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**APPROACH PAPER
FOR
MASTER PLAN
OF
THIRUVANANTHAPURAM CAPITAL REGION**

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India is passing through a fast rate of urbanization. In the year 1951 there were 2822 census (urban) towns accommodating 17.30% of the country's population. By the year 2001 the census urban towns increased to 4378 and our urban population was 27.80% of the nation's population. This is increasing every year and the Recommendations of the Administrative Reforms Commission (ARC) appointed by Government of India submitted in October 2007 state that 'by 2050, over half of India's population is expected to be urban dwellers'.

Kerala is not far behind. 26 percent of the State's population lived in urban areas in the year 2001. But this urban content is increasing fast. Thiruvananthapuram district had 32.35 lakhs population in 2001, out of which 10.93 lakhs (33.79%) lived in urban areas. Perhaps in the seven years from 2001 to 2008 the urban population in the district might have increased to 36%.

Thiruvananthapuram is the capital city region and people from all over the State migrate to Thiruvananthapuram for settling down due to employment in government and quasi government institutions. Moreover Thiruvananthapuram has during the last ten years attracted a large number of job seekers from within the State and from other States. The importance of Thiruvananthapuram City region has increased substantially over the last few decades not only as an administrative capital but also as an economical active region contributing to the State's economy.

"Urbanisation and economic development have a strong positive correlation which is indicated by the fact that a country with a high per capita is also likely to have a high degree of urbanization. ----- The economic advantages provided by urban areas are many. Generally, industrial, commercial and service sectors tend to concentrate in and around urban areas. These areas provide a larger concentration of material, labour, infrastructure and services related inputs on the one hand and also the market in the form of consumers, on the other". (ARC)

It is in this background that we look at the Thiruvananthapuram Urban Region with its multiplicity of functional roles:

- As an administrative capital region of the State with the prestige and grandeur it shall have;

- As a Knowledge Centre with the many educational and research institutions situated in and around the city and as a human resource skill development centre;
- As a major transit centre for people and goods;
- As a production centre of modern goods and services; and
- As a tourist gateway with its variety of tourist attractions like beaches, hill stations, forests, backwaters, heritage structures and precincts and nature.

Development of Thiruvananthapuram City region has larger spread effects benefiting the State as a whole. It is in this context that we now analyse the scope and prospects of the second Master Plan for TCR, considering the fact that the first Master Plan for Thiruvananthapuram was limited in scope and contents. Over the decades the concept of Urban Development Plan has undergone many changes in content and the issues to be addressed.

1.0 PROFILE OF THIRUVANANTHAPURAM CITY REGION

Thiruvananthapuram district has a gross area of 2192 sq km (5.64% of the area of the State) accommodating 32,34,356 persons (2001) of which is 10.16% of the State's population of 318,41,374. Out of this district population 10.92 lakhs lived in urban areas. Thiruvananthapuram district has five statutory urban areas, namely, Thiruvananthapuram City, Neyyattinkara, Nedumangad, Attingal and Varkala towns.

Neyyattinkara and Attingal towns are located along the NH 47 at a distance of 20 km on the south of the city and 28 km on the north of the city respectively. Nedumangad town is about 20 km to the north east side of the city along the Shencottah interstate road (State Highway - SH). The coastal town of Varkala is 50 km to the north west of the city linked by connecting roads from Kallambalam and from Paripally on the NH 47. Varkala town has rail connectivity on the Thiruvananthapuram - Kollam railway.

Thiruvananthapuram city and a few adjoining Panchayat areas around the city are considered together as the jurisdictional area of Thiruvananthapuram Development Authority (TRIDA) with a total area of 296.35 sq km. The constituent units within the TRIDA area are noted in the table below:

Constituent Units of TRIDA with their area and population (2001)

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No.	City/Panchayat	Area (sq km)	Population (2001)	Density (p/sq km)	No. of HHs
1	Thiruvananthapuram (M.C.)	141.74	744983	5256	174670
2	Kazhakuttam	19.47	34131	1753	7755
3	Sreekariam	23.73	49145	2071	11794
4	Kudappanakunnu	7.69	38175	4964	9263
5	Vattiyurkavu	10.61	41890	3948	9996
6	Kalliyur	17.23	36836	2137	9007
7	Vilavoorkal	12.02	27495	2287	6441
8	Vilappil	19.42	34079	1755	8174
9	Pallichal	21.70	45118	2079	10807
10	Venganoor	10.12	33372	3298	8205
11	Vizhinjam	12.62	47170	3738	9273
	TOTAL	296.35	1132394	3026(Av.)	265385

The Census of India 2001 has categorized urban areas also as Urban Agglomerations (UA). UA is defined as a continuous urban spread constituting a town and its adjoining urban out growths, or two or more physically contiguous towns together and any adjoining urban out growths of such towns. Based on this concept, Thiruvananthapuram Urban Agglomeration is considered as Thiruvananthapuram City together with Kazhakuttam Out growth (OG) (5.03 sq km), Sreekariam OG (8.87 sq km), Kudappanakunnu OG (7.69 sq km), Vattiyurkavu OG (1.11 sq km) and Kovalam OG (3.33 sq km). Total area of TUA (Thiruvananthapuram Urban Agglomeration) was 167.77 sq km (2001) with a total population of 8.90 lakhs.

The City Development Plan (CDP) for Thiruvananthapuram prepared by the Thiruvananthapuram (2006) had attempted to project the population in the TUA for the period up to the year 2031. It is estimated that the **City Population** which is 744983 in 2001 may grow to 7.70 lakhs in 2011, to 7.96 lakhs in 2021 and to 8.50 lakhs in the year 2031. However this attempt at population projection shall not be considered as conclusive, since the scene may change when major new development initiatives are implemented within the city region. In fact according to ELECTION DATA OF 2005 the Trivandrum corporation had around 7.5 Lakhs registered voters which points to a conservative population estimate of 10 lakhs of all ages in 2005 itself. Vizhinjam International Container Transshipment Terminal (ICTT, Techno City, TechnoPark expansion and similar major projects which provide substantial job opportunities may create economic spread effects and open out avenues for large volume of service sector employment within the city region. This may attract immigration into the city region.

Thiruvananthapuram City has six major regional roads, which link the city to the region around, provide connectivity within the district, link the capital city to the other districts and also provide interstate connectivity.

These six roads are:

- (i) NH 47 to Attingal - Kollam
- (ii) MC Road to Kottayam
- (iii) State Highway to Nedumangad - Shencottah (interstate road)
- (iv) MDR to Tirumala - Kattakada (eligible for upgrading to an interstate road via Kottoor & Amabasamudram to Tirunelveli)
- (v) NH 47 to Neyyattinkara - Kanya Kumari (interstate road) and
- (vi) MDR to Vizhinjam - Poovar (linkage to NH Bypass and partly becoming NH bypass)

The City has a linear rail connectivity (i) along the coast to Kollam linking Varkala enroute on the north and (ii) through Neyyattinkara to Nagarcoil in Tamil Nadu.

Thiruvananthapuram Airport, though elevated to the status of an international airport nearly 25 years ago, is yet to get world class terminal and facilities. The new terminal building under construction with direct access at Chackai from the NH Bypass is considered as the beginning of a development process

Observed Development Trends within the City Region

The regional roads converge to the city and these major road corridors are rather loosely linked by radial road pattern. Obviously this would appear to be a near ideal situation. However, this road theorized network does not work the way traffic experts would expect the network to work. Such a network should also induce uniformly distributed development activities around the city. This also has not happened.

Within the city and along the peripheral areas, the city region has experienced road corridor based development intensification. However it can be seen that major development impetus has been received mainly by only three road corridors:

- NH 47 from the city to Kazhakuttam
- MC Road from Kesavadasapuram to Mannanthala - gradually getting extended to Vattappara
- NH Bypass from Kazhakuttam to Thiruvallam

The major road corridors which have attracted large scale development impetus 6 are:

No.	Road Corridor	Remarks on nature of development
1	Along NH 47 up to Kazhakuttam	Reasons could be institutional developments in the Medical College Zone and near Sreekariam, Kulathur, Kariavattom & Kazhakuttam - Availability of developable land & good transportation facilities intensified spread of development along this corridor and in the adjoining areas
2	Along the SH1 i.e. MC Road up to Mannanthala	Largely favoured by the migrating families from the old central Travancore area- religious grouping and affinity for community togetherness - establishment of good educational institutions along this corridor - good connectivity from the city - availability of good developable vacant land -
3	NH Bypass from Kazhakuttam to Thiruvallom	The bypass was aligned through a low lying land on the western side of the city - this corridor opened out large extent of land for development - advantages are: cheaper prices, availability of large parcels, nearness to the city centre, nearness to airport and railway station, NH connectivity etc.

Road Corridors which attracted only residential development or lesser developments

No	Road Corridor	Remarks on the nature of development
1	Peroorkada - Vattiyoorkavu - Nedumangad road	In spite of the nearness to the city, due to the absence of major state investments, this corridor mainly attracted only residential developments
2	NH 47 towards Nagercoil	Positive features are - nearness to the city centre, availability of land, interstate road corridor etc. In spite of this lack of Government initiatives and inadequacy of good infrastructure, non availability of good road and transport facility etc. resulted in our not able to exploit the potential of this corridor
3	Vizhinjam - Poovar - Nagercoil road corridor	Coastal road - tourism importance - scope for widening and improvement ; in spite of these this corridor lacked development inputs to be made a major zone of the city region Opportunity now getting opened out due to Vizhinjam ICTT

The south (Nemom to Neyyatinkara stretch) side of the city, the south-east (Peyad, Vilappilsala, Vattiyoorkavu, Nettayam, Kachani side) side of the city, the eastern side (beyond Peroorkada towards Nedumangad) and the south-western side (Ambalathara, Venganoor side) have the capacity to absorb more development inputs provided planned infrastructure development can precede land development.

2.0 PLANNING EFFORTS SO FAR

- (1) The first Master Plan for Thiruvananthapuram was prepared by the Chief Town Planner and Consulting Architect to Government during 1966, but was approved by Government only in 1971. This Master Plan had a horizon period of 20 years i.e., from 1966 to 1986
- (2) Development Plan for Trivandrum Medical College Area was prepared and approved (approved in 1976)
- (3) Development Plan for Kovalam - Vizhinjam area was approved by Government (approved in 1978)
- (4) Detailed Town Planning (DTP) Schemes were prepared for the following areas (each scheme area consisting of about 50 to 100 ha of land)-
 - East Fort - Pazhavangadi area (approved in 1979)
 - MG Road from Spencer Junction to Mele-Pazhavangadi (approved in 1982)
 - Palayam area (approved in 1978)
 - Musuem - Kaudiar Avenue (approved in 1986)
 - Pravachambalam area (approved in 1985)
 - Peroorkada area (approved in 1983)
 - Thampanoor area (approved in 1994)
 - Pappanamcode area (approved in 1995)
 - Vellar (Kovalam) area (approved in 1977)
 - Kesavadasapuram area (approved in 1983)
 - Pattom area (published in 1979)
 - PMG to Plamoodu area (approved in 1992)
 - Chalai area (approved in 1979)
 - NH Bypass from Akkulam to Thiruvallam (5 schemes) (published in 1991)
 - Area from Aryasala to Thycaud W & C Hospital Junction (approved in 1980)
 - Area around Vikas Bhavan, Palayam (published in 1977)
 - Fort area (published in 1992)
 - Vellayambalam to Thycaud Road (published in 1994)
 - Kochar road (Maruthamkuzhi to Killipalam) area (published in 1991)
 - Power House road (published in 1992)
 - Punnan road (published in 1993)
 - Kaudiar area (published in 1994)

- (5) Draft of the Second Master Plan for Thiruvananthapuram was attempted in 1994 and was published for discussions. However, the process was not taken further for finalization and approval by Government. (However, the draft Plan prepared before 2001 could not take into account the population studies of Census 2001. The jurisdictional area of the city increased from 74.93 sq km to 141.74 sq km. Moreover a large number of suggestions were received after publication of the draft Master Plan and during the public consultation meetings held by TRIDA. This necessitated revision of the Draft Plan).
- (6) The following aspects also necessitate drastic revision of the draft Master Plan published before 2001:
- Thiruvananthapuram Capital City Road Improvement Project (now under implementation) caused variations in road widths and alignments for the 12 road stretches from those proposed in the earlier Town Planning Schemes.
 - Developments that have taken place by the side of NH Bypass
 - Shifting of the airport terminal to the eastern side
 - TechnoPark and its further expansion and the developments that have taken place in Kazhakuttam area
 - Proposed TechnoCity at Pallipuram
 - Proposed Vizhinjam ICTT
 - Shifting of Civil Station to Kudappanakunnu
 - Proposed eastern side Outer Ring Road as City Bypass on the eastern side which may open out a new development corridor with development impacts in the entire eastern region

3.0 MAJOR URBAN INFRASTRUCTURE PROJECTS UNDER IMPLEMENTATION 9

The following infrastructure development projects are under implementation in the city region:

- TCRIP - Thiruvananthapuram City Road Improvement Project - Widening and improvement of 12 road stretches, which include underpass at Palayam and Overbridges at Reserve Bank Junction and at Thakaraparambu Road Junction
- JBIC assisted Water Supply Augmentation Project
- ADB assisted KSUDP (Kerala Sustainable Urban Development Project)- under which Sewerage, Surface Water Drainage and Road Improvement projects are implemented
- JnNURM (Jawaharlal Nehru National Urban Renewal Mission) assisted projects for establishment of Sewage Treatment Plant (STP) at Muttathara, extension of sewerage system to uncovered areas in the city, reducing unaccounted water loss by changing non working meters and changing the old individual connections and improvements to solid waste management system.
- Various schemes including slum improvement projects to benefit Urban Poor under KSUDP and JnNURM
- Improvements & modernization of Thiruvananthapuram Central Railway Station
- New terminal facilities for Thiruvananthapuram International Airport

4.0 MAJOR NEW INSTITUTIONAL AND DEVELOPMENT PROJECTS ALREADY DECIDED TO BE LOCATED IN THE TCR

The following are the new institutions newly located and already decided to be located in the city region:

- Expansion of Techno Park at Kazhakuttam
- Infosys premises near Techno Park
- UST Global and other IT majors near Techno Park
- TechnoCity at Pallipuram
- Indian Institute of Space Technology (IIST) at Valiamala near Nedumangad
- Indian Institute of Science Education and Research (IISER) at Vithura
- Life Sciences Park at Mangalapuram proposed by KSIDC
- Health care Park proposed by KSIDC

- Telecom City at Kulathur
- Brahmos Project near the Airport
- Defence Production Park
- International Convention centre at Akkulam

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The following projects which may substantially contribute to the development of Thiruvananthapuram Region and the State as a whole are being pursued by the State Government:

- (1) Vizhinjam ICTT
- (2) Ship Building Facility at Poovar
- (3) Extension of National Waterway from Kollam to Kovalam

The citizens of Thiruvananthapuram have aired their aspirations for certain development actions on many occasions. Moreover certain development projects have been talked about, but specific actions are yet to be taken for projecting these ideas and for implementation. A few of such proposals are listed below:

- (i) Development of a Second Railway Terminal as a major station with adequate facilities at Kochuveli
- (ii) Transit and Bus facilities from Kochuveli to the city centre and vice versa
- (iii) Railway Coaching facilities at Nemom
- (iv) Establishment of Inter-district and interstate bus terminal at Eanchakkal adjacent to NH Bypass
- (v) Redevelopment of Thampanoor City centre Bus terminal with modern facilities
- (vi) Development of Rajiv Gandhi Biotechnology Centre as an institute of world repute and establishment of a Biotechnology related Deemed University under RGBC
- (vii) Construction of a new highway from the city through Kattakada, Kottoor and Ambasamudram to Tirunelveli to meet the 'Golden Quadrilateral' which would be economically beneficial to the State
- (viii) Construction of eastern bypass linking Attingal, Nedumangad and Neyyattinkara to Vizhinjam as a urban development corridor and facilitating container movement

It is heartening to note that the following development projects are included in the 11 State Budget for 2008-09. Perhaps it is for an agency like Thiruvananthapuram Development Authority (TRIDA) meant for coordination and initiating actions for planning and development in the Thiruvananthapuram Capital City Region to coordinate with the concerned agencies and to facilitate establishment of the institutions or implementation of the proposed projects.

Major Budget Provisions made for Capital City Development

KERALA BUDGET PROPOSALS 2008-09

No.	Sector	Project	Tentative Allocation (in Rs. Lakhs)
1	KSEB	Strengthening of Transmission Distribution Network	150
2	Industries	Indian Institute of Handloom Technology	100
3	KSIDC	Electronics Hub, Life Science Park, Health Care Park, Luxury Train	
4	KINFRA	Film Video Park - Animation Centre, Biotechnology Park, Expansion of Apparel Park, Knowledge City, SEZ, Non Conventional Energy Park	
5	New	Centre for Training Professional Managers of PSUs	
6	I.T.	Finishing School, International Centre for Free Software and Free Knowledge	
7	PORT	Directorate at Vizhinjam Vizhinjam Cargo Harbour	2275 5
8	Tourism	Convention centre at Hotel Samudra, Vellar, Kovalam	150
9	Science & Technology	National centre for Indigenous/ Traditional Knowledge, Kerala Institute of Environment, Science & Technology, Kerala Science City	
10	Medical Education	Heart Foundation Indian Institute of Diabetes	50
11	Ayurveda	Ayurveda College Thiruvananthapuram, AYUSH University	
12	Urban Development	Capital City Development Project CRI, Water Supply, Bus Terminals, Fish Market, SWM, Beautification, ICTT, Tagore Theatre, Street Lighting, Theerapatham	598.94
13	Labour	Kerala State Design Institute, Aryanad	
14	SC/ST	Office Complex Ambedkar Bhavan	250 650
15	NORKA	Norka Village	50

5.0 DEVELOPMENT ISSUES

The attempt here in discussing Development Issues is only to highlight a few major issues in order to lead the way to the Master Planning exercise and not to discuss all the felt infrastructure problems and the non maintenance of infrastructure assets. It is believed that certain macro level development issues discussed here would enable the planning process and experts to recognize the emerging scenario of Thiruvananthapuram city region concept and the scope of development planning.

- (i) Discussions on Thiruvananthapuram development have always been focused only in the city area and the immediate periphery. Most of the infrastructure programmes proposed have also been located or desired to be located within the city (the best example is the Bramhos Missile Project - located right in the city centre, in spite of the fact that such a project in the present site does not have scope for further expansion and that such a defence production park should be ideally located in the outer regions of the city).
- (ii) Concept of a regional perspective for the capital city region is yet to emerge. While the Census was talking of Urban Agglomeration comprising of the city area (141.74 sq km) and 5 urban outgrowths (26.03 sq km) (total area of TUA - 167.77 sq km), this city region was focused in the City Development Plan for Thiruvananthapuram prepared under JnNURM. The Government constituted TRIDA in the early 80s carving out the old city area and the adjoining Panchayat areas around, which totalled to 296.35 sq km. The TRIDA comprises of the present TMC area of 141.74 sq km and the ten adjoining Panchayat areas with a total area of 154.61 sq km.

In spite of the above certain development actions like the TechnoCity and Vizhinjam ICTT have transcended the boundaries of even the TRIDA area. In this context we have to delineate the planning region around the capital city which needs to be considered in the preparation of the Second Master Plan for Thiruvananthapuram. It is obvious that unless the immediate region around the city is also planned to have guided development, the area around the city may face unplanned haphazard development which may upset all infrastructure planning.

- (iii) The four small towns within Thiruvananthapuram district are not being utilized to the advantage of development of the city region, in spite of the fact that all the four towns are within easy commuting distance from the city and have good road connectivity. In contrast, one can see Chennai Metropolitan Development Authority (CMDA) striving hard through Metropolitan Regional Plan to develop ring towns and satellite towns through huge investments. Such a policy is to benefit both the metropolitan city and the small towns around.

Neyyattinkara town (and the adjoining Balaramapuram Panchayat area) may be the natural beneficiary of the spread effects of Vizhinjam ICTT and Shipyard at Poovar. Development policies for these areas may have to be considered.

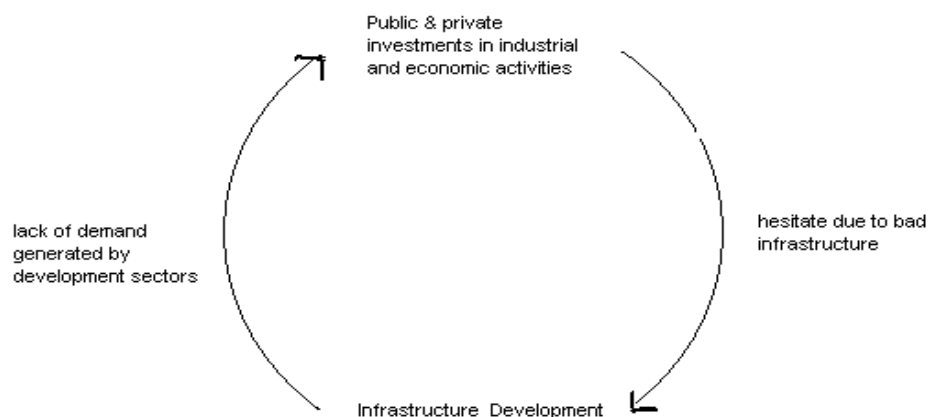
When the IT and BT (biotechnology) sector developments extend farther from Kazhakkuttam to Pallippuram and Mangalapuram, **Attingal** town on the NH 47 may have a key role to play.

Varkala is the second tourist destination in the district within 30 minutes commuting distance by train. Adequate land is available in this scenic coastal town to attract and absorb recreational and conference/convention facilities of the capital region. This scope for development would develop manifold when the railways start operating suburban rail network / electrical multiple units (EMU).

Nedumangad town is situated within 20 km of the city on the interstate road to Shencottah and Tirunelveli. A large number of institutions of national repute like TBGRI (Tropical Botanical gardens and Research Institute), VBI(Veterinary Biological Institute), ISRO Valiamala, IIST(Indian Institute of Space Technology), Valiamala and IISER(Indian Institute of Science Education and research) at Vithura may improve the importance of Nedumangad as the central urban node to provide service facilities for all these institutions. Perhaps this importance of Nedumangad would further escalate when the conceived rail link from Punalur to Thiruvananthapuram and the road link to Tirunelveli and Koodankulam via Kottur and Ambasamudram are realized. It is learned that the Government of India have also originated schemes for satellite towns and high ways to bypass major cities. These schemes can also be

utilized advantageously to benefit the 4 small towns in the district to the advantage of the Capital region Development.

- (iv) A few institutions earlier proposed in Thiruvananthapuram were relocated in other areas of the state or lost to the state citing non availability of land in Thiruvananthapuram. In fact it is not non-availability of land but non- availability of suitable land with adequate infrastructure and connectivity. This is a vicious circle where public and private investments in industrial and economic activities hesitate due to inadequate infrastructure and infrastructure developments have not happened because demand has not been generated by productive economic investments.



- (v) Without negating the point made in para (iv) above, it is to considered that the average width of the state in Thiruvananthapuram is only about 30 to 40 km. Considering the constraints of coastal zone regulations (on the west) and reserved forests (on the east) the effective width of land for human activities may be an average of only 25 km. Though this puts a constraint on highly land intensive industrial activities like automobile plants, it is possible to utilize land with adequate infrastructure for modern soft industries like the IT, BT etc. and also for specialized institutional activities. Perhaps proposals for economic development in the district may have to consider locating such selected activities in Thiruvananthapuram region.

(vi) Paragraphs (iv) & (v) above need also to be looked at in the perspective of the high density of population in the district. Since large scale land acquisition for productive activities without displacement of the resident population is difficult, pragmatic approaches would be ---

- Identification and planned conservation and utilization of Government puramboke land, excess land, abandoned /unproductive estates for development purposes
- Utilization of vacant lands in the elevated areas of Neyyattinkara, Nedumangad and Chirayinkeezhu taluks
- Relocation and rehabilitation (R&R) to be made part of the project proposal

(vii) The elementary principle of development is that infrastructure development should precede construction of buildings or establishment of any institution at a particular locality. This is often ignored; with the result that an institution may be built somewhere or a few residential buildings may be built somewhere and after that people may clamour for infrastructure development and then as a problem solving measure slowly access roads or water supply or street light may be provided there.

To illustrate this aspect, indicative infrastructure development programmes for each of the probable investments is tentatively worked out and shown in **ANNEXURE 1.**

(viii) Concept of City within the City: It is high time that we learn from the experience of other Metro cities. Other Metros have experienced unplanned urban sprawl extending towards their peripheral areas and towns. In these cases it is not known where the city ends. The surrounding land mass has all been gobbled up for construction purposes totally upsetting the environmental setting. Transportation costs are increasing and the city centre road corridors are flooded with vehicles. Many other problems of such unregulated urban sprawl are not discussed here in detail.

Thiruvananthapuram city region should plan for such urban sprawl which may happen towards Attingal NH, towards Vattapara, towards Vizhinjam, towards Neyyattinkara NH or along other major corridors. Perhaps, we may

think on the concept of 'city within the city' where every major zone 16 will be planned as a self contained zone within the city region so that the need to travel/daily commutation to other zones can be minimized, most of the services can be planned as stand alone systems within the zone etc. Kazhakuttam zone can be a small city itself with its own housing facilities, commercial facilities, recreational facilities, mini-water supply system, its own sewerage system with STP etc. Perhaps such small urban systems may also reduce the cost of services. Transport costs may be brought down and time may be saved for productive purposes. Localised energy saving non polluting vehicles can be used for mini transport service within the zone.

6.0 DEVELOPMENT POTENTIAL IN THE TCR

In many of the discussions on the development of Thiruvananthapuram, people had mainly raised two development needs:

- (i) Thiruvananthapuram being the state capital, it shall have development actions suited to elevate it to the stature of other state capitals in South India
- (ii) Road, public transport, sewerage, surface water drainage, solid waste management and other infrastructure projects to be improved to mitigate problems and to reduce inadequacies to serve the existing population

However, in an Urban Development Plan for Thiruvananthapuram apart from these two developments needs predevelopment initiatives to be considered. Such pre development initiatives should consider:

- The natural and manmade assets already available in the city region;
- Sustainable development of the region;
- Identification of the development potential of the region;
- Establishment of production centres which can contribute to regional economic development and provide job opportunities;
- Establishment of the educational/training/ skill up gradation institution to enable the youth to make themselves eligible to

avail of the emerging job opportunities in the production and 17 service centres; and

- Provision of infrastructure, facilities, services and amenities of good quality in sufficient quantity to provide a good urban living and working environment

The following development potentials are worth considering:

(1) TCR as a Knowledge Region

- (a) Due to traditional reasons and due to recent economic reasons, a number of educational institutions of higher learning and research are located in the Capital City Region. Similarly, a large number of central and state level research institutions are also located here. These educational institutions and research institutions can be functionally linked so that the higher order facilities in the research institutions can be used by the research scholars of the educational institutions and the research institutions can utilize the expertise and man power of the students and research scholars to carry out research work. Such functional linkages can also enable setting up of specialized equipment laboratories pooled facilities.
- (b) Location of highly specialized educational and research facilities
- (c) Creation of Knowledge Banks and Modernized Central Libraries which can be accessed from any institution from any part of the state. Moreover centralized institutional book lending facilities can also be developed.

Such Knowledge Bank can also become a store house for Reports, Study Reports, Maps, Subject wise reports, Research studies, books etc. on any subject and/ or area related to Kerala.

(2) TCR as an Economic Production Centre

- Technopark is the first I.T. Park in India. Technopark is in the expansion process. A few I.T. majors like Tata, Infosys, UST Global etc. are setting up their own I.T. Parks nearby. More over the state is promoting TechnoCity near Pallipuram

- Chitranjali studio is being upgraded as a good film production 18 centre. Film and Video Park, Animation centres etc. are attracting film production units. Thiruvananthapuram with lab facilities and natural assets is a good place for film production and processing
- Biotechnology and Biodiversity centres and agricultural and horticultural and fruit and flower promotion centres find Thiruvananthapuram as an ideal place to flourish
- Keltron is the first state sponsored electronic development institution in India. It has had its ups and downs. But it is seen that Thiruvananthapuram is a suitable location for establishing electronic Parks since demand for medical electronics, surveillance and security equipments, electronic engineering equipments etc. are increasing in the world today.
- The southern and eastern regions of the city are very fertile and the people have agricultural tradition. This hinterland region of the capital city can be considered for intensified horticultural production of vegetables, fruits and flowers. This region can also absorb planned investments in medicinal crops, processing of medicinal plants and manufacture of ayurvedic drugs. Such horticultural produces can also bring in substantial foreign exchange.

(3) Development of service sectors in TCR

In view of the administrative status as the state capital Thiruvananthapuram was considered earlier only as a service town, with predominance of Government sector jobs. But during the last two decades this functional role of city has gradually changed.

- Thiruvananthapuram has emerged as the gate way to Kerala tourism. Thiruvananthapuram and Kovalam have become one of the ‘must see’ destinations of domestic and foreign tourists. However, the potential of nature tourism with beaches, hill stations, backwaters, estuaries and heritage structures all within 50km of the city are yet to be fully explored.
- Thiruvananthapuram has been and still remains to be the best ‘skill upgrading’ centre in Kerala. The huge potential of human resource development existing and proposed in the city region would make

Thiruvananthapuram as the most sought after HR bank of the 19 world, provided care is taken to plan and establish specialized institutions of higher learning, to establish specialized job oriented training facilities and to elevate the select institutions existing now as centres of excellence.

- Thiruvananthapuram region has traditionally been a centre for artisans in wood and ivory works and weavers in handloom fabrics. These two trades and resulting production centres can be developed if required design centres, training facilities and production parks are established.
- In view of the interstate linkages Neyyattinkara - Balaramapuram had acted as a regional market centre for agricultural produces. Similarly Nedumangad had been a collection and distribution centre for hill produces and local agricultural produces. Planned strengthening of these two activities could benefit the entire district.
- The Capital City Region has experienced a construction boom during the last twenty years. Vast quantity of construction materials are consumed in the region and an array of engineering personnel and builders operate in the region. However, engineering production centres and regional markets for construction materials have not developed in the region. Planned development of these would generate good economic activities in the district.

(4) TCR as a health destination

Thiruvananthapuram Medical College campus had only 3 institutions in the past; but now this campus has seven institutions. The RCC and the SCTIMST have recognition at the national level and patients from within the country and abroad visit this campus. A large number of public sector and private sector specialized hospitals operating from the capital city region have gradually become a health destination for patients from abroad and from outside the state. This potential of health facility has not been fully tapped. Our traditional system of Ayurveda has world wide acceptance now. World class facilities need to be developed in this system to attract foreigners.

By upgrading the treatment facilities and related facilities and through organized marketing TCR may be able elevated to become the health destination for the world.

7.0 DEVELOPMENT VISION AND DEVELOPMENT STRATEGIES

The Second Master Plan for Thiruvananthapuram may have to attempt to identify the Development Vision for TCR. Though preparation of such a Vision Document for TCR was attempted earlier, we have not evolved a long term Development Vision. The City Development Plan prepared under JnNURM has identified priorities in infrastructure development based on Development Vision and Development Strategies. However these have to be revisited and revised to evolve Vision and development strategies which can take TCR to the next few decades of transformation into an economically vibrant metropolitan area.

8.0 SCOPE AND CONTENTS OF THE MASTER PLAN

The traditional Master Plan for a town or city was a simple document aiming mainly at a planned urban Land Use strategy required for a projected population and an anticipated socio economic role of the town. The Master Plan also attempted a possible road network plan and future transportation requirements. In addition the Master Plan also assessed infrastructure requirements taking into consideration the future population. Development Controls were included as Land Zoning regulations.

During the last three decades the concept of Master Plan (Urban Development Plan) has undergone changes. New planning parameters and new urban issues are addressed in the Master Plan of today. Instead of rigid land use regulations, Master Plan of today adopts flexible land utilization strategies. Newer planning tools are adopted for implementation of Master Plan proposals and accordingly the planning approach in the Master Plan itself is modified.

A few of the new emerging settlement planning parameters are:

- Urban Transport
- Urban Poor including slum improvement, informal sector etc.
- Waste management including solid wastes, sewage etc.
- Energy efficiency including alternative sources of energy
- Green and sustainable settlement development
- Surface water drainage, water conservation, ground water recharging as

The Master Plan delineates subsidiary Plans to be prepared under the broad guidelines of the Master Plan as under:

- (i) Preparation of **Area Development Plans** (Zonal Development Plans - ZDP) for specific areas within the planning region as prioritized as growth zones, specific development zones etc. (examples of prioritized areas for preparation of detailed ZDPs are Vizhinjan zone, Kazhakuttam zone, Kudappanakunnu zone etc.)
- (ii) Preparation of **Subject Plans** indicating the subjects which need to be prioritized based on requirements of the planning region (examples of aspects for preparation of subject plans are: Urban Mass Transport, Housing, Urban Poor, Waste Management, Drainage Master Plan etc.)

It has now become necessary for the Master Plan to indicate the plan implementation tools to guide the Urban Local Governments and Development Authorities.

- **Land Pooling** (Plot Reconstitution Technique-PRT) is an effective tool adopted in many countries to assemble land for various public uses and/or to promote development in an area - this technique is adopted in lieu of large scale land acquisition, which has become difficult in Kerala
- **Urban regeneration** methods are now attempted to rejuvenate the old parts of the city (like Chalai area, central commercial areas along the MG Road etc.) so that the existing land owners, tenants and sub tenants are not thrown pout, but at the same time large size plot development would be made possible leaving land required for road widening, vehicle parking and usable city scale open spaces. Various incentive programmes are combined with this to encourage land owners to pool their land parcels to make a big land parcels to avail of the concessions.
- To enable effective implementation of zoning regulations and differential FAR considerations, strategy of **Transfer of Development Right (TDR)** is used by which the Master can enforce lower FAR (low intensity development) in certain areas or propose conservation of heritage structures or conservation of green areas or low lying areas which are required to be conserved to ensure surface water drainage or to conserve open spaces.

- When schemes giving lower intensity of development or commercially less viable or schemes which lower monetary returns are proposed in certain areas within the city region, to compensate for the loss land owners are offered schemes like ‘**Accommodation Reservation**’.

There could be various other planning and development tools like Transit Oriented Development (TOD), Carrying Capacity Studies, Development Impact Analysis, Environment Impact Analysis etc. which need to be used in deciding on what development, where and in what measure.

9.0 DISCUSSIONS ON A FEW IMPORTANT SECTORS

9.1 Traffic & Transportation including options for Mass Transportation System suited for TCR

Kerala had achieved growth in the basic infrastructure field of public transport during the last decade thanks to the liberalized stage carrier permitting policy of the Motor Vehicles Act of 1989. However this achievement is not reflected in the State capital and surrounding areas catered. When the other states have laid special emphasis on modernization and improvement of public (mass) transport system in the respective capital cities, Thiruvananthapuram has not made any substantial improvement in mass transportation. This has even affected even the economic development in the city region.

The National Association of Software and Service Companies (NASSCOM) had commissioned a study to assess the attractiveness of 13 Indian cities across ten States as Information Technology Enabled Services (ITES) destinations analyzing the key strengths vis-a vis areas of concern of these cities. Thiruvananthapuram was adjudged the best city in the country having world class I.T / ITES facilities. But this commendable achievement was played down by stating the poor public transport system in the city. The inadequacy of this infrastructure facility is telling upon the economic growth of the state capital and blocking its growth. Proliferation of two wheelers & three wheelers, private vehicles and accidents, traffic jams etc. can be attributed to inadequate bus service. There is total failure in providing transportation facilities commensurate with that required for a state capital of about 10 lakhs of population and 2 lakhs of floating population.

Travel facilities on modern standards with out waste of time and money are the needs of the capital city region if the region has to develop as an economically vibrant city. Bus services in the city region are to be substantially improved to meet the expectations of travel of different sections of the society.

It is regretted to note that Government have issued a notification vide G.O. (P) No. 108/94/PW&T dated 24.11.1994 that has restricted the number of buses in the city (restricted the number of KSRTC buses to 410 and private buses to 100). The logic of such a Government Order is not known. The detailed statistics on bus transport facility is given in **ANNEXURE 2** which shows that Government has really acted on this order by limiting the number of buses. It is perhaps high time we review our policy on bus transport and modernize and improve the bus system as they have done in Bangalore and Chennai.

Increase in the number of buses proportionate to passengers is a norm in all the other districts. But In the city and in the nationalized areas of the district, there is no increase in the number of buses in the last decade. Although many operating centers have been opened, there is no significant improvement in bus availability. Only the buses operated in other units are transferred to the newly opened centers. The travel demands of the urban population are hardly being met by the existing public transport system.

The Comprehensive Traffic and Transportation Study (CTTS) for Thiruvananthapuram (2001) carried out by the Consulting Engineering Services Pvt. Ltd., New Delhi for the Department of Transport, Kerala point out that only about 40 percent of the travels are made in bus transport, which explains why our city roads are plagued by personal vehicles - 2 wheelers, three wheelers and four wheelers. It is recommended that 60 to 70 percent of the travels should gradually be shifted to public mass transport systems in order to reduce traffic volume on our roads.

The CTTS has recommended for a mass transit corridor from Kazhakuttam to Balaramapuram (to be developed in two stages) with extensions to the Airport from East Fort and to Peroorkada from Palayam. Since this is only a general recommendation in the CTTS, it is necessary to prepare feasibility studies for various options of mass transport, which would give more insight into the various options available and what the Capital City region would like to pursue. However, it is becoming imperative that

Urban Transport in the Capital Region should be managed by an exclusive body 24 delinking it from the State wide KSRTC. This is all the more necessary since eventually TCR Urban Transport may consist of other modes also in an addition to road based bus transport.

9.2 Land Use - Zoning and Development Regulations

Land within the Thiruvananthapuram city and the immediate region needs to be utilized prudently for public uses, residential uses, commercial uses and recreational uses with due consideration for environment. Compatible land use strategy needs to in place and regulated so as per the Master Plan. Future requirements for land for various uses need to be reasonably estimated and reservation shall be made for that, since it is not possible to produce land when the requirement surfaces. These are all within the concept of the Master Plan.

However, it is debated all over the country whether the Master Plan should attempt at a rigid land use strategy or should it have only a guideline plan with a flexible land use policy. Since land is a private domain, a guideline plan may not be sufficient to guide compatible land use development. Perhaps we may need regulations which can be enforced by the local authority. Meanwhile it is argued that it was the liberal relaxations that were allowed from time to time which destroyed the objectives of the first Master Plan for Thiruvananthapuram. It is to be discussed as to how a liberal, flexible land use policy which promotes development, but prohibits in compatible indiscriminate use of land can be adopted in the Second Master Plan for Thiruvananthapuram.

The Land Use Zoning does not just guide land use, but also prescribes on the intensity of development that can be allowed in each zone within the planning area. This interpreted as Floor Area Ratio (FAR), height zoning etc. are closely related to the capacity of infrastructure that can support the maximum intensity of development that may come up in each zone. Perhaps, such zoning regulations also propose the density or population distribution and also indicate the high intensity and low intensity development zones within the city region. This policy attempts at a three dimensional development approach to the planning region. By relating this approach to infrastructure planning and design, the threshold costs of infrastructure provision can be worked out.

The above discussion leads us to believe that Land Use and Zoning Regulations are not just arbitrary exercises in Master Plan preparation, but are based on scientific studies and based on sound theoretical footings.

9.3 Urban Sanitation - including water supply, sewerage, storm water drainage, solid waste management etc.

Master Plan for a developing urban region no longer restricts itself with land use zoning, preparation of traffic and transportation plan and estimating infrastructure requirements. Master Plan now transforms itself into is a Sustainable Urban Development Plan. Sustainability aspect is regarded in every aspect of Master Plan like land utilization, conservation of ecologically and environmentally sensitive areas, conservation of heritage, urban transport planning, provision of services and waste management.

However only a few of these aspects are briefly cited here in this note to bring home the fact that varied approaches are required to solve every issue and that every single issue is not to be regarded as 'State Provided' service, but as a participatory programme.

Water Supply: The traditional practice of dependence on surface water and ground water has been up. We look forward to the Kerala Water Authority to provide piped water. The centralized intake, production and distribution system is becoming costlier every year. The increasing production cost and the burden of maladministration, system faults and cost overruns are passed on to the cost of water. It is high time that we develop parallel systems at least to partly supplement the existing centralized water supply systems. (i) The existing ponds and rivers/streams should be conserved and partly used for washing and recreational purposes. (ii) Community wells and localized stand alone mini water supply systems can be thought of for concentrated communities, leaving the O&M costs to the beneficiary communities. (iii) We generally have an apathy towards rain water harvesting (RWH) since we believe that RWH is for rain starved states like Tamil Nadu and Andhra and we have four or five months of rain in an year. Even the regulations in the Building Rules for new buildings are ignored. Perhaps all Government and quasi Government buildings should set examples which can be emulated by others for providing RWH systems and use of water thus stored.

Alternative methods to the city wide centralized water supply schemes should be 26 discussed for adoption.

Sewerage: Thiruvananthapuram has gone for centralized sewerage system to serve a major part of the city area. This system is being expanded to the uncovered area and 107 mld (million litres per day) capacity sewage treatment plant (STP) is under construction at Muttathara. As we know such a centralized sewerage system is a prohibitively costly proposition. It may not be possible even to recover operating costs from the system by levying user charges or sewerage cess. Alternative decentralised sewerage systems may have to be considered. Perhaps water recycling may also have to be thought of since we are warned that we are moving towards an age of water scarcity.

Surface Water Drainage: Thiruvananthapuram city has been in the news very often for the wrong reasons. The persistent Thampanoor and East Fort area flooding during heavy rains has put all the engineering experts to shame. We generally have a feeling that all these rain water and sullage (wash water from residential properties and from commercial establishments) should be collected through masonry drains and drained off into the sea. We presume that we have a right to allow water collecting within our premises to be allowed to drain off into the adjacent street.

Case study: One of the newly developed residential colonies in a low lying area recently annexed to the city is a case in point. Most of the recently constructed houses of the upper middle class and high income group families have their open yards around the buildings almost fully paved. Rain water falling on the yard immediately runs out through the gate into the narrow roads. In addition most of them collect rain water on the roof through 10 cm diameter PVC pipes and these pipes are buried under the paved surface with outlets at one corner of the gate to discharge water into the narrow roads. As a result of these actions, the narrow roads (unauthorized subdivision of land into residential plots without leaving stipulated width for roads) within the residential area are flooded during rains and the City Corporation is at the receiving end for not mitigating this problem of flooding. The roads are not provided with side drains since the roads are narrow and since drains would not have gradient to allow gravity flow as the area is low lying and bowl shaped in spite of its nearness to the river. Problem solving measures are not discussed here as they are somewhat obvious.

Rain water harvesting, allowing percolation of surface water into the soil for ground water recharging, conservation of existing water bodies in the neighbourhood and recharging of these water bodies with filtered drain water etc. should be considered instead of allowing all the water resources to drain off into the sea or to cause flooding in some part of the city (like Thampanoor area).

Solid Waste Management: More than 50 percent of the solid waste generated in the city comes from residential buildings. On an average the city produces 300 tons of solid waste every day. If the City Corporation were to collect all these every day and process them, it can be imagined that it is a Herculean task. Still the city tries to manage or cover up with whatever they could do. But huge sums are being spent in the process. When the City collects about Rs. 30 to 35 crores every year as Own Source Income (through tax and non tax revenue) about Rs.12 crores is spent every year on Public Health and Sanitation. Perhaps this is the single largest head of expenditure of the City Corporation. Quite a substantial percentage of this expenditure is going for solid waste management.

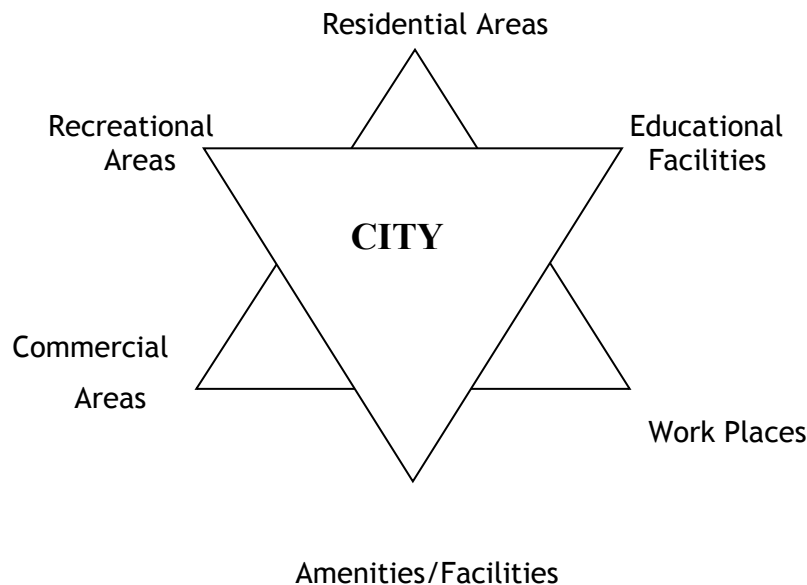
Centralized solid waste collection and disposal/processing arrangement are becoming highly uneconomical. Moreover the arrangement also jeopardizes the living environment of the people in Vilappilsala. We should be planning in terms of decentralised collection and disposal/processing systems mostly oriented towards recycling of waste. Various options for waste processing or disposal are not discussed here since they are beyond the scope of this Approach Paper.

Energy Efficient Cities: In Architecture people are talking of 'Green Architecture'. In green architecture the following aspects are looked into and credit rating is attempted to see whether a building possesses green qualities:

- Sustainable site
- Water Efficiency
- Energy and atmosphere - where lighting, ventilation, air conditioning, CFC, Ozone depletion etc. are considered
- Materials and resources
- Indoor environmental quality
- Innovation and design process etc.

(Based on LEED Green Building Rating System)

Cities have also started talking about sustainable urban settlements, green cities and energy efficient cities. The efficiency of a city primarily depends on the land use policy - on juxtaposition of the various uses within the city. A city essentially consists of six major land use groups. This can best be shown on as the vertex of a six cornered star as shown below:



Primarily the efficiency of the city depends on how the residential areas, work places and commercial areas are located. Proximity of residential zones to educational institutions and to recreational zones also matter. All these functional areas are linked by transport network. In a concept of city within the city the large city does not function based on a mono-nuclei concept. There may be multiple nuclei within a large city, each of the nuclei within a mini city. In such a concept the need to travel daily through longer distances for our daily activities can be avoided saving money and time and reducing automobile pollution thus saving the environment.

In addition to this Location Efficiency, the Green City also considers Environmental Preservation, Compact and self-contained zones, pedestrian friendly & energy efficient transport system, inter connected Zones, Resource Efficiency etc. Planning circles believe that in future this consideration of green cities would become the mandatory process to plan a city.

Human Settlement Planning was hitherto a major domain of the Governmental function. People's participation in Master Plan for towns and cities was restricted to airing views on the draft Plan when it was published for public consultation. The major participation was limited to those who submitted complaints when their properties were affected adversely. All these changed when Government enacted Kerala Municipality Act and Kerala Panchayat Raj Act in 1994, when based on the provisions of the 73rd and 74th CAA, participatory planning was adopted for settlement level planning and for annual and five year project planning.

Stakeholder consultations have become essential processes in understanding the strengths and potential of the city region, in evolving Development Vision and Development Strategies for the City Region, in generating ideas for city region development and in prioritising on infrastructure developments.

We have gone through a long period of 'no plan' for Thiruvananthapuram. During this period demographic changes, physical area changes and growth trends have taken place. Need for re-delineation of the planning region has happened. In addition to these, the very concept of Urban Development Plan and its contents is debated widely in the country. Recently some cities have produced Master Plans which they call as Sustainable Urban Development Plans. Newer and newer parameters demand to be considered in Master Plan. Planning has begun to be considered as a multi disciplinary approach. Traditionally, the State Town and Country Planning Department has been assigned the responsibility for preparation of Plan. However, expertise and staff strength in the Department have not been broadened to assume a multi disciplinary approach in settlement planning. Therefore it may be necessary to adopt other means to ensure participation of expertise in other disciplines / subjects in the process of preparation of Master Plan. It is time to consider participation of a wide spectrum of specialists in master planning tasks.

11.0 Institutional Arrangements for Plan Formulation

Under the provisions of the Travancore Town Planning Act 1108 Government had constituted Thiruvananthapuram Development Authority (TRIDA) entrusting it with the responsibility for planning and development of the city area and the ten Panchayat areas around it. However the State Department of Town Planning has traditionally been preparing Town Planning Schemes in the State since the Town Planning Act recognizes

the appointment of Chief Town Planner, his/her support staff and the establishment 30 associated with it. With the technical expertise available with the Department of Town and Country Planning, TRIDA can take lead role in causing preparation of the Master Plan for Thiruvananthapuram Region.

The 73rd and 74th Constitution Amendment had for the first time entrusted the responsibility for spatial planning to the local governments. Kerala had recognized this empowerment and had enacted our Municipality and Panchayat Raj Acts accordingly. Therefore now Thiruvananthapuram Municipal Corporation, the four Municipalities in the district and the Panchayats have the responsibility for preparing Spatial Development Plans for their respective areas of jurisdiction.

When the planning area transcends the boundaries of one local government the exercise of combined planning becomes difficult since all those local governments within the planning area may have to come together to jointly plan for the area. Perhaps TRIDA can take lead the role as long as the delineated planning area is comprised within the area of jurisdiction of the TRIDA. If the designated planning area of Thiruvananthapuram city region is a larger area extending beyond the TRIDA area, we may have to decide on a combined participatory planning process in which the Department of Town and Country Planning takes a lead role to coordinate all the local governments within the planning area.

The further aspect in the institutional arrangement is the expertise required for the Planning exercise. As discussed in paragraph 10 of this Paper, planning has become a complex exercise requiring varied expertise in the multi disciplinary process. Since constitution of a single planning team within one Department or Authority with experts of all required disciplines may be a difficult process, it may be required to outsource a few of the studies and analysis to other selected agencies or experts retaining the plan coordination task with the Department of Town and Country Planning. Perhaps TRIDA should act as a facilitator in this task since a Government department may be constrained with certain limitations and regulations.

Perhaps it may be required to discuss a host of other aspects related to the process of planning in the road to the formulation of the Second Master Plan for Thiruvananthapuram City Region. These may best be left to the many organizations on whom the responsibility of planning of the Capital City Region is bestowed.

**Projects already approved for TCR & new Project Proposals under various
sectors and
the related Infrastructure Development Programmes required to be undertaken
Information Technology and Knowledge Sector**

Sanctioned schemes	Proposed schemes	Infrastructure to be provided
Technocity and Technpark Phase III		Electricity, Water Supply, Sewerage, Access Roads, Mass Transit
	Development of an IT Corridor and Information Technology Investment Region (ITIR) (Phase I) from Mangalapuram to Aakulam Phase II along Outer Ring Road	Land bank, Electricity, Water Supply, Sewerage, Access Roads, Mass Transit
Electronic Hardware Hub by KINFRA		Land bank, Electricity, Water Supply, Sewerage, Access Roads, Mass Transit
Biotechnology Park by KSIDC		Electricity, Water Supply, Sewerage, Access Roads, Mass Transit
Telecom City		Electricity, Water Supply, Sewerage, Access Roads, Mass Transit
Film City (Thiruvallom)		Electricity, Water Supply, Sewerage, Access Roads, Mass Transit

Infrastructure

Vizhinjam International Container Trans-shipment Terminal	Coast Guard Station Berth for submarines and naval ships	Land, Eastern Bypass from Kaniyapuram-Pothencode _ Mannanthala- Peroorkada-Vattiyoorkavu-Peyad- Balaramapuram-Vizhinjam, Inland Container facility, Container freight station, Truck Terminals
Fishing Harbour	Marine Products Industries	Connectivity with N.H. Bypass, 4 laning of Existing N.H.47 from Kazhakkuttam To Inchivila Via Pappanamcode, Water, Power, Rail link from Balaramapuram, Warehouses, Development of roads to Neyyatinkara, and the city.
Ship Yard at Poovar	Handloom and textile	Bring water from Neyyar Dam for drinking

	industry.	water projects at Vizhinjam, 32 Kovalam And the City.
Bunkering facilities	Cruise service to Colombo	Construction of upper dams for Neyyar and Peppara reservoirs.

Tourism

Kovalam, Varkala, Sanghamughom, Veli, Aakkulam, Ponmudi	Peppara, Neyyar Dam, Poovar, Edaya, Backwaters from Kappil to Aakkulam,	Roads, Security arrangements, public transport, Accommodation
International Convention centre, Akkulam	Beach tourism development from Kappil to Poovar under Central scheme, including tourism economic zone	Coastal road from Kappil to Poovar, Public transport, Accommodation, Recreation facilities.
	Varkala as venue for Meetings, Conferences, Convention Centres, Exhibitions and to be made part of tourism circuit	Star hotels, Connectivity to Airport, Air taxi Services, Suburban rail connectivity between Neyyattinkara and Varkala with 45 minutes frequency
Heritage structures and zones , Heritage tour	Amusement park at Veli, Recreation zone at Muttathara	Public transport, Food joints, Illumination
Elephant shelter at Kottoor, Ecotourism	Pilgrim tourism (Attukal, Beemappally, Vettukadu, Agasthyakoodam, Aruvippuram, Varkala, Chempazhanchy, Master plan for Attukal Zone	Roads, Transport facilities, Restaurants, Public comfort and cloak room facilities. Identification of new tourism and recreational spots in the Corporation, Municipal and Panchayat areas of the district.
Botanical Gardens at Palode (TBGRI)	House boat building industry in the backwaters	Transport, Boat Jetties, Local food joints, Water sports
Habitat Centre(Kaudiar)	Medical Tourism (including Ayurveda, and traditional healing practices)	Widening of road from Kaudiar to Peroorkada, Land for new hospitals and healing centers
Aruvikkara (Department of Tourism and Water Resources Department)	Dolphinarium (Akkulam) , Marine Aquarium, Oceanarium (Vizhinjam) CMFRI Centre, Hub for ornamental fish industry and pearl oyster culture	Public transport, Restaurants, bathing facilities, security arrangements, Garden, Lighting
Boat House at Vallakadavu	Crafts Village (Handicrafts and Souvenirs), Rural Tourism (Vizhinjam), Handloom Village (Balaramapuram)	Cleaning of Parvathy Puthanar, Re development of lands adjoining Parvathy Puthanar, Boating facilities, Water transport
Fresh water Acquarium (Neyyar Dam)	Museum at Kovalam Palace	

Trade centre	Vellayani lake, International Centre in Eco Tourism	Roads, Land, 33 Recreational facilities.
Helicopter Tourism	Art gallery (Fine Arts College), Theme Galleries (Museums), International, National and other Film Festivals	Land for Indoor arena for reality shows, mega events and public meetings, Roads, Multiplex theatres
	Cultural Complex at Tagore Theatre (redevelopment of Tagore Theatre), Dance Museum (Vattiyoorkavu)	
	Theerapatham Urban Renewal Project	Canal development, bund roads, lighting, Recreation centres
	Agro Tourism (Vellayani, Punchakari, AGRI: College, Kalliyoor, Thirupuram)	Transportation, Restaurants,
	Sports Tourism	Hostels, Stadium, Gyms

Healthcare activities		
Development of Medical College Hospital under PMSSY (Rs. 120 crores)	Medicity, Mangalapuram (Rs. 100 crores)	Internal Roads, water supply, Electricity, New road connecting NH bypass, Pulayanarcotta and Medical College, Development of Ulloor - Medical College- Kannammoola, Karamana - Thirumala, Bakery- Poojappura, Mudavanmugal- Thrikkannapuram, new roads leading to the New National Institutes proposed
Panchakarma Hospital (4crores) Poojappura Centre of Excellence (Ayurveda College)	International Institute of Ayurvedic Medical Sciences and Research/ Ayurveda University	
Ayurveda Drug research (Poojapura)	Redevelopment of the Ayurveda W&C Hospital Poojappura	
	Medical city (integrated Medicare institutions in Allopathy, Ayurveda, Homeopathy, Unani, Sidha and other traditional healing systems)	
National testing centre for medical devices in SCTIMST	Herbal park	
Heart foundation (27 crores)	Centre for stem cell and tissue Engineering	
International Diabetes	Medial tourism(Foreign clientele)	

Institute		34
	Mental health centre	
	Bench of the High Court of Kerala with filing powers	Buildings, roads, public transport
Restoration of water bodies		
Parvathi Puthanar	Restoration and conservation of Vellayani Lake	Schemes envisaged in ADB and JnNNURM projects. Roads recreational areas, water transport, boat jetties, water sports, riverbank protection
Waterway from Kollam to Kovalam		
Weir at Munnattumukku		
Restoration and conservation of Karamana River		
Killiyar renovation and protection		
Railway Development		
Up gradation of Central Station (Thampanoor) to world class standards	Periodic Overhauling Workshop	Land for expansion of terminal facilities and for vehicle parking, Power
Satellite station at Kochuveli	New B.G. line from TVPM to Punalur via Nedumangad to be the extension of the 'Sabari line'.	Improvement to access road Bus Terminal Truck Terminal
Operating Centre/ Coaching Station at Nemom	A new Peninsular Railway Zone with headquarters at the state capital	Additional land acquisition
Mainline Electrical Multiple Units	High speed Railway Corridor	Railway stations linked bus services as in Mumbai
Doubling and Electrification of TVPM- Kanyakumari line		
Airport		
New International Terminal	Freighter services from foreign countries	Air taxi Services, Connectivity to N.H. By pass, Redevelopment of Veli and Pettah Railway Stations, Taxi services, Parking facilities, Dedicated road to city centre
Aircraft Maintenance Base	Refueling facility	
Rajiv Gandhi Aviation Centre		

Helicopter services		35
International Cargo Complex		
Central Sector National Institutes		
Indian Institute of Space Technology (IIST), Rajeev Gandhi Centre for Biotechnology (RGCB), Indian Institute of Science Education & Research (IISER)	Indian Institute of Science Education and Research, R&D centre for Non conventional Energy sources, All India Institute of Science & Technology (Genetics, Nanotechnology, Bio_ Informatics, Bio-Technology, Manufacture science), Indian Institute Of Technology (I.I.T) (Budget provision provided twice), Centre for Molecular Materials, Bio - I.T. Park, Semi -Conductor Fabrication City, Defense Production Park	Comparatively large areas of land, Accommodation, and Roads, Transport facilities, Education Centers

Statistics on Bus Services in Thiruvananthapuram

1. Availability of buses

UNIT	Schedule			Number of buses			% of cancellat- -ion	Services available	Mini Buses (include d in buses)
	1920	2005	2007	1990	2005	2007			
Thiru'puram city	160	121	120	170	119	113	27	83	12
Vikas Bhavan	78	78	79	85	85	84	20	67	11
Pappanamcode	114	122	129	123	123	112	20	90	24
Peroorkada	57	88	85	60	85	78	16	66	7
Total	429	409	413	441	412	387		306	54

2. Increase in the number of passengers

UNIT	Number of passengers					
	2005		2006		Up to 3/2007	
	Annual total	Monthly average	Annual total	Monthly average	Total	Monthly average
Thiru'puram City	344,67,480	28,72,290	351,56,829	29,29,736	84,65,793	28,21,931
Vikas Bhavan	154,98,189	12,91,518	184,65,037	15,38,752	49,19,380	16,39,793
Pappanamcode	150,08,268	12,50,689	153,12,962	12,76,080	40,27,240	13,42,413
Peroorkada	279,38,165	23,28,180	288,44,424	24,03,702	57,80,895	19,26,965
Vellanad	58,61,918	5,71,827	102,12,046	8,51,004	24,63,948	8,21,316
Total	997,74,020	83,14,502	1079,91298	89,99,275	256,57,256	85,52,418

3. Increase in the income of City Depots

Unit	Revenue		
	2005 - 06 Total	2006 - 07 Total	Increase in income Total
Thiru'puram City	147411295	156019776	8606461
Vikas Bhavan	107560090	117962409	10402319
Pappanamcode	135596408	137076954	1480546
Peroorkada	106407211	105781816	625395
Vellanad	75498357	84427110	8928753
Total	572473361	601268065	28794704