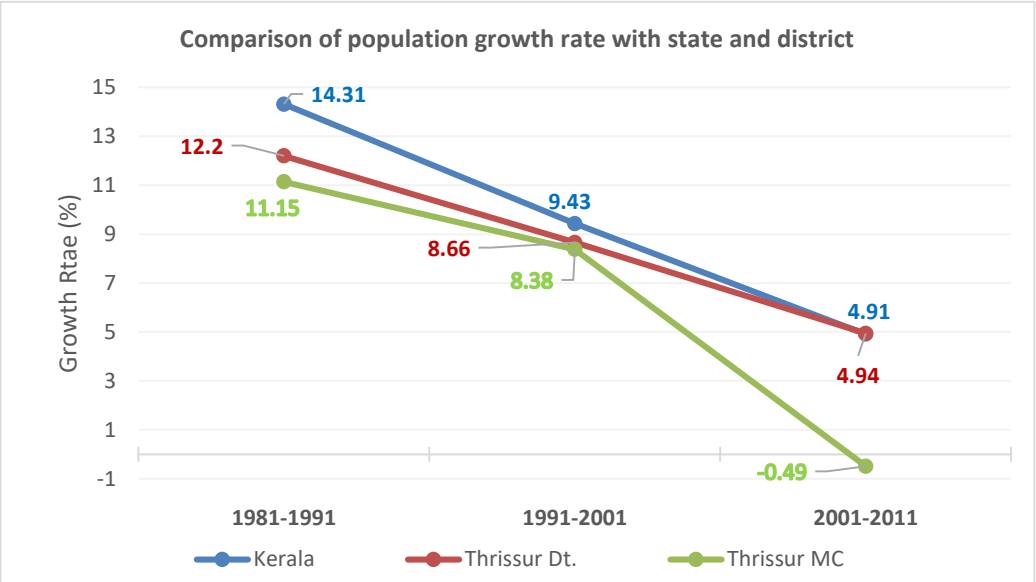
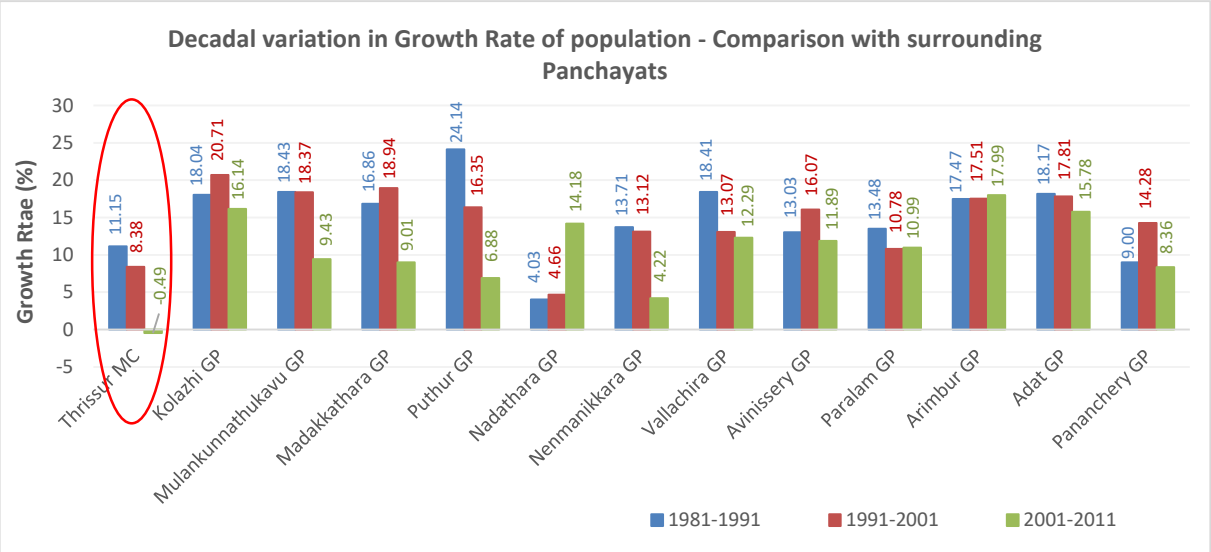


Fig 3.5 Comparison of Population Growth Rate with state and district

Source: Census Data - 1981, 1991, 2001 & 2012

Fig. 3.7 shows the decadal variation of population growth rate of Thrissur MC in comparison with other ULBs in the district. Even though all the ULBs shows a decreasing trend in population growth rate during the last three decades, Chavakkad and Kunnamkulam Municipalities witnessed a slight increase in population growth rate during the last decade. Among all the ULBs, Wadakkanchery Municipality exhibits a higher population growth rate value of 7.46% during 2001-2011, the increase of which can be attributed to the changes in the urbanisation pattern of the area. The presence of abundant public and semi-public institutions, paddy fields and high land values are the reasons for the negative growth rate in Thrissur MC.



Source: Census Data - 1981, 1991, 2001 and 2011

Fig 3.6Decadal variation in Growth Rate of Population – Comparison with surrounding Panchayats

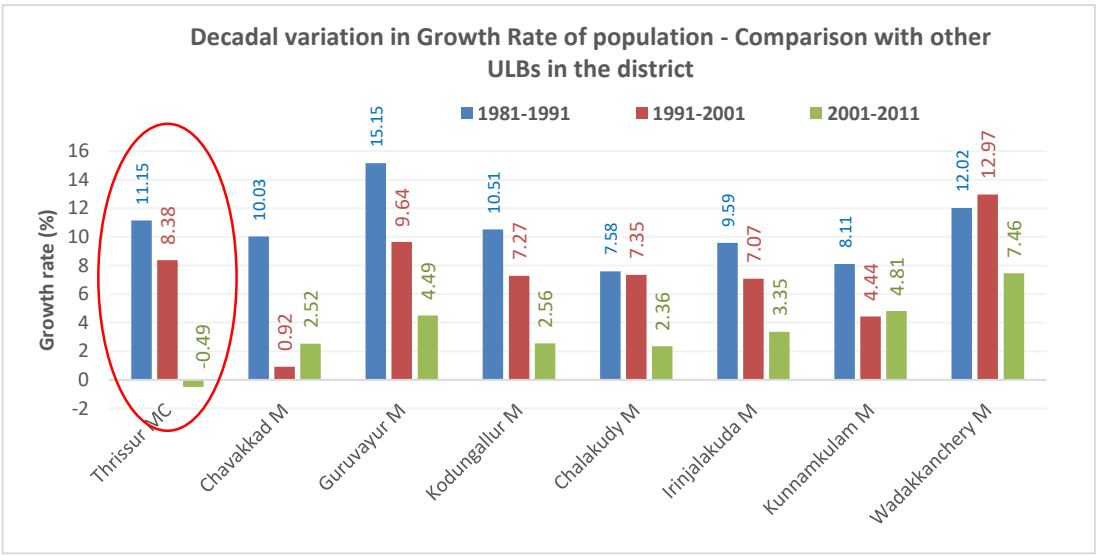


Fig 3.7Decadal variation in Growth Rate of Population – Comparison with other ULBs in the district

Source: Census Data - 1981, 1991, 2001 and 2011

While comparing the population growth rate with other Municipal Corporations in Kerala, as depicted in fig.3.8, shows that only Thrissur Municipal Corporation shows a negative growth rate. Thiruvananthapuram MC tops the chart with a growth rate of 3.25% followed by Kannur MC (2.67%) and Kollam MC (1.70%).Prominence of being the state capital as well as the availability of more employment opportunities as a result of urbanisation and economic development are the main reasons for the increased population growth rate in Thiruvananthapuram city compared to other cities. Kannur Municipality which got elevated to Municipal Corporation status in 2015, is in the track of urbanisation and shows a higher growth rate value. Presence of paddy fields and more public & semi-public institutions in the city area as well as the shifting of population towards nearby panchayats are the major reasons for the decline in population growth rate in Thrissur MC compared to other cities.

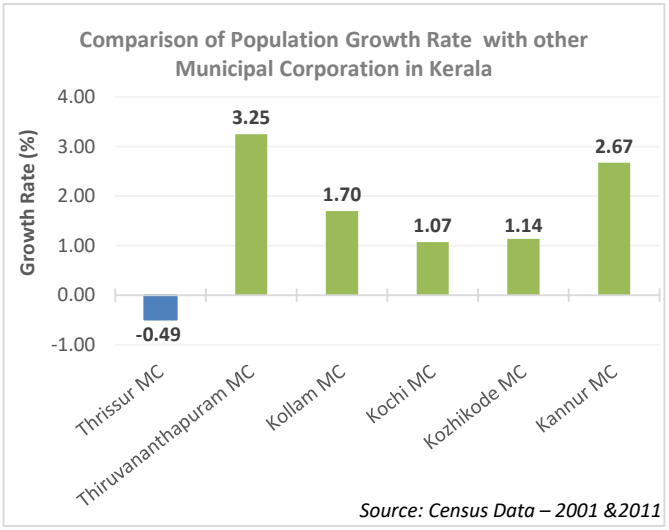


Fig 3.8 Comparison of Population Growth Rate with other MunicipalCorporations in Kerala

3.3 POPULATION DENSITY

Density of population is defined as the number of persons per square kilometre. It is an important index of population which shows the concentration of population in a particular area. As per 2011 census, the population density of Kerala state and Thrissur district are 860 persons/sq.km. and 1029 persons/sq.km. respectively.

The population density of Thrissur Municipal Corporation area is higher when compared with that of district and state values with a gross density of 3115persons per sq.km. and net density of 4173 persons per sq.km. The temporal variation of population density of Kerala, Thrissur District and Thrissur MC, as given in fig.3.9., shows that the population density displays an increasing trend. Even though the population density in Thrissur MC has increased till 2001, it shows a slight fall from 3131persons per sq.km. to 3115 persons per sq.km. during 2001-2011,the reduction of which can be attributed to the out-migration

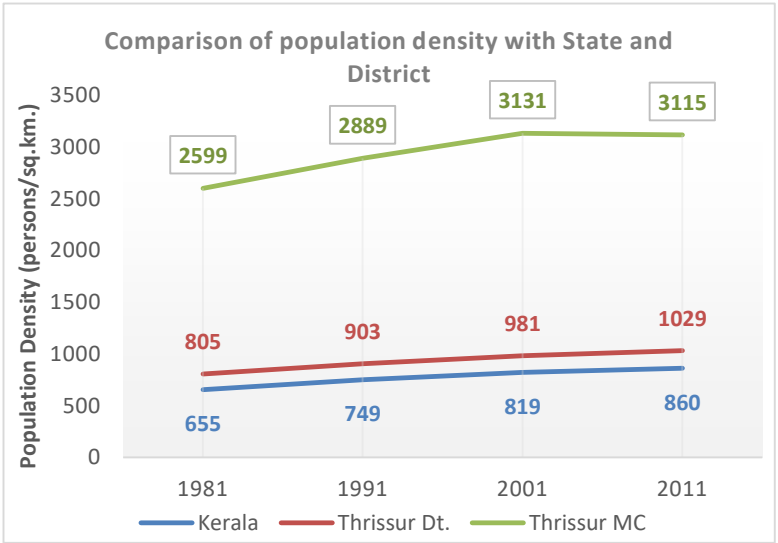
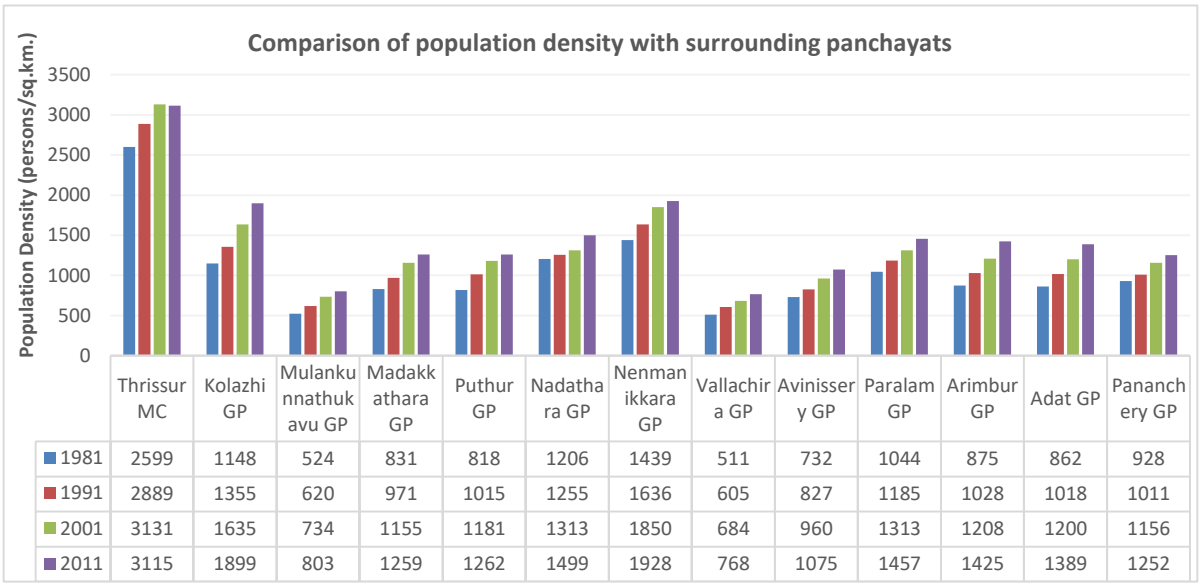


Fig 3.9 Comparison of Population Density with State &Thrissur Dt.

Source: Census Data – 1981, 1991, 2001 &2011

that may have caused due to increased land values. Fig. 3.10 shows the temporal variation of population density in comparison with surrounding panchayats. It can be seen that all the panchayats show an increasing trend in population density with Nenmanikkara and Kolazhy panchayats showing the highest values of around 1900 persons/sq.km.



	Thrissur MC	Kolazhi GP	Mulankunnathukavu GP	Madakkathara GP	Puthur GP	Nadathara GP	Nenmanikkara GP	Vallachira GP	Avinissery GP	Paralam GP	Arimbur GP	Adat GP	Pananchery GP
1981	2599	1148	524	831	818	1206	1439	511	732	1044	875	862	928
1991	2889	1355	620	971	1015	1255	1636	605	827	1185	1028	1018	1011
2001	3131	1635	734	1155	1181	1313	1850	684	960	1313	1208	1200	1156
2011	3115	1899	803	1259	1262	1499	1928	768	1075	1457	1425	1389	1252

Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.10 Comparison of Population Density with surrounding panchayats

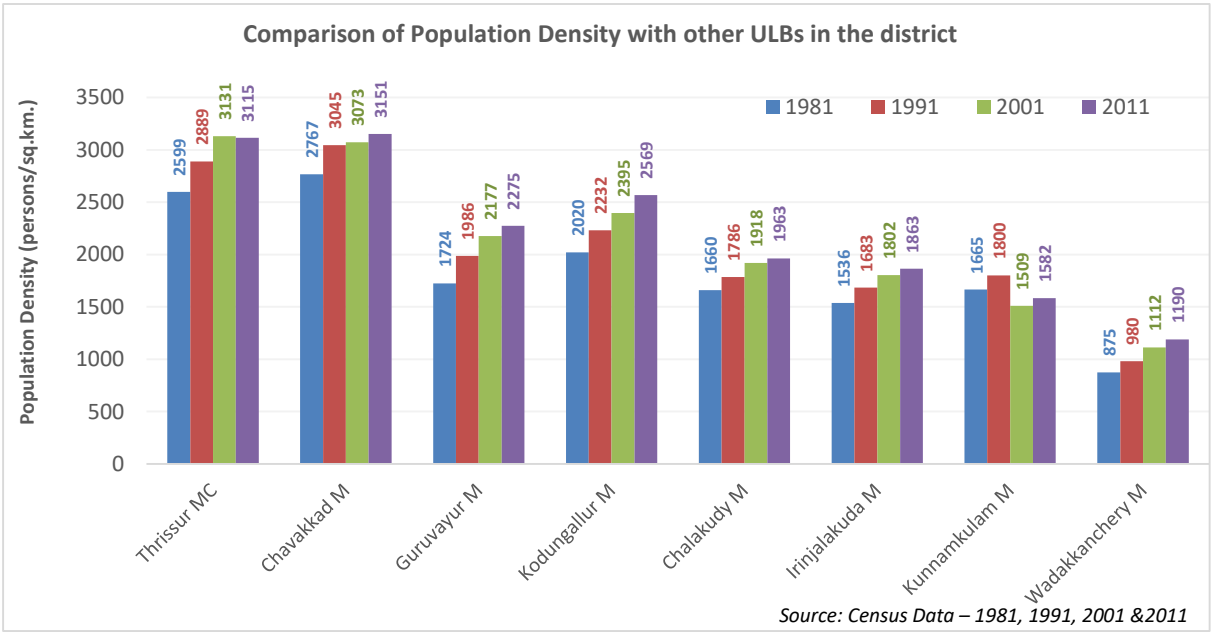
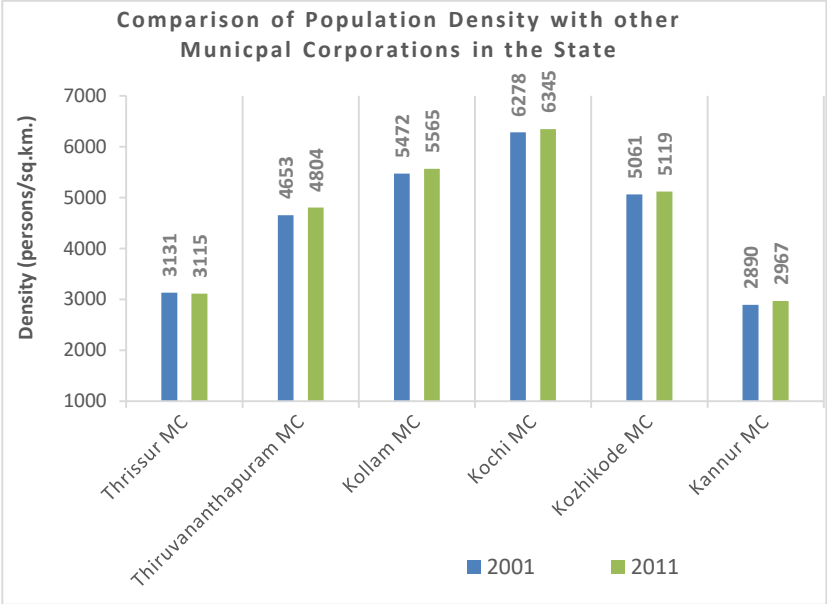


Fig 3.11 Comparison of Population Density with other ULBs in the district

Comparison of population density with other ULBs in the district is shown in fig. 3.11. From the graph, it can be seen that almost all the ULBs show an increasing trend in population density from 1981 onwards except in case of Kunnamkulam town. Thrissur Municipal Corporation and Chavakkad Municipality almost show a similar trend and range of population density values during the last 3 decades and has the highest density of 3115persons/sq.km. and 3151 persons/sq.km. among other ULBs in the district as per 2011 census. The density of

Thrissur Municipal Corporation is the highest among other municipalities in the district from 1991 to 2001 but experienced a slight fall in 2011. Wadakkanchery Grama Panchayat which got upgraded to Municipal status in 2015, is a newly developing town in the district and shows the least value for population density among other ULBs in the district.

Upon comparing the variation of population density during 2001-2011 with other Municipal Corporations in the state, as depicted in fig. 3.12, shows that Thrissur Municipal Corporation has a comparatively lower population density holding the second last position, which is mainly due to the presence of various public and semi-public institutions, paddy fields, etc. in the Corporation area. Kochi MC shows the highest density and the Kannur MC the lowest. Other Municipal Corporations of Kozhikode, Kollam and Thiruvananthapuram also shows higher density of population than in Thrissur. Thrissur MC shows a decline in population from 2001 to 2011 and thus exhibits a reduction in population density too. All other Municipal Corporations exhibits an increase in population and thus population density during 2001-2011.



Source: Census Data – 2001 &2011

Fig 3.12 Comparison of Population Density with other Municipal Corporations in Kerala

3.4 POPULATION DISTRIBUTION & CONCENTRATION

As per 2011 census data, there are 52 wards in Thrissur Municipal Corporation area. But in 2015, these wards have been reconstituted to 55 wards. So as to get the various distribution pattern based on population, the available census data of 2011 apportioned with the respective voters list of 2012 and 2015 to get the distribution pattern. Accordingly, the distribution of population, population density and population concentration in 55 wards in the Corporation area is shown in fig. 3.13, fig.3.14 and fig.3.15 respectively.

Distribution of population in the corporation area shows that Edakkunny and Anchery wards constitutes the most number of people with a population of 8666 and 8083 respectively. Cheroor, Valarkavu and Thaikkattussery also shows a higher value of population more than 7000 persons. Kannankulangara, Gandhinagar and Ramavarmapuram wards shows lowest population, the least being at Kannankulangara with 3936 persons.

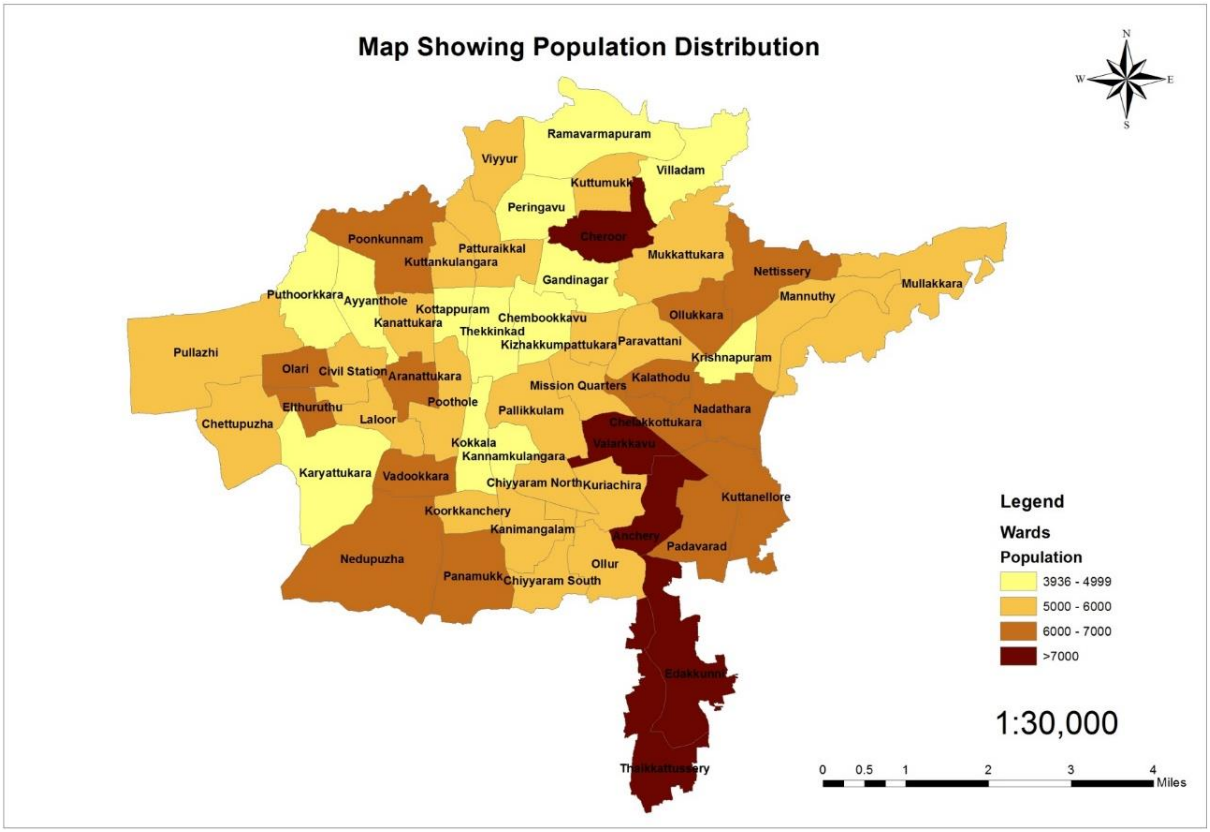


Fig 3.13 Ward-wise Population Distribution in the Corporation area

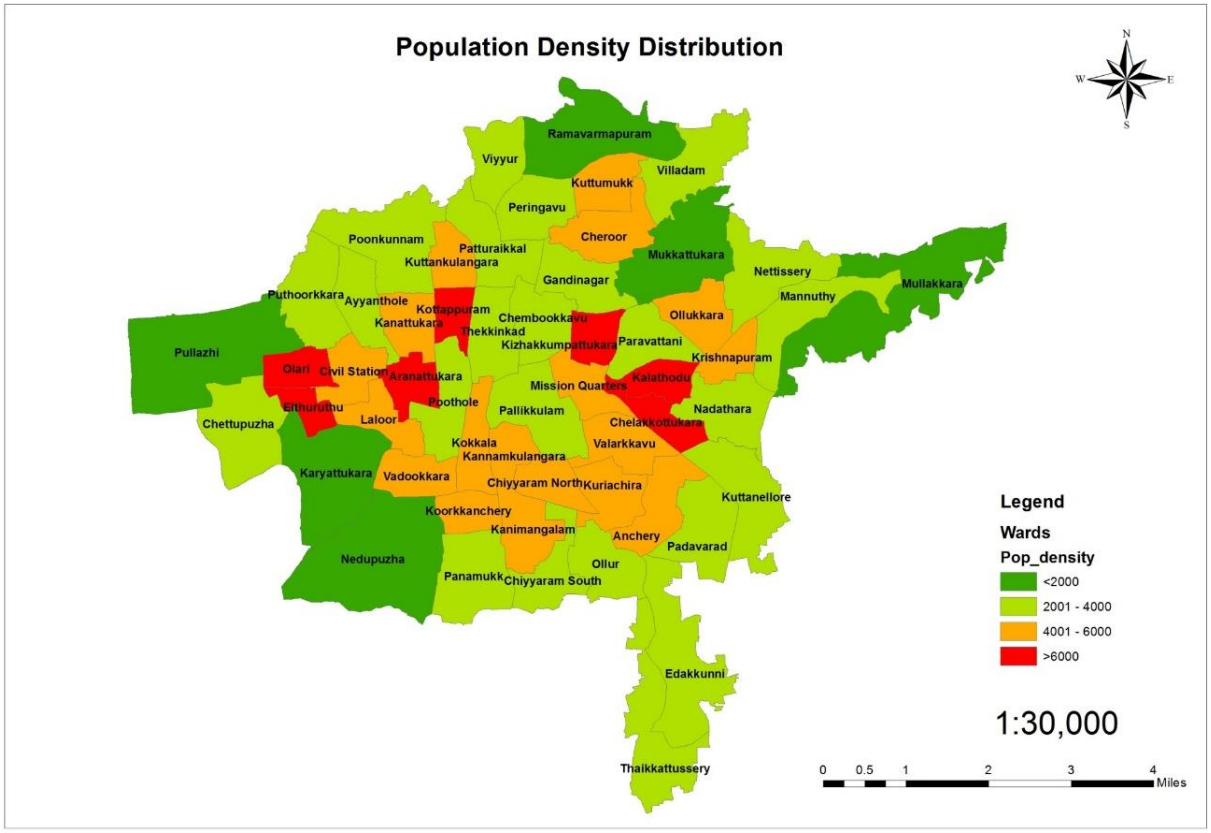


Fig 3.14 Ward-wise Population Density Distribution in the Corporation area

Ward wise population density distribution map shows that Elthuruthu ward shows the maximum density of 9234 persons per sq.km., followed by Olari and Kalathodu with a density of 6957 and 6904 persons/sq.km. respectively. This shows the concentration of residential activities in these wards. Ramavarmapuram (1188 person/sq.km.), Mullakkara (1138person/sq.km.) and Pullazhi(1042 persons/sq.km)are the least dense wards, due to the presence of agricultural activities as well as public and semi-public institutions in these areas.

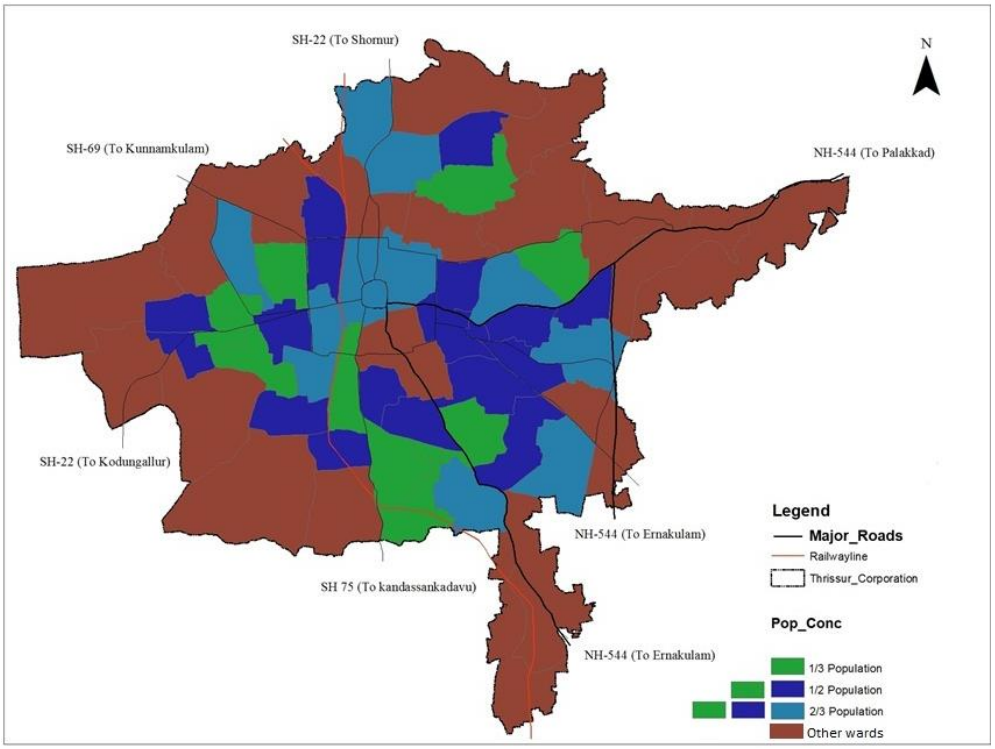
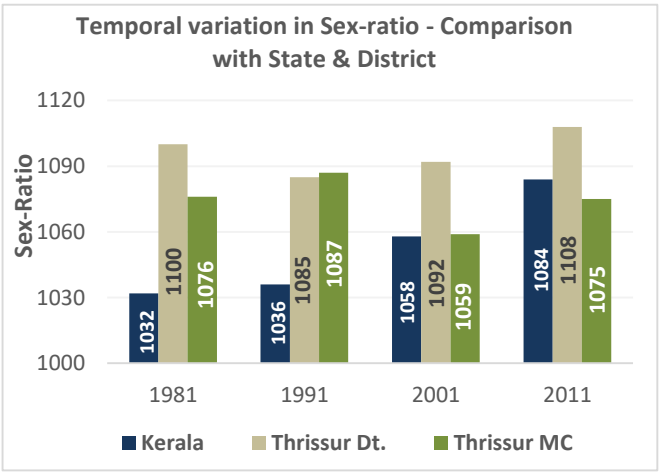


Fig 3.15 Population Concentration Pattern of Thrissur Municipal Corporation area

Figure 3.15 shows the concentration of population in various wards of the Corporation area. Its shows the concentration pattern of one-third population, half population and two-thirds population. It can be seen from the map that two-thirds of the population is concentrated in the central core and rest of the population in the peripheral areas.

3.5 SEX-RATIO

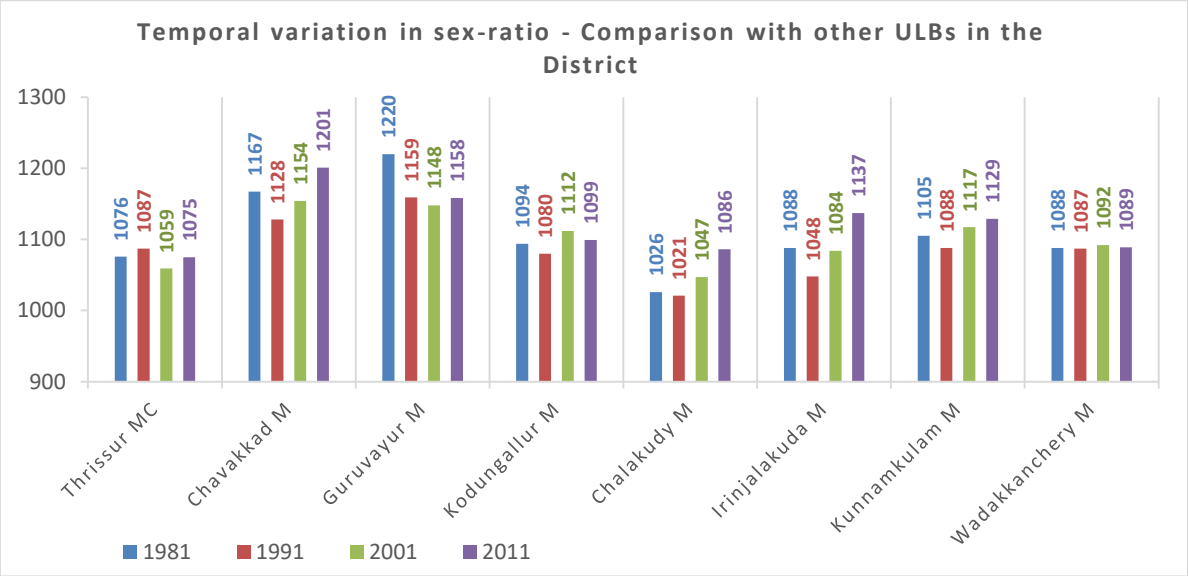
Sex composition of human population is one of the basic demographic characteristics. Changes in sex composition largely reflect the underlying socio-economic and cultural pattern of a society. Sex-ratio is an important social-indicator for measuring the extent of equity prevailing between males and females at a given point of time. It is counted for number of females per 1000 males.



Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.16 Comparison of sex-ratio with State & District

As per 2011 census, Kerala state has the highest sex-ratio in India with a value of 1084. Sex-ratio of Thrissur district as well Thrissur Municipal Corporation are higher than the state average with values of 1108 and 1075 respectively. Temporal variation in sex-ratio of Thrissur Municipal Corporation in comparison with state and district, as given in fig. 3.16, shows that Thrissur district displays the highest sex-ratio from 1981 onwards, except in 1991. Upon comparing the sex-ratio with other ULBs in the district, as given in fig. 3.17, shows that Thrissur city has the lowest sex-ratio and Chavakkad town has the highest sex-ratio in 2011.

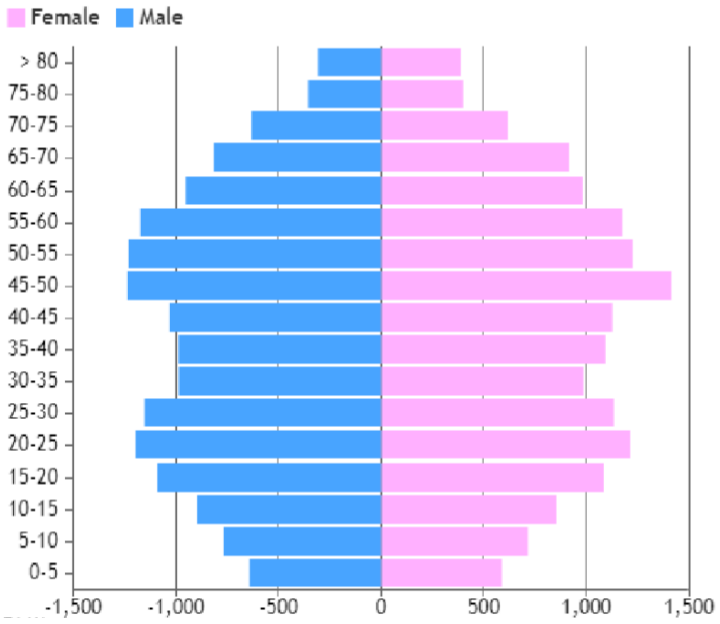


Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.17 Comparison of sex-ratio with other ULBs in the District

3.5.1 Age-Sex Pyramid

A population pyramid, also called an age-sex pyramid is a graphical illustration that shows the distribution of various age groups in a population, which forms the shape of a pyramid when the population is growing. Age-sex pyramid, as obtained from Socio-economic survey(10%, stratified random sample) of Thrissur Municipal Corporation area in 2019 is shown in fig. 3.18.From the graph, it can be observed that female population is lower compared male population in the age-group 0-15 years, whereas male population is lower in the age group 35-50 years and in the age group 60yrs and above. The reduction in the number of female population in the age group 0-15yrs needs attention since this shows the



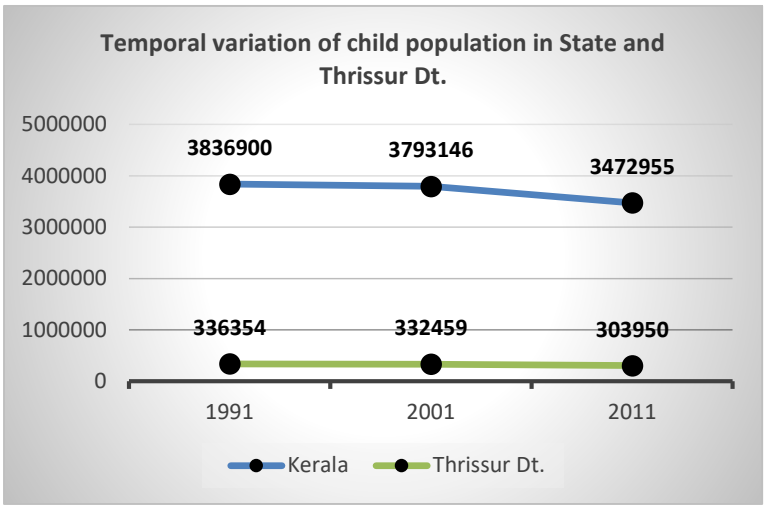
Source: Socio-economic Survey - 2019

Fig 3.18 Age-sex pyramid

reduction in child sex ratio which will result in a decline of female population and hence the reduction of sex ratio in future. More number of people in the age group 25-35 shows the working potential of the population. The higher number of female population in the age above 60 years shows the higher life expectancy of females compared to males.

3.6 CHILD POPULATION & CHILD SEX-RATIO

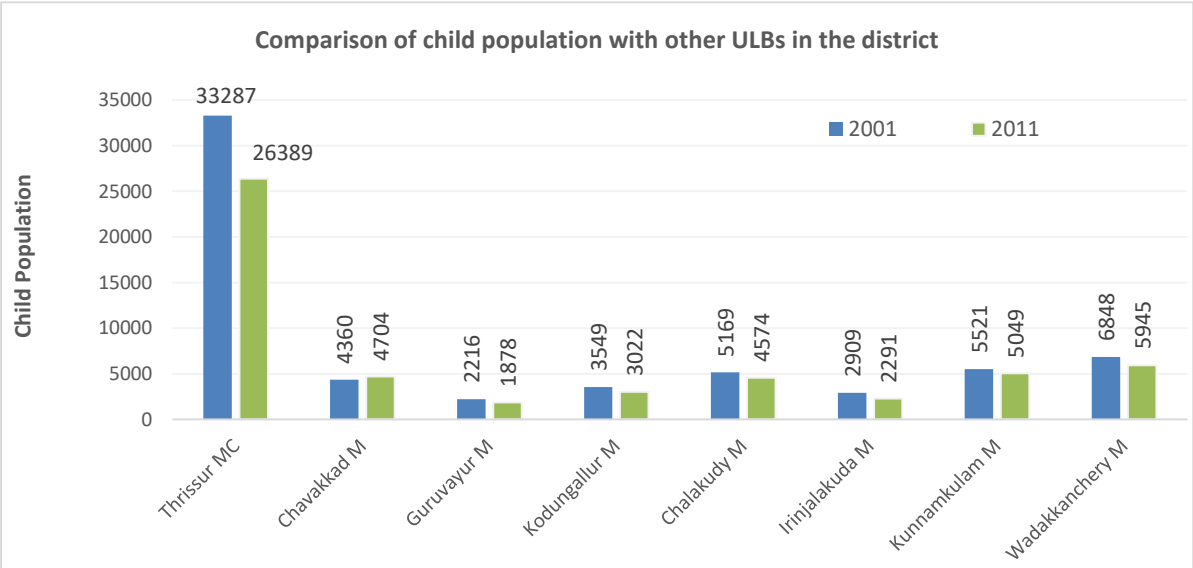
The child population in Kerala shows a declining trend. The final population totals of Census 2011 issued by the Directorate of Census Operations reveal a negative growth rate of the child population in the State (- 8.44%). The census figures show that the child (0-6 years) population is declining in all districts except Malappuram. The total number of children in Kerala is 3472955, with the highest(574041) in Malappuram and the lowest (92324) in Wayanad. Fig. 3.19 shows the temporal variation of child population in the State and Thrissur District.



Source: Census Data – 1991, 2001 &2011

Fig 3.19Temporal variation in child population in State & District

The total number of child population in Thrissur MC as per 2011census is 26389 which is 8.4% of total population. Out of total child population 13534 (51.29%)are male and 12855 (48.71%) are female. Upon comparing the variation of child population in all the ULBs in the district during the last decade, as given in fig. 3.20, shows that the child population in Thrissur MC has declined by about 20.7%. This Indicates the reduction in number of people in the

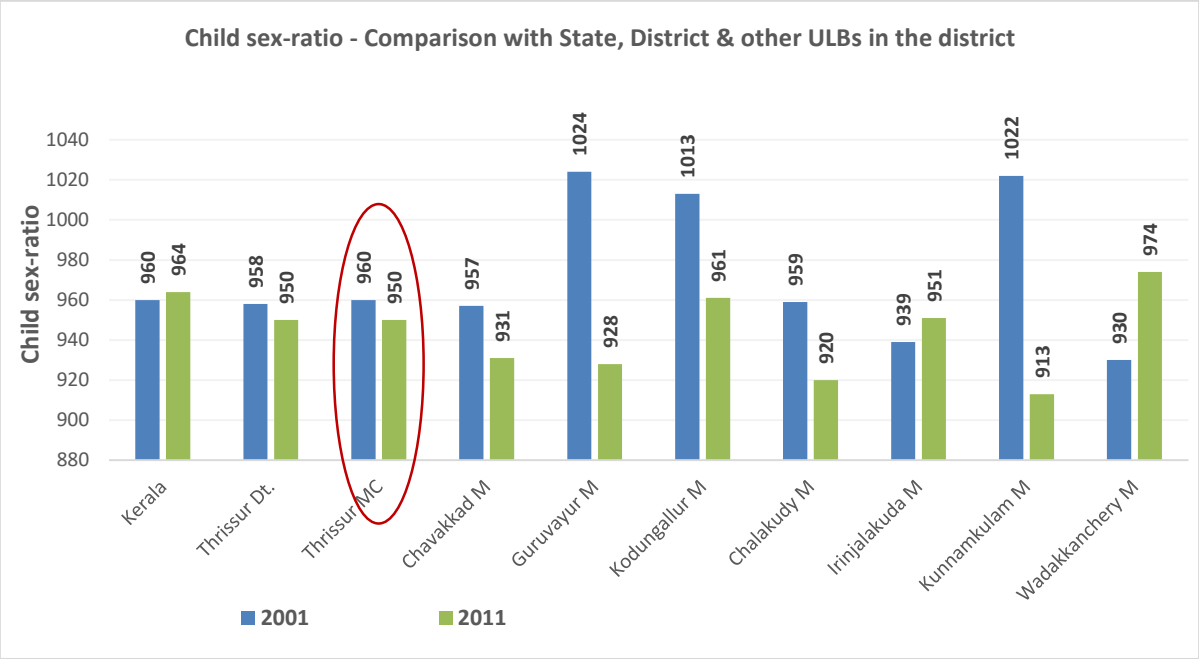


Source: Census Data –2001 &2011

Fig 3.20Comparison of child population with other ULBs in the District

future as well as the reduction in the human resource potential of the city. All the other ULBs except Chavakkad Municipality shows a decline in total number of child population.

The data on child sex–ratio i.e., the sex-ratio of males and females in the age group 0-6yrs is very prominent from the point of view that it is an indicator of the likely future trends of sex-ratio of the population and an indicative of the birth rate. As per 2011 census, the child sex-ratio of the state is 964. Variation of child sex-ratio of Thrissur Municipal Corporation during 2001-2011, in comparison with state, district and other ULBs in the district are shown in fig 3.21. Child sex-ratio is seen decreasing in almost all the places indicates the reduction in number of female children with respect to male children. Guruvayur, Kunnamkulam and Kodungallur Municipalities which displayed higher sex-ratio value more than 1000 in the year 2001 declined to a value less than 1000 in 2011.

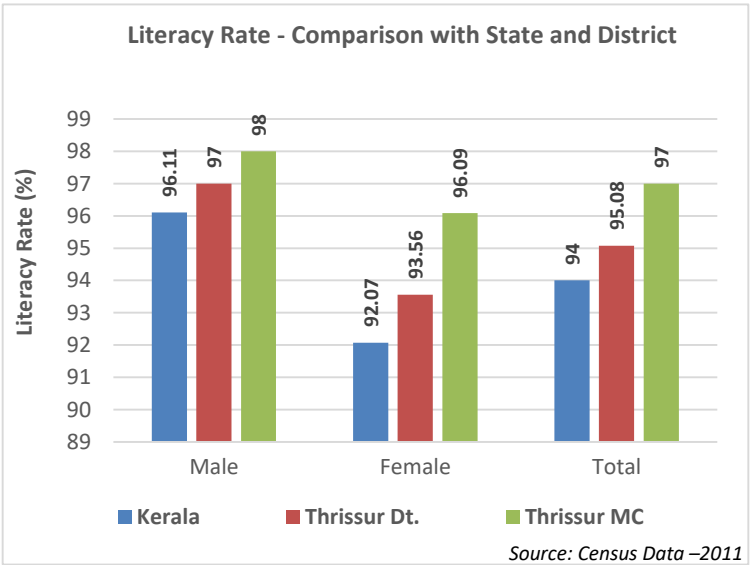


Source: Census Data – 2001 &2011

Fig 3.21Comparison of Child Sex-ratio with State, District and other ULBs in the District

3.7 LITERACY

Kerala is the most literate state in India with a rate of 94% whereas India's literacy rate is only 74.04% as per 2011 census. The high literacy rate of Kerala is a result of the continuous efforts taken by pioneers/ social reformers/ kings/ rulers/ elected governments working towards an educational revolution. Modern

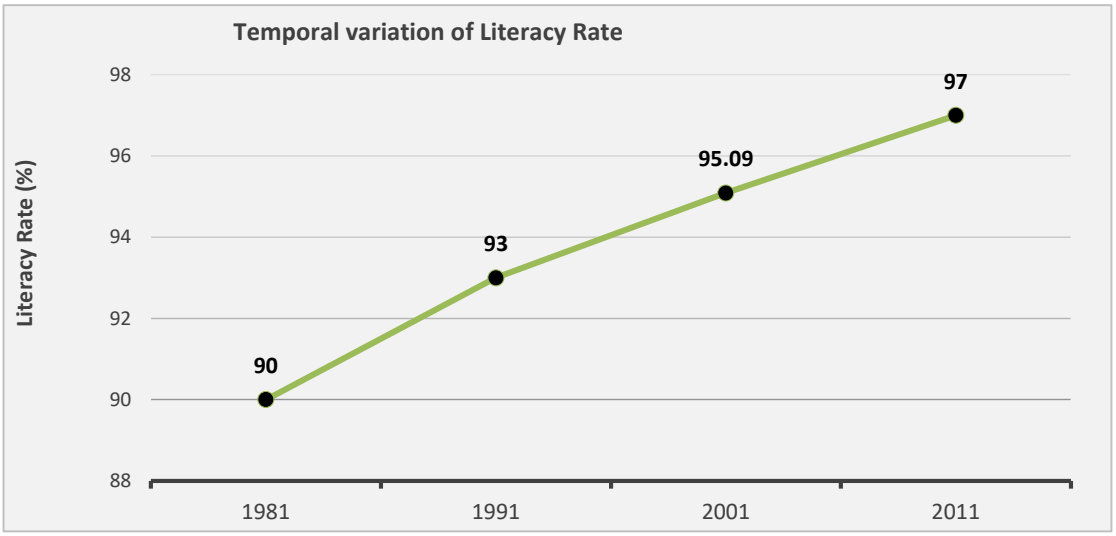


Source: Census Data –2011

Fig 3.22 Comparison of Literacy Rate with State and District

policies adopted by the governments also played a key role in the aggravation of the already accelerating literacy rate.

Fig. 3.22 shows the comparison of Literacy rate of Thrissur MC with that of state and district as per 2011 census data. It can be seen from the graph that Thrissur district shows higher values than the state, and Thrissur MC shows higher values than both the state and district in terms of male, female as well as total literacy rate. It can be seen that male literacy rate is higher in Thrissur city, state and district. Thrissur MC has 97% literates, the rate of which shows an increasing trend from 1981 onwards, as shown in fig. 3.23. All these shows the importance of education as well as the remarkable human resource potential of Thrissur. Presence of various educational institutions in the city area as well the awareness of the need for education among the citizens are the reasons for higher literacy rate in the city.

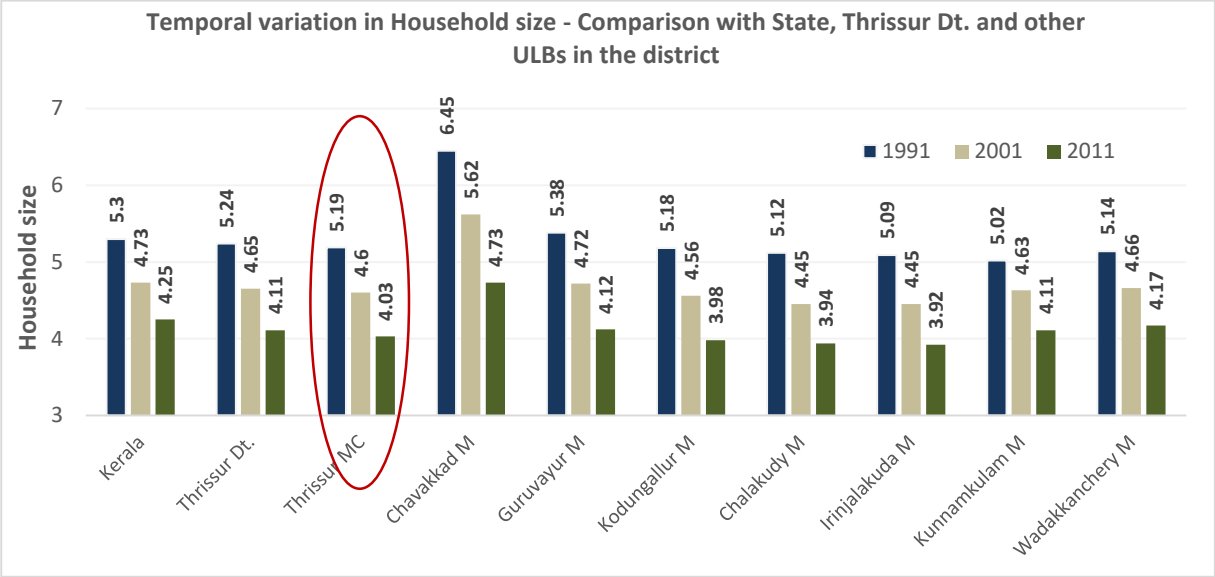


Source: Census Data – 1981, 1991, 2001 &2011

Fig 3.23 Temporal variation of Literacy Rate of Thrissur Municipal Corporation

3.8 HOUSEHOLD SIZE

Household is another important component of demography. A 'household' is usually a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. In Kerala, as against a total population of 3, 34, 06,061 persons in 2011 census, number of households is 7853,754 and average household size is 4.25.Thrissur district, which has a population of 3121200, has 759210number of households with an average household size of 4.11. In Thrissur Municipal Corporation, as against a total population of 315957 persons, number of household is 78336 and household size is 4.03. Thrissur city is having a lower household size when compared to the state and district. Temporal variation in household size, as given in fig. 3.24, shows a decreasing trend in the state, district, Thrissur MC as well as in all other ULBs in the district. Upon comparing with other ULBs in the district, Chavakkad Municipality is showing the highest and Irinjalakuda Municipality is showing the lowest household size. Changes in the society which shows a shift from the culture of joint family system to nuclear families can be evidently seen from the variation of household size over the decades.



Source: Census Data –1991, 2001 &2011

Fig 3.24 Temporal variation in Household size – Comparison with State, Thrissur dt. & other ULBs in the district

3.9 INFERENCE

The total population in Thrissur Municipal Corporation is showing a decreasing trend and has registered a negative growth rate during 2001-2011. When compared with the state, the district, other Municipal Corporations in the state, other ULBs in the district and with surrounding local bodies, only Thrissur MC shows a negative growth rate in population during 2001-2011. The reduction in Growth rate shows the deterioration of urban centres mainly due to the congestion and unaffordable land value. Due to the reduction in population in 2011, the population density has also reduced to a value of 3115 persons per sq.km. Upon comparing with the density of nearby Panchayats, it can be seen that there shows an increase in population density in those areas. While comparing the ward-level population density, inner peripheral wards shows the highest population density due to its proximity to the central core. Thrissur MC shows a lower density when compared to other Municipal Corporations in the state. This shows the potential of Thrissur City to hold more population if new employment opportunities and other infrastructure facilities are developed.

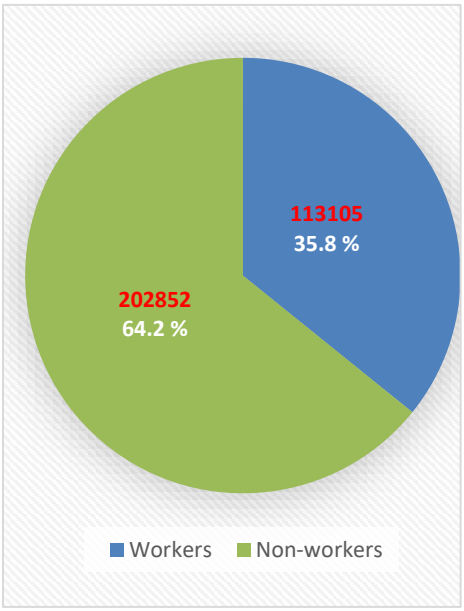
The sex-ratio of Thrissur MC is lower than the state, district and other ULBs in the district. Age-sex pyramid obtained from the socio-economic survey reveals that the maximum number of people is in the age group 45-55, which indicates a higher number of aged population in the future and the need for better planning interventions for the aged. Higher number of people in the age-group 20-30yrs shows the human resource potential of the city. Child sex ratio and female population shows a decreasing trend which results in domination of male population in the future. The increase in literacy rate shows the overall upliftment of the society and its citizens. The decrease in house hold size points out the increase in the number of nuclear families which thereby shows the need for more infrastructure facilities.

CHAPTER 4
OCCUPATIONAL STRUCTURE



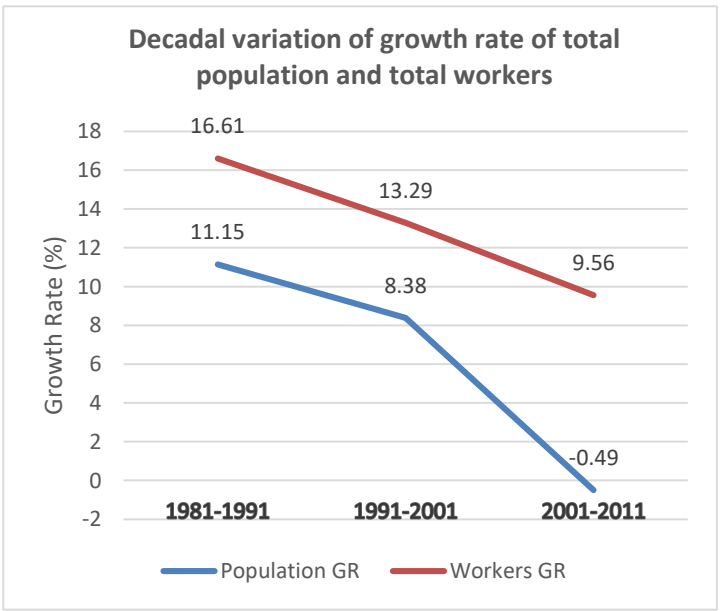
The composition of work force is called the Occupational Structure. Employment is a major indicator of financial well-being of an area and its residents. Hence it is a chief parameter under study while preparing Master Plan for any area. This chapter reveals the existing pattern of occupational structure, analysis of the temporal changes, gender participation, duration of employment etc. based on 2011 census data as well as socio-economy survey of 2019.

4.1 WORK FORCE



Source: 2011 Census data

Fig. 4.1 Total workers and Non-workers in Thrissur Municipal Corporation



Source: Census data – 1981, 1991, 2001 & 2011

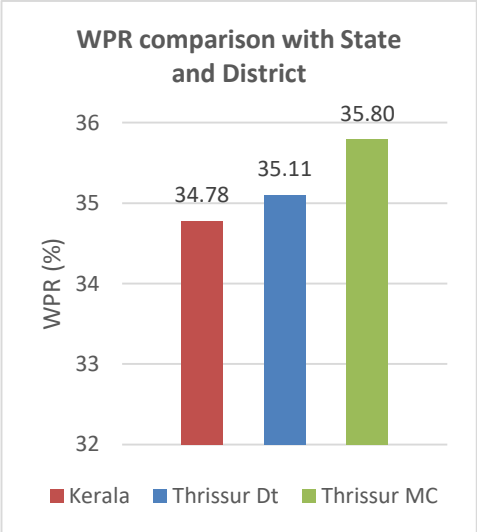
Fig. 4.2 Decadal variation of Growth Rate of Total Population and Total Workers in Thrissur Municipal Corporation

Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also include effective supervision and direction of work. It even includes part time help or unpaid work on farm, family enterprise or in any other economic activity. All persons (irrespective of age and sex) who participated in any economically productive activity during any reference period are defined as workers. As per 2011 Census total workers in Thrissur Municipal Corporation area is 113105, which is 35.80% of total population. Figure 4.1 shows the percentage of total workers and non-workers in the city.

Figure 4.2 shows the decadal variation of Growth Rate of total population and total workers in Thrissur Municipal Corporation. During the last decade population growth rate showed a sudden decline by 8.87% and reached negative growth whereas growth rate of total workers somewhat shows a steady decrease in value with an average decrease of 3.5%during the last decades. Even though the growth rates of total population and total workers shows a decreasing trend, growth rate of total workers shows a better value. This indicates the increase in the number of total workers with respect to the total population which is clearly reflected in the work participation rate as detailed below.

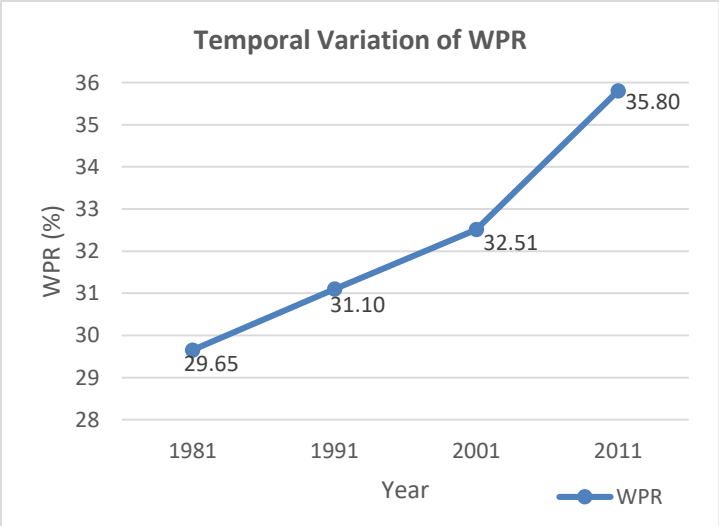
4.2 WORK PARTICIPATION RATE (WPR)

The working population and Work Participation (WPR) highlights the occupational distribution of a region. It is a measure of the active portion of an economy's labour force. It refers to the number of people who are either employed or are actively looking for work. Work Participation Rate is defined as the percentage of total workers with respect to the total population. As per 2011 census, the WPR of Thrissur city is 35.80 which is higher than the State and district values of 34.78 and 35.11 respectively. Fig. 4.3 shows the comparison of WPR of Thrissur City with respect to the district and state.



Source: 2011 Census data

Fig. 4.3 WPR comparison of Thrissur City with State and District

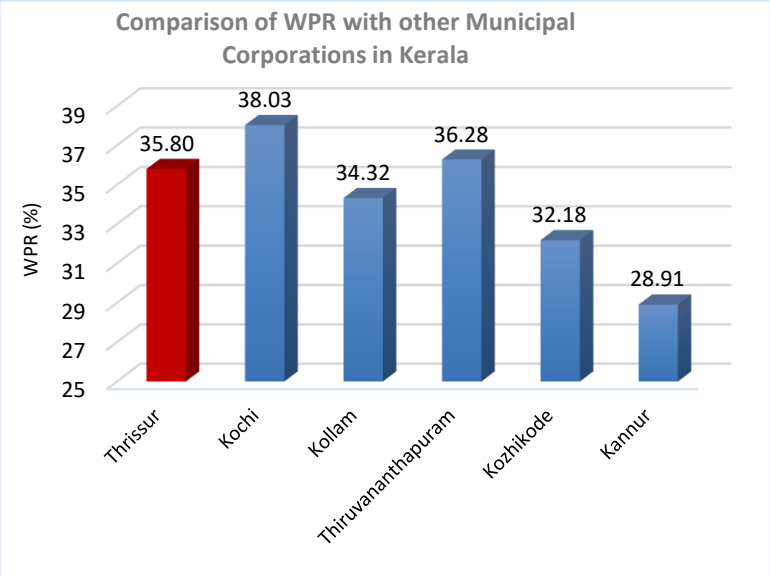


Source: Census data – 1981, 1991, 2001 & 2011

Fig. 4.4 Temporal variation of Work Participation Rate in Thrissur Municipal Corporation

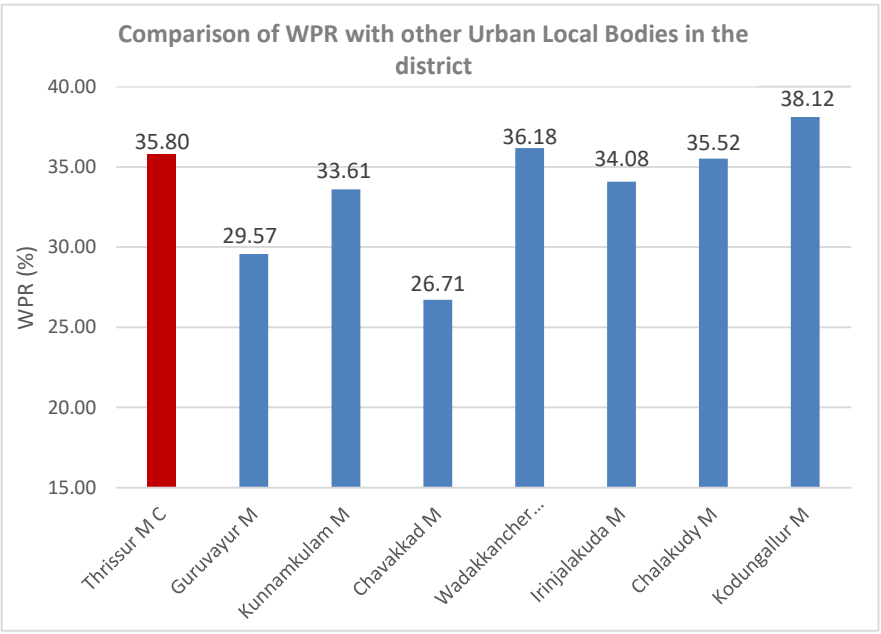
Temporal variation of WPR helps to understand the nature of growth of working population with respect to the total population. Temporal variation of WPR of Thrissur city, as depicted in fig. 4.4 indicates that the work participation rate has followed an increasing trend during the last three decades. During 1981-2001, WPR showed a gradual increase with an average increase of 1.45% whereas during 2001-2011 it showed in an increase by 3.29% which can clearly relate to the sudden decline in population growth rate. This indicates the presence of more people in the working age group and more people are getting increasingly engaged in productive economic activities. This indicates the growth in economic sector of Thrissur City.

Fig. 4.5 shows the comparison of WPR of Thrissur Corporation with other Municipal Corporations in Kerala. From the graph, it is found that Kochi and Thiruvananthapuram MC shows a higher WPR than Thrissur. This might be an indication of the presence of more job opportunities in those cities than that in Thrissur.



Source: 2011 Census data

Fig. 4.5 Comparison of WPR with other Municipal Corporations in Kerala

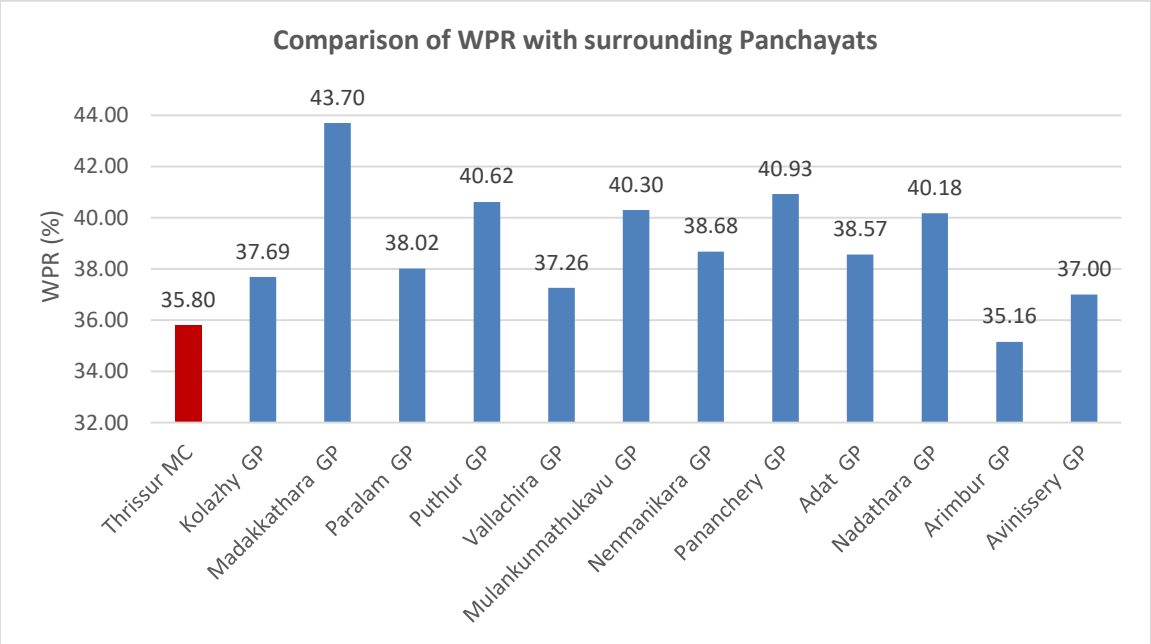


Source: 2011 Census data

Fig. 4.6 Comparison of WPR with other Urban Local Bodies (ULBs) in Thrissur

Fig. 4.6 shows the comparison of WPR of Thrissur City with other urban local bodies (ULBs) in Thrissur district. Among the ULBs in the district, Thrissur City stands in 3rd position in respect of WPR values, next to Kodungallur (38.12) and Wadakkanchery (36.18) Chavakkad Municipality shows the least WPR value of 26.71.

Upon comparing the WPR of Thrissur City with surrounding local bodies, as depicted in fig. 4.7, Thrissur City shows a much lower value, just above Arimbur GP which shows the lowest value of 35.16. Madakkathara GP shows the highest WPR value of 43.70 followed by Pananchery GP (40.93) and Puthur GP (40.62). Concentration of primary sector activities makes WPR higher in these areas. Commercialization and tertiary sector activities as well as minimal primary sector activities makes the WPR value of Thrissur city lower when compared to surrounding Panchayats.

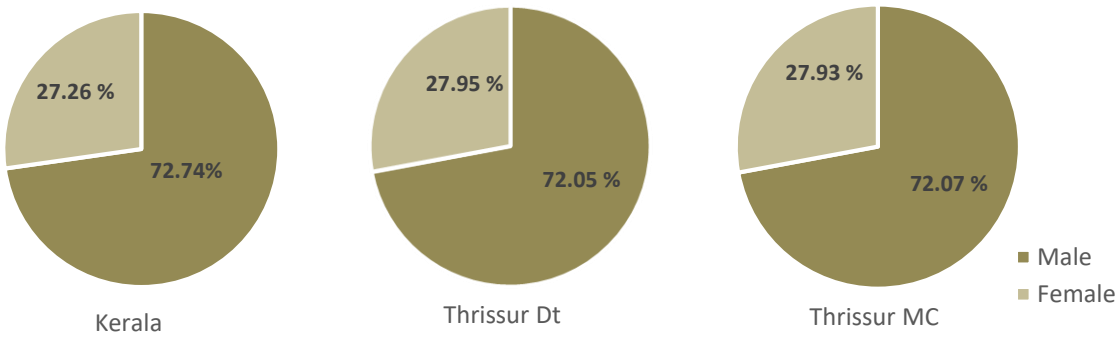


Source: 2011 Census data

Fig. 4.7 Comparison of WPR with surrounding Grama Panchayats

4.2.1 Gender based analysis of Work Participation Rate

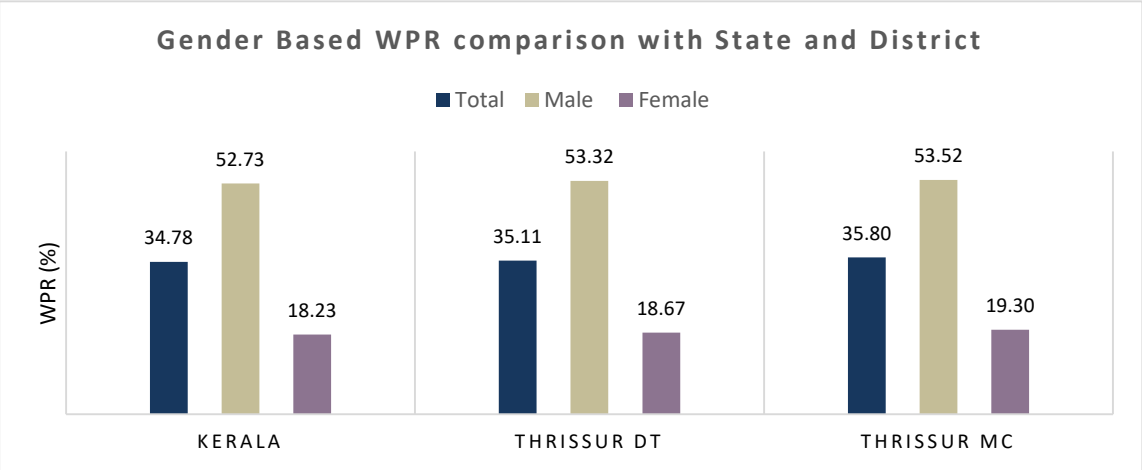
It is important to learn about work participation of males &females in economy, so that corrective decision may be taken for overall economic growth. The female economic activity and women's employment are main issues in the economy of all developing nations. Hence, gender based analysis of workers was done to understand the participation and contribution of male and female population in the economy of Thrissur.



Source: 2011 Census data

Fig. 4.8 Percentage composition of male and female workers with respect to total workers

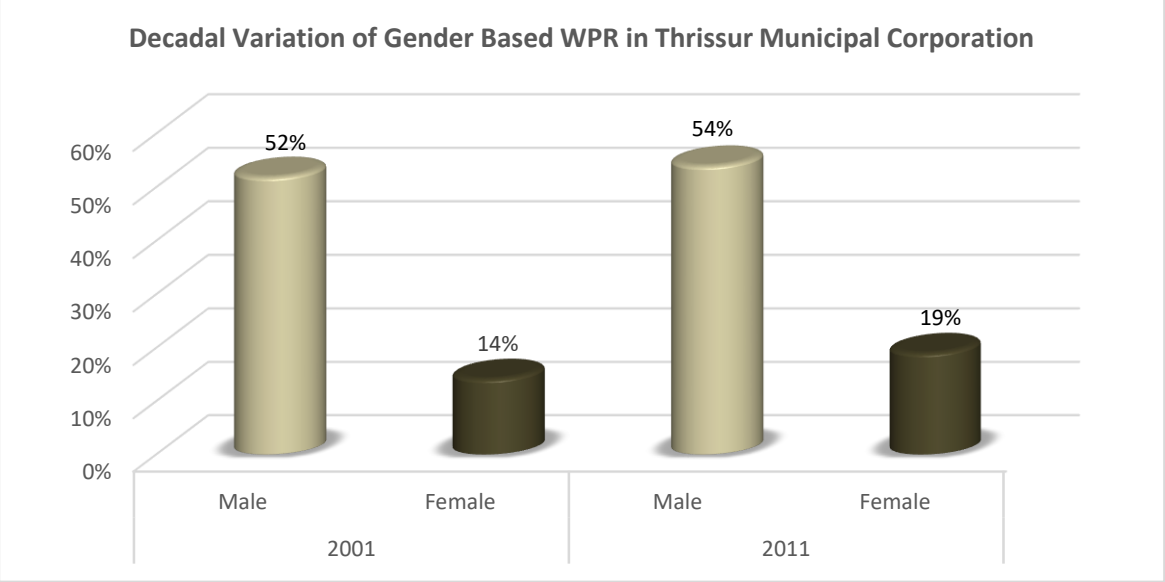
The total workforce in Kerala, as per 2011 Census is around 11.6 million out of which 8.4 million are males and only 3.2 million are females. Even though there are slight variations, Thrissur City, Thrissur Dt. and Kerala show a similar composition of male and female workers with respect to total workers, as depicted in fig. 4.8. In Thrissur MC, out of the total workers, 72.07% are male and 27.93% are female. Employment opportunities for women may be enhanced in order to increase female participation in work force.



Source: 2011 Census data

Fig. 4.9 Gender based WPR comparison with State and District

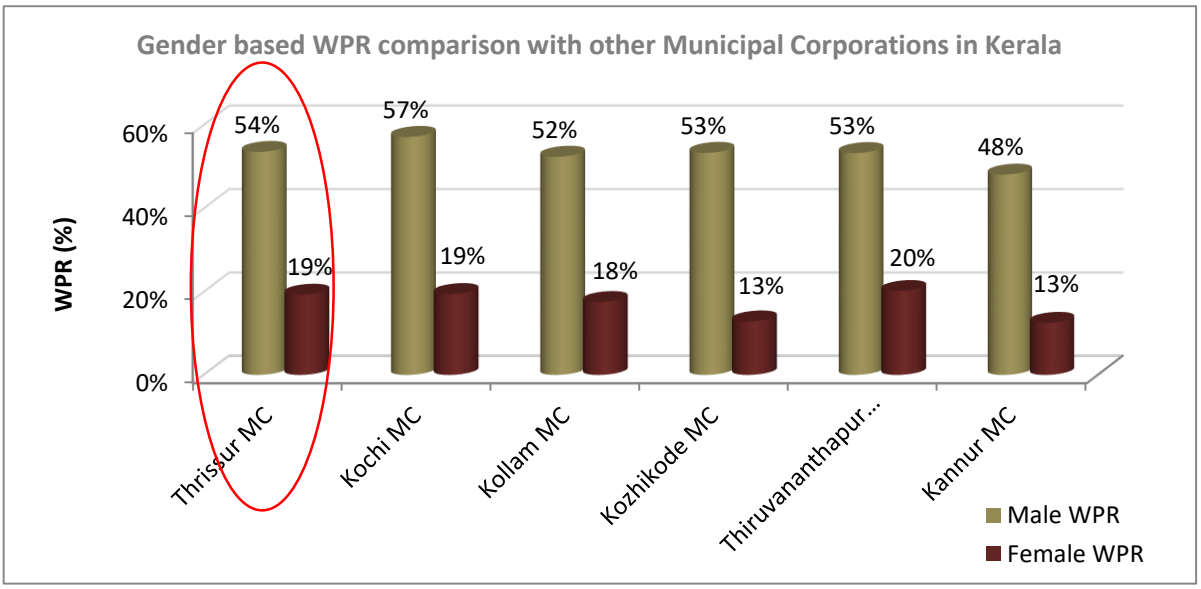
Comparison of male-female WPR of Thrissur Corporation area with State and district, as depicted in fig. 4.9 shows that Thrissur Municipal Corporation is having almost similar trend as that of state and district. Even though the total WPR (35.80), is slightly higher in Thrissur Corporation, male WPR (53.52) is slightly lower than the state and slightly higher than the district. Female WPR (19.30) is more in Thrissur Municipal Corporation in comparison with State and district shows the increased participation of female population in work force andthe presence of more job opportunities for female population.



Source: 2001 and 2011 Census data

Fig. 4.10 Decadal variation of Gender based WPR in Thrissur Municipal Corporation

The decadal variation of gender based WPR as represented in fig. 4.10 shows that male and female WPR has increased during 2001-2011. Male WPR has increased from 52% to 54% having an increase of2% whereas female WPR has increased from 14% to 19% having an increase of 5%. This shows an increased contribution of both men and women in economic activity. More percentage increase in female WPR shows light to the societal changes occurred which thereby increased participation of female population in work force.



Source: 2001 and 2011 Census data

Fig. 4.11 Gender based WPR comparison with other Municipal Corporations in Kerala

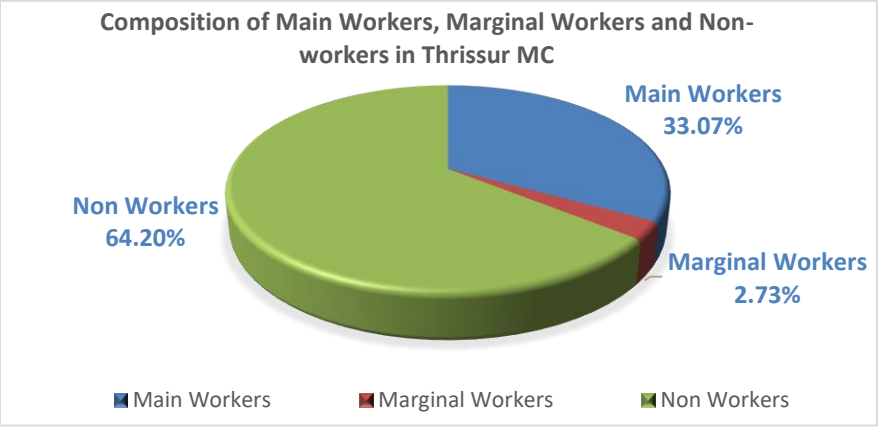
Comparison of male–female WPR of Thrissur MC with other Municipal Corporations in the state, as per 2011 Census is shown in fig. 4.11. There is higher disparity in male and female WPR in all Municipal Corporations. Thrissur MC follows the same trend as well. Male WPR is highest in Kochi MC (57%) followed By Thrissur MC (54%) whereas female WPR is highest in Thiruvananthapuram MC (20%) followed by Thrissur MC (19%) and Kochi MC (19%).

4.3 OCCUPATIONAL STRUCTURE

The total workers in any area are classified in to main workers and marginal workers. As per census those workers who are engaged in economic productive activity for the major part of the reference period (i.e. 6 months or more in a year) are termed as main workers while marginal workers work for less than six months in a year. As per census, workers are categorized as cultivators, agricultural labourers, household industrial labourers and other workers. This classification is generally termed as the occupational structure of the planning unit (Four fold Classification of workers). A person who did not work during the reference period is treated as non-worker.

As per Census 2011 the total number of workers in Thrissur MC is 113105which include 81514 male workers and 31591 female workers. The male workers constitute 72.07% of the total workers, which indicates the clear dominance of male workers in all sectors. Out of total

workers, there are 104484 main workers and 8621 marginal workers. Fig. 4.12 shows the composition of main workers, marginal workers and non-workers in Thrissur Corporation.



Source: 2011 Census data

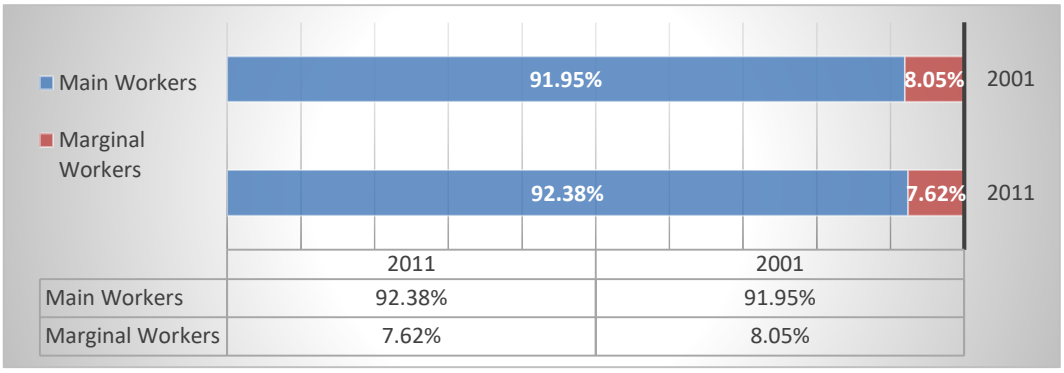
Fig. 4.12 Composition of main workers, marginal workers and non-workers in Thrissur Corporation

Table 4.1 shows the details of workers in Thrissur MC, Thrissur Dt. and Kerala. Total workers constitutes 35.80% of the total population, which include 33.07 % of Main workers and 2.73 % of marginal workers. 64.20% of the population is non-workers.

Table 4.1 Classification of Total Workers (Main + Marginal) in Thrissur Municipal Corporation

	Total Population	Workers			WPR
		Main workers	Marginal workers	Total workers	
Kerala	33406061	9329747	2289316	11619063	34.78
Thrissur District	3121200	929506	166221	1095727	35.11
Thrissur Municipal Corporation	315957	104484	8621	113105	35.80

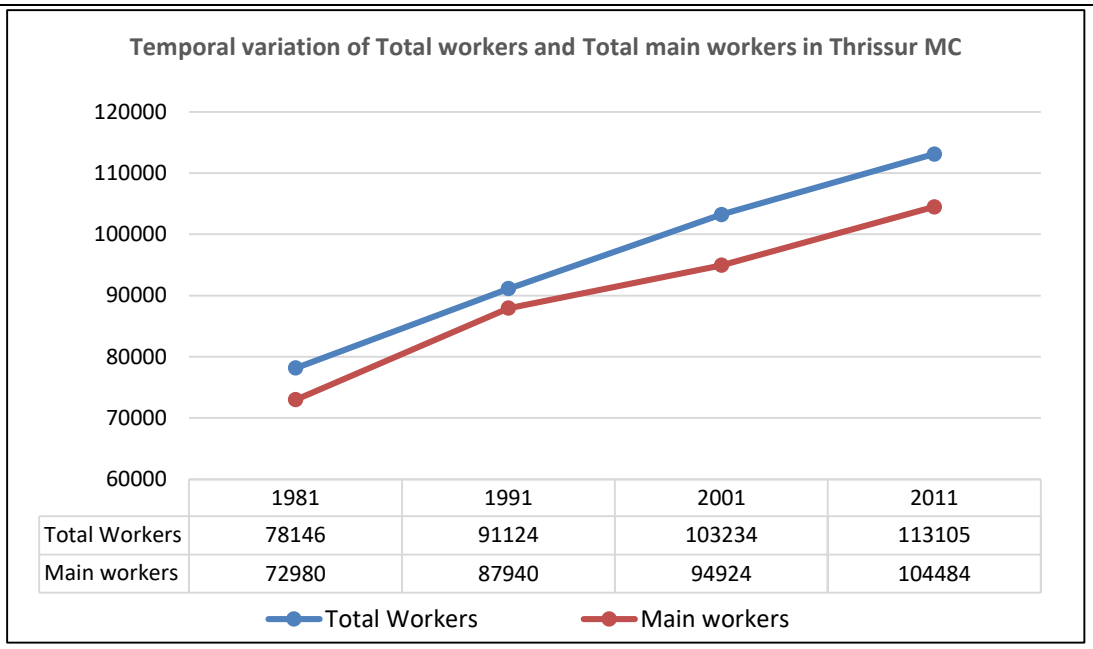
Source: 2011 Census data



Source: 2001 and 2011 Census data

Fig. 4.13 Composition of main workers and marginal workers w.r.t to total workers in Thrissur MC

Composition of main and marginal workers with respect to total workers during 2001 and 2011, as depicted in figure 4.13 shows that there is a slight increase in the number main workers in 2011. This indicates that people are moving towards a trend of engaging in some sort of economic activity for most of the part in a year.

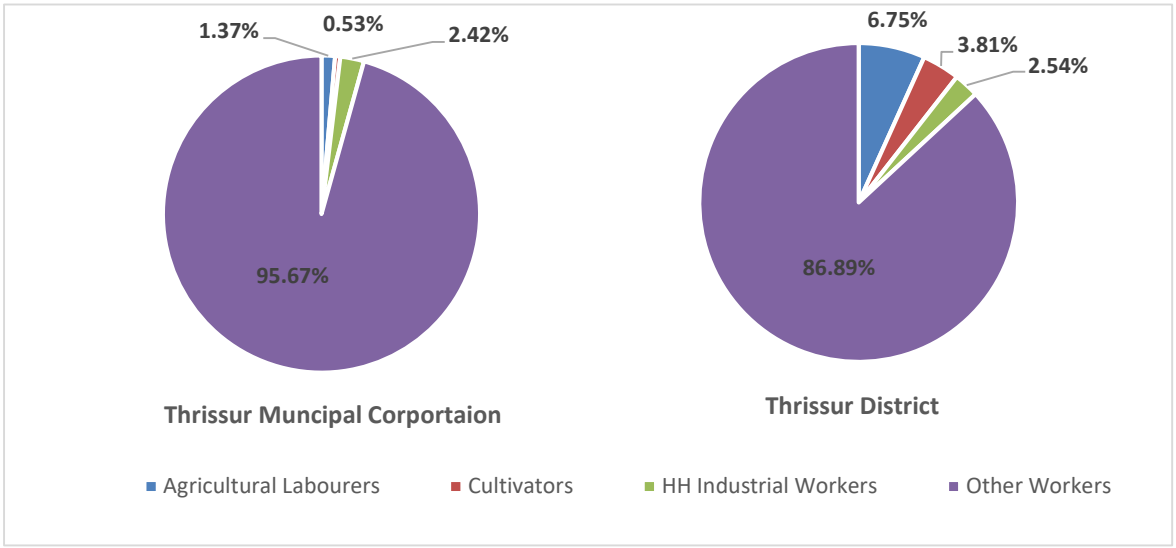


	1981	1991	2001	2011
Total Workers	78146	91124	103234	113105
Main workers	72980	87940	94924	104484

Source: Census data – 1981, 1991, 2001 & 2011

Fig. 4.14 Temporal variation of main workers and total workers in Thrissur MC

Fig. 4.14 shows the temporal variation of total workers and main workers in the Thrissur MC. Total workers as well as main workers shows a high increase in number which indicates the productive economic activities of people.The society can be predicted to be relatively productive and stable economy.



Source: 2011 Census data

Fig. 4.15 Fourfold classification of workers in Thrissur Municipal Corporation & Thrissur District

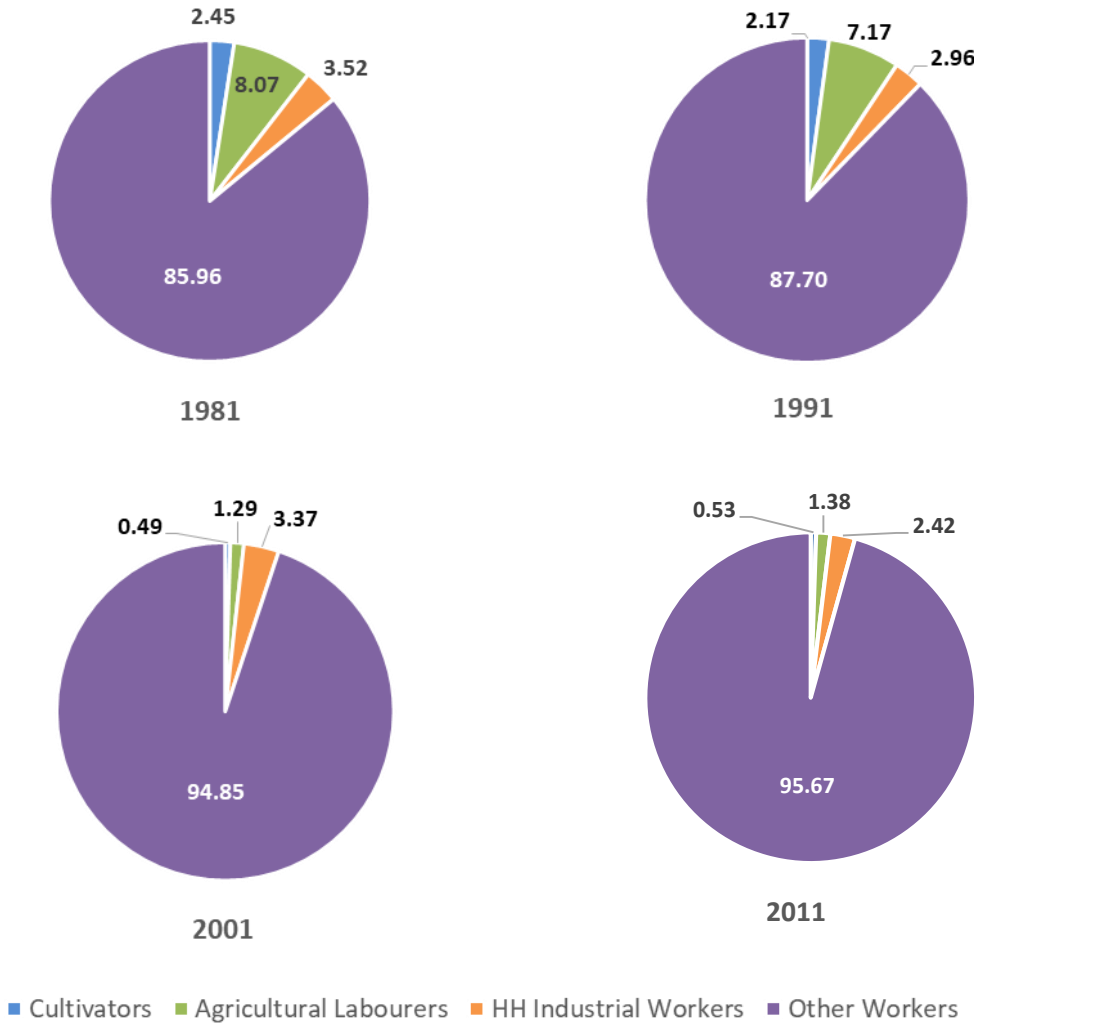
Four fold classification of workers in Thrissur MC and district as per 2011 census is shown in fig. 4.15. Percentage of other workers is found to be higher in both the cases. In case of Household Industrial workers, both the city and the district follow same trend. Persons engaged in primary sector activities are very less in Thrissur city when compared to the district,

the number of cultivators being even negligible. All these shows the high affinity of people towards tertiary sector activities both in case of the city as well as the district.

Table 4.2 Fourfold classification of Total Workers (Main + Marginal) in Thrissur Municipal Corporation

Workers Classification	1981		1991		2001		2011	
	Persons	%	Persons	%	Persons	%	Persons	%
Agricultural Labourers	6311	8.1	6538	7.18	1935	1.87	1555	1.38
Cultivators	1915	2.5	1974	2.17	563	0.55	596	0.53
House Hold Workers	2748	3.5	2700	2.96	3508	3.4	2741	2.42
Other Workers	67172	86	79911	87.7	97228	94.2	108213	95.67
Total Workers	78146	100	91124	100	103234	100	113105	100

Source: Census Report 1981, 1991, 2001 and 2011



Source: Census Report 1981, 1991, 2001 and 2011

Fig. 4.16 Temporal variation of total workers (fourfold classification) in Thrissur Municipal Corporation

The details of total workers in Thrissur Municipal Corporation area during 1981, 1991, 2001 & 2011 are shown in table 4.2. There is a high increase in number of total workers in the

city. The temporal variation of total workers (fourfold classification), as depicted in fig.4.16 shows that the percentage of other workers has increased by 9.71% from 1981 to 2011. This shows a trend of moving towards service/ tertiary sector activities. Strong base of Thrissur city in trade and commerce activities is the reason for increase in tertiary sector activities. Household Industrial workers almost show a consistent trend ranging between 2.4–3.6% during the last three decades. People engaged in primary sector activities which almost constituted 10.52% in 1981 has declined to a value of just 1.91% in 2011. The conversion of agricultural lands for other uses, lack of labour force, increase in wages of agricultural labourers, reduced value for the goods produced, etc. has led to the reduction in agricultural activities. The increased affinity towards the tertiary sector activities as well the increased negligence towards the primary activities thereby reveals the urbanizing nature of the area.

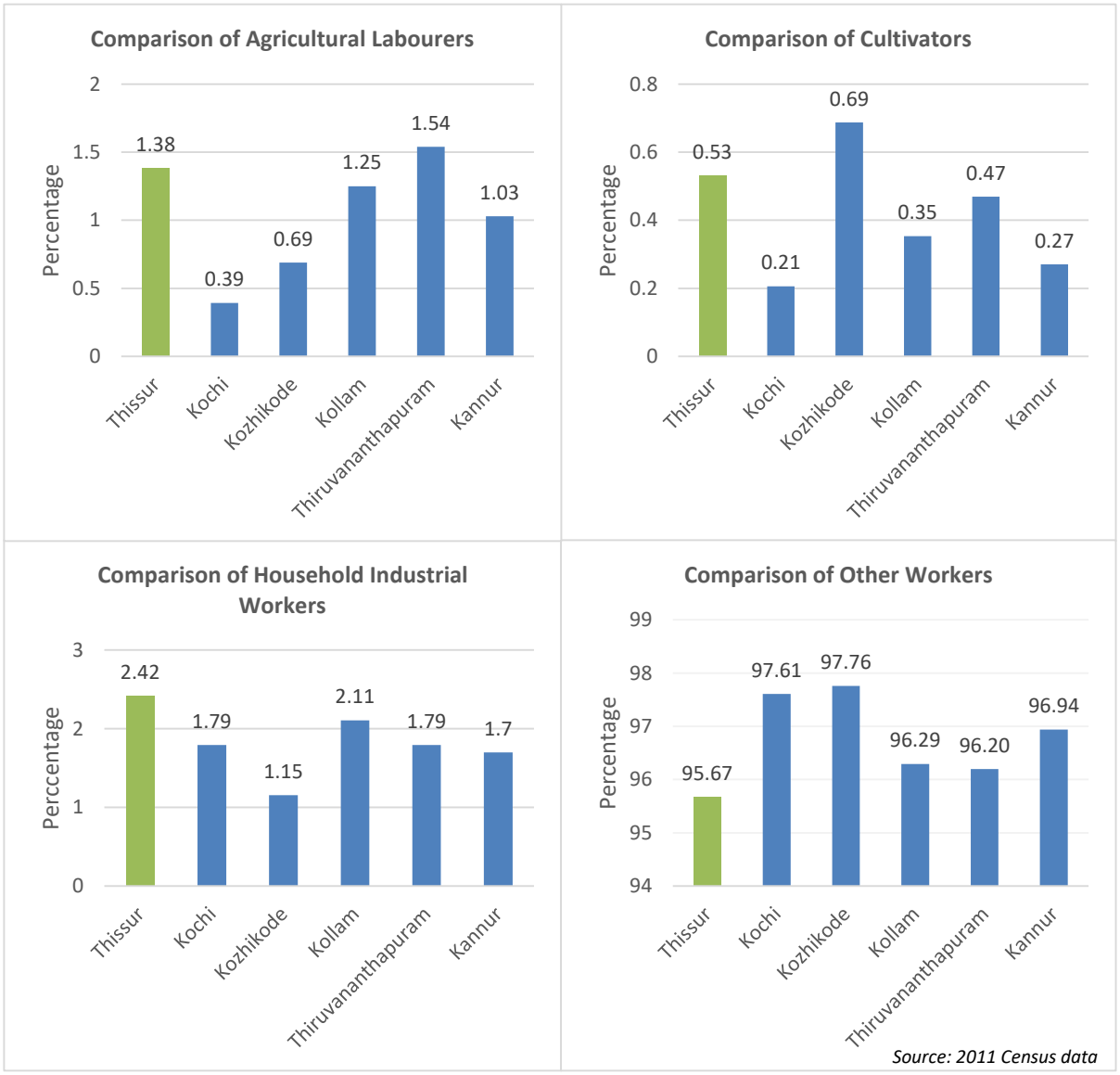


Fig. 4.17 Comparison of total workers (fourfold classification) with Other Municipal Corporations in Kerala

While comparing the (fourfold classification) of Thrissur Municipal Corporation with other Municipal Corporations in Kerala (fig. 4.17), it can be seen that the number of persons engaged in primary sector as well as secondary sector activities are almost higher in Thrissur

Corporation. The presence of agricultural land within the corporation area as well as more opportunities for the household industrial workers in Thrissur are the reasons for this. Upon comparing the other workers, it can be seen that the number of other workers is found to be least in Thrissur Corporation. This shows that Thrissur has not completely neglected primary and secondary activities and holds a better position in terms of maintaining these. Thrissur city can sustain as an urban centre by still upholding the available potential from these sectors.

4.4 SOCIO ECONOMIC SURVEY

Workers can be classified in three categories i.e. primary, secondary and tertiary. The primary occupations include all those essential activities such as agriculture and allied activities like animal husbandry, forestry, fishery, poultry farming etc. Secondary activities include manufacturing industries composed of both large and small scale and mining. Tertiary activities include all other activities like transport, communication, banking, insurance, trade etc.

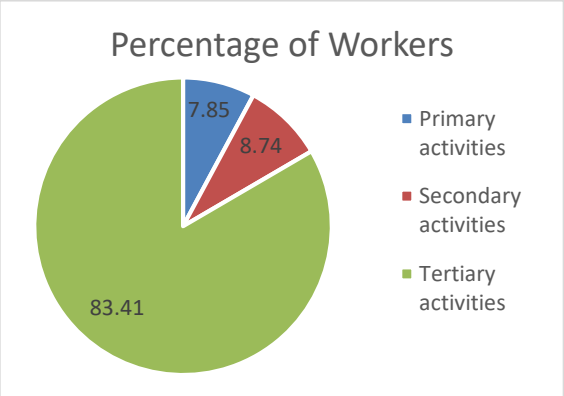
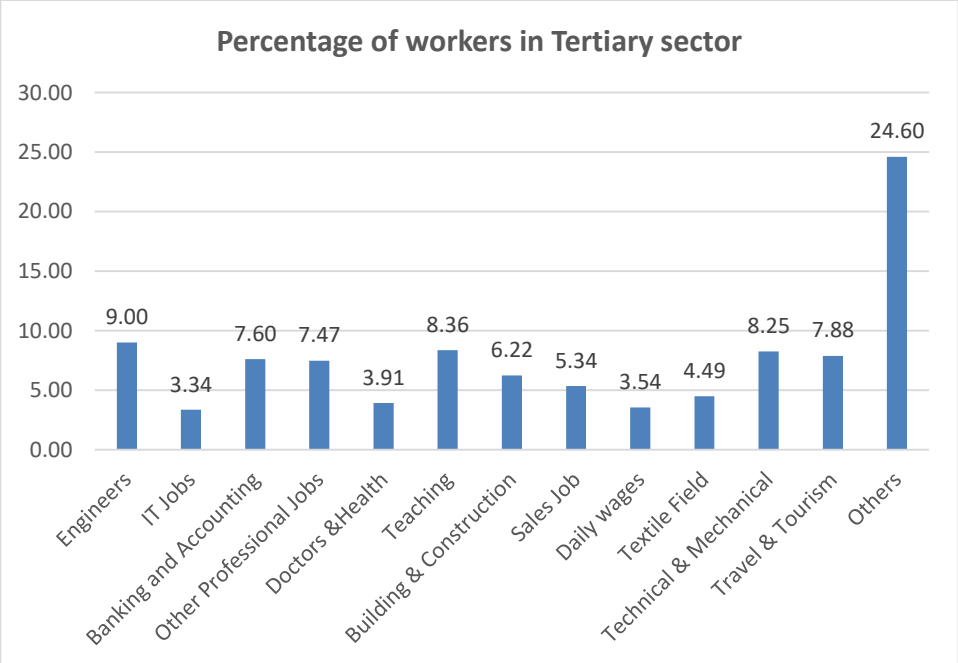


Fig 4.18 Percentage of workers in each sector
Source: Socio-Economic survey data, 2019



Source: Socio-Economic survey data, 2019

Fig 4.19 Percentage of workers in Tertiary sector

As per socio economic survey 2019 the percentage of primary secondary and tertiary workers of Thrissur city is shown in figure 4.18. From socio-economic data analysis results, the workers in primary jobs are the least with only 7.85% contribution. Workers population in tertiary sector is 83.41%. Majority people working in primary sector are the agricultural

labourers and cultivators. Maximum people in secondary sector are doing their own business. Figure 4.19 shows the percentage of workers in Tertiary sector.

Figure 4.20 shows the status of employment inn Thrissur city as per socio economic survey 2019. It shows that only 3% of the people in the town are NRIs.

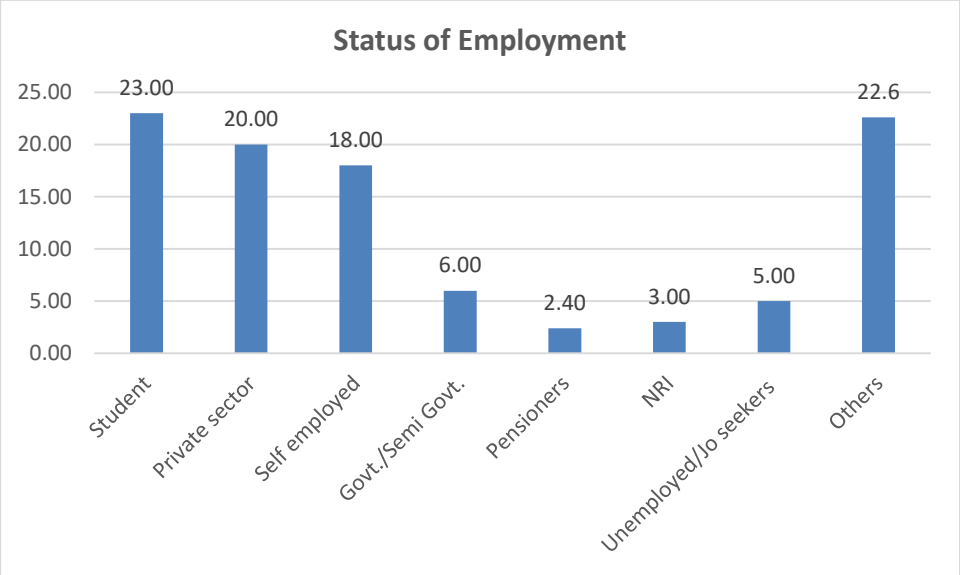


Fig 4.20 Status of Employment (Source: Socio-Economic survey,2019)

4.5 DEPENDENCY RATIO

The dependency ratio is an age-population ratio of those typically not in the labour force (the Dependent part) and those typically in the labour force (the productive part). It is used to measure the pressure on productive population. Table 4.3 shows the dependency ratio of State, District and Thrissur City as per Census 2011. The dependency ratio of Thrissur City shows a better value of 1.79 when compared to State and District values of 1.88 and 1.85 respectively.

Table 4.3 Comparison of Dependency Ratio with State and District

	Workers	Non-Workers	Dependency Ratio
Kerala State	11619063	21786998	1.88
Thrissur District	1095727	2025473	1.85
Thrissur Corporation	113105	202852	1.79

Source: 2011 Census data

4.6 INFERENCE

The Work Participation Rate (WPR) shows a higher value of 35.80% in Thrissur city when compared to State and District, indicates the increasing participation of people in work force. Even though the growth rate of population as well as that of workers are decreasing, the WPR value shows an increasing trend from 1981 onwards. Upon comparing the WPR value with other Corporations in Kerala, Thrissur holds third position next to Kochi and

Thiruvananthapuram. More thrust in improving trade and commerce activities can increase more job opportunities and thereby increasing the participation of people in work force. Even though the participation of women has increased from 14% to 19% during last decade, there is high disparity between the male and female WPR values. Providing more women friendly opportunities can further improve the participation of women in work force. Moreover, job opportunities has to be increased to some extent in order to improvise the overall work participation of people.

As per 2011 census, 35.80% of total population in Thrissur city are workers and 64.20% are non-workers. Out of the total workers 92.38% are main workers and 7.62% are marginal workers. The workers shows an increasing trend from 1981 onwards. Dependency ratio of Thrissur Corporation is lesser than that of Kerala and Thrissur district indicates the lower burden of non-workers on working population.

Fourfold classification of main workers, as per 2011 census shows that almost 95.67% of workers are included in 'other workers' category. Agricultural labourers and Cultivators together constitutes only 1.91% and Household Industrial Workers constitutes 2.42% of total workers. Temporal variation of workers reveals the trend of people moving towards tertiary sector activities as well as moving away from primary sector activities, together indicates the urbanizing nature of the city. But, upon comparing with other Municipal Corporations in Kerala, Thrissur holds a better position in terms of primary sector activities. The availability of cultivable area is more in Thrissur than in any other Municipal Corporations. Shortage of agriculture labourers has adversely affected agricultural sector. Mechanization can help to a certain limit. Land available for agriculture must be utilized by group farming and public private partnership. Cultivation has to be encouraged in all agricultural lands available in the city with the help of various government sponsored programs, thereby reducing the problem of unemployment to some extent.

CHAPTER 5
LAND USE



This chapter details out the existing land use of Thrissur City based on the land use survey conducted by Department of Town and Country Planning. Spatial structure of various land uses is analysed in detail.

5.1 EXISTING LAND USE OF THRISSUR CITY

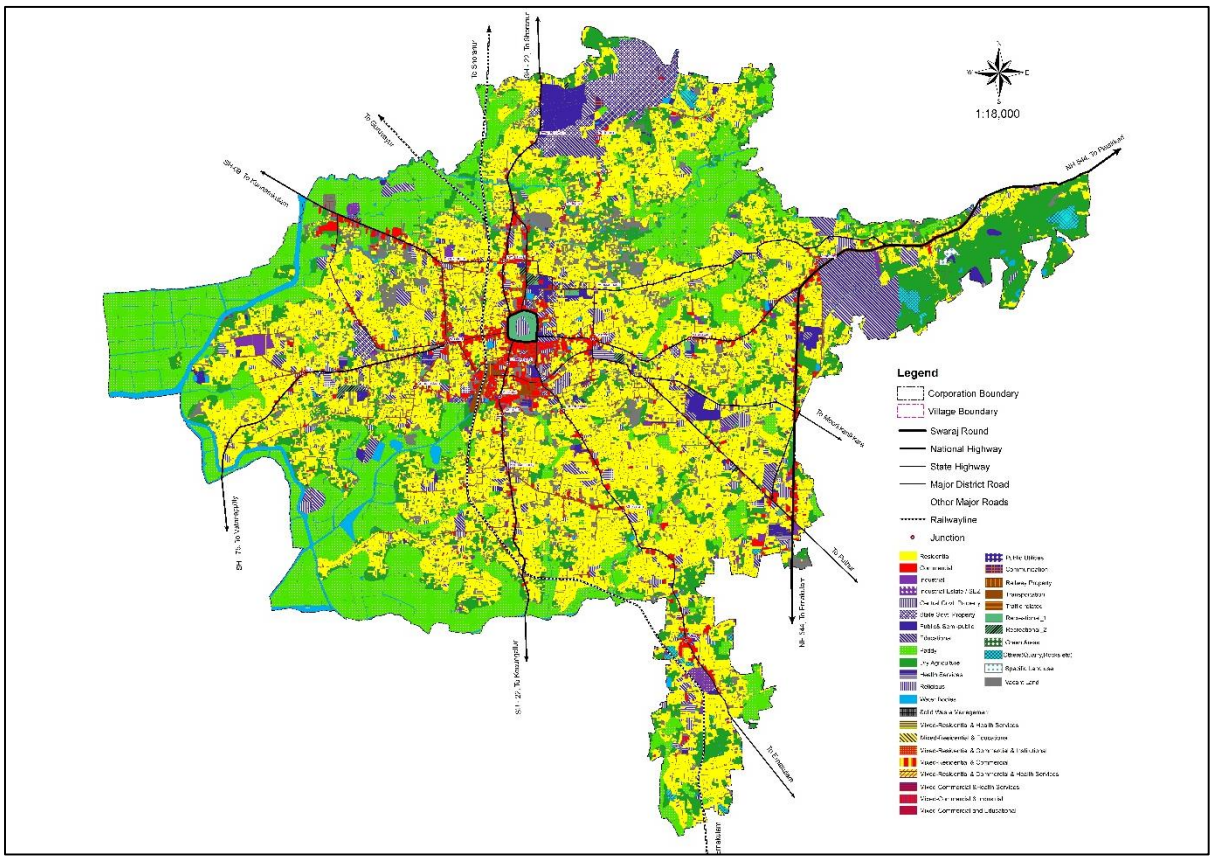


Fig 5.1 Existing Land use map of Thrissur Municipal Corporation area - 2019

The structure of any city is best understood through the study of the extent and distribution of various land uses. During the formation of Thrissur Municipal Corporation, six

Panchayats were added to the existing Thrissur Municipal area. Therefore the presence of Agricultural activities is seen in abundance in Thrissur City compared to the other Cities in Kerala State. Fig 5.1 shows the existing land use of Thrissur City based on the Land use survey conducted by Department of Town and Country Planning in 2019.

Table 5.1 Existing Land use break up - 2019

Land use	Total Area		Developable Area	
	Area (Sq.km)	Percentage (%)	URDPFI Standards (%)	Percentage (%)
Residential	40.14	39.58	43-48	52.33
Commercial	2.8	2.76	4-6	3.80
Industrial	1.00	0.98	7-9	1.44
Mixed	0.66	0.65	-	0.89
Public & Semi-public	9.45	9.32	6-8	12.02
Park & Open Spaces	0.45	0.44	12-14	0.44
Traffic & Transportation	5.69	5.61	10-12	6.04
Dry Agriculture	12.12	11.95	-	16.46
Paddy	20.22	19.94	-	-
Water bodies	2.83	2.79	-	-
Vacant Land	5.21	5.14	-	6.07
Others	0.85	0.84	-	0.51
	101.42	100	**100**	**100**

Source: Land use survey 2019

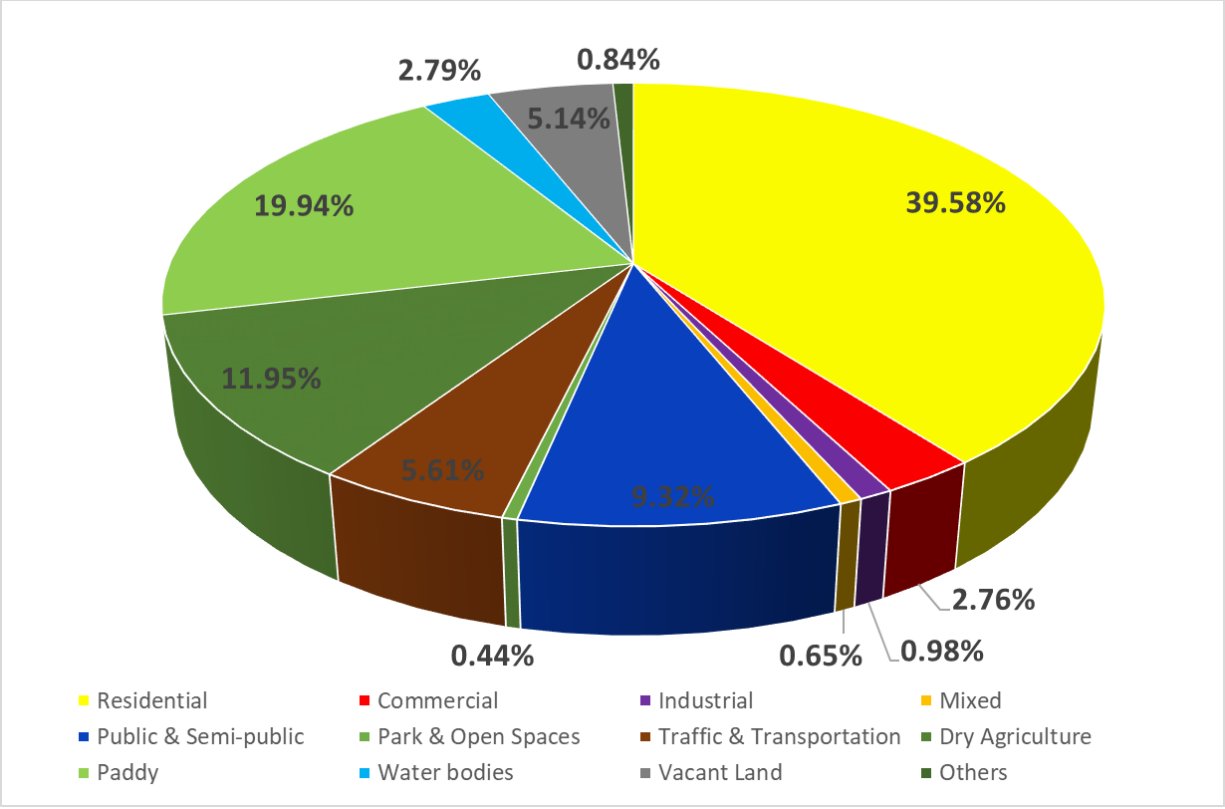


Fig 5.2 Existing Land use Break up – 2019 *(Source: Land use survey 2019)*

Land use break up in Thrissur city is shown in table 5.1 and the percentage wise distribution of different land use is shown in fig 5.2. Residential (39.58%) and Agricultural (31.89%) land uses are predominant in Thrissur City. Being the cultural and educational centre of the state, Public & semi-public land use constitute about 9.32% and it is succeeded by 5.61% of traffic and transportation land use. Commercial activities contributes 2.76% followed by 0.65% of mixed land use which includes residential, commercial, institutional, health care, etc. Industrial Land use constitutes 0.98% and Park & open space acquires 0.44% of land. The availability of vacant land is 5.14%. Thrissur City is covered by 2.79% of Waterbodies and 0.84% of other land use which includes waste lands, Quarry and rocky areas.

As per URDPFI Guidelines, Thrissur city falls under the category of Medium town (Population 1,00,000 to 5,00,000). Comparison of land use with URDPFI standards (developable area) as given in table 5.1 shows that the percentage of all the major classes of land use except Residential, Public & Semi-public uses falls below the optimum standard requirement. This difference is mainly due to the special context of Kerala which shows an urban-rural continuum as well as some minor differences in the categorization of uses in our context. Moreover, the presence of agricultural land use intensely, pull back the availability land for other uses

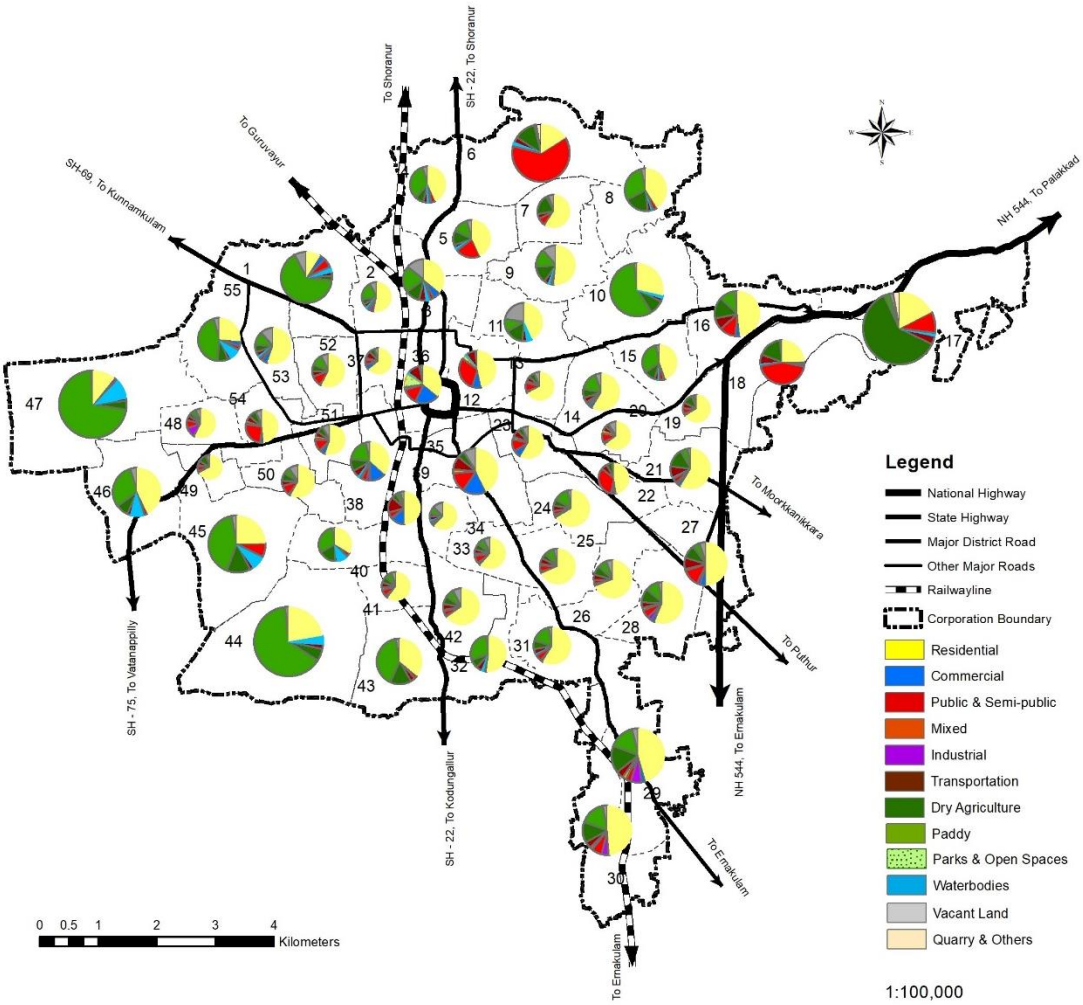


Fig 5.3 Ward wise distribution of land use in Thrissur Municipal Corporation

Ward wise distribution of land use, as represented in fig. 5.3 shows that Residential use is the most prominent land use in majority of the wards. There are also some wards which shows prominence in other land uses also. Poonkunnam, Viyyur, Villadom, Mukkattukara, Mullakkara, Vadukkara, Panamukku, Nedupuzha, Karyattukara, Chettupuzha, Pullazhi, and Puthurkkara are the wards where agriculture land use is much higher than other uses. These lands are retained as such due to the Kerala Conservation of Paddy Land and Wetland Act, 2008. Before this act large area of paddy lands are converted to various other land uses by achieving Kerala Land Utilization (KLU) certificate from the concerned authorities. It can also be seen that the agriculture land use is high in those wards where major roads are not passing through. In certain wards such as Ramavarmapuram and Mannuthy, Public & Semi-public use is higher than other land uses.

Thekkinkadu ward, which constitutes the city centre, shows distribution of mixed land use character with commercial use as prominent. This is one of the major feature of Thrissur City.

5.2 LAND USE DISTRIBUTION AND CONCENTRATION

Land use distribution shows the spread of a certain land use in city whereas concentration reveals the general pattern of the area (ward) with respect to the local body. Concentration index (C.I) is used to find out the concentration of a particular use in a ward and the comparison of this show the availability of various sectors in different wards.

$$\text{C.I. of a land use} = \frac{\text{Percentage of a particular land use in a ward}}{\text{Percentage of that particular land use in the Local body}}$$

5.2.1 RESIDENTIAL USE

Residential use constitutes about 39.58% of the total area of the city and it is the prominent land use in majority of the wards. Distribution of Residential land use in the city area, as given in fig.5.4 shows that the residential areas are widely distributed in the city, the intensity of which is less in some agricultural and institutional dominant areas.

As per socio-economic survey, the percentage of people having more than 25 cents plot area is less than 10% only. Therefore a mixture of residential/ agriculture land use is very less in the city. Moreover, this shows the urban nature with less land holdings. This also indicates high land value and less land availability.

Concentration of residential land use in the city, as represented in fig. 5.5 shows that residential concentration is found to be more in the south-eastern parts of the city area. It can also be seen that 13 wards shows a C.I. value above 1.5 with the highest concentration being in Ward No.25 (Kuriachira) with a C.I of 1.70, followed by Ward 26 (Anchery - 1.68) and Ward 49 (Elthuruthu – 1.66). Residential land use seen very less in those wards where agriculture concentration is higher and also other wards like Ramavarmapuram, Thekkinkadu, etc. where other land use concentration like public and semi-public, commercial dominations are higher.

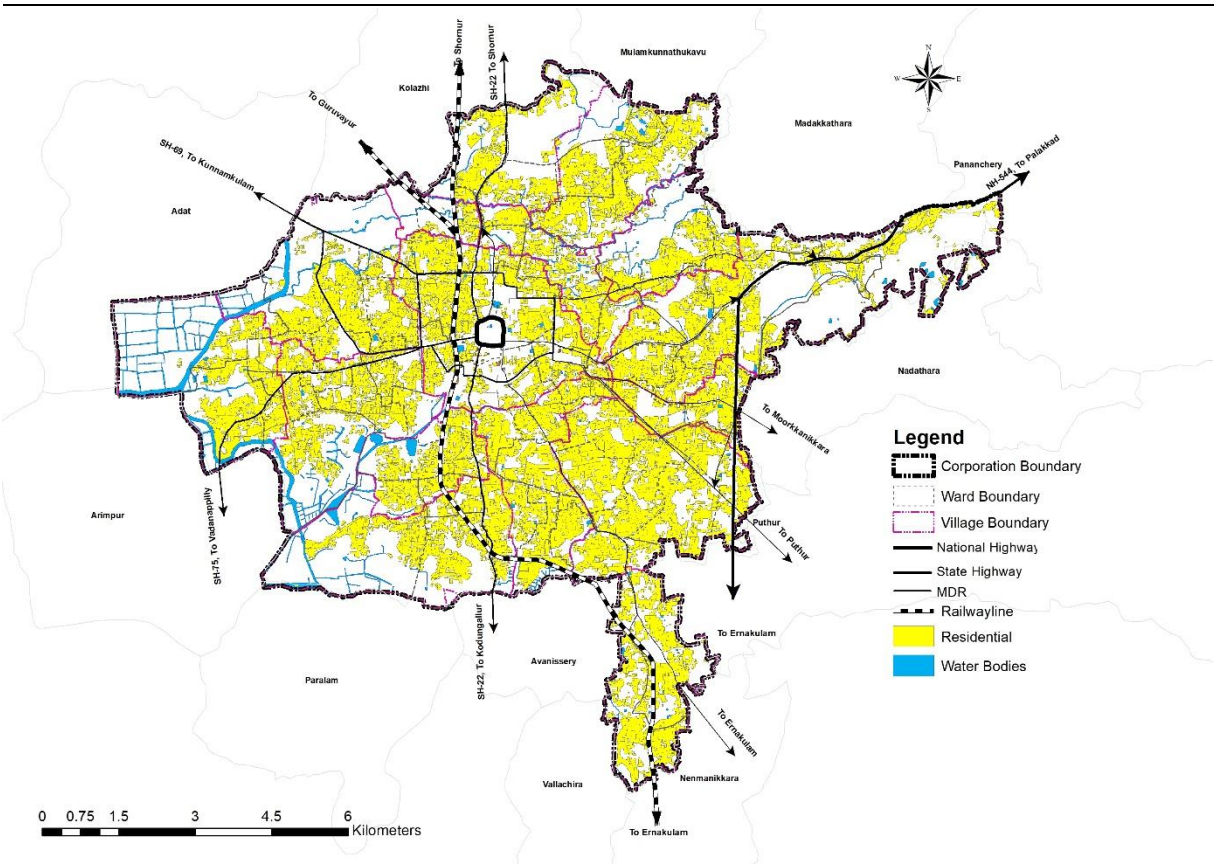


Fig 5.4 Distribution of Residential Land Use

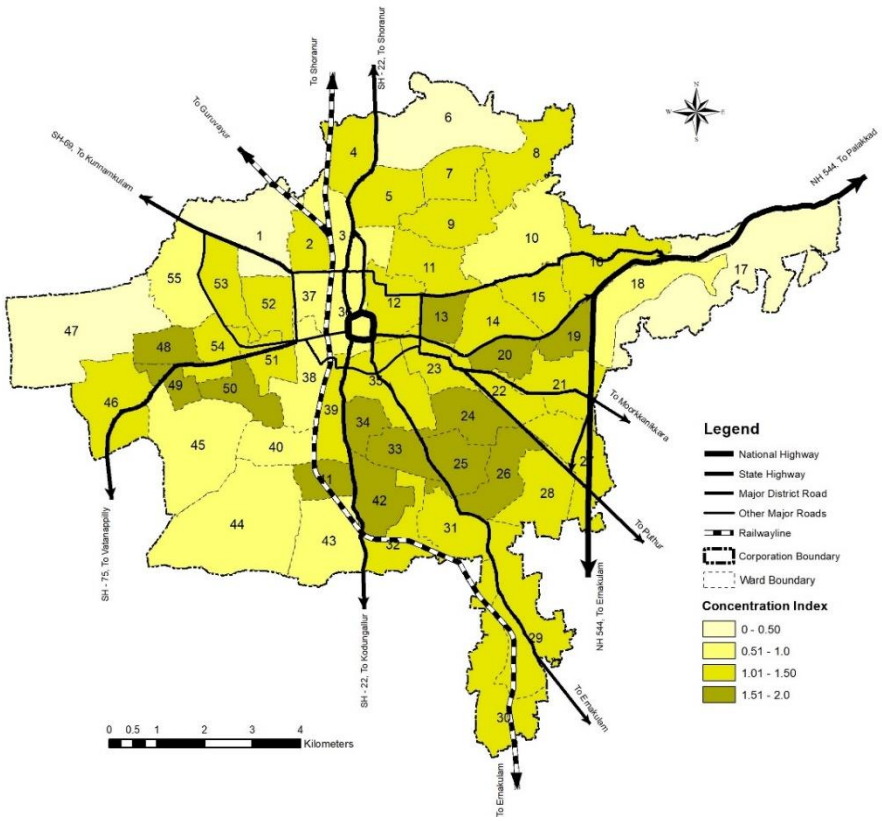


Fig 5.5 Concentration of Residential Land Use

5.2.2 COMMERCIAL USE

Commercial land use constitutes about 2.76% of the city area. More commercial centres are around Swaraj Round and along the major roads. Major commercial nodes are Swaraj Round, East Fort, West Fort, High Road, Sakthan market premises, Kokkalai, Chettiyangadi, North Bus Stand and Patturaikkal. Minor commercial centres are Olari, Ayyanthole, Mannuthy, Koorkanchery, Kuriachira and Ollur. Distribution and concentration of commercial land use in the city area are represented in fig. 5.6 and fig. 5.7 respectively.

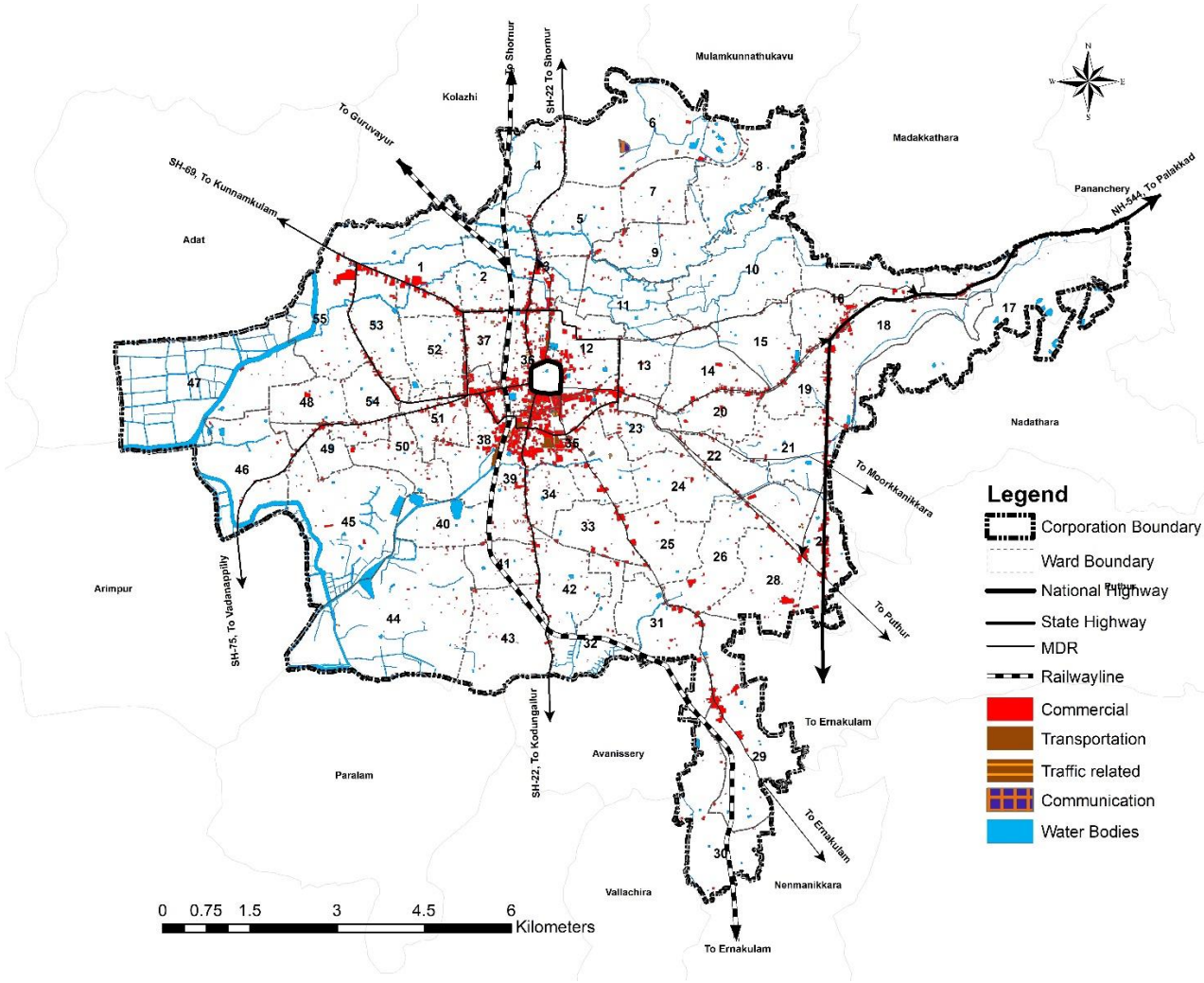


Fig 5.6 Distribution of Commercial Land Use

From the fig. 5.7, it can be seen that the commercial concentration is very high in central part of the city around the Swaraj Round. In the central area, the higher concentration can be seen in the south-eastern portion which once served as the commercial centre of Thrissur town and still continues its commercial character. Highest concentration is in ward 36 (Thekkinkadu) with C.I. value of 7.27 followed by ward 35 (Pallikkulam – 5.69) and ward 39 (Kokkala – 4.71). It is observed that commercial indexes along the major roads are in an increasing trend. The concentration of commercial centres around the core area shows that there will be more need for infrastructural facilities like parking spaces, pedestrian friendly spaces, spaces for loading & unloading, etc.

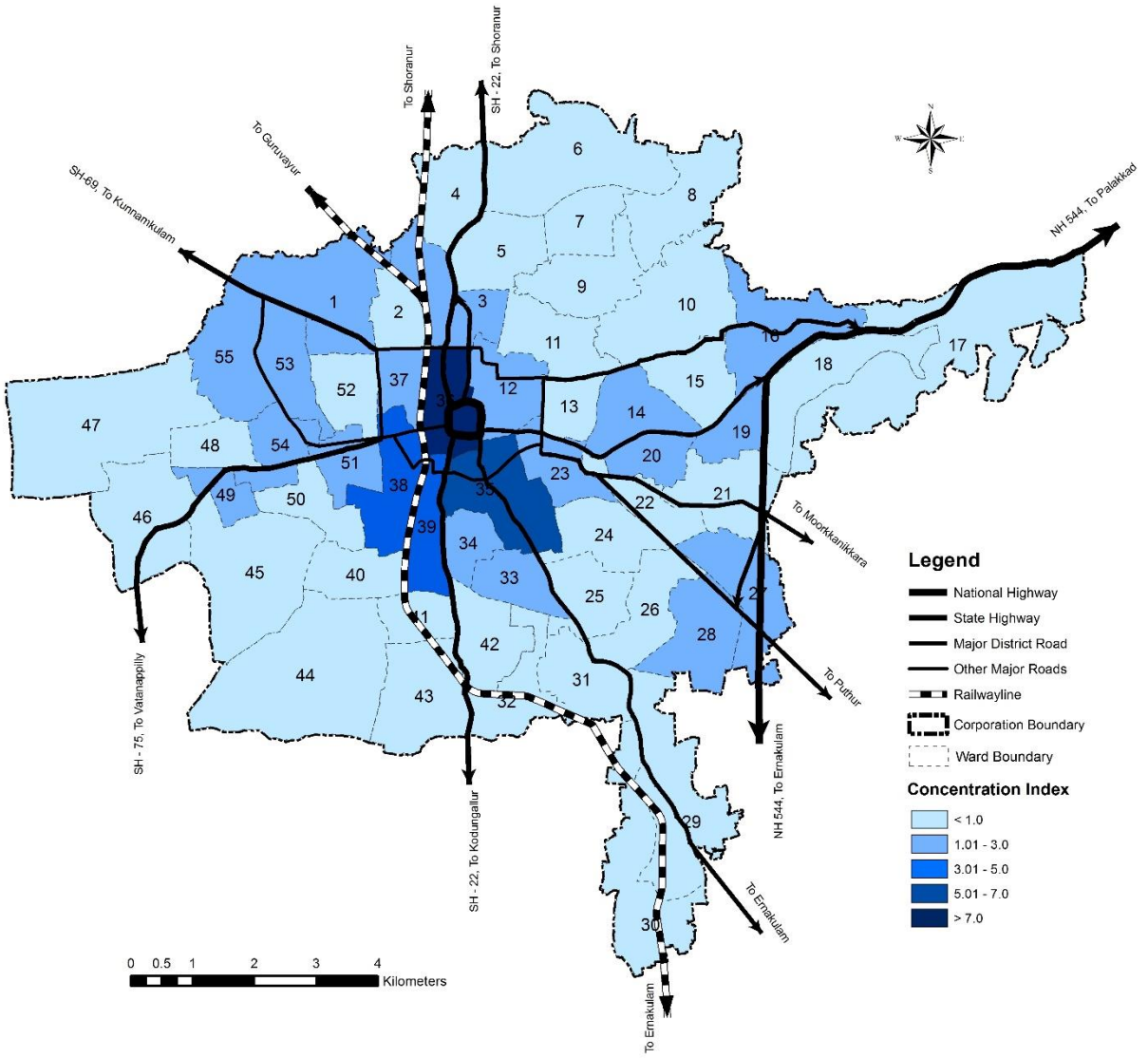


Fig 5.7 Concentration of Commercial Land Use

5.2.3 INDUSTRIAL USE

Its strategic central position in the state, availability of infrastructure for transport of goods through rail, road, nearness to the Cochin port, availability of man power, etc. are the factors congenial for the growth and development of industries in Thrissur city. However, industrial development has been handicapped in the city for the want of natural resources and the raw materials required for the major manufacturing industries. Ollur industrial estate, textile industries and brick kilns are the major industrial contributors in the city. Industrial land use only contributes 0.98% of the total area of the city and majority of the industries (especially brick kilns) here face development issues and are in the verge of shutdown. Also, there are no major manufacturing industrial establishments in the city. Distribution of industrial land use in the city is shown in fig. 5.8.

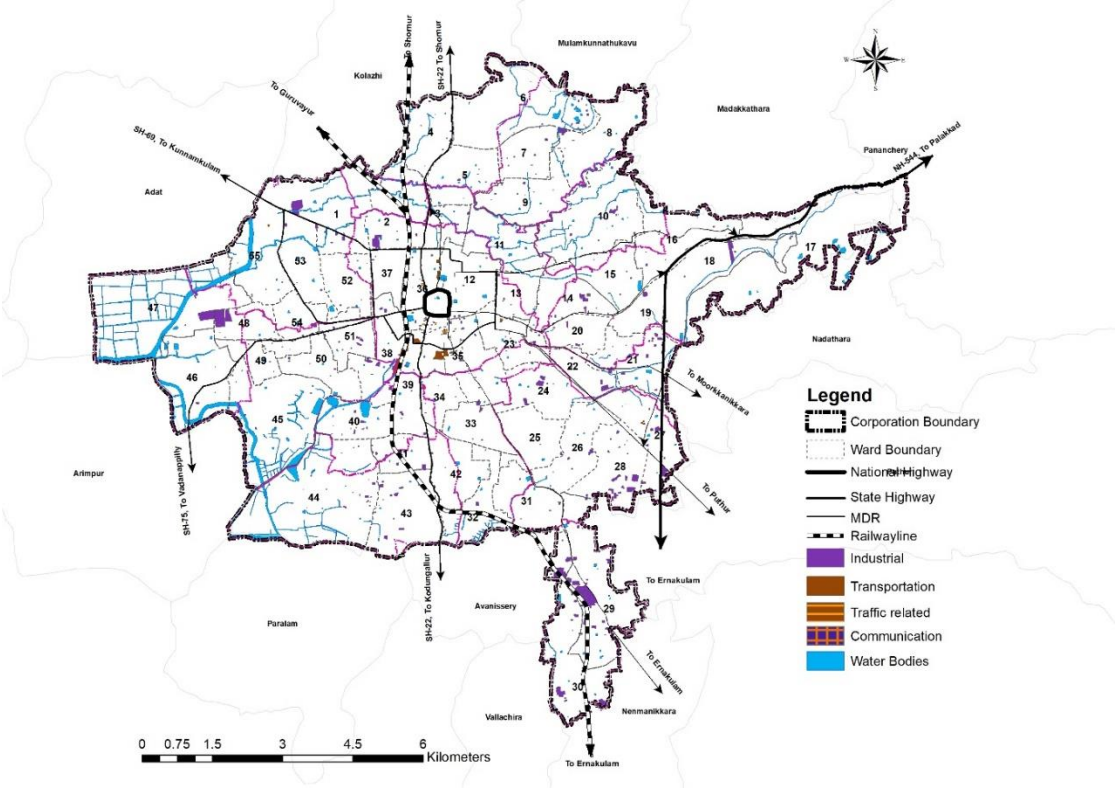


Fig 5.8 Distribution of Industrial Land Use

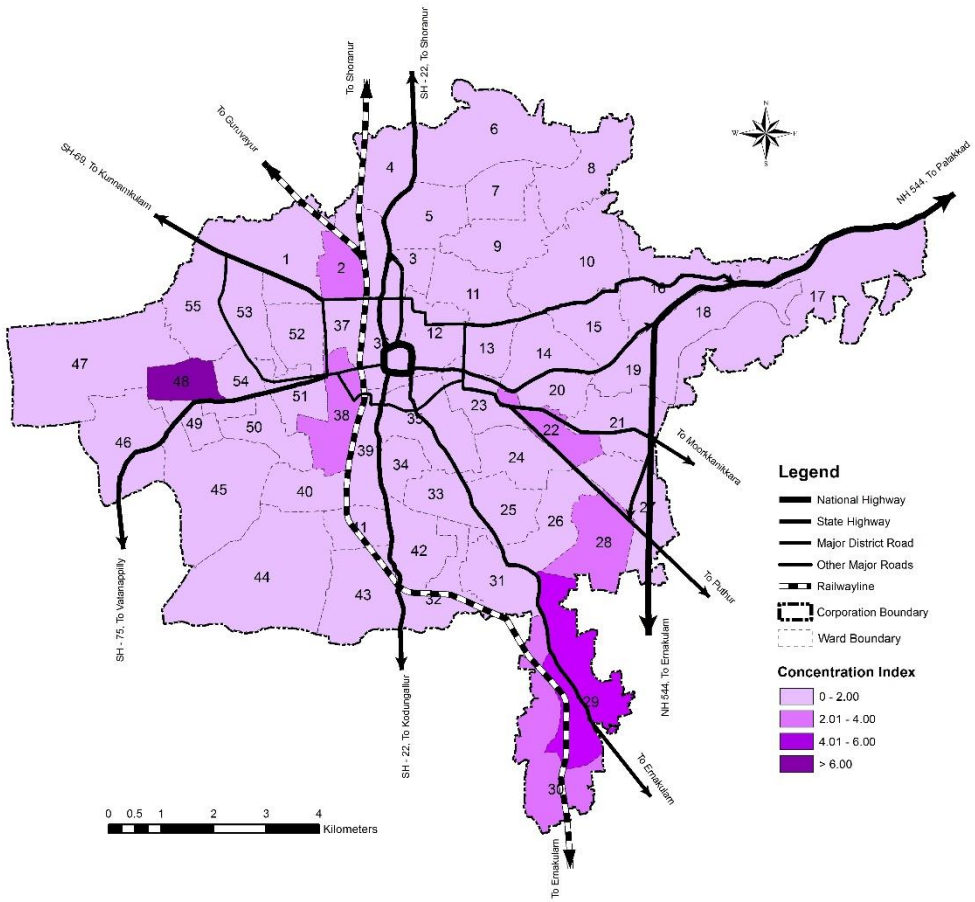


Fig 5.9 Concentration of Industrial Land Use

Concentration of industrial land use is shown in fig. 5.9. It can be seen that industrial concentration is highest in ward 48 (Olari) with C.I. value of 9.68 followed by ward 29 (Edakkunny - 5.41) and 30 (Thaikkattussery – 3.78). There is scope for industrial development along the NH 544, old NH & SH corridor due to the availability of large parcels there.

5.2.4 PUBLIC & SEMI-PUBLIC USE

Next to Residential and Agricultural land use, Public & Semi-public land use is predominant in Thrissur City. Being the cultural and educational centre of the state, there exists various Public & Semi-public institutions in the city. Public offices, cultural centres, educational institutions, health care institutions, religious institutions, Central Jail, etc. contributes to the Public & Semi-public land use in the city and is well distributed. It contributes about 9.32% of the total land use of the city. Distribution and Concentration of Public & Semi-public land use in Thrissur city is shown in fig. 5.10 and fig 5.11 respectively. Highest concentration of Public & Semi-public use can be seen in ward 6 (Ramavarmapuram) with a C.I. value of 6.69, which is contributed by the presence of Central prison, Police Academy, Radio Station, etc. Ward 18 (Mannuthy – 4.78) also shows higher concentration due to the presence of College of Vetenirary and Animal Sciences. Central area of Thrissur also dominates in public use due to the presence of temples, churches and other cultural centres.

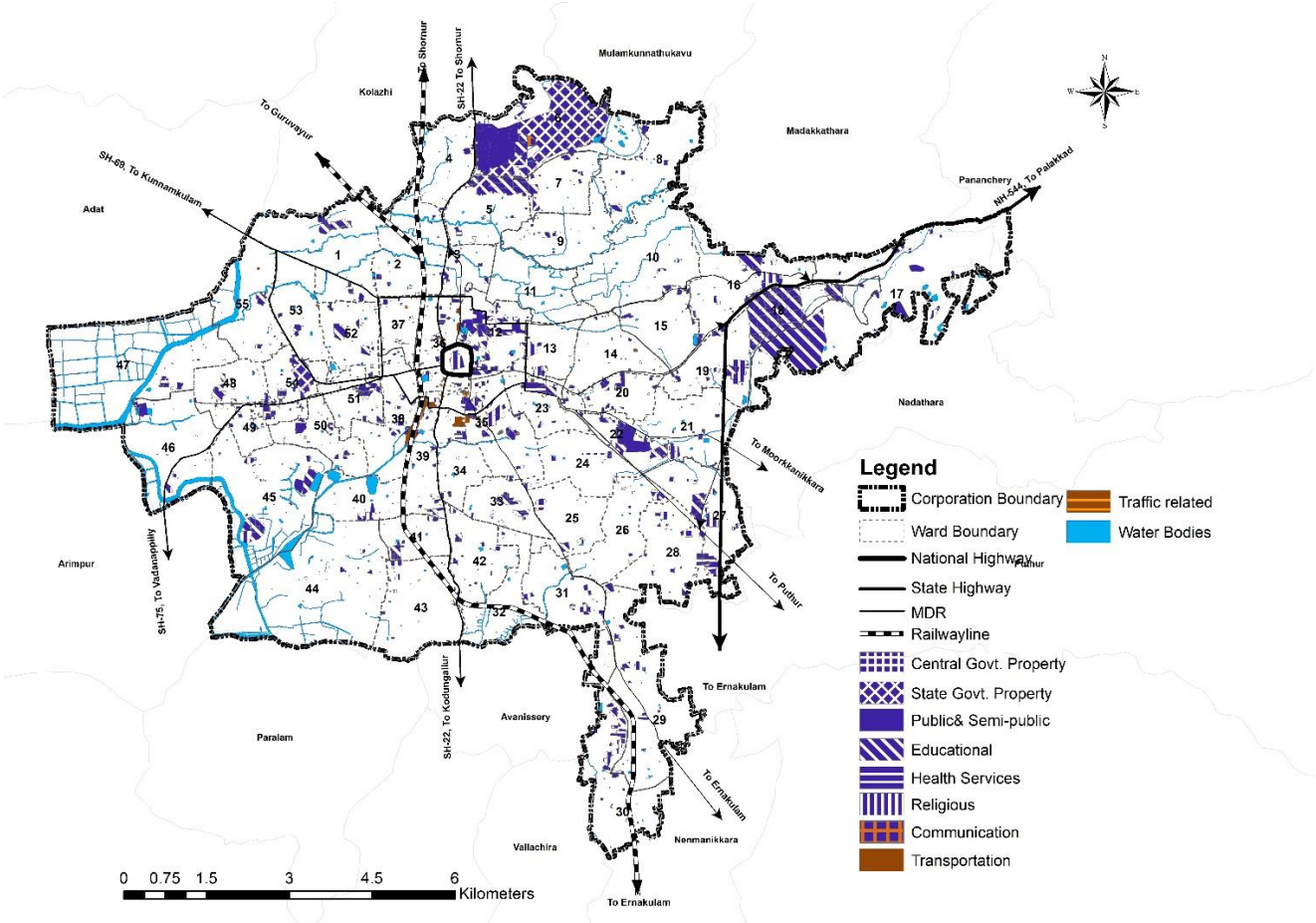


Fig 5.10 Distribution of Public & Semi-public Land Use

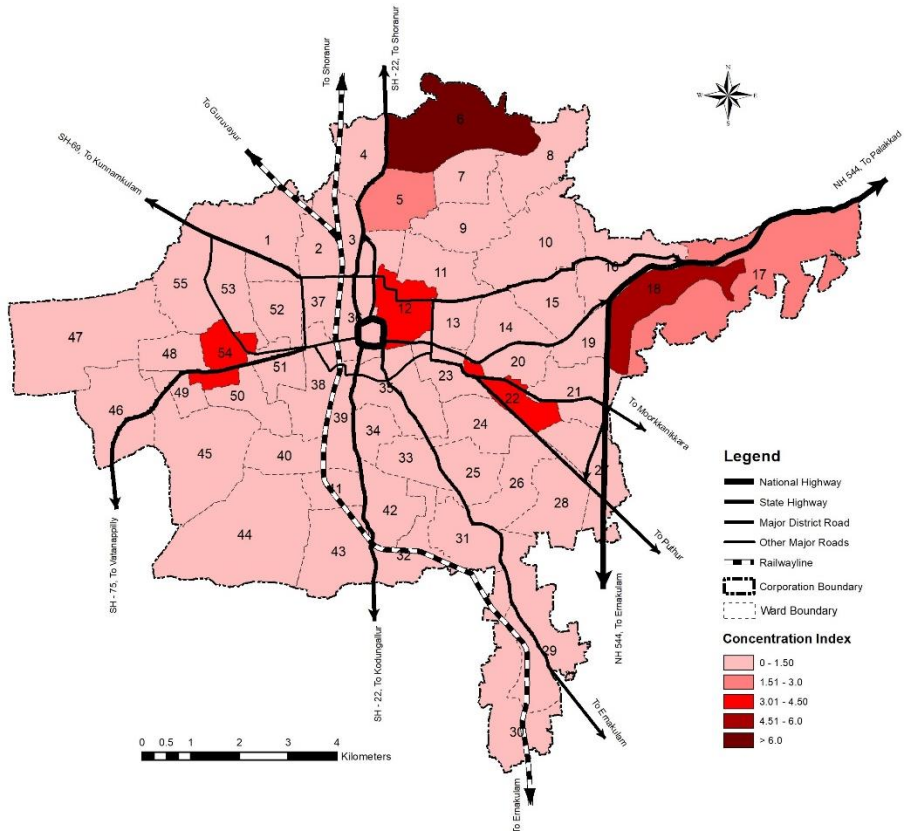


Fig 5.11 Concentration of Public & Semi-public Land Use

5.2.5 MIXED USE

Mixed land use contributes about 0.65% of the total area of Thrissur City. This indicates the changing pattern in land use which tends to move towards to a new trend by adopting mixed

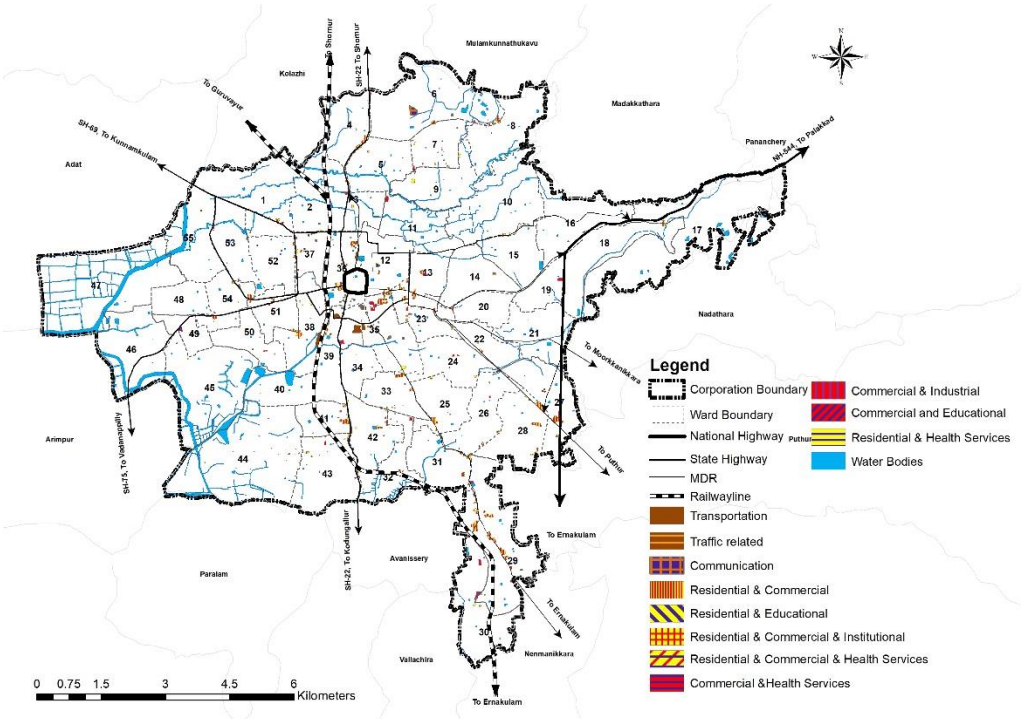


Fig 5.12 Distribution of Mixed Land Use

land use. Mixed use comprises of land uses such as residential, commercial, public and semi-public. Distribution of Mixed Land use in Thrissur city is shown in fig. 5.12 Presently, this land use is found predominantly in the central areas of the city. Demand driven needs, division of land parcels and high density building features mixed land use and it provides for the optimum uses of land with sufficient facilities and minimal trip generation.

5.2.6 AGRICULTURAL LAND USE

Agricultural land use is the second prominent land use in Thrissur Municipal Corporation area. It contributes about 31.89% of the total area of the city. During the formation of Thrissur Municipal Corporation, six Panchayats were added to the existing Thrissur Municipal area and some of these Panchayats were clearly agricultural dominant and this led to the abundance of areas with agricultural activity in Thrissur city when compared to other cities in the state.

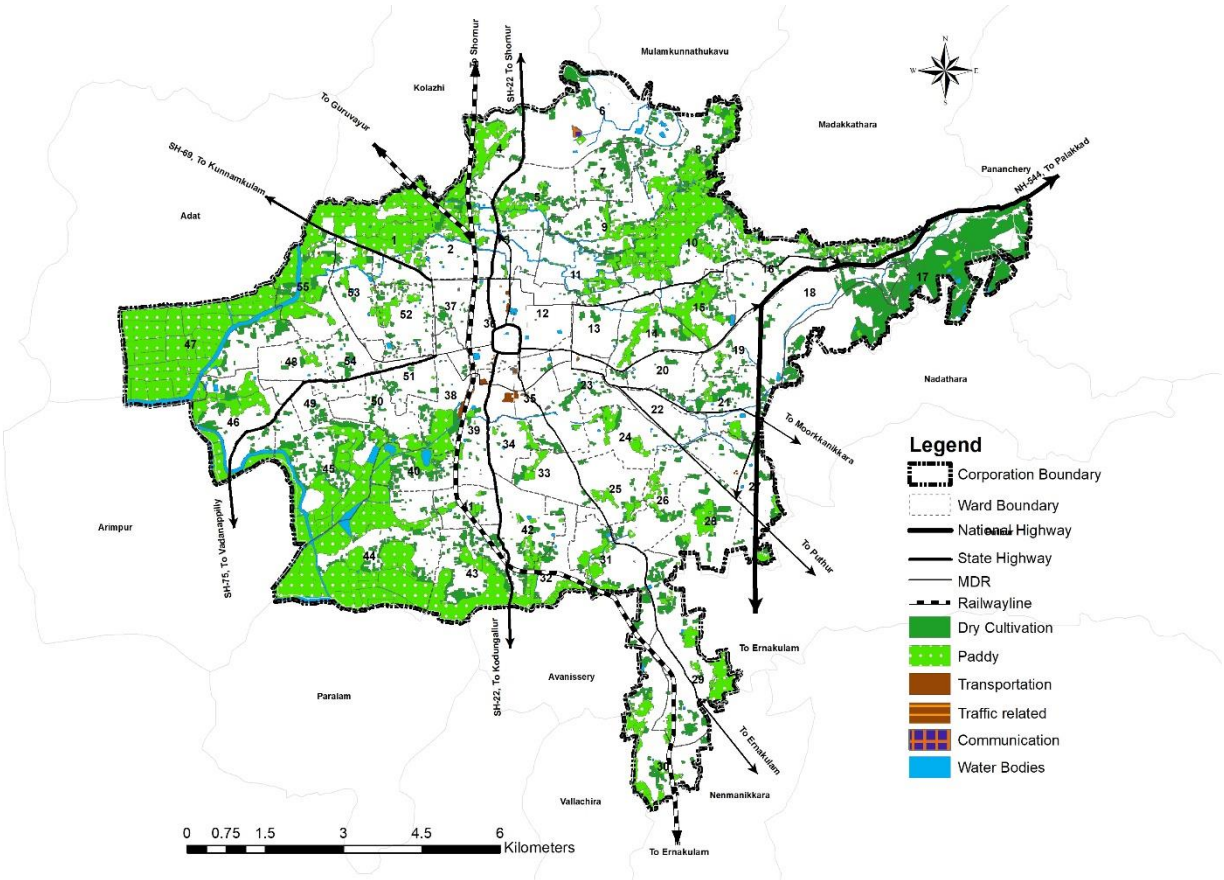


Fig 5.13 Distribution of Agricultural Land Use

Distribution of agricultural land use in Thrissur city is shown in fig. 5.13 Agriculture land use is mainly subdivided into wet agriculture and dry agriculture. Dry agriculture mainly constitutes the cultivation of coconut, arecanut, rubber plantations and other land crops and it constitutes about 11.95% of the city area. Apart from the distributed cultivation of coconut in the city area, Rubber plantation can be seen in the eastern part of the City in Ollukkara

Village. Wet agriculture constitutes paddy cultivation and 20.77% of the city area is covered by paddy fields. There exists single crop paddy lands, multi crop paddy and paddy lands without cultivation. The paddy fields without cultivation is under the threat of land conversion. Single crop paddy or Kole lands are water logged areas and therefore it may escape from land conversion. The presence of 'The Kerala Conservation of Paddy Land and Wetland Act, 2008' is preventing these areas from land conversion. But the paddy without cultivation and some portions of multi crop paddy is in the threshold of conversion threat. It is seen that the conversion of land is possible in eastern part whereas western part can be completely retained as paddy fields. Paddy fields located nearby major roads are also facing the threat of land use conversion. It can be clearly seen from the figure that the agricultural lands along major roads have reduced due to conversion.

Fig.5.14 shows the concentration of agricultural land use in Thrissur city. It can be clearly seen that the agriculture land use concentration is more in peripheral wards with the highest concentration in ward 47 (Pullazhi) with a C.I. of 2.23 followed by ward 44 (Nedupuzha

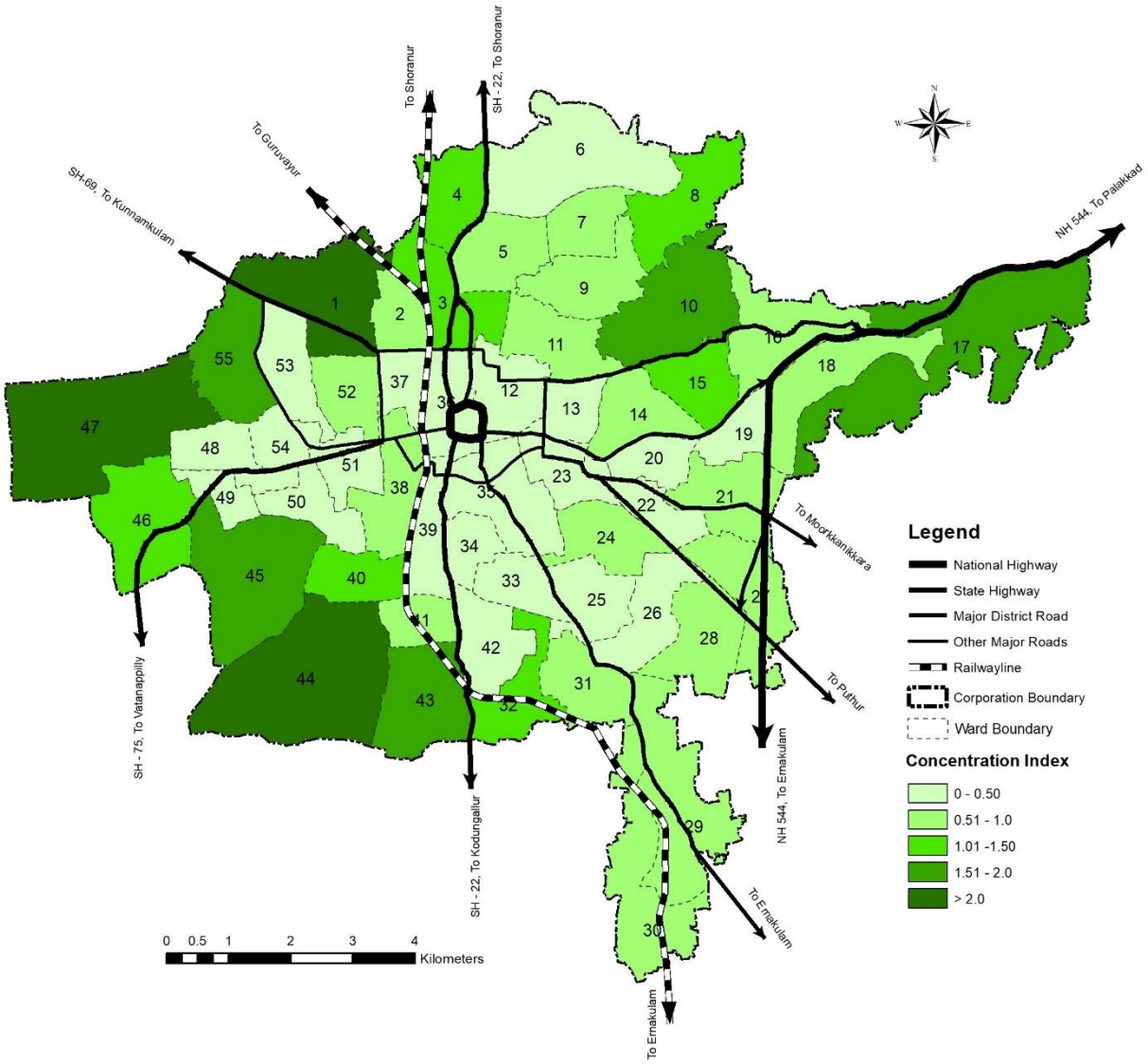


Fig 5.14 Concentration of Agricultural Land Use

– 2.07) and ward 1 (Poonkunnam – 2.03). Agricultural lands along major roads have reduced due to conversion.

5.2.7 TRANSPORTATION

In terms of transportation needs Thrissur city has got a good inter-city, inter-district and inter-state connectivity with the presence of National Highway, State Highways and Railway passing through the city. NH-544 (Salem-Kochi), SH-22 (Kodungalloor-Shornur), SH-69 (Thrissur-Kuttipuram), SH-75 (Thrissur-Vadanappilly) are the major highways passing through the city. Apart from these, the road network in the city constituted by Swaraj Round, Ring Roads, other sub arterial roads & collector streets. The city has rail connectivy to the North and the south of the state. The railway branches at Poonkunnam in the city to have a line to the temple town Guruvayur. The city also possess 3 bus terminus, one major railway station (Thrissur) and 2 minor stations (Poonkunnam & Ollur). Transportation land use constitute about 5.61% of the city which is far behind the standards (10-12%), as specified in URDPFI Guidelines.

5.2.8 PARKS & OPEN SPACES

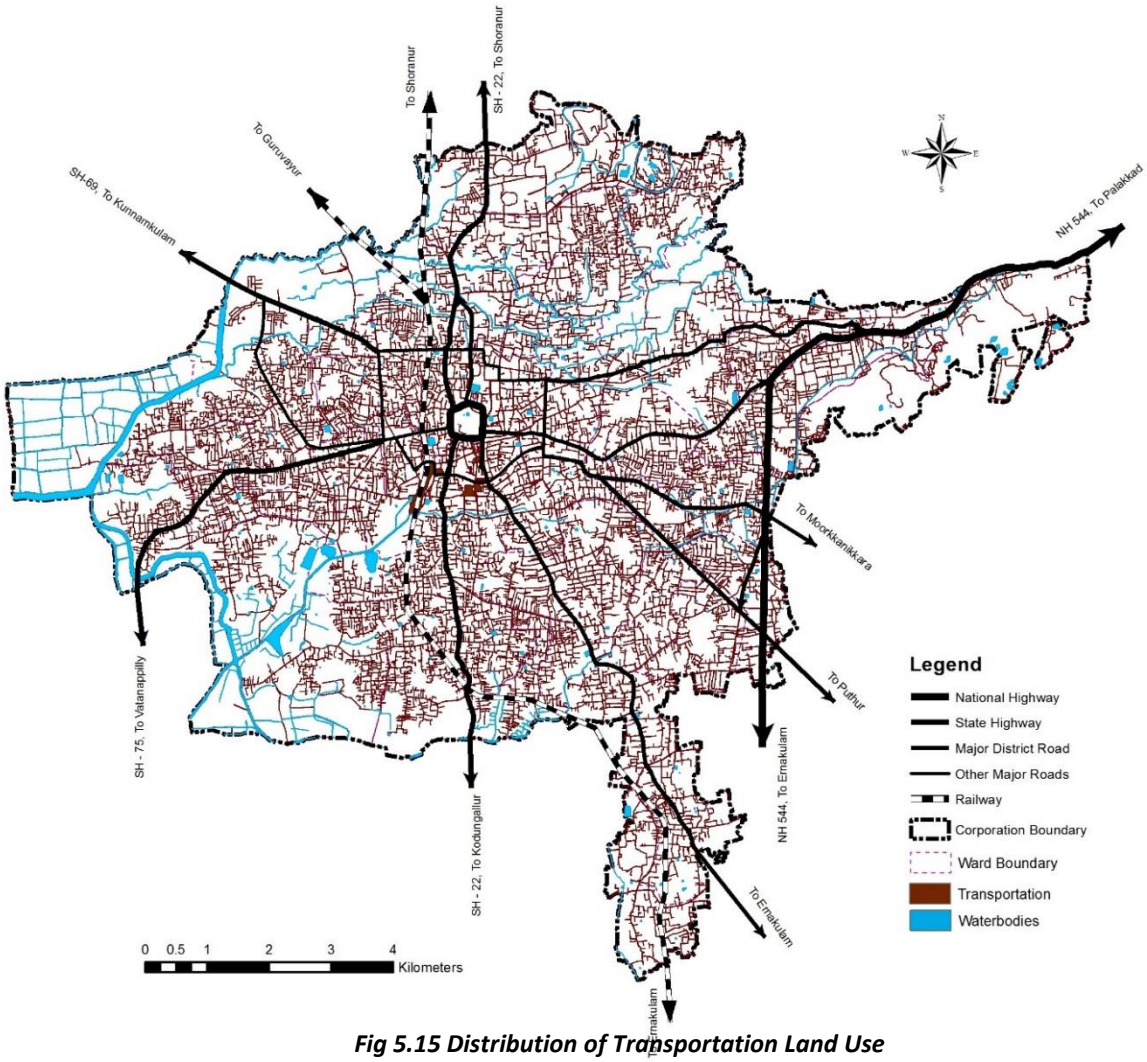


Fig 5.15 Distribution of Transportation Land Use

This land use consists of open spaces such as stadia, playgrounds, parks, open maidans, etc. Thekkinkadu maidan owned by Cochin Devaswom is one of the major open space located in the heart of the city. It serves as a breathing space as well as an activity corner for the city. Nehru Park also plays an important role in the city centre serving recreational purpose. Even though there are a lot of playgrounds in the city as part of educational institutions, the one's which owned by Municipal Corporation is minimal and is limited to only 0.44% of the total area of the city. Some of these playgrounds and stadia owned by educational institutions (mainly colleges) are open to public for their needs. Distribution of Parks & Opens Spaces in Thrissur city is shown in fig. 5.16.

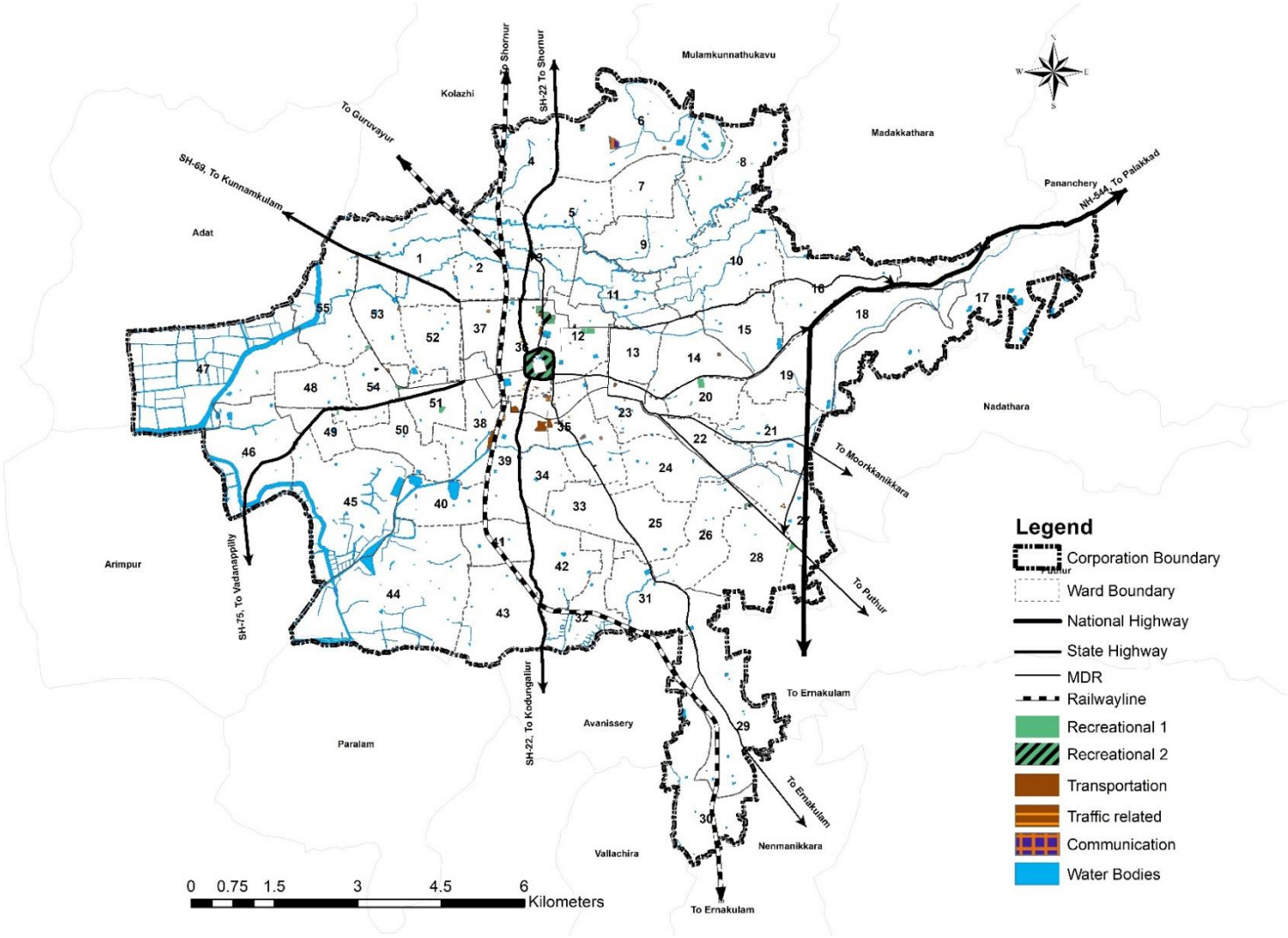


Fig 5.16 Distribution of Parks & Open spaces

5.2.9 VACANT LAND

In Thrissur City 5.14% of land area is coming under vacant land category i.e. there is no particular use of land in these areas and are kept vacant. The availability of vacant land is mainly due to the conversion of paddy lands. These paddy lands are kept vacant because of the regulations in the Sanctioned Development Plan or any of the Detailed Town Planning Schemes. Distribution of vacant lands in Thrissur city is shown in fig. 5.17 The vacant lands are found to be more concentrated in Peringavu and Poonkunnam areas. The abundance of

vacant land is due to the conversion of paddy fields to other uses because of zonal exemption available till 2007. Majority of the developed land is used for residential purpose due to the increasing demand for the residences. Since these are converted paddy lands, water logging is frequent in these areas. These vacant lands are all privately owned and is open for various private investments and development in future.

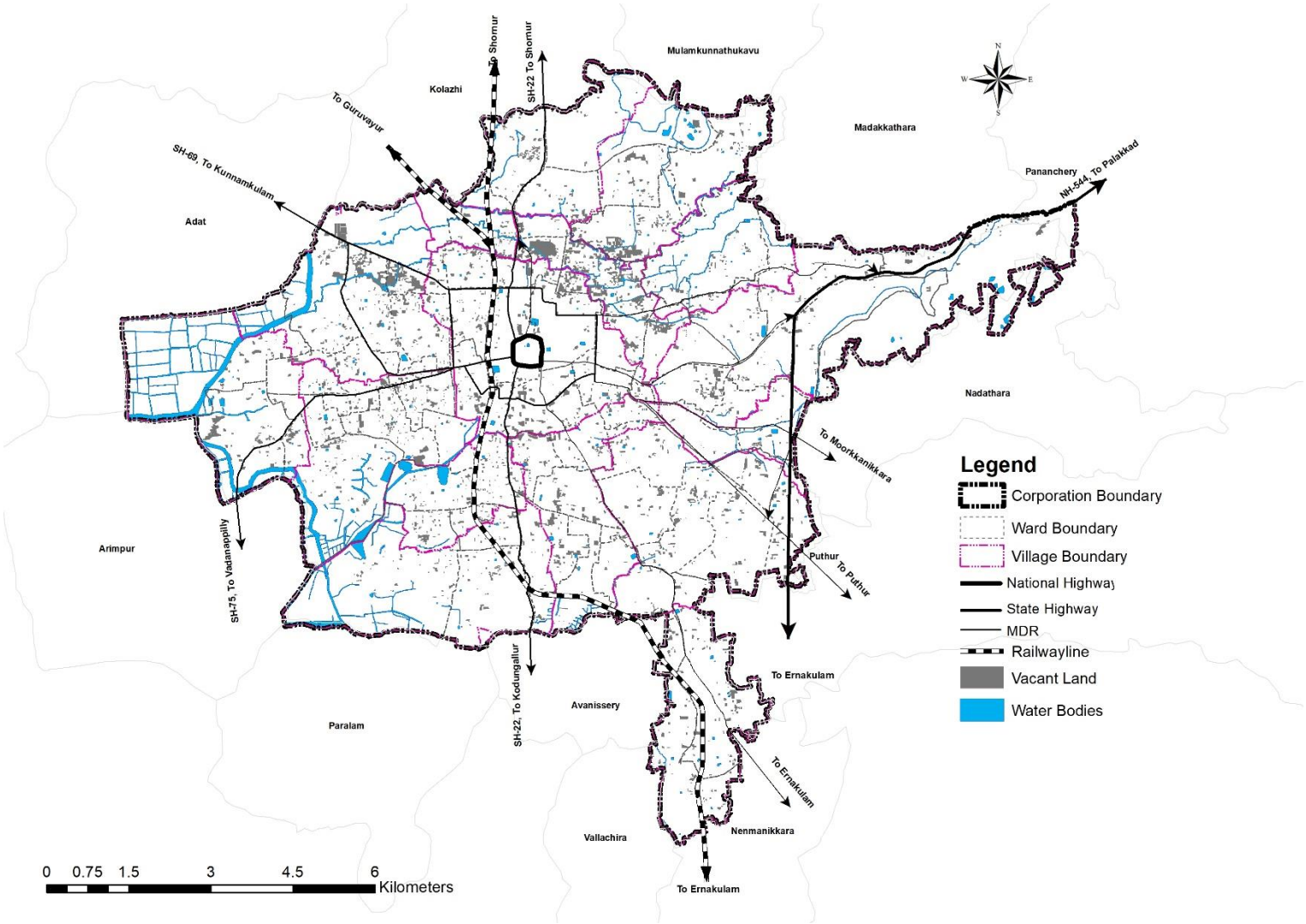


Fig 5.17 Distribution of Vacant Lands

5.2.10 WATERBODIES

Water bodies constitutes about 2.79% of Thrissur City which is more than the Commercial and Industrial land use. The presence of Kole paddy lands is one of the reasons behind it. Distribution of water bodies in Thrissur city is shown in fig. 5.18 No major river passes through the city and the water bodies here are mainly concentrated in agriculture zones. It can be seen that water bodies are found to be higher in Pullazhi and Chettupuzha wards where active agricultural land exists. Moreover, that water bodies are distributed throughout the city in the form of small streams as well as ponds. Even though drains are seen

all over the city, a proper drainage system is not functioning here. This leads to the formation of water logged areas during monsoon season, mainly due to the clogging of drains with solid waste. This can be remedied by regular cleaning and proper management of the drainage system.

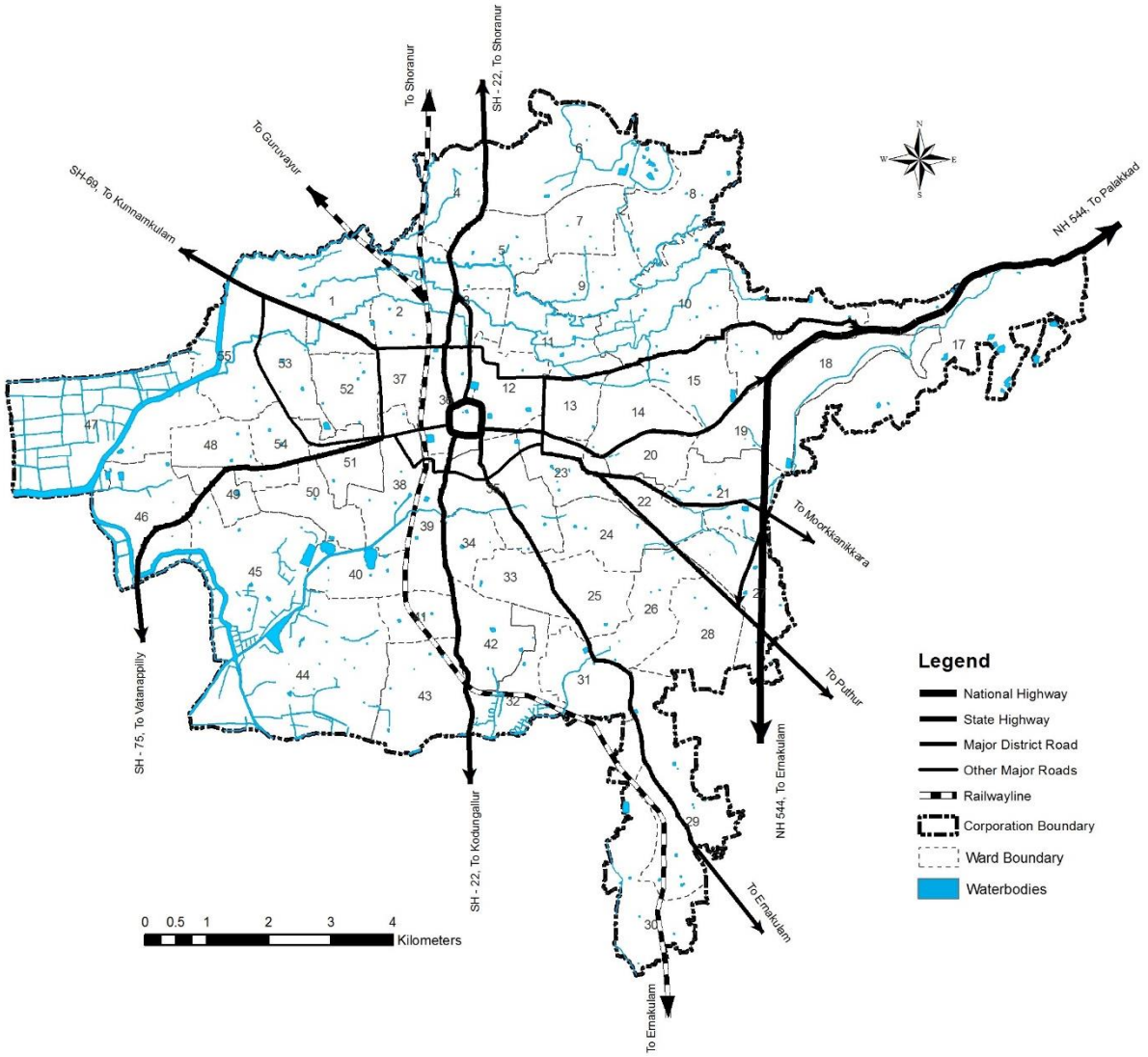


Fig 5.18 Distribution of Waterbodies

5.2.11 OTHERS

0.84% of land use is coming under other land use which includes rock and quarry areas.

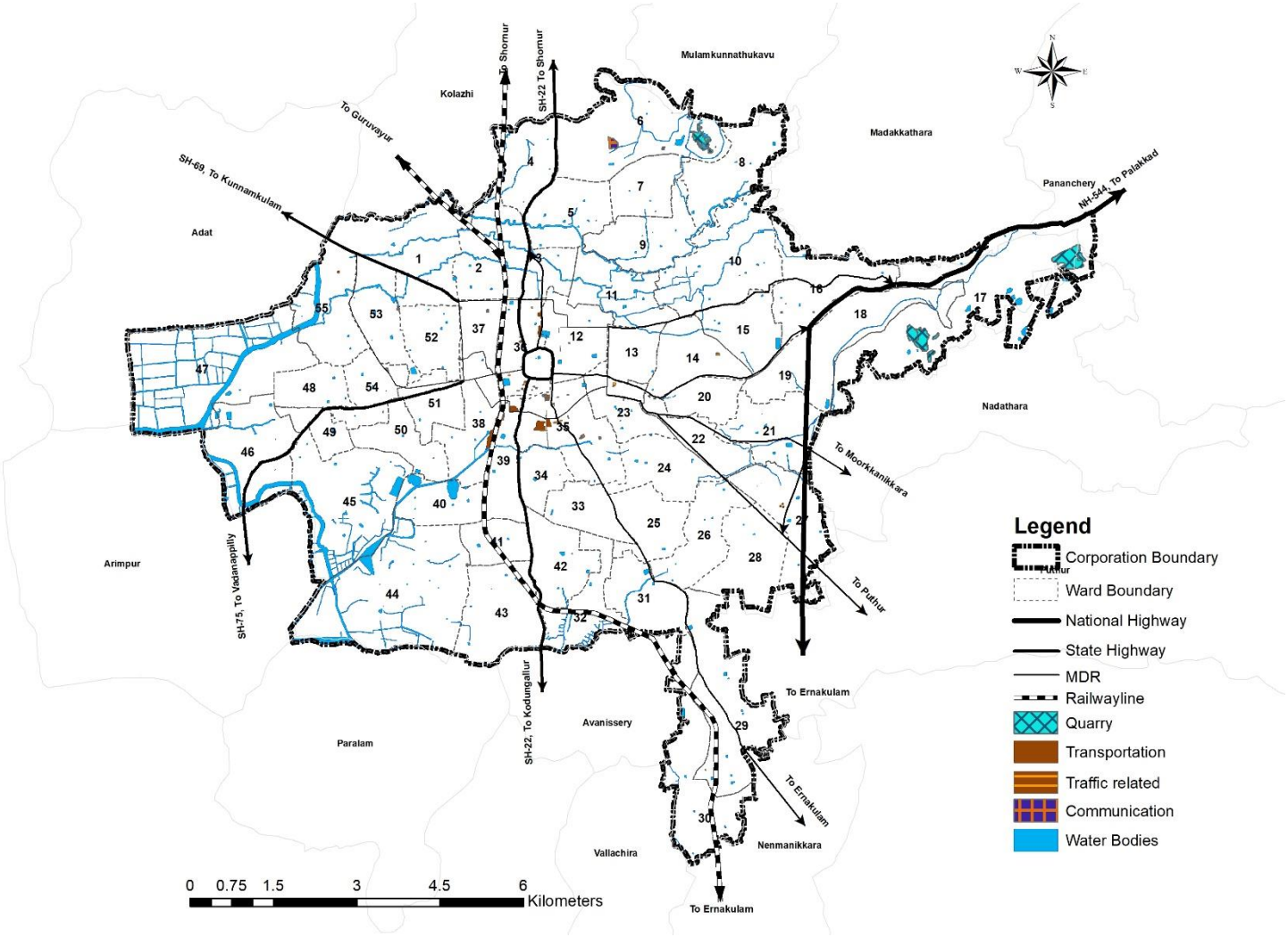


Fig 5.19 Distribution of Other land use (Rock, Quarry)

5.3 FUNCTIONAL CHARACTER

Functional Character of Kerala is seen as rural urban continuum throughout the State. The function of a local body is the major activity within the local body, may it be primary sector activities (rural activity), secondary sector / tertiary sector activities (urban activities) or the combination of both.

The functional character of Thrissur district as per IDDP Perspective Plan, 2012 is shown in the fig 5.20. There are settlements exhibiting a combination of the two characters which needs to be explored. Analysis based on land use and average plot size (methodology adopted for IDDP, Thrissur report) shows that there exists semi-urban and semi-rural character in settlements in addition to the urban and rural character. An area can be classified as semi-urban, if there exists (or it is likely to introduce) both urban and rural activities with predominance to urban activities. If the predominant activity is rural, in the area where both urban and rural activities co-exist; it is classified as a semi-rural area.

The spatial distribution of the settlements based on its character shows a clear demarcation in the pattern of the settlements in four categories. Thrissur Municipal Corporation and the municipalities except Chalakudy shows urban character. Some of the coastal local bodies also show urban character. Semi-urban character is exhibited by local bodies that have urban influence like Vallathole Nagar (located near to Shornur Municipality in Palakkad District), Elavally and Vallachira. Most of the local bodies in the midland and high land region of the District exhibit rural character. Semi-rural character is seen in those local bodies which are in a transition zone between local bodies of urban and rural character. This also shows that the neighbouring Panchayats of Thrissur Municipal Corporation are not having urban character.

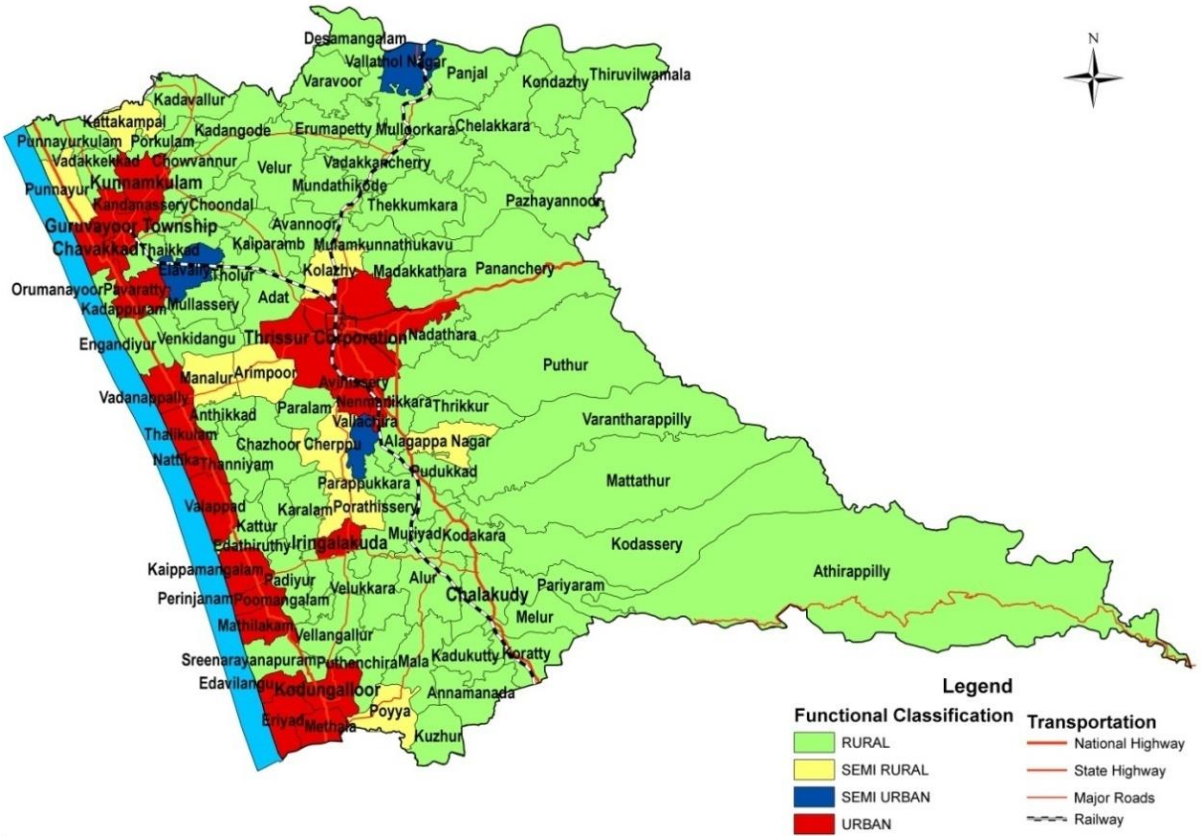


Fig 5.20 Functional Character of Thrissur District

According to the analysis of functional character of the district, Thrissur Municipal Corporation shows urban functional character. The functional character of different wards in Thrissur Municipal Corporation, as shown in fig 5.21, clearly shows the difference in character within the city. There exist wards which exhibit urban, semi-rural and rural character. There is no wards which shows semi-urban character. The city is mainly engaged in tertiary activities and a part of it is having primary nature also. The prominence in tertiary sector activities exhibits the urban nature and the wards where agriculture land use is having higher concentration shows rural character. Wards with agriculture and residential mixed land use with predominance in agricultural use constitute to semi-rural character. Out of the 55 wards in the city, a total of 43 wards show urban character, 8 wards shows semi-rural character and 4 wards completely shows rural character.

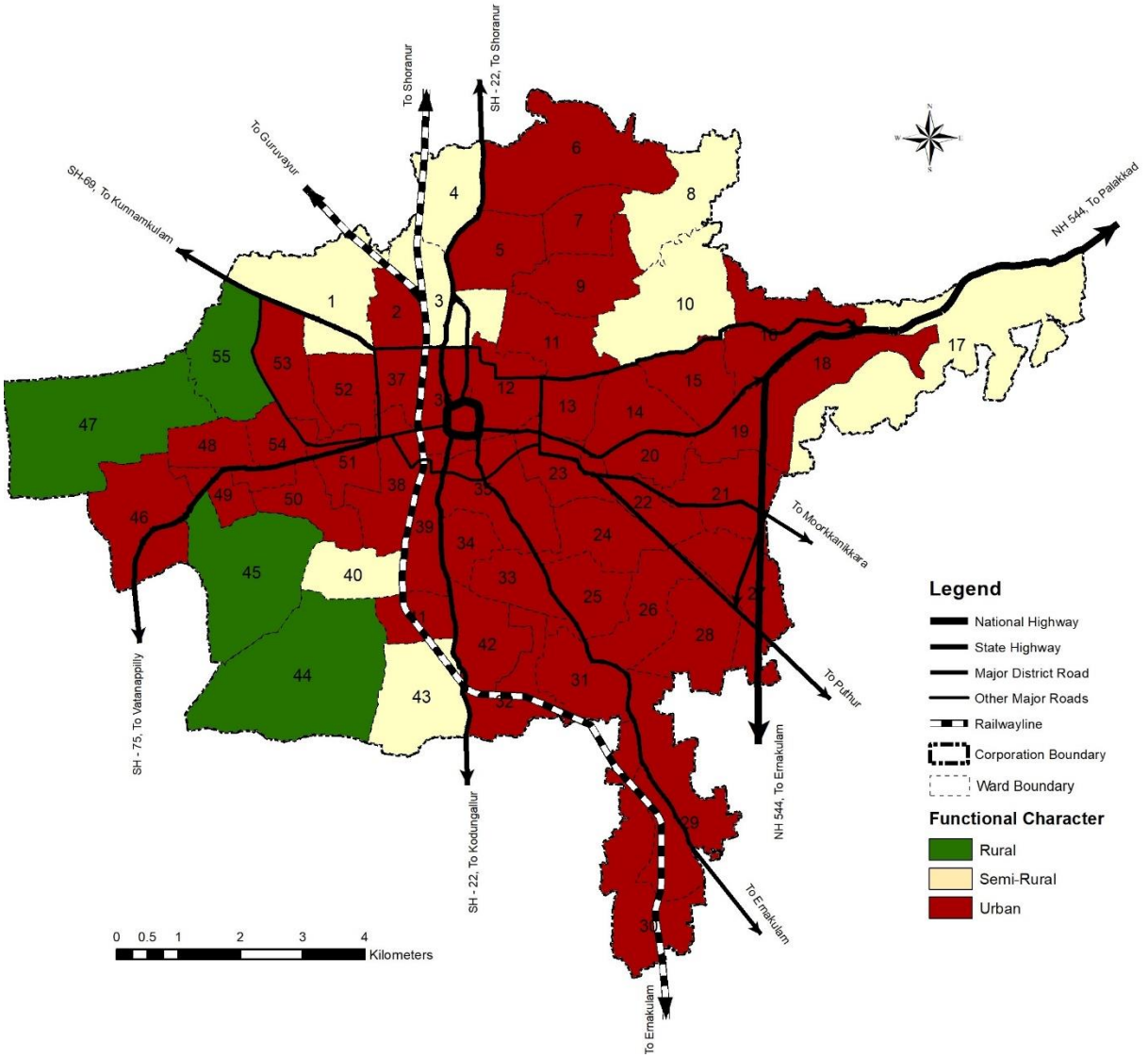


Fig 5.21 Functional Character of Thrissur city

The functional character of the city gives a clear idea about the growth of the city. It can be seen that the wards having urban nature are situated along major roads. All major roads in Thrissur City have commercial centres along them which have resulted in the urban character of the area. A conflict to this is the wards situated along Kunnamkulam road which are showing rural character as clear from the fig 5.21. This is due to the presence of environmentally sensitive kole lands at the neighbouring area of the road. Growth of commercial activities in this area is restricted to an extent for protecting these kole lands and to prevent their conversion.

5.4 INFERENCE

Land use analysis indicates that majority of the land use in Thrissur City is urban but it is equally blessed with agriculture land use also. The unique feature of equal importance to all categories of land use in central area of the city is also revealed from this analysis. It can be seen that agriculture dominant wards also shows high presence of water channels which facilitates irrigation activities. Overall analysis points out that although one-third area of the

city is constituted by agriculture activities, the rest of the areas clearly shows urban character moreover tending towards a mixed character with presence of residential, commercial, institutional activities, etc. in a harmony. The presence of agriculture land use is high Thrissur Municipal Corporation area when compared to other Municipal Corporations in the state and this shows its unique nature and potential. The agricultural areas can be retained by introducing new techniques for more yields in less area. More development can be achieved in the city by developing the private vacant lands available on a PPP basis and re-densification of the core areas through proper planning.

CHAPTER 6
TRADE & COMMERCE



Trade and commerce is concerned with facilitating the exchange of goods and services in the economy. Its major function is to satisfy human needs by considering the demands in the society. The economic base of Thrissur City is mainly based on trade and commerce. Real estate business, financial and banking services, other commercial establishments, etc. also contribute to the economy of the city to some extent. Apart from the central commercial core of the city, the transport corridors guided the development of commercial centres in various parts of the city. For improving the economic base of the city, trade and commercial activities have to be strengthened.

6.1 INTRODUCTION

Sakthan Thampuran, the torch bearer to shed away the darkness of superstition and illiteracy, invited 52 Christian families to Thrissur to lay foundation for the trade and commerce of this city. As a result, Thrissur rose up as the trend setter of business in the erstwhile state of Cochin. Before Thrissur prospered as the centre of business, rice used to be imported from Singapore and Burma. But the people of Kerala were not satisfied that rice as a foul smell resulting from the long duration of transportation. To remove the displeasure it was decided to import paddy from those countries instead of rice, and the paddy was boiled and made rice in Thrissur, together with locally produced. And thus the Rice Bazaar of Thrissur got into prominence. Engineering business had very fertile land in Thrissur, but owing to the shortage of raw material, high living standard, hike in wages etc. engineering business started to fade. Diamond works had an upper hand in the business field of Thrissur. But later when the business got flourished in other areas, Thrissur had to slowly withdraw from the field. Banking became the primary concern of the business community of Thrissur. Chitty Companies entered into the field of banking and a number of such scheduled banks got started here. Surprisingly there was time when this little city of Thrissur had the most number of banks in India.

According to Reserve Bank of India, the city in the 1930's boasted of head offices of 58 banks and was recognized by RBI as 'Banking Town'. Even now also it's the headquarters of

some major banks and non-banking financial institutions. Kuri Companies remained as the source and the sustenance for the people.

The High Road of Thrissur remains the centre of Jewellery business. The gold companies of Thrissur distribute Jewellery to various part of the country. Even in the international Jewellery Trade, Thrissur has a significant position.

The Vegetable market of Thrissur played as the regular market of vegetable products. The farmers could bring their products and they could get them sold out. The tile factory of Thrissur used to distribute various types of tiles in various parts of the country. Roofing tiles, flooring tiles and tiles for decoration from Thrissur travelled far and wide to different markets. But now the demand has been on the decrease due to the onslaught of ceramic tiles, granites and marble, and the tile units are now under the threat of closure.

6.2 EXISTING SCENARIO

On a detailed study of the land use map of Thrissur City, it can be analysedthat2.92% (2.96 sq. km.)of the area is beingused for commercial purposes. The distribution of commercial centres in the city is as given in figure 6.1. It can be seen that more commercial centres are around the Swaraj round and along the major roads.

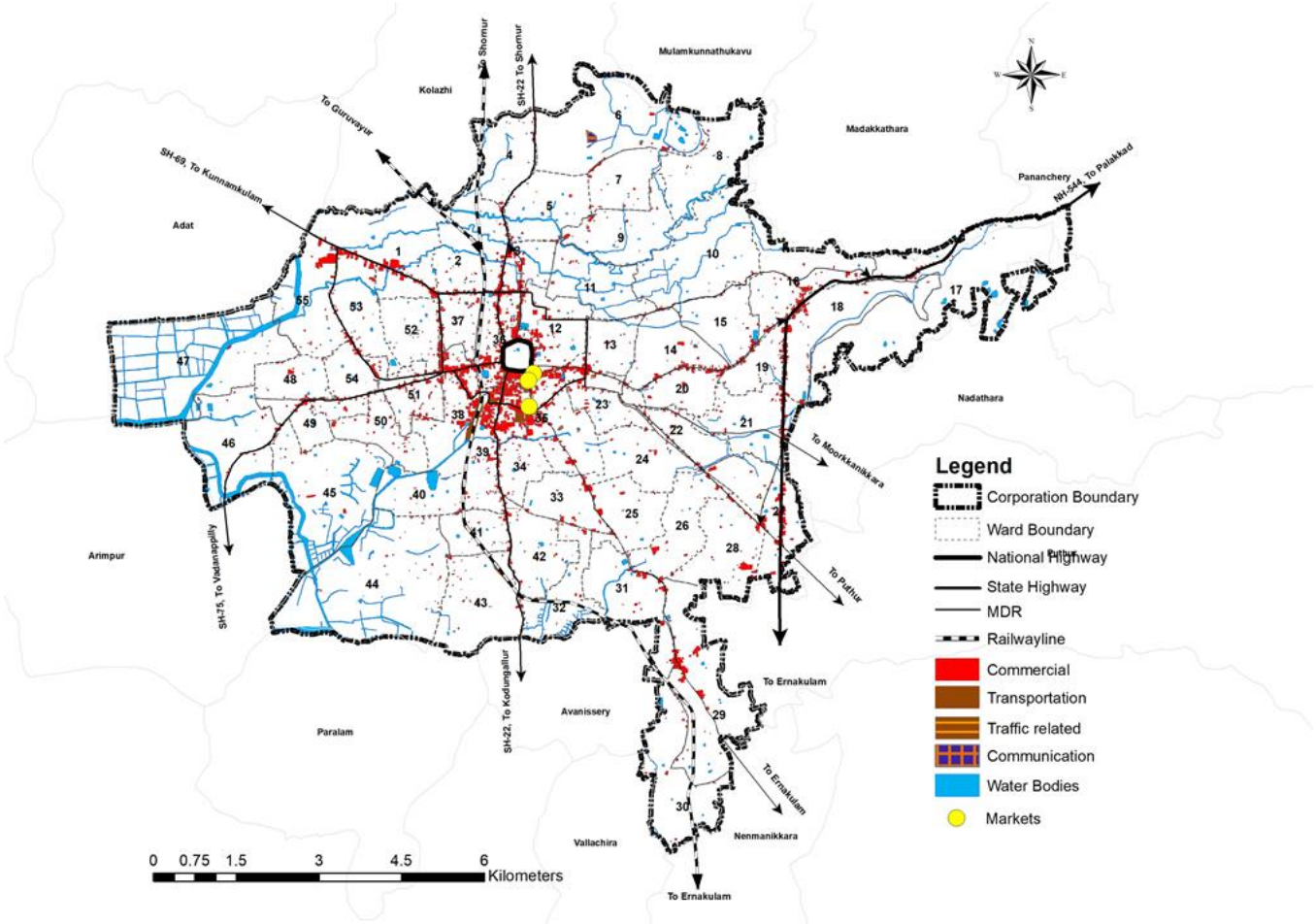


Fig 6.1 Distribution of Commercial centres in Thrissur city

6.3 TRADE AND COMMERCIAL CENTRES

Thrissur City is a major commercial hub in Kerala. The commercial activities are mostly concentrated on the Swaraj round, East Fort, West Fort, High road, Sakthan market premises, Kokkalai, Chettiyangadi, North bus stand and Patturaikkal. The other commercial centres are Olari, Ayyanthole, Mannuthy, Koorkanchery, Kuriachira and Ollur. Modern retailing is a big business and revenue earner for the city. Jewellery and textile retailing occupies a major part of the retailing business in Thrissur. The city is considered as hub of jewellery and textile business in South India. Thrissur is one of the major manufacturing centres of plain gold and rolled gold jewellery in South India; up to 70% of Kerala's jewellery is manufactured in Thrissur. There are around 3,000 gold ornaments manufacturing units in the city. The industry provides direct and indirect employment to thousands of people in Thrissur. Most of the jewellery and textile groups have outlets in Thrissur and provide jobs to thousands of people. The jewellery groups and the textile shops are mostly situated on or near to Swaraj round.

Major commercial nodes in Thrissur city, according to their respective hierarchy in the city, are shown in fig. 6.2 and detailed in table 6.1. It can be seen that the major nodes of commercial sector are located in and around of Swaraj round. This creates large traffic problems which have to be solved for maintaining the commercial activities at the same pace. It can be found that the inadequacy of space is also a problem for the development of existing

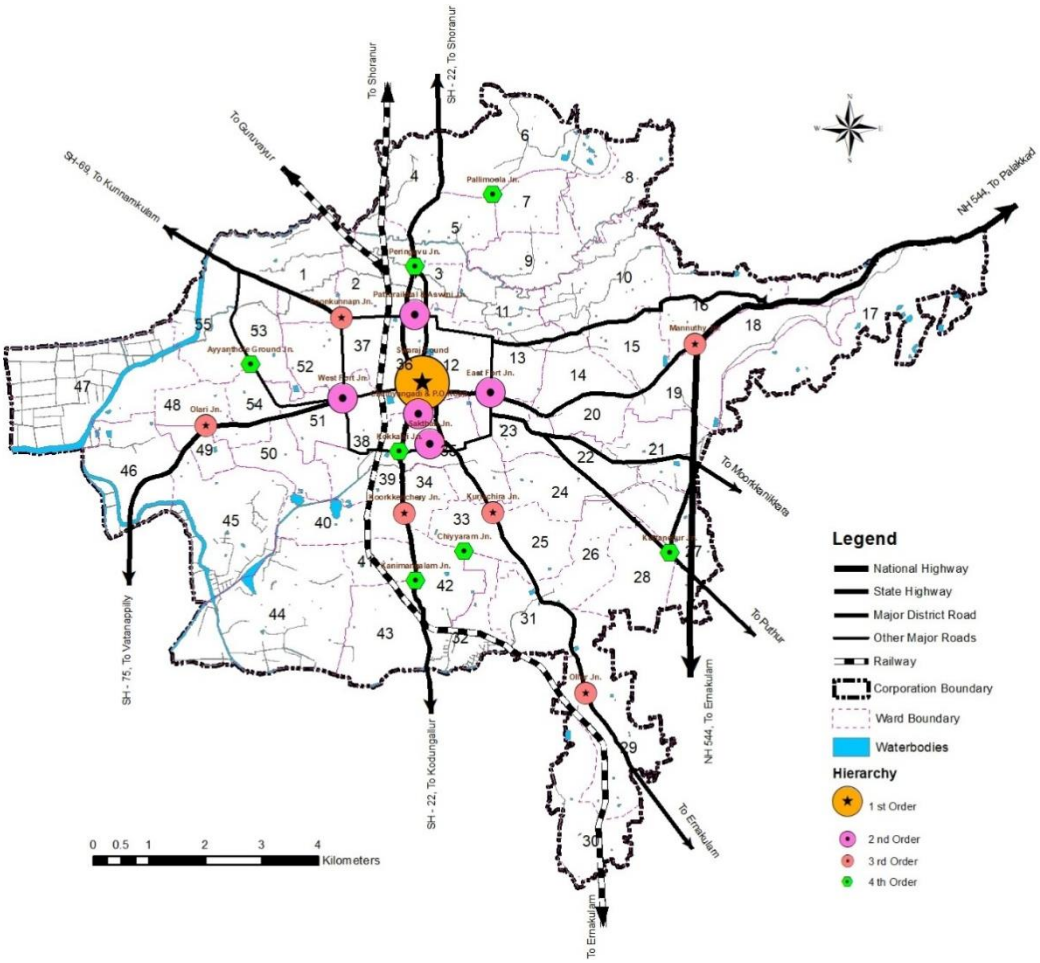


Fig. 6.2 Hierarchy of commercial nodes in Thrissur Municipal Corporation

commercial centres. Other major nodes are distributed in various parts of the city which facilitates the basic needs of the people in its immediate service area.

Table 6.1Hierarchy of commercial nodes in Thrissur Municipal Corporation

Commercial Node	Type of commercial establishment					Hierarchy of node	Hierarchy of Centre as per URDPFI
	Bank/ Finance	Hotel/ Restaurant	Retail/ Wholesale	Others	Total		
Patturaikal Jn. &Aswini Jn.	11	11	54	35	111	2nd Order	Community Centre
East Fort Jn.	11	17	269	36	333	2nd Order	Community Centre
West Fort Jn.	13	20	176	63	272	2nd Order	Community Centre
Kokkalai Jn.	1	0	11	20	32	4th Order	Convenience Shopping Centre
ChettiyangadiJn., Post Office Road Jn.	2	5	165	16	188	2nd Order	Community Centre
Mannuthy Jn.	4	2	50	27	83	3rd Order	Local Shopping Centre
Koorkanchery Jn.	3	3	118	10	134	3rd Order	Local Shopping Centre
Chiyyaram Jn.	2	2	13	4	21	4th Order	Convenience Shopping Centre
Ollur Jn.		3	37	3	43	3rd Order	Local Shopping Centre
Kuriachira Jn.	10	12	61	35	118	3rd Order	Local Shopping Centre
Sakthan	6	17	97	15	135	2nd Order	Community Centre
Kanimangalam Jn.	2	1	10	6	19	4th Order	Convenience Shopping Centre
Punkunam Jn.	6	8	16	16	46	3rd Order	Local Shopping Centre
Ayyanthole Ground Jn.	6	11	27	20	64	4th Order	Convenience Shopping Centre
Kuttanelllur Jn.	2	4	28	6	40	4th Order	Convenience Shopping Centre
Olari Jn.	7	3	51	17	78	3rd Order	Local Shopping Centre
Pallimoola Jn.	2	2	27	3	34	4th Order	Convenience Shopping Centre
Peringavu Jn.	2	1	19	18	40	4th Order	Convenience Shopping Centre
Round	82	107	1115	2338	3642	1st order	District centre
	172	229	2344	2688	5433		

Source: Primary Survey - 2019

In terms of market facility, the city consists of 3 prominent markets (Rice Market, Jai Hind Market, Sakthan Market) in the central area as well as small market facilities towards the peripheries catering to the needs of the people over there. Rice Market (Ariyangadi) near High Road, Jai Hind Market near M.O. Road and Sakthan Thampuran Market are the major markets in the city. Rice Market (Ariyangadi) near High Road, is a wholesale market for different kinds

of rice. The market traces its origin around 200 years ago. The Sakthan Thampuran Market located in Sakthan Nagar consists of fish market, meat market, fruit market and vegetable market. Jai Hind Market near M.O. Road can be considered as a one stop place for stationaries, fruits, vegetables, etc. Apart from these markets, more than 215 shops are working in the city in informal sector. About 140 shopping complexes/mallsas well as Hyper markets and super markets are functioning in the city including City Centre (Round West), Selex Mall (College Road), Centre Point (M G road), Kalyan Hyper Market (Near North Bus Stand), Big Bazaar (Aswini Junction), Elite Super Market, etc. These all shows how much Thrissur city is in front of Trade and commerce.



Fig 6.3 Sakthan market



Fig 6.4 Jai Hind Market



Fig 6.5 Rice Market (Ariyangadi)

The concentration of commercial centres in wards of Thrissur Municipal Corporation is given in fig 6.6 shown below. It can be seen that the concentration is very high in central part of the city around the Swaraj Round. Commercial concentration is found to be highest in the ward Thekkinkadu, succeeded by Pallikkulam and Poothole wards. The concentration of commercial centres in these wards shows that there will be more need for parking spaces so that road traffic is not affected due to large flow of vehicles to these areas. The commercial indexes are seen along the major roads, which shows the development of commercial sector along the major roads.

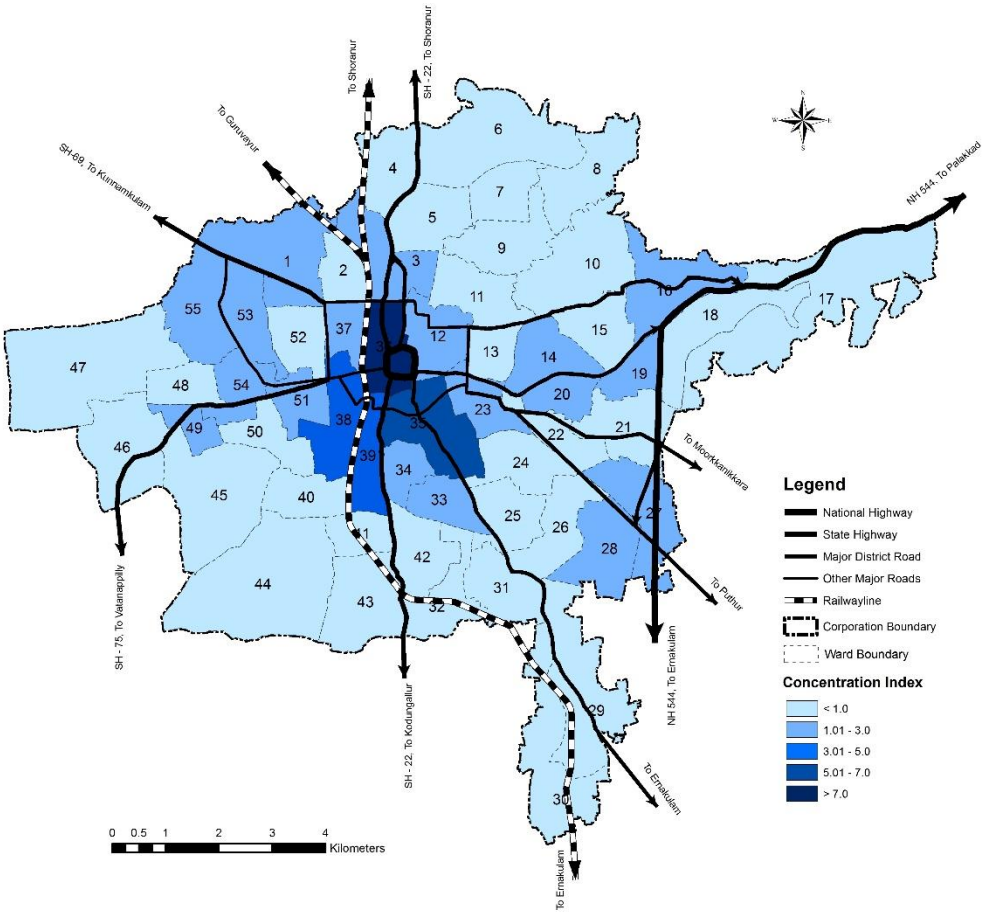


Fig 6.6 Commercial concentration in wards of Municipal Corporation

6.4 STREET VENDORS

At present street vendors are being seen as a public nuisance and encroachers by the authorities concerned and that the services they render to the general public are getting overlooked. Contrary to this, street vendors are making significant contributions to the growth of the urban centres and in the development of local economies. Street - vending helps bring down unemployment and poverty. Street vendors meet the common people's needs for a variety of goods and services through their micro retail activities; they should be treated as integral part of urban life with appropriate rights.

There is need to regulate street-vending to ensure that it does not result in problems such as loss of taxes to the local and State governments, unauthorized occupation of roads and walkways, marketing of poor quality products, manipulation of weights and measures, and littering of garbage. Committees must be constituted at the level of the local self-government institutions to protect the means of living of the street vendors and streamline their activities. This will help the street vendors to secure institutionalized financial support and legally enforceable protection.

In order to protect the rights of urban street vendors and to regulate street vending activities and for matters connected therewith or incidental thereto, The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 was enacted by

Parliament of India. As per the 38th section of this act, the state has enacted Kerala Street Vendors (Protection of Livelihood, Regulation of Street Vending) Scheme, 2016. The scheme aims to legitimise street vending with regulatory mechanism. Under this scheme, the urban local bodies should arrange facility to accommodate street vendors. It aims to protect the livelihood of the hawkers and ensure protection to their business. The authority should take action to ensure welfare of the vendors under the scheme.



Fig 6.7 Street vendors

Details of the informal sector activities in Thrissur city is given table 6.2.

Table 6.2Details of informal sector activities in Thrissur Municipal Corporation

Sl. No.	Area of concentration of informal sector activities	Type of activity	No. of street vendors	Work force
1	Bata Junction	Clothes	5	7
		Select Item	1	1
2	Bini Road	Food Items	4	4
3	Chembukkavu	Food Items	1	1
4	Chiyyaram, Galilee	Food Items	2	2
5	Corporation Road	Food Items	1	1
6	East Police station Road	Food Items	1	1
7	Fathima Road	Food Items	4	4
		Others	2	6
8	Foot Path, Old Pattalam Road	Clothes	5	5
		Others	5	5
9	High Road	Food Items	1	1
		Others	1	1
10	Ikkandawarrior Road	Food Items	5	9
11	Jai-Hind Market	Food Items	34	37
		Clothes	2	2
12	Jubilee Mission Road	Food Items	4	8
13	Kairali Theatre	Clothes	1	1
14	Kalathode	Food Items	2	3
15	Kanjani Road	Food Items	1	1
16	Kannankulangara Road	Food Items	1	1
17	KarunakaranNambiar Road,	Food Items	4	4
		Others	1	1
18	Kizhakkumpattukara	Food Items	2	4
19	Kottapuram	Food Items	2	1

		Others	1	1
		Select Item	1	1
20	KSRTC road	Others	2	2
		Food Items	1	1
		Clothes	1	1
21	Kuriachira Canal	Food Items	1	1
22	M O Road	Clothes	51	59
		Food Items	12	12
		Others	25	25
		Electronics/Mechanical goods	5	5
		Select Item	1	1
23	Mannuthy Centre	Food Items	24	38
		Others	5	5
24	Museum Road	Food Items	2	3
25	Near Bata	Electronics/Mechanical goods	1	1
26	Near Dhanalakshmi Bank	Food Items	1	1
27	Near District Hospital	Others	1	1
28	Near Jubilee Mission	Food Items	1	1
29	Near Kalyan	Food Items	1	1
30	North Bus Stand	Others	2	3
		Toys	1	1
		Food Items	1	3
31	Old Pattalam Road	Others	15	15
		Clothes	12	12
		Food Items	7	7
		Electronics/Mechanical goods	2	2
32	Ollur	Food Items	2	2
33	Opp. Bismi	Food Items	1	1
34	Opp. Galilee Retreat Centre	Others	1	
35	Palace Road	Food Items	7	7
		Others	2	2
		Select Item	1	1
36	Pallikkulam	Clothes	12	12
		Electronics/Mechanical goods	3	3
		Others	36	36
		Food Items	108	123
		Select Item	1	1
37	Paramekavu Palace Road	Others	2	2
38	Paravattani	Food Items	3	6
39	Pattalam Road	Clothes	30	42
		Others	50	50
		Electronics/Mechanical goods	6	6
		Food Items	26	36
		Toys	1	1
40	Patturaikkal	Clothes	1	2
41	Pookunnam	Food Items	94	118
42	ThekkinkaduMaidan	Food Items	1	1
43	Poothole Road	Food Items	3	4

44	PuthenNadakkavu	Food Items	1	1
		Others	1	1
45	Round South	Others	4	4
		Food Items	1	1
46	Sakthan Market	Toys	1	1
		Clothes	11	11
		Others	18	18
		Food Items	98	118
47	South Nada	Others	1	1
48	T B Road	Food Items	3	3
		Others	4	4
49	Thekkinkadu	Others	17	17
		Clothes	16	16
		Toys	1	1
		Electronics/Mechanical goods	1	1
		Select Item	3	3
50	Thrissur Palakkad Highway	Others	1	1
		Food Items	1	1
51	North Bus Stand	Others	7	7
		Food Items	4	6
		Select Item	2	1
		Clothes	1	1
		Food Items	1	1

Source: Primary Survey, 2019

6.5 DEVELOPMENT ISSUES

Analysis of various trade and commerce activities within the Municipal Corporation area shows light into the various problems as well as potential of the city in commercial sector. The city comprises of various levels of commercial nodes which acts as a hub of activities with which the people can rely on. Associated with these nodes various issues also arise such as parking, encroachment and other infrastructural issues, street vendors as well as other informal sector activities, etc. Lack of sufficient parking spaces especially for loading and unloading of goods from trucks is one of the main problems faced by this sector. The parking area allotted for trucks is present only at Sakthan market premises. The North Bus Stand and the Municipal Bus Stand is located in the centre of the commercial node of Thrissur, which creates more congestion and conflicts in this area. As the major nodes of commercial sector are located in and around of Swaraj round, it creates large traffic problems which have to be solved for maintaining the commercial activities at the same pace. It can be found that the inadequacy of space is also a problem for the development of existing commercial centres.

Many shopping complexes are functioning in the buildings owned by Municipal Corporation. Many of the commercial buildings are to be demolished/reconstructed/ renovated as they have exceeded its lifespan, thus lacking the structural stability. This could be done through public private partnership.

The markets functioning inside the city do not have any proper facilities for the disposal of the waste generated there. Proper treatment of wastes from market area has to be ensured with the introduction of treatment plants. There are two Organic waste converters (OWC), one in Sakthan Nagarand one at Pallikulam road. Presently, Solid waste generated in the markets are sent to these OWC Plants. Wastes from market area, fish market and from meat market have to be treated separately. For this purpose, new treatment plants have to be introduced.

6.6 COMMERCIAL SURVEY

Commercial survey was conducted among the shop owners at the major commercial centres. A questionnaire was filled up on the basis of queries made among the shop owners. The findings from the commercial survey are as follows:

- The various commercial shops in the nodes are found to be Retail shops, wholesale shops, banks, hotels or others. About 56% of these shops are retail type. Figure 6.8shows the various types of business activities within the study area.
- 97% of the customers in wholesale trade and 100% of the consumers in retail trade are from the locality
- Around 47% % of the shops owners are transporting goods in van, 21% in two wheelers and 18% in autorikshaw
- About 77% of the shops are in rented buildings
- 87% of the buildings are made of RCC
- Rent for the last 5 years shows an increasing trend in case of 96% of shops
- Storage facility is said to be sufficient for 98% of shops.
- Figure 6.9 shows the dependence on various water sources. About 40% of the commercial shops uses KWA supply.

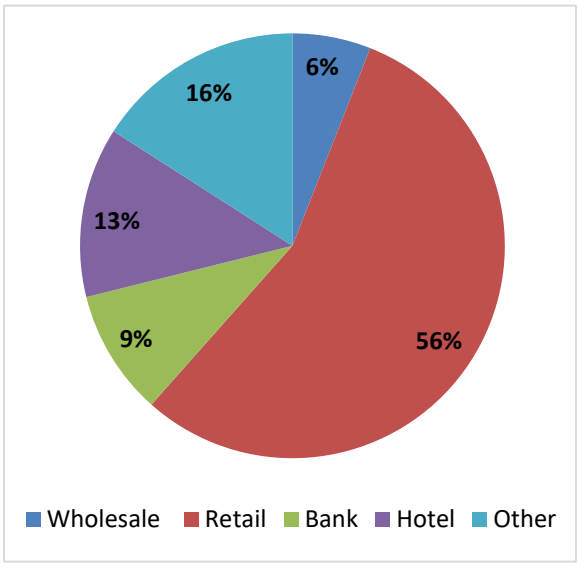


Fig. 6.8 Type of Business

Source: Commercial Survey, 2019

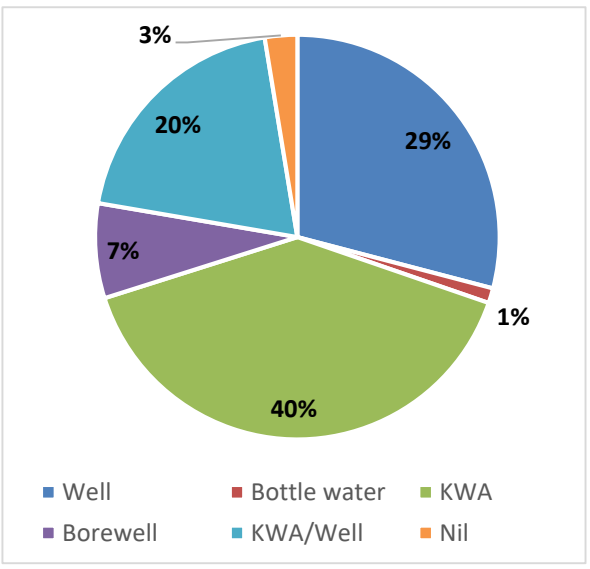


Fig. 6.9 Water facility

Source: Commercial Survey, 2019

- Only 41% of the commercial shops have sufficient parking facility. Swaraj round experiences a dire condition to meet parking needs. Figure 6.8 shows the parking deficiency of major nodes in the study area with respect to the total parking deficiency.
- Most of the shop owners are not aware of any financial assistances offered to small entrepreneurs.
- About 46% of the waste collection is carried out by Kudumbasree units.

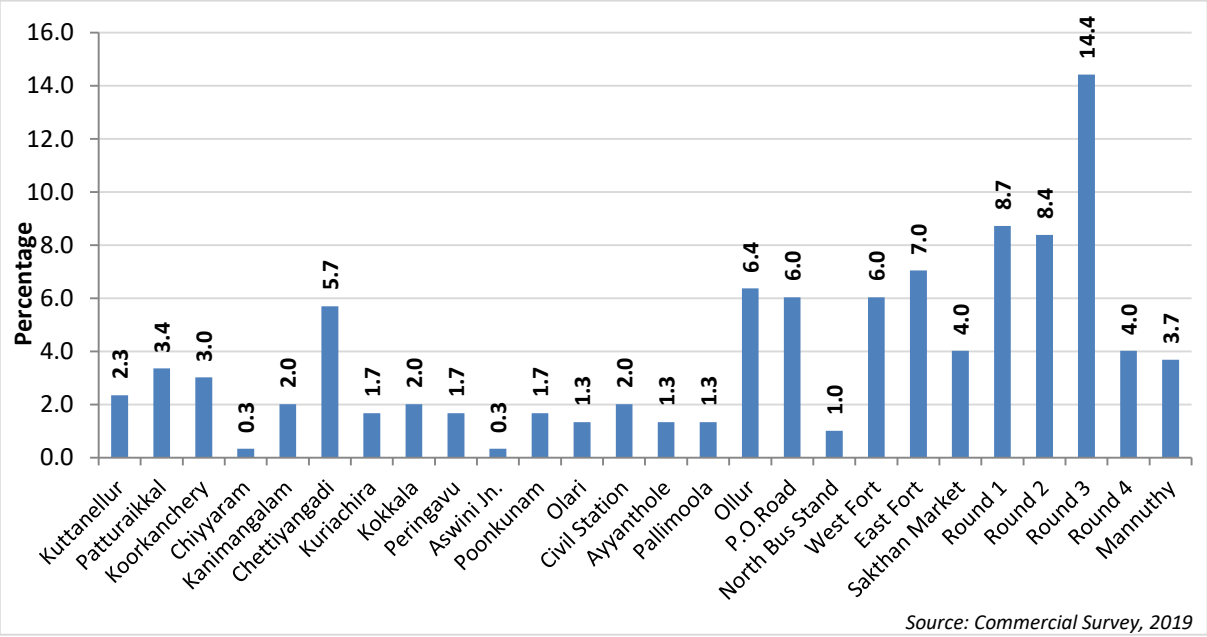


Fig. 6.10 Parking deficiency

6.7 INFERENCE

The commercial nodes of the city are facing a number of development issues. The replacement of old aged building to the full facilitated new shopping complexes with public participation, in the city can solve the problem to a limit.

Road widening and provision of parking spaces near major commercial centres will help to increase the outcome. Proper methods for collection and disposal of wastes from commercial area have to be introduced. Street vending must be regulated.

CHAPTER 7
TOURISM & HERITAGE



Tourism is one of the popular ways for spending leisure time. It is an important and vital sector since it in bringing economic development to an area. Thrissur city has got various potentials in the fields of tourism, pilgrimage and heritage. Utilizing these potentials in an efficient and sustainable manner will help in providing revenue and employment to the people. This chapter details out the tourist potentials, both heritage and pilgrimage, at local and regional level.

7.1 TOURISM



Fig 7.1 Location of major tourist attractions in Thrissur city

Tourism is the second largest fastest growing industry in the world. Tourism is an important tool for the development on account of its potentials for generating income and employment. It is one of the harmless industries, because it doesn't create any threats to the nature and it also helps the development of the destinations. It also promotes Kerala's natural face that means agricultural, cultural events, festivals etc. The festivals in Thrissur have given a new face to Kerala Tourism.

Table 7.1 Tourist Destinations in Thrissur City

Sl. No	Tourist Attractions	Type	Tourist Season
1	State Museum &Zoo	Architecture, Archaeology, wild life	All the year
2	Vadakkumnathan Temple	Pilgrimage, architecture, heritage	
3	Paramekkavu Temple	Pilgrimage, architecture, heritage	
4	Thiruvambady Temple	Pilgrimage, architecture, heritage	
5	Lourde's Metropolitan Cathedral	Pilgrimage, architecture, heritage	
6	Puthenpalli	Pilgrimage, architecture, heritage	
7	St. Antony's Church, Ollur	Pilgrimage, architecture, heritage	
8	St. Euphrasia Tomb Shrine, Ollur	Pilgrimage	
9	Kuttankulangara Sree Krishna Temple	Pilgrimage, architecture, heritage	
10	Sree Maheswara Temple, Koorkanchery	Pilgrimage, architecture, heritage	
11	Onam Festivities Pulikkali	Pilgrimage	Aug-Sep
12	Thrissur Pooram	Pilgrimage	April-May
13	Boun Natale	Religious, CUltural	December
14	Sakthan Thampuran palace	Heritage, architecture, Cultural,	All the year
15	Kerala Sangeeta Nataka Academy	Cultural, Heritage	
16	Kerala Sahitya Academy	Cultural, Heritage	
17	Kerala Lalitakala Academy	Cultural, Heritage	

Source: Local enquiry

Thrissur is known as the cultural capital of Kerala and is rich in its varied culture and heritage. Thrissur formerly known as Thrissivaperur is built around a 65-acre (260,000 sq.km.) hillock called the Thekkinkadu Maidan which seats the Vadakkumnathan temple. This area is the city's cultural and spiritual centre, offering an array of festivals, historical buildings and natural sights. Thrissur is also renowned for the famous festival of 'Thrissur Pooram', the most colourful and spectacular temple festival in Kerala. The festival is held at Thekkinkadu Maidan during April or May. Thrissur has a well-known temple trio of Vadakkumnathan temple,Thiruvambady temple and Paramekkavu temple, as well as two famous churches, the Our Lady of Lourdes Metropolitan Cathedral and



Fig 7.2 Thrissur Pooram

the Basilica of Our Lady of Dolours (Puthan Pally or New Church). Thrissur is also the venue of Pulikali during Onam celebrations during August or September.

Tourism has contributed heavily to the economy of Thrissur. Domestic tourists generally use the city as a hub to explore the highly promoted tourism industry of the state of Kerala. The city with its temples, old churches and its culture is ranked as one of the important destination of domestic tourists visiting Kerala.

The tourism attraction of Thrissur is based on its vibrant landscapes. Thrissur provides a miniature of Kerala with representation of all its products. So all forms of tourism like cultural, festivals, heritage, pilgrim, etc. have strong base for development in Thrissur. Thrissur is known as 'cultural capital' of Kerala because Kerala Sahithya Acadamy, Lalithakala Acadamy, Sangeetha Nataka Acadamy, Kerala Kalamandalam are located in Thrissur.

Major tourist attractions in Thrissur City are given in table 7.1. Spatial location of these places are represented in fig. 7.2. From the figure, it can be seen that majority of the attracting features in the city are located in or around the Central area.

7.2 PILGRIM TOURISM

Pilgrimage tourism is the type of tourism that entirely motivates tourists for the achievement of religious attitude and practices. There are various religious institutions in Thrissur which helps in promoting the religious/pilgrimage tourism. These institutions forms an important part of religious/pilgrim circuit within the district. Various places that attracts pilgrim tourists to Thrissur city are as described below.

7.2.1 TEMPLES

Thekkinkadu Maidhanam, 65-acre (260,000 sq.m.) hillock which seats the Vadakkumnathan Temple is an oval shaped open ground in the centre of the Thrissur City which is under the custody of the Cochin Devaswom Board (CDB). It hosts the spectacular cultural festival Thrissur Pooram, which is considered the 'Mother of all Poorams' in Kerala. King of Cochin, Rama Varma IX(popularly known as Sakthan Thampuran) constructed the Thekkinkadu Maidan at the heart of Thrissur City after destroying the forest around the Vadakkumnathan Temple despite the resistance of Brahmin priests and other orthodox section of people.



Fig 7.3 Vadakkumnathan temple, Paramekkavu Temple & Thiruvambady temple

The city of Thrissur is blessed with a number of temples like Sree Vadakkumnathan Temple, Paramekkavu temple, Thiruvamabady Sree Krishna temple, Poonkunnam Siva Temple, See Maheswara temple Koorkkencherry, Ayyanthole Karthyani temple, Bhuvanewsari Navagraha Temple, Asokeshwaram Siva temple, etc.

The city of Thrissur is developed around the central Thekkinkadu maidan which houses the famous Vadakkumnathan temple, which is believed to have been founded by the legendary Saint Parasurama. The temple is known as 'Tenkailasam'which means 'Kailas of the south'. This temple is one of the most ancient Grama Kshetras of Kerala with exquisite wood carvings and mural paintings. It is surrounded by thick and hefty walls with massive gopurams on all sides. There are 3 main shrines in the temple of which, the central shrine contains all the mural paintings which depict the battle scenes from the Mahabharatha, a few decorative designs and two paintings of Lord Sivas wedding and the Thandava dance.

Thiruvambadi Sri Krishna Temple is one of the largest Sree Krishna temples in Kerala. Goddess Devi (Vishnu Maya) is also an important deity of the temple. The temple is a proud participant of the grand Thrissur Pooram festival.

Paramekkavu Bagavathi Temple which is one of the largest Bagavathi temples in Kerala is also situated in the city. The temple is situated opposite to the eastern gateway of Vadakkumnathan temple. It is considered to be over 1000 years old.

The various festivities of the temples in the city also contributes to the cultural aspects of the city. The world renowned 'Thrissur Pooram' which attracts national as well as international tourists is the festivity which is hosted in the vicinity of Vadakkumnathan Temple and is mainly conducted by Paramakkevu and Thrivambady Temples, along 8 with eight other constituent temples in and around the city.

7.2.2 CHURCHES



Fig 7.4 Puthan pally, St. Antony's Forane Church, Ollur, Marth Mariyam Church & Bible Tower

The city of Thrissur, is also famous for its churches. One of the highest church in Asia, the Basilica of Our Lady of Dolours (Puthan Pally), and Our Lady of Lourdes Metropolitan Cathedral which has an underground shrine, is an architectural masterpiece of architectural in whole Kerala. The Marth Mariam Big Church, which is the Indian headquarters of Assyrian

Church of the East, is also situated at Thrissur. St. Anthony's Forane Church, also known as 'Chinna Roma' (Small Rome), is also situated at Ollur in Thrissur.

Basilica of Our Lady of Dolours (Puthan Pally) is the biggest and tallest church in Asia, situated in the heart of the city. It is famous for its Gothic style architecture. It was built in 1925. Blessed in 2004, the central tower depicts the whole life of Jesus and is the first Christian art gallery in Kerala. Built in fine Indo-Gothic style with an area of 25,000 square feet (2,300 sq.m.), it has soaring belfries at the entrance, double storied aisles all along the nave and transepts, and eleven altars, five on either side of the main one. It is the largest church in India and its exuberant interior decorations include fine specimens of murals, images of saints and scenes from the scriptures. The construction of this biggest church in India was done in different phases, which was started in the year 1929. The two front towers are of 146 feet height each and the central tower with 260 feet height makes this church as tallest in Asia. 11 altars and musical church bells adorn the interior of Puthan Palli. The ceiling has mural paintings of the holy trinity.

The St. Anthony's church of Ollur is one of the oldest church built in 18th century. The resident of Ollur, Sri.Chiramel Chakoru Palu got the permission from Raja of Cochin to build the church. The foundation stone was laid by Rev. Marollical Poulose. The seven storied bell tower was admirable and it was of gothic architecture style and built in the period 1883-1893. One of the best models of Christian Architecture in India. This is famous for the exquisite works of art in wood. When the church was a building in early 18thcentury, the then Maharaja of the erstwhile Cochin State had donated some of the best timber from the renowned forests of the Western Ghats (mainly Teak and (V)eetty or rosewood), for its construction.

The Marth Mariam Big Church, locally known as the Valiya Palli (big church) is believed to be the oldest church in Thrissur, dating back to when Shakthan Thampuran settled 64 Syrian Christians families in Thrissur around the end of 18th century. The name is given not because of its size, but for its age and interestingly, parts of the Mass are still held in Syrian. The congregation still follows old rites and has no idols or pictorial representations of Christ inside the chapel, but only the cross. Here you can see huge chandeliers and coloured glass balls dangling from the ceiling, the choir's gallery and a tulip-shaped pulpit. This church is known as Kaldaya Suriyani Palli or else as Valiya palli and is an architecturally important church.

The Bible Tower is the tallest church tower in India and Asia. The 260 feet (79 m) tower stands tall elegantly behind two towers of 140 feet (43 m) height. The Red Cross on the top of the Bible Tower is lit to show the presence of the Roman Catholic Church in Thrissur. It can be seen from anywhere in the Thrissur city. In the tower we can see childhood of Christ carved in wood, healing of Jesus depicted in stained glass, miracles of Jesus in brass, sufferings of Jesus Christ in oil paints, beautiful painting of apostles in terra cotta, mural paintings of the life history of St. Thomas, and glorious resurrection of Jesus depicted in canvas.

7.3 FESTIVITIES & CELEBRATIONS

7.3.1 THRISSUR POORAM

Thrissur Pooram is called 'the pooram of all poorams' (festival). It is the biggest of all poorams held in Kerala state. 'Thrissur Pooram', is celebrated every year in the month of Medam (mid-April to mid-may) as per the Malayalam calendar. Thrissur City plays host, for 36 hours from the wee hours of the pooram day, to one of the largest collection of people and



Fig 7.5 Thrissur Pooram festivities

elephants. The richly decorated elephant, as seen during the Thrissur Pooram, is now globally recognised, and its association with Kerala. On the pooram day, fifty (50) or more elephants pass through the very center of the city, the Vadakkumnathan Temple. The main features of the Pooram are these decorated elephants with their nettipattam (decorative golden headdress), beautifully crafted kolam, decorative bells and ornaments etc. Add to this is the panchavadyam, the rhythmic beating of the drum and what would be a cacophony otherwise is turned into an organized but spontaneous symphony. The fireworks display in the early hours of the next day, rival shows held anywhere in the world, without even using many of the modern and newer pyrotechnics.

Thrissur Pooram is one of the most spectacular festivals in the world. In terms of visual splendor, the grand assembly of caparisoned elephants, amazing pyrotechnic displays, spellbinding ensembles of percussion instruments and enthusiastic crowds, there is no match for it. One can't find a festive gathering and celebration on such a scale anywhere else. It is Lord Shiva or Vadakkumnathan who presides over the Pooram festival, providing it with its vast arena, through the Lord himself has no role in the whole affair. Instead it is the two Goddesses from nearby Thiruvambadi, and Paramekkavu temples who play the major roles in the Pooram.

7.3.2 PULIKKALI

Pulikkali is a recreational folk art from the state of Kerala. It is performed by trained artists to entertain people on the occasion of Onam, an annual harvest festival. On the fourth day of Onam celebrations (Nalaam Onam), performers painted like tigers



Fig 7.6 Pulikkali

and hunters in bright yellow, red, and black dance to the beats of instruments like Udukku and Thakil. Literal meaning of Pulikkali is the 'play of the tigers' hence the performance revolve around the theme of tiger hunting. The folk art is mainly practiced in Thrissur district of Kerala. Best place to watch the show is at Swaraj Round in Thrissur city on the fourth day of Onam, where various Pulikkali troupes assemble to display their skills. The festival attracts thousands of people to the Thrissur city.

7.3.3 BUON NATALE



Fig 7.7 Boun Natale

Buon Natale is the cultural festival organized by the Thrissur Archdiocese and Thrissur Citizenry in association with Christmas celebration. It is held in the premises of Thrissur city in Kerala every year from 2013. Buon Natale procession entered the Guinness World Records in 2014 for having the maximum number of people dressed up as Santa Claus. This event was started to raise charitable funds along with the celebrations. The procession starts from St Thomas College in Thrissur, encircles Swaraj Round and ends at Sakthan Thampuran Ground. Members from different churches under the Thrissur Archdiocese participates in the procession.

7.4 CULTURAL TOURISM & OTHER AMENITIES

Thrissur is known as the Cultural Capital of Kerala. The cultural contributions of Thrissur are very important. It was a great centre of learning and culture. The history of Thrissur carry great writers like Kovilan, Kunjunni mash, Kamala Surayya, Sara Joseph, Ashokan cheruvil etc. Famous thinkers such as Joseph Mundasseri, C. Achuttha menon and many others were from this city. Current Books and House of Knowledge were two prominent bookstores in the 1950s to 1980s of Thrissur history. A land of famous writers, artists, musicians and journalists as well, Thrissur boasts of having benefited from the best of men and women. Ouseppachan, Johnson, Mohan Sitara, Alphonse are well-known film musicians and Ramu Karyatt, Bharathan, Kamal, Lohithadas, Lal Jose, Sathyan Anthikkad, Bharath Premji are noted film directors. This shows the cultural richness of Thrissur.

7.4.1 KERALA SAHITHYA ACADEMY



Fig 7.8 Kerala Sahithya Academy

It was founded on 15th August in the year 1956 at Thiruvananthapuram and later shifted to Thrissur by 1958. The main aim of the academy is to help in the development of Malayalam Language and Literature. It actually works with the co-operation of the Kerala Sahitya Academy in New Delhi and development of Malayalam Language and Literature. The Kerala Sahitya Academy is located near to the central core of Thrissur city.

7.4.2 KERALA SANGEETHA NATAKA ACADEMY



Fig 7.9 Kerala Sangeetha Nataka Academy

The State Academy of Performing Arts is located in the Thrissur City of Kerala. It is the nucleus of all amateur arts clubs and training institutions in the state. It was established on April 12, 1938. Some of the main objectives of the academy are to encourage and promote dance, drama, music, folk arts and such other performing art forms prevalent in Kerala; promote co-operation among the artistes, art institutions and art organizations in the state; conduct festivals, camps, workshops and seminars for the promotion of different performing arts; promote publication of books on performing arts; and give encouragement to artistes through awards, prizes, scholarships and other measures to recognize meritorious work in the field of dance, drama, music, folk art and allied art forms. It works in close collaboration with the Sangeetha Nataka Academy in New Delhi for the enrichment of Indian culture. A regional theatre is constructed in Thrissur with all modern facilities.

7.4.3 KERALA LALITHAKALA ACADEMY

It was founded in the year 1962. The main aim of the Academy is to encourage the culture, sculpture, painting, plastic and visual arts. It is the nerve centre of artistic and cultural events and discussions in Kerala. The academy plays a vital role in the establishment of culture that mainly tries to develop various activities especially in the field of visual arts like Graphics, Paintings, Ceramics, Sculptures, Photography and other allied fields of fine arts.



Fig 7.10 Kerala Lalithakala Academy

7.4.4 THE STATE MUSEUM & ZOO, THRISSSUR

Spread over an area of 13.5 acres (55,000 m2) of land, it is home to the wide variety of animals, reptiles and birds. There is a special building which houses snakes also. The zoo includes some of the rare and endangered varieties of species. The variety of wildlife in the Thrissur zoo includes tiger, lion, deer, sloth bears, monkeys, hippopotamus, camels, Cobras, kraits, viper, rat snakes and other diverse varieties. The snake park has a reptilian collection of King Cobra, Kraits, Vipers and rat snakes.



Fig 7.11 State Museum & Zoo, Thrissur

7.5 HERITAGE

Heritage is a broad concept and includes the natural as well as the cultural environment. It is what the past generation has preserved and handed over to the present generation and has to be handed down to the future generation. It is a process evolving along time and growing along time. It is a cultural document of the past, and the elements of the heritage are the representatives of the evolution of a place. It records and expresses the long process of historic development.

Thrissur District of Kerala State, which is identical with the central region of Kerala, is rich in history and cultural tradition of all the administrative divisions of the State. Thrissur holds out the greatest fascination to the student of ancient history, archaeology and culture. The Vadakkumnathan temple - the centuries old Siva Temple, the famous Thrissur Pooram with innumerable parasols, ornamented elephants and the gyroscopic works, coupled with other local art forms such as Koodiyattam, Kathakali and Ramanattam made it the cultural capital of the princely Cochin State. Some of the major places in Thrissur having heritage/historical importance are as follows.

7.5.1 VADAKKUMNATHAN TEMPLE

Vadakkumnatha temple is the center point of Thrissur town. The temple is identified as a protected monument under Archeological Survey of India. Vadakkumnatha temple is one of the most ancient Grama Kshetras of Kerala with exquisite wood carvings and mural paintings (16th 17th century AD). It is surrounded by thick and hefty walls with massive gopurams on all sides. There are three main shrines in the temple of which, the central shrine contains all the mural paintings which depict the battle scenes from the Mahabaratha, a few decorative designs and two paintings of Siva wedding and the Thandava dance.



Fig 7.12 Vadakkumnathan Temple

7.5.2 SAKTHAN THAMPURAN PALACE& ARCHAEOLOGICAL MUSEUM

Earlier known as Vadakkekara Palace, this palace was reconstructed in Kerala-Dutch style in 1795 by Ramavarma Thampuran of the erstwhile Princely State of Cochin, well known as Sakthan Thampuran. Also known as Palace Thoppu, the campus covers an area of 6 acres. Here one can see three tombs including that of Sakthan Thampuran, the greatest ruler of the Cochin dynasty. There is a Bronze Gallery where one can find bronze statues belonging to the period between the 12th and the 18th centuries, a Sculpture Gallery displaying granite statues from the 9th century to the 17th century, a Numismatics Gallery, which systematically displays

ancient coins, which were in circulation in the former province of Kochi and neighbouring kingdoms and the History Gallery depicting some of the milestones of the Kochi dynasty and the Epigraphy Gallery showcasing the genesis and evolution of ancient writings.



Fig 7.13 Sakthan Thampuran Palace

Archaeological Museum of Thrissur is also housed inside this palace. The museum displays collections of the wood carvings, metal sculptures and ancient jewellery. Museum showcases a rare collection of paintings and artefacts to create awareness about the architectural heritage of the state among the public as well as the students of archaeology. Bearing a distinct mark of traditional and western influence in its construction, the stately archaeological museum boasts of a rare collection of exhibits well preserved for posterity. The museum has the largest collection of excavated materials from Megalithic sites in Kerala. It is preserved by Archaeological Department. The palace compound covers an area of 6 acres. Its eastern gateway with royal emblem and western gateway are notable features. Near to the western gateway, Tippu's flag staff is planted and conserved.

7.5.3 BRAHMASWOM MADOM

This is situated in the heart of the city. Several relics and heirlooms of Archaeological importance are kept here. This building is of Architectural importance. Ownership - Archaeology Department



Fig 7.14 Brahmaswom Madom

7.5.4 ERATTACHIRA KOVILAKOM

It was owned by Cochin rulers. Square laterite column supporting the balcony on the upper floor which has wooden floor boards are of century old. The stepped roof line and triple storied gateway shows the architectural magnificence of the building and now it is functioning as Medical Store of Kerala Government Health Department. It has an age more than 200 years.



Fig 7.15 Erattachira Kovilakom

7.5.5 OLD COURT

This was the Kachery building of Kochi Kings, which now functions as Treasury. This Historic building is a good example of Kerala's indigenous architectural style with a colonial influence. The traditional sloping roofs are supported by the wooden posts which added the beauty of the building. An attractive wooden staircase leads to the upper floor. The



Fig 7.16 Old Court

tower clocks give an ancestral look to the building. But now several modifications are made to the structure.

7.5.6 VILVATTOM MENHIR

Starting from the Stone Age, Thrissur must have been the site of human settlement. This is evidenced by the presence of megalithic monuments at Ramavarmapuram, Kuttoor,Cherur and Villadam. The Ramavarmapuram monument is in granite and is of Menhir type. The monument in Ramavarmapuram is 15 feet height and 12 feet 4 inches broad. From 1944, it is under the protection of Department of Archaeology. The monument is locally known as 'Padakkallu' or 'Pulachikkallu'. These menhirs are memorials for the departed souls put up at burial sites. They belong to the Megalithic Age of Kerala, which is roughly estimated between 1000 BCE and 500 CE. The Ramavarmapuram Menhir is also believed to be a monument belonging to the Sangam period in the South Indian history.



Fig 7.17 Menhir

The table below shows the details of the protected monuments in Thrissur Corporation listed by Department of Archaeology, Kerala state.

Table 7.2 Details of the protected monuments in Thrissur Corporation

Sl . No	Monuments	Features	Survey Number
1	Vadakkechira Palace compound	• Images of Nagaraja and Nagayakshi under a Saptaparna tree in the Vadakkechira palace compound • A Monument put up at the site were the Zamorin Raja of Kozhikode • A monument put up at the site where Raja Rama Varma alias Sakthan Tampuran was cremated in 1805 • A monument put up at the site where Rama Varma Raja of Kochi was cremated in 1851 • Western gateway • Eastern gateway • Tipu's flag staff planted originally on the North-west corner of the fort round the palace but now shifted and planted on the bund near the western gateway.	210,213 214,215, 216
2	Menhir	• A Megalithic monument (Menhir) standing opposite Anappaara on the left side of the Viyyur Thanikudam Road	510
3	Kollamcode Palace	Kollamkode palace building	313

Source: Department of Archaeology, Kerala

As per the art and heritage assets listing done by Town & country Planning Department, Marthamariyam church, Ollur Ferona church, Puthenpalli and Tharakan's residence is also been included as heritage buildings.

7.6 REGIONAL TOURISM CIRCUIT

Tourism is the life line of Thrissur. With many marvellous attractions in and out, the city hosts thousands of tourists every year. In Thrissur City, tourism is based on cultural, heritage and religious. Creation and development of integrated tourism circuits based on Thrissur unique heritage and culture will improve the tourism sector.

Two distinct tourist circuits has been identified which can be developed and promoted for tourism as shown in fig 7.17. This tourist circuit is a combination of religion, heritage and recreational destinations in and around the Thrissur City. It includes important destinations like Guruvayoor temple, Triprayar temple, Vilangan hills, mural painting centre, Nattika beach, Snehatheeram beach, etc. This tourist circuit also combines the recreational and wild life sanctuary destinations like Peechi Dam and Chimmini wild life sanctuary.

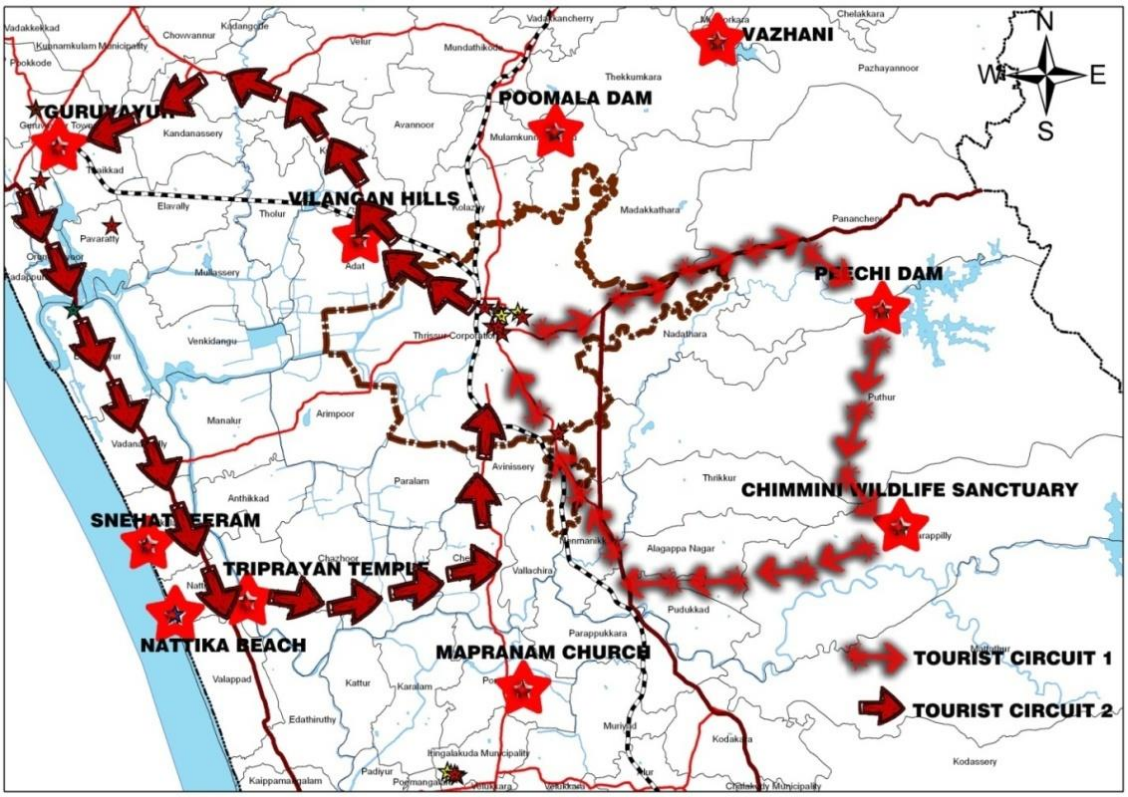


Fig 7.18 Tourist Circuits for Thrissur City (*Source: DTPC)*

Apart from these, District Promotion Council (DTPC), Thrissur offers various tourist circuits and programmes such as:

- **Thrissur Koleland Tour:** Kole paddy field - Mangrove Boating - Chavakkad Beach visit and kite flying - Turtle rearing centre
- **Yellow Circuit (Cultural Tourism):** Thrissur - Kerala Kalamandalam - Puppet art gallery - Sakthan Thampuran Museum Thrissur - Zoo and Museum - Ayurveda Museum, Thaikkkattussery – Thrissur
- **Brown Circuit (Dam Tourism):** Thrissur - Chimmony dam - Peechi dam - Vazhani dam - Poomala dam – Vilangan Hills – Thrissur
- **Blue Circuit (Water Tourism):** Thrissur – Vazhachal – Charppa – Athirappilly – Thumburmoozhi - Dolphin Beach, Munakkal - Thrissur
- **Green Circuit (Backwater Tourism):** Thrissur - Chimmony dam - Enamvu boat cruise – Snehatheeram – Thrissur
- **Orange Circuit (Muziris Heritage Tourism):** Thrissur - Kottappuram Fort - North Paravur Synagogue - Paliam Kovilakam - Paliam Nalukettu - Pattanam Excavation Centre and Museum – Thrissur
- **Red Circuit (Assorted Circuit Tourism):** Thrissur – Vilangankunnu - Vazhani dam - Zoo and museum - Snehatheeram beach – Thrissur



Fig. 7.19 Tourism Circuits by DTPC Thrissur

- **Mazha Yathra (Monsoon Tourism Package)**: Thumboormoozhi Garden - Athirappilly Falls - Vazhachal Falls - Peringalkuth Dam - Sholayar Dam
- **Students Jungle Safari**

- **Valparai Hill Safari**
- **Backwater Safari**
- **Barrier Free Tours – for differently abled persons**
- **Eco trip (nature & culture)**
- **Nalambalam (Karkitakam Special), etc.**

Various tourism activities by DTPC Thrissur which are under planning stage are:

- **Thrissur Adventure Trails:**
  - Cheppara Rock Garden – rock climbing, rappelling, camping (planning stage)
  - Malakkappara – Mayiladumpara jeep safari (planning stage)
  - Chimmony Dam Ecotourism (ongoing activities by Forest Department)
- **Thrissur Heritage Trails:**
  - Heritage Walks – Thrissur, Irinjalakkuda, Kodungallur, Kunnamkulam
  - Pilgrim circuits – Bhaktimarga Tourism temple tour from Thrissur and Guruvayur; churches and mosques
  - Art and craft special interest tours – melam, elephants, art forms, handicrafts, Ayurveda etc.
  - Village Life Experience – Responsible Tourism Mission tour packages
  - Book my pooram @ Thrissur – Festival special tour package

7.7 TOURISM INFRASTRUCTURE

In tourism perspective, Thrissur city mainly acts as a hub for various facilities. The city attracts international/national tourists mainly during the time of cultural events like Thrissur pooram, Pulikkali & Boun Natale. Other spots are mainly attracted by local/regional tourists. Due to its strategic location in the district, the city acts as a hub for various facilities for the development of tourism such as accommodation facilities, transportation facilities, etc.

The basic infrastructure facilities for tourists are satisfactory in Thrissur city. The accommodation facility in the city and adjoining areas are satisfactory in terms of quantity as per existing requirement. The existing accommodations facilities include Hotels, Resorts, Home Stays, Ayurveda Centre, Government Guest House, PWD Rest House etc. Although the infrastructure facilities available in the city are satisfactory, more accommodation, amenities and transportation facilities are needed for its improvement. Moreover, parking and other basic amenities at bus terminals have to be improved with special emphasis on hygienic surroundings.

The tourists visiting the nearby tourist destinations utilizes the accommodation facilities available in Thrissur city. Pilgrims visiting Guruvayur temple, at times find difficulties for accommodation facilities there due to the high increase in number of pilgrims. Also, the nearest major railway station to Guruvayur is Thrissur Railway Station where almost all the trains have their stops. Due to these peculiarities, the pilgrims will depend on the city for meeting their various needs. This will help in gaining revenue and in the development of

Thrissur City. The number of pilgrims is expected to increase in the coming years and this will result in more need for accommodation facilities and thus tourists depending on Thrissur City will increase with year as Guruvayur is almost a saturated place as far as land use is considered and no scope for development of new infrastructure is possible there. This will help Thrissur City for attracting tourists who will be forced to depend on the hotels here. With the increase in tourists, more need for facilities will arise in the city which has to be met by providing more number of high standard accommodation facilities.

The development trend has been studied based on the inflow of tourist over the years and the revenue generated by the DTPC, Thrissur. The revenue generated by DTPC shows that presently there is an increasing trend in the last years. The increasing income of Destination Management councils under DTPC shows the improvement.

Table 7.3 Major Hotels in Thrissur City

Sl. No.	Name	Ownership Type
1	Casino Hotel	Private
2	Hotel Pooram International	Private
3	Hotel Garuda	Private
4	Hotel Luciya Palace	Private
5	Trichur Towers	Private
6	Hotel Elite International	Private
7	Hotel Lulu International	Private
8	Hotel Manappuram	Private
9	Hotel Palace Tower	Private
10	Sea fort Tourist Home	Private
11	Hotel Kovilakam	Private
12	Hotel Dass Continental	Private
13	Hotel Emerald inn	Private
14	Hotel Pearl Regency	Private
15	Hotel Ammu Regency	Private
16	Hotel Ashoka Inn	Private
17	Hotel Joys palace	Private
18	Hotel Niya regency	Private
19	P W D Rest House	Govt.
20	Yathri Nivas	KTDC
21	Hotel Merlin International	Private
22	Hotel Cee Pee Tower	Private
23	National Tourist Home	Private
24	Hotel Pathans	Private
25	Siddhartha Regency	Private
26	She Lodge	Private

Source: District tourism office, Thrissur

The private participation in tourism sector is also showing an increasing trend. The private sector is also showing an increasing trend. Due to the non-availability of exact data on private sector turnover, it is very difficult to substitute the development trend based on revenue generation. However the Tourism sector in Thrissur shows an increasing trend over the years.

Table 7.4 Major Homestay Facilities Thrissur City

Sl. No.	Ward/Location	No. of Homes
1	Kuriachira	1
2	Koorkanchery	1
3	Ayyanthole	1
	Total	3

Source: District tourism office, Thrissur

The Homestays are also doing well and more people are being encouraged to apply for registration under homestay concept. So over all it shows an increasing trend in all level and helps to improve the potential.

7.8 PROBLEMS

The major problems are in the tourism sector are as follows:

- Roads to destinations need to be improved and maintained properly.
- Shortage of facilities of International standards to attract foreign tourists.
- Lack of proper tourism infrastructure facilities
- Deficiency of proper waste management plants/systems in tourist centres.
- Proper parking spaces required at all destinations.
- Need of Guided Tours
- Lack of coordination between line departments and agencies for time bound implementation of tourism projects
- Absence of tourism study centre

In Thrissur the tourism development is depended mainly upon the festivals and the cultural elements. Natural attraction is only getting less importance compared to other attractions. Lack of quality accommodation facilities is another limitation. There are many natural areas in Thrissur having good potential. The potential of developing a circuit based destination promotion is much lacking in Thrissur. Even though some attempts are being done to improve the situation through implementation of various projects. Lack of funds causes the delay of the works and in the progress of the scheme.

Several years back, there was a water way from Aranattukara (Vanchikulam) to Cochin and Ponnani through the Canoli Canal. Vanchikulam Boat Jetty was one of the major transhipment points for transportation of the region. This water way can be modified and utilized as tourist attraction point.

Apart from the cultural elements, entertainment also must be ensured for the tourists. For this purpose, new schemes have to be introduced. An amusement park can be started which will be beneficial for entertaining the tourists.

7.9 INFERENCE

Thrissur is rich with a number of historical sites and monuments. A large number of temples and important pilgrim centres are present here. All these have to be protected for future generation. Proper planning and Tourism Promotion can make Thrissur a popular tourist destination. More accommodation facilities have to be encouraged to its maximum. New Tourist circuits have to be developed by giving importance to the unexplored areas of Thrissur. Activity based tourism has tremendous scope in tourism promotion. It gives a variety experience to the tourists to enjoy the culture and heritage of Thrissur. Efficient promotion strategies are necessary for achieving a good result. Vanchikulam Boat Jetty can be modified and converted to a tourism area. The roads connecting tourism areas have to be well maintained. More number of home stay facilities has to be introduced with the help of people in the city. Government has to introduce agencies for studying the current tourist attractions, to maintain and improve them and to guide tourists to such places. Places of historical importance have to be well maintained with the help of government agencies.

CHAPTER 8
INDUSTRY



Growth in the industrial sector is one of the vital figures that influences the economic growth of an area. Existing scenario of industrial sector in Thrissur city is detailed here. The existing industrial activities can also be considered as a boost for many upcoming activities.

8.1 INTRODUCTION

The location of Thrissur is ideal for industrial development. Its central position, facilities for transport of goods through rail, road, nearness to the Cochin port and availability of man power, electricity and water supply are factors congenial for the growth and development of industries. But industrial development has been handicapped for want of natural resources and the raw materials required for the major manufacturing industries. As such there are no major manufacturing industrial establishments in Thrissur City.

From 1610 onwards small industries are established in Thrissur City. These industries are mainly based on timber, gold, silver and aluminium. Thrissur City became an industrial centre from the beginning of this century by the establishment of textile industry. The first umbrella making units, Manilas, E.P.Devassy was established in this area.

The Cultural and educational tradition of this area goes back to early stages. The main printing press such as Gomathy, Mangalodhayam, Bharathavilasam, Express, Geetha, and Mahatma are also functioned in the lap of the city. Thrissur was in a step forward in the industries of gold, timber, newspaper and photography also. The timber, tile and printing industries are shattered and Thrissur City became a commercial centre.

8.2 ANALYSIS OF EXISTING STATUS

An industry can be called as a large scale one if it has an investment of more than 10 crores for setting the plant and machinery. Industry with 5 to 10 crore investment is said to be a medium one and that having an investment between 25 lakhs and 5 crores called as small scale industry. Micro industries are small enterprises having an overall investment of about 25

lakhs. Distribution of industrial land use in the city is shown in fig. 8.1. Industrial land use only contributes 1.10% of the total area of the city and its major portion is constituted by Ollur Industrial Estate, Laxmi Mills Pullazhi, Sitaram Mills Poonkunnam, etc.

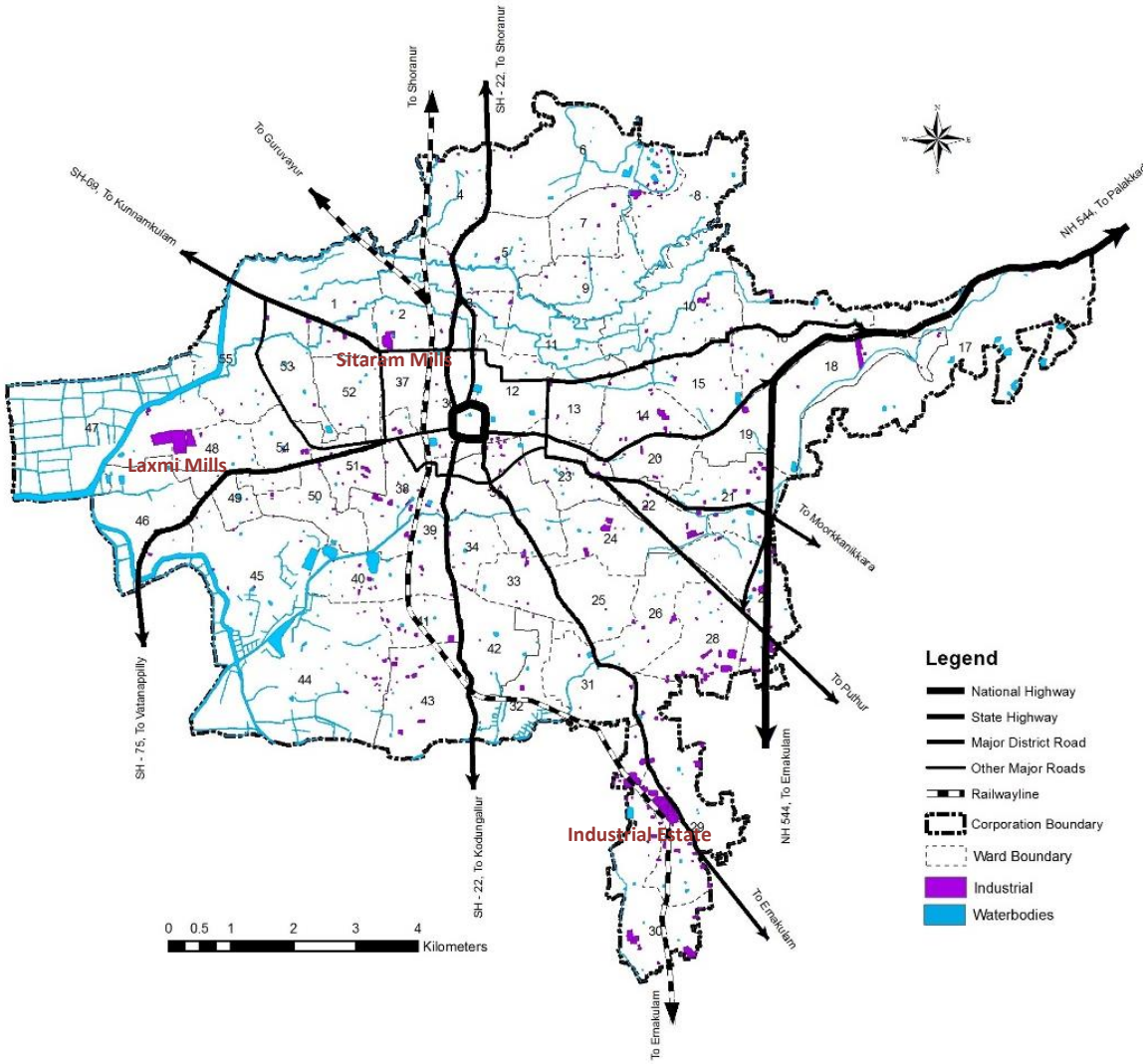


Fig 8.1 Distribution of Industrial Land use in Thrissur city

As per the available data, altogether there are 1427 industrial units in the town. Among these are 3 large scale industry, 2 medium scale industry, 94 small scale industries and remaining micro scale industries. A total of 10952 people are employed in the industrial sector in Thrissur Municipal Corporation. These industries cover about 1.12 sq. km land in the city. The details of Industries in the town are shown in table 8.1.

Table 8.1 Industries in Thrissur City

Sl. No.	Types of Industries	No. of units	No. of workers
1	Large	3	914
2	Medium	2	94
3	Small	94	2332
4	Micro	1328	7612

Source District Industries Centre, Thrissur

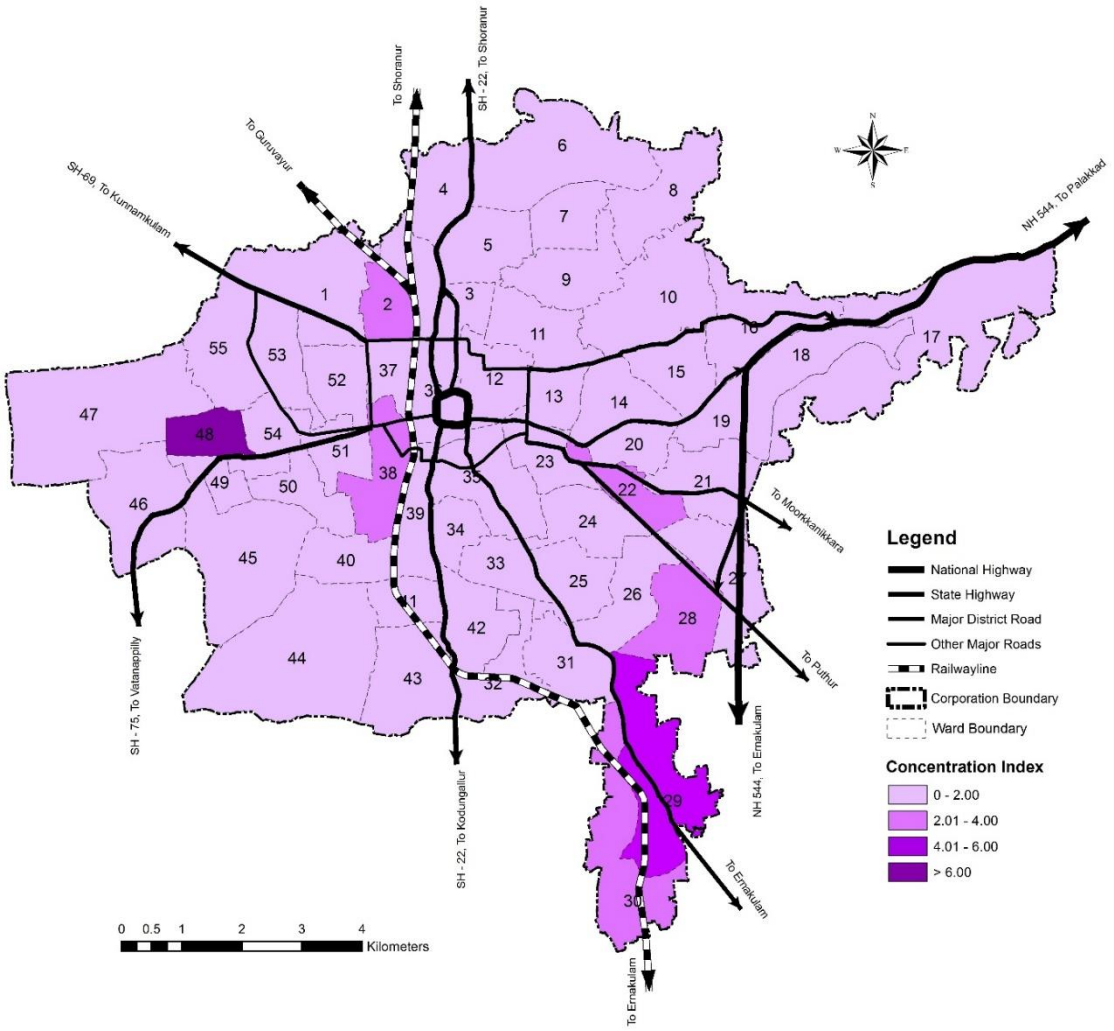
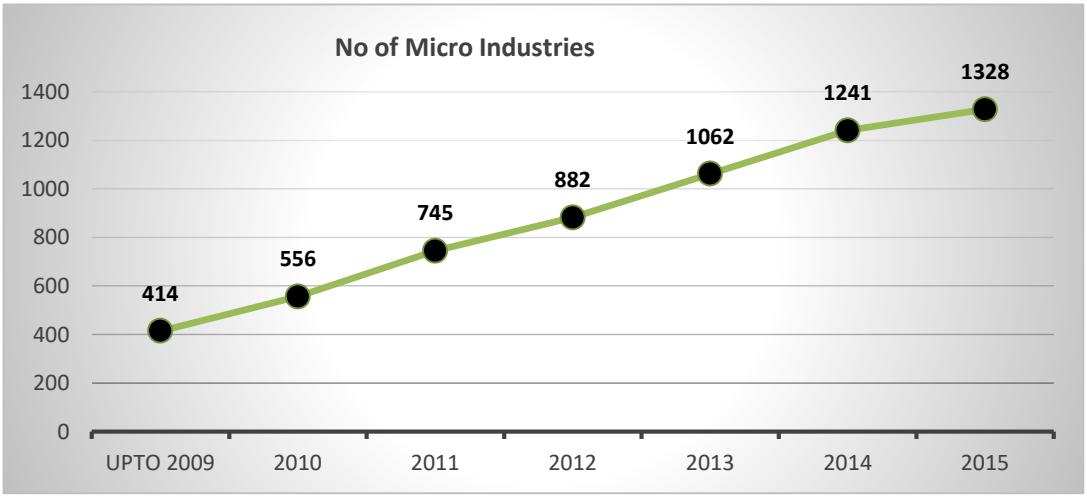


Fig 8.2 Concentration of industries in Thrissur city

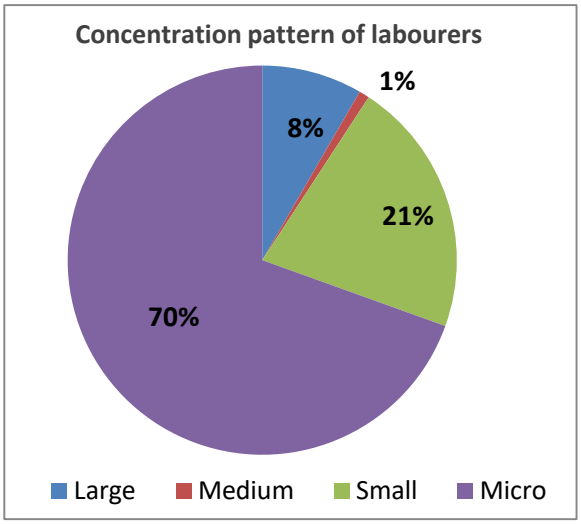
Figure 8.2 shows the concentration pattern of land under industrial use in Town. From the above figure showing the concentration index of industries in Thrissur City, it can be seen that the industrial concentration is high in wards Olari, Edakkunni, Thaikkattussery and Padavaradu.



Source District Industries Centre

Fig 8.3 Growth of Micro Industries

Figure 8.3 shows the growth of micro industries in Thrissur Municipal Corporation. It can be seen from the graph that the number of micro industries have increased more than thrice from 2009 to 2015. Even though Thrissur city has presence of household industries, none of them were registered under District Industries Centre. Figure 8.4 shows the concentration pattern of labourers in various types of industries. It can be seen that out of 1427 industries 1328 are micro based industries and 7612 labourers are working in this, which is the 70% of total workers.



Source District Industries Centre

Fig 8.4 Concentration pattern of labourers

8.3 INDUSTRIAL SURVEY

The major findings from the industrial survey conducted among the existing industries in the town are as follows.

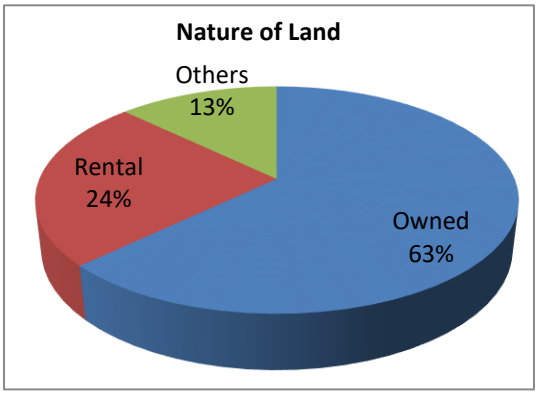


Fig 8.5 Nature of land ownership

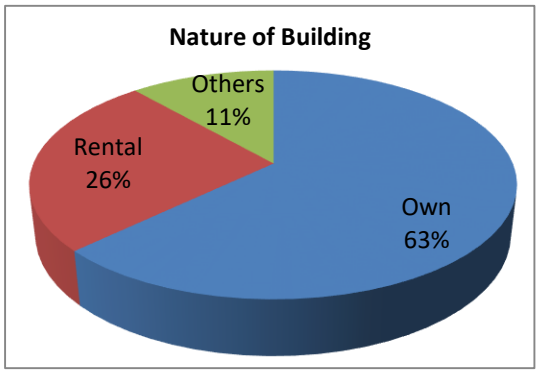


Fig 8.6 Nature of building ownership

Source Industrial Survey

- About 63% of the industries are setup at owned land and building, and 24% on rented land and 26% on rental buildings as shown in figures 8.5 and 8.6.
- 100% of the industries have their own storage systems.
- Most important commodities manufactured: Tiles and Bricks, Food products, General Engineering products.
- About 57% of the industries market the products outside the district. Finished products are mainly transported by road. Only 26% of the industries manufacture products by complete mechanical methods. About 26% of the industries adopts value addition of products.
- About 49% of the workers in industrial sector is unskilled
- Export based industries are very few only 11%
- About 40% of the industries buy raw materials available within the district.
- About 69% of the industries manufacture products continuously
- There is no water scarcity for working the industries. 90% of the industries uses well and bore well as the sources of water. Only 10% depend on Kerala water authority for water.
- Major power source is KSEB

- All the industries have sufficient transportation facility, whereas about 97% of the industries have sufficient parking facility
- All the industries have suitable waste disposal system and drainage facilities
- Only 8% of the industries have got financial assistance from Government or Semi - Governmental institutions

8.4 MICRO, SMALL AND MEDIUM ENTERPRISES (MSME)

Maximum number of MSMEs registered under Thrissur Municipal Corporation is 1427 numbers. Category wise 13% of the total registered MSMEs in Thrissur City are jewellery and plastic based enterprises. The second largest share is for 10% are textile based.

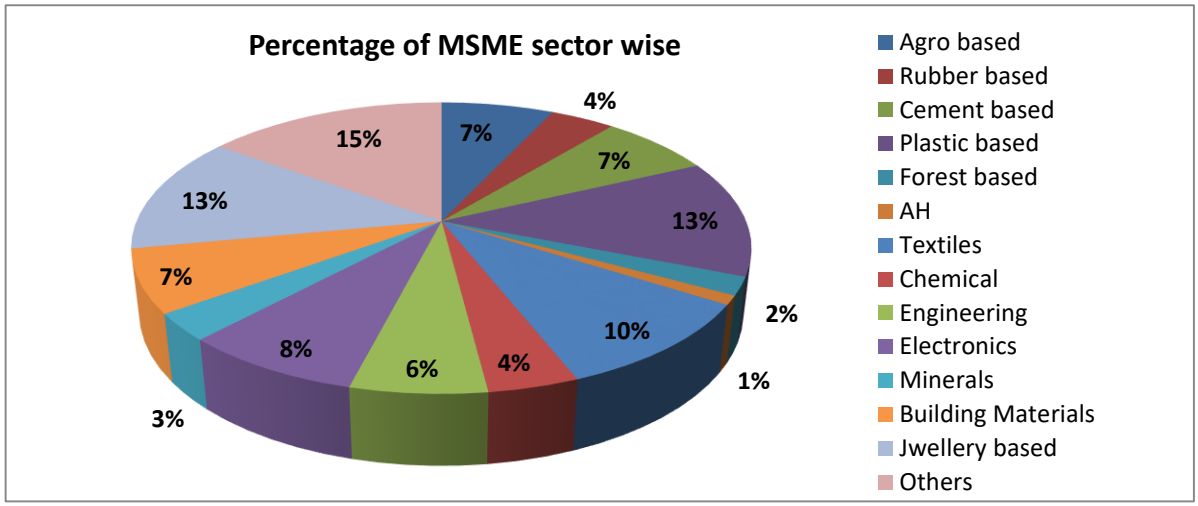


Fig 8.7 Percentage of MSME sector wise (*Source District Industries Centre)*

An industrial estate is located at Ollur which houses a number of industries. Apart from this, there are 2 textile mills in the city. They are Kerala Lakshmi mill at Pullazhi and Sitaram spinning mill at Poonkunnam. Sitaram spinning and weaving mill, earliest mill in the district (1909) and Kerala Lakshmi mill produce cotton and polyester blended yarn. There are about 350 workers in these 2 institutions together. In addition to this about 135 micro scale industries are functioning in this sector.



Fig 8.8 Ollur Industrial Estate

There are 103 numbers of Agro based industries in Thrissur City. The main issues faced by this sector are lack of local availability of raw materials and high competition in the market. There are 60 numbers of chemical based industrial units in Thrissur City. Spatial disparity of rural areas, high capital investment and pollution problems are the main reasons for the shortage of chemical industry in the city. Growth rate of engineering based units is also very high in the city. 92 engineering based units are working inside the city. One of the problems faced by this sector is lack of working capital. Thrissur City has 2 MSME registered mineral based industrial units. The main problems faced by this category are non-availability as well as high cost of Raw materials.

Thrissur is famous for gold and diamond industry. Thrissur City has 48 registered gold based industries. Pots and lamps making using brass and bronze is also an established industry in this area. The city is also emerging as the largest hub for ayurvedic drug manufacturing industry. Out of the 850 ayurvedic drug-manufacturing units in Kerala, about 150 units, including some of the major ayurvedic drug manufacturers in the Kerala state are located in and around the city. Of these, some of the companies like the Oushadhi, Sitaram Ayurvedic Pharmacy Ltd, SNA Oushadhasala etc. are among the leading ayurvedic drug manufacturers in the city.

8.5 INFERENCE

Thrissur City has immense potential for industrial development due to the presence of Coimbatore Kochi corridor and human resource available. Lack of enough flow of credit to this sector and lack of modern infrastructural facilities hold back the developmental prospects. The major problems identified are lack of working capital, management issues, labour issues, improper resource utilization, improper marketing and lack of involvement of financial institutions, changing technology, unhealthy market competitions and power shortage problems. These problems have to be solved for the development of industrial sector in Thrissur City.

The working of existing MSME units can produce more output if the units make use of new technologies and good managerial skills. The reason for the closure and sickness is mainly marketing problems, change of technology, and high cost of production and high interest rate of bank loans. Entrepreneurship development programmes, networking of large, medium enterprises with micro and small enterprises, support of BDS providers can facilitate new industrial sectors and sustaining of existing enterprises. Government can well support such developmental programmes with appropriate policies, fiscal incentives and infrastructural support.

The establishments of a large number of manufacturing industries is urgently required to provide adequate employment opportunities for the growing masses and to stabilize the economy of the city.

CHAPTER 9
AGRICULTURE & ALLIED SECTORS



Agriculture plays a crucial role in the entire life of an economy. In addition to providing food and raw material, agriculture also provides employment opportunities to many people. This chapter analyses the existing status and development issues of Agriculture and allied sectors in Thrissur city.

9.1 AGRICULTURE

Geographically, Thrissur city have a small hillock, Thekkinkadu Maidan in the centre which have a gradual slope towards all directions. There exists vast tracts of paddy fields and kole lands (low lying paddy fields water logged for most time of the year) in and around the city especially in northern and western parts. Paddy fields are located in northern& western parts and kole lands in western area of the city. Large hill tracts with rubber plantations are located in eastern part of the city especially in Ollukkara area.

Thrissur city is located in the mid land region and geologically the area is composed mostly of Archean gneisses & crystalline schist's and type of soil seen is laterite. Sandy loam type of soil is also available in some parts. The main cultivation is paddy & coconut. Paddy fields are located in almost all the parts of the city. At present, majority of these fields are left vacant. Some rubber and cash crop plantations are there in eastern parts of the city.

The district has a tropical humid climate with an oppressive hot season with plentiful and fairly assured seasonal rainfall. The hot season from March to May is followed by the south-west monsoon season from June to September. October and November form the post-monsoon or retreating monsoon season. The rains stop by the end of November and the rest of the period is generally dry.

In Thrissur city, agriculture always had a second priority since olden days due to its prominence in trade and commerce. As per the records of Principal Agricultural Office, the total cultivable area available in Thrissur City is 9822 ha., of which 2309 ha. is wet land and 7513 ha. is dry land. Total irrigated area is about 6556 ha.

9.1.1 EXISTING SCENARIO

As per the land use map of Thrissur City, 33.42% (33.89 sq. km) of the land is used for agricultural purposes, out of which 12.65% is dry agriculture and 20.77% is constituted by paddy and wet lands. The distributionof agricultural land in Thrissur City is shown in fig 9.1. It can be seen that the agricultural concentration in wards Pullazhi and Nedupuzha are found to be maximum.

It can be seen from the socio economic survey that only 6.1% of people in Thrissur City are having a plot area greater than 25 cents. So it can be estimated that an increase in agricultural area cannot be expected in future.

One of the main problems faced in agriculture sector is the non-availability of labourers. People engaged in agricultural works are found to be decreasing. As per 2001 census, there was only 1.87% of agricultural labourers in the city. This value was reduced to 1.38% as per 2011 census. Comparison of percentage of agricultural labourers in all Municipal Corporations in the state are shown in fig 9.1. It can been seen that in all the Municipal Corporations in the state, the percentage of agricultural labourers is less than 2%. However, in Thrissur Municipal Corporation, the percentage of agricultural labourers are found to be comparatively high which was mainly due to the presence of agricultural lands within the Corporation area.

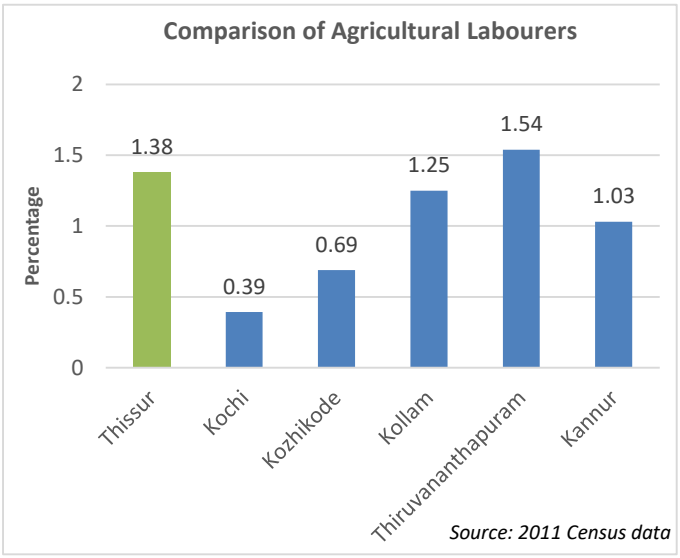


Fig. 9.1 Comparison of Agricultural Labourers with Other Municipal Corporations in Kerala

9.1.2 PADDY CULTIVATION

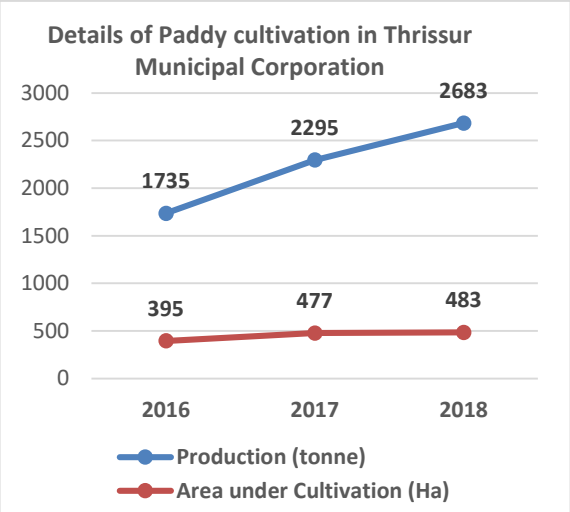
Paddy is one of the major crops cultivated in Thrissur district. It serves as a livelihood for a large number of people. It has also got a lot of ecological significance in this area. The paddy cultivated area in Thrissur City is only 3.19% of that in the district. Paddy cultivation is being taken up in seasons namely, *Virippu, Mundakan* and *Puncha*. *Virippu* is the Kharif crop, raised during the South West Monsoon season. *Mundakan* is the Rabi crop raised during Sep-Dec. The summer crop raised during Jan-May is called *Puncha* and is cultivated in areas of assured irrigation. *Mundakan* is the major crop in terms of area cultivated.As per the data obtained from Principal Agricultural Office, Thrissur, the area of cultivation of *virippu* has shown a very rapid decline from almost 201 ha in 1995 to just 11.66 ha in 2018. In the same way the cultivated area of *mundakan*andpunchahas also shown decline from 1817 ha to 201.42 ha and 768 ha to 270 ha respectively from 1995 to 2018. *Mundakan* and *puncha* cultivation is done in kole fields also. The area of cultivation in kole fields has shown a very rapid decline. The production has also reduced considerably during this period from 9780

tonnes to 2683tonnes. Area and production of different crops of paddy cultivation from 2016 to 2018 are given in table 9.1. From the table, it can be inferred that although the area of cultivation has reduced considerably during last 2 decades, through various activities and government initiatives to promote agriculture, the production and area under cultivation shows a slight increase in recent years. The same is represented graphically in fig.9.2. Seasonal variation of paddy production, as depicted in fig. 9.3 shows that production is more during *mundakan* and *puncha* crop season. This is mainly because of the cultivation in the wide range of kole fields in the city.

Table 9.1 Details of paddy cultivation in Thrissur Municipal Corporation

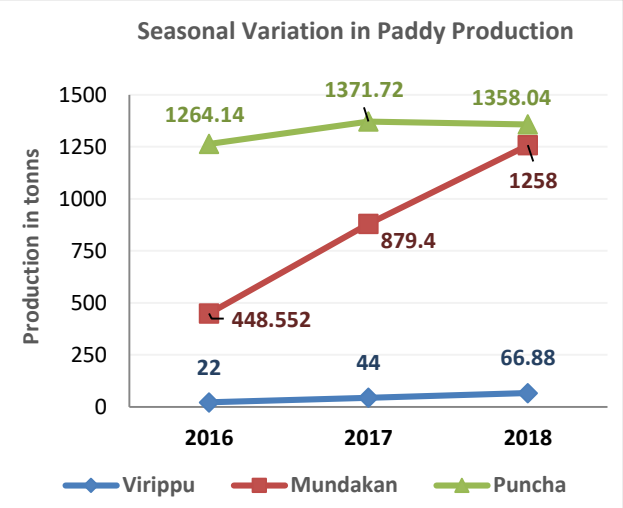
Crop		Production (tonne)			Area under Cultivation (Ha)		
		2016	2017	2018	2016	2017	2018
Paddy	Virippu	22	44	66.88	6	9.7	11.66
	Mundakan	448.552	879.4	1258	119.16	187.46	201.42
	Puncha	1264.14	1371.72	1358.04	270	280	270

Source: Principal agricultural office, Thrissur



Source: Principal agricultural office, Thrissur

Fig. 9.2 Details of paddy cultivation in Thrissur Municipal Corporation



Source: Principal agricultural office, Thrissur

Fig. 9.3 Seasonal variation of paddy production in Thrissur Municipal Corporation

The unique wetlands called Kole lands, lying at sea level contribute to Kerala's rice produce and paddy cultivation for centuries. The Kole wetlands are part of a long estuarine ecosystem. The kole lands of Thrissur spread along the Western periphery of the city mainly concentrated in Puzhakkal and some outskirts. Paddy lands without cultivation are under the threat of land conversion.



Fig. 9. 4 Kole land

Due to the redistribution of landholdings, area under paddy has decreased greatly. Farmers began diverting the waterlogged rice fields to perennial crops such as coconut or arecanut. They also started growing other more profitable crops like rubber. Land is habitually kept fallow for years since cultivation is not profitable and as a result, priority is given to cash crops such as rubber, banana, vegetables, coconut, arecanut, and nutmeg.

Padasekhara Samith is play a vital role in the agricultural activities by providing adequate facilities and support to the farmers. Details of padasekhara samithis in Thrissur Municipal Corporation area is given in table 9.2.

Table 9.2Details of Padasekhara Samithis in Thrissur Municipal Corporation

ക്രമനമ്പർ	പാടശേഖരസമിതിയുടെപേര്	സ്ഥലം/വില്ലേജ്	പാടശേഖരത്തിന്റെവിസ്തീർണം(ഹെക്ടർ)
1	കിഴക്കൻ കോൾ പോർകോൾ കർഷക സമിതി കണിമംഗലം	കൂർക്കഞ്ചേരി	15.196
2	വടൂക്കര ഓലക്കട കോൾ പടവ്	കൂർക്കഞ്ചേരി	16.062
3	അക്കരപ്പറ്റി കർഷക സമിതി നെടുപുഴ	കൂർക്കഞ്ചേരി	9.352
4	ചിയ്യാരം സമാജം കടുംകൃഷി സംഘം	കൂർക്കഞ്ചേരി	11.372
5	നെൽകതിർ മദാമ്മത്തോപ്പ് കിഴക്കുഭാഗം	കൂർക്കഞ്ചേരി	15.756
6	മദാമ്മത്തോപ്പ് പടിഞ്ഞാറ് ഭാഗം	കൂർക്കഞ്ചേരി	14.332
7	കോർഡിനേറ്റർ കണിമംഗലം അഡ്ഹേക് സമിതി സബ് കമ്മിറ്റി	കൂർക്കഞ്ചേരി	220
8	നെടുപുഴ കരിമ്പറ്റ കോൾ പടവ് കർഷക സംഘം	കൂർക്കഞ്ചേരി	25.74
9	മൂപ്പാടം നെല്ലുഉത്പാദക സമിതി	കൂർക്കഞ്ചേരി	12
10	കോച്ചേരി കോൾ കർഷക സമിതി	കൂർക്കഞ്ചേരി	16
11	നെടുപുഴ സൗത്ത് കർഷക സമിതി	കൂർക്കഞ്ചേരി	1.688
12	തുരുത്തും പാടം കർഷക സമിതി	കൂർക്കഞ്ചേരി	2.152
13	അിക്കുഴി പാടം കർഷക സമിതി	കൂർക്കഞ്ചേരി	2.472
14	കോടന്നൂർ കോൾ ഫാർമിംഗ് സൊസൈറ്റി	കൂർക്കഞ്ചേരി	39.728
15	കുടിചിറ	ഒല്ലൂർ	
16	കൂറൂവ	ഒല്ലൂർ	
17	ഓറിയാമ്പുറം	ഒല്ലൂർ	
18	അര്യൻ പാടം	എം എൽ എ റോഡ്	60
19	കല്ലായി	എം എൽ എ റോഡ്	60.7
20	എൽത്തുരുത്ത് കോൾ	എൽത്തുരത്ത്	32.4
21	പുല്ലഴി കോൾ	പുല്ലഴി	25.5
22	ചേറ്റുപുഴ വെസ്റ്റ്	പുല്ലഴി	19.02
23	പനിക്കര കിനി	പുല്ലഴി	
24	മത്തൻ കോൾ	അരണാട്ടുക്കര	20.2
25	മണിനാടൻ	അരണാട്ടുക്കര	33.18
26	പുറത്തി	അരണാട്ടുക്കര	31.5
27	കുറ്റിമുക്ക് പാടശേഖരം	നെട്ടിശ്ശേരി	27.31
28	നെട്ടിശ്ശേരിപാടശേഖരം	നെട്ടിശ്ശേരി	25.86

29	മുക്കാടുക്കരപാടശേഖരം	നെട്ടിശ്ശേരി	15.33
30	നല്ലങ്കരപാടശേഖരം	നെട്ടിശ്ശേരി	13.7
31	പുഞ്ചപാടം	നെട്ടിശ്ശേരി	7.4
32	ഇലഞ്ഞികുളം	നെട്ടിശ്ശേരി	4.94
33	കൊട്ടേപ്പാടം	വിൽവട്ടം	
34	കൂടപ്പാടം	വിൽവട്ടം	
35	പാറക്കുളം	വിൽവട്ടം	
36	വില്ലടം	വിൽവട്ടം	26
37	വിയ്യൂർ വടക്കേപ്പാടം	വിൽവട്ടം	
38	നെല്ലിക്കാട്	വിൽവട്ടം	9

Source: Principal Agricultural office, Thrissur

Distribution of paddy fields in Thrissur Corporation area is shown in fig. 9.5. From figure, it can be seen that paddy is mainly distributed in the outer areas of the city and is mainly concentrated in wards Pullazhi, Nedupuzha, Poonkunam, Mukkattukara, etc.

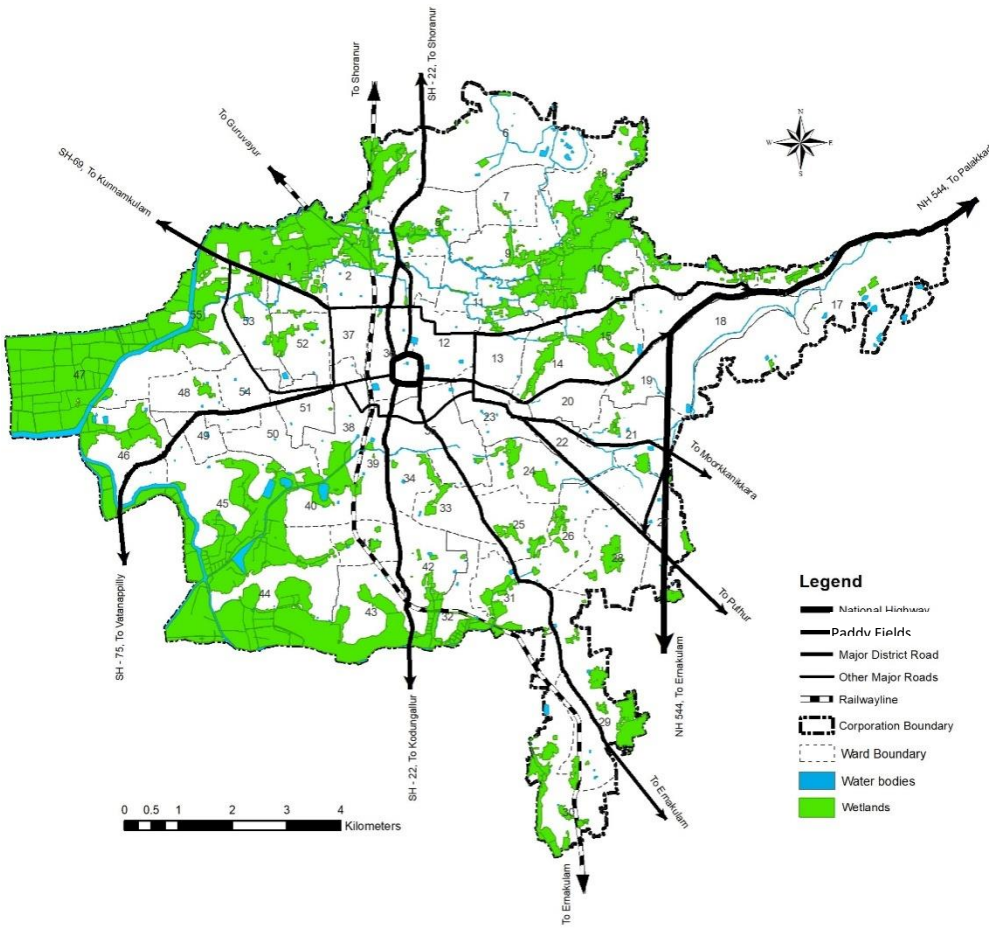


Fig. 9.5 Distribution of paddy fields in Thrissur Municipal Corporation

9.1.3 DRY AGRICULTURE

Apart from paddy cultivation, dry agriculture play an important role in Thrissur City. The major cash crops cultivated in the city are coconut, arecanut, pepper, tapioca, cashew,

nutmeg, banana and vegetables. Except rubber, other cultivations are done inside the house premises instead of separate land for cultivation. The details of area and production of cash crops are shown in table 9.3. From the table, it can be seen that tapioca, vegetables, pepper and nutmeg cultivation shows increase in production. This is due to the awareness of the

Table 9.3 Details of cash crop cultivation in Thrissur Municipal Corporation

Crop		Production (tonne)			Area under Cultivation (Ha)		
		2016	2017	2018	2016	2017	2018
Dry Agriculture	Coconut(nuts/year)	14812375	14554375	14252475	1361.24	1418.64	1456.14
	Arecanut	878.836	794.23	675.482	106.35	92.4	83.105
	Pepper	272.389	286.492	306.358	50.7	48.86	52.32
	Tapioca	2580.5	3291.75	3923.5	19	25.55	32.95
	Cashew	25.164	19.918	18.581	16.45	14.35	11.85
	Nutmeg	14.784	19.622	21.738	25.96	32.31	36.39
	Banana (Nendra)	427.248	375.625	363.75	29.2	28.05	33.3
	Other Bananas	280.27	265.74	273.54	94.4	101.05	104.85
	Vegetables	97.166	111.888	132.484	39.8	47.1	58.8

Source: Principal agricultural office, Thrissur

better management practice to be adopted in plantations and due to fertilize effect. Although area under cultivation of coconut and banana have increased, the productivity shows a decrease.

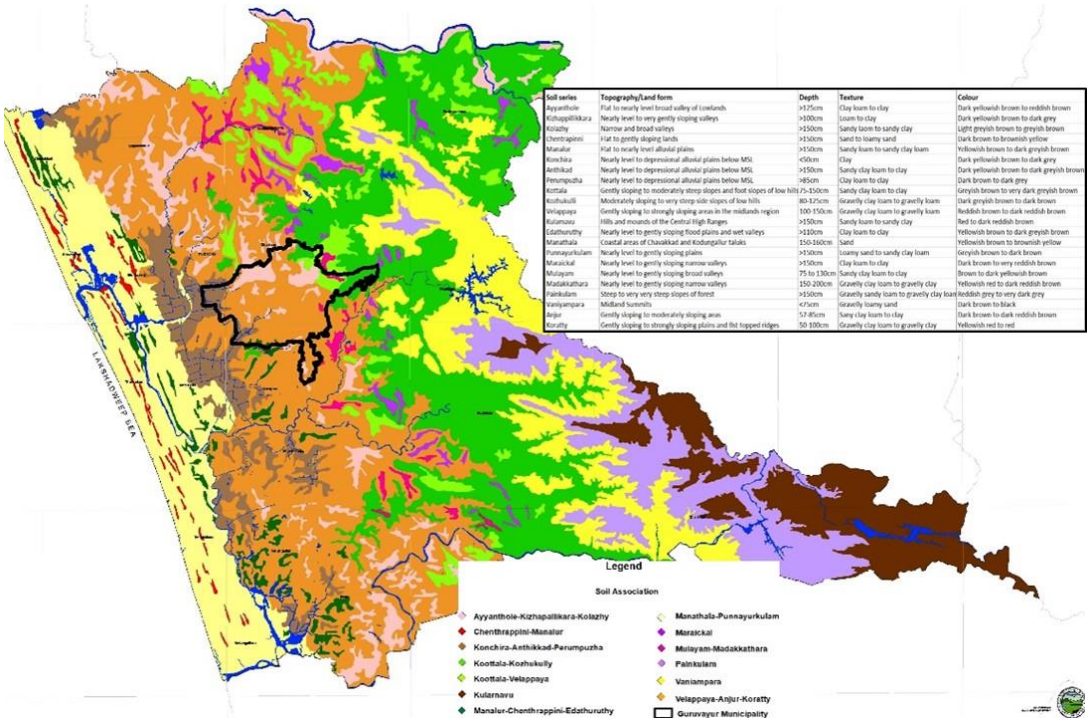


Fig. 9.6 Soil suitability map of Thrissur District *Source: IDDP Thrissur, 2012*

Floriculture can fetch a fixed income to the cultivators and the demand can be seen to increase in market. Various floriculture clubs are functioning within the city. No medicinal plants are cultivated inside the city. Medicinal plants can be grown and this will help the farmers. These can also be done by women at home which will be a highly beneficial hobby. Agricultural development will help improving the economical status of the cityas well as to make the city self-sufficient.

The soil suitability map of Thrissur district, as given in fig. 9.6 shows that the town belongs to Velappaya-Anjur-Koratty, Mulayam-Madakkathara, Manalur-Chenthrapinny-Edathuruthy, Koottala-Kozhukully, Ayyanthole-Kizhipilllikkara soil series.Suitable crops for this soil series are paddy, coconut, rubber, vegetables and banana.

9.1.4 IRRIGATION FACILITIES

As per the existing scenario the city is irrigated mainly through rainwater, streams, *thodu* and the irrigation canals from Peechi.The *puncha* cultivation mainly depends on the irrigation canals. Some ponds are also used for agricultural purposes. The main ponds used for irrigation are *Vadakkechira, Padinjarechira* and *Kolepadavu*. The *Panchikkalthodu* at Ayyanthole, *Attachirathodu* at Viyyur and *Puzhakkalpuzha* are also used for irrigation purposes. There exist 33 ponds within the Municipal Corporation area, but the physical conditions of these ponds are not good. Hence by proper care and management, these ponds can be transformed for irrigation purposes and even for drinking water purposes. Various ponds within the city area are listed in table 9.4.



Fig. 9.7 Vadakkechira

Table 9.4 Ponds within Thrissur Municipal Corporation area

Sl. No	Name of Pond	Sl. No	Name of Pond	Sl. No	Name of Pond
1	Padinjarechira	12	Vadakkechira	23	Aalumkulam
2	Pallikulam	13	West Place Road Pond	24	Viyyur Pond
3	Keeramkulangara pond	14	Puthankulam	25	Pandikavu pond
4	Paramekkavu Temple pond	15	Kanattukkara Kulam	26	Peringavu Pond (2 nos)
5	Ambadikulam	16	Vanchikulam	27	Alayngattukulam
6	Vettukulam	17	Parakulam	28	Varappilly Kulam
7	Kannapuram Kulam	18	Panamkuttichira Kulam	29	Avanure Kulam
8	Manathittakulam	19	Manalipadam Kulam	30	Manalarkavu Kulam
9	Karthyayani pond	20	Cheerachi Kulam	31	Dhanwathiri Kulam
10	Koalpadavu	21	KothaKulam	32	Aanakulam
11	Elanjikulam	22	Vathikulam	33	Chira

Source: Municipal Corporation, Thrissur

Map showing the micro watersheds in Thrissur Municipal Corporation is shown in figure 9.8. From the map, it can be seen that Thrissur Municipal Corporation is part of 34 micro watersheds, either wholly or partially. Proper water management has to be implemented with the help of specialists / experts, which will help the cultivators. The quantity of water required can be reduced by proper management. Use of drip irrigation, sprinkle irrigation, etc. instead of ponding will help to increase the output for a variety of crops. This will also help to reduce the water wastage, soil removal and will help to the maximum utilization of fertilizers used. The method of irrigation that helps the cultivation has to be identified with the help of specialists.

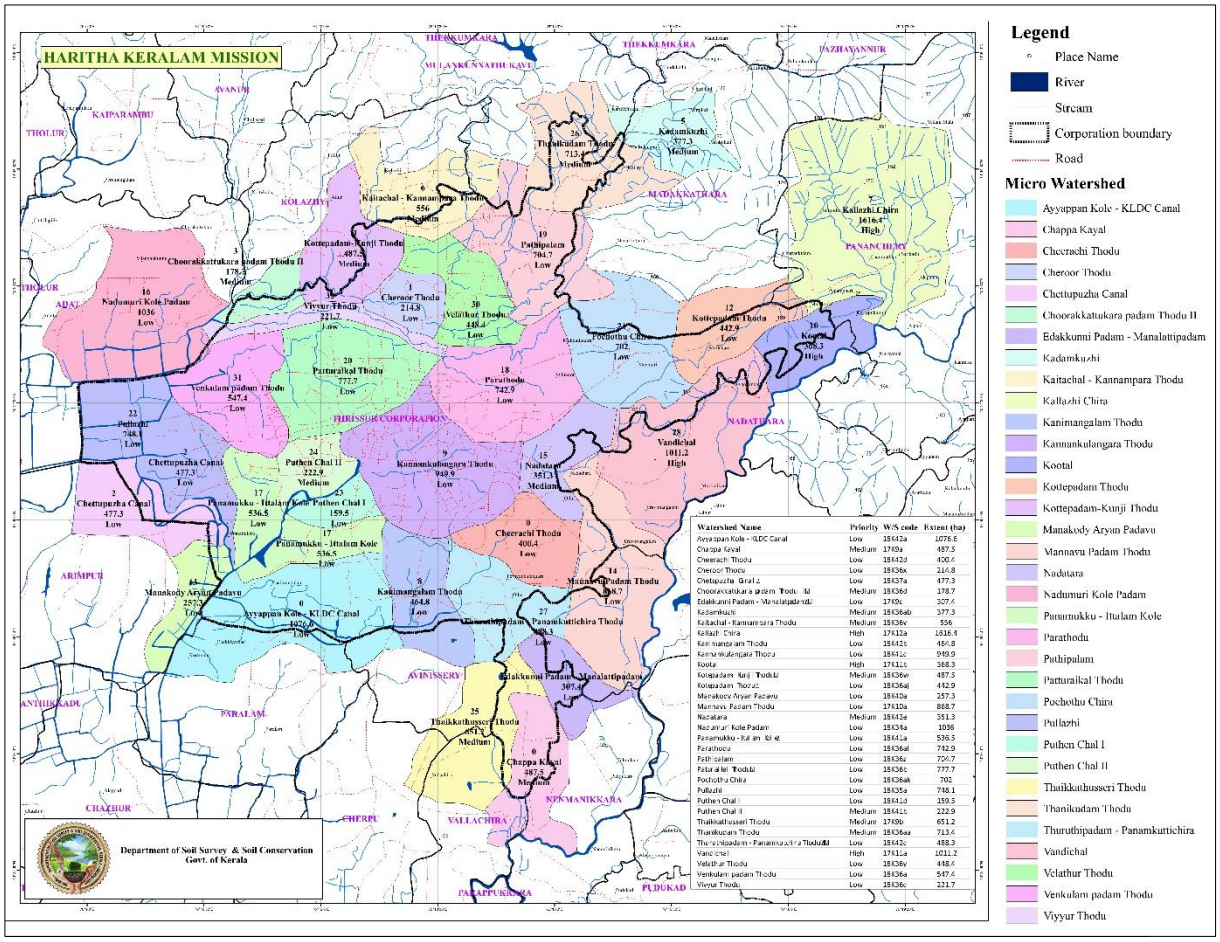


Fig. 9.8 Micro watersheds in Thrissur Municipal Corporation

(Source: Dept of Soil Survey & Soil Conservation)

9.1.5 TRADING FACILITIES

There are some weekly markets functioning in various parts of the city.Rice market (Ariyangadi)near High Road, Jai Hind Market near M.O.Road and vegetable market at Sakthan Nagar are prominent in marketing these special items.

9.1.6 PROBLEMS AND POTENTIALS

The major problems faced in the agricultural sector are as follows:



Fig 9.9 Conversion of paddy land

- Non- availability of good quality seeds
- Conversion of paddy land for other uses
- Scarcity of labourers / machinery
- Lack of water management facilities
- Degradation of double crop lands to single crop
- Spread of crop diseases and pests
- Lack of facilities for export and marketing
- Natural Calamities
- Problem to find markets
- High price of manures
- Formulation of an integrated project for kole lands for infrastructure, ecosystem, fisheries, animal husbandry, etc.
- Lack of research focusing on special issues like new variety, acidity, etc. for kole lands.
- Lack of sufficient extension activities by Krishibhavan.
- Lack of system for forecasting pest and disease out breaks.
- Contamination of wastes thrown out by urban population into kole lands.

9.1.7 SCHEMES/PROGRAMMES IN THE AGRICULTURAL SECTOR

Agriculture department distributes various funds from Central and State governments through the 6 Krishi Bhavans in Thrissur Municipal Corporation. Main projects in the agricultural sector are as follows:

- Provide subsidies to paddy cultivators for purchase of seeds, manure, medicines, etc.
- Free electricity for farmers
- Pension for farmers above 60 years of age
- Fund for fruit and vegetable cultivation utilizing the horticulture mission fund.
- Provision of basic amenities for paddy lands according to Rashriya Krishi Vikas Yojana
- Loans for purchase of machineries, starting bio gas plant, etc.
- Funds provided for drip and lift irrigation facilities
- Insurance for paddy
- Provide good quality hybrid variety of breeds of animal
- 'Subiksha Keralam' scheme- aims at large scale production of paddy, fruits, vegetables, tubers, grains and legumes as part of achieving self-sufficiency.

9.2 ANIMAL HUSBANDRY

In olden days most of the people depends on agriculture as their main source of life. Hence cattle are reared for milk, ploughing in field, pulling the bullock carts and as a source of bio fertilizer. The decrease in area of paddy cultivating lands, modernization of cultivation methods, non-availability of workers were also resulted in the degradation of cattle rearing. In the present scenario, cattle are used only for milk and meat. Animal husbandry sector

provides milk, meat, egg, manure, hide and work force. The major incomes generating animal wealth are milk, meat and egg. It is of vital importance in generating additional employment opportunities & supplemented incomes of small and marginal farmers.

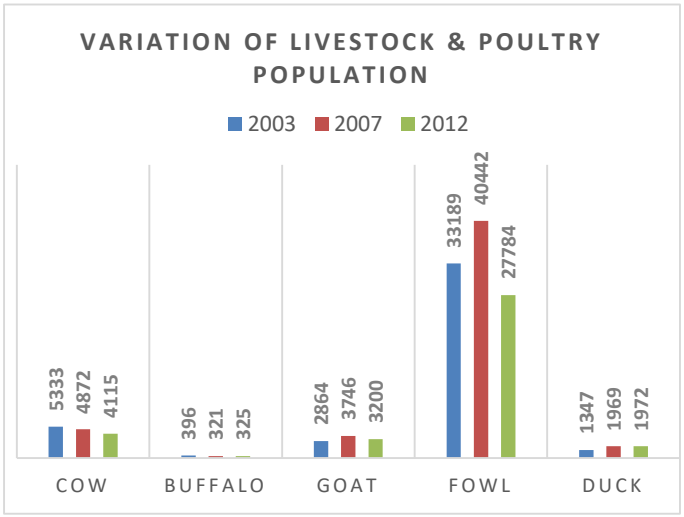
The livestock population in Thrissur Corporation area as per the 19th Livestock Census Report of 2012 is detailed in table 9.5. It mainly includes cattle, buffalo, fowl, duck, goat, dog and others. Domesticated dogs shows the highest number followed by cattle and goats. Poultry shows a greater number in the city in which fowls are the most common with a total number of 27,784.

Table 9.5 Livestock Population in Thrissur City

Livestock/ Poultry	Cattle			Buffaloes	Goats	Dogs		Others	Total Live Stock	Fowls	Ducks	Others	Total Poultry
	Indigenous	Cross bred	Total			Domestic	Others						
No.	4	4111	4115	325	3200	7724	1297	2733	19394	27784	1972	-	29756

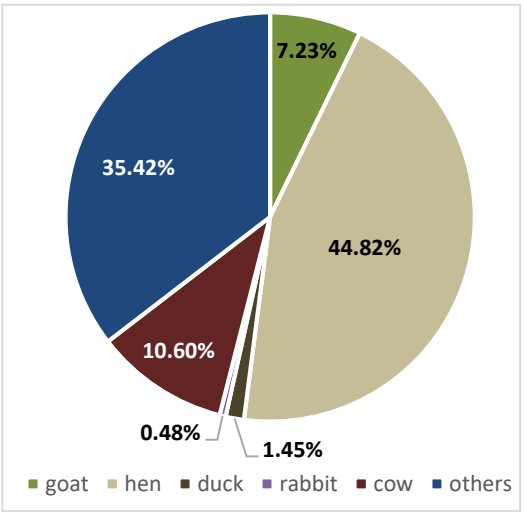
Source: 19th livestock census report - 2012

Of the total livestock population in the District, Thrissur city has only 3.4% of livestock population. A striking feature of poultry development in the city is the prevalence of backyard poultry farms. Moreover the economic factor of poultry farm is much above other livestock sector.



Source: 17th, 18th& 19th livestock census reports

Fig 9.10 Variation of Livestock& Poultry Population



Source: Socio-economic Survey - 2019

Fig 9.11Details of domestic animals

The details of domestic animals obtained from socio economic survey is represented in fig. 9.11. From the graph it can be seen that out of the total animals domesticated, about 46% is constituted by poultry. 44.82% of the domesticated animals is constituted by hens/fowls, followed by cow (10.60%), goat (7.23%). About 35.42% of the domesticated animals in constituted by other category which includes dogs, pigs, etc. It can be seen that

about 42.93% of houses have hen at their houses. It was found that about 17.75% of houses have at least one domestic animal except dog. It can also be found from the survey that only 4.83% of the households domesticate animals for their various needs.

9.2.1 PRODUCTION AND CONSUMPTION PATTERN OF ANIMAL HUSBANDRY PRODUCTS

Indian Council of Medical Research (ICMR) recommends 280ml of milk, 16g of meat and 0.25 egg/day per person respectively. National egg co-ordination committee recommends half an egg per day. But the gap between requirement and availability of milk, meat and eggs are getting higher. Details of the production and consumption of various by-products of animal husbandry sector are discussed below.

Table 9.6 Dairy farms in Thrissur MC

Sl. No.	Dairy Production Unit	Milk Production (Litres/day)
1	ULF Farm, Mannuthy	550
2	Chettupuzha	28
3	Veliyannur	150

Source: Dairy Development Office, Thrissur

For milk products, 3 dairy farmsare located within the Municipal Corporation area, the details of which are given in table 9.6. Total 728 litres of milk is produced daily in these dairy farms. Apart from these dairy farms, there are 8 milk collection centres/societies in the city, which collects milk from household dairy farmers. Details of dairy societies are given in table 9.7. About 2700 litres of milk collected daily through these societies, which is about3% of the total consumption in the city. In addition to this, a dairy plant of MILMA is functioning at Ramavarmapuram.As per the ICMR recommendations, approximate daily requirement of milk in the city is 88468 litres. But the daily production is only 728 litres. The gap between the demand and the production in the city is very high. In order to meet the demand of the people, it made available from other outside areas and sources.

In Thrissur District, meat is marketed both under authorized sector as well as unauthorized sector. There are 2 authorized slaughter houses in the city located at Kuriachira and Veterinary College, Mannuthy. As per ICMR standards about 151660kg/month meat is required in the city. Kuriachira slaughter house situated in a 3 acre land. About 236750kg/month meat is produced at Kuriachira slaughter house. Around 35 numbers of cattle are slaughters every day brought from Laloor, Kuzhalmannam, Vaniyamkulam, etc. They are tested by a veterinary doctor the evening before and slaughtered the next morning in their presence. The slaughtered meat is taken from there by the owners and waste is treated there itself in a treatment plant. Cow dung is taken by farmers. Skin and blood fetched by agencies. There are a number of unauthorized slaughter

Table 9.7 Milk Societies in Thrissur MC

Details of Milk Collection		
Sl. No	**Unit**	**Milk collection (Liters/day)**
1	Villadam	190
2	Ollukkara	209
3	Puzhakkal	50
4	Chiyyaram	252
5	Koorkkencherry	24
6	Nedupuzha	625
7	Anchery	517
8	Cherur	77

Source: Dairy Development Office, Thrissur

houses working in the Corporation. Their safety measures cannot be ensured. The slaughter houses functioning in the city serves the nearby panchayats too.

There are 3 poultry farms/selling outlets and 2 hatcher is in the city. Details of the poultry farms are given in table 9.8. As per the ICMR recommendation, about 23.7 lakhs eggs are required per month for the population. The egg production does not meet the requirement and leaves a big gap in availability of eggs, which is met by supplies from neighbouring states.

Table 9.8 Poultry farms/outlets in Thrissur MC

South Indian Poultry Farm, Mannuthy	No. of Birds Reared - 5000
Broiler Farm/Selling Outlet, Olari	Average Number of birds sold - 300
Broiler Farm/Selling Outlet, Ayyanthole	Average Number of birds sold - 300

Source: Secondary data

The monthly requirement of animal husbandry products in the city as per the ICMR recommendations is given in table 9.9. It is understood that production of these within the city in far behind the demand. The consumption of milk, meat and eggs are increased due to the upcoming of more restaurants, hotels, flats and the Govt. decision to give milk to each student upto high school under Govt. sector. During earlier years, cattle breeding helped to meet the need of natural manure and other agricultural works. But with the decline of agriculture sector, number of cattle also reduced considerably. This has resulted in a reduction in milk and meat production in the city. So to meet the increased need, animal husbandry products are brought from neighbouring states.

Table 9.9 Monthly requirement of animal husbandry products in Thrissur MC

Product	ICMR Recommendations (per day per person)	Approximate Monthly Requirement in the city	Approximate Monthly Production in the city
Milk	280 ml	2654039 Litres	81000 litres
Meat	16 gm	151660 Kg	-
Eggs	0.25	2369678 nos	-

Source: ICMR, Dairy Development Office, Thrissur

9.2.2 MARKETS

The meat and egg produced in Thrissur city is sold mainly through local markets inside and outside the city. Though there are authorized slaughter houses and authorized sales counters for milk, meat and egg, large number of unauthorized markets sale of low quality and disease bearing livestock products are functioning in Thrissur City. Majority of animals are brought from neighbouring States.

There exists 9 sales counter for milk produces, 59 for egg and 11 for meat. Kerala Veterinary and Animal Sciences University at Mannuthy has provision for the sale of meat, milk, egg and their allied products. The increasing demand of milk, meat and eggs has forced us to import them from neighbouring areas. The quality of such products has to be ensured by proper yardsticks by appropriate authorities.

In order to explore the market for livestock products our production strategy need to be market oriented in nature. It should be in tune with local, domestic and international market. Production and branding of traditional livestock products, which fetches good price, should be promoted. Cost of production has to be reduced considerably without affecting the quality of products. Changes in the extension approach, market forecasting system, value addition, awareness on diseases affecting trade of livestock products, consumer behaviour, production of livestock products based on the demographic characteristics of the population, good manufacturing and retail practices, best production practices and implementation of food safety norms, etc. need more emphasis.With the help of such agencies, farmers will be able to get more awareness on value addition, food safety norms, branding and problems and prospects of marketing including the four cardinals of marketing like product, price, promotion and place.

Ducks, emu, turkey, goose, etc. are reared mainly for their products due to the high demand for meat and eggs. Many people are coming into pet bird farming as it fetches good income. There are seven ornamental farms in Thrissur city. Main Ornamental Poultry includes Cochin Bandom, Silky Fowl, Brahma, Polish Cap, Game Bandom, Ruffled feather Fowls, Millie fleur etc. The Emu rearing is getting more and more popular nowadays. It is reared for oil, meat and egg and also kept as a pet. Fancy Pigeon farming is an emerging field in aviculture sector in Kerala. The Rabbit rearing is also a profitable business, not only its meat but also its fur fetches good price to the farmer. The Rabbit meat is relished by many and is very nutritious. The Pet animals and birds rearing can fetch a good income and people are coming into this field.

9.2.3 VETERINARY HOSPITALS

The Veterinary institutions of Animal Husbandry Department comprise of lower level breeding centers namely (ICDP) sub centres, veterinary dispensaries and veterinary hospitals extending health care facilities to the livestock and poultry. One Veterinary sub centre at Chettupuzha and Veterinary hospital at Thiruvambady are working inside the city under Animal Husbandry Department. District Veterinary Centre (DVC) which is situated at Thiruvambady is headed by the Chief Veterinary Officer. This institution is acting as the referral centre. DVC is having an active elephant squad which is having capture gun facility. Apart from these Veterinary Hospitals under Animal Husbandry Department there are two Veterinary Hospitals of Kerala Agricultural University, one at Kokkalai and other at Mannuthy which are considered as state level referral Veterinary Hospitals.

9.2.4 OTHER RELATED DEPARTMENTS AND AGENCIES

1. Kerala Agricultural University – College of Veterinary and Animal Sciences, Mannuthy
2. College of Dairy Science and Technology, Mannuthy
3. Dairy Development Department, Chembukavu
4. MILMA, Ramavarmapuram

5. State Zoo
6. KaadaValarthal Society (Thrissur Jilla panchayat Hatchery), Ollur
7. Animal Welfare Organisations (Blue cross society, Mannuthy; Aanapremisangam, Thrissur, etc.)
8. Dog Squad Training Centre, Ramavarmapuram
9. Incentive cattle development project sub centre, Thiruvambady
10. Society for prevention of cruelty against Animals (SPCA) functions in the district Veterinary centre, at Thiruvambady
11. Medicine store at Ayyanthole

9.3 FISHERIES

Thrissur City has no coastal region. There are three authorized fish markets working within the city. Here fishes are brought from other places. About 40 people are working in this sector. But unauthorized fish sale centres are also working at places like Patturaikkal, West fort, Olari, Ayyanthole ground, East Fort etc. As per the data from fisheries office 18 families are registered as fisherman in the city.



Fig 9.12 Fish market

There are 33 ponds in Thrissur City (details in table 9.3), some of which can be utilized for cultivation of fish. Many more private ponds exist in the city. They are filled and used for other purposes. These ponds can be used effectively for fish hatcheries. This will help to meet the need of Thrissur City and also help to employ certain number of people.

9.4 INFERENCE

From detailed study of the agricultural crops of the city it can be identified that the land used for agricultural purposes is diminishing. The congested living condition, high value of the land and unawareness are the main reason behind this. A reported decline in the area under cultivation can be offset by farming high-yielding crop varieties and harnessing advanced technology.

The uncultivated paddy lands especially kole lands are to be cultivated with the help of public private partnership. The paddy lands that are kept vacant during summer months can be located and vegetable cultivation carried out by organizing farmers into small groups and offering attractive subsidies. Paddy lands in off seasons are to be used for cultivation of vegetables so as to attain self-sufficiency in the field of agriculture. Availability of good quality and chemical free vegetables can be ensured only by promoting homestead cultivation of vegetables. By providing farm inputs such as seeds, manures and plant protection chemicals, farmers avail the benefit of large scale economies.

Efficient and economic use of water is ensured with the implementation of schemes such as promotion of micro irrigation. Drip and sprinkler irrigation systems are promoted under this scheme. Increase in use of organic manures, compost, biological agents, bio fertilizers and bio pesticides instead of chemicals, extensive farm mechanization, increase in area under fish farming, fragmentation of land holdings, etc. will help in the rise of agriculture sector.

Study classes and financial assistance are to be given for those who are interested in floriculture and medicinal plant industry. This will help to earn high income due to increasing demand in this sector. The modern agronomy, plant breeding, pesticides and fertilizers and technological improvements have sharply increased yields from cultivation, but at the same time have caused widespread ecological damage and negative human health effects.

Considering the animal husbandry sector, it can be seen that the production of milk and egg in the city is very less compared to its demand. But the meat production is higher than that required as per ICMR recommendations. These meat production centres can serve to wider areas to the adjoining panchayats. To meet the demand of milk and egg we have to implement dairy farms, milk collection centres and poultry farms. The execution of these plants generates a lot of wastes and proper waste disposal and managing methods are also to be implemented such as biogas plant, conversion of waste to fertilizers etc. Public private partnership can be proposed for development of these sectors.

Sectors like dog breeding, fancy bird rearing, rabbit rearing and elephant rearing and animal welfare issues need to be given more emphasis in the future. There exists a wide gap between availability and consumption of animal protein sources. So the immediate challenge is to fill this gap so as to achieve sustainable food security in the district.

Agriculture and its allied sector plays an important role in the day to day life of the people in area. They can act as an economic base as well as meet the primary need for food for the people. But in an urbanised area like Thrissur, we can see that the importance of agricultural and its allied sector have been reduced. Promoting these sectors in an efficient and innovative manner will be beneficial to the city and its population.

CHAPTER 10
TRAFFIC & TRANSPORTATION



Transportation planning is essential for any region to design and prepare for future needs so as to ensure better mobility of people and goods. The increased urban development and traffic congestion have made it more necessary to effectively manage traffic in the cities. In order to make the flow of traffic timely and orderly, transport system management measures should be accepted. This chapter details out the base line traffic and transportation data and also schematic transport development plan for Thrissur city based on the study conducted by KSCSTE-NATPAC in 2019.

10.1 INTRODUCTION

The purpose of Master Plan is to formulate long term land use and other development proposals for the horizon period to have balanced growth of the Urban Centres. As part of this exercise, the Department of Town & Country Planning has entrusted KSCSTE-NATPAC (Kerala State Council for Science, Technology & Environment - National Transportation Planning & Research Centre) to carry out Traffic and Transportation Studies for Thrissur City. The outcome of the study will serve as useful inputs for preparation of Transportation Sectoral Plan.
The objectives of the study are as follows:

- To assess the existing transportation network {Road, rail, water, air} and to identify the traffic bottlenecks.
- To study the traffic volume on selected roads and to assess the extent of shortfall of the road system
- To study the traffic, parking and pedestrian characteristics
- To study the Origin-Destination characteristics of passenger and goods traffic passing through the town for all modes;
- To assess problems and potentials of all modes of transport, like public transport such as bus, Water, air and rail, IPT, NMT, etc.

- To assess the traffic flow pattern for the horizon year and formulate a road development plan for the town and frame specific proposals on measures to encourage public transport including suggestions on new bus routes, proposals to promote non-motorized transport, multi-modal integration, pedestrian and parking facilities

The transportation network of Thrissur city is shown in fig. 10.1. Thrissur is well connected to different places through good road and rail network. National Highways NH-544 and NH-66 passes through Thrissur district but only NH-544 passes through the city. NH-544 traverses the city from different points and gain access to nearby cities like Kochi, Coimbatore and Palakkad. The state highways Kodungalloor-Shornur (SH-22), Thrissur-Kuttipuram (SH-69) and Thrissur-Vadanappilly (SH-75) passes through the city and connect other local bodies. It also has many arterial roads which connect to other parts of the district.

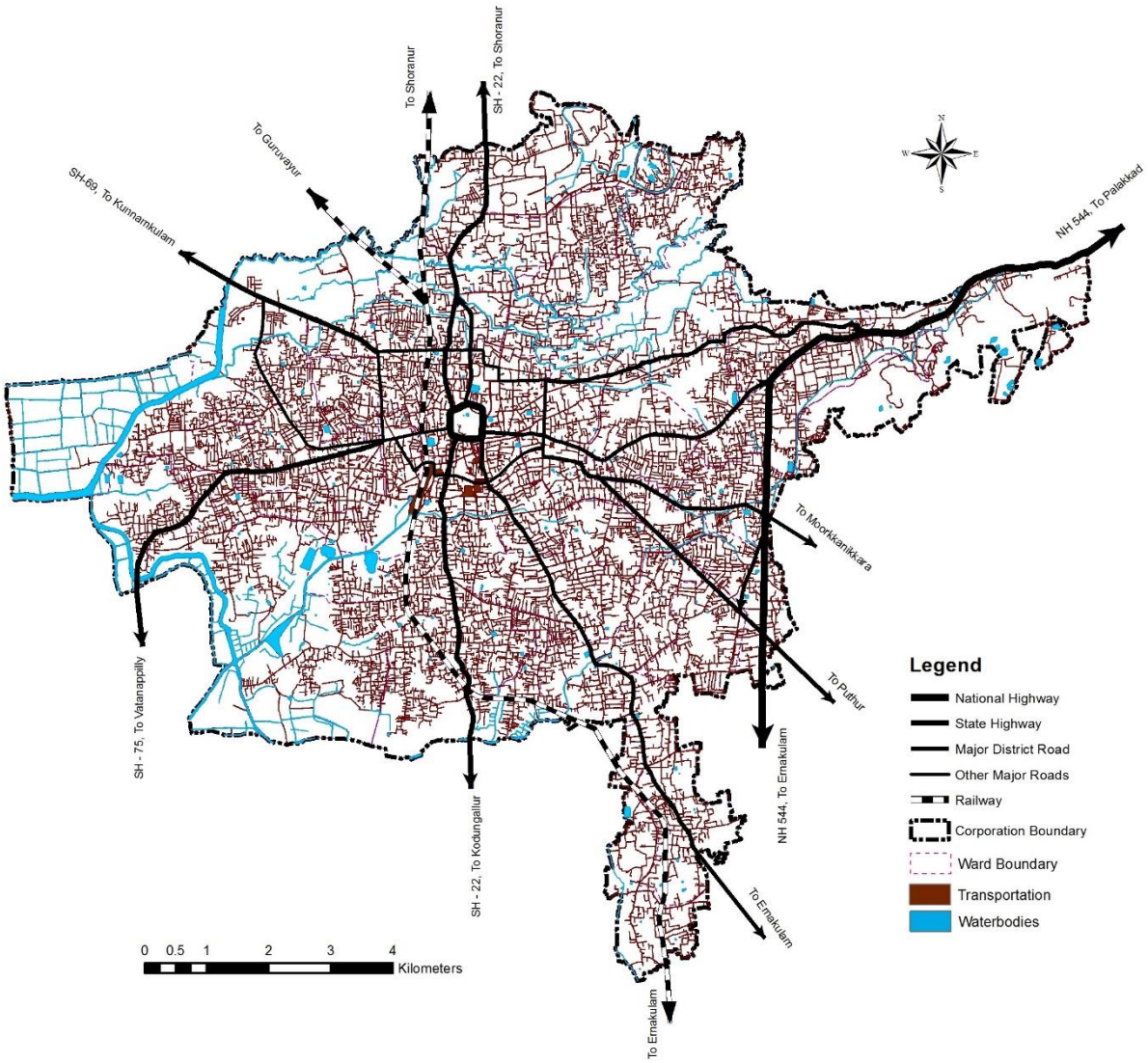


Fig 10.1 Transportation Network of Thrissur City

10.2 CHARACTERISTICS OF TRANSPORTATION NETWORK

10.2.1 ROAD TRANSPORT

Road network in Thrissur city is constituted by National Highway (NH 544), State Highways (SH 22, SH 75, and SH 69), arterial roads and various collector streets. The major roads in the city helps in intra city, intercity, intra state and interstate transportation. Thrissur City is served by public transport system consisting of both State owned Kerala State Road Transport Corporation (KSRTC) and private buses. State-owned KSRTC runs inter-state, inter-district and intra-district services. There are fairly large numbers of private buses meeting the travel demand of the people of Thrissur. The city has three bus terminals viz. KSRTC Bus Stand near Railway Station, Sakthan Thampuran Private Bus Stand in Sakthan Thampuran Nagar, Vadakke Stand (Northern Bus Stand) nearby Round North. Intermediate Public Transport Modes (IPT) like auto and taxi services are also common in the city.



Fig 10.2 Sakthan Thampuran Bus Stand



Fig 10.3 KSRTC Bus Stand Thrissur

Thrissur has several bus terminals that offer buses for short and long distance routes. The North Bus Stand is located at the middle of the city and provides bus services for traveling from one place to another within Thrissur. The KSRTC bus depot offers inter-state and long distance bus services to the tourists.

The Sakthan Thampuran Private Bus Stand Thrissur, is one of the largest private bus stations in Kerala, and is located at the southern part of the city core. The bus stand is named after the renowned ruler of Thrissur, Sakthan Thampuran and it is situated in Sakthan Thampuran Nagar. This Bus Stand is in close proximity to one of the most important commercial areas of the city. It serves as the origin of various intra and intercity bus services to places such as Kodungallore, Irinjalakuda, Triprayar, Kunnamkulam, Guruvayur, Ollur, Peechi, Palakkad, Manjeri, Kozhikode, North Paravur, etc.

As per the data from Thrissur Municipal Corporation, there exist 1168 kms of road stretch in the city out of which 1105 kms constituted by surfaced roads and 63 kms by unsurfaced roads.

10.2.2 RAILWAYS

Thrissur Railway Station is a major railway head in South India and A1 classified station operated by the Southern Railway zone of the Indian Railways and comes under the Thiruvananthapuram railway division. It is the busiest railway station in Kerala state in terms of rail traffic with 189 halting trains. Daily trains are available to Mumbai, New Delhi, Kolkata,

Bangalore, Chennai, Mangalore, and Hyderabad. This station lies on the Shoranur – Cochin Harbour section, which is one of the busiest railway corridors in Kerala. It has three satellite stations, Punkunnam railway station and two minor stations, Ollur railway station and Mulankunnathukavu railway station. Thrissur Railway Station also connects to the temple town of Guruvayur by Thrissur-Guruvayur Section.

Suburban rail services from Thrissur to other neighbouring districts are on the cards. This will provide fast connectivity to Kochi, Kottayam, Alappuzha districts. The Delhi Metro Rail Corporation had carried out a study on the feasibility of operating an inter-district suburban-rail service. The report said that suburban services were possible in the Guruvayur-Thrissur-Kochi; Alappuzha-Kochi; and Kochi - Kottayam sectors.

10.2.3 INLAND WATER TRANSPORT

In earlier times, there was goods transportation from Aranattukara (Vanchikulam) to Cochin and Ponnani through the Canoli Canal. Vanchikulam Boat Jetty was one of the major transshipment points for the goods transportation of the region. When the road transportation came into prominence, the waterways were relegated to the background.

10.3 ONGOING PROJECTS

The Thrissur Municipal Corporation is implementing a number of projects under the Central Government's Amrut scheme as part of urban transport reforms. Construction of new foot paths and upgrading of existing ones are undergoing in division nos 2,3,5,32,37. Existing roads within the Corporation are being repaired as part of Amrut. About 75% of total work has been completed. Some of the other important Projects are listed below:

- Construction of Sky Walk (Akasapatha) for pedestrians has started at Mathrubhumi Junction near Saktan Bus Stand and Market.
- Foot over bridge near the North bus stand.
- Construction of Foot Subway at MO Road near Municipal Office.

10.4 EXISTING TRAFFIC CHARACTERISTICS

The existing traffic characteristics in Thrissur City were studied to identify the main problems and potentials here. To compile necessary inputs for the study, various primary surveys were conducted in the study area. For the purpose of carrying out the surveys, major roads in the study area were divided into 111 homogeneous sections based on the land use and traffic characteristics. Various surveys carried out for transportation study are as follows:

- Road network inventory survey
- Speed and delay survey
- Link volume survey
- Turning volume count survey
- Origin-destination survey
- Entry/ Exit survey at bus terminals

- Parking Survey
- Pedestrian Survey

10.4.1 ROAD NETWORK INVENTORY SURVEY

An understanding of the extent and quality of road network is very important to formulate plans for the future. Road inventory survey were carried on all the major roads to obtain information like road length, width, right of way, cross-sectional components, surface condition, adjacent land use type etc.

10.4.2 SPEED AND DELAY SURVEY

Speed of vehicular traffic largely reflects the level of service, capacity, and efficiency of road network. To understand these aspects, Speed and Delay survey conducted in all the major roads of Thrissur City by adopting the 'Moving Car Observer' method. The test vehicle was allowed to run at the perceptible average speed of traffic stream along the project road. The observers traveling in the test car recorded the journey, running & delay timings, and the cause of delays, if any. The test vehicle ran in both directions of the traffic stream, and in both peak/off-peak hours. A total of 27 road stretches in the city were observed as part of the study.

10.4.3 LINK VOLUME SURVEY

Traffic volume is an important input to understand the efficiency at which the system works and the general quality of service offered to road users. Link volume count survey was carried out at mid points of all the homogeneous sections within the study area between 8.00 AM and 8.00 PM. The survey was conducted for a period ranging from 4 to 12 hours depending on the intensity of traffic and availability of past traffic data.

10.4.4 TURNING VOLUME COUNT SURVEY

The level of service of urban roads to a great extent depends on efficient control of traffic at road intersections. Thus, the intersections have an important role to play in efficient and smooth traffic flow in the network. Turning movement survey was conducted at 41 major intersections in the city to obtain information on the directional movement of traffic. Classified traffic volume counts of all vehicle types were made separately for all turning movements from each approach arm as per guidelines given in IRC SP 41. The survey was conducted by recording traffic for each successive 15-minute intervals, for a period of four to eight hours during the morning and evening peak periods. The data on peak hour volume with turning movement flows was used to analyze the traffic in the intersection.

10.4.5 ORIGIN-DESTINATION SURVEY

Origin-Destination survey (O-D Survey) was carried out with the primary objective of studying the travel pattern of passenger and goods traffic into Thrissur city and identifying the significant traffic generating and attracting areas. An analysis of the traffic movements will provide the proportion of bye-passable traffic along with the major external interaction areas.

Origin-destination surveys were conducted at six major entry/exit points in the city. The survey was carried out for a duration ranging between 12 and 24 hours. List of outer-cordon survey locations are given in table 10.1. The O-D survey was conducted as per the guidelines in IRC: 102. Roadside Interview Method was adopted for conducting the survey. The vehicles were stopped at random with the help of police, and the drivers were interviewed to collect the travel characteristics of passenger and goods vehicles.

Table 10.1 Origin and Destination survey Locations

S. No	Name of road	Location
1.	Ernakulam road	Paliyekkara
2.	Palakkad road	Mullakkara
3.	Shoranur road	Kolazhi
4.	Kuttippuram road	Muthuvara
5.	Kodungalloor road	Palakkal
6.	Kanjani road	Chettupuzhapalam

10.4.6 ENTRY/EXIT SURVEY AT BUS TERMINALS

Survey to understand the space utility of buses was conducted at the following bus terminals in Thrissur city.

- KSRTC Bus Stand Thrissur
- Sakthan Stand Thrissur
- Vadakke Stand Thrissur

During the survey conducted throughout the day, details of time of entry/ exit, origin/destination details and type of operation were observed at all entry/exit points of the terminals.

10.4.7 PARKING SURVEY

To assess the parking demand and accumulation, parking survey was carried out at locations where the intensity of parking was very high. Registration Number Plate method was adopted to collect the data on parking duration and accumulation of all categories of vehicles. From this, parking turnover and peak hour parking requirements was worked out.

10.4.8 PEDESTRIAN CROSSING COUNT SURVEY

Pedestrians are an important component of road users. Pedestrian volume survey was conducted at all the arms of major intersections and road sections where the cross movements of pedestrians were found to be very high. The surveys were carried out for a period of four to eight hours during the peak periods. 27 locations were surveyed for the cross movement survey and 2 locations for lateral movement survey.

10.4.9 ANALYSIS AND INTERPRETATION OF DATA

From the analysis of data, the base year traffic and travel characteristics were evaluated using the following parameters.

1. Characteristics of transport network
2. Capacity utilization of major roads, and intersections

3. Parking demand and supply characteristics
4. Travel pattern of inter-city passenger and freight movement
5. Characteristics of inter-city passenger and goods traffic

For forecasting of future travel demand for the study, a horizon year of 2030 was considered and accordingly future levels of traffic on the road system were estimated. Growth rate method was used to project the traffic demand for various horizon years.

In order to meet the base year and projected demand for various horizon years, a long term traffic and transport development plan has been formulated for the city. This covers planning of future transport development and network improvements such as parallel road links, bypasses for inter-city arterial roads, grade-separated pedestrian facilities across busy road, flyovers at major intersections, over bridges and development of integrated bus terminals and public transport system.

10.5 ROAD NETWORK CHARACTERISTICS OF THRISSUR CITY

10.5.1 ROAD INVENTORY

A detailed road inventory was carried out to collect the information of major roads in the study region. The parameters that were collected during the road inventory survey were length, formation width, carriageway type, width, and condition, shoulder width, drains width, and land use surrounding the road. A total of 129.33 km of roads were studied for road inventory, most of them being arterial roads.

Swaraj Round is the lifeline of Thrissur City around which lies the entire activities of the city. With a length of 2.51 km around the Thekkinkadau Maidan and Vadakkumnathan temple and three lane road width, the circular road houses numerous commercial establishments on the left side of the round. With one way traffic regulation in force in clock wise direction, the road carries heavy volume of traffic throughout the day. Eight major roads and 11 minor roads originate from the round. High road leading to Ernakulam (9km), MO road leading to Sakthan Thampuran Bus Station (2.5km), Kuruppam road leading to Kodungallur (5.65km), MG road leading to West Fort, Shoranur Road (6.0km), Karunakaran Nambiar road (1.0km), Town Hall Road (1.0km) and Palakkad road (5.12km) are the major roads originating from the Round.

Kandassankadavu Road or Thrissur-Kanjany Road (SH 75) is the one of the major roads in Thrissur, which runs for about 6km through Sankara Iyer junction to West Fort junction and passes through Chettupuzha, the corporation boundary. The carriageway of the stretch varies from 3.5m to 3.75m width and 2m unpaved shoulder on either side. Thrissur – Kunnamkulam SH 69 originates from Patturaikkal junction, and passes through Poonkunnam junction, and Muthuvara, the corporation boundary with a length of about 5km within the corporation limits. The carriageway of the stretch varies from 3.5m to 7m width with unpaved shoulders. Other major roads in Thrissur are Thrissur-Palakkad road which covers 5.12km length in the corporation limits with the carriageway width of 3.75m and the Ernakulam road running about

9km with the carriageway width of 3.75m to 5m, Kodungallur-Shoranur SH 22 covering about 5.64km with carriageway width of 3.5m to 3.75m

Inventory details of major roads in Thrissur City are given in table 10.2. The road inventory details will give a clear picture regarding the pattern or capacity of roads in the city.

10.5.2 SPEED AND DELAY CHARACTERISTICS

Speed and delay survey was carried out to find out the journey speed, running speed and types of delay such as stopped delay and operational delay and to evaluate the level of service or quality of traffic flow of the roads. The surveys were carried out during peak and off-peak periods in both directions using the moving car observer method. This survey was carried on 85.91 kms of road stretches in Thrissur city. Summary of speed and delay characteristics are given in Table 10.3.

Table 10.2 Inventory Details of Major Roads in Thrissur Corporation

H.S	Road Section	Length	Type of road	No.of Lanes	Pavement Type	Carriageway (m)		Shoulder (m)				Footpath (m)				Drain (m)				ROW(m)	Landuse	
						LHS	RHS	LHS Type	Width (m)	RHS Type	Width (m)	LHS Type Paved/Unpaved	Width (m)	RHS Type	Width (m)	LHS-Type (Closed/ Open)	Width (m)	RHS-Type (Closed/ Open)	Width (m)		LHS	RHS
	Swaraj Round																					
1	Bini Jn to Palace road Jn	0.515	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.3	C	P
2	Palace road Jn to St. Thomas road Jn	0.14	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.5	C	P
3	St. Thomas road Jn to High road Jn	0.71	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.3	C	P
4	High road Jn to MO road Jn	0.185	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.3	C	P
5	MO road Jn to Manikandanlal Jn	0.22	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.3	C	P
6	Manikandanlal Jn to Naduvilal Jn	0.212	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.8	C	P
7	Naduvilal Jn to Naikkanal Jn	0.269	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.5	C	P
8	Naikkanal Jn to Bini Jn	0.255	Arterial	3	Flexible	14	14	-		-	-	Paved	-	Paved	3	-	-	O	1	19.5	C	P
		2.506																				
	Kandassankadavu Road/Thrissur-Kanjany Road:SH 75																					
9	Naduvilal to Sankaralyer Jn	0.9	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2	-	-	-	-	C	1	C	1	9.8	C	C
10	Sankaralyer Jn to West Fort Jn	0.2	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2	-	-	-	-	C	1	C	1	9.8	C	C
11	West Fort to Elthuruth	3	Arterial	2	Flexible	3.5	3.5	Unpaved	3.8	Unpaved	4	-	-	-	-	O	1	O	1	13.3	C/R	C/R
12	Elthuruth to Chettupuzha (Corporation Boundary)	1.9	Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	3	-	-	-	-	O	1	O	1	10.5	C/R	C/R
		6.00																				
	Azheekodan Road																					
13	Diwanji Junction to Diwnajimoola	0.236	Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	2	-	-	-	-	C	1	C	1	9.3	C/R	C/R
14	Diwnajimoola to Poothole Jn	0.138	Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	2	-	-	-	-	C	1	C	1	9.3	C/R	C/R
		0.374																				
	Poothole Road																					
15	Thoppinmoola bus stop to Poothole Jn	1.56	Sub-Arterial	2	Flexible	3	3	Unpaved	3	Unpaved	1	-	-	-	-	O	2	O	1	10	C/R	C/R
16	Poothole Jn to Sankaralyer Jn	0.622	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2	-	-	-	-	O	1	O	1	9.8	C	C
		2.182																				
	Thrissur Kunnamkulam Road:SH 69																					
17	Patturaikkal Jn to Pookunnam Jn	1.1	Arterial	2	Flexible	3.5	3.5	Unpaved	0.8	Unpaved	0.8	Paved	2	Paved	1	-	-	-	-	7.5	C	C
18	Punkunnam to Lulu Jn (Nippon Toyota)	2.05	Arterial	4	Flexible	7	7	Unpaved	3.5	Unpaved	1	-	-	-	-	O	2	-	-	13	C	O
19	Lulu Jn (Nippon Toyota) to Muthuvara (Corporation Boundary)	1.6	Arterial	4	Flexible	7	7	Unpaved	3.5	Unpaved	2	-	-	-	-	-	-	-	-	12.5	C	O
		4.75																				
	Thrissur Shornur Road:SH-22																					
20	Swaraj Round to Aswini	0.87	Arterial	4	Flexible	7	7	Unpaved	1.5	Unpaved	1	Paved	2	Paved	2	C	2	C	2	15.5	C	C/P
21	Aswini to Peringavu	0.972	Arterial	4	Flexible	7	7	Unpaved	2	Unpaved	1.5	-	-	-	-	O	2	O	1	13	C/O	C/O
22	Peringavu to Viyyur	0.637	Arterial	4	Flexible	7	7	Unpaved	1.5	Unpaved	1.5	-	-	-	-	O	1	O	1	12	C/R	C/R
23	Viyyur to Power house Jn	0.863	Arterial	4	Flexible	7	7	Unpaved	1.5	Unpaved	1.5	-	-	-	-	O	1	O	1	12	C/R	C/R
24	Power house Jn to Kolazhy (Corporation Boundary)	2.26	Arterial	4	Flexible	7	7	Unpaved	1.5	Unpaved	1.5	-	-	-	-	O	1	O	1	12	C/R	C/R
		5.602																				
	Shoranur Road/Vivekananda road																					
25	Swaraj round to Patturaikkal Jn	0.965	Arterial	2	Flexible	3	3	Unpaved	1	Unpaved	1	-	-	-	-	C	2	C	1	7.5	R/C	R/C
26	Patturaikkal to Peringavu	0.905	Arterial	2	Flexible	7	7	Unpaved	3	Unpaved	2.5	-	-	-	-	O	2	O	2	16	R/C	R/C
27	Patturaikkal to Aswini	0.35	Arterial	2	Flexible	3.75	3.75	Unpaved	2.5	Unpaved	2.5	-	-	-	-	C	2	C	1	11.3	C	C
		2.22																				
	Thrissur-Palakkad Road																					
28	St. Thomas Jn to Ambakkaden Jn	0.59	Arterial	2	Flexible	3.75	3.75	Paved	0.5	Paved	0.5	Paved	2	Paved	2	-	-	-	-	8.3	C	C
29	Ambakkaden Jn to East Fort Jn	0.39	Arterial	2	Flexible	3.75	3.75	Paved	0.5	Paved	0.5	Paved	2	Paved	2	-	-	-	-	8.3	C	C
30	East Fort Jn to Mannuthy Bypass Jn	4.14	Arterial	2	Flexible	3.75	3.75	Paved	-	Paved	3.5	-		Unpaved	4.5	C/O		-	1	14	R/C	R/C
		5.12																				
	Ernakulam Road																					
31	High Road Jn to Manorama Jn	0.75	Arterial	2	Flexible	5		Unpaved	0.5	Unpaved	0.5	Unpaved	1	Unpaved	1	O	1	O	1	8	C	C
32	Manorama Jn to Kuriachira	1.68	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2.5	-	-	-	-	C	1	C	1	10.3	R/C	R/C
33	Kuriachira to Ollur	3.9	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2.5	-	-	-	-	O	1	O	1	10.3	R/C	R/C
34	Ollur to Thalore (Corporation Boundary)	2.65	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2	-	-	-	-	O	1	-	-	8.8	R/C	R/C
		8.98																				
	A C Achutha Menon Road/Sankarya Road																					
35	Sankaralyer Jn to Chakkamukku Jn	1.16	Arterial	2	Flexible	3.5	3.5	-	-	-	-	-	-	-	-	-	-	-	-	3.5	C	C
	Palliyil Road																					
36	West Fort to Chakkamukku	0.907	Arterial	4	Flexible	7	7	-	-	-	-	Paved	3	Paved	3	-	-	O	1	12.5	C	C
	Kottappuram Road																					

H.S	Road Section	Length	Type of road	No.of Lanes	Pavement Type	Carriageway (m)		Shoulder (m)				Footpath (m)				Drain (m)				ROW(m)	Landuse	
						LHS	RHS	LHS Type	Width (m)	RHS Type	Width (m)	LHS Type Paved/Unpaved	Width (m)	RHS Type	Width (m)	LHS-Type (Closed/ Open)	Width (m)	RHS-Type (Closed/ Open)	Width (m)		LHS	RHS
37	Chakkamukku Jn to Poonkunnam Jn	0.95	Arterial	4	Flexible	10.5	10.5	Paved	1.8	Paved	1.5	Paved	3	Paved	3	-	-	-	-	19.3	C	C
	MO Road																					
38	MO Jn to PO Jn	0.256	Arterial	4	Flexible	3.75	3.75	Paved	1	Paved	1	Paved	5	Paved	5	-	-	-	-	18.5	C	C
39	PO Jn to Mathrubhumi Roundabout	0.465	Arterial	4	Flexible	7	7	-	-	-	-	Paved	2	Paved	2	C	1	C	1	13	P	P
40	Mathrubhumi Roundabout to Shakthan Round Jn	0.191	Arterial	4	Flexible	10	10	-	-	-	-	Paved	1	Paved	3	C	1	-	-	15.2	C	P
41	Shakthan Round Jn to Kannamkulangara	1.59	Arterial	4	Flexible	7	7	Unpaved	4	Unpaved	4	-	-	-	-	-	-	-	-	15	C/O	C/O
		2.502																				
	Kodungallur Shornur Road: SH-22																					
42	Manikandanlal Jn to Chettiyangadi Jn	0.42	Arterial	2	Flexible	3.75	3.75	-	-	-	-	Paved	1	Paved	1	C	1	C	1	7.8	C	C
43	Chettiyangadi Jn to VeliyannoorJn(one way)	0.205	Arterial	2	Flexible	7		-	-	-	-	Paved	1	Paved	1	C	1	C	1	11	C	C
44	Veliyannoor Jn to Kokkala Jn	0.4	Arterial	2	Flexible	3.5	3.5	-	-	-	-	Paved	1	Paved	1	C	2	C	1	8.5	C	C
45	Kokkala Jn to Koorkkanchery	1.3	Arterial	2	Flexible	3.5	3.5	-	-	-	-	Paved	1	Paved	1	-	-	-	-	5.5	C	C
46	Koorkkanchery to Palakkal (Corporation Boundary)	3.32	Arterial	2	Flexible	3.75	3.75	Unpaved	2	Unpaved	2	-	-	-	-	O	1	O	1	9.8	C/R	C/R
		5.645																				
	NH 544 (Palakkad - Ernakulam Road)																					
47	Mannuthy Bypass Jn to Nadathara Jn	2.17	Arterial	2	Flexible	5.5	5.5	Paved	1	Paved	1	-	-	-	-	C	1	C	0.5	12	C	C
48	Nadathara Jn to Kuttanellur Bypass	1.9	Arterial	2	Flexible	3.5	3.5	Unpaved	3	Unpaved	2.5	-	-	-	-	O	1	O	1	11	R/C	R/C
49	Kuttanellur Bypass Jn to Thalore (Corporation Boundary)	4.87	Arterial	2	Flexible	5.5	5.5	Paved	0.3	Paved	0.5	-	-	-	-	C	1	C	0.5	12	C	C
		8.94																				
	Thrissur - Mannamangalam Road																					
50	East Fort Jn to Jubilee Mission Hospital Jn	0.335	Arterial	2	Flexible	3.75	3.75	Unpaved	2.5	Unpaved	2	-	-	-	-	C	1	-	-	9.3	R/C	R/C
51	Jubilee Mission Hospital Jn to Chelakkottukara	1.05	Arterial	2	Flexible	3.75	3.75	Unpaved	3.5	Unpaved	2.5	-	-	-	-	C	1	C	1	11.8	R/C	R/C
52	Chelakkottukara to Ancherichira	1.64	Arterial	2	Flexible	3.75	3.75	Unpaved	3	Unpaved	2	-	-	-	-	C	1	O	1	10.8	R/C	R/C
53	Ancherichira to Kuttanellur Jn	1.47	Sub-Arterial	2	Flexible	3.75	3.75	Unpaved	2.5	Unpaved	2	-	-	-	-	O	1	O	1	10.3	R/C	R/C
54	Kuttanellur Jn- Kuttanellur Bypass	0.484	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	3	Unpaved	2.5	-	-	-	-	O	1	O	1	11	R/C	R/C
		4.979																				
	Thrissur - Moorkkanikkara Road																					
55	Chelakkottukara to Nadathara	2.55	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	3	Unpaved	3	-	-	-	-	O	1	O	1	11.3	R/C	R/C
	Jubilee Mission Jn to Veliyannur Jn																					
56	Jubilee Mission Hospital Jn to Manorama Jn	1.2	Arterial	2	Flexible	5		Unpaved	0.5	Unpaved	0.5	Unpaved	1	Unpaved	1	O	1	O	1	8	C	C
57	Manorama Jn to Mathrubhumi Roundabout	0.18	Arterial	4	Flexible	8	8	Unpaved	9	Unpaved	6.5	Paved	2	Paved	2	C	1	C	1	29.5	C	C
58	Mathrubhumi Roundabout to Veliyannur Jn	0.5	Arterial	4	Flexible	7.5	7	Unpaved	3.5	Unpaved	5.2	Paved	2	Paved	2	-	-	-	-	20.6	C	C/O
		1.88																				
	KSRTC Round (One way)																					
59	Veliyannur Jn to KSRTC Jn	0.2	Arterial	2	Flexible	16.5		-	-	-	-	Paved	2	Paved	2	C	1	C	1	21.5	C	P
60	KSRTC Jn to Diwanji Jn	0.187	Arterial	2	Flexible	3.75	3.75	-	-	-	-	Paved	1	Paved	1	-	-	-	-	5.8	P/C	P
61	Diwanji Jn to Chettiyangadi Jn	0.25	Arterial	2	Flexible	3.75	3.75	-	-	-	-	Paved	1	Paved	1	C	1	C	1	7.8	C	C
		0.637																				
	Masjid Road																					
62	Energy Station to KSRTC Jn	0.35	Arterial	2	Flexible	3.5	3.5	Unpaved	1.5	Unpaved	1.5	-	-	-	-	C	1	C	1	8.5	R/C	R/C
	Mannuthy - Ollur Road																					
63	Nadathara Bypass Jn to Kuttannellur Jn	1.64	Sub-Arterial	2	Flexible	3	3	Paved	3.5	Paved	4	-	-	-	-	O	1	O	1	12.5	O/R	R
64	Kuttanellur Jn to Padavarad Jn	0.983	Sub-Arterial	2	Flexible	3	3	Unpaved	3.5	Unpaved	2.5	-	-	-	-	-	-	-	-	9	R	I
65	Padavarad Jn to Ollur Jn	2.21	Sub-Arterial	2	Flexible	3	3	Unpaved	2	Unpaved	2	-	-	-	-	O	1	-	-	8	R/C	R/C
		4.833																				
	TB Road																					
66	Energy Station - Kokkala Jn	0.2	Sub-Arterial	2	Flexible	3	3	Unpaved	1	Unpaved	1	-	-	-	-	C	1	C	1	7	C	C
67	Kokkala Jn to Shakthan Roundabout	0.55	Arterial	4	Flexible	7	7	Unpaved	2	-	-	Paved	1	Paved	1	-	-	O	2	13	P	C
68	Shakthan Roundabout to Kattookaran Jn	0.4	Arterial	4	Flexible	7	7	Unpaved	2	-	-	Paved	1	Paved	1	-	-	O	2	13	P	C
		1.15																				
	Bishop Palace Road-MDR																					
69	Paramekkavu - Town Hall Road	0.72	Arterial	2	Flexible	13		-	-	-	-	Paved	2	Paved	3	C	1	C	1	19	C	C
70	Chembukkavu Jn - Aswini Jn	1	Arterial	2	Flexible	3.75	3.75	Paved	1.7	Paved	3	-	-	-	-	O	1	O	1	10.5	R	R
71	Chembukkavu Jn - Nettissery	5.21	Arterial	2	Flexible	3.75	3.75	Unpaved	1.8	Unpaved	2	-	-	-	-	O	1	C	2	10	C	C
72	Nettissery-Mannuthy	4.1	Sub-Arterial	2	Flexible	3	3	Unpaved	1	Unpaved	0.8	-	-	-	-	O	1	-	-	5.8	R/C	R/C
		11.03																				

H.S	Road Section	Length	Type of road	No.of Lanes	Pavement Type	Carriageway (m)		Shoulder (m)			Footpath (m)			Drain (m)			ROW(m)	Landuse	
						LHS	RHS	LHS Type	Width (m)	RHS Type	LHS Type Paved/Unpaved	Width (m)	RHS Type	Width (m)	LHS-Type (Closed/ Open)	Width (m)	RHS-Type (Closed/ Open)	Width (m)	LHS	RHS
	Ayyanthole Road(Civil Line Road																		
73	West Fort Jn to - Chungam Jn	0.536	Arterial	2	Flexible	3.5	3.5	Unpaved	4	Unpaved	-	-	-	-	O	1	O	3	15.5	C/R	C/R
74	Chungam Jn - Civil Line Jn	0.9	Arterial	2	Flexible	7	7	-	-	-	Paved	3	Paved	3	-	-	-	-	13	C/R	C/R
75	Civil Lines Jn - Lulu Jn(Nippon Toyoto)	2.4	Arterial	2	Flexible	3.75	3.75	Unpaved	3	Unpaved	5	-	-	-	O	1	O	1	13.8	C/R	C/R
76	Ayyanthole Rd - Pulluzhi (Puthurkara) Rd	0.5	Arterial	2	Flexible	3.75	3.75	Paved	2	Unpaved	2.5	-	-	-	C	1	-	-	9.3	C/R	C/R
77	Puthurkara Rd- Olarikara	0.9	Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	2	-	-	-	O	0.5	O	0.5	12	C	C
78	Ayyanthole Rd- Law College	0.35	Sub-Arterial	2	Flexible	3	3	Unpaved	0.5	Unpaved	0.5	-	-	-	-	-	-	-	10	C	C
79	Ayyanthole Road- Collectorate	0.3	Arterial	2	Flexible	3.5	3.5	Unpaved	4	Unpaved	4	-	-	-	O	1	O	3	15.5	C/R	C/R
		5.886																			
	Post Office Road																				
80	Chettiyangadi Jn to High road Jn	0.55	Arterial	1	Flexible	3.5	3.75	Paved	0.5	Paved	0.5	Paved	1	Paved	1	-	-	-	-	6.5	C	C
	Rice Bazar Road																				
81	Aniuvilakku Jn to Ambakkadan Jn	0.8	Arterial	2	Flexible		6	Unpaved	0.5	Unpaved	0.5	Unpaved	1	Unpaved	1	O	1	O	1	9	C	C
	Thiruvambady Road																				
82	Pookunnam to Shoranur Road	1	Sub-Arterial	2	Flexible	3.5	3.5	U/P	2.5	U/P	3	-	-	-	O	1	O	1	11.3	C/R	C
	Vivyur Power House to Thannikkudam Road																				
83	Vivyur Power House Jn to Pallimoola	1	Arterial	1	Flexible		4	Unpaved	1.5	Unpaved	1.5	-	-	-	-	-	-	-	7	C/A	C
84	Pallimoola to Corporation Boundary (Thannikkudam)	5	Sub-Arterial	2	Flexible		5.5	Unpaved	5	Unpaved	3.5	-	-	-	O	1	O	1	16	C	C/R
		6																			
	Ramavarmapuram road																				
85	Kinar Jn to Pallimoola Jn	1.8	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	1	Unpaved	2.5	-	-	-	O	1	O	1	9	R/C	R/C
	Stadium road																				
86	Stadium Jn to Chembukkavu round	0.6	Arterial	2	Flexible		9.5	Paved	1.4	Paved	2	Paved	2	-	-	1	-	-	15.4	R	P
	RC Bishop House Road																				
87	East Fort Jn to Pension Moola bus stop	0.9	Arterial	2	Flexible	3.75	3.75	Paved	1	Paved	1.5	Paved	1	Paved	1	C	1	C	1	10.3	1	1
	Netaji Road																				
88	West Fort Jn to Thoppimoola Jn	1	Sub-Arterial	2	Flexible	3.5	3.5	Paved	6	Paved	7	-	-	-	-	-	-	-	16.5	C/R	C/R
	Sree Kerala varma college Road																				
89	Chungam Jn -College	0.9	Arterial	2	Flexible	3.5	3.5	Unpaved	1	Unpaved	1	-	-	-	O	1	O	3	15.5	C/R	C/R
	Anchagadi Road																				
90	Chungam Jn - Poothole Road	0.7	Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	2	-	-	-	O	1	O	3	15.5	C/R	C/R
	Calvary Road																				
91	West Fort - Poothole Road	1	Sub-Arterial	2	Flexible		06-Aug	Unpaved	2	Unpaved	1	-	-	-	Open	1	Closed	1	12	C	C
	Peringavu to Vivyur																				
92	Peringavu Jn to Vivyur	0.9	Arterial	4	Flexible	7	7	Unpaved	1.5	Unpaved	1.5	-	-	-	O	1	O	1	12	C/R	C/R
	Other Roads																				
93	Edakunny Road (MDR 01)	3.5	Sub-Arterial	2	Flexible		5	Unpaved	1	Unpaved	1	-	-	-	Open	1	Closed	1	9	C/R	C/R
94	Mullakara Thottapadi Road (MDR 013B)	1.65	Sub-Arterial	1	Flexible		2.5	Unpaved	0.7	Unpaved	0.7	-	-	-	Open	1	Open	-	10	R	R
95	Mullakara - Mulayam (MDR 009)	4.65	Sub-Arterial	2	Flexible		3	Unpaved	1.5	Unpaved	1.5	-	-	-	-	-	-	-	8	R	R
96	Mudikode - Mulayam/ Koota	1.7	Sub-Arterial	2	Flexible		5	Unpaved	1	Unpaved	1	-	-	-	Open	1	Open	1	10	R	R
97	Ethuruth - Olari (MDR 35)	0.6	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	0.5	Unpaved	0.5	-	-	-	O	1	-	-	8.5	R	R
98	Mannuthy - Bazar Road (MDR 20)	0.4	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	0.5	Unpaved	0.5	-	-	-	O	1	-	-	8.5	R	R
99	Mannuthy - Chirakkakode (MDR 006)	0.5	Sub-Arterial	2	Flexible		5.5	Unpaved	2	Unpaved	1	-	-	-	-	-	-	1	9	C/R	C/R
100	MLA Road- Kitt road	0.6	Sub-Arterial	2	Flexible		7	Unpaved	0.5	Unpaved	0.5	Paved	1	-	-	-	-	1	10	A	A
101	Mundapalam Junction - KSRTC	0.6	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	2	Unpaved	2	-	-	-	O	1	-	-	8.5	R	R
102	Benette Road- Town Hall	0.9	Sub-Arterial	2	Flexible	3.5	3.5	Paved	2.3	Paved	0.8	Paved	1	Paved	3	C	1	C	17.1	C	C
103	Cherur - Kuttimukku	1.5	Sub-Arterial	2	Flexible	3	3	Unpaved	0.5	Unpaved	0.5	-	-	-	-	-	-	-	10	C	C
104	Murur Rd - Railway station	0.5	Sub-Arterial	2	Flexible		5	Unpaved	0.5	Unpaved	0.7	-	-	-	Open	1	Open	1	8	C	C
105	Swaraj to Vallikattu Lane	0.2	Sub-Arterial	2	Flexible		3-5	Unpaved	1	Unpaved	1	-	-	-	Open	0.7	Closed	0.7	10	C	C
106	Cherur - Ramavarmapuram	1.3	Sub-Arterial	2	Flexible	3.5	3.5	Unpaved	1	Unpaved	3	Unpaved	3	Unpaved	1	-	-	-	10	C	C
107	St Marys- town hall	0.62	Sub-Arterial	2	Flexible	3.5	3.5	Paved	2.3	Paved	0.8	Paved	1	Paved	3	C	1	C	12	C	C
108	Mahakari Vyloplli Sreedhara Menon Road	0.4	Sub-Arterial	2	Flexible		3-5	Unpaved	1	Unpaved	1	-	-	-	-	Open	0.7	Closed	10	C	C
109	Swaraj to AR Menon	0.73	Sub-Arterial	2	Flexible		3.5-5.5	Unpaved	1	Unpaved	1	-	-	-	-	Open	0.7	Closed	10	C	C
110	Koorkkanchery to Chiyyaram Road	2.3	Sub-Arterial	2	Flexible	3	3	Unpaved	3	-	-	Paved	3	-	-	-	O	1	9.5	R	R
111	Koorkkanchery to SN road	0.5	Sub-Arterial	2	Flexible	3.5	3.5	Paved	2.3	Paved	0.8	Paved	1	Paved	3	C	1	C	1	10	C	C
	Total Length	**23.15**																			
		129.333																			

Land use : C - Commercial, R - Residential, I - Industrial, P - Public, O – Open Land

Drain Type:C-Closed, O-Open

Footpath& Shoulder Type: P-Paved, U-Unpaved

Table 10.3 Speed and delay characteristics on major roads in Thrissur city

Sl No	Name of Road	HS No	Name of Homogenous Section (HS)	Length (km)	Average Journey Speed (kmph)		Average Running Speed (kmph)	
					Peak	Off-peak	Peak	Off-peak
1	Swaraj Round	1	Bini Jn to Bini Jn	2.00	20.11	30.40	24.41	31.25
		2	Naduvilal to SankaraIyer Jn	0.90	16.20	22.13	17.90	25.00
		3	SankaraIyer Jn to West Fort Jn	0.20	24.00	39.14	26.67	45.19
	Kandassankadavu	4	West Fort to Corporation Boundary	6.10	40.89	47.74	41.12	47.84
2	Road	**Average speed**			**37.34**	**44.30**	**37.82**	**44.91**
		5	Aswini Jn to Patturaikkal Jn	0.50	18.56	28.04	21.43	30.14
		6	Patturaikkal Jn to Poonkunnam Jn	1.10	15.97	28.29	17.76	29.33
		7	Poonkunnam Jn to Lulu Jn	2.00	23.23	39.40	32.73	41.05
		8	Lulu Jn to Corporation Boundary	0.60	25.50	36.62	27.13	37.25
3	Kunnankulam Road	**Average speed**			**21.09**	**34.74**	**26.66**	**36.14**
		9	Naikkanal Jn to Patturaikkal Jn	1.00	21.36	24.66	22.61	25.53
		10	Patturaikkal Jn to Peringavu Jn	1.00	24.83	33.13	26.28	35.38
		11	Bini Jn to Aswini Jn	0.90	24.92	26.13	27.23	26.56
		12	Aswini Jn to Peringavu Jn	1.00		37.50		39.98
		13	Peringavu Jn to Viyyur Power House Jn	2.70	27.77		28.50	
		14	Viyyur Power House Jn to Corporation Boundary	2.80		41.25		42.46
4	Shornur Road	**Average speed**			**15.28**	**24.92**	**15.99**	**25.92**
		15	St. Thomas Jn to East Fort Jn	1.00	20.52	26.67	21.59	34.95
		16	East Fort Jn to Mannuthy Bypass Jn	4.20	27.64	31.11	30.00	31.63
		17	Mannuthy Bypass Jn to Mannuthy Jn	1.10	26.40	46.45	39.60	51.06
		18	Mannuthy Jn to Corporation Boundary	4.80		57.72		58.29
5	Palakkad Road	**Average speed**			**14.92**	**43.74**	**17.22**	**45.38**
		19	High Road Jn to Manorama Jn	0.70	21.02		22.33	
		20	Manorama Jn to Chiyyaram	2.70		30.40		31.60
		21	Chiyyaram to Ollur	2.80		29.14		30.37
		22	Ollur to Corporation Boundary	2.10		34.77		35.86
6	Ernakulam Road	**Average speed**			**1.77**	**28.52**	**1.88**	**29.60**
		23	MO Jn to Mathrubhumi Roundabout (Shakthan statue)	0.80	17.31		21.18	
		24	Mathrubhumi Roundabout to Shakthan Round Jn	0.20	18.54		20.23	
7	MO Road	**Average speed**			**17.55**	**-**	**20.99**	**-**
		25	Manikandanlal Jn to Chettiyangadi Jn	0.40	11.43	20.00	15.16	20.57
		26	Chettiyangadi Jn to Veliyannoor Jn	0.30	12.64	32.73	17.01	34.84
		27	Veliyannoor Jn to Kokkala Jn	0.40	12.31	22.49	13.98	26.60
		28	Kokkala Jn to Koorkkanchery	1.30	18.80	24.69	19.42	25.44
		29	Koorkkanchery to Corporation Boundary	2.70	22.09	34.71	22.29	34.90
8	Kodungallur Road	**Average speed**			**19.09**	**29.93**	**20.04**	**30.71**
		30	Mannuthy Bypass Jn to Nadathara Jn	3.50	24.59	28.08	25.85	30.64
		31	Nadathara Jn to Kuttanellur Bypass Jn	1.90	27.54	34.34	28.32	35.65
	NH 544 (Palakkad -	32	Kuttanellur Bypass Jn to Corporation Boundary	0.80	27.91	36.78	28.61	37.87
9	Ernakulam Road)	**Average speed**			**25.92**	**31.12**	**26.96**	**33.11**

Sl No	Name of Road	HS No	Name of Homogenous Section (HS)	Length (km)	Average Journey Speed (kmph)		Average Running Speed (kmph)	
					Peak	Off-peak	Peak	Off-peak
Other Major Roads								
	AchuthaMenon	33	West Fort Jn to Poonkunnam Jn	1.40		32.31		33.38
10	Road	34	Poonkunnam to SankaraIyer Jn	1.40		26.67		27.69
		35	West Fort Jn to Chungam	0.60	18.23		19.38	
	West Fort Jn to Lulu	36	Chungam to Civil Station	0.70		47.69		48.66
11	Jn (via Civil Station)	37	Civil Station to Lulu Jn	2.60		37.16		37.71
		38	Chettiyangadi Jn to Post Office Jn	0.40	16.94	24.00	18.00	24.83
12	Post Office Road	39	Post Office Jn to High Road Jn	0.20	14.12	24.00	15.65	25.71
13	Palace Road	40	Palace Road Jn to Public Library Jn	0.70	18.26	26.53	21.91	27.10
14	Rice Bazar Road	41	Anjuvilakku Jn to Ambakkadan Jn	0.70		26.25		27.10
		42	Jubilee Mission Hospital Jn to Manorama Jn	1.10		39.60		40.41
		43	Manorama Jn to Mathrubhumi Roundabout	0.17	15.50		17.01	
	Jubilee Mission Jn to	44	Mathrubhumi Roundabout to					
15	Veliyannur Jn		Veliyannur Jn	0.45	21.89		23.14	
16	Masjid Road	45	Kokkala Jn to KSRTC Jn	0.50	15.38		15.65	
		46	East Fort Jn to Jubilee Mission Hospital Jn	0.20	13.13		14.92	
		47	Jubilee Mission Hospital Jn to Chelakkottukara	1.20	21.93		24.41	
	Thrissur -	48	Chelakkottukara to Kuttanellur	3.20		38.92		39.32
	Mannamangalam		Kuttanellur Jn to Kuttanellur					
17	Road	49	Bypass Jn	1.20		61.71		62.61
		50	Chembukkavu Jn to Public Library Jn	0.14	24.00		25.20	
		51	Public Library Jn to Stadium Jn	0.35		38.18		38.18
		52	Stadium Jn to Drugs Controller Office	0.23		27.60		28.55
	Chembukkavu		Drugs Controller Office to					
18	Round (One way)	53	Chembukkavu Jn	0.22	20.31		20.84	
		54	Veliyannur Jn to KSRTC Jn	0.20	1.43		3.40	
		55	KSRTC Jn to Railway Station Jn	0.20	11.43		14.15	
	KSRTC Round (One		Railway Station Jn to					
19	way)	56	Chettiyangadi Jn	0.30	20.00		22.04	
		57	Railway Jn to DiwanjiMoola Jn	0.40	16.00		16.94	
		58	DiwanjiMoola Jn to Poothole Jn	0.40	6.99		8.89	
20	Poothole Road	59	Poothole Jn to SankaraIyer Jn	0.20	24.83		26.67	
		60	Kokkala Jn to Shakthan Roundabout	0.60		32.73		33.23
		61	Shakthan Roundabout to					
21	TB Road		Kattookaran Jn	0.40		27.69		28.80
22	Cheroor Road	62	Drugs Controller Office to Pallimoola Jn	3.00		29.75		30.14
23	Stadium to Aswini Road	63	Stadium Jn to Aswini Jn	0.45	23.82	31.15	28.42	31.76
		64	Viyyur Power House Jn to Pallimoola	1.20		39.30		43.41
	Viyyur Power House to Thannikkudam	65	Pallimoola to Corporation					
24	Road		Boundary (Thannikkudam)	3.10		43.51		43.89
25	RC Bishop House Road	66	East Fort Jn to Pension Moola bus	0.90	20.90	29.19	21.46	30.00
		67	Chembukkavu Jn to Pensionmoola bus stop Jn	0.80	21.65		22.15	
	Chembukkavu to	68	Pensionmoola bus stop Jn to					
	MannuthyRoad (via		Nellankara	1.50	41.73	42.19	42.50	43.90
	PuthanVettuvazhi	69	Nellankara to Mukkattukara	1.50	34.52	35.61	35.48	36.74
26	Road)	70	Mukkattukara to Mannuthy Jn	1.70	35.37	37.09	35.89	37.55

10.5.2.1 Average Journey Speed

To find out the average traveling speed, speed and delay test was conducted on important roads at different timings. The maximum average journey speed of 37km/hr was recorded in Kandasankadavu road during peak hours and the maximum average journey speed during off-peak hours is also observed in the same road with the speed 44.30 km/hr. The speed, however, was quite minimal at 20kmph around Swaraj Round due to congestion created by bus stops, approaching roads and high volume of vehicles. Lot of pedestrian movements were found on this stretch due to the location of a few schools and commercial activities. The movement through the roads around KSRTC Terminal (through Diwanji moola - Chettiyangadi – Veliyannoor) during peak hours has found out to be as low as 12 km/hr. The average journey speed from Swaraj Round to Mannuthy in the Palakkad road during peak hours was observed to be very low 15 km/hr. In this road stretch, the delay was due to congestion near St. Thomas College and East fort areas.

10.5.2.2 Causes of Delay

Delay to moving traffic is attributed to traffic congestion, high crossing pedestrian movements, poor pavement condition, and stoppage of buses at bus stops and conflicting movements of traffic at intersections

Table 10.4 Peak hour traffic flow observed at major intersections in Thrissur City

S.No	Name of Intersection	Type of Intersection	Peak Hour Volume (PCU)	S.No	Name of Intersection	Type of Intersection	Peak Hour Volume (PCU)
1	Ambakkadan	4 Arm	6,430	22	Patturaikkal	4 Arm	9,085
2	Aswini	4 Arm	7,007	23	Peringavu	3 Arm	8,011
3	Chembukavu	4 Arm	4,121	24	Poonkunnam	3 Arm	7,681
4	Chettiyangadi	4 Arm	5,132	25	Poothole	4 Arm	3,010
5	Chungam	4 Arm	3,286	26	Shakthan Round	4 Arm	6,356
6	Diwanjimoola	3 Arm	7,078	27	SankaraIyer	4 Arm	8,761
7	Diwanji	3 Arm	6,397	28	Veliyannur	4 Arm	5,820
8	Eastfort	4 Arm	7,276	29	Viyyur Power House	4 Arm	4,582
9	Jubilee Mission	3 Arm	5,576	30	West Fort	5 Arm	12,573
10	Kalyan	3 Arm	3,962	31	Bini	3 Arm	7,112
11	Kokkala	4 Arm	5,779	32	Palace Road	3 Arm	5,375
12	Koorkkanchery	4 Arm	5,349	33	St. Thomas	3 Arm	5,369
13	KSRTC	3 Arm	3,530	34	High Road	3 Arm	10,639
14	Kuttanellur	4 Arm	3,877	35	M. O. road	3 Arm	5,470
15	Lulu	3 Arm	4,688	36	Manikandanlal	3 Arm	6,985
16	Mannuthty	3 Arm	4,554	37	Naduvilal	3 Arm	10,287
17	Manorama	4 Arm	6,007	38	Naikkanal	3 Arm	9,910
18	Mathrubhumi Round	4 Arm	7,843	39	kuriachira	3 Arm	6,223
19	Nadathara	4 Arm	4,974	40	Civil station	3 Arm	4,564
20	Ollur	4 Arm	4,787	41	Ramanilayam	4 Arm	6,305
21	Pallimoola	4 Arm	3,297				

10.5.3 TRAFFIC VOLUME AT MAJOR INTERSECTIONS

Turning movement of vehicles was conducted at 41 major intersections in Thrissur City to ascertain the peak hour demands. A consolidated table showing traffic at the 41 major intersections are given in table 10.4. It can be seen that West fort junction managed the city's highest peak-hour traffic volume of around 13,000 PCU, followed by High road & Naduvilal junction handling more than 10,000 PCU. Patturaikkal & Naikkanal junctions managed traffic around 9,000 PCU to 10,000 PCU whereas Peringavu and Sankara Iyer junctions managed traffic between 8,000 PCU and 9,000 PCU. Aswini Hospital, Diwanjimoola, East Fort, Mathrubhumi Round, Poonkunnam & Bini junctions handled traffic between 7,000 PCU and 8,000 PCU. Intersections such as Poothole, Pallimoola, Chungam, Kuttanellur and KSRTC handled traffic less than 4,000 PCU during the peak hour.

10.5.4 TRAFFIC VOLUME & CAPACITY UTILIZATION

10.5.4.1 Link Volume

Data on Traffic volume and its composition were collected for all primary road links in Thrissur through traffic volume survey. These data were converted into a 'Passenger Car Units (PCU)' using conversion factors recommended by IRC. From the study, it is found that the highest traffic volume of 7,600 PCU was observed in the road stretch between Manikandanal Jn. and Naduvilal Jn. on Swaraj Round during peak hour, followed by 6,000PCU on Naduvilal Jn. - Naikkanal Jn. section on the round. In Kanjany SH 75, the traffic volume during the peak hours varied from 1,877 PCU to 3,200 PCU. State highway 69 which runs from Thrissur to Kunnamkulam carried the traffic ranging from 700PCU to 4,000PCU

10.5.4.2 Capacity Utilization

Capacity utilization of the road stretches is measured by the volume-by-capacity ratio (V/C Ratio). It is the ratio of volume of traffic plying on the road stretch to the capacity of the road stretch. Capacity of different road sections were worked out from the specifications of IRC-106-1990 (Guidelines for capacity on urban roads). While working out the capacities, due consideration was given to carriage-way width, the proximity of junctions, parking, lateral clearance, shoulder, surface condition etc. The volume capacity ratio of major roads given in table 10.5. It is observed that Ollur to Thalore road section had the highest volume by capacity ratio in the city. More than 50% of the road stretches hold traffic more than its capacity. There are about 64 road sections where the traffic volume exceeded the design capacity and are mentioned in table 10.6.

Table 10.5 Volume-capacity ratio of selected road stretches in Thrissur city

Homogeneous Section	Name of the Road	Volume (in PCU)	Capacity	V/C ratio
	Ernakulam Road			
31	High Road Jn to Manorama Jn	2014	1500	1.34
32	Manorama Jn to Kuriachira	1848	1500	1.23
33	Kuriachira to Ollur	3843	1500	2.56
34	Ollur to Thalore (Corporation Boundary)	4698	1500	3
	A C Achutha Menon Road/Sankarya Road			
35	SankaraIyer Jn to Chakkamukku Jn	1402	1200	1.17
	Palliyil Road			
36	West Fort to Chakkamukku	5288	1500	3.53
	Kottappuram Road			
37	Chakkamukku Jn to Poonkunnam Jn	3097	1500	2.06
	MO Road			
38	MO Jn to PO Jn	960	1500	0.64
39	PO Jn to Mathrubhumi Roundabout	2340	1500	1.56
40	Mathrubhumi Roundabout to Shakthan Round Jn	4173	1500	2.78
41	Shakthan Round Jn to Kannamkulangara	1629	1500	1.09
	Kodungallur Shornur Road: SH-22			
42	Manikandanlal Jn to Chettiyangadi Jn	1767	1500	1.18
43	Chettiyangadi Jn to Veliyannoor Jn	2975	1500	1.98
44	Veliyannoor Jn to Kokkala Jn	2387	1500	1.59
45	Kokkala Jn to Koorkkanchery	3593	1500	2.40
46	Koorkkanchery to Palakkal (Corporation Boundary)	1038	1500	0.69
	NH 544 (Palakkad - Ernakulam Road)			
47	Mannuthy Bypass Jn to Nadathara	1726	1500	1.15
48	Nadathara Jn to Kuttanellur Bypass	971	1500	0.65
49	Kuttanellur Bypass Jn to Thalore (Corporation Boundary)	1323	1500	0.88
	Thrissur - Mannamangalam Road (MDR 003)			
50	East Fort Jn to Jubilee Mission Hospital Jn	2064	1500	1.38
51	Jubilee Mission Hospital Jn to Chelakkottukara	1588	1500	1.06
52	Chelakkottukara to Ancherichira	1059	1500	0.71
53	Ancherichira to Kuttanellur Jn	668	1500	0.45
54	Kuttanellur Jn- Kuttanellur Bypass	1001	1500	0.67

Homogeneous Section	Name of the Road	Volume (in PCU)	Capacity	V/C ratio
	Thrissur - Moorkkanikkara Road			
55	Chelakkottukara to Nadathara	1053	1500	0.70
	Jubilee Mission Jn to Veliyannur Jn			
56	Jubilee Mission Hospital Jn to Manorama Jn	1339	1200	1.12
57	Manorama Jn to Mathrubhumi Roundabout	1384	1200	1.15
58	Mathrubhumi Roundabout to Veliyannur Jn	1630	1200	1.36
	KSRTC Round			
59	Veliyannur Jn to KSRTC Jn	3693	1200	3.08
60	KSRTC Jn to Diwanji Jn	3095	1200	2.58
61	Diwanji Jn to Chettiyangadi Jn	1820	1200	1.52
	Mannuthy - Ollur Road			
63	Nadathara Bypass Jn to Kuttannellur Jn	373	1200	0.31
64	Kuttanellur Jn to Padavarad Jn	307	1200	0.26
65	Padavarad Jn to Ollur Jn	205	1200	0.17
	TB Road			
66	Energy Station - Kokkala Jn	1598	1200	1.33
67	Kokkala Jn to Shakthan Roundabout	418	1200	0.35
68	Shakthan Roundabout to Kattookaran Jn	1265	1200	1.05
	Bishop Palace Road-MDR			
69	Paramekkavu - Town Hall Road	2528	1200	2.11
70	Chembukkavu Jn - Aswini Jn	2093	1200	1.74
71	Chembukkavu Jn - Nettissery	399	1200	0.33
72	Nettissery-Mannuthy	665	1200	0.55
	Ayyanthole Road/Civil Line Road			
73	West Fort Jn to - Chungam Jn	3935	1500	2.62
74	Chungam Jn - Civil Line Jn	1122	1500	0.75
75	Civil Lines Jn - Lulu Jn(Nippon Toyoto)	2552	1500	1.70
76	Ayyanthole Rd - Pullazhi (Puthurkara) Rd	2827	1500	1.88
77	Puthurkara Rd- Olarikara	510	1500	0.34
78	Ayyanthole Rd- Law College	1488	1500	0.99
79	Ayyanthole Road- Collectorate	1329	1500	0.89
	Post Office Road			
80	Chettiyangadi Jn to High road Jn	2340	1200	1.95

Homogeneous Section	Name of the Road	Volume (in PCU)	Capacity	V/C ratio
	Rice Bazar Road			
81	Anjuvilakku Jn to Ambakkadan Jn	559	1200	0.47
	Thiruvambady Road			
82	Pookunnam to Shoranur Road	550	1200	0.46
	Viyyur Power House to Thannikkudam Road			
83	Viyyur Power House Jn to Pallimoola	635	900	0.71
84	(Thannikkudam)	990	900	1.10
	Ramavarmapuram road			
85	Kinar Jn to Pallimoola Jn	1300	900	1.44
	Stadium road			
86	Stadium Jn to Chembukkavu round	2366	900	2.63
	RC Bishop House Road			
87	East Fort Jn to Pension Moola bus stop	1479	1200	1.23
	Netaji Road			
88	West Fort Jn to Thoppinmoola Jn	209	1200	0.17
	Sree Kerala varma college Road			
89	Chungam Jn -College	107	900	0.12
	Anchagadi Road			
90	Chungam Jn - Poothole	159	900	0.18
	Calvary Road			
91	West Fort - Poothole Road	2585	1200	2.15
	Peringavu to Viyyur			
92	Peringavu Jn to Viyyur	393	1200	0.33
	Other Roads			
93	Edakunny Road (MDR 01)	169	1200	0.14
94	Mullakara Thottapadi Road (MDR 013B)	141	1200	0.12
95	Mullakara - Mulayam (MDR 009)	263	1200	0.22
96	Mudikode - Mulayam/ Koota	393	1200	0.33
97	Elthuruth - Olari (MDR 35)	887	1200	0.74
98	Mannuthy - Bazar Road (MDR 20)	2102	1200	1.75
99	Mannuthy - Chirakkakode (MDR 006)	363	1200	0.30
100	MLA Road- Kutt road	1967	1200	1.64
101	Mundapalam Junction - KSRTC	1463	900	1.63
102	Benette road to Town hall	1423	1200	1.19
103	Cherur - Kuttimukku	1829	1200	1.52
104	Marar Rd - Railway station	1853	1200	1.54
105	Swaraj to Vallikattu Lane	1862	1200	1.55
106	Cherur - Ramavarmapuram	2278	1200	1.90
107	St Marys- town hall	1879	1200	1.57
108	Mahakari Vylopilli Sreedhara Menon Road	3118	1200	2.60
109	Swaraj to AR Menon	622	1200	0.52
110	Koorkkanchery to Chiyyaram Road	523	1200	0.44
111	Koorkkanchery to SN road	195	1200	0.16

Table 10.6 Road sections with traffic volume higher than their carrying capacity

1	High road Jn to MO road Jn	33	Mannuthy Bypass Jn to Nadathara Jn
2	Manikandanlal Jn to Naduvilal Jn	34	East Fort Jn to Jubilee Mission Hospital Jn
3	Naduvilal Jn to Naikkanal Jn	35	Jubilee Mission Hospital Jn to Chelakkottukara
4	Naduvilal to SankaraIyer Jn	36	Jubilee Mission Hospital Jn to Manorama Jn
5	SankaraIyer Jn to West Fort Jn	37	Manorama Jn to Mathrubhumi Roundabout
6	Elthuruth to Chettupuzha Corporation Boundary	38	Mathrubhumi Roundabout to Veliyannur Jn
7	Diwanji Junction to Diwnajimoola	39	Veliyannur Jn to KSRTC Jn
8	Diwnajimoola to Poothole Jn	40	KSRTC Jn to Diwanji Jn
9	Poothole Jn to SankaraIyer Jn	41	Diwanji Jn to Chettiyangadi Jn
10	Punkunnam to Lulu Jn (Nippon Toyota)	42	Energy Station - Kokkala Jn
11	Lulu Jn (Nippon Toyota) to Muthuvara (Corporation Boundary)	43	Shakthan Roundabout to Kattookaran Jn
12	Patturaikkal to Peringavu	44	Paramekkavu - Town Hall Road
13	Peringavu to Aswini	45	Chembukkavu Jn - Aswini Jn
14	Aswini to Swaraj Round	46	West Fort Jn to - Chungam Jn
15	Peringavu to Viyyur	47	Civil Lines Jn - Lulu Jn(Nippon Toyoto)
16	Power house Jn to Kolazhy (Corporation Boundary)	48	Ayyanthole Rd - Pullazhi (Puthurkara) Rd
17	St. Thomas Jn to Ambakkaden Jn	49	Chettiyangadi Jn to High road Jn
18	East Fort Jn to Mannuthy Bypass Jn	50	Pallimoola to Corporation Boundary (Thannikkudam)
19	High Road Jn to Manorama Jn	51	Ramavarmapuram road
20	Manorama Jn to Kuriachira	52	Stadium road
21	Kuriachira to Ollur	53	RC Bishop House Road
22	Ollur to Thalore (Corporation Boundary)	54	Calvary Road
23	A C Achutha Menon Road	55	Mannuthy - Bazar Road (MDR 20)
24	Palliyil Road	56	MLA Road- Kutt road
25	Kottappuram Road	57	Mundapalam Junction – KSRTC
26	PO Jn to Mathrubhumi Roundabout	58	Benette road to Town hall
27	Mathrubhumi Roundabout to Shakthan Round Jn	59	Cherur – Kuttimukku
28	Shakthan Round Jn to Kannamkulangara	60	Marar Rd - Railway station
29	Manikandanlal Jn to Chettiyangadi Jn	61	Swaraj to Vallikattu Lane
30	Chettiyangadi Jn to Veliyannoor Jn	62	Cherur – Ramavarmapuram
31	Veliyannoor Jn to Kokkala Jn	63	St Marys- town hall
32	Kokkala Jn to Koorkkanchery	64	MahakariVylopilliSreedhara Menon Road

10.5.5 PARKING CHARACTERISTICS

Parking space deficit at both on and off streets of Thrissur City increases the search time for parking spot resulting in traffic congestion. There is a huge On-street parking

Table 10.7 Locations selected for parking survey in Thrissur City

Sl No	Name of Road	Sl No	Name of Road
On-Street parking locations			
1	Swaraj Round	13	Shornur road to North bus stand
2	High Road	14	Pookunam
3	Marar Road	15	Poonkunnam Junction
4	Karunakaran Nambiar road	16	Swaraj to MG
5	Shornur Road	17	Kurichira
6	St Thomas Road	18	Civil line
7	Kuruppam Road	19	MG Road to Swaraj
8	Pattalam Road	20	Calvery Road
9	M O Road	21	Ayanthole Road
10	Palace Road	22	Achuthamenon Road
11	Sakthan Market to Fish Market	23	Nethaji Road
12	Aswani junction		
Off street parking locations			
24	Kuruppam Road	26	M O Road
25	Kalyan Silks		

incentivized because it is either free or priced lower than off-street parking. Parking accumulation and duration survey was carried out at all the major road stretches where the parking accumulations were found to be high. Registration plate method was used to collect data on parking duration and accumulation of all categories of vehicles during both peak and off peak period. Different categories of vehicles were converted to equivalent car space (ECS) based on the conversion factors recommended by MOUD for arriving at a single value to denote parking accumulation. Locations selected Parking survey are given in table 10.7.

10.5.5.1 On-Street Parking

From the parking accumulation study of vehicles observed at various locations in Thrissur shows that Swaraj Round had the maximum parking accumulation of 518 vehicles, followed by High Road with 373 vehicles on both sides for a length of 700m, Kumarapuram road stretch with 241 vehicles and MO Road stretch (154 vehicles) in that order. Two-wheelers were the primary category of vehicles parked (80.4%), followed by car (10%) and auto rickshaws (9%). In terms of ECS, it was found to be dense around the Swaraj Round area with 184 ECS of vehicles. Other major parking areas were High road with 111ECS, M O Road (39 ECS), Kuruppam Road (88 ECS) and Palace Road having 69 ECS.

Duration of parking of different types of vehicles in selected areas of the city shows that most of the vehicles (61.57%) were parked for less than 30 minutes, 18.16% of the vehicles parked for a duration of 30 to 60 minutes and less than 10% of the vehicles parked for more than one hour.

10.5.5.2 Off-Street Parking

The users of on-street parking are casual users who use the space for a short period. In many urban centers, some areas are exclusively allotted for parking which will be at some distance away from the mainstream of traffic. Such parking is referred to as off-street parking. They may be operated by either public agencies or private firms. Major locations selected for Off-Street Parking Surveys are Kalyan Silks shop and MO Road. The off-street parking accumulation of vehicles observed at various locations in the city shows that MO Road (Opposite BSNL Office) had the maximum parking accumulation of 111 vehicles inside and 46 vehicles outside, which was followed by Kalyan silks car parking with 72 vehicles inside and 30 vehicles on the outside direction. Car was the primary category of vehicles parked in Kalyan silks shop (92.86% IN and 93.62% OUT) followed by other vehicle (4.76% IN and 3.19% OUT) and autorickshaws (2.38% IN and 3.19% OUT). In Kalyan silks car parking area, car was the major category of vehicles parked (52.56%IN and 70.47% OUT) followed by two-wheeler (44.03% IN and 25.50% OUT). In MO Road (Opposite BSNL Office) 86.05% share was car in the inside direction, which is followed by two-wheeler of 7.87% shares. Considering vehicles parked outside the MO Road 78.74% shares of vehicles were car, and 9.45 % vehicles were two-wheelers.

10.5.6 PEDESTRIAN VOLUME

Pedestrians are an essential component of road users. In urban areas, a significant proportion of trips are performed by walk. They are the most vulnerable road users in urban

areas. The pedestrian facilities such as footpath are encroached by the frontage of the shopkeepers or by vendors. Due to the absence of footpath railings, pedestrian spillover is high, which obstructs the movement of vehicular traffic. Pedestrian surveys were carried out at 14 locations, where pedestrian volume were high.

Table 10.8 Peak Hour Pedestrian Cross Movement

Sl No	Name of Road	Direction	Peak Time	Peak hour Pedestrian Flow		
				Up	Down	Total
		Patturaickkal to Aswini	17.30-18.30	125	89	214
		Patturaickkal to Punkunnam	18.15-19.15	53	66	119
1	Patturaickkal Jn	Patturaickkal to Shoranur	18.00-19.00	84	79	163
		Manorama to Ikkanda Warrior Jn	8.45-9.45	169	26	195
		Manorama to KSRTC	16.30-17.30	60	107	167
		Round to Manorama	9.30-10.30	118	126	244
2	Manorama Jn	Manorama to Kodungalloor	8.30-9.30	201	19	220
		Sakthan Statue to High Road	18.15-19.15	97	99	196
		Sakthan Statue to Kannamkulangara	16.00-17.00	259	130	389
		Sakthan Statue to Stand	15.45-16.45	484	693	1177
3	Sakthan Statue Jn	Sakthan Statue to Railway Station	8.45-9.45	374	148	522
		Sakthan Jn to Round	17.45-18.45	95	96	191
		Sakthan to Manorama	18.00-19.00	500	143	643
		Sakthan to Statue	8.45-9.45	291	447	738
4	Sakthan Jn	Sakthan Stand to KSRTC	8.30-9.30	223	1035	1258
		Manikandanlal to Temple	8.45-9.45	785	477	1262
5	Manikandanlal Jn	Manikandanlal to Kuruppam Road	8.45-9.45	62	421	483
		Karunakaran Nambiar Road	16.30-17.30	891	836	1727
6	Vadakke Stand	Shoranur Road	15.45-16.45	1272	487	1759
7	Kalyan Jn	Kalyan Jn to Temple	8.30-9.30	830	963	1793
8	Naduvilal Jn	To Temple	9.00-10.00	528	494	1022
9	M.O. Jn	To Temple	8.30-9.30	308	1408	1716
		To Temple	18.00-19.00	107	244	351
10	Naikkannal Jn	M.G.Road	8.45-9.45	96	74	170
11	Palace Road	To Temple	16.00-17.00	423	142	565
12	CMS School Jn	CMS School to Temple	8.45-9.45	12	37	49
13	High Road Jn	To Temple	15.30-16.30	117	877	994
14	St.Thomas Jn	To Temple	8.45-9.45	710	599	1309
		Bini Jn to Aswini Road	15.30-16.30	170	794	964
		Bini Jn to Temple	11.00-12.00	381	151	532
15	Bini Jn	Swaraj to Bini	16.00-17.00	204	433	637
		Down Ayyanthole to Civil line	18.00-19.00	69	61	130
16	Civil Station	Up Towards Collectorate	17.00-18.00	179	185	364
		Arm 1	9.00-10.00	72	36	108
17	Kuriachira	Arm 2-Ernakulam-Thrissur	12.00-13.00	91	117	208
18	Kuruppam Road	Kuruppam Road	17.00-18.00	513	462	975
		Naduvinal-West Fort	17.00-18.00	310	457	767
19	M G Road	MG - Swaraj	12.00-13.00	408	202	610
20	MG Rd to Swaraj	MG Rd to Swaraj	9.00-10.00	42	251	293
21	North Bus Stand	Down Stand to Round	17.00-18.00	389	298	687
	Paramekkavu (Palace	Swaraj to Palace Road	14.00-15.00	262	290	552
22	Road)	Swaraj Round to Paramekkavu	17.00-18.00	124	174	298
23	Poonkunam Jn	Poonkunnam to Patturaikal	17.00-18.00	109	110	219
24	Railway station Jn	Railway station -KSRTC	17.00-18.00	463	600	1063
		Bishop palace-sahithya academy	9.00-10.00	68	455	523
25	Ramanillayam Jn	Ramanilayam-Town	8.00-9.00	159	34	193
26	Sapna Jn	Sapna - Swaraj	15.00-16.00	63	67	130
27	Shornur Road	Shornur Road	17.00-18.00	298	244	542

Peak hour pedestrian cross and lateral movements at major pedestrian locations in Thrissur City are given in table 10.8 and table 10.9 respectively. Pedestrian lateral movements were observed at two locations namely Railway Station Jn. and Vadakke Stand Jn. It could be seen that at both locations, the lateral volume of movements lied between 167 and 420. Pedestrian cross movements are observed are 27 major locations. It could be seen that the peak time and flow of pedestrian traffic were varying for different locations. Locations such as St. Thomas Junction, Kalyan Jn. to Temple, Shoranur Road, railway station junction, Karunakaran Nambiar Road, Manikandanal to Temple, Sakthan Stand to KSRTC, Sakthan Statue to Stand, Naduvilal Junction to Temple, St. Thomas Junction to temple & M.O Junction to temple had highest pedestrians with more than 1,000 pedestrians per hour, followed by Kuruppam road with 976, Bini Jn. to Aswini Road (964), High Road Junction to temple (994) and Naduvilal-West Fort direction of M G Road with 767.

Table 10.9 Peak Hour Pedestrian Lateral Movement

Sl. No.	Name Of The Junction	Name of Road	Peak Value							
			Left				Right			
			Time	Up	Down	Total	Time	Up	Down	Total
1	Railway Station JN	Towards KSRTC Terminal	17.30-18.30	251	194	445	11.00-12.00	222	175	397
		Towards Chettiyangadi	18.15-19.15	213	187	400	16.30-17.30	225	195	420
2	Vadakke Stand	Towards Aswini Junction	16.30-17.30	243	1082	1325	17.45-18.45	68	94	162

10.6 CHARACTERISTICS OF INTER-CITY PASSENGER TRAFFIC

Inter-city travel characteristics of passenger and goods movements were obtained by conducting origin-destination survey of a sample number of passenger & commercial vehicles passing through major outer cordon points in Thrissur city. Volume survey of all the vehicles entering/exiting the study region was conducted at six outer cordon points of the study region. Classified volume of vehicles was recorded according to their direction of travel. The maximum daily traffic volume of 56,513 PCU was observed at Mannuthy survey station on NH-544, followed by 40,000 vehicles on Kodungallur road, 33,000 vehicles on Kanjani road and 31,000 vehicles each at Shoranur road and Kuttippuram road. Palakkad road had the least volume of 28,000 vehicles/ day.

For analysis of O-D (Origin-Destination) data collected from the field, places within and outside the study region were divided into a number of zones. Accordingly, the study region was divided into 30 traffic zones, the boundaries of the zone forming the combined boundary of one or more wards or Panchayats. In a similar way, outside study region was divided into 18 traffic zones, which included the immediate surrounding areas, adjoining Districts and neighboring States. The traffic zones adopted for the study is shown in fig. 10.4.

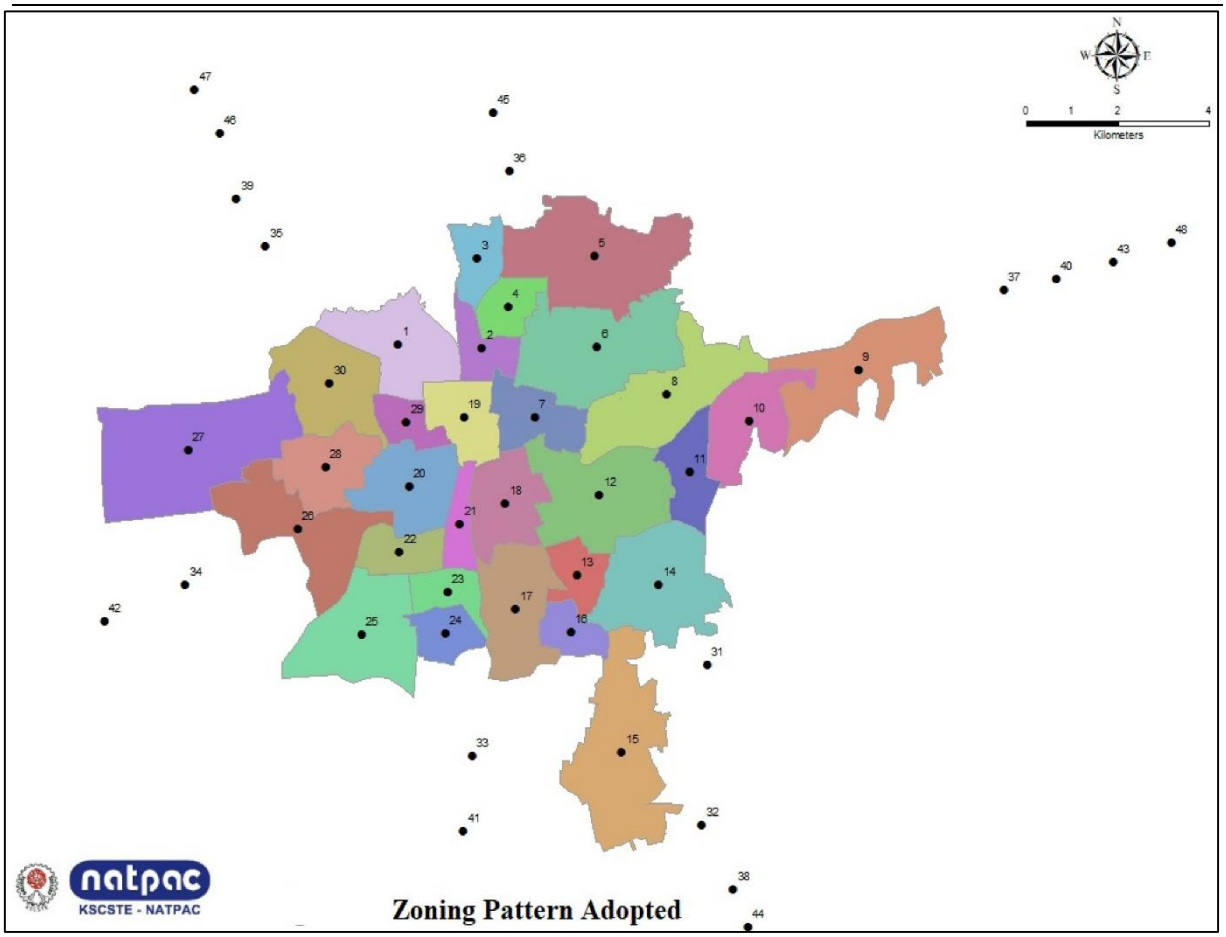


Fig. 10.4 Zoning Pattern adopted for O-D study

10.6.1 ORIGIN-DESTINATION OF PASSENGER TRIPS

A total of 7.67 lakh passenger trips were performed as inter-city trips in the study region on a day. The major traffic generating zones within the study region was zone 19 (Thekkinkadu and Kottappuram) with 38,755 passenger trips constituting 5 per cent of the total passenger trips. In the case of external zones within Thrissur district, the major traffic generating zones were Peramangalam, Adatt, Kunnamkulam, Guruvayoor, Chavakkad area (96,783 trips), Kolazhy, Wadakkanchery, Shoranur, Cheruthuruthy, Chelakkara area (52,719 trips) and Pudukkad, Kadukutty, Kodakara, Kodassery, Koratty, Pariyaram, Meloor, Chalakkudy, Athirappilly area (47,392 trips). Major component of passenger trips originated from other neighboring districts were 27,379 passenger trips from Idukki and Ernakulam districts. A total of 15,146 inter-State trips mostly from Tamil Nadu were performed in the study region.

An analysis of inter-city trip attractions revealed that Poonkunnam, and Kuttankulangara area attracted 61,049 inter-city passenger trips from various zones. Among the external zones within district, the highest number of 60,019 trips was attracted to Peramangalam, Adatt, Kunnamkulam, Guruvayoor, Chavakkad area. Other districts including Ernakulam district and Idukki district collectively attracted 86,577 trips. Other States including Tamil Nadu attracted 13,298 trips.

10.6.2 MODAL-SPLIT

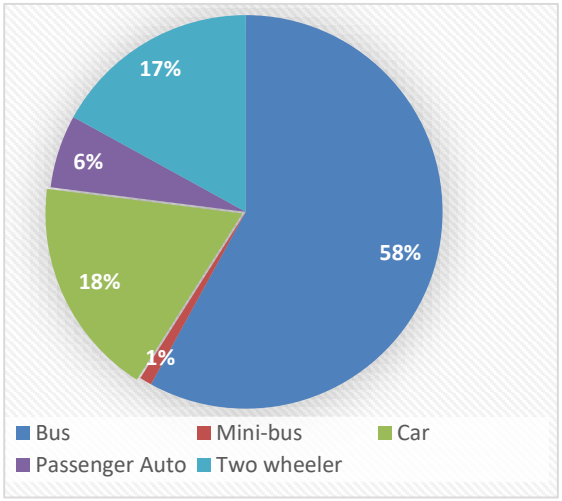


Fig. 10.5 Modal Split of intercity passenger trips

Inter-city passenger road transport in Thrissur is predominantly met by road based KSRTC buses, private buses, mini-buses, and a host of personalized vehicles like 4-wheelers, two-wheelers etc. An analysis of the O-D survey data collected from outer cordon survey locations revealed that an estimated 7.67 lakh inter-city passenger trips were performed in the study region on a reference day consisting of 4.42 lakh bus passenger trips (58%), 11,466 minibus passenger trips (1%), 1.40 lakh car/van/jeep passenger trips (18 %), 44,628 auto-rickshaw passenger trips (6%) and 1.29 lakh two wheeler passenger trips (17%). It could be inferred that public transport had a significant role in meeting the inter-city passenger demand. Table 10.10 and fig. 10.5 gives the modal split of inter-city passenger traffic in Thrissur city.

Table 10.10 Modal Split of Inter-City Daily Passenger Trips in Thrissur City

Sl. No.	Mode of travel	No. of passengers	% of passengers
1	Bus	441,735	58%
2	Mini-bus	11,466	1%
3	Car	140,311	18%
4	Passenger Auto	44,628	6%
5	Two wheeler	129,299	17%
	Total	**767,437**	**100%**

10.6.3 PURPOSE OF TRIP

Analysis of the purpose of trip made by the passenger revealed that majority of the trips were made for work purposes (45.66%). Fig. 10.6 shows the distribution of inter-city passenger trips for different purposes according to mode of travel.

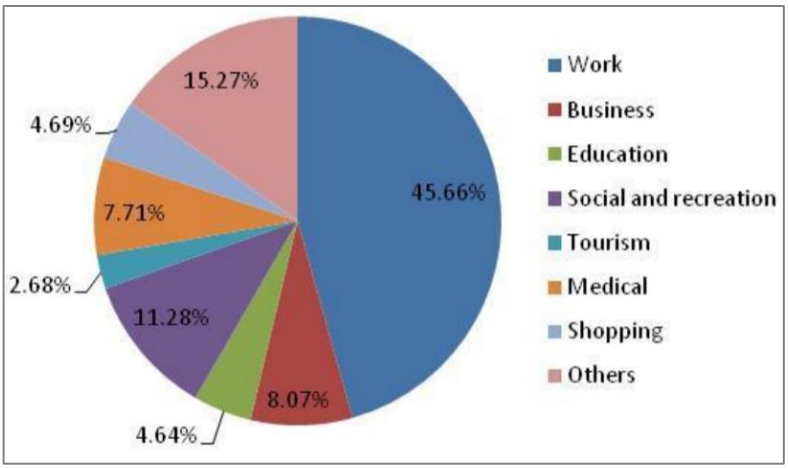


Fig. 10.6 Purpose Wise Inter-City Passenger Trips in Thrissur city

10.6.4 PATTERN OF INTER-CITY PASSENGER TRIPS

The pattern of inter-city passenger traffic revealed that there were 2.82 lakh internal - external trips (Study region to outside study region), out of 7.67 lakh inter-city passenger trips. They constituted 37 percent of total trips. A total of 3.24 lakh trips were external - internal

trips (outside study region to study region) constituting 42 percent of the total trips. External - external trips to the tune of about one lakh were performed through the study region, and they were 13 percent of the total trips. Table 10.11 shows the inter-city passenger trip pattern.

Table 10.11 Pattern of Inter-City Passenger Trips in Thrissur city

Sl No	Pattern of movement	No. of passengers	Percent of passengers
1	Internal to Internal	6,480	8.30%
2	Internal to External	106,963	36.69%
3	External to Internal	46,343	42.19%
4	External to External	190,997	12.82%
	Total	**767,437**	**100.00**

10.7 PROBLEMS & ISSUES

- Narrow width of roads in central part of the city;
- Heavy traffic congestion at the central area due to the mix of intra-city and inter-city traffic. This is due to the absence of bypasses as well due to the locations of bus terminals and wholesale market in the central city;
- Heavy pedestrian traffic in central part of the city;
- Mixed traffic conditions with the presence of slow moving vehicles on critical road sections;
- Unorganized on-street parking demand along the major corridors and the absence of off-street parking facilities at critical locations;
- High trip attraction of the central city around Swaraj Round area due to the concentration of activities like commercial (wholesale and retail), work, health, education and recreation;
- Presence of rail level crossings on major roads;
- Movement of inter-city buses on congested central city roads due to the location of inter-city bus stand within the central city;
- Encroachment of right of way for non-transport purposes;
- Idle parking and uncontrolled loading/unloading activities by trucks near go-downs and wholesale markets within the central city;
- Absence of planned bus bays;
- Scientifically not designed intersections; and
- Bad road conditions

10.8 TRAFFIC PROJECTION

A long-term transport plan to address the needs of the cities in the future is the fundamental principle behind urban transport planning. The future travel demand for the horizon year, therefore, needs to be forecast. Traffic forecasts help to assess the road network shortcomings and therefore improve the capacity and plan for the road network, such as the development of new roads, missing road links etc. This segment discusses various transport

projection approaches adopted for the study and traffic projection for various horizon years. Various methods of traffic projection employed in the transport planning include:

i. Growth factor method
ii. Regression analysis method based on economic indicators like population, per-capita vehicle ownership, income growth, growth rate in industrial sector and land use pattern
iii. Interpolation method based on the past trend in traffic growth rates

The relationship established between the various economic indicators for passenger and goods traffic movement can be used to estimate the future demand in an area. Also, the growth rate of the vehicular population in the area over the years will give a reasonable estimate of future trips. The traffic volume on links from the past years can be used to establish a growth rate for prediction of the future volume on links.

10.8.1 TECHNIQUES ADOPTED FOR PROJECTION

In the case of Thrissur town, traffic projections were carried out according to the growth rates worked out on the following basis:

- Growth rate based on realistic estimates using influencing parameters
- Rates arrived based on studies conducted by NATPAC in different towns of similar size in Kerala in the past,
- The growth rate of vehicle population in Thrissur over the years and
- Variation of AADT on major roads from biannual counts made by PWD periodically

Data on traffic volumes found at different intersections of city roads collected by NATPAC during different times were used. The increase in traffic growth is shown to be volatile in nature, exhibiting varied patterns at various locations. Accordingly, traffic development in small and medium- sized towns are usually between 3% and 6%. The following growth rates were adopted for Thrissur city for different categories of roads. (table 10.12)

Table 10.12 Adopted Traffic Growth Rate

Hierarchy of road	Annual traffic growth rate (%)	
	2030	2040
Primary road	5	4
Secondary road	4	3
Tertiary road	3	2

10.8.2 PROJECTED LINK VOLUME ON EXISTING NETWORK

The estimated daily traffic for different horizon years on various road stretches in Thrissur is given in table 10.13. The volume-capacity ratio for the horizon years is also presented in this table. It can be seen that virtually all the main road corridors in the city will be heavily congested in the horizon year, with the expected traffic more than the road capacity. Hence, the corridor should be upgraded adequately to handle future traffic.

Table 10.13 Volume-capacity ratio on major road links in Thrissur City

HS NO.	Name of Homeogenous section	2030		2040	
		Volume (in PCU)	V/C ratio	Volume (in PCU)	V/C ratio
	Swaraj Round				
1	Bini Jn to Palace road Jn	529	0.15	782	0.22
2	Palace road Jn to St. Thomas road Jn	3,998	1.11	5,918	1.64
3	St. Thomas road Jn to High road Jn	1,755	0.49	2,598	0.72
4	High road Jn to MO road Jn	8,735	2.43	12,929	3.59
5	MO road Jn to Manikandanlal Jn	1,264	0.35	1,872	0.52
6	Manikandanlal Jn to Naduvilal Jn	12,383	3.44	18,330	5.09
7	Naduvilal Jn to Naikkanal Jn	11,259	3.13	16,666	4.63
8	Naikkanal Jn to Bini Jn	1,486	0.41	2,200	0.61
	Kandassankadavu Road/Thrissur-KanjanyRoad:SH 75				
9	Naduvilal to SankaraIyer Jn	3,057	2.04	4,526	3.02
10	SankaraIyer Jn to West Fort Jn	8,430	5.62	12,479	8.32
11	West Fort to Elthuruth	907	0.60	1,343	0.90
12	Elthuruth to Chettupuzha Corporation Boundary	5,238	3.49	7,755	5.17
	Azheekodan Road				
13	Diwanji Junction to Diwnajimoola	6,900	4.60	10,213	6.81
14	Diwnajimoola to Poothole Jn	3,884	2.59	5,749	3.83
	Poothole Road				
15	Thoppinmoola bus stop to Poothole Jn	458	0.38	615	0.51
16	Poothole Jn to SankaraIyer Jn	1,708	1.42	2,296	1.91
	Thrissur KunnamkulamRoad:SH 69				
17	Patturaikkal Jn to Pookunnam Jn	1,171	0.78	1,733	1.16
18	Punkunnam to Lulu Jn (Nippon Toyota)	5,400	3.60	7,993	5.33
19	Lulu Jn (Nippon Toyota) to Muthuvara (Corporation Boundary)	6,675	4.45	9,881	6.59
	Thrissur Shornur Road:SH-22				
20	Swaraj Round to Aswini	5,166	3.44	7,646	5.10
21	Aswini to Peringavu	3,812	2.54	5,643	3.76
22	Peringavu to Viyyur	5,962	3.97	8,825	5.88
23	Viyyur to Power house Jn	520	0.35	770	0.51
24	Power house Jn to Kolazhy (Corporation Boundary)	7,121	4.75	10,541	7.03
	Shornur Road/Vivekananda road				
25	Swaraj round to Patturaikkal Jn	1,563	1.04	2,314	1.54
26	Patturaikkal to Peringavu	2,635	1.76	3,900	2.60
27	Aswini to Patturaikkal	1,304	0.87	1,930	1.29
	Thrissur-Palakkad Road				
28	St. Thomas Jn to Ambakkaden Jn	2,625	1.75	3,885	2.59
29	Ambakkaden Jn to East Fort Jn	3,454	2.30	5,113	3.41
30	East Fort Jn to Mannuthy Bypass Jn	1,304	0.87	1,930	1.29
	Ernakulam Road				
31	High Road Jn to Manorama Jn	3,281	2.19	4,857	3.24
32	Manorama Jn to Kuriachira	3,011	2.01	4,457	2.97
33	Kuriachira to Ollur	6,260	4.17	9,266	6.18
34	Ollur to Thalore (Corporation Boundary)	7,653	5.10	11,328	7.55

HS NO.	Name of Homeogenous section	2030		2040	
		Volume (in PCU)	V/C ratio	Volume (in PCU)	V/C ratio
	A C Achutha Menon Road/Sankarya Road				
35	SankaraIyer Jn to Chakkamukku Jn	1,402	1.17	1,884	1.57
	Palliyil Road				
36	West Fort to Chakkamukku	8,614	5.74	12,750	8.50
	Kottappuram Road				
37	Chakkamukku Jn to Poonkunnam Jn	5,044	3.36	7,466	4.98
	MO Road				
38	MO Jn to PO Jn	1,564	1.04	2,315	1.54
39	PO Jn to Mathrubhumi Roundabout	3,812	2.54	5,643	3.76
40	Mathrubhumi Roundabout to Shakthan Round Jn	6,798	4.53	10,063	6.71
41	Shakthan Round Jn to Kannamkulangara	2,653	1.77	3,927	2.62
	KodungallurShornur Road: SH-22				
42	Manikandanlal Jn to Chettiyangadi Jn	2,879	1.92	4,261	2.84
43	Chettiyangadi Jn to Veliyannoor Jn	4,845	3.23	7,172	4.78
44	Veliyannoor Jn to Kokkala Jn	3,889	2.59	5,756	3.84
45	Kokkala Jn to Koorkkanchery	5,853	3.90	8,664	5.78
46	Koorkkanchery to Palakkal (Corporation Boundary)	1,691	1.13	2,503	1.67
	NH 544 (Palakkad - Ernakulam Road)				
47	Mannuthy Bypass Jn to Nadathara Jn	2,812	1.87	4,162	2.77
48	Nadathara Jn to Kuttanellur Bypass	1,582	1.05	2,342	1.56
49	Kuttanellur Bypass Jn to Thalore (Corporation Boundary)	2,154	1.44	3,189	2.13
	Thrissur - Mannamangalam Road (MDR 003)				
50	East Fort Jn to Jubilee Mission Hospital Jn	3,363	2.24	4,977	3.32
51	Jubilee Mission Hospital Jn to Chelakkottukara	2,587	1.72	3,830	2.55
52	Chelakkottukara to Ancherichira	1,725	1.15	2,553	1.70
53	Ancherichira to Kuttanellur Jn	1,088	0.73	1,610	1.07
54	Kuttanellur Jn- Kuttanellur Bypass	1,631	1.09	2,415	1.61
	Thrissur - Moorkkanikkara Road				
55	Chelakkottukara to Nadathara	1,715	1.14	2,539	1.69
	Jubilee Mission Jn to Veliyannur Jn				
56	Jubilee Mission Hospital Jn to Manorama Jn	1,339	1.12	1,799	1.50
57	Manorama Jn to Mathrubhumi Roundabout	1,384	1.15	1,861	1.55
58	Mathrubhumi Roundabout to Veliyannur Jn	1,630	1.36	2,191	1.83
	KSRTC Round (One way)				
59	Veliyannur Jn to KSRTC Jn	3,693	3.08	4,963	4.14
60	KSRTC Jn to Diwanji Jn	3,095	2.58	4,159	3.47
61	Diwanji Jn to Chettiyangadi Jn	1,820	1.52	2,446	2.04
	Mannuthy - Ollur Road				
63	Nadathara Bypass Jn toKuttannellur Jn	373	0.31	501	0.42
64	Kuttanellur Jn to Padavarad Jn	307	0.26	413	0.34
65	Padavarad Jn to Ollur Jn	205	0.17	275	0.23

HS NO.	Name of Homeogenous section	2030		2040	
		Volume (in PCU)	V/C ratio	Volume (in PCU)	V/C ratio
	TB Road				
66	Energy Station - Kokkala Jn	1,598	1.33	2,148	1.79
67	Kokkala Jn to Shakthan Roundabout	418	0.35	561	0.47
68	Shakthan Roundabout to Kattookaran Jn	1,265	1.05	1,700	1.42
	Bishop Palace Road-MDR				
69	Paramekkavu - Town Hall Road	2,528	2.11	3,398	2.83
70	Chembukkavu Jn - Aswini Jn	2,093	1.74	2,813	2.34
71	Chembukkavu Jn - Nettissery	399	0.33	537	0.45
72	Nettissery-Mannuthy	665	0.55	894	0.75
	Ayyanthole Road/Civil Line Road				
73	West Fort Jn to - Chungam Jn	6,409	4.27	9,488	6.33
74	Chungam Jn - Civil Line Jn	1,828	1.22	2,706	1.80
75	Civil Lines Jn - Lulu Jn(Nippon Toyoto)	4,158	2.77	6,154	4.10
76	Ayyanthole Rd - Pullazhi (Puthurkara) Rd	4,604	3.07	6,816	4.54
77	Puthurkara Rd- Olarikara	831	0.55	1,230	0.82
78	Ayyanthole Rd- Law College	2,424	1.62	3,589	2.39
79	Ayyanthole Road- Collectorate	2,165	1.44	3,205	2.14
	Post Office Road				
80	Chettiyangadi Jn to High road Jn	2,340	1.95	3,145	2.62
	Rice Bazar Road				
81	Anjuvilakku Jn to Ambakkadan Jn	559	0.47	752	0.63
	Thiruvambady Road				
82	Pookunnam to Shoranur Road	550	0.46	740	0.62
	Viyyur Power House to Thannikkudam Road				
83	Viyyur Power House Jn to Pallimoola	853	0.95	1,040	1.16
84	Pallimoola to Corporation Boundary (Thannikkudam)	1,331	1.48	1,622	1.80
	Ramavarmapuram road				
85	Kinar Jn to Pallimoola Jn	1,747	1.94	2,130	2.37
	Stadium road				
86	Stadium Jn to Chembukkavu round	3,179	3.53	3,875	4.31
	RC Bishop House Road				
87	East Fort Jn to Pension Moola bus stop	1,479	1.23	1,988	1.66
	Netaji Road				
88	West Fort Jn to Thoppinmoola Jn	209	0.17	281	0.23
	Sree Kerala varma college Road				
89	Chungam Jn -College	144	0.16	175	0.19
	Anchagadi Road				
90	Chungam Jn - Poothole	213	0.24	260	0.29
	Calvary Road				
91	West Fort - Poothole Road	2,585	2.15	3,473	2.89
	Peringavu to Viyyur				
92	Peringavu Jn to Viyyur	393	0.33	529	0.44

HS NO.	Name of Homeogenous section	2030		2040	
		Volume (in PCU)	V/C ratio	Volume (in PCU)	V/C ratio
	Other Roads				
93	Edakunny Road (MDR 01)	228	0.19	278	0.23
94	MullakaraThottapadi Road (MDR 013B)	189	0.16	230	0.19
95	Mullakara - Mulayam (MDR 009)	353	0.29	430	0.36
96	Mudikode - Mulayam/ Koota	528	0.44	644	0.54
97	Elthuruth - Olari (MDR 35)	1,193	0.99	1,454	1.21
98	Mannuthy - Bazar Road (MDR 20)	2,825	2.35	3,443	2.87
99	Mannuthy - Chirakkakode (MDR 006)	488	0.41	595	0.50
100	MLA Road- Kutt road	2,643	2.20	3,222	2.68
101	Mundapalam Junction - KSRTC	1,967	2.19	2,397	2.66
102	Benette road to Town hall	1,912	1.59	2,331	1.94
103	Cherur - Kuttimukku	2,458	2.05	2,996	2.50
104	Marar Rd - Railway station	2,490	2.07	3,035	2.53
105	Swaraj to Vallikattu Lane	2,502	2.09	3,050	2.54
106	Cherur - Ramavarmapuram	3,062	2.55	3,732	3.11
107	St Marys- town hall	2,526	2.10	3,079	2.57
108	MahakariVylopilliSreedhara Menon Road	4,191	3.49	5,109	4.26
109	Swaraj to AR Menon	836	0.70	1,019	0.85
110	Koorkkanchery to Chiyyaram Road	703	0.59	857	0.71
111	Koorkkanchery to SN road	262	0.22	319	0.27

10.9 INFERENCE

Based on detailed studies, base line data pertaining to traffic and transportation has been compiled for Thrissur study area consisting of Thrissur City. The base line data contains the characteristics of transport network in the study area, volume and capacity utilization on major roads, parking and pedestrian volume, and characteristics of inter-city passenger and goods traffic movements. In addition, projection of traffic on major roads has been carried out for various horizon years considering the growth potentials of the study area. Based on traffic projection, a long term transport network plan has been prepared covering all modes of traffic.

Lack of parking areas creates hurdles for through traffic because of on street parking. Seasonal variation in the demand of parking area shows the need of vacant public spaces for dual purpose that is for parking in peak period and for any other purposes in other seasons. Vehicles were found traveling at low speed due to bad road condition. The roads must be well maintained so as to reduce accidents and traffic problems. Adequate right of way must be given to all roads so that the widening can be made easier in future if necessary.

For a smooth flow of urban life, efficient transportation system is necessary. For this, various short term, mid-term and long term measures are proposed. Adhering to the policies as well as the introduction of innovative initiatives in transportation sector will help in reducing various traffic related issues. Non-motorized friendly measures and the measures to

encourage the use of public transport may be adopted for a sustainable future. The long-term Transportation Development Plan will go a long way in achieving transport driven land use development for the city in the coming years.

CHAPTER 11
WATER SUPPLY



This chapter analyses the existing status and development issues of water supply provisions in the City. Availability of drinking water, good sanitation and pollution free environment are the three essential factors of a healthy society. Generally health and sanitation are linked to safe drinking water. Water pollution is a major problem in the global context.

11.1 INTRODUCTION

Water has always been an important and life sustaining drinks to humans and is essential to the survival of all organisms. But only less than 1% of the whole water on earth is accessible to man and other living beings in the form of fresh water found in lakes, rivers and underground aquifers. The average annual rainfall of the State is estimated at 3000 mm. However, it's spatial and temporal distribution pattern is mainly responsible for the frequent floods and droughts in Kerala. About 60% of the annual rainfall in the state is received during the South-West Monsoon (June – August), 25% during North – East Monsoon (September – November) and the remaining during the summer months.

Thrissur City has a tropical humid climate, with an oppressive summer and plentiful seasonal rainfall. The hot season, lasting from March to May, is followed by the south-west monsoon from June to September. The northeast monsoon occurs from October to November and the rest of the year is generally dry. Average annual rainfall in Thrissur City is about 2767mm.Seasonally, monsoon season experiences maximum precipitation followed by post monsoon and pre monsoon seasons.

11.2 EXISTING SCENARIO

Till 1961, Thrissur city and the surrounding panchayats were provided with water supply by the use of local shallow open wells. During the year 1961, water supply scheme was commissioned to extract, treat and distribute water from Peechi reservoir at a distance of

23kms. The scheme was further augmented during the years 1986 and 1995. Peechi reservoir was constructed mainly for irrigation purposes but it also provide water to the neighboring panchayats of Arimpur, Manalur, Kolazhy, Pananchery, Mulankunnathukavu and Avanur, as well as to the Medical College and the Kerala Agricultural University. The main source of drinking water in Thrissur City is from Peechi reservoir. In addition to the above, certain parts of Ollur and Ollukkara villages, which are in the corporation, are provided with different water supply schemes. Thrissur Municipal Corporation and 19 surrounding panchayats jointly implemented a scheme (100 MLD) for drinking water from Karuvannurpuzha with the aid of Central Government, by using rapid sand filtration method. The existing water supply system in the city generally provides adequate coverage of the urban area; however supply is intermittent in some outer areas due to limited supply capacity and water losses.

11.2.1 EXISTING WATER SOURCES

Surface sources, ground water sources and rainwater collected from roof of buildings meetthe water requirement for different purposes i.e., domestic needs, industrial &commercial needs, institutional needs, fire-fighting, livestock, public purpose, agricultural needs etc. Identification of sources of water supply, their conservation and optimal utilization are of utmost importance.

Table 11.1 Main Sources of Drinking Water in the City

Source and Treatment	Storage Tanks	Capacity	Supply	Connections
Peechi Dam (Sedimentation & Filtration) 36 and 14.5 MLD treatment plants	Corporation Office Section	4 Overhead Tanks owned by the corporation in the city- 19 MLD	Old Municipal area	21386
	KWA Section Office 1 & 2	Overhead Tank Chembukkavu-3MLD Corporation Area other than old Municipal area Olari - 10 MLD Nethaji - 2.3 MLD	Koorkancherry 3 MLD	5557
			Ollukkara 2 MLD	2857
			Nadathara (part) 2MLD	8210
			Vilvattom 3 MLD	3940
		Ayyanthole 5 MLD		8300

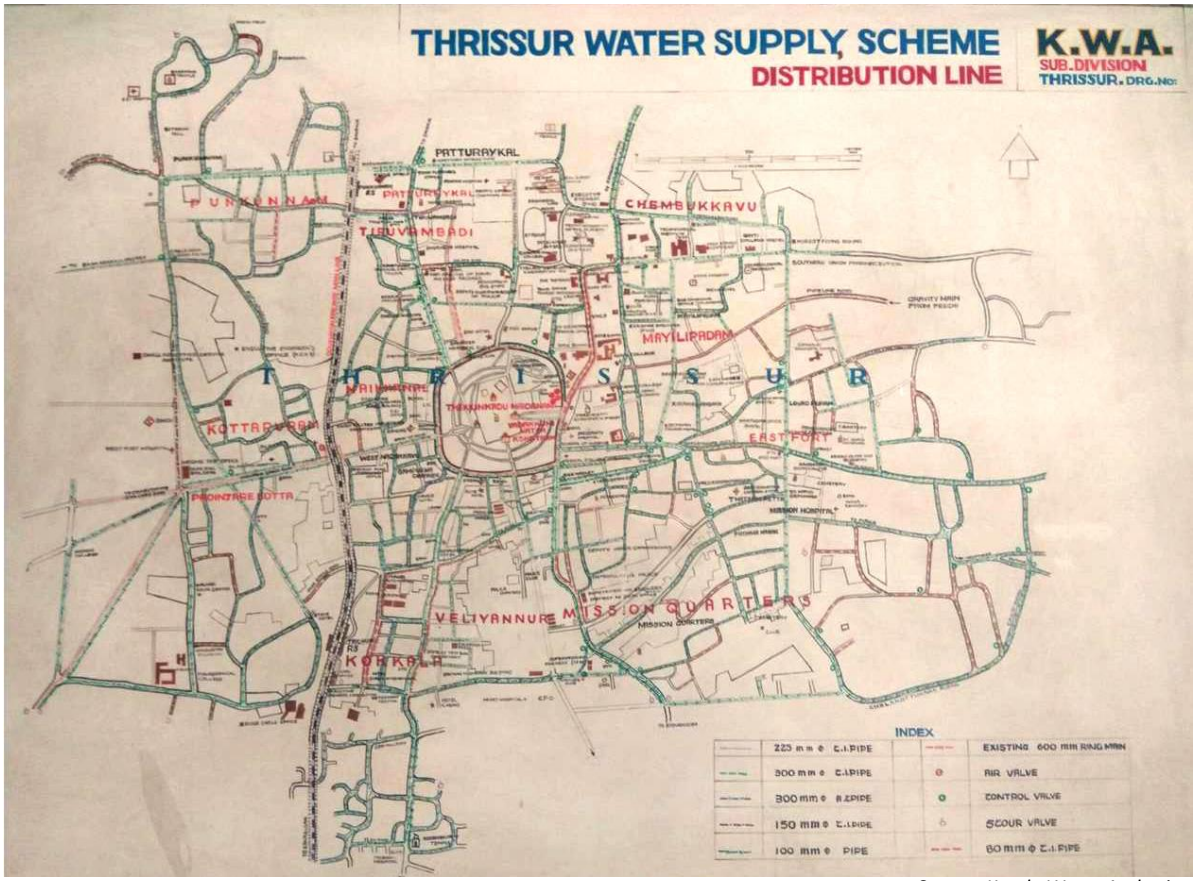
Source: KWA Thrissur, Thrissur Municipal Corporation

The principal sources of water for domestic use in rural areas are open wells. Field surveys conducted by CWRDM (Centre for Water Resource Development and Management,

Kozhikode) indicates that open well density in Kerala varies from 100 to 250 wells per sq.km. On an average 85% to 90% of wells are used for drinking purposes.

Surface sources include rivers, fresh water lakes, streams, ponds etc.The data from socio economic survey conducted in 2019 shows that majority (79%) of population in the city depends on wells for potable water and 16% of the population depends on water supplied byKerala Water Authority (Piped water supply). Ponds, public bore wells and Community wells are also used for water supply.

Peechi Dam serves as the main source of water supply for Thrissur City. Water from the intake at the Dam is treated in the 36 and 14.5 MLD treatment plants at Peechi and supplied to Thrissur City and nearby Grama Panchayats. The water is treated through sedimentation, filtration and the quantity of water supplied/day from Peechi dam under Municipal Corporation Office Section is estimated at 19 MLD (approximately). The total quantity of water supplied by KWA is about 15 MLD (approximately).The balance is supplied by bore wells and ponds. For the above purpose water authority has installed water tanks. The details of the water supply sources in the city are given in table 11.1.Water Distribution network of old Municipal area of Thrissur shown in fig. 11.1.



Source: Kerala Water Authority

Fig. 11.1 Water Distribution Network for Old Municipal area of Thrissur

Data from Socio economic survey reveals that 75.32% of the households surveyed depend on well water for their needs and 16.27% depend on water supplied by KWA/Municipal Corporation. Data on the duration of water supply and distance to the water

source showed that 98% of the total households has access to drinking water within 1/2kms and only 3% of the families have duration of water supply less than one hour.

Table11.2 Main Sources of Water in the City

Source of water	Percentage (%)
Well	75.32
Municipal Corporation/KWA	16.27
Borewell	3.26
Others	5.15

Source: Socio-economic Survey-2019

Table11.3 Duration of Water Supply & Distance to Water Sources

Duration	**<1hr**	**>1hr**
% of Families	3	97
Distance	**<0.5km**	**>0.5km**
% of Families	98	2

Source: Socio-economic Survey-2019

11.2.2 WATER REQUIREMENT

The Environmental Hygiene Committee suggested certain optimum service levels for communities based on population groups. In the Code of Basic Requirements of Water Supply, Drainage and Sanitation (IS: 1172-1983) as well as in the National Building Code, minimum of 135 lpcd has been recommended for all residences provided with full flushing system. Total water requirement for the city as per the standards is shown in the table 11.4.

Table11.4 Water Demand in the City

Year		**2011 (Base year)**	**2021**
Population		315596	333223
1.	Domestic Water Demand (135 lpcd)	42.61	44.99
2.	Non-Domestic Water Demand (20.8% of (1))	8.86	9.36
3.	Fire Demand (1% of (1)+(2))	0.51	0.54
4.	UFW (15% of (1)+(2)+(3))	7.80	8.23
	Total Water Demand ((1)+(2)+(3)+(4))	**59.78**	**63.12**
Storage Capacity Required (with allowance of 33%)		79.51	83.95

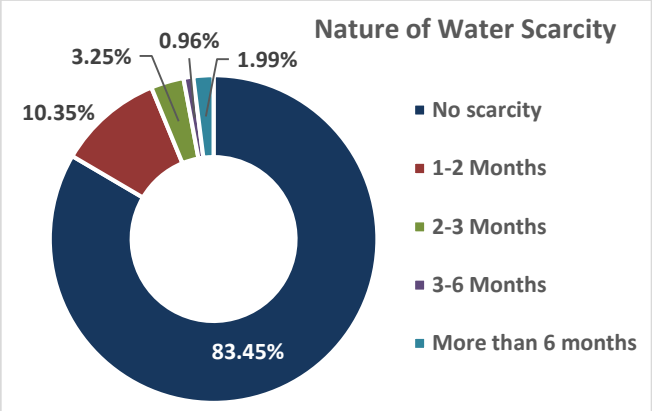
11.3 WATER SCARCITY

As per the water supply duration and scarcity data available from Kerala Water Authority, the old Municipal area is provided with daily water supply for more than 12 hours but in certain pockets, particularly in high-level areas, water scarcity is felt. It was found that about 2% of household are suffering with water scarcity for duration of more than 6 months. In some added areas, water is provided only on alternative days of limited duration especially at Ayyanthole, Koorkkencherry and Vilvattom. Significant wastage of water is noticed in Thrissur old Municipal area. On account of frequent leakages in the distribution system consumers are often forced to use contaminated water. As in any other city, the residents, who are in the low lying areas or near the OHTs, continue to draw water throughout the day. The old Municipal town is provided with uninterrupted water supply at the cost of the added areas and high-level pockets. After offsetting the losses in production processes and

distribution the present per capita availability of water in Thrissur city is about 100 lpcd. The priority is clearly a program for leak detection to reduce losses and plant optimization to increase efficiency together with the replacement of the transmission main in certain segments and total replacement of the transmission main

In Thrissur city, loss of water is noticed at all stages, from production, transmission and distribution system. Considerable leakages are noticed in the distribution system particularly in the house service connections due to intermittent supply. Substantial wastage of water is noticed in the public stand posts due to free flow of water, and in low lying pockets. It has been assessed that the leakage level in the distribution system will be more than 30%.

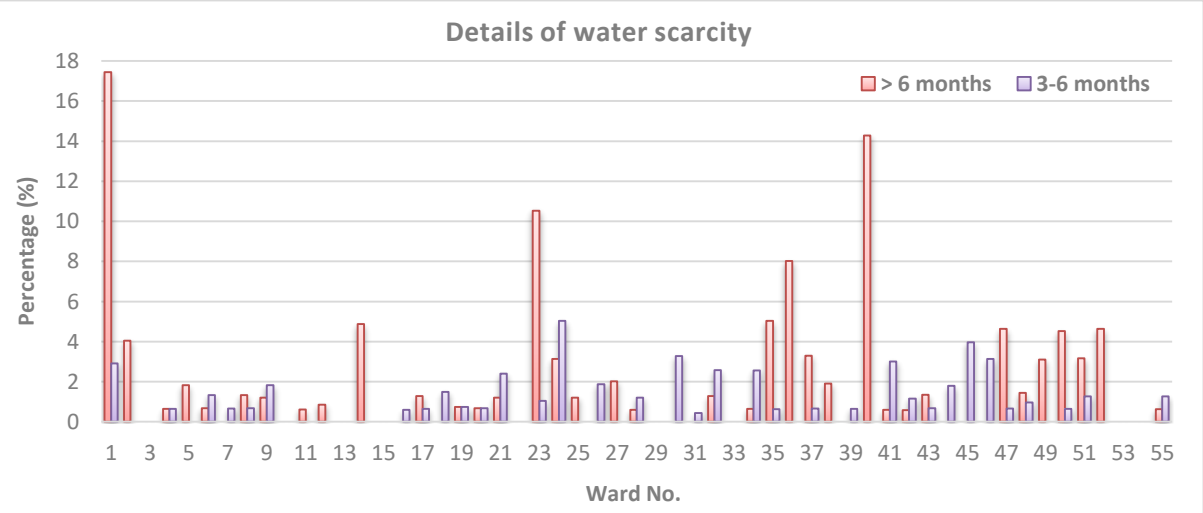
A study regarding the proximity of water sources to households conducted in Socio economic survey reveals that in Thrissur City almost 98% of population has water sources within 0.5km from their houses, whereas the situation is different in outside parts of the city. It also reveals that 16.55% of families suffer from water shortage at least for 1-2 months. Nature of water scarcity in Thrissur city is given in fig. 11.2.



Source: Socio-economic Survey-2019

Fig. 11.2 Nature of Water Scarcity

The analysis of data collected from offices of Kerala Water Authority reflected the shortage/deficit of piped water supply in Thrissur City. As per KWA records, wards 10, 31, 32, 33, 34, 39, 40, 41, 42, 43, 45, 46, 47, 48, 49 & 52 have water supply once in 2 days and no wards have all day water supply. As per the socio economic survey, at least 10 wards are found to have severe water scarcity for more than 6 months. The water scarcity details obtained from socio-economic survey is represented in fig.11.3. It shows that ward 1 (Poonkunnam) is having



Source: Socio-economic Survey-2019

Fig 11.3 Ward wise water scarcity details

highest scarcity with about 17.44% of households having water scarcity for more than 6 months, followed by wards 40 (Vadookkara) and 23 (Mission Quarters) with 14.29% and 10.53% respectively. This means they have no projects for drinking water supply in the ward and they mainly depend on other sources for meeting their domestic purposes. The scarcity of water is affected dangerously in summer season especially in the month of February, March, April and May. Wards Ollukkara (ward 15) and Mukkattukara (ward 10) shows the least scarcity.

Industries that generate wastewater with high concentrations of conventional pollutants (e.g. oil and grease), toxic pollutants (e.g. heavy metals, volatile organic compounds) or other nonconventional pollutants such as ammonia, need specialized treatment systems.

11.4 WATER SUPPLY PROJECTS UNDER AMRUT SCHEME

Table11.5 Water supply projects under AMRUT scheme

Sl. No	Project [Department/Implementing Agency]	Project Cost (Lakhs)
1	AMRUT-Supplying and fixing bulk flow meters in the transmission mains under Thrissur Corporation area	100
2	AMRUT- Supplying laying ,testing, commissioning and maintaining of 700 mm DI K9 raw water gravity main from Dam to aerator of 36 mld WTP at Peechi.	100
3	AMRUT-Survey and replacing of faulty meters and pipe lines and providing new water connections in Thrissur Corporation area	300
4	AMRUT - Zoning and mapping of water supply system of Thrissur Corporation - Supply and laying of various dia. pipes – Part 2	1700
5	AMRUT - Zoning and mapping of water supply system of Thrissur Corporation - Supply and laying of various dia. pipes – Part I	800
6	Completion of ongoing Schemes –UWSS TO Ollur & Edakkunni Census Town Villages in Thrissur Corporation –Construction of 20LL Capacity OHSR at Ollur & Supplying, Laying Distribution lines and construction of retaining wall at WTP, Arattupuzha.	1140
7	Construction of 10 LL OHSR at Anappara with Pumping system and pumping main from Cherur to Anappara- Improvement of water supply system in Div 6.7 and 8 of Thrissur corporation Part-1	800
8	Construction of 10 LL OHSR at Anappara with Pumping system and pumping main from Cherur to Anappara- Improvement of water supply system in Div 6,7 and 8 of Thrissur corporation Part-2	580
9	Construction of 5LL OHSR at Kuttanellur with pumping system at Kuriachira and pumping main for 4KM with 200 mm DI and 5KM distribution line	800
10	Construction of new 20 MLD WTP at Peechi Thrissur Corporation	1730
11	Construction of new 20 MLD WTP at Peechi Thrissur Corporation-Phase-2	1730
12	Design construction and commissioning of 3.00 MLD WTP , Reservoir and pumping main for Ollukkara zone in Thrissur Corporation	600

13	Floating Intake Structure at Peechi Reservoir	500
14	Installation of generator at Peechi and dedicated power feeder line from 33KV substation Pattikkad to Peechi treatment plant	300
15	Laying of distribution lines from existing OHT at Kizhakumpattukara to Nellikunnu area for around 15 km with varying dia. pipelines-(Dia. 200 mm DI to 110 mm PVC	600
16	Rehabilitation of Thrissur Corporation water scheme to Koorkenchery zone –Supply and Laying for separate Branched gravity main of 400mm D1K9 and replacement of 700mm premo with 700mm D1K9 pipe and supply erection	341
17	Renovation of existing damaged pump house in Thrissur Corporation	55
18	Strengthening the existing distribution system to Thrissur corporation area – Replacement of very old 80/100/125/300 mm AC &700mm premo pipes with 110/140 mm PVC and 200/300/350 mm D1 pipes at various places in Thrissur Corporation-Phase-1	1440
19	Strengthening the existing distribution system to Thrissur corporation area – Replacement of very old 80/100/125/300 mm AC &700mm premo pipes with 110/140 mm PVC and 200/300/350 mm D1 pipes at various places in Thrissur Corporation-Phase-2	1295
20	WET- Water Efficient Thrissur	500

Source: www.amrutkerala.com

Details of the various water supply projects in Thrissur Municipal Corporation under the infrastructure development sub-scheme of the Centrally Sponsored Scheme of AMRUT is given in table 11.5.

11.5 GROUND WATER

As per the data available from Ground Water Department, the average ground water level in Thrissur Municipal Corporation area is 6.16 mbgl (metres below ground level). The ground water level in the observation wells in the city shows a slight declining trend, when analysed for the last 10 years. The department had already implemented 33 Nos. of Bore well based Micro Water Supply Schemes in Thrissur Corporation area and few more schemes are in various stages of implementation

11.6 INFERENCE

On a detailed analysis of the above factors it can be divulged that Thrissur City is under severe water shortage especially in summer season. The water supply from KWA is found to be insufficient in meeting the needs of people. More projects have to be introduced for meeting the water demand of people in the city. Sanitation methods also have to be modified and treatment plants introduced for providing a hygienic situation in the city. The following measures may be adopted overcome this situation.

- **Proper Conservation and Protection of the Surface Sources**

Existing water resources have to be protected from pollution so that water can be made available for the future needs. Water bodies present in Thrissur City have to be identified with help of their survey numbers and their boundaries have to be demarcated in the land use maps and ensure that they are protected from encroachment. Encroachment of

water bodies if found should be punished by law. To reduce the encroachment of water bodies, a green strip may be proposed along the sides of them. Authorities must ensure that water bodies are not affected by any form of construction in an area so that encroachment is reduced.

If proper conservation and protection measures are taken, other surface sources across the city can also be utilized as drinking water sources. We have about 33 small and large ponds in the city. Proper measures have to be taken to protect them from pollution. New projects have to be introduced which will help in utilizing these water sources for irrigation and domestic purposes effectively. Government has to take proper measures to develop, coordinate, and oversee protection programmes and conduct related monitoring, training, and out-reach activities.

- **Rain Water Harvesting Projects**

Rain water is the purest form of natural resource of water. Rain water harvesting is one of the easiest ways to protect the water. This must be encouraged so that runoff water is saved and infiltrated to increase the water table of the area. The awareness towards the use of rain water has to be promoted for the fight against the drought. Implementation of rain water harvesting for every house hold as mandatory or accepting as a Government programme, this will solve the problem of drinking water during summer.

- **Water Recharging**

This programme has an important role in increasing the capacity, preservation of water for an extended period, which will diminish the scarcity of water in summer. As mentioned in the studies, people of Thrissur City are depending more on open wells than any other sources. The over exploitation of ground water has created an imbalance between the withdrawal and recharging of ground water resulting in exhausting of ground water potential. The rain water is simply wasted as surface runoff and not allowed to penetrate into the ground. If this water can be diverted to recharge open wells of the private sector with some kind of simple infiltration arrangements, the effect will be spontaneous and will be a huge relief during the acute summer. This can be used for recharging the bore well sources also.

- **AWARENESS PROGRAMME**

Awareness of the drinking water, availability of the pure water, quality of the available water, conservation, usage etc. are to be understood by everybody. Programmes have to be conducted by government for the public, aware of the need for maintaining the hygiene of open wells, ill effects of using impure water for domestic purpose and the need for conserving water resources for future.

- **MAINTENANCE OF THE EXISTING PIPE LINES**

As for water distribution facilities, many of the existing pipes laid are damaged and not replaced due to lack of funds. The problem aggravates due to intermittent supply. When the supply is intermittent, the chances of pipes getting damaged will be more, resulting in supply

of poor quality water. The capacity and working condition of the water treatment plant has to be increased.

- **Waste Water Recycling Plant**

A waste water recycling plant has to be implemented to treat sewage water. Domestic sewage is 99.9% pure water; the other 0.1% is pollutants. This can be effectively treated with the help of modern plants. The recycled water can to be used for agricultural purposes which will be helpful for common man.

Industrial pollution of water bodies can be reduced by enforcement of proper rules and regulations by the Government bodies.

- **Self-Financed Drinking Water Projects**

By the introduction of self-financed drinking water projects at places of water scarcity through public private partnership, water scarcity problem can be reduced.Peechi dam is the main supply centre for water of Thrissur City. New sources have to be found and utilized so that the increasing need for people in the coming years can be met. One of the projects is utilization of water from Karuvannur River. Water from river can be stored and brought through Vallachira for meeting the demand in Thrissur City. Water level in K.L.D.C canal can be kept to a fixed level throughout so as to increase the water table.

CHAPTER 12
SOLID WASTE MANAGEMENT & SANITATION



This chapter details out the waste management (liquid and solid) methods adopted in Thrissur City, its defects, need for new and improved techniques for waste treatment so as to maintain a clean and healthy environment in the area.

12.1 INTRODUCTION

For any society craving for better hygienic and health conditions, proper waste management provisions are indispensable. Compared to other Municipal Corporations in Kerala, Thrissur enjoys overall satisfactory sanitation facilities. Since a number of high-rise buildings (apartments, lodges and commercial buildings) and hotels are being erected, the city is having the large number of pollution units.

Solid waste can attract rodents and insects which may cause gastrointestinal diseases, yellow fever, plague and other contaminating diseases. Exposure to hazardous wastes, particularly when they are burned, can cause various other diseases including cancer. Waste can contaminate surface water, groundwater, soil, and air which will affect all living organisms as well as the environment. Waste treatment and disposal produces significant greenhouse gas (GHG) emissions, notably methane, which contribute significantly to the global climate change.

Providing good sanitation is an obligatory function of the local bodies. This includes providing good sanitation facilities in households, markets, public places, etc. as well as proper solid & liquid waste disposal and treatment systems. The solid waste management and liquid waste disposals are the obligatory functions of Urban Local Bodies (ULBs). But in the city, these services are poorly managed, creating problems of health, sanitation and environmental degradation. An unhealthy sanitary condition itself invites difficulty in disposal of liquid waste generated from households. Contamination of ground water due to insanitary conditions leads to many health problems. So sanitation has to be considered with great importance. No scheme for recycling of waste water is prevailing in the city.

Problems faced are:

- Waste is not collected from sources
- Lack of segregation of recyclable waste
- Roads and Drains are not cleaned properly
- Lack of proper Drainage System
- Unscientific transportation of waste
- Waste is not properly processed
- Open defecation of labourers migrated from other states
- Non availability of land for constructing toilets in schools, anganwadi and other public places

Solid Waste Management has become a major problem faced by Thrissur City. The waste generated in houses are dumped merely in open places. This will cause dangerous diseases like Dengue Fever, Chikungunya, Hepatitis, etc. The table 12.1 shows the percentage of households diagnosed with various diseases within last 5 years.

Table 12.1 Diseases in last 5 years

Type	Dengue	Chikun gunya	Hepatitis	TB	Typhoid	Chicken Pox	Cancer	Kidney diseases	Heart diseases
Average % for the LSGI in each category	0.5	0.13	0.06	0.03	0.04	0.58	0.4	0.13	0.76

Source: Socio economic survey- 2019

Clean Kerala Mission is a body constituted under the Government of Kerala for rendering assistance in the management and disposal of solid and liquid waste by the Municipalities and other local bodies as laid down in the Municipal Solid Wastes (Management and Handing) Rules, 2016 under the Environment (Protection) Act, 1986, which was brought out by the Ministry of Environment and Forests (MoEF). The Clean Kerala Mission now known as Suchithwa Mission is responsible for total sanitation activities. The Mission is now on, to the goal of waste free Kerala and implementation of methodology.

The following guidelines are given for action plan:

1. Latrines for everybody
2. Sanitation in schools
3. Toilets in anganwadis
4. Disposal and management of waste
5. Clean hygienic roads
6. Clean hygienic colonies

Sanitation programme is a major project for improving the quality of life of the people. Total Sanitation Campaign (TSC) is a project initiative by Central Government of India introduced in 1999, which is jointly funded by Central Government and respective State Governments. It was introduced to accelerate the sanitation coverage throughout the country, particularly in rural areas. It focused on information and education to generate public

demand for sanitation facilities, particularly in schools. The TSC made some progress, but it suffered from its relatively low priority and its ineffective deployment of resources. It was renamed Nirmal Bharat Abhiyan in 2012 and re-launched as Swachh Bharat Abhiyan in 2014.

Total Sanitation Campaign, Thrissur was started in the year 2003.The main aim of the project was to improve the quality and life of the rural people by appropriate interventions such as construction of individual house hold latrines, toilets in anganwadis and schools and management of solid and liquid waste in a decentralized manner.

For the sanitation of Thrissur City, Municipal Corporation has implemented the following projects:

1. Construction of Bio-gas plant: A bio gas plant has constructed at Aanappara Old Age Home.
2. SanjiviniSamagra Health Project: For mosquito eradication spraying and fogging, medical camps are conducted in all wards.
3. Plastic Shredding machine: To destroy the plastic wastes four plastic shredding machines are installed at Laloor. The shredded plastic is used for tarring roads.
4. Samagra Arogya Insurance Padhathy: As national insurance company Ltd as agent an insurance scheme has implemented for the residents at Laloor.
5. Girls friendly toilet: Girls friendly toilets are constructed at Ayyanthole Girls VHSS

12.2 LIQUID WASTE

There is no public sewerage system in Thrissur Municipal Corporation. As per the Socio-economic survey 2019 it can be analysed that 99.11% of the families use septic tank. Only 0.89% use other ways for their sanitary waste disposal. De-sludging of septic tanks is not done regularly which reduces their treatment efficiency. A piped sewerage scheme was proposed for Thrissur in the City Development Plan in 1972, for better environmental sanitation and hygiene in the city. However this proposal did not progress.

The pollution potential of the wastes can be reduced significantly by better housekeeping and adopting methods to minimize wastes before and after its generation. Domestic sewage is 99.9% pure water; the other 0.1% is pollutants. This can be treated and used for irrigation purpose.

Table 12.2 Methods of Sanitary Waste Disposal

Category of sanitary waste disposal	Septic tank	Leach Pit	Common toilet System	Others
Average % for the LSGI in each category	99.11	0.20	0.13	0.56

Source: Socio Economic Survey 2019

Thrissur City has drains for the removal of rain water. But due to defective planning these drains are not in proper working condition. Details of drains are given in table 12.3.

Table 12.3 Details of drains in Thrissur City

Type	Open surface drains	Covered drains	Underground sewerage	Others	Sewage Treatment Plant
Length (km)	50	30	1.8	150	Nil
Area served (Sq. km)	138.8	83.3	5	- (road side)	

Source: Thrissur Municipal Corporation

Waste water from residences, hotels and all different buildings enter the drainage system without any proper treatment. This causes clogging of the drains due to plastic and other solid/liquid waste products entering into the drain. The waste products cause many problems like bad odour, contamination of nearby water sources by infiltration, breeding of mosquitoes, and other unhealthy situations.

The present system of sewage disposal and treatment is through septic tank, which is a cost effective solution, if it is properly de-sludged, maintained and its effluent is discharged into soakage pits. Desludging of septic tanks is not carried out on a regular basis due to non-availability of sludge suction machines. A treatment plant for digesting sludge was constructed in the past but was never successfully operated and consequently abandoned. Sludge is environmentally classed as a hazardous material and its safe disposal and treatment is mandatory. In some of the areas, septic tank effluents along with sullage from kitchens and bathrooms is discharged to road side drains, which often stagnate due to obstruction from solid waste. Due to the above inadequacies in sanitation and waste water management, there is justification for introducing an underground sewerage system and sewage treatment facility for the city. The roadside drains will continue to carry storm water after the implementation of an underground sewerage system.

Since the city's growth is rapid, large portions of land may not be available for the construction of a sewage treatment plant. Keeping this aspect in consideration, the sewage treatment technology to be adopted should require minimum possible area satisfying all the discharge norms of sewage treatment. Evaluation of alternative treatment technologies indicates that up flow Anaerobic Sludge Blanket (UASB) and Fluidized Aerobic Bed (FAB) based plants are quite comparable in terms of overall investments. However the land requirement of FAB reactor is less than half the requirement of UASB plant, therefore FAB is recommended as the most suited technology in the present situation.

12.3 SOLID WASTE

Disposal of solid waste is a big problem faced by Thrissur City. Waste materials are found to be dumped on road sides at many places which cause, unhygienic situations. Waste Treatment plants have to be introduced for the proper disposal of waste collected from the city.

Table 12.4 Details of Waste Disposal in Thrissur City

Place of waste disposal	Own compound	Municipal collection	Garbage bin	Biogas plant	Street/Open space	Others
Average %	81.11	10.28	2.88	0.03	0.92	4.78

Source: Socio Economic Survey 2019

Table 12.4 shows the places of waste disposal by residents in Thrissur City as obtained from socio economic survey conducted in 2019. From the data, it can be seen that about 81% of the residential waste generated is disposed within their own compound itself.

The management of municipal solid wastes is covered by the Municipal Solid Wastes (Management and Handing) Rules, 2016 under the Environment (Protection) Act, 1986, which was brought out by the Ministry of Environment and Forests (MoEF). These rules are applicable to all urban local bodies and are to be implemented by the local bodies. They prescribe a policy for waste management which covers:

- Collection and waste storage;
- Segregation of waste;
- Littering;
- Transportation; and
- Waste processing (compost plants, energy recover etc.)

12.3.1 WASTE GENERATION& COLLECTION

In the city, on an average 213 tonnes of solid waste is generated daily from various sources such as domestic waste, shops & establishments, vegetable & fruit market, meat & slaughter house, clinical waste, construction/demolition waste, etc. Solid waste is being collected by using different methods viz.

1. Primary collection
2. Door to Door collection (Kudumbasree)
3. By drain cleaning

Table 12.5 Waste Generated in Thrissur City

Ward	Average generation (Tons/day)	Average collection (Tons/day)	No. of Houses covered for House to House Collection	Total Area Used for Sanitary Land Fill (sq. Km)	Manpower deployed	Sites used for Land Fill
1 to 55	213 Ton/daily	40.3	86604	nil (Trenching ground at Laloor is not using)	permanent staff 162 DLR-330	nil

Source: Thrissur Municipal Corporation office

Even though the waste collection mechanism is distributed all over the city limits through Kudumbasree workers, only 23% of the total solid waste produced daily is collected by this means. The Health Department of Thrissur Municipal Corporation has a fleet of 48

collection vehicles which includes 34 goods auto, 7 mini truck, 4 tippers and 3 tractors are used. There are 11 sanitary supervisors, 30 health assistants, 161 health workers and 330 daily labour workers engaged in solid waste collection and disposal activities. There are two Organic Waste Converters (OWC), one at Sakthan stand and one at Pallikulam road) in the city. Solid waste generated in the market is send to the OWC Plant in Sakthan Nagar. In the case of non-biodegradable, the segregated ones is collected by private agency.

A variety of methods for the primary collection and storage of solid waste comprising (i) open storage points; and (ii) small bins. All bins are emptied manually, under Swarna Jayanthi Shahari Rozhar Yojana (SJSRY). Thrissur Municipal Corporation has initiated a scheme for door-to-door collection of garbage by one 'Kudumbasree' unit.

Table 12.6 List of MCF and RRF

Sl. No.	Name of plant
1	Paravattani RRF 1
2	Paravattani RRF 2
3	Paravattani RRF 3
4	Paravattani MCF
5	Padavarad MCF
6	Koorkkanchery MCF 1
7	Koorkkanchery MCF 2
8	Kokkala MCF 1
9	Kokkala MCF 2
10	Kokkala MCF 3
11	Sakthan MCF
12	Pullazhi MCF
13	West fort MCF
14	Vilvattam MCF
15	Pallikkulam MCF

Source: Thrissur Municipal Corporation office

Table 12.7 List of OWC Plants

Sl. No.	Name of plant
1	Sakthan OWC Plant
2	Kuriyachira OWC Plant
3	Kovilakathupadam OWC Plant
4	Sakthan Biogas Plant
5	Ollur Biogas Plant
6	Agathi mandiram Biogas Plant
7	Mannuthi Biogas Plant
8	West fort Biogas Plant
9	Slaughter house Biogas Plant

Source: Thrissur Municipal Corporation office

12.3.2 STREET CLEANING

Under the Kerala Municipalities Act 1994, road/street sweeping and drain cleaning are obligatory responsibilities of the Municipal Corporation. The sweepers of the Thrissur Municipal Corporation are provided with the tools/equipments like brooms made of coconut leaves, baskets, wheelbarrows/push carts and shovels for the street cleansing operation. Only the main roads and city centre area are cleaned daily between 6:30 hours and 12:30 hours; other parts of the city are not cleaned daily. Street sweepers keep the waste collected in small heaps, which are removed by a handcart collection crew.

12.3.3 WASTE DISPOSAL

Waste disposal is a major environmental issue in Thrissur City. Thrissur Municipal Corporation was operating a municipal waste composting plant and a disposal site with an extent of 4 Ha at Laloor in Ayyanthole village, 8 Km from the city centre, which was started functioning from 2002. But due to various social and environmental issues, the waste disposal in this site have been terminated.

A decentralized scientific system for waste disposal has to be introduced in Thrissur City so as to overcome the problems created at Laloor. Many schemes are in progress and these will help in reducing the problems created due to waste dumping at different places. The project also proposed setting up of treatment facilities in all divisions of the Municipal Corporation. To eradicate the problems of Laloor, there was an attempt under Thrissur Municipal Corporation with the help of Agricultural University to implement a project LAMP (Laloor Model Project).

The economic costs of managing waste are high, and are paid for by local bodies. Money can often be saved with more efficiently designed collection routes, modifying vehicles, and with public education. Environmental policies such as pay as you throw can reduce the cost of management and reduce waste quantities. Waste recovery can curve economic costs because it avoids extracting raw materials and often cuts transportation costs. The location of waste treatment and disposal facilities often has an impact on property values due to noise, dust, pollution, unsightliness, and negative stigma.

It can be seen that the work of ‘kudumbasree’ members have helped a lot in reduction of waste problems in Thrissur City. They collect the waste from households which are helpful for people living in apartments and other congested areas where they have no place for waste disposal. Apart from these, the Corporation have a team of ‘green army’ for waste collection. At present there are 6 teams with 165 women were engaged for this.

As part of the initiative by the local body to promote waste management at its source, subsidies are being given to households who adopts waste disposal methods at their houses, i.e. the source of production of waste. As of now, a total of 727 biogas plants, 2272 pipe composts, 400 smart bio bins, 50 bio bins in 1349 apartments have been provided. The city compost thus produced were either used in houses or collected by the Corporation with the help of Green Army and redistributed for agricultural needs. Other organic wastes in the city

is treated by means of OWC plants Sakthan and Kuriachira. A portion of organic wastes is collected by 5 pig farms for pig rearing.

12.4 BIO MEDICAL AND HAZARDOUS WASTE

Besides MSW management rules, there are separate rules on handling and management of bio-medical waste as well as hazardous waste. As per requirements, all small hospitals, nursing homes, laboratories, dispensaries and pathology laboratories, regardless of size, should attempt to follow the directions contained in the Rules and the instructions given by the Central Pollution Control Board and State Pollution Control Boards. The State Government and the Municipal Authorities should take the lead in setting up proper facilities for their own medical establishments. It should be ensured by the medical institutions that their bio-medical waste does not get mixed with municipal solid waste. Bio-medical waste management is currently being regulated under the Bio-Medical Waste (Management and Handling) Rules, 1998.

Bio-Medical Waste from all the hospitals in Thrissur Municipal Corporation except from Mother Hospital is collected by the IMAGE and carried to a biomedical treatment plant located at Palakkad. In Mother Hospital a plant is working for the disposal of bio medical waste.

12.5 MARKET WASTES

As mentioned in previous sections, the waste generated in markets are treated by means of Organic Wastes Converters. In addition to this, total 8 biogas plants have been established in various markets in the city. Presently, the wastes from the vegetable market is provided to farmers (agricultural land area of 3 acres and above) for cattle feed as well as for composting.

12.6 PUBLIC CONVENIENCE

There are around 125 public toilets in numbers and 26 comfort stations situated at the different parts of city. Comfort stations are running in pay & use mode. Most of them are working in substandard condition which need proper maintenance and upgradation.

12.7 MEASURES IN SOLID WASTE DISPOSAL SCHEME

- Ensure transport routes for transport of waste to the treatment plant.
- Training for tanker operators and workers on site dangers, including potential health effects from sludge.
- Provision of appropriate protective gear (waterproof boots, gloves) to operators.
- Design must provide proper protection to leach pit and community sanitation blocks.
- Make alternative arrangement for drainage and water flow in.
- Design of interception drainage network uphill of landfill to divert runoff water from encroaching on landfill area. Protection of unstable soil surfaces from high velocity runoff must be ensured. No direct drainage to a stream, river or backwater must be permitted. Monitoring of water quality parameters in selected downstream water bodies and groundwater will check integrity of system.

- Proper noise management must be there by including noise suppressors on stationary machinery such as pumps and compressors and scheduling of activities.
- Provide early information to most affected people in the adjoining area.
- Installation of barrier nets and warning signs at the site.
- Identification of re-use opportunities for silt/spoil (e.g. use for filling or erecting side slopes on site) and sites for disposal of unused silt/spoil; (e.g. disposal to low lying area for land filling/road construction location/agricultural fields).
- Regular maintenance of de-silting and transportation equipment.
- Provision of a buffer zone on vulnerable perimeters with earthworks and landscaping to provide physical separation and a visual screen for the development
- Establish tree-planting and landscaping on boundaries with neighbouring residential areas.
- Daily compacting, spreading and covering of incoming refuse.
- Provide gas control systems in landfill.

12.8 ONGOING/ UPCOMING PROJECTS

In order to tackle the problem of waste management, the various projects are being introduced by the local body. They are as follows:

- Mattampuram Septage Plant – Septage plant having capacity of 10 KLD have been constructed and will be commissioned soon.
- Snehaveedu - Tender completed for 100 KLD septage plant.
- Corporation Hospital Plant – Tender completed for a 360 KLD standalone sewage plant purely for the treating waste water from hospitals. (Amrut Project)
- Proposed Sewage Plant near Vanchikulam having capacity of 2.5 MLD with 27km of pipelines.
- Mobitrash – OWC Machine placed in vehicles and operated with the help of generators which helps in disposing the wastes at source. (proposal)
- Elaborating the services of Green Army
- Upgradion of existing OWCs
- Waste to energy plant in 6.22 Ha of land at Ollukkara village. It's a joint venture of KSIDC & Thrissur Municipal Corporation

12.9 DRAINAGE

12.9.1 EXISTING DRAINAGE NETWORK

There are a number of drains, natural canals and water bodies in the city, which are the major carriers of storm water runoff. Details of drainages in the city are given in table 12.8.

Table 12.8 Details of drain network in Thrissur city

SL No	Name of the Drain	Wards coverage	Length (Kms)	Capacity	Open/ Covered
1	Aristo road	23,35,	1.2	NA	Covered
2	Ariyangadi road	12,35	1.2	-	Covered
3	Shornur road	36	1.2	-	Covered
4	Mini stadium to south	20	1.25	-	Open/ Covered
5	Nellikunnu road	14	1.26	-	Open/ Covered
6	Avenue road	35	1.3	-	Open/ Covered
7	Church circle road	36	1.3	-	Covered
8	Thiruvanikavu road	19	1.4	-	Open/ Covered
9	Krishnapuram	19,20	1.4	-	Open/ Covered
10	Unity road	24,23	1.7	-	Covered
11	Swaraj round	36	1.9	-	Covered
12	Manorama road	35	2	-	Covered
13	Bathern asramam road	35	2	-	Covered

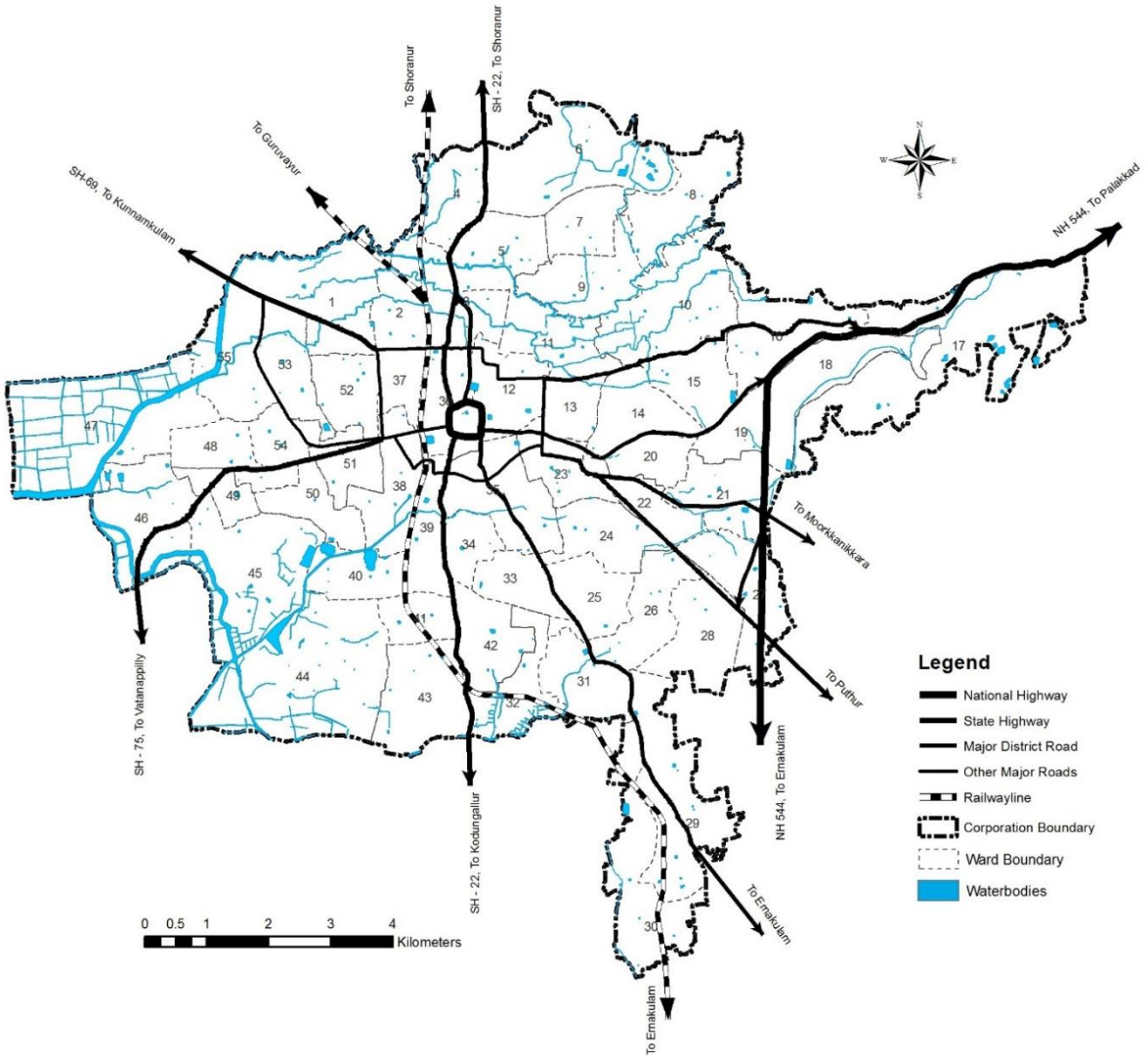


Fig 12.1 Distribution of water bodies in Thrissur City

Figure 12.1 shows the distribution of water bodies in Thrissur City. The topographical feature of the Thrissur City shows that the city centre is at the highest elevation, with terrain slopes in all the four directions. The average annual rainfall of the city is about 3,200 mm. A number of natural canals and wetlands exist in the city. These canals and wetlands are major recipients of storm water runoff. Sloping terrain and the existing canals facilitate the natural drainage of storm water runoff from the city. However, unplanned conversion of wetlands into urban developed areas, overloads the existing canals and result in flooding and water logging in certain areas of the city particularly during the monsoon. The details taken from the Trichur Engineer's centre Preliminary report on Flood & Water-2004 and detailed project of Storm water Drainage for Thrissur Municipal Corporation prepared by WAPCOS-ISA Consortium for Kerala Sustainable Urban Development Project in 2009 are used here.

60% of the existing roads have side drains. The city has been divided into four drainage zones namely East, West, North and South zones. Major primary canals in the city like Kunduvara thodu, Panamkuttichira, Chiyyaram thodu, Panchikkal thodu and Vanchikulam pond receives the storm runoff of almost the entire city. The primary canals outfalls either to the Chettuva River or to Puthenthodu during its runoff. The total length of the primary and secondary canals/drains that carry the city runoff is about 45 km.

East drainage zone is the largest drainage zone. It covers about 50% of the Municpal Corporation area. The drainage catchment areas covered under this zone are East Fort, Kalathodu, Nettissery, Chembukavu, Patturaikkal etc. The Kunduvarathodu and Puzhakkal Canal are major recipients of storm runoff in this zone. The sides in most of the stretches along the length of Kunduvarathodu do not have adequate protection. The sides of the canal are required to be protected to prevent further encroachment, flooding the adjoining area and erosion of bank.

West, North and South drainage zones are the three drainage zones that cover the remaining part of the TMC area. Major primary canals in these zones are Panamkuttichira, Chiyyaram and part of Panchikkalthodu, Cheerachithodu and Mundupalam-Kokkalaithodu. Peringavu in the north and Sakthan Bus Stand and adjoining area in the south are major waterlogged areas in the city. Other flood prone areas in the city are Kunduvara, Nallekara, Mylippadam, AKG Colony, Mundupalam and Udayanagar Colony. It is reported that about 15% of the city area is subject to flood/water logging during the monsoon and about 100,000 populations are affected due to water logging or flooding. In some waterlogged areas water rises up to a height of 0.6m to 1m.

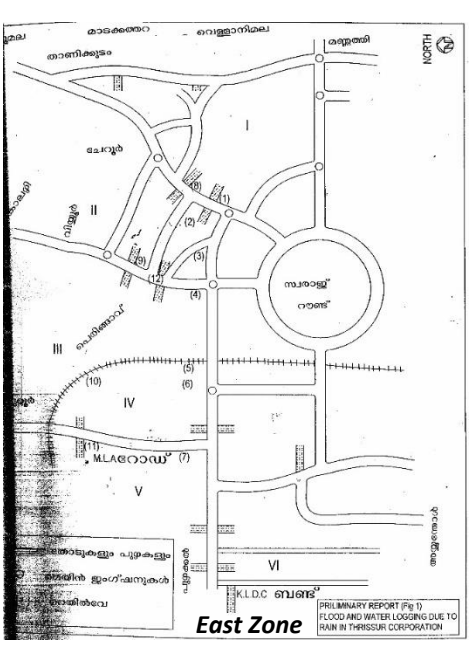
The main reasons identified for flooding in the city are the deposition of silt and wastes and growth of vegetation in the primary drainage canals/drains which reduced the carrying capacity of the canals/drains, Overloading to the existing primary and secondary canals/drains due to unplanned development and haphazard filling up of low land/water bodies without giving due consideration to drainage, Inadequate flow capacity and poor condition of certain culverts that obstruct normal flow in the canals/drains and sometime results overflow and flooding in the adjoining areas.

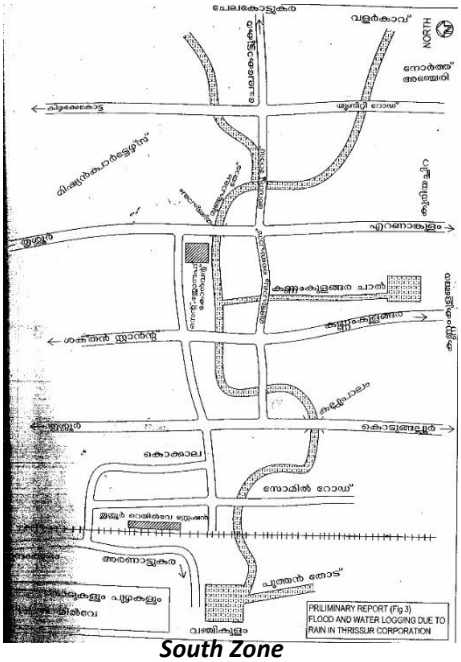
Vanchikulam tank is a major recipient of storm runoff of the west drainage zone. The tank acts as an intermediate holding basin of the city runoff before final disposal of the runoff to the Chettuva River via Puthenthodu. The tank capacity has been reduced due to silt deposition and vegetation growth. As a result the adjoining areas get inundated during heavy rainfall. In order to minimize flooding in the surrounding area, the capacity of the tank needs to be restored.



Fig 12.2 Vanchikkulam

12.9.2 IDENTIFICATION OF GAPS IN THE NETWORK





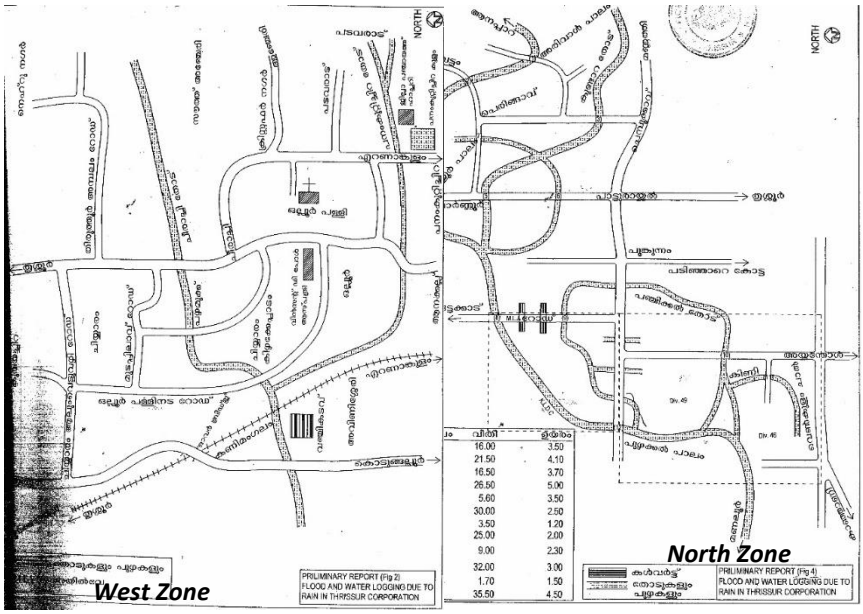


Fig. 12.3 Drainage Zones in Thrissur city

East zone: - The extend of catchment in this zone in the city is calculated to be 49 sq. km. The rain water is collected at Kunduvara area and drains to Puzhakkalthodu as seen in Fig 12.3. The five major crossings in this area are identified as Cheroor road, TUDA road, Shornur road, the railway track and MLA road. There are 12 cross drainage arrangement in these crossings. At the Cheroor road crossing immediately to the downstream of Kattachirathodu there is a foot bridge across the thodu which nearly restrict the flow of water in the thodu causing flooding up.

In between Cheroor road and Shornur road after connecting Kannanchirathodu, the flow is seen very thin whereas flood is caused in the Peringavu area. The sluice [(6) in fig.]after the railway culvert [(5) in fig.] causes a major obstacle for the flow.The flood discharge in the downstream after MLA road is also seen not proper. The flood flow from east zone is intercepted in the above 5 cross sections and finally join with the Puzhakkalthodu, and the ultimate drain out point is the Enamakkal regulator.

South Zone: Cheerachithodu and Panamkuttichira are the major drains in the first area of south zone as detailed in figure. The main crossing after State highway is the Pazhamukku and ends at Avinissery area. It crosses the railway track to join Vanchikulam. The Padavarad-Panamkuttichira tributary to Cheerachithodu also crosses state highway and joins the main thodu in between the railway crossing and Pazhamukku. South zone in fig. 12.3 shows the Mundupalam-Kokkalai drain. The vent way of the thodu is considerably reduced in the Avenue road side where the road crossing is 3m.

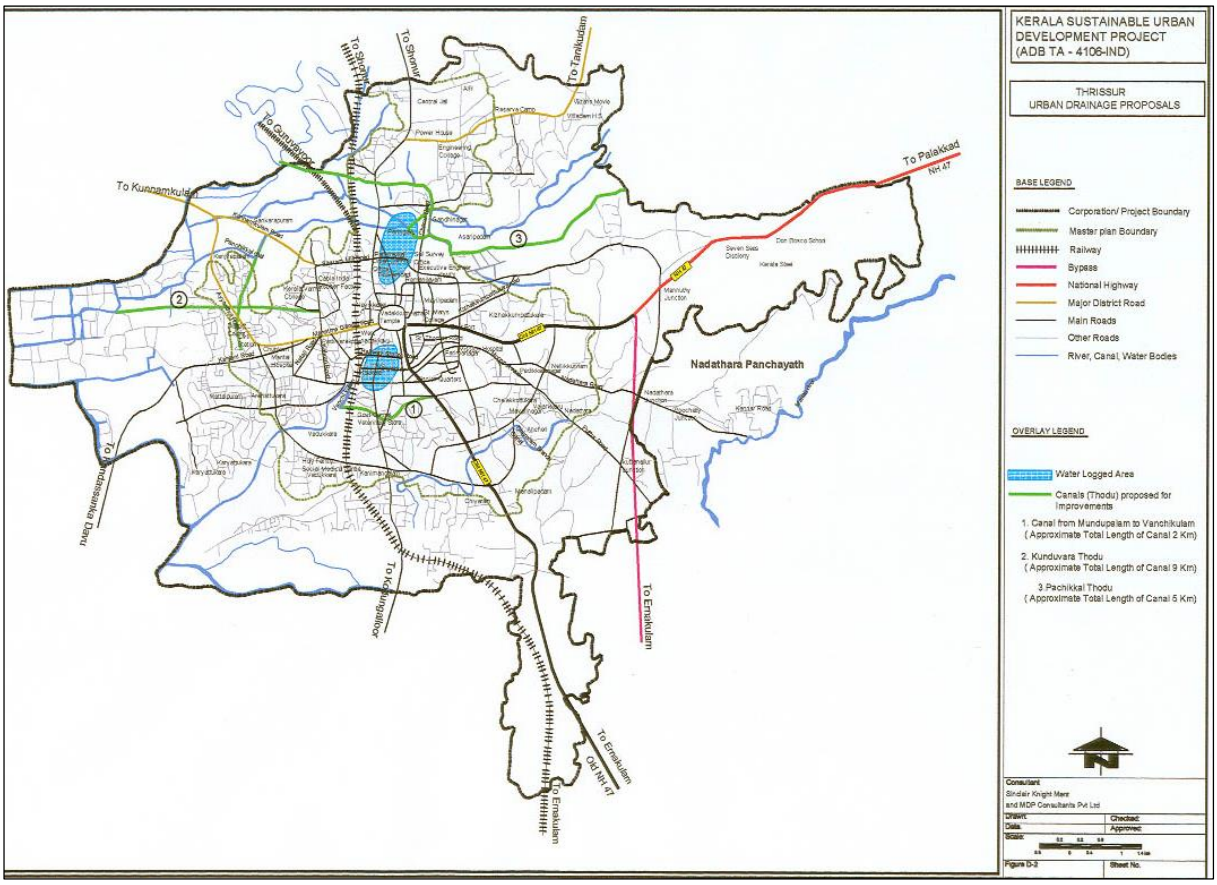


Fig. 12.4 Urban Drainage Proposals for Thrissur Municipal Corporation by KSUDP

North and West Zone: - In North zone the flooding up is due to the restricted flow of water due to the MLA road. The details of both North and West zone in the figure.

Urban drainage proposals for Thrissur Municipal Corporation formulated as per the detailed project report on Storm Water Drainage for Thrissur Municipal Corporation (ADB) prepared by WAPCOS–ISA Consortium for Kerala Sustainable Urban Development Project (KSUDP) is as shown in fig. 12.4.

The existing city drainage system lacks proper maintenance. The Thrissur Municipal Corporation (TMC), State Irrigation Department and Public Works Department are jointly responsible for operation and maintenance of the existing drainage system of the city. Better coordination among these agencies is essential for maintenance of the overall drainage system of the city. Lack of public awareness is also a factor for poor functioning of the existing drains/canal. Citizens should be made aware of the fact that indiscriminate disposal of the wastes into the waterways not only create drainage problems, but also detriment to their health and hygiene. Separation of city wastes (both liquid and solid) from the storm water flow is very important for the improvement of the existing drainage system of the city. The encroachment of high residential buildings, conversion of low lying areas causes flood and water logging. Widening the culverts, side protection, deepening and cleaning of thodu, constructions of suitable weirs can overcome the problems due to heavy rain.



Fig 12.5 Disposal of the waste in Drains

Storm Water Drainage projects are currently underway in various divisions within the Corporation as part of the Amrut Project. It serves most of the divisions within Municipal Corporation and almost 94% of the total works are completed. When these works are 100% complete, the problems of storm water drainage within the city limits will be solved to some extent.

12.10 INFERENCE

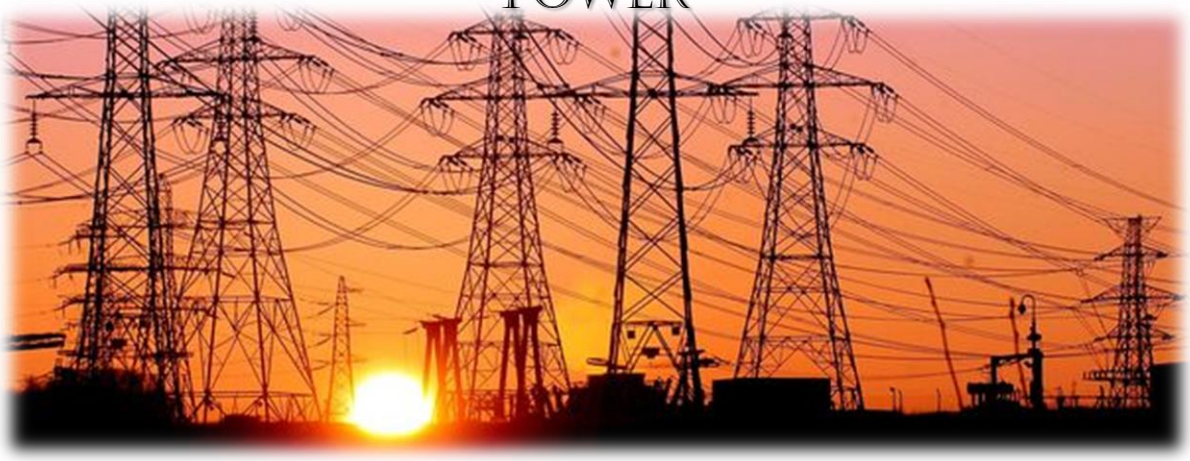
Sanitation methods have to be modified and treatment plants introduced must cater the needs for providing a hygienic situation in the City. Remedial emergency actions have been taken by the Municipal Corporation to solve the waste management problems and it is to setup decentralized waste management plants at various centres of the city. A decentralized scientific system for waste disposal has to be introduced in Thrissur City and treatment plants have to be well maintained so that they work effectively.

From 01-07-2011 plastic and plastic products below 40 micron is being banned in Thrissur Municipal Corporation jurisdiction. Plastic bags containers etc. that causes environmental issues should be banned and instead cotton / paper bags are to be made available. Provide coloured bins to residents for segregated collection of waste. Provide

sufficient gender friendly toilets and bathrooms. Effluent treatment plant is to be provided in every hospital. There should be effective arrangements for disposal of dangerous waste biogas vermi-compost plants should be erected. There should be enough number of comfort stations; eco police/green police check posts. In factories and industries, all pollution control, measures should be maintained and checked for efficiency. License for slaughter houses and meat shops should be granted only on proper waste disposal facilities. Action may be initiated against offenders and those without license. Install bio gas plants and check them for proper functioning in order to avoid pollution of air and water. Separate Solid Waste disposal arrangements should be provided in all flats / apartments etc. with suitable amendments in Kerala Municipal Building Rule / Kerala Panchayat Building Rule.

Separation of city wastes from the storm water, prevention of drains from encroachments, preventing conversion of low lying areas which results in flood and water logging will be beneficial for maintaining the drainage of the city. Measures like widening of the culverts, side protection, deepening and cleaning of thodu, constructions of suitable weirs can overcome the problems of floods during heavy rain.

CHAPTER 13
POWER



This chapter analyses the existing status and development issues of Power sector in Thrissur Municipal Corporation. The sector covers wide area which includes the different ways of power generation using conventional and non-conventional energy sources, different means of transmission and distribution. Existing status, the overall development trend, problems faced, development issues pertaining to the sector and the evaluation of ongoing and committed projects are discussed here.

13.1 INTRODUCTION

Thrissur Municipal Corporation has the golden achievement to be a Corporation with all houses electrified. Distribution of electricity in Thrissur is carried out by Thrissur Municipal Corporation licensee (in old Municipal area) and KSEB (remaining areas).The number of consumers in Thrissur City is 139830. Out of the 139830 consumers 36802 are inside the old municipal area. This means 26.31% of the connections are given by the local body itself. Although the houses are all electrified, socio-economic survey-2019 showed that about 2% of households seems to have some fluctuations in voltage. Municipal Corporation supplies power mainly from the 110KV & 66KV substations at



Fig 13.1 Substation

Table 13.1 Power Distribution Network Details of Thrissur Municipal Corporation

Source of Power	Distance (kms.)	Total Electricity Demand (MVA)	Total electricity Supply (MVA)	Total Consumption (KWH)
KSEB WEST	4 km	25M V A	25 M V A	50046558
KSEB EAST	54 km	83.33M V A	83.33M V A	18734861
KSEB Ltd. (Corporation Zone)	12.65 km	36MVA	36MVA	128390000

Source: Vidyudhi Bhavan Trichur and Electrical Section, Municipal Corporation office

Aswani Junction and from 33KV substation at Ikkanda Warrier Road whereas KSEB supplies power mainly from 400KV substation at Madakkathara and distributed to the city through 110KV substations at Viyyur, Ollur & Pullazhi. Power distribution network details in Thrissur Municipal Corporation is given in table 13.1.

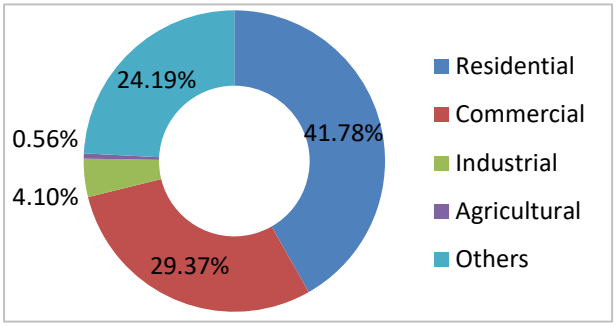


Fig 13.2 Category wise power consumption details

Source: Vidyudhi Bhavan Trichur and Electrical Section, Municipal Corporation office

The studies conducted for Integrated District Development Plan for Thrissur reveals that the number of Domestic consumers is greater in Thrissur Municipal Corporation than any other local bodies in the District. The category wise consumption of energy is as shown in table 13.2 and represented graphically in fig.13.2.

Table 13.2 Category Wise Energy Consumption

Total Consumption (KWH)	Category wise break-up of consumption				
	Residential	Industrial	Commercial	Agricultural	Others
197171419	82370013	8092166	57915540	1095728	47697972

Source: Vidyudhi Bhavan Trichur and Electrical Section, Municipal Corporation office

It can be seen that the consumption in residential sector is very high in the city about 41.78% of the total consumption. This shows the increased influence of residential activities in the city. Commercial consumption comes around 29.37% of the total. From the data agriculture usage can be found to be very negligible amount of 0.56% of total power consumption.

Table 13.3 Category Wise Energy Connection

Total No. of connections	Category wise break-up of connections				
	Residential	Industrial	Commercial	Agricultural	Others
139875	100446	2180	32002	4690	557

Source: Vidyudlhi Bhavan Trichur and Electrical Section, Municipal Corporation office

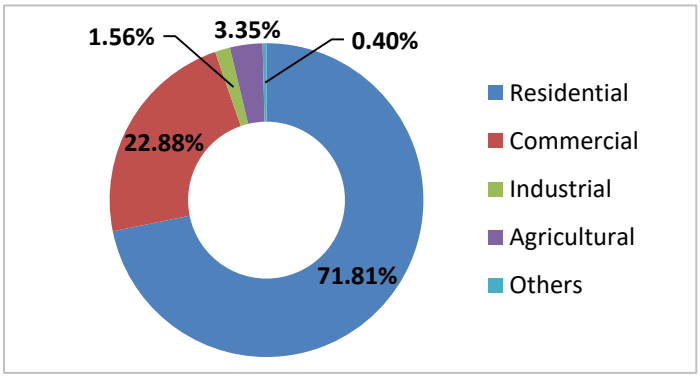


Fig 13.3 Category wise power connection details

Source: Vidyudhi Bhavan Trichur and Electrical Section, Municipal Corporation office

Category wise power connection details are provided in table 13.3 and represented graphically in fig. 13.3. The figure shows that the maximum power connections are in the domestic category (71.81%) followed by commercial (22.88%) and agriculture (3.35%).

Comparison of power connection and consumption in Thrissur city is shown in fig. 13.4. From the comparison, it can be seen that although domestic sector contributes about 72% of total connections, the sector contributes only about 42% of the total power consumption in the city. Percentage Power consumption is higher in commercial, industrial and other sectors than its percentage of connections.

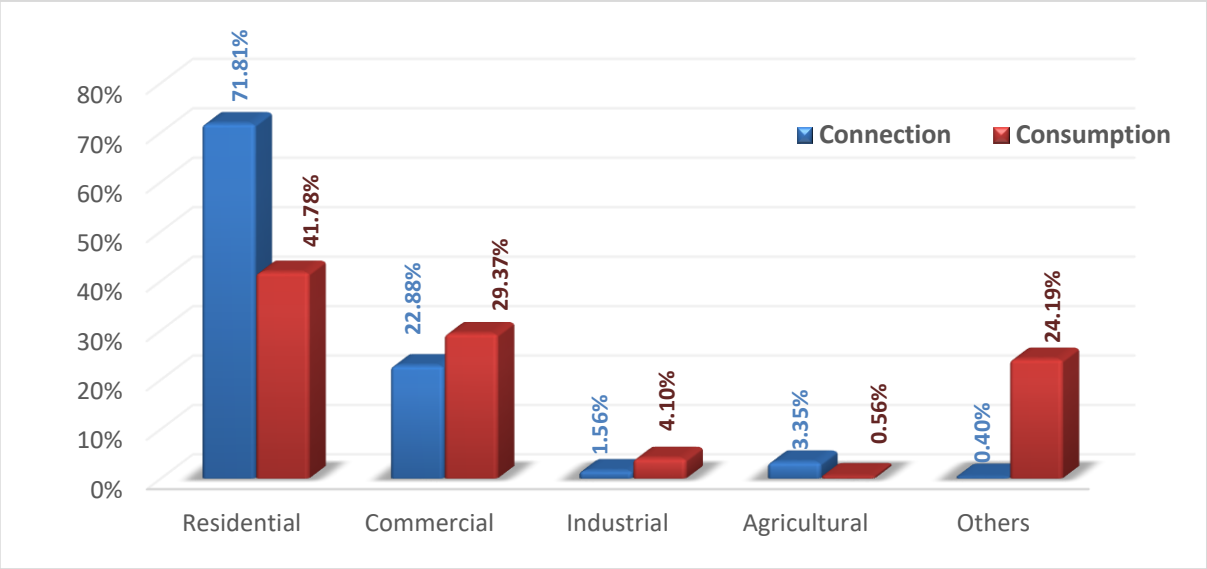


Fig 13.4 Comparison between connection & consumption

Decadal variation of power consumption, as shown in figure 13.5 shows that more amount of consumption hike is in domestic sector. It shows the increased influence of residential activities in the city.

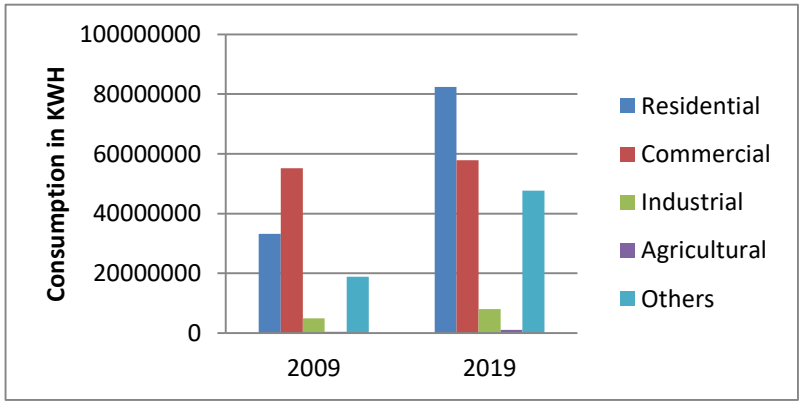


Fig 13.5 Decadal variation of power consumption

As per the objective of the KSEB to distribute uninterrupted, better voltage supply to its consumers, areas with low voltages(less than 150V) were identified by the officers of KSEB and steps were taken to prepare voltage improvement programmes in the above areas. With an aim of ensuring consumer satisfaction, certain electrical section offices were implemented as model section offices in 2010.

The main features of model section offices include:

1. Sufficient facilities for consumers and employees
2. Enquiry counters with facilities for registering applications and complaints.
3. Extended cash collection hours(8.00-13.00,13.00-18.00)
4. 100% static meters
5. Zero faulty meters

6. Safety equipments provided at all section offices and usage ensured
7. Corruption free offices
8. Eliminate low voltage areas
9. 100 % disconnection of all defaulted consumers
10. Distribution loss to be within 10 %.

Presently the sections working as model sections in Thrissur City are Ayyanthole and Viyyur. Awareness programmes for energy conservation and safety were conducted in various parts of the district. All the electrical section offices were computerized.

13.2 ENERGY CONSUMPTION AT HOUSEHOLD LEVEL

Energy consumption at household level, as obtained from Socio-economic survey-2019 is given in table 13.4. The survey results shows that major source of energy used for domestic consumption is LPG followed by electricity, firewood and kerosene. Only 0.26% of households make use some kind of non-conventional source of energy.

Table 13.4 Energy Consumption at Household

Energy Source	Percentage
Electricity	46.12%
LPG	80.53%
Firewood	31.97%
Kerosene	21.73%
Others	6.17%

Source: Socio-economic Survey-2019

13.3 STREETLIGHTING

Streetlighting covers almost all areas of Thrissur Municipal Corporation area, but they are not well distributed. There are a total of 2891 streetlights in the city, but there are various pockets which are not covered by streetlights. Works are being carried out to install steetlighting provisions to cover the whole of the city area as part of the infrastructure development sub scheme of the Centrally Sponsored Scheme of AMRUT.

13.4 PROBLEMS IDENTIFIED

Even though the district is about to be 100 % electrified, some areas are found to be un-electrified in various panchayats. These areas belong to BPL households and are not in a condition even to do wiring.

13.5 DISTRIBUTION

Various projects are proposed to be implemented in this sector such as restructured accelerated power development reforms programme (R-APDRP) from 2008 onwards.

The main features of this includes:

- Metering of distribution transformers and feeders
- Adoption of it applications for meter reading, billing and collection, energy auditing and accounting.
- Establishment of IT enabled consumer service centres
- Installation of capacitor banks and mobile service centres
- Renovation, modernization and strengthening of 11 kv level substations, transformers
- Re conductoring of lines at 11 kV lines and below.

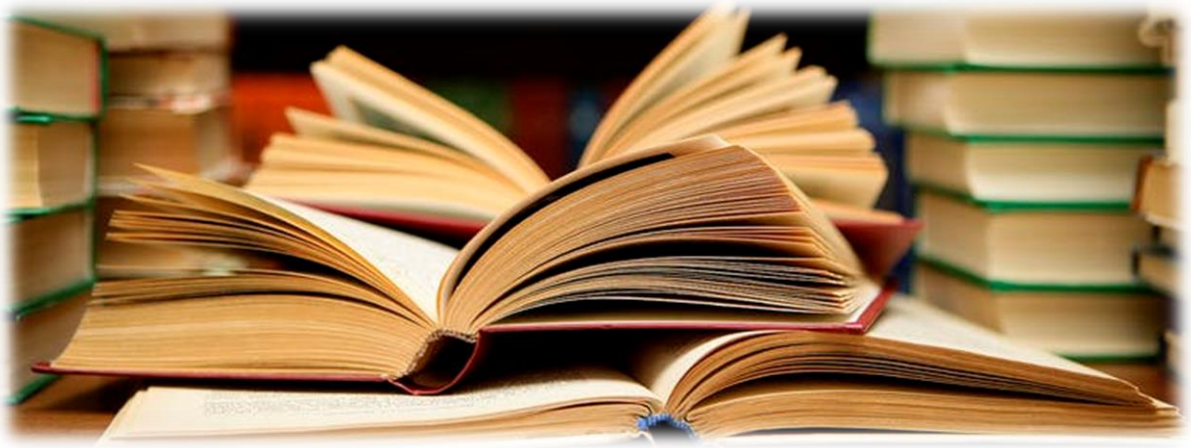
- Load bifurcation
- Feeder separation
- Load balancing
- Replacement of electromagnetic energy meters with tamper proof electronics meters.

13.6 INFERENCE

As far as the power sector in the district is considered, the power consumption seems to be proportional to the growth of consumers. Hence steps should be initiated from various fields to reduce the energy consumption or else it would be very difficult to meet the required demand from the existing resources.

Similarly steps should be taken to utilize the nonconventional energy sources to generate electricity such as from bio waste, using wind energy wherever it is feasible and using tidal energy in the coastal areas. Effective utilization of the available resources could build up a better environment to cater the future demands of the district.

CHAPTER 14
EDUCATION



In a civilised society, education is of paramount importance. The main social objective of education is to complete the socialization process. Education in its general sense is a form of learning in which knowledge, skills and habits of a group of people are transferred from one generation to the next through teaching, training, research, etc. With the advancement in science& technology and intellectual thinking, educated and trained personnel are required in every field to achieve the well-being of the society. This chapter details out the existing educational status, available educational infrastructure as well as the development issues in Educational sector in Thrissur City.

Education is a social process, which helps a man to handle the duties and responsibilities of the society. Thrissur is well known throughout the entire country of India for its immense advancement in the field of mass education. Thrissur has traditionally been a centre of learning. Being a part of a state that has achieved almost 95% literacy rate, Thrissur district as well as Thrissur city offers good opportunities for education at all levels including schools, colleges and university. One of the important facts about the educational sector of Thrissur is that it is capable of reaching out to the people from different walks of life. In Thrissur, education is not limited to the privileged class of the society. It provides ample opportunities for financial and intellectual development to the people of the young generation of the region. Another important aspect of Thrissur educational sector is that it offers a wide range of choice in terms of courses as well as type of educational institute.

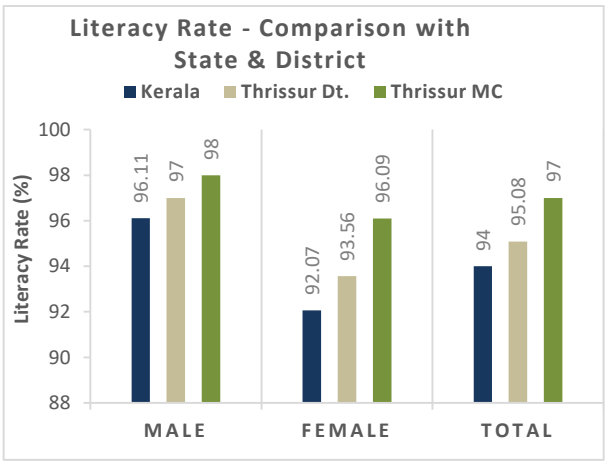
With the decline of Buddhism and Jainism due to the growing supremacy of Brahmanism during the revival of Hinduism, Thrissur became an important centre of Sanskrit learning. Thrissur also has many educational institutions, known all across Kerala for the quality of education they impart. Thrissur has a reputation for being student friendly. With the existence of Kerala Agricultural University, Kerala University of Health and Allied Sciences, Medical Colleges(Government Medical College, Jubilee Mission Medical College and Research Institute, Amala Institute of Medical Sciences), about a dozen engineering colleges (including

Government Engineering College), an Ayurveda college, a Veterinary college, business schools, law college, fine arts college, well-known arts and science colleges, good residential schools, etc., Thrissur is considered as a scholar's city.

Thrissur has emerged as the prime centre in South India for students seeking entry into the professional courses. Many reputed Coaching Centres for the engineering and medical UG Entrance exams are located in Thrissur. As many as thousands of students, mostly from different parts of the district, state and some from outside, are undergoing Entrance coaching in Thrissur and these leads to a huge inflow of migrant students, which thereby influenced the economic structure of Thrissur city mainly benefiting trade & commerce activities, food & beverages sector, entertainment industries, transport & communication, etc.

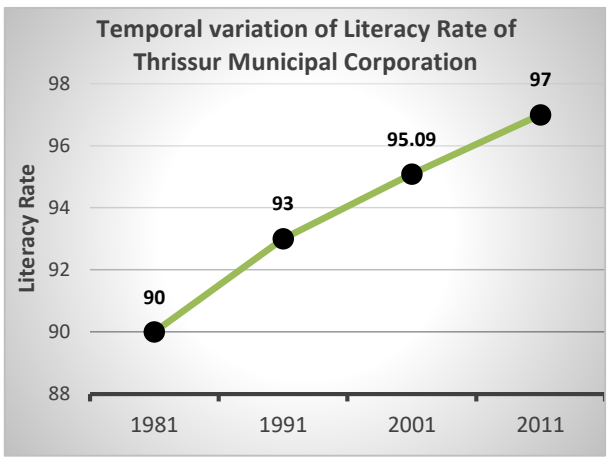
14.1 EDUCATIONAL STATUS

The literacy rate of Thrissur city, as per 2011 census is 97% with male literacy rate being 98% and female literacy being 96.09%. Fig. 14.1 shows the comparison of Literacy rate of Thrissur MC with that of state and district as per 2011 census data. It can be seen from the graph that Thrissur district shows higher values than the state, and Thrissur MC shows higher values than both the state and district in terms of male, female as well as total literacy rate. It can be seen that male literacy rate is found to be the highest in Thrissur city, state as well as the district. In a state with higher sex-ratio, the lower percentage of female literacy with respect to male literacy needs attention as it shows the educational backwardness of women in some walks of life. In order to improve the female literacy rate, sufficient measures may be taken to promote the girl child education.



Source: 2011 Census data

Fig. 14.1 Comparison of Literacy Rate with State & District



Source: Census data – 1981, 1991,2001& 2011

Fig. 14.2 Temporal variation of Literacy Rate of Thrissur Municipal Corporation

The temporal variation of literacy rate of Thrissur MC, as given in fig. 14.2, shows increasing trend from 1981 onwards. This shows the educational stability of Thrissur city. Presence of various educational institutions in the city area as well the awareness about the importance of education among the citizens are the reasons for higher literacy rate in the city.

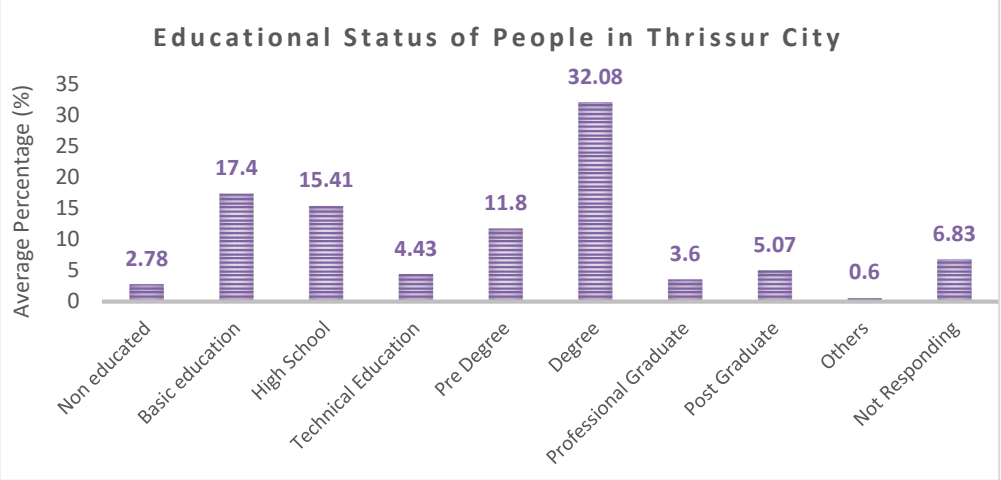


Fig. 14.3 Educational Status of people in Thrissur City

Source: Socio-economic Survey 2019

The educational status of people as per socio economic survey conducted in Thrissur Municipal Corporation in 2019, from among 10% of residents in this area is shown in fig. 14.3. It shows that 2.78% of the total people surveyed is non-educated. About 17.4% of people are having basic education, 15.4% people are educated up to high school level, 4.43% having technical education and 11.8% having pre degree education. 40.75% people are having graduation and above with 3.6% professional graduates and 5.07% post graduates. 6.83% of the people have not responded to the survey. Majority of the people have acquired high school education. This is because of the sufficient availability of educational institutions up to high school level in the city as well as the educational culture of the society to attain the basic education to at least matriculation level.

14.2 EXISTING EDUCATIONAL FACILITIES

Thrissur city is blessed with a number educational institutions which facilitates various category of people according to their needs, ranging from pre-primary schools to professional colleges. Details of educational institutions present in the city and their available infrastructure are as follows.

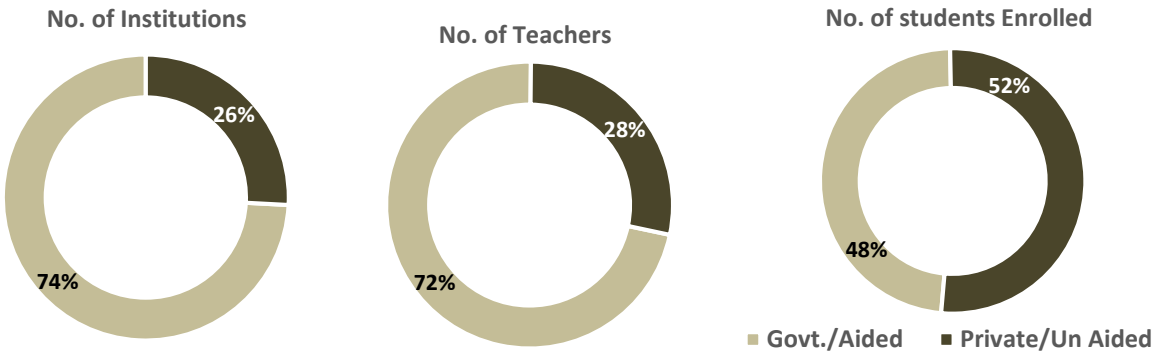
14.2.1 ELEMENTARY & SECONDARY EDUCATION

Elementary and secondary education covers the schooling period from pre-primary level to higher secondary / vocational higher secondary education. The existing status of pre-primary schools, lower and upper primary schools, high schools, higher secondary/ vocational higher secondary schools and higher educational institutions in the city are given in table 14.1. Around 120 educational institutions are working in this general education category. The city also has a Technical High School which is situated at Chembukkavu. There are 3 special schools working in Thrissur City, which are Asha Bhavan School for Deaf, Padavarad; Amrita Speech and Hearing Improvement School, Ayyanthole and St. Joseph's Special School for Mentally Retarded Children, Cheroor. Apart from these specials schools, other welfare/training centres for differently abled children/adults are functioning in the city.

Table14.1 Existing Status of Primary & Secondary Educational Institutions in Thrissur City

Type of Institutions	No. of Institutions		No. of Class Rooms		No. of students enrolled		No. of teachers	
	Govt./ Aided	Private	Govt./ Aided	Private	Govt./ Aided	Private	Govt./ Aided	Private
Lower Primary	37	5	168	15	3240	575	52	38
Upper Primary	37	5	180	22	6480	612	52	41
Secondary	36	13	245	42	4320	6752	324	117
Higher Secondary/ Vocational Higher Secondary	16	14	125	128	3200	3275	288	112
School for Special Needs	0	3	0	25	0	377	0	52
Total	89	30	718	217	9720	10404	716	281
	119		935		20124		997	

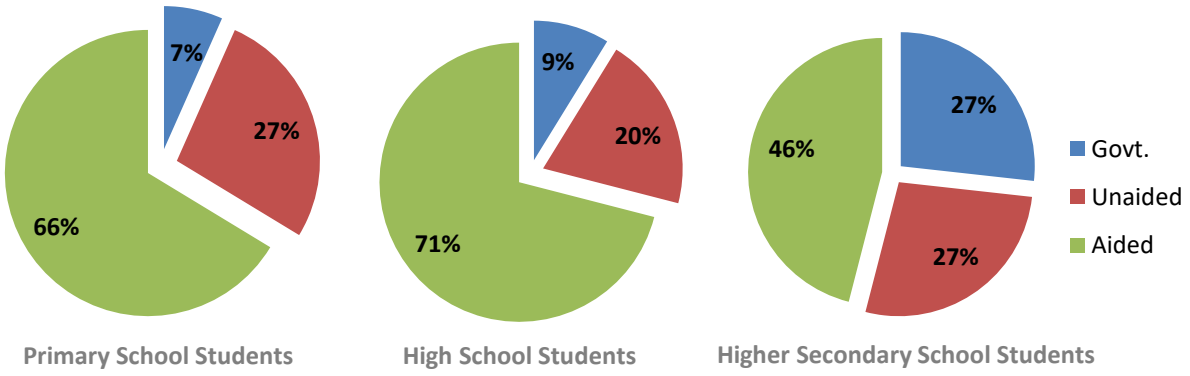
Source: Secondary Data for AMRUT - 2018



Source: Secondary Data for AMRUT - 2018

Fig. 14.4 Comparison of No. of institutions, No. of students enrolled and No. of teachers under various sector

Comparison of number of institutions, number of students enrolled and number of teachers under various sectors is shown in fig. 14.4.The distribution of educational institutions shows that 74% of the schools are either Government institution or Government Aided institution and 26% are privately owned or unaided institutions. Out of the 74% of Govt./Govt. Aided schools, more share is contributed by Govt. Aided Institutions. More number of government/aided schools shows the accessibility to acquire education to all classes of the society. But the profusion of aided and un-aided schools in the city leads to the dropout of



Source: Secondary Data for AMRUT - 2018

Fig. 14.5 Percentage breakup of students in Govt., Aided & Unaided Institutions

children from various government institutions. Moreover, the dropout of students from government educational institutions is to be controlled. It can also be seen from the graph that, although the no. of schools are more in the Govt. /Aided institutions more students are being enrolled in private institutions.

Percentage breakup of students in Govt., Aided and Un-aided Institutions are represented in fig. 14.5. Moving towards from lower classes to higher classes shows that number or students in government institutions are increasing, subsequently reducing the number of students in unaided institutions. This shows the importance of quality and affordable education provided in government institutions. Government institutions needs upgradation in terms of infrastructure and ancillary facilities, so that the present students are benefitted and more students are attracted to government schools. It can thereby provide quality education and services to the students at all levels of education.

In terms of infrastructure and ancillary facilities, almost all schools in the city are found to have access to good facilities except some government schools. Some educational institutions are found to have no playground facility. Municipal Corporation Stadium, Thope Stadium, Government Engineering College Ground, etc. serves as the sports/games activity area for their Annual School Sports Meet for those schools which lack sufficient playground facility. All the UP, HS, HSS and VHSS have computer lab and internet facility. The educational

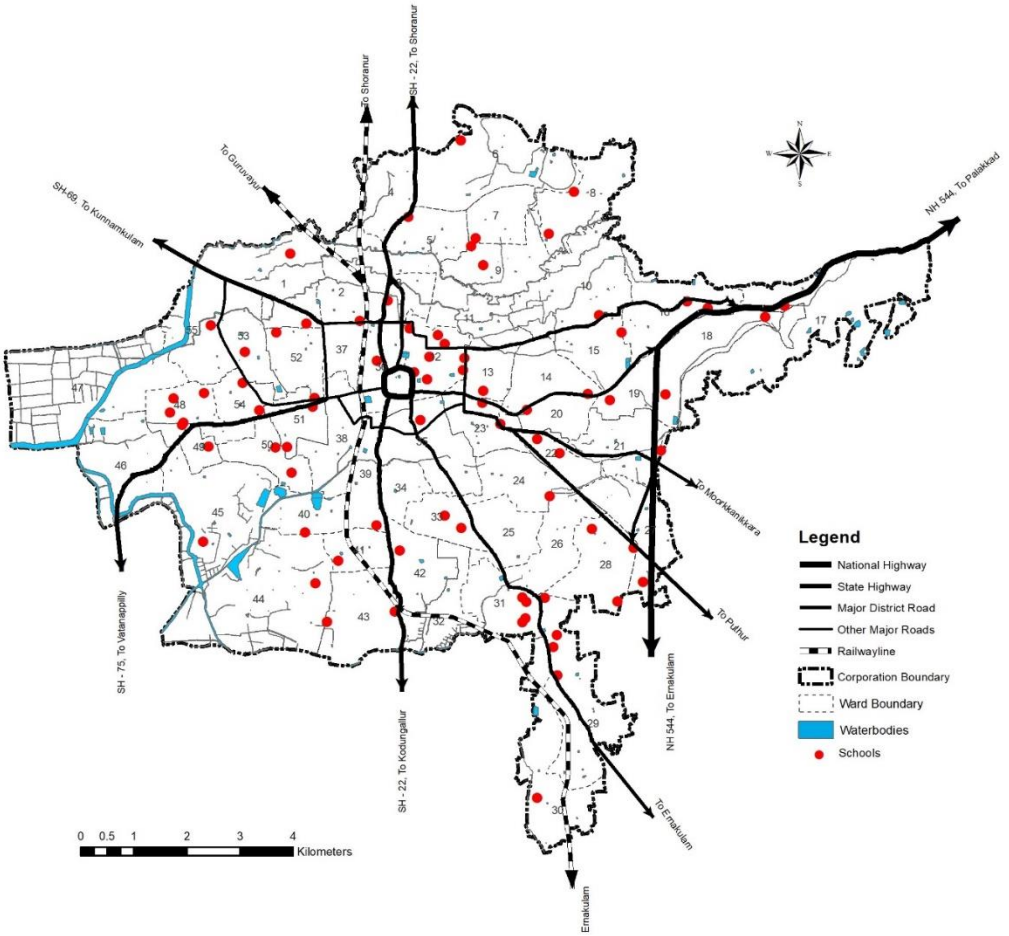


Fig. 14.6 Distribution of major schools in the city

institutions depend on well as major source of water. Water authority also supplies water to majority of the schools. Every school is found to have separate toilets for girls and boys.

The distribution of major schools in the city, as given fig. 14.6, shows that schools are well distributed in the city and it can easily be accessed by the people. There exists about 20 schools within a radius of 1.5 kms from Swaraj Round, out of which 8 schools are only less than 0.5 km distant from the round. This shows the concentration of schools in the central area.

14.2.2 HIGHER EDUCATION

Higher Education mainly refers to the next level of education which is acquired after primary and secondary education. Thrissur city have abundant number of higher education facilities. The higher education system prevailed in the city mainly consists of certificate courses, diploma courses, other technical course, graduation, post-graduation, professional education, etc. The higher education facilities available in the city are detailed below.

14.2.2.1 Arts & Science Colleges

Thrissur City is affluent in provisions for higher education. There are six Arts and Science Colleges which are affiliated to University of Calicut and are under Government/ Govt. Aided sector Calicut University are in the city. They are Sree Kerala Varma College, St. Thomas College, St. Mary's College, Vimala College, St. Aloysius College and Sri. C. Achutha Menon Government College. Out of these aided colleges Vimala College and St. Thomas College have acquired autonomous status. The city also have other private institutions offering arts, science and management courses like Sakthan Thampuran college of Arts & Science, Paramekkavu College of Arts & Science, Co-operative Arts & Science College, etc. List of major colleges in Thrissur city is given in table 14.2.

Table 14.2 Major Colleges (Arts, Science, Commerce, Management, etc.) in Thrissur City

Sl. No.	Name of College	Location	Public/Private
1	Sree Kerala Varma College	Kanattukara	Aided
2	St Thomas College	Thrissur	Aided
3	Vimala College (Women's College)	Cheroor	Aided
4	St. Mary's college (Women's College)	Thrissur	Aided
5	Sri. C. Achuthamenon Govt. College	Kuttanellur	Govt.
6	St. Aloysius College, Thrissur	Elthuruth	Aided
7	Paramekkavu College of Arts & Science	Thrissur	Private
8	SakthanThampuran College of Arts & Science (Women's)	Thrissur	Private
9	Don Bosco College	Mannuthy	Private
10	Co-operative Arts & Science College	Thrissur	Private
11	PG Centre	Thrissur	Private
12	Chaldean Syrian College	East Fort	Private
13	St. Thomas College	Thrissur	Private
14	Carmel College of Commerce & Management Studies	Anchery	Private
15	John Mathai Centre	Aranattukara	Private

Source: Secondary Data for AMRUT - 2018



Fig. 14.7 Sri Kerala Varma College



Fig. 14.8 Vimala College



Fig. 14.9 Sri.C. Achuthamenon Govt. Colleae

14.2.2.2 Professional Colleges

Thrissur district is enriched with the availability of all types of professional and technical education facility. For professional and technical education, we cannot depend on the local body completely. But Thrissur City consists of almost all types of professional colleges. There is a Government Medical College at Mulankunnathukavu and a network of technical schools in Thrissur district. The Medical College was started in the year 1981. This is the 5th Medical College in the State. There is an Ayurveda College at Thaikkattussery – Ollur in private sector.

Thrissur city has one Government Engineering College, one law college, 2 teachers training colleges, Kerala Agricultural University, College of Dairy Science and Technology, College of Veterinary & Animal Sciences, Government College of Fine Arts and School of Drama under Government sector; and one medical college (Jubilee Mission Medical College), one Ayurveda college (Vaidyaratnam Ayurveda College), 3 nursing colleges, hospitals offering Medical DNB courses, etc. in private sector.

Government Engineering College, Thrissur established in 1957, is the second of its kind in Kerala and is one of the most prestigious and reputed technical education institution in south India. The college campus spread over an area of more than 75 acres is located at Ramavarmapuram. Since its inception, the college has shown enormous growth in all fronts and currently it is one of the most sought after college in engineering education with an annual intake of 759 students at present. The college offers B. Tech, B. Arch, M. Tech, M. Plan & MCA courses and is affiliated to the University of Calicut &APJ Abdul Kalam Technological University, which is recognized by the All India Council for Technical Education (AICTE) &Council of Architecture (COA). The institution is ISO 9001: 2008 certified and the programmes are accredited by the National Board of Accreditation (NBA).



Fig. 14.10 Government Engineering College Thrissur

Other major professional educational institution functioning in Thrissur City is Kerala Agricultural University (KAU). It is the primary and the principal instrumentality of the Kerala state in providing human resources, skills and technology, required for the sustainable

development of its agriculture, defined broadly encompassing all production activities based on land and water, including crop production (agriculture) and forestry through conducting, interfacing and integrating education, research and extension in these spheres of economic endeavour. It is situated at Vellanikkara. Deemed to have come into existence by the 'The Agricultural University Act, 1971', the University became operational since 1972 when the then existing two educational and 21 research institutions administered by the Departments of Agriculture and Animal Husbandry of the Government of Kerala, were brought under one umbrella for facilitating the sustainable and accelerated development of agriculture in the State. There are various teaching campuses under the university in various parts of the state and the university offers courses related to agriculture, forestry, environment, banking, etc. In Thrissur campus, it houses College of Agriculture (CoA); College of Horticulture (CoH), College of Co-operation, Banking & Management (CCBM); College of Forestry (CoF), Academy of Climate Change Education & Research (ACCER).



Fig. 14.11 College of Agriculture, KAU

Kerala University of Health Sciences (KUHS) which was established by the 'Kerala University of Health Sciences Act 2010' is situated in the adjoining Mulankunnathukavu Panchayat, is only at a distance of about 10km north from Swaraj Round. It was established for ensuring proper and systematic instruction, teaching, training and research in Modern Medicine, Homoeopathy and Indian Systems of Medicine including Ayurveda, Siddha, Yoga, Naturopathy, Unani and other allied sciences and also to have uniformity in the various academic programmes in medical and allied subjects in the State of Kerala. The University is mandated to affiliate all Colleges and Institutions in Kerala, imparting professional education in health care. Government Medical College Thrissur which was initially located in Thrissur city was relocated to Mulankunnathukavu and is situated adjacent to Kerala University of Health Sciences.



Fig. 14.12 College of Veterinary & Animal Sciences

College of Dairy Science & Technology and College of Veterinary & Animal Sciences under Kerala Veterinary and animal Sciences University is functioning in the city and is located at Mannuthy. The Government Training College, which is located in Palace Road, was established in 1945. Another B.Ed. centre is the Institute of Advanced Studies at Ollur. The details of the major professional educational institutions in Thrissur city are given in table 14.3.



Fig. 14.13 Govt. College of Fine Arts



Fig. 14.14 Govt. Law College, Thrissur

Table 14.3 Major Professional Colleges in Thrissur City

Sl. No.	Name of College	Location	Public/ Private
1	Govt. Engineering college Thrissur	Ramavarmapuram	Govt.
2	Jubilee Mission Medical College	East Fort	Private
3	Govt. Law College Thrissur	Ayyanthole	Govt.
4	Kerala Agricultural University	Vellayani	Govt.
5	Teachers Training College	Ollur	Govt.
6	Institute of Advanced Studies in Education	Palace Road	Govt.
7	Nava Jyothi College of Teacher Education	Pullazhi	Private
8	College of Dairy Science and Technology	Mannuthi	Govt.
9	College of Veterinary Animal Sciences	Mannuthi	Govt.
10	Govt. College of Fine Arts	Chembukavu	Govt.
11	Vaidyartanam Ayurvedic college	Thaikkattussery	Private
12	Govt. Teachers Training Institute	Ramavarmapuram	Govt.
13	Jubilee Mission Nursing College	Kachery	Private
14	Mother College of Nursing	Olari	Private
15	West Fort college of Nursing	Punkkunnam	Private
17	School of Drama	Aranattukara	Govt.

Source: Secondary Data for AMRUT - 2018

14.2.2.3 Other Technical Institutions

Apart from the professional engineering colleges, Thrissur city has a number of other technical institutions like Polytechnic Colleges, Industrial Training Institutes (ITI) and Industrial Training Centres (ITC). Maharaja's Technical Institute (MTI) at Chembukkavu and Women's Polytechnic College at Nedupuzha offers 3 year Diploma courses in various engineering streams and are functioning in the government sector. Other than these polytechnic diploma colleges, institutions like ITIs and ITCs offer 2 year industrial training courses. Details of major technical institutions in the city are given in table 14.4.

Table 14.4 Other major Technical Institutions in Thrissur City

Sl. No.	Name of College	Location	Public/ Private	Type of Institute
1	Maharaja's Technical Institute	Chembukkavu	Govt.	Polytechnic
2	Women's Polytechnic college	Nedupuzha	Govt.	Polytechnic
3	Govt. ITI (SCDD), Herbert Nagar,	Nedupuzha	Govt.	ITI
4	Food Craft Institute	Poothole	Govt.	

5	St.Mary's Orphanage Vocational Training Centre Private ITI	Kachery	Private	ITI
6	R. Sanker Memorial Private ITI	Koorkanchery	Private	ITI
7	Thozhil Abhyasana Peedam Private ITI	Nellikkunnu	Private	ITI
8	Victory ITI	Mannuthy	Private	ITI
9	Phonetic Private ITI	Nadathara	Private	ITI
10	R. Ganesh Memorial Victory Private ITI	Ollukkara	Private	ITI
11	Amala Private ITI	Near North Bus Stand	Private	ITI
12	Don Bosco Private ITI	Mannuthy	Private	ITI

Source: Secondary Data for AMRUT – 2018, Industrial Training Department, Kerala

14.2.2.4 Other Institutions

Thrissur city also houses various other educational institutes like Engineering/Medical/NATA Entrance Coaching Centres, Bank/PSC/SSC/UPSC Examination Coaching Centres, Computer Centres offering various courses like DCA, PGDCA, PDSE, Tally, SST, AutoCAD, Revit, 3dsMAX, Primavera, STAAD Pro, ArcGIS, MS Office, Photoshop, Java, C-programming, etc., type-writing institutes, various interview/Spoken English/IELTS Coaching Centres, Fire & Safety Academy, Avaiation Academies, etc., located in various parts of the city, the majority of which are concentrated in the central area. LBS Centre for Science & Technology Regional Office at Chiyyaram and Electronic Corporation of India Limited - Information Technology Division are under Government Sector.

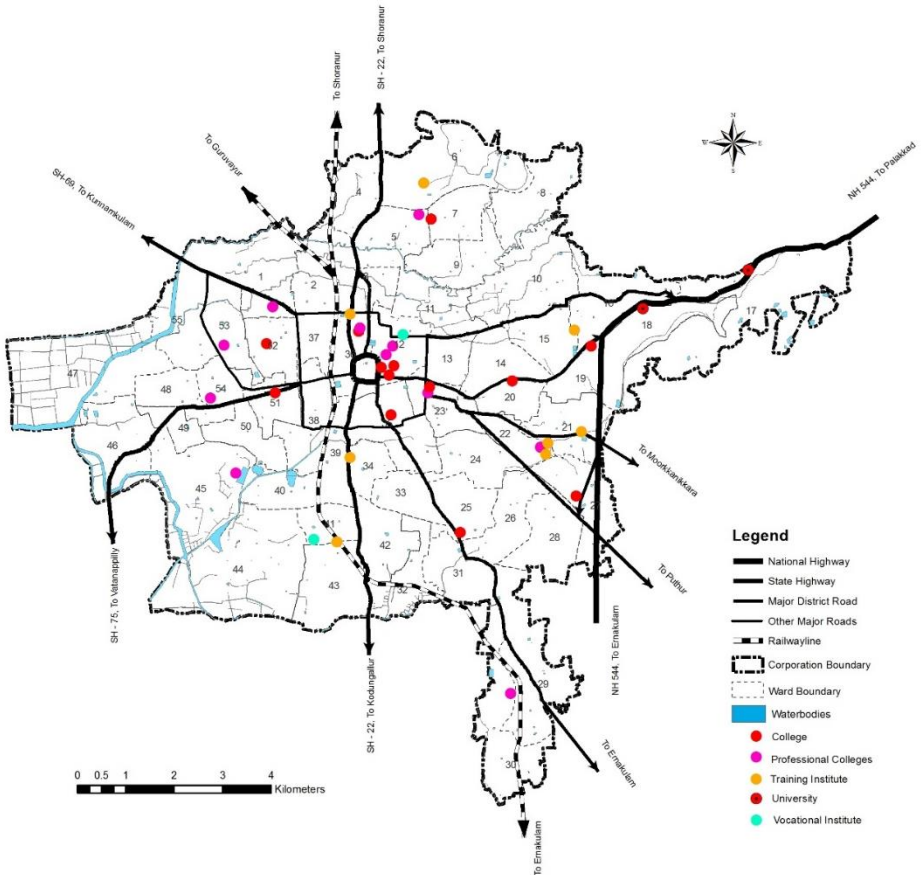


Fig. 14.15 Distribution of major higher educational institutions in the city

The distribution of major higher educational facilities in Thrissur city is shown in fig. 14.15. Being the district headquarters, the city serves as the facilitator for various needs of the people in from the surrounding areas as well from various parts of the district. The facilities are well connected by transportation network and are easily accessible.

14.3 SERVICE LEVEL BENCHMARKS

The educational facilities available in Thrissur city in comparison with the planning standards as per the URDPFI Guidelines, is given in table 14.5. According to the planning standards, almost all the existing facilities available in the city in education sector are more than the required number. This shows the importance of Thrissur city as a service provider for the surrounding areas as well as various parts of the district. Schools for physically challenged marks a shortage by 5 numbers. The city has only 2 schools for such children both in the field of speech & hearing. More schools for differently abled children may be introduced in the city so that such differently abled children are benefitted. Professional educational institutions in the city like Government Engineering College, Jubilee Mission Medical College as well as Government Medical College, Thrissur & Amala Medical College situated in the surrounding Panchayats which lies just outside the Corporation boundary, not only serves the people in the city and district but also attract students from various parts of the state and country.

Table 14.5 Comparison of existing educational facilities in Thrissur City with planning standards as per URDPFI Guidelines

Category		Population served per unit	No. of units required - 2019	Existing units - 2019
Primary & Secondary Education	Pre-primary & nursery school	2500	127	253
	Primary School (I to V)	5000	63	84
	Senior secondary School (VI to XII)	7500	42	79
	School for physically challenged	45000	7	2
	School for mentally challenged	10 lakh	1	1
Higher Education	College (General)	1.25 lakh	3	6
	Technical Education (one ITI and one polytechnic)	10 lakh	2	10
	Engineering College	10 lakh	1	1
	Medical College	10 lakh	1	1
	Nursing & Paramedical Institute	10 lakh	1	3
	Veterinary Institute	-	-	1
	Other professional colleges	10 lakh	1	10

Source: URDPFI Guidelines, Secondary Data for AMRUT – 2018

Due to the prominence in Engineering/Medical entrance coaching classes in Thrissur city, more students are attracted towards schools located in the city and its environs. This point out the need for more number of Higher Secondary education facilities in the city. Also the number of VHSS institutions in the city has to be increased so that students are able to get through vocational education during the school time itself. Furthermore, introducing more Scholarships & Grants by the government for the students from Socially & Economically

Backward classes in the society, helps in attracting more students from those sections, which thereby helps them attain an overall upliftment.

Moreover, the students must be made aware of all social evils and they must be prepared and trained to overcome all such instances. Programs like Special Protection Group, Student's Police, NCC, Scouts& Guides, Disaster Management Training, etc. may be included as mandatory provision along with the academic curriculum.

14.4 INFERENCE

The opportunities available for education and the abundance of educational institutions in Thrissur City have resulted in an increase in the literacy rate. Literacy rate of Thrissur Municipal Corporation is found to be high when compared with the state and district. The facilities for education available in Thrissur City are more than that specified as per planning standards and people are attracted due to these facilities. But inorder to cater the demand in higher secondary education due to the prominence of Medical/Engineering Entrance coaching centres in the city, more schools have to be introduced in the city and surrounding areas.

Almost all private educational institutions are found to be having good infrastructure and facilities for the students. But government institutions are found to have lacking several infrastructure and ancillary facilities which needs to be resolved. Moreover, the dropout of students from government educational institutions is to be controlled in order to regulate the growth of private sectors in educational field who take education as a business instead of a service to society. Also, the Government institutions needs upgradation in terms of infrastructure and ancillary facilities so that quality education and services are available to all.

The city shows deficit is in the number of schools available for physically challenged students when compared to planning standards, which needs an improvement in number and ancillary facilities. Improved educational facilities needs to be provided for differently abled as well as autistic children. In the city, such special schools are only available in private sector. More facilities may be introduced in Government sector so that children from economically weaker sections can rely them.

In terms of facilities available for higher education, the city has a wider variety of opportunities ranging from Arts &Science Colleges to professional colleges like Engineering College, Medical College, Law College, etc. Thrissur city can be termed as a one stop centre in the district for attaining various category of higher education. The city has sufficient/ more than sufficient number of facilities in higher education as demanded by planning standards. But being the district headquarters and due to its strategic location in the state, the city has to cater a wider range of population and a service provider to nearby areas, various parts of the district and several parts of the state as well. Hence, qualitative and quantitative betterment of infrastructure and ancillary facilities in education sector are needed in the city in order to cater the growing demands.

CHAPTER 15
HEALTH



The ultimate motivation of planning process is to improve the standards of living of the human beings. To improve the quality of life of inhabitants, the health facilities are to be provided as per standards. The progress of a town is also dependent on the factor of health enjoyed by its inhabitants.

Health is the level of functional or metabolic efficiency of a living organism. In humans, it is the general condition of a person's mind and body, usually meaning to be free from illness, injury or pain. Good health facilities are essential for building up healthy society which in turn promotes the economic growth of the area. Analysis of the existing scenario in health sector which covers the study on health indicators, existing health infrastructure and problems associated with it, along with the understanding of various planning standards will enable us to identify the future development potentials in the sector.

15.1 HEALTH INDICATORS

The demographic indicators available at the district level are given in table 15.1 shows that the district and the State follow similar statistics.

Table 15.1 Health Indicators

Health Indicators	Thrissur Dt	Kerala
Life Expectancy	74	74.9
Infant Mortality Rate (1000 population)	7.27	6.31
Maternal Mortality rate (per 1 lakh live births)	21	24
Birth Rate (1000 population)	14.46	14.62
Death Rate (1000 population)	8.94	7.64
Total Fertility rate (Children/Women)	1.8	1.76
Sex ratio	1108	1084
Child Sex ratio	950	959

Source: Vital Statistics report 2017

Table 15.2 Predominant Diseases

Name of predominant diseases	No. of persons affected
Leprosy	51
Filaria	46
Tuberculosis	2003
Cholera (2016 - cases 365, 2017 - Nil)	365
Dengue(2016 – 350 cases/death, 2017-2)	365/ 2 death
Chikungunya (2016 – 15 cases, 2017-Nil)	15
Malaria (2016 – 125 cases, 2017 – 39 cases	164

Source: DMO Office, 2017

15.2 HEALTH INFRASTRUCTURE

The details of various health institutions in Thrissur city are given in table 15.3. From the table it can be seen that city is self-sufficient in the case of Allopathic treatment facilities. From the figure 15.1 which shows the concentration pattern of hospitals, doctors and no. of beds in various fields of medicine, it can be seen that about 66% of the health institutions in the city are in allopathic system which include 13 health institutions in government sector and 35in private sector. Ayurveda system of medicine stands next to Allopathic system. The city has got about 27% of Ayurveda health institutions which includes 6 in government sector and 14 in private sector. Homeopathic and other systems are very less in number in terms of infrastructure as well as the availability of doctors.

Table 15.3 Details of Hospitals in Thrissur City

Type of hospital	No of Hospitals/ dispensaries/CHC/PHC	No of Doctors	No. of Beds
Allopathic	48	827	5471
Ayurveda	20	68	493
Homeopathic	2	4	25
Others	3	17	18

Source: DMO Office, Ayurveda DMO, Homeo DMO, Palliative centre Thrissur

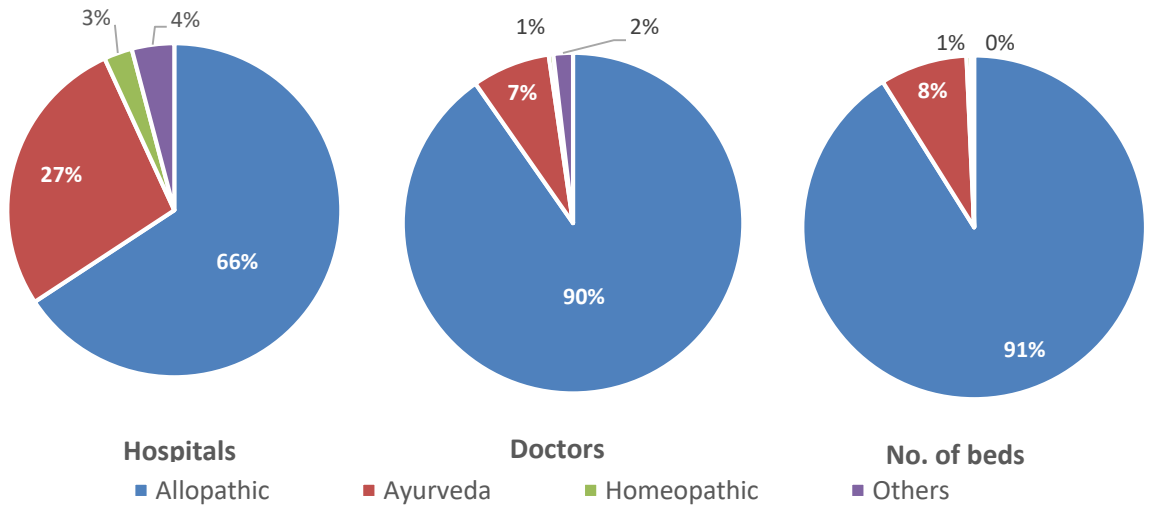
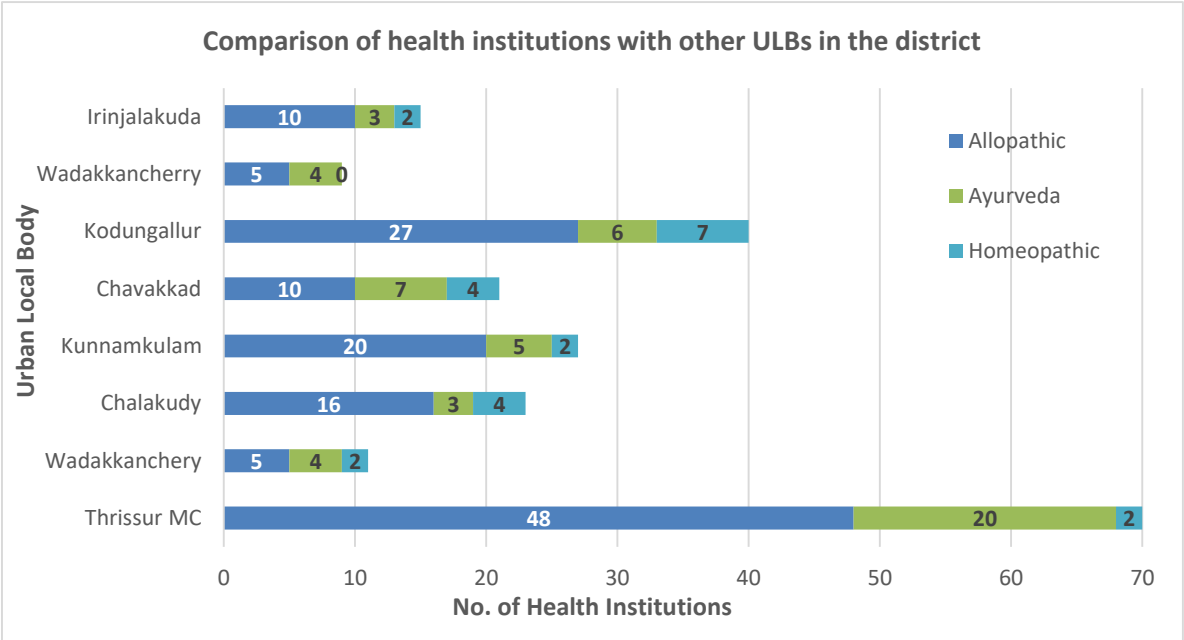


Fig. 15.1 Concentration pattern of Hospitals, Doctors and No. of beds *Source: DMO Office*

Fig. 15.1 indicates that the number of allopathic doctors is about 90% and ayurveda doctors constitutes 7%. The doctors in homeopathic and other sectors are very less in the city which is about 1% and 2% respectively. This causes inconvenience for people who are seeking medical help in those system of medicine. Comparing the bed strength in hospitals, it can be seen that 91% are in allopathic hospitals, 8% are in ayurveda hospitals, 1% in homeopathic hospitals and are very negligible in other sectors. More hospitals have to be introduced in government level to cater the needs of people who are seeking medical help other than in allopathic system.

Health institutions in Thrissur city is compared with that in other ULBs of the district, the details of which are represented in fig. 15.2. From the graph it can be seen that all the towns shows similar pattern with higher number of allopathic health care facility. Being the district headquarters, Thrissur city has to cater the needs of a wider range of population and it can be clearly inferred from the graph that Thrissur city possess higher number health care facilities when compared to other ULBs in the district. Kodungallur town, which is comparatively far (about 38kms) from Thrissur city stands next to Thrissur, with a total number of 40 health care institutions. People from different areas in the district depends on Thrissur city for higher order facilities and thrust may be given to enhance the quality and accessibility of various facilities and health infrastructure to the people.



Source: DMO Office

Fig. 15.2 Comparison of Health Institutions with other Urban Local Bodies (ULBs) in the district

From the spatial distribution of health care facilities in the Thrissur Corporation area shown in fig.15.3 shows that majority of the health institutions are concentrated in the core area of the city and its concentration reduces towards the periphery. Kuttanellur area in eastern periphery of the city lacks basic level of allopathic health care facility.

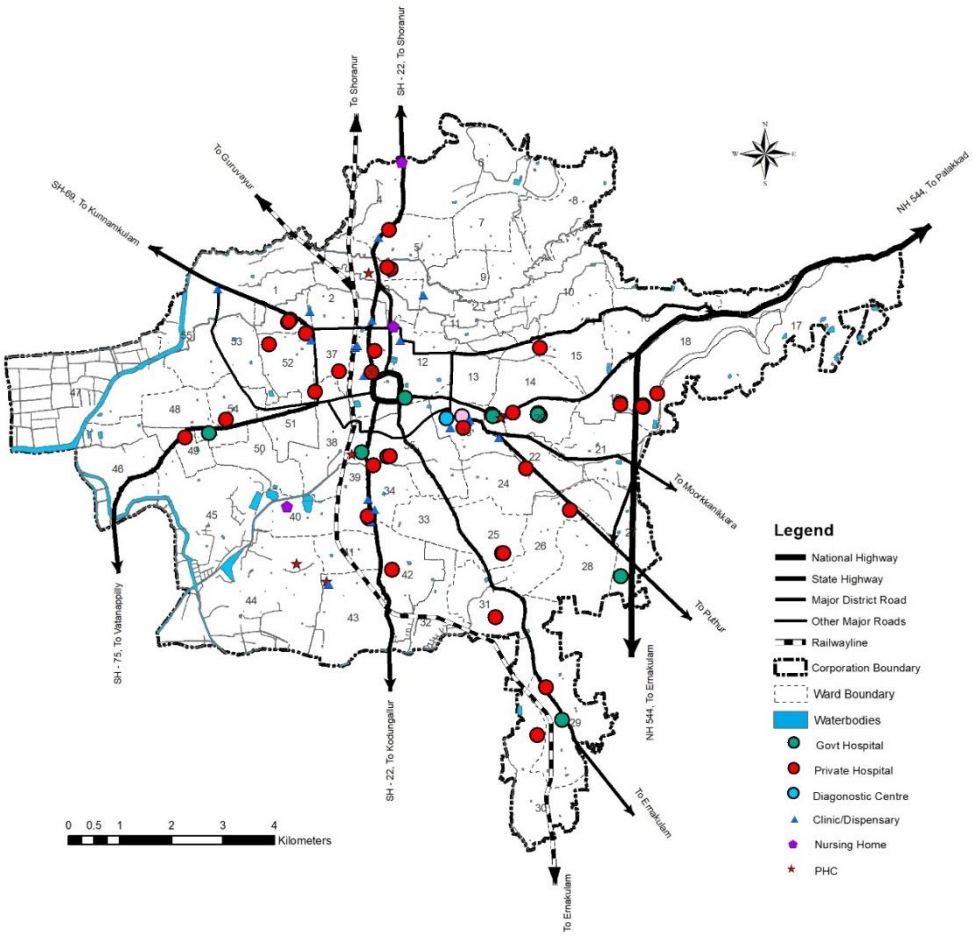


Fig. 15.3 Spatial distribution of Health Institutions in Thrissur Municipal Corporation

15.2.1 ALLOPATHIC SECTOR

In allopathic sector, Thrissur City has got 48 health institutions, out of which 13 are in government sector and 35 in private sector. There are 39 Hospitals, 1 Community Health Centre (CHC), 6 Primary Health Centres (PHCs) and 2 Dispensaries at present. Details of health institutions in both government and private sector are described below.

15.2.1.1 Hospitals – Government Sector

One of the major hospital in government sector in the city is the District Hospital, Thrissur. District hospitals are to provide all types of tertiary level services. These institutions are expected to provide the super specialty services like Cardiology, Neurology, Plastic Surgery, Urology and Paediatric surgery. Specialty dental services – Maxillofacial surgery, conservative and Orthodontics are to be provided at this level. The district hospital which is situated in the heart of Thrissur City, is the prime priority of the people, especially for the economically weaker section of this area for specialized treatments. But it lacks the facilities like sufficient staff, operation theatre, diagnostic facilities, waste disposal, etc. The vacant space available due to the relocation of Government Medical College Hospital to Mulankunnathukavu may be utilized for the development of the District Hospital. District hospital must be provided with specialized staff and modern facilities. Cardiology, neurology,

nephrology, plastic surgery, 24 hour trauma care unit, etc. must be made to function in the district hospital. Efficient service must be ensured.



Fig. 15.4 District Hospital, Thrissur

Other allopathic hospitals in Government sector in the city are Government Mental Health Centre, West Fort; TB Centre functioning in district Hospital and ESI Hospital, Olarikkara. Apart from these hospitals, there are also various Health Centres and dispensaries in the city. There are 1 CHC, 6 PHCs and 2 dispensaries located in Thrissur city. Government Medical College Thrissur located in the adjoining Avanoor Panchayat, is a higher order facility in health sector which cater to the needs of people in the corporation area, Thrissur district as well as adjoining areas within the districts of Malappuram and Palakkad.

15.2.1.2 Hospitals - Private Sector

In addition to Government hospitals and Primary Health Centres 35 private hospitals are functioning in Thrissur City. Out of this, seven Specialty Hospitals including 1 self-financing Medical College (Jubilee Mission Medical College) are functioning in Thrissur City. All these institutions are having super specialty departments like Neurology, Neuro Surgery, Cardiology, Gastroenterology, Urology, Nephrology etc. The emergence of private hospitals shows the nature of people to move towards ultra-modern facilities, lack of free treatment providing Government hospitals with good infrastructure and the absence of specialty treatment facilities available in them.

Private hospitals also lack important safety measures for controlling pollution. No bio medical and waste treatment plant is working in most of the hospitals except Mother Hospital, Jubilee Mission Hospital and Daya Hospital. Bio-Medical Waste from all the hospitals in Thrissur Municipal Corporation except from Mother Hospital is collected by the IMAGE and carried to a biomedical treatment plant located at Palakkad. Government has to impose laws to regulate the proper functioning of the private hospitals. Hygienic conditions have to be made available in the hospitals.

15.2.2 AYURVEDA SECTOR

Ayurveda, the traditional system of medicine which has its origin in the Indian subcontinent is the second most widely popular system of medicine after allopathic system. It has got much importance in Thrissur District especially in Thrissur City. Various Ayurveda medicine manufacturers like Vaidyarathnam Ayurveda, Sitaram Ayurveda, SNA, Oushadhi, Kandamkulathy, etc. are from Thrissur district, the majority of which are headquartered within Thrissur City. One Ayurveda college namely VaidyaratnamAyurveda College, is located in the Corporation area.

There are a total of 20 Ayurveda health institutions functioning in Thrissur city. Out of which 2 Ayurveda hospitals, 3 Ayurveda dispensaries and 1 vishavaidya dispensary are in

government sector and 14 Ayurveda hospitals are in private sector.Rama VarmaDistrict Hospital, Government Ayurveda hospital, Villadom, OushadhiPanchakarma Hospital and Research institutes, Vaidya Ratnam Ayurveda Hospital are some of the famous Ayurveda hospitals functioning inside the city. They are also famous for the Ayurvedic treatments like Kizhi, Uzhichil etc.



Fig 15.5 Rama Varma District Hospital



Fig 15.6 Vaidyarathnam Ayurveda College

15.2.3 HOMEOPATHIC SECTOR

The Department of Homoeopathy in Thrissur District is functioning with 1 Government Homeo Hospital in Kizhakkumpattukara (which is the one and only Homeo Hospital in Thrissur under the Department) and 39 Government Homeo Dispensaries in different Panchayats. The hospital is situated within the Thrissur city and one dispensary is also functioning in the city. The Homeo hospital has a lab with semi Auto Analyzer, Haematology Analyser and Ultrasound scanner. This institution has specialty departments for piles, fistula, diabetics, urology and cancer. . Government Homeopathy Hospital situated at Kizhakkumpattukara is equipped with 25 bed inpatient capacity and is facing major problems in its development due to paucity of own building. Due to these space constraints, an additional wing for the hospital has been opened and presently functioning in Poothole Road, Thrissur. Lack of skilled staff is the main problem in this sector and it has to be solved for enhancing working condition of Government Homeo hospitals.

15.2.4 OTHERS

Apart from various Hospitals/Dispensaries/PHCs in allopathic, ayurvedic and homeopathic sectors, 3 Naturopathy Hospital, 1 Unani Dispensary and 2 Pain and Palliative Care Centres (1 in government sector and 1 in private sector) are functioning in the city. Naturopathy Majority of the patients approaching Pain and Palliative care centres are from the weaker sections of the society. They provide medical aid as well as aid for sustenance for the dependent needy family. Such societies work with a mission to improve the quality of life of people suffering from prolonged debilitating illness by providing best possible holistic care made affordable and acceptable through community participation and also to help the affected families.

15.3 MAJOR DISEASES

Details of the major diseases occurring in the city as per the socio-economic survey 2019 is given in table 15.4. From the survey results, it can be seen that the major diseases occurring in Thrissur City are chickenpox, dengue fever, chikungunya, heart diseases, cancer,

kidney diseases, hepatitis, typhoid, TB, etc. The major threats are from areas with paddy fields, water logged areas, insufficient drainage facilities, improper waste managements, migrant labourers from affected States, travelling of people to affected areas of other states. Majority of diseases seen in the city is due to the unhygienic condition of the surrounding area and contaminated water. It can be seen that about 0.5% of houses were affected with dengue feverand 0.13% of houses with chikungunya which are usually spread through mosquitoes. One case of leptospirosis and 2 cases of typhoid were reported in the city. These show the requirement of eliminating water logging and maintaining hygienic conditions in Thrissur City so that breeding of mosquitoes as well as the spread of other communicable diseases can be eliminated. Other communicable diseases like Chicken pox (0.58%) and Tuberculosis (.02%) was reported in the city. Diseases like cancer, heart and kidney diseases show greater percentage of occurrence in the city. These shows the need for following a healthy lifestyle for the people and citizen-friendly measures may be adopted to offer provisions for maintaining a healthy lifestyle.

Table 15.4 Details of houses diagnosed with diseases within last 5 years

Type	Cholera	Dengue fever	Chikungunya	Hepatitis	TB	Typhoid	Malaria	Chicken Pox	leptospirosis	Cancer	Heart disease	Kidney disease	Other diseases
Average % for the LSGI in each category	0	0.5	0.13	0.03	0.03	0.02	0	0.58	0.01	0.4	0.76	0.13	0.35

Source: Socio-Economic Survey 2019

Methods to reduce the spread of diseases to be initiated with the aid from government. Anti- mosquito work by use of anti-larval sprays like fenthion, fogging, etc. to be done by the Municipal Corporation. Works like cleaning of drains and canals to reduce the clogging of water and thus preventing the breeding of mosquitoes must be carried out annually. Fund to be allotted for this from the government.

Students may be given awareness programmes at school level for maintaining a good and hygienic living condition. Health clubs may be introduced and sports activities may be promoted in all schools. It is necessary to educate students, the ill-effects of using drugs like pan masalas, tobacco, etc. The sale of such drugs should be made inaccessible to students and should be banned near educational institutions by means of law enforcement. Provisions for student counselling should be introduced in every schools for the betterment of mental wellness of the students.

15.4 ONGOING AND COMMITTED PROJECTS UNDER HEALTH SECTOR

Pre-Monsoon cleaning: Premises cleaning, drainage cleaning, fogging and spraying done by the Municipal Corporation, awareness programme to school and college students about the pre monsoon diseases, drug distribution against the disease month.

In all the 55 divisions of the Municipal Corporation, 2 workers per division are deployed in anti-mosquito work. Anti-larval spraying, using Fenthion is done regularly and fogging with Technical Malathion is done wherever necessary. Fogging is done with 3 fogging machines and provision is provided in the project fund for acquiring more sprays and fogging machines.

Drains are cleaned periodically to prevent clogging. Annual cleaning is also done and the required fund is provided to the concerned Health Inspectors. Surveys are conducted to find out the problems with the Septic tanks and adequate measures are adopted to solve them. A preventive measure for mosquito breeding like covering the vent pipes with nets is an exemplary in this direction.

Ensure the supply of good food items in hotels, food stalls, meat market, etc. with frequent inspections. Hotels, Restaurants, Meat Stalls etc. are regularly inspected by squads. Fine is imposed on those hotels whose hygienic conditions are not found satisfactory. Notices are also given to rectify the problem areas. Meat Stalls are also inspected regularly and notices are given in the required cases. Veterinary Surgeon is appointed in the slaughter house on deputation basis for technical approval.

15.5 SERVICE LEVEL BENCHMARKS

The various health infrastructure available in Thrissur city in comparison with the planning standards as per the URDPFI Guidelines, is given in table 15.5. According to the planning standards, almost all the health care facilities in Thrissur city are sufficient or more than sufficient. Government Medical College, Thrissur and Amala Medical College situated in

Table 15.5 Comparison of health care facilities in Thrissur City with planning standards as per URDPFI Guidelines

Health Care Facilities	No. of Beds	Population served per unit	No. of units required - 2019	Existing units - 2019
Dispensary	-	15,000	21	22
Nursing Home, child welfare and maternity centre	25-30 beds	45,000 – 1 lakh	2	4
Polyclinic	Some observation beds	1 lakh	2	3
Intermediate Hospital (Category B)	80 beds	1 lakh	2	7
Intermediate Hospital (Category A)	200 beds	1 lakh	2	3
Multi-speciality Hospital (NBC)	200 beds	1 lakh	2	4
Speciality hospital (NBC)	200 beds	1 lakh	2	3
General Hospital (NBC)	500 beds	2.5 lakh	1	1
Medical College	-	10 lakh	1	1

Source: URDPFI Guidelines, DMO Office

the surrounding Panchayats, lies just outside the Corporation boundary, also serves the people of the city as well as the district. As Thrissur city is the district headquarters, it has to cater a wider range of population and a service provider to nearby areas. Hence, qualitative as well as quantitative betterment of facilities and infrastructure in health sector are needed in the city.

15.6 INFERENCE

Being the district headquarters and the primary order settlement in the Thrissur district, Thrissur city serves as a service provide and has to cater wide range of population, as people from various parts of the district depends on the city for medical aid and treatment. Existing health services in the government and private sector requires considerable upgradation for improving their capacity to provide desired level of services to the people. Spatial distribution of health institution facilities requires rationalization for providing equitable distribution of such infrastructure. Government health care institutions have to be made available with good and modern infrastructural facilities and equipments so that common man can afford the treatment. Facilities available in sectors like Homeopathic, Ayurveda etc. are very less compared to other sectors. More facilities have to be introduced in these sectors by the government so that people seeking medical aid in these are benefited.

CHAPTER 16
HOUSING



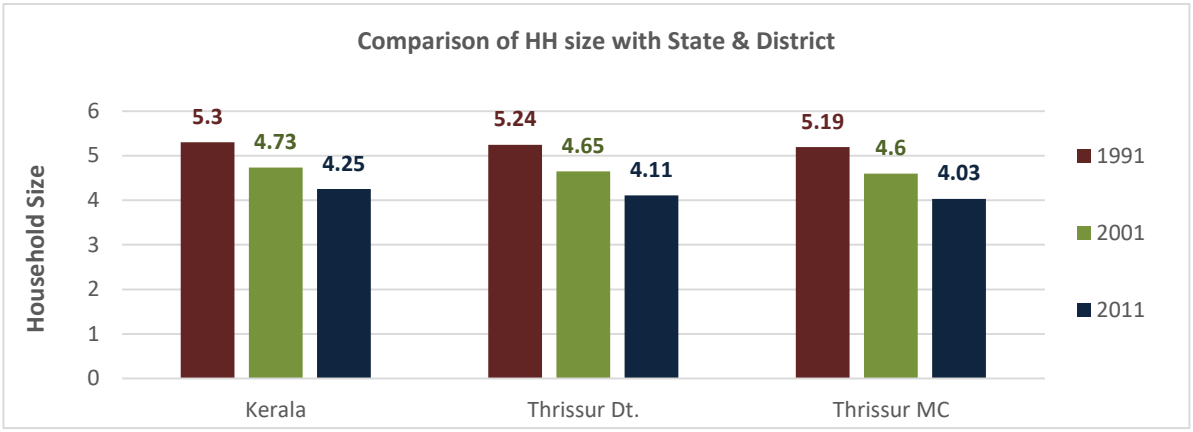
Housing generally refers to the social problem ensuring that the members of society have a shelter to live in. Housing is not merely confined to the four walls which make a houses but also all the supporting infrastructure which are required to sustain the human life. The rapid increase in population and the evolution of nuclear family system have increased the need for housing in the cities and towns. One of the urgent problems that should engage the serious attention of planners is the provision of sufficient dwellings enabling each household to have their own house. This Chapter deals with the housing stock, shortage, conditions, substandard housing in the city area as well as the various schemes & programmes in the housing sector.

The need for housing is not only one of the basic human need, but also the indicator of living standard of the population. Housing is not mere provision of four walls and a roof but it also requires to be supplemented by access to basic amenities such as water and sanitation, thereby offering a sense of privacy, safety, dignity and better living. From a broader level of societal perspective, housing quality signals standard of living of people, level of economic development of the region, values that shape the social and political system, quality of government and governance system and so on. The right to housing and adequate shelter as guaranteed in the Directive Principles of State Policy enshrined in the Constitution places an obligation on the Governments to ensure housing for all. With the increase in population of urban areas as well as the trend of moving towards nuclear family system, the gap between supply and demand of the housing has been ever widening with the increasing prices of real estate sector as well as the considerable shortage in the availability of land suitable for housing.

16.1 HOUSEHOLD SIZE

A 'household' is usually a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. As per 2011 census, Thrissur Municipal Corporation is having 78,336 households with an average household size of Thrissur Municipal Corporation is 4.03. Whereas, Kerala State and Thrissur District is having an average household size of 4.25 and 4.11 respectively. Household size of Thrissur Municipal Corporation is lower when compared to the state and district.

Temporal variation in household size, as given in fig. 16.1, shows a decreasing trend in the state, district, Thrissur MC as well as in all other ULBs in the district. Changes in the society which shows a shift from the culture of joint family system to nuclear families can be evidently seen from the variation of household size over the decades.

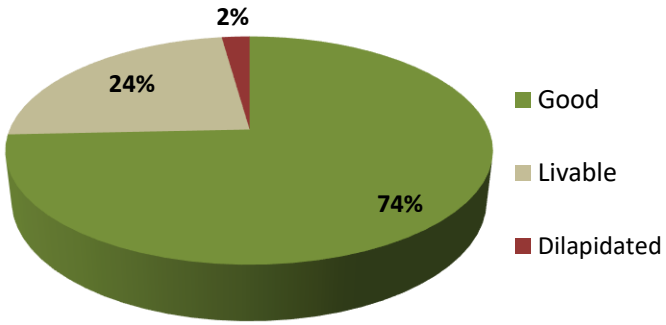


Source: Census Data – 1991, 2001 & 2011

Fig 16.1 Comparison of Household size with State & District

16.2 EXISTING SCENARIO

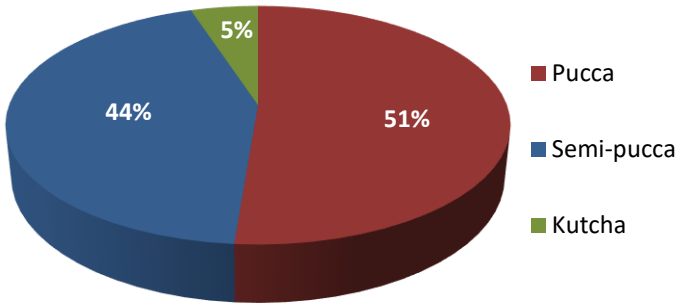
A 'Census House' is a building or part of a building used or recognized as a separate unit because it has a separate main entrance from the road or common courtyard or staircase, etc. As per 2011 census, Thrissur Municipal Corporation comprises of 113817 census houses out of which 13366 are vacant. The occupied census houses are used for different purposes and out of which 76,485 census houses are used as residence or residence-cum-other uses.



Source: Census Data – 2011

Fig 16.2 Structural condition of houses

Structural condition of the census houses which are used as residence or residence-cum-other uses, as given in fig. 16.2 shows that 74% are in good condition, 24% are livable and 2% are in dilapidated condition.



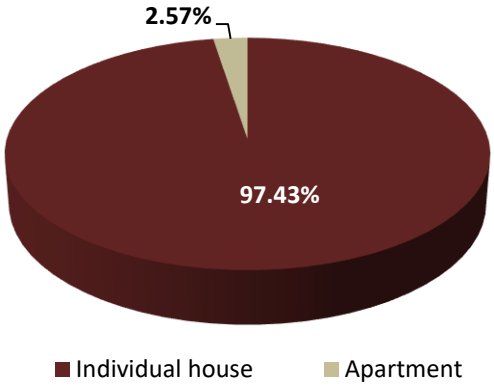
Source: Census Data – 2011

Fig 16.3 Physical condition of houses

Physical condition of houses as per 2011 census data shows that 51% households live in pucca houses, 44% live in semi-pucca houses and 5% live in Kutcha houses. Housing condition is to be improved for households living in Kutcha and dilapidated houses.

16.2.1 SOCIO-ECONOMIC SAMPLE SURVEY

As the census data available was from the year 2011 and the data of which was enumerated in 2010, various changes might have happened during this time span from 2010. In order to assess the present conditions of the people and society, a Socio economic sample survey was conducted in Thrissur Municipal Corporation area during 2019. 10% sample of the total households were surveyed. This shows a reflection of the present society. Major observations from the survey which deals with housing sector are detailed below.

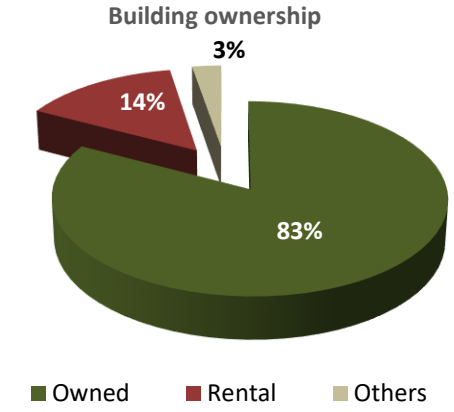


Source: Socio-economic survey – 2019

Fig 16.4 Housing Type

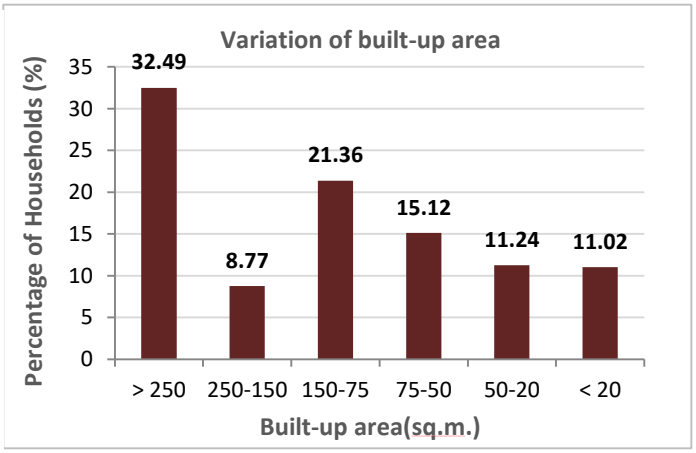
Out of the total households surveyed, 97.43% households live in individual houses and the rest 2.57% in apartments (fig. 16.4).

Building ownership details as given in fig. 16.5 shows that, 83% of the households in the city lives in own house, 14% in rented houses and 3% depends on other means for housing. On examining the variation in built-up area of houses, as depicted in fig. 16.6 shows that about 1/3 rd of the households live in houses having built-up area of 250 sq.m. and above. 11% of the households live in houses having built-up area less than 20sq.m.



Source: Socio-economic survey – 2019

Fig 16.5 Building Ownership



Source: Socio-economic survey – 2019

Fig 16.6 Variation of built-up area

Land ownership data obtained from the survey is given in fig. 16.7. It shows that nearly 10% of households doesn't possess land ownership. Schemes for providing financial assistance in owning land and house must be properly monitored to reach the right beneficiary. Variation of plot area, as depicted in fig. 16.8 shows that about 72% of the households surveyed have plot area less than 10 cents, out of which 37.32% are in the range 6-10 cents and 5.75% have less than 3 cents of land. This

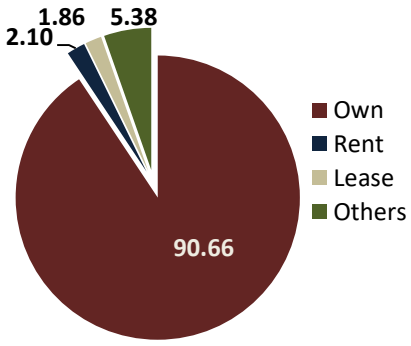
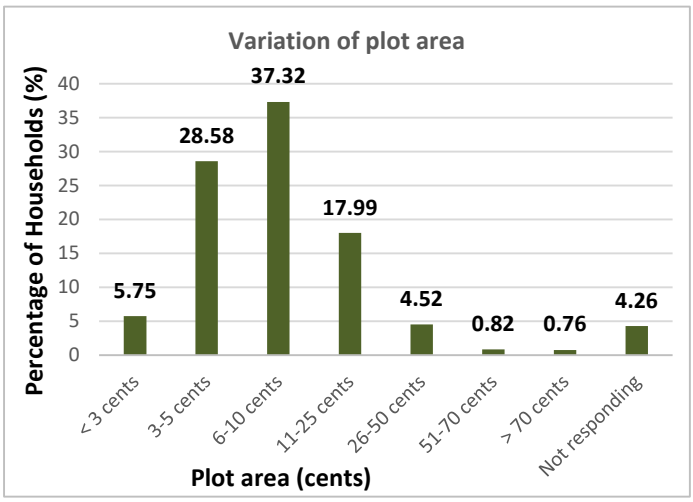


Fig 16.7 Land ownership

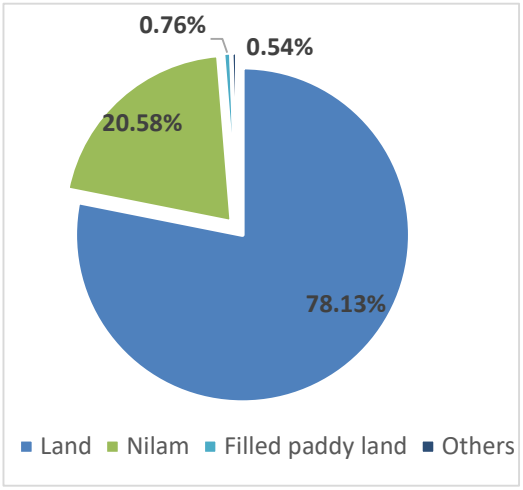
Source: Socio-economic survey – 2019

may be mainly due to the high land values within the corporation area which limits the horizontal spread to some extent. Land type as per revenue records of the surveyed households is given in fig.16.9. It shows that about 1/5 th (20.58%) of the surveyed households have their houses in the land type 'Nilam' and nearly 1% in 'filled paddy land'.



Source: Socio-economic survey – 2019

Fig 16.8 Variation of plot area

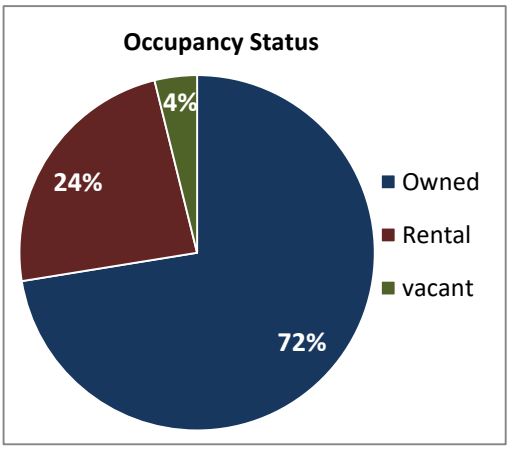


Source: Socio-economic survey – 2019

Fig 16.9 Land Type

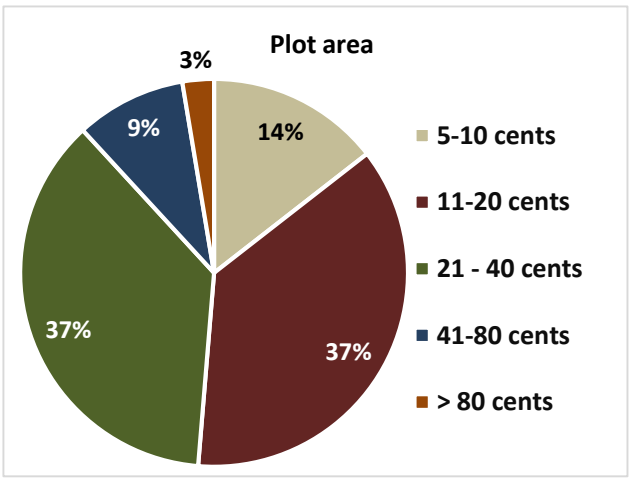
16.2.2 Housing Apartments/Flats

In order to assess the present conditions of housing apartments/flats in the city, a sample Apartment Survey was conducted in 2019. 25% sample was selected for the survey and a total of 76 flats/apartments having a total 1684 dwelling units were surveyed. The results of the survey are shown in figures 16.10, 16.11 and 16.12. Majority of flats having number of floors in the range of 3-9. Only 16% of the flats having 10 floors and above.



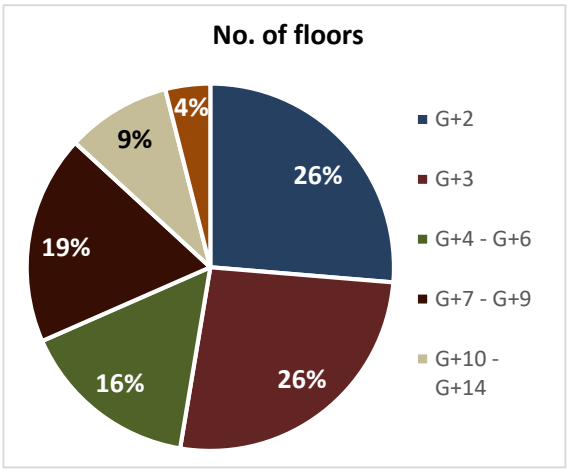
Source: Apartment Survey – 2019

Fig 16.10 Occupancy status of dwelling units



Source: Apartment Survey – 2019

Fig 16.11 Plot area



Source: Apartment Survey – 2019

Fig 16.12 No. of floor in apartments

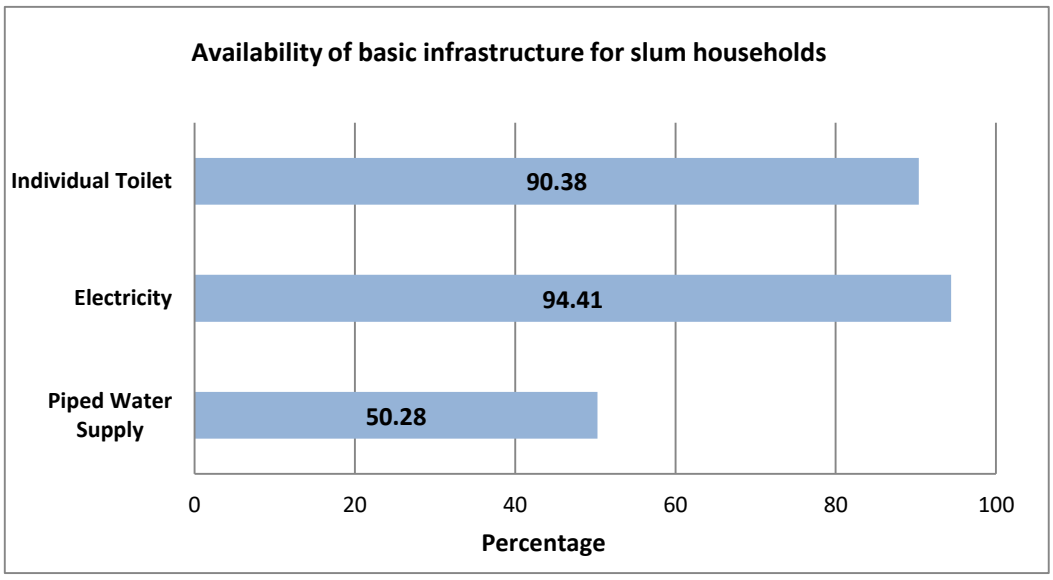
16.3 SUBSTANDARD HOUSING

The high land value in the city has made the poor find it difficult to get affordable land for their housing need. This has resulted in the growth of slums and Economically Weaker Section (EWS) colonies. The Master Plan has to identify present deficiencies in the housing stock and future requirements and it has to indicate how shelter and land requirement for the urban poor should be provided. It is essential to estimate the actual housing needs of the populace (including affordability), particularly for those below Poverty Line.



Fig 16.13 Slum near Aswini Junction

2001 census indicates that Thrissur city has a slum population equivalent to 0.50% of the total city population. 1776 families are identified as 'poor families' in the jurisdiction of Thrissur Municipal Corporation, i.e. a total risk population of about 59715. As per the survey conducted by RAY cell of Thrissur Municipal Corporation in 2015, only 41 slums satisfy the conditions of Slums as stated by PMAY Scheme. There are 2504 slum households with a population of 9931, occupied in area of 4248 cents. Details of slums in Thrissur Municipal Corporation which satisfy the conditions of PMAY scheme are given in table 16.1. Analysis of the availability of basic infrastructure for slum households is shown in fig. 16.14. Many of the slum households lack basic infrastructure, mainly piped water supply. Only 50% of the slum households are covered by piped water supply, the rest depends on other sources for their day to day needs. Basic infrastructure facilities is to be made accessible for all the people.



Source: Municipal Corporation Office Thrissur

Fig 16.14 Availability of basic infrastructure for slum households

Table 16.1 Details of Slum area in Thrissur Municipal Corporation which satisfy the conditions of PMAY Scheme

Sl. No	Slum Name	Ward No.	No. of household	Total population	Availability of facilities/amenities					Other Amenities
					Piped Water supply	Electricity	Individual Toilet	Road	Street light	
1	Aani company Kachery canal	27	40	163	7	38	40	No	Yes	-
2	Aiswarya nagar lakshamveed	21	23	97	13	22	23	Yes	Yes	2 Self Help Groups, 2 Credit Societies, 1 youth association
3	A K G Nagar (Poonkunnam)	1	72	310	71	71	72	No	Yes	-
4	Aranattukara Kadavaram	50	17	78	17	17	17	Yes	Yes	-
5	Diwanjimoola colony	39	23	97	23	23	22	Yes	No	-
6	Herbert colony	43	133	506	45	130	133	Yes	Yes	Nest Anganwadi
7	J P Nagar	21	23	88	4	23	23	No	Yes	-
8	Kachery canal puramboke colony	21	30	121	6	30	30	No	Yes	PHC , Homeopathy Clinic
9	Kanal purambpoke ani company	22	47	159	28	43	47	Yes	Yes	-
10	Kokkala	39	60	268	60	60	60	No	Yes	Anganwadi
11	Kovilakathum padam	12	21	83	19	21	21	No	Yes	-
12	Kuttanellur temple colony (Shivapuri)	27	68	247	0	68	67	No	Yes	Anganwadi
13	Mailipadam	12	21	89	21	20	21	Yes	Yes	Anganwadi
14	Manniyankara 3 cent colony	46	38	150	15	38	38	Yes	No	-
15	M B Nagar 3 cent colony	21	210	788	25	204	210	Yes	No	Anganwadi, PHC , Homeopathy Clinic
16	Michabhoomi	6	46	162	46	46	46	Yes	No	-

17	Monnukutty	37	18	68	18	17	18	No	Yes	-
18	Mundoli temple colony	27	45	188	7	36	37	No	Yes	Anganwadi
19	Naikkan koodaran	26	18	80	13	17	17	No	Yes	-
20	Nedupuzha pattikajathy	44	57	232	17	52	57	No	Yes	Anganwadi
21	Nellankkara Lakshamveed	14	42	173	12	42	42	Yes	Yes	Anganwadi
22	Nellankkara Lakshamveed harijan	14	25	100	15	25	25	No	Yes	Anganwadi
23	Padavarad church colony	27	17	56	3	16	17	Yes	Yes	-
24	Padavarad KSK	27	53	200	45	53	43	No	Yes	Anganwadi, Community hall, Pvt primary school and pre -school
25	Pallan colony	22	119	460	18	117	119	Yes	Yes	Anganwadi
26	Panamjakam	16	19	74	0	18	18	Yes	Yes	-
27	Pattalakkunnu	18	108	425	57	103	108	Yes	Yes	-
28	Pattalakkunnu 3 cent colony	18	17	66	7	15	16	Yes	Yes	-
29	Pattalakkunnu 4 cent colony	18	62	234	30	59	61	No	Yes	-
30	Peringavu water works	5	28	127	14	28	24	Yes	Yes	Livelihood/ production centre, Anganwadi
31	Plavalapp	17	11	59	3	10	11	Yes	Yes	-
32	Pope nagar colony	18	188	720	102	175	182	No	Yes	Urban health centre with community hall,
33	Pulari	47	124	478	122	71	33	No	No	Anganwadi
34	Shankarath lane	41	53	220	36	51	37	No	Yes	Livelihood/ production centre
35	S J colony	6	201	816	107	190	198	Yes	Yes	-
36	Thrikkumarak udam	52	168	672	141	159	113	Yes	Yes	Anganwadi
37	Thriveni colony	24	37	184	9	37	35	No	Yes	-

38	Udayagrama m KESS	27	71	259	9	71	70	Yes	Yes	-
39	Vailoppilly	10	67	262	7	67	65	Yes	Yes	Anganwadi
40	Vakayil	38	65	284	64	63	29	Yes	Yes	-
41	Valarkkavu Souhardra lane	24	19	88	3	18	18	No	No	-
Total			**2504**	**9931**	**1259**	**2364**	**2263**			

Source: Municipal Corporation Office Thrissur

16.4 SCHEMES & PROGRAMMES

Various ongoing state and central government schemes for housing can reduce the shortage of houses in the city. Schemes like Life mission, Pradhana Mantri Awas Yojana (PMAY), IHSDP, RAY are the schemes in the Municipal Corporation area. According to LIFE Mission Programme, there are 5439 House less people in Thrissur Municipal Corporation. Details of various housing schemes/programmes is as included in table.16.2.

Table 16.2 Schemes and Programmes in Housing sector

Name of Scheme	Dwellings constructed during last five years	Size of the dwelling unit in sq.m.	Price of house	Mode of payment	No. of households benefited
I H S D P	120	30 sq.m	4.3 lak	Cheque to cost ford	88
R A Y	12	30 sq.m	4.2 lak	cheque	12
P M AY	129	60 sq.m	3 lak	NEFT	129

Source: Municipal Corporation of Thrissur (Year: 2016) (needs updation)

16.5 INFERENCE

As shelter is one of the basic human need, housing sector requires the attention of planners as well as policy makers. Augment supply of land for housing by opening up new areas of development and provide adequate infrastructure for the benefit of the people. Proper monitoring and management of various ongoing housing schemes so that the eligible families are benefitted. Slum Improvement Programmes for upgrading the services, amenities, hygiene and environment have to be introduced. Ensure supply of affordable land through approaches such as reservation of specified amount of land in new developments. Promote availability of cheap building materials; skill development programmes to ensure supply of skilled workers in construction industry; improve access to finance.

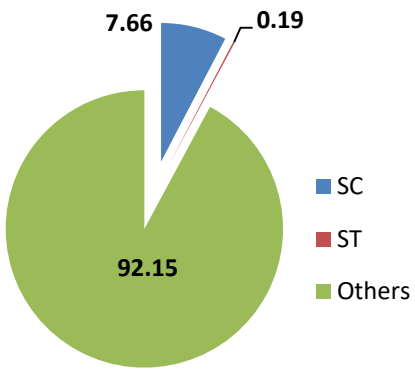
CHAPTER 17
SPECIAL CONCERN AREAS



This chapter deals with the areas which requires special attention and thrust. Details of social and economic backwardness, poverty, women and child development, etc. are discussed here.

17.1 SOCIAL BACKWARDNESS & POVERTY

Backwardness is a manifestation of several independent circumstances that may be social, cultural, economic, educational or even political. Poverty is a social phenomenon in which a section of the society is unable to fulfil even its basic necessities of life. Poverty continues to prevail among the downtrodden and depressed sections of the people. Socio economic inequalities between place and people have sharpened over the years. Social backwardness in the ultimate analysis is the result of poverty to a large extent. Poverty is often concentrated in certain segments of society, generally defined by region, by age, or by social group. Social backwardness which results from poverty is likely to be aggravated by considerations of their caste. In ascertaining social backwardness of the class of citizens, caste and poverty are both relevant for determining the backwardness but neither caste nor poverty alone will be the determining factor. This shows the relevance of both caste and poverty in determining factor of social backwardness of citizens.



Source: 2011 Census data

Fig. 17.1 Percentage share of SC/ST Population

17.1.1 SC/ST POPULATION

As per 2011 census, out of the total population of 3,15,957 in Thrissur Municipal Corporation area, 24,210 (7.66%) people belong to Scheduled Caste (SC) Community and 605 (0.19%) people belong to Scheduled Tribe (ST) Community.

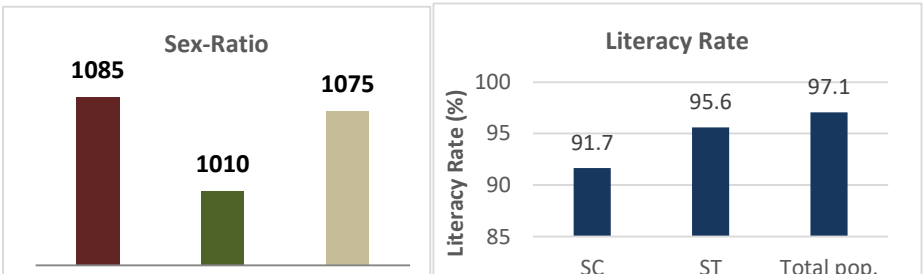


Fig. 17.2 Sex-Ratio & Literacy Rate of SC/ST Population

Source: 2011 Census data

Sex ratio of SC and ST population in the city is 1085 and 1010 respectively, against a value of 1075 for the whole population in the city. Literacy rate of SC/ST population is found to be less than that of the whole city. Literacy rate of SC and ST population are 91.7% and 95.6% respectively, whereas it shows a value of 97.1% for the whole population.

There are 5744 SC households and 148 ST households. Upon comparing the household size with the whole Corporation area, it can be seen that the values of SC/ST population is higher. Household size of SC and ST population are 4.21 and 4.09 respectively, whereas for the Corporation area, it shows a value of 4.03.

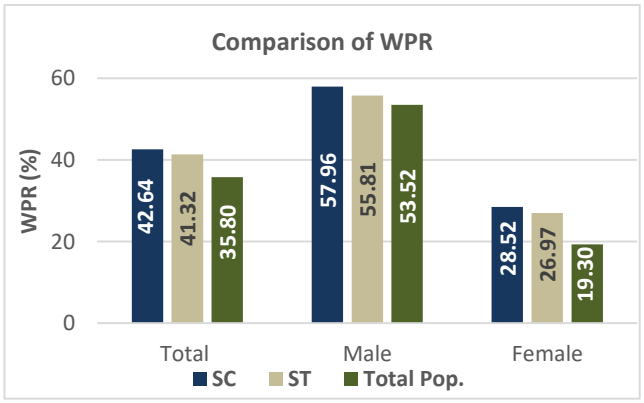


Fig. 17.3 Comparison of WPR

Source: 2011 Census data

Work Participation of SC/ST population when compared with the whole city area, shows a higher value. Work Participation Rate (WPR) of SC and ST population are 42.64% and 41.32% respectively against a value of 35.80% for the whole city. Both the male and female WPR also shows a similar higher trend when compared with the whole population in the city. Male WPR shows values of 57.96%, 55.81% and 53.52% respectively for SC, ST and total population. Whereas, female WPR for SC, ST and total population are 28.52%, 26.97% and 19.30% respectively. Occupational structure shows a similar pattern as that of the total population in the city with higher number of 'other workers'. 94.70% of SC population and 95.43% of ST population are 'other workers'.

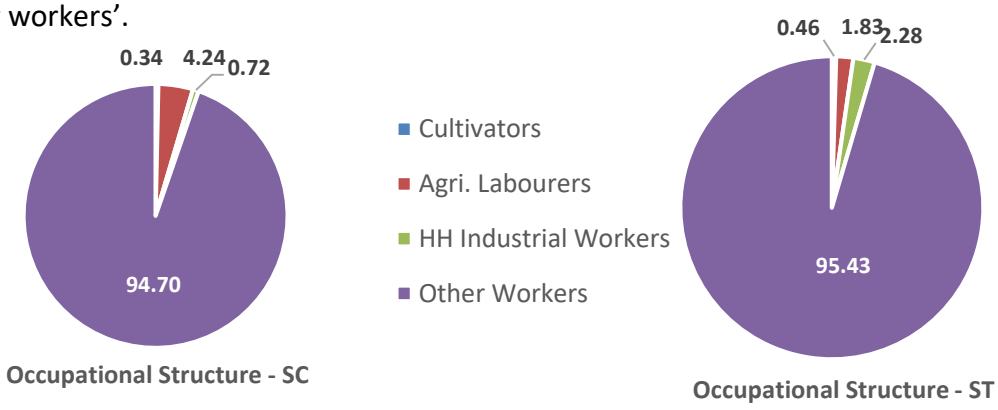


Fig. 17.4 Occupational Structure of SC/ST Population

Source: Census data –2011

17.1.2 BPL HOUSEHOLDS

As per the latest available BPL Survey which was conducted in 2009, there are 21779 BPL Households in Thrissur Municipal Corporation, i.e., 27.9 % of total households in the city. Nearly one third households in the city belongs to BPL category shows the need for overall upliftment of weaker sections of the society by strengthening the services provided as well as poverty alleviation. The socio-economic sample survey of 2019 shows the presence of about 20% of BPL households in the city.

The BPL survey was based on the following 9 indicators

i. The family not having a house fit for occupying.
ii. Scarcity of drinking water
iii. Family not having sanitary latrine
iv. Family in which members are inadequately literate
v. Family in which more than one member is not having income
vi. Family not having sufficient food for survival
vii. Family in which there are children below 5 years
viii. Members of family addicted to liquor and other intoxication
ix. SC/ ST family

In Kerala, the rate of poverty is continuously diminishing. Respective Governments have undertaken several welfare measures and have given importance to minimum needs programme. Measures like increase in stress on education, reservation of seats in Government jobs, increase in women empowerment and empowering weaker sections of the society are also expected to contribute in the alleviation of poverty.

Though the statistics of National Sample Survey (NSSO) points that poverty has been reduced, the issues related to poverty reduction still remains crucial and critical. There arise new problems in the field of food security, shelter, access to safe drinking water, better sanitation, employment, health, education etc. The absolute poor are marginalized even though there are intervention from the part of government departments and local bodies. This happens to be the after effect of national level policies of liberalization. The important developmental issues identified in these areas are:-

- Transformation of cultivation from food crops to cash crops leading to migration of labour. Thus the workers among BPL population are forced to migrate from agriculture to other sectors such as coolies, construction works etc.
- Decline of the traditional industrial sector and consequent unemployment directly affect the BPL population
- The animal husbandry sector has become under-remunerative for the BPL Population.
- Services from Public Health Institutions are not sufficient to cater the poor. Cost of treatment alienates the poor from availing treatment.

- Social development and security issues are not well taken care of and addressed timely.
- Poverty reduction strategy through enterprise development does not follow a holistic approach

The economic status of the BPL people is evaluated based on the occupational structure and average annual income of BPL population. The BPL survey conducted during 2009 reveals that the BPL population are mainly occupied as coolie, agriculture labourers, fishermen etc. There is a shift of agriculture labourers to other workers over the period of time. Also over the years there is a tendency to shift from food based to commercial based crops. The trend line of area of Food and Commercial crops from 1986-2004, clearly indicates the shift in cropping pattern from food to commercial crops. This has resulted in the migration of poor labourers from agriculture to other sectors. This could be the reason of high percentage of coolies among BPL population. Since workers in the traditional industries are from among the BPL population, they are directly and severely affected by the decline in the sector. The animal husbandry sector has become under remunerative due to declining trend of animal population, increasing cost of inputs of production etc.

17.1.3 SC/ST INDEX & BPL INDEX

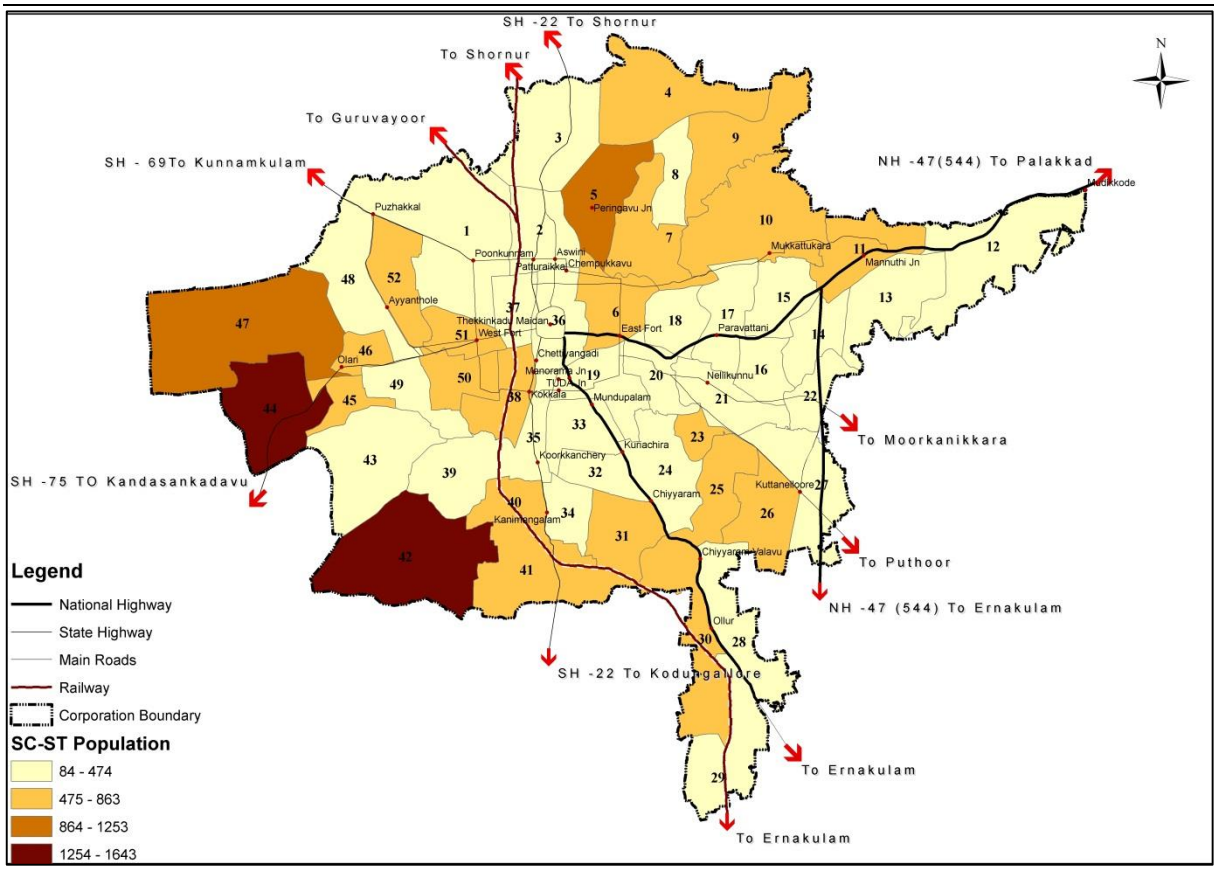
SC/ST index and BPL index are the various indices used to find the social backwardness of a place. Ward wise concentration of SC/ST population and BPL population is found out using these indices.

SC/ST index = Total no. of SC/ST people in ward ÷ Population of that LSGI

In the same way the BPL index is also calculated. It may be < 1, = 1 or > 1.

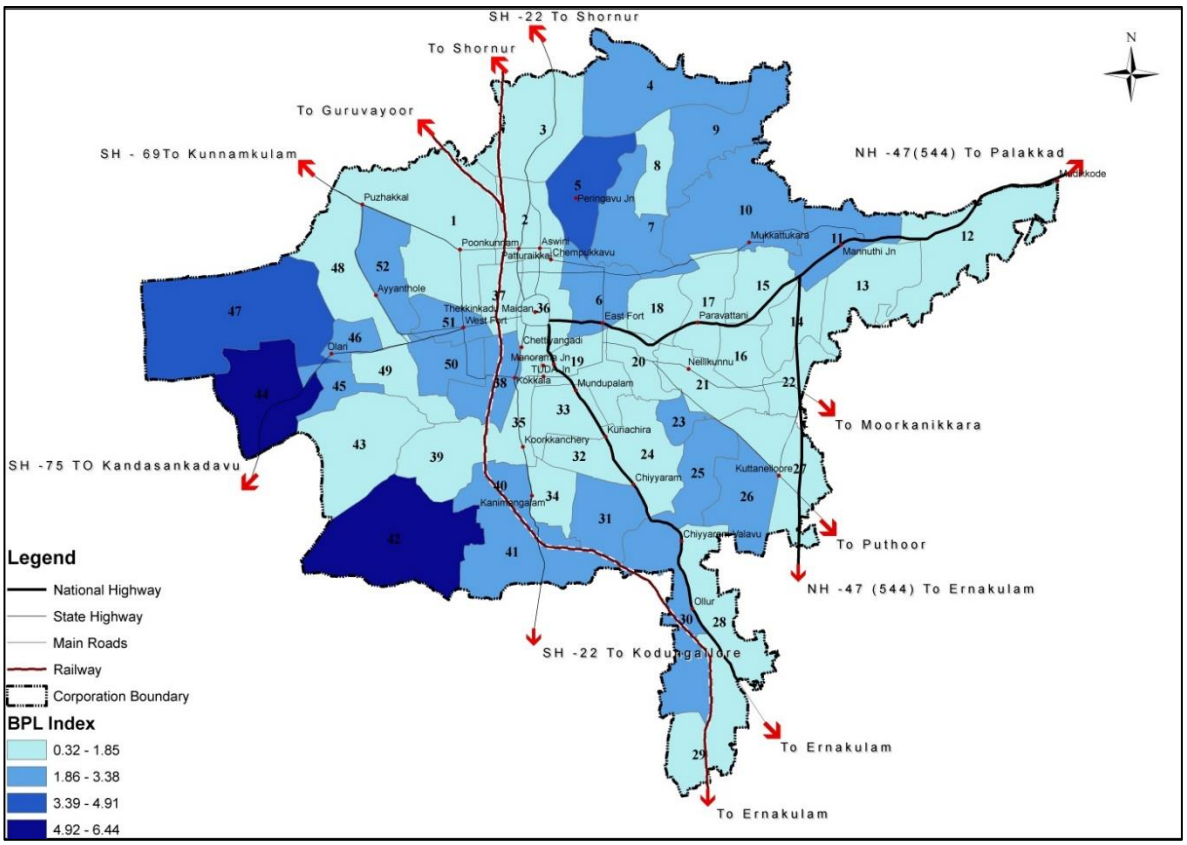
Ward wise concentration of SC and ST population in Thrissur City, as calculated from 2011 census data and the respective ward classification (52 wards) in 2011, is shown fig. 17.5. It is found that SC/ST people are mainly concentrated in ward 42 (Nedupuzha) and ward 44 (Chettupuzha).

As per the BPL survey - 2009 conducted by the Municipal Corporation Office, 21809 people comes under below poverty line. Out of the 52 wards (as in 2009), 39 wards have index > 1. Out of the 52 wards, Nedupuzha (4.28) and Chettupuzha wards have Index > 4. The BPL index of the 52 wards of Thrissur City is shown in the figure given fig. 17.6. From the figure, it is evident that socially backward classes are mainly concentrated in some wards and the concentration is found maximum in wards Nedupuzha and Chettupuzha. Next comes wards Peringavu and Pullazhi. In these wards people depends on agriculture, construction, head load and such daily wages works as their sources of income.



Source: Census data –2011

Fig 17.5 Distribution of SC-ST population in Thrissur City



Source: BPL Survey, 2009

Fig 17.6 BPL Index in Thrissur City

17.1.4 POVERTY ALLEVIATION

Problems

- Problem of landlessness is more
- Drinking Water: Critical in many parts
- Sanitation: Mainly Solid waste disposal
- Health: Inadequate service from Government Hospitals. Private hospitals are not approachable to the poor
- Lack of methodology to identify poverty
- Illogical utilization of funds
- Disparity between intensity of poverty and investment of resources
- Economic development through Community Based Organizations (CBOs) of women has not gained momentum
- A cluster approach has not been developed
- Inherent limitations for development of microenterprises in Kudumbasree, State/Centrally sponsored schemes, etc. as part of poverty reduction activities especially in the areas of product development, marketing strategies, technology accessing etc.

Potentials

- Intervention through promoting cultivation of vegetables, fruits and ornamental plants etc.
- Dairy Development
- Revamping traditional industries through product development, diversification and technology upgradation
- Micro enterprise development through cluster approach
- Intervention of LSGIs in Health and Education Sector
- Effective network of CBOs of poor women under Kudumbasree
- Flexibility of executing poverty reduction activities in Kudumbasree

17.1.5 SCHEMES & PROGRAMMES

Government have initiated, sustained, and refined various planning schemes to help the poor attain self-sufficiency in food production. The most important initiative has been the supply of basic commodities, particularly food at controlled prices, available throughout the country as poor spend about 80 percent of their income on food. The schemes have however not been very successful because the rate of poverty reduction lags behind the rapid population growth rate.

Eradication of poverty is generally considered to be a long-term goal. Poverty alleviation is expected to make better progress in the next 50 years than in the past, as a trickle-down effect of the growing middle class. Increasing stress on education, reservation of seats in government jobs and the increasing empowerment of women and the economically

weaker sections of society, are also expected to contribute to the alleviation of poverty. The growth of the middle class indicates that economic prosperity has indeed been very impressive, but the distribution of wealth is not at all even.

E.M.S housing scheme has been introduced with the objective of providing houses to all houseless–landless members of the society and also to provide land and house to all landless, houseless members belonging to Below Poverty Line. The objective of IAY (Indira Aawaz Yojana) is primarily to help construction of dwelling units by members of SC/ST, Free bonded labourers and also non SC/ST, rural people below the poverty line by providing them with grant in-aid.

Under KSUDP, the objective of capacity building for poverty alleviation initiatives is to ensure that the Project benefits reach the poorest of poor and that all stakeholders involved in the Project are well informed regarding the activities and process to achieve Project activities. A key component for successful implementation of poverty alleviation initiatives is the constitution of a Civil Society Organization (CSO), which is expected to identify requirement of the poor and vulnerable, and facilitate Project implementation. The CSO will essentially comprise city-level stakeholders including but not limited to the Municipal Corporation, business groups, and resident welfare associations, NGOs, CBOs, CDS and Kudumbasree. Training of CSO members, UPA staff at Municipal Corporation, Kudumbasree and CDS members is therefore imperative and may be carried out through identified training institutes. While training needs assessment is a requisite for identifying areas of capacity building, the following is an indicative list.

- Community Infrastructure Fund (CIF):

  These activities may include:

  - Planning and identification of community infrastructure needs;
  - Operational and maintenance issues relatingto infrastructure provision; and
  - Awareness regarding women empowerment, environmental health and diseases, and education.

- Poverty Social Fund (PSF):

  These activities may include:

  - Conceptual clarity for scaling-up livelihood initiatives through livelihood development strategies;
  - Facilitating confederation of Self Help Groups to graduate into Micro Finance Institutions (MFI); and
  - Focus on business development initiatives for micro enterprises.

- Strategic Programs:

  These may include:

  - Project development programs with specific reference to CIF and PSF utilization;

- CSO networking and resource convergence; and
- Creating strategy mechanism for CSO to run programs under health, sanitation and income generation.

17.2 WOMEN & CHILD WELFARE

There is strong connections between the status of the environment and the welfare of women and children in India. Women, especially in lower-income groups, both in the rural and urban sector, work longer hours than men. Their work pattern differs and is more prone to health hazards. In urban areas, where lower economic group women live in crowded smoke-filled shanties in unhygienic slums, they spend long hours indoors, leading to respiratory diseases.

There are several environmental factors that are closely linked to the welfare of women and children. Thrissur City has Mother and child welfare centres at Paravattani, Aranattukara, Kokkalai and Patturaikkal. The mother and Child welfare centre at Paravattani is working as community Health centre. 4 MCH centres are working inside the city for mother and child welfare. The details are given in table 15.6.

Table 17.1 MCH Centres in the City

Name of MCH Centre	Duration	No of patients attended	Remarks
MCH Centre Paravattani	Daily clinic	25	Patients are treated by a Medical college House surgeon
MCH centre Aranattukara	Once in a week	20	
MCH centre Kokkalai	Once in a week	20	
MCH centre, Patturaikkal	Once in a week	20	

Source: Kudumbasree unit, Thrissur Municipal Corporation office

The department of women and child development is one of the major departments in the district implementing variety of programmes for the development of women & children. The main objective includes development of women & children, protecting children from being neglected, exploited, prevent destitution and delinquency, provide alternative shelter based rehabilitation through institutional treatment, improve health nutritional status of children and women, create awareness among women to improve overall living conditions.

The department has developed many programmes in fulfilment of the above objectives. Integrated Child Development Services (ICDS) schemes are present all over the area. The department is also responsible for prevention of juvenile delinquency, destitution & negligence of children by parents and is running an observation home, a juvenile home under government sector and 7 destitute cottages run by NGO's are given financial assistance. All the services are provided through Anganwadi centre and there are 1303 anganwadi workers in the district providing services to the pregnant & lactating women with nutritional food 300 days in a year, immunizing children and pregnant women and other basic services. Various schemes under the ICDS programme are as follows:

- Informal pre-primary education through Anganwadis

- Immunization and disease prevention programmes
- Psycho-social service for teenage girls (School Counselling Programmes)
- Nutritious food for children below 6 yrs, pregnant women, lactating mothers, etc.
- Take Home Ration Strategy – Provision of nutritious food (nutri-mix) for the children below the age of 3yrs.
- ICDS training
- Medical kit and pre-school kit for anganwadis
- Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) – SABLA
- Commissioner maternity benefit scheme (Indira Gandhi Mathruthva Sahayog Yojana)
- Karyakarthru Bhima Yojana – insurance scheme for anganwadi workers

17.2.1 SCHEMES OF THE DEPARTMENT

Various schemes of the department for the women and child welfare are as follows:

- Attendance scholarship for girls up to 10th standard.
- Assistance to girls in job oriented courses & encouragement to take up self-employment through bank loans.
- Providing scholarship to disabled students and encouraging them for self-employment.
- Widow marriage
- Assistance to mahilamandals and mahila federations.

Holy Angel's Foundling Home, Pullazhi is an organization receiving Grant-in-Aid from Ministry of Women & Child Development, for promoting domestic adoption (0-6 yrs. of age).

Table 17.2 Details of Project Offices in Thrissur Municipal Corporation

No.	Name of ICDS Projects
1.	District Social Welfare Office, Chembukkavu
2.	Programme Office, Chembukkavu
3.	Probation Office, Ayyanthole
4.	Juvenile Home, Ramavarmapuram
5.	Observation Home, Ramavarmapuram
6.	Ashabhavan, Ramavarmapuram
7.	Prathyasa Bhavan, Ramavarmapuram
8.	Old age Home, Ramavarmapuram
9.	Mahilamandiram, Ramavarmapuram
10.	ICDS Cherpu
11.	ICDS Ollukkara

Source: ICDS

17.3 OTHER SOCIAL WELFARE SCHEMES & PROGRAMMES

In order to address the issues of the vulnerable sections of the society, Social Justice Department of Kerala has formulated 'Kerala Social Security Mission' in 2009. It mainly aims at the formulation and implementation of various schemes for the welfare of the destitute, the geriatric, women, children, physically challenged, the diseased, etc., in a time-bound manner. Various schemes under the Social Security Mission are as follows:

- *Aswasakiranam* – Monthly financial aid for the persons who take cares of critically ill patients.
- Cancer Care – Free treatment for cancer affected children under the age of 18yrs.
- *Thalolam* – Financial aid for the children under the age of 18years treatment of heart problem, neuro disorders, cerebral palsy, autism, etc.
- *Sruthitharangam* – Cochlear implantation scheme for the children of age 0-5 yrs.
- *Snehapoorvam* – Monthly financial aid for the education of children whose either/both parents are demised and being taken care by other family members/relatives who are not financially able.
- *Snehasparsam* – Monthly financial aid and rehabilitation of destitute unmarried mothers.
- *Vayomithram* - Medical aid for the older people above the age of 65yrs.
- State Initiative on Disabilities for the prevention of disabilities.
- *Samaswasam* – Medical and financial aid for persons having kidney failures.
- Karunya Deposit Scheme
- We-Care – Collecting funds and resources from various sources for social welfare activities.

17.4 INFERENCE

Various vulnerable sections of the society which requires special attention while formulating policies and programmes were discussed. It is found that literacy rate of SC/ST population is behind the values for the whole city, which shows the backwardness in their social circumstances, that should be improved so that their children will be benefitted to acquire proper education. Higher WPR rate of SC/ST population shows their need for engaging in any sort of work to meet their living. More employment opportunities may be introduced to improve their financial stability.

The Women & Child Development Department with the ICDS and IWDS (Integrated Child Development Service and Integrated Women's Development Service) functions for the Empowerment, upliftment and welfare of Women and children under its various schemes. Family welfare, education, health, nutrition and health education, justice and equality, etc. are the various issues focused for the welfare of Women and Children. Economic and social empowerment of women with protection to women from domestic violence, rights of property by female members, dowry prohibition, and protection from sexual harassment, indecent representation of women and many other women favouring actions are governed

by the department. Innovative projects for empowering women and self-sufficient employment opportunities for the women has to be introduced.

Long run economic growth per person is achieved through increases in capital (factors that increase productivity), both human and physical, and technology. Improving human capital, in the form of health, is needed for economic growth.

- Strengthening frameworks for sustainable and inclusive economic growth which will benefit the poor
- Supporting interventions which enable the poor to improve their productivity
- Encouraging governments, institutions and donors to be more accountable to the poor
- Reducing the vulnerability of the poor

Government have introduced many programmes for enabling the poor to increase their productivity, through access to credit, markets, property rights, technology, health and education systems. This will help in the progress of backward classes. There are certain areas of concern in the development of BPL population. Improvement of substandard area should be given top priority. Also, infrastructure facilities including safe drinking water, electricity, solid waste disposal system etc. should be provided in the BPL concentration areas. Thus in order to have best results in the area of poverty alleviation, there has to be an integrated approach for poverty alleviation through concerted efforts of Government Departments and others.

CHAPTER 18
RECREATIONAL FACILITIES & CIVIC AMENITIES



This chapter describes about existing status, problems and potentials of the recreational facilities as well as all major civic amenities located in Thrissur city.

18.1 RECREATIONAL FACILITIES

Recreation is an essential part of human life and finds many different forms which are shaped naturally by individual interests but also by the surrounding social construction. Recreation is an activity of leisure. The "need to do something for recreations" is an essential element of human biology and psychology. Recreational activities can be communal or solitary, active or passive, outdoors or indoors, healthy or harmful, and useful for society or otherwise. Tourism has recognized that many visitors are specifically attracted by recreational facilities. In support of recreational activities, government has taken an important role in their creation, maintenance, and organization, and whole industries have developed merchandise or services. Recreation-related business is an important factor in the economy. Active recreational facilities include stadium, playgrounds, etc. whereas passive recreational includes libraries, parks, open spaces, etc.

18.1.1 PARKS & OPEN SPACES

A public space is a meeting or gathering places that exist outside the home and workplace that are generally accessible by the public, and which foster resident interaction and opportunities for contact and proximity. The benefits that an urban open space provides to its citizens can be generally classified as recreation, ecology, aesthetic value, and positive health impacts. Psychological benefits gained by visitors to urban green spaces increases with their biodiversity. Open space provides recreational areas for the residents and helps to enhance the beauty and environmental quality of neighbourhoods. Time spent in an urban open space for recreation offers a relief from the urban environment and a break from stressful day to day life.



Fig. 18.1 Thekkinkadu Maidan

One of the important open space in the city is Thekkinkadu Maidan, a hillock which seats Sree Vadakkumnnathan temple and located centrally in the city having an extent of about 65acres. It serves as a major activity centre in the city and hosts the major festival of 'Thrissur Pooram'. It houses the Nehru Park as well. It is encircled by the major road called 'Swaraj Round'. The whole city branches radially out from the Swaraj Round mainly by means of 8 major roads and various minor roads.



Fig. 18.2 Nehru Park

As per the existing land use of 2019, park and open spaces constitutes about 0.34% of the total area of Thrissur City. The details of existing parks and open spaces in the city are given in table 18.1 below.

Table 18.1 Details of Parks and Open Spaces

	Sl. No.	NAME	LOCATION/WARD
Park	1	Nehru Park	Swaraj Round
	2	Ayyanthole Childrens Park	Ayyanthole
	3	Kuttikalude Gramam – Childrens Park	Ollukkara
	4	Ramavarma Park	Thrissur Round East
	5	Freedom Park	Viyyur
Open Space/ Playground	6	Thekkinkadu Maidan	Swaraj Round
	7	Ayyanthole Play Ground	Ayyanthole
	8	Karyattukkara Play Ground	Karyattukkara
	9	Poonkunnam Play Ground	Poonkunnam
	10	Chakkamukku Childrens Play GRound	Chakkamukku
	11	Nethaji Ground	Kalvary road
	12	Tharakan's Play Ground	Aranattukkara
	13	Valiyalukkal Play Ground	Valiyalukkal
	14	Anappara Ground	Anappara
	15	Anakkulam	Ollukkara
	16	Elanjikkulam	Near Lourde Hospital, Mannuthy
	18	Play ground	Ollur
	19	Play ground	Engineering college, Cheroor
	20	Play ground	Paravattani

Source: AMRUT Secondary data - 2018

18.1.2 STADIUMS & SWIMMING POOLS

Thrissur city comprises of various outdoor as well as indoor stadiums to promote the sports/games activities of the people. Thrissur Municipal Corporation stadium, also known as the Palace Stadium, is one of the oldest stadiums in Kerala is situated adjacent to Sakthan Thampuran Palace. It has a capacity to hold 15000 people and is the first synthetic football turf in Kerala state. Other stadiums in the city are Thope Stadium, Kerala Varma College Stadium and Agricultural University Stadium.

In order to facilitate the needs of the people and for the convenience of conducting tournaments during unpleasant weather as well as at night, two major indoor stadiums exist in the city. V.K.N. Menon Indoor Stadium, which is situated adjacent to the Municipal Corporation Stadium, is owned by Kerala State Sports Council. The stadium is mainly used for badminton, judo and weightlifting. It has advanced acoustical facilities and has 10 courts with air-conditioned hall and modern arena lighting. Another Women indoor stadium is also functioning in Ayyanthole. Apart from these, Kinattingal Tennis Academy and Banerji Tennis Club are also functioning in Thrissur.



Fig. 18.3 V.K.N. Menon Indoor Stadium



Fig. 18.4 Municipal Corporation Stadium

In order to promote aquatic sports activities, two major aquatic complexes are situated in the city. Thrissur Aquatic Complex is a swimming pool complex owned by Thrissur District Sports council, is built in 1987 in 3.5 acres of land. Various state and national level tournaments are being held here. Vimala International Aquatic Academy is another aquatic complex situated in the city owned by Vimala College, Thrissur. Apart from these, another aquatics club is situated at Mission Quarters and an indoor swimming pool in Kinattingal Tennis & Sports Academy.

Table 18.2 Details of Stadiums & Swimming Pools

Facility	NAME	LOCATION/WARD
Stadium	The Municipal Corporation stadium	Palace road
	Thope Stadium	East Fort
	Kerala Varma College Stadium	Kerala Varma College
	Agricultural university stadium	Mannuthy
	VKN Menon Indoor stadium	Palace road
	Kinattingal Tennis& Sports Academy	Puzhakkal
	Banerji Tennis club	Swaraj Round
	Women Indoor stadium	Ayyanthole
Swimming Pool	Aquatic Complex	Vadakke Stand
	Aquatic Club	Mission quarters
	Vimala International Aquatic Academy	Padukkad

Source: AMRUT Secondary data - 2018

As a part of Central Government's Amrut Project below specified parks are undergoing rennovation:

- Nehru park at Swaraj Round in 3 different Phases
- Pakalveedu park at Panamkuttichira
- Achutha Menon park
- Vanchikulam Park

As per URDPFI Guidelines, one District Sports Centre is required for 1 lakh population. The city is blessed with many sports facilities, but many of these needs further upgradationto meet the growing demands of the city as well as its population.

18.1.3 THEATRES

Movies are a major source of recreational activity for the people in Thrissur city. Thecity has got a number of movie theatres, the majority of which are located in the central core of the city. Apart from these 10 theatres, INOX Movies, a multiplex inside the Sobha City Mall, Puzhakkal, situated just outside the city periphery, is also widely accepted by the people in the city and its outskirts.

Table 18.3 List of Theatres in Thrissur City

NAME	LOCATION	EXTENT	SEATS
Georgettans Ragam	Round South	35 cent	747
Ravi Krishna Theatre	MG Road	38 cent	339
Ramdas Theatre			614
Jos Theatre	Round South	25 cent	870
Kairali Theatre	Round North	50 cent	685
Sree Theatre	Round North		383
Bindu Movies	West Fort	55 cent	1049
Girija Theatre	Patturaikkal	50 cent	500
Ganam Cinemas	Valarkkavu	55 cent	340
Deepa Cinema	Viyyur	30 cent	312

Source: AMRUT Secondary data - 2018

18.1.4 ZOO & MUSEUMS

Zoo and Museum are the other recreational facilities available in the city. State Museum &Zoo, Thrissur which started functioning in 1885 is located in the heart of the city, with an extent of around 13.5 acres is one of the oldest in the country and is home to the wide variety of animals, reptiles, and birds. The zoo compound also includes a natural history museum and an art museum that showcase the socio-cultural heritage of the region. A new



Fig. 18.5 The State Museum, Thrissur



Fig. 18.6 Sakthan Thampuran Palace – Archaeological Museum

zoological park is being constructed in the nearby Puthur Panchayat, to relocate the existing zoo from 13.5 acres of land to a new environment having an extent of 306 acres, the works of which are under progress.

Table 18.4 List of Museum & Zoo in Thrissur City

FACILITIES	NAME	LOCATION/WARD
Zoo	State Museum & Zoo, Thrissur	Chembukkavu
Museum/ Art Gallery	SakthanThampuran Palace - Archaeological Museum	Near North Bus Stand
	Kollengode Palace - Mural Arts Museum,	Chembukkavu

Source: AMRUT Secondary data - 2018

The palaces of Kollengode & Cochin Royal families, are now preserved by Archaeology Department as museums which are accessible to public. Sakthan Thampuran Palace, also known as Vadakkekara Palace, is situated near North Bus Stand, now serves as an Archaeological Museum and is well known all over the region for its collection of relics. Kollengode Palace, situated at Chembukkavu, now serves as a Mural Arts Museum.

18.1.5 SPATIAL DISTRIBUTION OF RECREATIONAL FACILITIES

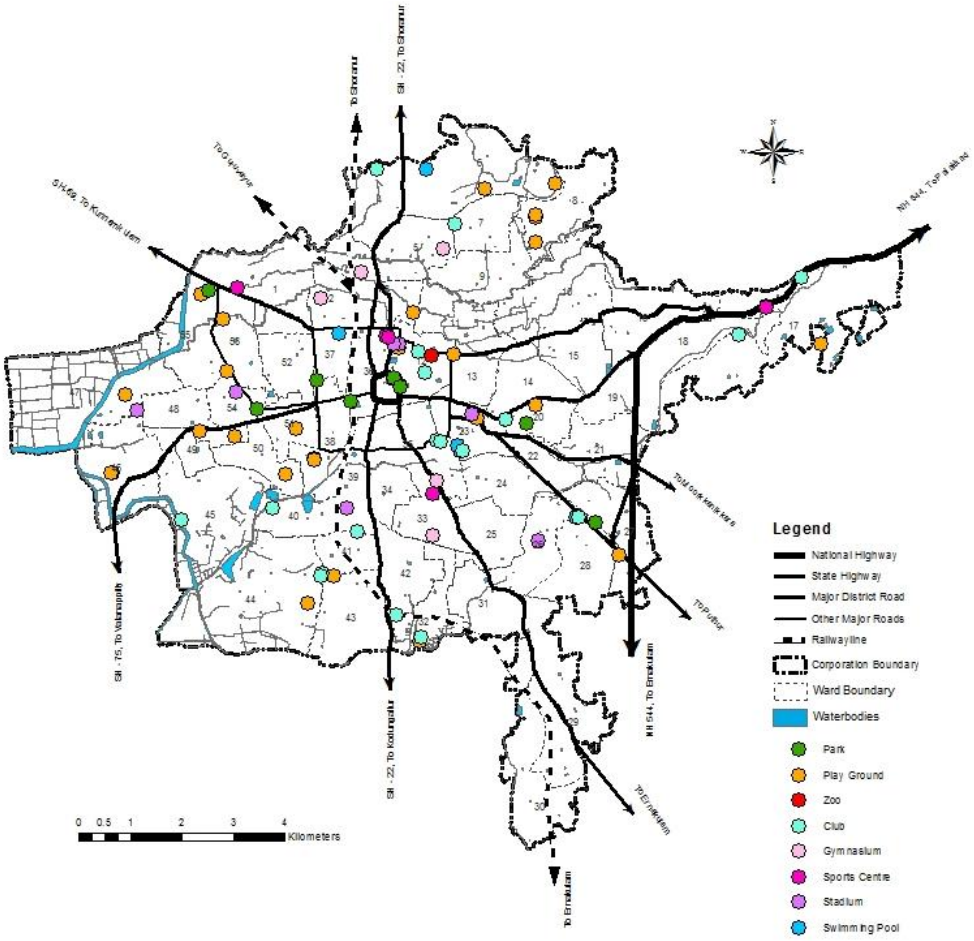


Fig. 18.7 Map showing the spatial distribution of recreational facilities in Thrissur city.

18.2 OTHER CIVIC AMENITIES

Civic amenities mainly includes the facilities that are required for the general public in the city. These amenities are mainly provided by the government and local bodies. Some of these may also be owned by various organizations, trusts, private parties, etc.

18.2.1 COMMUNITY CENTRES

Community centres are public locations where members of a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community. List of community centres in Thrissur City are given in table 18.5.

Thrissur city has a number of community centres which are widely distributed in the city. The Town Hall is one of the prominent community centre in Thrissur. It has an imposing Victorian style building in a large site with lawns and gardens. It was constructed during the Dewanship of R.K Shanmughom Chetti and was built in the honour of the then emperor of India, King George, for his silver jubilee. It is a very important building where public meetings and numerous cultural programmes are held regularly. It has an area of about 250 cents. Apart from the town hall, the city has more than 30 community halls as well as auditoriums which functions for the various needs of the community. The city also have other hall/auditoriums which functions as part of various religious institutions as well as hotels.



Fig. 18.8 Town Hall, Thrissur



Fig. 18.9 Chaldean Centre

Table 18.5 Details of Community Centres in Thrissur City

Name	Location
Town Hall	Chembukavu
Priyadarsini Auditorium	Ayyanthole
Town hall	Ollur
Mini Community Hall	Thrikkumaramkudam colony
Vadakke Samooha Madom	Shornur road
Paandi Samooha Madom	PazhayaNadakavu
Durganjali Auditorium	Olarikkara
Sree-Lakshmi Auditorium	Olari
Tagore Centenary hall	Aranattukara

Banerji Memorial Club	Round North
Chaldean Centre	Pallikkulam road
Hotel Elite international	Round South
M.O. John Memorial Hall	Thrissur
Bini Agencies	Round North
Perinchery's conference Hall	Round North
Royal Hall	Palace road
Appan Thampuran Smarakam	Ayyanthole
Kerala Sahitya Academy Hall	Palace Road
Natyagraham Sangeetha Nataka Hall	Chembukavu
Kerala Sangeetha Nadaka Academy	Chembukavu
Fine Arts Society	Chembukavu
Sree Sankara Hall	M.G.Road
Kousthubham Hall	Shornur road
Lions club	Thrissur city
Ollukkara Kalyana Mandapam	Ollukkara
Pushpanjali Hall	Thrissur city
Thiruvambady Devaswom Hall	Swaraj Round
Trichur Zonal Office	Koorkanchery
Kizhekkepuram samajam Hall	Ayyanthole
Chacko Memorial Hall	Calvary road
Community Hall Ollur	Cheerachi
Anchery Mini Community Hall	Anchery

Source: AMRUT Secondary data - 2018

As per URDPFI Guidelines, one community hall with an extent of 2000sq.m.is required for a population of 15000. Hence, a minimum of 21 community centres are required in the city as per the population and the city has sufficient number of community centres at present.

18.2.2 READING ROOMS & LIBRARIES

A library can be considered a store-house of knowledge which renders great service to the society and is open to all classes of people. It plays a very important role in promoting the progress of knowledge. In Thrissur city, many libraries are present and the major one is the 'Public library' situated inside the Town hall. It was founded in 1873 and has a collection of more than one lakh books and about 100 periodicals. Kerala Sahitya academy library was determined to have a significant collection of Malayalam language materials when the National Bibliography of Indian Literature was compiled in the mid-twentieth century. The details of all public libraries existing in the city are given in table 18.6.

Table 18.6 Details of Public Libraries in Thrissur City

Name	Location	No. of books
Trichur Public Library	Inside Town Hall	117254
Pullazhi Vayanasala	Pullazhi	6002
Appan Thampuran Vayanasala	Ayyanthole	16576
Puthurkkara Vayanasala	Puthurkkara	12594
Outpost Vayanasala	Ayyanthole	8312
Chettupuzha Vayanasala	Chettupuzha	9981
Grameena Vayanasala	Kuttanellur	8892
Mahatma Library	Mannuthy	7311
Friends Public Library	Ollukkara	4213
Grameena Vayanasala	Kanimangalam	5889
Sanmarga Deepam Grameena Vayanasala	Vadookara	11690
Kerala Library	Kuriachira	11822
Grameena Vayanasala	Olari	6933
Grameena Vayanasala	Aranattukara	10022
Prof. Joseph Mundassery Smaraka Vayanasala	Chembukavu	3000
Jaihind Library	Kanattukkara	6049
Njanodhayam Vayanasala	Poonkunnam	11132
Regal Library	Peringavu	7334
Yuvajana Sangam Vayanasala	Villadam	9796
Kasthurbha Samajam Vayanasala	Kuttimukku	11182
Grameena Vayanasala	Cheroor	9742
Grameena Vayanasala	Kolazhy	11532
EMS Smaraka Vayanasala	Nadathara	1360

Source: Public Library, Thrissur & Library Council

As per URDPFI Guidelines, one library is required for a population of 15000. Hence, a minimum of 21 libraries are required in the city, but the city has 23 libraries.

18.2.3 CULTURAL CENTRES

A cultural centre is a building or complex that promotes culture and arts. Thrissur city, being renowned as the cultural capital of Kerala, is blessed with culture and arts promoting centres such as Kerala Sahitya Academy, Kerala Sangeetha-Nataka Academy, and Kerala Lalitha Kala Academy functioning under Department of Culture, Government of Kerala. In a view to develop the skills and talents of children, Jawahar Bala Bhavan, an autonomous music, dance and arts school under the cultural department of Government of Kerala, also functions in the city. Details of cultural centres in the city is given in table 18.7.

Table 18.7 Details of Cultural Centres in Thrissur City

Name	Location
Kerala Sahitya Academy	Palace Road
Kerala Sangeetha – Nataka Academy & Regional Theatre	Chembukkavu
Kerala Lalitha Kala Academy	Chembukkavu
JawaharBalaBhavan	Chembukkavu

Source: AMRUT Secondary data - 2018



Fig. 18.10 Kerala Sahitya Academy



Fig. 18.11 Kerala Lalitha Kala Academy

18.2.4 POLICE STATIONS

There are 6 police stations within the corporation area. As per URDPFI Guidelines, one police station is required for 90000 population and 4 police stations are required in the city as per standards. Thrissur city has more than sufficient number of police stations.

Table 18.8 Details of Police Stations in Thrissur City

Name	Numbers	Location
Police Station	1	Ollur
	1	Thrissur East
	1	Mannuthy
	1	Viyyur
	1	Nedupuzha
	1	Thrissur West

Source: AMRUT Secondary data - 2018

18.2.5 FIRE STATIONS

Thrissur city has a fire rescue station located at Veliyannur and a fire & rescue academy at Viyyur. As per URDPFI Guidelines, one fire station is required for 2 lakh population/5-7 km radius. Service area of existing fire station in the city is shown in fig.18.12.

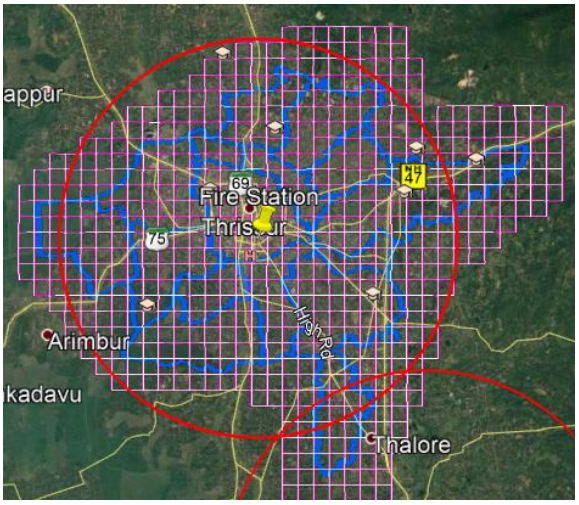


Fig. 18.12 Service area of existing fire station

Fig. 18.13 shows the location of police stations and fire stations in the city.

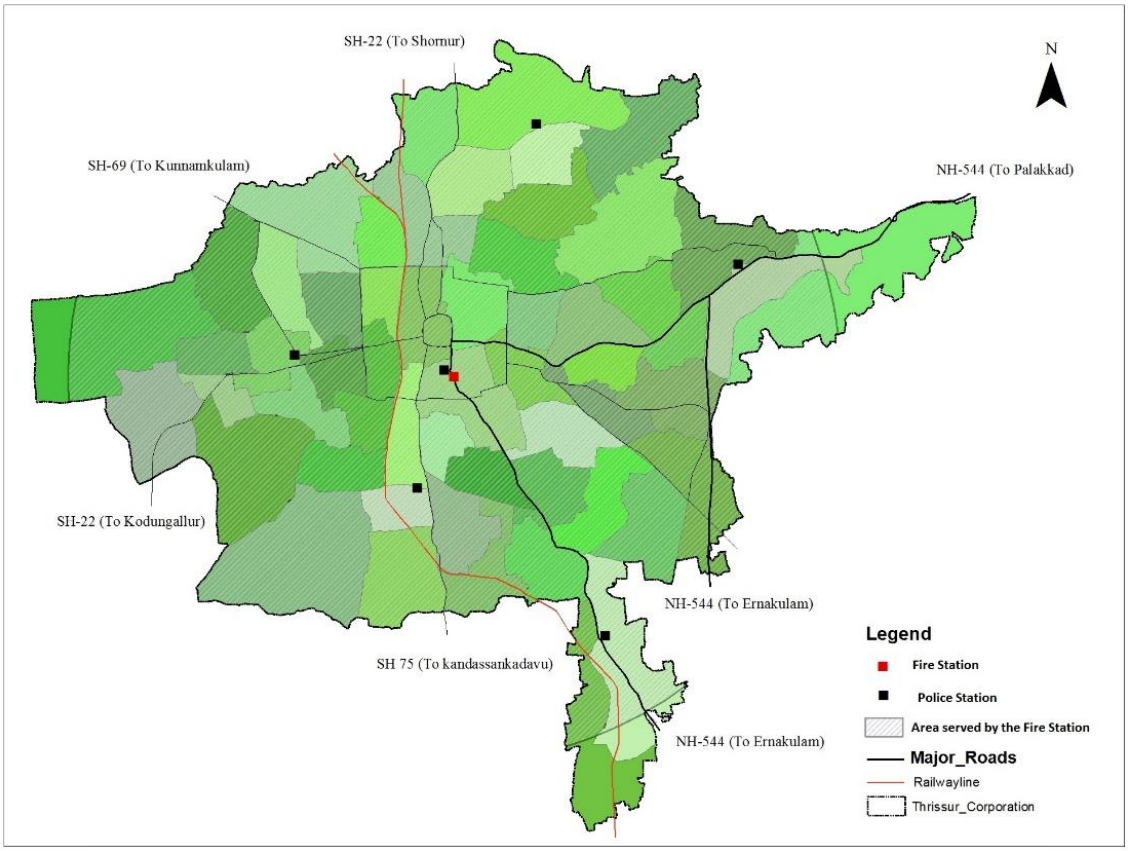


Fig. 18.13 Spatial distribution of police stations and fire station in the city

18.2.6 COMMUNICATION FACILITIES

Communication facilities mainly include post offices, telephone service, internet facilities and fax services. As per URDPFI Guidelines, one post office is required for 15,000 population. About 21 post offices are required as per standards and the Thrissur city has 23 post offices, which sufficient in number. Thrissur city has 7 telephone exchanges, where the standards demand one telephone exchange of 40000 lines for a population of 4 lakhs.

18.2.7 COMFORT STATIONS

Comfort station is a building with toilet and lavatory facilities, often associated with a rest room, which is meant for public use. There are 26 Comfort Stations present in Thrissur Corporation. Proper monitoring, maintenance and periodical cleaning must be ensured in all comfort stations.

18.2.8 FUEL STATIONS

Fuel stations are well distributed in the corporation area. As per standards, one fuel station is required for 15,000 population and accordingly about 21 fuel station are required in the city. The city consists of 27 fuel stations, which is sufficient as per standards. Details of fuel stations in the city is given in table 18.9.

Table 18.9 Details of Fuel Stations in Thrissur City

Name	Number	Location
Fuel Station/ Petrol Pump	1	Ambakkadan Junction
	2	Kalathode
	1	EnrouteNadathara
	1	ShakthanThampuran Nagar
	2	Mundupalam
	1	Kuriachira
	1	Ollur
	1	Kuttanellur Overbridge
	1	Ramavarmapuram
	1	Aswini Junction
	1	Near Girija Theatre
	1	North Bus Stand
	1	Kovilakathumpadam
	1	Near CMS School
	1	Round North
	2	MG Road
	1	Near Kalyan Motors
	1	Chettupuzha
	1	Kannapuram
	1	Near Sankarayyar Junction.
	1	KSRTC Bus Stand
	1	Veliyannur
	1	Kanimangalam

Source: AMRUT Secondary data - 2018

18.2.9 LPG GODOWNS

As per standards, one LPG godown is required for 1 lakh population and accordingly 3 LPG godowns are required. There are 4 LPG godowns situated in the corporation area.

Table 18.10 Details of LPG Godowns in Thrissur City

Name	Numbers	Location
LPG Godown	1- Indane	Pullazhy
	2-Kumar services	Puthurkkara
	3-Neethi Godown	Ayyanthole
	4-Santhosh gas	Ramavarmapuram

Source: AMRUT Secondary data - 2018

18.2.10 CREMATORIUM AND BURIAL GROUNDS

Thrissur city consists of 6 crematorium/cremation grounds. The details of the crematoria existing in Thrissur City are detailed in table 18.11.

Table 18.11 Details of Crematoria in Thrissur City

NAME	LOCATION	EXTENT
Municipal Corporation Cremation Ground	Laloor	1.5 acre
Vadookara Electric crematorium	Vadookara	
Brahmins Cremation Ground	Near SankarayyarJn	0.35 acre
Municipal Corporation Cremation Ground	Vilvattom	0.35 acre
Pattalakunnu Burial Ground	Kalathodu	0.50 acre
ParamekkavuGas Crematorium	MLA Road	

Source: AMRUT Secondary data - 2018

URDPFI Guidelines suggests the following standards, as given in table 18.12, for cremation/ burial grounds. As per the guidelines, Thrissur city have enough facilities available for cremation. But the proper monitoring and maintenance of such facilities may be ensured to avoid problems in the society. Apart from these crematorium/ burial grounds, various cemeteries are often associated with churches/ mosques which are exclusively used by members of that communities.

Table 18.12Norms for Cremation/ Burial Grounds as per URDPFI Guidelines

Electric Crematorium	1 for large size towns	2 Ha
Burial Ground	1 for 5 lakh population	4 Ha
Cremation Ground	1 for 5 lakh population	2.5 Ha

Source: URDPFI Guidelines - 2014

18.3 INFERENCE

On a detailed analysis it can be seen that Thrissur City is blessed with enough recreational facilities like Parks and Open spaces, Stadiums, Theatres, Zoo, Museums, etc. The existing facilities should be protected and well maintained for future generations. Conserving the waterbodies and its precincts can enhance the tourism sector and leads to a healthy living environment. As per URDPFI Guidelines, the required recreational space is 12-14% of total area, i.e., about 12.5 sq.km. The city has about 0.34 sq.km. of parks & open space. Spatial distribution of recreational facilities shows that, except parks & open spaces, the majority of recreational facilities are concentrated in the central area of city. The provision of more open spaces for common gathering will uplift the healthy living and environmental condition.

The analysis of the existing civic amenities shows the presence of sufficient number of facilities in the city. But being the district headquarters and a service provider for various parts of the district, more facilities are to be made available in the city for meeting the demands of the resident and floating population. Many of the existing facilities are to be upgraded to meet the growing demands and the proper monitoring and maintenance of such facilities must be ensured in long run.

CHAPTER 19
ENVIRONMENT & DISASTER MANAGEMENT



This chapter deals with the ecologically and environmentally important areas in the city. Disaster management in a broader level and the disaster risk & vulnerability of the city are also briefly dealt here.

19.1 ENVIRONMENT PROTECTION

Environmental protection is a practice of protecting the environment, on individual, organizational or governmental level, for the benefit of the natural environment and humans. Due to the pressures of population and our technology the biophysical environment is being degraded, sometimes permanently. This has been recognized and governments began placing restraints on activities that caused environmental degradation.

The unmanageable increase in population has placed a tremendous burden on natural resources. This has resulted in shortage of food and due to excessive farming, use of chemicals and pesticides and excessive use of ground water, the natural resources have been affected. Water resources are badly polluted and emission of toxic fumes from industry and vehicles has deprived us of clean air. Industrialization and a growing consumer economy have led to the problem of indisposed garbage and uncontrolled sewage.

19.1.1 AIR POLLUTION

Air pollution is a serious issue in the present. Emission from industries and vehicles are the main cause for air pollution. People suffer from breathing ailments, heart disease, lung infections and even cancer. Emission of pollutants by the industries has to be controlled by enforcing laws by the government. Quantity of various types of air pollutants in the city area, as observed in Air Pollution Monitoring Station present at Poonkunnam, taken during December 2016, is given in table 19.1. Pollutant levels in the city is found to be far below the maximum permissible limit as recommended by the National Ambient Air Quality Standards (NAQSS, 2009).

Table 19.1 Air Pollution Concentration (µg/m³) in Thrissur City

Type of pollutant	Area				Standards
	Residential	Industrial	Commercial	Others	Concentration in Ambient Air Industrial, Residential, Rural &Other Areas
SO_2	3	Has not been analysed yet			50-80
NO	4.5				40-80
SPM (suspended particulate matter)	14.011				60-100

Source: Kerala State Pollution Control Board, National Ambient Air Quality Standards (2009)

19.1.2 WATER POLLUTION

Water is an essential need for life. Protection of it is hence very important. The ground water is found to be contaminated due to improper sewage treatment practices, pollutants from industries, exploitation of ground water by the help of bore wells, infiltration of fertilizers and other chemicals from fields, etc. These have to be properly controlled so that water is protected and thus people are protected from diseases spreading through the contaminated water. Apart from this, waste is found to be dumped in various ponds, drains, etc. This is also major concern regarding the water bodies in the city.

Table 19.2 Water Pollution (Mg/l)

BOD level	Coliform level	PH value
Pond water - 2.9 (3 days at 27^{0}C)	Pond water - 850	Pond water - 7.1
	Well water W1 - 0, W2 - 200, W3 - 20, W4 - 90	Well water W1=7, W2=7.3, W3=7.2, W4=7.1
	Tap water T1=0, T2=70, T3=10, T4=50	Tap Water T1=7, T2=7.1, T3=7, T4=7.2

Source: Kerala State Pollution Control Board, Thrissur (2017)

Pond: Pond near Patturaikkal Over bridge

Well : W1 - Co-operative Public School, Padukkadu, W2 - NSLP school, Madakkathara, W3- BVB, Poochatty, W4- St. Joseph CGHSS, Mission Quarters, Thrissur

Tap Water : T1 - Near Mannuthy Market, T2 - Near Nadathara Road, T3 - Near Thrissur Fish Market,T4 - Near at Office

19.1.3 WETLANDS

Wetlands are important part of the ecosystem and are also the most threatened part of it due to conversion. Conserving wetlands as shields against scarcity of water, floods, environmental pollution, and distress of micro- climatic vagaries is therefore important. Kerala has the largest proportion of land area under wetlands among all the states of India.

The unique wetlands called Kole lands, lying at sea level contribute to Kerala's rice produce and paddy cultivation for centuries. The Kole wetlands are part of a long estuarine ecosystem. Conservation of its geography, hydrology and biodiversity are crucial for the

sustenance of our ecological balance. These wetland ecosystems are also strategic locations of biodiversity as they are the last resorts of the migrants and some endemic life forms. The kole lands of Thrissur spread along the Western periphery of the city mainly concentrated in Puzhakkal and some outskirts.

Unfortunately this unique habitat is under threat of devastation as large parts are reclaimed for construction activities and for roads. The kole fields are shrinking and getting polluted day by day. Chemical fertilizers, pesticides, industrial waste water and other nasty human interventions are annihilating this lively ecological formation. Trapping, shooting and poisoning the birds are also on the increase.



Fig. 19. 1 Kole land

Unplanned exploitation of ground water through bore-wells has led to the lowering of water table. This again is a bigger threat for kole lands and the adjacent areas of Thrissur. These lands are very environmentally sensitive and hence it has to be conserved from conversion. Paddy lands without cultivation are under the threat of land conversion.

The conversion of waterlogged wetland to dry land will create everlasting problems to both surface and groundwater including hurdles in drainage, flood control, replenishing groundwater and furthering salt water intrusion. For a growing city like Thrissur water availability is a serious matter. The diversion of low-lying lands is likely to have serious negative implications, including the fall in water table and reduced water quality. Changes in the land use will also cause microclimatic problems in the area such as changes in temperature converting the areas into several 'heat islands'. Filling the wetlands will also disturb the hydrologic regime of the wetland.

Currently the most important threat to the Kole wetlands is the real estate ventures that are devouring the area though the real estate business is not confined to the Kole wetland. The fast, urban sprawl has already consumed many of the smaller wetlands close to the city of Thrissur giving way to huge constructions. The urban sprawl now encompasses areas like Ayyanthole, Poonkunnam and Puzhakkal villages, located in the city premises.

19.2 DISASTER MANAGEMENT – RISK ASSESSMENT

A natural disaster is a major adverse event resulting from natural processes of the Earth like floods, landslides tsunami, earthquakes etc. A natural disaster can cause loss of life or property damage, and typically leaves some economic damage in its wake, the severity of which depends on the affected population's resilience, or ability to recover.

Disaster mitigation measures is essential in planning process. Mitigation is the ongoing effort to lessen the impact disasters have on people and property. Mitigation involves keeping

homes away from floodplains, engineering bridges to withstand earthquakes, creating and enforcing effective building codes to protect property from floods, landslides etc. It describes the ongoing effort at the federal, state, local and individual levels to lessen the impact of disasters upon our families, homes, communities and economy.

In practice, mitigation can take many forms. It can involve actions such as:

- Promoting sound land use planning based on known hazards
- Buying flood insurance to protect your belongings
- Relocating or elevating structures out of the floodplains
- Securing shelves and water heaters to nearby walls.
- Developing, adopting, and enforcing effective building codes and standards
- Engineering roads and bridges to withstand earthquakes and floods
- Developing and implementing a plan in community to reduce your susceptibility to hazards

19.2.1 TYPE OF DISASTERS

Various hazards that have happened within the corporation is studied and listed. Even though there are areas in the district which are prone to landslides and earthquake, the susceptibility details laid down in District Disaster Management Plan for Thrissur–2015 shows that the city doesn't pose any threat in terms of these hazards. Certain mountainous areas of the district are prone to landslide & landslips and fall under zone IV of earthquake hazard areas. The district has a coastal line of 54kms, which is susceptible to coastal erosion, sea surges, cyclone and Tsunami. As Thrissur Municipal Corporation does not possess any coastal line, it is not vulnerable to coastal hazards.

Hazard Mapping

Hazard seasonality mapping of the district, prepared based on past trends, as provided in the District Disaster Management Plan for Thrissur, 2015 is shown in Table 19.3. The table provides information regarding the seasonal variation in respect of the occurrence of various hazards.

Table 19.3 Hazard seasonality of the district

Disaster	J	F	M	A	M	J	J	A	S	O	N	D
Earthquake												
Drought												
Fire												
Lightning												
Flood												

Source: NCESS

Source: District Disaster Management Plan for Thrissur, 2015

19.2.1.1 Heat wave

Heat wave as a hazard causing disaster scenario, is little more than the physical phenomenon of high heat conditions, and is characterized as a complex of hydro-climatic risks coupled with social, occupational and public health risks. Recently, several parts of India are experiencing severe heat waves. Urban areas and cities are the places which have higher temperatures than rural places. This phenomenon is referred to as "Urban Heat Island'.

- Impact on livelihood

In case of Thrissur, where majority of individuals might be working in unorganized and informal sectors that have to earn their daily livelihood. Thus, on the advent of long spells of Heat Wave they either have to stay indoors and compromise their source of income or run the risk of succumbing to Heat Wave related illness upon continuing to work. This necessitates exploring alternate options for such kind of vulnerable population for income generation to sustain a healthy life.

- Impact on Agriculture

Apart from, impact on human life and health especially, the Heat Wave has also been found to profoundly affect crop production both in terms of quantity and quality. Primarily, crop loss is encountered due to water scarcity and higher mortality in new plantations. Conservation and expansion of green areas in and around cities could be an effective mitigation strategy to counter the effects of urban heat islands

19.2.1.2 Earthquake

The entire state of Kerala falls under Zone III and has an expected intensity of 5.6 M in Richter scale. Central Kerala has many fault lines passing through which has caused earthquake events in the past. Though there have not been major accidents, damages to buildings and ground cracks have been reported. Kerala State Disaster Management Plan Profile, 2015, reports higher seismic activity along the Kottayam Idukki region and Thrissur Palakkad Region.

Thrissur Municipal Corporation has reported earthquake event in the past in ward 35. The earthquake susceptibility map of Thrissur district and Thrissur Corporation is shown in figure 19.3 and figure 19.4.

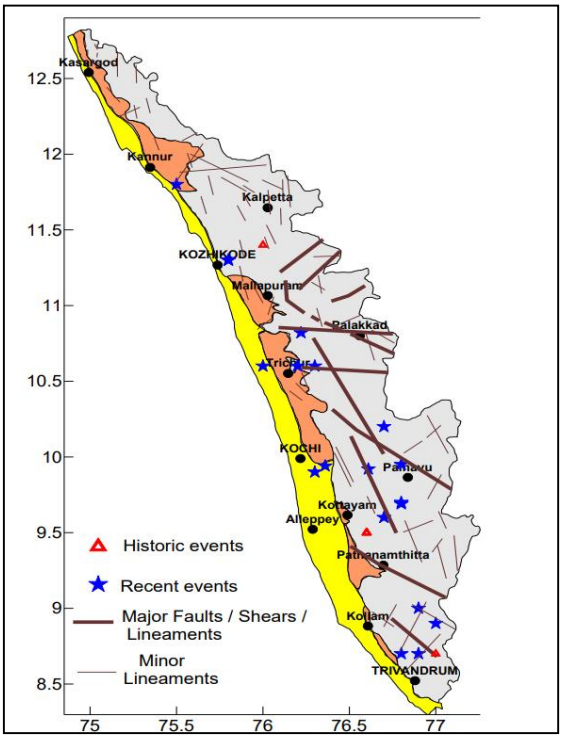


Fig.19.2 Seismic profile of the state
(Source: KSDMA)

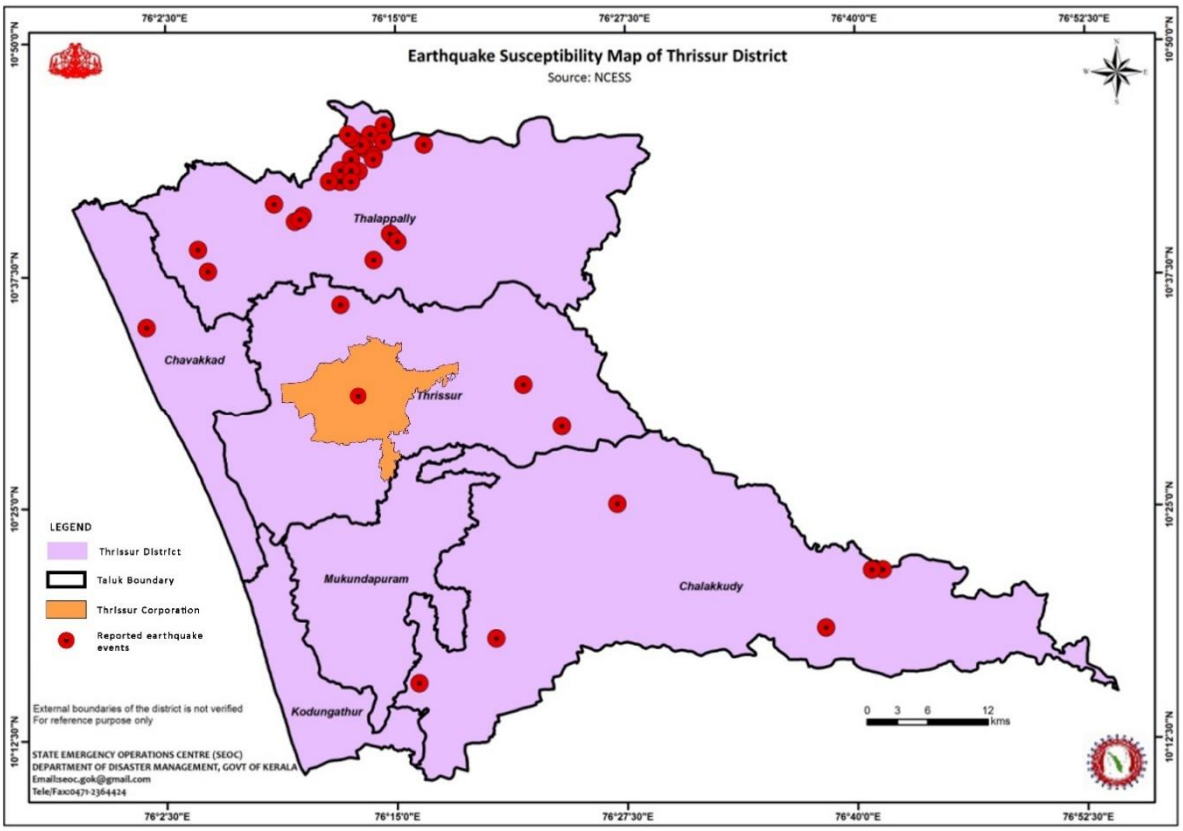


Figure 19.3 Earthquake susceptibility map of Thrissur district *(Source: KSDMA)*

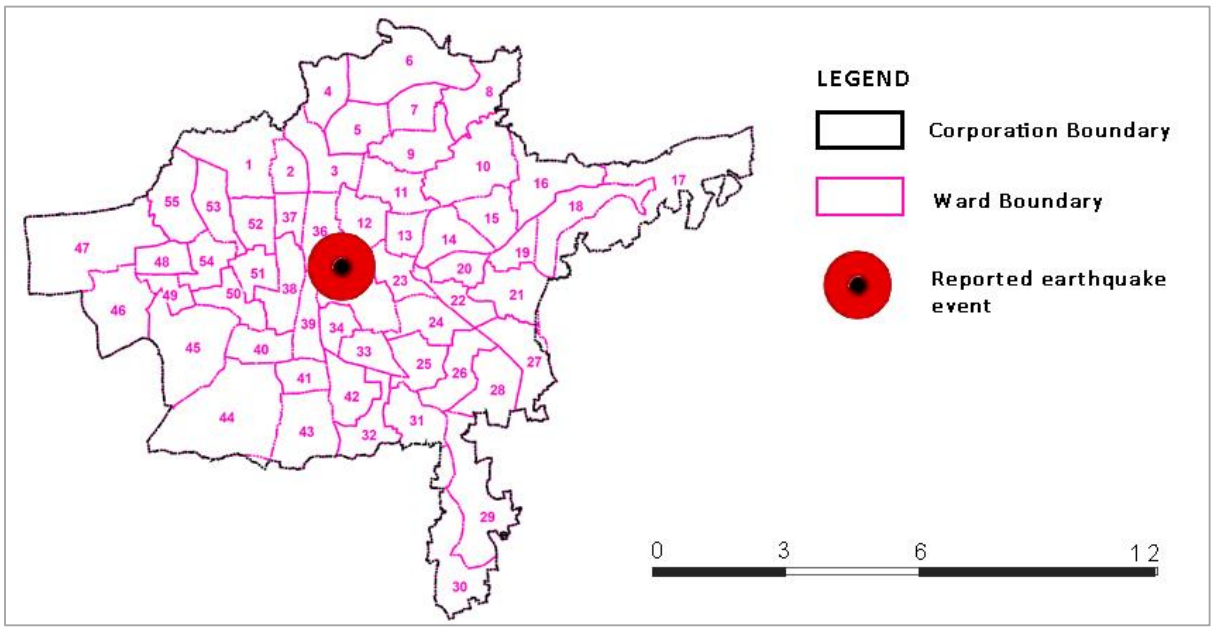


Figure 19.4 Earthquake susceptibility map of Thrissur Corporation *(Source: KSDMA)*

19.2.1.3 Drought

Kerala experiences drought like condition annually during summer months of March to May. Climate change and erratic rainfall pattern has accelerated this condition causing longer and frequent droughts. Kerala is officially marked as mild to moderately arid by the Indian Meteorological Department.

As per the District disaster Management Plan 2015, Thrissur district falls under the category of moderate drought area. Thrissur Corporation also falls under the same moderate drought condition.

Drought affects the non-perennial rivers and it leads to lowering of the ground water table. Water scarcity in Kerala is determined by the changing rainfall patterns. Drought susceptibility map of Thrissur District is shown in figure 19.5.

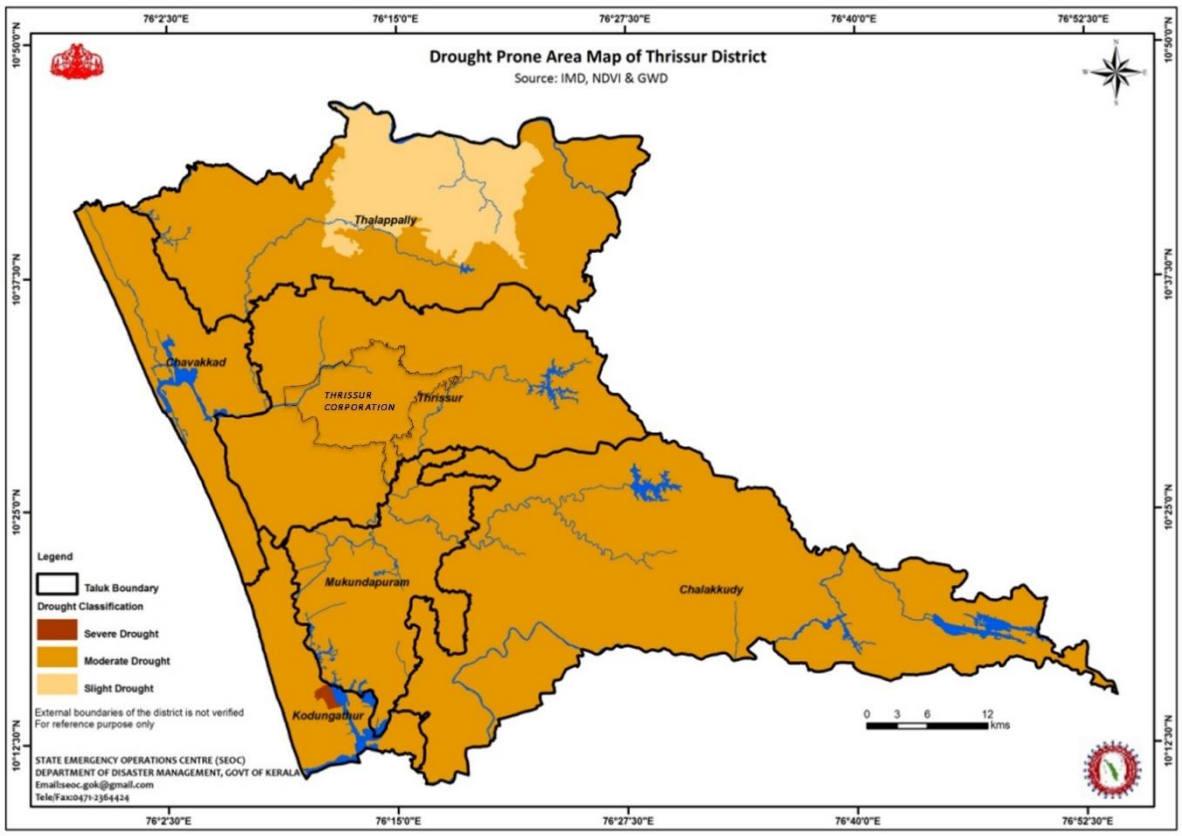


Fig.19.5 Drought susceptibility map of Thrissur District *(Source: KSDMA)*

19.2.1.4 Lightning

Kerala's typical topography favours frequent Cumulonimbus (Cb) cloud formation especially during the months of April-May and October-November. The lightning phenomena is observed majorly during the summer showers and the N-E monsoons in the state. The midland region of Kerala is prone to lightning Hazards. According to studies conducted, there has been on an average 71 deaths and 112 injuries due to lightning every year. Property damage due to lighting is also very high in the state.

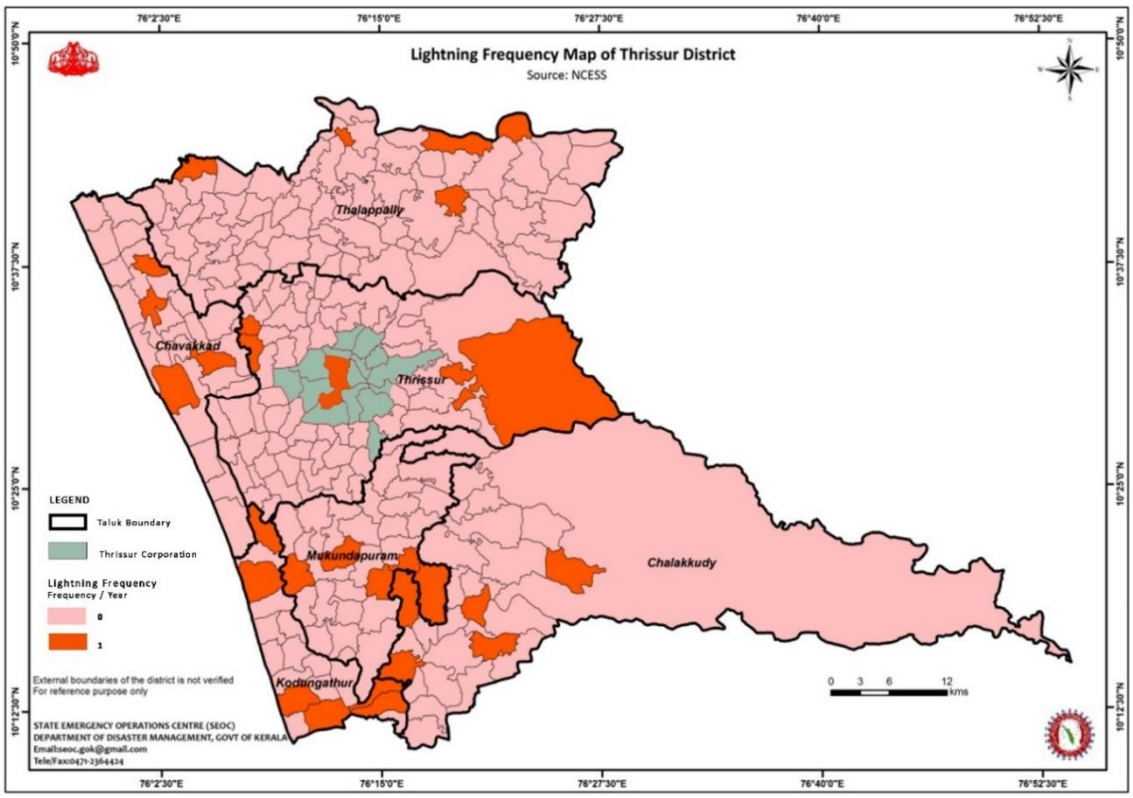


Fig. 19.6 Lightning Frequency map of Thrissur District *(Source: KSDMA)*

Thrissur district is less prone to lightning occurrences. Thrissur Corporation has recorded only few cases of fatal/injurious lighting hazard incidents when compared to the other regions in the state. Wards 1, 2, 3, 35, 36, 37, 38, 39, 40 have a lightning frequency of one and the rest of the wards in the corporation have a lightning frequency zero. The lightning frequency map of Thrissur District and Thrissur Corporation is shown in figure 19.6 and 19.7.

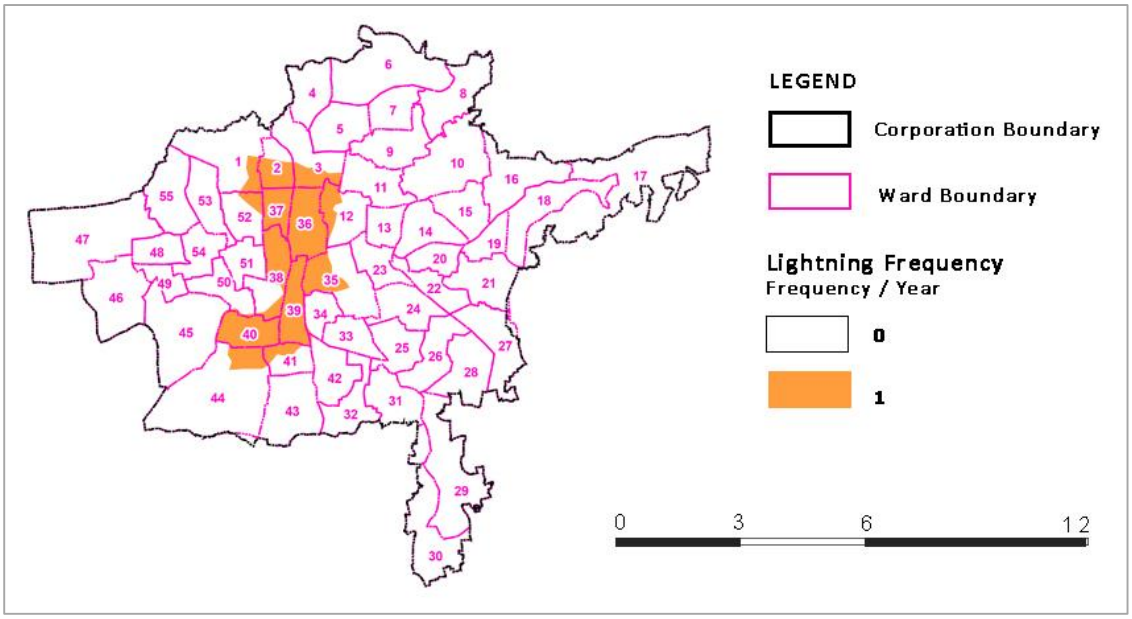


Fig. 19.7 Lightning Frequency map of Thrissur Corporation *(Source: KSDMA)*

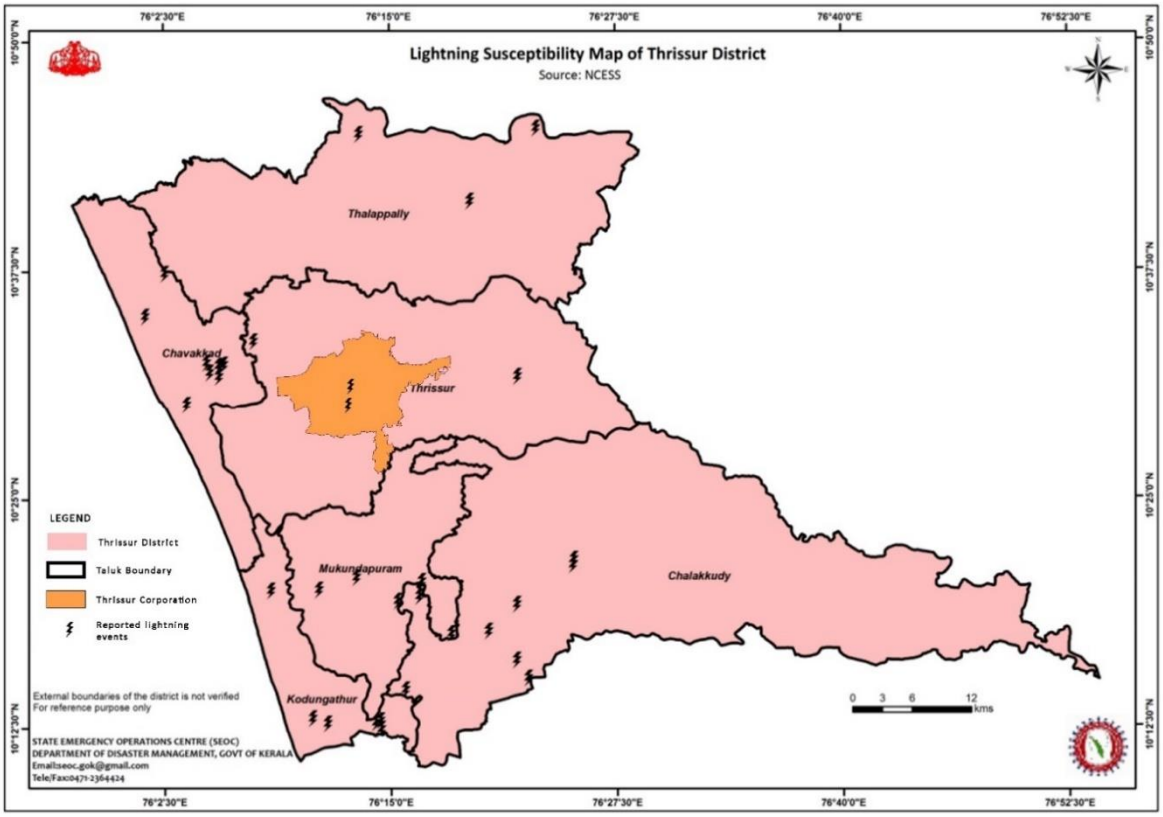


Fig.19.8 Lightning Susceptibility map of Thrissur District *(Source: KSDMA)*

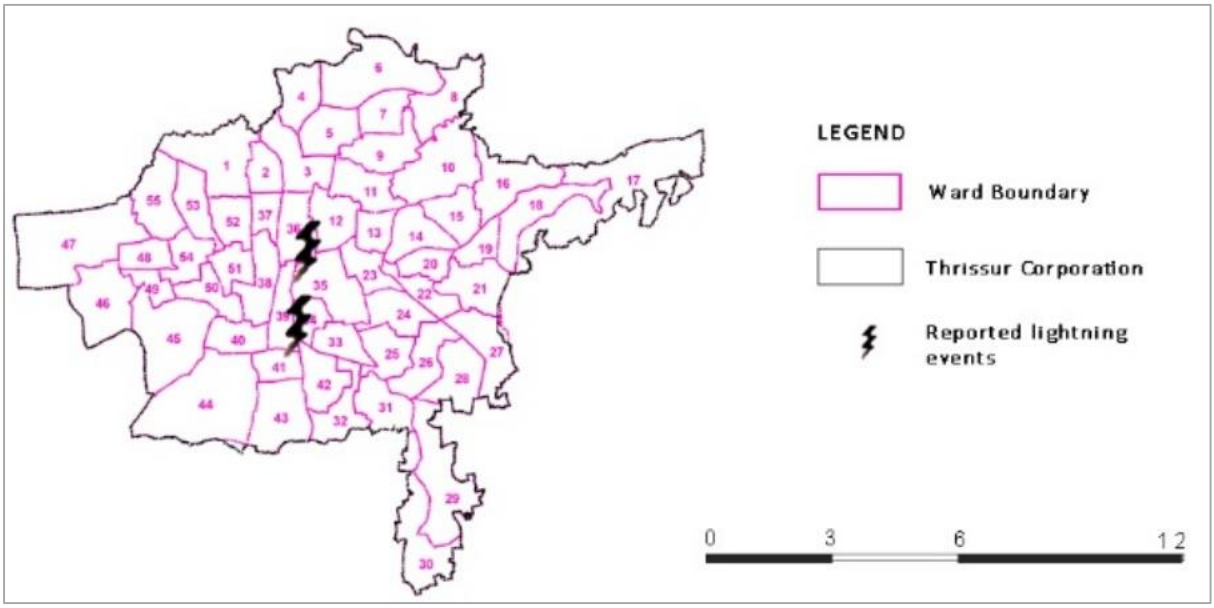


Fig.19.9 Lightning Susceptibility map of Thrissur Corporation *(Source: KSDMA)*

The high ground areas of wards 12, 35, 36 are more susceptible to lightning occurrences. The Lightning Susceptibility map of Thrissur District and Thrissur Corporation is shown in figure 19.8 and 19.9.

19.2.1.5 Landslide

Kerala is one of the most densely populated Indian state (860 persons per sq.km) which makes it even more vulnerable to damages and losses on account of disasters. Landslide or mudslide have increased in the recent years in the state of Kerala. Debris flow is the most prevalent and hazardous type of mass movement in Kerala. Kerala recorded the maximum number of landslides (2239 out of 3782 major landslides) in the last seven years between 2015 and 2022. Landslide Susceptibility map of Thrissur District and Thrissur Corporation is shown in figure 19.10 and 19.11.

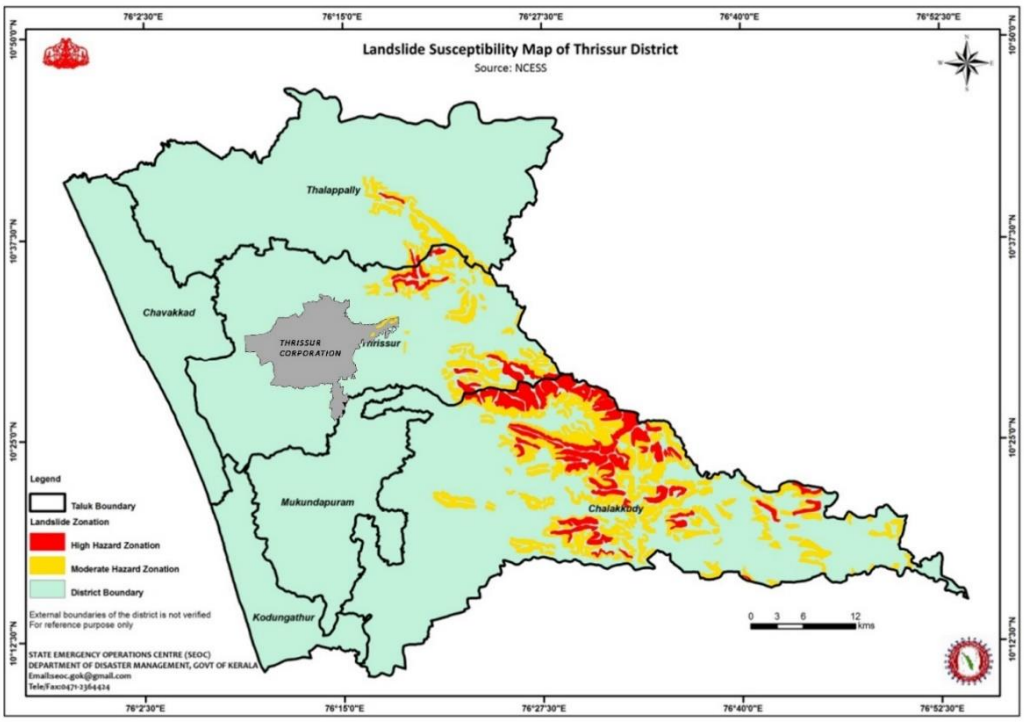


Figure 19.10 Landslide Susceptibility map of Thrissur District *(Source: KSDMA)*

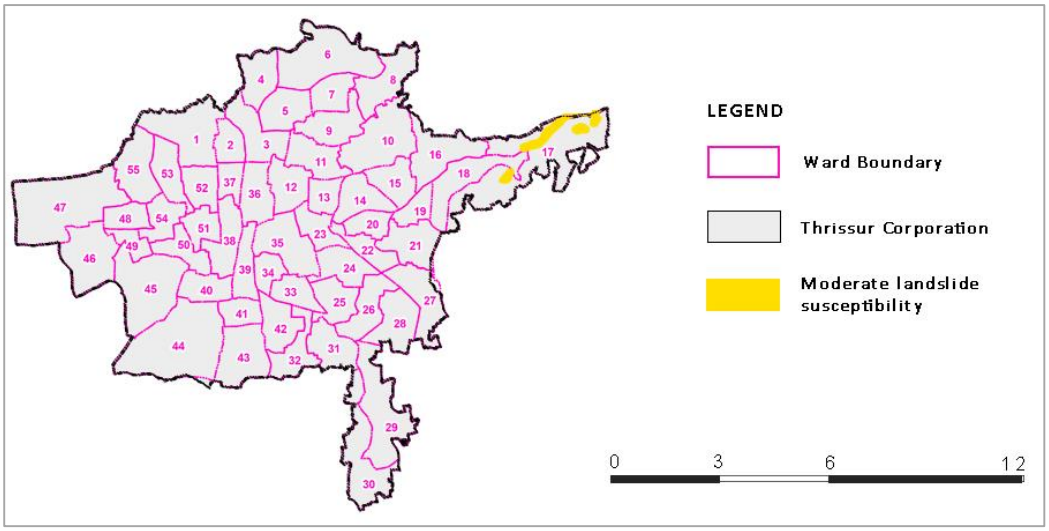


Figure 19.11 Landslide Susceptibility map of Thrissur Corporation *(Source: KSDMA)*

Wards 17 and 18 have landslide susceptibility in the corporation according to District Disaster Management Plan.

19.2.1.6 Festival Hazard

Thrissur being the cultural capital of Kerala hosts many festivals the annual Pooram festival, Pulikali relating to Onam, Boun Nathale and this causes high festival hazard risk due to the mass gatherings. The chance of man-animal conflict is also high as pooram involves assembly of elephants. Figure 19.12 shows the festival hazard susceptibility map of Thrissur District.

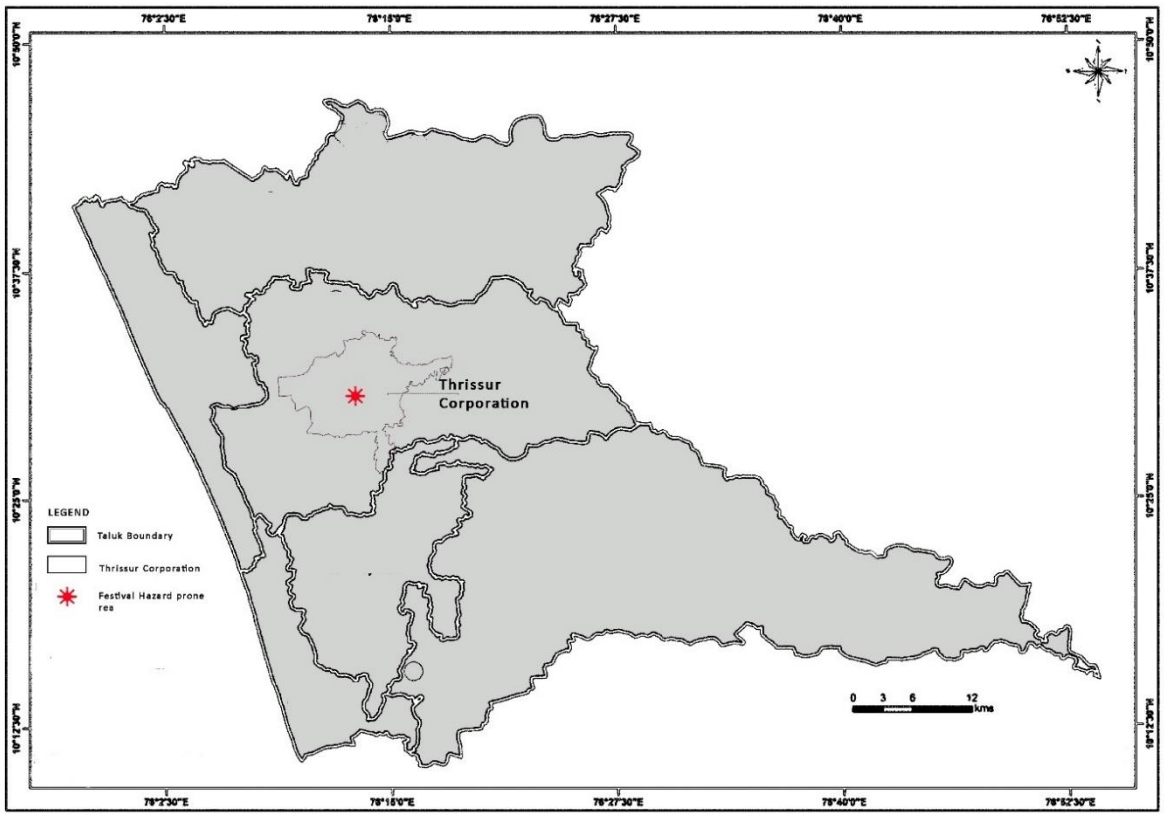


Figure 19.12 Festival hazard Susceptibility map of Thrissur District *(Source: KSDMA)*

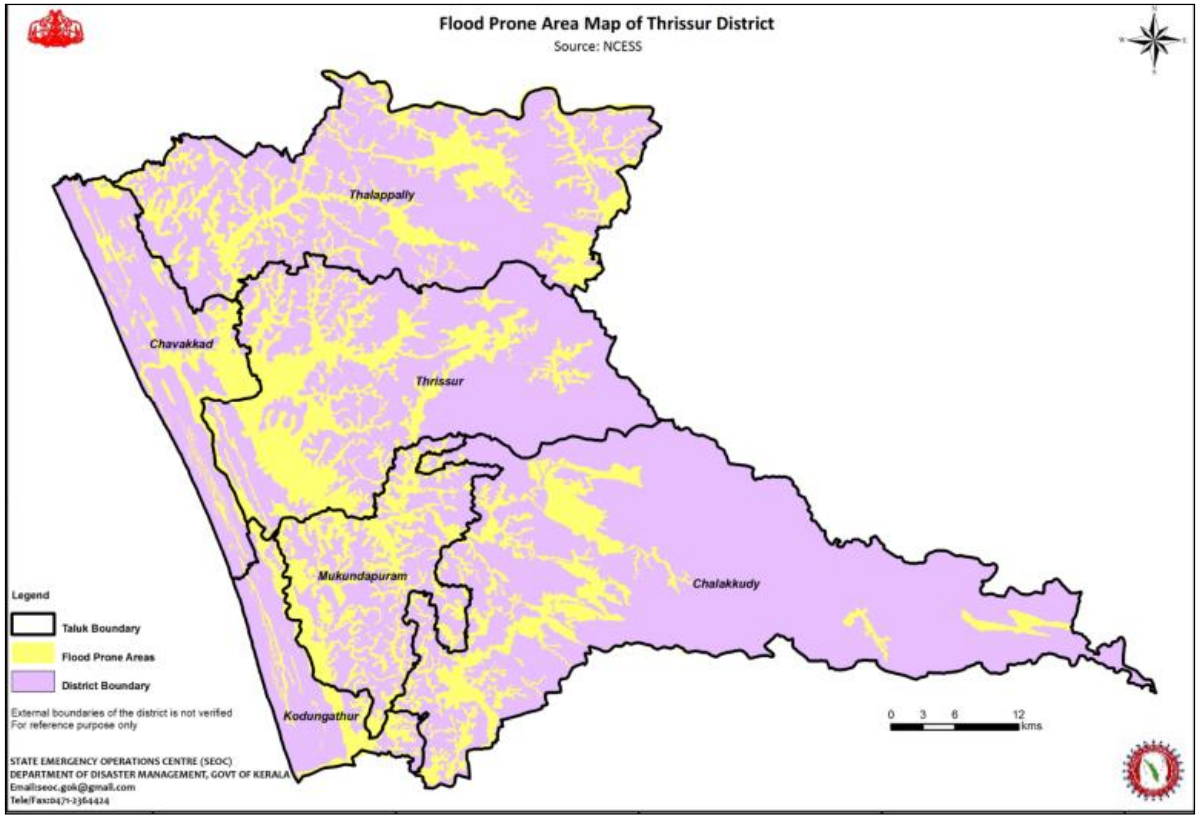
19.2.1.7 Flood

In Kerala, riverine flooding is a recurring event consequent to heavy or continuous rainfall exceeding the absorptive capacity of soil and flow capacity of streams and rivers. This causes a water course to overflow its banks onto flood plains; which by definition is a relatively flat land adjacent to a natural water course, composed primarily of unconsolidated depositional material derived from sediments transported by the related stream and subjected to periodic flooding. Reclamation and settlement in floodplain areas is a major cause of flood damage in Kerala. Defining the entire flood potential in a given area is a delicate task. Major flood events occurred in the state mainly during the years 1924, 1961, 2018 and 2019.

The 2018 floods were the most disastrous that cause severe damage and great extent of loss in Thrissur District. The floods and landslides destroyed city's private and public

infrastructure including houses, roads, bridges, schools, health facilities, and other utility and production services.

Flood Prone Areas in Thrissur district are mainly River Basins, Reservoir down streams and Kole lands. Flood prone area map of Thrissur district prepared by NCESS in 2015, for District Disaster Management Plan for Thrissur is shown in fig. 19.13. As per the report, nearly 688 sq.km area is flood prone. About 154.72 sq.km. area of Thrissur taluk is flooded annually, i.e., 23.40% of the total area of the taluk.



Source: KSDMA

Fig. 19.13 Flood prone areas of the district

One of the major disaster that has occurred in the recent past is the mega flood that happened during 2018 & 2019.

Mega Flood 2018 along with landslides caused several severe damages in Thrissur district including the death of 62 people. About 1,37,932 houses were affected. Among 256 villages in Thrissur district, 91 were severely affected and 140 were partially affected. The inflow of water from Peringalkuthu reservoir from Parambikulam and Upper Sholayar dam from Tamil Nadu Sholayar dam resulted in the overflow of Chalakudy River which was the root cause for flooding in Chalakudy taluk. Damage of Arattupuzha cheriyapalam bund and Illickal bund along the Karuvannur River caused flood in Mukundapuram and Thrissur taluk. Due to breach of the bund, water over flowed in the regions like Pullu, Manakkodi, Arimbur, Karuvannur, Urakam and Irinjalakuda.

Source: 2018 flood report

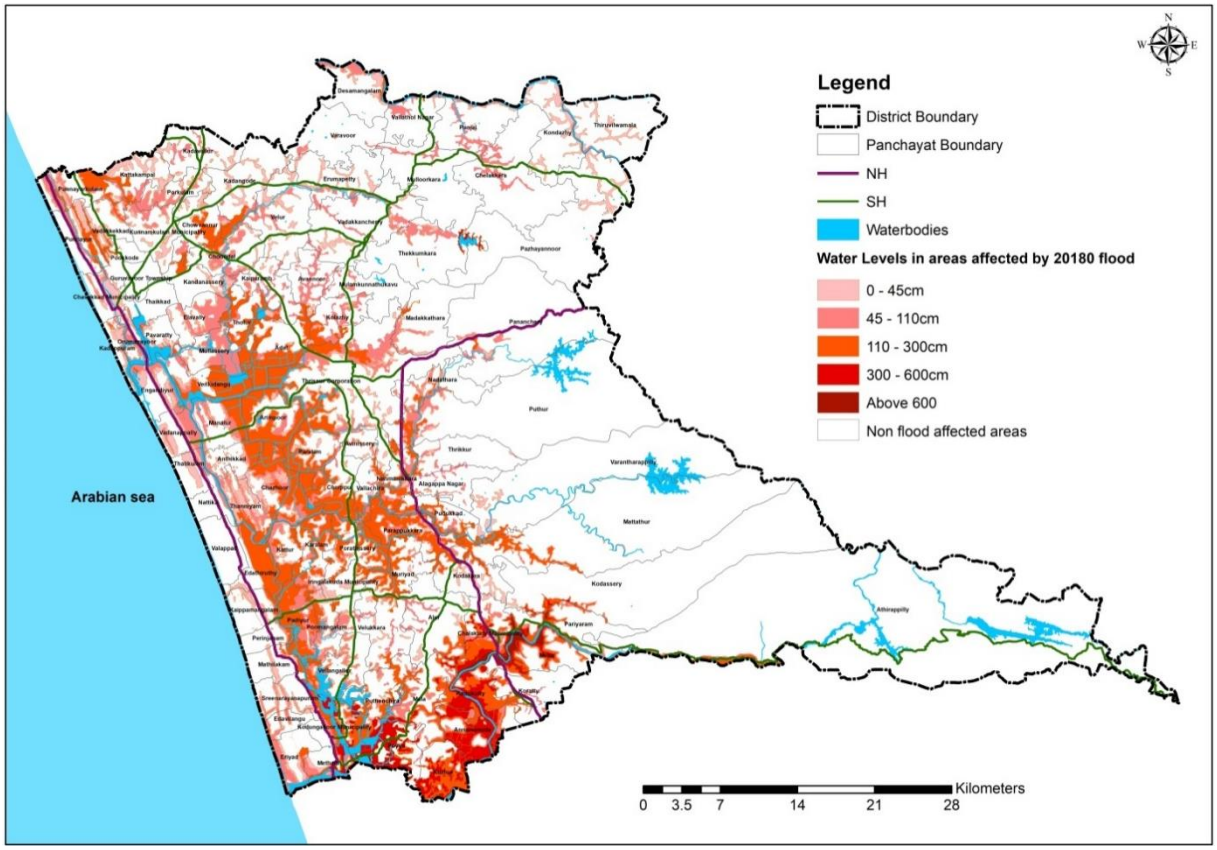


Fig. 19.14 Flood map of Thrissur 2018

Source: 2018 flood report

Nearly 25% of the total area of the district was affected by flood. The intensity of flood was severe in 2.5% of the total area. These were areas flooded beyond 3m depth. Chalakkudy, Kodungallur and some regions of Mukundapuram and Thalappilly taluks come under this category. Out of the total area of 3035sq.km. of the district, 751 sq.km area is affected from flood. Out of the total flooded area, 1% of the area is flooded beyond 6m depth. 9% of the flooded area is having an inundation depth of 3-6m. 40% of the flooded area is having an inundation depth of 1.1-3m. 29% of the flooded area is having an inundation depth of 0.45-1.1m. 22% of the flooded area flooded upto a height of 0.45 m.

Flood mapping of Thrissur district done as per the data of the mega flood of 2018 is given in fig. 19.14 and the village map representing the impact of the flood is given in fig. 19.15. From these maps, it can be seen that the areas near Chalakkudy River and Periyar ie, Chalakkudy and Kodungallur Taluks are severely affected by the flood. These municipality areas having higher population are flooded to a height beyond 3m. Therefore the number of flood affected population as well as number of flood affected houses are found to be the maximum in these areas.

Even though the population is highest in Thrissur Municipal Corporation when compared to other local bodies in the district, the depth of inundation of the flood is found to be lesser in this area. Hence the severity of flood was less compared to other areas like Chalakkudy and Kodungallur.

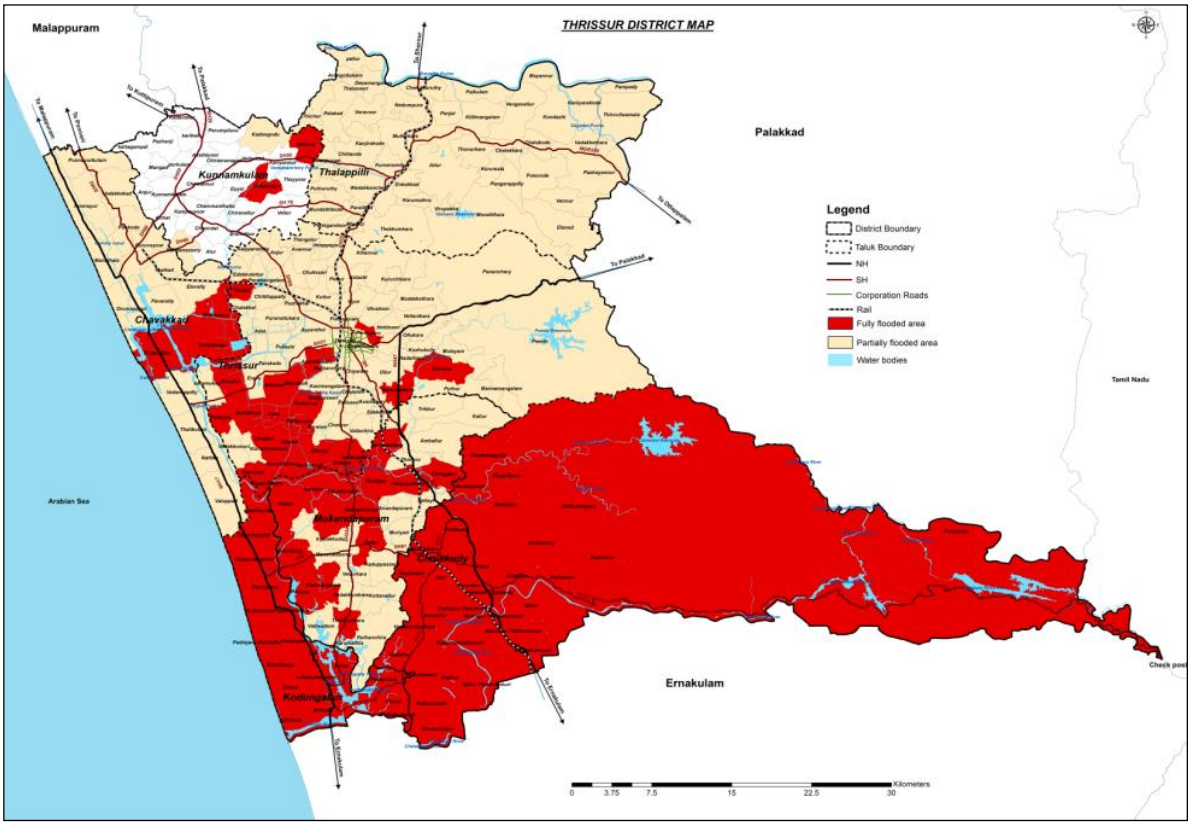


Fig. 19.15 Flood affected villages in Thrissur district

Source: 2018 flood report

❖ Flood Impact in Thrissur Taluk

30% of the total area of Thrissur taluk is affected by flood. The maximum depth of inundation of flood in Thrissur taluk is 3m whereas it was beyond 6m in some other areas of the district. Out of the flooded areas in Thrissur taluk, nearly 53% of the area is flooded upto a height between 1.1-3m. 30% of the area is flooded at 0.45-1.1m. 53% of area is flooded upto0.45m. The severity of flood in Thrissur taluk is comparatively less since the area flooded beyond 3m depth is nil. But 53% of the flooded area is having height beyond 1.1m causing several damages to infrastructure. The flooded areas of Thrissur Taluk is shown in fig. 19.16.

Paralam, Cherp, Chazhoor areas in Thrissur taluk were critically affected by the flood due to the misrouting of Karuvannur River and breaking of Arattupuzha bund. Peringavu and Thanniyam were also flooded due to the rise in waterlevel of the rivers. Landslides wereoccured at Panancherry, Puthoor and Nadathara in Thrissur taluk. Areas near kole lands such asAdat, Arimbur, Pullu, Anthikkad, Kanjani were also flooded.

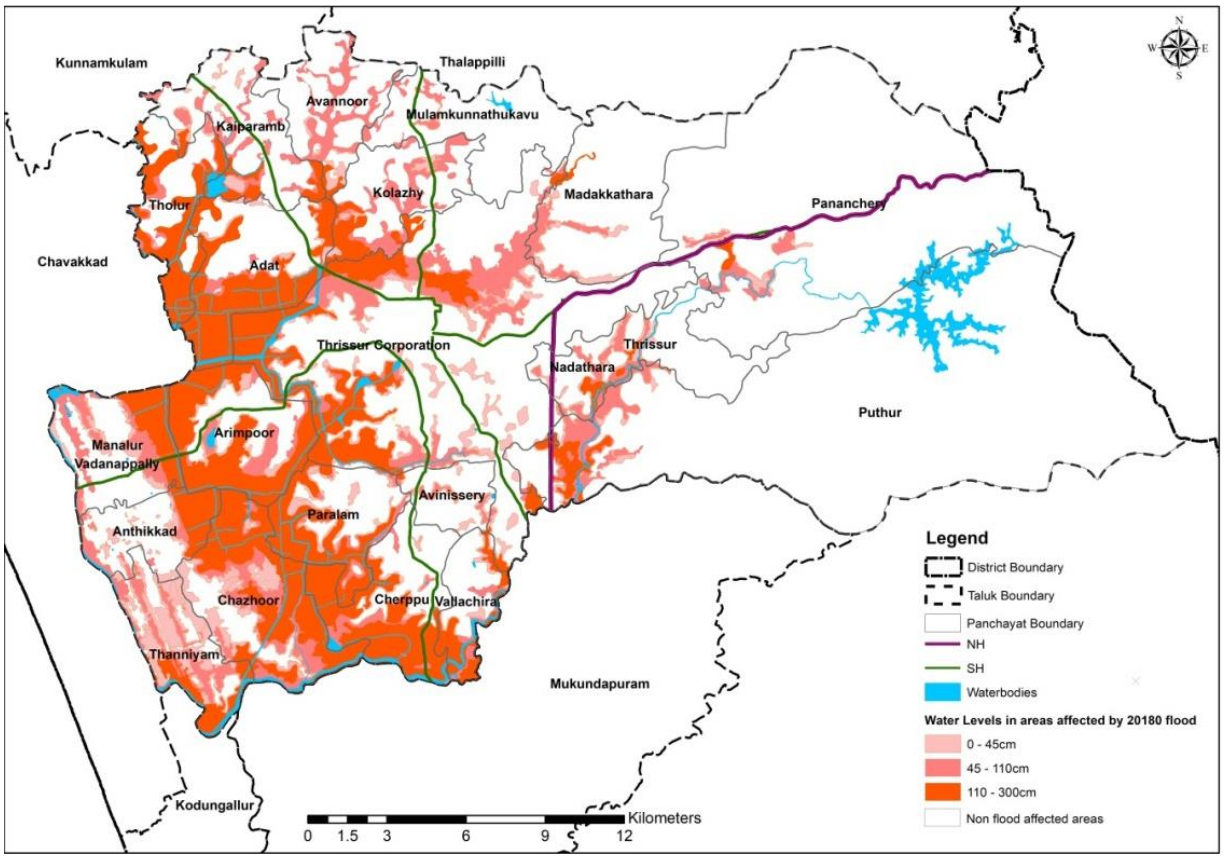


Fig. 19.16 Flooded areas in Thrissur Taluk

Source: 2018 flood report

Nearly 40% of Thrissur Municipal Corporation area was flooded. The flooded areas were on the North and Western parts of the city which were mainly paddy fields according to the land use. A total number of 6381 persons resided in various flood relief camps. Number of houses which were affected by flood accounts to 8103.

Severity of flood in the Taluk area is having an implication in the flooding of certain areas in Thrissur Municipal Corporation also. Due the heavy rains and other consequences, water retention capacity of wetlands reached its maximum thereby flooding its surroundings. Certain low lying pockets which lacks proper run off mechanism were also affected by flood.

High intensive water levels about 110- 300 cm during 2018 floods were observed in Punkunnam (Ward 1), Kuttankulanagara (Ward 2), Gandhi Nagar (Ward 11), Vadukkara (Ward 40), Nedupuzha(Ward 44), Kariattukara(Ward 45) and Pullazhi (Ward 47) which mainly constitutes the North West and South West regions of Thrissur Corporation.

In Thrissur Corporation about 62.44% of the total area was not affected by flood. Out of the remaining 37.56% area, 7.85% area had an inundation depth of about 0-45cm, 12.91% area had an inundation depth of about 45-110 cm and 16.80% area had an inundation depth of about 110-300 cm.

❖ **Hazard Risk Assessment for Thrissur Corporation**

The Hazard risk for the corporation is assessed using Hazard risk matrix from the published guidelines for risk informed master plans and is obtained through evaluation of many variables that affect the hazard impact and hazard vulnerability within the corporation. For the analysis Flood Hazard Probability of Kerala based on Historic Data (KSDMA is adopted. The impact of flood is analysed by taking into consideration the flood inundation levels, hazard return probability and duration of hazard in the corporation area.

Nearly 40% of Thrissur Municipal Corporation area was flooded. The flooded areas were on the North and Western parts of the city which were mainly paddy fields according to the land use. Due the heavy rains and other consequences, water retention capacity of wetlands reached its maximum thereby flooding its surroundings. Certain low-lying pockets which lack proper run off mechanism were also affected by flood.

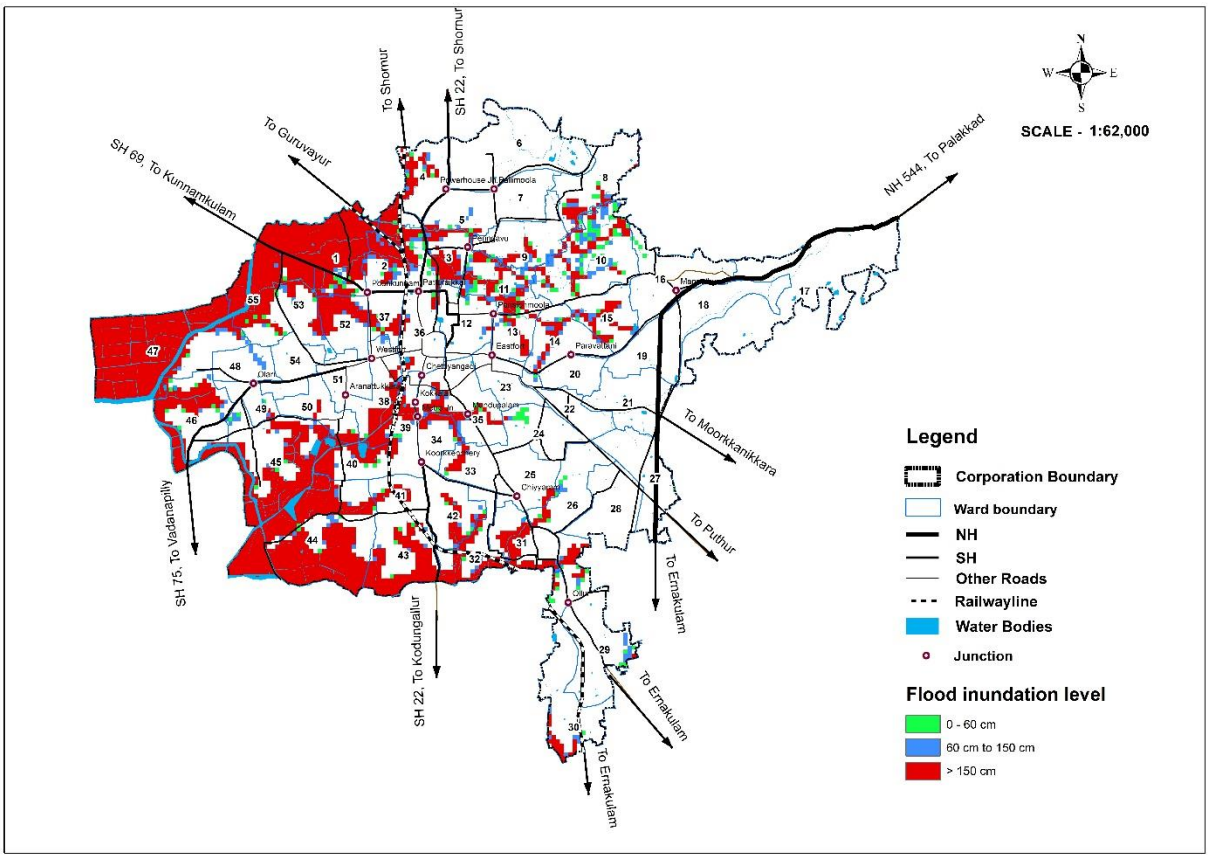
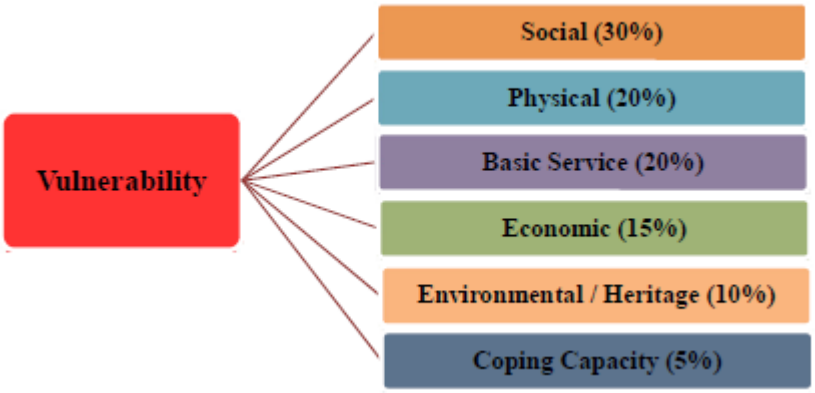


Figure 19.17 Flood Inundation level within Thrissur Corporation based on Flood Hazard Probability of Kerala based on Historic Data *Source: Kerala State Disaster Management Authority*

Flood Vulnerability in Thrissur Corporation

Flood vulnerability is analysed by considering certain parameters. The parameters that contribute social, physical, basic services, economic, environment/heritage and coping capacity. Each parameter should be considered according to their weightage. Ward wise vulnerability rating map of Thrissur Corporation is shown in figure 19.18.



From the ward wise vulnerability map, Ward 6,7,17,18,19,20,21,23, 27,28,51 and 54 shows moderate vulnerable level and all other wards shows high vulnerable level.

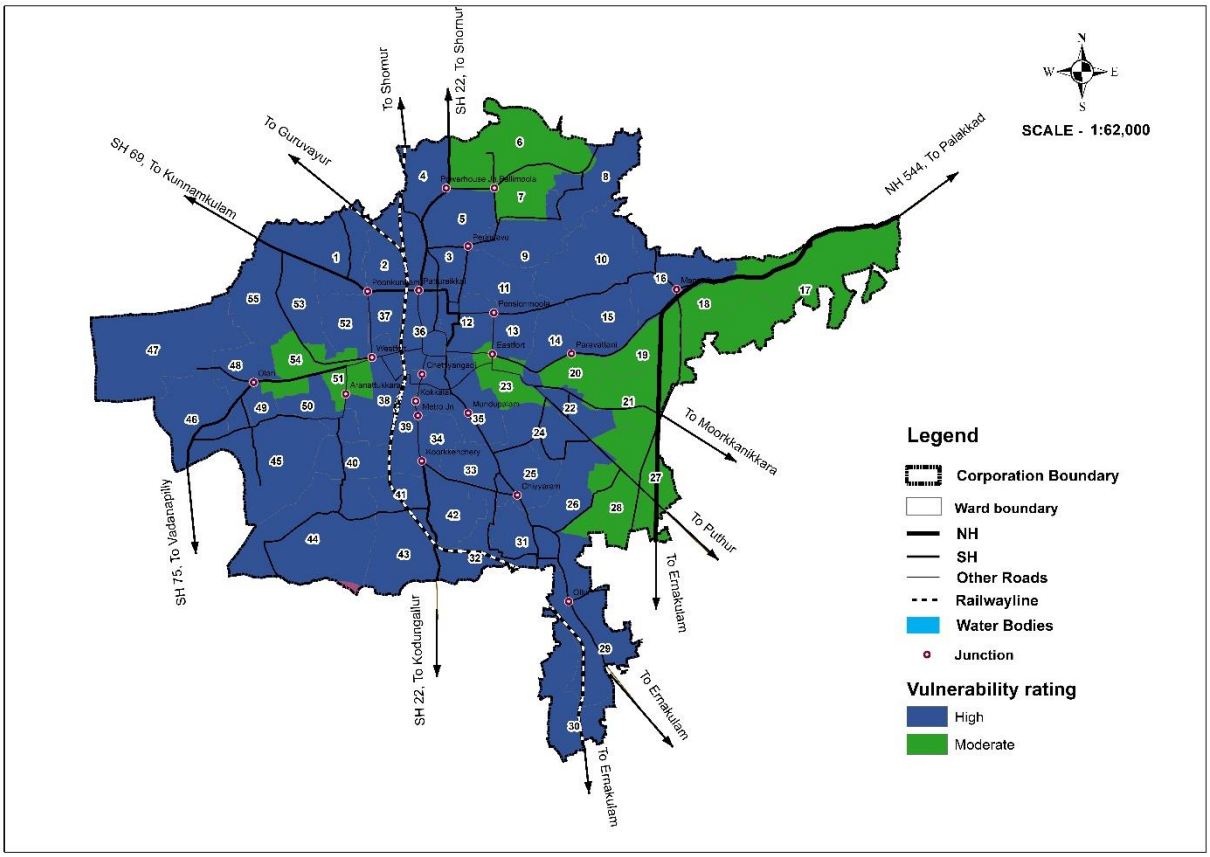


Fig. 19.18 Ward wise Vulnerability map of Thrissur Corporation

- ***Social vulnerability :***

Percentage of population affected, socially backward population, economically backward population, children, senior citizens, transgender etc. are taken into

consideration for calculating social vulnerability. Ward 2 and 11 has most vulnerable population (more than 80%) whereas wards 3,11,44 and 52 has more than 50% vulnerable population.

Economically vulnerable population data is collected from Nammal Nammukayi report 2020 which states that except for ward 36 most wards have vulnerable population from 15-25 percent. High intensive water levels about 110- 300 cm during 2018 floods were observed in Punkunnam (Ward 1), Kuttankulanagara (Ward 2), Gandhi Nagar (Ward 11), Vadukkara (Ward 40), Nedupuzha(Ward 44), Kariattukara(Ward 45) and Pullazhi(Ward 47) which mainly constitutes the North West and South West regions of Thrissur Corporation.

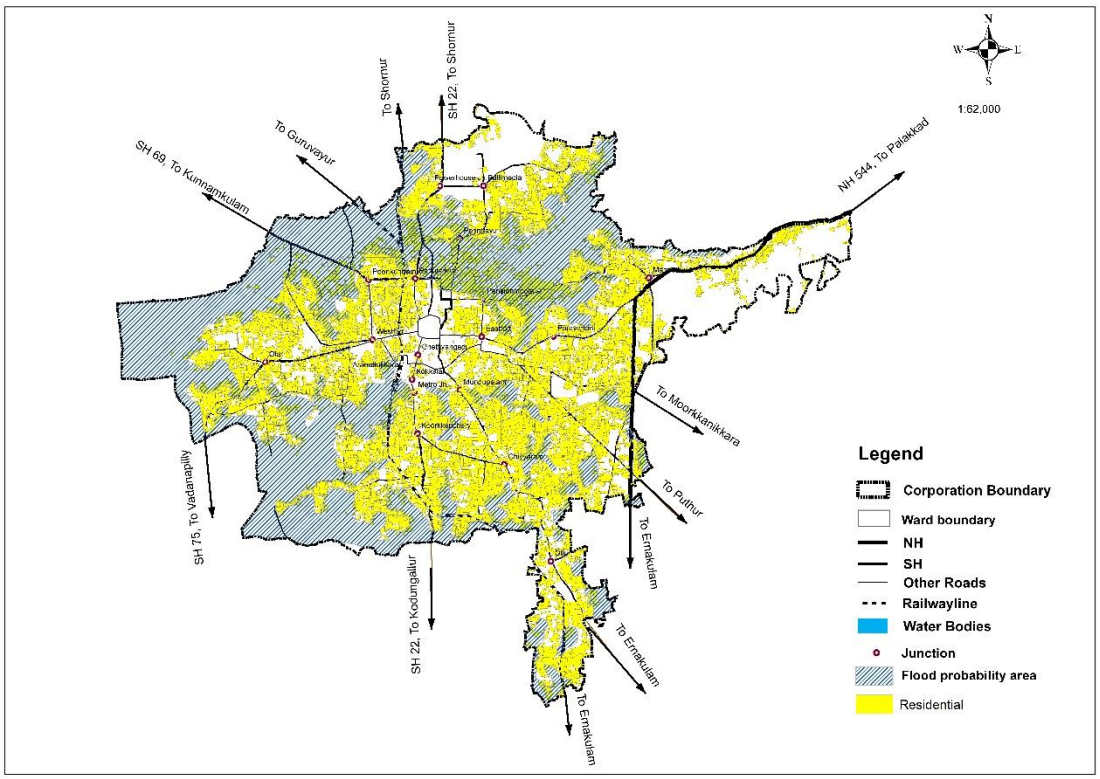


Fig. 19.19 Flood probability map with residential land use

- ***Physical Vulnerability***

The factors of road and rail transportation, buildings and their vulnerability and land cover is considered for calculating the physical vulnerability.It is observed that most of the buildings in the wards of Thrissur Corporation is pucca with some semi pucca and very few kutcha buildings. Hence the chances of destruction of buildings due to flood is minimal in the Corporation.

Railway lines along wards 1,3,4,31, are affected fully and ward 2 and ward 39 are affected more than 50 percent. In the case of roads, 50% of roads are likely to be affected in wards 2,11,44,45,52,55 and wards 1 and 3 are more severely affected.

The different available infrastructure facilities in town are plotted with the hazard zone to identify the availability of these facilities in a future possible flood event and the inter-connectivity of the available facilities. Rescue camps can be provided in the nearby public institutions like church halls, madrassas, schools etc.

- ***Basic services***

Social infrastructure such as Hospitals, Schools, Community Halls, Police Station, Fire Station, Village Office, LSG office, Pumping stations, Treatment plants, Electric sub stations, Transformers etc that are likely to be affected in each ward is analyzed and it is seen that more than 50 % of these basic amenities are likely to be affected in wards 1,3 and 55.

Basic services in wards 8,15, 38, 44,45,46 and 52 also have more than 25% probability of getting affected by the hazard and hence planning must be done such that the day to day activities of citizens does not get halted during such events of flood in the municipality.

The sanitation system in all wards within the corporation is septic tanks and hence have a very high chance of getting affected by floods. Also, the water table being high in the region poses a threat to contamination of drinking water in wells and ponds during the event of floods as these are primary drinking water sources in all wards except ward 36.

- ***Economic vulnerability***

More than half of the population in each ward is observed to be employed in informal sector, daily wages, local level economic sector or agriculture sector in the corporation according to socio-economic survey.

Flood Hazards can cause economic damage and as a result affect the livelihood of such people in particular and this increases the economic vulnerability. More than 90% of economic activities such as Tourism, Commercial, Industrial, Agriculture, Fisheries, Animal Husbandry etc. are vulnerable to damage or disruption in the event of flood in ward 1,44,47,55 while the chances of being affected by it is 60-80 % in wards 2,3,4,10, 11,13,31,32, 38,40,42,43, 45,46,52 and 53.

- ***Environmental and heritage factors***

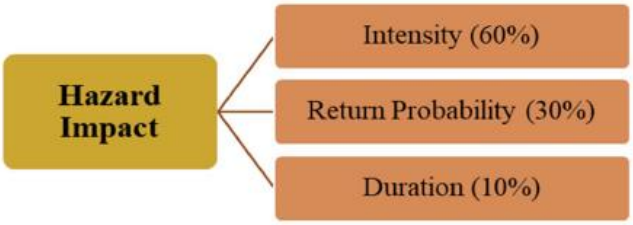
Low-lying paddy kole lands are more vulnerable to flooding and are considered as hazard vulnerable sensitive areas. Wards 1,2,3,13,44,46,47 and 55 have 90 percent sensitive low-lying /paddy cultivation areas.

- ***Coping capacity***

Coping capacity of the corporation is measured by analyzing the different actions that has been taken as a part of disaster mitigation such as Updating of Local Disaster Management Plan, Constitution of Steering Committee, Constitution of Emergency

Response Team, Formulation of Evacuation Plan and Disaster Risk Reduction activities in the region. The corporation has prepared disaster management plan and formed the steering committee and emergency response team in the Nammal Namukayi report 2020.

Flood impact in Thrissur Corporation



Flood impact rating is measured by analyzing the 3 parameters. They are intensity, return probability, and duration. Intensity of flood is taken from the return probability map of Kerala based on historic data prepared by Kerala Disaster management Authority.

In case of flood, inundation level can be used for intensity of hazard. According to the inundation level intensity can be classified as high, moderate and low. Flood probability map for 50 years prepared by KSDMA is considered for the analysis. Duration of flood is taken as less than 2 days. Hazard impact rating map of Thrissur Corporation is shown in figure 19.20. From the hazard impact rating map of Thrissur Corporation, 79.53% flooded areas shows very high impact value, 10.09% shows moderate impact and 10.34 shows high impact.

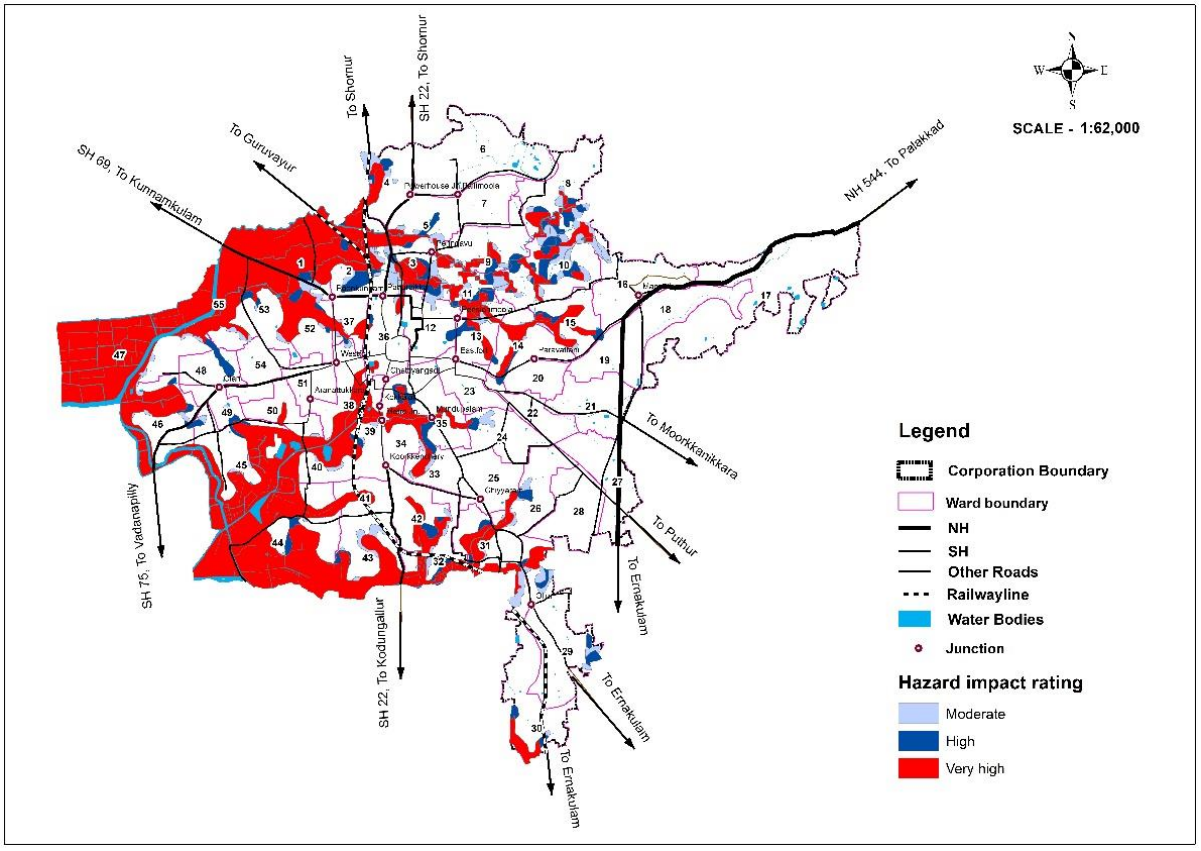


Fig.19.20 Flood hazard impact rating map of Thrissur Corporation

Flood Risk Map

The Flood Hazard risk Map is shown in the next figure and it indicates the high risk and moderately risk zones in Thrissur Corporation. The map is obtained by combining the intensity of vulnerability factors and hazard impact factors for flood hazard in the study area. Fig. 19.21 shows the flood zonation map of Thrissur Corporation.

Table 19.4 Risk Matrix

			Hazard Impact			
			Low	Moderate	High	Very High
			0 - 2.5	*2.5-5*	*5-7.5*	*7.5-10*
Vulnerability	Low	*0- 25*	L1	L2	M3	M4
	Moderate	*26 - 50*	L2	M3	M4	H5
	High	*51 - 75*	M3	M4	H5	H6
	Very High	*76 - 100*	M4	H5	H6	VH7

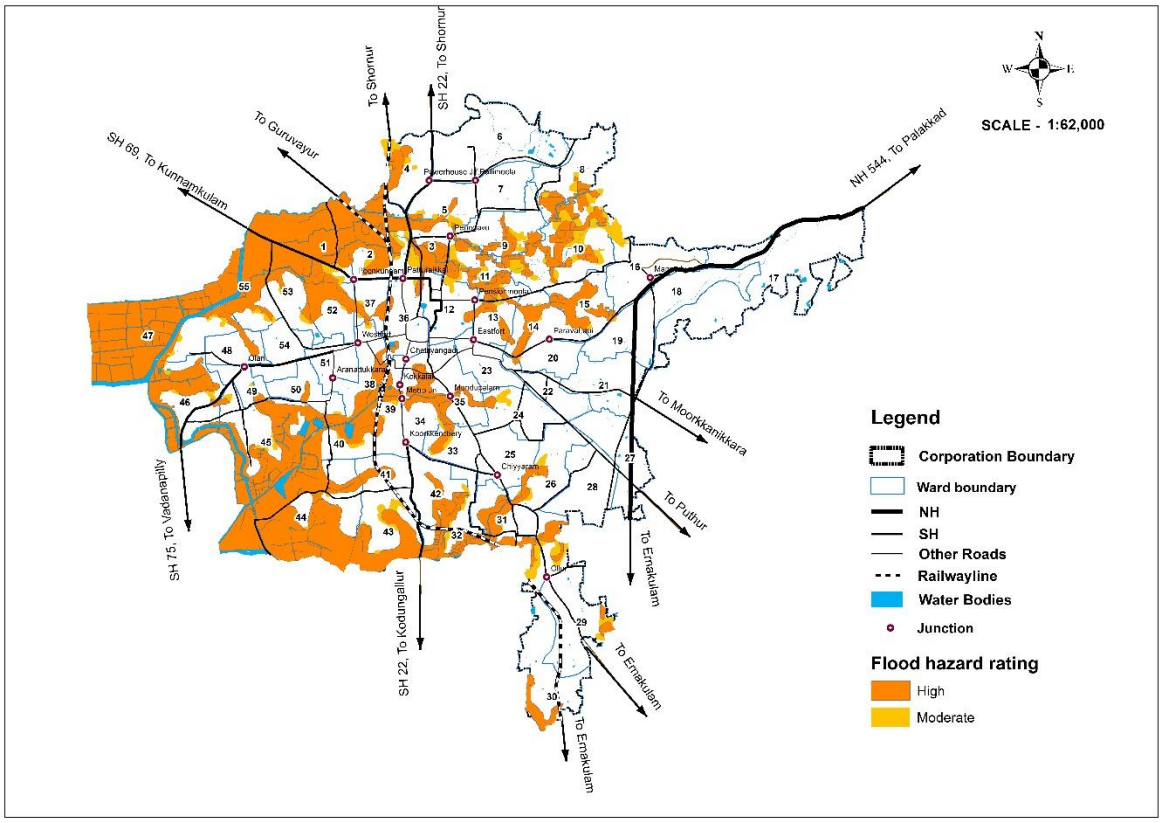


Fig. 19.21 Flood hazard risk map of Thrissur Corporation

Hazard zone Vs Distribution of infrastructures

The different available infrastructure facilities in town are plotted with the clusters to identify the availability of these facilities in a future possible flood event and the inter-connectivity of the available facilities. It is shown in Fig. 19.22. Analyzing the map several social infrastructures like schools, colleges, hospitals are found in the hazard zones. Schools and hospitals under hazard zone:

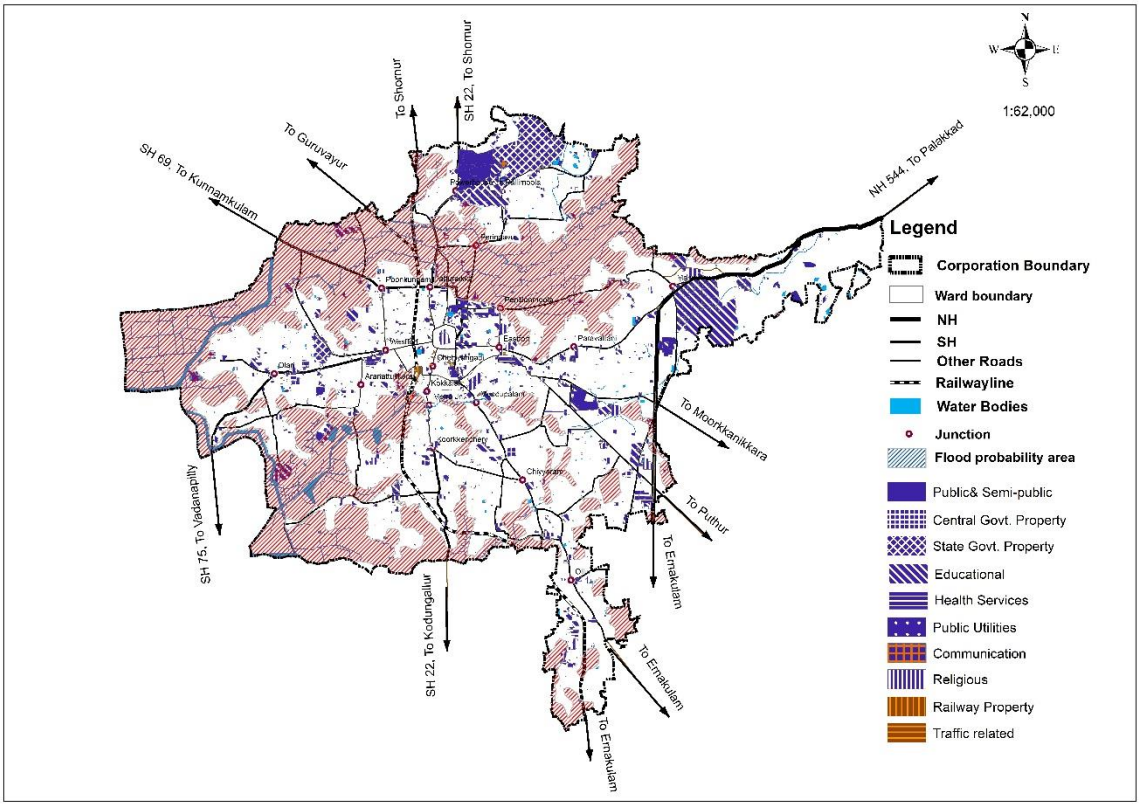


Fig. 19.22 Hazard zone Vs distribution of infrastructures

- St. Aloysius College, Elthuruth
- Holy Angel's founding home, Pullazhy
- Amrita Vidyalayam, Ayyanthole
- Paramekkavu Vidya Mandir, MLA road
- West fort high tech hospital, Pookunnam
- Saraswathy Vidya Nikethan, Pookunnam
- Sree Keralavarma College, Pookunnam
- Daya General Hospital, Viyyur
- Devamatha CMI Public School, Thrissur
- Sacred heart Church, Chembookavu

Rescue camps can be made available in the nearby public institutions like church halls, madrassas, schools etc. Possible flood rescue routes and relief camps, health institutions can be identified from these rescue related infrastructures.

19.3 INFERENCE

Environmental protection is very important for a healthy living. Air, water and land have to be protected from pollutants. We have to fight to preserve the world's species, resources and the beautiful diversity of nature. Proper control on pollutants from industries and other sources have to be made with the enforcement of strict laws from government.

Disaster management, on the other hand, is of greater importance for the protection of an environment and its inhabitants. Disaster risk arises when hazards interact with physical, social, economic and environmental vulnerabilities. Despite the growing understanding and acceptance of the importance of disaster risk reduction and increased disaster response capacities, disasters and in particular the management and reduction of risk continue to pose a challenge. Local body level vulnerability assessment as well as disaster management action plan has to be formulated and reviewed periodically for the effective preparedness, management and on-time response at times of disasters. Making communities resilient to all types of vulnerabilities is necessary and measures are to be taken in this regard. Since schools, hospitals, Churches is coming under Thrissur Corporation is in the hazard zone, proper care should be taken while selecting safe routes and relief camps.

CHAPTER 20
DEVELOPMENT ADMINISTRATION & FINANCE



This chapter deals with the Government departments related to the development of Municipal Corporation and also the income and expenditure of the same.

20.1 THRISSUR MUNICIPAL CORPORATION

The development activities in Thrissur city is carried out by Thrissur Municipal Corporation itself. The Kerala Municipalities Act, 1994, now governs all municipal functions in the Thrissur Municipal Corporation. The development activities coming under Thrissur Municipal Corporation are given below.

1. Public health – Primary health centres
2. Waste disposal
3. Construction and maintenance of Markets
4. Infrastructure facilities in Colonies
5. Conservation of Public ponds
6. Governance of institutions transferred to the Municipal Corporation
7. Planning social welfare schemes, implementing integrated child development scheme (ICDS)
8. Planning and providing urban basic services including water supply, sanitation, storm water drainage, Electricity and urban roads. (Excluding those provided/maintained by the State Public Works Department).

According to the Kerala Municipal Act, 1994, the Municipal Corporation/local self-government is responsible for:

1) Civic service delivery that consists of

- *Preparing and implementing a water supply and sewage disposal scheme*
- *Providing adequate sanitation through solid waste collection and disposal (including bio-medical and hazardous waste), low cost sanitation and surface drainage*
- *Providing street lighting facilities*
- *Constructing and maintaining roads*

- *Providing facilities for public conveniences*

2) Administrative services that consist of

- *Issuing various certificates*
- *Maintaining public amenities*
- *Maintaining public utility services*
- *Providing ambulance services*

3) Regulatory services that consist of

- *Issuing licenses and permits*
- *Registering births, deaths, marriages, and private hospitals and tutorials*
- *Issuing notices and other certificates for taxation purposes*
- *Maintaining records and registers of all municipal transactions*
- *Abating nuisances*

4) Transferred services that consist of undertaking

- *Maintenance and operations of health and educational institutions*
- *Economic development in the LSGI jurisdiction*
- *Social welfare programs*
- *Social security schemes*

State-level Departments, Programs and Missions, and Institutions also govern urban management and basic service delivery in the State's urban local bodies.

a) State Level Departments of Local Self Government, Water Resources, Public Works, Revenue and Housing, General Administration, Power, Health, Science and Technology, Environment provide policy and administrative directions to various State and local-level agencies for effective urban basic service delivery. Departments overseeing transferred functions like education, health, etc. also play a key role in urban service delivery.

b) Missions constituted by government of Kerala effectively administer the process of good governance, facilitate urban environmental management, improve financial management in urban local bodies and assist in poverty alleviation; these include the Modernizing Government Program (MGP), Clean Kerala Mission (CKM), Information Kerala Mission (IKM), and State Poverty Eradication Mission (Kudumbasree).

c) Institutions supporting activities in urban management include Kerala Water Authority (KWA), Kerala Urban Development Finance Corporation (KUDFC), and Kerala Institute of Local Administration (KILA), and Development Authorities.

20.1.1 Organisation structure of Municipal Corporation

The structure of the Municipal Corporation consists of two wings, i.e. the administrative wing and the executive wing. The administrative wing is headed by Mayor and consists of the council members. The executive wing is headed by Secretary and consists of revenue, health, accounts, general, engineering and town planning department. Organizational structure in Thrissur Municipal Corporation is shown in figure 20.1.

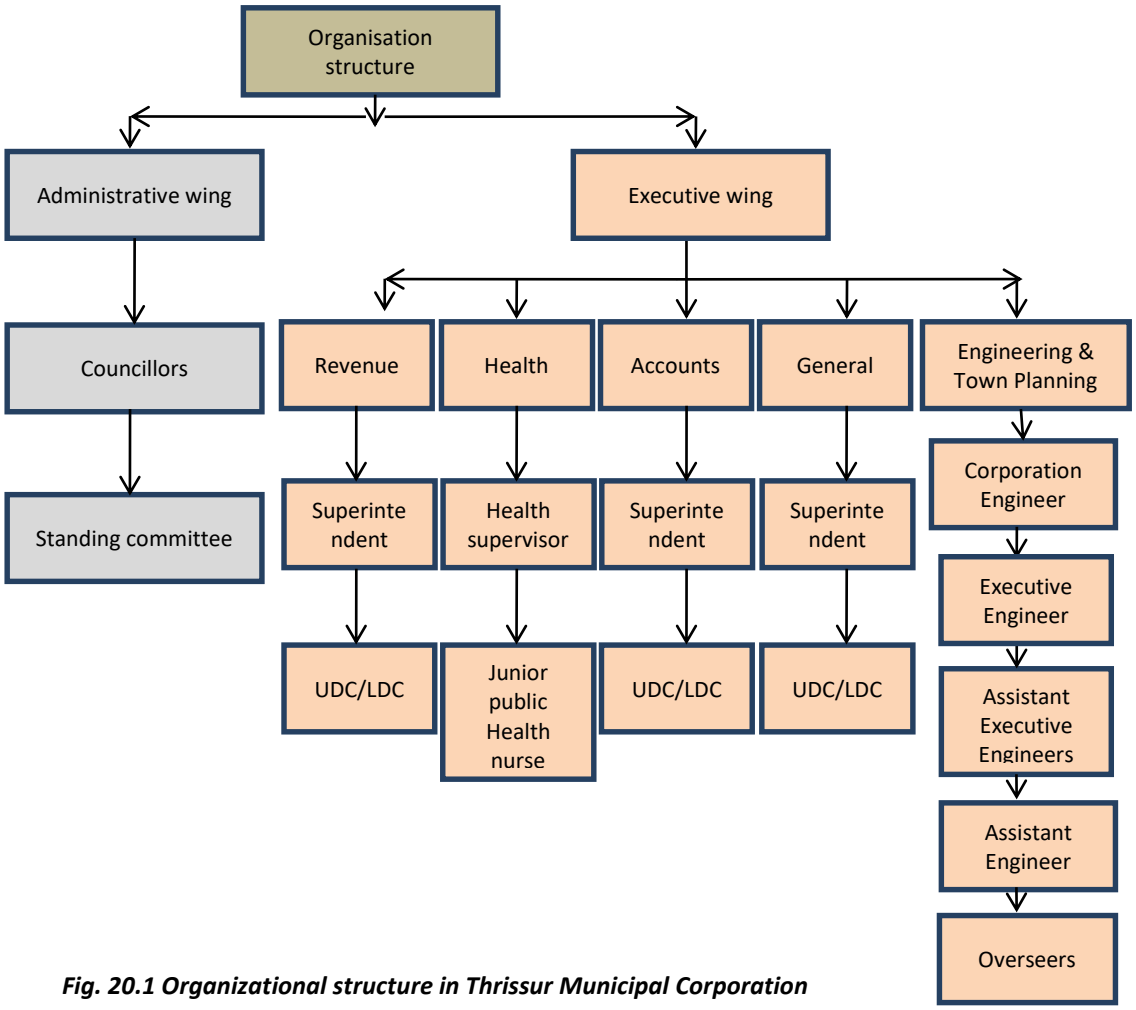


Fig. 20.1 Organizational structure in Thrissur Municipal Corporation

20.1.1.1 Administrative Wing

The Corporation council, the political arm of the Corporation consists of 55 elected councillors, each representing a ward. The Mayor (elected from among the councillors) heads the municipal corporation, which performs its duties as per the provisions of the Kerala Municipalities Act 1994. The political wing provides an overall direction to the Corporation and performs its functions through a set of committees constituted for different purposes.

20.1.1.2 Executive Wing

The executive wing is responsible for day-to-day operations of the corporation, and is headed by the Corporation Secretary. Secretary is the administrative head of the corporation

and is supported mainly by five departments in the operations. The organizational structure of the corporation comprises of five functional departments. The function of clerical staff dealing under each department/ section of the Corporation is coded for the sake of work allocation and standardization. Various departments under the ULB share the responsibility of service delivery within the Corporation. The functions of various officials/departments, under the Administrative wing, are elucidated here under:

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

ii. General Administration Department: The department is headed by the Secretary and assisted by Superintendents and other officers. This department is responsible for establishment, other essential matters relating to office, officers, staff and their welfare like preparation of staff pay bills, maintenance of registers for advances, GPF, pension, PF's etc.

iii. Engineering Department: The Superintendent Engineer heads the engineering department, and is assisted by Executive Engineer, Assistant Executive Engineer, Assistant Engineer and overseers. With regards to field work, Scheme works are delegated to one Assistant Engineer who also looks after regular works, related to Public Works, Drains, Street Lighting. A major function of the Corporation is formulation and execution of Works- like construction and maintenance of roads, buildings and other infrastructure systems. Another major function of this department is issue of building license, preparation and implementation of development plans and eviction of encroachments, urban planning and building regulation.

iv. Revenue and Accounts Department: The department is headed by the Revenue Inspector and assisted by junior assistant. The Accounts Section is responsible for supervising all financial transactions related to the Corporation, advising the Revenue Officers on all internal financial matters, updating financial receipts and expenditure details in accordance with the utilization of funds, reporting deviations in expenditure of funds in any of the allocated schemes, assisting preparation of the Corporation budget, maintenance of accounts regarding stamp duty, SFC Grants, MP,MLA Grants, maintenance of petty cash book and general cash book and attending to audit requirements and other such accounts-related duties. Revenue Officer, heading the Revenue Section, is responsible for collecting taxes such as, trade tax, house tax, advertisement tax, and entertainment tax; development charges; transfer of properties collection of duty; issuing notices for recovery of tax; and monitoring revenue collections of the ULB. In addition to this staffs from revenue department works in water supply unit for old Municipal area of Corporation.

v. Public Health Department: The department is headed by Health Officer, and is responsible for ULB services such as Solid waste management, public health related works like malaria control, family planning, mother and child health care, birth and death registration etc, and other government assisted programs related to health and poverty reduction and awareness programs. The Health Officer assisted by the Health supervisor and Health Inspectors, Junior Health Inspectors and Junior Public Health Nurse. Junior Public Health Nurse Supervisors are in-charge of works execution at the field level, which includes monitoring and supervising the work of sanitary labourers in the wards under their charge and attending to specific local complaints. Besides, this department is responsible for the enforcement of the Public Health Act. The Public Health Department is vested with the responsibility of ensuring safe sanitation and cleanliness of the town. The department is also responsible for the maintenance of corporation Dispensaries, Burial Grounds and slaughter houses. One of the most crucial services of the Corporation is maintenance of sanitation and cleanliness in the town. This involves mainly conservancy works involving sweeping of roads, garbage collection and disposal, cleaning of drains, and disinfecting of drains. Staff Details of Thrissur Municipal Corporation is shown in table 20.1.

Table 20.1 Staff Details of Thrissur Municipal Corporation

Sl. No.	Name of Division	Sanctioned Post	No. of Posts filled	Posts Vacant
1	Administration	54	48	6
2	Finance	14	14	0
3	Engineering	58	42	16
4	Planning	34	34	0
5	Housing (Revenue)	25	25	0
6	Public Health & Utilities	49	39	10
7	Transportation	9	6	3
8	Other, if any (Water Section)	11	11	0

20.1.2 WATER SUPPLY

Water supply to the parts of Thrissur Municipal Corporation and nearby Grama Panchayats is done by KWA. But water supply in the old municipal area is done by Thrissur Municipal Corporation itself. Municipal Corporation and KWA depends Peechi dam as the main source of supply. The offices of KWA are functioning inside the Town. The Municipal Corporation is not charging any money for the water supplied through public stand posts or street taps.

20.1.3 ELECTRICITY SUPPLY

Thrissur Municipal Corporation lends electricity from the board and supply it to the old municipal area, the other parts are served by the electricity board itself. The offices of KSEB are functioning inside the Town.

More than 178 number of Government offices are working inside the Town, which includes state and central govt. offices (Municipal Corporation office, Local fund, KSEB, KWA,BSNL, Forest, Fisheries, Survey, Education, Health, Telephone exchange, Dairy development, Kerala Lalithakala Academy, Public work, Courts etc.) Some of them are working inside the Civil Station situated at Ayyanthole and Chembukavu. Most of them are inside the Municipal buildings. A radio station and Television relay station is working inside the Town.

It can be seen that almost all government offices in the Town are either having their own building or are in buildings owned by Municipal Corporation. There are about 19 shopping complexes, 93 staff quarters, 3 bus stand buildings, 26 comfort stations, 10 halls/auditoriums, one open air theatre, one town hall, income tax office, 2 rest houses, one old age home, 4 veterinary hospitals, 10 rescue homes, 3 crematoria/burial grounds, one treatment plant, 10 parks (including small and large), 2 stadiums, 14 open spaces & play grounds etc. under Municipal Corporation. These buildings earn income to Municipal Corporation in the form of rent which accounts for the major part of revenue income of Municipal Corporation.

20.2 MUNICIPAL FUND

All cash received by the Municipal Corporation constitute a fund called the Municipal Fund (Fund) under the Kerala Municipality Act 1994 (KM Act 1994). The items of income credited to the Fund consist of the following:

- Own source revenue which includes taxes, duties, cess and surcharge, fees from licenses and permissions, income from municipal properties, and income from other miscellaneous items;
- Share of the taxes levied by the Government and transferred to the Municipal Corporation;
- Grants released to the Municipal Corporation by the Government for the implementation of schemes, projects and plans formulated by the Municipal Corporation;
- Grants released to the Municipal Corporation by the Government for implementation of schemes, projects and plans assigned or entrusted to the Municipal Corporation under the KM Act 1994;
- Money rose through donations and contributions from the public and non-governmental agencies.

20.3 INCOME AND EXPENDITURE STATEMENT

Revenues are recorded only when received while expenditures are only recognized when paid. The Revenue Account deals with the recurring Revenue Receipts and Expenditures of the Municipal Corporation. The revenue account of Thrissur Municipal Corporation for the years 2016-2017, 2017-2018 & 2018-2019 are given in table 20.2.

Table 20.2Income Statement of Thrissur Municipal Corporation

INCOME (Amount in Rs.)			
Head of Account	**2016-2017**	**2017-2018**	**2018-2019**
Tax Revenue	351,884,022.00	365,044,979.00	342,586,670.00
Assigned Revenues & Compensation	92,766.00	84,851,640.00	NA
Rental Income from Municipal properties	66,155,294.00	76,778,566.00	84,695,001.00
Fees& User Charges	145,348,776.00	134,162,191.00	118,025,089.00
Sale &Charges	1,288,956.00	4,187,718.00	918,823.00
Revenue Grants, Contributions & Subsidies	907,717,978.00	1,532,097,773.00	1,562467,127.00
Income from investments	0	15,050.00	17,300.00
Interest Earned	10,311,724.00	10,795,785.00	1,246,267.00
Other Income	14,673,754,.00	14,086,379,.00	6,299,413.00
Total Income	1,482,799,516.00	2,207,933,702.00	2,116,255,690.00

Source: Municipal Corporation Office, Thrissur

Total revenue income is increasing from 2016-2017 to 2018-2019. It increased from about 148.27 crores to 211.62 crores within three years. This shows the positive side of Thrissur Municipal Corporation income.

As per table 20.3, expenditure is also found to increase from 103.66 crores to 173.28 crores within a time period of three years. But referring table 22.1 and 22.2 there is a balance of (Gross surplus/Deficit of Income over Expenditure) 44.61, 73.38 & 38.34 crores in 2016-2017, 2017-2018, 2018-2019 respectively. Fig. 21.2 shows the variation in income, expenditure and gross surplus/deficit details of Thrissur Municipal Corporation for the last years.

Table 20.3Expenditure Statement of Thrissur Municipal Corporation

EXPENDITURE (Amount in Rs.)			
Head of Account	**2016-2017**	**2017-2018**	**2018-2019**
Establishment Expenses	335,552,908.00	351,248,858.00	491,279,772.00
Administrative Expenses	57,581,447.00	40,125,294.00,	75,937,849.00,
Operations &Maintenance	257,136,254.00	202,550,191.00	290,045,138.00
Interest & Finance Charges	3,109,633.00	4,429,176.00	4,498,621.00

Programme Expenses	181,565,484.00	535,101,973.00	671,283,784.00
Decentralised plan programme-Service Sector	934-,442,269.00	151,011,243.00	58,869,174.00
Decentralised plan programme-Infrastructure Sector	115,550,126.00	194,438,522.00	169,410,357.00
Decentralised plan programme –Projects not included in Sector Division	11,230,173.00	20,318,868.00	22,070,114.00
Revenue Grants, Contribution and subsidies	773,086.00	1,197,210.00	10,612289.00
Provisions and Write off	32,018,680.00	5,003,968.00	NA
Depreciation	42,177,960.00	8,874,524.00	14,827,483.00
Total Expenditure	1,036,695,751.00	1,474,174,533.00	1,732,896,732.00

Source: Municipal Corporation office, Thrissur

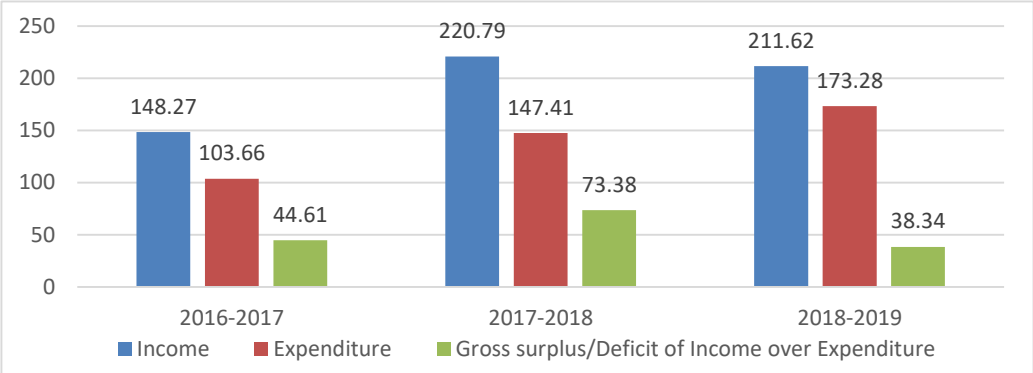


Fig 20.2 Variation Income, Expenditure and Gross surplus/Deficit

It can be used for development activities. This is one of the major potential of Thrissur Municipal Corporation. This balance amount is the fund that can be utilized for the development activities of the Municipal Corporation. It can be found that the fund is reducing with year. Measures have to be taken to increase this balance fund so that development activities can be carried out easily. For this purpose, the tax collection from all the sectors has to be made effective by the government. Property Tax is the biggest source of own tax income of the Municipal Corporation. It can be seen that the main income for the Municipal Corporation is from taxes collected. It can be found from the data that the tax collected shows a slight decrease from 2016 to 2019, hence measures have to be taken to increase this so that revenue collection can be increased.

20.3.1 Assets and Liability

An asset is a resource with economic value that an individual, corporation or country owns or controls with the expectation that it will provide future benefit. A liability is a legally binding obligation payable to another entity. Liabilities are incurred in order to fund the ongoing activities of a business. Examples of liabilities are accounts payable, accrued expenses, wages payable, and taxes.

These obligations are eventually settled through the transfer of cash or other assets to the other party. Assets and liability details of Thrissur Municipal Corporation is mentioned in the Table 20.4.

Table 20.4Assets & Liabilities of Thrissur Municipal Corporation

THRISSUR CORPORATION - LIABILITIES				
Sl No	**Items**	**2016-2017**	**2017-2018**	**2018-2019**
1	Total Reserve and Surplus	1490551531.23	2278733078.23	2683185283.23
2	Total Grants, Contributions for Specific purposes	417423716.75	233785143.75	418354699.75
3	Total Loans	8889686.00	8889686.00	50187055.00
4	Total Current Liabilities and Provision	383147343.50	354012063.50	262491774.50
Total	**Liabilities**	**2300012277.48**	**2875419971.48**	**3414218812.48**
THRISSUR CORPORATION - ASSETS				
1	Total Fixed Assets	1296122061.63	1524577836.63	2054138485.63
2	Total Investments	44241764.00	195138644.00	52172895.00
3	Total Current Assets Loans and Advances	1044513433.85	1152084944.85	1304285755.85
4	Total Miscellaneous Expenditure	3618546.00	3618546.00	3621676.00
Total	**Assets**	**2300012277.48**	**2875419971.48**	**3414218812.48**

Source: Municipal Corporation office, Thrissur

The key financial issues affecting the Municipal Corporation that need immediate attention are

- There is significant scope for improving the collection performance. Municipal Corporation must exercise all its statutory powers to enforce collection from chronic defaulters. In addition, it must also explore other means like extensive public awareness campaign or reminder to settle property tax, appointment of tax collectors on commission basis, giving discounts or other incentives for early payment, full or partial condonation of surcharges if past accounts are settled in full, etc.
- There has been no change in the Property Tax rate and annual rental value (ARV) of buildings or lands since 1992. State Government must act urgently on the legislation required to put the new system in place, i.e. plinth area based Property Tax and once every four years revision.
- The database on property holdings is outdated. The last survey of properties was carried out in late 1980's. Municipal Corporation must undertake a detailed survey to identify properties that are not included yet in the tax net. In addition, it must speed-up computerization of the database.

- Water charges collected from water supply distribution could not fully cover even the cash operating and maintenance costs. If the situation continues, the Municipal Corporation cannot sustain the operations in the long-run. State Government must allow water tariff to be raised to a level that at least cash operating and maintenance costs can be fully covered. State Government must also act on the legislation required to introduce periodic revision of tariff, say once every 3 years.
- There has been no regular revision of other taxes and non-tax income items while the costs of revenue administration and delivery of municipal services have risen. State Government must act on the legislation required to introduce automatic indexation or periodic revision of other taxes and non-tax income items.
- There is a lack of adequate financial management and information system. Adequate financial management and information system is necessary for effective revenue administration and cost control. There is also a lack of reliable information as to the assets required to be maintained. State Government must prescribe that accounts be maintained under a double entry accrual based accounting system. Asset register must also be kept and regularly updated.

20.3.2 E-Governance

E-Governance is an effort to improve access to information, accountability and transparency in services. This provides facilities for payment of dues to the lodging of public grievances and the system of work sanctions. Major E-governance activities in Municipal Corporation are in the following area:

- Birth /Death /Marriage Certificate
- Plan Monitoring
- Building Permission
- Tenders
- Social Security Pension
- PF details of Employees

The website must allow people to see their property dues, access their births and death, provides information about infrastructure works being undertaken by the Municipal Corporation and the status of various tender notices, building applications, complaints or grievances etc. The general information about the weather, local news, tourist areas, train and bus timings, etc. and hosts a virtual meeting place for citizens to discuss issues related urban governance and also provide citizens with the opportunity to have online conversations with the Officials.

Enquiry counter opened in front of Municipal Corporation office should work more resourcefully which will provide the people with all orders and request forms at free of cost as required. Registers of departments like revenue assessment, health, and water must be updated and services to common people must be done accurately.

20.4 INFERENCE

Municipal finance plays a key role in any local government. While Municipal Corporations are empowered to levy and collect their own taxes and user service charges, they must be efficient in revenue administration so that they can generate sufficient funds from various sources to deliver and finance municipal services. Municipal Corporations must be cost efficient and control expenditures within their reasonable limits. Otherwise, they will fail to accumulate adequate surplus funds to undertake additional and future development programs.

The surplus revenue income of Thrissur Municipal Corporation is the major potential for the development of this area. Therefore the surplus amount can be effectively used for the project proposals of the master plan.

CHAPTER 21
LINKAGES & EXISTING SPATIAL STRUCTURE



This chapter provides an empirical evaluation of the potential relationship between sectoral linkages. Intra-sectoral linkages, inter-sectoral relations and linkages between settlements characteristics helps for carving out an integrated development vision and help out to derive desirable spatial pattern.

21.1 LINKAGES

Understanding linkages will help in analysing the potential relationship between various sectors concerning the development of a city. This helps in formulating a better development perspective and will give a possible feedback mechanism that will exist among various sectors. Inter-sectoral linkages as well as linkage between settlement characteristics & sectoral developments are discussed in detail.

21.1.1 INTER-SCTORAL LINKAGES

From the analysis of different sectors in the planning area, the core sectors identified for inter-sector analysis are as follows:

- Agriculture
- Trade & Commerce
- Transportation
- Tourism
- Environment

21.1.1.1 Linkage between Agriculture and Trade &Commerce

Almost 34% of the city is coming under agricultural land use purpose. This shows the potential for agricultural production and a scope for direct selling. Exploitation of outside market forces can thus be avoided. Proper functioning of these direct selling processes can be

managed by providing required special market facilities for this. Promoting organic production along with its value addition will result in good trade opportunities as well as create more job opportunities and economy.

21.1.1.2 Linkage between Agriculture and Transportation

An efficient transportation system is required for the proper marketing of agricultural produces. Thrissur city has got good connectivity to all its parts and neighbouring settlements which shows the potential for the transportation of agricultural produces. Pattern of agricultural marketing is strongly influenced by nature of transport service & affordability. Provision of more peripheral roads and the connectivity of ring roads will improve the access to all the parts of the city as well enhance agricultural marketing.

21.1.1.3 Linkage between Agriculture and Environment

Agriculture plays a key role in land management and has a huge responsibility in the preservation of natural resources. Thrissur city is experiencing a significant reduction in the paddy cultivation in terms of production and productivity. Agricultural production should be increased to meet the demand of a town and the increased agricultural experiments may lead to adverse impacts on the environment. Land filling of Paddy fields and its usage for other purposes has decreased the ground water level and in turn affected the availability of water in ponds and wells, especially in summer season. Unscientific use of chemical fertilizers and insecticides are affecting biotic environment. Use of Bio fertilizers must be promoted. Agricultural fields are active ecosystems with large variety of organisms enjoying their lives mutually depending on each other. Hence it is highly important to protect these cultivable lands so as to maintain food chain in its real form.

21.1.1.4 Linkage between Agriculture and Tourism

Thrissur, being the cultural capital of the state has got good tourism potential due to its spectacular cultural and heritage value. Apart from this, the city have scope for developing participatory/farm tourism models in its kole land area.

21.1.1.5 Linkage between Trade & Commerce and Transportation

Thrissur city has good connectivity through road and rail transport. Road transport system includes NH, SH and other major roads connecting the city to neighbouring settlements. Future profile of the state as per the State Urbanisation Report-2012, shows that the city lies in the Alappuzha-Ernakulam-Thrissur-Palakkad urban development corridor envisaged to form in 2031 and its strategic location helps in the development of trading and commercial activities.

21.1.1.6 Linkage between Trade & Commerce and Tourism

Tourism plays a major role in the economic aspects of Thrissur district. In tourism sector, city has to act as a service provider for the whole district. Development of commercial sector will definitely encourage the tourism sector, since large number of tourists with more

purchasing power will be attracted to the area. Identified Tourism destinations, development of tourism circuits, modernization of infrastructural facilities are the emerging needs in this sector.

21.1.1.7 Linkage between Tourism and Environment

Tourism and environment have a dual relationship. Certain level of environmental quality is meant for healthy development of tourism sector. However, unbridled development in tourism sector can adversely affect the environment. The main attraction of the district is its cultural and heritage value. Participatory models and sustainable tourism activities are preferred. Agriculture and all its wonderful trappings when properly and uniquely packaged, give possibilities of farm tourism activities and thereby strengthening the economy. The linkage between tourism and environment is to be made as balancing each other by proper planning intervention.

21.1.2 LINKAGE BETWEEN SETTLEMENT CHARACTERISTICS & SECTORAL DEVELOPMENTS

21.1.2.1 Effect of Population growth on various development sectors

The growth in population has an indefinable effect on all the development sectors, since development is for the people and by the people. With growth in population, the human activities increases and it reflects on the transportation needs of the people. In general, the transportation needs grow exponentially with the increase in population. But in case of Thrissur city, as the population growth is very low, the demand in various development sectors only require improvements which are in par with this trend of population growth. The physical improvements to the transport network, the demand for water supply, sewerage system, solid waste management system, energy, education, health care, recreational and other civic amenities has direct relation to the increase in population. However, physical infrastructure for these services cannot be built incrementally. Hence, these facilities are to be developed in a phased manner dovetailing with the respective threshold population. The housing sector also has direct relation with the growth in population. However, development in this sector can be taken up in an incremental manner to an extent.

21.1.2.2 Changes in Traffic & Transportation needs due to growth in various sectors

The relation between demand for traffic & transportation infrastructure and different sectors of economy is a very dynamic one. The growth in any sector of economy calls for instantaneous changes in the demand pattern for transportation infrastructure. Transportation infrastructure cannot be provided in an incremental manner. Phase wise expansion is the only solution. Hence, careful consideration is required in any Master Plan while dealing with development in major sectors of economy and social infrastructure. The growth in industrial locations shall be identified in such a manner that, connectivity from the existing network is adequate, so that efforts in expansion of network to meet the additional demand are optimum. Since the increase in demand of freight transport, development of a truck terminal is essential. The increase in trade and commerce increases the intra city traffic

also. Therefore, development of trade & commerce meant for local consumption should be decentralised to the maximum extent possible. Development of education and health care sectors means establishment of institutions of higher order also. This shall increase the passenger traffic. The locational decisions of such institutions shall be taken so that the existing network is suitably used by the additional demand and development of the network is possible in a phased manner. Additional tourism facilities also will result in changes in demand pattern. Hence, the future transport network shall consider keeping the need to the demands from tourism sector also.

21.1.2.3 Land use changes and Environment

The major land use changes thus affecting environment, identified in Thrissur city is the depletion of paddy field and conversion of dry cultivation area for construction purpose. There has been a considerable decline in area of paddy field and the extent under cultivation. The agricultural production is not a very significant factor to be considered while formulating land use policy in an urban context. However, the paddy land essentially acts as green open space and functions as reservoir of water during rains preventing floods and fast run off. Changes in this land use shall reduce the green cover and hence shall adversely affect the environmental quality. Reducing the building footprint is the answer to this problem. Reducing the building footprint also shall mean compact development for which it is easier and less costly to provide basic amenities like water, sewerage system, energy, roads, etc. Providing waste treatment facilities are also easier in a compact development. The distribution of various land uses in the city decides the traffic pattern of the town and hence has environmental ramifications. Therefore, the changes in land use shall be managed in such a way that traffic and transportation needs are optimised causing less pollution from vehicular traffic and less consumption of precious fossil fuels.

21.1.2.4 Energy efficiency and Land use

The benefits of energy saved by land use planning measures are of long term and hence need careful consideration. The compact nature of development reduces intra city traffic and thus saves fossil fuel. Efficient layout of various land uses based on their compatibility and trip generation characteristics shall result in reduction in use of energy for transportation needs. The compactness and proper layout shall prompt pedestrian traffic also contributing to energy conservation. This also help to conserve energy in sectors like water supply, electricity etc. The formation of urban heat islands can be avoided by appropriate land use measures. This shall cause savings in energy by reduced demand for air conditioning and artificial ventilation.

21.2 EXISTING SPATIAL STRUCTURE

21.2.1 FUNCTIONAL CHARACTER

The function of a settlement is the major activity within the settlement, be it primary sector activities (rural), secondary sector / tertiary sector activities (urban activities) or the combination of the above. The spatial distribution of the settlements based on its character

shows a clear demarcation in the pattern of the settlements. In a regional context, Thrissur Municipal Corporation shows urban functional character, whereas within the city, the ward wise character clearly showing the difference in functional character inside the city. The ward where agriculture land use is having higher concentration shows rural character. In Thrissur Municipal Corporation area, 40 number of wards are showing urban nature, 7 wards showing semi-rural character and 8 wards completely shows rural character. It is also clear that Thrissur City is mainly engaged in tertiary activities and a part of it is having primary nature also. None of the wards show semi urban character.

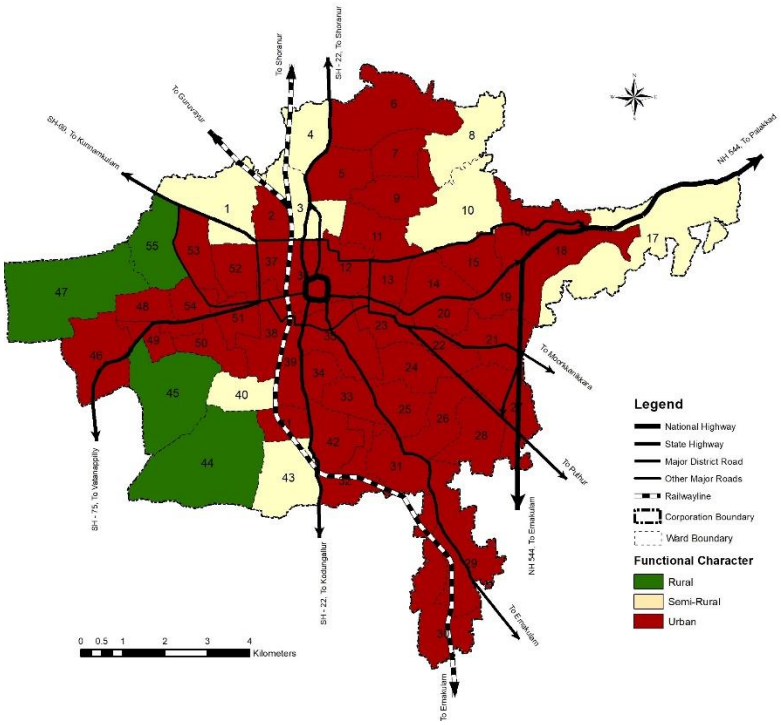


Fig. 21.1 Functional Character of Thrissur city

The functional character of Thrissur City gives a clear idea about the growth of the city. It can be seen that the wards having urban nature are situated along major roads. All major roads in the city have commercial centres along them which have resulted in the urban character of the area. A conflict to this is the wards situated along Kunnamkulam road which are showing rural character. This is due to the presence of environmentally sensitive kole lands at the neighbouring area of the road.

21.2.2 ACTIVITY PATTERN

The activity pattern of Thrissur city is derived by taking two aspects, such as Land use concentration index and functional character of wards. These two aspects are overlaid on each other to find out the general distribution of activity pattern in the city.

Land use concentration provides the information about the dominant land use in each ward. Ward wise activity zone based land use concentration (Dominant Land use) of Thrissur Municipal Corporation is given in fig. 21.2. From the figure, it can be seen that the central core of the city is dominated by commercial activities. Wards with the presence of Central Jail, Police academy, Engineering College, Agricultural University, Veterinary & Animal Sciences University, etc. shows public dominance and can be seen predominantly in the northern and north-eastern periphery of the city. Ward 29 and 48 shows industrial dominance due to the presence of Industrial Estate, brick kiln, and textile industry. Majority of wards in the western periphery of the city shows agricultural dominance due to the presence of paddy fields there.

Rest of the wards are with residential dominance and are mainly located concentrically from the inner core with commercial activities.

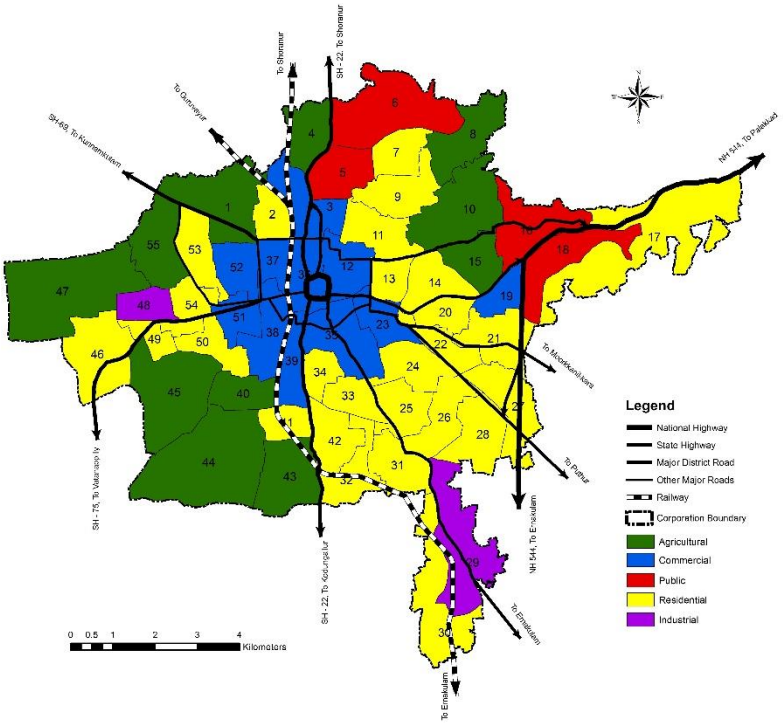


Fig. 21.2 Ward wise Dominant Land use in Thrissur city

As mentioned earlier, the general activity pattern of the city is derived through the study of existing land use Concentration index and functional character. The functional character is determined based on population distribution along with land use pattern and concentration index is studied based on land use analysis. The activity pattern within the Corporation is derived by combining the characters under the two aspects of Concentration index and Functional Character. The resultant activity pattern which is derived from the analysis defines the city into Agriculture activity, Public & Semi Public activity, Commercial activity, Industrial activity, and Mixed Residential activity. The basis with which these activities are derived based on various combination of functional character and land use concentration is given in table 21.1 and the resultant spatial representation of these activities are shown in fig. 21.3.

Table 21.1 Determination of Activity Pattern in Thrissur Municipal Corporation

Sl. No.	Combinations of Land use & Functional Character		Activity Pattern
	Functional Character	Land use CI	
1	Urban	Residential	**Mixed Residential**
2	Urban	Public & Semi-public	**Public & Semi-public**
3	Urban	Commercial	**Commercial**
4	Urban	Agricultural	**Agricultural**
5	Urban	Industrial	**Industrial**
6	Semi-rural	Agricultural	**Agricultural**
7	Semi-rural	Public & Semi-public	**Public & Semi-public**
8	Semi-rural	Commercial	**Commercial**
9	Semi-rural	Residential	**Mixed Residential**
10	Rural	Agricultural	**Agricultural**

From the fig. 21.3, it can be seen that core area of the city is constituted by Commercial activities. Surrounding the central core of commercial activities, residential activity mixed with other activities shows the prominent character. The industrial areas are found in wards Edakkunni and Olari. Public &semi-public activities are concentrated in North eastern region where institutional use dominates. Agriculture area is mostly found in the fringes of the city and these areas are mainly constituted by paddy fields.

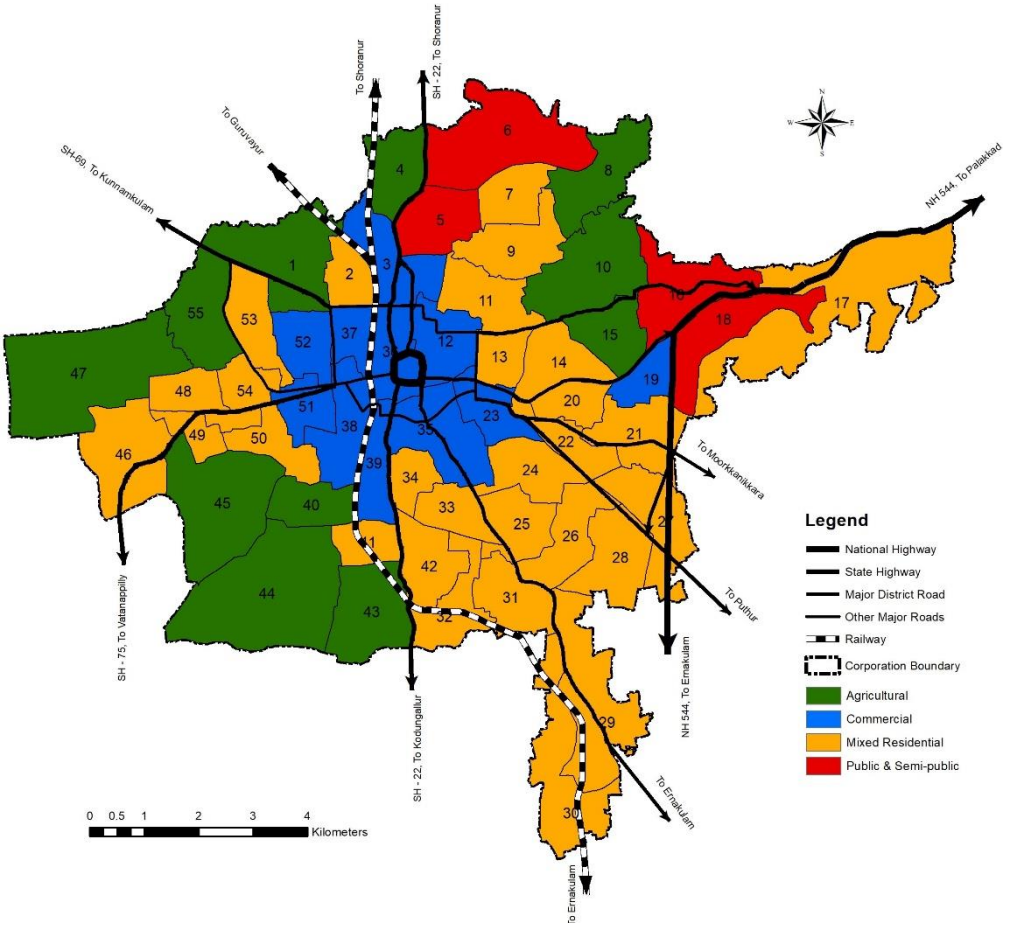


Fig. 21.3 Activity Pattern in Thrissur city

21.2.3 TRANSPORTATION NETWORK

Thrissur city has got a good inter-city, inter-district and inter-state connectivity with the presence of National Highway, State Highways and Railway passing through the city. NH-544 (Salem-Kochi), SH-22 (Shornur-Thrissur-Kodungallur), SH-69 (Thrissur-Kuttippuram), SH-75 (Thrissur-Kanjani-Vadanappally) are the major highways passing through the city. Apart from these, the road network in the city constituted by Swaraj Round, Ring Roads, other sub arterial roads & collector streets. The city has rail connectivity to the North and the south of the state. The railway branches at Poonkunnam in the city to have a line to the temple town Guruvayur. Fig. 21.4 shows the major transportation network of the city along with the major transportation nodes.

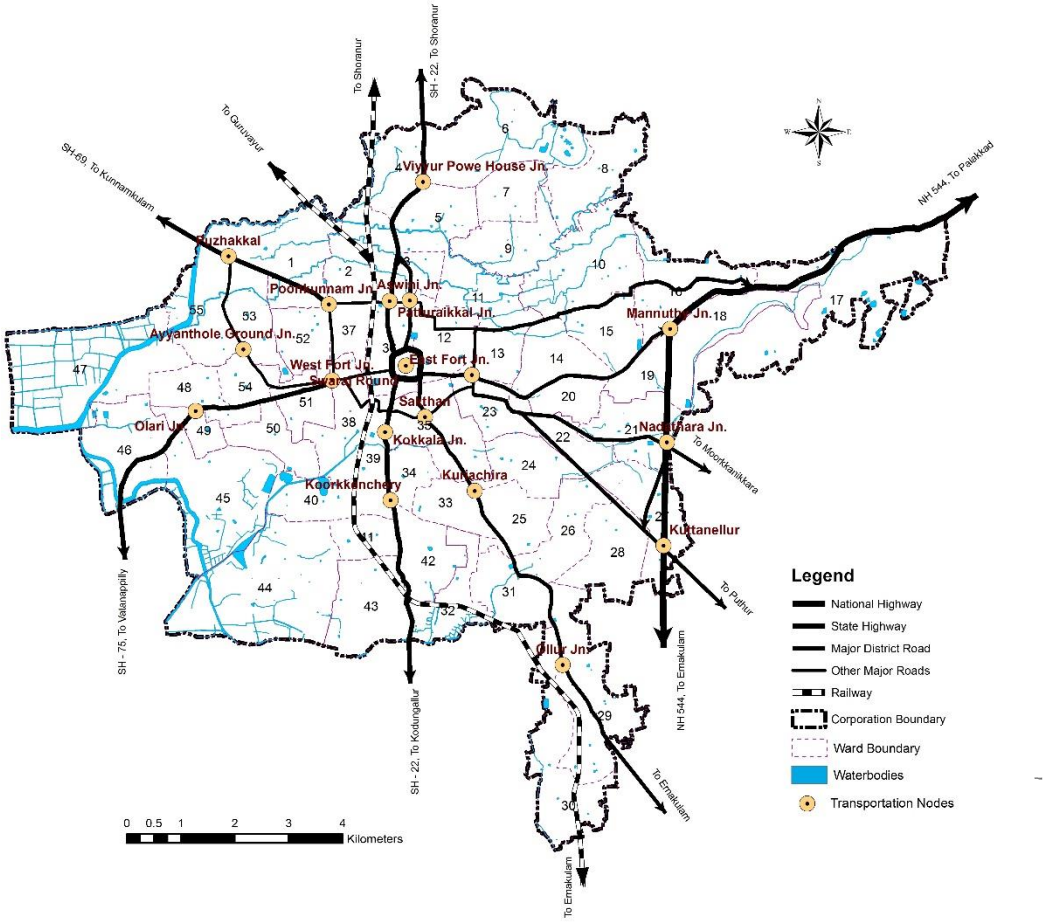


Fig. 21.4 Major Transportation network and nodes in Thrissur city

21.2.4 HIERARCHY OF COMMERCIAL NODES

Major commercial nodes in Thrissur city, according to their respective hierarchy in the city, are shown in fig. 21.5. It can be seen that the major nodes of commercial sector are located in and around of Swaraj round. Other major nodes are distributed in various parts of the city which facilitates the basic needs of the people in its immediate service area. Existing commercial nodes in Thrissur city are as follows:

Hierarchy	Commercial Node
1st Order	SwarajRound
2nd Order	Patturaikal Jn. &Aswini Jn., East Fort Jn., West Fort Jn. , Sakthan , ChettiyangadiJn. &Post Office Road Jn.
3rd Order	Mannuthy Jn., Koorkanchery Jn., Ollur Jn., Kuriachira Jn., Punkunam Jn., Olari Jn.
4th Order	Kokkalai Jn., Chiyyaram Jn., Kanimangalam Jn., Ayyanthole Ground Jn., Kuttanelllur Jn., Pallimoola Jn., Peringavu Jn.

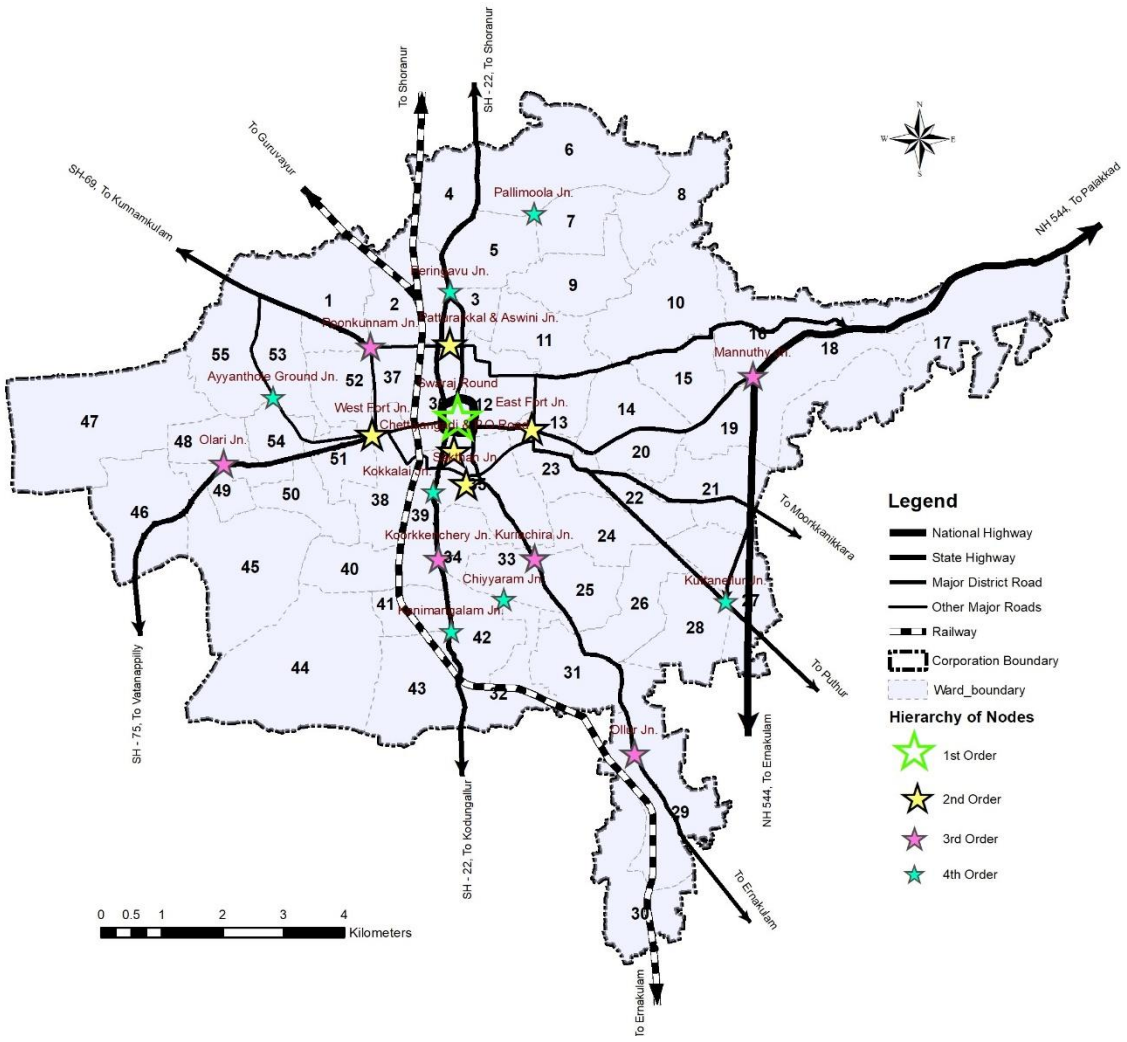


Fig. 21.5 Hierarchy of Commercial Nodes in Thrissur city

21.2.5 EXISTING SPATIAL STRUCTURE

Existing spatial structure of Thrissur city, derived out by consideringthe existing activity pattern, existing connectivity and existing commercial nodes is shown in fig. 21.6. As the district headquarters, Thrissur city acts as a service provider to its neighbouring settlements and to the entire district. The existing spatial structure reveals this particular nature with dominance in commercial and public & semi-public activities. Residential use with a mixture of other uses could be seen when moving away from the core to the fringes. This shows the potential for mixed development in the city. Industrial use is found to be minimal and agricultural use dominates in the periphery of the city. Development of transportation network has great influence in forming the character of the city. Major settlements are found in places which are in close proximity to the major road networks.

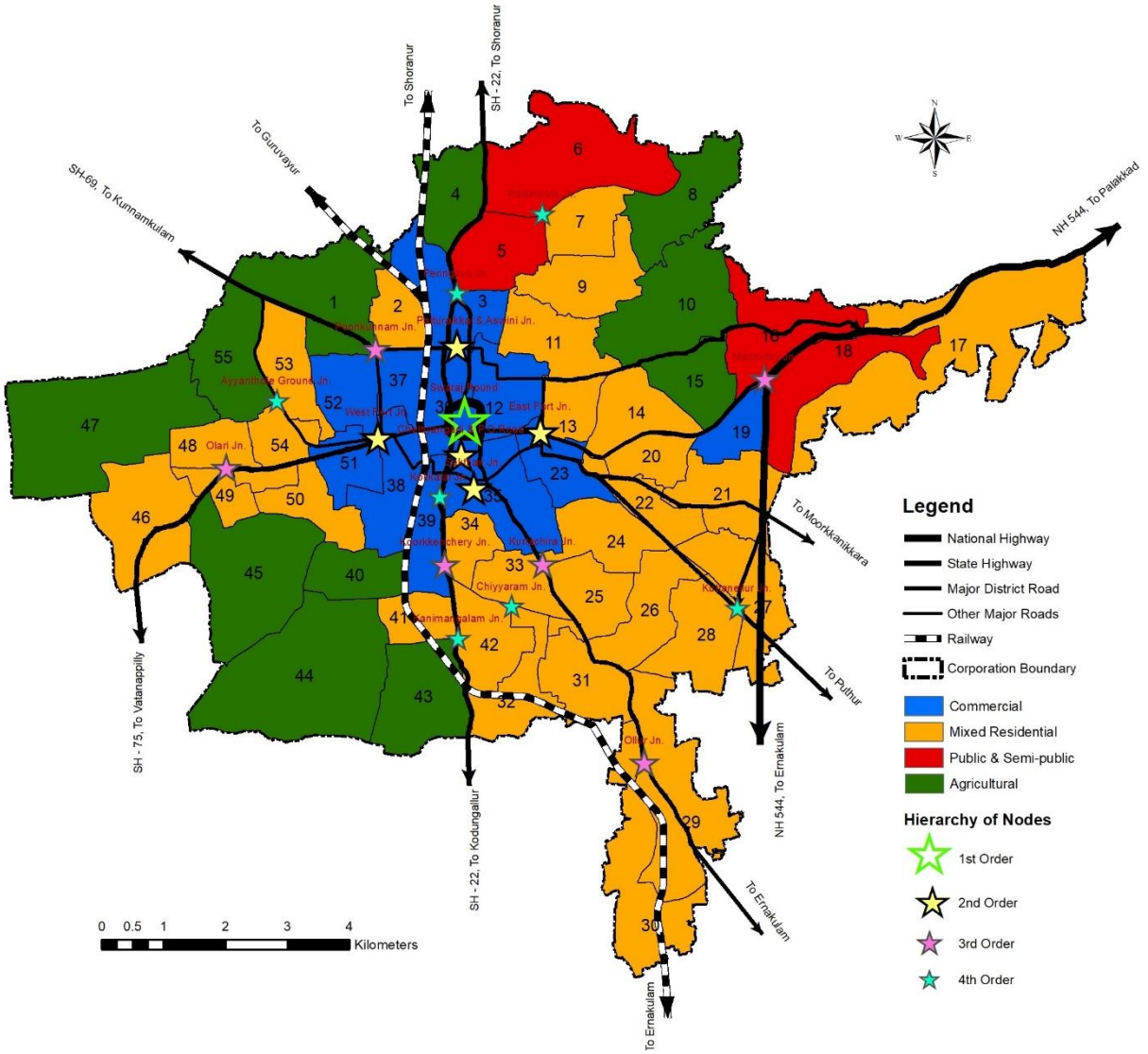
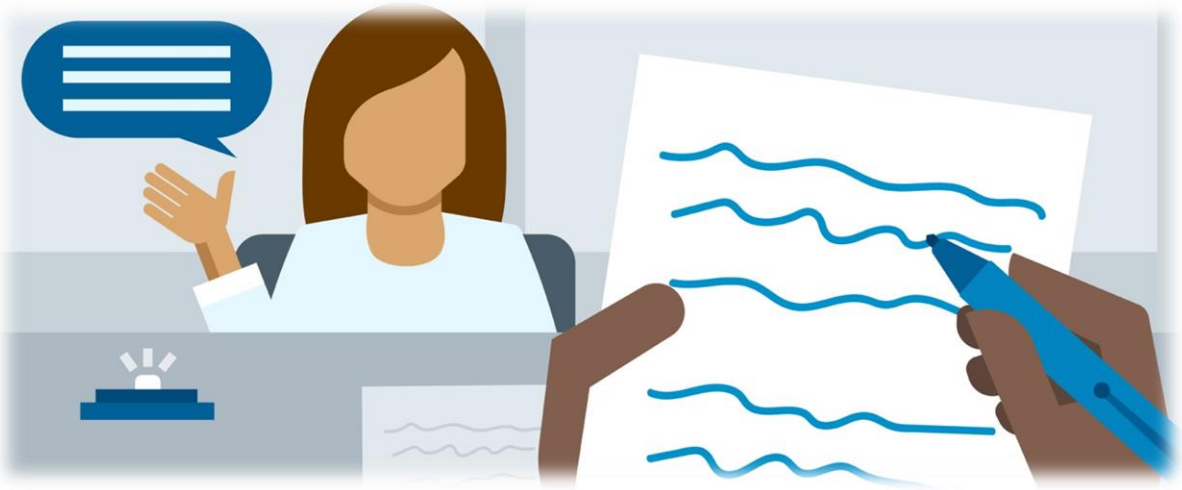


Fig. 21.6 Existing Spatial Structure of Thrissur city

21.3 INFERENCE

The study of linkages reveals the need of giving due consideration to the core sectors of Trade & Commerce, Agriculture, Transportation, Tourism, Environment and their inter-sectoral linkages as well as the linkages between settlements character and sectoral developments is essential to ensure the optimal resource utilisation and to trigger the local economic development. The spatial structure reveals the existing character of the city and its future potential for mixed development along with its commercial, agricultural, and public & semi-public dominance.

CHAPTER 22
FINDINGS & SUGGESTIONS



This Chapter explains about the major findings based on the Analysis of various sectors.

22.1 REGIONAL SETTINGS

- According to IDDP, Thrissur City comes under Multifunctional zone. All urban activities especially higher order educational and health care facilities and transportation network coping up with the requirements etc. are to be made available. This zone will act as a service centre for the entire district.
- Thrissur City is considered as the only first order settlement in the district based on the facilities available, its multifunctional character (seat of specialized and regional level facilities, status as administrative headquarters, trade and commercial centre of the district and Art & Cultural Centre) and its spatial location within the district.
- Thrissur City is located almost in the geographic centre of the district and reflects the character of activities of the whole district.
- Thrissur City is said to be rich in tourism, heritage, cultural, religious and archaeological wealth and acts as cultural centre of district as well as the state. Thrissur City has a good role in industrial sector also. Gold and diamond industry, textile industry, real estate, banking, brick and tile industry, furniture making, auto mobile industry etc. are existing.
- Thrissur City has intense potential in infrastructure facilities like super specialty hospitals, four star hotels, health institutions, IT parks, educational facilities etc.

- Thrissur City is surrounded by intensive agriculture zone. So agro and allied industries like processing units, value addition units etc. also have potential in this area.
- Thrissur City, the proposed provisional centre of Thrissur district, will develop as a regional centre in the state, next only to Cochin. The development of the zone should be in such a way that it should minimize the degradation of nature and other pollution related activities.

22.2 POPULATION

- Thrissur and Kannur Municipal Corporations have less population density when compared with other Municipal Corporations in Kerala state, but more density than the state, district and neighboring urban areas.

- Core area of Municipal Corporation is a dense one but the fringe area is free to hold more population.

- This shows that Thrissur City have the capacity to hold more population as a Municipal Corporation but at present it is acting as a major urban centre in the district.

- To hold more population new employment opportunities and basic infra-structure facilities must be developed.

- 8.38% is the growth rate of population in Thrissur Municipal Corporation as per 2001 census. But it is showing negative growth rate as per 2011 census data. This shows that the city has to adopt new developmental policies to attract people.

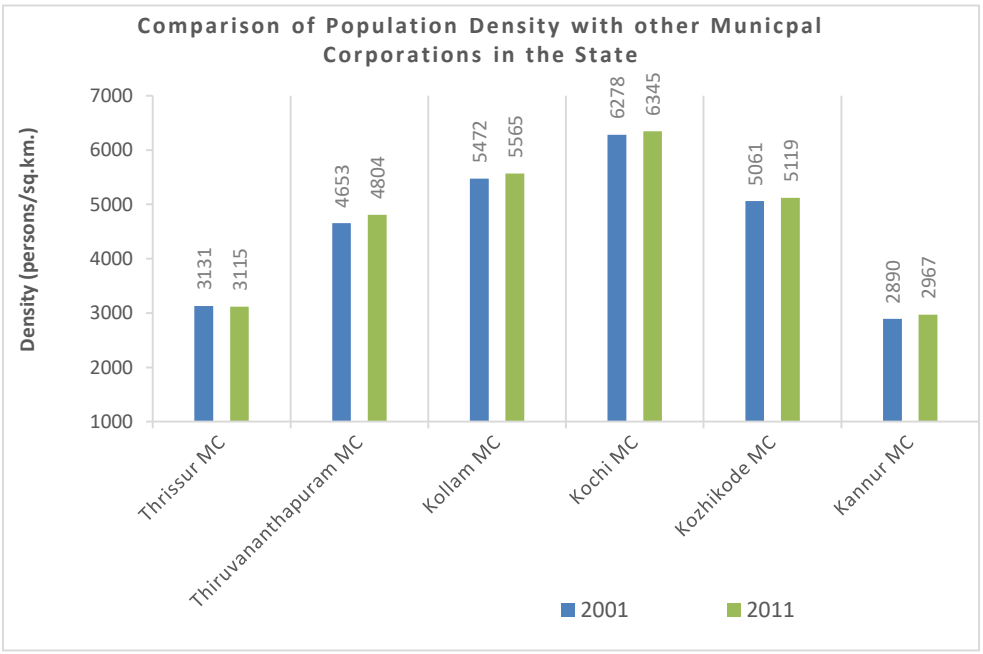
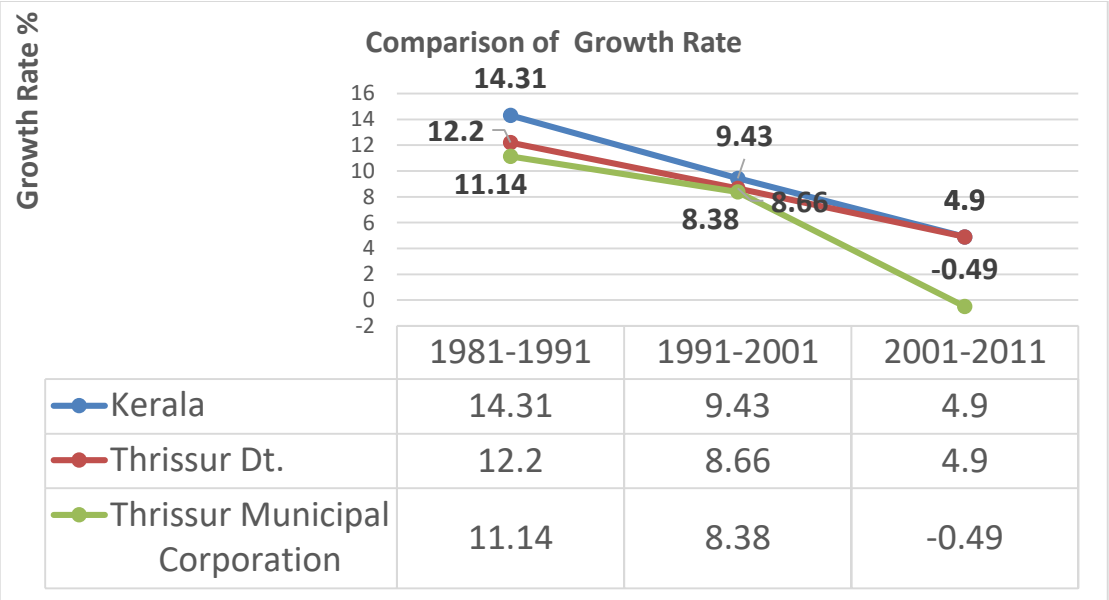


Fig 22.1 Comparison of gross population density of Municipal Corporations *(Source: Census 2001,2011)*

- Spatial analysis shows that concentration of population is more in those areas where major roads are passing through. But all areas in the city is equally healthy for residential use.

- As per sex ratio the female population is high but it is found to be decreasing as per socio economic survey 2019. Child sex ratio also shows the decreasing female population which results in domination of male population in the coming years.



	1981-1991	1991-2001	2001-2011
Kerala	14.31	9.43	4.9
Thrissur Dt.	12.2	8.66	4.9
Thrissur Municipal Corporation	11.14	8.38	-0.49

Fig 22.2 Growth Rate of Population *(Source: Census 1981, 1991, 2001, 2011)*

- Household size also shows the reduction in population and the emergence of nuclear families which demands more development in all sectors.

22.3 OCCUPATIONAL PATTERN

- The WFPR of Thrissur Municipal Corporation is less than that of neighboring local bodies and less than major Municipal Corporations like Kochi and Thiruvananthapuram. This shows that the human resource in Thrissur City is not participating in the work force up to the level of neighboring local bodies. This gives an indication for the need of more employment opportunities.
- Lack of agriculture labourers has caused agriculture as an uneconomical sector. Mechanization in this field can help to a certain limit. Land available for agriculture must be utilized for it by group farming and public private partnership.

- Spatially agriculture labours, cultivators and household industrial workers are concentrated in the fringe of the city where more infrastructure development is required.

- The work force participation rate has shown an increase during last years. This shows the increase in job opportunities in the area. But that increase is not enough to have

the WPR up to the level of neighbouring local bodies. Among nearest urban local bodies Kodungallur and Wadakkancherry municipalities shows more WFPR than the Municipal Corporation.

- It was found that there are more people engaged in household industries in Thrissur City when compared to other Municipal Corporations in Kerala. The rapid increase in House Hold Industrial workers from 1991 to 2001 shows the increase in number of small scale industries in the city.

- 95.67% are working in tertiary sector. This shows that the city is developed based on service sector, trade and commerce.

- While comparing the workers of Thrissur City with the district, it can be seen that the number of persons engaged in agricultural works are minimum. Among the working class, 1.37% of the workers are in agricultural activity.

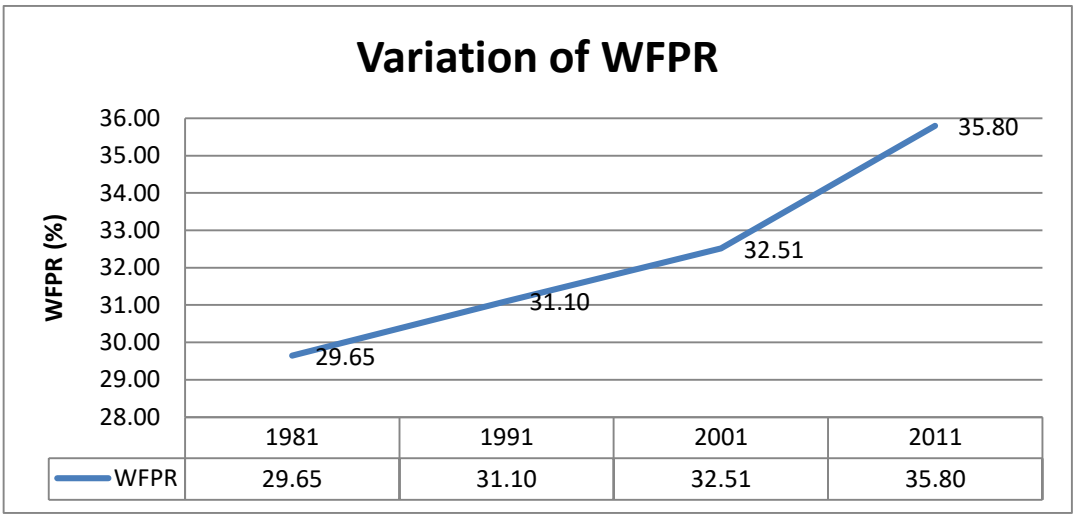


Fig 22.3 Variation of WPR *(Source: Census 1981, 1991, 2001, 2011)*

22.4 LAND USE

- Land use analysis indicates that majority of Thrissur City is urban but it is equally blessed with agriculture land use also.

- Majority of land area (39.58%) in Thrissur City is used for residential purpose.

- Agricultural lands, 31.89% (including paddy and dry cultivation) are situated away from the central area of the city. The central area has higher population density and almost all commercial and public activities are concentrated here. Agricultural lands located far away from major roads and other public commercial centres, are comparatively safer from land conversion than other agriculture lands.
- Thrissur has a significant area under Kole lands which are water logged areas. These Kole lands are retained as such under the provisions of the Kerala Conservation of Paddy Land and Wetland Act. However, there is a threat of conversion in those lands

which are left fallow without paddy cultivation. It is also observed that there is a tendency to shift to other cash crops since paddy cultivation is not economical.

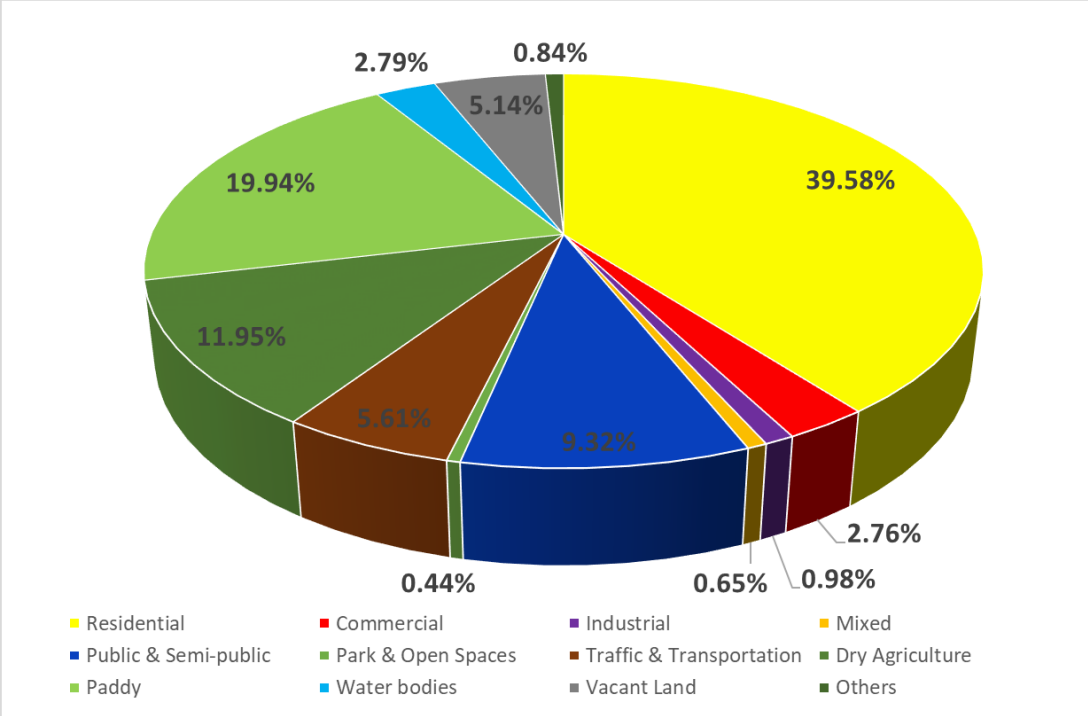


Fig 22.4 Existing Land use Break up – 2019 (*Source: Land use survey 2019)*

- The unique feature of Thrissur city centre ward (core area) namely Thekkinkadu is that it has predominance of all major Land use.
- There are some wards where public and semipublic land use is higher than other land uses.
- Agriculture Land use and water bodies are concentrated in western, southwestern and eastern parts of the city.
- Overall analysis points out that Thrissur Municipal Corporation is not yet reached to the level of other Municipal Corporation in urbanization. More development can be achieved for this area by developing the vacant land available and decongesting the core areas.

22.5 TRADE & COMMERCE

- On a detailed study of the land use map of Thrissur City, it can be analysed that 2.76 % of the area is to be used for commercial purposes. More commercial centres are located around the Swaraj round (core area) and along the major roads.
- The city is considered as hub of jewellery and textile business in South India.
- The commercial activities are mostly concentrated along the Swaraj round, Kizhakkekotta, West Fort, High road, Sakthan market premises, Kokkalai, Chettiyangadi, North bus stand and Patturaikkal. The other commercial centres are Olari, Ayyanthole, Mannuthy, Koorkenchey, Kuriachira and Ollur. The distribution of Trade & Commerce centres to outer areas can decongest the core area.

- Lack of sufficient parking space especially for heavy vehicles for loading and unloading goods are the main problem faced by this sector. Possible Road widening and provision of parking spaces near major commercial centres will help to increase the outcome.
- Many of the commercial buildings in the city centre are to be demolished and reconstructed as they have exceeded the life period.
- Proper treatment of wastes from market area has to be ensured with the introduction of treatment plants. Wastes from market area, fish market and from meat market have to be treated separately.

22.6 TOURISM

- Thrissur is well known for its cultural and religious panorama.

- The famous Temple trio named as Vadakkumnathan, Paramekkavu and Thiruvambadi are renowned throughout the world.

- Thrissur Pooram, a spectacular religious festival in South India and known as “Mother of all Poorams” which brings thousands of people from around the world. Thrissur Pooram is considered as the cultural cherry in Kerala’s culture.

- Another attraction of this city is the "Puli Kali" ("Puli" means 'tiger' and "Kali" means 'play') on the fourth day of Onam celebrations (NalaamOnam) in August or September.

- Basilica of Our Lady of Dolours (Puthan Pally) is the biggest and tallest church in Asia, situated in the heart of the city of Thrissur. It is famous for its Gothic style architecture.

- Our Lady of Lourdes's Metropolitan Cathedral of Syrian Catholics is noted for its imposing interior.

- Existence of Kerala Sahitya Academy, Kerala Sangeetha Nataka Academy etc. in the city centre promotes the cultural dignity and attracts many people from farther areas to Thrissur City. The proximity to other cultural centres like Kerala Kala Mandalam, Cheruthuruthy attracts people from abroad also.

- The city and the area around it have a number of museums, art schools, and institutes, which are dedicated to preserving and promoting the rich cultural traditions of Kerala.

- The above factors help in attracting tourists towards Thrissur which can be encouraged by providing more improved facilities for outsiders.

- Introduction of few packages and promotion of pilgrim tourism by including neighbouring pilgrim places like Guruvayur can attract more tourists. Good promotion strategies campaigns will help to achieve the aims and a good result.

- Thrissur has a large number of well-known heritage temples including the Thiruvambady temple, Vadakkumnathan temple and Paramekkavu temple, as well as two famous churches, the Our Lady of Lourdes Metropolitan Cathedral and the Basilica of Our Lady of Dolours (Puthan Pally or New Church).

- These historical and cultural places in Thrissur have to be protected for the future generation.

22.7 INDUSTRIAL SECTOR

- Thrissur City has immense potential for industrial development. Lack of enough flow of credit to this sector and lack of modern infrastructural facilities hold back the developmental prospects.

- The major problems in this sector are lack of working capital, management issues, labour issues, improper resource utilization, improper marketing and lack of involvement of financial institutions, changing technology, unhealthy market competitions

- There are 1328 micro, 94 small, 2 medium and 3 large scale industries registered in the city under MSME Act. About 10952 people work under these industries.

- Most of the Micro industries are plastic based, textile based and jewelry based industries

- The establishments of a large number of manufacturing/service industries is required to provide adequate employment opportunities for the growing masses and to stabilize the economy of the city.

22.8 AGRICULTURE AND ALLIED FIELDS

- The percentage of agricultural labourers in Thrissur Municipal Corporation stands next to Thiruvananthapuram Municipal Corporation.

- Even though 33.42 % of land is coming under Agricultural use, people engaged in agriculture activities are found to be very less. According to 2011 census data, there are only 1555 agricultural laborers in Thrissur City.

- Available agricultural lands are not utilized for productive activities. It is kept as vacant land for long period and ultimately converted for other uses.

- Lack of agriculture labourers has caused agriculture as an uneconomical sector. Mechanization in this field can help to a certain limit.

- Major important crops are banana, paddy and coconut.

- Peechi Irrigation Canal, Panchikkal Thodu at Ayyanthole, Vadakkechira, Attachira Thodu under Vilvattom zonal office are the major sources of irrigation.

- Cleaning of existing thodus and water channels for irrigation facility can promote productivity.

- Proper maintenance of the irrigation facilities will help to utilize the water without wastage.

- Use of drip irrigation, sprinkle irrigation, etc. instead of ponding will help to increase the output for a variety of crops.

- A reported decline in the area under cultivation can be offset by farming high-yielding crop varieties and harnessing advanced technology.

- Paddy lands in off seasons are to be used for cultivation of vegetables so as to attain self-sufficiency in the field of agriculture.

- Gap between demand and supply of milk and eggs are getting higher.

- To meet the demand of milk, meat and egg, implementation of dairy farms, milk collection centers, authorized slaughter houses, poultry farms etc. has to be implemented.

- There is only one authorized slaughter house in the city situated at Kuriachira. The maintenance of this has to be improved by introducing new and improved facilities.

- There is no particular fish cultivation in the city. The 33 existing ponds in Thrissur City can be utilized for fish farming.

- Production of milk in Thrissur City comes around 81000 liters/month only where as demand is 2654039 liters/month. The demand has to be met by starting dairy farm in the city. More collection centers have to be started so as to have a good coordination of the production and consumption areas.

- Promotion of public-private partnership in this sector may help in increasing the supply.

- With the help of various agencies farmers will be able to get more awareness on value addition, food safety norms, branding and problems and prospects of marketing including the four cardinals of marketing like product, price, promotion and place.

22.9 TRANSPORTATION

- Thrissur City has good inter district and intra district connectivity both by road and railway.
- Result of Traffic Survey conducted by NATPAC shows that some of the major roads in Thrissur City has V/C ratio greater than 1, which indicates the need for increasing the road width possibly with land availability.

- Heavy traffic congestion at the central area due to the mix of intra-city and inter-city traffic. This is due to the absence of bypasses as well due to the locations of bus terminals and wholesale market in the central city.

- Unorganized on-street parking demand along the major corridors and the absence of off-street parking facilities at critical locations are some problems in the city.

- Junction improvement has to be done to reduce the traffic problems

- Flyovers, Subways, Wing bridges, Automatic traffic signal systems, Traffic islands, etc. can be introduced at places necessary to reduce the traffic problems.

- Proper drainage facilities must be ensured.

- An outer and middle ring road have to be introduced to reduce the traffic problems in the city.

- New bus stands proposed at different places outside of city core area for accommodating buses coming from different areas so that traffic volume can be reduced in city centre.

- New truck terminal for the trucks to alight instead of entering the city core area will help to reduce the traffic problems.

22.10 DRINKING WATER

- Major source of water for public distribution is from Peechi reservoir with a yield of 50.5 MLD.

- 78.58% of people depend on domestic wells/bore wells for drinking water

- About 16.27% of people depend only on Water Authority/Municipal corporation to meet the domestic demand for water.

- 6.2% of people are found to suffer from water scarcity for more than 2 months.

- It has been assessed that the leakage level in the distribution system will be more than 30%. The maintenance of existing pipe lines have to be done to solve this problem.

- The water supply from KWA is found to be insufficient in meeting the needs of people. More projects have to be introduced for meeting the water demand of people in the city. Thrissur Municipal Corporation and 19 surrounding pachayat jointly implemented a scheme (100 MLD) for drinking water from Karuvannurpuzha with the aid of Central Government

- Sanitation methods have to be modified and treatment plants introduced for providing a hygienic situation in the city. A waste water recycling plant has to be implemented and the recycled water can be use for irrigation purposes.

- The capacity and working condition of the water treatment plant at Peechi has to be increased.

- There are about 33 ponds of varying size in Thrissur City which have to be protected and utilized to meet the water demand.

- Implementation of rain water harvesting for every house hold or ward wise will solve the problem of drinking water during summer.

22.11 SOLID WASTE MANAGEMENT

- Waste disposal is a major environmental issue in the city. Thrissur Municipal Corporation had been dumping Municipal Solid Waste (MSW) in Laloor area for the past three decades, but not functioning now.

- Thrissur city alone produce about 213 tonnes of unsegregated waste everyday. Even though 100% of households & 2 markets are covered through primary collection and door to door collection system, about 23% of the total solid waste produced daily is only collected by the Corporation workers.

- There are no effective steps for disposal of hospital waste which can cause contagious diseases. There is a biomedical treatment plant (BMTP) located at Palakkad and a vehicle from BMTP, Palakkad normally collects the waste from Thrissur also.

- A decentralized scientific system for waste disposal has to be introduced in Thrissur City so as to reduce the problems. Now corporation proposed a new solid waste treatment centre at Ollukkara village

- Environmental policies such as pay as you throw can reduce the cost of management and reduce waste quantities. Waste recovery can curve economic costs because it avoids extracting raw materials and often cuts transportation costs.

22.12 POWER

- Distribution of electricity in Thrissur is carried out by Thrissur Municipal Corporation licensee (in old Municipal area) and KSEB.

- Full electrification has been obtained in Thrissur City.

- The number of Domestic consumers is greater in Thrissur Municipal Corporation than any other LSGIs in Thrissur District.
- Percentage consumption is higher in commercial , industrial and other sectors than its percentage of connections

- Presently Ayyanthole and Viyyur sections are working as model sections in Thrissur City.

- Steps should be initiated from various fields to reduce the energy consumption.

- Steps should be taken to utilize the nonconventional energy sources to generate electricity.

22.13 EDUCATION

- The opportunities available for education and the abundance of educational institutions in Thrissur City have resulted in an increase in the literacy rate. Literacy rate of Thrissur Municipal Corporation is found to be higher than other nearby local bodies and Districts. Female literacy rate is also found to be the highest in Thrissur Municipal Corporation.

- The facilities for education in Thrissur City are above planning standards and people are attracted due to these facilities.

- The availability of different categories of professional college in Thrissur City shows the richness in education field.
- Percentage of students in government sector increases as they move to higher classes

- Arts and Science colleges, professional colleges, and teachers training colleges are sufficient in number for the coming plan year 2039.

- More schools for mentally retarded and autistic children.

- More government aided technical institutions have to be introduced for serving economically weaker section.

22.14 HEALTH

- Thrissur City is self-sufficient in the case of Allopathic Treatment facilities. There 13 health institutions working under government in Allopathic sector for the service of people in the city as well as district and state.

- Health facilities in the city are much higher than the planning standard provisions.

- Government has to impose laws to regulate the proper functioning of the private hospitals. Hygienic conditions have to be made available in the hospitals. Bio medical waste treatment plant has to be introduced in every hospital for treating their waste products in a safe way.

- Majority of diseases seen in the city are due to the unhygienic conditions of the surrounding area and contaminated water.

- Advanced and sophisticated investigation facilities should be made available in Government sector and the existing facilities and services should be strengthened so that people of all sectors are benefited.

- There are 4 Mother and Child Health centers working inside the city for mother and child welfare.

- The WCD Department with the ICDS and IWDS (Integrated Child Development Service and Integrated Women's Development Service) functions for the Empowerment, upliftment and welfare of Women and children under its various schemes.

22.15 HOUSING & SLUMS

- As per 2011 census, 98% of the houses are in either good condition or in livable condition only 2% of houses recorded as in dilapidated condition
- As per the socio-economic sample survey conducted in 2019, nearly 10% of households doesn't possess land ownership.

- As per the survey conducted by RAY cell of Thrissur Corporation in 2015, there are 41 slums within the city limits

- Slum Improvement Programmes for upgrading the services, amenities, hygiene and environment have to be introduced.

- Ensure supply of affordable land through approaches such as reservation of specified amount of land in new developments.

- Conversion of Paddy lands into small residential plots is seen at various location of the town as a part of continuing housing schemes of Govt. for backward classes, which should be minimized for the conservation of Paddy lands.

22.16 SOCIALLY BACKWARD CLASSES

- As per 2011 census, 7.85% of the people in Thrissur City are SC/ST and in Thrissur district it is 11.91% (354226).

- SC/ST people are mostly concentrated in wards Nedupuzha and Chettupuzha in the city. In these wards people depends on agriculture, construction, head load and such daily wages works as their income.

- The conversion of agricultural lands for other land uses and reduction in production activities have resulted in the lowering of income of people which finally resulted in the increase in number of substandard living conditions.

- Government has initiated, sustained, and refined various planning schemes to help the poor attain self-sufficiency in food production. The most important initiative has been the supply of basic commodities, particularly food at controlled prices, available throughout the country as poor spend about 80 percent of their income on food.

- As per Socio-economic sample survey 2019, about 20% of households belong to BPL category.
- Infrastructure facilities including safe drinking water, electricity, solid waste disposal system etc. should be provided in the BPL concentration areas.

- In order to have best results in the area of poverty alleviation, there has to be an integrated approach for poverty alleviation through concerted efforts of Government Departments and others.

22.17 ENVIRONMENT & DISASTER MANAGEMENT

- Kole lands contributing to the rice produce and paddy cultivation of the city are environmentally sensitive areas.

- Conservation of its geography, hydrology and biodiversity are crucial for the sustenance of our ecological balance.

- The Kole lands, to be protected without pollution is a necessity to conserve our ecosystem.

- Conversion of kole lands to other uses are to be stopped by proper measures from the part of government.

- Proper control on pollutants from industries and other sources have to be made with the enforcement of strict laws from government.

- Several studies conducted by various departments shows that Thrissur Municipal Corporation does not possess any threat in terms of landslide, previous instances of earthquake and not vulnerable to coastal hazards

- During Mega flood- 2018 nearly 40% of Thrissur Municipal Corporation area was flooded. The flooded areas were on the North and Western parts of the city which were mainly paddy fields according to the land use.

- Local body level vulnerability assessment as well as disaster management action plan has to be formulated and reviewed periodically for the effective preparedness, management and on-time response at times of disasters.

- On mapping the flood hazard zones of Corporation, it is seen that some parts of the Corporation falls within high hazard and medium hazard zones. Suitable regulations as mitigation measures are required in such zones.

22.18 GOVERNANCE

- The development activities under Thrissur City are carried out by Thrissur Municipal Corporation itself. The Kerala Municipalities Act, 1994, now governs all municipal functions in the Thrissur Municipal Corporation.

- Public health, waste disposal, maintenance of markets, maintain social welfare of people in the city, control all institutions in the area, Planning and providing urban basic services including water supply, sanitation, storm water drainage, Electricity and urban roads are the development activities coming under Thrissur Municipal Corporation.

- All cash received by the Municipal Corporation constitute a fund called the Municipal Fund under the Kerala Municipality Act 1994 (KM Act 1994).

- Own source revenue which includes taxes, duties, cess and surcharge, etc., rents for the buildings, and grants from government are the main source of income for the Municipal Corporation.

- From the analysis of the income collected and expenditure of Municipal Corporation, it can be found that the revenue collected has to be increased by so that the functions are cost effective. With the increase in expenditure with year, income collected is not found to have a similar increase.

- Taxes have to be revised and the collection has to be made in an effective way.

- E-sevasystem must be introduced for helping people.

- Adequate financial management and information system is necessary for effective revenue administration and cost control.

- Municipal corporations must be cost efficient and control expenditures within their reasonable limits.

CHAPTER 23
GOALS & OBJECTIVES



This Chapter describes the future direction, or vision, that the Municipal Corporation should follow as a result of the Master Plan. These vision principles described as goals is the general target to be reached through completing a series of tasks. These tasks named as objectives are designed to meet the goal.

23.1 GOALS

The development goals are formulated from the observations and findings derived from the analysis of the sectors. The Master Plan Goals will drive development alternatives and serve as the ultimate criteria for the selection of the preferred development option and other major decisions throughout the plan process. The goals of a plan not only direct the focus of the actual plan preparation, they are also the basis for regulation changes, for capital improvements program funding, and for future planning priorities. The goal of new Master Plan is to provide a comprehensive framework for physical Master planning within the city.

According to Integrated District Development plan, Thrissur City comes under Multifunctional zone. Thrissur-Kochi corridor traversing Thrissur City exhibits spatial concentration of secondary and tertiary activities and acts as a major generator of economic momentum. This zone will act as a service centre for the entire district. The proximity to Kochi and Coimbatore the major commercial hubs of the country, can develop Thrissur as the satellite city for these cities. The abundance of social infra-structure facilities like educational and health institutions also reveal that Thrissur Municipal Corporation is acting as a service provider to the district as well as the state. Being a **service contributor** the major emphasis must be given to the **development of infrastructure facilities for a healthy living condition ensuring richer and happier life to the people**. To make the city green, secure, hygienic and elegant for living. Provision of better transportation facilities, drinking water, solid waste disposal, etc. can enhance the development of the area.

Development of new infrastructural facilities and economic background leads to high population density and growth rate. As per our analysis, the city is capable to hold more population which necessitates the **generation of new job opportunities.** The presence of

95.67 % of Tertiary sector occupation structure shows the importance of service sector with the support of Trade and commerce.

Thrissur City is rich in heritage, cultural, religious and archaeological wealth and acts as cultural centre of district as well as the state. The above factors help in attracting tourists towards Thrissur. **Promotion of tourism by conserving the heritage and cultural sensitivity of the area by** introducing new innovative entertainment facilities possibly with land availability can promote tourism sector to a higher level. Provision of high standard accommodation facilities for attracting more and more foreign Tourists and also other facilities for local tourist will enhance the tourism sector.

The presence of Coimbatore - Kochi Corridor in the city shows the immense potential for development of Industries and Trade and Commerce. But as per our analysis, the city is reluctant to industrial and allied development. The optimum utilization of the available potential can promote the **economic growth of the area.**

Conservation of geography, hydrology and biodiversity are crucial for the sustenance of our ecological balance. Issues like solid waste disposal, filling of paddy lands and kole lands, air and water pollution have to be considered and proper **measures has to be adopted for the protection of our environment**.

Thrissur City is found to have almost all the facilities required for a satisfactory living. Educational facilities, health facilities, housing, drinking water, etc. are found to be in the required level. **Protection and balanced development of these facilities** for the future has to be ensured.

The major development goals are:

- Develop Thrissur City as a major service contributor of the state.
- Ensure healthy living condition with the provision of excellent infrastructure facilities.
- Boost up Trade and Commerce by decentralizing this activity from core area.
- Promotion of tourism sector by the conservation of rich heritage and cultural values.
- Ecological conservation and environmental protection.
- Ensure sustainable and balanced development of resources and facilities.

23.2 OBJECTIVES

The Master Plan objectives represent policy and planning guidelines for identifying and evaluating the development alternatives by more clearly defining the future needs of various sectors and maintaining focus throughout the planning effort.

As per our analysis the facilities for education in Thrissur City is above planning standards and people are attracted due to these facilities. Arts and Science colleges, professional colleges, and teachers training colleges are sufficient in number for the coming

plan year 2039. The availability of different categories of professional college in Thrissur City shows the richness in education field. Health facilities in Thrissur City are much higher than the planning standard provisions.

Thus Thrissur city is acting as the major service centre of the district as well as the state. **To enhance the service centre** to a superior level the available infrastructure facilities has to ensure utmost quality. **Provision of accommodation facilities, traffic and transportation, sanitation etc. is essential for developing this service sector.**

For reducing congestion in the city centre, restriction of vehicular traffic access to the core area and to the major inner transverse streets must be guaranteed. An outer and middle ring road have to be introduced to reduce the traffic problems in the city. Provide adequate on-site parking for all land uses in order to avoid any parking overflow from the city on to the local street network. Flyovers, Subways, Wing bridges, Automatic traffic signal systems, Traffic islands, etc. can be introduced at places necessary to reduce the traffic problems. Provide city bus services within the city to interconnect the various public transport modes servicing the site. **Ensure provision of congestion free traffic flow by proper traffic management supplemented by bypasses, fly over, subways, parking facilities, etc.**

Tertiary sector occupation pattern is considered as the economic backbone of Thrissur City. The city is considered as hub of jewellery and textile business in South India. The commercial activities are mostly concentrated on the Swaraj round, Kizhakkekotta, West Fort, High road, Sakthan market premises, Kokkalai, Chettiyangadi, North bus stand and Patturaikkal. About 95% of people are working under this sector and hence **Trade and commercial activities are to be developed in a more efficient and planned manner**. New ventures in this field are to be introduced to accommodate more employment facilities to cater to the needs of the residents of Thrissur City.

The increasing population density and growth rate indicates the economic stability of the area which results in attracting more people towards Thrissur. The current WFPR is 35.80% which is expected to increase by 2039. The proximity of two major commercial and industrial hubs along with the presence of Coimbatore - Kochi corridor points out the potential for industrial development. This shows the need for **increasing the economic growth by enhancing job opportunities and better socio economic environment**.

Thrissur is well known for its cultural and religious panorama. Thrissur has a large number of well-known temples including the Thiruvambady temple, Vadakkumnathan temple and Paramekkavu temple, as well as two famous churches, the Our Lady of Lourdes Metropolitan Cathedral and the Basilica of Our Lady of Dolours. There are a number of museums, art schools, and institutes, which are dedicated to preserving and promoting the rich cultural traditions of Kerala. **Conservation and effective utilization of the rich cultural and heritage background of Thrissur is to be done to enhance tourism**.

There are many natural areas in Thrissur having good potential. The potential of developing a circuit based destination promotion is much lacking in Thrissur. New Tourist circuits have to be developed by giving importance to the untouched areas of Thrissur. **Connecting pilgrim tourism spots with other centres for attracting more tourists**. Proper planning and Tourism Promotion can make Thrissur a popular Tourist destination.

Waste disposal is a major environmental issue in the city. The solid waste management and liquid waste disposals are the obligatory functions of Urban Local Bodies. **Making Thrissur a clean city by proper solid waste management** must be a goal. As per the standards the city generate solid waste at an estimated average of 500g/p/d. Since proper Solid waste disposal plants are not available for Thrissur city, a decentralized scientific system for waste disposal has to be introduced in Thrissur City so as to reduce the problem of waste disposal.

There exist vast tracts of paddy fields and kole lands in and around the city especially in northern and western parts of the city. Conserving wetlands as shields against scarcity of water, floods, environmental pollution, and distress of micro- climatic vagaries is important to maintain the ecological balance. The conversion of waterlogged wetland to dry land will create everlasting problems to both surface and groundwater including hurdles in drainage, flood control, replenishing groundwater. So **measures to minimize environmental pollution and ecological imbalance**.

Available agricultural lands in Thrissur City which comes around 32% of total land area are not utilized for productive activities. Lack of agriculture labourers has caused agriculture as an uneconomical sector. Mechanization in this field can help to a certain limit. Use of high-yielding crop varieties, harnessing advanced technologies, use of bio fertilizers, proper maintenance of the irrigation facilities, etc. will help to increase the outcome from agriculture. **Agricultural activities must be promoted by effective utilization of agricultural labour along with the introduction of agro based industries, promotion of horticulture, etc**.

Health facilities, education facilities, drinking water, power, housing, etc. in Thrissur City are much higher than the planning standard provisions. Ensure optimum utilization of land and other natural resources which are perishable. We must **achieve spatial distribution of facilities and optimum use of resources for a sustainable development**.

The major development objectives are

- **To enhance service sector with the provision of superior infrastructure facilities**
- **To ensure provision of congestion free traffic flow by proper traffic management supplemented by bypasses, fly over, subways, parking facilities, etc.**
- **To decentralize the commercial activity zone from the core area in a planned manner for better development and congestion free area**
- **To guarantee the growth of trade and commerce by proper arrangement of the Infrastructure facilities**

- **To increase the economic growth by enhancing job opportunities and better socio economic environment**
- **To promote industrial activities by using the available potentials**
- **Conservation and effective utilization of the rich cultural and heritage background of Thrissur is to be done to enhance tourism**
- **Connecting pilgrim tourism spots with other centres for attracting more tourists**
- **Making Thrissur a clean city by proper solid waste management and proper drainage system**
- **Measures to conserve ecologically important areas and minimize environmental pollution**
- **Agricultural activities must be promoted by effective utilization of agricultural labors**
- **To achieve spatial distribution of facilities and optimum use of resources for a sustainable development**
- **To incorporate solutions for hazard mitigation and resilience.**

CHAPTER 24
DEVELOPMENT POLICIES & STRATEGIES



This chapter includes the policies and strategies derived from the sectoral and settlement studies, spatial analysis and development concept.

Strategies and policies are closely related. They provide direction for the organization and form the basis of operational plans. Strategy refers to the determination of the long-term objectives of an enterprise and the adoption of courses of action to achieve these aims, while policies are concepts that guide the thought processes and behavior of managers when they make decisions. The aim is to provide an efficient and effective use of land in the public interest in order to meet the identified needs of the area, whilst also having regard to national and regional planning guidance.

24.1 GENERAL DEVELOPMENT POLICY

To develop Thrissur into a prominent service centre and an economically self-sustained City with strengthening of trade and commerce, tourism, industrial and agricultural sectors. To generate a process of spatial development which optimizes the utilization of resources, reduces regional, spatial and economic imbalances, protects the environment and maintains an ecological balance.

Considering the importance attached to functional and development demand of different locations, the City is divided into 7 policy development zones such as Core zone, Promotive urban development zone, Urban development zone, Institutional zone, Economic development zone, Agriculture zone and special zone-Hillock area. Core area further sub divided into heritage zone and two sub zones namely as Commercial core zone and Mixed use core zone with respect to the developmental demand as shown in figure 24.1.Sector wise development policies and strategies are discussed below.

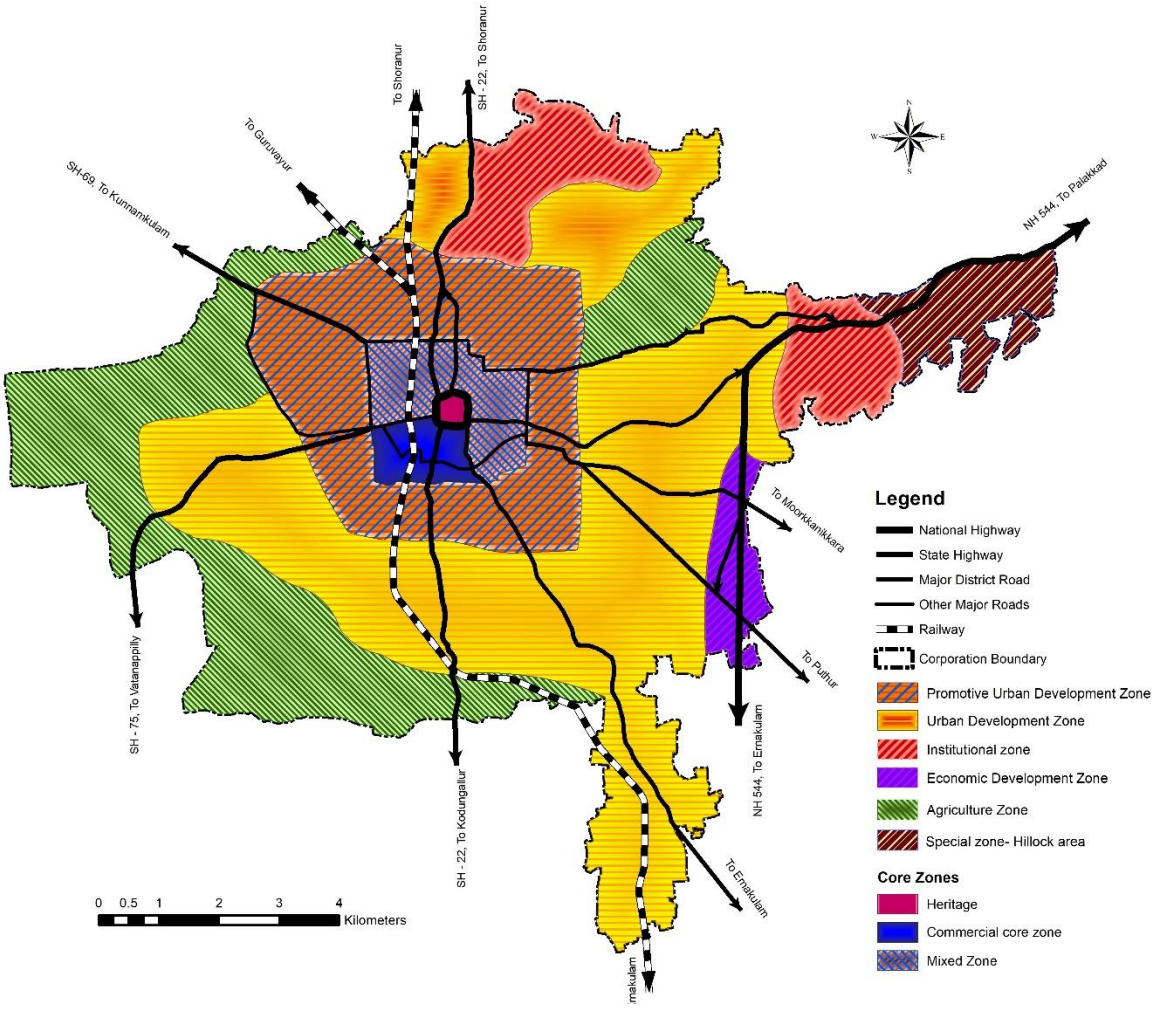


Fig 24.1 Developmental Policy zone

24.2 SECTORAL DEVELOPMENT POLICIES & STRATEGIES

24.2.1 TRADE & COMMERCE

Trade and Commerce is considered as the economic backbone of Thrissur City and it is considered as hub of jewellery and textile business in South India. The concentration of commercial centers in the core area is the major advantage and disadvantage of Thrissur City. Decentralization of Commercial centre along with the provision of adequate infrastructure has to be ensured.

- Ensure adequate infrastructure facility for the growth of commercial activities in core area
- Adequate parking facilities
- Pedestrian linkages between significant locations within CBD
- Waste disposal made effective
- Road network connecting all commercial centres

24.2.2 EDUCATION SECTOR

Thrissur acts as the educational hub for the District. Thrissur City is blessed with the presence of various categories of professional institutions. But the infrastructure facilities in Government institutions are found to have many defects which have to be solved. The abundance of educational facilities is attracting people from inside and outside of the district. Therefore basic infrastructure facilities of the city have to be improved for the development of this sector. Thrissur with its unique skills and traditional knowledge coupled with skill development programmes has immense potential to make learning accessible to all sections of the society and hence develop into a learning city with equal opportunities for all. Thus, Thrissur with its vibrant and green core, its existing socio-cultural fabric and prominent institutions has the capacity to evolve into a full fledged learning city.

24.2.3 HEALTH

Thrissur City is acting as the major health centre of the district. Even though Health facilities are up to satisfactory level, certain anomalies have to be removed.

- Allopathy, Ayurveda and Homeopathy methods to be coordinated
- Introduce advanced and sophisticated investigation techniques
- Ensure proper infrastructural facilities for all hospitals
- Bio medical waste treatment plant to be introduced in every hospital
- Awareness programs to be conducted by government departments

24.2.4 TOURISM & HERITAGE

The tourism industry plays an important role in the economy of Thrissur and City is rich in heritage, cultural, religious and archaeological wealth and acts as a cultural centre of the district as well as the state.

- Focus on domestic tourism as a major driver of tourism growth
- Develop integrated tourism circuits based on Thrissur City heritage, culture and pilgrims
- Allow sufficient funds to ensure heritage conservation and protection
- Promote cultural and heritage tourism
- Ensure adequate infrastructural facilities for tourists
- Develop water ways like Vanchikulam boat jetty
- Tourism facilities like amusement park, Botanical garden etc. to be introduced possibly with land availability.

24.2.5 SOLID WASTE AND SANITATION

Solid waste Management is the major issue faced by the authorities in Thrissur Municipal Corporation. Strictly adhesive policies and strategies are required for managing solid waste.

- A decentralized scientific system for waste disposal has to be introduced
- Pollution control measures ensured in factories and industries
- Comfort stations to be constructed and maintained
- Ensure proper drainage
- Bio medical treatment plants to be enforced in hospitals
- Market waste treatment to be done separately
- Bio gas plants to be introduced
- Awareness programs to promote good sanitation and waste management practices must be taken up

24.2.6 TRANSPORTATION

Congestion and over-stretched transport systems are making travel more time-consuming and often unsafe and, as a result, negatively impacting the urban efficiency. An effective road network should be formed and maintained connecting all the nodal points of the City.

The success of the plan for city mostly depends on the well planned and scientifically designed pattern of road networks. This master plan propose to provide the system of link road connecting different hierarchy of roads, with the view to eliminate considerable traffic that are emanating from National Highways and major District roads, as well as the long distanced inter urban traffic. Introduction of effective public transport system is essential to reduce the abundance of private vehicle in core area must be envisaged.

- Signalizing road intersections
- Provide adequate parking spaces to remove traffic bottle necks
- Establish a planned road network allowing inter connectivity of all important areas
- *Possible widening of existing roads in accordance with availability of land to meet the demand in future*
- Design to bypass traffic from the CBD area
- Ensuring proper maintenance of roads
- Enhancing public transport system

24.2.7 AGRICULTURE

From the existing land use analysis of Thrissur City, it was estimated that about 33.42% of the land is under agricultural sector. The agricultural areas are found to exist in the outer fringes of the City which is to be safe guarded from the urban growth of the CBD area. Thus agricultural sector can be utilized for developing an economic base by exploiting the available land in the City. Agricultural sector and animal husbandry can be made to work interrelated which will enhance the development of both sectors.

- Integration of agriculture and animal husbandry sectors in some areas for better products
- Establishment of marketing for products
- Increase outcome with commercial crops like coconut, rubber, areca nut, etc.
- Planned use of irrigation facilities
- Introduction on modern techniques and machinery
- Efficient use of Agriculture labourers

24.2.8 GOVERNANCE

To achieve all policies, it is essential to strengthen urban governance and management through greater decentralization and enhanced accountability, and establish appropriate delivery mechanisms and regulatory frameworks for various urban infrastructure and services.

- Property tax administration needs to be improved
- Tax coverage and collection to be made effective
- The potential of advertisement tax also needs to be better exploited
- Private Public Partnerships will reduce the government burden on expenditure, mainly capital

CHAPTER 25
DEVELOPMENT CONCEPT



This chapter explains about the Development Concept evolved out from the development objectives formulated from the findings of sectoral analysis based on the problems and potentials existing in the area. The development concept of Thrissur City is detailed out here.

Analysis of various sectors clearly points out the development of Thrissur City as a first order settlement and service contributor of the district, with an aspiration to develop as the major commercial, educational and tourism hub of the state with the enhancement of infrastructure facility. The potential for the development of industrial sector due to the presence of major corridor has to be encouraged for better economic growth.

From the land use analysis it is certainly seen that agriculture lands are abundant in Thrissur city so that an eco- friendly development without affecting the ecologically important areas has to be considered. The thrust in urban development is keeping the agriculture land as fallow land and then leading to threshold of land conversion to meet the urban demand. The development impact of other sectors must not affect the environmental perceptive of the area. But the suitable change in land use has to be implemented for the developmental demand.

The geographical location of Thrissur City is in the midland regions of Kerala. It is situated around a hillock which automatically drains out rainwater but the interventions created by human beings are generating water logged areas here and there without proper channelization of drain water. The major portion of the area is highly suitable for urban development activity. The development concept is evolved out from the spatial and social structure of Thrissur City.

25.1 EXISTING SPATIAL STRUCTURE

Spatial structure refers to the characteristics of the existing fabric of the city. It relies on the organic relation between social, physical and economical environment. Folk

(Organism), Work (Function) and Place (Environment) are the basic tools to identify the existing fabric of the city.

FOLK (organism) - **Social** aspect

WORK (function) - **Economic** aspect

PLACE (environment) - **Physical** aspect



Fig. 25.1 Tools to identify existing fabric of city

We analysed the interaction between man/society to nature & land in terms of social, physical, economical parameters and try to bring out a spatial representation for each.



Fig. 25.2 Parameters for deriving spatial structure

The core area of Thrissur City is a multi-functional zone, equally carrying all major land use activities showing the capability of attracting people for various purposes to City centre, creating more traffic congestion. Therefore the development in this area has to be regulated in a way to decongest the City centre. Decentralization of commercial activity can prevent the rush of people towards the core area. Redevelopment and retrofitting of the central old town area can be addressed for enhancing the urban character of the locale.

Commercial, Public & semi-public, residential and tourism activities are equally spread over the core area of the city. Agriculture land use found in the Western and eastern periphery of the city are the major sensitive areas which are under threat of land conversion. The presence of Kole lands, paddy fields, water bodies are acting as ecologically sensitive areas of the city. The residential and commercial areas are concentrated along the major roads whereas intense agriculture areas are seen away from the major roads. Industrial activities in the city is comparatively less and concentrated mainly in wards Edakkunni, Olari and Kuttanellur. On the eastern side of the city a vast area is covered with hillock. The city also shows prominence in education and health sector by the sufficient availability of such facilities. In general, the city acts as a higher order service provider in the district. Spatial Distribution of all these activities influence in formulating a development vision for Thrissur City.

Road network of Thrissur city is based on Ring and Radial Road pattern. Radial pattern of road network are seen in Thrissur City centre where Thekkinkadu maidan is acting as the focal point. Since Thrissur is located at the centre of Kerala state, it is blessed with inter and intra state connectivity. Three state highways and the National Highway 544 is passing through this area. Widening of these roads is inevitable for a smooth traffic flow. Most important concept of traffic and transportation is to divert the major traffic away from the central area. Therefore outer and peripheral ring roads are proposed to reach various places without touching the core area. The core has to be free from heavy traffic flow and therefore promotion of advanced public transport system has to be introduced to avoid all sorts of deficiencies in parking and the occurrence of traffic congestion. Thus the concept for road development is to complement the existing Ring and Radial pattern as shown in fig 25.3. Outer rings are proposed to decongest the core and these ring roads helps in directly taking the passengers and goods from outer places to their destinations without entering in to the core.

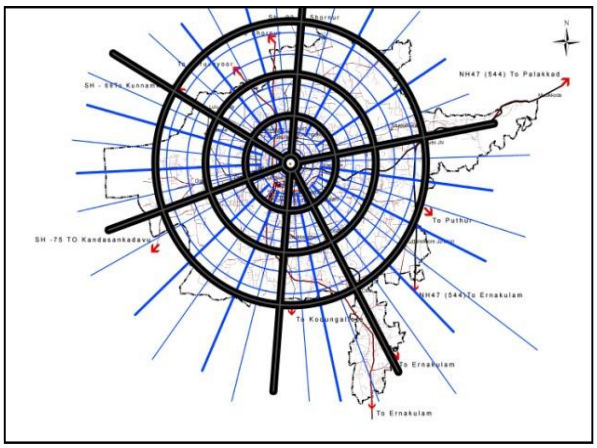


Fig 25.3 Concept of Road Development

The spatial structure of Thrissur city is evolved out by integrating all the factors explained above. Thus, the existing spatial structure of Thrissur city, derived out by

considering the existing activity pattern, existing connectivity and existing commercial nodes is shown in figure 25.4.

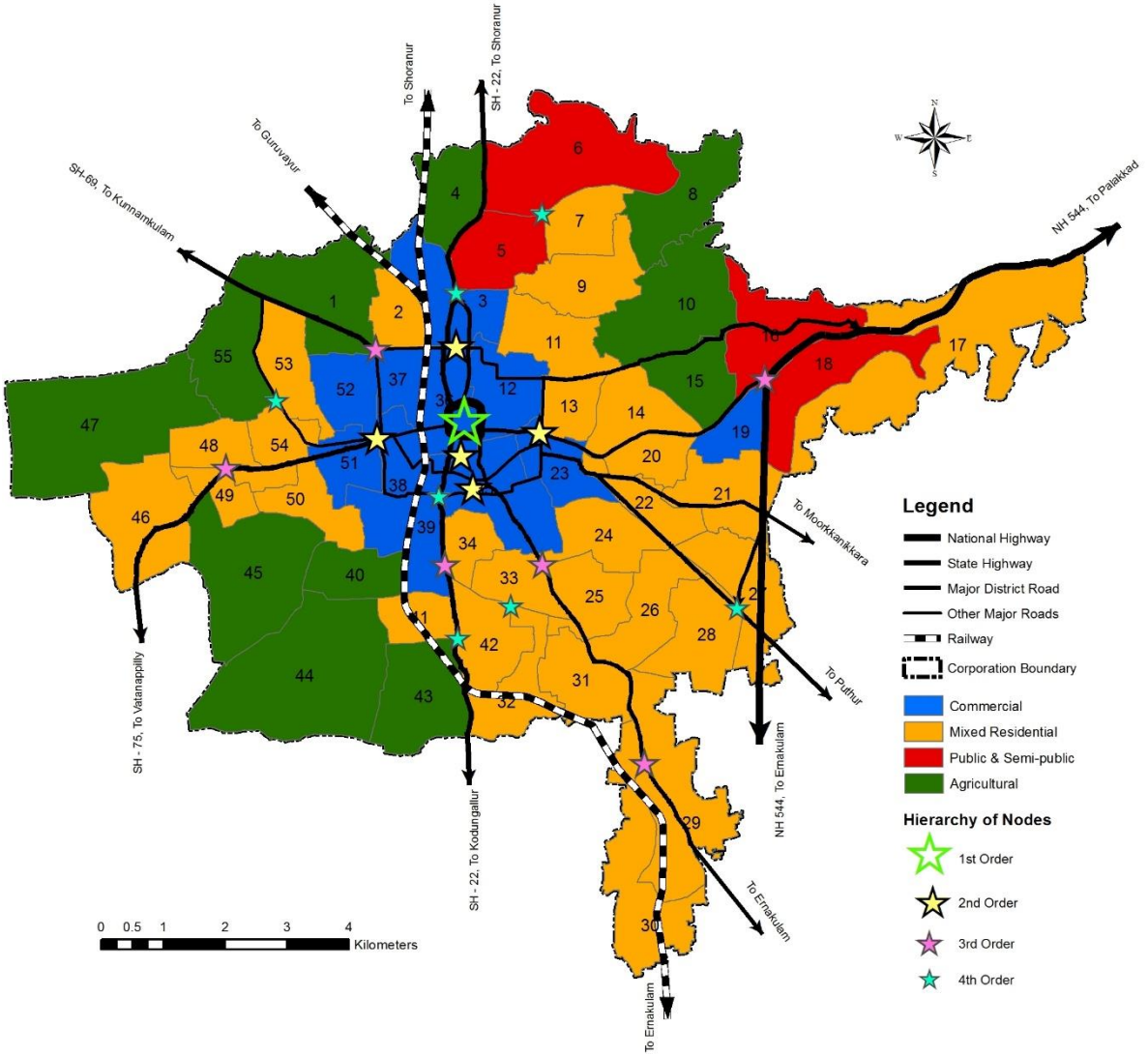


Fig 25.4 Existing Spatial structure

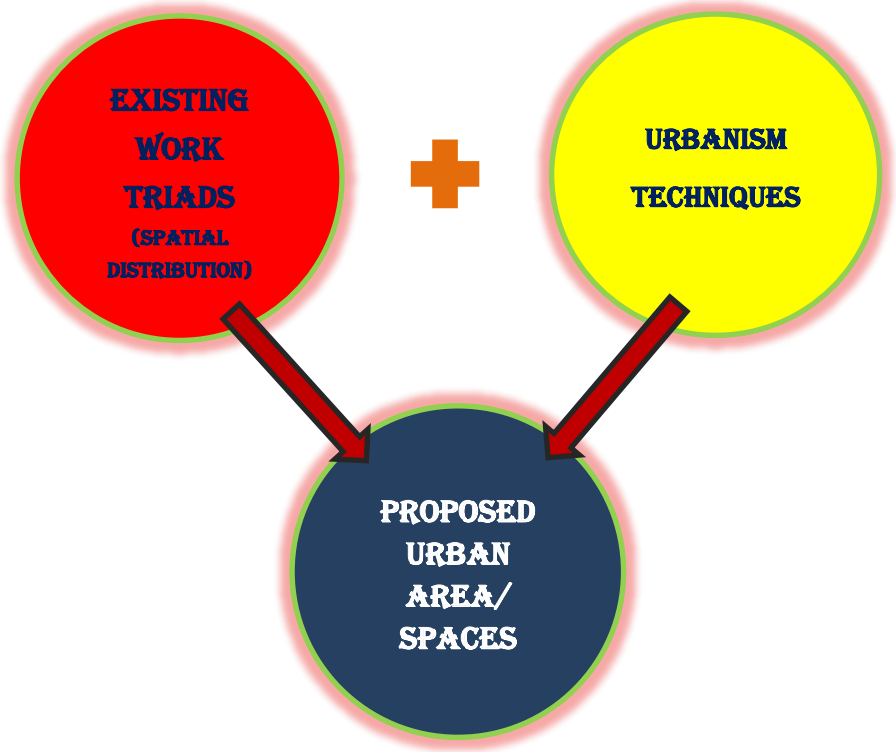
25.2 DEVELOPMENT CONCEPT

Based on the evaluation of spatial distribution of land uses, major road pattern and spatial structure development concept is evolved. While formulating a vision for future development, apart from considering various quantitative aspects, due consideration may be given to qualitative aspects of development. These Qualitative aspects are the urban characteristics that can be identified/felt by the people and which improve the quality of life.

This master plan is formulated under the Centrally Sponsored Scheme of AMRUT (Atal Mission for Rejuvenation and Urban Transformation). As the name suggests its major thrust is to have an urban transformation by means of improving the quality of life. A city is not just a place to live, but a complex and dynamic system that unites a certain community of people and is called upon to ultimately improve the quality of life of every person. It is a

transformation from city to an urban space having quality. The term Rejuvenation means the Renovation/Renewal of a city considering existing facts based on Folk, Work, and Place

Considering all these, the main concept for the future development of Thrissur city is to convert the existing city spatial morphology and its all assets to an Urban phenomenon spaces for providing 'Quality of life'.



The concept of 'new urbanism' can be introduced in the city which will result in urban rejuvenation and transformation. New urbanism techniques that are adaptable to our context can be injected by piecemeal approach in which general policies and procedures are applied to a precinct of a city in order to steer development in specific directions.





CITY

URBAN AREA/SPACES

FOR QUALITY OF LIFE

25.2.1 PRINCIPLES OF URBANISM



Walkability & Connectivity



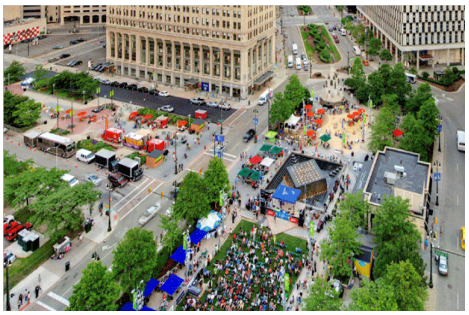
Mixed-Use & Diversity



Quality Architecture & Urban Design



Transit Oriented Development



Place making

QUALITY LIFE



Green areas

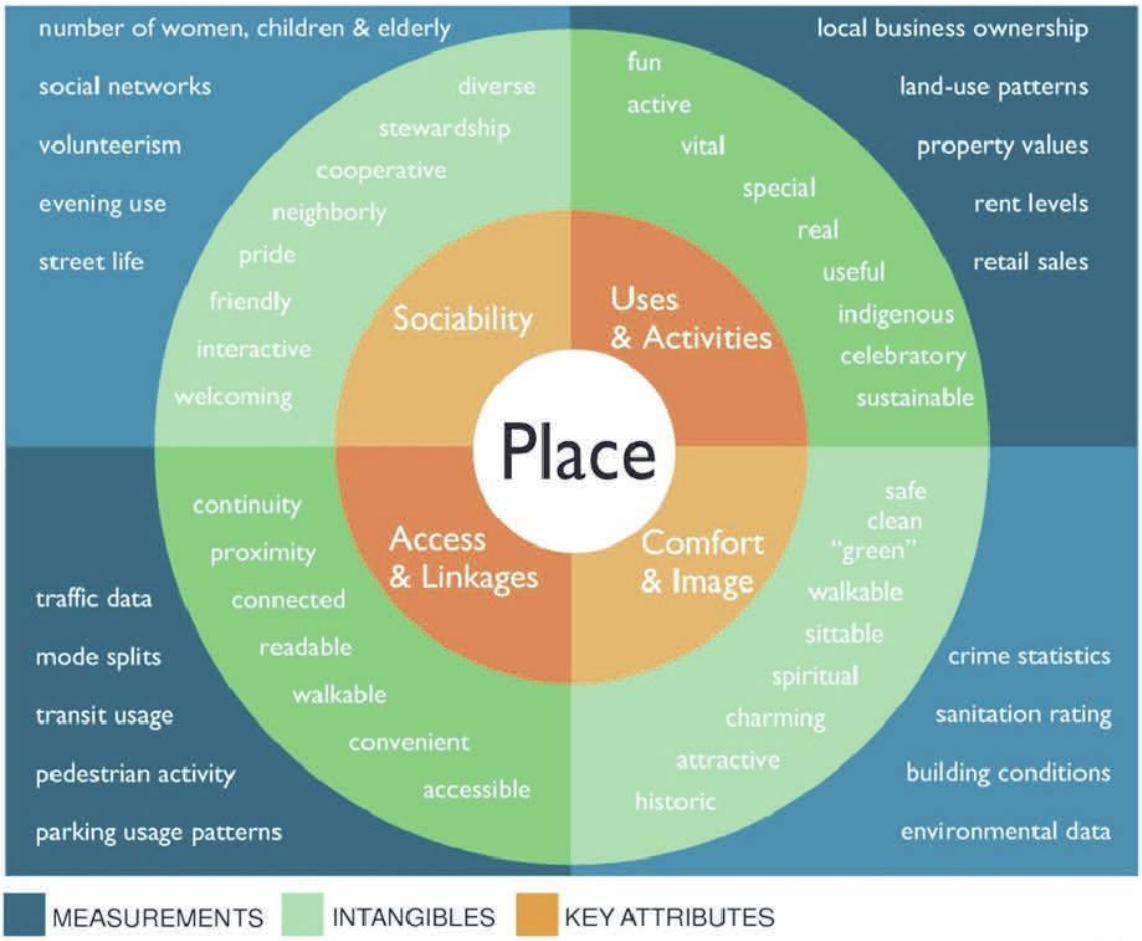


Sustainability



Traditional Neighborhood Structure

25.2.2 MEASURES OF URBANISM



25.2.3 SPONGE CITY



In present times with the inevitable global warming which compromises the environment's natural ability for restoration, extreme climatic changes have been leading up to an increase in the frequency of occurrence of disasters. In contour regions, water flows from ridges to valleys, thus increasing the potential for damage in floodplains where habitable structures are present. In flood-prone regions, it's fundamental to build structures that can and will withstand floods. The proper materials and construction techniques required to pull off proper protection to the property and especially the lives of living beings in and around the structures are of extreme importance.

A sponge city is an urban area which has been designed to cope with excess rainfall using a variety of techniques. Existing urban areas often have to deal with flooding caused by



heavy rain, high tides or swollen rivers, and sponge city design can mitigate or prevent such events by providing the area with the ability to naturally absorb the water.

The term “sponge cities” is used to describe urban areas with abundant natural areas such as trees, lakes and parks or other good design intended to absorb rain and prevent flooding.

Integrating sponge city requirements into the planning of urban development land not only provides a practical approach to better balance storm water management indicators and the land utilization aspects of urban planning, but also can achieve a reasonable tradeoff between the development of individual districts and the environmental protection of the whole urban watershed. Fig. 25.5 shows the components of sponge city approach.

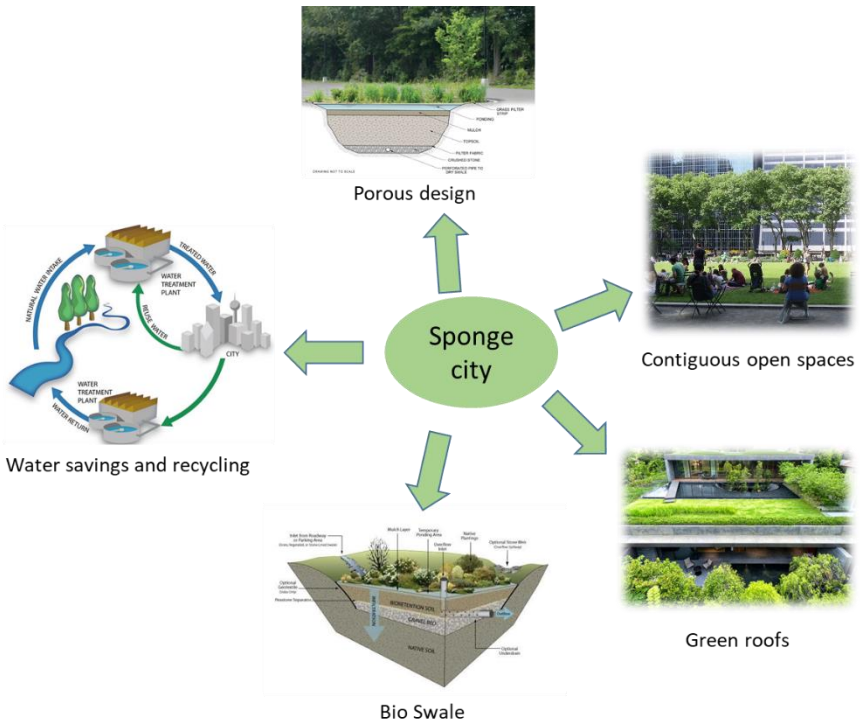


Fig. 25.5 Components of Sponge city approach

There is a wide range of benefits associated with the implementation of sponge cities. These include:

- More clean water for the city
- Reduction in flood risk
- Lower burdens on drainage systems
- Greener, healthier, more enjoyable urban spaces
- Enriched biodiversity

Disaster management in the present context is very essential in urban planning. It is important that the development of new infrastructures in an urban area should ensure the safety of structures and protect beings from calamities. These developments should be equipped with appropriate measures for dealing with such extremities. Floods are one of the most common natural disasters that are extremely deadly to living beings and property.

Flood risk map based on the flood return probability map of Kerala State Disaster management Authority is shown in figure 25.6 Some of the areas in the North west and South west regions in the Corporation are flood prone areas and most of these are active or non-active paddy which acts as catchment area for storm water. The flood prone areas demarked in the city are high risk and moderate risk areas. These areas need mitigation measures/ guidelines to prevent adverse effect of flood and reduce human intervention considering vulnerability level of each ward.

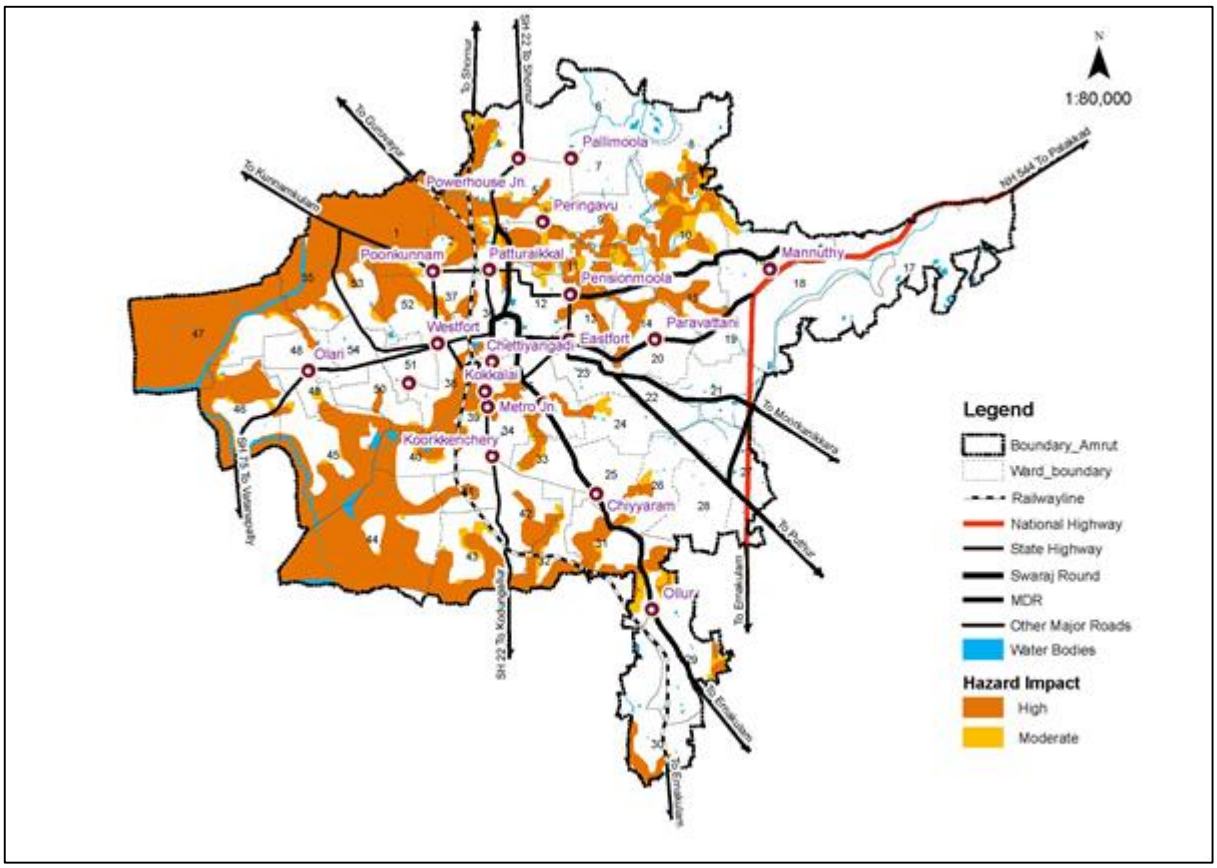


Fig. 25.6 Flood hazard zonation map of Thrissur Corporation

The projects proposed in these areas should be developed in concurrence with the Sponge city concept with proper flood mitigation techniques like Water retention structures, rain water harvesting, proper drainage, use of permeable materials for paving etc.

25.2.4 LEARNING CITY

Thrissur city is one of the 77 learning cities in UNESCO Global Network of Learning Cities. The UNESCO Global Network of Learning Cities is an international policy-oriented network providing inspiration, know-how and best practice. The initiative on learning cities developed by the UNESCO Institute for Lifelong Learning defines a learning city as follows:
A Learning City is a city which effectively mobilizes its resources in every sector to

- promote inclusive learning from basic to higher education;
- revitalize learning in families and communities;
- facilitate learning for and in the workplace;
- extend the use of modern learning technologies;
- enhance quality and excellence in learning;
- foster a culture of learning throughout life.

In so doing it will create and reinforce individual empowerment and social cohesion, economic and cultural prosperity, and sustainable development.

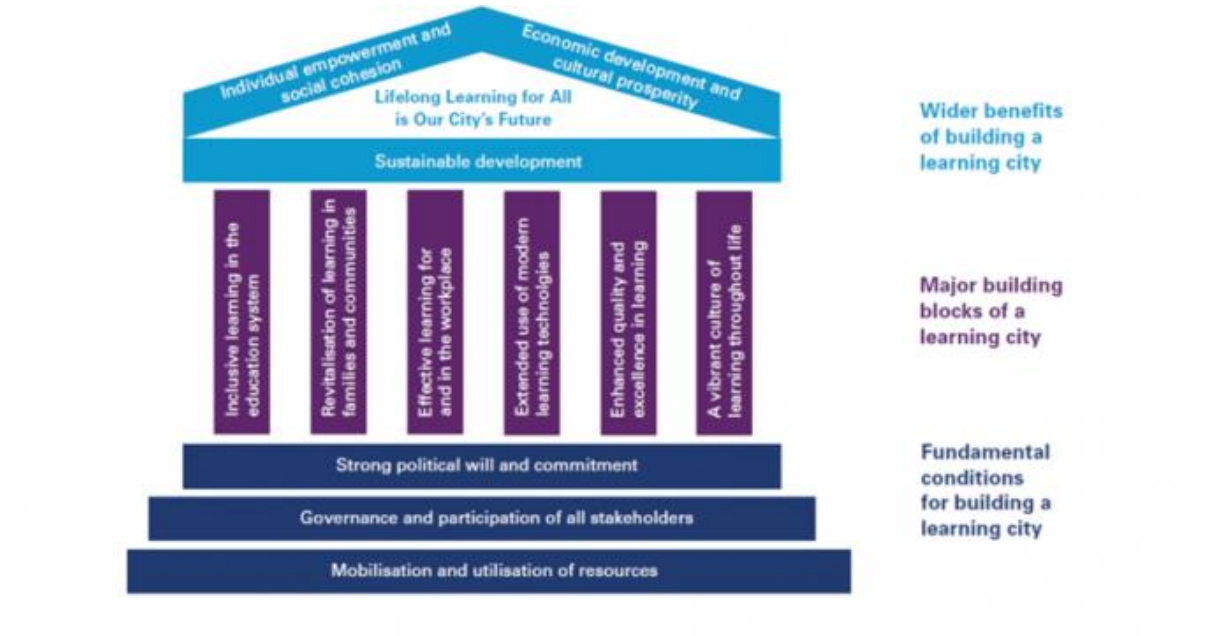


Fig.25.7 Key Features of Leaning Cities

Thrissur city is blessed with opportunities arising out of its spatial planning and good connectivity turning it into one of the major business hubs of Kerala. At the same time, Thrissur has a very rich cultural and infrastructural base for becoming a learning city which is evident from the study on the existing scenario within the city where there are good opportunities for education at all levels including schools, colleges and university. Thrissur offers a wide range of choices and opportunities in the field of education, be it fine arts, law, engineering, medicine, agriculture, Thrissur is home to one of the best institutions in the state that deals with the respective fields. One of the important facts about the educational sector of Thrissur is that it is capable of reaching out to people from different walks of life and it provides ample opportunities for financial and intellectual development of the young generation of the region.

Co-opting the other disciplinary knowledge from institutions help in the creation of vibrant learning ecosystem and community learning. These institutions are easily accessible from Thrissur corporation and aid in the advancement of inclusive learning opportunities for all. Thrissur with its unique skills and traditional knowledge coupled with skill development programmes has immense potential to make learning accessible to all sections of the society and hence develop into a learning city with equal opportunities for all. Thus, Thrissur with its vibrant and green core, its existing socio-cultural fabric and prominent institutions has the capacity to evolve into a full fledged learning city.

25.3 EVOLUTION OF CONCEPT

Based on the evaluation of spatial distribution of land uses, major road pattern and spatial structure development concept is evolved. Due to the emergence of educational and health institutions Thrissur is acting as a major Service Contributor city for the region. Thrissur is showing an increasing growth in commercial sector which leads to attracting more people. Trade and Commerce has gained major preference from ancient time and attracted many number of commercial activities within the Thrissur City. Commercial activities are found to be concentrated mainly in the core area, and the rest are scattered around the core area. Hence providing more space for commercial activities away from core will decentralize the intensity of this activity in the core area as well as improve the economic status and make Thrissur as a major commercial hub of state. The decentralization will also pave way for rejuvenation schemes in the now congested core commercial areas.

Thrissur city consists of 9.24% of Public and semipublic land use which includes educational and health institutions along with all other public activities. Thrissur city having the unique feature of large public areas shows its importance in service sector. All existing public and semipublic institutions are proposed to be retained in their existing locations.

Tourism is an important tool for the development on account of its potentials for generating income and employment. The tourism sector in Thrissur city is mainly depending on the religious and cultural tourism. The strategic location of the city in the district and the state as well as its good connectivity helps in the development of these sector in the city.

Agricultural lands, mostly wet agriculture is also a prominent land use in Thrissur city. Kole lands and wetlands are present in the city which has to be conserved for environmental protection. By applying the sponge city design , these lands can act as areas with the ability to naturally absorb the water and as retention areas.

Due to the presence of Coimbatore Kochi economic development corridor, Thrissur city has a potential for industrial development. The city has maximum concentration of agro based, food processing, chemical, and textile, rubber and service sector. Industries can provide job opportunities to the local people of the city. Taking advantages of this potential, the existing industrial units in the city could be expanded.

By integrating various sectoral studies and spatial structure, the development concept for Thrissur city is evolved. The ceremonial '**Ring & Radial pattern**' extended and superimposed with **Mixed use & Diversity** for bringing out the possibilities of '**New Urbanism**' in the city and is schematically shown in fig 25.8.

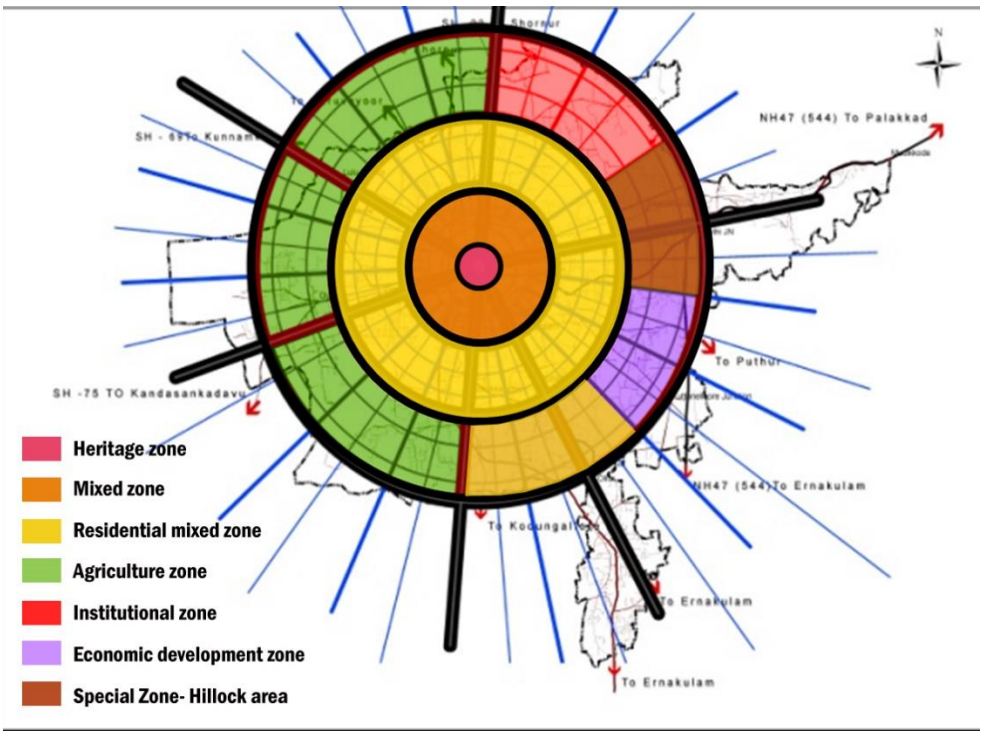


Fig 25.8 Schematic representation of development concept for Thrissur city

The central area consisting of Vadakkumnathan Temple and Thekkinkadu Maidan is considered for heritage protection. Surrounding this is the old city area constituting various activities such as commercial, residential, public & semi-public as well as recreational activities. An approach for redevelopment, rejuvenation and retrofitting of these areas is required. So in order to promote this, this area is proposed to be developed as a mixed core zone. Localised plans can be evolved for designing the core area considering aspects like Heritage aspects, Walkability, Connectivity, Urban design, Green open spaces, Universal accessibility, Parking, Informal sector etc. Surrounding the core zone, areas with a higher concentration of residential activities could be seen. Hence such areas are envisaged as 'residential mixed' zones. Large land parcels with public & semi-public use as well as agricultural use could be seen towards the periphery of the city. Hence, such areas are demarcated as institutional and agricultural zones. In addition to this, NH-544 corridor has a potential to develop as an economic corridor as mentioned in the study part. So the area along the NH-544 corridor can be regulated as economic development zone in southern arm and special zone considering ecological aspects in the eastern arm.

As per the above zoning, the development concept thus derived, is shown in fig.25.9. The city is divided into 7 major development zones such as:

- Core zone(Heritage, Mixed core and Commercial core zones)

- Promotive Urban development zone (Mixed zone)
- Urban Development zone(Residential Mix zone)
- Economic development zone
- Institutional zone
- Agriculture zone
- Special zone- Hillock area

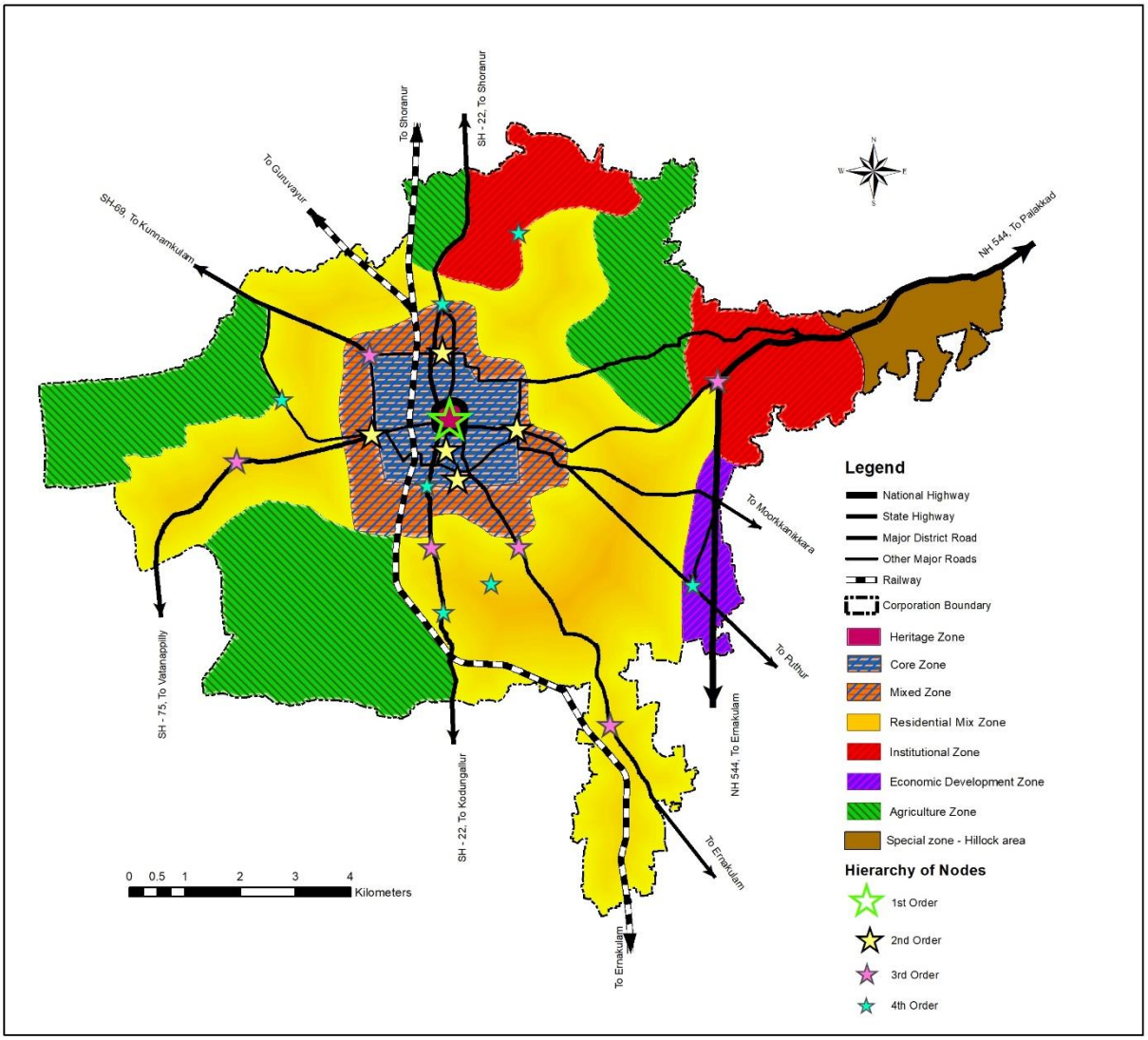


Fig 25.9 Development Concept for Thrissur city

The development zones are delineated by grouping the areas possessing similar major land use and economic activity pattern as per the spatial analysis. Proposed land use and zoning regulation has to be evolved from this Development concept. Based on the hazard – vulnerability analysis city area has been zoned into high and moderate risk zones. The development of the area is to be controlled based on the zonation.

CHAPTER 26
POPULATION PROJECTION



This chapter gives the projected population for the plan year of Master Plan and the projected requirements as per the standards.

26.1 POPULATION PROJECTION

Population projection is usually done by understanding the pattern of population growth in the past and assuming the same pattern will continue in the future, the present population is projected to the desired future period. Population projection is based on every 10 years like 2021, 2031 and 2041 and so on. Even though plan year is 2039, here requirements are projected to 2041 in order to complete a cycle of 10 years.

26.1.1 POPULATION PROJECTION (TREND)

Population growth of an area depends on numbers of births, death, in migrants and out migrants over a time period taken for the population projection. If one can predict the exact future values of all these factors, population projection of that area can be done very accurately.

26.1.1.1 Arithmetic Method

In this method, the difference between the populations of a place at a given interval is taken and added to later date to get the future population with the same intervals. This method is not accurate since it does not envisage any change in the growth rate during the period of study.

$$P_n = P_o + rn$$

Where P_n is the population in the nth year, P_o is population of the base year; **r** is annual increase of population, **n** number of years. Population of Thrissur City during 1981, 1991, 2001 and 2011 are 263584, 292963, 317526, 315596 respectively.

Year	Population	Increase in Population(Pn-Po)	$r=P_n-P_o/10$
1971	251736		
1981	263584	11848	1184.8
1991	292963	29379	2937.9
2001	317526	24563	2456.3
2011	315596	-1930	-193
	Total	63860	6386
	Average	15965	1596.5

P_{2021} = 315596 + (1596.5 x 10) = 331561
P_{2031} = 331561 + (1596.5 x 10) = 347526
$P_{2041=}$ 347526 + (1596.5 X 10)= 363491

26.1.1.2 GEOMETRIC INCREASE METHOD

In this method the ratio between decadal populations are taken as common and the least available population figure multiplied by the common ratio as the projected population total for the period after an equal interval. This method does not envisage any change in population due to social, political or economic behavior of people.

Year	Population	Increase in Population	r
1971	251736		
1981	263584	11848	1.05
1991	292963	29379	1.11
2001	317526	24563	1.08
2011	315596	-1930	1.00
	Total	63860	4.24
	Average	15965	1.06

Population for 2021 = 315596 x 1.06 =	334532
Population for 2031 = 334239. x 1.06=	354604
Population for 2041 = 354604 x 1.06=	375880

26.1.1.3 INCREMENTAL INCREASE METHOD

In this method, the average increase / decrease during the past decades are taken and the average incremental increase is added for each consecutive decade. This method is somewhat reliable since it possesses the growing trend of the past few decades.

Year	Population	Increase in Population	Incremental Increase
1971	251736		
1981	263584	11848	
1991	292963	29379	17531
2001	317526	24563	-4816
2011	315596	-1930	-26493
	Total	63860	-13778
	Average	15965	-4592.66667

Population at the end of decade $P_n = P_0$ + (Average increase + Incremental increase x No. of decade).

Population for 2021 = 315596 + (15965+ -4592.66667 x1)
= 326968
Population for 2031 = 315596 + (15965 +-4592.66667x2)
= 322376
Population for 2041 = 315596 + (15965 +-4592.66667x3)
= 317783

26.1.1.4 DECREASING RATE OF GROWTH METHOD

This method analyses the decrease in percentage increase during the past decade and predicts the future population taking the average of the decrease. This method envisages the percentage increase during decades and decrease in decadal increase.

The population growth rate of 2021, 2031 and 2041 are calculated assuming that the same percentage of decrease in population growth prevails as that of 2011 for the succeeding three decades. Based on the population growth rate calculated, the population of the City is projected for 2021, 2031 and 2041.

Year	Population	Increase in Population	Percentage increase	increase in %
1971	251736			
1981	263584	11848	4.71	
1991	292963	29379	11.15	6.44
2001	317526	24563	8.38	-2.7616372
2011	315596	-1930	-0.61	-8.9921595
	Average	15965	5.91	-1.7714474

Population at the end of, 2021, 2031 and 2041 will be

Year	Net % Increase in Population	Population = (P_0 + net % increase)
2021	(5.91-¯1.77) = 7.68	315596 + (7.68 x 315596/100) =339830
2031	(7.68-¯1.77) =9.45	339830 + (9.45 x 339830/100) = 371944
2041	(9.45-¯1.77) =11.22	371944+ (11.22 x 371944/100)=413676

26.2 PERSPECTIVE POPULATION FOR THE YEAR 2021, 2031 AND 2041

The perspective population is arrived by taking the average of all the population projections through the various methods discussed above.

Table 26.1 PROJECTED POPULATIONS FOR 2041

Sl No	Method	Population in 2021	Population in 2031	Population in 2041
1	Arithmetic method	331561	347526	363491
2	Geometric method	334532	354604	375880
3	Incremental increase method	326968	322376	317783
4	Decreasing rate of growth method	339830	371944	413676
	Average	**333223**	**349112**	**367708**

26.3 PROJECTED POPULATION OF THRISSUR CITY

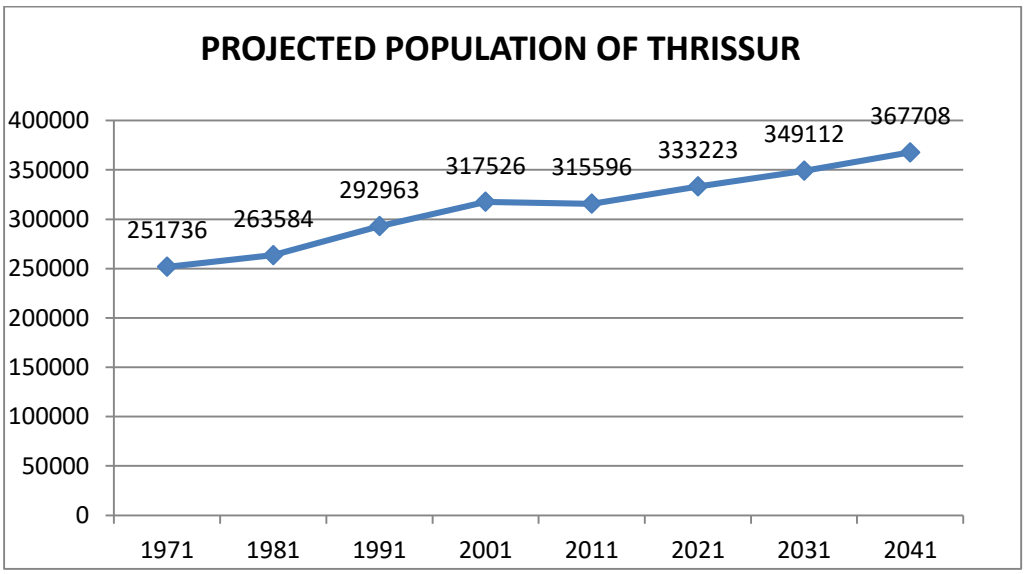


Fig 26.1 Projected Population for Plan Year

The expected populations of Thrissur City are shown graphically in above figure. Population is expected to reach 367708 by 2041 due to the provision of developmental policies.

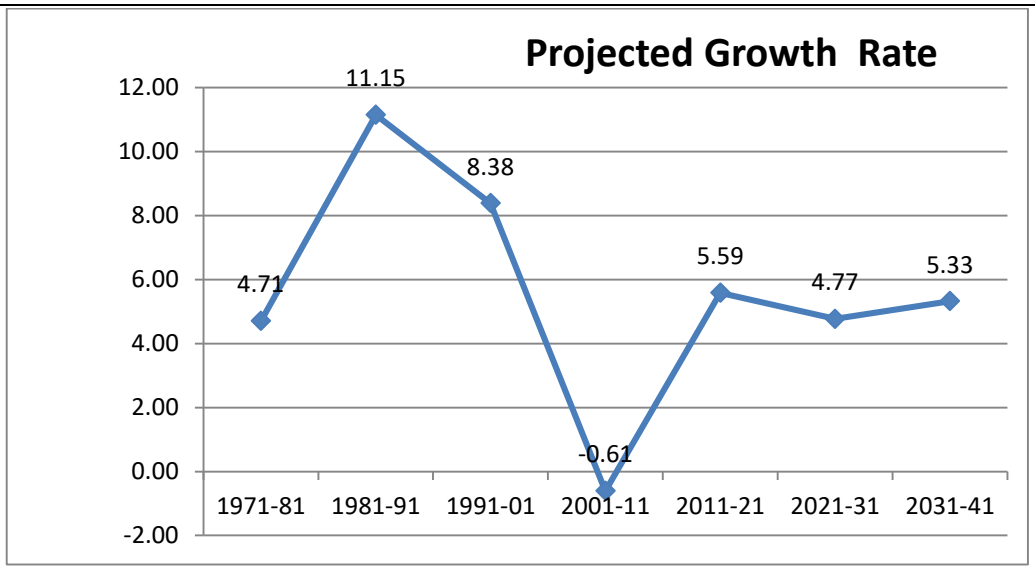


Fig 26.2 Projected Growth Rate

From the fig 26.2 above, it can be seen that the growth rate of population of Thrissur City will increases after the implementation of new projects. This shows the importance for introducing a planned growth for the city which will help the people there for a better living.

26.4 ANTICIPATED CHANGES IN OCCUPATIONAL PATTERN

The economic activities govern the occupational structure of the area. The expected population by 2041 is 367708.With the introduction of new development projects as per the new Master plan, economic base will be increased which will further result in the increase of job opportunities in City. From the projected work force participation rate for Thrissur City, it can be found that the WPR reaches about 43.94% by the end of 2041.

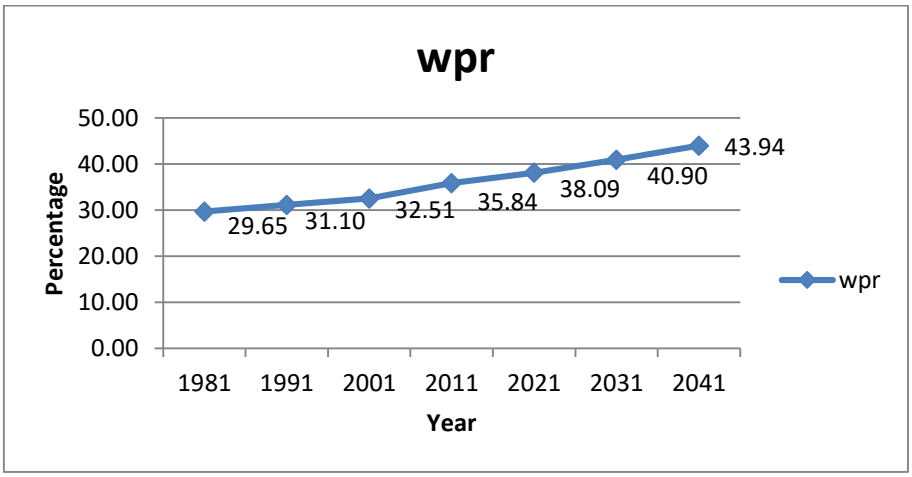


Fig 26.3 Projected WPR of Thrissur City

From the past data, it can be seen that the number of house hold industries are showing an increasing trend in Thrissur City. It is expected that the trend will be same in coming years also. Thus it is assumed that house hold industrial workers will be increased as

in table 26.2 below. It can be seen that the percentage of agricultural labours and cultivators are decreasing with year. It can be expected that similar trend will be shown in the coming years also. Even though measures are being taken with the enforcement of zoning regulations, conversion of agricultural land will not be as effective as expected. Considering these factors, the expected workers in agricultural field are derived.

Table 26.2 EXPECTED OCCUPATIONAL STRUCTURE FOR PLAN YEAR

Workers Classification	2011		2021		2031		2041	
	Person	%	Person	%	Person	%	Person	%
Agricultural Labourers	1555	1.37	507	0.39	-535	-0.36	-1594	-0.94
Cultivators	596	0.53	308	0.24	30	0.02	-241	-0.14
Household Workers	2741	2.42	2747	2.13	2751	1.87	2798	1.64
Other Workers	108213	95.67	125153	97.23	145122	98.48	169401	99.43
Total Main Workers	113105	100	128715	100	147368	100	170364	100

Occupation structure of Thrissur City is as shown in table above. Table shows the difference in classification of workers between 2011 and 2041. It is expected that the agricultural labourers, cultivators and household workers will decrease by 2041. Count of other workers is expected to increase from 95.67% to 99.43% of total workers.

26.5 PROJECTION OF REQUIREMENTS

26.5.1 AREA REQUIREMENT FOR VARIOUS URBAN USES BY 2039

Thrissur City can be considered as a medium town II as per URDPFI guidelines (population 1,00,000 to 5,00,000). The requirements for the medium town II as per URDPFI guidelines (for developable area) are worked out in table 26.3 below.

Table 26.3 EXISTING AND PROPOSED LAND USE AREA

Land use	URDPFI guideline (%)	Existing Land use 2019		Proposed Land use 2039	
		Area (sq.km)	Percentage	Area (sq.km)	Percentage
Residential	43-48	40.14	51.22	39.53	50.11
Commercial	4-6	2.8	3.57	2.04	2.59
Industrial	7-9	1	1.28	0.93	1.18
Mixed use	-	0.66	0.84	11.65	14.77
Public and Semi public	6-8	9.45	12.06	10.15	12.87
Industrial and Commercial mixed	-	-		0.85	1.08
Transport and Communication	10-12	5.69	7.26	5.94	7.53

Park and Open spaces	12-14	0.45	0.57	0.21	0.27
Vacant land	-	5.21	6.65	-	
Agriculture(Dry)	Balance	12.12	15.47	4.38	5.55
Others		0.85	1.08	2.78	3.52
Heritage Zone	-	-		0.42	0.53
Total	**100**	78.37	100	78.88	100

Residential Areas

At present an area of 40.14 sq.km is being occupied for residential purpose which is about 51% of developable area. As per URDPFI guidelines an area of only 43-48 % is to be required. An area of 39.53 Sq.km is provided under this zone in proposed new Master plan, which is around 50 % of the total land use.

Commercial Uses

According to land use survey 2019, 3.57% of land is used for commercial purposes in Thrissur City. URDPFI guidelines propose an area of 4-6% for commercial uses. As trade and commerce is considered as major activity in City, An area of 2.59 % of total land use is exclusively allotted for this section. Commercial uses are permitted in industrial and commercial zones and mixed zone. This will collectively accommodate a sizable amount of commercial activities in city.

Industrial Area

As per URDPFI guidelines, for small and medium towns, industrial workers are taken to be about 20% of total working population. Thus it is estimated that there will be around 32314 industrial workers in Thrissur City by 2041.

As per URDPFI guidelines, density of industrial workers must be in the range of 100 pph to 125 pph. Assuming employment density as 125 pph, the extent of industrial area will be 32314/125 = 258.51 ha. Thus about 2.59 sq.km of Thrissur City can be estimated to be occupied by industries by 2041.In addition to this an industrial and commercial mixed zone is proposed along NH 544. Thus collectively a projected area of 2% can be reserved for industrial activities in the City.

Public and Semi-public Use

According to land use survey 2019, there is 9.45 sq.km (12 %) of land area under public and semi-public use in Thrissur City. As per URDPFI guidelines, area of 6-8 % of total area must be provided for public and semi-public uses for a medium town. Since there will be introduction of new facilities like hospitals, educational institutions, etc. in future, we must allot a higher percentage for public and semi-public uses. Hence an area of 12.87 % of total can be taken for this purpose. Thus a projected area of 10.15 sq.km has to be allotted for public and semi-public use.

Transport and Communication

According to URDPFI guidelines, an area of 10-12% should be allotted for transport and communication purposes in the case of medium town. It can be found that only 6% of total area is used for this purpose in Thrissur City.

In order to accommodate the fast growing traffic in Thrissur and to reduce the traffic problems existing here, more road networks have to be introduced. From the traffic survey conducted by NATPAC, it was found that the width of many roads have to be increased so as to accommodate the traffic volume. By considering these, an area of about 7.53% of total which comes around 5.94 sq.km has to be used for transport and communication uses.

Park and Open spaces

Land uses coming under this category are playing fields, stadium, parks and open maidans, gardens, etc. under the ownership of public agencies. Current area available for park and open spaces use is found to be very less. According to URDPFI guidelines, 12-14 % of total land area must be used for park and open spaces for the case of a medium town. But while considering the current unavailability of land, this guideline cannot be followed. It is given that for a medium town, park and open spaces shall be provided at the rate of 1.4-1.6 ha/ 1000 persons. In proposals some of the open areas are included in special zones for the ease of materialization of the project. These projects will provide the land for park and open spaces activities.

Dry agriculture

Dry agriculture constitute 12.12 sq.km of area of the City. In case of dry agricultural land, some active areas like rubber plantations, mixed crop areas and coconut plantation are included under agricultural use zone.

As per land use 2019, 20.22 sq.km. of land comes under paddy land. The paddy fields are to be conserved for future.

26.6 REQUIREMENT OF PHYSICAL INFRASTRUCTURE

Requirements in Thrissur City for 2041 according to standard guidelines are given below.

26.6.1 ENVIRONMENTAL INFRASTRUCTURE

a) Water Supply

The estimated water demand for a city is broadly classified as domestic and non-domestic. The domestic water demand includes per capita consumption and system losses, while non-domestic water demand includes industrial and commercial consumption, institutional consumption and firefighting demand. A minimum of 70-100 lpcd and a maximum of 135-150 lpcd are recommended by URDPFI for domestic uses. As per CPHEEO guidelines, the domestic water requirement is 135 lpcd. Future domestic water requirement have been calculated as 135 lpcd based on existing scenario along with the standards assigned as per URDPFI and CPHEEO norms. Considering non domestic demand such as industrial, commercial

and institutional uses, the quantity is same as 20% of domestic supply. An additional 1 % is given for fire demand. As per Central Public Health and Environmental Engineering Organisation (CPHEEO) manual, a maximum provision of 15% towards un accounted water losses shall be made. An allowance of 33% has to be given for elevated storage capacity. 100% of supplied water is to be properly treated. Table 25.4shows estimated water demand of town for the horizon years.

Table 26.4 ESTIMATED WATER DEMAND FOR THRISSUR MUNICIPAL CORPORATION

Year			2011 (Base year)	2021	2031	2041
Population		Unit	315596	333223	349112	367708
1	Domestic Water Demand (135 lpcd)	MLD	42.61	44.99	47.13	49.64
2	Non-Domestic Water Demand (20.8% of (1))	MLD	8.86	9.36	9.80	10.33
3	Fire Demand (1% of (1)+(2))	MLD	0.51	0.54	0.57	0.60
4	UFW (15% of (1)+(2)+(3))	MLD	7.80	8.23	8.63	9.09
	Total Water Demand ((1)+(2)+(3)+(4))	MLD	**59.78**	**63.12**	**66.13**	69.66
	Storage Capacity Required (with allowance of 33%)	MLD	79.51	83.95	87.95	92.65

At Present in Thrissur Municipal corporation about 34.3 MLD of Water supply is available to the entire area. From this the future demand is estimated at 367708x 135 = 49640580 litres per day for domestic uses.

b) Electricity

One electric substation of 11 KV for 15,000 population is taken as the general standard for all categories of towns. Municipal Corporation supplies power mainly from the 110KV & 66KV substations at Aswani Junction and from 33KV substation at Ikkanda Warrier Road whereas KSEB supplies power mainly from 400KV substation at Madakkathara and distributed to the city through 110KV substations at Viyyur, Ollur & Pullazhi. For 2041, 11KV substation of 24 number is required. Power requirements for horizon years are shown in table 26.5

TABLE 26.5 PROJECTED POWER REQUIREMENT

Year Projected	2011 (Base Year)	2021	2031	2041
Population	315596	333223	349112	367708
Substation: One 11KV Substation for every 15000	21	22	23	24
Area requirement @ 0.05 acre/substation	1.05	1.1	1.15	1.20

c) Solid Waste Disposal

As per URDPFI guidelines, the waste generation varies from about a quarter of kilogram per capita in small towns to about half a kilogram per capita in large and metro cities. Thrissur Municipal Corporation is a medium town the waste generation will be 500 g/p/d and an extra 35% of waste generated as non-biodegradable i.e., 213 tonnes per day for the whole town. During treatment both biodegradable and non-biodegradable wastes are to be separated. In 2041 waste generation will be around 248 tonnes per day. Treatment plants with modern techniques have to be implemented for the effective treatment of this waste. Decentralized treatment plants can remedy the current situation. Presently Corporation has identified 6.2164 Ha of land at Ollukkara village for 'waste to energy' treatment plant. Table 26.6 shows projection of solid waste of town.

TABLE 26.6 PROJECTED SOLID WASTE PRODUCTION AND COMPOST PLANT AREA

Year Projected		2011 (Base Year)	2021	2031	2041
Population		315596	333223	349112	367708
Solid waste generation @ 500g/p/d	Tonnes/day	157.80	166.61	174.56	183.85
35% extra for non-biodegradable	Tonnes/day	55.23	58.31	61.10	64.35
Composting 400 sq.m /tonne	Acres	21.06	22.23	23.29	24.53

d) Sewerage

Treatment of sewerage is essential for hygienic environment. Small and medium towns may be encouraged for adopting low-cost sanitation techniques with the technical assistance by local bodies and involvement of NGO's in implementation of such programmes. For Thrissur City, an effective public sewerage system is required. Septic tanks and ESP type latrines are sufficient for meeting the demands. Sewerage treatment plant is generally designed for a quantity of 80% of the total water supply. At present in Thrissur city there is no effective sewer system. Work of one sewage treatment plant is in progress which has a treatment capacity of only 2.5 MLD. By 2041, 98.29 MLD capacity treatment plant will be required. This gap needs to be addressed.

Based on the future population growth the total waste water generated and capacity of treatment plant required are mentioned below in the table 26.7

TABLE 26.7. PROJECTED SEWAGE TREATMENT CAPACITY REQUIREMENT

Year		2011 (Base Year)	2021	2031	2041
Population	Unit	315596	333223	349112	367708
1. Waste water (80% of per capita demand)	MLD	34.08	35.99	37.70	39.71
2. Peak factor	MLD	2.25	2.25	2.25	2.25

3. Total waste water	MLD	76.68	80.98	84.83	89.35
Treatment capacity (1.1% x 3)	MLD	84.35	89.08	93.31	98.29

e) Transportation, parking& street lights

Table 26.8 shows projection of various aspects in transportation, parking and street lights. The projections are made taking the view point that only two type of roads should be built with major share to bituminous roads (85% of total roads), and the rest 15% to concrete roads. Accordingly, while earthen road and WBM roads are proposed to be converted to bituminous or to concrete road. Improvement of major roads and construction of new roads are necessary for a growing town. Among various categories of street lights, priority is given to power lamps (70%), followed by tube lights and high mast lamps (30).

Table 26. 8 Transportation and Street lighting requirement

Sl. No.	Particulars		2021	2031	2041
1	Population		333223	349112	367708
2	Road length @ 0.00096 per capita (km)		320	335	353
	Road Type	1. Concrete (km) @15% of total road length	48	50	53
		2. Bituminous (km)@ 85% of total road length	272	285	300
3	Lamp poles @ 30 m c/c		10667	11167	11767
	Street Lights	1. Tube Light @ 30% of lamp poles	3200	3350	3530
		2. High power lamps @ 70% of lamp poles	7467	7817	8237
4	High Mast Lamps @ 0.1% of lamp poles		11	11	12
5	Parking facilities @ 0.4 Ha of land per 10000 people		13.33	13.96	14.71

26.6.2 SOCIAL INFRASTRUCTURE

a) Educational Facilities

Projections of educational facilities are made based on URDPFI guidelines is shown in tables 26.9 and 26.10.

Table 26.9 Educational Infrastructure for pre-primary to secondary level

Year	**Existing (2019)**	**Required 2011 (Base Year)**	**Gap**	**2021**	**2031**	**2041**
Category		315596		333223	349112	367708
Pre-primary & nursery school (1 for 2500)	253	126	Nil	133	140	147

Primary School (I to V) (1 for 5000)	84	63	Nil	67	70	74
Senior secondary School (VI to XII) (1 for 7500)	79	42	Nil	44	47	49
School for physically challenged (1 for 45000)	2	7	5	7	8	8
School for mentally challenged (1 for 10 lakh)	1	1	Nil	1	1	1

Table 26.10 Educational Infrastructure for higher & professional education

Year	Existing (2019)	Required 2011 (Base Year)	Gap	2021	2031	2041
Category		315596		333223	349112	367708
College (1 for 1.25 lakh)	13	3	Nil	3	3	3
Technical Education (1 ITI and 1 polytechnic) (1 for 10 lakh)	10	1	Nil	1	1	1
Engineering College (1 for 10 lakh)	1	1	Nil	1	1	1
Medical College (1 for 10 lakh)	1	1	Nil	1	1	1
Nursing & Paramedical Institute (1 for 10 lakh)	6	1	Nil	1	1	1
Other professional colleges (1 for 10 lakh)	10	1	Nil	1	1	1

Thrissur town is having improved educational background for both primary as well as higher education sector, and it acts as a major service provider of educational facilities in the vicinity. More number of schools should be developed for the physically challenged children.

b) Healthcare Facilities

The provisions of adequate health care facilities are necessary for every town. As per the URDPFI guidelines the health institutions necessary for Thrissur town is mentioned in the table given below.

At present there are no gaps seen in medical facilities but existing facilities in government sector needs upgradation. Projection of health facilities are shown in table 26.11.

Table 26.11 PROJECTED REQUIREMENTS FOR HEALTH SECTOR

Health Care Facilities	**Existing (2019)**	Required 2011 (Base Year)	*Gap*	*2021*	*2031*	*2041*
		315596		333223	349112	367708
Dispensary (1 for 15000)	22	21	Nil	22	23	24
Nursing Home, child welfare and maternity centre - 25 to 30 beds (1 for 1 lakh)	4	3	Nil	3	3	4
Polyclinic (1 for 1 lakh)	3	3	Nil	3	3	4
Intermediete Hospital B (1 for 1 lakh)	7	3	Nil	3	3	4
Intermediete Hospital A (1 for 1 lakh)	3	3	Nil	3	3	4
Multi speciality Hospital (1 for 1 lakh)	4	3	Nil	3	3	4
Speciality hospital (1 for 1 lakh)	3	3	Nil	3	3	4
General Hospital (1 for 2.5 lakh)	1	1	Nil	1	1	1
Medical College (1 for 10 lakh)	1	1	Nil	1	1	1

c) Recreational Facilities

As per the URDPFI guidelines the recreational facilities needed are mentioned in the table below, at present in Thrissur town there is only limited locations especially for open recreational activities so there should be emergency in setting up of recreational facilities in the town. Table 26.12 shows the projection of recreational facilities.

TABLE 26.12. PROJECTED REQUIREMENT FOR RECREATIONAL FACILITIES

Recreational Facilities	*Existing (2019)*	*Required* 2011 (Base Year)	*Gap*	*2021*	*2031*	*2041*
		315596		333223	349112	367708
Community room/hall (1 for every 15000)	40	21	Nil	22	23	24
Library (1 for every 15000)	27	21	Nil	22	23	24
Neighbourhood park(1 for 15000)	9	21	12	22	23	24

Neighbourhood play area (1 for 15000)	14	21	7	22	23	24
Music dance and Drama centre (1 for 1 lakh)	1	3	2	3	3	4
Recreational club (1 for every 1 lakh)	14	3	Nil	3	3	4
Community park (1 for 1 lakh)	1	3	2	3	3	4
District sports centre (1 for 1 lakh)	1	3	2	3	3	4

d) Utilities

From the standard data, the required numbers of different utilities are worked out as given in table 26.13. It can be seen that some utilities are not available to the requirement in the City.

TABLE 26.13 PROJECTED REQUIREMENT FOR UTILITIES

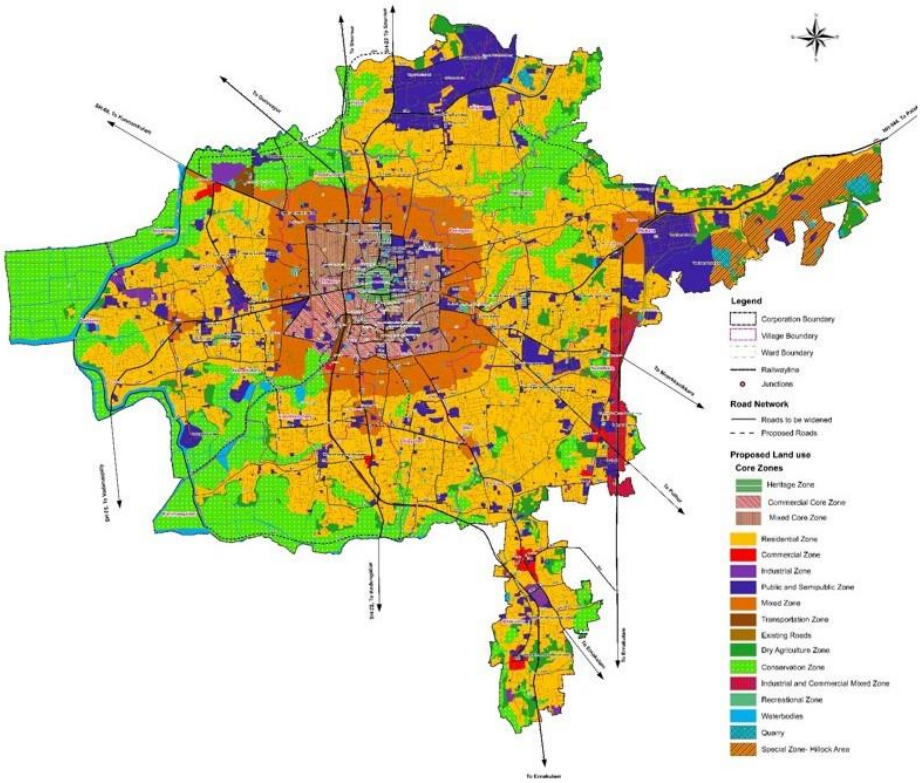
Utilities	Existing (2019)	Required2011 (Base Year)	Gap	2021	2031	2041
Population		315596		333223	349112	367708
LPG Godown (1 for every 50000)	4	6	2	7	7	7
Post Office (1 for every 15000)	23	21	Nil	22	23	24
Police Station (1 for every 90000)	6	4	Nil	4	4	4
Fire Station (1 for 2 lakh)	1	2	1	2	2	2
Crematoria and burial ground (1 for 5 lakh)	5	1	Nil	1	1	1

Thrissur Municipal Corporation lag behind in WFPR, i.e. the job opportunities has to be increased to some extent.

Even though 33% of land is coming under Agricultural use, people engaged in agriculture activities are found to be very less. According to 2001 census data, there are only 1935 agricultural labourers in Thrissur City. Shortage of agriculture labourers has adversely affected agricultural sector. Mechanization can help to a certain limit. Land available for agriculture must be utilized by group farming and public private partnership.

The data shows that the agricultural labourers and cultivators are found to be concentrated towards the outskirts of the city, in and around the wards having agricultural lands. House hold industrial workers are found to be scattered throughout the city.

CHAPTER 27
LAND USE PLAN -2039



The main proposals in land use for various activities introduced in the Master plan and the location proposed for each land use as per development concept is detailed in this chapter.

As per the developmental policy the city is alienated in to various policy zones. Different Policy zones have different uses. The major land use proposals are detailed out below.

27.1 CORE ZONE

Thrissur City is considered as the centre of all commercial activities of the District. All major commercial activities are concentrated in and around the Swaraj Round at the core area of the City. Not only the commercial activities but public areas like temples and churches, hospitals, recreational areas, educational institutions, etc. and dense residential areas are found to have equal share in this area. As per land use analysis also it is clearly seen that the equal distribution of these major land uses are shown in the core area. Therefore a zone with multi functions consisting of commercial, residential, public and semipublic land use is allowed at the city centre between Swaraj round and Ring road. For decongesting this central area certain regulations are given to Floor area ratio in the zoning regulations and the core zone is subdivided into 2 subzones. Each zone is giving importance to different types of land uses as per the development concept envisioned for the city.

27.1.1 HERITAGE ZONE

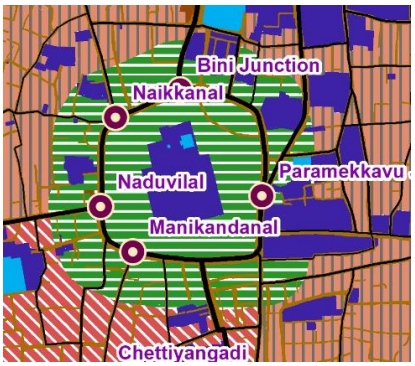


Fig 27.1 Heritage zone

Thrissur is known as the cultural capital of Kerala and is rich in its varied culture and heritage. Tourists are attracted to Thrissur due to the presence of these places which are now in the threat of encroachment. These places have to be preserved by enforcement of proper zoning regulations so that they are available for the future generation also. The Vadakkumnathan Temple is considered as the centrally protected monument which is under the Ancient Monuments and Archaeological Sites and Remains Act, 2010 and therefore the temple precincts and surrounding Thekkinkadu maidanam in Core zone is considered as Heritage zone giving due respect to the monument. The development at this zone will be in accordance with the provisions given in zoning regulation.

In order to prevent future hindrance or interventions to the aesthetic view and ambience of the Sri.Vadakkumnathan temple and its architectural looks and to maintain the sanctity of the temple premises an area extending to the depth of 150 m from the outer edge of Swaraj round is also included in heritage zone. In this zone certain restrictions are given to the urban profile of the buildings. The height of the building is restricted 15m and the structure of the building shall follow the Traditional Kerala Temple Architectural style with sloping roof cladded with Mangalore pattern tiles. FAR shall be limited to 1.5 or as per KMBR, whichever is minimum.

27.1.2 SUB ZONES

In the Core zone apart from the Heritage zone the area is divided in to two subzones between Swaraj round and ring road as shown in the figure 27.2. Each zone is having importance to different land use and named as 1) Commercial core zone and 2) Mixed Core zone

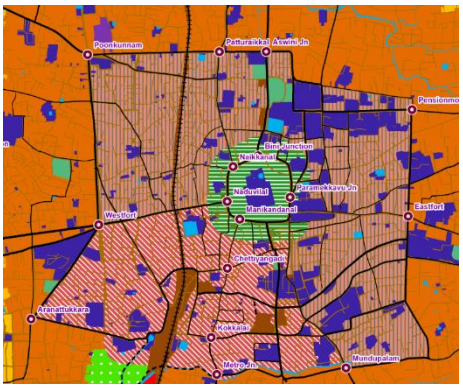


Fig 27.2 Sub zones

27.2 RESIDENTIAL ZONE

As per existing Land use map of 2019, the Residential area found to be 40.14 Sq. km. It is expected to be coming around an area of 39.53 sq.km in Residential zone alone by 2039 which is about 38.98% of total area of the City. In addition to this Residential mixed commercial areas are also proposed in Master plan. Mixed zones are provided at core zones and along major roads, junctions where both residential and commercial activities can be developed in the future. Population densities of residential areas are increasing day by day by

the emergence of flat system. Therefore the areas where residential use exists are kept as residential zones. The remaining area is met from the mixed zones provided along the roads.

27.3 COMMERCIAL ZONE

Commercial sector is said to be the back bone of economy of Thrissur City. So a proposed area of 0.51 sq. km is suggested for this sector alone. In addition to this, other commercial use proposals are given in the Mixed use zone.



Fig 27.3 At Puzhakkal

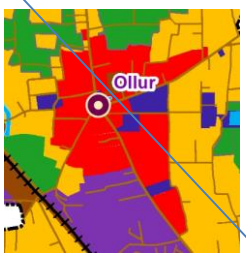


Fig 27.4 At Ollur



Fig 27.5 At Thaikattussery



Fig 27.6 At Kuttanellur

27.4 MIXED ZONE

To decongest the Core area a mixed zone of about 2.59 sq.km is provided in the intensive urban development zone surrounding the ring road, with that the total mixed area of city comes to 11.65 sq.km. This provision will expand the city centre to the outer area and thus the core area can be saved from congestion.

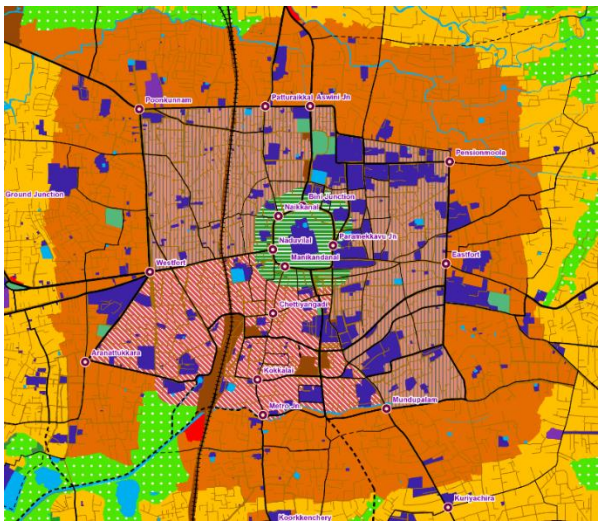


Fig 27.7 Mixed zone at Promotive Urban Development

Due to easy access from the roads, the area along the roads is found to be more exploited by commercial activities. Existing Land use maps shows that a ribbon development exists along almost all roads in the City. In the zoning regulation, a general guideline is included which allows mixed zone (subject to conditions) to a depth of 50m from roads having width more than 9m, a depth of 100 m from roads having width more than 12m, a depth of 200m for roads having width more than 18m and a depth of 300m along NH544. Other areas which are considered as Mixed Use zones are as shown in figure 27.7.

The major junctions are also proposed with mixed use so that the development is possible as required in the major junctions.

27.5 INDUSTRIAL ZONE

Industrial areas are spread out all over the City. An industrial area of about 0.93 sq. km is included in this zone alone for the plan year. In addition to this, Industrial and commercial

mixed area near Ollur, effectively adds an extended area for industrial use. For improving the employment opportunities and thus the economic background of the City, introduction of new industrial areas is a must. An area of 20 Ha are proposed at Puzhakkal paadam for Kinfra and some area is proposed at Ollur industrial estate.

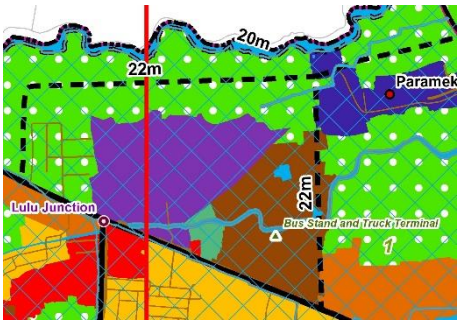


Fig 27.8 Kinfra Industries at Puzhakkal

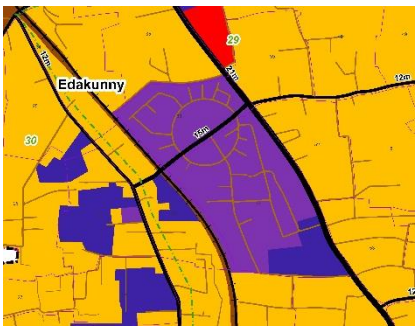


Fig 27.9 Ollur Industrial area

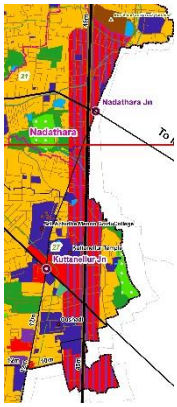


Fig 27.10 Industrial Commercial mixed zone along NH 544

27.6 INDUSTRIAL AND COMMERCIAL MIXED ZONE

Industrial land use can be induced along the sides of major corridor connecting Coimbatore and Kochi. Good accessibility to these can develop the industrial growth. The land abutting the NH 544 where the regional international connectivity is more, a depth of 100 m from the National Highway is proposed for Mixed Industrial Commercial land use as shown in figure 27.10. This area collectively comes around 0.85 sq.km. As per IDDP, Thrissur, these areas are included in economic development corridor, which will increase the potential of this stretch.

27.7 TRANSPORTATION ZONE

Proposed area of 5.94 sq. km is suggested for this zone. The detailed explanation of traffic and transportation planning 2039 is given in chapter 27. Existing traffic and transportation facilities has to be maintained with proper connectivity and with required facilities. Traffic problems are found to be one of the main issues that need attention in the city.

27.8 PUBLIC AND SEMI-PUBLIC ZONE

It can be seen that the existing public and semi-public areas in the City satisfies the requirements. About 10.15 sq. km area of land use comes under public and semi-public sector. Besides this, Public and semi-public uses are permitted in the multi-functional zone proposed at Core zone and outskirts of the city for meeting the future demand. Almost all public facilities exist in Corporation are found to be at the standard limit. Preservation of existing public zone from encroachments and conservation of heritage sites coming under the city for the future generation has to be implemented.

27.9 DRY AGRICULTURE ZONE

The areas where cultivation is not possible due to encroachment and land filling done by surrounding people are taken in to consideration for development purpose. Therefore agriculture zone has a considerable reduction in area, but proper cultivation of this area can meet certain extend of demand. Available land for dry agriculture cultivation is 4.38 sq.km. This area is zoned for dry agricultural use.

27.10 RECREATIONAL ZONE

As per the existing land use 2019, only 0.45 sq. km area is found to be available for this purpose. The proposed area for recreational purpose is 0.21 sq.km. In order to find more space for parks, the vacant lands and some part of uncultivated paddy lands are demarcated for recreational purpose. Existing recreational spaces have been retained. Beautifications of existing parks and water bodies are proposed for the development of recreational activities.

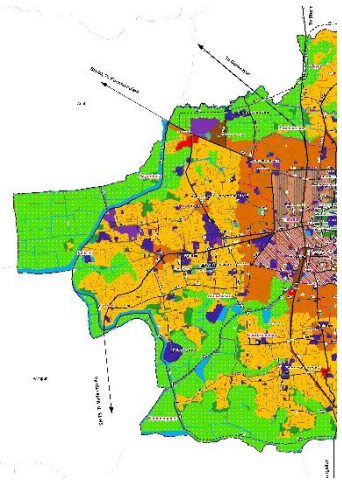


Fig 27.11 Pullazhipadam

27.11 CONSERVATION ZONE

As per land use survey-2019 there exist 19.59 sq.km of land under this category, the figure includes the land without cultivation also. All such wet lands are to be conserved. However, any development in such areas shall be strictly adhering to the provisions of the Paddy land and wet land Act in force. Certain uncultivated paddy fields are converted for other required development uses. 19.32 % of the total land area is under conservation zone.

27.12 WATER BODIES

Conservation of existing water bodies is an essential need of a Master plan. To meet the water demand in the coming years, it is suggested to retain this area without encroachments for other uses. The proper maintenance of existing natural drainage without encroachments can remedy the major water logging problem and also scarcity of water during the summer season. Maintenance of water bodies are to be done with the help of the fund allotted for the same in the proposal. Area under this zone as per proposed land use plan is 2.95 Sq.Km.

27.13 SPECIAL ZONE-HILLOCK AREA

On the eastern side of the city, along the sides of NH 544. Area of land comes under this category is 2.42 %. It is ecologically important simultaneously lies on the economically potential corridor. All Constructions/ Land developments in this zone is proposed to be carried out with minimum disturbance to the terrain and ecology of the area. The height of the building is restricted to 12m from surrounding ground level at any point.

27.14 QUARRY

As per land use survey an area of 0.36 sq.km of land is under this category. It consists of rocks and quarry areas. It is intended to keep this area under the same category and some possible projects like adventure tourism are proposed in this zone.

27.15 RISK ZONES

As per The Flood Hazard risk Map derived based on the risk analysis low lying area zone 1 and low lying area zone 2 are indicated in the proposed land use map.

27.16 PROPOSED LAND USE MAP

Reduction in Residential, commercial, industrial and public and semipublic land use is because of amalgamation of it in mixed uses. The Proposed Land Use Map depicting proposed use of Land in the local planning area is appended and land use breakup as per the proposed Land Use is given in table 27.12 below. Vacant lands are completely utilized for developmental purposes.

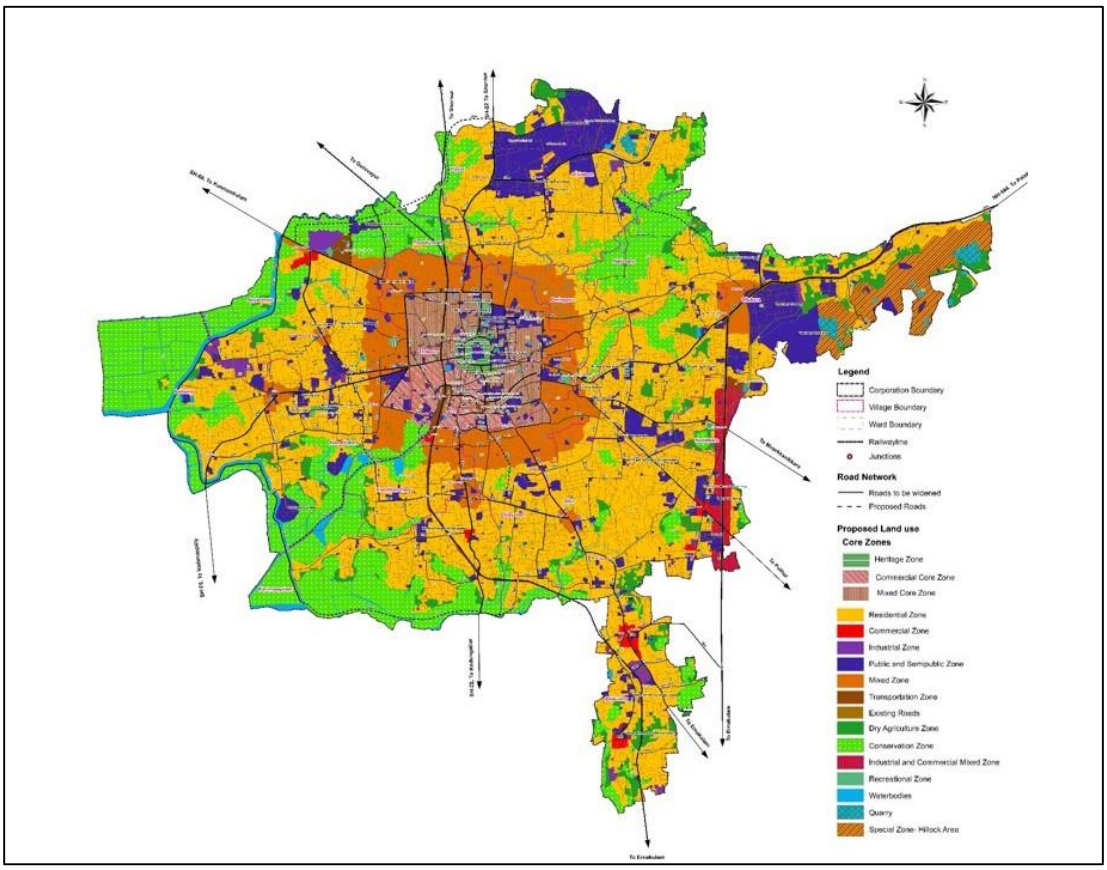


Fig 27.12 Proposed Land Use Map 2039

Table 27.1 PROPOSED LAND USE 2039

SI No	Land use	Area(Sq. km)	Percentage
1	Heritage zone	0.41	0.4
2	Commercial core zone	1.53	1.51
3	Mixed core zone	2.62	2.58
4	Residential zone	40.68	40.11
5	Commercial zone	0.52	0.51
6	Industrial zone	0.73	0.72
7	Industrial and Commercial Mixed zone	0.85	0.84
8	Public and Semipublic zone	10.25	10.1
9	Transportation zone	5.3	5.23
10	Mixed zone	9.01	8.88
11	Conservation zone	19.45	19.18
12	Dry Agriculture zone	4.12	4.06
13	Recreational zone	0.22	0.22
14	Water bodies	2.95	2.91
15	Special Zone-Hillock area	2.42	2.39
16	Quarry	0.36	0.36
	Total	**101.42**	**100**

CHAPTER 28
TRANSPORTATION PLAN -2039



This chapter gives an outline of the future transportation network expected to build up in the City according to the new Master plan.

Thrissur is connected to the North-South Corridor by the four-lined NH-544. The highway traverses the entire length and breadth of the city from different points and provides access to the nearby cities such as Kochi, Palakkad and Coimbatore. NH-544 provides two main exit points at Mannuthy and Thalore to the Thrissur city. The city is largely dependent on private buses, taxis and auto rickshaws for public transport. State-owned KSRTC runs inter-state, inter-district and city services.

28.1 FORECASTING OF TRAVEL DEMAND FOR HORIZON YEAR

Transportation plans are long range and involve planning for future target year. It becomes necessary to undertake predictions of travel pattern and transportation requirements for the target year. The effectiveness and efficiency of any facility will deteriorate gradually after certain years. The traffic engineering measures will be effective for the first five or six years. Thereafter, with the changing traffic scenario, they may have to be revised or redesigned.

Transportation infrastructure has a longer useful life ranging from five to 20 years. Provision of facilities such as widening of roads, transport terminals, restructuring of the existing public transport system and development of off-street parking-lots will come under this category. Therefore, the facilities are designed to meet the travel demand for the anticipated future year. Future transportation demand is tied up with the future land use, economic activities, future population and employment data.

For forecasting of future travel demand for the study, a horizon year of 2039 was considered and accordingly future levels of traffic on the road system were estimated. Growth rate method was used to project the traffic demand for various horizon years.

In order to meet the base year and projected demand for various horizon years, a long term traffic and transport Master plan has been formulated for the city. This covers planning of future transport development and network improvements such as parallel road links, bypasses for inter-city arterial roads, grade-separated pedestrian facilities across busy road, flyovers at major intersections, over bridges and development of integrated bus terminals and public transport system.

28.2 PROPOSALS FOR TRANSPORTATION PLAN 2039

Narrow width of roads in central part of the city and heavy traffic congestion at the central area due to the mix of intra-city and inter-city traffic are the main bottlenecks of the Thrissur city. This is due to the absence of bypasses as well due to the locations of bus terminals and wholesale market in the city centre. Most of the arterial and sub-arterial roads are under Public Works Department (Roads and Buildings Division) and collector roads under the Municipal Corporation. These authorities are responsible for development and maintenance for their roads. Inadequate maintenance by these agencies due to various reasons, frequent road cuttings etc. has resulted in poor riding quality for most of the city roads. All the problems together have resulted in speed reduction during the peak-hours in city roads in general.

28.2.1 ROADS

Thrissur City is served by public transport system consisting of both State owned Kerala State Road Transport Corporation (KSRTC) and private buses. KSRTC runs inter-state, inter-district and city service. There are fairly large numbers of private buses meeting the travel demand of Thrissur people. Thrissur have three bus stations –Shaktan Thampuran Private Bus Stand in Sakthan Thampuran Nagar, Vadakke Stand (Northern Bus Stand) and the KSRTC Bus Station near the Thrissur Railway Station. Intermediate Public Transport Modes (IPT) like auto, taxi is serving the travel needs of Thrissur City.

From the projected volume, it can be seen that the capacity of current road sections are insufficient to meet the future demand. This will lead to heavy congestion and traffic jams. In order to remedy this,possible road widening and new link roads to be established with the help of new Master plan.

PROPOSED ROAD NETWORK FOR 2039

New proposals consist of Ring roads, Arterial roads, Sub Arterial roads and Collector roads.

1) Ring Roads

To reduce the mixing up of intra-city and inter-city traffic, proposals of ring roads are made. This will help to reduce the congestion in the core area of the City where road widening is not possible. Thus to divert the traffic from the major roads, alternate link roads are formed in the city.

Since the core area of City has high density of buildings, new road proposals will affect public life. Therefore existing roads are proposed to widen possibly without giving much difficulty to public. The road widening are proposed by taking into consideration the existing sanctioned Detailed Town Planning schemes which are already regulated by local body.

Ring roads proposed in the Master plan are

- Ring Road
- Outer Ring Road
- Peripheral road

Details of the ring roads proposed are as given in table 27.1 below.

Table 28.1 DETAILS OF RING ROADS PROPOSED

NAME OF ROAD	ROAD SECTIONS
Ring Road – Pookunnam Jn – Patturaikkal Jn 18m, Patturaikkal - Aswani Jn to Chembukkavu Jn– 22m, Museum Road 18m, Bishop Palace Road (Pensionmoola to East Fort) 20m, Bishop Alappad road 18m, Aristo Road 15m, Avenue Road - MundupalamJn – Frvadakken Road – Balya Hospital –Metro Jn – Railway Fly over – 18m, vanchikkulam -22m, vanchikkulam to Thoppinmoola - 15m, Thoppinmoola - West Fort - Punkunnam – 22	Poonkunnam – Patturaikal – Aswini Junction –Chembukkavu- Pension Moola - East fort– Cemmetry Jn – Aristo road – Unity Road Jn - Avenue Road – Mundupalam Jn – Frvadakken Road – Balya Hospital – Metro Jn – Railway Fly over – , Vanchikkulam through KLDC Canal Bund – Thoppinmoola – West Fort - Poonkunnam
Outer Ring Road – Lulu Jn – Ayyanthole Civil station – 25m, kanjani Road – SN Park Road, Vadookkara Jn - Nirmalapuram Church Road – Alumvettuvazhi 18m, Chiyyaram Jn – 25m,Ernakulam Road 21m, Ollur Jn (Panamkuttichira) - Marathakara Road – Thrikkur Road -18m, NH 544, Mannuthy Chiraikkakkode Road – State Seed Farm – Through Nettissery Paddy 22m, Kalyan Opal side road – Kuttumuck Villadom Road -KSEB Road – 18m, Milma 22m– PallimoolaJn – Powerhouse Jn – 22m, Shornur Road 27m, Through Viyyur Paddy - Kottekkad Road Jn – Through Puzhakkal Paddy - Lulu Jn.22m	Lulu Jn – Ayyanthole Civilstation –Kanjani Road – SN Park Road - Infant Jesus Convent Road – Vadookara KLDC Canal Bridge – Vadookkara Jn - Vadookara gate – Vadookara Manavazhi Jn – Nirmalapuram Road – Kannamkulangara Road Jn near water tank - Chiyyaram road Jn – Ernakulam Road – OllurJn (Panamkuttichira) - Marathakara Road – Thrikkur Road – NH 544 – Mannuthy Chiraikkakkode Road – State Seed Farm – Through Nettissery Paddy – Kuttumuck Villadom Road – KSEB Road- Milma – PallimoolaJn – Powerhouse Jn – Shornur Road – Through Viyyur Paddy - Kottekkad Road Jn – Through Puzhakkal Paddy - Lulu Jn.

Peripheral Road –From NH 544 Mannuthy Bypass road Kuttanellur St. Jude Church to Padavaradu centre-10m, Padavaraducentre to Ollur Company pady Jn. at Ernakulam road -12m , Ollur company pady Jn. to AkkaraMemmorial Hall - 21m, AkkaraMemmorial Hall - OllurPallinada road - ChiyyaramVijayamatha Church - Nasranipalam – Chiyyaram South Munayam -12m , South Munayam - Kodungallur Road Jn – Kanjani road Jn – Puzhakkal Road Jn - 22m	NH Bye pass (Oushadhi) –PadavaraduJn – Ernakulam Road Jn(Via.Peruvankulangara) – Ollur (Akkara Hall) – VijayamathaChurchJn – South Munayam–Kodungallur Road Jn – Kanjani Road Jn – Puzhakkal Road

The details of the ring roads are as given in fig 28.1 given below

2) Swaraj Round

Swaraj round is the name for circular road in the centre of the city of Thrissur surrounding the 65 acre Thekkinkadumaidan. Swaraj Round is one of the biggest commercial centers and busiest shopping areas of Kerala which houses shopping centers, retail outlets of jewelers, textiles. It is also the prime location for shopping in Thrissur for gold and textiles. It is the central business district (CBD) areas of Thrissur city.

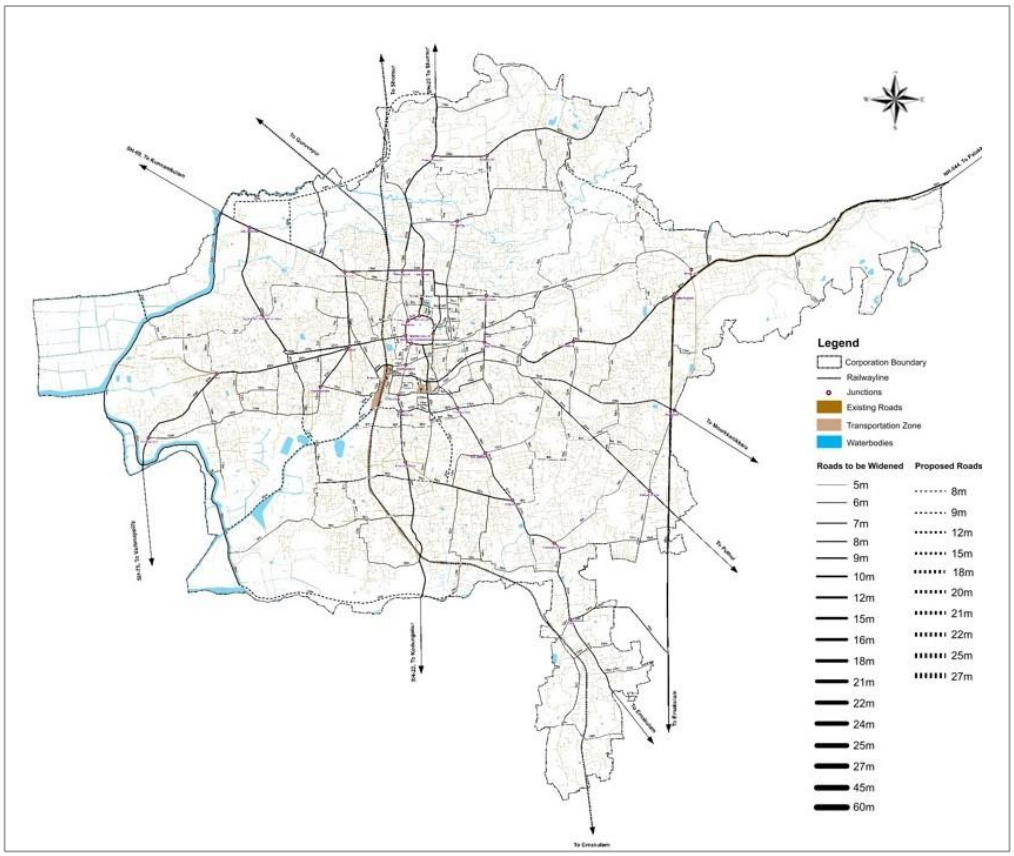


Fig 28.1 Proposed Roads

There exist eight major roads and 11 minor roads emanating radially from the Swaraj round. These roads lead to important destinations within the City, nearby towns like Shornur, Palakkad, Kodungallur, Guruvayur, and Ernakulam, other parts of the state and also neighbouring states like Tamil Nadu and Karnataka. Swaraj Round carries high volume of traffic. Public transport buses entering/exiting the town make use of various sections of the round to their respective destinations.

The pedestrians walking along the Swaraj Round are provided with elevated and paved sidewalks on the outer side of the round while the cross-stream pedestrians on the Swaraj Round are opened to high risks. There are three pedestrian subways in the Swaraj Round. One at M.O road junction, second near Paramekkavu temple and third in M.O. road itself. Pedestrians are not using Subways provided in the Swaraj Round. The vehicular traffic around the Swaraj Round moves in two or more streams and severely endangers safety of cross-movements of pedestrians.

It is seen that, the traffic volume of Swaraj Round is more than its capacity. Though the widening of Swaraj Round is inevitable, its implementation is difficult due to the following reasons

- The widening could provide for one side only towards outward of Swaraj Round. This will be impractical due to the existing development of the particular area is considered.
- The Swaraj round and some outward areas are lies under no development zone of the ASI site, of Sri. Vadakkumnathan temple. So that once a building is demolished in this area as a part of road widening, rebuilding the same will be difficult.

In this context, it is decided to continue the width of Swaraj Round as 22m, the current width itself.

3) Arterial Roads

An arterial road is a high-capacity road whose primary function is to deliver traffic from collector roads to freeways, and between urban centres. Arterials are laid out as the backbone of a traffic network and should be designed to afford the highest level of service, as is practical.

State Highways

State Highways SH-69 Thrissur-Kuttippuram Road, SH-22 Kodungallur - Shornur Road, SH-75 Thrissur - Kanjani - Vadanappally Road are the three state highways which connect city with its suburbs and Municipalities. These road sections are proposed to be widened to a possible width of 25m & 27 m from the existing status, for the stretches outwards of Ring road. These sections are incorporated to form the ring road proposed in the Master plan.

Thrissur has also many arterial roads which connect to other parts of Thrissur district like Chalakudy, Chavakkad, Irinjalakuda, Kodungallur, Mala, Wadakkanchery and Guruvayur.

Nearest Airport is Nedumbassery International Airport, Cochin. The existing width and the proposed widening of these arterial roads are given in detail in table 27.2.

4) Sub Arterial and Collector Roads

A sub-arterial road is a road connecting arterial roads to areas of development, and carrying traffic directly from one part of a region to another. A collector road or distributor road is a low to moderate-capacity road which serve to move traffic from local streets to arterial roads. Unlike arterials, collectors are also designed to provide access to residential properties. The proposal details of the sub arterial and collector roads are given in table 27.2.

Roads proposed through wetlands can be planned as elevated roads.

Table 28.2 DETAILS OF ROAD PROPOSALS IN THRISSUR CITY

Sl. No.	Name of Road	Proposed Road Width (m)
1	Swaraj Round	22m
2	Paliyam Road - Vallikkattu Road Jn – upto Palace Raod Jn	Shornur Road – Vallikkattu Road Jn 9m, Vallikkattu Road Jn – Palace Road Jn – 8m
3	Sahithya Academy Side Road	12m
4	Bennet Road	12m
5	Rice Bazar Road	12m
6	Post Office Road	12m
7	Marar Road Jn – Thekkemadam - MG Road Jn	8m
8	Mannath Lane	7m
9	Kunnathumana Lane	7m
10	Palakkal Angadi	6m
11	Ring Road	Pookunnam Jn – Patturaikkal Jn 18m, Patturaikkal - Aswani Jn to Chembukkavu Jn– 22m, Museum Road 18m, Bishop Palace Road (Pensionmoola to East Fort) 20m, Bishop Alappad road 18m, Aristo Road 15m, Avenue Road - MundupalamJn – Frvadakken Road – Balya Hospital –Metro Jn – Railway Fly over – 18m, vanchikkulam -22m, vanchikkulam to Thoppinmoola -15m, Thoppinmoola - West Fort - Punkunnam – 22
12	Mathrubhoomi Jn to Manorama Jn	25 m

13	Outer Ring Road	Lulu Jn – Ayyanthole Civil station – 25m, kanjani Road – SN Park Road, Vadookkara Jn - Nirmalapuram Church Road – Alumvettuvazhi 18m, Chiyyaram Jn – 25m,Ernakulam Road 21m, Ollur Jn (Panamkuttichira) - Marathakara Road – Thrikkur Road -18m, NH 544, Mannuthy Chiraikkakkode Road – State Seed Farm – Through Nettissery Paddy 22m, Kalyan Opal side road – Kuttumuck Villadom Road -KSEB Road – 18m, Milma 22m– PallimoolaJn – Powerhouse Jn – 22m, Shornur Road 27m, Through Viyyur Paddy - Kottekkad Road Jn – Through Puzhakkal Paddy - Lulu Jn.22m
14	Peripheral Road	From NH 544 Mannuthy Bypass road Kuttanellur St. Jude Church to Padavaradu centre-10m, Padavaraducentre to Ollur Company pady Jn. at Ernakulam road -12m , Ollur company pady Jn. to AkkaraMemmorial Hall - 21m, AkkaraMemmorial Hall - OllurPallinada road - ChiyyaramVijayamatha Church - Nasranipalam – Chiyyaram South Munayam -12m , South Munayam - Kodungallur Road Jn – Kanjani road Jn – Puzhakkal Road Jn - 22m
15	NH from Mannuthy Jn towards Palakkad up to Corporation Boundary	60 m
16	Mannuthy By pass Jn to Ollur Village Boundary	45 m
17	Swaraj Round to Ollukkara By pass Jn. (Old NH)	Swaraj round to East fort -10m, East fort to Kizhakkumpattukarajn. – 15m, Kizhakkumpattukarajn.- Mannuthy Bypass Jn.-25m
18	SH 22 Swaraj Round to Peringavu Bridge Jn (Shornur Road)	From Swaraj Round to Patturaikkal Jn.-12m, Patturaikkal (Chungam) Jn. -15m, Patturaikkal Chungam to Peringavu bridge – 27m
19	From Swaraj Round to Corporation Boundary at Padukad	Swaraj round to Peringavupalam Jn.-25m (Karunakaranambair road), Peringavu bridge to Corporation boundary (Padokaduthodu) -27m
20	SH 75 Swaraj Round to Kanjani Road (including M.G Road) (Up to outer ring road)	Swaraj round to M.G.road Parayil Jn. -21m, Parayil Jn. - West fort Jn -Kanjani road up to Corporation boundary -25m

21	From SH 22 Swaraj Round to Kodungallur Road (Up to Corporation boundary)	From Swaraj round to Kuruppam road – kokkalai Jn.-10m, kokkalai Jn. to Koorkkenchery temple Jn.-18m, Koorkkenchery temple Jn. to Corporation boundary -25m
22	Swaraj Round – Manorama Jn-Ernakulam Road (Old NH High Road) (Up to Corporation boundary)	From Swaraj round to High road – Manorama Jn - Mundupalam Jn -15m, Mundupalam Jn. to Kuriachira Jn. -18m, Kuriachira Jn. to Corporation boundary at Thaloor – 21m
23	SH 69 Poonkunnam - Kunnamkulam Road (Up to Corporation boundary)	25m
24	From" Y" Jn. Sankaraiyyar Road to Mathrubhumi Jn.	From" Y" Jn. of Sankaraiyyar Road to Poothole Junction Diwanjimoola over bridge west side -15m, From over bridge west side to Diwanjimoola -25m, From Diwanjimoola to KSRTC south corner -15m, KSRTC south corner to Sakthan Mathrubhumi Jn.-25m
25	Manorama Jn - IkkandavarierJn	25 m
26	Swaraj Round to Pentark Jn	25 m
27	M.L.A Road (Punkunnam Kuttur road)	18 m
28	Nellankara Bhagavathi Temple Jn to Mannuty Jn. (Mukkattukara Road)	12 m
29	Poothole Jn – Vanchikulam - KLDC Bund upto Ring Road	22m
30	Nethaji Road -Aranattukara Church Jn Toll Gate Road	West Fort – Thoppinmoola (Nethaji Road) – 22m, Thoppinmoola - Arnattukara - ChettupuzhaJn -12m
31	Vallachira - Thaloor Road Thaikkattussery Jn. Via	10 m
32	Palace Road – upto Chembukkavu Jn	21 m
33	Pattalam Market side road – Sakthan Stand	25m
34	Ayyanthole – Karthiayani temple Jn - Ayyanthole Ground – Pullazhi - AG Quarters Road - Pullazhi Bund Road	Ayyanthole – Karthiayani temple Jn - 10m, Ayyanthole Ground – Pullazhi - AG Quarters Road - Pullazhi Bund Road – 9m
35	Revathymoola to Olari Jn	10m
36	M.G.Road - Kottappuram Road - Kottappuram chakkamukku - Sankaramkulangara Jn.- Karthiayani temple Jn	10m
37	West Peringavu Bridge Jn - East Peringavu Jn	12m
38	Balabhavan Jn to Pallimoola Jn (Cheroor Road)	Balabhavan Jn – Cheroor Kinar Jn -15 m, Cheroor Kinar Jn – Pallimoola – 18m

39	Padukkad Jn to Dhooradarshan Road	12 m
40	Milma Jn – City Boundary (Thanikudam Road)	22 m
41	Ambakkadan Moola Jn to Nellankara Bhagavathy temple Jn	Ambakkadan Jn. – Assissi road – Bishop Palace road -10m, Bishop Palace Jn. – Nellankara Bhagavathy Temple Jn -16m
42	From Kizhakkumpattukara Jn. at old NH to Bishop palace –Nellankara Bus route Road	12 m
43	Mulayam Jn to City Boundary Road	12 m
44	Subash Nagar Road	12 m
45	Fathima Nagar to Nadathara Road	From Fathimanagar Jn. to Mar Aprem Church Jn. – Padikkala Bus stop -15m, Padikkala Bus stop to Nadathara City Boundary -21m
46	Kizhakkumpattukara to S.N.A Road	10 m
47	Mar Aprem Church Jn to Puthur Road	From Mar Aprem Church Jn. to Chelakkottukara culvert -15m, From Chelakkottukara culvert to Corporation boundary at Puthur road -21m
48	Nadathara By Pass to Padavarad Jn (Govt. College Road)	12m
49	Thottappadi to Christopher Nagar	9 m
50	Cheerachivalavu to Ollur Palli	10 m
51	Alum vettuvazhi(Al Jn) - Vijayamatha Church Jn	12 m
52	Chiyyaram Corporation Staff Quarters Road to Chelakkottukara Jn	12 m
53	Unity Road to Chelakkottukara Jn (SN Road)	10 m
54	Ollur Jn (Rail way gate via) to Over bridge Jn	12 m
55	Ollur Industrial Estate to ThaikkattusseryJn	15 m
56	K.S.R.T.C Jn – Fathima Jn (including Kokkalai, Mission Quarters Road)	KSRTC Jn – Kokkalai Jn – 15m, KokkalaiJn –TB Road –PWD office – 21m, Ernakulam Road Jn - 12m- Ernakulam Road Jn - Mission Quarters Road – 10m
57	South Indian Bank Road	15m
58	Kannamkulangara Road From Fr.Vadakkan road to water tank Jn.at Alumvettuvazhi	12m
59	Chungam Road – Vanchikulam (goods shed)	Chungam Jn. at West fort Kanjani road to Thoppinmoola -10m,Thoppinmoola Jn - Vanchikkulam- 15m

60	Ayyanthole – Laloor Road	Kanjani Road Jn – Laloor Center -10m, Laloor trenching ground road – ESI Side Road – Chettupuzha Road - 12m
61	Viyyur – Kottekkad Road	15 m
62	Bhalabhavan – Pension Moola Road	8m
63	Puthenvettuvazhy	15 m
64	Valarkavu –Anchery school	9 m
65	Saw mill Road	9m
66	Valiyalukkal – Mathamathoppu	Valiyalukkal to Nedupuzha Womens Poly(straight road) -12m, Nedupuzha Poly to Vadookkara Road Jn. - Mathamathoppu -9m
67	Vadookkara – Karimbattathope Road	9 m
68	Panamukku Center - Vattappinni temple – Nedupuzha AKG - Chanapetta Road	Panamukku Center - Vattappinni temple– 12m, Nedupuzha AKG - Chanapetta Road – Outer Ring Road - 8m
69	Kanimangalam over bridge Road – Panamukku Road	12 m
70	Kalyanamandapam Road (Ollurcentre – one way)	15 m
71	Starting point of Marar Road – Deevanjimoola	12 m
72	Swaraj Round – Kottappuram Road (Dr. AR Menon Road)	9 m
73	Vallikkattu Lane	12 m
74	Zenana Mission Road	Museum road to Womens club road 8 m, Womens club road to college road – 8 m
75	Co-operative Road (Bennet road bylane)	9 m
76	Womens Club Road	12 m
77	Cross Road (Pipe line Cross Road)	10 m
78	Cross Road (Palace Road - SH Convent)	12 m
79	St.Mary's College Road	12 m
80	Vailoppili Nagar – Kuttumuck Pathipalam	Vailoppili Nagar – 8m Nettissery – Pathipalam - 12m
81	Avenue Road (side road Engineering College – Shornur Road Jn)	8 m
82	Peringavu Avenue Road (side of Dhanuanthiri temple)	6 m
83	Anapara - Chullikkattu Road	12m

84	Cheroor Kinar– Kuttumuck Temple – Nettissery - Mukkattukara Road	Cheroor Kinar– Kuttumuck Temple – 12m, Kuttumuck Temple – Nettissery - Mukkattukara- 9 m
85	Mukkattukara Church – Ollukkara	9m
86	Korappatha Lane (Swaraj round North)	8 m
87	Nellikkunnu kinar – Kura road	9 m
88	Ambakkadan Road – Ikkandavariyar Road – Cemetry	8 m
89	Chembootil Lane	7 m
90	Marar Road	9 m
91	Deepika Office Road	9 m
92	Madona Jn – Ancherichira	10m
93	Gosayikunnu – West Hill – Kannamkulangara Road	9m
94	Erinjeriangadi – Chaldian school road	7 m
95	Kanjani Road Jn - Elthuruth College - Bridge Road	12m
96	Kannankulangara by pass	25m
97	Lourde Nagar - Priyadarsini Nagar Road	9 m
98	Kuttumuck Temple – Sandeepani School – Outer Ring Road Jn	12m
99	Road Opposite to Ollur KSEB	12m
100	Road Opposite to Ollur Flyover	12m
101	Chiyyaram Post Office Road	12m
102	Nehru Nagar – Anchery Road	9m
103	Sivapuri Road	9m
104	Puthur Road Jn – Rahabath Road – Nellikkunnu Paravattani Jn – Kunnathunkara Road	12m
105	Ramanilayam side Road	22m
106	Poonkunnam – Thiruvambhadi Road	10m
107	Olari – Lakshmi Mill - Vadakkumuri	10m
108	Kannamkulangara - Parapuram Road	10m
109	Ayyanthole Chungam – Keralavarma College Road	7m

110	West fort - Civil Lane Road	27m
111	Mission Quarters Cemetery Road	18 m
112	Power house Jn - Pallimoola Jn	22m
113	Heart Hospital Side Road	12m
114	Heart Hospital South Side Road	15m
115	Puzhakkal Truck Terminal East Side Road	22m
116	Chiyyaram – Thiruthur temple road-Ancherichira	9m
117	Puzhakkal bund Road from Sobha city junction to MLA road along KLDC canal bund (Kundukad Reach)	20m

28.2.2 WATERWAY

There was goods transportation from Aranattukara (Vanchikulam) to Cochin and Ponnani through the Kanoli Canal. Vanchikulam Boat Jettywas one of the major transshipment points for the goods transportation of the region. When the road transportation came to existence the waterways were relegated to the background and now these water channels are blocked by the dumping of garbage's into it. This ancient water channel must be reclaimed and renovated for boat services and other recreational purposes.



Fig 28.2Vanchikulam water way

28.2.3 RAIL

Thrissur Railway Station connects Thrissur city to the railway map of India. This station is considered as the gateway to Kerala, by providing trains to many directions. It lies on the busy Shoranur - Ernakulam section. Thrissur city have a satellite station at Poonkunnam and a minor station atOllur. Suburban rail services from Thrissur to other neighbouring districts are on the cards. This will provide fast connectivity to Kochi, Kottayam, Alappuzha districts. The Delhi Metro Rail Corporation had carried out a study on the feasibility of operating an inter-district suburban-rail service. The report said that suburban services were possible in the Guruvayur-Thrissur-Kochi; Alappuzha-Kochi; and Kochi -Kottayam sectors.



Fig 28.3 Thrissur Railway Station

28.3 BUS TERMINALS

The presence of three bus terminals in Thrissur City is not sufficient to conceive all buses coming to the city. Bus traffic from the radial roads is now forced to go round the city to reach the bus stands. Therefore the traffic management of buses has to be provided in such a way that the heavy/ large buses must be able to reach the bus stands without entering the citycentre. The Citycentre must be catered with enough plights of interim public transport facilities. At present all private buses towards Chavakkad, Guruvayur area start from the Sakthan bus stand due to which the whole area experiences traffic congestion. Buses from Thrissur-Guruvayur road have to enter the Swaraj Round to reach the bus stand. As a result, passengers as well as the vehicles face several constraints such as traffic congestion, lack of parking space, limited parking time, absence of passenger seating capacity at the terminal, issues of unofficial/ illegal parking charges, and lack of security in business.

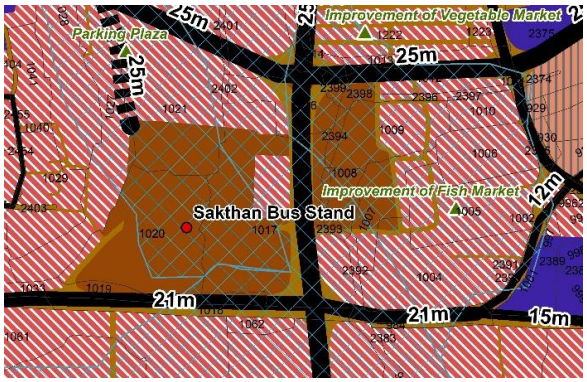


Fig 28.4 Sakthan Bus stand

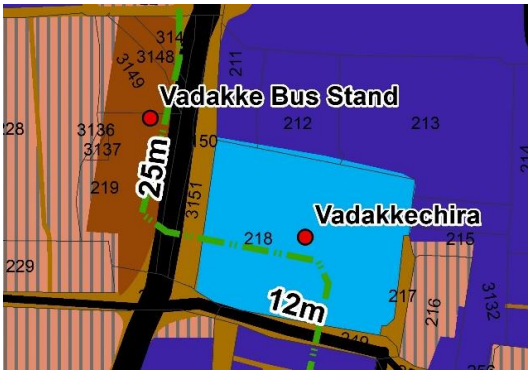


Fig28.5 Vadakke Bus stand

In order to address these issues, it has been proposed to build three bus stands, one is at Puzhakkalpadam, second one is at Ollur junction, and third one is on the side of NH- 544, near to Elenjikulam with all modern facilities. The function of a bus terminal is to provide with the necessary facilities that would ensure smooth flow of the vehicles and passengers. The design will take into consideration traffic demand, traffic characteristics, function of terminal, and assessment of capacity, facilities and costs involved. It will also consider location analyses, key risk factors, weighing of various costs v/s benefits to the various stakeholders and various options for development.

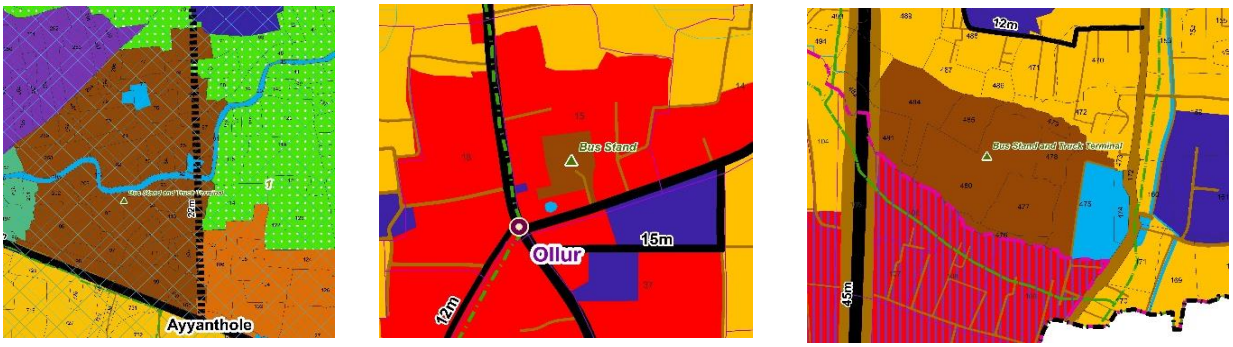


Fig 28.6 Sites for Proposed Bus stands at Puzhakkal, Ollur and Elanjikulam

28.4 TRUCK TERMINALS

Goods transport accounts for about 50% of transportation in and around the suburbs of the city. Agricultural and commercial commodities are the primary goods being transported. Emerging trends in transportation have caused problems of severe traffic congestion. The presence of national Highway increased the number of trucks from Coimbatore to Ernakulam and vice versa.

For meeting the needs of the trucks coming to City, truck terminals have to be introduced. Along with the proposed bus stand a truck terminal can be set at Ollukkara village near the National Highway- 544 near to Elenjikulam so that all the trucks coming to the city through this route can alight here and thus a major amount of heavy vehicle goods towards the city can be reduced.

One truck terminal can also be set at Puzhakkal paadam near the proposed bus stand. Trucks usually come to this area due to the abundance of commercial areas for sanitary goods, vehicle dealers, etc. existing near the Puzhakkal road. The truck terminal will also include additional infrastructure such as security and administrative offices, transport offices, banking offices, toilet block for drivers, and accommodation for traders. The terminal will also have a first aid center, fire station, transformers and general lighting for the campus, automobile shops, workshops, service stations, restaurants, petrol and diesel filling stations, a motel for traders and drivers, etc.

28.5 FLYOVERS

In the proposed Transportation Plan 2041, there are proposals for five flyovers. These flyovers are located at the roads meeting the railway cross and water bodies and to bypass the traffic at those points. List of proposed Flyovers are given below.

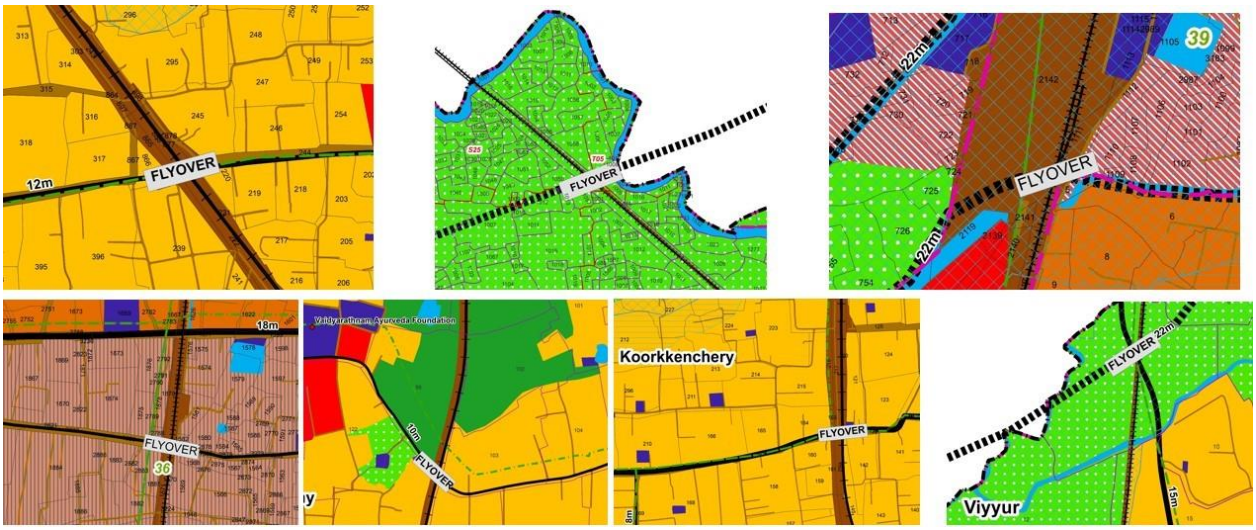


Fig 28.7 Proposed flyovers

1. Near Metro Junction (for new alignment)
2. Vadookkara Gate (for existing road)
3. NedupuzhaGate(for new bypass to Valiyalukkal – Womens Polytechnic reach – exist. Road)
4. South side of city boundary (Existing Thalore- Vallachira road)
5. Thiruvambady Gate (Existing road)
6. Outer Ring Road – Near Paramekkavu school
7. Partial Flyover – Chembessery Bridge

28.6 SUBWAY

- Padukkad
- Crossing connecting Railway station & KSRTC Stand

28.7 BRIDGE WIDENING

- Patturaikkal
- Kottappuram bridge
- Kanimangalam over bridge

28.8 JUNCTION IMPROVEMENT

Chettupuzha, Olari, Ayyanthole Civil Lane, Lulu Centre, Poonkunnam, AranattukaraJn, Poothole, Deevanjimoola, ChettiyangadiJn, Kokkalai – Metro Jn – Kannamkulangara Road Jn – Mundupalam, Mission Quarters road Jn, East Fort, Chempukkavu, Patturaikkal, Power Station Jn, Pallimoola, Peringavu, Nellankara, Paravattani, Chelakkottukara, AncheryChira, KuttanellurJn, Koorkenchery, Christopher Nagar, Companipadi, Ollur, ThaikkattusseryJn, Akkara Hall Jn, Cheroor Kinar Jn.

28.9 PROVISION FOR HELIPAD



A helipad can be essential in remote or emergency situations, facilitating quick medical evacuations, search and rescue operations or transporting critical supplies. Currently private ownership helipads are available in Thrissur Corporation. These can be beneficial particularly for business executives allowing them efficient transportation without relying on public facilities. A helipad can be proposed at suitable location in Thrissur Corporation. At least 35m width and length is needed for a helipad.

28.10 PARKING AREAS

Lack of Parking spaces for vehicles is the main problem faced in City. In order to reduce the problems arising due to parked vehicles at road sides, some areas have to be located for parking spaces near the city so that the problem can be reduced to some extent.



Fig 28.8 Proposals near Sakthan Bus stand

A parking plaza is proposed near the Sakthan Bus stand so that people can park their vehicles here and make use of the bus service to enter the city so that the traffic volume to the central area is reduced to certain limit.

Apart from the parking plaza, a tempo parking area is also proposed near the Sakthan stand to help the vehicles carrying vegetables to Sakthan Market. A site for a flower market proposed near the above said area. The vacant space near the bus stand can be utilized for building a shopping complex, conventional centre and office complex. The details are as given in figure.

A parking site also proposed near AswiniJn.to reduce the problems near Big Bazaar and Aswini Hospital. Lack of parking area for Aswini hospital and Big Bazaar creates traffic problems due to on road parking of vehicles. In order to reduce this, a parking area is proposed at this site.

28.11 OFF-STREET PARKING MANAGEMENT

Multi-level Car Parking at Available Areas

High parking deficiency was observed at southern and western areas of Swaraj Round, Sakthan bus stand area, Westfort junction and Patturaikkal-Aswini Hospital junctions. Off-street multilevel parking spaces can be planned in these areas to meet the present and future demands. Such structures should take into account the capacity of access road and adjoining streets so that entry and exit from the parking lot does not aggravate congestion. Suitable Large public spaces such as Parks, Playgrounds, stadium and under-utilised public amenities and land at select localities can be utilised for off-street parking through use of basements,

under-ground parking structures. Care must be taken not to disturb the functioning of the space above. Parking plaza have been proposed near Sakthan bus stand and Aswini Junction. South west part of the city core has been demarcated for promoting commercial activities. More parking spaces especially multilevel parking can be planned in this area. Outside the core area, promotive urban area is suggested where both residential and commercial activities are promoted. Hence proper allocation of parking spaces should be ensured in new projects coming up in this locations.

Effective Use of Available Public and Private Land

- Vacant lands available in the core area like parts of Thekkinkadu maidan, can be utilised for parking. Any unused space in public facilities may be used for parking. This can be executed in any unused spaces associated with Corporation assets, public buildings etc.
- Even when off-street parking is available to users of personal motor vehicles, it is often underutilized due to the low or no cost of on-street parking and poor enforcement. Municipal Corporation may ensure that on-street parking should be managed and enforced effectively.
- The parking space provided within the buildings / building complexes as per the applicable building bye-laws may be fully utilized before permitting any on-street parking for the occupants/ visitors. Post occupancy audits can be conducted to ensure utilisation of parking spaces in the buildings.
- Require or encourage the development of overflow parking plans for special events.

Parking Levy and Valet Parking

Methods like parking levy, subsidized public transit passes, and valet parking may be explored to manage the parking issue. Parking levy is a tax introduced on the benefit of free or cheap parking near the workplace. It will reduce the number of employees driving into the inner city, and increase the usage of park and ride lots in the periphery. Also subsidized public transit passes can be issued to encourage employees to park at the periphery and leave the prime spaces for customers. In contrast to self-parking, vehicles are parked for the owner by a person called a valet. The advantage is that it is possible to pack more cars into a given physical space. Also it is convenient for the customers as they do not have to walk from a distant parking spot carrying heavy loads. Valet parking system can be planned in business locations where parking is scarce.

28.12 ON-STREET PARKING MANAGEMENT

Following parking management measures may be adopted at suitable places.

- On-street parking may be allowed on roads wherever there is adequate Right of Way (RoW) with the approval of expert panel comprising of stakeholders like the traffic police, Corporation, shop owners etc.
- On roads with RoW less than 7.5m, only parallel parking on left side with unidirectional traffic movement can be allowed subject to availability of a clear RoW of 5m.

- Parallel parking configuration shall be adopted for all three-wheeled and four wheeled vehicles including motor cars, light commercial vehicles, buses and trucks. Perpendicular parking configuration shall be adopted for motorised two wheelers as well as bicycles.
- On street parking spaces shall be designed as per IRC: SP:12:2015.
- Care shall be taken to eliminate the conflicts between pedestrians, cyclists and vehicles while planning for on street parking spaces.
- Areas up to 50 m from intersections on all arms and other critical locations shall be kept free from parking and other encroachments.
- Parking shall be prohibited up to 3 metres on both sides of pedestrian crossings with appropriate road markings showing boundary of parking lots and 'No parking zone'.
- Parking and halting (including auto rickshaws) shall be prohibited up to 20 metres prior to the bus stop and 15 metres after the bus stop.
- Parking shall be prohibited up to 10 metres on both sides of entrance and exit gates of fire stations, electric supply sub-stations and hospitals.
- Road signage systems for parking shall be provided in all roads.
- Parking spaces in the ratio of 1:20 four wheeler parking spaces shall be reserved for specially abled persons which shall be free of parking charges and which shall not be used by anyone other than such persons. ID cards shall be distributed by Municipal Corporation to such persons on demand. Reserved parking spaces for specially abled persons shall be designed according to IRC: SP: 12:2015.

28.13 INTELLIGENT TRANSPORT SYSTEM

An intelligent transport system is proposed in the following areas for Thrissur city.

Traffic Management Centre (TMC):

TMC has the following components.

- Installing video cameras at key locations
- Setting up a communication system with local policemen as well as with the traffic signal controller
- Installing variable message signs (for passing on real-time traffic information to the road users, route guidance, parking information)

Traffic Incidence Management (TIM):

TIM involves a set of co-ordinated operations among the law and enforcement team, fire and rescue team, emergency medical services, transportation agencies, towing and recovery agencies, and media, as given below:

- Incident detection
- Verification of the incident
- Passing on the relevant information to the motorists
- Dispatching the response team
- Traffic management Incident clearance for restoring the roadway capacity to its pre-incident condition

Development of Cordon zones:

Cordon zones are used primarily in urban centers where mass transit is an alternative to driving. Drivers entering a cordon zone are charged a toll that exceeds the cost of mass transit. Development of cordon zones in the CBD areas and highly congested corridors of Thrissur city would help to reduce the traffic congestion, parking problems and related environment pollution of these areas. By charging high toll for personalized vehicles entering these cordon zones towards congestion charges, the number of vehicles entering these zones could be restricted through ITS, using electronic toll collection and license plates. The tolls could be worked out based on the congestion level prevailing in these locations and could be varied with respect to vehicle type and time of entry.

GPS Based Intelligent Tracking System:

The system enables both operators and users of public transport services by providing improved communication between dispatchers and drivers and the capability for passengers to access bus schedules that are instantly up-to-date. With GPS tracking, bus riders can access electronic schedules with near real-time updates. By being able to interact with bus scheduling systems, commuters may be more likely to ride and rely on the bus. That means repeat customers for the transit system, whether traveling along their usual route or riding to a variety of different locations. It will provide the users with the following information;

- Number of buses that go to the required destination, bus numbers, bus timings
- Routes through which the bus would pass
- Time taken for the bus to reach
- Maps that would guide the passenger with his/her route and
- Track the present location of the bus and updating the passenger about the correct time for the bus to reach the respective bus stops

28.14 FISCAL MEASURES

Fiscal measures are a useful instrument in the hands of the government to bring about, with conscious purpose, a rate structure within the transport industry which will correspond closely enough to the social costs of providing different services and social benefits derived from them and at thes ame time to be able to assess the value of the burdens imposed or the concessions conferred.

High - quality public transport fuels cities' productivity, but high - quality implementation depends critically on appropriate funding mechanisms. Public transport financing needs are increasing significantly due to growing demand, higher customer quality expectations, and rising production factor costs. Inadequate funding will lead to lower quality of service, leading to fewer passengers and lower revenue. To secure resilient public transport funding, its funding mix must be strengthened and diversified. This involves optimizing fare revenues, developing additional revenues through value -added services, and using the proceeds from charges levied on indirect beneficiaries (car users, businesses and employers, property owners) to fund public transport.

Concerned authorities should consider fiscal measures to achieve a balanced modal split and to secure the budget necessary to implement urban transport projects. Apart from setting up an Institutional mechanism, the authorities should consider the following:

- Fare policy for public transportation, taxis and autos, parking
- Subsidy policy for Public Transport and IPT operations
- Private and public transport vehicles taxes
- Permits and regularization of IPT vehicles
- Road congestion charging

28.14.1 Fare policy for public transportation, taxis and autos, parking

Public Transportation: Cost coverage or recovery should be the basis of pricing primarily. Costs should be interpreted in wider and comprehensive terms from the social point of view if the pricing policy is to be adequate and satisfactory from the point of efficient and economical use of a country's resources.

Fare may be defined as the price the passenger pays for a ride. In most developing countries, fares are fixed by the Government or by the appropriate road transport control authority asper the fare policy of the Government. Indeed, operational costs changes and socio political developments may require readjustment of the fare structure from time to time. Sometimes fares are subjected to change on the operator's representation and the pressure exerted by them declaring strikes. Government may set its own fare policy as to offering concessional fare, workman fare, students fare, telescopic fare, per bus kilometre fare, per passenger kilometre fare, flat fares, stage fares etc. However, the most common is the stage fare.

It should be noted that the pricing policy in the case of road passenger services cannot be considered to be based on or related to either the commercial or profit maximization principle or the marginal social welfare cost principle.

Intermediate transport services: In the case of intermediate transport services such as taxis, autos, etc., they are operated purely on commercial basis and the fares are fixed by the government from time to time keeping in mind the cost variations occurring due to hike in various inputs of the operation of services.

Parking: Price mechanisms can be an effective way to reduce parking demand. Motorists should be charged directly for using parking facilities. Even a relatively small parking fee can cause significant travel impacts and provide significant reduction in parking demand. Government and Corporation could directly control prices for on-street parking, off-street parking at public facilities (offices, schools, parks, etc.) and municipal parking facilities.

28.14.2 Subsidy policy for Public Transport and IPT operations

Issues relating to the subsidization of transport services are quite often raised in the discussion

of financial viability of transport agencies/undertakings. Certain social obligations are generally cast on the agencies like the railways/ road transport passenger services to carry goods/ passengers at concessional rates, which are not or may not be remunerative in relation to the costs of their carriage or even the average cost of carriage in the system. In certain cases, such subsidization of services though financially unremunerated to the undertaking may be economically beneficial for the country. However, Subsidization should be periodically reviewed from the point of view of its effectiveness

28.14.3 Private and public transport vehicles Taxes

Taxation of road transport can be at the local, or central government level or at any other level of intermediate public authorities like state Governments as in India. There is a general demand that taxation revenues of the road transport sector should be fully made available to the development and maintenance of roads in the interest of the development of road transport. This point of view has been examined in the past and the general view is that it would be necessary to take a realistic view of the need and purpose of taxation in a developing country. A possible solution to avoid unnecessary controversy in this area of charging for road use may be a system of direct charging for such use though such a system cannot be considered to be free from problems. Pricing for road use on the basis of cost of road use, cost being interpreted to include social costs like congestion costs etc., would have to take note of variations in costs arising from the following:-

a) Differences in vehicle types
b) Differences in distances travelled
c) Differences in location
d) Differences in the time of day or year

28.14.4 Permits and regularisation of IPT vehicles

There seems to be an increasing lawlessness among Autorikshaw drivers and there is a need to bring them under the scanner. In this regards, the following suggestions merit consideration.

a) Limiting the number of Autorikshaw/ taxis to be operated in the city limits
b) Restricting the number of Autorikshaw coming from the rural areas and parking within the city limits
c) Earmarking spaces for auto/ taxi stands and specifying numbers
d) There should be issue of receipts for payment of rental charges
e) Strict adherence to uniform for drivers and display of a badge containing name and other important details of the operator

28.14.5 Road congestion charging

The fundamental idea is to charge people who cause congestion to other users of the traffic under congestion charges. Congestion lowers travel time, increases air quality and reduces emissions of greenhouse gas. The aim of congestion charging is to reduce peak time traffic by moving the demand to other mode of transport (carpools, vanpools and transit) or

off-peak time. Depending on the distance / area and the time, the congestion charge depends on the amount. The charging of congestion would reduce road congestion and raise the average road system speed. It will also reduce pollution and waste fuel due to car idling at signaling intersections. The income generated can be useful for improving public transport, improving road transport and so on.

28.15 PUBLIC AWARENESS

People involved in transportation decision-making (public officials, planning professionals and community members) should live without using a personal automobile for at least two typicalweeks each year that involve normal travel activities (commuting, shopping, social events, etc.) in order to experience the non-automobile transportation system.

For making Thrissur a cleaner and greener place, it is the responsibility of the individual, Irrespective of age or socio-economic status, to render their efforts and make the mission possible;

a) Adopt and popularize car-pooling
b) Use Public transport where available
c) Clean fuel filters, air filters and oil filters regularly
d) Clean carbon deposits from silencers
e) Maintain recommended tyre pressure
f) Awareness campaign to build public awareness

CHAPTER 29
DTP SCHEMES AND THEIR REVOCATION

Detailed town planning (DTP) schemes are detailed proposals for development of areas at micro level. There are twelve sanctioned DTP schemes in Thrissur City and these schemes played an important role in execution of major roads and also eradicated the haphazard development to a great extent. The sanctioned DTP schemes in Thrissur Municipal Corporation area are listed below and the location is shown in fig 29.1.

1. DTP scheme for Thekkinkadu Maidan
2. DTP scheme for Existing Shornur Road area
3. DTP scheme for Shornur Bye-Pass Road area
4. DTP scheme for North Ring Road (Part-II) area
5. DTP scheme for Ring Road East
6. DTP scheme for Erattachira-Chettiangadi area
7. DTP scheme for South-West Swaraj Round Area
8. DTP scheme for MG Road Area
9. DTP scheme for West Ring Road
10. DTP scheme for Kannankulangara area
11. DTP scheme for Kannamkulangara Extension (South-West)
12. DTP scheme for Junction Improvement of Aranattukara

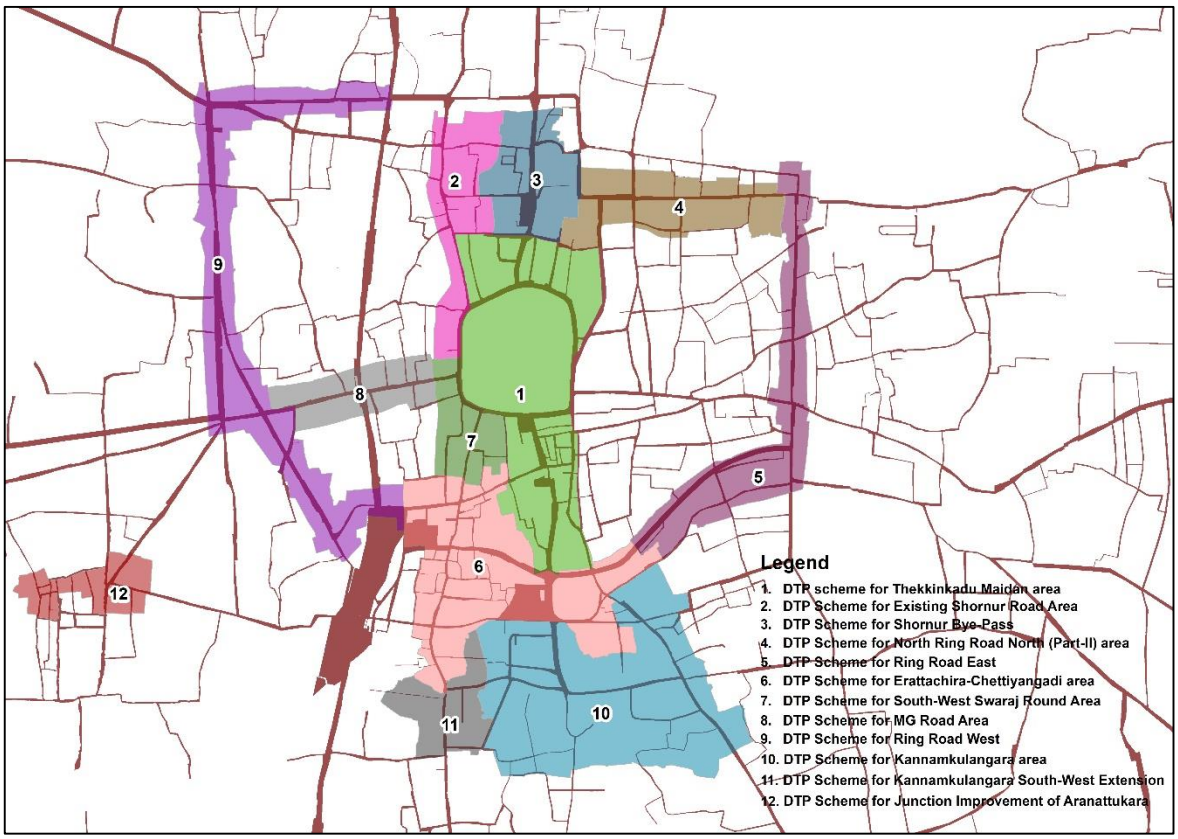


Fig 29.1 Sanctioned DTP schemes in Thrissur Municipal Corporation area

29.1 DTP SCHEME FOR THEKKINKADU MAIDAN

29.1.1 REVIEW OF DTP SCHEME

This scheme is sanctioned as per G.O (M.S) No. 240/75/LAD & SWD dated on 24.09.1975 in an area of 60 Ha in the central part of Thrissur City. This Scheme is focused to develop the commercial land use and road network.

Swaraj round and M.O road are the major roads passing through the scheme area. Widening of Swaraj round to a width of 30m, M.O road to 25m and creation of new road from M.O road to Mathrubhumi junction are the major road proposals. The road proposals aim to open up and improve undeveloped area on the southern portion of the scheme area, which is an extension of the existing central business area. Further commercial development is promoted through commercial landuse zoning proposals along M.O road and the new proposed road.

The proposals for road widening and new road creation under DTP Scheme are partially achieved. Current scenario shows, heavy traffic congestion in core area because of inadequate carrying capacity of roads due to the emergence of surplus vehicles. In the Master plan – 2039 under AMRUT Scheme, M.O road is proposed to be 25m wide to tackle this future demand.

Road widening proposal of Swaraj round to 30m is not achieved. The present scenario is that the widening of Swaraj round is possible for one side only, outward of the round and the prevailing ASI regulation of Sri. Vadakkumnathan temple leads to development control for that particular area. To conserve the heritage and central open space further construction of any building in Thekinkadu maidan area is discouraged. This diminishes the importance and need for the 30 m road widening proposal of the existing swaraj round road as per the DTP scheme. In this context, it is decided to continue the width of Swaraj Round as 22m, the current width itself. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.1.

Table 29.1 Comparison of the proposals in DTP Scheme for Thekkinkadu Maidan and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Swaraj round	30m	22m	22m	22m
Municipal office road	25 m	25m	25 m	23m
Nayarangadi	15 m		No widening proposal	13m

Road connecting Nayarangadi and PO road	15 m		No widening proposal	6m
Thanjan lane	10 m		No widening proposal	10m
Road connecting High road and MO road	20 m		12m	13m

Commercial developments are completely achieved. Existing land use indicates that 64% of residential landuse have been converted to commercial use, this shows a growing trend for commercial development. The same is being enhanced through the mixed land use zoning proposal under AMRUT Scheme.

29.1.2 SCHEME REVOCATION

Commercial developments which were proposed in the scheme area are completely achieved and most of the land proposed in the residential zone have been converted to commercial use . Area under this scheme excluding Vadakkumnadha temple, Thekkin kadu maidan and area up to a depth of 150m from outer boundary of swaraj round is proposed to be included in mixed core zone and commercial core zone. As the developments proposed in this scheme are accommodated in master plan, the DTP scheme for Thekkinkadu Maidan shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.2 DTP SCHEME FOR EXISTING SHORNUR ROAD AREA

29.2.1 REVIEW OF DTP SCHEME

Sanctioned as per G.O (M.S) No. 135/90/LAD dated on 06.09.1990 in an area of 21Ha and located in northern side of Thekkinkadu maidan, this Scheme is focused to develop the commercial use, widening of roads and junction improvements.

Shornur road is the major road passing through the scheme area and Commercial developments are promoted through mixed use zoning proposals along Shornur road. To facilitate the development of the scheme area, road widening and junction improvement proposals for Shornur road and its sub roads are proposed. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.2.

Table 29.2 Comparison of the proposals in DTP scheme for existing Shornur road area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Shornur road (Swaraj Round to Patturaikkal jn)	15m	12m	12m	9m
Thiruvambady road	12m	15m	15m	9m
Paliyam road	10m	12m	12m	7m
Kunnath Mana lane	10m	12m	7m	7m
Kundoor madam lane	7m		No widening proposal	4m
Kallingal street	7m		No widening proposal	6m
A.R Menon Road	7m	9 m	9 m	7m

The proposed road width as per DTP scheme has not been achieved while a parallel road connecting Thrissur to Shornur near Vadakkechira has gained prominence and is being promoted further by a 25 m road widening proposal under AMRUT Scheme. This diminishes the importance and need for the 15 m road widening proposal of the existing Shornur road as per the DTP scheme, however the 12 m road widening proposal under AMRUT Scheme is required to support the future commercial development. The Commercial developments in the proposed mixed-use zone under the DTP Scheme are achieved completely without attaining the proposed road width. The scheme area being part of the core of Thrissur city is under urbanisation pressures which attracts further commercial development. AMRUT Scheme proposes a mixed-use development in the area to accommodate this development.

29.2.2 SCHEME REVOCATION

As the proposed developments of commercial use and developments of roads in this scheme are accommodated in master plan, DTP scheme for existing Shornur road area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.3 DTP SCHEME FOR SHORNUR BYE-PASS ROAD AREA

29.3.1 REVIEW OF DTP SCHEME

Sanctioned as per G. O (M.S) No. 138/98/LAD dated on 29.06.1998 in an area of 21Ha and located in northern side of swaraj round (starting from Paliyam road to Aquatic complex), this Scheme aims to develop road network and retain public and semi-public areas.

Major proposals include 25 m road widening of Karunakaran Nambiar Road, road junction improvements along the road, development of new road connecting existing Thrissur shornnur road to Karunakaran Nambiar Road and a road connecting this to west palace road. DTP Scheme also includes zoning proposals to retain public and semi-public areas. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.3.

Table 29.3 Comparison of the proposals in DTP scheme for Shornur bye-pass road area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Karunakaran Nambiar road	25 m	25m	25 m	25m
Kundoor madam lane	15 m		No widening proposal	10m
Stadium road	15m		No widening proposal	10m
West Palace road	12m		No widening proposal	14m
Swimming pool road	10m		No widening proposal	10m
Paliyam road	12m	12m	12m	11m

Junction improvement and road widening are almost achieved in this scheme area. Road proposal of 12m Paliyam road and 25m radial road (Karunakaran Nambiar Road) are coming in this area as per the Master plan 2039. This area belongs to mixed core zone in new Master plan.

The proposal for retaining public and semi-public areas are achieved completely and proposed for commercial and transportation zones are fully utilized. However existing land use indicates that 65% of residential land use have been converted to commercial use, this shows a growing trend for commercial development. The same is being enhanced through the mixed land use zoning proposal under AMRUT Scheme.

29.3.2 SCHEME REVOCATION

As the major road proposals in the scheme area are completely achieved and the area under this scheme is proposed to include in mixed core zone in new Master plan, the DTP scheme for Shornur Bye-Pass Road area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.4 DTP SCHEME FOR NORTH RING ROAD (PART-II) AREA

29.4.1 REVIEW OF DTP SCHEME

This scheme is sanctioned as per G.O (M.S) No. 185/90/LAD dated on 15.11.1990 in an area of 28.2Ha and located in north eastern side of the ring road. This scheme is focused to retain the public and semipublic uses which are predominant in this scheme area.

The land use proposals include retaining the public and semipublic uses. Major road proposals like Museum Road were proposed to a width of 25m and Palace road to 18 m width. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.4.

Table 29.4 Comparison of the proposals in DTP scheme for north ring road (part-II) area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Museum road	25m	18m	22 m	16m
Pallikulam Thavoos road	25m	22m	9 m	14m
Palace road	18m	21m	21m	21m
Zanana mission road	12m	12m	12m, 9m	9m
Museum cross lane	12m		No widening proposal	10m
Town hall road	25m	18m	22 m	28m
Womens club road	12m	12m	12 m	8m
Regional theater road	25m	22m	22m	18m

Currently the public and semipublic uses are retained as such and the road proposals are partially achieved. Museum Road, Pallikulam Thayyoor Road and Town Hall Road are developed to a width of 22 m as part of ring road proposal under AMRUT Scheme. The ring road proposals diminishes the importance and need for the other road widening proposal per the DTP scheme, however adequate road widening proposal under AMRUT Scheme is

required to support the future needs. Land uses are zoned under existing public zone and mixed zone under AMRUT Scheme to conserve the heritage and culture of Thrissur.

29.4.2 SCHEME REVOCATION

As the major road proposals in the scheme area are achieved and the area under this scheme is proposed to include in mixed core zone and public and semipublic zone in new Master plan, DTP scheme for North Ring Road (Part-II) area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.5 DTP SCHEME FOR RING ROAD EAST

29.5.1 REVIEW OF DTP SCHEME

Sanctioned as per G.O (M.S) No. 110/99/LAD dated on 1.06.99 in an area of 34 ha and located in eastern part of ring road extending from Pension moola to Manorama junction, this scheme is focused to develop residential, commercial, public and semipublic zones uses along with road widening and junction improvement.

Major proposals are road widening of Ikkanda Warrior Road to 25 m width and widening of other roads; junction improvement and creation of new road with commercial, residential and public and semipublic zones adjoining these roads. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.5.

Table 29.5 Comparison of the proposals in DTP scheme for ring road east and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Thrissur Palakkad road	25m	15m	15 m	10m
R.C Bishop House road	25m	22m	22 m	12m
Ikkanda warrior road	25m	25 m	25 m	25m
Moospet road	18m	22m	22m, 15 m	15m
Kizhakumpattukara road	15m	16m	16 m	9m
Museum road	25m	18m	22m	7m
Puthanvettuvazhi road	18m	15m	15 m	11m
Chembukavu road	15m	8 m	8 m	4m

Proposal for creation of new road (Ikkanda Warrior Road) is completely achieved and road widening proposals are partially achieved. R.C Bishop House Road and Moospet Road are

developed to a width of 22 m as part of ring road proposal under AMRUT Scheme. The ring road proposals diminishes the importance and need for the other road widening proposal per the DTP scheme, however adequate road widening proposal under AMRUT Scheme is required to support the future needs. The land use zoning proposals of residential, commercial, public and semipublic zones are fully achieved where public and semipublic areas are retained as such in new Master plan. Land uses are zoned under mixed zone and mixed core zone under AMRUT Scheme to facilitate future commercial development.

29.5.2 SCHEME REVOCATION

As the major road proposals in the scheme area are achieved and the area under this scheme is proposed to include in mixed core zone in new Master plan, the DTP scheme for Ring Road East shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.6 DTP SCHEME FOR ERATTACHIRA-CHETTIANGADI AREA

29.6.1 REVIEW OF DTP SCHEME

This scheme is sanctioned as per G.O (M.S) No. 208/90/LAD dated on 11.12.90 in an area of 50Ha and located in southern side of the Swaraj round including Sakthan bus stand. This scheme is focused to develop residential, commercial, industrial and traffic and transportation uses.

Sakthan Bus Stand Road, Manorama Road, and Railway Station Road are the major roads passing through the scheme area and is proposed to a width of 25 m. The other road widening proposals include Kokkala to Sakthan Stand Road to a width of 18 m, Star Chemicals Side Road to a width of 9m. The land use proposal includes zoning regulations for residential, commercial, industrial and traffic and transportation uses.

Major road proposal including Manorama jn, Mathurbhurni jn, Veliyanoor jn, and KSRTC jn to a width of 25m is achieved almost completely. Existing scenario gives importance to the development of commercial and residential activities whereas industrial development is reduced to a great extent. This is one of the DTP schemes which became real to ground in the case of road development. In the master plan 2039 these major roads are restrained as such with a width of 25 m. The land use proposals for development of residential, commercial, industrial, traffic and transportation uses are completely achieved. Under AMRUT Scheme the land use is regulated as part of commercial core zone to facilitate future commercial development. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.6.

Table 29.6 Comparison of the proposals in DTP scheme for Erattachira-Chettiangadi area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Sakthan Bus Stand Road	25 m	25 m	25 m	16m, 25 m
Kokkala to Sakthan Stand Road	18 m	21 m	21 m	9m, 21m
Manorama Road	25m	25 m	25 m	25m
Railway Station Road	25 m	25 m	15 m	11m
Star Chemicals Side Road	9 m		No widening proposal	6m

29.6.2 SCHEME REVOCATION

As the major road proposals and land use proposals in the scheme area are achieved and the area under this scheme is proposed to include in mixed core zone and commercial core zone in new Master plan, the DTP scheme for Erattachira - Chettiangadi Area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.7 DTP SCHEME FOR SOUTHWEST SWARAJ ROUND AREA

29.7.1 REVIEW OF DTP SCHEME

Sanctioned as per G.O (M.S) No. 183/90/LAD dated on 15.11.1990 in an area of 12Ha and located in south western side of the Swaraj round, this scheme was oriented for the development of roads and commercial activities.

The major road proposals include road widening of Marar Road, Kuruppam road and Road connecting Mannadiar lane and Chembottil lane. The land use proposal focuses on zoning regulations for mixed use and commercial activities.

The road widening proposals are partially achieved. Since Kuruppam Road is the major corridor that facilitates commercial development the road widening proposal of 10m width is taken forward under AMRUT Scheme. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.7.

The proposed mixed used and commercial developments are completely achieved. Existing land use indicates that 51% of residential land use have been converted to commercial use, this shows a growing trend for commercial development. The same is being enhanced through the mixed land use zoning proposal under AMRUT Scheme.

Table 29.7 Comparison of the proposals in DTP scheme for Southwest Swaraj round area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Marar road	10 m	12 m	12 m	12m
Kuruppam road	12m	10 m	10 m	8m
Road connecting Mannadiar lane and Chembottil lane	7m		No widening proposal	5m

29.7.2 SCHEME REVOCATION

As the major road proposals and land use proposals in the scheme area are achieved and the area under this scheme is proposed to include in commercial core zone and decongestion core zone in new Master plan, the DTP scheme for south west Swaraj round area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.8 DTP SCHEME FOR MG ROAD AREA

29.8.1 REVIEW OF DTP SCHEME

Sanctioned as per G. O (M. S) No. 209/92/LAD dated on 14.08.1992 in an area of 14.5Ha and it is situated in the surrounding area of M.G.road. The objective of the scheme is to develop road network and retain public and semi-public areas.

Major proposals comprise of road proposals such as widening of M.G road and its ancillary roads. The landuse proposals include zoning regulations for residential and commercial activities. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.8.

Table 29.8 Comparison of the proposals in DTP scheme for M G road area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
M.G. road	21m	21 m	21 m	15m

Kottapuram road	12m	12 m	12 m	6m
Mannath lane	10m	12m	7m	6m
Pottayil lane	7m		No widening proposal	5m
Marath lane	7m		No widening proposal	6m
Machingal lane	7m		No widening proposal	6m

M.G road is proposed for a road width of 21 m under DTP scheme but the maximum existing width achieved is 16 m. As per the existing scenario, the scheme area attracts commercial development in order to facilitate this, the DTP proposal of 21 m M.G Road widening is taken forward under AMRUT Scheme. Similarly, DTP road widening proposals for Kottapuram road and Mannath Lane are taken forward. The prominence of Marath lane and Machingal lane diminishes as Mannath Lane is developed under AMRUT Scheme.

The landuse proposal for residential and commercial zones are achieved completely. This scheme belongs to core area and therefore land uses are proposed under commercial core zone and mixed core zone as per the Masterplan – 2039 to accommodate the future commercial needs.

29.8.2 SCHEME REVOCATION

As the major road proposals in this scheme are adopted in the new master plan and area under this scheme is proposed to include in commercial core zone and mixed core zone in new Master plan, the DTP scheme for MG Road Area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.9 DTP SCHEME FOR WEST RING ROAD

29.9.1 REVIEW OF DTP SCHEME

This scheme is sanctioned as per G.O (M.S) No. 132/92/LAD dated on 27.05.1992 in an area of 62Ha and located in south western side of ring road (Divanjimoola to Patturaikal over bridge). This scheme focuses on the commercial development, widening of roads and junction improvements.

Major road passing through this scheme area is the Ring road. Proposed width of ring road is 25m. The land use proposals include regulations for commercial development and retainment of certain stretch of paddy fields as such in this scheme. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.9.

Table 29.9 Comparison of the proposals in DTP scheme for west ring road and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
C.Achutha Menon road (Westfort to Punkunnam)	21 m, 25 m	22 m	22 m	15m,30m
Sankaraiyar road	25m	15 m	15 m	17m
Shankarankulangara road	9m	12 m	12 m	8m
Thrissur Kunnamkulam road	20m	25 m	25 m	16m
Road connecting Patturaikkal jn to Poonkunnam jn	25 m	22 m	18 m	15m
Ayyanthole road	25m	27 m	27 m	21m
Sree Kerala Varma College Road	9m	10 m	10 m	9m

The proposal of road widening is partially achieved. C.Achutha Menon Road and road connecting Patturaikkal Jn to Poonkunnam Jn are developed to a width of 22 m and 18m respectively as part of ring road proposal under AMRUT Scheme. The other road widening proposals under DTP Scheme are enhanced through AMRUT Scheme for facilitating the future commercial needs. Currently 27 % of Residential and 86.67 % paddy zones are converted to commercial zones. Land uses are zoned under commercial core zone, mixed core zone and mixed zone under AMRUT Scheme to facilitate future commercial development.

29.9.2 SCHEME REVOCATION

As the major road proposal in the scheme is accommodated as ring road in the new master plan and the area under this scheme is proposed to include in commercial core zone and mixed core zone in new Master plan, The DTP scheme for West Ring Road shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.10 DTP SCHEME FOR KANNANKULANGARA AREA

29.10.1 REVIEW OF DTP SCHEME

This DTP scheme is sanctioned as per G.O (M.S) No. 28/89/LAD & SWD dated on 04.04.1989 in an area of 75Ha located in the southern side of Sakthan Thampuran bus stand. This Scheme is focused to develop the road networks and mixed land use.

Major proposals are creation of new roads like Mundupalam road, Balya road and heart hospital road to a width of 15m and other roads to a width of 12m. Road from TUDA junction to Kannamkulangara road junction is proposed to a width of 25m. Land use development proposals include residential, commercial and mixed use zoning. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.10.

Table 29.10 Comparison of the proposals in DTP scheme for Kannankulangara area and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Municipal Office Road	25m	25 m	25 m	23m
High Road	18m	15 m	15 m	15m
TB Road	18m	21 m	21 m	10m
Balya Kanamkulangara Road	15m		No widening proposal	12m
Heart Hospital Road	15m	15 m	12m, 15m	15m
Cemetery Road	15m	21m	22m	8m
Mundupalam Road	13m	15m	22m	12m
Balya Road	12m	22 m	22 m	12m

Currently a mixture of dry cultivation, commercial, residential, and public land uses are seen in this area and have achieved completely as per DTP scheme. The partially achieved road widening proposal of Municipal office road of width 25 m and heart hospital road of width 15m is taken forward under AMRUT Scheme and other road widening proposals including TB Road of 22m width, Cemetery Road of 15 m width are developed further to cater the future commercial needs. Mundupalam Road and Balya Road are developed to a width of 22 m as part of ring road proposal under AMRUT Scheme.

29.10.2 SCHEME REVOCATION

As the major road proposals and land use proposals in the scheme area are almost achieved and the area under this scheme is proposed to include in commercial core zone and mixed zone in new Master plan, the DTP scheme for Kannankulangara area shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.11 DTP SCHEME FOR KANNAMKULANGARA EXTENSION (SOUTH WEST)

29.11.1 REVIEW OF DTP SCHEME

Sanctioned as per G.O (M.S) No. 136/98/LAD dated on 23.6.1998 in an area of 15Ha and placed in South Western side of the ring road in Thrissur City, the scheme focuses on residential development, road widening and junction improvements.

Kodungallur road (SH-22) is the major road passing through the scheme area and is proposed to a width of 18 m. The other road widening proposals include Balya road to a width of 15 m, Metropolitian side road to a width of 7m, road connecting Thankamani jn to Balya Kanamkulangara to a width of 7m. The land use proposal focuses on zoning regulations for residential activities.

Proposed Residential developments are kept as vacant land and widening of roads are partially achieved. Recently most of the vacant lands are in the threshold of development. In the Master plan 2039 under AMRUT Scheme, this area is marked under mixed and commercial core zone for further development. The partially achieved road widening proposal of Kodungallur road of width 18m is taken forward under AMRUT Scheme and other road widening proposals including Balya road of 22m width, road connecting Thankamani jn to Balya Kannamkulangara of 15 m width are developed further to cater the future commercial needs. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.11.

Table 29.11 Comparison of the proposals in DTP scheme for Kannamkulangara extension (south west) and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
Kodungallur Shornur Road	18m	18 m	18m	14m
Balya Road	15m	22 m	22m	12m
Metropolitan Side Road	7m	8 m	No Road Proposal	5m
Road Connecting Thankamani Jn To Balya Kanamkulangara	7m	15 m	15m	7m

29.11.2 SCHEME REVOCATION

As the major road proposals and land use proposals in the scheme area are almost achieved and the area under this scheme is proposed to include in commercial core zone and mixed zone in new Master plan, the DTP scheme for Kannamkulangara extension (south west) shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

29.12 DTP SCHEME FOR JUNCTION IMPROVEMENT OF ARANATTUKARA

29.12.1 REVIEW OF DTP SCHEME

Sanctioned as per G.O (M.S) No. 144/91/LAD dated on 16.05.1991 in an area of 14Ha and located in south western side of ring road, this Scheme gives importance to junction improvement only.

Proposal for a road width of 18m to Poothole, 24m to West fort, 15m to Aranattukara road and 10m to Chungam are the major road proposals in this scheme.

Currently roads are not developed as per DTP proposals. In the Master plan 2039, West fort road and Poothole road are proposed to a width of 22m and 18m respectively as a part of Ring road development. This diminishes the importance and need for the 15 m road widening proposal of the Aranattukara-Chungam road as per the DTP scheme, however the 10 m road widening proposal under AMRUT Scheme is required to support the future commercial development. The DTP proposal of 15 m Aranattukara road widening is taken forward under AMRUT Scheme. A comparison of the proposals in DTP scheme and Master Plan is given in table 29.12.

Table 29.12 Comparison of the proposals in DTP scheme for junction improvement of Aranattukara and Master Plan

Name of road stretch	Proposed Road width as per DTP scheme	Proposed Road width as per Sanctioned Master plan-2031	Proposed Road width as per Amrut Master plan-2039	Existing road width
West fort (Nethaji) Road	15m	24 m	24m	10 m
Aranattukara-Chungam road	15m	10 m	10 m	10 m
Aranattukara road	15m	15 m	15m	10m
Poothole road	12m	21 m	22m	10 m

29.12.2 SCHEME REVOCATION

As the major road proposals in this scheme are adopted in the new master plan and the area under this scheme is proposed to include in residential zone and mixed zone in new Master plan, The DTP scheme for junction improvement of Aranattukara shall stand revoked as provided under 2nd proviso to section 50(1) of the KT&CP Act,2016; once the master plan is sanctioned under section 36(8) of the KT&CP Act,2016.

CHAPTER 30
SECTORAL PROPOSALS



This chapter includes the sector wise proposal derived from the sectoral analysis, spatial analysis and development concept for the horizon period.

The overall development vision of a city depends on qualitative and quantitative aspects of development. These aspects are not mutually exclusive, but rather, when properly used, they are mutually reinforcing and complementary. Qualitative aspects mainly aims at sectors which will pave the way to formulate sector specific proposals. These includes the priorities for industrial and tourism development, infrastructure service improvements, basic services to all, etc. and contributes to the quantitative aspects. Remunerative nature of some of these projects will help in increasing the income of the Municipal Corporation during its implementation.

Thrissur city being one of the fast growing urban areas of Kerala, is acting as the major service centre of the district as well as the state. To enhance the service centre to a higher level the available infrastructure facilities has to ensure utmost quality. The overall upliftment of all the aspects contributing to the development will result in improvising the quality of life of people. The following sections details out the various sectoral proposals.

30.1 EDUCATION

Thrissur has traditionally been a centre of learning. Thrissur city possess educational facilities of different order ranging from pre-primary education to professional colleges. Government Institutions, Government-Aided institutions as wells as private institutions plays equal role in the development of educational sector in the city.

The opportunities available for education in Thrissur have resulted in an increase in the literacy rate. The availability of different categories of professional colleges in Thrissur City shows the richness in education field. The presence of famous Engineering/ Medical entrance education centres in Thrissur City demands more high schools and higher secondary schools. The emergence of engineering colleges lowered the number of technical institutes, polytechnics etc. which acts as the major job oriented education for the students.

The existing number of educational institutions in the city is more than sufficient as per requirement of the horizon period except for the facilities of special schools for the

differently abled children. Hence, improved educational facilities for differently abled, mentally retarded and autistic children have to be provided for their welfare and betterment. Moreover, the infrastructure facilities in all educational institutions especially government institutions has to be improved to meet up with standards provided by private institutions.

Provision of more VHSE courses will be beneficial to students who are interested in vocational or job oriented courses. The quality of education can be improved by including some innovative interventions in the education sector.

The prominence of education sector in the city shows its potential for innovative development. New concepts like infotainment can be efficiently implemented in the city. Infotainment means getting information through entertainment. It is basically derived from the concept of ICE: Information, Communication and Entertainment. This will provide a completely different learning experience for students. Urban Infotainment Centre may be introduced in the city for this purpose. Students as well as parents will be benefitted from this.

30.1.1 Develop Thrissur as a Learning city

Thrissur is one of the Asian cities of 77 learning cities UNESCO Global Network of Learning Cities. Presence of educational institutions, MSME regional office are the main advantage of Thrissur city to be developed as a learning city. The UNESCO Global Network of Learning Cities (GNLC) is an international policy-oriented network providing inspiration, know-how, and best practice. It is coordinated by the UNESCO Institute for Lifelong Learning (UIL). The network supports its member cities by promoting policy dialogue and peer learning, documenting effective strategies and best practice, fostering partnerships, providing capacity development, developing tools and instruments to design, implement and monitor learning cities' strategies.

United Nations Educational, Scientific and Cultural Organization
UNESCO Institute for Lifelong Learning
Global Network of Learning Cities
www.uil.unesco.org/learning-cities

For an ideal learning city only learning in classrooms are not sufficient learning opportunities should be made available at public spaces. Figure 30.1 shows the images which depicts learning city concept.





















Fig. 30.1 Images showing learning city concept

Thrissur as a learning city can develop:

- Learning Kiosks in public spaces
- Learning exhibitions and weekly fests
- Public talent search competitions
- Women skill development training centres
- Digital information boards in public spaces
- Wifi enabled Touch screen help desks
- Reading corners in parks and public spaces
- Open spaces as learning centers for Martial arts, painting, dance, music, yoga etc. for all age groups
- Business and industrial training centers utilising existing educational infrastructure
- Mobile libraries and bookshops
- Inclusive participation of aged,children, differently abled, persons from economically weaker sections etc
- Community learning centres



Fig. 30.2 Learning city concept

Concept of learning cities include following initiatives:

- Education for elderly
- Cultural chain programme
- Reading upliftment programme

- ***Learning city library***

Thrissur as the Cultural Capital of Kerala hosts a large number of academic, research, training institutions supporting the learning needs of wide range of people. Kerala Health university, Kerala Agricultural University, Kerala Veterinary University, Central Sanskrit University, Government Engineering College, Thrissur School of Drama, Arts and science colleges, training institutes, technical institutions, Kerala Institute of Local Administration (KILA), Kerala Police Academy, Kerala Excise Academy and Research Centre, Kerala Forest Research Institute, Thrissur School of Drama, School of Fine Arts are the major educational institutions in Thrissur city region. A public library can be proposed at the location of the Thrissur Municipal Corporation office which is proposed to be shifted to Sakthan Thampuran Nagar. The location of proposed library is shown in figure 30.3. This library can be used for all age groups and provide opportunities for inter-institutional borrowings.



Fig. 30.3 Proposed learning city library at the present Municipal Corporation Office premises

The Library can be a major research library, with items in many languages and in many formats, both print and digital: books, manuscripts, journals, newspapers, magazines, sound and music recordings, videos, play-scripts, patents, databases, maps, stamps, prints, drawings. This library could be a place for open forum discussions hub and newly published books, papers, journals etc. might be added to the collection. Buildings for the library can be constructed with traditional architectural style as shown in figure 30.4.

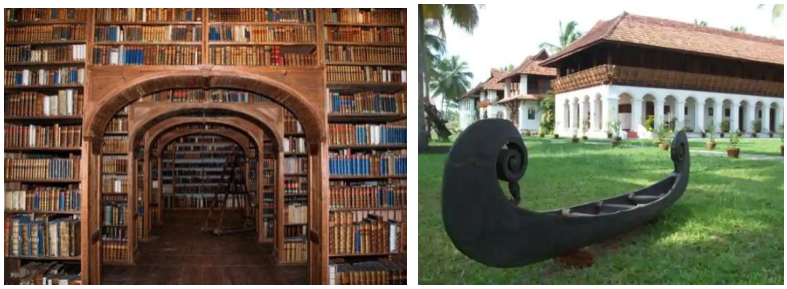


Fig. 30.4 Model for learning city library

30.2 HEALTH

Health is a very important sector which needs great attention. It can be seen that Thrissur City has well equipped and standard hospitals in allopathic sector which attracts people from various parts of the district. The city has one medical college, one general hospital, 10 multi-speciality as well as intermediate hospitals with more than 200 beds. There are also 2 medical colleges in the adjacent panchayats which are easily accessible from the city. All these shows the importance of the city to serve as a service provider in healthcare facilities. All the existing facilities in allopathic health care is more than sufficient that required in plan period.

With the increasing trend of more people attracted towards ayurvedic and homeopathic treatment, more number of hospitals has to be set to meet the growing need. These two systems of medicine must be raised to a higher level to serve its rising demand. All the systems of medicines must work hand in hand during the outbreak of any epidemic disease.

Government hospitals and dispensaries must be ensured with good infrastructural facilities. Modern treatment facilities and equipment must be made available in the government hospitals so that common man can afford the treatment. General Hospital in Thrissur must be provided with specialized staff and modern facilities. Cardiology, neurology, nephrology, plastic surgery, etc. must be made to function in the hospital. Pain and palliative care centres must be made available in all PHCs. The service of ambulances and vehicles may be ensured in hospitals.

Psychological well-being requires equal consideration as that of physical well-being. Various social, environmental and pre-existing risk factors have impact on the mental health of the people. Changes in lifestyle which arose due to urbanization as well the increased competition in all fields are generally associated with an increase in mental stress and disorders. In order to address these situations and to make people lead a mindful living, holistic wellness centres may be introduced in the city.

Methods to reduce spreading of diseases have to be initiated with the aid from government. Anti- mosquito work by use of anti-larval sprays like fenthion, fogging etc. has to be done by local body initiatives. Works like cleaning of drains and canals to reduce the clogging of water, preventing breeding of mosquitoes, etc. must be carried out annually.

Awareness programs may be conducted at school level to grow the awareness of good and hygienic living conditions among students. Health clubs may be started in all schools. Students must be aware of the demerits of using drugs like pan masalas, tobacco, etc. The sale of such drugs should be banned near educational institutions by law. Counselling facilities may be introduced in schools so as improve the mental health of students.

The supply of good food items in hotels, food stalls, meat market, etc. may be ensured with frequent inspections.

In order to have healthy living environment it is very important to adopt proper and efficient waste management measures. Decentralized way of waste disposal has to be introduced in the City. Local body can ensure household treatment of solid waste at a subsidy rate to reduce the accumulation of solid waste.

Proposals in health sector by the working group are:

- Upgrade Chiyaram sub centre to PHC
- Urban Health Centre at Kacheri
- Three Storey Building for Ollur CHC
- Homeo Dispensary in Ollur Zonal
- Sub Centre at Valarkkavu

- Renovation of Thottapadi and Thaikkattusseri Sub Centre.
- Quality Testing Machine in Fruit and Vegetable Market
- De-addiction Centre
- PHC and Ayurveda Dispensary at Punkunnam.

30.3 TRADE AND COMMERCE

Trade and commerce is said to be the backbone of Thrissur City. Thrissur City is said to be the major jewel and textile centre of South India.

30.3.1 IT Park near Railway station

The proposed Information Technology (IT) park near Thrissur railway station can provide an environment that will enable the localization of various tech-related companies. It is a development that brings together office spaces, residential areas, and retail developments in order to enhance the operations of tech corporates, thereby providing various benefits and economies of scale to each individual business entity. Also people living far and near will be able to get jobs, and this will definitely be a relief to the overall economy of the local body.



Fig. 30.5. IT Park model

By aiding the growth of tenant companies, information technology parks play a significant role in the development of local economies. They help create new jobs, attract foreign capital, and increase local and national competitiveness. This developmental role is particularly important in transition economies, which must absorb a great deal of structural unemployment and reach with rapid technological developments in the global economy. Figure 30.6 shows the location of IT park proposed near railway station.



Fig. 30.6. IT Park near railway station

30.3.2 Exhibition/Cultural centre

As a part of trade, new products and modern equipments are displayed and sold at Thrissur by traders from all parts of India. For this purpose, the need of a permanent space for exhibition, conferences and meetings etc. are required at the city centre of Thrissur. Presently, many of such exhibitions are either held at Thekkinkad Maidan or at Corporation land in Sakthan Nagar.

A permanent place has to be found for this which can be met by a permanent exhibition centre. An exhibition centre incorporating all the modern facilities can be set at place of Zoo at Chembukkavu which is proposed to shift to Puthur. Since Chembukkavu area have various cultural institutions and it is active in cultural/ traditional activities, new cultural centre with modern facilities can be proposed in that area.

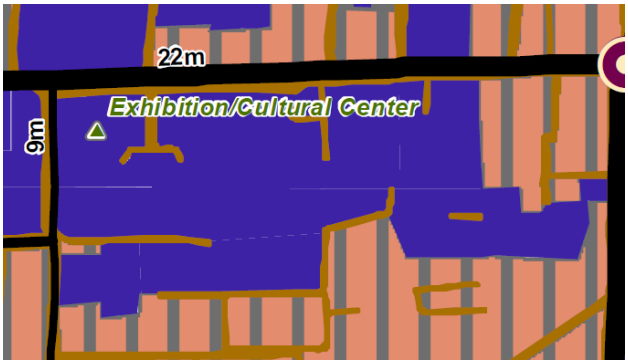


Fig. 30.7 Site for Exhibition Centre and Open Theatre

Proximity to other cultural centres can make this area suitable for attracting foreign tourists. The remaining area can be utilized for a mini park for the recreation purpose and a shopping cum Ayurveda centre incorporating yoga, meditation, music therapy, and exercise centre can be set up by conserving the existing buildings there. An open theatre can also be introduced there, which will help entertaining people with plays, dramas, events, etc. Figure 30.7 shows the site of zoo where these proposals can be accommodated after the shifting the zoo to its new location at Puthur.

30.3.3 Weekly markets and Evening markets

In order to make the city more active and lively, weekly markets and evening markets can be introduced in city. There are already some sort street vending activities functioning in the city on Sundays, but this can be raised to rather a higher level. Such initiatives may be introduced in once in week in a stipulated time, say, evening 6 – 11pm, Sundays, etc. Areas in and around the city core may be utilised for this. During this stipulated time period, pedestrian activities may be promoted. For this, traffic restrictions may be imposed in Swaraj Round.



Fig. 30.8 Weekly/Night Markets

Easily installable and reusable temporary structures and provisions may be adopted for such street activities. Street vending and various sorts of other activities for place making such as eat streets, performance corners, etc. may be introduced as part of this. A systematic

approach should be adopted for its management such that its organisation, traffic control measures, waste disposal, premises cleaning, etc. may be well planned, maintained and executed.

30.3.4 Convention centre, Mall, Office complex, Parking plaza near Sakthan Thampuran bus stand

Convention centre, mall, office complex and parking plaza proposed near Sakthan bus stand could provide a platform for international convention and forums where individuals and groups gather to promote and share common interests. The proximity of the major transportation nodes such as Thrissur Railway station, KSRTC Stand, Sakthan Private Stand contributes to the locational advantage of the project.

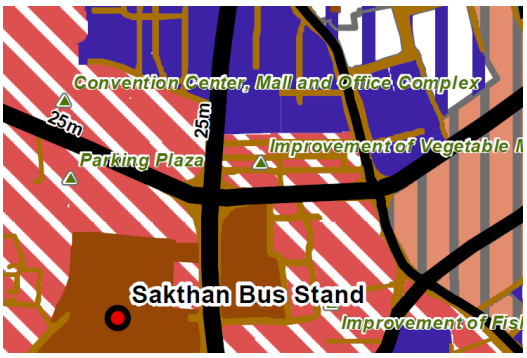


Fig. 30.9 Convention Centre and mall, office complex and parking plaza

The project includes a multi storied convention centre and shopping mall. Also the Thrissur Municipal Corporation office is proposed to shift from M.O. road to this location. The proposal could provide with concert halls, lecture halls, meeting rooms, exhibition hall and conference rooms that would add to the revenue generation.



30.10 Multi-level Parking Plaza



30.11 Convention centre and Mall

30.3.5 Improvement of vegetable and fish market near Sakthan Thampuran bus stand

Sakthan market has been working as a regulated market from the time of Sakthan Thampuran. It helps cultivators to sell their goods. Modernization of the market has to be made with the idea to connect the cultivators, traders and the common people.

Apart from vegetables, sale of fruits and flowers must also be encouraged here. Proper hygienic conditions must be ensured. Awareness program for consumers and traders for keeping the premises clean and tidy must be given. Strict monitoring of cleanliness by giving penalty to the violators.

During the reign of Sakthan Thampuran, Kokkalai-Vanchikulam water way was used for transport of goods from Thrissur to Aranattukara which was the commercial centre at that time. Vanchikulam was once a busy landing point for cargo and passenger boats. Thrissur City is reviving the glory of the ancient boat jetty, which has turned into a garbage dump yard. This water route can be rebuilt to nearby areas also and can be used for trade purpose and thus

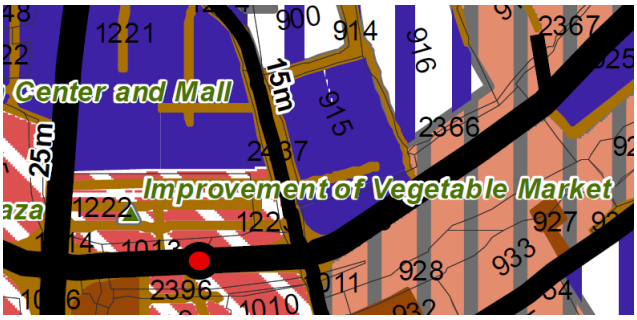


Fig 30.12 Vegetable Market near Sakthan Bus Stand

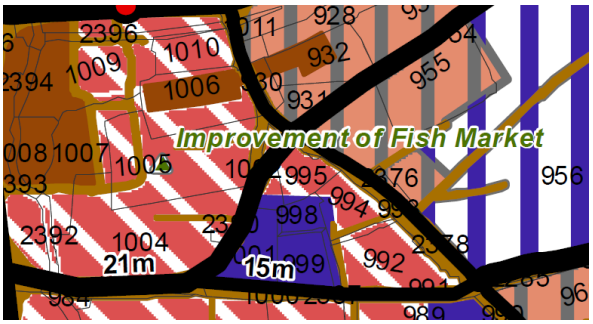


Fig 30.13 Fish Market near Sakthan Bus Stand

reduce the cost and difficulty encountered in road transport. This will also help to increase tourist interest for the said area.

A permanent solution has to be found to solve the problems arising due to waste management. Provision has to be made for daily collection of waste from Kuriachira slaughter house, Sakthan market, etc. and dispose at specific treatment plants equipped with all modern techniques for converting the waste into useful forms like biogas, electric energy or manure.

30.3.6 Street vending zones

New Golden flea market has been established by the Corporation for street venders in Pattalam road. Street vending along the Pattalam road is restricted and the street venders are relocated to the golden flea market near Sakthan bus stand. Street vending activities can be provided along roads having footpath width 2m or more.

30.4 INDUSTRY

Thrissur City has potential for industrial development due to the presence of Coimbatore - Kochi corridor. This main corridor can be considered as economic development corridor. The central position of Thrissur, facilities for transport of goods through rail, road, nearness to the Cochin port and availability of human resource, electricity and water supply are factors congenial for the growth and development of industries. Industries like textile, timber, agriculture-based industries, and tiles industries are present in Thrissur. The major problems identified are lack of working capital, management issues, labour issues, improper resource utilization, improper marketing and lack of involvement of financial institutions, changing technology, unhealthy market competitions and power shortage problems.

Development of industries will help in increasing the job opportunities to people and thus help in improving their living standard. An industrial area at Puzhakkal padam for KINFRA industries has been set which will be beneficial for the development of City. With the introduction of this industry, development of the area will be enhanced and the people nearby will be able to get employment which will further attract people towards this area which is at the outskirts of the City limit and thus help in reducing the population density at the core area.

Natural products like jack fruit, mango, cashew, etc. available at seasons have to be processed and the products can be exported. This can be started as household industry and will help to increase the job availability. Food processing units near by the western paddy fields can enhance the value of the agriculture products.

Textiles like Lakshmi mill, Sitaram mill, etc. have to be modernized with new machineries capable of producing good quality textiles. Grants for these have to be provided.

In order to promote the ornaments and jewellery industries in the city, specific areas can be demarcated for its manufacturing. These collective units helps in establishing an organisational setup in this field. Such collective units can also be helpful in properly managing the hazardous waste generated as part of jewellery works rather than having isolated units which are spread here and there in the city.

The city has also potential in new household level industrial activities such as cake production, artefacts making, etc. Industrial training centres can be provided so as to ensure systematic training in order to raise the quality and quantity of industrial production. In order to promote ladies entering such fields, training sessions for the same as well as incentives for its effective implementation may be introduced.

30.5 TOURISM AND HERITAGE

Tourism plays an important role in contributing to the economy of a place by providing direct and indirect employment. A tourist reception centre to help and guide the tourists to various cultural and heritage centres in Thrissur can be introduced in or around the premises of Thrissur Municipal Corporation office.

Regional linkages, connectivity and access play vital role in tourism development. Thrissur which is centrally located in the state of Kerala is a rich reservoir in history, culture and archaeological remains. The connectivity of the city by road and networks are well facilitated that tourists take pleasure in reaching this destination. Sufficient accommodation facilities available in and around the city which suits all kinds of people ensures a comfortable stay for the tourists coming to the city. The city also serves as higher order centre in the district in terms of providing various services and supporting infrastructure for the development of tourism sector.

It can be seen that Thrissur City have many cultural and heritage sites for tourists, but no entertainment opportunities available for them. For providing a complete package for tourists, entertainment facilities available here must also have to be checked.

Thrissur tourist attraction comprises of well-known temples such as Vadakkumnathan temple, Paramekkavu temple and Thiruvambady temple. The tourists cannot however exclude the notable two churches in the city, Our Lady of Lourdes Metropolitan Cathedral and Our Lady of Dolours Basilica (PuthanPalli). The archaeological museum displays relics and is a treat for the art connoisseurs. All the heritage buildings are exposed to history and are important for tourism. Therefore, they must be preserved for the knowledge of future generations.

The barrier of caste and religion is not observed during Thrissur festivals. Thrissur pooram, Pulikkali, Kummattikkali, BounNatale, etc are the major festivities and celebrations in the city. Thrissur pooram is considered to be the mother of all temple festivals. This main attraction of this festival is a colourful procession of caparisoned elephants, drum concerts, parasol exchanges, pyro-techniques display and public participation. Thrissur Pooram, for long as one can remember the two dominant temple groups hallowed by many temples in Thiruvambady and Paramekkavu clans look into a friendly combat for supremacy, is celebrated every year during April-May.



Recently introduced Thrissur night Shopping Festival which lasted a month from mid-December to mid-January can be considered as new venture in this area. This shopping festival added to the celebrations of Christmas and New Year. Various light arrangements, street performances, night walking culture, outdoor eat street culture, etc. were part of this. In coming years these can be more improvised using various innovative ideas to make a live and social life for people.





Fig. 30.14 Glimpse of Thrissur city during the shopping festival season

Apart from various cultural, heritage and religious tourism activities in the city, there are possibilities for development of other types of tourism activities such as health tourism, farm and participatory tourism, etc. Health tourism in the city can be developed mainly due to the presence of ayurvedic centres like Oushadhi, Thaikattumoosu, Vaidyaratnam, Sitaram etc. who are famous in the field of Ayurveda treatment throughout the world. Ayurveda centres and resorts have to be developed and all modern facilities made available so as to develop health tourism. Herbariums may also be developed along with this. Schemes for exporting Ayurveda medicines have to be introduced.

30.5.1 Vanchikulam - Puzhakkal waterway

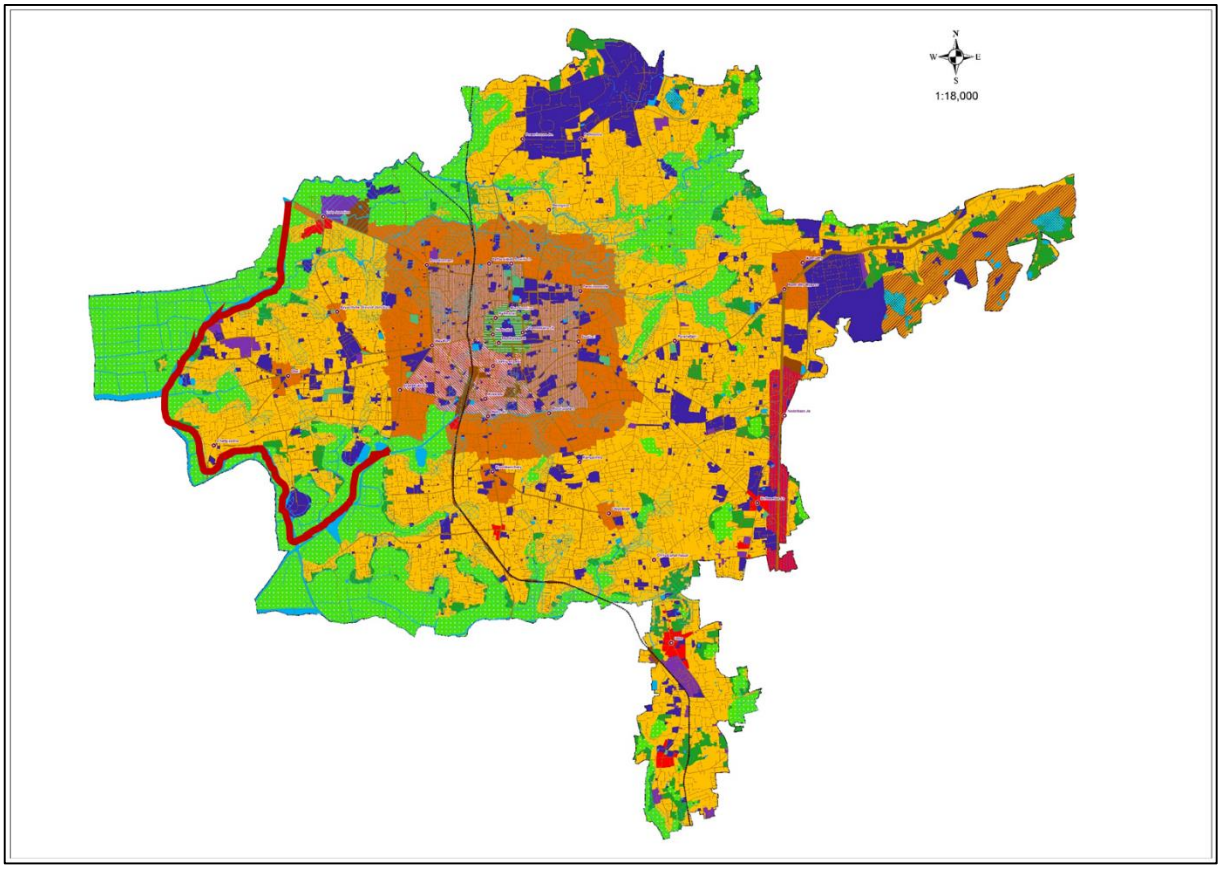


Fig. 30.15 Vanchikulam - Puzhakkal waterway

A waterway can be introduced from Vanchikulam to Puzhakkal for recreational purpose. After renovation it should be one of the best tourist destination in the city. Embankments of the water way has to be strengthened and proper width should be maintained throughout the length. Walkway/cycling tracks should be provided on both sides. Landscaping and plantation should be done on the sides of water way. Cafeteria/shops should be provided on intermediate points where this water way crosses the roads. This water way can be used for boat services. For that height of the bridges should be raised. Paddy fields on the sides of water way will give a panoramic view to the travellers.

Boating can start from Vanchikulam and end near Puzhakal river tourism village. An aquarium with modern facilities can be proposed in the Vanchikkulam premises. Due to the presence of water body, the aquarium could be made more interesting. Figure 30.16 shows the proposals in Vanchikulam. A recreation zone is proposed along puzhakkal Kurinjakkal bund road with 25m width.



Fig. 30.16 Recreational zone along Puzhakkal Kurinjakkal bund road



Fig. 30.17 Aquarium, walk way, boating proposed at Vanchikulam

To prevent the conversion of paddy lands for other uses and help the land owners to gain more economic yield per unit area farm tourism can be introduced in selected uncultivated paddy areas in Vanchikulam. The goal is to plan a development that would be oriented toward creating an urban farm that is wholly consistent with the physiographic feature of the area. Families can spend time with their loved ones with the mesmerizing sound of the flowing water and the surrounding ambiance.

Nature parks can be introduced at Vanchikulam and water front park at Puzhakkal associated with this waterway to increase the tourism potential of the proposal. A nature park is a designation for a protected natural area by means of long-term land planning, sustainable resource management and limitation of agricultural and real estate developments. These valuable landscapes are preserved in their present ecological state and promoted for ecotourism purposes.



Fig. 30.18 Walkways in Nature park

30.5.2 Farm tourism



Fig. 30.19 Farm Tourism activities

Nearly one third of the Thrissur city's land use is contributed by agricultural activities. This shows the potential of the city in agricultural based tourism activities. Agro tourism or participatory tourism can be efficiently implemented in the agricultural prominent areas in the city, mainly towards its western periphery.

30.5.3 Adventure tourism

Adventure tourism is very popular among young age tourists. Adventure tourism gains much of its excitement by allowing the tourists to step outside their comfort zone. This may be from experiencing cultural shock or through the performance of acts that required some degree of risk (real or perceived) and physical danger. Unused quarry areas in the city have the potential to be developed to adventure tourism destination.



Fig. 30.20 Adventure Tourism activities

30.5.4 Tourism Circuits

Tourist attractions in Thrissur lie in its old temples, cultural centres for paintings, dances & literature and splendid festivals. Thrissur is the best option where we can experience the authentic culture of South Indian state. September to March is generally considered as tourist season in Thrissur City. In order to explore Thrissur and its surroundings, tourism circuits which covers its full potentials whether it is religious, cultural or nature exploration, etc. may be proposed. Wider network which covers the various parts of the district may also be taken into account.

In Thrissur city, we have a temple trio – Vadakkumnathan temple, Paramekkavu temple and Thiruvambady temple which attract pilgrims towards the City. These three famous temples are located at the heart of the city and are easily accessible. Edakunni Sree Durga Bhagavathy Temple is one of the 108 Durga temples believed to have been built by the great sage Parasurama. Other important temples to be visited are Poonkunnam Siva temple, Poonkunnam SeethaRamaswamy temple, KuttankulangaraSree Krishna temple, Sree Bagavathy temple at Olarikara, Kuttumukku Siva temple, Koorkenchery Siva temple, etc.

There are several significant churches including Lady of Lourdes Cathedral, Puthanpally church, the famous St. Antony's Forane church situated in Ollur, Mart Mariam big church, etc. The tomb of blessed Euphrasia Eluvathingal of the Sacred Heart (Evuprasiamma), the famous pilgrim centre is at St. Mary's convent, Ollur.

Hanafi Sunnath Jama-ath Masjid also called as Chettiyangadi palli is a famous Muslim pilgrim centre at Thrissur City.

Sakthan Thampuran Palace situated near North Bus Stand is an example of traditional architectural style of Kerala. It houses the Archaeological Museum and has temple models,

stone reliefs, reproductions of the Mattancherry murals, etc. Another attraction is a nice little art museum which has a good collection of woodcarvings, metal sculptures, kathakali figures and ancient jewellery. 2 kms from the centre of city is the zoo (expected to be shifted to Puthur), which is a wonderful place for animal enthusiasts and children. Kollengode Palace, which is situated near the zoo, is a unique blend of traditional Kerala architecture with western design. The palace now houses the Mural Art Museum.

Apart from corporation area, two distinct regional tourist circuits have been identified which can be developed and promoted for tourism

1. Religion and Heritage circuits - Includes important destinations like Guruvayoor, Thriprayar temple, Vilangan hills, mural painting centre, Nattika beach and Snehatheeram.
2. Wildlife and recreational circuits - Includes destinations like Peechi dam, Chimmoni wild life sanctuary, Vazhani Dam, Poomala Dam,etc.

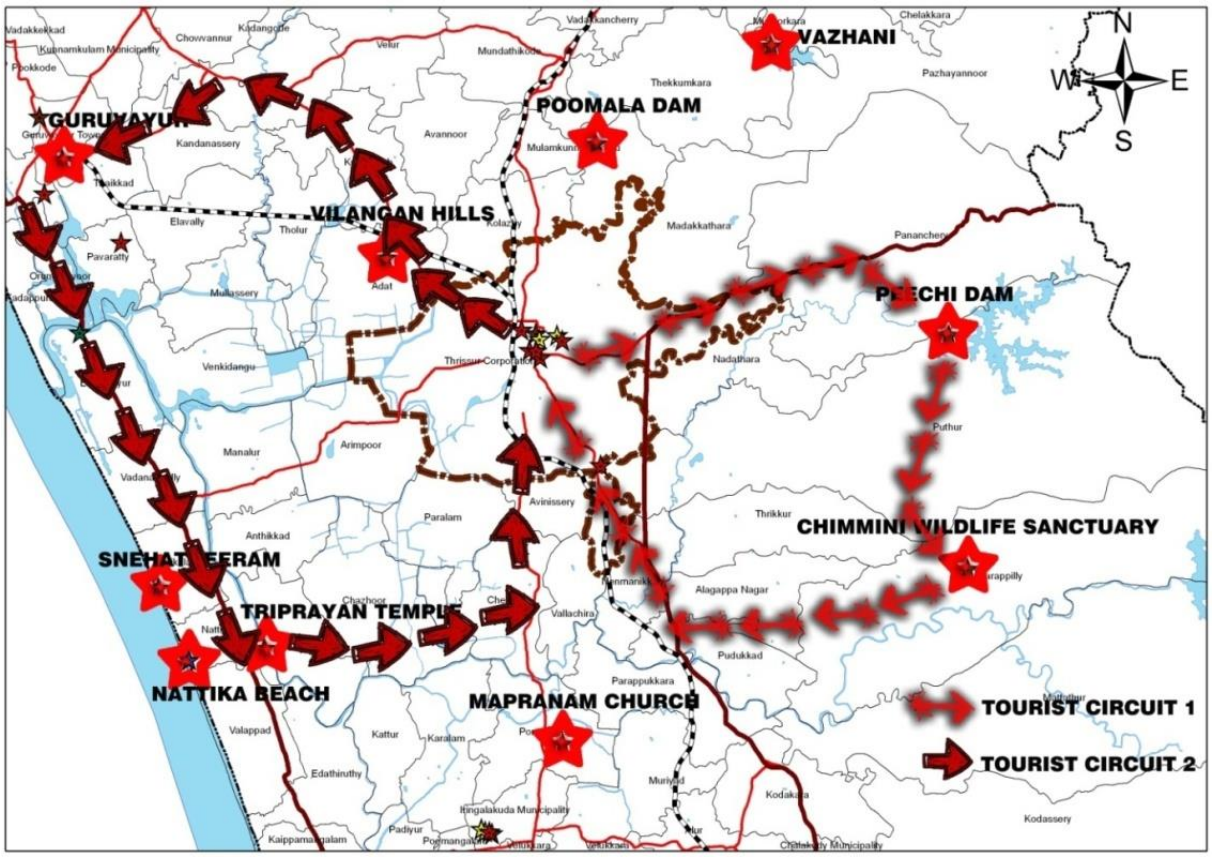


Fig. 30.21 Proposed Tourism circuits

Apart from these, District Promotion Council (DTPC), Thrissur offers various tourist circuits and programmes.

30.5.5 Beautification of ponds

Beautification of ponds in Corporation is proposed and this will increase the tourism potential in the city. The beautification of the ponds will include de-silting, erecting a boundary wall around the pond, making a pathway for morning and evening walkers, installing benches and landscaping and plantation around those ponds which have space. Also Vanchikulam, Aanakulam, Vadakkechira can be used for providing boating facilities which can entertain tourists .



Fig. 30.22 Vadakkechira



Fig.30.23 Pond beautification

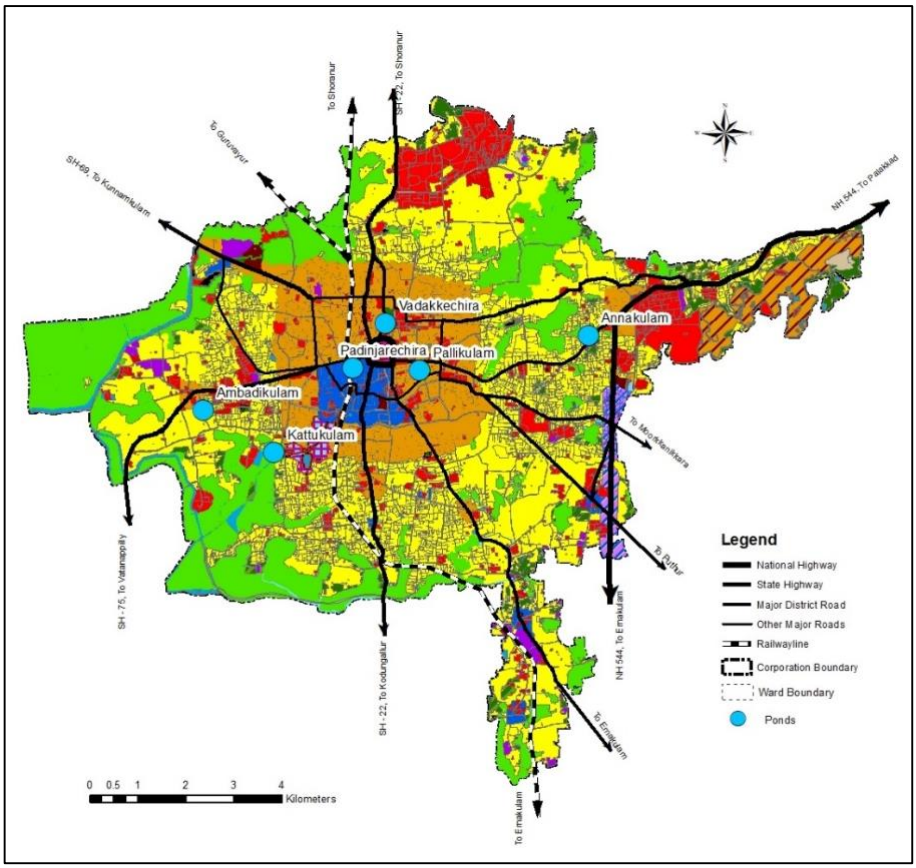


Fig.30.24 Location of Ponds

Corporation can directly implement this project through contractors and MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act). The ponds that are need to be rejuvenated are listed below.

- Vadakkechira
- Aanakulam
- Pallikulam
- Padinjarechira
- Kattukulam
- Elanjikulam
- Ambadikulam

30.5.6 Midnight Shopathon

Seasonal shopping festivals till midnight can be planned in the core area. Street food stalls, music bands and cultural events can be made part of the festival. Late night public transport can be arranged and non-motorized transport modes like walking and cycling can be encouraged.



Fig. 30.25 Midnight shopping festival

30.6 AGRICULTURE

Thrissur City has 33.42% of land under agriculture use. Major problems encountered in this field are lack of labourers, conversion of paddy fields, plant diseases, high cost of fertilizers, etc.

A system for forecasting pest and disease out breaks has to be set up which will be beneficial for the farmers to take precaution against such calamities.

Agriculture department distributes various funds from central and state governments through the 6 krishibhavans in the City. Schemes for providing subsidies to paddy cultivators for purchase of seeds, manure, medicines, etc., free electricity, loans for purchase of machineries, starting bio gas plant, etc. are introduced by Agriculture Department for helping Cultivators.

In order to meet the irrigation requirement, schemes for drip and lift irrigation facilities which will enhance the production are introduced. Existing ponds and canals are maintained and fund for annual maintenance should be allotted by Municipal Corporation Authorities. Proposal for providing a green strip of 5 m width at both sides of existing natural drainage.

Introducing latest and innovative technologies in the agricultural sector can increase the production and yield. Some of the methods which could be used efficiently in the agricultural sector are as follows:

- Practice of cultivating, processing and distributing food in or around urban areas.
  Prospects in Thrissur City
  - Large tracts of uncultivated paddy and Kole lands inside the Corporation area

- Large individual landholdings in urban fringes
- Roof top farming
- Vertical farming



Fig. 30.26 Urban farming



Fig. 30.27 Vertical farming

- Urban Kissan (Hydroponics)- objective of soil-less farming is to cultivate vegetables with minimal use of soil & water



Fig. 30.28 Urban Kissan – Hydroponics

- Organic Farming - Adat Model
  Due to the heavy use of fertilizers in Kole lands causing deterioration of drinking water sources and damage to flora & fauna. As a solution to this lime is used to reduce acidity of soil, use of organic manures and adopting bio-control methods. This method followed by proper monitoring and scientific interactions resulted in the creation 'Adat' model rice. Local body level vermi-compost, fish culturing & organic cultivation of other items are also associated with this project.

- Mixed Cropping - employed to minimize risk and as an insurance against crop failure due to abnormal weather conditions. This helps in increasing the yield and retaining the productivity of soil. As a result soil is not left barren in any part of the year and led to increased income.
- Weekly markets and Evening Markets – Areas can be demarcated at main commercial nodes for weekly markets and evening markets.

- Naattu Chanda- a scheme of collaboration to sell organic stuff cultivated, directly to the consumers at reasonable rates where an agency provides space to sell and supervision to check authenticity of the sale.



Fig. 30.29 Mixed Cropping



Fig. 30.30 Organic Farming - Adat Model

30.7 ANIMAL HUSBANDRY SECTOR

Introduce new dairy farms and milk societies for collection and distribution of milk. Provision of subsidies to farmers will help in the establishment of small scale dairy farms. Proper coordination with agricultural sector will help to find the food required for the cattle and the by-products from cattle can be used as bio fertilizer for cultivation. Veterinary hospitals with modern techniques have to be introduced for the welfare of animals. Farmers must be encouraged by providing them with markets for selling their products at an economical rate. Waste from plants to be demolished with the introduction of bio gas and bio fertilizer plants.

- Improved veterinary services with disease prevention programmes are introduced for better results.
- The 33 ponds available in the City can be used for cultivation of fishes which will help to reduce the scarcity of fishes in our market and will also help to earn the farmers a fixed income.
- Modern techniques for storage of products to be made use for better economy. This will help the producers to supply the products to distant markets and thus ensure the price of the item.
- Scientific methods to be introduced in slaughter houses. Value addition of products is to be made which will encourage people to get engaged in agricultural activities.
- Milk vending machines can be installed at several locations.
- Animal shelters can be provided for stray animals.



Fig. 30.31 Milk vending

30.8 DRINKING WATER

30.8.1 Protect Existing Water Resources

Existing water resources have to be protected from pollution so that water can be made available for the future needs. Water bodies present in the City have to be identified with help of their survey numbers and their boundaries have to be demarcated in the land use maps and ensure that they are protected from encroachment. Encroachment of water bodies if found should be punished by law. Authorities must ensure that water bodies are not affected by any form of construction in an area so that encroachment is reduced.

Ponds within the city must be protected by building embankments and the use of this pond water for drinking water supply and irrigation must be utilized.

30.8.2 New Projects

Peechi dam is the main supply centre of water for Thrissur City. New sources have to be found and utilized so that the increasing need for people in the coming years can be met. One proposal is to provide a bypass line for main line from Peechi at Mudicode.

One of the projects is utilization of water from Karuvannur River. Water from river can be stored and used for meeting the demand in Thrissur City.

Rain water harvesting is one of the easiest ways to protect the water. This must be encouraged so that runoff water is saved and infiltrated to increase the water table of the area.

New treatment plants have to be introduced for treatment of water and thus utilize it for water supply purposes. According to topography of Thrissur City, Vanchikulam area has good potential for water treatment plant.

As part of Central Government's Amrut Project, construction of New Water Treatment Plant and Over Head Service Reservoir at different zones are going on, in addition to that strengthening the existing system of clean water supply in various parts of the Thrissur Corporation area, replacing existing pipelines, surveying and replacing faulty meters and pipelines and providing new connections etc. are also going on. According to the data received from the Corporation, about 75% of the above projects are completed. Some of the specific projects included in Amrut are given below:

- Design construction and commissioning of 3 MLD WTP, Reservoir and pumping main for Ollukara zone.
- Construction of new 20 MLD WTP at Peechi Thrissur Corporation-Phase-2.
- Laying of distribution lines from existing OHT at Kizhakumpattukara to Nellikunnu area for around 15 km with varying diameter pipelines - (Dia: 200 mm DI to 110 mm PVC.
- Construction of 10 LL OHSR at Anappara with Pumping system and pumping main from Cherur to Anappara which improve the water supply system in Div 6,7 and 8.
- Construction of 5LL OHSR at Kuttanelloor with pumping system at Kuriyachira and pumping main for 4KM with 200 mm DI and 5KM distribution line.

30.9 SANITATION

Thrissur city lack a proper mechanism for the treatment of waste generated in the city. Even though there are OWC plants in close proximity to markets, there are certain other areas which are being unattended. Sanitation methods have to be modified and the treatment facilities provided must cater to the needs for maintaining a hygienic situation in the city. Remedial emergency actions have to be taken by the local body to solve the waste management problems. A decentralized scientific system for waste disposal has to be introduced in the city and the treatment facilities have to be well maintained for their effective functioning.

The Solid Waste Management Rules, 2016, states the necessity of segregation of wastes at source. It is the responsibility of generators to segregate waste into three categories — wet, dry and hazardous waste — and hand over the segregated waste to authorised waste collectors or local bodies. Measures may be taken effectively implement this method.

Different coloured bins may be provided to the residents for the segregated collection of waste.

Use of Biogas and vermi-compost plants should be promoted. Separate Solid Waste disposal arrangements should be provided in all flats/apartments, multi-storied buildings, etc. with suitable amendments in Building Rule. Effluent treatment plant must be provided in every hospital. There should be effective arrangements for disposal of hazardous wastes.

Separation of city wastes from the storm water, prevention of drains from encroachments, preventing conversion of low lying areas which results in flood and water logging will be beneficial for maintaining the drainage of the city. Measures like widening of the culverts, side protection, deepening and cleaning of canals/thodu, constructions of suitable weirs can overcome the problems of floods during heavy rain.

Various initiatives by the local body to tackle the problem of waste management are as follows:

- Mattampuram Septage Plant – Septage plant having capacity of 10 KLD have been constructed and will be commissioned soon.
- Proposed plant at Snehaveedu - Tender completed for 100 KLD septage plant.
- Proposed Corporation Hospital Plant – Tender completed for a 360 KLD standalone sewage plant purely for the treating waste water from hospitals.
- Proposed Mobitrash – OWC Machine placed in vehicles and operated with the help of generators which helps in disposing the wastes at source.
- Elaborating the services of Green Army
- Upgradation of existing OWCs

30.9.1 Sewage Treatment Plants

Location of 2.5 MLD STP is proposed close to Vadookkara crematorium in survey number 293 of Koorkenchery village. Another 5 MLD STP is proposed at Kottappuram area in survey number 1962 of Thrissur Village which is Corporation owned land. This project includes construction of STP for Thrissur Corporation. Construction of STP includes centralised networked underground sewerage system and sewage treatment plant.

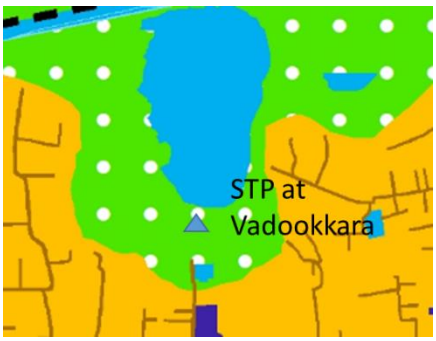


Fig. 30.32 Location of STP at Vadookkara



Fig. 30.33 Location of STP at Kottappuram

30.9.2 Waste to Energy plant

The proposed location for Waste to Energy plant is in Ollukkara village near Kerala Agricultural University. 'Waste to Energy' is a global initiative in the field of waste management. It turns the non-recyclable waste into secure energy and valuable raw materials in an environmentally safe manner. It helps in reducing the amount of waste being landfilled.



Fig. 30.34 Waste to Energy plant at Ollukkara Village

Waste-to-Energy and Recycling are complementary waste treatment methods in integrated waste management systems. Household and similar waste should be sorted at source and the clean materials should be sent to high quality recycling. The remaining waste, that cannot be recycled in a technically or economically viable way, should be used to generate energy. Additionally, the energy produced in Waste-to-Energy plants also contributes to climate protection and security of energy supply, by replacing fossil fuels that would have been used to produce this energy in conventional power plants. Such plants could be set up at a regional level which can cater to a larger population. A waste to energy plant is proposed in Ollukkara village in an extent of 6 ha.

30.10 POWER

Kerala State Electricity Board controls the main projects regarding power. They have made projects for the improvement of this sector.

Some of the main long term projects are to implement a pre-paid billing system and to install bill collection machines in the city. Computerization of the whole system will be helpful for the people. Website which helps to provide the details of the consumers, the payment details, online payment facilities, etc. to be set up. The main benefits of system are as given below.

- **Improved Cash flow** – With pre-paid meters, there are no arrears to collect and the tenant can control their budget to use as much as they can afford.
- **No Credit and Arrears Collection Costs** –No credit and collection issues exist
- **No Deposits** - No need to take deposits for electricity.
- **No Monthly Bills** - No need to send monthly usage bills for electricity.
- **No Reconnect Charges** –no need to disconnect and reconnect.

- **Tenants Love Them** –can easily monitor their electricity use and spend as much as they can afford. This creates a greater awareness and control of costs. It also totally avoids any bill complaints on usage.
- Energy conservation as it reduces electrical consumption when users can monitor their own usage.

One of the proposals by KSEB is to supply electricity through underground cables on major roads. This will be beneficial at Swaraj round and other major roads.

New substations are proposed to serve the Eastern and Western part of the City. The details of the proposed substations and 33 KV electric lines are as shown in the figure. A new 110 KV substation is proposed by Thrissur Corporation under AMRUT project at south side of Laloor Crematorium.

As part of the initiative to promote the use of renewable energy resources, rooftop and vertical solar panelling may be adopted wherever applicable. This may be made mandatory for large constructions for effectively utilizing various leftover spaces.



Fig 30.35 Solar Paneling

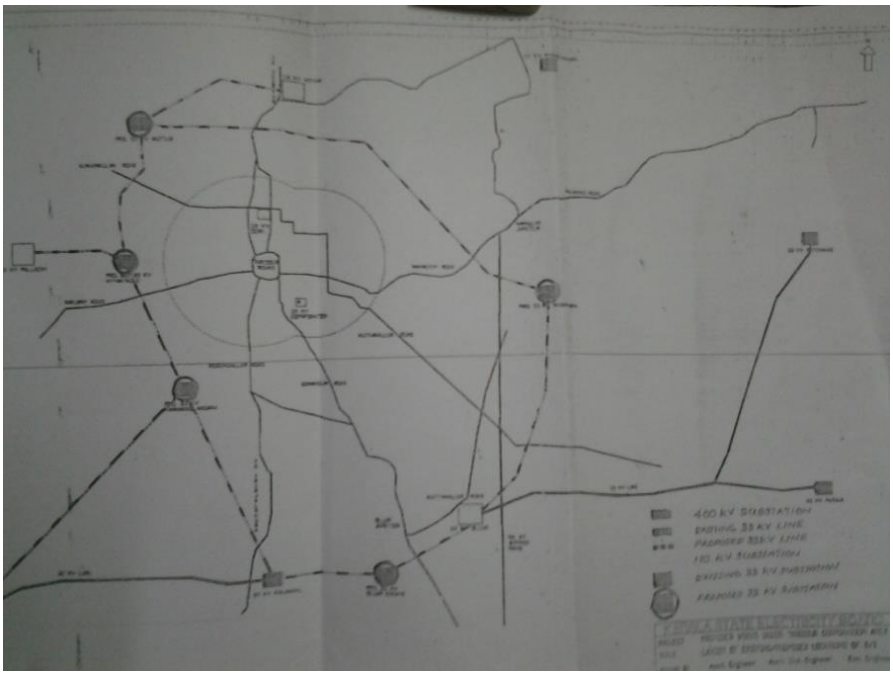


Fig 30.36 Proposed Sub Stations and Electric Line

30.11 SPECIAL CONCERN AREAS

Proposals in this sector are:

- Gender Resource Centre (GRC): It is expected that the Gender Resource Centres will be able to draw upon the resources of all the categories of women who have a potential to contribute to the overall development of the economy. Women will be encouraged to set up enterprise though self Help Groups. Interaction between the educated and uneducated groups will be the focal point of development of the Gender Resource Centres so that all the three groups over a period of time are able to contribute each other's development and at the same time achieve the overall objective of women's empowerment.
- Ladies Friendly Toilets, Rest Room, Vending Machine
- Temporary Shelter for victims of domestic violence
- Safe Auto- Taxi
- Marketing of Products from women entrepreneurs

30.12 OTHER CIVIC AMENITIES

Thrissur city is blessed with a public library with more than one lakh books and a library inside Sahitya Academy for students of different Universities. Community centres are public locations where members of a community tend together for group activities, social support, public information, and other purposes. Strengthening and modernisation of existing facilities is essential. Community halls are proposed in Chembukavu, Panamukku, Kuttanellur and Parks and comfort station at Ambadykulam.

Due to the importance of cultural activities in the city, the city has the potential to develop a cultural interpretation centre. An interpretation centre is an institution for dissemination of knowledge of natural or cultural heritage. They use different means of communication to enhance the understanding of culture and heritage. Unlike traditional museums, interpretation centres do not usually aim to collect, conserve and study objects; they are specialized institutions for communicating the significance and meaning of heritage. They work to educate and raise awareness. Earlier efforts were there to propose a cultural centre in the property of All India Radio at Ramavarmapuram. So this site may be utilised for this cultural interpretation centre. Various capsule performances and virtual reality shows may be introduced to exhibit the rich cultural values of the city, district and state.

30.13 RECREATIONAL

As a part of improvising recreational facilities in the city, performance corners may be introduced in the city. These spaces may be owned and managed by the local body and may be rented out to individuals, groups, etc. to showcase their talents and commercial enterprises, companies, etc. for their promotional activities. Provisions of eat corners and streets along with these performance corners will make the area and city more vibrant lively.

The city lack a good aquarium facility. An aquarium with modern facilities may be proposed in the Vanchikkulam premises. Due to the presence of water body, the aquarium could be made more interesting. Thematic performance areas based on culture and traditions may also be introduced in the Vanchikkulam premises.

Panamkuttichira Pakalveedu Park is being newly constructed as part of the Amrut project. Renovation of Achutha Menon Park is also underway.



Fig 30.37 Aquarium

30.13.1 Eco parks/Waterfront parks

Low lying areas are proposed as Eco parks/Waterfront parks which has to be developed without disturbing the ecosystem incorporating the Sponge city concepts. Parks can be envisioned at locations near Puzhakkal Tourism Village, Viyyur Bridge and near Puthenvettuvazhi 3rd street. Eco parks/Waterfront parks proposed can be designed with Walkways, Decks, Park benches and seats etc. in an eco-friendly manner using appropriate technologies.



Fig. 30.38 Walkways and Decks

30.13.2 Open air stage

An open air stage is proposed near BSNL office in Pattalam road. The construction of the stage is under progress and is done by the corporation. The stage is creating E.M.S square with an aim to introduce an open stage in the city. A 7-feet tall statue of E. M. S. Namboodiripad, the first Chief Minister of Kerala is constructed in the location.



Fig. 30.39 Open air stage

30.13.3 Mini meeting hall and library

Mini meeting halls for conventions, seminars, public meetings can be proposed at suitable locations along with libraries especially for old age.

30.14 GOVERNANCE

Enquiry counter to be opened at Municipal Corporation office which will be helping the people with all forms of orders and request at free of cost as required. Registers of departments like revenue assessment, health, and water must be updated and services to common people must be done accurately. Tax collection must be made effective. Tax revision must be done so that income to Municipal Corporation can be increased.

30.14.1 E-Governance

E-governance in Municipal Corporation focuses on improving national element of citizen services through defining service levels and outcomes; facilitating interaction between local government, citizens and other stakeholders; improving quality of internal operation of local government; enhancing transparency and accountability; enhancing citizen interface and improving service delivery to citizens. E-governance programmes in Municipal Corporation are progressing under the guidance of Information Kerala mission. Some of the Services to be provided by the online facility are

- Birth registration, Birth certification
- Death registration, Death certification
- Marriage registration, Marriage certification
- Building plan registration, Building plan approval
- Water connection registration
- Tender schedule
- Well / Bore well registration, Sewerage connection registration
- Commercial water tax collection
- Property tax collection
- Shop lease / rent collection
- Water charge collection
- Complaints registration
- Advertisement tax collection
- Passbook issues
- Contractor registration
- Electricity charges

30.15 URBAN DESIGN

Urban design is the art of creating and shaping cities and towns. It involves the arrangement and design of buildings, public spaces, transport systems, services, and amenities. It is the process of giving form, shape, and character to groups of buildings, to whole neighbourhoods, and the city. It is a framework that orders the elements into a network of streets, squares, and blocks. Urban design blends architecture, landscape architecture, and city planning together to make urban areas functional and attractive. Thus, it helps in enhancing the quality of city life.

Thrissur city is renowned for its cultural aspects and heritage. Cultural and traditions plays an inseparable part in the social life of its people. So, while introducing the Qualitative development in the city, due consideration could be given to these aspects. Qualitative aspects are adopted mainly by incorporating various principles of urban design and new urbanism which thereby enhance the quality of life of the people. These aspects can be

implemented on case to case basis in the city. The quality life can thus be ensured by introducing the following measures such as:

- Walkability & Connectivity
- Mixed-Use & Diversity
- Quality Architecture & Urban Design
- Building Character
- Transit Oriented Development (TOD)
- Place making
- Green areas
- Sustainability
- Traditional Neighbourhood Structure, etc.

30.15.1 Walkability & Connectivity

Walkability is a measure of how friendly an area is to walking. It is the extent to which the built environment is friendly to the presence of people living, shopping, visiting, enjoying or spending time in an area. It has health, environmental, and economic benefits. It is an important concept in sustainable urban design. Factors influencing walkability include the presence or absence and quality of footpaths, sidewalks or other pedestrian rights-of-way, traffic and road conditions, land use patterns, building accessibility, safety, etc. Major infrastructural factors include access to mass transit, presence and quality of footpaths, buffers to moving traffic (planter strips, on-street parking or bike lanes) and pedestrian crossings, aesthetics, nearby local destinations, air quality, shade or sun in appropriate seasons, street furniture, traffic volume and speed, and wind conditions.



Fig 30.40 Walkable spaces

Walkability is also examined based on the surrounding built environment. Density, diversity, design, destination accessibility, and distance to transit, of the built environment heavily influence an area's walkability. Combinations of these factors influence an individual's decision to walk. Pedestrian friendly street design (buildings close to street; porches, windows & doors; tree-lined streets; on street parking; hidden parking lots; garages in rear lane; narrow, slow speed streets) is an important aspect to be considered for this. Exclusive pedestrian streets, free of any motorable vehicles can be considered in special cases.

Connectivity refers to the state of being connected. Interconnectivity of places helps in supporting walkability. Interconnected street grid network helps in dispersing the traffic

and eases walking. A hierarchy of narrow streets, boulevards, and alleys can be made for creating ease in walking. High quality pedestrian network and public realm makes walking pleasurable.

Considering the context of Thrissur city, walkability can be mainly enhanced in and around the central core of the city surrounding Thekkinkadu Maidan. This area constitutes the major activity node in the city. As a preliminary phase to this, pedestrian connectivity can be improvised mainly in Swaraj Round, 8 major radial roads emanating from Swaraj round (Palace Road, College Road, High Road, M.O.Road, Kuruppam Road, M.G. Road, Shoranur Road and Karunakaran Nambiar Road) and the intermediate ring road. Schematic representation of the availability of pedestrian walkways in the demarcated area is shown in fig. 30.41. There are roads with pedestrian walkways on both sides of the road, either one side of the road and with no pedestrian walkways.

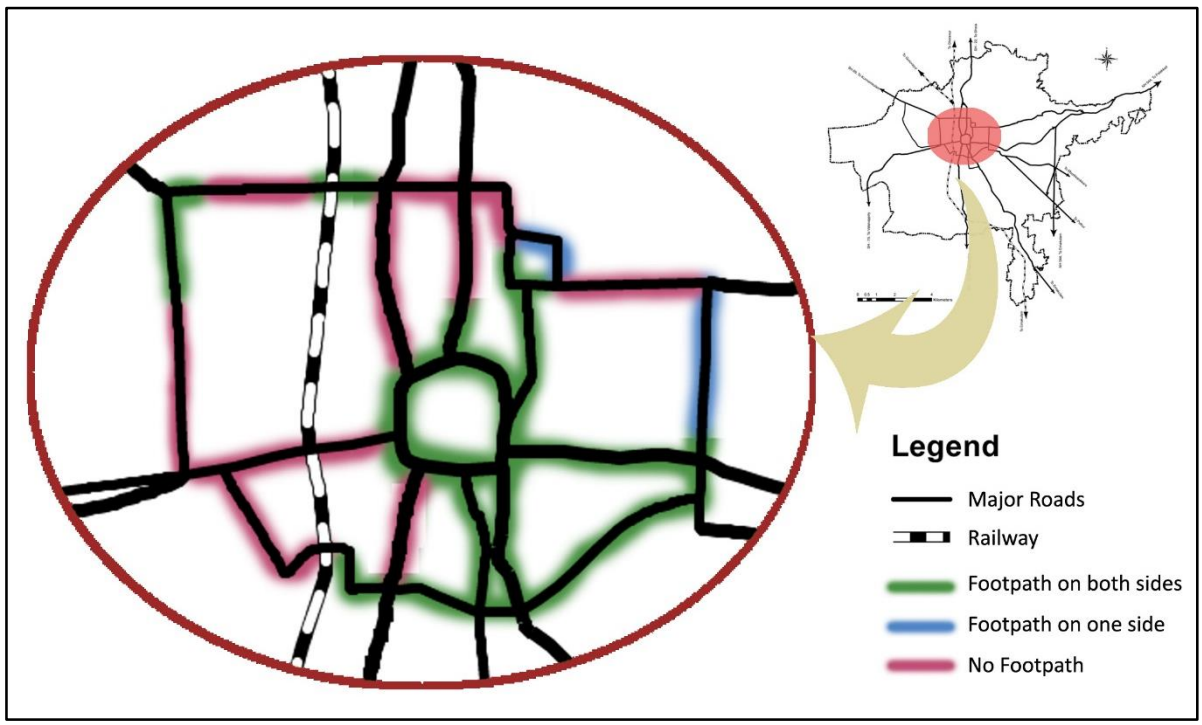


Fig 30.41 Existing pedestrian facility in the city core

Swaraj Round and the major roads towards the south eastern parts shows the availability of pedestrian walkway on both sides of the roads. Bishop Palace road and Chembukkavu area have pedestrian walkway only one side of the road. Condition of existing pedestrian walkways can be improvised and could be made user friendly conforming to the requirements of differently abled persons. New pedestrian walkways can be introduced in the major roads which lack pedestrian facilities. For walkways adjacent to buildings, the roof canopies of the buildings can be extended over the footpath, in order to provide adequate shading to the pedestrians. Apart from walkways, street furniture can be introduced along the walkway wherever possible. Trees, plants and shrubs could be planted near the walkways to

provide shading as well as to enhance the quality of space. Pedestrian friendly measures may be introduced at junctions and road crossing.

As part of the AMRUT project, footpaths, foot overbridges and subways are being constructed in various parts of the Corporation. In addition, at the junction near Shakthan Bus Stand(Mathrubhumi Junction), a circular skywalk is under construction .

30.15.2 Mixed Use & Diversity

Mixed use and diversity underlie the urban design movement 'New Urbanism'. Mixed-use development is a type of urban development that blends varied uses such as residential, commercial, cultural, institutional, or entertainment uses into one space, where those functions are to some degree physically and functionally integrated, and that provides pedestrian connections. It may apply to a single building, existing or new neighbourhood, or in zoning policy across an entire city or other political unit. This helps in having neighbourhoods which are more diverse.

Mixed-use development allows the creation of plazas and outdoor corridors between buildings and sidewalks. Street facing facades have a maximum setback to how much space is allocated for pedestrians to gather in. Landscaping another feature in outdoor spaces allow trees and plants to grow on buildings vertically rather than being faced out in a front row. Mixed-use in centres that have higher population density has allowed people to access places through public transit and has helped encourage walking, biking, and cycling to places of work and errands. With street-level design, Mixed-uses allowed the designs of pedestrian walkways, plazas, and eye distances to shops and workplaces.

Various benefits of implementing mixed use and diversity includes:

- greater housing variety and density, more affordable housing (smaller units), life-cycle housing (starter homes to larger homes to senior housing)
- more walkable neighbourhoods
- reduced distances between housing, workplaces, retail businesses, and other amenities and destinations
- better access to fresh, healthy foods (as food retail and farmer's markets can be accessed on foot/bike or by transit)
- more compact development, land-use synergy (e.g. residents provide customers for retail which provide amenities for residents)
- Stronger neighbourhood character, "sense of place", community identity, etc.



Fig 30.42 Spaces having mixed and diverse uses

30.15.3 Quality Architecture & Urban Design

It emphasizes on beauty, aesthetics, human comfort, and creating a sense of place; Special placement of civic uses and sites within community. Human scale architecture & beautiful surroundings nourish the human spirit can be introduced as part of this. As the city is known for its culture and values, this identity can be brought into the city by means of providing traditional entry gateways to the city (such as Torana in Buddhist Architecture, Pai Lou in Chinese Architecture, etc.) at major entry/exit point in the city.

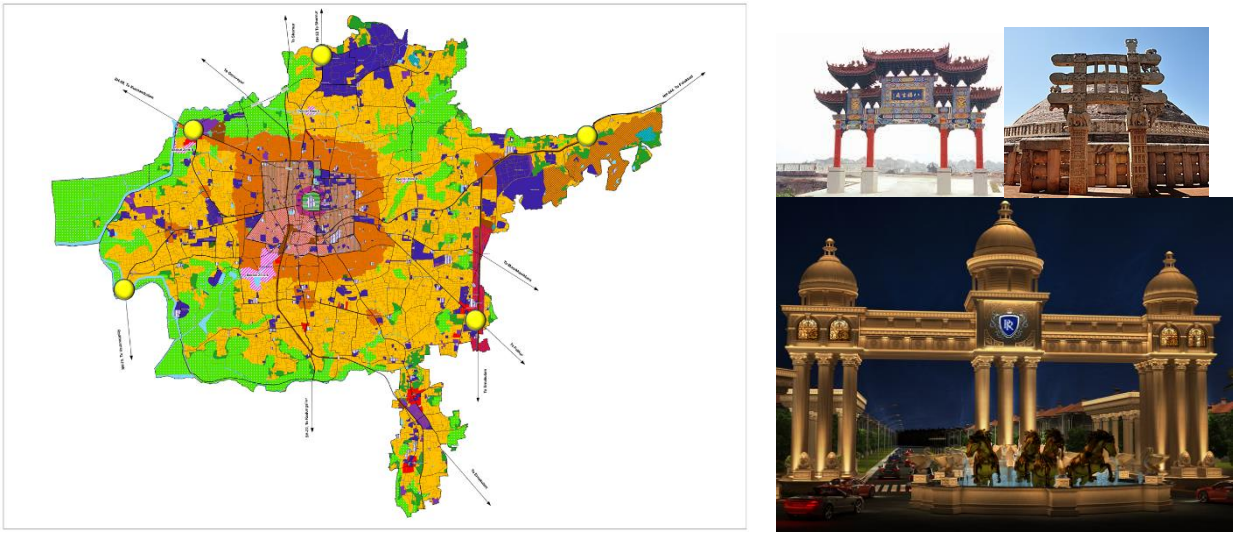


Fig 30.43 Proposed Locations of gateways

30.15.4 Building Character

Sree Vadakkumnathan temple, located in the centre of the city is a classic example of Kerala's rich cultural heritage and traditional architecture. It has received 'Award of Excellence' at the UNESCO Asia-Pacific Awards for Cultural Heritage Conservation in 2015 for taking great strides in protecting its legacy in architecture and now restored to its old glory. The temple has been listed in ASI Heritage sites for the presence of exquisite murals in the temple. Considering this aspect, 100m radius from compound wall of temple will fall in the No Development Zone as per the ASI regulations. The next 200m is the regulated area where constructions should be in conformity with the ASI regulations which is evolved for creating a traditional character to the precinct. Inspired from this aspect, the buildings facing Swaraj Round and the 8 major roads leading to Swaraj Round which falls within the above mentioned area, can be done with specific traditional building treatment, to enhance the character of the city as a temple town. It can be roof treatment with mangalore tiles, sloping roof, and façade treatment with traditional building elements (such as jalis, brackets, trellis, etc.), materials (wood, laterite, stone, etc.) and colour. This may initially be made mandatory to new constructions and then may be imposed to existing structures by the completion of the plan period. The whole process of transformation may be implemented in phases and incentives may be given to those who completes the work within each stipulated phase. Detailed

implementation strategies for this may be adopted in consultation with Arts & Heritage Commission and concerned stakeholders.

30.15.5 Transit Oriented Development

Transit-oriented development (TOD) is a type of urban development that maximizes the amount of residential, commercial and recreational spaces within a walkable distance from public transport facilities. It promotes a symbiotic relationship between dense, compact urban form and public transport use. In doing so, TOD aims to increase public transport ridership by reducing the use of private vehicles and by promoting sustainable urban growth.

A TOD typically includes a central transit stop (such as a train station, or light rail or bus stop) surrounded by a high-density mixed-use area, with lower-density areas spreading out from this centre. A TOD is also typically designed to be more walkable than other built-up areas, through using smaller block sizes and reducing the land area dedicated to automobiles. The densest areas of a TOD are normally located within a radius of 400 to 800m around the central transit stop, as this is considered to be an appropriate scale for pedestrians, thus solving the last mile problem. Implementing the features of TOD in the city can help in decongesting the central core of the city by promoting public transit.

30.15.6 Place Making

Place making is a multi-faceted approach to the planning, design and management of public spaces. It capitalizes on a community's assets, inspiration and potential with the intention of creating public spaces that promote people's health, happiness and well-being.

Place making inspires people to collectively reimagine and reinvent public spaces as the heart of every community. Strengthening the connection between people and the places they share, place making refers to a collaborative process by which we can shape our public realm in order to maximize shared value. More than just promoting better urban design, place making facilitates creative patterns of use, paying particular attention to the physical, cultural, and social identities that define a place and support its ongoing evolution.

These spaces are ideal for making meaningful contributions to communities while generating maximum interest among citizens. They are excellent branding vehicles for the authorities and establishing a direct relationship between space and users. It helps to

- Transform unused or underused areas into active spaces.
- Make the space interactive and ensure maximum citizen participation by providing variety of activities through thoughtful interventions
- Address neighbourhood needs, requirements and aspirations.
- Utilize and highlight the local assets and resources.
- Create ecologically sustainable and adaptable sites for future use.

Quality of life of a city is greatly dependent on the quality of its public spaces. Ministry of Urban Development (MoUD) puts great emphasis on a vibrant public life to calculate the Liveability Index of cities. Some of the measures that can be directly impacted through thoughtful place making are Identity & Culture, Public Open Spaces, Mixed Land Use & Compactness, Wastewater Management and Solid Waste Management. Core features of successful public space are:

- Walkable sidewalks/ pavers
- Lighting
- Places of rest
- Interactive and Social Elements
- Art Components
- Plantations and Greenery
- Proximity to Bus Stops, Bike Racks and Parking
- Food, etc.

These features of place making can be effectively introduced in Thrissur city to make a lively city with quality liveable spaces. Certain initiatives like Commercial Street, eat street, cultural street, performers' street/corner, thematic parks/areas, community sculptures etc. can be introduced in the city at different places. These can be permanent arrangement or can be temporary measures according to the various cultural and seasonal requirement such as Pooram, Onam, Christmas & New Year, Thrissur Night Shopping Festival, etc.



Fig 30.44 Place making examples

Street for Kids project at Sree Ramavarma park



Fig 30.45 Images showing Street for kids initiative

Designing Streets for Kids to set a new global baseline for designing urban streets by Global Designing Cities Initiative (GDCI) released. Designing Streets for Kids builds upon the approach of putting people first, with a focus on the specific needs of babies, children, and their caregivers as pedestrians, cyclists, and transit users in urban streets around the world.

Sree Rama Varma park in Swaraj round can be developed as a child friendly street with park. Cycling facilities, kids competitions may be arranged in the park. Arts and sports activities can be promoted as part of the learning city initiative. As part of Global Designing Cities Initiative (GDCI), street for kids project is proposed at Sree Ramavarma park by Kerala institute of local administration and School of Architecture, Government Engineering College, Thrissur. The major proposals in the park are:

- Seating spaces
- Tea stall
- Relocation of statue
- Visually appealing background
- Hydration station
- Water body
- Pedestrian path
- Friendship bench concept



Fig. 30.46 Sree Rama Varma Park, Thrissur

30.15.7 Green Areas

Green spaces and other nature-based solutions offer innovative approaches to increase the quality of urban settings, enhance local resilience and promote sustainable lifestyles, improving both the health and the well-being of urban residents. Parks, playgrounds or vegetation in public and private places are a central component of these approaches and can help to ensure that:

- Urban residents have adequate opportunities for exposure to nature;
- Urban biodiversity is maintained and protected;
- Environmental hazards such as air pollution or noise are reduced;

- The impacts of extreme weather events (heat waves, extreme rainfall or flooding) are mitigated;
- The quality of urban living is enhanced;
- The health and well-being of residents is improved.

Urban green space is a component of 'green infrastructure'. It is an important part of public open spaces and common services provided by a city and can serve as a health-promoting setting for all members of the urban community. It is therefore necessary to ensure that public green spaces are easily accessible for all population groups and distributed equitably within the city. Urban green space is an important investment that local authorities can make on behalf of citizens and their well-being. It can provide opportunities for active lifestyles.



Fig 30.47 Green Areas

30.15.8 Sustainability

Sustainability can be defined as the practice of maintaining world processes of productivity indefinitely — natural or human-made — by replacing resources used with resources of equal or greater value without degrading or endangering natural biotic systems. Sustainable development ties together concern for the carrying capacity of natural systems with the social, political, and economic challenges faced by humanity. Sustainability can be achieved by:

- Minimal environmental impact of development and its operations
- Eco-friendly technologies, respect for ecology and value of natural systems
- Energy efficiency
- Less use of finite fuels
- More local production
- More walking, less driving, etc.

30.15.9 Traditional neighbourhood structure

Traditional neighbourhood structures may mean differently in different context. A traditional neighbourhood structure can be a suburb consisting of single family homes with big yards and plenty of greenery. In other cities, neighbourhood structures can be multi-unit

housing with little to no landscaping, or homes that are close to each other. Traditional neighbourhood structures, also consider how civilians interact with each other, and overall quality of life. An authentic neighbourhood may contain:

- Discernable centre and edge
- Public space at centre
- Importance of quality public realm; public open space designed as civic art
- Contains a range of uses and densities within 10-minute walk
- Transect planning: Highest densities at town centre; progressively less dense towards the edge. Transect is an analytical system that conceptualizes mutually reinforcing elements, creating a series of specific natural habitats and/or urban lifestyle settings. The Transect integrates environmental methodology for habitat assessment with zoning methodology for community design. The professional boundary between the natural and man-made disappears, enabling environmentalists to assess the design of the human habitat and the urbanists to support the viability of nature. This urban-to-rural transect hierarchy has appropriate building and street types for each area along the continuum

Traditional Neighbourhood Developments seek to remedy the most pressing problems associated with sprawl - low-density, auto-oriented development, single-use developments lacking context and distinctiveness. Automobile dependence results from the fragmentation of residential, commercial and industrial uses as is often required in modern zoning. This design practice makes neighbourhoods unwelcoming to pedestrians and bicyclists and thus reduces community vitality. It also increases traffic. Zoning utilizing Traditional Neighbourhood Development that mixes uses and forms in a compact area, on the other hand, can create high quality neighbourhoods.

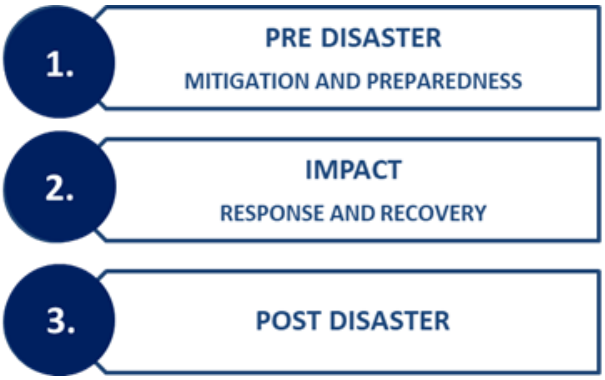
30.16 DISASTER MANAGEMENT AND MITIGATION

Disasters are serious disruptions to the functioning of a community that exceed its capacity to cope using its own resources. Disasters can be caused by natural, man-made and technological hazards, as well as various factors that influence the exposure and vulnerability of a community.

Disaster management is a process of effectively preparing for and responding to disasters. It involves strategically organizing resources to lessen the harm that disasters cause. It also involves a systematic approach to managing the responsibilities of disaster prevention, preparedness, response, and recovery. Disaster risk reduction aims to reduce socio economic vulnerabilities to disaster and deals with the environmental and other hazards that trigger them. Disaster management can be executed in four phases which are Mitigation, Preparedness, Response and Recovery.

30.16.1 Disaster Management Measures - flood

The complete disaster management includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure. When properly implemented, the disaster-management can lessen the impact of a catastrophic event/disaster. The disaster management involves the following phases:



PRE-DISASTER PHASE

Mitigation

Disaster Mitigation measures are those that eliminate or reduce the impacts and risks of hazards through proactive sustained measures taken before an emergency or disaster occurs. The aim of mitigation activities is to protect people and structures during disaster and to reduce the cost of response and recovery. Mitigation measures includes following activities like,

- **Structural Measures**

Flood mitigation in the form of physical measures to prevent the flood waters from reaching potential damage centres includes measures like:

- Widening of natural drains
- Embankments and dykes.
- Natural detention basin.
- Channel improvement.
- Drainage improvement.
- Diversion of flood waters
- Watershed Management / Catchment area treatment.
- Anti-erosion works.

- **Non-Structural Measures**

Non-structural measures strive to keep the people away from flood waters, it includes measures like:

- Identifying the type of disaster which could occur and likelihood of its occurrence.
- Risk Assessment and Vulnerability Analysis
- Recognizing the consequences of the events along with the cost of response and recovery.
- Strengthening of public infrastructure.
- Efforts to make community more resilient to a disastrous event through mitigation public awareness programs.

➢ **Plot level Mitigation measures**

The built environment guidelines can be introduced in the hazard prone areas.

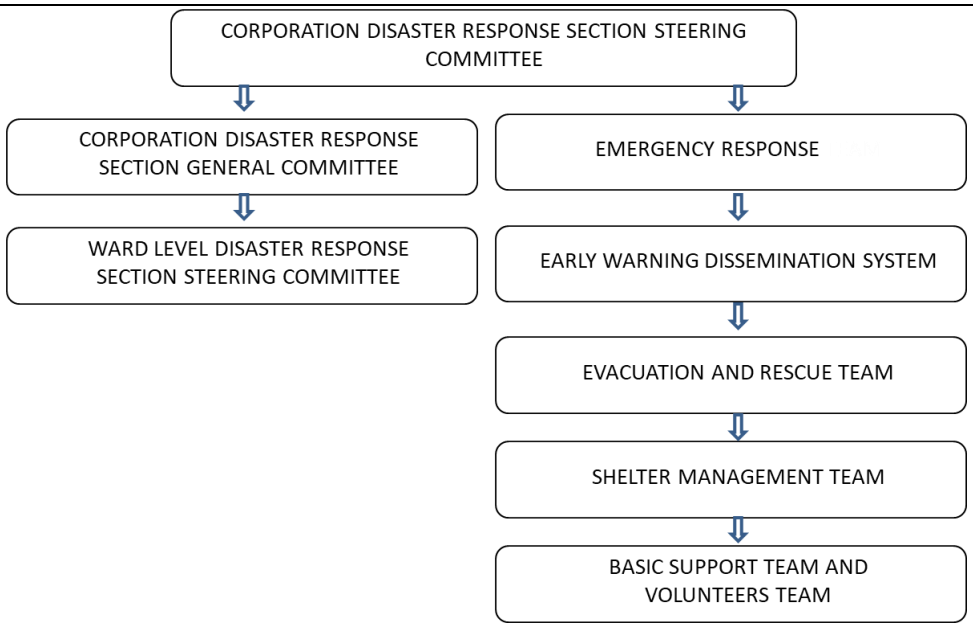
- Site layout:
  Ground should be sloping away from the building.
- Plinth:
  The plinth level of the house must be above the most common flood level in the area and naturally above the drain level in the village as far as possible.
- Floor level Requirements:
  The finished floor level of habitable rooms must be above the flood hazard level;

Preparedness

Disaster Preparedness refers to measures taken to prepare for and reduce the effects of disasters. This is achieved through research and planning in order to try to predict areas or regions that may be at risk of disaster and where possible prevent these from occurring and/or reduce the impact those disasters on the vulnerable populations that may be affected so they can effectively cope. Disaster preparedness activities embedded with risk reduction measures can prevent disaster situations and also result in saving maximum lives and livelihoods during any disaster situation, enabling the affected population to get back to normalcy within a short time period.

Complete Disaster mitigation against any disasters may not be achieved so harmful consequences of a disaster may be reduced by taking certain actions before its occurrence. Preparedness includes planning, training and educational activities like,

- Developing disaster preparedness plans that describe measure to be taken, where to go or who to call for help in a disaster.
- Exercising emergency plans through drills and full-scale exercise.
- Establishing early warning system.
- Identifying the resources available and developing a supply list of items that are essential in a disaster.
- Allocation of responsibilities to the individual Actors/ Groups/Institutions/Organizations-Different teams had been constituted and documented in ‘NammalNamukkayi’ plan. The various actors are given below:
-



- **Relief Camps**

Relief camps shall be set up in order to accommodate people affected by a disaster. The camp shall be temporary or permanent in nature, with basic necessities. People in the camp shall be encouraged to return to their respective accommodation once the normalcy



Fig 30.48 Relief camps

has returned. Fig. shows the Relief camp location that has been used during the time of Mega flood 2018. Currently, there are 43 numbers of camps in Thrissur Corporation.

a) relief camps

Table 30.1 List of Relief camps

Sl No	Relief Camps	Sl No	Relief Camps
1	St George LPS Mukkattukara	23	Viyyur Chruch Parish Hall
2	Chruch Nellankara	24	St. Francis LP School Viyyur
3	Nellakara LPS	25	Vyapari Vyavasayi Hall Vlyyur
4	Anganwadi Elanjikulam	26	Secondary School Villadam
5	GHSS Ayyanthole	27	Govt. Womens Polytechnic College Nedupuzha
6	Tarakan's School	28	Chiyyaram Madom
7	Pullazhi Chruch Parish Hall	29	Holy Family School Chembukavu
8	NSS Karayogam Chettupuzha	30	Pakalveedu Olarikkara

9	GHSS Poonkunnam	31	Navajyothi Pullazhi
10	Vivekodhayam School	32	SNDP Karyattukara
11	Sree Kerala Varma College	33	Church Olari
12	Poonkunnam Janaki Hall	34	St Mary's LPS Chiyyaram
13	Seetharam Kalyanamandapam Poonkunnam	35	Popu John LPS Chiyyaram
14	Poonkunnam RC Chruch	36	Nedupuzha School Kanimangalam
15	Vailopilli Govt School Ollur	37	SCB Auditorium Vadookara, Koorkenchery
16	GUPS Panamkkuttichira	38	Jawahar Balabhavan Peringavu
17	St. Pauls Chruch Thaikkattussery	39	BMS Office Patturaikal Thrissur
18	Kachery Madona Chruch Ollur	40	Community Hall Kokkalai Thrissur
19	Govt Achuthamenon College Kuttanellur	41	NSUPS Cheroor Villadam
20	Viyyur Manalarkavu Temple	42	Sagaram Hostel Evanoor Viyyur
21	Devamatha School Patturaikkal	43	NSS Karayogam Viyyur
22	Vimala College Cheroor		

b) Alternative routes

Safe routes and alternate routes have to be mapped and communicated to the citizens through effective media to help the rescue operations. The proposed alternative road network should ensure reaching of every nook and corner of the planning area in case of a calamity. Proper drainage network shall be prepared and implemented especially along the arterial roads that are taken as the alternative routes to reach the destined relief camps. Roads that got submerged during the past floods in the corporation are identified and listed below, elevated roads are to be proposed in place of these.

- SH-69 Thrissur Kuttippuram Road via punkunam
- Puthenvettuvazhi Road
- ViyoorPeringavu Road
- Nedupuzha Road

c) Supporting amenities

Ensure adequate supporting amenities like food, water, health, sanitation & hygiene and waste management as per the Kerala State minimum standards of relief.

- **Safe zone parking**

During the time of floods and heavy rains the vehicles are to be protected and to be prevented with proper prior precautions to reduce the loss and damage of vehicles. Parking the cars on elevated grounds at the time of warning would be beneficial, and when the condition gets worse people could be evacuated in an orderly manner to the respective relief camps without being worried about their vehicles, cattle and other possessions. Safe zones for parking are to be identified within the corporation. These may be areas which are open grounds of public or semipublic institutions, which are outside flood prone area that can be used as parking lots in

case of floods. Multilevel parking proposals outside the flood prone areas could be utilized for this purpose in addition to these identified spots.

- **Livestock Shelter**

Floods can often lead to loss of livestock but this loss can be drastically reduced by prior planning and evacuation of the animals. Various vacant areas in the vicinity of relief camps and outside the flood prone zone can be identified to shelter the livestock of the corporation.

- **Multi-purpose Rescue shelter**

During the flood time, public institutions like schools, colleges, auditoriums and worship places are selected for functioning as rescue shelters. The regular functioning of these institutions will get affected if the relief camps prolong for a long time. More over some of these shelters may not have sufficient facilities like kitchen and toilets. Multi – purpose rescue shelter proposals outside the flood prone are necessary to meet the requirement.

- **Modifying Critical Infrastructure**

Critical infrastructures in the high hazard zones can be modified relocated to safer areas. Upgradations can be done to critical infrastructures that cannot be relocated out of the hazard zones. Typical upgrades include raising floor levels, changing infrastructure materials, improving drainage networks in the surrounding areas etc.

IMPACT STAGE

Response

Disaster Response phase occurs in the immediate aftermath of a disaster as an immediate action or relief. It consists of a number of elements like; warning/evacuation, search and rescue, providing immediate assistance, assessing damage, continuing assistance and the immediate restoration or construction of infrastructure. The aim of emergency response is to provide immediate assistance to maintain life, improve health and support the morale of the affected population.

Disaster Response measures includes following activities like,

- Implementation of Disaster Response plan.
- Taking action to protect the community and animals.
- Conducting lifesaving missions like evacuation, search and rescue.
- Providing assistance for relocation to safe zones
- Allocating temporary shelter for the needy.
- Ensuring provision of food, water and emergency health care to the affected.
- Providing emergency assistance and critical services to victims.
- Conduction of a rapid situation assessment.

Recovery

The recovery phase is the restoration of an organization following any impacts from a disaster. The best outcomes are achieved by ensuring recovery strategies align with community need and are led by the affected community. A community-led approach supports the rapid restoration of services essential to human wellbeing and presents an opportunity to build resilience and improve community circumstances and preparedness beyond their pre-disaster status.

This phase occurs after the disaster to return the community's system and activities by rebuilding or restoration efforts beyond the provisions of immediate relief like;

- Rehabilitation.
- Rebuilding of damaged structures
- Taking actions to Prevent and reduce stress related illness.
- Providing financial support to people affected.
- Development of practices and policies to reduce the vulnerability and to avoid or mitigate similar situation in future.

POST-DISASTER PHASE

Post-disaster recovery planning is defined as developing a set of strategies to assist a community in rebuilding after a disaster occurs. Recovery planning can also be thought of as building the blueprint for reconstruction of the community after a disaster. There are a number of activities that communities can engage in to address post-disaster recovery. These strategies may include developing and implementing:

- Post-disaster recovery plans
- Post-disaster buildable lands inventories
- Utility recovery and reconstruction plans
- Temporary shelter and housing plans, and
- The establishment of a coordinating organization and guiding principles for reconstruction.

30.16.2 Disaster Management Measures - Heat Wave

Heat Wave as an extreme weather event has recently has become a concern for disaster management in India. For last few years, heat wave during the summer season is increasingly affecting morbidity and mortality in the country. Looking at the current scenario, effective response is important for saving peoples life and health, besides evolving strategies for future risk mitigation and management of heat waves conditions. Extreme weather conditions have become so obvious and impacted lives all across the world particularly over the last decade and more. Hence, ways and means to understand and cope with extreme heat events have become essential to coping strategies for communities.

Precautionary measures

Drinking water supply arrangements, oral rehydration salts and intravenous fluids are made available at public places like railway stations and bus stations, emergency medical

camps are set up across various heat wave prone states. Citizens are issued advisories such as not to leave their homes at noon unless absolutely necessary. Further, rescheduling of timing in educational institutions, working hours, especially of those doing physical labour, veterinary measures, bus timings, etc. can be modified, once heat wave warnings are issued during peak summer months for better adapting to severe heat wave situations.

Heat wave action planning framework

When preparing a planned framework for heat wave measures, the following four key strategies should be focused.

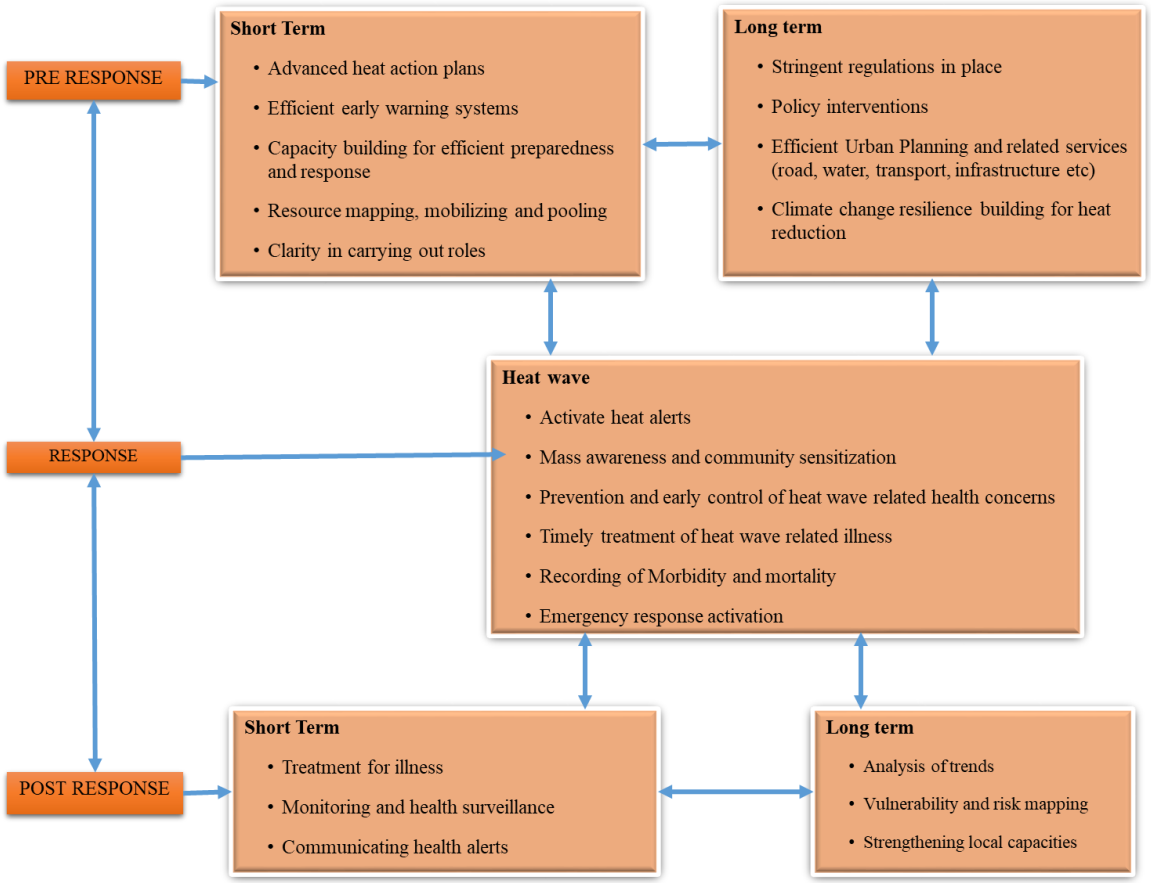


Fig. 30.49 Framework for heat wave management

a) Building public awareness on risk of heat waves through mass outreach programme in local language
b) Implementing response system to prevent heat-related death and illness at the onset
c) Initiating an EWS and inter-agency collaboration framework to alert citizens on predicted extreme temperature and
d) Capacity building among city officials and healthcare professionals to recognize and respond to heat-related illnesses.

Effective heat wave management requires that individuals, families and other related stakeholders are prepared for and able to manage the possible impacts. Short- and long term

interventions therefore need to be considered at the planning stage as shown in fig.30.48. This framework will help to promote heat wave management planning and facilitate in prevention and preparedness towards avoiding health impacts. This would also call for Institutional coordination, advance research and mainstreaming, resource mobilization, communication, monitoring and evaluation and adequate capacity building.

Methods to reduce heat wave effect

Loss in green cover and increased concretization in urban areas has led to cities becoming 'urban heat islands', which pose significant threats to not just human populations but also contribute to global climate change. The effect of these heat wave can be reduced with the greening of the area. This can be achieved by methods like pocket forests, Miyawaki forests etc.

- ***Pocket forests - Miyawaki technique***

Miyawaki is a technique pioneered by Japanese botanist Akira Miyawaki, that helps build dense, native forests. The approach is supposed to ensure that plant growth is 10 times faster and the resulting plantation is 30 times denser than usual. It involves planting dozens of native species in the same area, and becomes maintenance-free after the first three years. Miyawaki technique can create such forests in small urban spaces, as small as 30 square feet. Suitable locations can be identified for Miyawaki forests.



Fig. 30.50 Miyawaki forest plantation in Bangaluru

CHAPTER – 31
PRIORITY PROJECTS, ACTION PLAN & PHASING

Various projects proposed to be implemented on priority basis are included in this chapter. The action plan to execute the projects and it's scheduling or phasing is also described here.

The components or elements and implementation methods described here are suggestions, and any suitable or essential components required can also be included in the project during the stage of preparation of DPR or during implementation stage. The fiscal requirement calculated for each project is by rough estimate only, and the actual amount shall be calculated while preparing DPR (Detailed Project Report) during implementation stage.

Master Plan has a time period of 20 years and this is divided into 4 phases. Each phase has 5 year time period. Suggestions for phasing of the selected priority projects are enlisted in the table given at the end of the chapter.

31.1 BUS TERMINAL AT PUZHAKKAL

31.1.1 Location and Ownership details

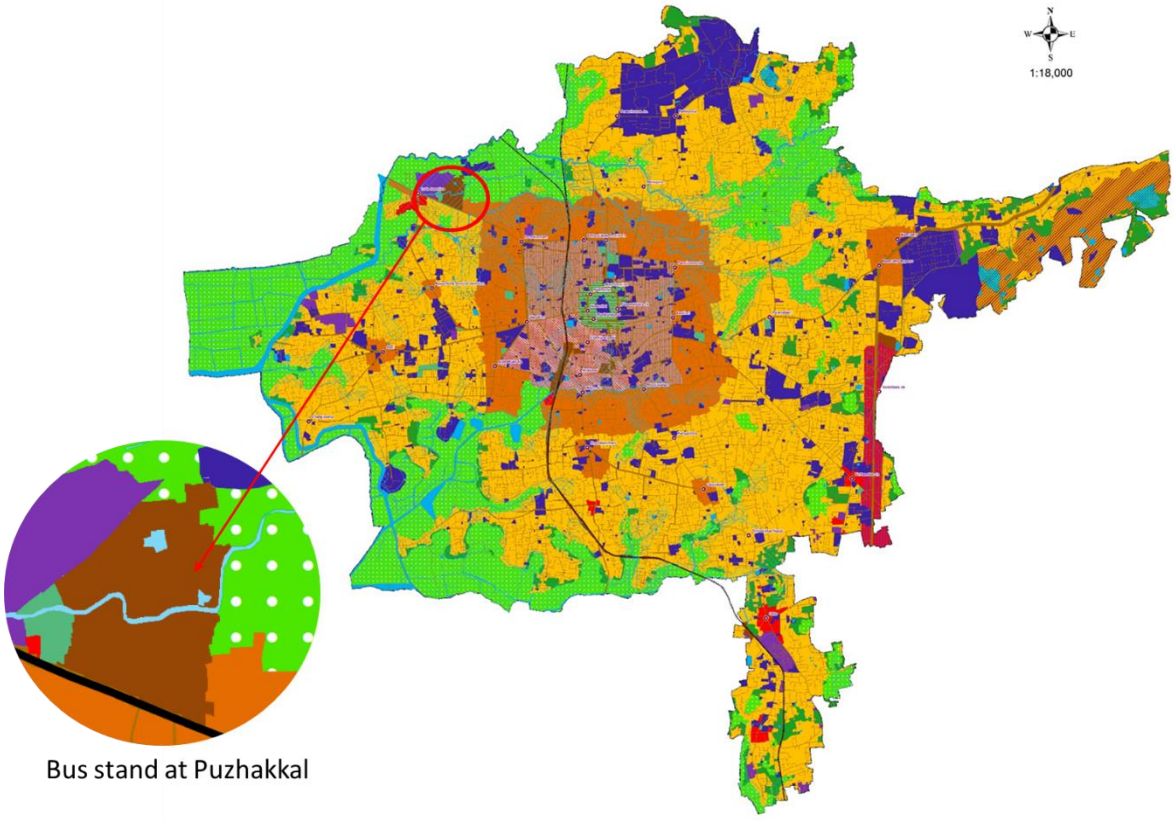


Fig 31.1 Location of Bus Terminal at Puzhakkal

The proposed site is located on the north side of the Thrissur Kozhikode road, about 1.5 km from the Poonkunnam junction. The proposed bus terminal at Puzhakkal is

located in Ayyanthole village along the SH69 in Sy no 72, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 93, 94, 95, 96, 97, 98, 99, 100, 101, 108, 109,110,111,112,113, 202, 203, 258,259, 260, 261, 264, 265 and 266. The available land for the proposed project is around 17.30 Ha. Of this, 8 Ha. can be used for a bus terminal and the remaining 9.3 Ha. is for proposed truck terminal. The proposed land is under private ownership.

31.1.2 Project brief

The Bus Terminal building will include bus parking spaces, passenger waiting areas, ticket booking offices, eating places, restrooms and other basic amenities. The proposed Bus terminal will accommodate car parking, two wheeler parking and autorickshaw stand with pick up and drop off areas. Adequate provision is made in terms of reserving space for fire station, workshop, water service station, gas station, and store room etc. for future expansion. Shopping complex buildings can be constructed in the area. The upper floors of these buildings can be used as a remunerating component as part of the value capture mechanism.



The bus terminal is designed to provide all necessary passenger and commuter facilities for an enhanced user experience. The main aspect of the terminal is to provide proper bus circulation and well designed and comfortable passenger terminal facilities.

As the proposed site is a wetland while developing this bus terminal at Puzhakkal, the sponge city concept can be implemented. An artificial lake for water retention/ storage structure can be planned in the site which will be act as a catchment area for the storm water during heavy rainfall. It is proposed to construct the bus bay areas for parking of buses and passengers waiting areas and other commercial and utility buildings on platforms with its lowest floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns. The proposal should be developed without obstructing the flow of water through the natural canals in the area and also ensuring proper water absorption and retention.

31.1.3 Need for the project

The location of existing bus stands is within the central area of the city, results in movement of inter-city bus traffic on congested urban roads. Locating bus stand outside of core area of the city will reduce the traffic in the central area of the town. Bus terminal at Puzhakkal is proposed to accommodate mainly for the buses in Thrissur Calicut and Thrissur Guruvayur route. Around 175 number of buses ply on this route. A bus terminal is essential for buses plying this route to avoid more traffic conjunction in the city core area.

31.1.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.1

Table 31.1 Responsible agencies and their roles in the Project- Bus Terminal at Puzhakkal

Components	Responsible Agencies/Mode
Funding and implementation	Corporation/ PPP /Govt
Operation and Maintenance	Thrissur Corporation/PPP

31.1.5 Suggested implementation mechanism

The corporation can purchase or get Govt funding for the required land and implement the project in the mode of public private partnership (PPP). The responsibility of operation and maintenance is vested in the corporation. Proper value capture mechanism can be promoted for extra income from the project.

31.1.6 Approximate project cost and funding

The approximate project cost is shown in table 31.2

Table 31.2 Approximate project cost for Bus Terminal at Puzhakkal

Sl. No.	Items	Amount in Crores
1	Land procurement and development	60
2	Construction of Infrastructure facilities	30
	Total	90

31.2 Bus terminal at Mannuthy

31.2.1 Location and ownership details

The proposed site is located on the east side of NH 544, about 1.2 km from the Mannuthy junction. The proposed bus terminal at Mannuthy is located in Ollukkara village Sy no 432 (part) on the west side of Elanjikkulam. The available land for the proposed project is around 5.0 Ha. Of this, 2.5 Ha. can be used for a bus terminal and the remaining 2.5 Ha. is for proposed truck terminal. The proposed land is under private ownership.

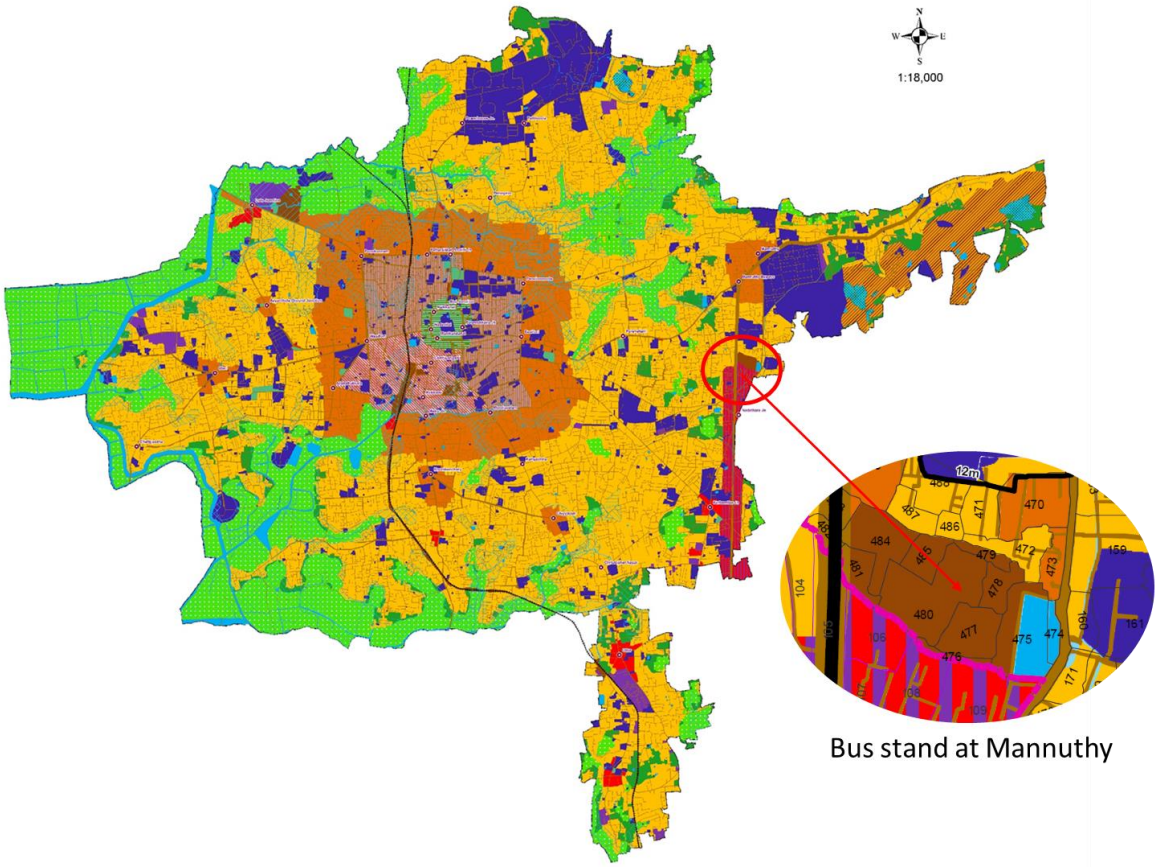


Fig 31. 2 Location of Bus Terminal at Mannuthy

31.2.2 Project brief

The proposed bus terminal should have following facilities.

- Bus parking spaces
- Passenger waiting areas
- Ticket booking offices
- Restaurant
- Comfort station
- Car/ Two wheeler parking
- Remunerating components for value capture mechanism



As the proposed site is a wetland while developing this bus terminal at Mannuthy, the sponge city concept can be implemented. The Elanjikkulam at east side of proposed site can be used as storage area of runoff water from the proposed bus terminal. It is proposed to construct the bus bay areas for parking of buses and passengers waiting areas to ensure proper infiltration of runoff water during rainfall. It is proposed to construct the other commercial and utility buildings on platforms with its lowest floor raised above ground level by foundation walls, shear walls, posts, piers, pilings, or

columns. The proposal should be developed without obstructing the flow of water through the natural canals in the area and also ensuring proper water absorption and retention.

31.2.3 Need for the project

The location of existing bus stands is within the central area of the city, results in movement of inter-city bus traffic on congested urban roads. Locating bus stand outside of core area of the city will reduce the traffic in the central area of the town. Bus terminal at Mannuthy is proposed to accommodate mainly for the buses in Thrissur - Palakkad route. Around 217 number of buses ply on this route. A bus terminal is essential for buses plying this route to avoid more traffic conjunction in the city core area.

31.2.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.3

Table 31.3 Responsible agencies and their roles in the Project – Bus Terminal at Mannuthy

Components	Responsible Agencies/Mode
Funding and implementation	Corporation/ PPP /Govt
Operation and Maintenance	Thrissur Corporation/PPP

31.2.5 Suggested implementation mechanism

The corporation can purchase or get Govt funding for the required land and implement the project in the mode of public private partnership (PPP). The responsibility of operation and maintenance is vested in the corporation. Proper value capture mechanism can be promoted for extra income from the project.

31.2.6 Approximate project cost and funding

The approximate project cost is shown in table 31.4.

Table 31.4 Approximate project cost for Bus terminal at Mannuthy

Sl. No.	Items	Amount in Crores
1	Land procurement and development	15
2	Construction of Infrastructure facilities	25
	Total	40

31.3 Bus terminal at Ollur

31.3.1 Location and ownership details

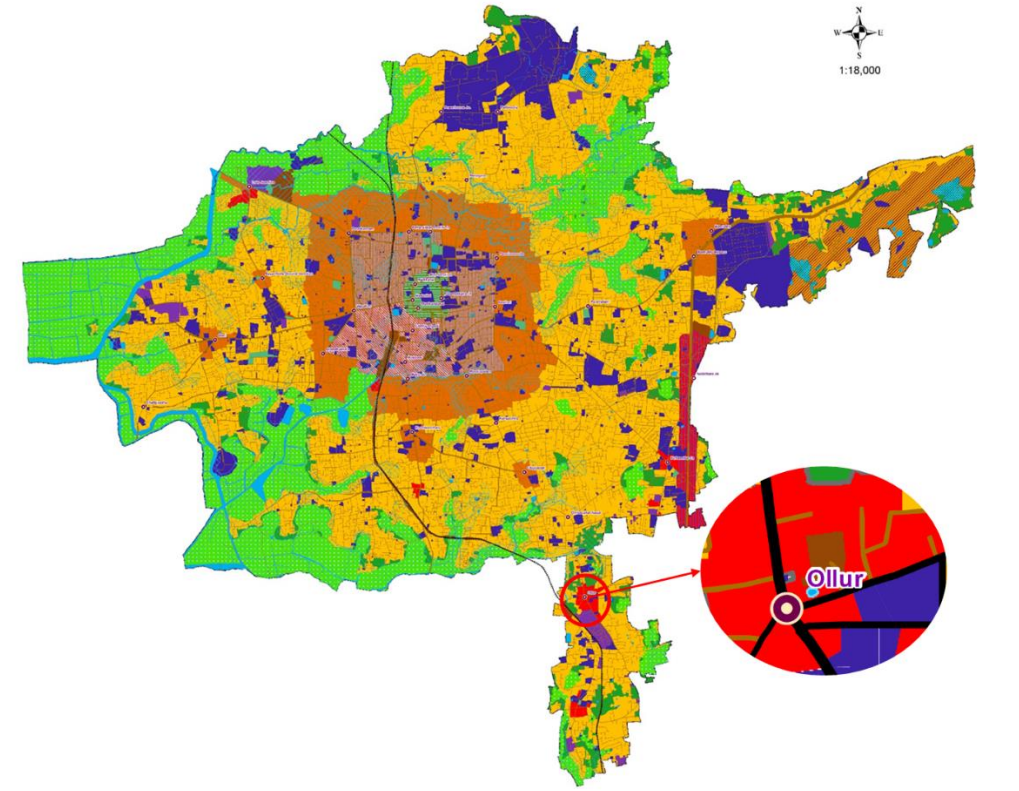


Fig 31.3 Location of Bus Ṭeminal at Ollur

The proposed site is located on the north side of Ollur – Marathakkara road, about 100 m from the Ollur junction. The proposed bus terminal at Oluur is located in Edakkunni village Sy no 15. The available land for the proposed project is around 0.47 Ha. The proposed land is under private ownership.

31.3.2 Project brief

The proposed bus terminal should have following facilities.

- Bus parking spaces
- Passenger waiting areas
- Ticket booking offices
- Restaurant
- Comfort station
- Car/ Two wheeler parking
- Remunerating components for value capture mechanism



31.3.3 Need for the project

The location of existing bus stands is within the central area of the city, results in movement of inter-city bus traffic on congested urban roads. Locating bus stand outside of core area of the city will reduce the traffic in the central area of the town. Bus terminal at Ollur

is proposed to accommodate mainly for the buses in Thrissur - Amballur route. Around 160 number of buses ply on this route. A bus terminal is essential for buses plying this route to avoid more traffic conjunction in the city core area.

31.3.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.5

Table 31.5 Responsible agencies and their roles in the Project – Bus Terminal at Ollur

Components	Responsible Agencies/Mode
Funding and implementation	Corporation/ PPP /Govt
Operation and Maintenance	Thrissur Corporation/PPP

31.3.5 Suggested implementation mechanism

The corporation can purchase or get Govt funding for the required land and implement the project in the mode of public private partnership (PPP). The responsibility of operation and maintenance is vested in the corporation. Proper value capture mechanism can be promoted for extra income from the project.

31.3.6 Approximate project cost and funding

The approximate project cost is shown in table 31.6

Table 31.6 Approximate project cost for Bus Terminal at Ollur

Sl. No.	Items	Amount in Crores
1	Land procurement and development	5
2	Construction of Infrastructure facilities	25
	Total	30

31.4 Sewage Treatment Plant

31.4.1 Location and ownership details

Sewage treatment plant is proposed in Survey number 293 of Koorkenchery village in an area of 70 cents owned by Thrissur Corporation. The location of proposed STP shown in fig.31.7.

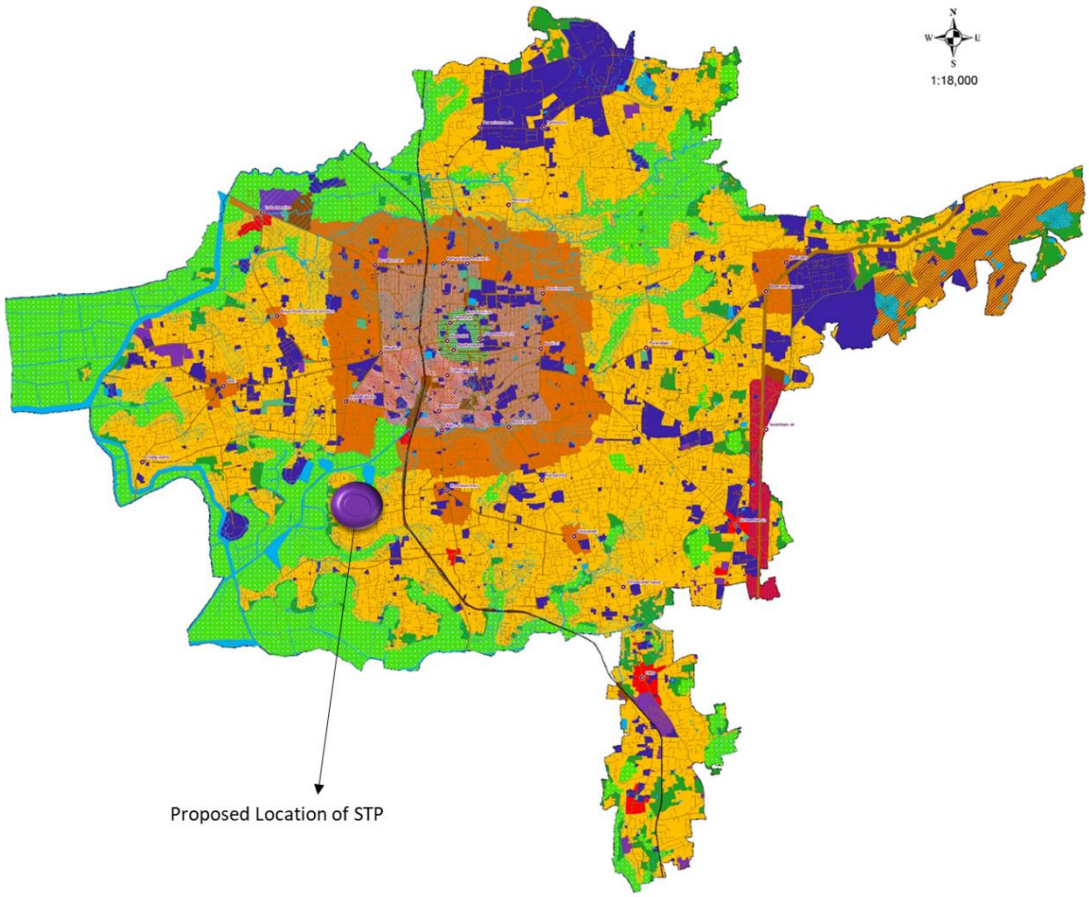


Fig 31.4 Location of Sewage Treatment Plant

31.4.2 Project brief

This project includes construction of STP for Thrissur Corporation. Construction of STP includes centralised networked underground sewerage system and sewage treatment plant.

Sewage treatment includes physical, chemical, and biological processes to remove these contaminants and produce environmentally safe treated wastewater (or treated effluent). A by-product of sewage treatment is usually a semi-solid waste or slurry, called sewage sludge that has to undergo further treatment before being suitable for disposal or land application. Since the city's growth is rapid, large portions of land may not be available for the construction of a sewage treatment plant. Keeping this aspect in consideration, the sewage treatment technology to be adopted should require minimum possible area satisfying all the discharge norms of sewage treatment.



Considering the sponge city concept adopted for the city, the water retaining areas should be conserved. Since the proposed land is low lying, the STP can be constructed over a pile foundation platform above the maximum water level without disturbing the existing condition of the place. Special care should be taken while designing the STP in vision to protect the flora and fauna of the area. During working no temporary filling is proposed. Pontoons are suggested for piling and concreting activities.

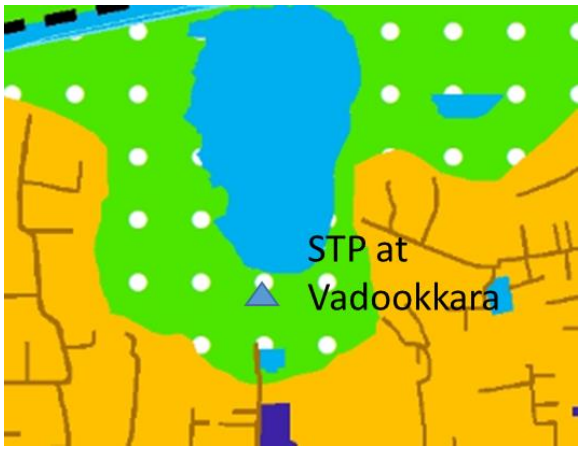


Fig 31.5 Location Sewage treatment plant at Vadookkara

31.4.3 Need for the project

With Uncontrolled urbanization, contamination of drinking water sources by sewage and septage has become a major threat to public health and safety. Under such circumstances it becomes essential to treat the sewage, so that the land or receiving water body can accept the treated water without any objections. Therefore, a waste management plan should be developed and implemented systematically so that urban areas can achieve improved sustainable development for the benefit of future generations and for the town itself.

There is no public sewerage system in Thrissur Municipal Corporation. As per the Socio-economic survey 2019 , 99.11% of the families use septic tank. De-sludging of septic tanks is not done regularly which reduces their treatment efficiency. A piped sewerage scheme was proposed for Thrissur in the City Development Plan in 1972, for better environmental sanitation and hygiene in the city. However, this proposal did not progress.

The World Bank report “Human Excreta Management in Urban Kerala: Towards Sustainable Options State-Wide” suggests different technology types for the urban local bodies of the State. As per the size, class and hydro geological conditions as suggested in the world bank report, a Combination of a) Low network + STP b) Majority Faecal sludge treatment plant is suggested for Thrissur city.

31.4.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.7

Table 31.7 Responsible agencies and their roles in the Project – STP at Vadookkara

Components	Responsible Agencies/Mode
Funding and implementation	KWA/Government/Corporation/PPP
Operation and Maintenance	KWA/Thrissur Corporation/PPP

31.4.5 Suggested implementation mechanism

For the setting up of sewage treatment plant The responsibility of commissioning, operation and maintenance is vested in the corporation. A nominal fee can be collected as collection charges from households and depending upon the quantity of waste generated higher fee can be collected from commercial or other establishments.

31.4.6 Approximate project cost and funding

The approximate project cost is shown in table 31.8

Table 31.8 Approximate project cost for STP at Vadookkara

Sl. No.	Items	Amount in Crores
1	Land procurement and development	10
2	Construction of Infrastructure facilities	60
	Total	70

31.5 Convention centre, Mall, Office complex, Parking plaza near Sakthan Thampuran bus stand

31.5.1 Location and ownership details

The proposed convention centre , mall and parking plaza is situated near to the Sakthan Thampuran Bus stand which is the heart of the city. The proximity of the major transportation nodes such as Thrissur Railway station, KSRTC Stand, Sakthan Private Stand contributes to the locational advantage of the project. The offices associated with the functioning of the municipal corporation can be accommodated at the proposed office complex. The proposed land is in Sy no 1021, 1022(part) in Thrissur village and owned by Thrissur corporation.



Fig. 31.6 Project location

31.5.2 Project brief

The project includes a multi storied convention centre and shopping mall. The proposal could provide with concert halls, lecture halls, meeting rooms, exhibition hall and conference rooms that would add to the revenue generation. The mall may have theater, gaming zone, food courts etc. It should be provided with good parking spaces. The proposed convention centre and mall could be developed in a way that it is perceived as an iconic structure of the city reflecting the socio cultural significance. Shopping complex buildings can be constructed in the area. The Ground floors of office complex can be used as a remunerating component as part of the value capture mechanism.





The proposal also plans to construct multi-level parking plaza to park more than hundred four wheelers and two wheelers. With the materialisation of the parking plaza, the people coming to city for various purposes will be able to utilize as a park and ride facility.

31.5.3 Need for the project

Convention centre is need for the gathering of entrepreneurs which would help the economic growth of the city. It also gives more employment opportunities. Shopping malls can provide the best shopping experiences such as social gatherings, entertainment, performances, product launches, promotions and festivals. Shopping malls tend to be a major tourist attraction. The mall can be more convenient, for a tourist, to have one central location to do all their shopping; rather than to have to drive many miles just to buy different types of products for their personal needs. The proposed project can earn revenue for the corporation.

31.5.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.9

Table 31.9 Responsible agencies and their roles in the Project

Components	Responsible Agencies/Mode
Funding and implementation	MP/MLA/CSR Funds, Corporation, PPP
Operation and Maintenance	Thrissur Corporation / PPP

31.5.5 Suggested implementation mechanism

Funding can be arranged through own funds or Govt funding or MP/MLA funds or PPP mode. The responsibility of construction management, operation and maintenance is vested in the corporation. Proper value capture mechanism can be promoted for extra income from the project.

31.5.6 Approximate project cost and funding

The approximate project cost is shown in table 31.10

Table 31.10 Approximate project cost

Sl. No.	Items	Amount in Crores
1	Land development	5
2	Convention centre	30
3	Mall	30
4	Office complex	25
5	Parking Plaza	40
	Total	130

31.6 Improvement of fish market and vegetable market near Sakthan Thampuran bus stand

31.6.1 Location and ownership details

Sakthan Thampuran market is one of the biggest markets in Kerala and is located at the centre of Thrissur, at Thrissur village in Sy no 1221P/, 1222, 1012P, 1013P, 1014P. The land has an extent of 1.1 ha. The existing fish market is located opposite to Sakthan bus stand, at Thrissur village in Sy no 1005P, 1007. The land has an extent of 1.1 ha. This land is owned by the Municipal Corporation.

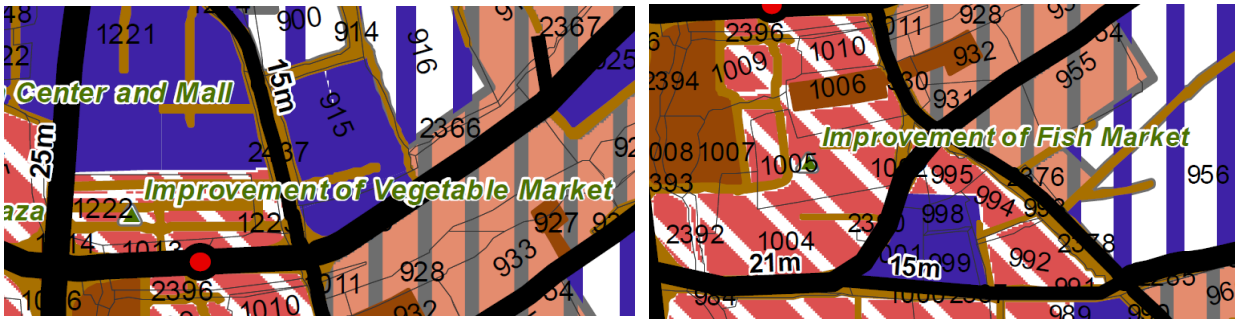


Fig. 31.7 Project location Improvement of fish market and vegetable market

31.6.2 Project brief



The vegetable and fish market houses both retail and wholesale store and sells a wide variety of vegetables and fishes. The project aims to renovate and make improvements to the existing market to improve its existing condition, to provide parking spaces and improve the loading and unloading facilities for better goods management better functioning of the market.

The proposed modern fish market complexes will be equipped with loading and unloading facilities, auction halls, weighing machines, marketing information centres with

digital display boards and offices for fish traders. The fish market complexes will also have access to facilities like ice plants, cold storage plants, Effluent treatment plant, internet and other communication facilities.

31.6.3 Need for the project

Sakthan market near Sakthan Bus stand is an important part of history of Thrissur. It came into being in the 1800s and is a significant element that shaped Thrissur. It is still a major market in Thrissur and services 1000s of people daily, it also provides jobs to many. But the present condition of the market is mediocre. It lacks infrastructure facilities such as parking spaces, dedicated loading and unloading spaces, truck parking spaces etc. This calls for a modification of the existing market to modernise it up to current standards and provide adequate facilities.

31.6.4 Responsible agencies

The possible agencies responsible for the projects is listed in the table 31.11

Table 31.11 Responsible agencies and their roles in the Project

Components	Responsible Agencies/Mode
Funding and implementation	MP/MLA/CSR Funds
Operation and Maintenance	Thrissur Corporation

31.6.5 Suggested implementation mechanism

Funding can be arranged through MP/MLA funds or PPP mode. The responsibility of construction management, operation and maintenance is vested in the corporation. Proper value capture mechanism can be promoted for extra income from the project.

31.6.6 Approximate project cost and funding

The approximate project cost is shown in table 31.12

Table 31.12 Approximate project cost

Sl. No.	Items	Amount in Crores
1	Renovation of Vegetable market	40
2	Renovation of Fish market	60
	Total	100

31.7 Phasing and Project cost

Based on the demand and necessity priority for each project is fixed. Phasing for each project is given below. Also period required for the completion of project and approximate project cost for the project is also included in the table below.

Table 31.15 Phasing

Sl.No.	Name of Project	Project Period in Years	Approximate Project Cost in crores	Phasing		
				1-5 years	5-10 years	10-15 years
1	Bus terminal at Puzhakal	2	90	✓		
2	Bus terminal at Mannuthy	1	40		✓	
3	Bus terminal at Ollur	1	30			✓
4	Sewage Treatment Plant	2	70	✓		
5	Convention Centre and Mall, Parking Plazza near Sakthan Thampuran Bus Stand	2	130			✓
6	Improvement of Vegetable and Fish market near Sakthan Bus Stand	2	100		✓	
	Total		**460**			

CHAPTER 32
ZONING REGULATIONS



32.1 GENERAL GUIDELINES

1. All future development shall be in conformity with the provisions of the Master Plan for Thrissur city
2. For the implementation and enforcement of the proposal envisaged in this Master Plan, areas have been zoned under various zones such as *heritage zone, commercial core zone, mixed core zone, residential zone, commercial zone, industrial zone, public and semi-public zone, mixed zone, , transportation zone, dry agriculture zone, conservation zone, Industrial & commercial mixed zone, recreational zone, water bodies, , quarry , special zone-hillock area, low lying area zone 1 and low lying area zone 2.* Details regarding the nature of uses *'permitted'* and uses *'restricted'* in each zone are given in Table 32.1. These regulations shall be enforced in conjunction with other specific provisions if any mentioned elsewhere in the Master Plan.
3. Uses *'permitted"* in a zone cover the uses that can be normally accommodated in the relevant zone. Such uses may be permitted by the Secretary, Thrissur Municipal Corporation (hereinafter referred to as Secretary). In some cases it may be possible to permit some other uses also, which are not likely to affect the quality and environment in a zone specified for a particular use. Such cases have to be individually examined based on their performance characteristics and special locational factors. Such cases which come under this category are classified as "*Uses Restricted*".
    a. Uses restricted- 1 Category deals with the restricted uses that may be permitted by the Secretary with the concurrence of the District Officer of the Local Self

Government Department (Planning) having jurisdiction over the area (hereinafter referred to as Town Planner).

b. Uses Restricted- 2 Category deals with the restricted uses that may be permitted by the Secretary with the concurrence of the Chief Town Planner of Local Self Government Department (Planning).

4. **"**Uses prohibited" are various objectionable uses in each zone which shall not be permitted under normal circumstances. All uses which does not come under 'Uses Permitted' or 'Uses Restricted' shall be considered as 'Uses *prohibited'.*
5. Any use not specified either in the 'uses permitted' or 'uses restricted' category of a particular use zone but which is of a similar nature to any use 'permitted' or 'restricted' in that particular use zone, may be permitted by the Secretary with the concurrence of the Town Planner.
6. If any portion of a zone is put to a *"Use Prohibited"* as stated in Para 4, before coming into operation of this Master Plan, such use shall be termed as *non-conforming use*. A non-conforming use may be allowed to continue in its existing location and essential repairs and maintenance for the structure may be permitted by the Secretary, provided that the said use create no adverse environmental influence in the zone. Addition, alteration or reconstruction, if found necessary as part of any mitigation measures may be permitted for such uses by the Secretary with the concurrence of the Town Planner. The total built up area of such non-conforming use shall not exceed 1.25 times the existing built up area.
7. Zoning regulations are not intended to prohibit existing uses that have been lawfully established prior to the enforcement of these regulations, unless otherwise specifically mentioned in this Master Plan. Zoning Regulations are essentially intended to help the competent authority in taking decisions regarding granting or refusal of permits for land development and construction of buildings/ structures.
8. Existing areas and structures of archaeological importance and religious uses may be permitted to continue in all the zones and shall be treated as permitted uses.
9. Subject to the zoning regulations of the respective use zones, more than one use may be combined in a building/ plot, provided that the area of individual uses shall be limited to that prescribed for each such use in the zoning regulation for the respective zone.
10. All future developments shall also be in conformity with the provisions of Kerala Municipality Building Rules, unless otherwise specified in these regulations or in any Detailed Town Planning Scheme in force.
11. Provisions/regulations under the Kerala Conservation of Paddy Land & Wetland Act 2008, Disaster Management Act, Archaeological Sites and Remains Act, Environment

Protection Act 1986 and any other applicable statutes as amended from time to time shall prevail over the respective provisions of this Master Plan.

12. Silence zone, as prescribed by the Noise Pollution (Regulation and Control) Rules, 2000 as amended from time to time, shall be applicable to such areas under this Master Plan.
13. Regulation of constructions and land developments on the sides of new roads / roads proposed for widening as per the scheme shall be governed by the distance from the centreline of the road, unless otherwise specified in the Master Plan or Detailed Town Planning Scheme in force or any Detailed Road Alignment approved by Government. If widening on one side of any stretch of the road is constrained due to the physical barriers of water body zone, railway land and protected archaeological monuments/sites the road widening in that stretch shall be accounted from the other side.
14. In the event of change in alignment of proposed roads in the Master Plan, after the commencement of land acquisition of the new alignment, the land parcels in stretches excluded from the original alignment may be changed to adjacent suitable land use zone with the concurrence of the Town Planner. This provision is applicable only to new road development proposals included along the roads mentioned in table below and not to widening proposals.

Sl. No.	Name of road
11	Ring Road (Balya road jn to Peripheral road)
13	Outer Ring Road • Lulu jn to Shornur road • Milma compound • Nettissery paddy – State seed farm • Vadookkara KLDC canal – Chettupuzha road jn.
14	Peripheral Road • South Munayam – Kodungallur road jn – Mathamma thoppu
29	Vanchikulam - KLDC Bund upto Ring Road
33	Pattalam side road – Veliyanoor Road - Sakthan Stand
34	Pullazhi AG Quarters- Pullazhi bund road
65	Saw mill Road
68	Chanapetta Road
93	Hill Bazar Road
94	Erinjery Angadi – Chaldean School Road
96	Kannankulangara by pass
99	Road opposite Ollur KSEB
115	Puzhakkal Truck Terminal east side
117	Puzhakkal bund Road from Sobha city junction to MLA road along KLDC canal bund

15. Operational constructions as defined in the Kerala Town & Country Planning Act 2016 shall be treated as permitted use in the Master Plan Area.

16. The Government shall have the power to issue clarifications in respect of technical interpretations, if any, required on any of the provisions of the Master Plan in consultation with the Chief Town Planner concerned of the Local Self Government Department (Planning).
17. Expansion of existing Public and Semi Public Institutions and existing Industrial units including their incidental uses to adjacent plots shall be treated as permitted use irrespective of the zone in which such adjacent plot lies, except in Water body zone.
18. Only the existing areas under Public and Semi Public uses, Industrial uses, quarry and waterbodies are intended to be included under Public and Semi Public zone, Industrial use zone, quarry and waterbodies zone respectively. If any private property put under uses other than those permitted or restricted in the above zones has got included within such zones, the Secretary may after verification of the revenue ownership documents, accord sanction for development by adopting the regulations of the surrounding land use zone in the proposed land use map, subject to the provisions as per applicable Acts, Rules and Government Orders in force in the State.
19. If public activity or industrial activity ceases or do not exists in a private land, uses permitted/ restricted in the surrounding land use zone shall be allowed in the plot with the concurrence of the Town Planner, if no records are available with Thrissur Municipal Corporation regarding any proposal for acquiring that particular land for any public use at the time of application for building construction or land development. Commercial and industrial uses may be permitted in areas zoned as quarry, if quarry activity ceases or do not exist in that particular land, subject to the provisions of other applicable statutes.
20. Uses Permitted in Mixed Zone may also be permitted by the Secretary, if not allowable otherwise as per the zoning regulations applicable, on both sides of the following roads (as per this Master Plan) in residential, commercial, dry agriculture , public & semipublic zones in land up to a depth shown against each road in the table below.

    Uses restricted in Mixed Zone may also be permitted by the Secretary if not allowable otherwise as per the zoning regulations applicable, but with the concurrence of the Town Planner or the Chief Town Planner as the case may be, on both sides of the following roads (as per this Master Plan) in such applicable zones as mentioned above in land up to a depth shown against each road in the table below:

Sl. No.	Category of Road	Depth (in metres) on both sides of the road up to which provisions of Mixed Zone is applicable
1	NH 544	300
2	All roads having an existing or proposed width of 18 metres or more	200
3	All roads having an existing or proposed width of 12 metres or more	100
4	All roads having an existing or proposed width of 9 metres or more	50

If more than 50% of the area of a plot is included within the Mixed Zone, the entire plot shall be deemed to be included under such Mixed Zone.

21. Disaster mitigation projects by competent authorities shall be permitted in all zones.
22. Transmission / telecommunication towers, wireless station, ATMs, water tanks, waste management units and public utility buildings/structures shall be treated as permitted uses in all zones except in Water body zone.
23. Projects of Central/ State Government, Local Self Government Institutions, Public Sector Undertakings and other Government Institutions may be permitted with concurrence of the Town Planner in all built up zones such as Residential, Commercial, Industrial, Public & Semi Public, Dry Agriculture Zone, Mixed use zone, if such uses are not included in the permitted uses or restricted uses as per the zoning regulations applicable.
24. No building construction other than compound wall, shall be allowed upto to a certain width on the landward side of the following water bodies.

Sl. No.	Name of Water Body	Width of land on the landward side where no constructions are allowed
1	Streams/ Thodu having width of 10m or more	3 m for Plot Area upto 5 cents 5 m for plot Area above 5 cents

25. In case of uncertainty in identifying the alignment and boundary of thodu, canal, river, existing public road, railway line and in the absence of survey boundaries for

the same in the Proposed Land Use Maps, it shall be referred to the actual position on ground as well as revenue records and decision taken by the Secretary in this regard shall be final.

26. If different land use zones falls within a single plot under the same ownership as on date of publication of this Masterplan, all uses permitted as per zoning regulations of such land use zones may be permitted by the Secretary in the plot. If application submitted includes any of the restricted uses and not included in such permitted uses, the Secretary shall issue permit with the concurrence of the Town Planner/Chief Town Planner, as the case may be. However, for the part of the plot which comes under waterbody zone, conservation zone, special zone this provision shall not be applicable.
27. Electric charging stations for vehicles may be permitted in all zones other than water body zone.
28. In Conservation zone, permitted and restricted uses in adjacent land use zone may be permitted with the concurrence of the Town Planner if that particular land in Conservation zone is not classified as paddy land or wetland as per revenue records at the time of issuance of permit.
29. Large Scale development projects in an area 1 hectare or more, exceeding an investment of Rs.100 Crores, which provide direct employment (after commissioning of the project) to the tune of not less than 500 may be permitted in all zones other than water body zone, if not included in the permitted uses or restricted uses as per zoning regulation applicable. In such cases, the recommendation of a committee with constitution as below shall be obtained, subject to satisfying the procedures laid out here under and the Secretary shall comply the same while issuing permit.

    Also, Adequate provision shall be made for supporting infrastructure such as water supply, sewerage, solid waste management, power supply etc. Separate systems for management of solid waste and sewage shall be provided and maintained by the developer at his cost. The project shall be completed within a period of 5 years or as suggested by the Committee.

Procedure to be followed

(a) The developer shall submit the project report, detailing the demand, feasibility and Environmental Impact Assessment aspects of the project, together with the approval, if necessary, obtained from the Ministry of Environment and Forests, Government of India to the Convener of the committee and the Convener shall make all arrangements for convening meeting of the committee at the earliest and

the committee shall consider and dispose of the project report within a period of one month from the date of receipt of the same.

(b) The constitution of the committee shall be as given under:

Principal Secretary/Secretary to Government, Local Self Government Department	-	Chairperson
The Director, Local Self Government Department (Urban)	-	Member
The Chief Town Planner, Local Self Government Department (Planning)	-	Convenor
The District officer of the LSGD (Planning) having jurisdiction over the district concerned	-	Member
Secretary(s) of Local Self Government(s) concerned	-	Member(s)

(c) The Convener shall fix the venue, date and time of the meeting in consultation with chairperson and shall be responsible for safe custody of records and communications thereof.

(d) The meeting shall be presided over by the Chairperson or in his absence by a member to be authorised by him.

(e) The quorum of the meeting shall be majority of the total number of members of the committee for the project.

(f) The developer shall also produce before the committee, all required clearances from the State and Central Government agencies concerned.

32.2. ZONING REGULATIONS

Table 32.1 ZONING REGULATIONS

PARA NO.	USES PERMITTED	USES RESTRICTED-1	USES RESTRICTED-2	USES PROHIBITED
1	2	3	4	5
1	**RESIDENTIAL ZONE**			
	All residences, Residential Flats/Apartments, night shelters, Orphanages,Old Age Homes, Dharmasalas, Residential Quarters, Farm Houses, Ashram,Mutt, Madrasa, Hostels and boarding Houses	Fuel Filling Stations		

	Shops, Commercial offices and Restaurants/Canteen/hotels, Banking and Financial institutions, and Professional Offices – built up area up to 300 sq.m. Parking Plaza Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexe-I)	Public utility areas and Public utility buildings other than those included in the permitted category. Cremation Ground / Crematorium, Burial Ground, Common Vault.		Any other uses not specified
	Educational institutions essentially serving the needs of residential community such as Day Care, Crèche, Nursery Schools, Kindergartens and schools offering general education (up to High school level).			
	Community facilities such as Community Halls, Recreational Clubs, Social Welfare Centres, Gymnasium /Yoga Centers, Libraries and reading rooms etc. having a built-up area limited to 200 m2.			
	Health institutions essentially serving the needs of residential community such as dispensaries, clinics (Out Patient), Diagnostic Centres etc. - built-up area limited to 200m2.			

	Utility Installations and Civic Amenities essentially serving the needs of residential community such as post office, police station, police post, telephone exchange, fire station, tot lots, parks, play grounds, water treatment plants below 5 MLD and weekly markets.	Outdoor game stadium, open air theatre, amusement park		
	Places of worship			
	Plant Nursery, Agriculture and Horticulture, Pastures and Grazing Grounds Fodder Cultivations, Seed Farms, Storage of Agricultural Produces and Seeds, Green Houses			
	Provided that the access road has a width of 5m minimum			
	Automobile workshops for 2/3 wheelers-built-up area limited to 200 sq.m			
	Provided that the access road has a width of 7m minimum			
	Hospitals with 5 beds, Higher secondary schools			
	Shops, Commercial offices, and Restaurants, Banking and Financial institutions, Professional Offices, Movie hall, Godowns, ware houses, storage non-hazardous, IT software – built up area up to 750 sq. m	LPG distribution centres. (excluding bottling plants and bulk storage) the built-up area limited to 50 m2.		
	Convention centres/Auditorium / Wedding Halls / Community halls , Exhibition Centers, Art Gallery, Cultural and information Centre, Museum, Other Public Utility Areas & Buildings, – built up area up to 500 sq. m			

	Provided that the access road has a width of 15m minimum			
	Shops, Commercial offices, and Restaurants, Banking and Financial institutions, Professional Offices, Movie hall, Godowns, ware houses, storage non-hazardous, IT software units – built up area above 750 sq. m		Multiplex Complex	
	Convention centres/Auditorium / Wedding Halls / Community halls , Exhibition Centers, Art Gallery, Cultural and information Centre, Museum, Other Public Utility Areas & Buildings, – built up area above 500 sq. m			
2	**COMMERCIAL ZONE**			
	All Shops including Shopping Complexes, Shopping malls, Hypermarkets, Automobile show rooms, Restaurants, Hotels, Motels, Markets, Professional offices, Commercial Offices & Establishments, Banking and financial institutions, Gymnasium / Yoga Centers, Beauty Parlors, Markets, IT software units, Godowns, ware houses, Storage non-hazardous materials, Stacking yard	Fuel Filling Stations	Multiplex Complex	
	Cottage Industries, Automobile workshops, Automobile workshops for 2/3 wheelers, Automobile Service Stations, Cold storage, Service Industries of non-nuisance Nature (See Annexure-I), Saw Mills, IT Hardware/Electronic Industries, Marble and Granite Storage/Cutting centers, ice factory, printing press, water treatment plan below 5 MLD.			Any other uses not specified
	Expansion of existing residential buildings. Single family residences, Residential flats/apartments with atleast the street facing			

	portion in two lower floors put under E and F occupancies of KMBR in force Hostels, Boarding houses, Guest Houses, Lodges, Night Shelters, orphanages, old age homes, Ashram , Mutt, Madrasa			
	Expansion of existing educational institutions Public Utility Areas & public utility buildings with built up area upto 500 sq.m Movie halls, auditorium, wedding hall, convention centres, community halls. Clinics, Diagnostic Centres and hospitals up to 50 beds Library and Reading Rooms, Social Welfare centres Places of worship Day Care and Crèche, Nursery/Kindergarten Fire station, P& T offices, telephone exchange	Public Utility Areas & public utility buildings with built up area above 500 sq.m Schools up to Higher Secondary level Vocational training institutions Museum, exhibition centre and art galleries Clinics, Diagnostic Centres and hospitals up to 300 beds		
	Tot Lots/Parks/Play Grounds, open air theatre, fairground, Amusement parks, camping site	Indoor/outdoor game stadium		
	Parking Plaza		Bus terminal/stand, Truck terminal	
	Plant Nursery, Agriculture and Horticulture, Pastures and Grazing Grounds Fodder Cultivations, Storage of Agricultural Produces and Seeds, Green Houses, fish farms, seed farms	Slaughter houses Gas godowns	.	
	Provided that the access road has a width of 12m minimum			
		Other Higher educational Institutions Hospitals above 300 beds		

3	**INDUSTRIAL ZONE**			
	All industries other than obnoxious and nuisance type industries, Automobile Workshops & Automobile Service Stations, Spray Painting Workshops, Saw Mills, Timber Yard, Ice Factory, Cold Storage, Fish and Meat Processing Units, Printing Press, Water Treatment Plants, Marble and Granite Storage and Cutting Centres, Industrial Estates & Industrial Parks.	Other Public Utility Areas and Public Buildings. Cremation Ground / Crematorium, Burial Ground, Common Vault. Storage of Explosives and Fire Works, Gas Godowns, Crusher Units. Sewage Treatment Plants, Dumping Yard. Slaughter House Fuel Filling Stations	Bus/truck terminals	Any other use not specified
	Shops, Professional Offices, Commercial Offices, Banks & other Financial Institutions, Restaurants, Canteen, Hotels - built-up area limited to 100 m2. IT Software units			
	Godowns/ Warehouses/ Storage of non-hazardous material, stacking yards.			
	Dairy and Dairy Farms, Dairy related Industries, Poultry Farms, Piggery Farm, Smoke House.			
	Dry Cleaning Plants, Power Plants, Sub Stations,			
	Transport Terminals incidental to industrial use.			
	Residential Uses incidental to the Industrial Use.			
	Any other activity essentially incidental to Industrial use.			
	Tot lots, Parks and Play Grounds attached to incidental residential use.			
4	**PUBLIC AND SEMI PUBLIC ZONE**			
	Residences with built up area up to 300 sq. m, Night Shelters, Orphanages/ Old Age Homes/Dharmasala, Residential Quarters, Farm		Bus terminals/stand, Truck terminal	

	Houses, Ashram/ Mutt Residential uses incidental to the public and semi public use			Any other use not specified
	Shops, Commercial offices, Restaurants/Canteen, Professional Offices , Banking and Financial institutions- built up area up to 1000 sq. m			
	All local, State and Central Government or public sector offices, Day care and crèche, All educational institutions, Police post/ police station, Forensic science lab, Fire station, P & T office, Library and reading rooms, Social welfare centres, Museum, Auditorium, Wedding hall, Exhibition Centre and art galleries, community halls, cultural and information centres, public utility buildings, places of worship, All medical institutions and incidental uses	Jail and Reformatory, R & D institutes, Radio and TV station, civil defense and home guard, Indoor game stadium, Convention centre, Amusement park		
	IT Hardware/ Electronic Industries, Automobile workshops for 2/3 wheelers, Water treatment plant	Parking Plaza		
	Tot Lots/Parks/Play Grounds, open air theatre , Zoological and botanical gardens, camping site	Fuel filling stations		
	Plant Nursery , Storage of Agricultural Produces and Seeds, pastures and grazing ground, fish farms, seed farms, Green Houses, Agriculture and Horticulture	Cremation ground/ crematorium, Burial Ground/Common Vault		
	Solid Waste Disposal area Only buildings/structures incidental to the solid waste disposal system are permitted. Green buffer of 5 m must be provided around solid waste disposal area.			
5	**MIXED ZONE**			
	All residences including apartments, Night shelters,		Multiplex Complex	Any other

	Residential Quarters, Hostels and boarding houses, lodges and guest houses, Ashram/Mutts, Orphanages, Old age homes, Dharmasalas			uses not specified
	All Shops including Shopping Complexes, ATM's, Restaurants, Hotels, Motels, Bakery and Confectionary's, Godowns, Warehouses, Storage, Professional offices, Commercial Offices & Establishments, Banking and financial institutions– **built up area upto 2000 sq.m** Gymnasium/Yoga Centers, Beauty Parlors Automobile show rooms, IT/ software units – built up area up to 2000 sq.m Markets-Plot area limited to 500 sq.m			
	All educational institutions, Forensic science lab, Social welfare centres, Museum, Auditorium, Wedding hall, Exhibition Centre and art galleries, community halls, cultural and information centres – built up area up to 300 sq.m Police post/Police stations, P & T office, Telephone exchange Day Care and Crèche, Nursery/Kindergarten, Library and Reading Rooms Clinics, diagnostic centres and hospitals upto 50 beds	Clinics, diagnostic centres and hospitals upto 100 beds		
	Cottage industry, Automobile workshops for 2/3 Wheelers, Automobile service station for light vehicles, Service Industries of non-nuisance nature (See Annexure-I), Printing press, Water treatment plants below 5 MLD	IT hardware/Electronic Industries		

	Tot Lots/Parks/Play Grounds, open air theatre , camping site	Outdoor game stadium, Amusement parks		
		Parking Plaza		
	Places of worship	Dairy Farms, Poultry Farms		
	Plant Nursery, Agriculture, Horticulture, Fodder cultivation, Pastures, Grazing grounds, Fish Farms, Seed Farms, green houses, Storage of Agriculture Produces and Seeds			
	PROVIDED THAT THE ACCESS ROAD HAS A WIDTH OF 5 m MINIMUM			
	All Shops including Shopping Complexes, Shopping malls, Restaurants, Hotels, Motels, Markets, Professional offices, Commercial Offices & Establishments Godown, warehouses, storage, Automobile show rooms, IT/ software units, stacking yard, Movie hall Weighbridge, Banking and financial institutions	Fuel Filling Stations		
	All educational institutions, Forensic science lab, Social welfare centres, Museum, Auditorium, Wedding hall, Exhibition Centre and art galleries, community halls, Public Utility Areas & Building cultural and information centres – **built up area up to 2000 sq. m**	Hospitals up to 300 beds Radio and TV station, Indoor game stadium		Any other uses not specified
	Automobile workshops, IT hardware/ Electronic Industries, Ice factory, Cold storage, Marble and granite storage/cutting centres, Water treatment plants	Automobile service station for heavy vehicles, Saw mill		
	Amusement park	Zoological and Botanical Gardens		
		Dairy farm /Poultry farm, Sewage treatment plant	Bus terminals/stand, Truck terminal	

	PROVIDED THAT THE ACCESS ROAD HAS A WIDTH OF 15 m MINIMUM			
	All educational institutions, Public Utility Areas & Building, R & D institutes, Forensic science lab, Museum, Auditorium, wedding hall, Movie halls, Convention centres Social Welfare centers, Exhibition centre and art gallery, Places of worship	Hospitals above 300 beds	Container terminal	Any other uses not specified
6	**HERITAGE ZONE**			
	All uses permitted in Mixed core zone	All uses restricted-1 in Mixed core zone	All uses restricted-2 in Mixed core zone	Any other uses not specified
	In addition, the following additional regulations shall apply: i. FAR shall be limited to 1.5 or as per KMBR, whichever is minimum. ii. The overall height of the construction upto the topmost point of the ridge of the roof shall not exceed 15 metres from the average ground level. iii. The slope of roof in facades shall be at an angle between 35 to 45 degrees from the horizontal and shall be finished with mangalore pattern (MP) or palace type terracotta colour tiles. iv. Provisions/regulations under Ancient Monuments and Archaeological sites and remains Act shall prevail over the above regulations, wherever applicable.			
7	**MIXED CORE ZONE**			
	All residences including apartments, Night shelters, Residential Quarters, Hostels and boarding houses, lodges and guest houses, - built up area up to 2000 sq. m Ashram/Mutts, Orphanages, Old age homes, Dharmasalas		Multiplex Complex	Any other uses not specified
	All Shops including Shopping Complexes, ATM's, Restaurants, Hotels, Motels, Bakery and Confectionary's, Godowns, Warehouses, Storage, Professional offices, Commercial Offices & Establishments, Banking and financial institutions– built up area upto 2000 sq.m Gymnasium/Yoga Centers, Beauty Parlors			

	Automobile show rooms, IT/ software units – built up area up to 2000 sq.m Markets-Plot area limited to 500 sq.m			
	All educational institutions, Forensic science lab, Social welfare centres, Museum, Auditorium, Wedding hall, Exhibition Centre and art galleries, community halls, cultural and information centres – built up area up to 300 sq.m Police post/Police stations, P & T office, Telephone exchange Day Care and Crèche, Nursery/Kindergarten, Library and Reading Rooms Clinics, diagnostic centres and hospitals upto 50 beds	Clinics, diagnostic centres and hospitals upto 100 beds		
	Cottage industry, Automobile workshops for 2/3 Wheelers, Automobile service station for light vehicles, Service Industries of non-nuisance nature (See Annexure-I), Printing press, Water treatment plants below 5 MLD	IT hardware/Electronic Industries		
	Tot Lots/Parks/Play Grounds, open air theatre , camping site	Outdoor game stadium, Amusement parks		
	Places of worship	Dairy Farms, Poultry Farms		
	Plant Nursery, Agriculture, Horticulture, Fodder cultivation, Pastures, Grazing grounds, Fish Farms, Seed Farms, green houses, Storage of Agriculture Produces and Seeds	Parking Plaza		
	PROVIDED THAT THE ACCESS ROAD HAS A WIDTH OF 5 m MINIMUM			
	All residences including apartments, Night shelters, Residential Quarters, Hostels and boarding houses, lodges	All residences including apartments, Night shelters, Residential Quarters, Hostels and		Any other uses not specified

	and guest houses, - built up area up to 3000sq. m	boarding houses, lodges and guest houses - built up area above 3000 sq. m		
	All Shops including Shopping Complexes, Shopping malls, Restaurants, Hotels, Motels, Markets, Professional offices, Commercial Offices & Establishments Godown, warehouses, storage, Automobile show rooms, IT/ software units, stacking yard, Movie hall Weighbridge, Banking and financial institutions - built up area up to 1000 sq. m	Fuel Filling Stations		
	All educational institutions, Forensic science lab, Social welfare centres, Museum, Auditorium, Wedding hall, Exhibition Centre and art galleries, community halls, Public Utility Areas & Building cultural and information centres – built up area up to 1000 sq. m	All educational institutions, Forensic science lab, , Social welfare centre, Exhibition Centre and art galleries, Museum, auditorium, wedding hall, convention centres, Indoor game stadium – built up area above 1000 sq. m and upto 2000 sq. m Hospitals up to 300 beds Radio and TV station, Indoor game stadium		
	Automobile workshops, IT hardware/ Electronic Industries, Ice factory, Cold storage, Marble and granite storage/cutting centres, Water treatment plants	Automobile service station for heavy vehicles, Saw mill		
	Amusement park	Zoological and Botanical Gardens	Bus terminals/stand, Truck terminal	

		Dairy farm /Poultry farm, Sewage treatment plant below 2MLD Cremation ground/ crematorium, Burial Ground/Common Vault, Sewage treatment plant above 2MLD		
	PROVIDED THAT THE ACCESS ROAD HAS A WIDTH OF 15 m MINIMUM			
	All Shops including Shopping Complexes, Shopping malls, Bear pubs/Parlor, Liquor Bars, Godown, warehouses, storage, Automobile show rooms, Restaurants, Hotels, Motels, Markets, Professional offices, Commercial Offices & Establishments, Weighbridge Banking and financial institutions, IT/ software units			Any other uses not specified
	All educational institutions, Public Utility Areas & Building, R & D institutes, Forensic science lab, Museum, Auditorium, wedding hall, Movie halls, Convention centres Social Welfare centers, Exhibition centre and art gallery, Places of worship	Hospitals above 300 beds	Container terminal	
8	**COMMERCIAL CORE ZONE**			
	All uses permitted in commercial zone	All uses restricted-1 in commercial zone	All uses restricted-2 in commercial zone	Any other uses not specified
9	**INDUSTRIAL COMMERCIAL MIXED ZONE**			
	All uses permitted under commercial and industrial use zones except bus/truck terminals	All uses restricted-1 under commercial and industrial use zones	All uses restricted-2 under commercial and industrial use zones	Any other uses not specified
10	**DRY AGRICULTURAL ZONE**			
	Single family residential buildings, Night shelters,Orphanages, Old Age Homes, Dharmasala, Ashram/Mutt	Fuel Filling Stations		Any other use not specified

	,Madrassa,Hostels and boarding houses, Farm houses			
	Shops, Commercial offices and Restaurants/Canteen/hotels, Banking and Financial institutions, and Professional Offices – built up area up to 750 sq.m. Parking Plaza			
	Cottage Industries including coir, Service Industries of non-nuisance Nature (See Annexe-I) Godowns/Warehouses/Storage – non-hazardous – built up area up to 300 sq. m	Junk yards, Cremation Ground / Crematorium, Burial Ground / Common Vault, Slaughter houses, Storage of explosive and fireworks, Gas Go Downs, Saw mills with Timber yard, Sewage Treatment plants		
	Clinics (Outpatient) and Diagnostic centers – floor area up to 200 sq. m, Day Care and Crèche, Nursery/Kindergarten/Primary & Upper primary schools, Library and Reading Rooms, Public Utility Areas & Buildings, Places of Worship		Bus terminal / Stand/Truck terminal	
	Auditorium/Wedding Halls/Community halls, Convention centre Social Welfare centers – floor area up to 500 sq. m			
	Tot Lots/Parks/Play Grounds, Open air theatre, Camping site, Amusement parks			
	Plant Nursery, Agriculture, Horticulture, Fodder cultivation, Pastures, Grazing grounds, Fish Farms, Seed Farms, Storage of Agricultural Produces and Seeds, green houses, Dairy farm, Poultry farm, Piggery farm	Fish / Meat processing centres		
	Provided that the access road has a width of 5m minimum			
	Automobile workshops for 2/3 wheelers-built-up area limited to 200 sq.m			

	Shops, Commercial offices, and Restaurants, Banking and Financial institutions, Professional Offices, Movie hall, Godowns, ware houses, storage non-hazardous, IT software units – built up area above 750 sq. m	Markets – Plot Area up to 500 sq. m		
	Convention centres/Auditorium / Wedding Halls / Community halls , Exhibition Centers, Art Gallery, Cultural and information Centre, Museum, Other Public Utility Areas & Buildings, – built up area above 500 sq. m	LPG distribution centres. (excluding bottling plants and bulk storage) the built-up area limited to 50 m2.		
	Residential flats / apartments			
11	**TRANSPORTATION ZONE**			
	All buildings and uses connected with transport and communication such as Bus Terminal / Lorry / Car/Jeep stand, Railway Station, Auto Rickshaw stand, essential repair and service shops related to the transport and communication use, Residential uses incidental to main use	Night Shelters	Container terminal	Any other use not specified
	Any use incidental to transportation use such as retail shops/ Restaurants/ Canteen, Night shelters, Guest houses, lodging facilities, Tot lots, Parks which form an integral part of transportation use.			
	Public Utility areas and buildings and parks which form an integral part of the transportation use	Police Post/Station, Post and Telegraph Office, Electric Sub-Station		
	Tot lots, Parks and play grounds			
	Parking plaza			
12	**RECREATIONAL ZONE**			
	Any construction for the development / improvement of park and open space, Tot Lots/Parks/Play Grounds, Zoological and Botanical Gardens, Bird Sanctuary Public Utility buildings –built-			Any other use not specified

	up area limited to 100sq.m Parking Plazas Fair Grounds, Open Air Theatre, Camping Site, ATMs, Incidental uses with built up area limited to 100 sq.m namely Residential buildings, Retail shops, Restaurants, Canteen.			
13	**WATER BODIES ZONE**			
	Water landings, Boat jetties, Bridges, side protection walls, Fish landing centers	Fish farms, Minor Public Utility areas & buildings which will not affect the character of the area		Any other use not specified
14	**CONSERVATION ZONE**			
	Paddy cultivation, Constructions or land developments in conformity with the Kerala Conservation of paddy land and wet land Act-2008, Agriculture/Horticulture/Fodder cultivation/Fish Farms/Seed Farms. Minor Public Utility areas & buildings which will not affect the character of the area			Any other use not specified
15	**QUARRY**			
	All uses permitted in recreational zone. Single family residential building not exceeding 300 sq.m. built up area. Minor public utility areas & building with built up area up to 100 sq.m. which will not affect the character of the area. Water treatment plants, water storage/distribution tanks.			Any other use not specified
16	**SPECIAL ZONE-HILLOCK AREA** ***(All Constructions/ Land developments in this zone shall be carried out with minimum disturbance to the terrain and ecology of the area. The height of the building should not exceed 12m from surrounding ground level at any point.)***			
	All uses permitted in Dry agricultural zone	All uses restricted-1 in Dry agricultural zone	All uses restricted-2 in Dry agricultural zone	

FLOOD HAZARD OVERLAY FOR FLOOD PRONE ZONES

Flood prone Zones: These are areas which are exposed to floods and are classified into various Zones (Low lying area zone 1 and Low lying area zone 2) based on the intensity of likely Floods in the design scenario of 50-year return period.

High Flood prone zones are areas likely to be inundated to a depth between 1.5m and 3m in the design flood scenario. Moderate Flood prone zones are areas likely to be inundated to a depth between 0.6m and 1.5m in the design flood scenario.

For the purpose of reducing Disaster Risk, proposed land use and the developments in various hazard zones are further modified by Flood Hazard Overlay regulations in Table 32.2 These additional regulations are aimed at reducing damages and losses to people and assets in the flood prone areas. Flood Hazard Overlay regulations have to be read in conjunction with the zoning regulations in Table 32.1 and wherever a conflict occurs the additional regulations in the Flood hazard overlay shall prevail.

Table 32.2 Flood Hazard Overlay regulations

Sl.No.	USES PERMITTED	USES RESTRICTED	USES PROHIBITED
1	**Low lying area zone 1: (inundation depth between 1.5m and 3m)**		
	Constructions in respective zones as in the proposed Land use Plan.		All other uses not specified
	Basement floors are not allowed for any use other than parking, STP, Storage tanks, and other essential services.		
	Plinth levels of all buildings should be at a height of minimum 0.75 meter above the existing ground level or on stilts of height minimum 0.75 meter from existing ground level.		
	No sharp-edged projections shall be fixed over the compound walls or gates, for facilitating easy evacuation.		
	All new single storeyed buildings should have a stairway to the roofs so that temporary shelter can be taken there		
	All new buildings shall have a minimum of one-third of the roof terrace kept open to sky subject to a minimum of 15sq.m, which shall be accessible to facilitate easy evacuation.		
	New constructions shall have at least a balcony or an open verandah or an open terrace in the upper floor(s) or an open stair connecting the upper floor(s) to the ground. Such balcony or open verandah or open terrace or open stair shall face the yard abutting the adjoining street to facilitate easy evacuation.		

	Percolation of water in plots shall not be restricted by impervious paving. If essential, only 25% of the mandatory open space required for the building shall be paved with such pavings.		
	All Existing ponds shall be preserved.		
	No construction/ land development shall obstruct/ reduce drainage capacity in the area.		
2	**Low lying area zone 2 : (inundation depth between 0.6m and 1.5m)**		
	Constructions in respective zones as in the proposed Land use Plan.		All other uses not specified
	Basement floors are not allowed for any use other than parking, STP, Storage tanks, and other essential services.		
	Plinth levels of all buildings should be at a height of minimum 0.60 meter above the existing ground level or on stilts of height minimum 0.60 meter from existing ground level.		
	No sharp-edged projections shall be fixed over the compound walls or gates, for facilitating easy evacuation.		
	All new single storeyed buildings should have a stairway to the roofs so that temporary shelter can be taken there		
	Percolation of water in plots shall not be restricted by dry paving. If essential, only 25% of the mandatory open space required for the building shall be dry paved.		
	New constructions shall have at least a balcony or an open verandah or an open terrace in the upper floor(s) or an open stair connecting the upper floor(s) to the ground. Such balcony or open verandah or open terrace or open stair shall face the yard abutting the adjoining street to facilitate easy evacuation.		
	All Existing ponds shall be preserved.		
	No construction/ land development shall obstruct/ reduce drainage capacity in the area.		

ANNEXURE - I

List of non-obnoxious and non-nuisance type of service or light industries

1. Aerated water and fruit beverages
2. Apparel making
3. Assembly of air coolers and conditioners
4. Assembly of bicycles, baby carriage and other small non motorized vehicles.
5. Atta - chakks
6. Ayurvedic medicinal formulations, Ayurvedic health club
7. Bakery products, biscuits, confectionaries
8. Bamboo and cane products (only dry operations)
9. Block making for printing
10. Card board or corrugated box and paper products (paper or pulp manufacturing excluded)
11. Carpet weaving
12. Cement and concrete products (where crusher is not used)
13. Chilling plants and cold storage
14. Coir (without bleaching / dyeing)
15. Concrete batching plants
16. Cotton and woolen hosiery/ Cotton and silk printing
17. Electro plating
18. Electronics and electrical goods
19. Electronics equipment (Assembly)
20. Engineering workshop and general fabrication works (without any chemical treatment)
21. Embroidery and lace manufacturing
22. Flour mills (job work only)
23. Foam bed, latex thread
24. Foot wear (rubber and PVC)
25. Furniture making
26. Fountain pens
27. Garment stitching, tailoring
28. Gold and silver smithy
29. Gold and silver thread sari work

30. Ice- cream or ice making
31. Insulation and other coated papers (paper or pulp manufacturing excluded)
32. Jobbing and machining
33. Light engineering
34. Laundry, dry cleaning and dyeing
35. Manufacturing of formulated synthetic detergent products
36. Manufacture of soaps involving process without generation of trade effluents(saponification of fats and fatty acids only)
37. Mineralized water
38. Musical instruments manufacturing
39. Oil ginning/expelling
40. Optical frames
41. Paint (by mixing process only)
42. Paper pins and U- clips
43. Power looms / hand looms (without dyeing & bleaching)
44. Photo and picture framing
45. Pressure testing units
46. Printing press
47. Rice mills
48. Rope (cotton and plastic)
49. Rubber gloves other than that for surgical and medical purpose
50. Rubberized coir mattresses
51. Scientific and mathematical instruments
52. Sports goods
53. Steeping and processing of grains
54. Small foundries
55. Tissue culturing
56. Toys
57. Water softening and demineralization plants
58. Watch, pen and spectacles repairing.

ANNEXURE - II

List of obnoxious and nuisance industries subject to Objectionable sounds, dust, odours, fumes, effluents or processes constituting hazardous use and which are to be located in hazardous zones (grouped)under Indian Standard Industrial classification(vide Regulation 7- 1, 7 - 2 and 13-2)

Manufacture of Food Stuff:

(1) Slaughtering, preservation of meat and fish and canning of fish

Manufacture of Beverages:

(2) Production of distilled spirits, wines, liquor etc. from alcoholic fruits and salts in distillery and brewery

(3) Production of country liquor and indigenous liquor such as toddy, liquor from mahua, palm juice

Manufacture of textiles:

(4) Dyeing and bleaching of cotton

Manufacturing of wood & wooden products, sawing and planning of wood:

(5) Wood seasoning

(6) Manufacture of veneer & plywood

(7) Paper, pulp and straw board

Manufacture of leather and leather products:

(8) Currying, tanning and finishing of hides and skins and preparation of finished leather

Manufacture of Rubber petroleum & local products:

(9) Manufacture of tyres and tubes and tyre retreading

(10) Manufacture of industrial and synthetic rubber

(11) Reclanation of rubber

(12) Production of petroleum, kerosene and other petrol products in refineries

(13) Production of chemicals and chemical products

Manufacture of chemical and chemical products:

(14) Manufacture of basic industrial chemicals such as acids, alkalies and their salts, not elsewhere specified(specially sulphurious, sulphuric, nitric, hydrochloric etc. acids, ammonia chlorine and bleaching powdermanufacture.)

(15) Manufacture of dyes, paints, colours, ink powder, varnishes, printing ink etc.

(16) Manufacture of fertilizers (specially from organic materials) (17) Manufacture of disinfectants andinsecticides

(18) Manufacture of Ammunition, explosives and fire works

(19) Manufacture of matches

Manufacture of Nonmetallic mineral products other than Petroleum and coal:

(20) Manufacture of cement

(21) Manufacture of lime

(22) Manufacture of plaster of paris

Manufacture of Basic Metals and their Products:

(23) Manufacture of iron and steel including sheeting, refining, rolling and conversion into basic forms

(24) Manufacture including smelting, refining etc. of nonferrous metals and alloys in basic forms

(25) Manufacture of ornaments

Manufacture of machinery (other than transport) and electrical equipment:

(26) Manufacture of all kinds of battery, Miscellaneous items not covered above

(27) Incineration, dumping and reduction of offal, dead animals, garbage or refuse

(28) Manufacture of gelatin and glue

(29) Fat, tallows, grease of lard refining of manufacture

(30) Bone meal, bone girst and bone powder (31) Manufacture of cashewnut shell oil and

(32) Other similar types of nuisance industries.

ANNEXURE - III

STAKE HOLDERS OF THRISSUR MUNICIPAL CORPORATION-2022

DIVISION NO.	NAME OF DIVISION	COUNCILLOR
1	PUNKUNNAM	Dr. V. AATHIRA
2	KUTTANKULANGARA	Sri. SURESH A. K
3	PATTURAIKAL	Smt. RADHIKA.N.V.
4	VIYYUR	Smt. RENYA BYJU
5	PERINGAVU	Sri. N. A. GOPAKUMAR
6	RAMAVARMAPURAM	Smt. RAJASREE GOPAN
7	KUTTUMUKKU	Smt. RADHIKA.M.V.
8	VILLADAM	Sri. I.SATHEESHKUMAR
9	CHEROOR	Adv. VILLI
10	MUKKATTUKARA	Smt. SUBHI SUKUMAR
11	GANDHI NAGAR	Sri. RAJAN.J.PALLAN
12	CHEMBUKKAVU	Smt. REGI ROY
13	KIZHAKUMPATTUKARA	Sri. JOHN DANIEL
14	PARAVATTANI	Smt. SHEEBA JOY
15	OLLUKARA	Smt. SYAMALA MURALEEDHARAN
16	NETTISSERI	Sri. M.K.VARGHESE
17	MULLAKKARA	Adv. T.A.ANEES AHAMMAD
18	MANNUTHY	Smt. RESHMA HEMAGE
19	KRISHNAPURAM	Smt. BEENA MURALI
20	KALATHODU	Smt. M.L.ROSY
21	NADATHARA	Smt. SHEEBA BABU
22	CHELAKOTTUKARA	Smt. MERCY AJI
23	MISSION QUARTERS	Smt. LEELA VARGHESE
24	VALARKAVU	Sri. E.V.SUNILRAJ
25	KURIYACHIRA	Smt. NIMMY RAPPAI
26	ANCHERI	Sri. VARGHESE KANDAMKULATHY
27	KUTTANELLUR	Smt. SYAMALA VENUGOPAL
28	PADAVARADU	Smt. NEETHU DILEESH
29	EDAKUNNI	Smt. CAROLIN JERISH PERINCHERY
30	THAIKATTUSSERY	Sri. C.P.PAULY
31	OLLUR	Sri. SANOJ.K.PAUL
32	CHIYYARAM SOUTH	Smt. LIMNA MANOJ
33	CHIYYARAM NORTH	Smt. ANCY JACOB PULIKOTTIL
34	KANNAMKULANGARA	Sri. MUKESH K. B
35	PALLIKULAM	Smt. SINDHU ANTO
36	THEKKINKADU	Smt. POORNIMA SURESH
37	KOTTAPPURAM	Smt. NIJI K.G.
38	POOTHOLE	Smt. SARAMMA ROBSON

39	KOKKALA	Sri. VINOD POLLANCHERY
40	VADUKKARA	Sri. P.V. ANILKUMAR
41	KOORKANCHERY	Sri. VINESH THAYYIL
42	KANIMANGALAM	Sri. JAYAPRAKAS POOVATHINGAL
43	PANAMUKKU	Sri. RAHULNATH A R
44	NEDUPUZHA	Sri. ABBY VARGHESE
45	KARIATTUKARA	Smt. LALI JAMES
46	CHETTUPUZHA	Adv. REGEENA JIPSON
47	PULLAZHI	Sri. K.RAMANADHAN
48	OLARI	Sri. SREELAL SREEDHAR
49	ELTHURUTH	Smt. SAJITHA SHIBU
50	LALOOR	Sri. P.K.SHAJAN
51	ARANATTUKARA	Sri. ANOOP DAVIS CADA
52	KANATTUKARA	Sri. P. SUKUMARAN
53	AYYANTHOLE	Sri. N.PRASAD
54	CIVIL STATION	Smt. SUNITHA VINU
55	PUTHURKARA	Smt. MAPHY DELSON

ANNEXURE IV

SPECIAL COMMITTEE-2022

Chairman Of The Committee	:	Sri. M.K.Varghese, Honble Mayor
Convenor Of The Committee	:	Secretary, Thrissur Municipal Corporation
Co-Convenor	:	Superintending Engineer, Thrissur Municipal Corporation
Member	:	Smt. M L Rosy
	:	Sri. P.K.Shajan
	:	Sri. Varghese Kandamkulathy
	:	Smt. Lali James
	:	Sri. John Daniel
	:	Smt. Saramma Robson
	:	Sri. Gopakumar N.A
	:	Smt. Sheeba Babu
	:	Sri. Rajan. J.Pallan
	:	Sri. I.Satheesh Kumar
	:	Sri. Jayaprakash Poovathingal
	:	Smt. Carolin Perinchery
	:	Adv. Anees Ahmad
	:	Adv. Regina Jipson
	:	Sri. Vinod Pollancherry
	:	Smt. Poornima Suresh
	:	Sri. E.V. Sunil Raj
	:	Smt. Rajasree Gopan
	:	District Town Planner,Thrissur
Expert Member	:	Prof. Bindu C.A, School of Architecture and Planning Govt. Engineering college Thrissur
Expert Member	:	Dr. Ajith Kaliyath, Urban Chair Professor, KILA,Thrissur