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DEVELOPMENT PLAN FOR CHANGANASSERY 2021

REPORT





Department of

DEVELOPMENT PLAN FOR

CHANGANASSERY 2021

REPORT

JUNE 2011

DEPARTMENT OF TOWN AND COUNTRY PLANNING,
KERALA STATE

PREFACE

Changanassery is an important Commercial Centre in Kottayam district. It was an important trade centre during the Thekkumcore regime itself.

Changanassery got the status of municipality in the year 1921. It is the Head quarter of Changanassery taluk. At present it is a first grade municipality with an area of 13.50 sq. km.

The existing Development Plan for Changanassery Town was sanctioned wide G.O.(MS) No.224/84/LA & SWD dt. 29/9/84. The changed development scenario necessitated the revision of this sanctioned town planning scheme.

According to the surveys, studies, analysis, consultation with the municipal council, concerned departments & stake holders the concept plan is evolved. The existing condition of the town and different planning issues are studied, and the future requirements and planning policies are arrived. Based on this, proposals are drawn and are detailed. The development control measures are proposed to guide the development according to the policies adopted.

I thankfully acknowledge the services of the staff of the Office of the Town Planner, Kottayam for their sincere efforts in the preparation of the plan. The valuable suggestions of the Town Planning Committee of Changanassery and the support extended by Chairman and members of Changanassery Municipal Council during the course of preparation of this plan are greatfully acknowledged.

Thiruvananthapuram
Date:

EAPEN VARUGHESE
CHIEF TOWN PLANNER
16/2/12

FOREWORD

Changanacherry Municipality was formed in the year 1921. This town is known as the land of "Anchuvilakku" (Five Lights) which has erected by the eminent Divan Sri. Veluthambi Dalawa, who founded the famous market of the Changanacherry. Foremerly this was the famous marketing centre of the Travancore. Even now Changanacherry is a trade exchange point of hill produces, vegetables, fish and rice to Highrange, Changanacherry town is the Gate Way to Highrange and Alappuzha and hence the town has major potential for spontaneous development in the future. It is in this context Changanacherry Municipal Council has decided to prepare a Revised Development Plan and Town And Country Planning Department was entrusted to prepare the same. The Draft Plan prepared by the Department has been approved after series of discussion in the Municipal Council following the procedure of Town Planning Act. This Development Plan will be a foundation document for the spatially planned, future development of the town.

I appreciate the efforts made by the personnels of the Department of Town and Country Planning - especially Office of the Chief Town Planner, Office of the District Town Planner and the Changanacherry Municipality in the dedicated work for the plan preparation.

Changanacherry

Omana George
Municipal Chairperson
Changanacherry

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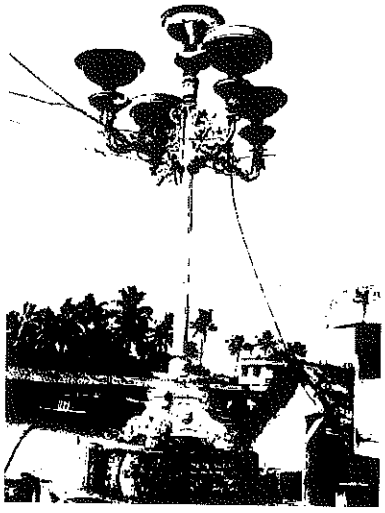
PART I



EXISTING CONDITIONS AND DEVELOPMENT ISSUES

1. INTRODUCTION

1.1 INTRODUCTION

Town or a city is a place of urban living. Urban area means an environment in which natural surroundings have been dominated by artificial or man-made surroundings, which man built for himself for his living, working and recreation. The Town planning is considered as an art of shaping and guiding the physical growth of the town creating buildings and environments to meet the various needs such as social, cultural, economic, recreation etc and to provide healthy conditions for both rich and poor to live, to work, and to play or relax, thus bringing about the social and economic well-being for the majority of people.

Though the term urban planning and development applies to planning of new towns and cities on virgin land, it also takes into account the development and improvement of the existing towns and their extension. The Town and Country Planning Department of Kerala hasn't got any opportunity to plan a new town on a virgin land. It's planning efforts are concentrated in the planned development of existing towns. In the case of Changanassery town the present Development Plan was based on classical town planning principle. So the above Development Plan envisaged development of sectoral centres, neighbourhood centres etc and suggested zoning regulation which discouraged mixed development of various uses. The changed development scenario requires re-assessment of future development requirement of the town. Hence it has been decided by the Changanassery Municipal Council to revise the first Development Plan published vde G.O (Ms) No.224/84/LA & SWD dated 29.9.1984.

In this plan the concept evolved is based on the surveys, studies, analysis, consultations with the Municipal council, concerned departments and stakeholders. The present trend of development is also considered for evolving the concept plan. The town is developing from the CBD to all directions mainly along the major transport corridors. So the concept evolved is a mono-centric city with service population of the region.

The urban development policy of the Government envisages the development of urban centres which has potential in industrial development, tourism, Information Technology, Trade and commerce as growth centre and have become the generators of economic momentum. It also

stresses the need for private investment in the provision of infrastructure and service sector. So in this context Changanassery is identified as a market, educational cum service town serving the hinterland and region.

The report consists of four parts. Part I consists of 15 chapters, giving a detailed information about the existing condition of the town and different planning issues. Part II comprises two chapters discussing about the future requirement of the town and policies adopted in planning. Part III of the report consists of 7 chapters describing the proposals, resources mobilization, strategies for implementation and project details. Finally, part IV explaining the development control measures. 24 appendices giving additional data and information further support these chapters.

1.2 OBJECTIVES

- **To evaluate the present Development plan and evolve a new planning strategy, considering the changed scenario and policies.**
- **To rationalize the land use pattern of the town considering the present trend of development**
- **To regulate urban development activities for the planned development of the town by evolving a liberalized land use-zoning regulation.**
- **Analyze the level of services of various infrastructure facilities and provide adequate infrastructure facilities like efficient transportation system, well-defined hierarchy of road networks, drainage, water supply and power supply.**
- **Identify the environmentally sensitive area and to propose measures for the protection of the eco-system.**
- **Being a social and cultural centre, study and suggest measures to preserve the historic, cultural and religious monuments.**

1.3 METHODOLOGY

The methodology adopted for the preparation of the plan is show in the figure 1.1.

METHODOLOGY

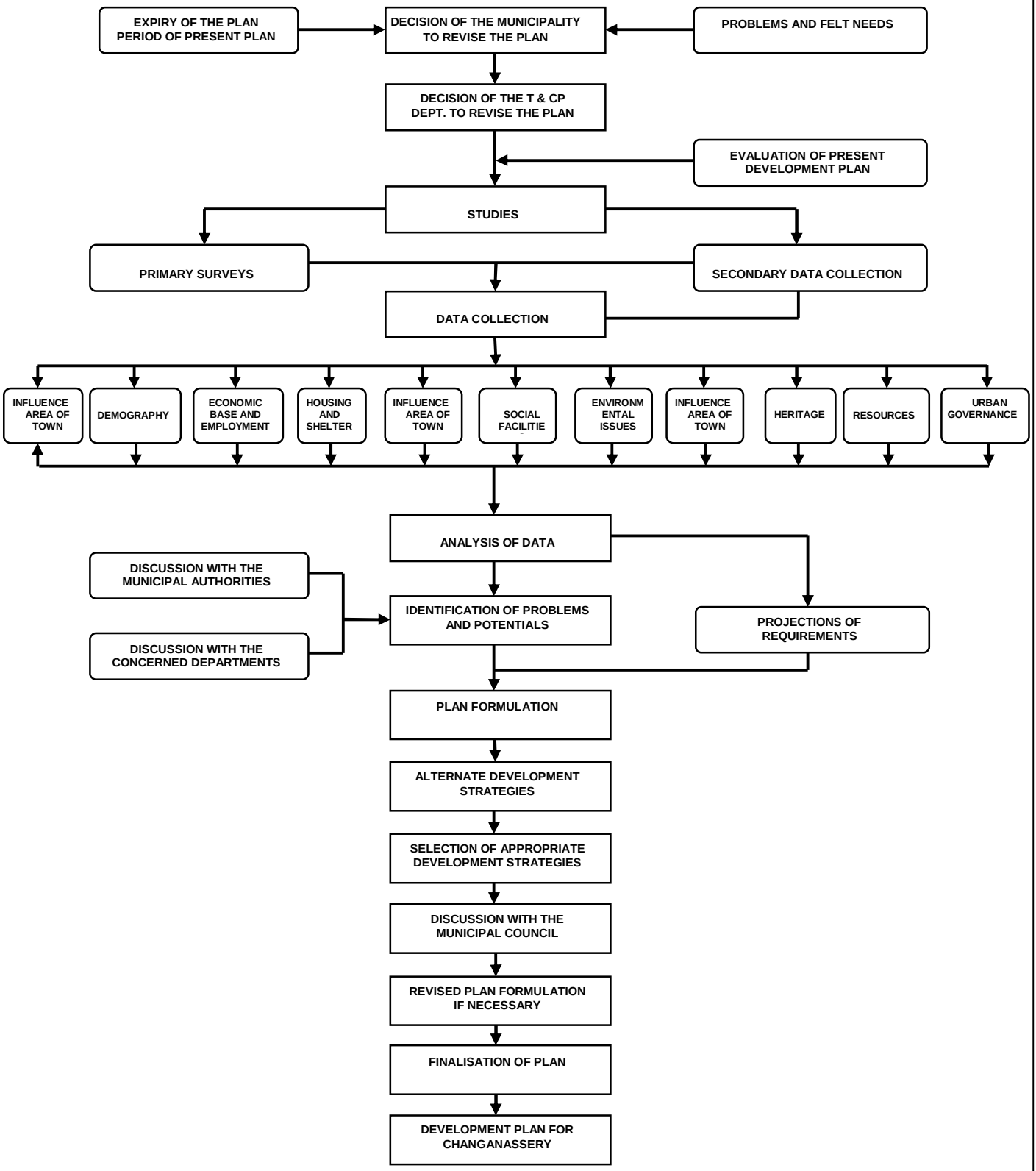


FIGURE 1.1

2. EVALUATION OF THE DEVELOPMENT PLAN 1975-2001

2.1 PLAN PERIOD AND PLANNING AREA

The development plan for Changanassery was approved by Government vide G.O. (MS) No.224/84/LA & SWD dated 29.07.1984 and the plan period was 1975-2001. The total plan area was 1666 hectares, which include 1326 hectares of Changanassery Municipality and 340 hectares of adjacent Vazhappally and Thrikkodithanam Grama panchayat.

2.2 PLANNING REGION

The Planning region for Changanassery was considered as the sub-region of Kottayam, consists of Changanassery taluk, Kanjirappally taluk, part of Kottayam taluk, Kuttanad taluk of Alappuzha district and part of Mallappally taluk and Thiruvalla taluk of Pathanamthitta district.

2.3 PROJECTED POPULATION

Population of Changanassery Municipality as per 1971 census was 48,545. For the horizon year the population projected by mathematical methods was 86,580 (maximum value using among different methods) and the population of the town assumed for planning by 2001 was 1,00,000.

2.4 SPACE REQUIERMENT FOR ADDITIONAL POPULATION

Gross population density of 100 persons per hectare and overall density of 60 persons per hectare was adopted in planning. Space for additional population was found by three means i.e. by increasing the density of population of existing residential areas, by increasing the area of developed land and by extending the town limit. An additional area of 340 hectares, comprising Chethipuzha, Kurisummoodu and Veroor areas of Thrikkodithanam and Vazhappally Grama Panchayats are included in the plan.

2.5 SPACE STANDARDS ADOPTED IN PLANNING

Residential density (gross Density)	: 110 persons per hectare
High school	: 2 hectare
Combined L. P and U.P. School	: 1.5 hectare
L P. School	: 0.5 hectare

Medical	: 6 beds per 1000 persons
Public Office	: 12 sq. m. Per worker
Park and open spaces	: 0.40 hectare/1000 person
Commercial activities	: 0.50 hectare/1000 person
Industrial areas	: 0.60 hectare/1000 person, industrial worker

2.6 PROPOSED LAND USE 2001

Land proposed for various uses in the plan is shown in table 2.1 .The proposed Land use plan of the Present Development plan is shown in the Map 2.1

TABLE 2.1 PROPOSED LAND USE 2001

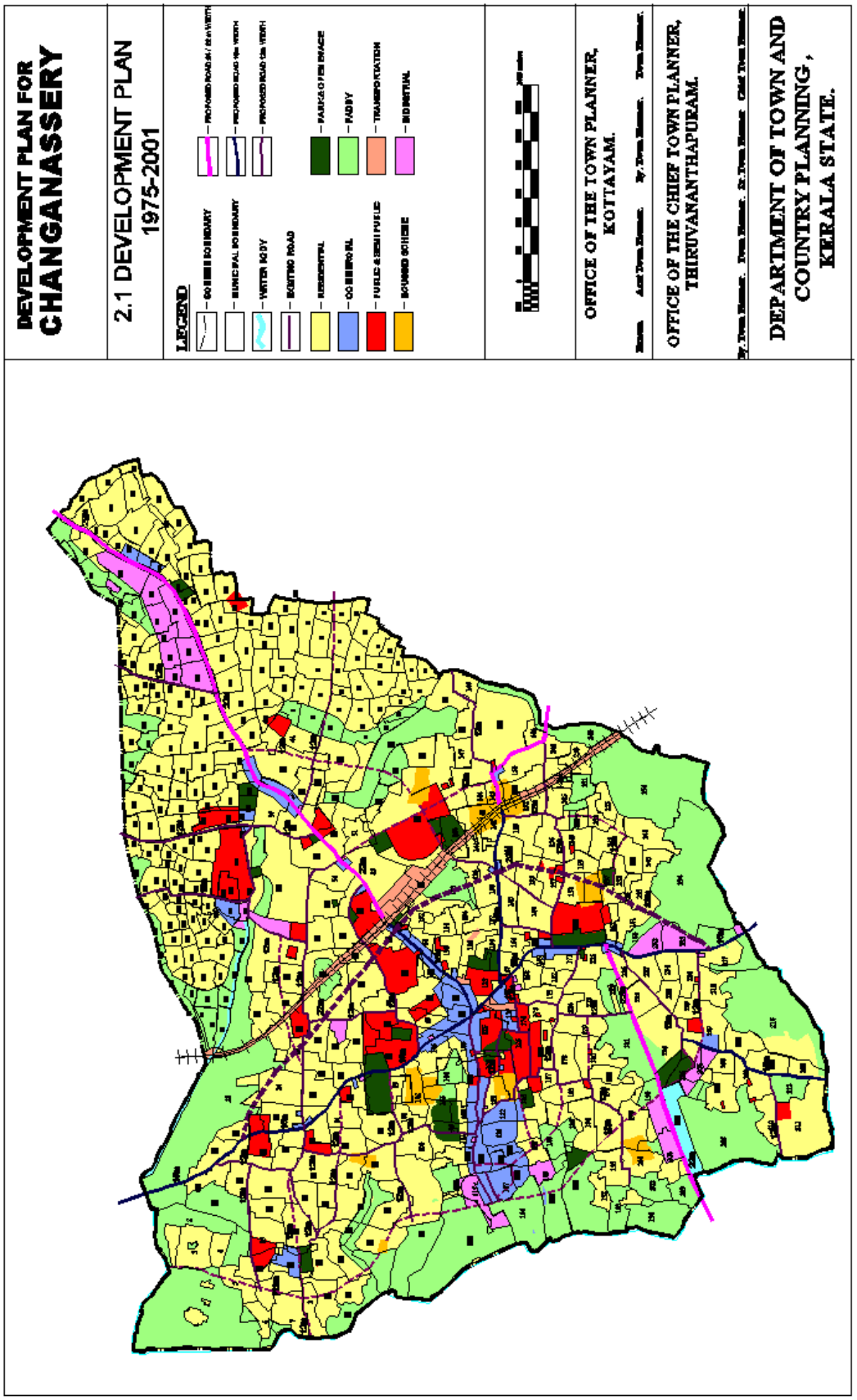
Land use	Area in hectare	% of total area	Area per 1000 person (2001) in hectares
Residential	910	54.60	9.10
Public and Semi public	114	6.85	1.14
Industrial	60	3.60	0.60
Commercial	50	3.00	0.50
Park and Open space	40	2.40	0.40
Major roads and Terminals	130	7.50	1.30
Railway	35	2.00	0.35
Paddy fields, watercourses and Marshy area	327	19.65	

2.7 PLANNING DIVISIONS

For planning and administrative purpose, the plan area was divided into 5 planning districts. The details of each district is show in the table 2.2

TABLE 2.2 PLANNING DIVISIONS FOR THE DEVELOPMENT PLAN 1975-2001

Planning district	Anticipated population	Predominant land use
CBD	30000	Trade and commerce
Vazhappally	20000	Residential
Chethipuzha – Veroor	20000	Residential and Industrial
Perunna	20000	Residential and Industrial
Cherukarakkunnu	10000	Administrative and Public use


DEVELOPMENT PLAN FOR
CHANGANASSERY
2.1 DEVELOPMENT PLAN
1975-2001
LEGEND
OFFICE OF THE TOWN PLANNER,
KOTTAYAM.
OFFICE OF THE CHIEF TOWN PLANNER,
THIRUVANANTHAPURAM.
DEPARTMENT OF TOWN AND
COUNTRY PLANNING,
KERALA STATE.

2.8 MAJOR PROPOSALS OF THE PLAN

i. Public sector housing schemes

Rental housing scheme, Industrial housing schemes, schemes for economically weaker sections, LIG, MIG, etc. are included in the plan.

ii. Commercial Development

Schemes for developing Changanassery as a regulated market, commercial centre at the town centre, shopping centres in each ward etc. are proposed in the plan.

iii. Industrial Development

50 hectares of land at 7 locations in various parts of the town was proposed for industrial development. Agro based, metal and timber oriented industries were proposed in these centres.

iv. Recreational areas

An area of total 43 hectares of land was proposed at various part of the town for recreational purpose. Proposals include aquatic sports stadium, major stadium, exhibition ground, Neighbourhood and sectoral parks.

v. Education

10 hectares of land was proposed for high education facilities like College, research centre etc.

vi. Medical

An additional area of 5 hectares of land was proposed for expansion of hospital.

vii. Transportation

Proposals in this sector include construction of a by-pass road, widening of existing roads and new road links.

2.9 COST ESTIMATE OF THE PLAN

The total estimated cost of various urban development projects envisaged in the plan was 1575 lakhs.

2.10 EVALUATION OF THE PLAN

2.10.1 Population

The population of the town has not increased as projected in the plan. The projected population of 2001 was 1,00,000, but as per 2001 census the population of the town is just 51,960. It is mainly due to

- **Social changes**
- **Very high population growth rate of surrounding Grama panchayats**
- **Urbanization of surrounding Grama panchayats**
- **Change in the traditional role of Changanassery as a transhipment point of commodities**
- **Lack of industrialization**

2.10.2 Project implementation



M.C.ROAD BY-PASS

Some of the projects envisaged in the plan especially transport sector could been implemented. Among that, by-pass road which is under construction is the major one. Some projects in housing sector has been implemented under the centrally sponsored scheme for the integrated development of small and medium towns But many projects proposed in the plan could not be materialized due to change in policies during the plan period and due to financial constraints.

2.10.3 Land use control

Environmentally sensitive areas like paddy fields, natural drains etc are protected by land use control. The developments along the major traffic corridors are also controlled.

3. PHYSICAL CHARACTERISTICS

3.1 LOCATION AND REGIONAL SETTING

Changanassery is situated at the southern end of Kottayam District, right at the heart of the former Central Travancore region of Kerala. The town has developed as a collection and distribution centre of the agricultural products of Kuttanad and Highrange regions. The town has established strong social and economic ties with a region spread over Changanassery, Kottayam taluk of Kottayam district, Kuttanad taluk of Alappuzha District and Mallappally and Thiruvalla taluks of Pathanamthitta district.

Changanassery town is located in the Main Central Road (S.H.1) at a distance of 20km. south of the District Headquarters, Kottayam and 140km. North of the state capital Thiruvananthapuram. It is well connected with the neighbouring urban centres like Thiruvalla, Adoor and Pathanamthitta by road and Alappuzha by both road and waterway and distance to these urban centre are 8km, 41km, 43km and 31 km respectively. It is also well connected to the highrange centres like Ponkunnam, Kanjirappally, Mundakkayam, Kumali and Kattappana by roadway. Ernakulam – Thiruvananthapuram B.G. Railway line is passing through Changanassery. The location and the regional settings of the town is shown in Map 3.1

3.2 EVOLUTION OF THE TOWN

The history of Changanassery can be traced back up to the 9th century A.D. This is the period believed to be the origin of typical Kerala style Architecture. Two temples located in the town namely, Vazhappally Siva Temple and Perunna Subhrahmanian temple and the Thrikkodithanam temple, located just outskirts of the town were constructed during the 9th century.

Inscriptions at Vazhappally temple mention about the reign of Rajasekhara Varma, an emperor of the Chera dynasty during the period A.D 220-844. The inscriptions of Bhaskara Ravi Varma, obtained from Perunna and Thrikkodithanam temples mention about the Chera Empire during AD-962 – 1019. The inscription refers to a Provincial Kingdom called “Nantuzhai Nadu”. It is believed that Changanasseri was capital of this Kingdom. Historical records show that

Changanassery was part of the Thekkumcore principality, with headquarters at Puzhavathu, until it was annexed to Travancore in the year 1750 AD by King Marthandavarma. The Puzhavathu temple was established in the year AD 1110. Christians and Muslims enjoyed much privilege during the period of Thekkumcore Rajas. The Cathedral church and Mosque at Puzhavathu were constructed in AD 1117.

Changanassery was an important trade centre during the Thekkumcore regime. There was a market behind the present Kavil Temple for the transaction of agricultural products. This market was functioning there till 1750, when Marthandavarma annexed Thekkumcore to Travancore.

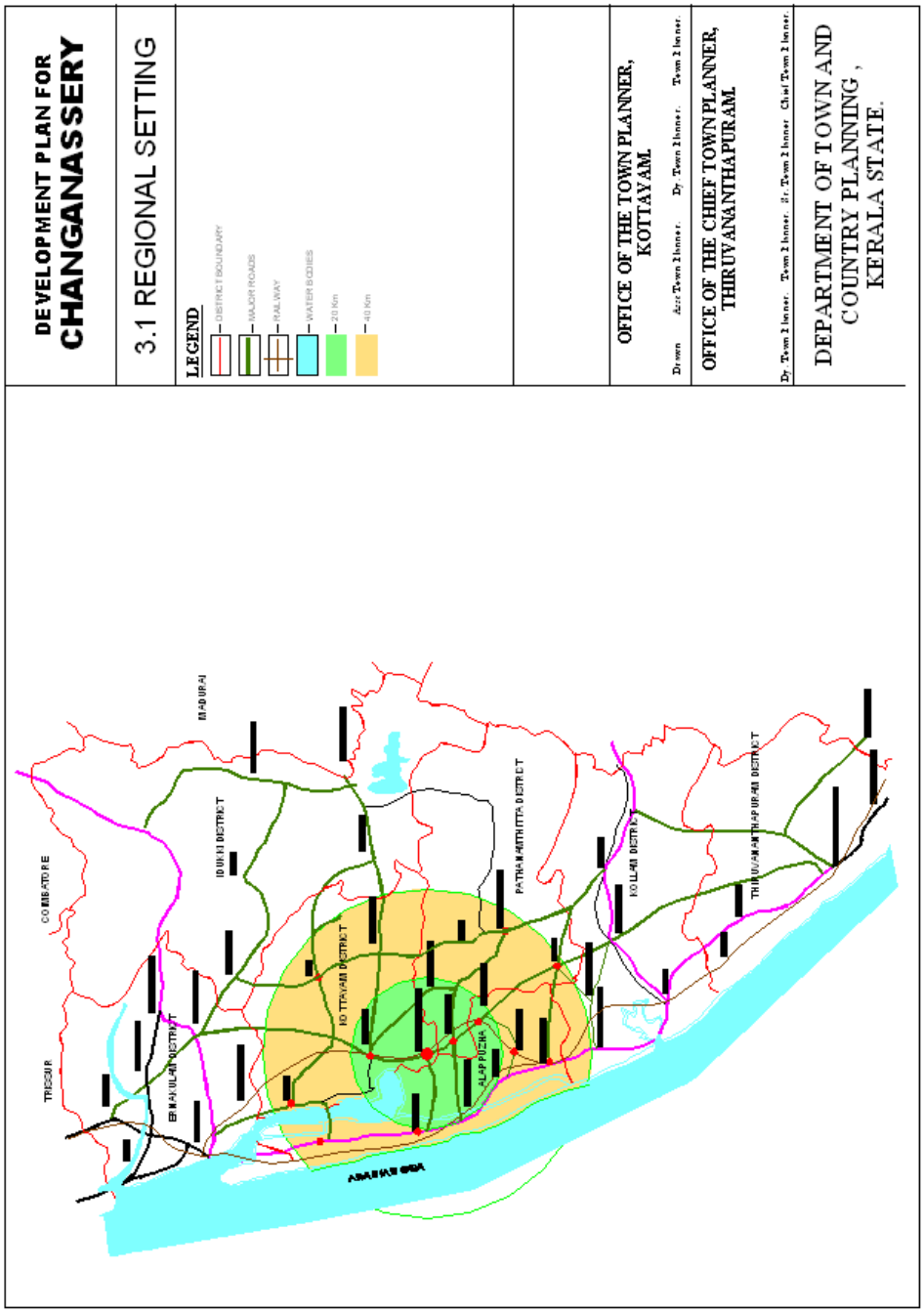
The date of origin of the name Changanassery is not seen recorded anywhere. Since the important and ancient temple was located at Thenganal village, about 8km. on the east of Changanassery town, the area adjoining Thenganal might have been referred to as Thenganalcherry, which later on might have become Changanassery.

After becoming part of Travancore state, the commercial importance of Changanassery reached its climax when Velu Thampi became Dalawa of Travancore state and it was he who opened the Changanassery vegetable market in the year 1805 realising the importance of the geographical location of Changanassery. He opened new roads and canals to provide better accessibility to the regional market at Changanassery and Changanassery became the largest market of Travancore at that time.



VELUTHAMPI DALAWA

In A. D. 1812 Rani Lakshmi Bai built the Lakshmipuram palace for the royal family from Parammanad in Malabar, who were forced to leave their country due to the attack of Hyder Ali of Mysore. Another land mark in the development of Changanassery town is the opening of the road connecting Kottayam and Changanassery in 1874, which forms part of present M.C.Road. Construction of Changanassery- Vazhoor Road and Alapuzha- Changanassery Road have also played a very important role in the development of the town.The town improvement committee was formed around the year 1901. It was upgraded as a Municipality in 1921. At present Changanassery is a first Grade Municipality with an area of 13.50sq. km. and population of 51960 (as per 2001 census provisional figure)


DEVELOPMENT PLAN FOR
CHANGANASSERY
3.1 REGIONAL SETTING
LEGEND
DISTRICT BOUNDARY
MAJOR ROADS
RAILWAY
WATER BODIES
10 Km
40 Km
OFFICE OF THE TOWN PLANNER,
KOTTAYAM.
Drawn
Asst Town Planner.
Dy. Town Planner.
Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER,
THIRUVANANTHAPURAM.
Dy. Town Planner.
Town Planner.
Sr. Town Planner.
Chief Town Planner
DEPARTMENT OF TOWN AND
COUNTRY PLANNING ,
KERALA STATE.
KOTTAYAM DISTRICT
PATHANAMTHITTA DISTRICT
ALAPPUZHA
ARABIAN SEA

3.3 PHYSICAL FEATURES

Kerala State is generally divided as three natural sub-divisions, the high land, the midland and the low land. Changanassery town lies near the western boundary of the midland region where it adjoins the low land of Kuttanad Region. The ground level of the town above MSL varies from 1m to 27m.

The southern and western part of the town is comparatively low lying plain areas and the central area is comparatively elevated plain area. 92.5% of the total land is either elevated or low lying plain areas and 4.5% is slopping ground and remaining 3% of the land is marshy areas.



PERUNNA TEMPLE POND



VAZHAPALLY TEMPLE POND

No major river flows through the town. The Manimala river passes through the southern part of Changanassery taluk. But there are a number of canals, including navigable canals flowing through the northern, western and southern part of the town. Canal starting from Poovakkattuchira, Canal parallel to A.C Road, Laikkad thodu, Boat jetty – Kuttisserikkadavu thodu, Kannanperoor thodu are the important canals passing through the town. In addition to that there are seven big ponds within the Municipal town limit namely Manakkalchira, Perunna temple pond, Chithrakulam, Parakkulam, Poovakkattuchira, Tamarakkulam and Vazhappally temple pond.

3.4 CLIMATE AND RAINFALL

The climate of the town is fairly moderate. Rainfall is available through out the year except for the months from January to April. Average rainfall of the year is 3400mm. The relative humidity is exceptionally high (90%) during the months of June, July and August. The town especially the western part experiences yearly flood during the monsoon and acute water shortage during the summer.

3.5 SOIL CONDITION

Laterite soil is predominant in the eastern parts of the town. Outcrops of granite beds are also seen extensively on the northern and eastern hillocks. Western part of the town is mainly low lying paddy fields with clay soil. It is believed that, these areas were once part of the Vembanad Lake.

3.6 EXISTING LAND USE

3.6.1 Introduction

While analysing the land use of the town it reveals that, 1010 hectares of land, which is 74.81 % of the total area of the town is developed area and the remaining part is undeveloped area. It is also seen that the area adjacent to the major transportation corridors like M.C. road, C.V. Road, Kaviyoor Road and T.B road are developed with commercial and public buildings. The remaining areas, except the peripheral areas on the north, west and south are developed as residential areas. The land use pattern of the town 2002 and a comparison with the land use of 1974 is shown in table 3.1 and the availability of land for various use per1000 population is shown in table 3.2 .The existing land use 2002 of Changanassery is shown in map 3.2.

TABLE 3.1 EXISTING LAND USE 2002 AND A COMPARISON WITH THE LAND USE 1974

Sl No.	Land use	Area in hectares		Percentage of total area		Percentage of developed area	
		1974	2002	1974	2002	1974	2002
1	Residential and dry cultivation	675	763.39	50.90	56.55	78.67	77.50
2	Public and Semi Public	74	88.62	5.58	6.56	8.62	8.99
3	Industrial	11	5.76	0.83	0.43	1.28	0.58
4	Commercial	16	37.17	1.2	2.75	1.86	3.77
5	Park and Open space	12	9.31	0.9	.69	1.39	0.95
6	Transportation	70	80.77	5.27	5.98	8.16	8.19
	Total developed area	**858**	**985.02**	**64.71**	**72.96**	**100.00**	**100.00**
7	Paddy field	432	319.04	32.58	23.63		
8	Water sources	36	45.94	2.71	3.40		
	Total	**1326**	**1350**	**100.00**	**100.00**		

TABLE 3.2 AVAILABILITY OF LAND FOR VARIOUS USE PER 1000 POPULATION

Sl. No	Land use	Area in Hectares (2002)	% of Developed area	Availability of land per 1000 population
1	Residential and dry cultivation	763.39	77.50	14.69
2	Public and Semi public	88.62	8.77	1.71
3	Industrial	05.7	0.57	0.11
4	Commercial	37.17	3.68	0.59
5	Park and Open space	09.31	0.92	0.18
6	Transportation	80.76	7.99	1.55

MAP 3.2 EXISTING LAND USE

A3 map

3.6.2 Residential use

The land under residential use has increased from 675 hectares in 1974 to 763.39 hectare in 2002 and during the same period, the population of the town has increased from 48,545 (1971) to 51,960 (2001). The increase in the area of land under residential use is not in the same proportion as that of increase in the population, i.e. the residential density has been reduced from 71.92 persons per hectare to 68.06 persons per hectare. The suggested residential density of a medium town like Changanassery is 100 – 150 persons per hectare. The residential area is evenly distributed all over the town area, but there is large variation in the density of population in different parts of the town.

- ***There is an out migration of people from Changanassery to the surrounding Grama panchayats where more space with comparatively better facilities is available.***
- ***People prefer homestead type of developments. So densification of the existing residential area has not taken place. Instead of that, new residential area has been developing.***
- ***Rapid urbanization of surrounding Grama panchayats.***

3.6.3 Public and semi public use

Public and semi public use includes administrative, educational, religious, cultural and medical institutions. The area of land coming under this use is 88.62 hectares, which is 6.56% of total town area. It is not up to the prescribed area of 10 - 12% for a medium town. The spatial pattern of this land use shows a balanced distribution all over the town area. Since these institutions are meeting the needs of a large hinterland, area under this use has to be increased to provide more community facilities.

- ***Majority of land coming under Public and semi public use category is used for educational or religious purposes***
- ***Land used for administrative, cultural and medical use are nominal***

3.6.4 Industrial use

Total area coming under industrial use is 5.76 hectares, which is only 0.43% of total area and it is very low when compared with the space standard of 8 – 10% for a medium town. There is sharp decrease in the area under industrial use when compared with the figures of 1974.

No large or medium type industries are located within the Municipal limit. The existing industries are small scale industries and spread all over the town area. There is an Industrial Estate at Veroor located on the outskirts of the town where a number of small scale and medium scale industries are functioning.

- ***No major industries established in the town in the past two decades. Few industries where shifted from the Municipal limit.***
- ***Most of the industries in the region are Agro-based Industries and these industries are established near to their raw materials.***

3.6.5 Commercial use

The commercial use consists of retail and wholesale trade, warehouses and storage, commercial institutions and professional establishments. 37.17 hectares of land come under commercial use, which is 2.75% of the total area. During 1974, the area under commercial use was just 16 hectares and there is a three-fold increase in commercial use in the past three decades. It shows that Changanassery is still retaining its status as a major commercial town of the region.

This spatial distribution of commercial land clearly indicate the concentration of this activity in the centre of the town, market area, along the major transportation corridors and at the nodal points formed by the intersection of important roads.

- ***Even though, Changanassery market lost its status as a major transhipment point of commodities, it is still the biggest market of the district and the region.***

3.6.6 Park and open space

Total area of land under park and Open space is 9.31 hectare, which is 0.69% of total area, against 18% area suggested for a medium town like Changanassery. Moreover that, there is a considerable reduction in the available land under Park and Open space during the last three decades. A portion of the available open space being converted for other uses. But the high percentage (23.63% of total town area) of agricultural land especially paddy fields provided lung space for the town and supplement the open space requirement.. Earmarking a system of green area by planned conservation of paddy fields is highly essential for the future need of the town.

- ***Open space for passive recreation is very limited in the town.***

3.6.7 Transportation use

The area under transportation use is 80.76 hectares which is 5.98% of the town area. This includes area under roads, bus terminals and railway installations. The percentage of land under transportation use is far below, the standard value of 12-14%, suggested for a medium town like Changanassery.

The roads are very narrow and the streets are irregular lanes and the bus terminals are very congested. For improving the transportation system additional area is to be brought under transportation use by forming new roads, widening of existing roads and improving the terminal facilities.

- ***Transportation problem is one of the major problems faced by the town. The spatial location of the bus stations at close intervals in the central area of the town and narrow roads, missing links, etc are the reasons for the traffic congestion in the town.***

3.6.8 Paddy fields

Area under paddy fields is 319.04 hectares which is 23.63% of the total town area. But in 1974, the total paddy field area was 432 hectares and in the past three decades, nearly 26% of paddy fields were converted for other uses.

- ***Even though comparatively high percentage of land is coming under paddy fields most of these paddy are remaining uncultivated. It is creating many environmental problems.***

3.6.9 Water courses

The area of land coming under watercourses is 45.94 hectares. These natural drains are acting as the major system for the surface drainage of water. Most of the watercourses in the town are facing many environmental problems.

- ***Decline of water transport system is one of the major reasons for the negligence towards the major watercourses.***

4. INFLUENCE AREA AND FUNCTIONAL AREA

4.1 INFLUENCE AREA OF THE TOWN

The endowment of the hinterland is another factor on which the growth of urban centres rests. An urban centre for example, can establish a mutually interacting relationship with its hinterland if it has a variety and extent of natural resources that the hinterland possesses in terms of both agricultural and mining potentials. A city's growth may be consistent and stable mainly because of the economic base is closely linked with that of its hinterland. The development of the regional economy helps the growth of small towns, which in the process become the main centres for their hinterland.

For the delineation of influence area of the town the functional dependency of surrounding taluks of the Changanassery has been studied. The following parameters are considered for delineating the influence area of the town.

- ***Administration***
- ***Medical***
- ***Education***
- ***Market***

i. Administration

Being the headquarters of Changanassery taluk people from the entire taluk depends on Changanassery town for various administrative needs. Hence the entire Changanassery taluk comes under the influence area of the town.



REVENUE TOWER

ii. Medical

The Taluk Headquarters hospital with bed strength of 207 is located at Changanassery. In addition to that 10 private hospitals with a total bed strength of 224 is also functioning in Changanassery.



TALUK HOSPITAL

An analysis of the native place of the inpatients of Changanassery taluk hospital reveals that, patients from the entire Changanassery taluk and also from parts of neighbouring Mallappally and Thiruvalla taluks of Pathanamthitta district and Kuttanad taluk of Alappuzha district avail the facilities of the taluk hospital. So the above 4 taluks comes under the influence area of Changanassery town as far as medical facilities concerned.

iii. Education

There are three first grade Arts and Science College in Changanassery and they attracting students from different part of the state. A scrutiny of the catchment area of the colleges in the town reveals that their influence zone spreads over an extensive area. But majority of the students is from Changanassery, Mallappally, Thiruvalla and Kuttanad taluks. So these four taluks are coming under the influence area of Changanassery for availing the educational facilities of Changanassery. Details of this analysis are presented in the Annexure A.II.

iv. Market

Details of commodity transaction through Changanassery market is shown in table 4. Commodities from all southern states are coming at Changanassery market. The entire Changanassery taluk, Major portion of Pathanamthitta and Alappuzha district coming under the influence zone of Changanassery. Details of commodity transaction through Changanassery market is presented in the annexure A.IV.

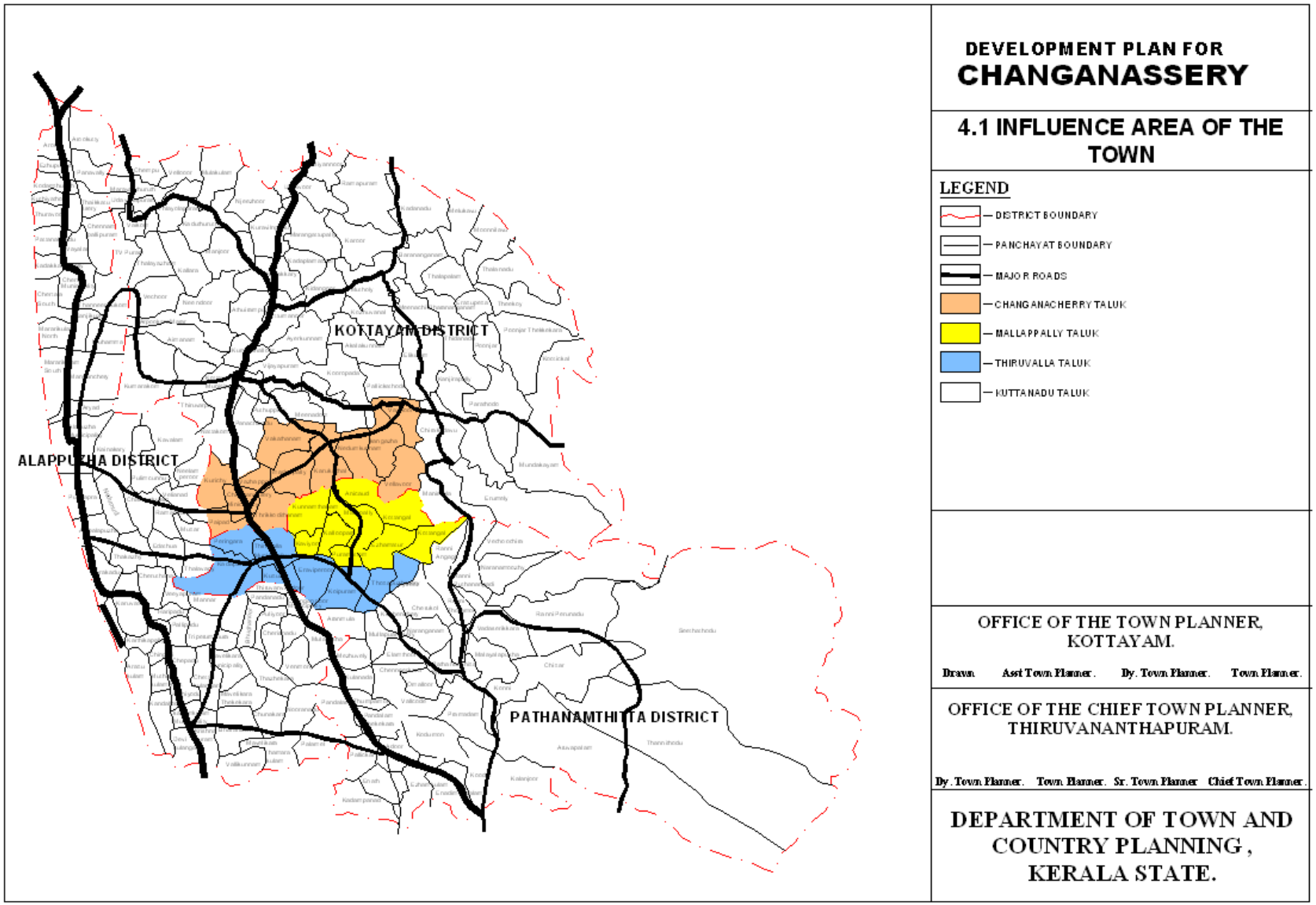


MARKET AREA

Based on the above studies, the four taluks i.e. **Changanassery, Thiruvalla, Mallappally and Kuttanad taluks** can have been delineated as the influence area of Changanassery town. The delineated influence area of the town is shown in the Map 4.1.

4.2 FLOATING POPULATION

Floating population is the non-resident population who are commuting to the town for employment, services (both Government and Private sector), Education, business and entertainment. The total floating population to Changanassery town is estimated as 1,12,634. Mode wise distribution of the commuters is given in the table 4.1 below. It shows that the floating population to the town is more than resident population.



DEVELOPMENT PLAN FOR
CHANGANASSERY

4.1 INFLUENCE AREA OF THE TOWN

LEGEND

- DISTRICT BOUNDARY
- PANCHAYAT BOUNDARY
- MAJOR ROADS
- CHANGANACHERRY TALUK
- MALLAPPALLY TALUK
- THIRUVALLA TALUK
- KUTTANADU TALUK

OFFICE OF THE TOWN PLANNER,
KOTTAYAM.

Drawn Asst Town Planner. Dy. Town Planner. Town Planner.

OFFICE OF THE CHIEF TOWN PLANNER,
THIRUVANANTHAPURAM.

Dy. Town Planner. Town Planner. Sr. Town Planner Chief Town Planner

DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.

TABLE 4.1 MODE WISE DISTRIBUTION OF COMMUTERS

Mode			Commuters
Bus commuters	-	Private	23,310
	-	KSRTC	12,425
Rail commuters			2,648
Water way			1,700
Car			49,980
Autorikshaw			13,158
Two wheelers			9,413
Total			**1,12,634**

Source: NATPAC Survey June 2001

4.3 CENTRAL AREA OF THE TOWN



Central area of the town is the area where major activities of the town like commercial, civic transport, educational, administrative, recreational etc. are located with population in the surrounding residential area supporting the C.B.D. functions. Based on the above criteria the fifteen Municipal wards of the town i.e. Perunna temple, Lakshmipuram Kottaram, Angadi, Anandapuram, Market, Municipal stadium, Chitrakulam, Boat jetty (part) YMCA, Aramana, Puthoor pally, Railway Station (Part), SH School (Part), Thirumala Temple and N.S.S. College as has been included in the delineated central area. The extent of the delineated central area is 464.24 hectares and the resident population in this area is 20,987, which is 40.39 percentage of the total town population. The C.B.D and the central area of the town are presented in Map 4.2.

4.4 TOWN CENTRE (C.B.D)

A town centre is a meeting place for the population as a whole. It is the focus of a radial system of roads and either in or near to the central bus terminus or railway station. It is the main administrative business, entertainment and cultural centre of the town. For Changanassery town the area identified as the CBD includes.

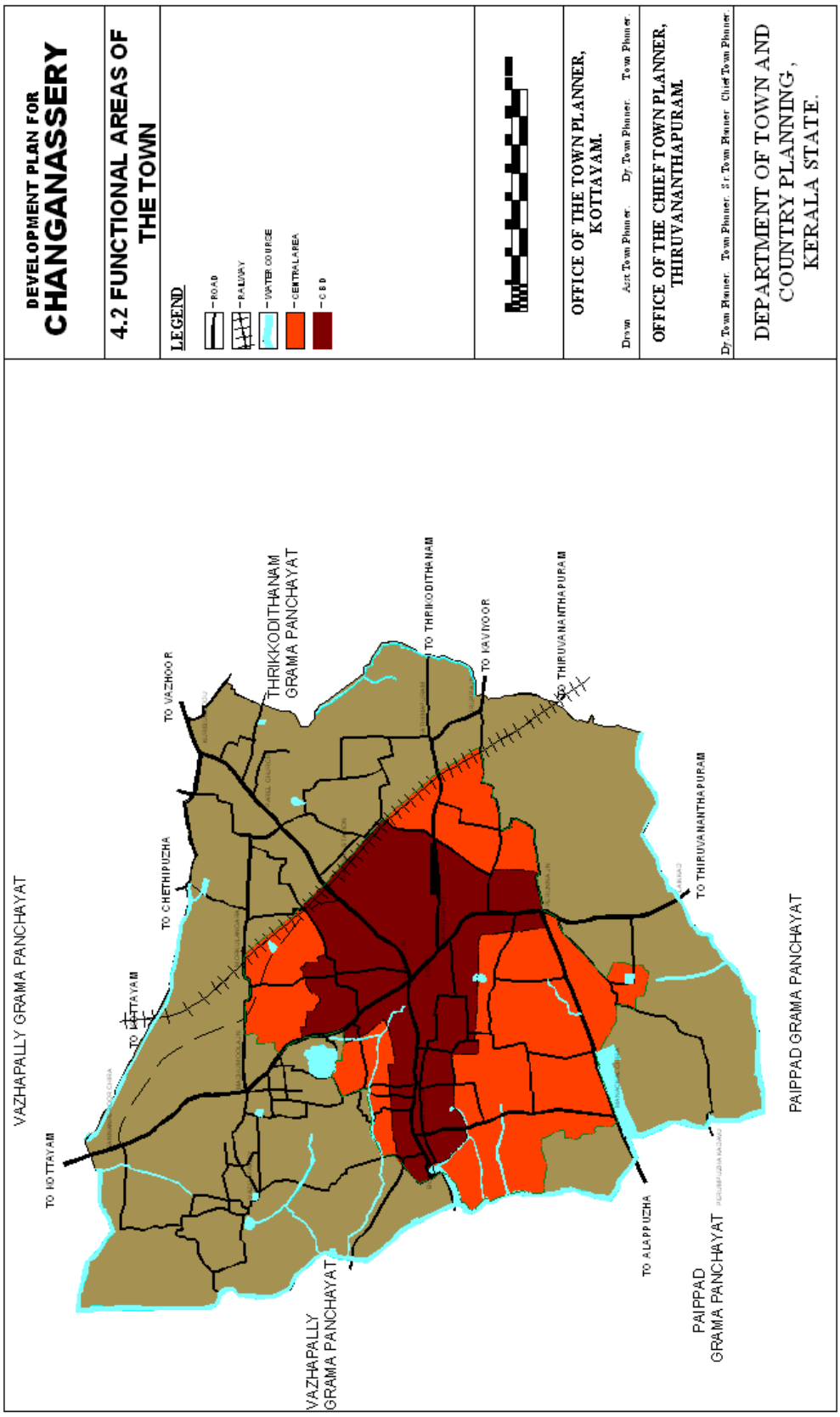
- The entire stretch of Boat Jetty Road where the market, wholesale and retail business and banking institutions etc are located.

- Municipal stadium, Chithrakulam wards where the most of the Government offices, taluk hospital, courts and the Municipal stadium etc are located.

- The stretch of M.C. Road from S.B College to NSS College and its surrounding areas, where Bus terminals, education institutions, Municipal office, retail business centres etc.are located.

- The eastern part of M.C. Road, up to Railway station, where Railway station, bus terminal, religious building, educational institutions, shopping centres, Kavalam Bazaar etc are located.

The total area of the town centre is 204.89 hectare, which is 15.18 percentage of the total town area. The town centre is shown in the Map 4.2.


DEVELOPMENT PLAN FOR
CHANGANASSERY
4.2 FUNCTIONAL AREAS OF THE TOWN
LEGEND
ROAD
RAILWAY
WATER COURSE
CENTRAL AREA
C B D
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drwn Asst Town Planner Dy Town Planner Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner Town Planner Jr. Town Planner Chief Town Planner
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
TO KOTTAYAM
TO KOTTAYAM
TO CHETHIPUZHA
TO VAZHOOR
THRIKKODITHANAM GRAMA PANCHAYAT
TO THRIKODITHANAM
TO VAYYOOR
TO THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
VAZHAPALLY GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT

5. DEMOGRAPHY

5.1 POPULATION SIZE OF THE TOWN

The population size of Changanassery as per the provisional census figure 2001 is 51,960 persons against 52,445 persons of 1991 census, i.e. the population size of the town has decreased by 485 persons. The population size of the town and variation in population size from 1901 onwards is shown in the table 5.1

TABLE 5.1 POPULATION SIZE OF THE TOWN AND VARIATION IN POPULATION SIZE

Year	Population	Variation in population
1901	14264	
1911	17242	+2978
1921	18955	+1713
1931	24201	+5246
1941	28381	+4180
1951	36289	+7908
1961	42376	+6087
1971	48545	+6169
1981	51955	+3410
1991	52445	+490
2001	51960	-485

Source: Census Reports

The population size of the town has been increasing from 14264 in 1901 to 52,445 in 1991. But the decadal variation of population size is showing a decreasing trend and during 1991-2001 period the population of the town even declined. This is a common phenomenon of most of the towns in the region. Table 5.2 shows the tendency of population growth of some similar and adjacent towns.

TABLE 5.2 COMPARISON WITH THE POPULATION GROWTH OF SIMILAR TOWNS

Sl. No.	Towns	1981	1991	2001
1	Changanassery	51955	52445	51960
2	Kottayam	64431	63155	60725

3	Pala	21624	21788	22640
4	Vaikom	21097	21890	22637
5	Thiruvalla	29225	54780	56828
6	Chengannur	24862	25872	25391
7	Pathanamthitta	32967	35882	37802
8	Alappuzha	169940	174666	177079
9	Cherthala	40492	43326	45102
10	Adoor	24995	26639	28943

Source : Census Reports

5.2 POPULATION GROWTH RATE

The decadal population growth rate of Changanassery Municipality from 1901 is shown in Table 5.3

TABLE 5.3 DECADAL POPULATION GROWTH RATE OF CHANGANASSERY

Year	Population	Population growth rate in %
1901	14264	
1911	17242	28.80
1921	18955	9.95
1931	24201	27.60
1941	28381	17.20
1951	36289	27.85
1961	42376	16.75
1971	48545	14.57
1981	51955	7.02
1991	52445	0.94
2001	51960	-0.92

The above table shows that the decadal population growth rate has a decreasing trend from 1951 onwards and even registered a negative growth rate during the 1991-2001 decade. But it is interesting to note that the most of the surrounding grama panchayats shows very high decadal growth rate during the last few decades. The adjacent grama panchayats i.e. Thrikkodithanam, Kurichi, Madappally, Paippad and Vazhappally registered a population growth rate of 19.73, 16.64, 13.39, 10.72 and 8.73 percentage respectively during the 1991-2001 decade, when compared to the population growth rate of 0.94 percentage of Changanassery during the same decade. The population growth characteristics of surrounding Grama Panchayats is presented in the Annexure A.III.

The phase of industrialization in this region is very low. Even the limited number of industries that have come up during the last decade have been located outside the town limit due to the availability of cheap land and availability of other facilities. This has resulted in the movement of population from urban centres to rural areas. A fairly good network of road connects the town to the surrounding areas. Therefore, people can stay outside the town limits and at the same time enjoy many of the amenities of the town. So the growth of population has taken place in the outskirts of the town. Social factors like a section of land owners in the town are not willing to subdivide the land in the town. So people are migrating to nearby panchayats.

5.3 URBANIZATION OF THE REGION

The urbanization trend of Kerala State and Kottayam district is given in the table 5.4.

TABLE 5.4 URBAN POPULATION OF KERALA STATE AND KOTTAYAM DISTRICT

Year	Kerala state			Kottayam District		
	Total population	Urban population	% of urban population	Total population	Urban population	% of urban population
1951	185.49	18.26	13.48	11.32	1.53	13.52
1961	169.4	25.54	15.11	13.14	1.65	12.56
1971	213.47	34.66	16.20	15.39	2.08	13.52
1981	254.54	47.71	18.74	16.97	1.59	9.37
1991	280.98	76.80	27.33	18.28	3.20	17.51
2001	318.39	82.67	25.97	19.53	2.99	15.31

The rural urban break up of five taluks of the district is given in the table 5.6. It shows that Changanassery is the second urbanized taluk of the district. But this is very low when, compared with the percentage of the state urban population.

TABLE 5.5 RURAL URBAN BREAK UP OF POPULATION OF KOTTAYAM DISTRICT

Taluk	Population			Percentage of urban population
	Total	Rural	Urban	
Vaikom	309387	286750	22637	7.32
Meenachil	403531	351216	52315	12.96
Kottayam	627903	455036	172967	27.53
Kanjirappally	260805	260805		
Changanassery	351275	299315	51960	14.79

The urban population of the state showed consistent increase over the decade. The percentage of urban population has increased two fold within a span of 5 decades. But during the same period the increase of urbanization of the district is very nominal in Changanassery taluk and registered a decline in percentage of urban population. Lack of industrialization of the district and widely dispersed type of habitation are reasons for the slow phase of urbanization. The percentage of urban population over the past 6 decades is shown in table 5.6.

TABLE 5.6 CHANGE IN URBAN POPULATION OF CHANGANASSERY TALUK

Year	Population		Percentage
	Total	Urban	
1951	361454	55928	15.47
1961	224431	42376	18.88
1971	265347	48545	18.29
1981	296073	51955	17.55
1991	322951	52445	16.24
2001	351275	51960	14.79

The urbanization trend of the surrounding Grama panchayats is shown in the Annexure A IV. It shows that many of the surrounding Grama panchayats especially Grama panchayats of Changanassery taluk have high population density and the percentage of male workers in non-agricultural sector also comparatively high. It illustrates the dispersed type of habitation of the people.

5.4 POPULATION DENSITY

The density of population (overall) of Changanassery town is 3849 persons per Sq. Km, which is comparatively a low value. It is mainly due to the homestead type of residential development. Comparison of residential densities with other three municipalities of the district is given in the table 5.7.

TABLE 5.7 POPULATION DENSITY OF TOWNS IN KOTTAYAM DISTRICT

Town	Area (in hectare)	Population (2001)	Population density (Persons per sq.km)
Kottayam	15.93	60725	3905
Changanassery	13.50	51960	3849
Palai	15.93	22640	1421
Vaikom	8.73	22637	2593

The residential density of Changanassery town is 65.92 persons per hectare. It is very low when compared with the suggested standard of 100-150 persons per hectare for a medium town like Changanassery.

5.5 SEX COMPOSITION

The sex ratio shows that female population exceeds male population in the town. The lower rate of decadal growth rate of population combined with a higher sex ratio indicates that there is an out migration of male population from the town for employment purpose. Variation in the sex ratio of the town and comparison with the state figures are shown in the table 5.8 and 5.9 respectively. The sex ratio i.e. number of female population per 1000 males of Changanassery shows an increasing trend over the years and it is higher than the taluk district and state values.

TABLE 5.8 VARIATION IN SEX COMPOSITION

Year	1901	1911	1921	1931	1941	1951	1961	1971	1981	1991	2001
Sex-Ratio	990	976	931	918	939	934	981	1004	1028	1016	1065

TABLE 5.9 COMPARISON OF SEX COMPOSITION 2001

	Sex ratio
Kerala state	1058
Kottayam district	1025
Changanassery taluk	1038
Changanassery town	1066

5.6 AGE STRUCTURE

As per the 2001 census, 5654 persons, which is 10.88 percentage of total population is coming under the age group of 0 – 6. But during the 1991 census the total persons in the age group 0-6 was 6043. It indicates that the population of the town will decrease in the future. Among the child population (0-6 age group) 51.66 percentage are male and the remaining 48.34 percentage are female. It indicates that in future the sex ratio may lower in favour of male persons.

5.7 LITERACY RATE

Literacy rate of Changanassery town as per 2001 census is 96.23%, with male literacy rate of 97.64 percentage and female literacy rate of 95.02 percentage. It is an indication of high level social standard. Table 5.10 gives a comparison of literacy rate of Changanassery town with

corresponding values of state, district and other three Municipalities of the district. Among the four municipalities in the district, Changanassery stands in the second place after Kottayam.

TABLE 5.10 COMPARISON OF LITERACY RATES

	Literacy rate (in percentage)
Kerala state	90.92
Kottayam district	95.90
Kottayam Municipality	96.79
Pala Municipality	95.48
Vaikom Municipality	94.87
Changanassery Municipality	96.23

5.8 HOUSEHOLD SIZE

The household size of Changanassery town as per the 1991 census is 5.3. The corresponding figure for the district is 5.05. The number of occupied residential houses, households and household size from 1961 is given in table 5.11. It shows that the household size, which was 7.40 in 1961, has been reduced to 5.3 in 1991. It shows the success of family planning programme and decrease in the size of family.

TABLE 5.11 VARIATION IN HOUSEHOLD SIZE

	1961	1971	1981	1991
Occupied residential house	5371	6657	7699	9818
No. of households	6456	7155	8549	10087
Household size	740	6.10	6.08	5.30

6. ECONOMIC BASE AND EMPLOYMENT

6.1 WORK PARTICIPATION RATE

The work participation rate of Changanassery as per 2001 census is 29.50%. The participation rate among male is 45.50 % and among female it is 10.58%. The participation rate shows an increasing trend after 1981, as illustrated in table 6.1. It is a good indication as it reflects the growth of economy and creation of new job opportunities. When compared with the participation rate of the district ie. 32.88% it is low and needs to be improved.

TABLE 6 .1 WORK PARTICIPATION RATE

	1961	1971	1981	1991	2001
Total population	42376	48545	51955	52445	51960
Total workers	11143	12324	12974	14324	15329
Participation rate	26.29%	25.39%	24.97%	27.31%	29.50%

6.2 SECTORAL DISTRIBUTION OF WORKERS

While analyzing the sectorwise distribution of workers (1991 census data) it reveals that majority of workers are in secondary sector (49.19%) and tertiary sector (46.42%). The number of workers in secondary and tertiary sector showing a steady increase over the decade, while the number of workers in the primary sector shows a decreasing trend. The details of sectorwise and sub-sectorwise workers are given in the table 6.2.

6.3 COMMERCIAL ACTIVITIES

Veluthampi Dalawa established the Changanassery market during the 18th century. Situated right in the heart of Central Travancore region and over the year, the town has developed as a collection and distribution centre of agricultural produces, both food and cash crops, besides being a wholesale market centre. In the absence of direct roadway facilities, the town acted as a major transhipment point of hill produces from the eastern high rages meant for export through Alappuzha. With the opening of the Alappuzha – Changanassery road, the flourishing waterways transport system was relegated to the background and has resulted in down sizing the transhipment activities of Changanassery.

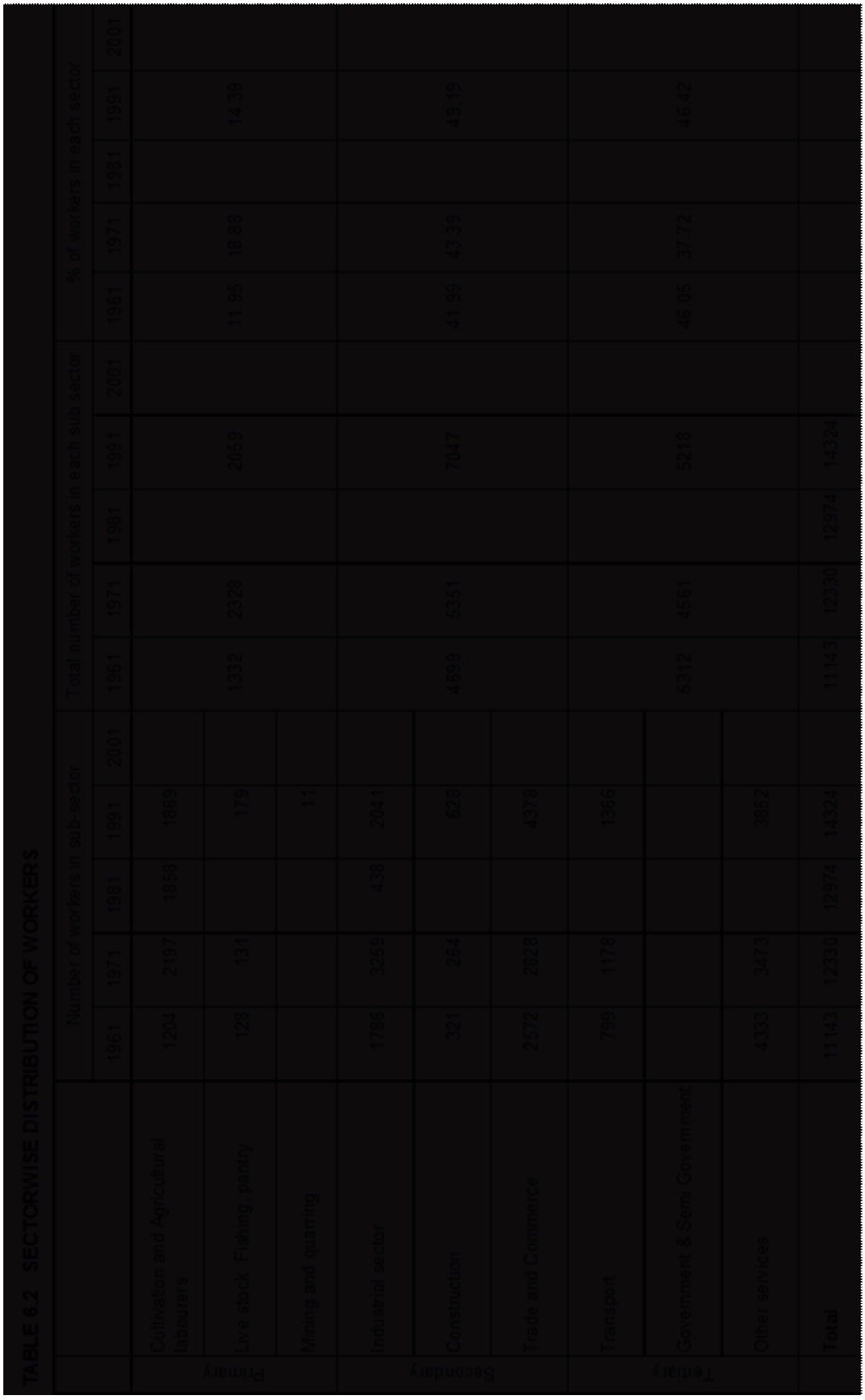


TABLE 6.2 SECTORWISE DISTRIBUTION OF WORKERS

		Number of workers in sub-sector				Total number of workers in each sub sector				% of workers in each sector			
		1961	1971	1981	1991	2001	1961	1971	1981	1991	2001		
Primary	Cultivators and Agricultural labourers	1204	2167	1658	1869		1302	2228		2059		11.95	18.88		14.39	
	Live stock, Fishing, mining	128	131		179											
	Mining and quarring				11											
Secondary	Industrial sector	1786	3259	4188	2041		4899	5351		7047		41.99	43.39		49.19	
	Construction	321	284		828											
	Trade and Commerce	2572	2828		4378											
Tertiary	Transport	789	1178		1366		5312	4591		2218		46.05	37.72		49.42	
	Government & Semi Government															
	Other services	4330	3473		3882											
Total		11141	12330		14324		11141	12330		12974	14324					



WHOLE SALE MARKET AT BOAT JETTY ROAD

Changanassery still retains its status as a major market of the region. This market is acting as an important distribution centre of food materials and general provisions brought from other areas and to the surrounding hinterland. It also acts as a collection centre of products produced in the surrounding areas. Details of commodities and products transacted through Changanassery market is shown in the Annexure A.V. Average arrival and off-take of major commodities are shown in the table 6.3.

Commodities from all southern states are arriving at Changanassery market for distribution to the surrounding area. The entire Changanassery taluk, Mallappally taluk, Kuttanad taluk and part of Kottayam and Kanjirappally taluks are coming under the influence zone of Changanassery market.

TABLE 6.3 AVERAGE ARRIVAL AND OFF TAKE OF COMMODITIES

Commodities	Average arrival / day	Average off-take / day
Rice (FP)	290.00	222.50
Rice (ON)	2280.50	2679.25
Wheat	532.25	321.50
Ginger	262.50	271.25
Bengalgram	230.00	230.00
Greengram	255.00	253.75
Redgram	130.00	122.50
Blackgram split	0.00	0.00
Tobacco	25.00	32.75
Ground nut	237.50	247.50
TS Powder	300.00	360.00
Tapioca raw	46.25	45.75
Tapioca dry	1.50	2.50
Copra	0.50	0.25
Banana	287.50	286.75
Total	4878.50	5076.25

Source : Economics and Statistics Department

6.4 INDUSTRIAL SECTOR

The Industrial sector in Changanassery is limited to one medium scale industry and a few small scale industries and no major industries functioning in the town. This sector has registered no growth during the past few years and few industries are being shifted from the town. There are 222 small-scale industrial units registered in the town. Details of small-scale industries functioning in Changanassery Municipality is given in table 6.4.

TABLE 6.4 EXISTING SMALL SCALE INDUSTRIES

Type of industries	Number of units
Engineering works	21
Garment units	56
Printing units	17
Automobile Workshops	40
Flour mills	6
Saw mills	7
Furniture manufacturing units	5
Gold/silver covering units	18
Service	25
Chemical/Dye units	3
Metal industries	4
Food processing units	6
Dry cleaning units	5
Others	3



INDUSTRIAL ESTATE

There is an industrial estate (development plots) of SIDCO at Veroor in Vazhappally Grama Panchayat, adjacent to the Municipal boundary. It occupies an area of 14.393 Acres and 58 industrial units are functioning here. Out of 58 units 55 units are rubber-based industries. Hawai sheets and straps, thread rubber, rice polisher, rubberized coir mats, tyre flaps, Battery containers, form rubber, car mats, mats and mattresses are the major products in the rubber based units. In plastic based industries mainly plastic films are produced. Re-processing of plastic is done in one unit. About 500 persons are getting direct employment in these units and an equal number of persons are getting indirect employment. The common facility service centre functioning in the industrial estate provides necessary support for the development of industrial sector.

6.5 INFORMAL SECTOR

Informal sector broadly consists of three groups viz. (I) Self employed traders, hawkers and family based workers (ii) Employees and workers in predominantly low wage sector, (iii) comparatively better wage paying occupation such as in construction, manufacturing and repair activities. A detailed study has been made about the hawkers and vendors in Changanassery town.

Hawkers and vendors have long been a common feature of sidewalks and markets of urban centres. Hawkers contribute substantially in meeting the needs of the community. They indirectly support the local artisans and poor section of the community, by making available commodities at a comparatively cheaper rate. Even though their activities can be justified socially, it is conflicting with the management of traffic and pedestrian movement on street, and in many cases affects the environmental quality.

A study has been conducted by the Town and Country Planning Department to assess various aspects of hawking. There are 78 hawkers/venders occupying different parts of the CBD area of the town. Their presence are being experienced in C.V. Road, Boat Jetty road, M.C. Road, Hospital road and in the link road connecting MC road and CV road, mainly adjacent to the central junction. Location of hawking area, number of hawkers commodities/service offered etc is given in the table 6.5.

TABLE 6.5 DETAILS OF HAWKERS AND VENDERS

Sl. No.	Road	No. of Hawkers	No. of Venders	No. of persons employed	Goods/Services
1	Link road connecting M.C road and C.V. Road	13	4	19	Vegetable, Fruits, Cloths, Spectacles, Chappel, Lottery
2	M.C. Road	12	6	18	Vegetable, Fruits, Panmasala, Cloths, Lottery, Cobblers
3	Boat Jetty Road	13	1	18	Stationery, Panmasala, Spices, Medicines
4	Changanassery – Vazhoor road	38		45	Vegetable, Fruits, Toys, Knife, Lottery, Cassete, Panmasala, Stationery
5	Hospital road	2		2	Cobbler

Maximum number of hawkers is present in the C.V. Road, between Central junction and Municipal Bus station and 38 hawkers are stationed here. Bus stations, Markets etc are the activities encouraging the existence of the hawkers. The entire footpath and the carriageway of the road have been encroached by the hawkers. This is one of the reasons for the congestion in the central junction.

Boat jetty road, which is leading to the main market and the link road connecting the M. C. Road is another hawking area. Even though there are some hawkers in M.C. Road, it scatters over a large area.

More details about the hawking activity in the town is available in the Annexure A. VI

7. HOUSING AND SHELTER

7.1 INTRODUCTION

Falling of birth rate and the social changes mentioned in previous chapters has lead to a gradual decrease in the urbanization rate. Demographic trend includes smaller families increasing demand for smaller housing unit closer to social services and amenities. But, renovation and modernization of existing stock is a higher priority than provision of new housing. As far as Changanassery in concerned as per the 1991 census the total number of households in Changanassery is 10087 and number of houses is 9818. So there is a numerical shortage of only 269 houses.

7.2 HOUSEHOLDS AND HOUSES

Table 7.1 presents the number of households, houses, household to houses ratio and household size of Changanassery town from 1961 census.

TABLE 7.1 HOUSEHOILDS AND HOUSES OF CHANGANASSERY TOWN

	1961	1971	1981	1991
Number of households	6456	7155	8549	10087
Number of houses	5371	6657	7699	9818
Houses to household ratio	0.83	0.93	0.90	0.97
Household size	7.40	6.80	6.08	5.30

The numerical shortage in number of houses has been showing a decreasing trend over the years. The house to household ratio, which was 0.83 in 1961, has been reached 0.97 in 1991.

7.3 STRUCTURAL CONDITIONS OF HOUSES

Good housing reflects the general welfare of the community. As per the survey conducted by the Town and Country Planning Department in 2002, out of 11,399 residential buildings in the town 1541 (13.52%) of the buildings are Kutcha building, 6202 (54.40%) are moderate buildings and the remaining 3656 (32.07%) are pucca buildings. But during 1970, 51

percentage of the total residential buildings in the town were kutcha or hut type buildings. So there was a remarkable increase in the structural quality of the building over the years. Details of the structural conditions of the buildings of Changanassery Municipality are given in Annexure A VII.

7.4 SQUATTER DWELLING

Like any other urban centres, Changanassery is also experiencing the problem of squatter dwelling. There are 28 approved slums in Changanassery as per the report "Urban Slums in Kerala 1995-1996" prepared by the Town and Country Planning Department. The list of these slums is given in the Annexure A.VII. A survey has been conducted by the Town and Country Planning Department in 2002 to identify and to assess the present condition of the identified slums. 31 slums were identified and detailed study has been conducted in these slums. The location of these squatter dwellings is shown in the Map 7.1.



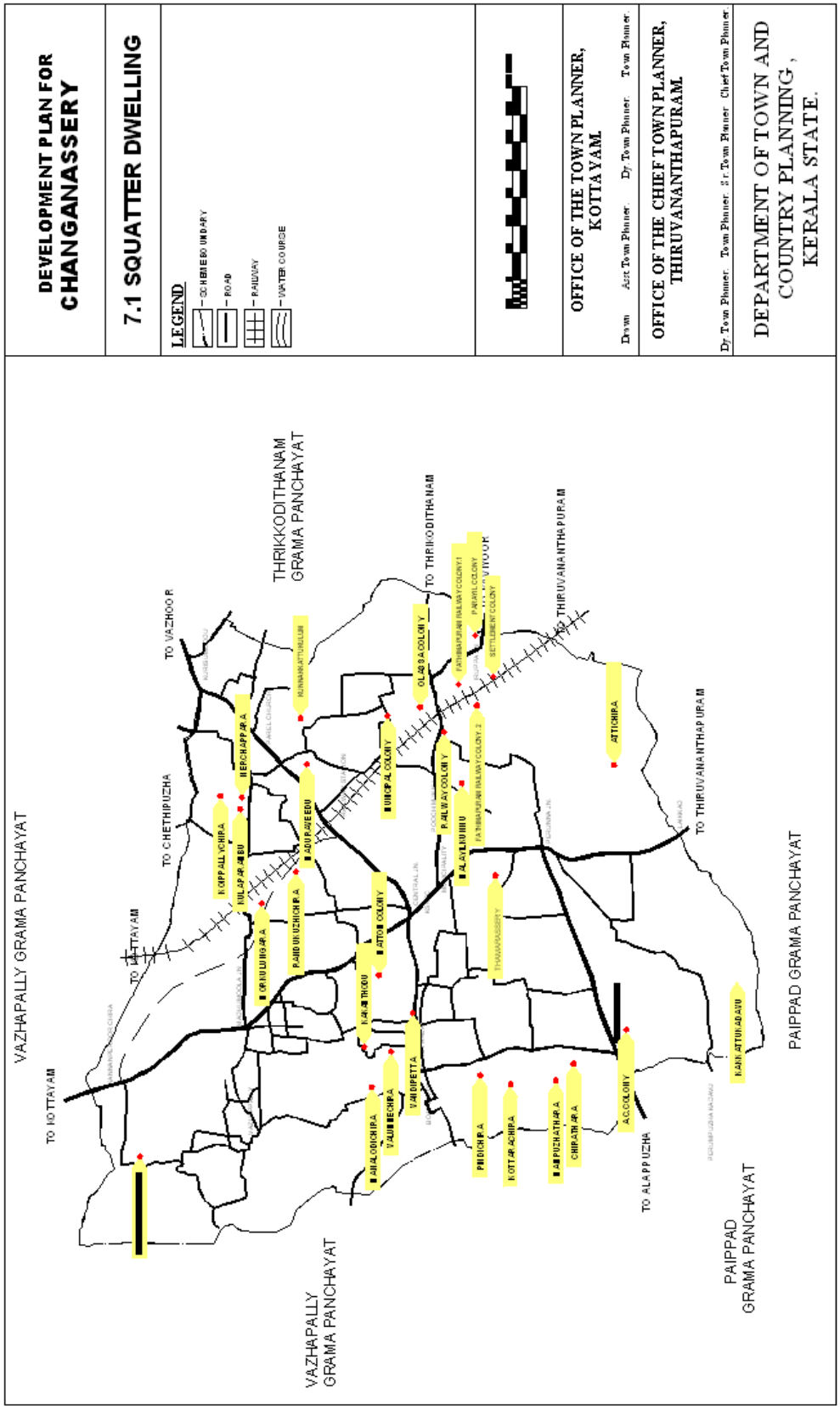
PERUNNA EAST SLUM

Total number of persons living in the slum area is 4189 (2001 male and 2188 female). The residential density of these slums are varying from 170 persons per hectare to 1157 persons per hectare, compare to the overall residential density of 68.06 persons per hectare of Changanassery town. In 22 slums the ownership of the land is with dwellers and the remaining 9 slums are located in puramboke land. Fathimapuram Railway colony 1 and 2, Railway colony, Olassa colony, Kunnakkattukulam colony, Malayilkkunnu colony, Moorkulanara Madaraveedu colony and Randukuzhichira colony are located in puramboke land and facing treat of eviction 916 persons of 206 families residing in these slums and there is an urgent need to rehabilitate these families.



RANDUKUZHICHIRA SLUM

Regarding the age of the slum, 5 slums are existing there for a period more than 50 years, 22 slums are 20 to 50 years old and the remaining 2 slums are less than 20 years old. In 25 slums the dwelling units are detached type and in remaining 4 slums, it is row type buildings. The structural conditions of buildings in these slums are comparatively good. In 23 slums the buildings are moderate type and are constructed with materials like bricks, tile and asbestos sheets. But in the remaining 6 slums, the buildings are Kutcha type and are constructed with perishable materials. Individual toilets are available in 18 slums, common toilets are available in 7 slums and in 6 slums there are no toilets at all. They are Fathimapuram railway colony 1 & 2, Railway colony,


DEVELOPMENT PLAN FOR
CHANGANASSERY
7.1 SQUATTER DWELLING
LEGEND
SCHEME BOUNDARY
ROAD
RAILWAY
WATER COURSE
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drawn Asst Town Planner. Dy. Town Planner. Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner. Town Planner. Sr. Town Planner. Chief Town Planner.
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
THRIKKODITHANAM GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
TO KOTTAYAM
TO CHETHIPUZHA
TO VAZHOOR
TO THRIKODITHANAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
KOIPPALLYCHIRA
KULAPARAMBU
NERCHAPPARA
KUNNARKATTUKULUM
MADURAVEEDU
MUNDIPAL COLONY
OLASSA COLONY
RAILWAY COLONY
ATTICHIRA
MORKULUNGARA
RANDUKUZHICHIRA
ATTOM COLONY
KANATHODU
VANDIPETTA
MANALODICHIRA
VALUMMECHIRA
PINDICHIRA
KOTTARACHIRA
MAMPUZHATHARA
CHIRATHARA
AC COLONY
KANKATTUKADAVU
THAMARASSERY
SETTLEMENT COLONY

Olassa colony, Settlement colony and Parayil colony. So immediate attention is required to address these problems. Protected water supply is available in 23 slums and drinking water is not available in 5 slums.

Approach road to the most of the slums are very good. Black topped surface road is available to 26 slums. But in the case of internal roads the picture is not good. There is no internal road in 11 slums and the condition of internal roads in 11 slums is very poor.

Solid waste disposal is another area which need interventions. There is no space for even the collection of solid wastes. In 26 slums the wastes are dumping in the available open spaces and streets. Frequency of collection of garbage is also very poor, and from almost all slums garbage is collected once in a week only.

Out of 31 slums 16 slums are affected by flood. The duration of flooding is varying from one week to more than 6 months. Duration of flood in slums like Kunnakkattukulam, Attichira, Randukuzhichira railway colony are severely affected by flooding.

Total number of households in the slum area is 894 and the total population is 4189. Among that the working force is 1686. Hardly 1.42% of the working force is employed in formal sectors and remaining persons were employed in informal sector. The demographic and other particulars of the slum is presented in the Annexure A.VIII and housing quality assessment of the slums are given in the Annexure IX.

8. TRANSPORTATION

8.1 INTRODUCTION

For the balanced development of an urban centre planned growth of spatial activities, coupled with provision of adequate infrastructural facilities like transport system, a well defined hierarchy of road network, drainage, water supply, power supply etc are required. But in most of the cities and towns the available road system is not able to cater to the present traffic. The fast development of socio-economic and commercial activities coupled with inadequacies of supporting facilities and ever increasing demand due to centralization of employment centres in C.B.D area caused a perpetual vicious circle of traffic problems.

Among the various urban infrastructure facilities transportation is the one, which shapes the structure and growth of the city. A workable circulation plan ensuring efficient operation of the transportation system facilitates economic growth of the town.

With progressive urbanization travel demand in towns has increased tremendously. This is evident from the long delays and traffic congestion observed on urban roads in most of the towns. In order to make the transport system efficient, there is a continuous need to maintain a balance between demand and supply of facilities within the towns and its environs.

8.2 TRAFFIC GENERATORS

The influence zone of the town is spread over entire Changanassery taluk, Kanjirappally taluk , Kuttanad taluk, Mallappally taluk and Thiruvalla taluk. There is heavy attraction of people from these areas for meeting their regular demands in higher education, social, administrative and travel needs. Category wise list of major traffic generators in the study region is given below:

- **Transportation** : Road, Railway, Waterway terminals
- **Commercial** : Wholesale market
- **Educational** : 3 Nos. of first grade colleges and other institutions

- **Social centres** : Head Quarters of Nair service Society,Changanassery Arch Diocese of Syrian Catholic community, Anandasramam – A centre of social and religion activityfounded by Sree Narayana Guru etc.
- **Administration** : Taluk Head Quarters

8.3 TRANSPORTATION SYSTEM

The transportation system in the region consists of three modes – roadway, railways and waterways. The roadway has major role in handling the traffic.

8.3.1 Road Network

Road network of the study region consists of PWD roads and Municipal roads. Length of roads coming under different categories of road is given in the table 8.1

TABLE 8.1 DETAILS OF DIFFERENT CATEGORIES OF ROAD

Maintained by	P.W.D	MUNICIPALITY		
Surface type	Bituminous	Bituminous	Metalled	Earthern
Length (in Km)	21.623	57.877	18.250	30.591

Following are the major PWD roads passing through the town

i. M.C. road (SH – 1)
ii. A. C. road (SH – 11)
iii. Changanassery – Vazhoor road
iv. Changanassery – Kaviyoor road
v. Market Road
vi. T. B. Road
vii. Boat Jetty Road

8.3.2 Railway

The broad-gauge railway line connecting Thiruvananthapuram and Ernakulam is passing through Changanassery and Changanassery is an important station in the region. It offer a convenient mode of travel to people from the hinterland and act as a major transhipment point for long distance passengers and daily commuters to and from other urban centres.

8.3.3 Waterways

For the waterlogged population of Kuttanad region, waterways were the only means of transport and their heavy dependence on the town resulted in its growth as a major

commercial, educational and social centre. Though the recent developments in road sector had diverted a sizeable share of commuters and goods movement, the recent spurt in tourism related activities could offer a unique opportunity for the development of this sector and will have its impact on the town as a major terminal in the eastern corridor.

Issues on waterways

- Existing waterways system are not fully utilized for water transportation.
- Closure of Thanneermukkom bund and other environmental changes in the areas has changed the hydrological regime and has led to proliferation of weeds which affected the free movement of boats.
- Lack of side protection measures has led to bank erosion.
- There is lack of co-ordination between agencies involved in maintenance of the way and service providers.
- Travel time is substantial and hence not competitive to road based transport.
- The existing fleet is very old and there is risk for accidents and there is no fleet to provide supplementary services during emergencies or during repairs of the existing fleets.
- Construction of new bridges without adequate clearance.
- There is inadequate fuel filling repair facilities.
- There is inadequate connectivity and integration with other travel modes. There is also a lack of integration of facilities for backwater and canal tourism.
- No attempts are made to utilize available waterways for goods transport in a systematic manner.
- The present condition of waterways is no more attractive for the purpose of tourism due to weed growth, siltation, clogging of canals, low height of bridges and pollution.
- No attempts are made for the beautification of canals.

8.4 EXISTING TRAFFIC PROBLEMS

Generally inadequacies in traffic and transportation facilities coupled with greater pressure of demand is felt in the case of Changanassery town mainly due to the following factors. Each of these problems will be discussed in detail in subsequent paragraphs.

- Non-availability of a by-pass roads – existing roads have to carry both local and through traffic.
- Heavy pressure of traffic, especially during the peak hour due to concentration of traffic generating activities in the CBD.
- Location of bus terminals right at the congested CBD area.
- Heavy demand for parking of vehicles on the curb side of major commercial streets
- Unplanned intersections with poor geometric standards.
- Unscientific location of bus stops
- Unauthorized occupation of road space by traders, street venders and temporary construction.
- Inadequate facilities of terminals.
- Each of the problems will be discussed in detail in subsequent paragraphs.

8.5 MAJOR TRAVEL CORRIDORS

The two State Highways along with others PWD roads form the major traffic corridors of the town. The list of major traffic corridors of the town is given in the table 8.2. Major share of the traffic through the town is carried by the above roads and the public transport system of the town is limited in these roads. So detailed studies are conducted for the above travel corridors.

TABLE 8.2 LIST OF MAJOR TRAFFIC CORRIDORS

Sl. No	Name of road/Corridors	Length in Km.
1	M.C.Road (S.H. 1) Lapalam to Kannanperoorchira	5.40
2	Alappuzha – Changanassery Road (SH 11) Manakkalchira to Perunna jn.	1.60
3	Vazhoor road Central junction to Kurissumood	2.55
4	Kaviyoor road Municipal office junction to Iruppa	2.30
5	Market road Central junction to Boat betty	1.40

8.6 ROAD INVENTORY

The details regarding the road inventory of major road links of the town are presented in Table 8.3. Due to geometric constrains many road stretches have geographic deficiencies with, poor

surface conditions, sharp curves and steep gradients. Many of the roads need large surface geometric correction and subsequently widening to IRC standards and strengthening of road.

TABLE 8.3 ROAD INVENTORY

Sl. No	Name of road section	Length	Carriage way width (m)	Type of surface	Terrain condition and other impediments
	MAIN CENTRAL ROAD (SH – 1)				
1	Kannanperoorchira – Mathumoola jn.	1.70	10.00	B. T	Plain terrain
2	Mathumoola jn – Central jn	1.50	10.10	B. T	Plain terrain, culvert, Petrol pump
3	Central jn. – Municipal office jn.	0.25	12.00	B. T	Plain terrain, Petrol pump
4	Lapalam – Perunna jn.	1.05	10.00	B. T	Plain terrain, narrow bridge
5	Perunna jn – NSS College jn	0.40	12.00	B. T	Plain terrain, culvert
6	N.S.S. College jn – Municipal Office jn.	0.50	12.00	B. T	Plain terrain, Petrol pump
	ALAPPUZHA – CHANGANASSERY ROAD (SH 11)				
7	Perunna - Manakkalchira	1.60	7.00	B.T	Plain terrain
	KAVIYOOR ROAD (MDR)				
8	Municipal Office jn. – Poochimukku	0.50	6.00	B.T	Plain terrain, culvert
9	Poochimukku – Iruppa	1.30	5.30		Plain terrain
10	Poochimukku – N.S.S.College	0.50	5.00	B.T	Plain terrain
	VAZHOOR ROAD (MDR)				
11	Central jn. – Railway station jn.	0.90	9.00	B.T	Plain terrain, culvert, Railway Over bridge
12	Railway station jn – Kurissumood jn	1.65	9.00	B.T	Plain terrain, culvert, Railway over bridge
13	Central jn – Boat Jetty	1.40	9.00	B.T	Plain terrain, Boat Jetty

Source : NATPAC survey, June 2001

8.7 SPEED AND DELAY CHARACTERISTICS

The speed and delay survey was carried out by moving car observes method. Trail runs were made during peak and off-peak hours to obtain the average journey speed along the major travel corridors. The main causes of the delay are roadside parking, slow moving vehicles, unplanned intersections, irrational bus stops and uncontrolled pedestrian crossings. The speed and delay characteristics along the major roads are given in the Table 8.4

On M.C.Road, comparatively high travel speed is recorded along the Mathumoola – Kannanperoorchira with a speed of about 48 km/hour. The minimum speed of 13km/hour was recorded on Central junction to Municipal office junction stretch. This 250m stretch is crowded and congested with auto parking, frequent pedestrian crossing, presents of large volume of slow moving vehicles and frequent movement of buses to and from the KSRTC stand adjacent to Main road in the CBD area.

For the road section from Perunna junction to Manakkalchira on A.C. Road, the average speed was found as 32km/hr. On Vazhoor road, the journey speed varied between 24 and 34 km/hr. between central junction and Kurissumood junction. The stretch between Central junction and Boat Jetty has recorded very slow speed of 5km/hr. Maximum delay of over 300 seconds was recorded on this stretch and the cause of delay has been due to parking of vehicles on both side of the road. On Kaviyoor road the delay recorded was 6 seconds. This road experienced a speed of 20 – 25 km/hr at various stretches.

8.8 LINK VOLUME AND CAPACITY UTILIZATION

The link volume, capacity, volume – capacity ratio of major travel corridor is presented in Table 8.5.The daily traffic volume varied from as low as 8,175 PCU on Alappuzha – Changanassery road to a maximum of 28,835 PCU per day observed on the section between NSS College Junction and Municipal Office junction on the Main Central Road .

On M.C. Road, the daily traffic volume varied from 13,850 PCUs between Kannanperoorchira – Mathumoola jn. stretch to 28,825 between NSS College jn to Municipal jn stretch.



M.C.ROAD

On Kaviyoor road, the daily traffic volume varied from 9,163 PCU on the Municipal Office junction – Poochimukku (one-way) stretch to 14,558 PCU recorded on the Poochimukku – NSS College junction (one way).

TABLE 8.4 SPEED AND DELAY CHARASTERISTICS OF MAJOR ROAD

Sl. No.	Name of Road /Stretches	Length (km)	Time taken (Sec)		Speed (Km/Hr)		Delay time (Sec)	Remarks
			With delay	Without delay	With delay	Without delay		
M.C. ROAD (SH – 1)								
1	Kannanperoorchira to Mathumoola jn.	1.7	129	127	47.44	48.19	2	Bus stop
2	Mathumoola jn to Central jn	1.5	166	163	32.53	33.13	3	Inter section
3	Central jn to Municipal Office jn	0.25	76	68	11.8	13.24	8.25	Parking, slow moving vehicle, Bus stand Pedestrian crossing
4	Layikad to perunna Jn	1.05	13	100	29.08	37.8	30	Narrow Bridge
5	Perunna jn to NSS College jn	0.4	42	42	19.78	34.29	22	Parking, Congestion and intersection
6	NSS College jn to Municipal office jn	0.5	91	69		26.09		Parking ,congestion and intersection
ALAPPUZHA – CHANGANASSERY ROAD (SH – 11)								
7	Perunna jn to Manakkalchira	1.6	181	181		31.82		
KAVIIYOOR SROAD (MDR)								
8	Municipal office jn to Poochimukku (Oneway)	0.5	84	84		21.43		Parking
9	Poochimukku to Pattathimukku	0.35	65	59	19.38	21.36	6	Congestion, Parking
10	Pattathimukku to Iruppa	0.95		146		23.42		
11	Poochimukku to NSS College Jn. (Oneway)	0.5	91	91		19.78		
VAZHOOR ROAD (MDR)								
12	Kurisinmoodu jn to Railway jn	1.65	188	178	31.55	33.37	10.25	Parking, Bus stop
13	Railway Station Jn to Central jn	0.9	147	133	22	24.36	14.25	Parking, Bus stop, Double side parking
14	Central jn to Boat Jetty	1.4	959	651	5.26	7.74	307.5	Parking, congestion, Double side parking, slow vehicle

Source:NATPAC Survey 2001

The stretch between Central junction and Railway station junction on Vazhoor road showed a maximum daily traffic volume of 24,313 PCU followed by 15,550 PCU in between Railway Station junction to Boat jetty.

TABLE 8.5 DAILY TRAFFIC VOLUME CAPACITY AND V/C RATIO OF MAJOR TRAVEL CORRIDORS

Sl. No.	Name of the road section	Daily Traffic volume (PCUs)	Capacity (PCUs)	Volume capacity ratio
	MAIN CENTRTAL ROAD			
1	Kannanperoorchira –Mathumoola jn	13850	18000	0.77
2	Mathumoola jn – Central jn	19625	18000	1.09
3	Central jn – Municipal jn	27700	21600	1.28
4	Lapalam – Perunna jn	20563	18000	1.14
5	Perunna jn – NSS College jn	24200	21600	1.12
6	NSS College jn – Municipal office jn	28825	21600	1.33
	ALAPPUZHA CHANGANASSERY ROAD			
7	Perunna jn – Manakkalchira	8175	11500	0.71
	KAVIYOOR ROAD (MDR)			
8	Municipal office jn – Poochimukku jn	9163	8000	1.15
9	Poochimukku – Iruppa	2750	7066	0.39
10	Poochimukku – NSS College jn	14588	6666	2.19
	VAZHOOR ROAD (MDR)			
11	Central jn – Railway Station jn	24313	16000	1.52
12	Railway Station – Kurissumood jn	15550	16000	0.97
13	Central jn – Boat jetty	9275	16000	0.58

Source : NATPAC Survey June 2001

Specifications of IRC –106-1990 “Guideline for capacity of Urban Roads” was adopted for working out the capacity of different roads. Practical capacities of roads in PCU/day are given in the Annexure A.X.

Except a few stretches, most of the major identified corridors reached its capacity. The table 8.6 shows that the road sections within the study area were over utilized with traffic volume far exceeding their carrying capacity.

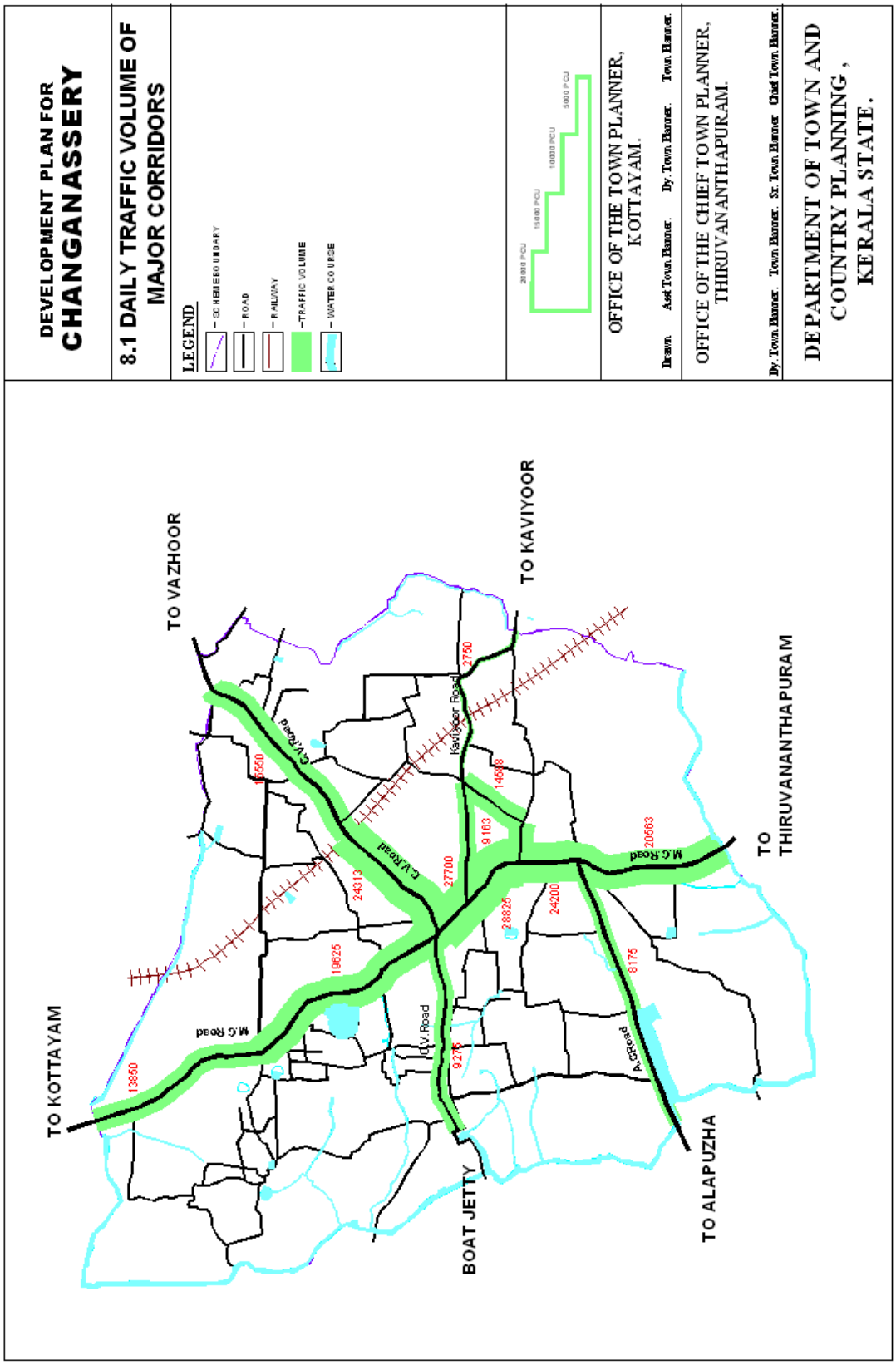

DEVELOPMENT PLAN FOR
CHANGANASSERY
8.1 DAILY TRAFFIC VOLUME OF MAJOR CORRIDORS
LEGEND
SCHEME BOUNDARY
ROAD
RAILWAY
TRAFFIC VOLUME
WATER COURSE
20000 PCU
15000 PCU
10000 PCU
5000 PCU
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drawn. Asst Town Planner. Dy. Town Planner. Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner. Town Planner. Sr. Town Planner Chief Town Planner.
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
TO VAZHOOR
TO KAVIYOOR
TO KOTTAYAM
TO THIRUVANANTHAPURAM
TO ALAPUZHA
BOAT JETTY
M.G Road
C.V.Road
Kaviyoor Road
A.C.Road
13850
19625
24313
27700
9163
14588
2750
28825
24200
20563
8175
9275

TABLE 8.6 OVER UTILISED ROAD SECTIONS

Sl. No.	Road section	V/C ratio
1	M.C.Road -Mathumoola jn to Central jn	1.09
2	M.C. Road -Central jn to Municipal jn	1.28
3	M.C.Road -Lapalam to Perunna jn	1.14
4	M. C. Road -Perunna jn to NSS College jn	1.12
5	M. C. Road -NSS College jn to Municipal office jn	1.33
6	Kaviyoor road -Municipal office jn to Poochimukku jn	1.15
7	Kaviyoor road -Poochimukku jn to NSS College jn	2.19
8	Vazhoor road -Central jn to Railway Station jn	1.52

It is observed that the entire stretch M.C. Road within the limit of Changanassery Municipality is over utilized with V/c ratio more than 1. The diagrammatic representations of daily traffic volume is shown in map 8.1

The peak hour traffic volume in number of vehicles is shown in the Annexure A. XI and that in PCU is shown in Annexure A. XII. The maximum number of vehicles (in peak hour) is operating in MC road (SH –1) in the NSS College jn – Municipal office stretch followed by Central Jn – Municipal Office stretch of the same road. The maximum peak hour traffic volume also observed in the same road stretches.

8.9 PARKING



VAZHOOR ROAD

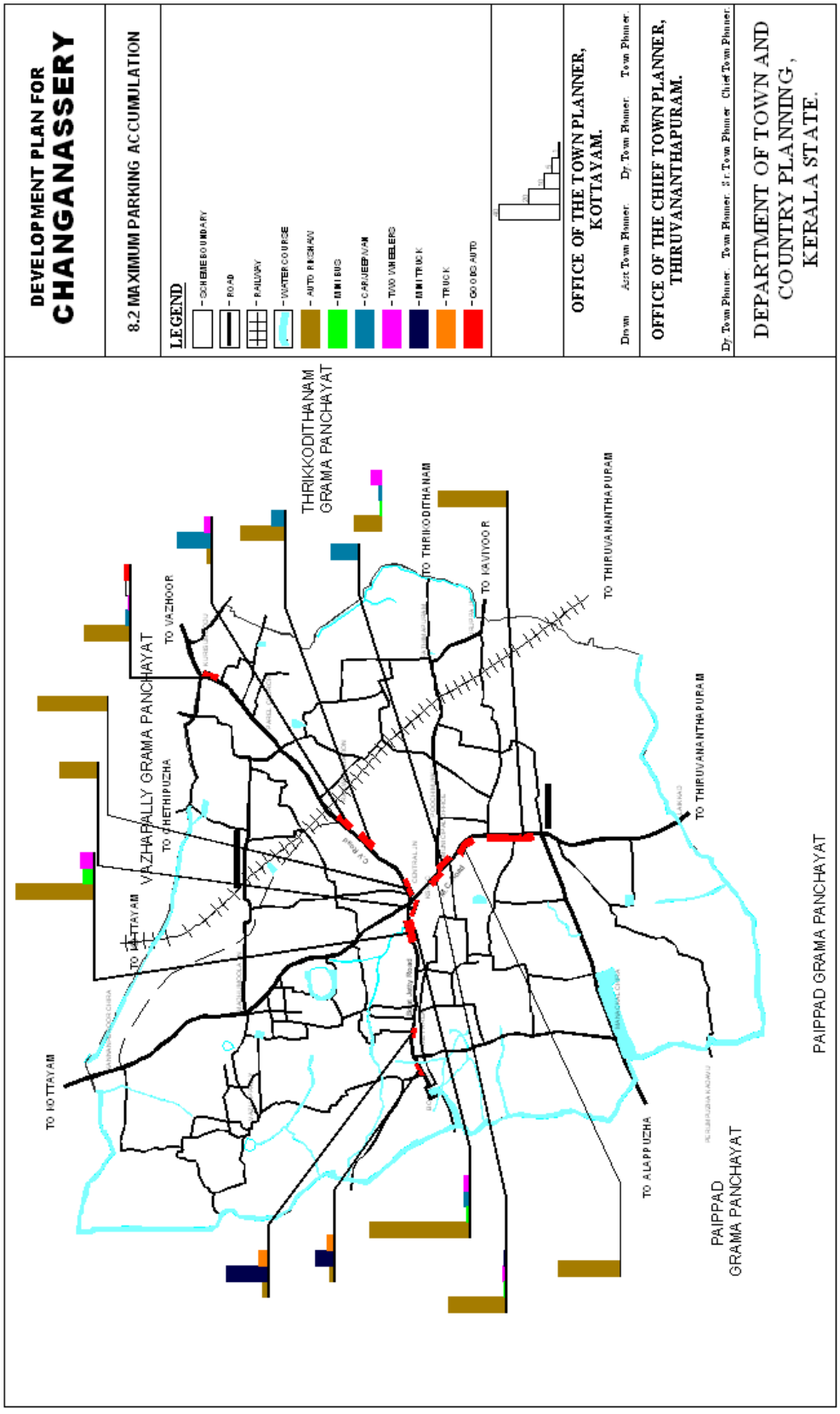
There are no organized off-street parking lots for vehicles within the town and generally all types of vehicles are parked on-street, depending upon the availability of space. Demand for parking of vehicles along major road intersections within the study area was analyzed to ascertain the accumulation of parked vehicles on these road sections. Passenger autorikshaws were found to be parked maximum in most of the road stretches. The maximum parking accumulation of different types of vehicles and accumulation time in major roads is given in the table 8.7. Different parking locations and category and number of vehicles parked at different locations are represented in the Map 8.2. On M.C. Road, Autorikshaw constitute maximum numbers among different vehicles parking at various locations followed by Car/Van/Jeep. Similar situation is seen in Vazhoor road and Kaviyoor road.



VAZHOOR ROAD

TABLE 8.7 MAXIMUM PARKING ACCUMULATION IN MAJOR ROADS

Sl. No.	Road stretch	Maximum accumulation time	Vehicles						
			Car/Van/ Jeep	Autoriskhaw	Two wheelers	Mini truck	Truck	Mini bus	Goods auto
1	M.C. Road - NSS College jn to Municipal bus stand	10.00		45					
2	M.C. Road - KSRTC Bus stand to T.B. Road	10.00	1	37	3	1			
3	M.C. Road - Municipal Bus stand to TB road	11.30		40					
4	M.C. Road - In front of Municipal office	12.30	18						
5	C.V. Road - Kurisaumood jn.	17.00	6	30	1	3			8
6	Kaviyoor - Poochimukku	10.00	3	37	7	1		1	
7	Hospital road	9.00		25					
8	C.V. Road - Central jn to Private bus stand	9.00		45					
9	C.V.d - Private bus stand to Apsara theatre	10.00	9	29					
10	C.V. Road - Marina lodge to Apsara theatre	11.30	22	5	5				
11	Market road - Central jn to Police quarters jn	10.00	2	65	4	4			
12	Market road - Central jn to Police quarters jn(right side)	10.00	7	51	7				
13	Market road - YMS sjn to Police station	12.30		4		27	6		
14	Market road - Boat jetty to YMS jn	12.00		3		12	5		


DEVELOPMENT PLAN FOR
CHANGANASSERY
8.2 MAXIMUM PARKING ACCUMULATION
LEGEND
- SCHEME BOUNDARY
- ROAD
- RAILWAY
- WATER COURSE
- AUTO RICKSHAW
- BUS
- CAR/JEEP/VAN
- TWO WHEELERS
- MINI TRUCK
- TRUCK
- GOODS AUTO
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Asst Town Planner
Dy Town Planner
Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy Town Planner
Town Planner
Sr Town Planner
Chief Town Planner
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
TO KOTTAYAM
VAZHAPALLY GRAMA PANCHAYAT
TO CHETHIPUZHA
TO VAZHOOR
THRIKKODITHANAM GRAMA PANCHAYAT
TO THRIKODITHANAM
TO KAVIYOOR
TO THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
PAIPPAD GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT

The demand for parking is maximum in Market road area. Here also maximum parking demand is for Autorikshaw. Being a marked area demand for parking of trucks and Mini trucks is also high.

An analysis of duration of parking of vehicles at various locations had been carried out to identify the short term and long term users. A high proportion of the vehicles parked at most of the locations were found to be for short duration (less than 30 minutes). However, vehicles like passenger autos were found to have long term parking up to one hour. On street parking of vehicles is one of the major reasons for traffic block in Changanassery. Parking of autorikshaws near bus stops and adjacent to major intersection is creating bottlenecks in that area. Presence of large number of autorikhaws in the town shows the inadequacy of Public transport system especially on the western part of the town.

8.10 PEDESTRIAN MOVEMENT



PEDESTRIAN CROSSING NEAR K.S.R.T.C

Walking is an important mode of transport. In urban areas a significant proportion of trips up to 2km. in length is performed on foot. Since the pedestrians are more vulnerable to being involved in accidents, it is imperative that adequate consideration should be given to their safety through provision of facilities like guardrails, secured crossing areas, foot paths and grade separations.

In Changanassery town, the pedestrian facilities are quite insufficient. Available footpaths are with inadequate capacity poor surface conditions and with lot of obstructions. In many places footpaths are being encroached by hawkers and venders and by adjacent shopkeepers. Out of total 248 accidents occurred during 1999-2000, pedestrian were victims in 149 accidents.

In Changanassery town maximum pedestrian cross – movement is observed in the M.C. Road in front of KSRTC Bus station. It has been observed that a total of more than 8000 people were crossing at this location. Kavalam Bazar, Private Bus station and Kurisummoodu of Vazhoor road, Central junction in M.C. Road are the other location in the town where the pedestrian cross movement is high. Peak hours and peak hour pedestrian cross movement at various locations are shown in the table 8.8.

TABLE 8.8 PEAK HOUR PEDESTRIAN MOVEMENT

Road	Locations	Peak hour	pedestrian movement
M. C. Road	KSRTC Bus station	11.30 - 12.30	1753
M. C. Road	Central junction	9.30 – 10.30	779

Vazhoor Road	Kavalam Bazaar	12.30 – 13.30	733
Vazhoor Road	Central junction	12.30 – 13.30	289
Vazhoor Road	Private Bus stand	9.30 – 10.30	290
Vazhoor Road	Kurisummoodu	17.00 – 18.00	396
Market Road	Central junction	9.30 – 10.30	512

Source: NATPAC survey June 2001

As per the IRC code, control measures at mid block crossings are warranted when, peak hour volume of pedestrians and vehicles are such that PV^2 value > 10^8 for undivided carriage way. PV^2 value at different location are shown in Table 8.9

TABLE 8.9 PV^2 VALUE AT VARIOUS CROSSING POINTS

Road	Locations	Peak hour pedestrian volume	Peak hour Traffic volume	PV^2 value
M.C. Road	KSRTC Bus station	1753	2156	81×10^8
M.C Road	Central junction	779	2156	24×10^8
Vazhoor Road	Kavalam Bazaar	733	2029	30×10^8
Vazhoor Road	Central junction	289	2029	12×10^8
Vazhoor Road	Private Bus stand	290	2029	12×10^8
Vazhoor Road	Kurisummoodu	396	1158	7×10^8
Market Road	Central junction	572	791	3×10^8

Source: NATPAC survey June 2001

The above analysis shows that the PV^2 value at all of the above point exceeds $1 \times 10^{8.}$ Hence certain type of controlled pedestrian crossing measures are to be introduce at these points.

8.11 ROAD ACCIDENTS

The spectacular increase in the number of motor vehicles on the road has created a major social problem – the loss of lives through road accidents. The appalling human missing and the serious economic loss caused by road accidents demand the attention of the society and call for the solutions of the problem.

Analysis of accident data revealed that out of 248 accidents reported during the year 1999 – 2000, there were 11 fatalities and 291 injuries. The severity of accidents reported in M.C. Road is evident from the fact that 176 peoples were injured from 158 accidents. Eight deaths occurred during the year 1999 – 2000 on M.C. Road within the town. On Alappuzha – Changanassery road, there were 10 accidents causing injuries to 18 persons. Details of road

accidents occurred in Changanassery during 1999 – 2002 is given in the table 8.10. The major accident spots of the town are shown in the Map 8.3.

TABLE 8.10 ROAD ACCIDENTS IN CHANGANASSERY TOWN DURING 1999 – 2000

Sl. No.	Location	No. of accidents	No. of persons injured	No. of fatalities
1	**M.C. Road**			
	Perunna	43	51	0
	Central Junction	29	35	0
	Mathumoola	19	22	0
	S.B. College	13	10	4
	Laikkad	13	16	0
	KSRTC Bus stand	10	11	1
	Vazhappally	9	9	1
	Palathara	7	7	1
	Municipal Office jn.	7	6	1
	Post Office jn.	5	6	0
	Kannanperoorchira	3	3	0
	Total	**158**	**176**	**8**
2	**Alappuzha Changanassery**			
	Manakkalchira	5	11	0
	Parachal Kalingu	3	5	0
	1st Bridge	2	2	0
	Total	**10**	**18**	**0**
3	**Vazhoor road**			
	Aramanpady	16	23	0
	Parelpally	13	15	1
	Kurisummoodu jn.	9	10	0
	S.B. School	5	6	0
	Near Railway Station	5	7	0
	Near Private Bus stand	4	4	2
	Apsara Theatre	3	4	
	Total	**55**	**69**	**3**
4	**Kaviyoor Road**			
	Pattathimukku	5	7	0
	Fathimapuram	4	5	0
	Total	**9**	**12**	**0**

5	**Market Road**			
	Boat Jetty	6	6	0
	Vandipettah	4	4	0
	Market	4	4	0
	Vattappally	2	2	0
	Total	**16**	**16**	**0**
	Grand total	**248**	**291**	**11**

Source: NATPAC study June 2001

Further analysis of accident data reveled that pedestrians were the major casualties in road accidents (149 accidents). Among the vehicles, two wheelers were involved in more than 25% of accidents (69 out of 248 accidents), followed by an equal proportion of passenger auto involved in the accidents. Light vehicles like cars/jeep were involved in 62 accidents while KSRTC buses were involved in 24 accidents. Detail severeness of accidents is shown in the table 8.11 and involvement of vehicles in accidents is shown in the table 8.12.

TABLE 8.11 SEVERNESS OF ACCIDENTS

Total number of accidents	248
Number of people injured	291
Number of people killed	11
Number of accidents in which pedestrians are victims	149

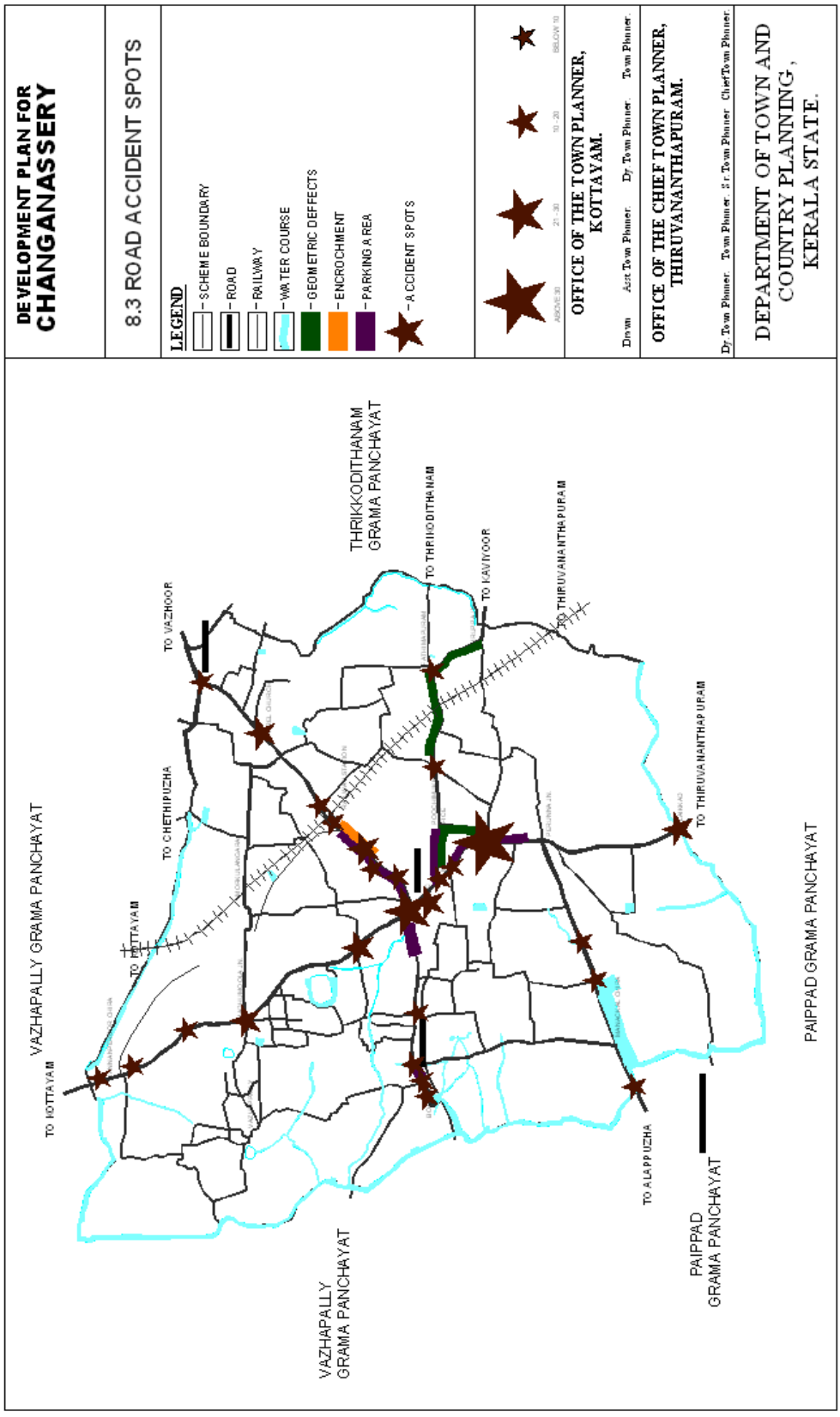
Source: NATPAC study June 2001

TABLE 8.12 VEHICLES INVOLVED IN THE ACCIDENTS

Vehicles	Number	Percentage
Two wheelers	69	27.82
Autorikshaw	68	27.42
Car/Jeep	62	25.00
KSRTC Buses	24	9.68
Truck	16	6.45
Tempo	4	1.60
Tractor	3	1.20
Mini truck	2	0.80

Source: NATPAC survey June 2001

High percentage of pedestrian involvement in road accidents shows that inadequacy in pedestrian facilities. Also many of the accidents occurred adjacent to intersections. It is mainly due to poor design and poor geometric of the intersections.


DEVELOPMENT PLAN FOR
CHANGANASSERY
8.3 ROAD ACCIDENT SPOTS
LEGEND
- SCHEME BOUNDARY
- ROAD
- RAILWAY
- WATER COURSE
- GEOMETRIC DEFFECTS
- ENCROCHMENT
- PARKING AREA
- ACCIDENT SPOTS
ABOVE 30
21 - 30
10 - 20
BELOW 10
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Draftsman
Asst Town Planner
Dy Town Planner
Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy Town Planner
Town Planner
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DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
TO KOTTAYAM
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TO VAZHOOR
THRIKKODITHANAM GRAMA PANCHAYAT
TO THRIKKODITHANAM
TO KAVIYOOR
THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
VAZHAPALLY GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT

8.12 PUBLIC TRANSPORT SYSTEM

8.12.1 Road transport

Both the Government owned KSRTC buses and private owned buses have equal role in the public road transport system. The volume of KSRTC and private buses for different roads within the municipal limit is given in the table 8.13. Number of bus trips per day in direction wise is given in table 8.14.The volume of trips per day by KSRTC and Private buses along the major traffic corridors is shown in the Map 8.4.

TABLE 8.13 NUMBER OF BUS TRIP PER DAY IN DIFFERENT ROADS

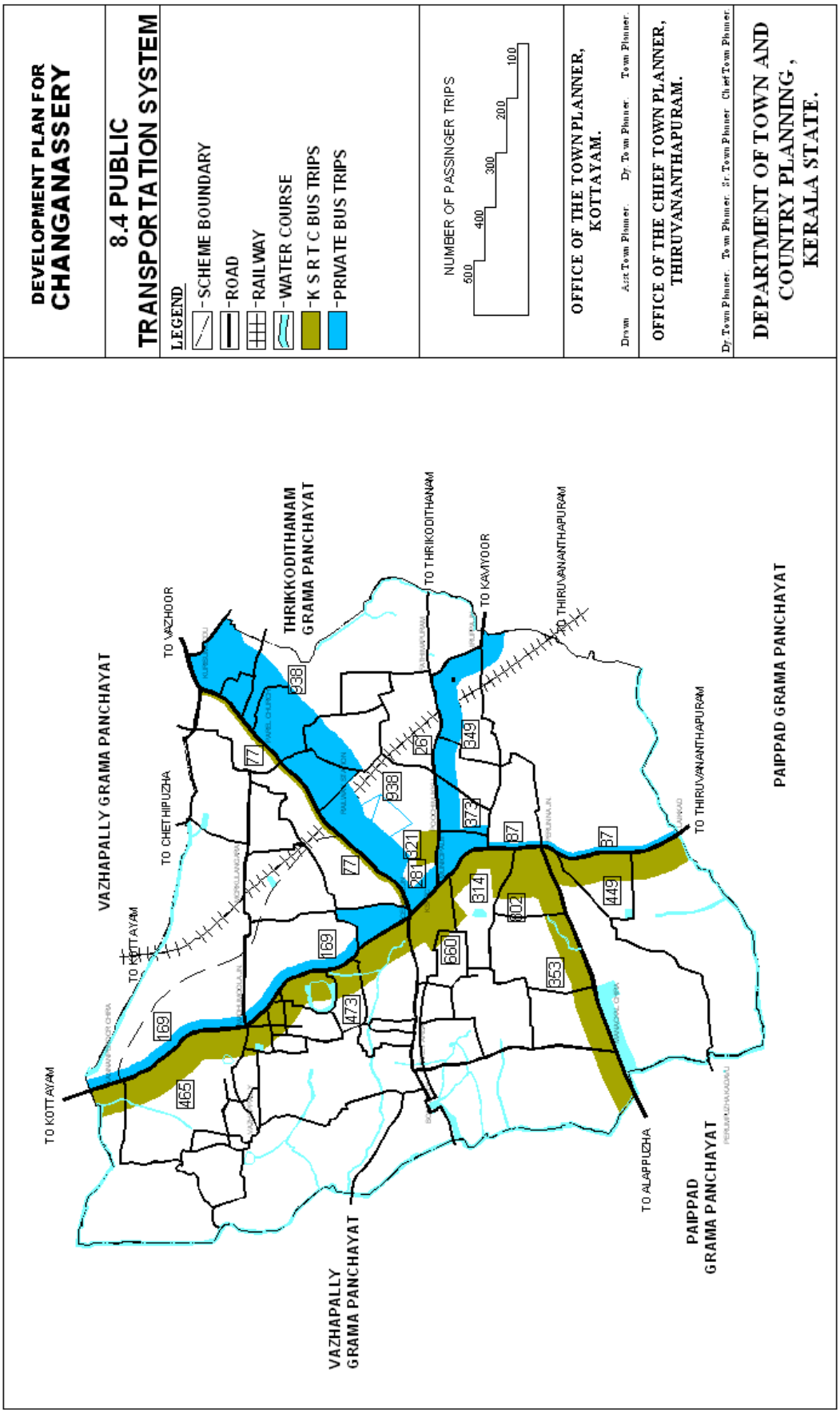
Road/Road stretch	KSRTC	Private	Total
M.C. ROAD			
Kannanperoorchira – Mathumoola jn	465	169	634
Mathumoola jn – Central jn	473	169	642
Central jn – Municipal office jn	660	281	941
Lapala – Perunna jn	449	87	536
Perunna jn – NSS College jn	802	87	889
NSS College jn – Municipal office jn	314	373	687
AC ROAD			
Perunna jn – Manakkalchira	353		353
KAVIYOOR ROAD			
Municipal office jn – Poochimukku	321	261	582
Poocohimukku – Iruppa	26	349	375
Poochimukku – NSS Collee jn	317	346	563
VAZHOOR ROAD			
Central jn – Private stand	77	147	224
Private stand – Railway station	77	938	1015
Railway station jn – Kurisummood jn	77	938	1015
Central jn – Boat jetty		4	4

Source: NATPAC survey June 2001

TABLE 8.14 BUS TRIPS – DIRECTION WISE

Direction	Road	Number day of trips per		
		KSRTC	Private	Total
North	M.C. Road	473	169	642
South	M.C .Road	802	87	889
West	A. C. Road	353		353
	Boat Jetty Road		4	4
East	Vazhoor road	77	938	1015
	Kaviyoor road	26	349	375
Total		1731	1547	3278

Source: NATPAC survey June 2001


DEVELOPMENT PLAN FOR
CHANGANASSERY
8.4 PUBLIC
TRANSPORTATION SYSTEM
LEGEND
-SCHEME BOUNDARY
-ROAD
-RAILWAY
-WATER COURSE
-K S R T C BUS TRIPS
-PRIVATE BUS TRIPS
NUMBER OF PASSINGER TRIPS
500
400
300
200
100
OFFICE OF THE TOWN PLANNER,
KOTTAYAM.
Drawn Asst Town Planner. Dy. Town Planner. Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER,
THIRUVANANTHAPURAM.
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GRAMA PANCHAYAT
PAIPPAD
GRAMA PANCHAYAT
TO KOTTAYAM
TO KOTTAYAM
TO CHETHIPUZHA
TO VAZHOOR
TO THRIKODITHANAM
TO KAVIYOOR
TO THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
169
465
169
473
77
938
77
938
261
349
373
321
281
87
87
314
302
449
660
353

8.12.2 Water Transport system



BOAT JETTY

On an average, three schedules per day are operated on eight routes from Changanassery. More than 1700 passengers commute by boat every day. An average of 22 trips is operated from Changanassery station. The incoming passengers are predominantly from Alappuzha and Kidangara routes. The operational details of passenger boat service are shown in the table 8.15.

TABLE 8.15 OPERATIONAL DETAILS OF PASSENGER BOAT SERVICES FROM CHANGANASSERY STATION

No of Schedules	No of Trips.	Name of route	Incoming passengers	Outgoing passengers
3	22	Changanassery to Alappuzha Changanassery to Leceo Leceo to Kidangara Changanassery to Kumarankary	928	795

Source: NATPAC survey June 2001

8.12.3 Rail Commuters



RAILWAY STATION

An analysis of the rail passengers data revealed that a total of 2648 passengers travel every day to and from Changanassery. The directional distribution of incoming and out going passengers are shown in the table 8.16. But this mode is mainly beneficial for long distance and inter city passengers

TABLE 8.16 INBOUND AND OUTBOUND RAIL PASSENGERS AT CHANGANASSERY STATION

Time interval	Inbound	Outbound	Total
06.00 – 21.00	1372	1276	2648

Source : NATPAC Survey June 2001

8.13 BUS TERMINALS

Three bus stations are functioning in Changanassery. The first one is the KSRTC bus station for Government owned KSRTC buses. The other two bus stations are owned by the Municipality and used for the operations of the private buses. Details of bus stations are presented in Table 8.17.

The KSRTC bus station is located in the MC road, adjacent to the central junction. The entry and exist of this bus station is directly from the MC road and this together with inadequate parking space in the bus station leading to traffic block in the M.C. Road. In many occasion it will lead to the traffic block of entire central area of the town. Inadequate bus bays, passenger amenities etc are the other problems of this bus station.



OLD MUNICIPAL BUS STATION

The Bus station in C.V. Road, adjacent to the Central junction is the first Municipal station. This is the major private bus station of the town and buses to High ranges and a portion of buses to Kottayam is operating from this station. Many of the basic passenger facilities are absent in this bus station.



PERUNNA MUNICIPAL STATION

Perunna bus station is the second Municipal bus station and it is in the developing stage. Buses to various parts of Pathanamthitta and Alappuzha district and a portion of buses to Kottayam are operating from this stand. Earlier, KSRTC buses to Alappuzha was also operating from this bus station.

Even though Changanassery is a major transhipment point, , passenger amenities like, waiting room, seating arrangements, clock rooms, restaurant, refreshment room, parking space etc are absent in all the three bus stations. All these stations are overcrowded and adequate space is not available for passengers. Location of these bus stations in the CBD area, approximately at 200m interval is one of the major reasons for the traffic congestion in the CBD area.

TABLE 8.17 DETAILS OF BUS STATIONS

Sl. No.	Name of the bus station	Used by	Area of the bus station	No. of bus bays	No. of trips operating per day
1	KSRTC Bus station	KSRTC Buses	2.5 acres	15	814
2	Old Municipal Bus station	Private buses	0.44 acres	11	471
3	Perunna Municipal stand	Private Buses	1.96 acres	7	303

8.14 INTER CITY TRAVEL CHARACTERISTICS

8.14.1 Introduction

An origin and destination survey has been carried out on selected outer – cordon points of all major roads leading to the study area, to determine the origin and destination characteristics of internal to external, external to internal and external to external passenger and goods movement across the cordon point.

The study region and the surrounding areas were divided into a number of traffic zones to capture the movement pattern of passenger and goods traffic vehicles. The zoning pattern adopted for the study is given in appendix XIII.

8.14.2 Inter city vehicular traffic

For this survey, five major entry/exist points to the town were selected. Details of vehicular traffic passing through the five outer cordon survey stations is given in the table 8.18.

TABLE 8.18 VEHICULAR TRAFFIC AT OUTER CORDON POINTS

Survey Station	Total vehicles	
	Number	PCU
Kurisummoodu	9319	10594
Iruppa	7135	7969
Manakkalchira	8436	11253
Laikkad	12417	15163
Kannanperoorchira	12518	15423

Source: NATPAC survey June 2001

An analysis of intercity traffic data for Changanassery town has revealed that as high as 15,463 vehicles interacted with the study region through Laikad survey point located on M.C. Road. Almost the same number of vehicles (15,423) has interaction with Changanassery town through Kannanperoorchira survey station located on the same road. Similarly the volume of vehicle through Kurisummood survey station located on Vazhoor road was 10594 followed by nearly 7469 vehicles through Iruppa located on Kaviyoor road.

Among the type of vehicles passing through the locations, car constituted the maximum followed by passenger autorikshaws and two wheelers. At all the survey stations, the distribution of inter-city passenger traffic shown in Appendices XIV, XV and XVI gives the O-D matrix of inter city passenger traffic by car, Autorikshaw and two-wheelers.

8.14.3 Volume of passenger traffic

An analysis of the O. D. survey data revealed that more than 2 lakhs inter city passenger trips - other than passenger trips through buses - were performed on a normal day. Trips by car (1.6 lakhs) alone amounted for almost 75% of total passenger traffic. Trips made by auto rickshaws accounted for 27998 passengers (13.50%) and nearly 2370 trips were performed by two wheelers (11.4%). Table 8.19 gives the modal split of inter-city road based passenger traffic in Changanassery town.

TABLE 8.19 MODEL SPLIT OF PASSENGER TRIPS

Vehicle	No. of Passengers trips	Percent
Car	156140	75.1
Autorikshaw	27998	13.5
Two wheelers	23701	11.4
Total	207839	100.00

8.14.4 Distribution of inter city passengers according to purpose of trips

The purpose of travel is an important proxy variable for land use pattern in transport planning process. The purpose of passenger trips was ascertained from the O.D survey. Out of 207829 inter city passenger trips in Changanassery study region, a maximum of 55,154 (27%) passenger trips were performed for work purpose. This was followed by nearly 45,000 back house trips (22%). Table 8.20 presents distribution of inter city passenger trips according to the purpose of travel.

TABLE 8.20 DISTRIBUTION OF INTER CITY PASSENGER TRAFFIC ACCORDING TO PURPOSE

Sl. No.	Occupation	Type of vehicle			Total	Per cent
		Car	Auto	Two wheeler		
1	Govt. Service	25630	2486	3318	31434	15.12
2	Private Service	21454	4061	4858	30373	14.61
3	Students	6899	1963	2651	11513	5.54
4	Business	60093	7340	7643	75076	36.12
5	Unemployed	3889	956	757	5702	2.74
6	Housewife	4077	1051	90	5218	2.51
7	Agriculture	5905	609	807	7321	3.52
8	Marginal worker	1801	2466	987	5254	2.53
9	Govt. industry	642	139	74	855	.41
10	Private industry	1886	960	422	3268	1.57
11	Professional	3389	663	422	4474	2.15
12	Retired	12937	1902	1032	15871	7.64
13	Others	7438	3402	640	11480	5.52
	Total	156140	27998	23701	207839	100

Source : NATPC Survey June 2001

8.14.5 Distribution of inter city passengers according to occupational status

The occupation of passengers was ascertained from the OD Survey. Businessmen constituted the major segment of travellers (36.12%) followed by employees working in private sector (14.61%) and Government sector (15.12%). Details of inter city passengers in different occupational group is given in table 8.21.

TABLE 8.21 DETAILS OF INTER-CITY PASSENGERS IN DIFFERENT OCCUPATIONAL GROUP

Sl. No.	Purpose	Type of vehicles			Total	Percent
		Car	Autorikshaw	Goods Auto		
1	Work	39070	8427	7612	55154	26.54
2	Education	5608	1497	1460	8565	4.12
3	Shopping	23429	4599	4021	32049	15.42
4	Recreation	9449	388	831	10668	5.13
5	Social	21486	2846	1947	26279	12.64
6	Back home	34463	5243	5250	44956	21.63
7	Medical	13544	2285	1478	17307	8.33
8	Others	9091	2667	1108	12861	6.19

Source : NATPC Survey June 2001

8.14.6 Origin and Destination of passenger trips

For the purpose of analyzing the OD Data the study region was divided into 38 traffic zones, including 5 internal zones within the municipal limit. From the study it was observed that a maximum of 23,172 passenger trips by car originated from zone 2 comprising Aramana, YWCA, Market Municipal stadium, Angadi, Puthoorpally and Boat jetty followed by 20,052 trips from Alappuzha. Among all the zones, zone 2 attracted maximum number of passenger car trips. (23,374 trips), which was followed by Kottayam direction (21,471 trips). Madappally Block generated car trips in the range of 690 to 5010.

Regarding the passenger auto trips, the analysis further revealed that the originating (5272 trips) and terminating traffic (6069 trips) were maximum in zone 2. Maximum number of originating and terminating passenger traffic of two wheelers were also found in zone 2, which were 3894 and 4191 trips respectively.

8.14.7 Modal split of goods traffic

Inter-city goods traffic in the region was handled by a number of goods vehicle consisting of 2440 trucks, 1647 mini trucks and 624 goods autos. Goods traffic to the tune of 18725 metric tonnes was transported to various destinations. The modal split of goods traffic is given in the table 8.22.

TABLE 8.22 MODAL SPLIT OF GOODS TRAFFIC

Sl. No.	Type of vehicles	No. of vehicles	Goods traffic (tones)	Percent to total
1	Truck	2440	12432	66
2	Mini truck	1647	5359	29
3	Goods auto	624	993	5
	Total	4711	18785	100

Source : NATPC Survey June 2001

8.14.8 Origin – Destination characteristics of goods transportation

The inter-city goods traffic movement within the study region was in the order of 18785 MT inclusive of through and by-passable traffic movement. The major traffic generating zones were zone 2 comprising of Aramana, YWCA, Market, Municipal stadium, Angadi, Puthurpally and Boat Jetty area with 2160 MT, followed by zone 32 comprising the southern district of Tamil Nadu, with 1983 MT. Among all the zones, zone 2 attracted the maximum number of trips, which was followed by zone 25 comprising of Alappuzha district. It is observed that Truck traffic in the range of 14 to 265 MT are attracted towards Madappally block.

Regarding the mini truck trips, the study revealed that a maximum of 1104 MT goods traffic was originated from zone 24, Thiruvalla, followed by zone 2 (779 MT). In case of goods traffic attraction, the major share is towards zone 2 (1098 MT) followed by zone 3, Kottayam (392 MT).

The maximum goods auto traffic generation was observed from zone 2 (282 MT) followed by zone 1 comprising of Kuttisserikadavu, Annapoorneswari temple, Poovakkattuchira, Gethsemany, Vazhappally temple and Manjadikkara area (175 MT), while goods auto traffic attraction was towards zone 6 comprising of Vazhappally Grama panchayat (289 MT) followed by zone 24, Alappuzha district (164MT). Vehicle type wise origin destination matrices are given in Appendices A. XVII, A. XVIII and A.XIX.

8.15 DIVERTABLE TRAFFIC (Other than trips by buses)

An analysis of O.D data has been made to find out divertable from the town. All passenger vehicles except public transport vehicles included in the analysis. Total number of passenger trips, divertable trips and percentage of divertable traffic is presented the table 8.23. The map 8.5 represents the desire lines of passenger trips.

TABLE 8.23 DIVERTABLE PASSENGER TRAFFIC

Mode	Total number of trips	Divertable trips	% of divertable traffic
Car	156160	54617	34.98
Autorikshaw	27998	1338	4.78
Two wheelers	23701	4,146	17.49
Total	207839	60101	28.92

From the above table, it can be seen that 34.98, 4.78 and 17.49 percentage of passenger trips made by car, Autorikshaw and two wheelers respectively can be divertable. A total of 60101 passenger trips out of 207839 passenger trips which accounts to 28.92 percentage are external to external passenger movement and can be diverted from the town centre. Details of origin and destination goods traffic, i.e. total goods traffic, divertable goods traffic and percentage of divertable traffic etc are shown in the table 8.24.

TABLE 8.24 DIVERTABLE GOODS TRAFFIC

Mode	Total goods traffic (tones)	Divertable goods traffic (tones)	Percentage of divertable traffic
Truck	12432	7215	58.00
Mini Truck	5359	2145	40.02
Goods auto	993	180	18.05
Total	18784	9540	50.79

From the above table, it is revealed that almost half of the goods traffic through the town is divertable, i.e. 9540 (50.79%) tones out of 18784 tones of goods traffic does not have their origin or destination within the town and can be divertable from town centre. Map 8.6 represents desire lines of goods traffic. An analysis also made to find overall divertable traffic, i.e. passenger trips and goods traffic together. The total divertable traffic from the town is worked out as 34.85 percentage.

8.16 SUMMARY OF ISSUES ON ROAD TRAFFIC AND TRANSPORT

- M.C. Road, Changanassery - Vazhoor road and Kaviyoor road passing through Changanassery Municipal area is highly congested with volume capacity ratio 1.33, 1.52, 2.19 respectively. This is mainly due to lack of alternate roads to the above roads in the town.

- Right of way of over 70% of total length of the town road network is below 5m, causing inadequacies in meeting the traffic volume.

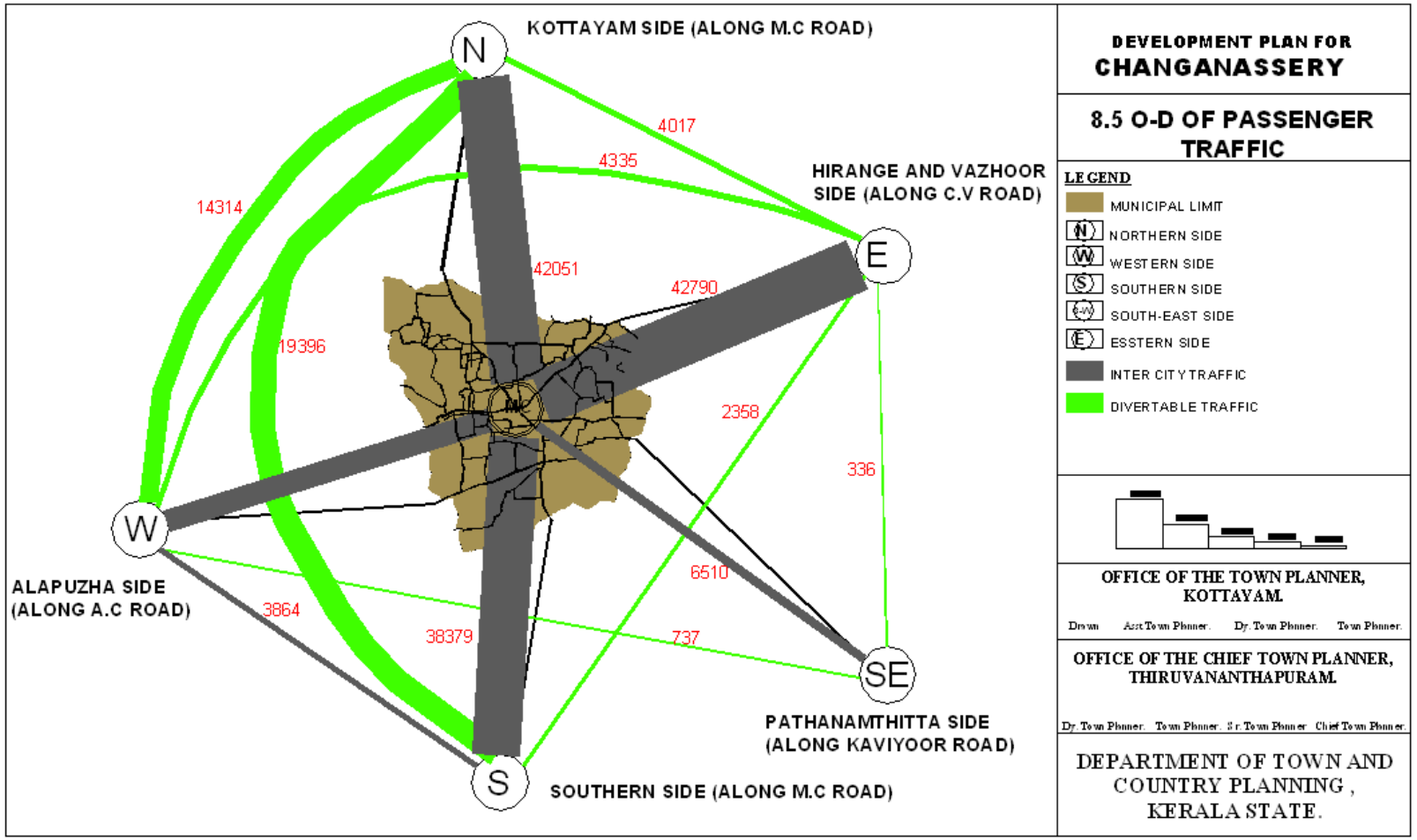
- Though 31.27% of total traffic can be diverted from Changanassery town, no by pass to the town is completed so far.

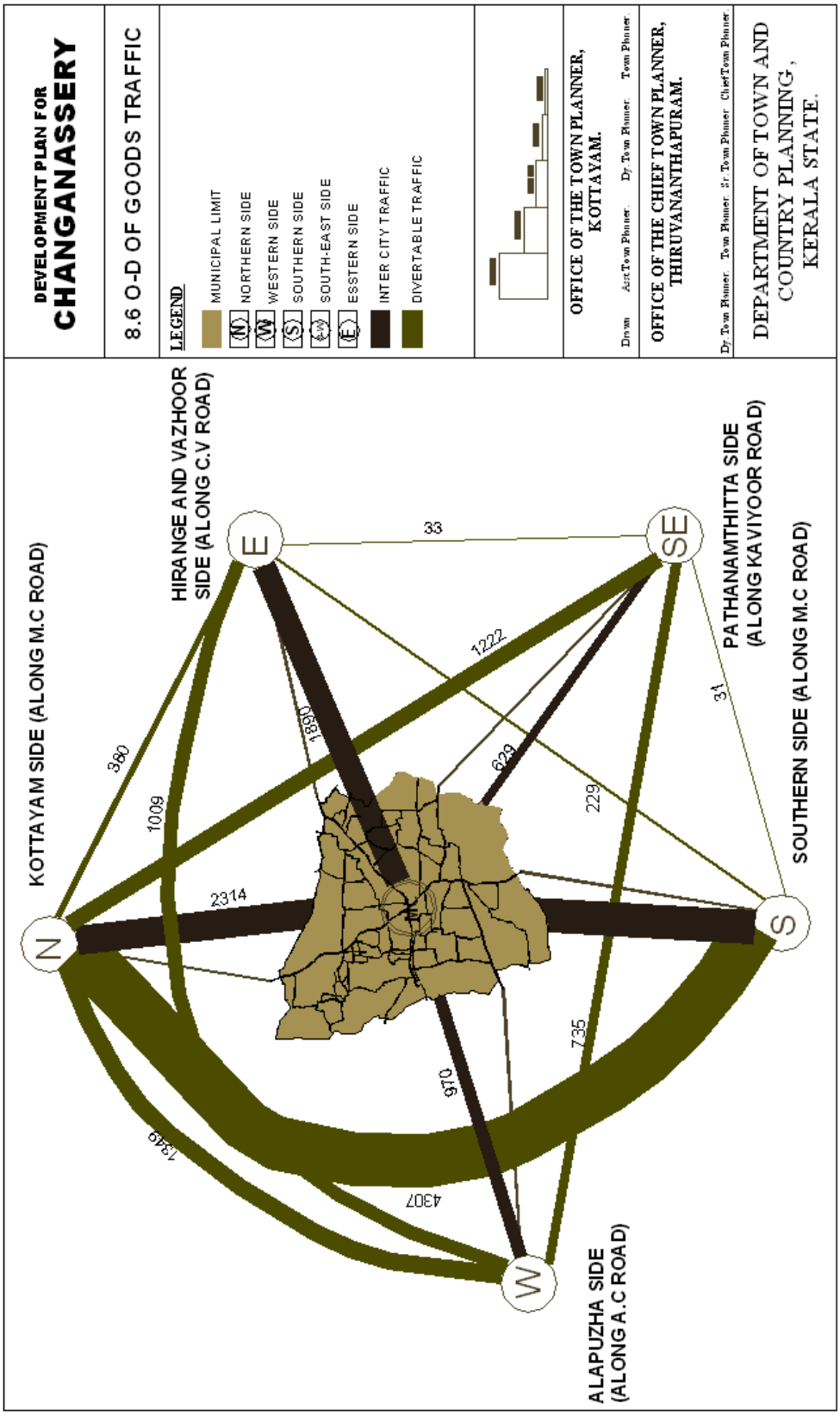
- Per annum number of accidents are as high as 248. Out of total accidents pedestrians are involved in 60% of accidents. This highlights lack of facilities for pedestrian movement.

- The town centre is congested due to location of 3 bus terminals at close intervals.

- Lack of mass transport facilities in the western part and a portion of the eastern part of the town. This cause excess dependency on personalized vehicles and intermediate mode of transport especially autorikshaws causing excess air and noise pollution.

- Congestion in the market area leads to traffic jams on approaches to market which in turn affect the traffic movement on Boat jetty road.


KOTTAYAM SIDE (ALONG M.C ROAD)
N
4017
4335
HIRANGE AND VAZHOOR SIDE (ALONG C.V ROAD)
E
14314
42051
42790
19396
2358
336
W
6510
ALAPUZHA SIDE (ALONG A.C ROAD)
3864
38379
737
SE
PATHANAMTHITTA SIDE (ALONG KAVIYOOR ROAD)
S
SOUTHERN SIDE (ALONG M.C ROAD)
DEVELOPMENT PLAN FOR
CHANGANASSERY
8.5 O-D OF PASSENGER TRAFFIC
LEGEND
MUNICIPAL LIMIT
NORTHERN SIDE
WESTERN SIDE
SOUTHERN SIDE
SOUTH-EAST SIDE
ESSTERN SIDE
INTER CITY TRAFFIC
DIVERTABLE TRAFFIC
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drawn
Asst Town Planner.
Dy. Town Planner.
Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner.
Town Planner.
Sr. Town Planner
Chief Town Planner.
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.


DEVELOPMENT PLAN FOR
CHANGANASSERY
8.6 O-D OF GOODS TRAFFIC
LEGEND
MUNICIPAL LIMIT
(N) NORTHERN SIDE
(W) WESTERN SIDE
(S) SOUTHERN SIDE
(SW) SOUTH-EAST SIDE
(E) ESSTERN SIDE
INTER CITY TRAFFIC
DIVERTABLE TRAFFIC
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Draftsman Asst Town Planner Dy. Town Planner Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner Town Planner Jr. Town Planner Chief Town Planner
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
KOTTAYAM SIDE (ALONG M.C ROAD)
HIRANGE AND VAZHOOR SIDE (ALONG C.V ROAD)
PATHANAMTHITTA SIDE (ALONG KAVIYOOR ROAD)
SOUTHERN SIDE (ALONG M.C ROAD)
ALAPUZHA SIDE (ALONG A.C ROAD)
N
E
SE
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W
380
1009
2314
1850
33
1222
629
229
31
735
970
4307
1349

9. SOCIAL INFRASTRUCTURE

9.1 INTRODUCTION

Kerala stands foremost among the states in India in the matter of literacy. This is mainly due to the development of educational facilities in the state. The percentage of literacy in the state as per 2001 census is 90.92 percentage and for Changanassery it is 96.23 percentage.

Besides being the headquarters of Changanassery taluk, the town is a major centre for educational, social, commercial and religious activities. The headquarters of Nair Service Society, Changanassery Arch Diocese of Syrian Catholic community, Anandasramam - a major religious centre etc are located at Changanassery. It is also a major educational centre.

9.2 EDUCATIONAL FACILITIES

9.2.1 HIGHER EDUCATION



N.S.S HINDU COLLEGE

Changanassery occupies a predominant role in the educational sector of Kerala, with three first grade colleges and a training college established before independence. The three arts and Science Colleges, St. Berchman's College, NSS College and Assumption College and the NSS BT College etc are located at the heart of the town itself. It offers Graduate and Post Graduate Degree courses in various Arts and Science subjects. Besides that, a few self-financing courses are also conducted here. Even though students studying here are mainly from Kottayam, Alappuzha and Pathanamthitta districts, it also attracts a good number of students from other parts of Kerala. Students, teacher, staff details of the four colleges are given in the table 9.1.



S.B. COLLEGE

TABLE 9.1 DETAILS OF COLLEGES

Sl. No.	Name of the Institution	Students			Teachers	Staff
		Male	Female	Total		
1	St. Berchman's College	2192	315	2507	168	98
2	NSS Hindu College	1364	2522	3866	169	86
3	Assumption College	0	2108	2108	108	74
4	NSS Training College	68	171	239	40	79
		3624	5116	8740	485	337

All the above four colleges were established before independence. Since then no new major educational institutions were established here. It is a major set back to the educational sector.

9.2.2 TECHNICAL EDUCATION

More than 15 institutions offer certificate courses in various subjects, functioning in the town. All these institutions are functioning in private sector. Certificate course in Civil and Electrical Engineering, various short term computer courses, X-ray and Laboratory Technician courses etc. are being conducted in these institutions. Three self financing Engineering Colleges were set up recently around Changanassery town within a distance of 20 kms from town centre. They are located at Pathamuttom, Pulinkunnu and Kallooppara.

9.2.3 SCHOOLS

There are 9 high schools in Government, aided and unaided sector with students' strength of 9588 functioning in the town. These schools cater to the needs of Changanassery town and students from the adjacent Grama Panchayats like Vazhappally, Thrikkodithanam, Paippad also study in these schools.

In addition to the above 4 higher secondary schools, 4 U.P. Schools and 13 L. P. Schools also function in Changanassery town. Educational details of schools is shown in the table 9.2.

TABLE 9.2 DETAILS OF SCHOOLS (2002-2003)

Sl. No.	Category of schools	Government		Aided		Unaided	
		No. of schools	No. of students	No. of schools	No. of students	No. of schools	No. of students
1	L. P. School	3	114	8	2228	2	1240
2	U.P. School	2	133	2	248		
3	High School	2	520	6	8309	2	1545
4	Plus Two school	2	520	5	2064	1	26

9.3 HEALTH FACILITIES



TALUK HOSPITAL

The principal Medical institution at Changanassery is the taluk hospital, which was established in 1889. The total extent of the hospital compound is 2 Acres and 90 cents and the total bed strength of the hospital is 207 and the average number of out patients is 450. This hospital cater to the needs of the people from Changanassery and Kuttanad taluk and a part of Mallappally and Thiruvalla taluks. Pediatric, Gynecology, Medical, Surgical, Ophthalmology, Dental, T.B, Ortho departments are available in the hospital and construction of X-ray, ECG and Blood bank are in progress. But for higher order medical facilities, people have to depend Medical College Hospital and other medical institutions of Kottayam.

In addition to taluk hospital there are a number of other medical institutions in Government and private sector providing treatment in Modern Medicine, Indian system of Medicine and Homeopathy. Details of medical institutions in Changanassery town is given in table 9.3.

TABLE 9.3 DETAILS OF MEDICAL INSTITUTIONS

Sl. No.	System of Medicine	Section	Hospitals	Clinics	No. of beds	Average No. of out patients	No. of doctors	No. of staff
1	Modern medicine	Government	1		207	450	11	108
		Private	10	20	224	500	44	161
2	Indian system of medicine	Government	1		10	200	2	12
		Private	3	3			10	10
3	Homeopathy	Government						
		Private		64			65	15

9.4 RECREATIONAL FACILITIES

The total land coming under recreational use is 9.31 hectares which is 0.69 percentage of the total area of town. It was 12 hectares during 1971, so there was a deduction in the area of park and open space during the past 40 years. The only public stadium available for active recreation is the Municipal stadium at Puzhavathu. This is now used for multi purpose functions. In addition to that play grounds are available in major educational institutions.



MUNICIPAL PARK AT POOVAKKATTUCHIRA

The municipal council maintain three small parks, one each at Poovakkattuchira, Perunna and near Railway station. There is enough potential to develop Poovakkattuchira as a regional level recreational centre. Four cinema theatres including two Air conditioned theatres functioning in the town.

9.5 SOCIAL AND CULTURAL ESTABLISHMENT



N.S.S HEADQUARTERS

Changanassery is a major centre of social activities. The headquarters of Nair Service Society is located here. Besides this, a centre for social and religious activity founded by Sree Narayana Guru and christened by Mahatma Gandhi known as Anandasramam is also located in the town. Moreover the town also houses the Headquarters of the Changanassery Arch Diocese of Syrian community.



BISHOP HOUSE

9.6 BANKING AND FINANCIAL INSTITUTIONS

Banking facilities at Changanassery are satisfactory. 8 Nationalized Banks and 4 other scheduled commercial banks are functioning here. Besides a number of Co-operative societies and private financial institutions are functioning here.

9.7 SHOPPING

Apart from the main market at Vattappally the major shopping area is concentrated at the inter section of MC road and C.V. Road. The market and the main junction locally called, as the 'Kavala' are the nerve centre of commercial activities. In addition to that either side of MC road from S.B. College to Perunna junction also developed as commercial area and different types of shops are functioning here.

9.8 RELIGIOUS INSTITUTIONS



VAZHAPALLY TEMPLE

Vazhappally Siva temple, Perunna Subhramanya temple and Puzhavathu temple are the most important temples of the town. In addition to that there are 21 other big and small temples situated in the town.



PAREL CHURCH

There are 12 churches located in different parts of the town and the Cathedral church, Parel church, CSI church, Marthoma church and ST. Thomas Jacobite church are the important Christian churches in the town. There are 8 mosques in different parts of the town. Puthoor Mosque and Puzhavathu Mosques are the main Muslim religious centres of the town.



PUTHOOR MOSQUE

9.9 FINDINGS

- ***Changanassery has lost its status as a major educational centre of Kerala, because no new educational centre with new courses especially in technical education field established in Changanassery in the recent past.***

- ***The facilities of the Taluk Headquarter Hospital to be upgraded. It will reduce rush at the District Hospital and Medical College Hospital.***

- ***Enough potential is there in the town to develop a regional level recreation/tourism centre.***

10. PHYSICAL INFRASTRUCTURE

10.1 WATER SUPPLY

A scheme for supply of protected water to the town was commissioned in 1977. The scheme known as Kuttanad Water Supply was implemented with LIC aid and was designed for supply of protected water to Thiruvalla and Changanassery municipalities and their adjacent Grama Panchayats and Kuttanad area. Water from Manimala river was utilized for this project with intake and treatment facilities at Kattode near Thiruvalla. The scheme had a designed capacity of 33 MLD and 3.5 million liter per day was the share for Changanassery Municipality. The per capita availability of water for the residents of Changanassery was 67 lpcd. The details of this scheme is given in the table 10.1.

TABLE 10.1 DETAILS OF KUTTANAD WATER SUPPLY SCHEME

Name of municipality/Grama panchayat	Population served	Year of commissioning	Number of public taps	Number of consumers
Changanassery	52445	1977	344	6665
Paippad	10800	1978	80	591
Thrikkodithanam	4200	1979	7	16
Vazhappally	5000	1983	41	1466
Kurichy	2800	1983	18	60

But later in 1997, a new scheme for Augmentation of water supply to Changanassery and Thiruvalla Municipalities has been commissioned. The new scheme is utilizing the water from Pamba River with its intake and treatment facilities at Kallissery near Chengannur. The scheme was implemented with the aid of HUDCO and LIC. The additional capacity of the project is 20 MLD and share of Changanassery Municipality was increased to 9.5 MLD. With the commissioning of the Augmentation scheme the per capita availability of the water raised up to 140 lpcd. and the water receiving under Kuttanad Water Supply scheme is now utilized for distribution to the surrounding Grama panchayats.

For the distribution of water 700mm diameter pipe is provided from the treatment plant at Kallissery to Thiruvalla. From Thiruvalla to the sump tank at Perunna 500mm pipe line is provided. The capacity of the sump tank at Perunna is 5,00,000 liters and from Perunna sump

well to the distribution tank at Cherukarakkunnu, 450mm diameter pipe provided. The capacity of the overhead tank at Cherukarakkunnu, is 20 lakhs liters and from here water is distributed to various parts of the town by gravity. The particulars of the consumers is given in the table 10.2.

TABLE 10.2 WATER SUPPLY - CONSUMERS AND AVAILABILITY OF WATER

Sl. No.	Type of consumers	Number of consumers	Quantity of water distributed in MLD
1	Stand post (Public tap)	420	1.5
2	Domestic	6051	3.5
3	Non-domestic (Commercial, public)	467	1.00
4	Industries	2	

Source: Kerala Water Authority

For the distribution of water the municipal area has been divided into three zones, namely Central area of the town, elevated area (Malayankunnu and area around T.B) and Vazhappally area. In 60% of distribution area, there is daily distribution of water and is 20% of area, water is distributing once in two days and in remaining 20% area water is distributing once in three days.

- ***The distribution network consists of AC pipes, which were laid in 1997, and 80% of these pipes required immediate replacement. Nearly 10% of wastage of water is there due to the defective distribution system.***

- ***Water shortage is being experienced in some elevated area. In 40% of town area water is not distributed daily. It is due to the absence of separate conveyance main to the elevated area.***

- ***Voltage problem is affecting the efficiency of the system.***

10.2 POWER DISTRIBUTION

Electric power to Changanassery town is being supplied from the Chethipuzha 66 KV sub station through 4 feeder lines, i.e. Changanassery town feeder, Vazhappally feeder, Changanassery feeder and Thrikkodithanam feeder. Consumption of electricity under different category is given in table 10.3. It shows that the consumption by High -Tension consumers is very low.

TABLE 10.3 CONSUMPTION OF ELECTRICITY*

Sl. No.	Type of consumers	Consumption in unit
1	Low-tension consumers (domestic, commercial and industrial consumers)	18,16,800
2	High-tension consumers	1,00,000
	Total	19,16,800

** including the power consumed by a portion of consumers in the Vazhappally Grama panchayat.*

While analyzing the number of consumers, 12,300 out of 16,860 consumers (73%) are domestic consumers. Consumers under the industrial category are just 300. Number of consumers under different category is presented in table 10.4 and number of street lights presented in the table 10.5.

TABLE 10.4 POWER SUPPLY - TYPES OF CONSUMERS

Sl. No	Type of consumers	Number of consumers
1	Type of street light	12300
2	Commercial	4200
3	Industrial	300
4	Agricultural	60

TABLE 10.5 DETAILS OF STREET LIGHTING

Sl. No.	Type of street light	Number
1	Ordinary lamps	3000
2	Tubes	2500
3	Sodium vapor lamps	250

There are few ongoing schemes for improving the voltage by providing new transformers and new distribution lines. There is a scheme for system improvement by inter-linking Changanassery and Vazhappally feeders.

There is proposal for a 110 kV Sub-station at Thrikkodithanam and two additional feeders from this sub-station to Changanassery.

- ***Low voltage problems at fag end***
- ***Inadequate street lighting in certain parts of the town.***

10.3 SOLID WASTE MANAGEMENT

Increase in the volume of urban waste are principally due to increasingly affluent life style, rather than urban growth. The municipal solid waste productions continue to grow both in per capita and over all terms. Assuming that 300 gm of solid waste is generated per day, the present quantum of solid waste generated will be about 16 tones.

An average of 8 – 10 tonnes of solid waste is being cleared every day in Changanassery. Particulars of solid waste collection, i.e. major collection points, frequency of collection, approximate quantity of waste etc are preserved in the Table 10.6.

TABLE 10.6 DETAILS OF SOLID WASTE COLLECTION (as on January 2003)

Sl. No.	Collection points	Approximate quantity of waste product per day (in tones)	Frequency of collection
1	Vegetable market	0.75	4 days / week
2	Vandipettah	0.75	4 days / week
3	Puzhavathu	0.50	2 days / week
4	Kottaram temple		2 days / week
5	Vettadi temple	0.5	2 days / week
6	Angadi		2 days / week
7	Old Municipal bus stand	2.50	Daily
8	Perunna stand		Daily
9	Railway station		Daily
10	Kurisummoodu		Daily
11	Parel Palli		Daily
12	Slaughter house		Daily
13	Fish market		Daily
14	Other wards (Western side of M.C. Road)	2.50	
15	Night collection from central area of the town	2.00	
16	Hotel wastes Different wards (eastern side of M.C. Road)	1.00	

Source: Municipal Office, Changanassery



DUMPING YARD AT FATHIMAPURAM

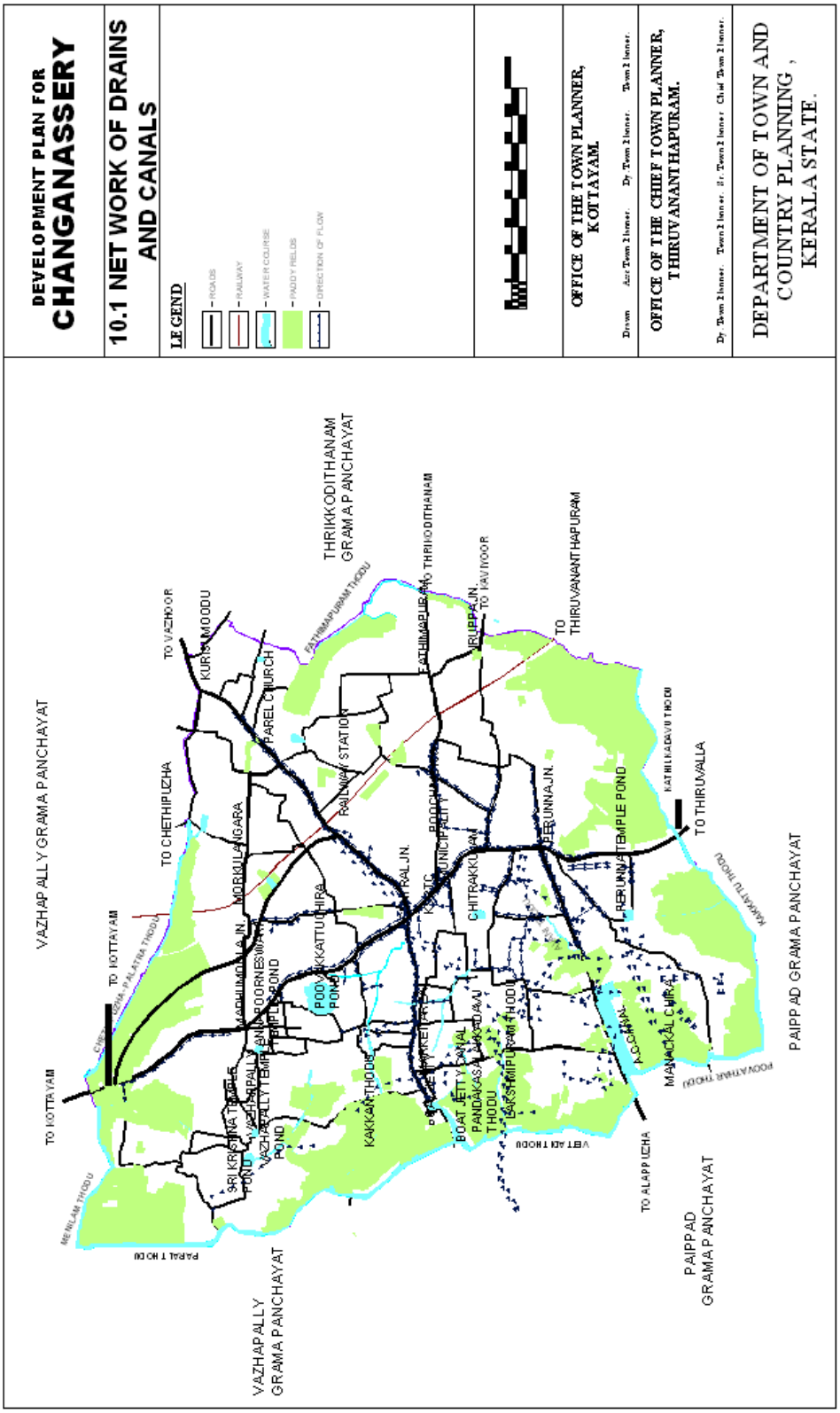
The Municipal area has been divided into two zones under two Health Inspectors for Managing the solid waste. There are 110 sanitary workers to clean the town manually who are supervised by 6 Junior Health Inspectors. About 75 dust bins are provided at different parts of the town for dumping solid waste. But at few points like vegetable market, Vandipetta and Fish market, the solid wastes are dumped in open places. The fleet of vehicles for collection of solid waste consists of tipper (1 No.), Van, (1 No), Tractor (1 No), Tiller (1 No) and about 20 nos. wheel barrows.

The dumping yard at Fathimapuram is used for depositing the solid wastes. Land filling method is adopted for disposing the solid wastes. Construction of a Vermi composting plant is nearing completion in the dumping yard compound for converting a portion of solid waste into manure. A slaughterhouse also is functioning in the Fathimapuram area. It is not a modern slaughterhouse and there is need for setting up a modern slaughterhouse. Following are the major problems identified which need to be addressed.

- Door to door collection of solid waste is absent and segregation at source is currently not in practice.
- The bin to population ratio is 1:693 against the recommended ratio of 1 bin for every 130 persons and the available bins are poorly maintained.
- Regular collection points are not available in some wards. Certain collection points are attended once in two and in some times once in three days.
- In some places, waste deposited on the street verges causes considerable nuisance to vehicular and pedestrian travellers.
- Waste is transported in open vehicles causing nuisance.
- Lack of maintenance to the vehicles using for solid waste collection.
- The road condition with respect to accessibility for different type of collection vehicles is very poor. Street especially in residential areas are very narrow and waste collection operation adds to traffic congestion problems.
- Many types of birds frequent to the site, feeding on the dumpsite and spread infectious matter in the area.

10.4 DRAINAGE

The drainage pattern of the town is governed by the natural slope. Major roads are provided by side drains and these drains are discharging water into the network of natural drains. In addition to that there are 7.725 km of natural drains within the town area and 12.700 km along the boundary of the town. The network of drains and canals has shown in the Map 10.1


DEVELOPMENT PLAN FOR
CHANGANASSERY
10.1 NET WORK OF DRAINS AND CANALS
LEGEND
ROADS
RAILWAY
WATER COURSE
PADDY FIELDS
DIRECTION OF FLOW
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
THRIKKODITHANAM GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
TO KOTTAYAM
TO VAZHOOR
TO CHETHIPUZHA
TO THIRUVANANTHAPURAM
TO THIRUVALLA
TO ALAPPUZHA
KURISUMOODU
PAREL CHURCH
RAILWAY STATION
MORKULANGARA
CHITRAKKUVAM
PERUNNA JN.
PERUNNA TEMPLE POND
KAKKAN THODU
MANACKALCHIRA
KATHILKADAVU THODU
KAKKATTU THODU
POOVATHAR THODU
VETTADI THODU
PAPAL THODU
MENILAM THODU
FATHIMAPURAM THODU
KATHILKADAVU THODU

11. ENVIRONMENTAL ISSUES

11.1 INTRODUCTION

Rapid urbanization can bring many environmental risk and problems and it is varying from town to town. Presence of industrial and commercial activities, population explosion, vehicular growth, conversion of open spaces etc. are leading to many environmental problems in urban area. Also many environmental issues are generated because of the interaction between the residing population, natural resources and the various activities for the economic development. The natural resources are typically extracted or issued as sinks to wastes and residues resulting in their depletion and degradation, while the infrastructure or urban amenities remain under continual stress resulting in inefficient consumption of mineral and energy. This affects health of population deteriorates the environment and economics of the urban area.

For the preparation of this plan detailed studies, consultation and analysis has been done or identifications and classification of environmental issues related to natural resources (paddy fields and natural drains), infrastructure (Traffic and Transportation, squatter dwellings), wastes etc. These environmental issues have been summarized in the subsequent paragraphs. It is observed that these environmental issues are inter-related and have important social and economic concerns.

11.2 PADDY FIELDS

Being situated at the upper reaches of Kuttanad region, the area coming under paddy fields is comparatively very high in Changanassery. A comparison of area under paddy field with other towns in the district is shown in the table 11.1. The percentage area of paddy fields in Changanassery is 23.63%, where as in Vaikom, which is in the second place the percentage of land under paddy field is only 12.87%.

TABLE 11.1 COMPARISON - PADDY FIELDS IN DIFERENT TOWNS

Town	Total area	Area under paddy fields	Percentage
Changanassery (2002)	1350	319.04	23.63
Kottayam (1995)	1550	131.50	8.27
Vaikom (1997)	873	111.91	12.87
Pala (1991)	1593	33.28	3.90



CHAMPAKKULAM PADAM



MENILAM

The paddy fields are located in the western, southern and northern part of the town. It is acting as open space and lung space of the town. But filling up of the paddy field is a major problem. It is mainly being converted for residential use. Over the past 30years, the area under paddy fields has been reduced by 113 hectares i.e. 25% of total paddy field area. Table 11.2 presents a comparison of the land coming under paddy field in 1971 and 2002.

TABLE 11.2 CHANGE IN THE AREA OF PADDY FIELDS

Year	1971	2002
Area of paddy fields (in hectare)	432	319.04
Percentage of paddy fields	32.58	20.97

But the conditions of the existing paddy fields are not encouraging. As per the study conducted by the Town and Country Planning Department in 2002, out of total 340.59 hectares of paddy fields, hardly in 96.15 hectares is used for paddy cultivation. 221.29 hectares are remaining uncultivated and 1.60 hectares of land is used for the cultivation of other crops. 21.55 hectares of land is recently filled and converted for other use. Paddy fields are remaining uncultivated due to following reasons.

- Cost of cultivation is very high when compared to the return from the cultivators
- Labour problem and Non-availability of labourers
- Scarcity of water in paddy fields, mainly due to the blockage of feeding canals
- Lack of interest in farmers due to reduced return from farming
- Demand of land for urban purpose and high land value leading to conversion of paddy fields.

But the uncultivated paddy fields and the filling up of paddy fields creates a lot of environmental problems.

- Normally, during the monsoon seasons the paddy fields are acting as a major basin for the collection of surplus water. But filling up

in many places reduced its capacity to hold water leading to flooding in adjacent places.

- Nutrient enrichment due to use of fertilizers and disposal of wastes have led to proliferation of weeds and bacterial contamination. Nuisance of mosquito, rats and snakes are also there in most of the areas.
- Due to many reasons, most of the uncultivated paddy fields become the basin of polluted water. It is affecting the quality of water in the adjacent wells. Few cases of epidemics is also reported due to polluted water.

The existing paddy fields in the Municipality is shown in the Map 11.1. The details of the existing paddy field are also given in Annexure. A.XX and the particulars of diseases reported from Changanassery is given in the Annexure A.XXI.

11.3 NATURAL DRAINS & WATERWAYS



PARAL THODU

Except at few locations, the town is surrounded by natural drain. A network of canal is there in the western part of the town. Total length of natural drain within the town limit is 7.725km and those in the boundary of the town are 12.700 km. Most of these canals were used as waterways earlier. Except a few canals all canals having the problem of weed growth. About 10.765 km. of canals can be used for inland navigation after the removal of weeds and dredging. Following are the major environmental issues experienced in this area.

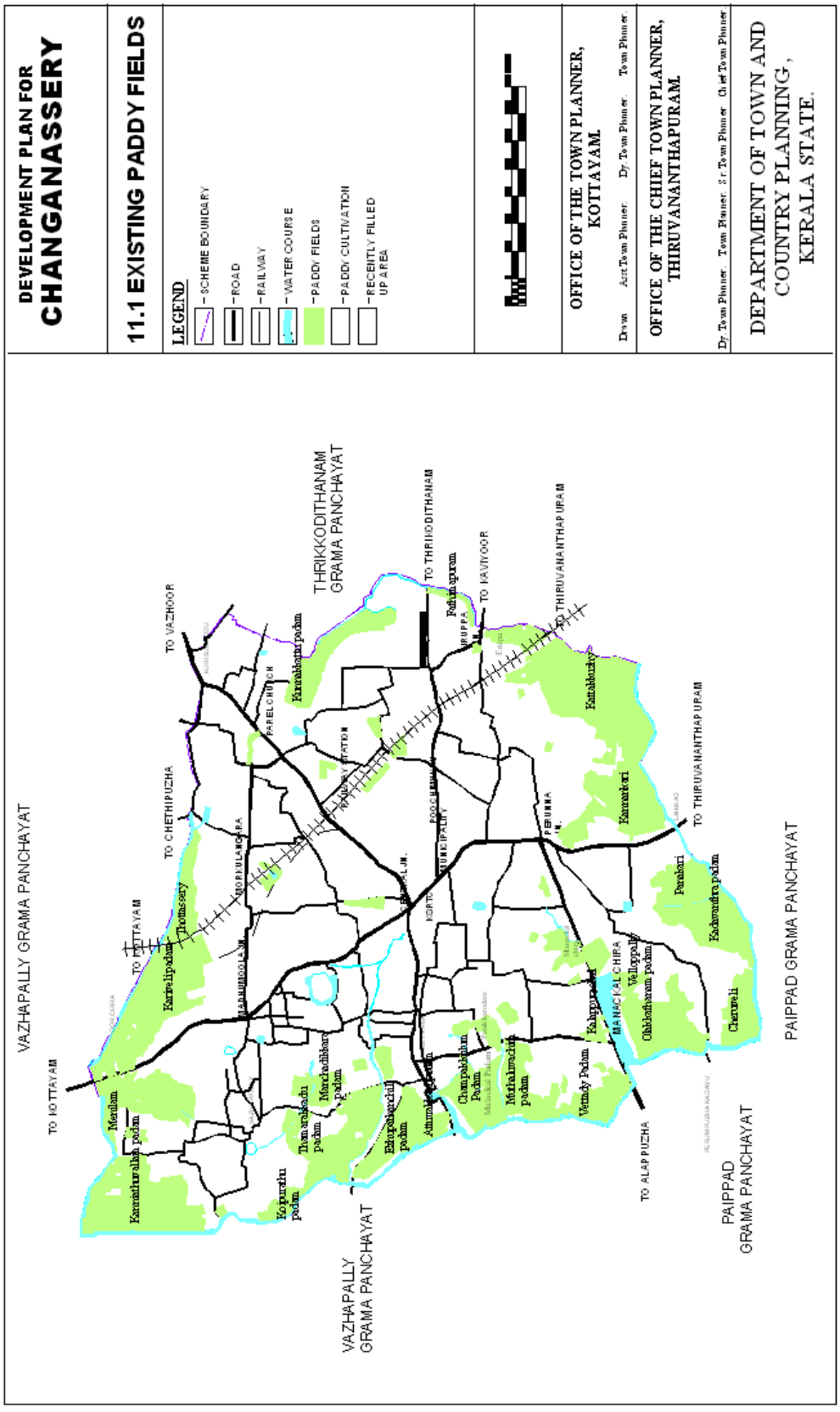


BOAT JETTY CANAL

- Growth of weeds and grass prevents the flow of water and ultimately leads to the pollution of water. It ultimately becomes a safe place for rats, snakes and mosquitoes.

- Flooding of the adjacent areas due to the blocking of drains, as the natural drain is the major means of drainage of the town.

- Significant loss of depth due to high rate of silt depositions. this has reduced the flood control capacity due to lower rateof flow of water.


DEVELOPMENT PLAN FOR
CHANGANASSERY
11.1 EXISTING PADDY FIELDS
LEGEND
SCHEME BOUNDARY
ROAD
RAILWAY
WATER COURSE
PADDY FIELDS
PADDY CULTIVATION
RECENTLY FILLED UP AREA
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drawn Asst.Town Planner. Dy. Town Planner. Town Planner.
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner. Town Planner. Sr. Town Planner. Chief Town Planner.
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
THRIKKODITHANAM GRAMA PANCHAYAT
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VAZHAPALLY GRAMA PANCHAYAT
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TO KOTTAYAM
TO CHETHIPUZHA
TO VAZHOOR
TO THRIKKODITHANAM
TO KAVIYOOR
TO THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
Merulam
Thottassery
Karivelipadam
Kurarakkattu padam
Kattakkuzhy
Kararankari
Parakari
Kadavanthra padam
Cheruveli
Vellappally
Olakkatharam padam
Kalappurakkal
Vettady Padam
Muthakuvachira padam
Champakkulam Padam
Ettupathanchil padam
Thamarakkadu padam
Koipurathu padam
Karavathuvallam padam
Manchadikkara padam
Kattuvallam padam
MANACKALCHIRA
PAREL CHURCH
RAILWAY STATION
MORKULANGARA
MADHUMOOLA JN.
KERTO
MUNICIPALITY
POOCHAKKAL
PERUNNA JN.
Kararankari
Kattakkuzhy
Fathimapuram
Kurarakkattu padam

Following are the major reasons for the blockage and weed growth in natural drains

- The closure of Thanneermukkom bund has changed the hydrological regime and has led to proliferation of weeds.
- Nutrient enrichment due to large inflow of residues and disposal of wastes from the habitations along the canal also lead to proliferation of weeds and bacterial contamination of the lake.

11.4 FLOODING

Flooding is the result of the problems mentioned in paragraph 11.2 and 11.3. Many area in the western part of the town is affected by flooding. About 79.47 hectares of land in the western part of the town is affected by periodic flooding. Duration of flooding is varying from 5 days to 25 days. List of the place affected by flooding is given in the Annexure. A.XXIII and the flood affected areas are shown in the Map 11.2

11.5 SQUATTER SETTLEMENTS AND BLIGHT AREAS

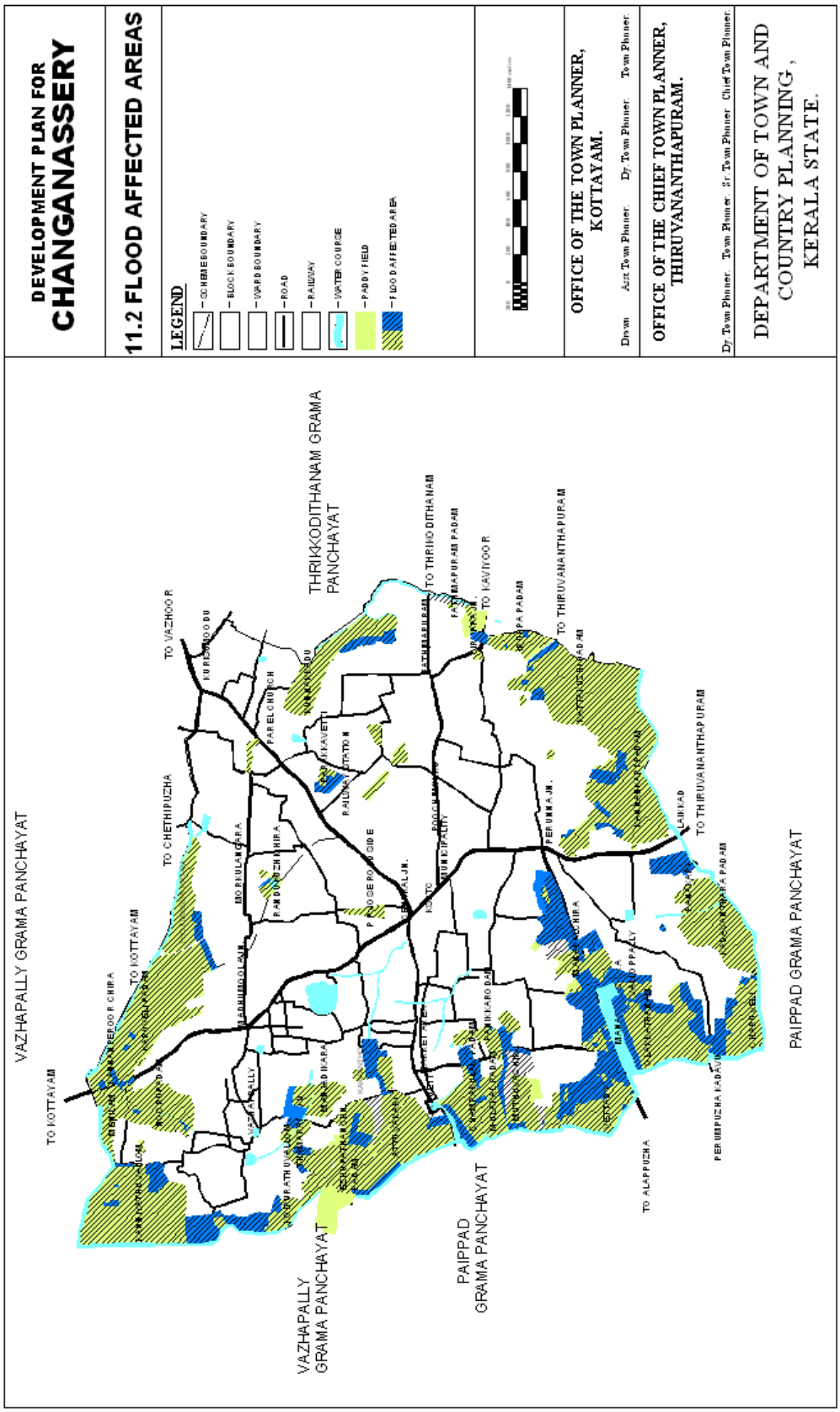
The phenomenon of an area and its activity deteriorating due to age, poor structural quality and inadequate maintenance facilities are observed in Changanassery also. About 29 slums were identified in different part of the town. These slums are with poor housing quality and its details are already described in paragraph 7.4. In addition to this a certain portion of the present market also identified as 'blight area' which also need renewal programme.

11.6 TRAFFIC AND ENVIRONMENT

Compared to large urban centres, the traffic situation in Changanassery is not serious. But following detrimental effect of traffic on our surroundings with respect to safety, noise and air pollution have been recognized.

- Safety
- Noise
- Air pollution
- Delay and congestion

Safety of road users have been endangered by the motor vehicles. Inadequate carriage way, poor surface condition of the roads, inadequate pedestrian facilities, poorly designed intersections etc are the reasons for road accidents. The details of road accidents are already described in the paragraph 8.11.


DEVELOPMENT PLAN FOR
CHANGANASSERY
11.2 FLOOD AFFECTED AREAS
LEGEND
— CORPORATION BOUNDARY
— BLOCK BOUNDARY
— WARD BOUNDARY
— ROAD
— RAILWAY
— WATER COURSE
— PADDY FIELD
— FLOOD AFFECTED AREA
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Draw Asst Town Planner. Dy Town Planner. Town Planner.
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TO CHETHIPUZHA
TO THRIKKODITHANAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
PAIPPAD GRAMA PANCHAYAT

Ribbon development along the major roads is a result of growth of road traffic and has many ill effect. The stretch of M.C Road from S.B College to Perunna junction, Vazhoor road from Apsara theatre to Central junction and the entire stretch of Market road are thickly built up with commercial and public buildings. Heavy traffic is experiencing in these stretches and the traffic volumes is far more than the capacity of the roads. Journey speed is as low as 5.26 KMPH in some stretches. Increase in vehicle operating cost, social cost due to delay, noise and air pollution due to traffic congestion are experienced in these stretches.

11.7 AESTHETICS

The visual ill effects of parking due to the absence of off street parking areas is being experienced at many part of the town.

To attract the attention of the motorists and pedestrians numerous advertisement boards are set up all along the streets, which mars the beauty of the surrounding landscape.

In almost all roads, the buildings are abutting the road without adequate setback from the road margin. This together with the insufficient right of way of roads and poor road geometric elements of roads is degrading the aesthetic beauty of the town. In addition to this there is the problem of road encroachment.

Most of the major travel corridors in the CBD area is being encroached by Hawkers. Hawking activity is more in Vazhoor road between the central junction and the municipal bus stand and in Boat jetty road. It is also appears at major road intersections. These activities are found conflicting with management of traffic on the streets and in many cases affecting the environmental quality.

12. HERITAGE

12.1 INTRODUCTION

Changes accompanying urban growth causes the destruction of distinctive and meaningful built and natural elements, eradicating the physical expression of former indigenous ways of life that are very much part of the settlement culture. Since the architecture is a long-term and large scale physical witness to the past, future generations will continue to refer to it as a reflection of the spirit of the historic culture.

During the recent decades, the rehabilitation and regeneration of historic centers has been increasingly recognized as an efficient tool for urban development synthesizing cultural values with economic opportunities. Maintaining and enhancing historic buildings and historic areas can be economically rewarding, and in long term, increase the value of private and public property.

As far as the Changanassery town is concerned there are a number of religious buildings with heritage value. In addition to that there is one palace, i.e. Lakshmipuram Palace, few sacred groves, buildings of educational institutions and a few buildings of certain social organizations. A list of major buildings / sites with heritage values is given in Annexure XXIV. Detailed description of the four important buildings, a sacred grove and Anchuvilakku are given in the subsequent paragraphs.

12.2 VAZHAPPALLY MAHADEVA TEMPLE



Three ancient temples, i.e. Perunna Subramania Swami temple, Vazhappally Mahadeva temple and Thrikkodithanam Temple with outstanding architectural beauty is situated in and around Changanassery. It is believed that these temples constructed during 8th or 9th century was patronized by Cheras and Ays of south Kerala. The inscriptions at Vazhappally temple mention about the region of Rajasekhara Varma, an emperor of Chera dynasty during the period AD 220 - 844.

In the architectural lay-out of Vazhappally temple "*Sreekovil*" which is in circular shape form the nucleus. The other components are open air *"Pradashina-patha", "Namaskara Mandapa*" in

front of Sri Kovil, the cloistered *"Nalambalam"*, paved outer *"Pradakshinavazhi"* etc. The main entrance to the "*Nalambalam"* is a very attractive two storied structure. Laterite, timber, tile and copper is used for the construction of the temple.

12.3 PERUNNA SUBRAMANIA SWAMI TEMPLE



The inscriptions of Bhaskara Ravi Varma obtained from Perunna and Thrikkodithanam temples mention about the vast area of Chera empire during AD 962 – 1019. The inscription mentioned about the provisional kingdon called "Nantuzhi Nadu". Like Vazhappally Mahadeva temple, the *"sri-Kovil"* of the Perunna temple also in circular in form and it is covered with copper plates. The other components are *"Pradakshina-patha", Nalambalam*", "*Balikkappura"* etc. The mast of the temple, which is constructed in brass, is another attraction.

12.4 ST. MARY'S METROPOLITAN CHURCH



The St. Mary's metropolitan church constructed in 1867 by the King of Travancore. The church was constructed in Anglical style. The stone cross of 20 feet height, made from single stone, is the major attraction.

12.5 LAKSHMIPURAM PALACE

The Lakshmipuram palace is the only palace existing in Changanassery. It was constructed by Rani Lakkshmi Bai in 1812 for the royal family from Parapurrnadu in Malabar, who forced to leave their country in fear of Tippu Sultan. It is a building of Kerala style architecture with "*Ettukettu*" and it is in the possession of the ancestors of the royal family and maintaining it in proper way.

12.6 SACRED GROVES

Parvakkattukoikkal kavu is the major sacred grove, still existing in Changanassery. It belongs to Chirakkal Kovilakam. It is in a neglected state and steps are to be taken to preserve this grove, as many sacred groves, which were once very common in our state, has been destroyed.

12.7 ANCHUVILAKKU



The Anchuvilakku at Boat Jetty was established by the citizens of Changanassery in 1905 as part of the centenary celebrations of the establishment of Changanassery market by Velu Thampi, the Dalawa of Travancore.

13. RESOURCES

13.1 INTRODOUCTION

Money, manpower and land are the main resources for planning and development of urban centres. Among these resources, land is limited and its availability differs from place to place. As a basic principle, allocation of these resources among various competing land use must be such that it helps in achieving a high level of economic efficiency.

It is always expected that the government should spend money or participate directly in building activities and development programmes. But in the changed scenario Government has lot of limitations. So private sector resources should also be appropriately mobilized for investment in the development of urban centres. The role of private sector in the development process should be duly recognized, depending upon the potential of urban centres and utilized in plan implementation. As a general fiscal policy on resource mobilization, it would be desirable to have a proper mix of public and private sector participation in the provision of infrastructure.

13.2 FISCAL RESOURCES

Traditional way of fiscal resource mobilization is followed in the Municipality. The main source of income is municipal taxes, fees for various services, income from properties, government grant (devolved fund), deposits and cess. The total receipts for the financial year 2000-2003 was 4,80,35,806 and the total revenue including the opening balance was 6,20,72,253. But only a small share of the total income is available for capital improvement programme and it is inadequate to provide infrastructural facilities and services in phase with demand.

The traditional system of funding, based on plan and budgetary allocations, has to be reduced and ultimately withdrawn due to fiscal deficit compulsions. Availability of funds for implementation urban development plans and service delivery system will not be easy. This has implications for the municipalities to devise innovative methods of resource mobilization through fiscal instruments and accessing the debt market.

13.3 HUMAN RESOURCES

Among the three major resources i.e. money, manpower and land, human resources are available in plenty. The details of human resources have already discussed in the chapter 6. In the decentralized planning process, some move has made for the utilization of human resources. But more steps are to be taken for the effective utilization of the human resources for the development of local economy and in the provision of infrastructure and services.

13.4 LAND

Urban land is emerging as a new area for local resources generation. Since the local authorities have to be involved in urban development and local economic development activities, they should use land as a resource for mobilization of funds. There already exist innovative examples of generation of substantial funds using urban land as a resource in many parts of the country. No steps in this direction has been adopted in Changanassery so far and there is enough potential for developing land as a major resource.

13.5 MINERAL RESOURCES

Hardly any mineral resources are available in Changanassery municipal town limit.

13.6 RAW MATERIALS

As far as the region is concerned, only Agro-based products are available. Rubber is the major crop in the eastern part of the region and paddy is the major crop in the southern part of the region.

14. URBAN GOVERNANCE AND FINANCE

14.1 INTRODUCTION

The historical adoption of 74th Constitutional Amendment Act by the Central Government in 1992 have paved the ways and means for independent functioning of local bodies. This act makes election to the urban local bodies mandatory, in addition to greater devolution of administrative and financial powers. In this chapter the existing system of Governance in the Changanassery Municipality in terms of elected and administrative wings and the financial status of the municipality are discussed.

14.2 THE ELECTED COUNCIL



MUNICIPAL OFFICE

The elected council consists of 32 members, which includes 11 women members. The Chairperson who is the head of the council has been elected from the elected members of the council. The Vice-chairperson, to assist the chairperson and also to discharge the duties of chairperson in absence is also elected by the members of the municipal council. There are five standing committees for finance, works, development, health, education, and welfare to assist the municipal council in respective fields. The vice-chairperson is the chairman of the finance standing committee and the members of the council will elect the chairpersons of other our standing committees.

14.3 ADMINISTRATIVE STRUCTURE OF THE MUNICIPALITY

The municipal secretary is the executive head of the Municipality and he is supported by the following four sections.

i. General Administration section
ii. Town Planning section
iii. Public health section and
iv. Peoples Planning section.

The administrative structure of the Municipality is given in the figure 14.1.

14.3.1 General Administration section

The General Administration section is headed by the P.A to the secretary and consists of three sub-divisions i.e. Establishment, Accounts and Revenue.

14.3.2 Town Planning section

The Town planning section is headed by the Town Planning Officer. This section looks after the implementation of the development plans and other town planning schemes, approval of building plan and lay out plans, detection of unauthorized construction, eviction of encroachments etc.

14.3.3 Engineering section

The Engineering section is headed by Municipal Engineer in the cadre of Executive Engineer and is assisted by two Assistant Engineers. This section is responsible for the project planning, execution and maintenance of basic services and other infrastructure within the town.

14.3.4 Public Health section

This section is headed by the public health officer Grade III. This section attends works like collection and disposal of solid wastes, cleaning of drains and work related to public health.

14.3.5 People's Planning section

This section co-ordinates the plan formation under decentralized planning process.

14.4 PLANNING PROCESS

Annual plans and five year plans for the municipality is being prepared under decentralized planning process.

14.5 MUNICIPAL FINANCE

14.5.1 Introduction

The 74th Constitution Amendment Act 1992, paved the way for devoluting financial and administrative power to urban local bodies in a large way. By this amendment the financial position of the urban local bodies improved and nearly 35% of the total plan fund of the state Government is devolved to the local bodies for plan implementation. The financial position of the municipality is discussed in the subsequent paragraphs.

14.5.2 Receipts of municipality

The receipts of the municipality has been grouped into, three categories i.e. Revenue, Capital and debt. The receipts under revenue includes income from taxes, income from other laws, income from the municipal properties, municipal fees, grant in and from Government, Grand in aid from Government for the maintenance of assets transferred from Government etc.

The receipts under capital includes Government Grants, government loans, income from municipal institutions, income from deposits, endowments Grant for implementing the programmes of the departments transferred to the municipality, Government Grant for decentralized planning etc.

The receipts under debt includes deposits, provident fund, pension fund, return from advances, sinking funds, library cess, surcharges, sale tax., income tax, labour welfare fund etc. The Table 14.1 presents an abstract of total receipts in the above three heads from the financial year 1998-99 onwards. The annexure A. XXV gives the full details of the income of the municipality from different sources from the financial year 1998-99 onwards.

TABLE 14.1 ABSTRACT OF MUNICIPAL INCOME

Sl. No	Head of account	1998-1999	1999-2000	2000-2001	2001-02	2002-03
1	Revenue	35547640	32070483	32222740	31980744	29992664
2	Capital	13978534	18412025	13216474	16863728	12801808
3	Debt	2340204	2366458	3529346	4087629	5241334
	Total income	51866378	52848966	48968560	52932101	48035806
Total income including opening Balance		62799643	61828150	70387119	69081403	62072253

Source: Municipal Office, Changanassery

14.5.3 Expenditure of the Municipality

Like the receipts, the expenditure of the Municipality is also classified into three accounts revenue account, capital account and debts account. The expenditure under revenue account includes the expenditure for administration and tax collection, public works, town planning, education, water supply and drainage, public health, street light, maintenance of municipal properties, Grant for maintenance of transferred assets etc.

The expenditure under capital account includes expenditure for management, public works, education, water supply and drainage, public health, street lighting, endowments, deposits,

poverty eradication programmes, expenditure for the programmes implemented through the departments transferred to the municipality, programmes under decentralized planning etc.

The expenditure under debt account include the expenditure for the repayment of deposits, repayment of cash deposits, pensions, re-payment of advances, library cess, sale tax, income tax, payment of welfare funds etc.

An abstract of the total expenditure of the Municipality under the above three heads is presented in the table 14.2. The annexure A.XXVI gives the details of expenditure from the financial year 1998-99 onwards.

TABLE 14.2 ABSTRACT OF MUNICIPAL EXPENDITURE

Sl. No	Head of account	1998-1999	1999-2000	2000-2001	2001-02	2002-03
1	Revenue account	40769312	28776053	26879680	31333952	30499110
2	Capital account	1542809	10082411	23847972	20949060	11448612
3	Debt account	3994127	1567017	3510165	2575078	4780258
Total Expenditure		46306248	40425481	54237817	54858090	46727980
Grand Total including closing Balance		62799643	61828150	70387119	69081403	62072253

Source: Municipal Office, Changanassery

15. CONCLUSIONS AND RECOMMENDATIONS

15.1 POPULATION OF TOWN.

Over the past decades, the town is registering a decreasing trend in population growth rate and the population even decreased during 1991-2001 period. Also the phase of urbanization of the region is very slow. The percentage of urban population of Changanacherry taluk is almost half of that of state value.

For the sustainable development of the town, demographers suggest that, the annual population growth rate shall be more than 2%. Some new activity shall be introduced to attract more population to the town.

15.2 ECONOMIC DEVELOPMENT.

The economic development of the town is at very low rate. It is mainly due to the slow phase of development of secondary sector. The industrial sector of the town is limited to one medium scale industry and few small-scale industries.

Prime importance shall be given for the development of secondary sector for the growth of the town. As far as Changanacherry is concerned, small scale industries are suitable for the town. Land, labour, Capital and Enterprise are the four components for industrialization. Among that first three components are available in abundance. For the development for enterprenuership facilities at the institutions like Common Facility Service Centre, Changanassery, Indian Rubber Research Institute etc are to be availed.

15.3 COMMERCIAL DEVELOPMENT

Once Changanacherry market was one of the largest markets in the state, but gradually lost importance mainly due to the change in transportation mode. But the area under commercial use is increasing. It shows that still there is scope for commercial development. Due to its geographical location and the availability of three modes of transportation, Changanassery can be developed as major collection and distribution centre of goods and regain its status as a major market.

15.4 EDUCATION

Changanassery is a major educational centre of Kerala. But gradually it is losing this status as no new educational institutions established in Changanassery in the recent past. Making few of the present higher education institution as centers of excellence and diversification of the courses etc are to be done to maintain the status as an educational centre.

15.5 HOUSING

Eventhough the number of houseless people is very less, nearly 8% of the total population is living in squatter dwellings with very poor environment. Also nine squatter dwellings are located in puramboke land. These problems are to be addressed with priority.

15.6 TRANSPORTATION

The town is located in one of the major travel corridor of the state. The availability of transportation facilities is one of the major potentials of the town. But like many other towns in the state, Changanassery is also facing all kinds of transportation and traffic problems. In fact it is one of the major problems faced by the town.

15.7 PHYSICAL INFRASTRUCTURE

In the case of infrastructural facilities like water supply, power supply, solid waste management, the facilities are not up to the satisfaction of citizens.

In this regard, another factor is to be considered is the floating population of the town. The floating population of the town is estimated as 1,12,634, which is more than the resident population. It is creating additional load on the available infrastructural facilities.

15.8 ENVIRONMENTAL ISSUES

The town is facing many environmental problems like conversion of paddy fields, pollution of natural drains, weed growth in drains and other water bodies, flooding, diseases, problem of squatter and slight areas, congestion noise and air pollution by vehicles etc. These problems need immediate intervention.

15.9 HERITAGE

There are a number of buildings, which have heritage and architectural importance. These buildings need to be preserved /conserved.

15.10 AGRICULTURE

Nearly 24 percentage of the total town area is paddy fields. But a major portion of the paddy fields are remaining uncultivated and it is leading to many environmental problems. A majority of the uncultivated paddy fields still can be utilized for agricultural purpose. Diversification of crop can be adopted for making agricultural profession more profitable.

15.11 RESOURCES

Limited resources are with the municipalities for investment in various urban development projects and for the maintenance of created assets. This is the major constrain in the development process. Innovative approaches shall be adopted for fiscal, land and human resources mobilization.

15.12 URBAN GOVERNANCE

While analyzing the different projects taken up by the municipality, it is noticed that, total funds are being divided among different wards on a priority basis and a town level approach was not adopted. While formulating projects a share of the funds shall be set apart for priority urban development projects at town level. Innovative approaches shall be adopted for resource mobilization in addition to the traditional system.

16. PROJECTED REQUIREMENTS

16.1 FUTURE POPULATION OF THE TOWN

16.1.1 Introduction

Projection of population has become an essential exercise to assess the future needs so that necessary steps can be taken to meet the demand and needs of the man in an orderly manner. Projection involves assumption of future status based on the past and present status and therefore are prone to error. Estimation based on extension of past trend is generally known as projection and estimation based on assumptions of factors other than non-interfered trends is known as estimation.

The perspective population mainly depends on factors like birth rate, death rate and migration and these factors depends on social, political and economic situation. The introduction of family planning programmes declined the birth rate and at the same time the improvements in the health sector decreased the death rate. These two factors are balancing and the population growth rate started declining. The decadal growth rate of Kerala reached 9.42 percentage during 1991-2001 period from the 14.32% growth rate of 1981-91 period. The corresponding figures for the district were 7.71% and 6.84% respectively.

The percentage of urban population is showing an increasing trend. The percentage of urban population of Kerala has increased to 27.33% in 1991 from 13.48% in 1957. But in Kottayam district, the increase in urban population is not at a high rate and it reached only 15.8% in 2001 from 13.52% of 1951.

The increase in the percentage of urban population is mainly due to the increase in the number of towns. The number of town has been increased to 197 in 1991 from 94 on 1951. But in the case of existing towns high population growth is recorded in few cities and towns and many of other towns showing zero and even negative growth rate.

16.1.2 Population projection

The population of Changanassery town for 1961, 1971, 1981, 1991 and 2001 are 42376, 48545, 51,955, 52,445 and 51,960 respectively. Following four mathematical methods were adopted for the projection of population based on the past trend.

i. Arithmetic increase method

Year	Population	Change in population
1961	42376	
1971	48545	6169
1981	51955	3410
1991	52445	490
2001	51960	-485
Average increase		2396

P t = Po + rn

r = 240

P 2011 = 51960 + 10 x 240 = 54,360

P 2021 = 51960 + 20 x 240 = 56,760

ii Geometric Increase method

$Pt = Po (1+r)^{t}$

(r – average annual growth rate)

P 2011 = 51960 $(1-0.001)^{10}$ = 51,479

P 2021 = 51960 $(1 – 0.001)^{20}$ = 51,003

iii Incremental increase method

Year	Population	Increase in population	Increase in increase of population
1961	42376		
1971	48545	6169	
1981	51955	3410	-2759
1991	52445	490	-2920
2001	51960	-485	-975
Average		2396	-2218

P 2011 = 51960 + (2396 – 2218) x 1 = 52138

P 2021 = 51960 + (2396 – 2218) x 2 = 52316

iv Decrease rate of growth method

Year	Population	Increase in percentage of population	Decrease in percentage increase
1961	42376		
1971	48545	6169	
1981	51955	3410	+7.75
1991	52445	490	+6.08
2001	51960	-485	+1.86
Average		2396	+5.16

$$P\ 2011 = 51{,}960 + \frac{(-0.92 - 5.16) \times 51{,}960}{100} = 48{,}800$$

$$P\ 2021 = 48{,}800 + \frac{(0.92 - 2 \times 5.16) \times 48{,}800}{100} = 43{,}315$$

The table 16.1 shows the projected population based on past trend. Two out of four methods indicate that the projected population for the year 2011 and 2021 is less than the current population.

TABLE 16.1 PROJECTED POPULATION

	2011	2021
Arithmetic increase method	54,360	56,760
Geometric increase method	51,479	51,003
Incremental increase method	52138	52386
Decrease rate of growth method	48,800	43,315

16.1.3 Estimated population

It is already mentioned that the population projected mathematically is lower than the current population. It is not admissible and the town should register an increase in population for its sustainability. World wide demographic analysis suggested that a town should have minimum 2% annual population growth rate for the sustainability. So for the Changanassery town 2% annual population growth rate is assumed for estimating the future population.

$$P_t = Po\ (1+r)^t$$

$$P\ 2011 = 51{,}960\ (1 + 0.02)^{10} = 63{,}339$$

$$P\ 2021 = 51{,}960\ (1 + 0.02)^{20} = 77{,}210$$

So the future population of the town is estimated as 63,000 and 77,000 for the year 2011 and 2021 respectively.

16.2 ECONOMIC BASE AND EMPLOYMENT GENERATION

The estimated population for Changanassery town by 2011 is 63,000 and by 2021 is 77,000. The work participation rate of Changanassery as per 2001 census is 29.50% and that for Kottayam district is 32.88%. The future working force of Changanassery is assumed as 35% of the projected population.

The present trend of sectorwise distribution of workers indicate that, the percentage of workers in the primary sector is showing a decreasing trend and there is corresponding increase in the percentage of workers in secondary and tertiary sectors. Same trend is also expected in the coming years and the perspective working population of Changanassery by 2011 is estimated as 22,050 and by 2021 as 26,950. The estimated occupational distribution of perspective working population and the additional employment to be generated by 2011 and 2021 is presented in the Table 16.2.

Thrust is given for more employment generation in the secondary sector. It is proposed to have 50% of total employment in this sector. The development of secondary sector will pave the way for the development of tertiary sector. Only nominal increase of job opportunities are expected in the primary sector. Altogether 6721 job has to be generated in the fist 10 years and 4900 job has to be generated in the next 10 years.

16.3 HOUSING AND SHELTER.

While dealing with housing, it is first necessary to distinguish between housing need and housing demand. Whereas the need refers to inadequacy of existing provisions when compared with socially acceptable norms, demand is an economic concept, wherein standard and amount of housing demand is related to households income and ability to pay. Both housing need and demand are affected by factors such as housing shortage and rate of obsolescence, whereas demand would be additionally affected by affordability and future housing needs. Future need of housing is assessed based on the following criteria.

- Structural condition of buildings.
- Unsuitable dwellings in squatter settlements.
- Housing for the additional households.

It is estimated that out of 11,399 residential buildings in the town 1541 (13.52%) residential buildings are kutcha buildings and require immediate upgradation.

TABLE 16.2 PERSPECTIVE WORKING POPULATION

Sl. No.	Occupation	Sector	Present Number of workers (App.)	No. of employment to be generated by 2011	% of employment by 2011	No. of employment to be generated by 2021	% of employment by 2021	Additional employmet to be created		
								2002-2012	2012-2022	Total
1	Urban agriculture and allied activities	Primary	2203	2646	12	2695	10	443	49	492
2	Industrial sector	Secondary	2184	3500	50	4200	50	1316	700	2016
3	Construction		671	800		1100		129	300	429
4	Trade and commerce		4685	6725		8175		2040	1450	3490
5	Transport	Tertiary	1462	2300	38	2500	40	838	200	1038
6	Other services		4124	6079		8280		1955	2201	4156
	Total		15329	22050	100	26950	100	6721	4900	11621

According to the studies conducted by the Town and Country Planning Department 206 households among the squatter dwellings are living in purampoke land that is Railway land and within the right of way of roads. So rehabilitation of these families is necessary.

The projected population of Changanacherry town by 2021 is 77,000. So an additional population of 25,040 has to be accommodated in the town. Approximately additional number of 5000 new houses is to be constructed in the next twenty years.

16.4 LAND REQUIREMENTS

The land requirement for various uses for the horizon year, ie by 2021 is worked out as given here under:-

16.4.1 Residential use

The total land under residential use is 763.39 Hectares, which is 56.55% of total town area (77.50% of developed land). The overall density of population is 38.49 persons per hectare and the residential density is 68.06 persons per hectare. The population of the town is not distributed evenly and there is large variation in the density of population in different parts of the town. It is varying from 19 persons per hectare in Kuttisserikkadavu ward to 105 persons per hectare in Perunna west ward.

Assuming a residential density of 100 persons per hectare 770 hectares of land is required for future residential use. An extent of 663.75 hectares has been proposed for residential use in residential use zone. In addition to that an additional area of 159.60 Ha of land has been proposed as residential mixed zone. The additional population is to be accommodated by re-densification of existing residential areas of low population density and conversion of some marshy land for residential purpose

16.4.2 Commercial use

Area required for commercial and trade activities have been worked out on the assumption that an average of 0.75 hectares/1000 person is required for commercial use. Considering the importance of the town as a regional market 68.58 hectares of land has been set apart for commercial use.

16.4.3 Public and Semi public use

At present 88.62 hectares of land is coming under public and semi public use. It is worked out to 1.71 hectares per 1000 population. The existing public and semi-public use land is proposed to be retained as such and no additional land is proposed in the category.

16.4.4 Industrial use

The number of industrial workers during 2021 is worked out as 4200. So additional 2016 new employment in the Industrial sector has to be provided. No major industries are proposed for the town and targeted employment generation under industrial sector is proposed to be met through promoting only small scale industrial units. These small scale units can be function in the residential area where the residential density is low. Also the small scale industries can be set up in other zones also, especially in residential mixed zone subject to certain conditions. An area of 159.60 hectares of land has been proposed as residential mixed zone.

16.4.5 Parks and open spaces area and recreational use area

In the proposed land use an area of 5.15Ha of land has been proposed for park and open spaces and 7.62 Ha of land has been proposed for Recreational Open Space.

16.4.6 Transport use

At present 80.76 hectares of land which is 5.98% of total town area is coming under transportation use. As transportation is one of the major problems of the town an additional area of 10.64 hectares of land has been set apart for this use. (Total 91.47 hectares)

16.4.7 Agriculture

Comparatively larger proportion of land, 319.04 hectares, which is 23.63% of total area of the town, is currently under agricultural use. Out of this paddy is being cultivated in hardly 96.15 hectares of land and about 221.29 hectares of land remain as uncultivated. This Plan proposes to retain 188.30 hectares of land for paddy cultivation. In addition to that 39.10 hectares of land proposed as Developable agricultural area. A portion of residential area can be utilized for dry cultivation, as the residential density is very low.

16.4.8 Water bodies

42.50 hectares of land is coming under water bodies. All measures are to be taken to protect these water bodies as these have major role in protection of the environment.

16.5 SOCIAL INFRASTRUCTURE

16.5.1 Introduction

Social amenities and infrastructure fall under the social welfare objectives of human development programme and are distinct from economic development objectives and especially in the context of the rapidly developing liberalized and competitive economic

scenario. The provision of these amenities shall consider the regional bearing as the town caters the requirements of a wider region comprising surrounding Grama Panchayats and towns for higher level facilities.

16.5.2 Education

Three first grade Arts and Science Colleges functioning in the town meeting the demand of the town as well as its hinterland. There are three new Engineering Colleges within 20-Km radius around the town and three Medical Colleges are functioning in the surrounding areas (Kottayam, Alappuzha and Thiruvalla). But new courses are to be introduced in these colleges to maintain the status of Changanassery as a major education centre of Kerala.

16.5.3 Health facilities

As mentioned earlier people of entire Changanacherry taluk depending the Taluk Hospital for their medical need. In addition to that a share of people from the surrounding taluk i.e. Kuttanad taluk of Alappuzha district, Mallapally and Thiruvalla taluks of Pathanamthitta also depending this hospital. Eventhough there are few hospitals in the private sector, the economically weaker section of the society mainly depending this hospital for their medical needs. The projected requirement of Medical facilities is presented the table 16.3. Eventhough the medical facilities in terms of bed strength is sufficient many of the modern medical facilities are absent in the town. So there is a need to introduce these facilities urgently.

TABLE 16.3. PROJECTED REQUIREMENT OF MEDICAL FACILITIES.

Particulars	Present status	2011	2021
Population	51960	63000	77000
Bed strength	441		
Projected requirement	200	200	200
Back log	Nil	Nil	Nil

16.6 TRANSPORTATION

16.6.1 Introduction

The prime requisite of long-term transport development plan is to realistically estimate the future travel demand pattern of the people. Thus, it becomes essential to do predictions of travel demand pattern for the horizon year. Traffic projection helps in evaluating the shortfalls in the existing road network and accordingly plan a new road net work by providing additional road including bye passes, link roads etc.

Methods of traffic projection

For projecting the future demand, various methods of traffic projection including statistical, economical and mathematical models are available. They could be judiciously utilized depending upon the level of accuracy warranted and the extent of database available. Various methods of traffic projections employed by the transport planner include.

- Growth factor method;
- Regression method based on economic indicators like population, per capita income, growth rate and growth rate in industrial sector, and
- Interpolation method based on past trend in traffic growth rates.

The quantifiable relationship established between the various economic indicators for passenger and goods transportation can be used to estimate the future trips in an area. Also the growth rate of vehicular population in the area over the years will give a good estimate of the 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.

16.6.2 Techniques adopted for projection

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

- Studies conducted by NATPC in towns of similar size in Kerala in the past;
- Growth rate of vehicle owner-ship in Changanassery town over the years.
- Growth trend of traffic volume on major roads collected by the PWD.

Table 16.4 shows values adopted based on the above criteria.

TABLE 16.4 THE GROWTH RATE OF TRAFFIC VOLUME

Basis	Annual growth rate observed in %
Studies conducted by NATPAC in similar towns in Kerala in the past	4 – 6 (Peak hour traffic)
Growth rate of vehicles in Kottayam district during 1996 – 99	9.55
Traffic volume count on major roads by PWD during 1993 – 96	14.07

The impact of annual traffic growth on peak hour traffic was estimated based on the peak hour factors on daily traffic. On the basis of a critical evaluation of the above growth rates and also

factors such as moderation in traffic growth over the years due to development of substitutes for transport including telecommunication and informatics, the following peak hour growth rates were adopted for Changanassery town for different categories of roads viz. arterial, sub arterial and collector roads. Table 16.5 shows growth rate adopted for different categories of roads in Changanacheery.

TABLE 16.5 GROWTH RATE ADOPTED FOR DIFFERENT CATAGORIES OF ROADS

Type of road	UP to 2010	Beyond 2010
Arterial road	6	5
Sub-arterial road	5	4

16.6.3 Projected link volume on existing network

Table 16.6 gives the estimated peak hour flow in different horizon years on various road stretches in Changanassery town. Volume – capacity ratio for different horizon years are also presented in this Table. It is observed that almost all the major road stretches in the study area would be severely congested in the horizon year with over-utilization of roads beyond their carrying capacity under 'do – nothing' option. The capacity utilization of major corridors like Mathumoola junction. to Central junction, Central junction to Municipal office junction, Lapalam to Perunna junction, Perunna junction to NSS College junction and beyond up to Municipal Office junction (One way) on Main Central Road (SH-1), Municipal Office junction to Poochimukku (One-way), Poochimukku to NSS College junction on Kaviyoor road (MDR) and Central junction to Railway Station on Vazhoor road (MDR) were found to exceed the carrying capacity in the base year itself. The section of main road passing from Poochimukku to NSS College junction will be the worst affected road section in the horizon year. The road sections mentioned above will have to carry traffic much beyond their capacity in the horizon year. Almost all the road stretches will be over-utilized by the year 2020, if adequate capacity augmentation for the road network is not carried out in the Town or if parallel roads are not developed.

The projected traffic on the existing road network of the CBD area implies that the existing road network would not be able to handle the traffic in the horizon year without up-gradation of the transport infrastructure facilities. However, traffic management schemes supplemented by geometric improvement of intersections will ease the traffic congestion for the next two or three years. However, augmentation of the capacity of the existing network by widening and early completion of the ongoing bye pass road project and provision of missing links is a must considering the increase in traffic volume.

TABLE 16.6 ESTIMATED PROJECTED PEAK TRAFFIC FLOW IN HORIZON YEARS

Sl. No.	Name of Stretch	Base year (2001		Expected volume in Horizon year			V/C Ratio			
		Volume	Capacity	2005	2010	2020	Base year	2005	2010	2020
I	**MAIN CENTRAL ROAD (SH-1)**									
1	Kannanperoorchira to Mathumoola Jn.	13850	18000	16835	21486	31804	0.77	0.94	1.19	1.77
2	Mathumoola jn to Central jn	19625	18000	23854	30445	45066	1.09	1.33	1.69	2.50
3	Central ljn to Municipal office jn	27700	21600	33670	42972	63609	1.28	1.56	1.99	2.94
4	Lapalam to oPerunna jn	20563	18000	24994	31900	47220	1.14	1.39	1.77	2.62
5	Perunna jn to NSS College jn	24200	21600	29415	37542	55572	1.12	1.36	1.74	2.57
6	NSS College jn to Municipal Ofice jn (One-way)	28825	21600	35037	44717	66192	1.33	1.62	2.07	3.06
II	**ALAPPUZHA - CHANGANASSERY ROAD (SH-11)**									
1	Perunna jn to Manakkakchira	8175	11500	9937	12682	18773	0.71	0.86	1.10	1.63
III	**KAVIYOOR ROAD (MDR)**									
1	Municipal Office jn to Poochimukku (One-way)	9163	8000	11138	14215	21041	1.15	1.39	1.78	2.63
2	Poochimukku to Iruppa	2750	7066	3343	4266	6315	0.39	0.47	0.60	0.89
3	Poochimukku to NSS College jn.	14588	6666	17732	22631	33499	2.19	2.66	3.39	5.03
IV	**VAZHOOR SROAD (MDR)**									
1	Central jn to Railway station jn	24313	16000	29553	37717	55831	1.52	1.85	2.36	3.49
2	Railwlay Station jn to Kurissummoodu jn	15550	16000	18901	24123	35708	0.97	1.18	1.51	2.23
3	Central jn to Boat Jetty	9275	16000	11274	14389	21299	0.58	0.70	0.90	1.33

16.7 PHYSICAL INFRASTRUCTRE

Adequate availability of good quality of water is the basic need of human life. Their standard, of course may vary. Infrastructure is the basic requirement of urban life and its adequacy and accessibility are two important ingredients and key contributors in the upgradation and enrichment of quality of urban life which is the primary objective of any planned development effort.

16.7.1 Water supply

According to climate, economic and other conditions a standard of 150 lpcd has been adopted for Changanassery town for domestic purpose. Present backlog and future requirement of water is presented in the Table 16.7.

TABLE 16.7. PROJECTED REQUIREMENT OF WATER

	Present	2011	2021
Domestic purpose	7.79 MLD	9.45 MLD	11.55 MLD
Institutional purpose	1.60	2.0	2.2
Total requirement	9.39	11.45	13.75
Supply	9.5 MLD	--	--

16.7.2 Sewerage

The treatment of sewerage is essential to check the decay in the environment as well as to provide hygienic condition to the population. The sewerage is estimated at the rate of 80% of water supply to any area. As the population density of the town is low, the present system of individual septic tanks can be continued. But by the end of plan period the provision of sewerage system can be considered. But in the squatter settlements, community level septic tanks are to be provided.

16.7.3 Drainage

Drainage system of the town is governed by natural drainage courses and topography. But problems of flooding is experienced in the southern and western part of the town, which is comparatively low-lying area. So provision of additional drains is required in this area. Also upgradation of drains in other parts of the town is also required.

16.7.4 Electricity

The estimated requirement of power is worked out on the assumption that an average 2 kilo watt power per household is required at town level use for domestic, commercial, industrial

and other purposes. The actual estimation of power requirement can be made based on the industrial development, commercial development, domestic and other requirement. Table 16.8 shows the projected power requirement.

TABLE 16.8 PROJECTED POWER REQUIREMENT

Year	Population	Power requirement(in KW)
2011	63,000	126000
2021	77,000	154000

16.7.5 Solid waste

The production of solid waste in an urban centre is a function of the socio-economic profile of the population and activities in the area. The insufficient conservancy services in most of the urban centers tend to leave the garbage spread on the road side or open spaces leading to unhygienic living conditions. The garbage spread on the road sides or open spaces leading to unhygienic living conditions. The garbage is removed by the municipal bodies and dumped at the sanitary land fill or converted to compost. The projected generation of solid waste is given in the table 16.9. It is assumed that 300 grams of solid waste generated per capita per day.

TABLE 16.9 PROJECTED QUANTITY OF SOLID WASTE GENERATED

Year	Population	Projected quantity of solid waste generated(in tonnes) per day	Quantity of solid waste collected in (tonnes)	Back log (in tonnes)
Present status	51,960	15.59	10.00	5.59
2011	63,000	18.90		
2021	77,000	23.10		

17. POLICIES FOR FUTURE DEVELOPMENT

17.1 BROAD POLICIES ADOPTED IN PLANNING

- **Planning area is limited to the Changanassery Municipal town area. This facilitate the implementation of the plan by the statutory authority (Municipal council) itself.**
- **When compared to the eastern part of the town, the western part is comparatively undeveloped. Emphasis will be given for fast development of the western part of the town.**
- **Re-densification of the low density residential area is proposed in the plan. This makes the optimum utilization of service facilities.**
- **Importance shall be given for the protection of environmentally sensitive areas like paddy fields, natural drains, water bodies etc.**
- **Utmost priority will be given for the industrialization and it is the major sector identified for the economic development of the town.**
- **Commercial development and Education are the other two major activities identified for the town.**
- **Provision of infrastructural facilities such as water supply, power, electricity to the population as per norms and standard.**
- **Transportation network has been proposed, considering the proposed land use pattern, the projected traffic demand and the proposals of the present development plan.**
- **Due importance will be given for the preservation and conservation of heritage buildings.**

- **The eastern bye-pass road area and a stretch of land along the western bye pass area will be taken as residential mixed area. This area will provide adequate land for various urban activities.**

- **Optimum utilization of available resources and adoption of innovative approaches for fiscal resource mobilization.**

17.2 PLANNING AREA

In the light of 74th Constitution Amendment Act and considering the status as the local Self Government, Planning area is limited to the Changanassery Municipal town area. This facilitate the implementation of the plan by the statutory authority (Municipal council) itself. The policies for future developments are framed considering this factor also.

17.3 POPULATION OF THE TOWN

The town is registering a decreasing growth rate and the estimated population of the town by 2011 i.e. 63,000 and by 2011 is 77,000. In order to attract more population to the town and to maintain a constant population growth rate following policies are adopted.

Policies

- Development of secondary sector to attract more population to the town. Cottage industries and non – nuisance type Service industries preferring for the town
- Development of commercial and educational activities as the secondary activities to attract more population to the town.

17.4 DEVELOPMENT STRATEGIES

17.4.1 Economic Development

Following strategies adopted for the economic development of the town.

- Industrial development, mainly cottage industries and non-nuisances type cottage industries proposing for the town.
- Development of the commercial activities of the town

17.4.2 Industrial sector

Low rate of industrialization is the major drawback for the development of the town.

Policies

- Cottage industries and non – nuisance type Service industries preferring for the town

- Creation of an atmosphere for the safe investment
- Promotion of industries based on rubbles, plastic and wood, which are the raw materials available locally.
- Promotion of cluster type of industrial development

17.4.3 Commercial development

Changanassery was one major market of Kerala and gradually it lost its importance. In order to regain the status as a major market following strategies are adopted.

Policies

- enlarging the existing CBD area for commercial development and provide new location for the same
- establishment of open market for farmers
- improving the accessibility to the market
- enlarging the existing C.B.D area for commercial development and provide new location for the same.

17.4.4 Agricultural sector

Nearly 24% of the total town area is paddy fields. As mentioned earlier major portion of the paddy fields remain uncultivated and it leads to many environmental problems.

Policies

- retain cultivable paddy fields and promote paddy cultivation
- adoption of multi-crop pattern
- promotion of fish farming
- promotion of vegetable and flower cultivation

17.4.5 Infrastructural facilities

Availability of proper infrastructural facility is necessary for any development.

Policies

- A road network that will give accessibility to the poorly developed area to reduce the present congestion in the C.B.D Area.
- Open up those areas having poor accessibility and accelerate development of these area
- Proper communication between interior zones
- Improvement of terminal facilities
- Augmentation of water supply and improvement of distribution network
- Desilting and strengthening of drains
- Progressively go in for privatization

17.4.6 Education

Three first grade Arts and Science Colleges in the town and three Engineering colleges and three Medical Colleges in the surrounding area meets the demand for higher education of the region.

Policies

- diversification of courses in the above colleges
- making the colleges as centres of excellence.

17.4.7 Tourism

Develop Changanassery as a major tourist transit centre between Alappuzha and Thekkady. Exploit the potential of canal network available in the town.

17.5 RESOURCE MOBILIZATION

Major constraint in the implementation of projects for the provision of various urban utilities and services is the inadequate fiscal resources.

Policies

- Effective tax collection and adopting innovative approach
- Promoting private sector investment
- Using urban land for resource generation

17.6 PROJECT IMPLEMENTATION

Difficulties in land acquisition, lack of fiscal resources etc are the major constraints in project implementation

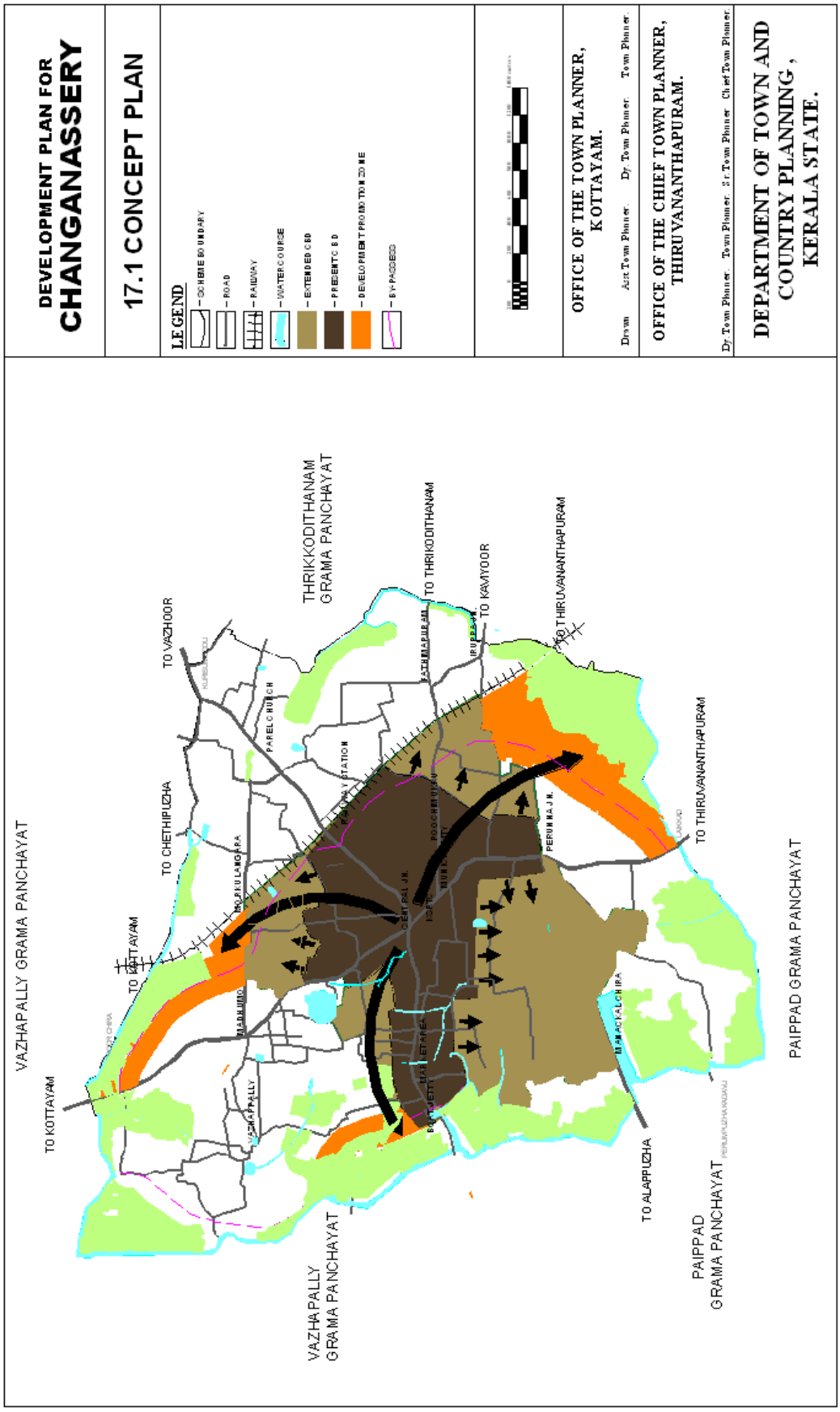
Policies

- Public-private participation in project implementation
- Participation of beneficiaries in plan implementation

17.7 CONCEPT PLAN

On the basis of analysis and projection a concept plan has been evolved. It is represented in map 17.1 Following are be concepts.

- Extension of present C.B.D
- Future development of the town is to be along the eastern and western bypass
- Decentralization of activities
- Protection of environmentally sensitive areas


DEVELOPMENT PLAN FOR
CHANGANASSERY
17.1 CONCEPT PLAN
LEGEND
– SCHEME BOUNDARY
– ROAD
– RAILWAY
– WATER COURSE
– EXTENDED CBD
– PRESENT CBD
– DEVELOPMENT PROMOTION ZONE
– BY-PASSES
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Drawn Asst Town Planner Dy. Town Planner Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner Town Planner Sr. Town Planner Chief Town Planner
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
VAZHAPALLY GRAMA PANCHAYAT
TO KOTTAYAM
TO KOTTAYAM
TO CHETHIPUZHA
TO VAZHOOR
THRIKKODITHANAM GRAMA PANCHAYAT
TO THRIKODITHANAM
TO KAVIYOOR
TO THIRUVANANTHAPURAM
TO THIRUVANANTHAPURAM
TO ALAPPUZHA
VAZHAPALLY GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT

18. LAND USE PLAN 2021

18.1 INTRODUCTION

Land use plays a major role in the process of evolving better environment. Better management and distribution of activities in the town will reduce many problems relating to traffic and service provision.

Changanassery is expected to be a service town and land use plan for 2021 is proposed in tune with the policies mentioned in previous chapter considering the present trend of land development and also based on projected requirements. Map 18.1 shows the proposed land use for 2021.

18.2 RESIDENTIAL USE

Assuming an average residential density of 100 persons per hectare, it is estimated that 770 hectares of land is required for residential use by 2021. The additional space for residential use is made available by re-densification of source of the low density residential pockets and by bringing additional land under residential use. An area of 663.1 hectares of land has been reserved for residential purpose as residential zone. In addition to that an area of 159 Hectares of land has been proposed as residential mixed zone

18.3 COMMERCIAL USE

The commercial activities of the town is presently concentrated in the Boat jetty road, M.C. Road from S.B College to Perunna and in Vazhoor road from Central junction to Railway station. In the proposed land use plan 68.58 hectares of land has been set apart for commercial use and this include area for both wholesale and retail shops. Since the major portion of the hinterland of the town is at the eastern part of the town, a new commercial node is proposed in Vazhoor road near Parel church as, Vazhoor road is the major travel corridor connecting the town with its hinterland on the eastern side. In addition to the exclusive commercial area commercial activities are also permitted in all major roads with certain restrictions.

18.4 PUBLIC AND SEMI PUBLIC USE

At present 87 hectares of land is coming under public and semi public use. All land which are presently under public and semi-public use is proposed to be retained as such for this purpose and no new land is proposed for this use.

18.5 INDUSTRIAL USE

As per the land use survey 2002, hardly 5.76 hectares of land, which is 0.43% of the total town area is coming under the industrial use and it is scattered along different part of the town. In this plan there is no proposal for an exclusive industrial zone. As only cottage

industries, service industries of non nuisance nature is proposed within town limit, provisions are incorporated in certain other zones for setting up of these type of industrial units under certain conditions.

18.6 TRANSPORTATION ZONE - 1&2

The CBD has acute parking shortage. The absence of vacant lands within the CBD has put a restriction on proposing off street parking space within the CBD area. However there are vacant lands available in close proximately to the present CBD. Since an expansion of the CBD could be expected during the plan period, it is advisable to make a provision for off street parking lots in the immediate vicinity of the present CBD. A transportation zone 2 which can accommodate both public and private parking is proposed near central junction (Kavala) by the side of P.P. Jose road. The proposed site has an extent of 0.83 hectares. The permissible and restricted uses for transportation zone is given in 'Chapter 24, Zoning Regulations'.

18.7 PARKS AND OPEN SPACES & RECREATIONAL USE

In addition to the existing land under park and open spaces, proposals are there for Park and Open Spaces at Poovakkattuchira, Manackalchira. A total area of 5.15 hectares has been proposed in this regard. A total area of 7.62 hectares has been proposed for recreational use. It include the International Stadium at Perunna, present Stadium in T.B.Road and recreational area near Boat Jetty.

18.8 AGRICULTURAL USE (Paddy /Environmentally Sensitive zone and Developable Agricultural zone)

319.04 hectares of land which is 23.63 % of the total town area is coming under paddy fields. In 75% of the paddy field there is no paddy cultivation and the remaining are marshy land. A portion of the uncultivated paddy field can be utilized for different urban activities, as it is not economical to bring back many of the uncultivated paddy to cultivable form. In this plan an area of 185.9 hectares of land is proposed to retained as paddy / Environmentally sensitive zone and 39.10 hectares of land has been proposed as Developable Agricultural zone.

18.9 MIXED ZONE

Major portion of land on either side old M.C. Road By-Pass and a portion of land along the Western By-Pass adjacent to Market area has been proposed as Residential Mixed Zone. It is generally a mixed zone and many non-residential uses like commercial, small-industrial, public use etc are also permissible in this zone I addition to residential use subject to certain conditions. An area of 159.60 hectares of land has been proposed under this zone.

MAP 18.1-A3 MAP PROPOSED LAND USE

18.10 ABSTRACT OF PROPOSED LAND USE 2021

The abstract of the proposed land use 2021 is presented in the table 18.1

TABLE I8.1 PROPOSED LAND USE 2021

Sl. No.	Land use	Area in hectares	Percentage of total area
1	Residential	663.1	49.12
2	Commercial	68.58	5.08
3	Public and Semi Public	86.98	6.44
4	Transportation	91.47	6.78
5	Recreational Use	7.62	0.56
6	Park and Open spaces	5.15	0.38
7	Paddy / Environmentally Sensitive Area	185.9	13.77
8	Developable Agricultural Area	39.10	2.89
9	Residential Mixed Use	159.60	11.82
	Water bodies	42.50	3.14
	TOTAL	1350	100.00

19. INFRASTRUCTURE PLAN 2021

19.1 INTRODUCTION

Infrastructure is the basic requirement of urban life and its adequacy and accessibility are the two important ingredients and key contributors in the upgradation and enrichment of quality of urban life, which is the primary objective of any planned development effort.

The extent and nature of problems faced by the town has already been mentioned in previous chapters. In the infrastructure plan 2021 the future infrastructural support to the town such as transportation, water supply, solid waste disposal, electric supply, surface drainage, housing, parks and open spaces etc. are proposed. This will promote the economic development of the town and will provide the essential urban facilities. Map 19.1 shows the location of major projects.

19.2 TRANSPORTATION

Transportation plan, discuss about three modes i.e. roadways, water ways and railways. While formulating the plan importance has been given for inter-modal co-ordination and inter-change facilities. Due importance has been given for providing an efficient transportation system considering the future traffic also. Transportation plan 2021 is given in chapter 20.

19.3 WATER SUPPLY

The water demand for the horizon year is estimated as 13.75MLD. The capacity of the present water supply system is to be increased by 4.25 MLD. Following are the major suggestions in this sector.

- Augmentation of the present water supply system to improve its capacity.
- Improvement of the distribution system by replacing the existing pipelines and by improving the efficiency of pumping from Perunna sump tank to Cherukarakunnu.
- Isolation of elevated water scarcity areas and providing separate distribution system to these areas.
- Encouraging rainwater harvesting to re-charge the ground water.

- Improving the public water supply system by providing additional public taps.

19.4 SOLID WASTE DISPOSAL

The solid waste generated by the year 2021 is estimated as 23.10 tonnes. An average 8-10 tonnes of solid waste is being collected per day now. So the collection, transportation and disposal system have to be upgraded to handle the additional quantum of solid waste. Following are the proposals to improve the collection and disposal of solid waste.

Collection

- A system for segregation of waste at source and door to door collection.
- Provision of additional bins at different points as per the standard
- Collection points in all developed areas.
- Collection of wastes in off-peak hour.

Transportation

- Improvement and modernization of fleet of vehicles for collection of waste and minimize air pollution.
- Optimum utilization of the current fleet of vehicles by conducting the waste collection operations in two shifts.

Disposal

- Improving the environmental condition of the present site and its surroundings at Fathimapuram.
- Expansion of Vermi-composting plant.
- Segregation of waste and land filling.
- Landscaping the surrounding area of dumping yard with trees absorbing poisonous gas.

19.5 SEWERAGE

A proper system of sewerage is essential to check decay in the environment as well as to provide hygienic living conditions to the population. The proposals in this sector include

- Provision of community level septic tanks in the squatter settlements.
- A sewerage system with treatment facilities, by the end of the plan period.

19.6 SURFACE DRAINAGE

The drainage system of the town is governed by natural drainage course and topography. Following are the proposal to improve the surface drainage.

- Cleaning blocks along the existing drainage channels to ensure free flow of water.
- Provision of road side drains in flood affected areas
- Regulation for conserving the existing water collection basins like paddy fields and water bodies.

19.7 ELECTRICITY

The estimated requirement of electricity by 2021 is estimated as 15400 kw. Provision of additional feeder lines, transformer etc are essential to improve the power supply.

19.8 CREMATION/BURIAL-GROUNDS

Setting up of an electric crematorium at the site of the present burial ground at Fathimapuram is proposed.

19.9 HOUSING

In housing sector intervention is essential in improving the structural conditions of Kutcha buildings and for the improvement of slums.

Improving the structural conditions

1541 houses, which is 13.52 percentage of the total housing stock which is belonging to the economically weaker section, need improvement in structural conditions.

Rehabilitation of slum dwellers

916 persons of 206 households of following slums living in puramboke land need immediate rehabilitation. Land for rehabilitation of these households has to be identified at different parts of the town and arrangements for financial assistance for construction of houses also to be made. Also steps are to be taken to prevent formation of slums again in future at the vacated land.

- Fathimapuram Railway Colony – 2
- Fathimapuram Railway Colony - 1
- Railway Colony
- Olassa colony

- Kunnakkattukulam
- Malayilkkunnu
- Morkulangara
- Madaraveedu
- Randukuzhichira

Slum improvement programme

In almost all the remaining 23 slums, many of the basic infrastructural facilities are absent. So a programme for providing better living environment to these slum dwellers is highly essential. Following 10 slums need immediate attention, as the housing quality of these slums is very poor.

19.10 PARKS AND OPEN SPACES & RECREATIONAL AREA

For meeting the recreational needs of the people following sites are identified

- Poovakkattuchira – Developing as a regional recreational centre.
- Park and OpenSpaces and water front recreational centre at Manakkalchira.
- Construction of a stadium of international standard at Perunna
- Existing Stadium near T.B
- Recreational area near Boat Jetty

19.11 INDUSTRIAL DEVELOPMENT

Secondary sector has been identified as a major sector for the economic development. Following are the proposals for the industrial development.

- Mini Industrial estate at Fathimapuram.
- Development promotion zones along the M.C. Road Bypass for setting up small-scale industries.
- Promotion of cluster development of industries utilizing the facilities of Veroor Industrial Estate.

19.12 TOURISM DEVELOPMENT

For the development of both domestic and foreign tourism following proposals are included in the plan.

- Park and Open Space and Recreational areas mentioned in paragraph 19.10).

- Development and rejuvenation of canals and promotion of canal and backwater tourism.
- Programme for utilizing the tourism potential of heritage buildings.

19.13 HEALTH FACILITIES

The town provides medical facilities for a large population of the hinterland. But for higher order facilities they have to depend on Kottayam District Hospital and Medical College or the private hospitals at Kottayam or Thiruvalla. For improving the Medical facilities of the town following are the major proposals.

- Increasing the bed strength of the Taluk Hospital by constructing new buildings and the other associated infrastructural facilities.
- Starting new departments including super specialties in the taluk hospital.
- Provision of facilities like scanning, blood banks, etc.
- Construction of new building for the Ayurveda hospital.
- Upgradation of the Government Homeo Hospital.

19.14 EDUCATION

In order to regain the status of Changanassery as a major educational centre, following proposals are included in the plan.

- Diversification of courses in the colleges and starting of new courses.

19.15 AGRICULTURE

In this plan 188.30 Hectares of paddy fields is proposed to be retained for agricultural purpose and designated as Paddy / Environmentally sensitive area and Developable Agricultural Area. Strict zoning regulations are imposed for the protection of the paddy fields. Following are the proposals in this sector.

- Cleaning and rejuvenation of canals
- A project to clear weeds and grass from the fields.
- Promotion of fish farming
- Promotion of cultivation of flowers and promotion of the cultivation of flowers and plants of medicinal value
- Establishment of an open market for farmers

19.16 HAWKING AREA

74 Hawkers / vendors stabled at different parts of the town. These hawkers have significant role in the economy of the town and providing job opportunities. A separate area for the hawkers is proposed at the following places.

- Adjacent to the new bus terminal in the Railway station area
- The area presently used as bus station in the Vazhoor road

19.17 HERITAGE

Programme for the conservation / preservation of the following buildings which have heritage value are proposed.

- Vazhappally Mahadeva temple
- Perunna Subshramanya Swami temple
- Metropolitan church
- Lakshmipuram palace
- Anchuvilakku

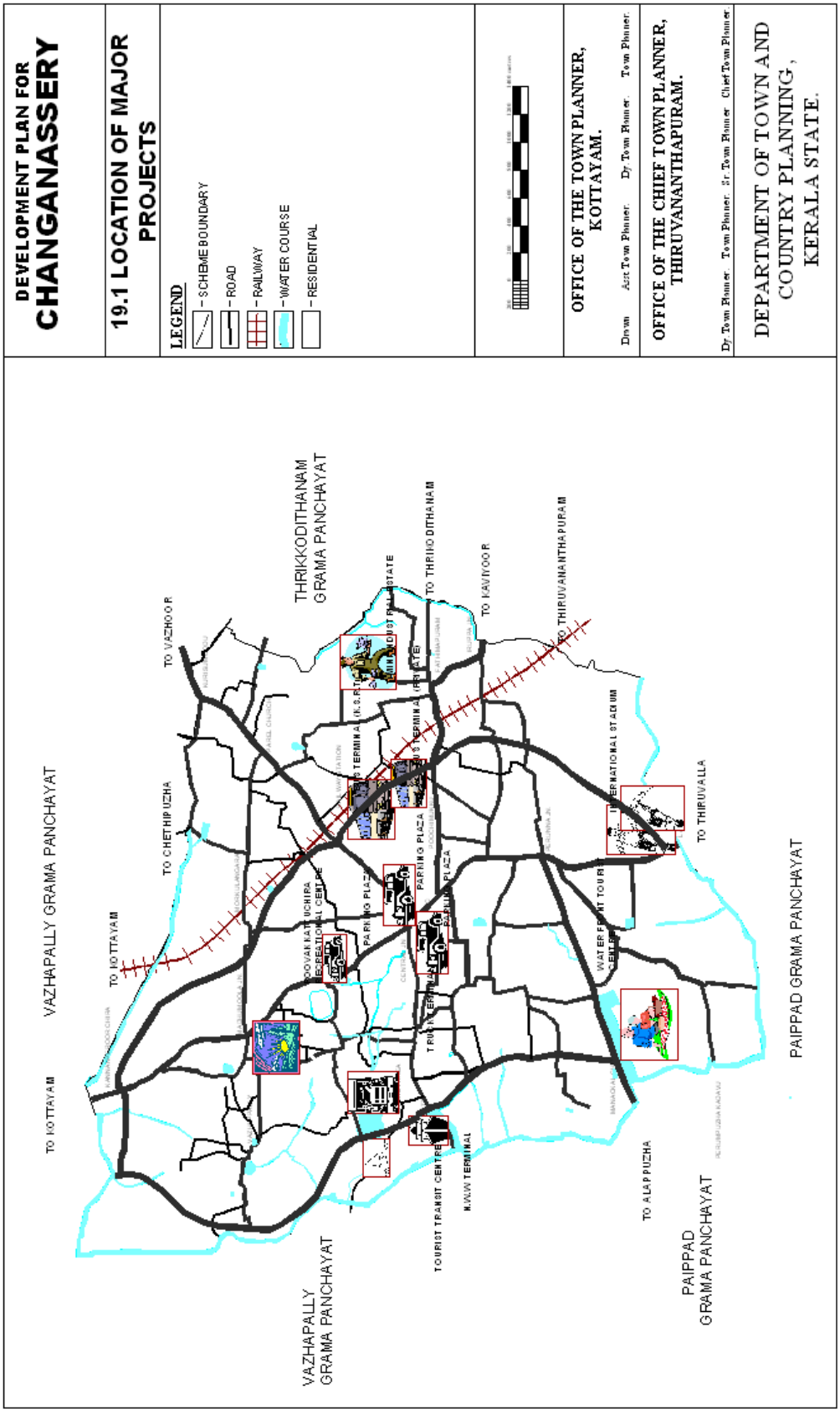
19.18 MARKET

A modern market is proposed in the present market area near Boat Jetty. An open market for farmers.

19.19 ENVIRONMENTAL

For the improvement of the environmental quality and conserving the environmentally sensitive area following proposals are included.

- Rejuvenation of canals and drains
- Conservation of paddy fields and encouraging cultivation
- Provision of drains in water logged area
- Slum improvement programs
- Conservation of following ponds
    - Poovakkattu chira
    - Vazhapally temple pond
    - Sree Krishna temple pond
    - Annapoorneswari temple pond
    - Chitrakkulam
    - Perunna temple pond
    - Vishnu Temple pond


DEVELOPMENT PLAN FOR
CHANGANASSERY
19.1 LOCATION OF MAJOR PROJECTS
LEGEND
- SCHEME BOUNDARY
- ROAD
- RAILWAY
- WATER COURSE
- RESIDENTIAL
OFFICE OF THE TOWN PLANNER, KOTTAYAM.
Asst Town Planner
Dy Town Planner
Town Planner
OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.
Dy. Town Planner
Town Planner
Sr. Town Planner
Chief Town Planner
DEPARTMENT OF TOWN AND COUNTRY PLANNING, KERALA STATE.
TO KOTTAYAM
VAZHAPALLY GRAMA PANCHAYAT
TO KOTTAYAM
TO VAZHOOR
TO CHETHIPUZHA
THRIKKODITHANAM GRAMA PANCHAYAT
TO THRIKODITHANAM
TO PAVIYOOR
TO THIRUVANANTHAPURAM
TO THIRUVALLA
TO ALAPPUZHA
VAZHAPALLY GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT
PAIPPAD GRAMA PANCHAYAT

20. TRANSPORTATION PLAN 2021

20.1 INTRODUCTION

Transportation plan 2021, discuss about three modes i.e. roadways, water ways and railways. While formulating the plan importance has been given for inter-modal co-ordination and inter-change facilities. Due importance has been given for providing an efficient transportation system considering the future traffic also. Map 20.1 shows the proposals in the transportation sector.

20.2 ROADWAY

Eventhough, the road density of the town is highest in the district, two roads, i.e M.C.Road and C.V.Road, carry major share of traffic through the town. Narrowness and poor surface condition of the existing roads and some missing links in the existing network are the reasons for this. In addition to that major traffic generating activities of the town are located in the above roads. Emphasis has been given for the improvement of road network by developing some existing roads, providing new links etc. New bus terminals are proposed considering inter-model change facilities and improving the bus routing system of the town. The shifting of bus terminal, from the C.B.D area of the town will decentralize some activity, which will help in reducing the congestion in the central area.

20.2.1 Proposed road network 2021

The existing road network of the town is not following any particular pattern due to topographical reasons. But it closely resembles radial pattern. The proposed road network of the town is shown in map 20.1. Three categories of the roads i.e. Arterial roads, sub-arterial roads and collector roads are proposed in the plan and details of these roads are shown in table 20.1, 20.2 and 20.3 respectively. Most of these roads are formed by widening the existing roads and few roads are also proposed for opening more land for various urban activities.

20.2.2 Arterial Roads

Principal road network for through traffic is included in this category. It is expected that these roads will carry major share of intra-urban traffic. Following are the major arterial road projects.

i. M.C. Road By pass

ii. Changanassery – Alappuzha road

iii. M.C.Road (Perunna to Laikkad)
iv. Changanassery-Kaviyoor road (from MC road bye pass to Municipal boundary)
v. Changanassery-Vazhoor road (from MC road bye pass to Municipal boundary)
vi. Western By pass
vii. Vazhapally Coloney Road

20.2.3 Sub-Arterial Roads

These streets are of a lower level of travel mobility than arterial streets. Following roads are designated as Sub-Arterial roads.

i. M.C. Road (Existing alignment)
ii. Perumpuzhakkadavu road (Perunna jn. to Panachimukku jn)
iii. Changanassery-Kaviyoor road (From Municipal office junction to M.C. Road Bye-pass)
iv. T.B. Road (up to Kavil temple)
v. Changanassery-Vazhoor road (From central junction to M.C. Road Bye-pass)
vi. Mathumoola – Parelpalli road

20.2.4 Collector roads

Collector street is one intended for collecting and distributing the traffic to and from Sub – arterial road and also for providing access to arterial streets and these are located in residential neighborhood, business areas. Following roads are identified as collector roads.

i. Perunna temple road
ii. Kakkattukadavu road (Panachimukku jn to Kakkattukadavu road)
iii. Perumpuzhakkadavu road (Panachimukku jn to Perumpuzhakkadavu)
iv. Manakkalchira - Perunna temple road
v. Mannam road (Perunna jn to Iruppa L.C)
vi. Perunna – Iruppa road (Via Thirumala)
vii. Fathimapuram – Pottasseri road
viii. Parayil slum road
ix. Fathimapuram – Parel Church road
x. Fathimapuram – Kunnakkattukulam road
xi. Holichurch English Medium school road
xii. Anandasramam – Kurissumood road (Via Chethipuzhakkadavu)
xiii. P.P.Jose Road
xiv. Mathumoola – Vazhappally temple road
xv. Annapoorneswari temple road
xvi. Mathumoola – Market road
xvii. Poovakkattuchira road (M.C. Road to western by pass)

xviii. Boat Jetty road
xix. Market – Puzhavathil road
xx. Metropolitan church road (municipal stadium to Market)
xxi. Pandakassalakkadavu road
xxii. Chithrakulam road
xxiii. NSS- Lekshmipuram (MC road to Lekshmipuram via Puzhavathil road)
xxiv. Avani road
xxv. Manakkalchira – Puzhavathil road
xxvi. Boat Jetty Road Extention
xxvii. Hospital road
xxviii. Poochimukku – NSS College road
xxix. Pattathimukku – NSS College road
xxx. EMS Road – Vettadi Temple Road

20.2.5 Bus Terminal Facilities

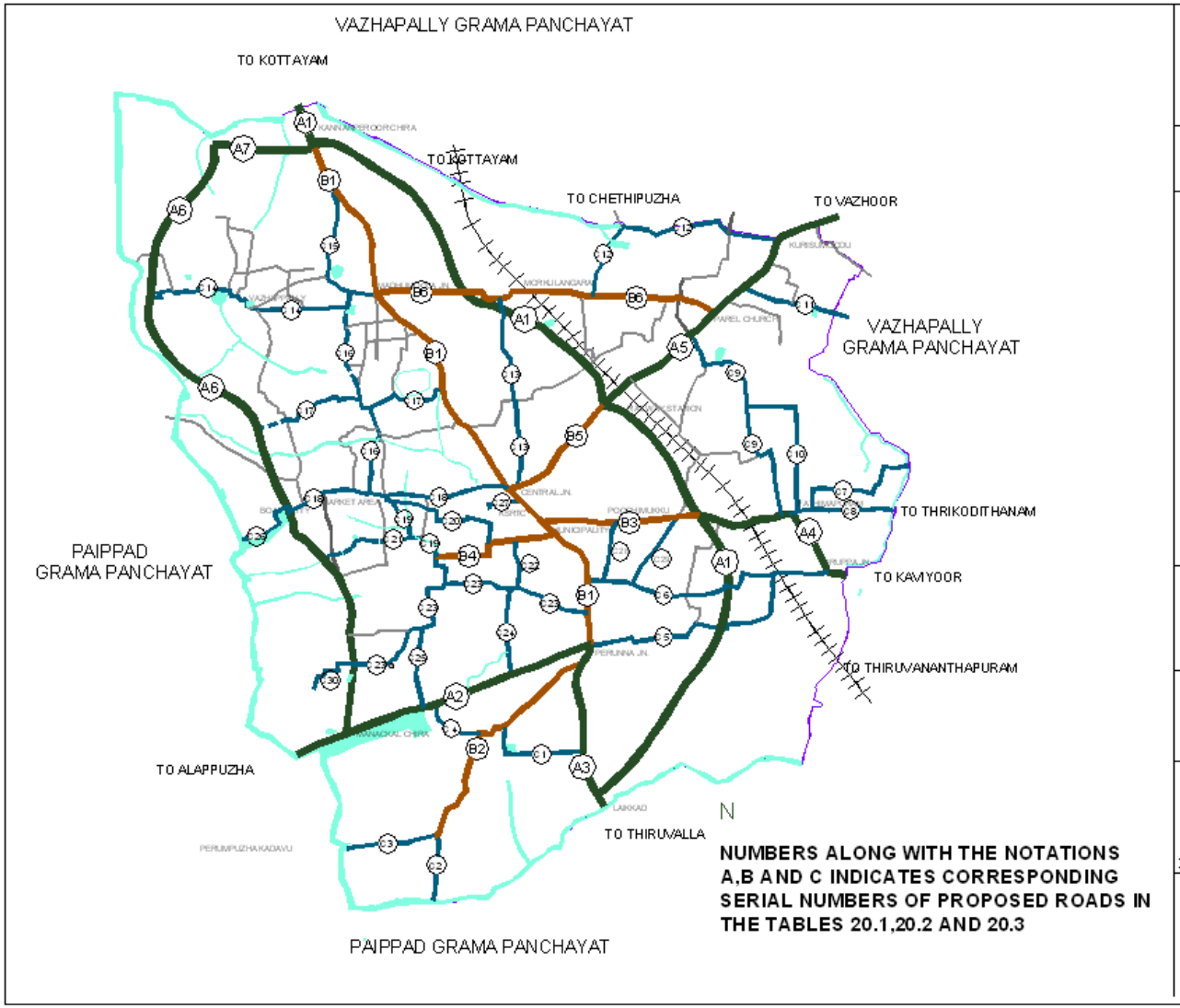
The condition of the existing bus terminals of the town has already been mentioned in the previous chapters. Moreover the existing bus stations are major traffic generators of the town and these stations are located about 250m apart. In order to decentralize some activities from the town centre two new bus terminals are proposed in the M.C.Road by-pass. The location of these terminals adjacent to the Railway Station will facilitate inter-model change facilities.

20.2.6 Parking Facilities

As noted in 18.6, Transportation zone 2 is proposed by the side of P.P Jose road near Central Junction (Kavala). This will accommodate off street parking facilities also.

20.2.8 Truck Terminal

Absence of an organized truck terminal is being experienced in Changanassery. Eventhough sufficient space is available at Vandipetta, facilities like rest room and dormitory for crew, service station etc. are not available. Eventhough the Municipality has started construction of truck terminal near vegetable market, its work is not completed. Early completion of this terminal with adequate amenities is essential. A road link from the Boat Jetty road and the proposed western by-pass is essential for the development of this terminal.



NUMBERS ALONG WITH THE NOTATIONS A,B AND C INDICATES CORRESPONDING SERIAL NUMBERS OF PROPOSED ROADS IN THE TABLES 20.1,20.2 AND 20.3

DEVELOPMENT PLAN FOR
CHANGANASSERY

18.1 TRANSPORTATION PLAN 2021

LEGEND

- SCHEME BOUNDARY
- ROAD
- RAILWAY
- WATER COURSE
- ARTERIAL ROAD
- SUB ARTERIAL ROAD
- COLLECTOR ROAD

OFFICE OF THE TOWN PLANNER, KOTTAYAM.

Drawn. Asst Town Planner. Dy. Town Planner. Town Planner.

OFFICE OF THE CHIEF TOWN PLANNER, THIRUVANANTHAPURAM.

Dy. Town Planner. Town Planner. Sr. Town Planner. Chief Town Planner.

DEPARTMENT OF TOWN AND COUNTRY PLANNING , KERALA STATE.

TABLE 20.1 LIST OF ARTERIAL ROAD (WIDTH 24m and 22m)

Sl. No.	Name of the road	Category	From	To	Length (in Km)					
					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	M.C. Road Bye pass	[illegible]	Vazhappally	Laikkad	5.50	2.00	5.50	18	24	3.00
2	A.C. Road		Perunna	Onnampalam	1.80		1.80	17	22	3.00
3	M.C. Road		Perunna	Laikkad	1.05		1.05	14	22	3.00
4	Kaviyoor Road		S.H. High School (pattathimukku)	Eruppa Bridge	1.07		1.07	8	22	3.00
5	C.V. Road		Railway statioln Jn	Kurisummood	1.34		1.34	15	22	3.00
6	Western Bye pass		Vazhappallychira	A.C. Road	0.86	3.10	3.96	13	22	3.00
7	Vazhapally Coloney Road		Palathara	Vazhapally Coloney	0.60		0.60	6	22	3.00

B. ARTERIAL ROAD (WIDTH 15.00 m)

Sl. No.	Name of the road	Category	From	To	Length					
					Widening of existing road (Km)	New Road (Km)	Total			
1	M.C. Road		Vazhappally chira	Perunna	3.65		3.65	12.00-16.00	15.00	3.00
2	Changanassery - Perumpuzha kadavu		Perunna	Panachikadavu jn	1.50		1.50	7.00	15.00	3.00
3	Kaviyoor Road		Municipal office jn	SH high School Pattathimukku	0.90		0.90	7.00-8.00	15.00	3.00
4	T.B Road		Post Office jn	Kavil Bhagavathi temple	0.67		0.67	5.00-13.00	15.00	3.00
5	C.V. Road		Central jn	Railway Station jn	0.80		0.80	12.00-15.00	15.00	3.00
6	Mathumoola - Parel palli road		Parel Church jn	Madummola Jn	1.75	0.23	1.98	`	15.00	3.00

TABLE 20.3 LIST OF COLLECTOR ROADS (WIDTH 12m / 8m)

Sl. No.	Name of the road	Category	From	To	Length (in Km)			Existing Width	Proposed Width	Building Line
					Width of existing road	New road	Total			
1	2	3	4	5	6	7	8	9	10	11
1	Perunna Temple road	Collector Street	Perunna Temple jn	Vallikkavu jn	0.63		0.63	8.00	12.00	3.00
2	Kakkattukadavu road		Panachikadavu jn	Kakkattukadavu	0.40		0.40	7.00	12.00	3.00
3	Perumpuzhakadavu Road		Panachikkadavu	Perumpuzhakadavu	0.55		0.55	7.00	12.00	3.00
4	Manakkachira-Perunna Temple road		Manackalchira	Perunna Temple	0.40		0.40	5.00	12.00	3.00
5	Mannam Road		Perunna jn	Erooppa level cross	1.37		1.37	5.00	12.00	3.00
6	Perunna-Eruppa Road		Perunna	Erooppa	1.45		1.45	7.00	12.00	3.00
7	Fathimapuram - Pattasseri Road		Fathimapuram jn	Pattasseri jn	0.40		0.40	3.0 - 5	12.00	3.00
8	Parayil slum road		Fathimapuram jn	Parayil slum	0.30		0.30	5.00	12.00	3.00
9	Fathimapuram - Parel church road		Parel church	Fathimapuram jn	1.39		1.39	5.0-6.0	12.00	3.00
10	Fathimapuram-Kunnakkattukula road		Fathimapuram jn	Kunnakkattukulam jn	0.70		0.70	5.00	12.00	3.00
11	Holychild English medium school road		Vazhoor Road	Municipal Boundary	0.56		0.56	5.00	12.00	3.00
12	Anandasramam - Kurisummood road		Anandasramam jn	Kurishummoodu jn	1.35		1.35	8.00	12.00	3.00

1	2	3	4	5	6	7	8	9	10	11
13	P.P.Jose Road		Central jn.	M.C. Road bypass			2.30	7.00	12.00	3.00
14	Mathumoola - Vazhappally temple road	[illegible]	Mathumoola jn	Parelkadavu (Western bye pass road)	1.50		1.50	3.5-6.5	12.00	3.00
15	Annapoorneswari temple road		MC Road	Mathumoola road	0.70		0.70	3.00	12.00	3.00
16	Mathumoola Market road		Mathumoola jn	Market road	1.03	0.15	1.18	6.0-6.4	12.00	3.00
17	Poovakkattuchira road		Poovakkattuchira	Western bye pass	1.00	0.30	1.30	4.0-6.0	12.00	3.00
18	Boat Jetty Road		Central ljn	Western bye pass (Boat Jetty)	1.30		1.30	10.0-13	12.00	3.00
19	Market - Puzhavathu road		Market	Kavil Temple Road	0.35		0.35	4.00	12.00	3.00
20	Metropolitan Church Road		Market	TB Road	0.70		0.70	8.0-11	12.00	3.00
21	Pandakasalakadavu road		Puzhavathu road	Western bye pass (Boat Jetty)	0.30	0.30	0.60	7.00	12.00	3.00
22	Chithrakulam road		TB Road	Hidayath jn	0.30		0.30	5.00	12.00	3.00
23	NSS - Lekshipuram road		Perunna NSS	Lekshmipuram	1.70		1.70	4.05	12.00	3.00
24	Avani Road		Hidayath	Avani jn	0.50		0.50	7.00	12.00	3.00
25	Manakkachira - Puzhavathu road		Puzhavathu	Manackachira jn	0.48		0.48	6.00	12.00	3.00
26	Boat Jetty Road Extension		Boat jetty	Municipal Boundary	0.8		0.80	3.00	12.00	3.00
27	Hospital road		M.C Road	Taluk Hospsital	0.25		0.25	5.00	12.00	3.00
28	Poochimukku - NSS College Road		Poochimukku	NSS College	0.32		0.32	7.00	12.00	3.00
29	Pattathimukku - NSS College road		Pattathimukku	NSS College	0.45		0.45	7.00	12.00	3.00
30	EMS Road - Vettadi Temple Road		Lekshmipuram	Vettady temple	0.45		0.45	6.50	8.00	3.00

20.3 WATERWAYS

Waterway system in the town is in undeveloped stage and only a small portion of the available waterways is utilized for services. Major factor hindering the development of water transport, are the slow phase of travel, unsuitability of the existing fleet in shallow canals etc. Nearness and connectivity with the National way No.3 (Vembanad lake) is helpful for the movement of passengers and goods and promotion of tourism. Following are the major proposals for development of waterways.

i. Rejuvenation of canals

Development of the following canals is helpful for using it for inter-city movements.

- Changanassery – Alappuzha canal
- Changanassery – Kottayam canal

ii. For improving the environmental condition in the western part of the town

Rejuvenation of following canals is necessary

- Chethipuzha-Palathara Thodu
- Menilam thodu
- Paral thodu
- Vettadi thodu
- Poova thodu
- Kathilkadav thodu and Kakkattukadavu thodu
- Boat Jetty canal
- Manchadikkara thodu
- Kakkan thodu
- Pandakassalakkadavu thodu
- Lakshmipuram thodu
- Fathimapuram thodu
- Avani thodu

ii Improvement of terminal facilities at the Boat jetty for both regular passengers and tourists.

iii Construction of a new cargo terminal with loading and unloading facilities.

iv Fleet improvement for reducing travel time and operation and maintenance cost .

20.4 RAILWAYS

Eventhough railway has no role in handling intra city passengers it is serving a large number of people in the hinterland. Doubling of the railway line through Changanassery is highly essential to improve the travel condition. The passenger facilities at the station are also to be improved.

21. RESOURCE MOBILISATION

21.1 INTRODUCTION

As already discussed in the chapter 13, money, manpower and land are the major resources for the development as far as Changanassery is concerned. This chapter focuses on the fiscal, land and human resources mobilization strategies to be adopted by the local body in meeting the resources for various development needs.

21.2 FISCAL RESOURCES MOBILIZATION

The reforms in financial sector and the new economic policies emphasize on transforming the role of government from provider to enabler. The traditional system of funding, based on plan and budgetary allocations, has to be reduced and ultimately withdrawn due to fiscal deficit compulsions. Availability of funds for implementing urban development plans and service delivery system will not be easy. This has implications for the local authorities to derive innovative methods for resource mobilization.

Implementation of the development plan and augmentation of urban services require massive financial investments which in the existing local fiscal situation, look quite a complex task. Urban areas have to be physically and economically rejuvenated to make them much more attractive for the new investments flowing in the wake of liberalization of industrial investments to take place there. The local bodies at present are handicapped by a frangible financial base, which has been declining. Resource mobilization efforts, therefore, have to consist of a number of policy interventions at state and local level. Following are some of the suggestions for fiscal resources mobilization.

- A policy decision to devote additional tax powers to the local bodies.
- Exploring the possibility of imposing land based (non-property) taxes for mobilization of financial resources. Possibility of imposing taxes like vacant/ Developed land tax, Tax on land value increment (LVIT), Betterment levy, Special Assessment. District

(SAD), Valorization charges, Development import Exaction (DIE) Development charges etc are to be explored.

- Effective Tax Administration
- Efficient pricing of directly changeable service like water supply, solid wastes collection and disposal, parks etc.
- The non-tax sources like remunerative and commercial projects, license fee, development charges, impact fees etc are promising areas for revenue generation and they should be exploited.
- The scope of institutional finance should be improved and along with that mobilization of funds from the debt markets should also be tapped.
- Public-private partnerships in implementation of projects. Build-own-operate-transfer (BOOT), Build-Own-transfer (BOT), Build-own-lease-transfer (BOLT) are the emerging variations of such partnership arrangement which need to be explored.

21.3 LAND AS A RESOURCE

Besides the above fiscal resource mobilization urban land is emerging as a new area for local resources generation and should be used as a resource for mobilization of funds.

Implementation of the plan proposals requires procurement of land either by way of private negotiation or through the Land Acquisition Act. Land procurement through such means naturally require huge capital investment which is beyond the fiscal capabilities of many of the local authorities. As a result, several plans remain only on paper. There is a growing consciousness that urban development should be self-financing with minimum burden on local bodies, state and central government. In the context of making the development schemes self-financing ,the following systems can be practiced.

- Land pooling and re-distribution scheme popularly known as town planning schemes.
- Transferable development rights.
- Accommodation reservation

21.4 HUMAN RESOURCES

Human resource, which is available in abundance has to be utilized for the economic development of the town. Following suggestions are proposed for mobilization of human resource.

- Programmes for developing the enterprenuership of the people for starting new enterprises.
- System for getting easy financial assistance and technical advice.
- Involvement of beneficiaries in project implementation in the form of voluntary service.

21.5 LEGISLATIVE SUPPORT

Legal support is required for the suggestion contained in the previous paragraphs. So the relevant acts and Development control rules are to be modified to enable the local body to make their resources mobilization more effective.

22. STRATEGIES FOR IMPLEMENTATION

22.1 INTRODUCTION

The development plan has traditionally been used as a tool to guide the urban development process. But in many cases, the desired result has not been achieved. It is, probably, because the implementation process was slow, restrictive and regulatory where the positive results were not seen immediately. This has generated a general apathy among people,polititions and administrators who are generally interested on quick and visible results. So the plans thus have become a target for severe criticism. The hurdles in the implementation of plan proposals and the strategies for implementation of plan proposals are discussed in this chapter.

22.2 HURDLES IN IMPLEMENTATION

Major objectives of Development Plans are to meet the physical, social and economic needs of a community by creating a better quality environment and to suggest policy measures to bring about the betterment of the community. But there are certain hurdles in the implementation stage to achieve the objectives of the plan. Following are the source of the issues in smooth implementation of plan.

- More often, the public agencies, who are supposed to implement the plan have their own agenda, which may not be in line with the approach of development plan.
- Though a significant portion of the developments falling place due to the initiate of private sector, this factor is not recognized in the plan.
- Except for a broad indication of the probable financing of the plan, no details are worked out mainly because the projections are so uncertain. Besides many programmes are conceptual and not backed by feasibility studies and financial resources.
- The concerns of the poor, informal sectors and similar weaker sections does not get reflected to the policies of the plan.
- The plans are conceived without considering the developments taking place in the area during the plan period, due to various reasons.

- Mechanism for public participation is very ineffective.
- Limited financial resources of the implementing agencies.
- Rigid laws and regulations regarding the management and promotion of development.

22.3 STRATEGIES FOR IMPLEMENTATION

Following strategies are adopted for the implementation of the plan.

- Integration of the proposals, with the programmes of the line departments.
- Involving the private sectors in the urban development programmes.
- Participatory approach in plan formulation and implementation.
- Detailed analysis of project cost, phasing and linking it with various financial sources under different schemes.
- Liberal rules and regulations for management and development promotions.

23. PROJECTS

23.1 INTRODUCTION

Major projects included in the plan, which are to be implemented within the plan period of 20 years, is presented here. Major components of the projects, approximate cost of projects, anticipated project benefits, financing mechanism, implementing agency etc are furnished in table 23.1.

23.2 PROJECT COST

Only rough cost estimate for the capital investment of each projects is given in table 23.1. The total estimated cost of the projects at the 2003 price level is 10474 lakhs (rough cost estimate only). Detailed financial analysis and cost estimation of each project is to be done during the implementation stage.

23.3 PROJECT BENEFIT

The anticipated benefit of each project is presented in the table 23.1.

23.4 FINANCING MECHANISM

This part proposes various instruments for raising funds for the implementation of the project. It includes plan fund, loan/grant from the Central and State Government, Private sector investments etc.

23.5 ADDITIONAL STUDIES

For the major projects, detailed investigations and studies like Environment Impact Assessment.

23.6 DETAILED TOWN PLANNING SCHEMES AND PROJECTS

Procedures for preparing Detailed town planning schemes for all new roads are taken immediately after publishing the Development Plan. Detailed town-planning schemes also to be prepared for all other developed areas on priority basis.

Road widening projects are also to be formulated for the existing roads based on the provisions of existing Acts and Rules.

Table 23.1- A3 SIZE

Table 23.1

Table 23.1

Table 23.1

Table 23.1

24. ZONING REGULATIONS

24.1 GENERAL CONDITIONS

1. All future developments shall be in conformity with the provisions of the Development Plan for Changanassery Town. The zonings regulation of the Development Plan for Changanassery is given in the Table 24.1.

2. For the implementation and enforcement of the proposals envisaged in this Development Plan areas have been zoned under various categories such as *residential, residential mixed, commercial, public and semi-public, transportation, recreational , parks and open spaces, paddy / environmentally sensitive zone, developable agricultural zone, water bodies etc*. Details regarding the nature of uses *'permitted'*, uses *'restricted'* and uses *'prohibited'* in each zone are given in the accompanying sheets. These regulations shall be enforced in conjunction with other specific provisions if any mentioned elsewhere in the scheme.

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, Changanassery Municipality, *hereinafter referred to as the 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 studied based on their performance characteristics and special locational factors. Such cases which come under this category are classified as *"Uses Restricted*". Restricted – 1 category deals with the uses that shall be restricted by the Secretary with the concurrence of the Town Planner of the District office of the Department of Town and Country Planning. Restricted – 2 category deals with the uses that shall be restricted by the Secretary with the concurrence of the Chief Town Planner of the Department of Town and Country Planning.

4. *"Uses prohibited"* enlists the various objectionable uses in each zone which shall not be permitted under normal circumstances.

5. 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 scheme. They are essentially intended to help the competent authority in decisions regarding granting or refusal of permits for land development and construction of buildings/ structures.

6. If any portion of a zone is put to a *"Use Prohibited"* as stated in Para 2, before the sanctioning of the scheme, 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 Chief Town Planner.

7. Existing areas and structures of archaeological importance, agricultural uses and religious uses may be permitted to continue in all the zones and shall not constitute non conforming uses. Efforts are to made for conservation of heritage buildings and structures mentioned in the chapter 12.

8. 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 centerline of the road, unless otherwise specified in the scheme or in any detailed road alignment approved by the Chief Town Planner.

9. Subject to zoning regulations of the respective use zones, more than one uses may be combined in a building, provided that the total floor area of such a building shall not exceed the maximum floor area permitted for any of such use premises in that use zone.

10. For the purpose of these regulations, floor area means the total floor area of the building on all floors.

11. Land to a depth of 150 m (from the central line of the road) in residential zone on either sides of the following roads viz. A.C Road, M.C Road, Kaviyoor Road, C.V Road and T.B Road is deemed as Residential Mixed use Zone.

12. In case of plots (of single ownership under a single land document) which falls in more than one zone except in paddy / environmentally sensitive zone and developable agricultural zone, the zoning regulation of major (more than 75% of plot area) portion of the plot is applicable to the remaining portion of the plot also.

TABLE. 24.1 ZONING REGULATIONS

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
1	**RESIDENTIAL ZONE**			
) enozl at nedlse:R	All Residences including apartments, Night Shelters, Orphanages, Old Age Homes, Dharmasala, Residential Quarters.	Automobile workshops for 2/3 Wheelers upto 200 sq.m subject to the condition that minimum access width to the plot shall be 7m.	Educational institutions of higher order.subject to the condition that minimum access width to the plot shall be 9m	All other uses not mentioned in column 2,3 and 4
	Retail Shops, weekly markets, restaurants, professional offices, banking and financial institutions, ATMs, Gymnasium/Yoga Centers - floor area of up to 200 sq.m.	Educational institutions up to Higher Secondary level, Hostels, Technical training institutions, subject to the condition that minimum access width to the plot shall be 7m	Fuel Filling Stations, Ashram /Mutt.	
	Cottage Industries, Service Industries of non-nuisance Nature (See Annexure A.XXV), with number of workers limited to 6 without power or 3 workers with power limited to 5 HP).	Auditorium/Wedding Halls/ Community halls up to 1000 sq.m of floor area, subject to the condition that minimum access width to the plot shall be 9m	Health centers up to 20 beds.	
	Public Utility Areas & Buildings essentially serving the needs of the local community.	Other Publlic Utility Areas&Buildings Guest house for public sector institutions.	Auditorium / Wedding Halls / Community halls above 1000 sq:m (subject to the condition that minimum access width to the plot shall be 12m)	
	Day Care and Creche, Nursery / Kinder Garten, Primary/Upper Primary School, Police Post/Police Station, Library and Reading Rooms, Clinics (out patients), social welfare centers.	Swimming Pools, Exhibition centers and Art gallery, Places of Worship, indoor games stadium etc only for meeting the demands of the local community.		
	IT software units	Smoke House attached to a residential building.		

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
	Tot Lots / Parks / Play grounds (only at neighbourhood level)	Transmission and telecommunication towers and Wireless Stations		
	Wells and irrigation ponds, pump house, plant nursery.			
	Auto and Taxi stand.			
	COMMERCIAL ZONE			
	All Shops including shopping complexes, Shopping malls, Multiplex and Hypermarkets, Restaurants, Hotels, Markets	Residences - floor area above 300 sq m including residential apartments	Warehouse/storage godowns of perishable and hazardous goods	All other uses not mentioned in column 2,3 and 4
	Professional offices, Commercial Offices & Establishments, Banking and financial institutions, IT Software units, Movie Halls.	Out door Game Stadium	Hospitals & Health Centers with IP facility above 50 beds.	
	Godowns/Warehouse/ Storage of non hazardous materials, stacking yards, Weigh bridge, Automobile show rooms.	General Education Institute, Specialised / Professional Educational Institute / Resarch and Development Institute		
	Residences - floor area upto 300 sq m.			
	Night Shelters, Orphanages, Old Age Homes, Dharmasala, hostels and boarding houses, lodges and guest houses, Ashram/Mutts.			
	Cottage Industries, Automobile workshops, Automobile Service Stations, Saw mills, Ice factory, Cold storage, Service Industries of non-nuisance nature (See Annexure A.XXV, with number of workers limited to 19 without power or 9 workers with power limited to 30 HP)			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
) enozl à cre mmoC(	Printing Press, Marble and Granite Storage/ Cutting centres, IT Hardware / Software /Electronic Industries.			
	Fuel Filling Stations			
	All Government and Public sector offices and institutions, Public Utility areas & buildings run by Government.			
	Day Care and Crèche, Educational institutions upto Higher Secondary Level, General Education/Training institutes, Vocational Training Institute, Expansion of existing educational institutions			
	Transmission / telecommunication towers and Wireless Stations.			
	Social welfare centers, Library and reading rooms, Museum, Convention centres/ Auditorium / Wedding Halls / Community halls, Gymnasium and Yoga centers, Exhibition Centres and Art Gallery, Indoor Games Stadium, Convention Centres.			
	Clinics, Diagnostic Centers and Hospitals up to 50 beds			
	Places of Worship.			
	Tot Lots, Parks & playgrounds, Fair Ground, Open air Theatre, Amusement Parks and Camping site			
	Taxi / Jeep / Autorickshaw stands, Parking sites and Plazas, Transport terminals			
	Plant nursery, Storage of agricultural produces and seeds, Green Houses			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	Uses permitted	Uses restricted-1	Uses restricted-2	Uses prohibited
3	RESIDENTIAL MIXED ZONE			
	All uses that are permitted in Residential Use Zone.	Museum, Exhibition Centres and Art Gallery	Bus Terminal / Stand, Lorry stand	All other uses not mentioned in column 2,3 and 4
	Ashram / Mutt	Places of Worship	Container Terminal	
	Guest Houses / Lodges	Fuel Filling Stations		
	Shops, Professional Offices, Banking and Financial Institutions,Commercial Offices / Estabishments, Restaurants /Canteen/Hotels, Gymnasium / Yoga Centers, Community Halls - floor area upto 200 sq m.	Indoor Games Stadium		
	Automobile workshops for 2/ 3 Wheelers			
	Service Industries of non-nuisance nature (See Annexure A.XXV) engaging not more than19 workers with out power or 9 workers with power limited to 15 HP			
	Civil Defense and Home Guard			
	Transmission towers, Telecommunication towers and Wireless Station			
	Post and Telegraph office, Fire Post/Fire Station, Telephone Exchange, Public Utility Areas & Buildings			
	Diagonostic Centres - floor area up to 100 sq m			
	Social Welfare centers - floor area up to 200 sq m			
	Parking Plaza, Taxi / Jeep Stand			
	Agriculture, Horticulture, Fodder cultivation, Pastures, Grazing grounds			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
) enoz dex Mat nedise R(	Fish Farms, Seed Farms, Diary Farms, Poultry Farms			
	Storage of Agricultural Produces and Seeds			
	Clinics (Outpatient) - floor area up to 200 sq m (Provided that the access road has a minimum width of 5m.)			
	Diagonostic Centres - floor area up to 500 sq m (Provided that the access road has a minimum width of 5m.)			
	Shops, Professional Offices, Commercial Offices / Estabishments, Banking and Financial Institutions, Restaurants / Canteen, Hotels, IT / Software Units - floor area upto 500 sq m (Provided that the access road has a minimum width of 8m.)			
	Weigh Bridge (Provided that the access road has a minimum width of 8m.)			
	Social Welfare centers - floor area above 200 sq m (Provided that the access road has a minimum width of 8m.)			
	Secondary / Higher Secondary Schools, Junior Technical Institutions (Provided that the access road has a minimum width of 8m.)			
	Movie Halls/Auditorium / Wedding Halls / Community halls - floor area upto 500 sq m (Provided that the access road has a minimum width of 8m.)			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
) enoz dex Mat ned se R	Diagonostic centres above 500 sq.m floor area, Hospitals & Health Centers -(up to 10 beds) (Provided that the access road has a minimum width of 8m.)			
	Public Offices, Shops, Professional Offices, Commercial Offices / Estabishments, Banking and Financial Institutions, Restaurants / Canteen, Hotels and IT / Software Units - floor area upto 1000 sq m with FAR limited to 2 (Provided that the access road has a minimum width of 8m.)			
	Markets - Plot Area upto 500 sq m (Provided that the access road has a minimum width of 8m.)			
	Godowns / Warehouses / Storage - non hazardous- floor area upto 200 sq m (Provided that the access road has a minimum width of 12m.)			
	Service Industries of Non Nuisance Nature (See Annexure A.XXV) engaging not more than19 workers with out power or 9 workers with power limited to 30 HP (Provided that the access road has a minimum width of 8m.)			
	Marble and Granite Storage / Cutting centres (Provided that the access road has a minimum width of 8m.)			
	Industrial Estates & Industrial Parks (Provided that the access road has a minimum width of 8m.)			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	Uses permitted	Uses restricted-1	Uses restricted-2	Uses prohibited
) enoz dex Mat nedlseR(	Automobile workshops/Automobile Service Stations - Light Vehicles (Provided that the access road has a minimum width of 8m.)			
	Educational institutions of higher order (Provided that the access road has a minimum width of 12m.)			
	Shops/ Offices above 1000 sqm floor area with FAR limited to 2. (Provided that the access road has a minimum width of 12m.)			
	Markets - Plot Area above 500 sq m (Provided that the access road has a minimum width of 12m.)			
	Hospitals & Health Centers - (up to 100 beds) with FAR limited to 2 (Provided that the access road has a minimum width of 12m.)			
	Godowns / Warehouses / Storage - non hazardous- floor area upto 500 sq m with FAR limited to 2 (Provided that the access road has a width of 12m minimum.)			
	Automobile workshops/Automobile Service Stations for Heavy Vehicles (Provided that the access road has a minimum width of 12m.)			
	Movie Halls, Auditorium / Wedding Halls / Community halls - floor area upto 1000 sq m (Provided that the access road has a minimum width of 12m.)			
	Hospitals & Health Centers - (up to 300 beds) (Provided that the access road has a minimum width of 18m.)			
	Movie Halls/Auditorium / Wedding Halls / Community halls - floor area above 1000 sq m with parking @ 1.1 times that of KMBR (Provided that the access road has a minimum width of 18m.)			

Column.1	Column.2	Column.3	Column.4	Column.5
Sl.No.	**Uses permitted**	**Uses restricted-1**	**Uses restricted-2**	**Uses prohibited**
4	**PUBLIC AND SEMIPUBLIC ZONE**			
) enozdi buP-i neSdnadi buP(	All Government /Public Sector offices and banks, Educational or research Institutions	Auditorium / Wedding Halls / Community halls/ Convention Centers incidental to public and semi public uses.	Cremation Ground / Crematorium, Burial Ground / Common Vault subjet to the condition that the area shall be sparsely built up and a green buffer of 10m shall be provided.	
	Library and Reading Rooms, Social Welfare centers, Museum, Exhibition Centres and Art Gallery	Cottage Industries, Service Industries of non-nuisance Nature (See Annexure A.XXV) with number of workers limited to 19 without power or 9 workers with power limited to 30 HP.		
	Places of workship	Parking Plazas		
	Clinics, Diagnostic centres and hospitals			
	Residential uses incidental to the public and semi public uses, Ashram/Mutts.			
	Hostels and boarding houses/ night shelters/ orphanages/ dharmasala/ guest houses (incidential to public and semi-public use).			
	Retail shops / Restaurants/canteen up to 200 sq.m, ATMs			
	Tot Lots/Parks/Play Grounds, Fair ground, Open air Theatre.			
	Transmission/telecommunication towers and wireless stations			

Column. 1	Column.2	Column.3	Column.4	Column.5
Sl.No.	Uses permitted	Uses restricted-1	Uses restricted-2	Uses prohibited
5	RECREATIONAL ZONE			
	Tot Lots/Parks/Play Grounds, Amusement Parks, Stadium, Fair Grounds, Open air Theatre, Camping Site, tourist transit centers, Swimming Pools, Exhibition Centres & Art Gallery, Library and Reading Rooms and essential incidental uses to the main recreational uses such as shops/restaurants / canteens/ ATMs/ vehicle parking facilities etc.		Auditorium / Wedding Halls / Community halls and Convention Centres incidental to the main recreational use.	All other uses not mentioned in column 2,3 and 4.
	Residential uses incidental to the recreational use			
	Transmission/telecommunication towers and wireless stations			
	Public Utility Areas & Buildings			
6	PARKS AND OPEN SPACES			
	Tot Lots/Parks/Play Grounds, Fair Grounds, Open air Theatre, Minor Public Utility Areas and Buildings			All other uses not mentioned in column 2,3 and 4.
7	WATER BODIES			
	Water landings, Pump Houses	Fish farms		All other uses not mentioned in column 2,3 and 4.

Column. 1	Column.2	Column.3	Column.4	Column.5
Sl.No.	Uses permitted	Uses restricted-1	Uses restricted-2	Uses prohibited
8	TRANSPORTATION ZONE -1			
	Transport terminals such as bus terminals/stand, Boat jetty, Container terminals,Truck/Lorry stand, auto rickshaw/taxi/jeep stands, Parking Plaza		Incidental uses such as Retail shops/ Restaurants/canteens up to 100 sq.m, night shelters, guest houses and lodges, which form an integral part of the transportation use proposed	All other uses not mentioned in column 2,3 and 4
	Transmission/Telecommunication towers and wireless stations			
	Public Utility areas and Buildings			
9	TRANSPORTATION ZONE -2			
	Parking plazas and Taxi/ Auto stands	Commercial buildings such as shops, restaurants, hotels, professional offices, banking and financial institutions, all with Ground Floor and Basement Floors (if any) exclusively for the parking of public and private vehicles at ratio 1:1		All other uses not listed in column 2,3 and 4
	Transmission/Telecommunication towers and wireless stations			

Column. 1	Column.2	Column.3	Column.4	Column.5
Sl.No.	Uses permitted	Uses restricted-1	Uses restricted-2	Uses prohibited
10	PADDY/ENVIRONMENTALLY SENSITIVE ZONE			
	Paddy cultivation	Agriculture / Horticulture / Fodder cultivation / Fish Farms / Seed Farms / Pump houses / Wells and irrigation ponds without any building construction, repair/ maintenance and reconstruction of existing authorised dwelling units without increase in the existing area of the building Construction of residence building under government approved housing schemes with plinth area upto 60 m² subject to the provisions contained in the KERALA CONSERVATION OF PADDY AND WET LAND ACT 2008		All other uses not restored in column 2, 3 and 4
11	DEVELOPABLE AGRICULTURAL ZONE			
	Paddy cultivation, Agriculture, Horticulture, Fodder cultivation, Fish Farms, Seed Farms, Pump house, Wells and irrigation ponds, minor public utility areas and buildings	Individual Residential Buildings upto 200 Sq. M. of total built up area with coverage limited 40% Subject to the provisions contained in the KERALA CONSERVATION OF PADDY AND WET LAND ACT 2008		All other uses not restored in columns 2,3 and 4
	Transmission/telecommunication towers and wireless stations			

ANNEXURE A.I

CATCHMENT AREAS OF COLLEGES

Sl. No.	Name of municipalities /panchayats	Block	S.B.College			Assumption		N.S.S.		Total
			Carrier	Degree	P.G.	Degree	P.G.	Degree	P.G.	
1	2	3	4	5	6	7	8	9	10	11
	Municipalities									
1	Kottayam			5	4			3	2	14
2	Changanassery			51	28	76	4	87	9	255
3	Pala			1		1				2
4	Vaikom				2					2
	Grama Panchayats									0
1	Thalayazham	Vaikom Block				2	1			3
2	Chempu							1		1
3	Maravanthuruth									0
4	T.V.Puram									0
5	Vechoor									0
6	Udayanapuram									0
7	Kaduthuruthy	Kaduthuruthi	1		2					3
8	Kallara		2						1	3
9	Manjoor							1		1
10	Mulakkulam		1	1						2
11	Njeezhoor									0
12	Thalayolaparambu							1		1
13	Velloor		1			1			1	3
14	Ettumanoor	Ettumanoor			8	3		1		12
15	Aymanom		1		4	1		2		8
16	Athirampuzha						1	1		2
17	Arpookara		1		3	2		1		7
18	Kumaranelloor		2		1	1	1	3		8
19	Neendoor		1	3				12	12	28
20	Kdaplamattom	Uzhavoor Block								0
21	Marangattupally									0
22	Kanakkary									0
23	Veliyannoor									0
24	Kidangoor		2		1			3		6
25	Kuravilangad		1	1	3	2			1	8
26	Uzhavoor		2			1				3
27	Ramapuram		1		1	1				3
28	Bharananganam	Lalam	1			2			1	4
29	Karoor					1				1
30	Kozhuvanal		1					3		4
31	Kadanad				1					1
32	Menachil									0
33	Mutholy		1							1
34	Melukavu	Erattupettah							1	1
35	Moonilavu									0
36	Poonjar				1	1		1	3	6
37	Poonjar Thekkekara							1		1
38	Thalappalam				1					1
39	Theekoy							1		1
40	Thalanad									0
41	Thidanad								1	1
42	Erattupettah				1	1		1		3
43	Akalakkunnam	Pampady								0
44	Elikulam			1				1	1	3
45	Kooroppada									0
46	Pampady		1	1		1		3		6
47	Pallikkathodu					3			2	5
48	Meenadom		1	1				9		11
49	Ayarkunnam	Pallam			1				1	2
50	Kumarakom		1					1		2
51	Nattakom		1	3	1	1		3		9
52	Puthuppally				2	1		2	1	6
53	Panachikkad									0
54	Thiruvarpu		1					2		3
55	Vijayapuram		1	3	4			3	3	14
56	Karukachal	Madappally	5	7	4	1	1	11		29
57	Kuruchi		2	9	7	8			7	33
58	Madappally		7	13	17	21		21	10	89
59	Paippad		3		1			10		14
60	Thrikkodithanam			12	3	19		4	6	44
61	Vakathanam		8	12	6	22		2		50
62	Vazhappally		11	21	8	22	4	31	13	110
63	Chirakkadadu	Vazhoor								0
64	Kangazha									0
65	Nedumkunnam		2	3	10	8		37	4	64
66	Vellavoor							1		1
67	Vazhoor		2	2	4	3		3		14
68	Erumely	Kanjirappally	1	1	2	4		9	1	18
69	Kanjirappally		1	1		2		3		7
70	Koottickal		1	6	5	12	1	11		36
71	Manimala		2	12	5	13		5	4	41
72	Mundakkayam		3	4	1	2		4	4	18
73	Parathodu			1		3			1	5

Sl. No.	Name of municipalities /panchayats	Block	S.B.College			Assumption		N.S.S.		Total
			Carrier	Degree	P.G.	Degree	P.G.	Degree	P.G.	
1	2	3	4	5	6	7	8	9	10	11
	Alappuzha District									0
	Municipalities									0
1	Cherthala									0
2	Alappuzha		8	6	4	6	7	1		32
3	Chengannur		3	4	7	8		4	1	27
4	Kayamkulam		1	3	1		2			7
5	Mavelikkara			3	1	4		2		10
	Grama Panchayats									0
1	Arookutty	Thaikkattussery								0
2	Chennam-Pallippuram									0
3	Panavally									0
4	Perumpalam									0
5	Thaikkattussery									0
6	Kadakkarappally	Pattanakkad								0
7	Vayalar									0
8	Pattanakkad									0
9	Thuravoor									0
10	Kuthiyathodu									0
11	Kodanthuruthu									0
12	Ezhupunna									0
13	Aroor			1				1		2
14	Mararikkulam North	Kanjikuzhy			1					1
15	Kanjikuzhy									0
16	Thanneermukkom									0
17	Muhamma		2							2
18	Cherthala south			1	4	8		2	1	16
19	Aryad	Aryad			1	1				2
20	Mannanchery									0
21	Mararikkulam North									0
22	Purakkad	Ambalappuzha			1					1
23	Ambalappuzha		1	1	1	3		1	1	8
24	Punnapra									0
25	Thalavady	Champakkulam		2	2	1				5
26	Edathua		1		5			2	1	9
27	Thakazhi		2			1		2	1	6
28	Nedumudi			1	2	1		11		15
29	Champakkulam			5	7	2		13		27
30	Kainakary			1	1			3		5
31	Muttar	Veliyanad	1	4		3	1	3		12
32	Veliyanad			5		3		7	8	23
33	Neelamperoor							3		3
34	Kavalam		2	12		7		11	1	33
35	Pulinkunnu		2	14	1	9		18	4	48
36	Ramankary		3	8	1	11		18	3	44
37	Mulakkuzha	Chengannur								0
38	Venmany									0
39	Cheriyanad			1	2			1		4
40	Ala									0
41	Puliyoor									0
42	Budhanoor									0
43	Mannar		1	2	1	2	1	1	3	11
44	Pandanad									0
45	Thiruvanavandoor									0
46	Chingoli	Harippad								0
47	Kathikappally									0
48	Thrikkunnappuzha									0
49	Kumarapuram									0
50	karuvatta									0
51	Harippad			1	3					4
52	Pallippad		1							1
53	Cheruthana									0
54	Veeyapuram									0
55	Pathiyoor	Muthukulam								0
56	Kanthalloor									0
57	Cheppad									0
58	Muthuklulam									0
59	Arattupuzha									0
60	Krishnapuram			1	2			2		5
61	Devikulangara									0
62	Mavelikkara thekkekkara	Mavelikkara								0
63	Chettikulangara		1					3	1	5
64	Chennithala			3	1	1		2	2	9
65	Thazhakkara									0
66	Nooranad	Bharanikkavu								0
67	Vallikkunnam					1				1
68	Bharanikkavu									0
69	Mav. Thamarakkulam									0
70	Chunakkara									0
71	Palamel									0

Sl. No.	Name of municipalities /panchayats	Block	S.B.College			Assumption		N.S.S.		Total
			Carrier	Degree	P.G.	Degree	P.G.	Degree	P.G.	
1	2	3	4	5	6	7	8	9	10	11
	Pathanamthitta District									0
	Municipalities									0
1	Thiruvalla		14	25	7	11		26	7	90
2	Pathanamthitta			3		3	2	6	1	15
3	Adoor					3				3
	Grama Panchayats									0
1	Anicad	Mallappally	1	2		1				4
2	Kaviyoor			2	1	2		1		6
3	Kottanad			1		1		1	1	4
4	Kottangal			1	2	2		2	1	8
5	Kallooppara				3	2			1	6
6	Kunnamthanam			2	2			6	2	12
7	Mallappally		2	2	8	8	2	7	1	30
8	Kadapra	Pulikeezhu								0
9	Kuttoor			6	2	1		1		10
10	Niranam		1		2			9	2	14
11	Nedumpram			4		3	1	5	2	15
12	Peringara		3	1				10	4	18
13	Ayiroor	Koipram	4		1	1		1	2	9
14	Eraviperoor		3		2	3		7	6	21
15	Koipram					1		2	2	5
16	Thottappuzhassery				1					1
17	Ezhumattur				1			1		2
18	Puramattom									0
19	Komalloor	Elanthoor	1	1	1					3
20	Chennerkkara		1			1				2
21	Elanthoor							2		2
22	Cherukol									0
23	Kozhenchery		1	1	3	1		1		7
24	Mallappuzhassery									0
25	Naranganam									0
26	Ranni-Pazhavangadi	Ranni								0
27	Ranni									0
28	Ranni-Angadickal									0
29	Ranni-Perinad						1			1
30	Vadasserikkara									0
31	Chittar									0
32	Seethathodu									0
33	Naranammoozhi									0
34	Vechoochira									0
35	Konni	Konni			1					1
36	Aruvapalam									0
37	Pramadom									0
38	Mailapra									0
39	Vallikodu		2							2
40	Thannithodu									0
41	Malayalappuzha									0
42	Panthalam	Panth								0
43	Panthalamn Thekkekkara									0
44	Thumpamon						1		2	3
45	Enadimangalam	Parasode								0
46	Enad									0
47	Ezhankulam									0
48	Kadambanad									0
49	Kalanjoor									0
50	Kodumon									0
51	Pallickal		1							1
52	Kulanada	Kulana						1		1
53	Aranmula				2					2
54	Mezhuveli									0
	Other Districts									0
1	Thiruvananthapuram				1	1		2	1	5
2	Kollam		3	14	10	8	1	9	3	48
3	Idukki		2	7	18	18		25	11	81
4	Ernakulam		2	10	18	13	3	5	11	62
5	Thrissur		3		4					7
6	Palakkad					3				3
7	Malappuram			1	2	1				4
8	Kozhikode		2	1	1	3				7
9	Wynad		1	1		1		1		4
10	Kasargod									0
11	Kannur				3				3	6
	Others									0
	Tamil Nadu					1		1		2

ANNEXURE II

POPULATION GROWTH RATE OF SURROUNDING GRAMA PANCHAYATS

Name of the Grama Panchayat	Block	Area (in sq.km)	Population			Population growth rate	
			1971	1981	1991	1971-81	1981-91
Changanacherry	Municipality		48545	51955	52445	7.02	0.94
Kuruchy	Madappally	16.22	21785	25357	29577	16.4	16.64
Vakathanam	Madappally	26.48	26398	28313	31222	7.25	10.27
Vazhappally	Madappally	21.73	25900	29527	32118	14	8.78
Karukachal	Madappally	22.4	16022	17721	20133	10.6	13.61
Madappally	Madappally	24.02	24104	26617	30182	10.43	13.39
Paipad	Madappally	20.88	17051	19672	21781	15.37	10.72
Thrikkodithanam	Madappally	13.31	19212	23777	28468	23.76	19.73
Chirakkadavu	Vazhoor	38.81	29017	30028	31813	3.48	5.94
Kangazha	Vazhoor	31.19	16701	19626	18644	17.51	-5
Nedumkunnam	Vazhoor	24.17	17152	19718	20024	14.96	1.55
Vellavoor	Vazhoor	23.46	13388	14582	15811	8.92	8.43
Vazhoor	Vazhoor	24.61	19089	19208	22584	0.62	17.58
Muttar	Veliyanad (ALP dist)	10.48		10472	10400		-0.69
Velianad	Veliyanad (ALP dist)	19.41		13356	13526		1.27
Neelamperoor	Veliyanad (ALP dist)	22.22		13101	13921		6.26
Kavalam	Veliyanad (ALP dist)	17.43		14240	14427		1.31
Pulimcunnu	Veliyanad (ALP dist)	31.5		23092	23667		2.49
Ramankari	Veliyanad (ALP dist)	16.17		13558	14026		
Anikadu	Mallappally (PTA dist)	19.04			14140		
Kaviyoor	Mallappally (PTA dist)	12.67			16311		
Kunnamthanam	Mallappally (PTA dist)	17.57			18489		
Mallappally	Mallappally (PTA dist)	20.01			17524		
Kottanad	Mallappally (PTA dist)	17.01			14188		
Kottangal	Mallappally (PTA dist)	23.08			16953		
Kallooppara	Mallappally (PTA dist)	16.86			17624		
Thalavady	Champakulam (ALP dist)	15.76		22528	22166		-1.61
Edathua	Champakulam (ALP dist)	22.29		22081	21715		-1.66
Thakazhy	Champakulam (ALP dist)	28.01		18577	19136		3.01
Nedumudy	Champakulam (ALP dist)	25.98		21707	21771		0.29
Champakulam	Champakulam (ALP dist)	22.97		17466	17369		-0.56
Kainakary	Champakulam (ALP dist)	36.64		20910	21160		1.2

ANNEXURE A.III

URBANISATION TREND OF SURROUNDING GRAMA PANCHAYATS

Name of Panchayat	Block	Area (in sq.km)	Population	Density of population	Total Workers (1991)			Non agricultural workers		% of male workers in non-agricultural sector
			1991	1991	Male	Female	Total	Total	Male	
Kuruchy	Madappally	16.22	29577	1823	7007	2177	9184	4514	3637	39.60
Vakathanam	Madappally	26.48	31222	1179	7499	1515	9014	4365	3147	34.91
Vazhappally	Madappally	21.73	32118	1478	7537	2052	9589	6190	4138	43.15
Karukachal	Madappally	22.40	20133	899	4706	829	5532	2680	2045	36.97
Madappally	Madappally	24.02	30182	1257	6933	1077	8010	3887	3153	39.36
Paipad	Madappally	20.88	21781	1043	4925	1522	6447	3030	2431	37.71
Thrikkodithanam	Madappally	13.31	28468	2139	6635	1405	8040	5434	4441	55.24
Chirakkadavu	Vazhoor	38.81	31813	820	8170	1273	9443	5205	4123	43.66
Kangazha	Vazhoor	31.19	18644	598	4304	635	4939	2411	1922	38.91
Nedumkunnam	Vazhoor	24.17	20024	828	4802	678	5480	2344	1839	33.56
Vellavoor	Vazhoor	23.46	15811	674	3964	523	4487	1659	1284	28.62
Vazhoor	Vazhoor	24.61	22584	918	5447	651	6098	2525	2018	33.09
Kainakary	Veliyanad (ALP dist)	36.64	21160	578	5152	3386	8538	1867	1537	18.00
Muttar	Veliyanad (ALP dist)	10.48	10400	992	2471	1346	3817	1469	988	25.88
Velianad	Veliyanad (ALP dist)	19.41	13526	697	3424	2031	5455	1801	996	18.26
Neelamperoor	Veliyanad (ALP dist)	22.22	13921	627	3689	1861	5550	1785	1263	22.76
Kavalam	Veliyanad (ALP dist)	17.43	14427	828	3562	2160	5722	1512	1121	19.59
Pulimcunnu	Veliyanad (ALP dist)	31.50	23667	751	5564	2878	8442	3034	2287	27.09
Ramankari	Veliyanad (ALP dist)	16.17	14026	867	3275	1692	4967	2363	1635	32.92
Anikadu	Mallappally (PTA dist)	19.04	14140	743	3406	614	4020	1551	1124	27.96
Kaviyoor	Mallappally (PTA dist)	12.67	16311	1287	3545	882	4427	2538	1898	42.87
Kunnamthanam	Mallappally (PTA dist)	17.57	18489	1052	3986	798	4784	2287	1737	36.31
Mallappally	Mallappally (PTA dist)	20.01	17524	876	3905	738	4643	2600	1979	42.62
Kottanad	Mallappally (PTA dist)	17.01	14188	834	3424	538	3962	1623	1344	33.92
Kottangal	Mallappally (PTA dist)	23.08	16953	735	4157	546	4703	2233	1799	38.25
Kallooppara	Mallappally (PTA dist)	16.86	17624	1045	3632	778	4410	2556	1961	44.47
Thalavady	Champakulam (ALP dist)	15.76	22166	1406	4572	2158	6730	3332	2312	34.35
Edathua	Champakulam (ALP dist)	22.29	21715	974	4918	2425	7343	2846	2008	27.35
Thakazhy	Champakulam (ALP dist)	28.01	19136	683	4329	2557	6886	2246	1818	26.40
Nedumudy	Champakulam (ALP dist)	25.98	21771	838	5183	2903	8286	2582	1784	21.53
Champakulam	Champakulam (ALP dist)	22.97	17369	756	4006	2159	6165	4548	1467	23.80
Kainakary	Champakulam (ALP dist)	36.64	21160	578	5152	3386	8538	1867	1537	18.00

ANNEXURE IV
DETAILS OF COMODITUY TRANSACTION THROUGH CHANGANASSERY MARKET

Sl. No.	Commodities	Arrived from	Distributed to
1	Rice (FP)	F.C. I Godown	Changanassery taluk
2	Rice (OM)	Kuttanad area, Andhra Pradesh, Karnataka	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
3	Coconut	Alappuzha, surrounding area of town	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
4	Copra	Surrounding area of the town	Processing, wholesale
5	Bengal gram	Maharasssshtra, Karnatak, Tamil Nadu	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
6	Green Gram	Maharashtra, Anadhra Pradesh, Tamil Nadu	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
7	Red gram	Maharashtra, Anadhra Pradesh, Tamil Nadu	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
8	Black gram	Maharashtra, Anadhra Pradesh, Tamil Nadu	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
9	Ground nut	Maharashtra, Anadhra Pradesh, Tamil Nadu	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
10	Canegar	Idukki district, Tamil Nadu, Karnataka	Changanassery taluk, Ranni, Kozhenchery, Pathanamthitta, Alappuzha
11	Sugar	Uttar Pradesh	
12	Red Chitti	Tamil Nadu, Andhra Pradesh	Changanassery taluk
13	Tobacco	Coimbatore	Changanassery Taluk Mallappally taluk and Kuttanad taluk
14	Areacanut	Kochikod, Mangalore	Changanassery Taluk Mallappally taluk and Kuttanad taluk
15	Bettle leaf	Local area, Pandalam	Changanassery Taluk Mallappally taluk and Kuttanad taluk
16	Banana	Waynad and Palakkad districts, Local area	Changanassery Taluk Mallappally taluk and Kuttanad taluk
17	Vegetable	Local area, Manoor Gram Panchayat and Tamil Nadu	Changanassery Taluk Mallappally taluk and Kuttanad taluk
18	Tapiocca (Raw)	Local area, Pandalam, pathanamthitta	Changanassery taluk
19	Tapiocca dry (white)	Local area	Local area

ANNEXURE V

STUDY ABOUT HAWKERS AND VENDERS

No.	Name of Road	Road strech	Hawker	Venders	goods / services																			Number of persons employed			From where commuters are coming									Production units at									Encroched on (C.W/ Foot path/ shoulder)		
					Vegetable	Lemon	Fruits	Toys	Knifes	Cloths	Chappal	Spectacle	Lottary	Cobbler	Cassete	Cashewnut	Panmasala	Stationary	Spices	Plastics	Pillow Bed	Medicines	Union glass	Male	Female	Total	Changanacherry	Vazhappally	Paippad	Madappally	Thrikkodithanam	Chothipusha	Adoor	Tamil Nadu	Other District	Changanacherry	Mysore	Alappuzha	Bombay	Delhi	Other parts of Kerala	Tamil Nadu	Other parts of India	C.W	F.P	shoulder	
1	Main road from Kurisumoodu to Kavumbhagam	M.C Road to C.V. Road (West)	4	1	1	2						1	1											6		6	6										1				1	2	1	5			
		M.C Road to C.V. Road (East)	9	3		2	4			1	1	3	1											13		13	13								3	3				1	4	1	12			
		Total	**13**	**4**	**1**	**4**	**4**			**1**	**1**	**4**	**2**											**19**		**19**	**19**								**3**	**4**				**2**	**6**	**2**	**17**			
2	Central Jn: to Municipal stand (East)	Central Jn: to Municipal stand (East)	8	2	1	1	1			1			2	4										10		10	6	1	1	1				1						5	3	2	1	9		
	Central Jn: to Municipal stand (West)	Central Jn: to Municipal stand (West)	4	4						1			2		1	2	2							8		8	6				1		1			4					2	2		8		
		Total	**12**	**6**	**1**	**1**	**1**			**2**			**4**	**4**	**1**	**2**	**2**							**18**		**18**	**12**	**1**	**1**	**1**	**1**		**1**	**1**		**4**					**5**	**5**	**4**	**1**	**17**		
3	Central Jn to Market(North}	Central Jn to Market(North}	6	1													3	2				1	1	7	1	8	7	1								3		1			1	2			7		
	Central Jn to Market(South}	Central Jn to Market(South}	7															1	1	1	1	3		9	1	10	7				3							1	1	1	4			7		
		Total	**13**	**1**													**3**	**3**	**1**	**1**	**1**	**4**	**1**	**16**	**2**	**18**	**14**	**1**			**3**					**3**		**2**	**1**	**1**	**5**	**2**			**14**		
4	Central Jn to Municipal Stand {South}	Central Jn to Municipal Stand {South}	33		13	6	4	3	1				2		2		2							39	1	40	25	6	1		2	5			1	1	3				3	16	10	2	31		
	Central Jn to Municipal Stand (North)	Central Jn to Municipal Stand (North)	5				1										1		3					5		5	5								1						4			5		
		Total	**38**		**13**	**6**	**5**	**3**	**1**				**2**		**2**		**3**		**3**					**44**	**1**	**45**	**30**	**6**	**1**		**2**	**5**			**1**	**2**	**3**				**3**	#	**10**	**2**	**36**		
5	Kurisumoodu Junction - Changanacherry - Kavumbhagam Road	KSRTC Jn - Govt. Hospital	2											2										2		2	2								2								h			

Source: Study conducted by Town and Country Planning Department 2002

ANNEXURE VI

STRUCTURAL CONDITION OF BUILDINGS

Ward No.	Residential			Commercial			Industrial			Public and Semi-Public									Other Buildings (Specify)			Other Buildings (Specify		
										Government			Private			Religious								
	K	M	P	K	M	P	K	M	P	K	M	P	K	M	P	K	M	P	K	M	P	K	M	P
1	145	254	69	1	14			1						1		1	2					1	1	
2	8	247	92		25	11				1	5			6			2	1					6	
3	13	281	148		74	58		3			1	3		5	1		1		5		3			
4	15	253	105	1	10	9					1						9					1		
5	69	231	56	2	5			1						1		2		1						
6	55	227	41	10	402	49		9			4			2									3	
7	35	203	89	12	113	224		4			19	3			12		1					5	7	
8	2	124	98	5	147	441			2		25	7	1	24	14		13					1	2	3
9	13	185	12	16	332	38								1	5		2	1				3		1
10	47	262	74	1	14						1						1			1				
11	70	286	121	6	7	4								1		1						5		
12	114	229	75	4	17	3		2	1		3						3		4	5				
13	66	257	185	11	38	14																4	2	
14	43	193	226	8	65	46	2	8				6			2		4		1	1	2			
15	43	154	160	2	39	217		1			2	2					4						2	
16	17	214	182	1	40	6	1	2	1		4	5		5			3			1				
17	15	153	224	2	21	49		1			1	2		1			1							
18	95	176	161		6			4					2	1			3							
19	15	171	155	4	43	324	3			1		17		6	29		8	7				11	3	1
20	79	136	155		9	26	2	2	1								6			1				
21	83	260	86	1	42	5		6			1			4			6	1						
22	34	256	59		35	22		1							6			6	1					
23	45	175	67	8	29	22					2				3								4	
24	66	177	174	5	49	99	1	4	1		2	4		1	9		1	1	7	3	1			
25	36	136	71	2	72	298		2				2	6	2	2		20	8						
26	3	63	41	4	262	201					1	8			18			1		1				
27	20	124	121	5	15	9	1							4	13		12	2				4		
28	21	179	164	4	91	63	1	3				1			2			3	1					
29	118	202	97	4	9			2	3		2			1			8	1				5	2	
30	48	126	119	4	9	7		5							2			2		3				
31	11	95	80	2	50	100		7	10		2			6	21			7						
32	97	173	149	1	20	11		1			1	1		2	1		2	2						
	1541	6202	3656	126	2104	2356	11	69	19	2	77	61	9	74	140	4	112	44	19	16	6	40	32	5

ANNEXURE A.VII

LIST OF APPROVED SLUMS OF CHANGANASSERY MUNICIPALITY

(As per the report " Urban slums in Kerala 1995 – 1996")

1. Valumelchira North
2. Valumelchira South
3. Kakkamthodu
4. Manalodichira
5. Mattom Colony
6. Pindichira
7. Mampuzhathara
8. Thamarassery
9. Chirathara
10. Vazhappally
11. Parayil
12. Kunnakkattukulam
13. Bishop colony
14. Municipal colony
15. Fathimapuram
16. Koippallychira
17. Nerchapara
18. Kakkattukadavu
19. Attichira
20. A.C.Colony
21. Maduuraveedu
22. Morkulangara Railway Colony
23. Fathimapuram Railway Colony
24. Perunna Railway Colony
25. Fathimapuram Railway Puthiparampu Col
26. Malayilkunnu Colony
27. Chekkarathazhayil
28. Kulaparampu

ANNEXURE VIII

AREA AND DEMOGRAPHIC DETAILS OF SQUATTER DWELLINGS

Sl.No.	Name of the slum	Ward Number	village	Location of the slum			Area (in Hectares		No of Households				Population			Occupation							
				C.B.D Area	Other Developed Area	Undeveloped Area	Own Land with Pattayam	Puramboke Land	S.C	S.T	Others	Total	Male	Female	Total	Govt. Service	Private Offices	Trade in Informal Sector	Agricultural Labourers	Industrial Laboures	Construction Labourers	Other Jobes	Unemployed
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	A.C.Colony	23	Vazhappally West				0.486		46		3	49	116	124	240	2			102		3	2	26
2	Attichira	19	Changanacherry				0.405		16		3	19	47	52	99				10	1	5	8	20
3	Chirathara	23	Changanacherry					0.182	17		2	19	40	40	80				33				10
4	Fathimapuram Railway Colony 1	17	Changanacherry					0.121			17	17	27	38	65			2	3		7	5	
5	Fathimapuram Railway Colony 2	16	Changanacherry					0.182			48	48	103	108	211				1	1	24	22	
6	Kakatukadavu	22	Changanacherry				0.607		37	11	4	52	108	112	220				110		3	10	40
7	Kakkamthodu	30	Vazhappally East				0.809		2		50	52	100	108	208	1	1	5	4			52	21
8	Koippallychira	8	Vazhappally East				0.712		1		45	46	104	125	229			5				43	1
9	Kotarachira	26	Vazhappally West				0.607		6		34	40	97	111	208						4	49	18
10	Kulaparampu	8	Vazhappally East				0.304				12	12	28	34	62	2	1	1			6	4	2
11	Kunnakkattukulam	10	Changanacherry					0.142	9		2	11	24	30	54	1			15		2	5	14
12	Maduraveedu	13	Changanacherry					0.085	15			15	31	29	60				7		4	5	18
13	Malayil Kunnu	16	Changanacherry				0.304		1		17	18	33	38	71			9	8	1	2	5	10
14	Mampuzhathara	23	Changanacherry				0.263		8		10	18	40	50	90	2					2	20	20
15	Manalodichira	31	Vazhappally East				0.142		6		12	18	34	42	76				7			13	5
16	Mattom Colony	29	Vazhappally West				0.809		7	2	83	92	238	257	495		6	11	4	6	21	100	4
17	Morkulangara	5	Vazhappally East					0.162			19	19	51	45	96	1	1	1	9	1	2	5	12
18	Municipal Colony	11	Changanacherry				0.324		53		3	56	137	148	285	9		1	15			56	22
19	Nerchappara	8	Vazhappally East				0.142				17	17	48	43	91	2	1	7			3	6	25
20	Olassa Colony	11	Changanacherry					0.202	1		7	8	19	15	34		1		7			2	7
21	Parayil Colony	17	Changanacherry				0.202		7		27	34	63	62	125				9		4	11	21
22	Pindichira	27	Changanacherry				0.202				19	19	35	47	82				15		12	2	2
23	Railway Colony	18	Changanacherry					0.182	8		20	28	49	67	116			1	9		8	16	1
24	Randukuzhichira Railway Colony	6	Vazhappally East					0.607	13		35	48	97	112	209	1	2	5	21	4	7	5	32
25	Settlement Colony	18	Changanacherry				0.324		16		12	28	52	55	107			2	18	3	5	5	1
26	Thamarassery-Puzhavath	14	Changanacherry				0.202		10		13	23	55	63	118	1	4	1	15	5	2	7	27
27	Valummechira Colony	30&31	Vazhappally West				0.405		17		18	35	90	90	180	1			19		4	40	9
28	Vandipetta	31	Vazhappally East				0.202				15	15	36	34	70			1				16	5
29	Vazhappally Harijan Colony	1	Vazhappally West				0.709		37		1	38	99	109	208	3	2		40	4	2	10	63
30	Thavalappara	9	Changanassery				0.182		2		8	10	25	28	53		1		7		5	2	20
31	Morkulangara	5	Vazhappally West				0.162				19	19	51	45	96		1	1	9	1	2	5	12

Source: Study conducted by Town and Country Planning Department 2002

ANNEXURE .IX- A3 SIZE

ANNEXURE A. X

PRACTICAL CAPACITIES OF TWO WAY URBAN ROADS IN PCU / DAY

Sl. No.	Description	Two - lane			Three - lane		Four - lane	
		6m	6.75m	7.3m	9m	10m	undivided	divided
1	Arterial (road with standing vehicles permitted, no frontage access, negligible cross traffic	12000	13500	15000	20000	22000	30000	36000
2	Sub arterial (road high capacity junctions and no waiting restrictions)	8000	10000	12000	16000	18000	24000	29000
3	Collector (road with capacity restrained by waiting vehicles with junctions)	3000 to 5000	4500 to 6000	6000 to 7500	9000 to 11000	11000 to 13000	18000	

ANNEXURE A - XI

PEAK HOUR LINK VOLUME ON MAJOR TRAVEL CORRIDORS IN CHANGANASSERY TOWN 2001 (in Vehicle)

Sl. No	Name road section	Fast vehicles									Slow vehicles				Total
		suB	suBi in M	raC	dtuA.ssaP	owT rdeehw	dixatuM kcut	kcurT	kcuri in M	dtuasdoopG	dcyqB	tracdmaH	tracKodiJB	sreftO	fp.oN sdqhev
A	**MAIN CENTRAL ROAD (SH 1)**														
1	Kannanperoorchira - Mathumoola jn.	75	6	308	179	301	2	26	50	30	87				1064
2	Mathumoola jn - Central jn	89	22	312	576	295	1	53	38	28	37	2		2	1425
3	Central jn - Municipal office	93	35	439	925	494		50	41	25	52	1	1		2156
4	Lapalam - Perunna jn	87	20	532	364	412		32	49	27	62	4		2	1591
5	Perunna jn - NSS College jn	106	22	565	482	509		40	52	34	86	1		1	1898
6	NSS College jn - Municipal Office jn (one-way)	118	25	613	662	659		42	60	37	91	1	1		2309
B	**ALAPPUZHA - CHANGANASSERY ROAD (SH 11)**														
7	Perunna Jn_Manackalchira	27	18	192	124	172		17	22	17	38	4		2	633
C	**KAVIYOOR ROAD (MDR)**														
8	Municipal Office jn-Poochimukku(one-way)	57	26	174	262	58		11	9	9	4				610
9	Poochimukku_Irupa	12	4	33	117	21		5	3	1	4			1	201
10	Poochimukku-N.S.S College Jn.(one-way)	59	29	68	440	256		13	23	15	5		3		1111
D	**VAZHOOR ROAD (MDR)**														
11	Central jn -railway Station	47	22	299	997	485		24	38	30	74	4	1	2	2029
12	Railway station Jn.-Kurisummoodu jn	92	16	295	345	273		27	24	14	72				1158
13	Central jn-Boat jetty		9	123	350	184		12	30	23	53	5	2		791

Source:NATPAC Survey June 2001

ANNEXURE A - XII

PEAK HOUR LINK VOLUME ON MAJOR TRAVEL CORRIDORS IN CHANGANASSERY TOWN 2001 (in PCU)

Sl. No	Name road section	Fast vehicles									Slow vehicles				Total
		suB	suBi ni M	raC	tt uA.ssaP	rabeen wo wT	elixatl uM kcut	kcurT	kcurt i ni M	suas doo G	el cyci B	trac dnaH	trac kcdl uB	sreht O	eulav UCP
A	**MAIN CENTRAL ROAD (SH 1)**														
1	Kannanperoorchira - Mathumoola jn.	225	9	308	179	121	9	78	75	30	44				1108
2	Mathumoola jn - Central jn	267	33	312	526	148	5	78	75	28	19	8		8	1570
3	Central jn - Municipal office	279	53	419	925	247		159	57	25	26	4	6		2216
4	Lapalam - Perunna jn	261	30	532	364	206		150	62	27	31	16		8	1645
5	Perunna jn - NSS College jn	318	33	565	482	255		96	74	34	43	4		4	1936
6	NSS College jn - Municipal Office jn (one-way)	354	38	613	662	330		120	78	37	46	4	6		2306
B	**ALAPPUZHA - CHANGANASSERY ROAD (SH 11)**							126	90						
7	Perunna Jn_Manackalchira	81	27	192	124	86		51	33	17	19	16		8	654
C	**KAVIYOOR ROAD (MDR)**														
8	Municipal Office jn-Poochimukku(one-way)	171	39	174	262	29		33	14	9	2				733
9	Poochimukku_Irupa	36	6	33	117	11		15	5	1	2				220
10	Poochimukku-N.S.S College Jn.(one-way)	177	44	268	440	128		39	35	15	3		18		1167
D	**VAZHOOR ROAD (MDR)**														
11	Central jn -railway Station	141	33	299	997	243		72	57	36	37	16	6	8	1945
12	Railway station Jn.	276	24	295	345	137		81	36	14	36				1244
13	Central jn-Boat jetty		14	123	350	92		30	45	23	27	20	12		742

Source:NATPAC Survey June 2001

ANNEXURE A-XIII

ZONES IDENTIFIED FOR OUTER CORDON SURVEY AT CHANGANASSERY

Zone No.	Ward No. and Name
A. Internal Zones	
1	1,2,3,4,5,50,32 Kuttisserkadavu, Annapoorneswari Temple, Poovakkattu Chira, Gathasamany, Vazhappally Temple Manjadikkara
2	4,29,27,28,26,13,31 Aramana, YMCA, Market, Municipal Stadium, Angadi, Pudurpally, Boat Jetty
3	20,21,22,23,24,25,14 Perunna Temple, Village Office, Perunna west, Vettadi Lakshmipuram Palace, Anandapuram, Chitrakulam
4	15,16,17,18,19 NSS College, Thurumalashektram, Fathimapuram, Iruppa, Peprunna east
5	6,7,8,9,10,11,12 Morkulangara, S.B. Hihgh School, Anandashramam, Kurisuumoodu, Pareppally, SHHigh School, Railway Station
B. External Zone - Surrounding Panchayats (madappally Block)	
6	Vazhappally
7	Paippadu
8	Thrikkodithanam
9	Madappally
10	Kurichi
11	Vakathanam
12	karukachal
Surrounding Blocks	
13	Vaikom
14	Kaduthuruthy
15	Ettumanoor
16	Uzhavoor
17	Lalam (Pala)
18	Erattupettah
19	pampady
20	Pallom
21	Vazhoor
22	Kanjirappally

ANNEXURE A.XIV

O-D MATRIX OF INTER CITY PASSENGER TRAFFIC BY CAR

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Total
1	Ward No.1,2,3,5,30,32		0				226	223	455.5	545	226	109	436		226							109		679	1514	1677.1					927				7352
2	Ward No.4,29,27,28,26,13,31		0				1957	1225	861.2	365	362	236	1061		245			489.3		117		353	353	2937	3095	2824	1509	302.8	606	245	742				23 1712
3	Ward No.20,21,22,23,24,25,14		0				237		358.9	458		114						237.5			237		114	1188	1271	734	294								5243
4	Ward No.15,16,17.18,19		0				1270	255	511.4	367			245			254				122	508		122	2032	1512	837									8035
5	Ward No.6,7,8,9,10,11,12		0				229	115	577.2	132	230		110					229.5					221	458.9	1420	1653.5	284				472				7322
6	Vazhappally	1310	2948		983	328			112	435			54												194	508	164								7036
7	Paippad	432	2029	247	583	62	92			54	142					112								439		31			31		140				4400
8	Thrikkodithanam	247	1027	308	308	103	62																	477		238					115			31	2916
9	Madappally	616	2770	923	308	2155	265		51				54		112			112						480	103	652	51		51		230				8933
10	Kurichi	0	1310	328	326			220	56	54													54		440	230			138		115				3273
11	Vakathanam	103	308				51		51																	115									628
12	Karukachal	103	923			103																			51	51			51						1282
13	Vaikom	0	0							54																	164								218
14	Kaduthuruthy	0	0																																
15	Ettumanoor	0	655	655						164															276	164		164	138						2216
16	Uzhavoor	326	0																										138						466
17	Lapalam (Pala)	0	0																								164								164
18	Erattupettah	0	0																								138								138
19	Pampady	0	410	103							51														51										615
20	Pallom	0	0		655																														655
21	Vazhoor	0	205			103																		112		166									586
22	Kanjirappally	0	308																							634									842
23	Kottayam	0	1457	655	983	1085			220	379															3077	2389	2276	328	634		164				14033
24	Thiruvalla	213	3472	1492	2468	1066	107	388	107	480	330	160	160			213	112	218		54			110	2917		672					784				15135
25	Alappuzha	1282	1661	641	1174	1069	592		160	535	218		214	325		553	112			214	112	482	54	7097	1077		383	939		272	659				20052
26	Pathanamthitta	439	1756	267	336	652		112		160	107			107						54				1892		295				107	1840	221			8233
27	Kollam	0	426		420	213				107	112													764		221				107	218				2594
28	Thiruvananthapuram	0	639				112			54		54						218						330		115					226	107			1855
29	Idukki	0	103																						138	217		164		54					622
30	Ernakulam	103	641			320	160		56			54												160	2199	414	1583	462	596						6858
31	Other Northern Districts	0	328					56		54															414		160								956
32	South Tamil Nadu	0	0																					112		107									219
33	North Tamil Nadu	0	0																											107					107
	Total	5176	23374	5619	8552	7259	5361	2595	3577	8873	1778	726	2334	432	583	1132	224	1504		561	857	944	1028	22074	16832	14492	7169	2360	2383	892	6636	328		31	156156

Source: NATPAC Survey June 2001

ANNEXURE XV

O-D MATRIX OF INTER CITY TRAFFIC BY AUTORIKSAW

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Total
1	Ward No. 1,2,3,5,30,32						1334	106	308															148	294	48									2238
2	Ward No. 4,29,27,28,26,13,31						663	833	833	1355		452	452												210	263	210									5272
3	Ward No. 20,21,22,23,24,25,14						636	440		112															1262	69									2519
4	Ward No. 15,16,17.18,19						561		537																710	182									1991
5	Ward No.6,7,8,9,10,11,12							222	333	632															196	100									1483
6	Vazhappally	460	689		460	230		53												101						24									2017
7	Paippad	122	566	244	61	61																		31		24									1109
8	Thrikkodithanam	183	1054	244	549	61	31						31													24									2177
9	Madappally		1404	468	234	702																				63									2871
10	Kurichi		460																							24									484
11	Vakathanam			156																															156
12	Karukachal	78	78																																156
13	Vaikom																																		
14	Kaduthuruthy																																		
15	Ettumanoor																																		
16	Uzhavoor																																		
17	Lalam (Pala)																								94										94
18	Erattupettah																																		
19	Pampady																								94										94
20	Pallom	230																																	230
21	Vazhoor																																		
22	Kanjirappally																																		
23	Kottayam			122		230				101																									453
24	Thiruvalla	251	879	628	502	126	200				74																								2660
25	Alappuzha		546	91	398			53																45	136									1269
26	Pathanamthitta	61	265		61	78					63																								528
27	Kollam		126																																126
28	Thiruvananthapuram																															74			74
	Total	1385	###	1953	###	1488	###	1708	2011	###	137	452	483							101				224	###	820	210					74			28001

Survey June 2001

ANNEXURE A.XVI

O-D MATRIX OF INTER CITY PASSENGER TRAFFIC BY TWO WHEELERS

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Total
1	Ward No. 1,2,3,5,30,32						309	142	284	123	88	31									44		31	44	194	126									1416
2	Ward No. 4,29,27,28,26,13,31						570	454	368	997	142	133	133			47				33	47	33		47	428	360	53				47					3894
3	Ward No. 20,21,22,23,24,25,14						48	147	188	135			34											145	348	34									1050
4	Ward No. 15,16,17.18,19						157	68	474	184	105		110								52			52	405	184	58								1850
5	Ward No.6,7,8,9,10,11,12						98	63	127	342		34	69											49	325	70									1177
6	Vazhappally	272	311		156	117		14	43	50														22	185		24								1194
7	Paippad	159	414	53	133	149	20			15	22													42	49	22									1078
8	Thrikkodithanam	186	643	126	425	152	42																	57	49	45									1725
9	Madappally	104	1026	387	102	387	59	7	7		7													59		23									2165
10	Kurichi	117	78		78	39			14	46			15												68	44	19								518
11	Vakathanam	15	193	15	15	45			7											15					24	16									345
12	Karukachal	15	89	30	45	15				23																55									272
13	Vaikom																																		19
14	Kaduthuruthy									19																									19
15	Ettumanoor																																		
16	Uzhavoor																																		
17	Lapalam (Pala)																																		
18	Erattupettah																																		
19	Pampady		15						7																										22
20	Pallom	39	117																						24										180
21	Vazhoor		30		13			14																											57
22	Kanjirappally		15				7																												22
23	Kottayam	78	121	13	39	39		28	14	15			15												286	209	98					15		970
24	Thiruvalla	367	590	183	380	118	136		46	77	23	30	46			22				23		23		270		186								2520
25	Alappuzha	195	482	146	424	293	80	47	102	31	68	55							24			15		377	98		14	24			22				2497
26	Pathanamthitta		28	88	72	30	7			15	68													53		45									406
27	Kollam																																		
28	Thiruvananthapuram									15											23														38
29	Idukki																																		
30	Ernakulam					49							15													24	39								127
31	Other Northern Districts	39	39																						24										102
32	South Tamil Nadu																																		
33	North Tamil Nadu																																		
	Total	1586	4191	1041	1882	1433	1534	985	1681	2087	523	283	436			69			24	71	167	71	31	1218	2506	1443	324	24			69		15		23696

.C Survey June 2001

ANNEXURE A.XVII

O-D MATRIX OF INTER CITY GOODS TRAFFIC(IN TONNES) BY TRUCKS

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	#	21	#	23	24	25	26	27	28	29	30	31	32	33	Total
1	Ward No. 1,2,3,5,30,32								7																	34					38				79
2	Ward No. 4,29,27,28,26,13,31								194	40	85			63			94						32		358	189	123	397	92.5			157		102	2160
3	Ward No. 20,21,22,23,24,25,14																							139		27							235		166
4	Ward No. 15,16,17.18,19								10	31																124								23	188
5	Ward No.6,7,8,9,10,11,12																									38									38
6	Vazhappally		26			11																				12									49
7	Paippad			154	41		82				14													16		373									680
8	Thrikkodithanam		91		41	41																				111								32	316
9	Madappally		19		5	9	7																		23	67								21	151
10	Kurichi				2					2			55							2					35	52	8								156
11	Vakathanam																																		
12	Karukachal		24	96	56	24		9										46								56									311
13	Vaikom																												57						57
14	Kaduthuruthy																																		
15	Ettumanoor		56																							52	3								111
16	Uzhavoor	51																								4									55
17	Lalam (Pala)					54																			1	53		37							147
18	Erattupettah																												21						21
19	Pampady																								1	31									32
20	Pallom																								33										41
21	Vazhoor																								233	19									28
22	Kanjirappally		12																							4									16
23	Kottayam		123		17				1				2												44	69	227	87	175				67	25	1026
24	Thiruvalla												19			80		318						58		96									571
25	Alappuzha		62	108	27	151				41						80						30		58			56	2		361	151		89		1260
26	Pathanamthitta		65	16																				16		132					102	54			385
27	Kollam		187							16					116									80											405
28	Thiruvananthapuram																							12								12			24
29	Idukki						58																			15			20						93
30	Ernakulam		211							44															146	47	156	135	34	37		580			780
31	Other Northern Districts		334					65																49	39		77	22							586
32	South Tamil Nadu		197													147								649		37	31				342				1983
33	North Tamil Nadu		189																					23		7									219
34	Karnataka		56																								119								175
35	Andhra Pradesh																																		
36	Western India								10															44											54
37	North Indian States																										71								71
	Total	51	1660	374	189	292	156	74	222	174	99		76	63	116	307	94	364		2		30	32	1144	913	1655	871	650	399	398	633	803	391	203	12434

Source; NATPAC Survey June 2001

ANNEXURE A.XVIII

O-D MATRIX OF INTER CITY GOODS TRAFFIC (in tonnes) BY MINI TRUCKS

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Total
1	WardNo. 1,2,3,5,30,32																						7			19									26
2	WardNo. 4,29,27,28,26,13,31							33		37		13	75							22		44		99	90	74	155	45	15	11	66				779
3	WardNo. 20,21,22,23,24,25,14								3															197	24		23								247
4	WardNo. 15,16,17.18,19																							88		7									95
5	WardNo.6,7,8,9,10,11,12									4																31	6								41
6	Vazhappally																								16	1		27							44
7	Paippad	21	1	48																						8					1				79
8	Thrikkodithanam		108	7	4						1		16											15		5		7							163
9	Madappally	42	116	27		48																		15	21	19	33				17				338
10	Kurichi									1			4													74	14								93
11	Vakathanam	27	19																																46
12	Karukachal		65																							2									67
13	Vaikom																									1	5								6
14	Kaduthuruthy																																		
15	Ettumanoor																								27	22									49
16	Uzhavoor																																		
17	Lapalam (Pala)																									24									24
18	Erattupettah																																		
19	Pampady																																		
20	Pallom																																		
21	Vazhoor																									23									23
22	Kanjirappally																									7		9							16
23	Kottayam		21			45																			41	109	10	29							255
24	Thiruvalla	21	128		628					28	1							70				4	49	113		30				10	26				1104
25	Alappuzha		27		11			10		13	8	2				70			9	1				88			25			21		88		26	414
26	Pathanamthitta		210													7								101		15									342
27	Kollam		21															14	49							7				14					84
28	Thiruvananthapuram																							153											174
29	Idukki		9																							19									28
30	Ernakulam		361																					23		39	156	37	15						742
31	Other Northern Districts		12																						106	3	15	15							76
32	South Tamil Nadu		12					10																	21	5									5
	Total	111	1098	82	643	93		53	3	83	10	15	100			77		84	58	23		48	56	892	355	544	442	171	30	56	119	88		26	5360

Source: NATPAC Survey June 2001

ANNEXURE A.XIX

O-D MATRIX OF INTER CITY GOODS TRAFFIC (in tonnes) BY GOODS AUTORIKSHAW

Origin		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Total
1	Ward No. 1,2,3,5,30,32						175																												175
2	Ward No. 4,29,27,28,26,13,31						44	60		18	140	9								9					2										282
3	Ward No. 20,21,22,23,24,25,14																																		
4	Ward No. 15,16,17.18,19									366																1									37
5	Ward No.6,7,8,9,10,11,12																																		
6	Vazhappally				13																					103									124
7	Paippad																																		
8	Thrikkodithanam																																		
9	Madappally					6																				3									9
10	Kurichi			128									9																						137
11	Vakathanam																																		11
12	Karukachal		11																																
13	Vaikom																																		
14	Kaduthuruthy																																		
15	Ettumanoor																																		
16	Uzhavoor																																		
17	Lalam (Pala)																																		
18	Erattupettah																																		
19	Pampady																																		
20	Pallom																																		
21	Vazhoor		3					7																	4										7
22	Kanjirappally																																		7
23	Kottayam				13	9				2																55									79
24	Thiruvalla																																		
25	Alappuzha		23				70																	7											100
26	Pathanamthitta					6																								23					29
	Total		45	128	26	21	289	67		56	140	9	9							9				7	4	164					23				997

Source: NATPAC Survey June 2001

annexure XX A3 SIZE

ANNEXURE XXI

COMMUNICATIVE DISEASES REPORTED IN TALUK HOSPITAL, CHANGANASSERY

Month	Diseases								
	Accute Water Diarrhoea	Dysentry	Accute Despnatory infection	Viral Hepetitis (A)	Weils Disease	TB	Pneumonia	Typhoid	Viral Hepetitis (B)
January-01	334		2023			1		1	
February-01	295		295	1		75	1	2	
March-01	199		1713	1		69	4		
April-01	145		1434	1		71	6		
May-01	145		1542			64	2	6	
June-01	284		1751			67	4	4	
July-01	417		1944			62			
August-01	192	126	1598	1		53	4	1	
September-01	178		1334	1		49	4		
October-01	134		1915	1		50		2	
November-01	162	25	236	3		44		1	
December-01	118	31	1297			47		1	
January-02	96	17	1113			48			2
February-02	94	21	972	6		40	8	4	
March-02	85	15	921			39			
April-02		21	909	7	1	50			
May-02	112	43	936	1	1	59	3	1	
June-02	126	50	1040	1		48	1	1	
July-02	148	61	1131	1		42	1		
August-02	117	41	920	4		48	3	1	
September-03	110	47	1778	3		60	4	5	
October-02									
November-02	135	45	929	3		41	22	2	

ANNEXURE –XXII- A3 SIZE

ANNEXURE XXIII

FLOOD AFECTED AREAS

Sl. No.	Name of area	Area (in hectares)	Duration of floodings (approximate)	Reasons
1	Menilam	1.83	7-15 days	Low lying area and uncultivated paddy field
2	Noorupadom	1.56	7-15 days	Low lying area and uncultivated paddy field
3	Kanniyathuvallom	5.65	10-20 days	Low lying area and uncultivated paddy field
4	Koyipurathuvallom	1.56	10 days	Low lying area
5	Thamarakkad	1.59	12 days	Low lying area
6	Kalappurackal	2.43	10 days	Low lying area
7	Vettadi	5.03	10-25 days	Low lying area, uncultivated paddy field, Blockage of natural drains
8	Muthalvachira	2.43	15-25 days	Low lying area, uncultivated paddy field, Blockage of natural drains
9	Panickarodam	1.50	10-15 days	Low lying area
10	Mulackal padam	0.50	10-20 days	Low lying area, uncultivated paddy field, Blockage of natural drains
11	Champakkulam	2.11	15-20 days	Low lying area, uncultivated paddy field, Blockage of natural drains
12	Kakkanthodu	2.03	5 days	Low lying area
13	Attuvakkarai	3.94	20 days	Low lying area, uncultivated paddy field, Blockage of natural drains
14	Ezhupathanchil padom	7.63	15 days	Low lying area, uncultivated paddy field, Blockage of natural drains
15	Olakkathanam	7.66	10 - 15 days	Low lying area
16	Valloppally	1.20	7 days	Low lying area
17	Charuveli	1.71	7-10 days	Low lying area
18	Kadavanthra	0.68	10 days	Low lying area, Blockage of natural drains
19	Panakkari	3.28	7-15 days	Low lying area, uncultivated paddy field, Blockage of natural drains
20	Kandankari	0.86	15 days	Low lying area, uncultivated paddy field, Blockage of natural drains
21	Manchadikkara	2.28	10 days	Low lying area, uncultivated paddy field
22	Randukuzhychira	0.94	7 days	Low lying area
23	PP Jose Road side	0.20	20 days	Low lying area
24	Parakkavetti	1.50	10 days	Low lying area
25	Kunnakkad	2.34	7-10 days	Low lying area, uncultivated paddy field
26	Fathimapuram padom	0.24	10 days	Low lying area, uncultivated paddy field
27	Irooppa padom	0.38	7 days	Low lying area, uncultivated paddy field
28	Kattakkuzhy	4.62	7-15 days	Low lying area, Blockage of natural drains
29	Thottasseri	0.65	10 days	Low lying area

Source: Survey conducted by Town and Country Planning Department

ANNEXURE A. XXIV

LIST OF MAJOR HERITAGE BUILDING AND SITES IN CHANGANASSERY TOWN

Sl. No	Name of the monuments buildings of heritage or architectural value	Age	Brief description
1	Keezhikulangar Siva Temple	1000	More than 1000 year old. But the old temple was destroyed and a new structure has been constructed in the place
2	St. Paul's Church, Vazhoor road`	160	Established by CSI Missioneries about 160 year back. It is a churchwith "*Anglical style* "
3	Thirumala Mahadeva temple	500	The temple with a sreekovil or rectangle shape, which was re-constructed with concrete roof in the later part of history.
4	Sree Mahavishnu temple Perunna East	500	The temple was belonging to Edamana Illam earlier. It was re-constructed later
5	Payyambra Illam	700	It is a small temple in dilapilated condition and is in the possession of Payyambra Namboothiri Illam.
6	Anandapuram	700	It is a temple with typoical Kerala style architecture.
7	St. Mary's Metropolitan church	136	Constructed by the King of Travancore in 1867.Constructed by stones, timber and tile. A huge corss of about 20 feet hight made from a single stone is the major attaction
8	Kavil Bhagavathi temple	900	Constructed by Thekkumcore principality. A temple constructed with timber and tile with a tall mast in front
9	Vettadi temple	800	Associated with the history of Travancore, as it related to *"E ttuveettil Pilla "*. It is in the possession of Archoiological Department and source renovation works already been started.
10	Pazhayapalli Muslim Jama - Ath Puzhavathil	950	Constructed about 950 yeas back in the land assigned by Thekkumcore Rajas. Reconstruction of this mosque is in progress with RCC structure, in place of old mosque with timber and tile.
11	Chithrakkadavu		Situated near '*Chithrakadavu* ' and was constructed by Thiruvithamkore Raja for the family members. Srenovation work is in progress.
12	Sree Vaikundeswaram Sandanagopala Moorthi Temple	200	It is a temple with '*Chuttambalam* ' and was constructed for the members of Lakshmipuram Palace.
13	Puthoor - Muslim jama Ath	215	A mosque constructed with brick and concrete. The "*Thazhikakkudam* " "*Ettuvattom* " are the major attractions. Chandanakkudam festival celebrated here is very famous .
14	Sree Pappadi Hanuman Devar Temple	400	Constructed during the regem of Ayilyam Thirunal and it is the only Hanuman temple the district. It is a temple constructed with laterate, granite and timber.
15	Vazhappally Sree Mahaveva Temple	1000	A temple of Kerala Architectural style constructed about 1000 years back. It is one among the 108 Siva temple. Inscription of this temple mention about Rajasekhara Varma, an emperor of Chera dynasty.
16	Thrikkayil Mahadeva Temple Manchadikkara	500	A temple constructed with timber, laterate etc. It is in neglected state now.
17	Parukkattukoikkal Kavu	400	It is a sacret Grove in the town
18	Morkulangar Sree Bhagavathi temple	very old	A temple with rectangular shape Sreekovil and constructed with stone, toimber and tile. It was renovated about 65 years back.
19	Perunna Subrahmania Swami Temple	1200	Constructed during the 8th century by Chenkuttavan King who ruled the Thiruvithamcore. The Sreekovil of the temple in in circular shape and it is covered with copper plates.
20	St. Mary's Church, Parayil	100	A famous church in Changanassery. The three storyed seminary building attached to the church is very attractive.

Source: Survey conducted by Town and Country Planning Department

ANNEXURE. A.XXV

LIST OF SERVICE INDUSTRIES OF NON-NUISANCE NATURE

1. Apparel making
2. Assembly of air coolers, conditioners
3. Assembly of bicycles, baby carriage and other small non-motorised vehicles
4. Atta-chakkies
5. Bakery products, biscuit confectionery
6. Bamboo and cane products (only dry operations)
7. Block making for printing
8. Cardboard or corrugated box and paper products (Paper or pulp manufacturing excluded)
9. Carpet weaving
10. Chilling plants and cold storage
11. Cotton and woolen hosiery
12. Electronic equipment,electrical goods
13. Fountain pens
14. Garments stitching, tailoring
15. Gold & Silver smithy
16. Gold & Silver thread sari works
17. Ground nut decorticating (Dry)
18. Ice-cream or Ice-making
19. Insulation and other coated papers(Paper or pulp manufacturing excluded)
20. Jobbing and machining
21. Leather footwear and leather products excluding tanning and hide processing
22. Light Engineering
23. Manufacture of formulated synthetic detergent products
24. Manufacture of soaps involving process without generation of trade effluent (saponifaction of fats and fatty acids only)
25. Medical and surgical instruments
26. Mineralised water

27. Musical instruments manufacturing
28. Oil ginning/expelling (no hydrogenation/ refining)
29. Optical –frames
30. Paint(by mixing process only)
31. Paper pins and U-clips
32. Plastic and P.V.C Processed goods
33. Power looms/ handlooms (without dyeing & bleaching)
34. Printing press
35. Radio assembling
36. Rice mullors
37. Rope (cotton & plastic)
38. Rubber goods industry
39. Scientific and mathematical instruments
40. Shoelace manufacturing
41. Sports goods
42. Steeping and processing of grains
43. Thermometer making
44. Toys Making
45. Spice grinding operation
46. Polythene, plastic and P .V.C. goods through through injection/extrusion moulding
47. Furniture without machinery
48. Electro plating
49. Gold and silver smithing
50. Rubber goods industry