

Advances in 21st Century Human Settlements

T. M. Vinod Kumar *Editor*

# Smart Master Planning for Cities

Case Studies on Digital Innovations

 Springer

# **Advances in 21st Century Human Settlements**

## **Series Editor**

Bharat Dahiya, School of Global Studies, Thammasat University, Bangkok, Thailand

## **Editorial Board**

Andrew Kirby, Arizona State University, Tempe, USA

Erhard Friedberg, Sciences Po-Paris, France

Rana P. B. Singh, Banaras Hindu University, Varanasi, India

Kongjian Yu, Peking University, Beijing, China

Mohamed El Sioufi, Monash University, Australia

Tim Campbell, Woodrow Wilson Center, USA

Yoshitsugu Hayashi, Chubu University, Kasugai, Japan

Xuemei Bai, Australian National University, Australia

Dagmar Haase, Humboldt University, Germany

Ben C. Arimah, United Nations Human Settlements Program, Nairobi, Kenya

Indexed by SCOPUS

This Series focuses on the entire spectrum of human settlements – from rural to urban, in different regions of the world, with questions such as: What factors cause and guide the process of change in human settlements from rural to urban in character, from hamlets and villages to towns, cities and megacities? Is this process different across time and space, how and why? Is there a future for rural life? Is it possible or not to have industrial development in rural settlements, and how? Why does ‘urban shrinkage’ occur? Are the rural areas urbanizing or is that urban areas are undergoing ‘ruralisation’ (in form of underserviced slums)? What are the challenges faced by ‘mega urban regions’, and how they can be/are being addressed? What drives economic dynamism in human settlements? Is the urban-based economic growth paradigm the only answer to the quest for sustainable development, or is there an urgent need to balance between economic growth on one hand and ecosystem restoration and conservation on the other – for the future sustainability of human habitats? How and what new technology is helping to achieve sustainable development in human settlements? What sort of changes in the current planning, management and governance of human settlements are needed to face the changing environment including the climate and increasing disaster risks? What is the uniqueness of the new ‘socio-cultural spaces’ that emerge in human settlements, and how they change over time? As rural settlements become urban, are the new ‘urban spaces’ resulting in the loss of rural life and ‘socio-cultural spaces’? What is leading the preservation of rural ‘socio-cultural spaces’ within the urbanizing world, and how? What is the emerging nature of the rural-urban interface, and what factors influence it? What are the emerging perspectives that help understand the human-environment-culture complex through the study of human settlements and the related ecosystems, and how do they transform our understanding of cultural landscapes and ‘waterscapes’ in the 21st Century? What else is and/or likely to be new vis-à-vis human settlements – now and in the future? The Series, therefore, welcomes contributions with fresh cognitive perspectives to understand the new and emerging realities of the 21st Century human settlements. Such perspectives will include a multidisciplinary analysis, constituting of the demographic, spatio-economic, environmental, technological, and planning, management and governance lenses.

If you are interested in submitting a proposal for this series, please contact the Series Editor, or the Publishing Editor:

Bharat Dahiya ([bharatdahiya@gmail.com](mailto:bharatdahiya@gmail.com)) or  
Loyola D’Silva ([loyola.dsilva@springer.com](mailto:loyola.dsilva@springer.com))

More information about this series at <https://link.springer.com/bookseries/13196>

T. M. Vinod Kumar  
Editor

# Smart Master Planning for Cities

Case Studies on Digital Innovations

*Editor*

T. M. Vinod Kumar  
Opp Calicut Orphanage  
Besant Nivas  
Kozhikode, Kerala, India

ISSN 2198-2546

ISSN 2198-2554 (electronic)

Advances in 21st Century Human Settlements

ISBN 978-981-19-2563-4

ISBN 978-981-19-2564-1 (eBook)

<https://doi.org/10.1007/978-981-19-2564-1>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2022

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.

The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

# Contents

## Introduction

|                                      |   |
|--------------------------------------|---|
| <b>Smarter Master Planning</b> ..... | 3 |
| T. M. Vinod Kumar                    |   |

## Bhopal

|                                                                                                                                             |    |
|---------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Application of Artificial Neural Network in Master Planning—A Case of Simulating the Land Use and Land Cover Changes in Bhopal</b> ..... | 83 |
| Vidhulekha Tiwari and Amit Chatterjee                                                                                                       |    |

## Chennai

|                                                                                                             |     |
|-------------------------------------------------------------------------------------------------------------|-----|
| <b>Smart Master Plan and 3D GIS Planning Support system—A Case of Chennai City, Tamil Nadu, India</b> ..... | 111 |
| Kusum Lata, Faiz Ahmed Chundeli, and Adinarayanane Ramamurthy                                               |     |

## Kozhikode

|                                                                           |     |
|---------------------------------------------------------------------------|-----|
| <b>Spatial Planning of Kattangal Smart Global Economic Community</b> .... | 147 |
| T. M. Vinod Kumar, Bimal Puthuvayi, and Riya Robi                         |     |

## Conclusion

|                                                                                                                                        |     |
|----------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>International Collaborative Research: Smart Master Planning of Cities Case studies of Digital Innovations and Conclusions</b> ..... | 243 |
| T. M. Vinod Kumar                                                                                                                      |     |

# Introduction

# Smarter Master Planning



T. M. Vinod Kumar

**Abstract** This book explores the capabilities of Smart Master Planning as against legacy Master Planning of cities practised. Master Planning of cities exists because cities under change need uninterrupted integrated area development and urban regulation that benefits and protects the rights of all citizens under the constitution. Despite many shortcomings of Master Planning as discussed in this chapter, and which made some big-ticket national urban development projects replacing it with other short-lived plans with different names by the Union Government, it still exists in India and all countries being revised once every 20 years as per the constitution since no alternative has emerged to replace it. The 100 Smart City Programme and Jawaharlal Nehru Urban Renewal Mission (JNNURM) of India were two big-ticket National projects involving a larger amount of public investment ever received by Indian cities so far, were not using Master Plan and detailed town planning schemes for its implementation for integrated area development but is based on some other non-statutory limited time and limited scope plans which by design is short-lived and intend to die soon after the project is over with no continuity for integrated development of cities. The 100 Smart city project is strictly not even using local self-government institutional mechanism under the constitution but a special purpose vehicle to implement, unlike JNNURM. Despite all these circumstances, local self-governments continues to prepare and execute Master Plans as their constitutional responsibility despite some plan holidays years. One intend of this book is to evolve and not replace Master Planning of cities with Smart Master Planning which can broadly be classified as digital master Planning or based on innovations in some domains of Master Planning practices as alternatives keeping the intent of intention of Constitution of India respected and implemented. This book searches for an effective strengthening of Master Planning mentioned in the 74th constitutional amendment of India which we call Smart Master Planning. This can be digital or with domain-specific changes in master planning. This chapter assesses quantitatively the candidate cities for Master Planning in India based on the census 2011 and compares them with registered professional urban planners to plan it. Then discuss how the supply of candidates master Planning cities and demand of Planners can be balanced in India. This chapter explores the

---

T. M. Vinod Kumar (✉)  
School of Planning and Architecture, New Delhi, India  
e-mail: [tmvinod@gmail.com](mailto:tmvinod@gmail.com)

first scope and approach of past colonial legacy in Master Planning followed by a critique by many scholars and practising planners. This will be the basis of domain-specific master planning innovations. The Digital Master Plan which is emerging in a limited manner is then studied from practices of certain countries as an alternative for legacy master planning first with its architecture, followed by three international case studies Barcelona in Spain, Greater Spring fields in Brisbane Australia and Dublin in Ireland. Finally, it is followed by an introduction to the case study chapter by the author and his study team in one of two volumes entitled Smart Master Planning: domain innovation and digital innovation.

**Keywords** Smart and legacy Master Planning of Cities • Scope and approach of legacy Master Planning • Colonial British influence in Master Planning • Critique of legacy Master Planning • Candidate cities • Coverage of Master Planning in India and registered planners • Digital Master Planning as alternative • Architecture of digital Master Planning • Examples of digital Master Planning • Barcelona • Dublin and greater spring field • Authors approach to smart Master Planning of this book

## 1 Introduction

This book researches the Smart Master Planning of Cities discussing innovations using case studies. Cities are urban agglomeration the true representation of urbanised geographic space as per the census of India and UNHABITAT and not Municipal boundary, planning area or other towns administrative boundary fixed arbitrarily. Master Planning approach differs in countries as per the governing system followed whether it is a Communist, Capitalist, Secular, Theocratic or Democratic country, besides based on, emerging urban issues and long-range vision of the city. The Constitution determines the governing system and approach to the City Master Plan based on several regulatory legislation encompassing all aspects of city life. This differs from country to country and federal state to state. The constitution is a living document, an instrument that makes the government system work [1].

The adjective smart indicates a better, effective and responsive way of doing Master Planning than practised now but goes much beyond. Undoubtedly, there were several such attempts in the past in many countries and federal states to do that from time to time resulting in an ever-growing body of knowledge in planning theory and techniques. However, the concept of smart as applicable to Master Planning is a product of the twenty-first century, which is an emerging topic of great significance, largely unknown and not practised under many systems of Governance.

Smart can be understood easily if we understand the functioning of our smartphone or many IoT or smart devices [2] that are invading all houses. There is a competition to make smart devices to achieve an economy of scale in production. They are today an integral part of internet usage, cost cheaper by every day and spread all over the world dramatically encompassing end uses, irrespective of their income, age group, class and caste. We have a smartphone that converts our single function dumb

phone to a multifunctional capability of a powerful but tiny computer in your pocket that perform all tasks of communication more efficiently and creatively using all modes of communication and provides, you with many extras like video messaging, SMS/text messaging, email messaging, music player in the background, camera, word processing, spreadsheets, database management, meeting your bank transaction requirements electronically and shopping needs without going to Bank or Mall/shop, Government offices and so on. In other words, a smartphone for a smart citizen converts a physical city to a virtual cyberspace city where all transactions in cash and kind are possible using a smartphone. There are rapid up-gradation from 2 G, 3 G to 4 G with the introduction of cheaper phones, for example, Jio-Google 4 G smart phones within the purchasing capacity of the low-income group. It also makes the brick-and-mortar malls, banks, physical Newspapers, Cinema Theatre, Auditoriums and Government offices not strictly required for smartphone using populations. The transportation system usages also change consequently creating implications to the practice of urban land use and transportation systems Master planning.

Smart devices such as a smart plug or smart switch in a smart home is no more the dumb plug doing the assigned function but can be activated by Amazon Echo talk commands to switch on the TV attached to it or switch off even at a predetermined time and even without an echo voice command. The smart plug monitors the heat generated in the plug and can be programmed to cut off the power when the heat is generated to a certain unacceptable level. It can be programmed to switch on a certain time and switch off a certain time based on the ambient temperature and humidity that is comfortable to the occupant of the room. You can then add by design many more functions and scenes to the smart plug/switch and only your imagination limits the functional addition. In smart, two underlying principles are common in all these devices; the internet and wireless communications in their many forms and other technologies related to electronics. They are highly responsive and have superior communication for action. These smart devices in cities can make many of them work together in a group triggered by motion sensors, thermal and humidity sensors and light sensors and can trigger create scenes you want at certain times predetermined where some or many devices work together as per needs.

The concept of Smart Master Planning is an adaptation and extension of these ideas given above in city planning. The unacceptable delay in plan making, as well as its implementation, can be prevented by smart master planning. That means smart planning and its implementation can be fused in one so that there is no time loss in Master Planning and between planning and implementation which is never attempted before and undoubtedly a new concept conceived as part of the functioning of smart devices. Value addition to Master Planning results when smart is applied to Master Planning. It all indicates the automation of Master Planning with minimal human involvement. In a Government, the administrative staff is multiplying like a virus, increasing the cost of administration and creating more and more inefficiencies, delays, frustration, and anger among end-user of a city the citizens. This unwanted growth of administrative staff who invent and pursue complicated administrative procedures is financed by tax paid by the citizen. This smart transformation of Master Planning reduces the cost of delivering Municipal Services in a very smart, efficient,

cost-effective way without an increase in administrative staff. This book is all about discussing this innovation using a case study that makes it highly replicable to many cities. This task is taken up by the study teams of chapters of this book in the hope and intention that anyone can use the results freely.

Master Planning has two main functions regulatory and development. All existing legislation applicable to the city is termed as regulation and area or spatial development is called development. The book “Geographic Information System for Smart Cities” [3] defined smart cities as follows. “Smart city is a knowledge-based city that develops extraordinary capabilities to be self-aware, how it functions 24 h and 7 days a week and communicate, selectively, in real-time knowledge to citizen end users for a satisfactory way of life with easy public delivery of services, comfortable mobility, conserve energy, environment and other natural resources, and create energetic face to face communities and a vibrant urban economy even at a time there are National economic downturns” [1]. If you replace the word smart city/city in this definition with Smart Master Planning, you get the definition of Smart Master Planning.

The smart city and smart master planning are conceived around the concept of six components-systems smart people, smart mobility, smart economy, smart environment, smart government, and smart living working together in an integrated manner [4]. So Master Planning for integrated area development is all about long-range planning for these six systems. This way of working around these concepts transforms any city into a smart city. The level of the smart city is the level at which the six components have progressed in their working in these cities. There is no end or saturation in any of these six components if innovative practices are emerging from creative people in future. Every city has some level of achievement in these components in a very partial and non-integrated manner. The smart Master Planning task, therefore, looks at the level of development of the city as smart and make smart master plans. The smart city is not an end state of a city but constantly evolving as the creative and innovative inputs of the citizen evolve with the more innovative functionality of the city added to its six components as per the needs. These are realised through smart master planning. The six components system of the smart cities were discussed in many books of the smart city series which was edited by the author. These components are discussed here to place the smart master planning in the right perspective.

Although this book has case studies on Smart Master Planning from other countries, this chapter is India Centric, the largest democracy in the world with a federal structure; because the author is a citizen of India and is most familiar with the Master Planning of India. The credential to write this chapter derives from the fact that as a teacher I have taught Master Planning and its different constituents to Planning students for several decades and as a professional consultant worked on Master Plan of Kuantan in Malaysia as a Structure Planner for the World Bank, Project Manager of the first Master Plan of Lakshadweep group of islands and Adviser to Tata Consultancy Services for the Master Plan of Gandhi Nagar the Capital of Gujarat State and innumerable urban development project all over India.

This introductory chapter is divided into 10 parts.

**Part 1** is this introduction which orients smart master planning in its full meaning.

**The second part** gives the most recent understanding of the scope of work of Master Planning practised in many parts of the world.

**Part 3** deals with the evolution of Master Planning in India. The archaeological investigation on the prehistoric cities in Harappa and Mohan-Ja-dare shows the urban design of cities for common people planned with a high level of civil engineering skill and great care for the use of all showing a democratic master planning. The same is true in cities planned based on the Vedic planning period. However, we do not have abundant written pieces on the master planning of these cities and omitted in this chapter. In contrast, during the British Colonial period, we have considerable written pieces available and this chapter concentrate on that. This is despite we have an inferior sample of British Master Planning in comparison with Mohan Jab Daro and Harappa period and Vedic and Mughal period. The only justification to study this period is because the Master Plan being practised in several parts of India was evolved in the colonial period and continued in many states even very recently with no change despite its not so satisfying approach.

**Part 4** looks at cities in the 2011 census and earlier for India, and Master Planning efforts in India. This is compared with available qualified city planners in India. With COVID 19, 2021 census will be delayed.

**Part 5** is a summary of a literature survey that critically look at the past Master Planning effort in all aspects. I may warn here no one who wrote these papers do have a high opinion on the Master Planning effort in India. They are unanimous in not celebrating these efforts but accept that as a necessary evil in the absence of worthwhile alternatives. Can we find a legally valid alternative is the focus of this book?

**The sixth part** looks at the alternative to Master Planning and discusses the architecture of Digital master Planning.

**The seventh part** discusses the implementation of digital master planning in Barcelona (Brownfield),

**The eighth part** presents a new town planned and implemented as a case study of Greater Springfield's digital master plan: a New Town in Brisbane Australia (Greenfield).

**The ninth part** presents an attempt at making a digital Master plan as a Case Study Dublin. Ireland Digital Master Planning (Brownfield).

**Part 10** briefly presents the approaches of Master planning suggested in this book as a city case study in Kozhikode Metropolitan Area. Finally, part 10 concludes this chapter with some definitive statements.

The Indian constitution believes in flexibility in implementing constitutional goals, in multi-levels of Governance of the nation [1], the states and Local self-governments like Municipal Corporation and Metropolitan planning committees, and others. The constitution exhibits adaptability as against dictatorial coercion on the other multilevel governance. Therefore, the constitution is updated with amendments as the needs arise and we are now on the 93rd amendment and in the 12th schedule of the Indian Constitution Article, 243 W gives 18 items the first is urban planning including town planning. The second is the regulation of land use and construction

of a building and the third being Planning for economic and social development. All these are the subject matter of the book.

The constitution of India in its flexibility and adaptability do not dictate how the Master Planning should be done and how urban regulation is to be achieved at different levels. It is left to us planners and academicians to design an approach acceptable and work within the legal framework of master Planning. This book is meant to achieve that through innovations and case studies detailing these innovations so that they can be used by those willing to use them.

So if you are a planner and I am a Mayor of a city empowered to appoint you as a planner as per the Indian Constitution, I shall ask you to give me a Master Plan of this city that double the GDP once every 2 years and demonstrate it. Is India producing such Mayors who ask these questions and planners confident to deliver what is asked convincingly and demonstrate in a sample area of the city? We will investigate the answer in the following paragraphs and all chapters of the book.

In this book for the hypothetical question posed, I want to consider cities as the worshipful Goddess of the wealth (Lakshmi of India) and planners of cities all smart people with or without a professional degree in planning who work for doubling of cities wealth in a premeditated limited time based on the knowledge including that is provided by the book. In the book, Smart Environment for Smart Cities [5], we discussed the rationale of how Indians in the Vedic period considered all elements of the environment in the universe as GOD so Lakshmi for Cities is acceptable for Indians.

Before answering this question raised by the hypothetical Mayor to hypothetical planner, we must critically understand what Master Planning of cities is all about.

## 2 Master Plan [6]

The master plan is the blueprint for the Long-Term Plan of a City generally 20 years, to guide the sustainable development of any city, formulating planning guidelines, policies, development codes and space requirements for various socio-economic activities and identifying infrastructure requirements. It is generally found to be executed for any city with local self-government such as a Municipality. Municipalities are constitutional entities in India. The constitutional body the election commission is assigned the responsibility to conduct periodic (5 years) election of local representatives in local government institutions like Municipality by voting. The Central and State Finance Commission determines the share of taxes that provides grants in aid from the consolidated fund of Government to support its 12<sup>th</sup> schedule functions. For local self-government, the state finance commission provides the standard of municipal services it should provide based on the quantum of grants available to the Municipality. It generally provides for municipal service which mostly is inadequate. Master Plan regulates the use of land and building by development control rules for environmental sustainability. Hence one view is that Master Plan is a Spatial Development Plan since regulation is meant to be undertaken in different areas of

the designated master plan of any city based on many states and central government legislation and the master plan postulates such as the use of land, and its intensity and many don't and dos related to that. 74th constitution amendments emphasise social justice and economic development and responsibility for Master planning are given to local bodies Master Plan. Master Plan focuses on social justice, by generally looks after the needs of people living in slums, economically weaker sections, and those under poverty and who sleeps every night with no roof over them in pavements. Hence Master Plan is for social justice and economic development. Economic development involves income generation as well as employment generation. World Bank emphasises the function of Master Plan as urban productivity increases, employment generation and poverty reduction, liveability, competitiveness in comparison to other cities as destinations for economic activities, sustainability, and bankability of urban government with a credit rating is also emphasised in some Master Plans. It may be emphasised that Master Plans always advocates the removal of poverty, foster economic development, environmental sustainability, better urban management and better urban finance. How far these are achieved by the Master Plan will be discussed later.

The Master Plan generally have many Components. They are

1. Spatial development plan generally called existing and proposed land use plan;
2. Resource mobilisation plan indicating the various source of financing plans such as state government grant in aid, house tax and other municipal taxes, grants for various government projects being implemented by municipality and others;
3. Institutional mechanism for plan implementation which may also involve collaboration with other government agencies and non-government agencies;
4. Comprehensive and easy to understand development management/promotion rules/regulations;
5. Participatory mechanism of the poor, women, NGO, Community and Socially Disadvantaged.

It may be noted all the above are not met satisfactorily in many Master Plans.

Generally, Master Planning follows a set procedure. A Master Plan must first conceptualise the city's future based on the existing land use plan and aspirations of the people, then cover all aspects of its planning, development, financing, phasing and management, along with institutional, financial, legal and administrative mechanisms for the realisation of this future. The outcome depends on the quality of the Master Plans. Development in the context of Master Planning means carrying out all or any of the works contemplated in a master plan and shall include building, engineering, or other operations in or over or under land, or any material change in the use of any building or land as proposed in the Proposed Master Plan. The Master Plan goal is to offer citizens a better quality of life; it is important to ensure in the master Planning that the growth and development of a city do not result in environmental degradation.

Let us look at concerning one sample state in India, the state of Kerala and the approach of Kerala Local Self Government Department for its 58 statutory towns. It states; "The present practice of annual planning based on the budgetary provision envisioning only short period implementation is inadequate and will hamper

the comprehensive mass-scale development of the town. Therefore, an integrated and coordinated planning strategy based on a comprehensive master scheme which effectively reflects the social, cultural, and heritage factors of every city is required". It is seen generally that these goals are never met adequately for various reasons.

Next, let us examine one city in Kerala and list out all Master Planning efforts statutory master Plans and non-statutory master Plans undertaken so far.

1. Non-Statutory Master Plan 1962 prepared by Shri. Rusi Khambatta at the request of Calicut Municipality.
2. Preparation of Statutory Regional Plan for Calicut city and 43 Panchayats. Surveys in 1964 and Interim Development Plan for Calicut Urban Complex (1967–1981) by Town and Country Planning Department Government of Kerala.
3. The second Statutory Master Plan was called the Development Plan for Calicut Urban Area (1981–2001). This was implemented through the number of Detailed Town Planning Schemes (DTP) by the Calicut Development Authority which now Government of Kerala has closed down most of the development Authorities in Kerala in their wisdom barring few such as Greater Kochi Development Authority, etc.
4. Non-Statutory Perspective Plan for Kozhikode 2003 (as part of UNDP-DST MATURE Project).
5. Non-Statutory Calicut Agglomeration Plan 2006 (Voluntary Effort of Indian Institute of Management, Centre for Water Resources Development and management, and others).
6. Non-Statutory Kerala Sustainable Urban Development Project Calicut Plan 2009.
7. Non-Statutory City Development Plan 2010 (for JNNURM Project but Calicut was not selected for this project by Central Government).
8. Statutory Master Plan of Kozhikode Area 2035.

A similar pattern exists all over India in master Planning

It can be seen that there were three statutory Master Plans with legal validity and five which were non-statutory with no legal validity but prepared for executing some project with very limited funds and limited period of the project allotted for project implementation. In between the second and third Master Plan of 20 years duration, there was a Master Plan holiday which gave great concern to real estate developers and other private builders whether what they are doing is legal or illegal that Can is demolished with new Master Plan legal land use and zonal plan.

There was a planned holiday in Kozhikode which was against the Government of Kerala Policy. The Plan holiday 2001 till June 2010 when the third Master Plan 2035 started and was completed in 2015 after considerable delays a part of Master Plan making all over India. There were many violations of the Master Plan 2001 during the plan period and plan holidays. There was then no new statutory Master Plan to conform. There was a complete, absence of proper development control and in Kozhikode and zonal development codes never existed, resulting in ad-hoc decisions.

Let us look at briefly Planning Issues Tackled in Master Plan 2001. They are

1. The decentralization of economic activities.
2. The rationalization of densities in the various parts of the urban area.
3. The streamlining of the transportation system.
4. The provision of easily accessible facilities such as education, health, recreation, shopping to all.
5. The provision of essential Urban Services.
6. Special consideration for the needs of the urban poor.
7. An implementation mechanism for balanced development including zoning and subdivision regulations suitable for local conditions.

I also enumerate here Planning Issues not generally tackled in statutory Master Plans

1. Local Economic development and social justice
2. Urban productivity, employment generation and poverty alleviation
3. Tourism Development
4. Urban Renewal
5. Solid Waste Management
6. Liveability, Competitiveness and Environment Sustainability
7. Urban Ecology and related Urban Form
8. Urban Governance.

The Objectives of the Perspective Plan prepared as part of the Department of Science and Technology MATURE project a non-statutory plan enumerated as above.

1. Rejuvenation of the trade and commerce sector in the city
2. Upliftment and up-gradation of Slums in the city
3. Better urban services including provision of drinking water
4. Better sanitation facilities
5. The decentralised and safe transportation system
6. Developing an institutional area near the city
7. Identifying the city as an educational centre and a tourism transit point
8. Solving environmental issues.

It may be noted that most of the Statutory and Non-statutory plans mentioned above incorporated most of the recommendations of the Perspective Plans or Urban Agglomeration Plan. The Plan holiday 2001 till June 2010 when the third Master Plan 2035 started and was completed in 2015 with considerable delays. There were many violations of the Master Plan 2001 during the plan period and plan holidays. There was then no new statutory Master Plan. There was a complete, absence of proper development control and development codes never existed, resulting in ad-hoc decisions as against the Government of Kerala's Policy is for "an integrated and coordinated planning strategy based on the comprehensive master scheme which effectively reflects the social, cultural, and heritage factors of every city are required".

It was during planning holidays the Calicut Development Authority which was entrusted to implement the second Master Plan and subsequent was closed down by the Government of Kerala as per their policy and Kozhikode Municipal Corporation

got the legal authority and power to plan Kozhikode, urban regulation and implement but there was inadequate technical manpower to do this work in the Municipal Corporation. There were no training opportunities created to do this new job to Municipal Corporation or augmentation of technical staff. There was no attempt to create adequate technically qualified persons in the local self-government to discharge the planning functions. The planning function which is now with local bodies was incapable of technically translating policies of urban development of the Kerala Government or the local body had any policy of urban development which may be called their own. In many cases, there has been arbitrariness in permitting the maximum Floor Area Ratio (FAR). From the planning point of view, the FAR permissible for an area shall be based on the considerations of the infrastructure available in the area. High rise-high density developments can be permitted only in those parts of the towns where the available infrastructure is well developed and/or the infrastructure capacity could be augmented without creating an imbalance to the infrastructure system of the town. This was not followed during the Plan holidays. No new Town Planning Schemes were undertaken by Kozhikode Municipal Corporation once the Master Plan 2035 came into being. Even before that the implementation of Town Planning Schemes by the Calicut Development Authority in comparison with other states in India was very poor.

Based on the above discussion let us suggest the focus of the Master Plan for the future are

1. Spatial (Pragmatic urban space based on regional space, rationalising land use-transportation and infrastructure system)
2. Social (A caring city for the young, old, those below the poverty level and sick; extending even palliative care for terminally sick)
3. Economic (A city which is an engine of economic development by the promotion of income, employment and attracting investment)
4. Environmental (A city that protects the environment, conserving and enhancing the quality of air, water and land resources, and cultural and heritage resources)
5. Governance (A city with better citizen-municipal corporation interface and customer relationship management for all interaction and activities and better Urban Management and Finance)
6. Financial (A city that upgrades the Financial health of Municipal Corporation to attract more bankable loans).

The Master Plan shall have a Strategic Framework like a Regional Spatial Strategy (RSS) and a Local Development Framework (LDF). The regional framework comes out in the Planning area concept to a limited extent in which Master Plan is prepared along with adjoining Municipalities and village panchayat. It comes short of including all urban agglomeration of the census of India.

Local Development Document (say each panchayat and subdivision of city like Municipal ward) will include the policies and strategy for the area, site-specific allocations, and a proposals map. Supplementary Documents may elaborate upon policies and proposals and may include such areas as development briefs for specific areas. Development Control will change in the way it is operated in some key respects.

A Spatial Strategy may be postulated for Master Plan. Articulate a spatial vision of what the city will look like at the end of the period of the strategy and show how this will contribute to achieving sustainable development objectives. A blue-green city is articulated by many Kozhikode environmentalists. It provides a concise spatial strategy for achieving that vision, defining its main aims and objectives, illustrated by a key diagram, with the policies highlighted. It addresses regional or sub-regional issues that will take advantage of the range of development options that exist at that level.

The Regional Transport Strategy (RTS) will form an integral part of the RSS. Be locationally but not site-specific, while not going into the level of detail more appropriate to a development plan; be focused on delivery mechanisms that make clear what is to be done by whom and by when.

It minimises the need to travel and reduces car dependency; for example, through high-density mixed-use developments, good public transport and pedestrian and cycle-friendly design. It creates a sense of place, reflecting the local character and integrated with adjoining landscapes, with well-designed buildings and attractive green spaces.

It makes efficient use of energy and resources, including energy and water conservation measures and recycling facilities, siting buildings for energy efficiency, using sustainable construction processes and materials, and using renewable energy where possible. It takes account of community requirements, by involving the community in the development process and designing for all types of people, by including a mix of housing.

### **3 Indian Urban Planning in British Colonial days and Its Influence Later**

The present-day Master planning in Kerala and many states in India is based mostly on legislation and planning techniques framed by colonial rulers. These rules are partial to colonial rulers in the sense it benefits more the East India Company that ruled India than Indians and were made to ease their ongoing colonial exploitation. Our legislators in parliament and assembly had never debated and reject or partially accept with modification, all these legislations which was made for Colonial rulers and not for native Indians whom they considered as slaves to be exploited. Even the imported competitive politics in India after the independence of India is an alien concept where traditionally Indian believes in consensus politics. The rationale is legislation is for all and why not make it the best pooling the intellectual resources of the opposition party. Unfortunately, there seems today some continuity with the British period than the best practices of Master Planning of prehistoric Harappa cities, Vedic period cities of Mughal period Cities which resulted in the archaeological a city for all than a present divided city giving more benefits to the colonial rulers of East India Company. So we study the Colonial influence in this section. I may

state here, the resulting master plan has not created any city similar to prehistoric Harappan cities, Vedic cities or Mughal cities all of which was the city for all. It cannot be in the British colony because past rich India was programmed by colonial rulers to be poor in a colonial day and the poor cannot sustain a city similar to what we had in Harappa. Ministry of External Affairs Government of India computed that British colonial rulers syphoned out to England from India a sum of \$ 45 Trillion impoverishing India and most affected was Indian cities. This process had a maximum adverse impact on city development. The British influence in planning for Indian cities showed this attempt more. The issues the urban planning generally addressed was intended mainly for Britishers in India and not the Indian natives because colonial rulers were also living in Indian cities. By using design and control of city space; selective provision of water, sewerage, roads, street lighting; and police all of them for the British and not for the natives by dividing invariably cities into two parts was the result of Colonial Master Planning. However, luckily this was not spread all over India uniformly since the British whites in India were few and the spread of British whites in India was mainly in port cities where the wealth of India got syphoned from the Indian gateway of port cities to the gateway to England. The British introduced concepts of urban planning for themselves that is familiar to them and not Indians with no regard to the glories of the wealthy past of India but based largely on emerging European ideals of health and sanitation that was prevalent in the post-Industrial revolution in England such as improved roads, spaciousness, order and beautification to safeguard British populated part of India. This is applied in Indian cities where no industrial revolutions were allowed by the colonialists to take place since the colonial rulers prevented it to happen as part of making India poorer. The place they resided is called 'White Town' while in the areas inhabited by poor Indians, as 'Black Town', where they implemented no or less and cheaper infrastructure, with minimum taxation since poor Indians cannot afford and minimum recurring expenditure in Black Town. So, every city has two parts, for example, Lutyens Delhi and the rest of Delhi in pre-Independent India. As colonial Masters, it was easy to persuade their Indian subjects to accept these imported ideas of post-industrial city as their own, though never without opposition. Undoubtedly there was a conflict with local leaders, but Colonial subjugation helped the British manage and force their way in India. The physical and administrative legacies of colonial rule in Indian Cities then were more or less the same in British India and later independent India till 1991 but seem to continue even today in the implementation of urban projects in cities where central government direct with some money in project and state government follow it. If Central Government says City Development Plan for JNNURM is to be used than the Master Plan under State Government, the latter followed it since money was there in the project. Even after independence, more power was given to appointed bureaucrats than to elected officials; along with subordination of city governments to state and national authorities; use of eminent domain especially for slum removal; a policy of low taxes regardless of civic needs; a pattern of patronage in contracting out urban service even if it is public sector undertakings; and more emphasis on impressive design and architecture for government and the elites than on the basic needs of the ever-increasing immigrant and poor urban masses. This exists

even today as a legacy of colonial rule and India could not overcome these legacies. This was the same in other colonies of the British such as in Africa where the British colonised. India's ancient legacy from the Republics of India of 2500 years ago which was based on consultations with beneficiaries and consensus being practised as in the sangha of Buddhism all over the world were disregarded by bureaucracy who from time to time produced government orders and encouraged competitive politics as against consensus politics to divide communities and rule.

As stated, Indian colonial cities have always been an area dominated, designed and occupied by the British, which was fortified to protect them like Forts named for St. George in Bombay and Madras, and for King William III in Calcutta (Figs. 1 and 2). Sometimes these areas were called the civil lines. Here the Colonial Masters built their homes not traditional Indian homes but British homes, shops, and churches as well as their commercial and administrative headquarters, with some variations since Fort William had few residential settlements while Fort St. George was a veritable city. The army was accommodated in a nearby area called the cantonment or camp. The much larger Indian area of the city was usually referred to as the native, or black town. As British control extended across India, such patterns of racial separation were repeated, although they never amounted to a system of apartheid. These were the main concepts of Indian cities under colonial rule.

Any official plan that emphasised this segregation was however short-lived, Indians overwhelmingly outnumbered the British in the Fort area in later years which made the colonialists lament that they do not have adequate legislation to separate



**Fig. 1** St. George Madras eighteenth century sketch. An eighteenth-century sketch of Fort St. George, Madras by Jan Van Ryne. Source [http://en.wikipedia.org/wiki/File:Fort\\_St.\\_George,\\_Chennai.jpg](http://en.wikipedia.org/wiki/File:Fort_St._George,_Chennai.jpg)



**Fig. 2** Fort William 18 Calcutta century sketch. 2. Fort William, Calcutta. Source [http://en.wikipedia.org/wiki/File:Fortwilliam\\_1760.jpg](http://en.wikipedia.org/wiki/File:Fortwilliam_1760.jpg)

Indians from this area. Out of a total population of 10,801 listed as dwelling in the Fort, 250 were English, 5464 Parses, 4061 Hindus, 775 'Moors', 146 Portuguese and 105 Armenians [7]. These groups, however, tended to be separated even within the Fort, with Churchgate Street functioning as an intangible line of demarcation that separated the British settlement to the south, characterised by 'whitewashed English homes with covered piazzas', from the 'brightly painted and carved ethnic Indian houses to the north' [8].

Later, suburbs began to develop outside the fort walls, the resulting suburbs were even less racially exclusive than the fort areas [9, 10]. European officials and merchants as well as wealthy Indians found themselves forming new elite neighbourhoods together as 'many Indian magnates began to move out of their wadis and Mohalla's to European dominated areas such as Malabar and Cumballa Hills, Breach Candy and Mahalaxmi.'

This mixing of rich Indians with British areas was gradually replaced by poorer Indians and the British start living together in white towns since they had better civic amenities. The existing laws were not sufficient to keep up their original intent but the British used every pretext to practice their intent.

For instance, after the revolt of 1857, the British saw their supremacy and rule under attack, they could retaliate with devastating, uncompromising and cruel power. The entire Indian population of Delhi was evacuated and allowed to return only in groups, like for instance Hindus in January 1858. Muslims not till the end of that year. Muslims who wanted their property back had to pay for it' (as cited [11]). The British break up the close-knit residential neighbourhoods where rebels could hide and escape British forces and create roads along which troops could be deployed quickly.

New sanitation measures included not only water supply and sewerage, but also extended to regulation and health examinations of the Indian women who serviced the British troops sexually. The British also introduced new taxes and collected them more efficiently to make the city pay for the new construction, services, and police [12]. This was mainly to fund infrastructure like roads which was not for people instead of for the army to navigate and suppress the rebellion. While before that people freely shared part of their land to create access to their homes and roads but the ruling British found that such things will never happen to roads and railway land solely to take away wealth in kind to Britain and it mainly served the British interest in India. So, there was a land acquisition act and the British forcefully acquired land in the name of eminent domain and executed the colonial infrastructure for the benefit of Britain. Surprisingly, a state like Kerala which is relatively poorer than other south Indian states because of less industrialisation and survival trend from Money order economy and non-productive household investment pattern from Gulf countries followed land acquisition than traditional land-sharing mechanism practised for thousands of years in India for city development. This is a good example of the lasting impact of British legacy through Indian Administrative service as if there exists a psychological barrier to overcome and cities in Kerala is a living example of lack of urban development because of inadequate land management. The same bureaucracy that implements the land acquisition forcefully was used to suppress potential wealth creators of cities by bureaucratic means and red tapes if not physical force to have any industrial and commercial activities by the native Indians so that the native become more impoverished and less strong. This continued in some form after independence. The confronting approach with strikes and bands to wealth creators like industrialists or big farmers by Marxist-led government in Kerala never allowed any industrialisation to take place in Kerala which affected adversely the economic base of Kerala cities. I feel this trend is there in Kerala even today in the name of socialism and communist party rules but with different slogans akin to environmental terrorism.

It was felt more legislation for urban governance was required to meet the emerging issues. The East India Company passed the Improvement in Towns Act (Act 26 of 1850) 30, which called for more contributions to support Municipal Commissions that would introduce urban improvements. Ahmedabad adopted the act in 1856, as did some towns in the Bengal presidency, also in the 1850s, and some in Punjab in the 1860s. By 1860, a new regime of municipal record-keeping and control over building activity in towns and cities was inaugurated through the new Municipal Committees [13], which focused largely on providing urban facilities and services and enforcing building bye-laws [14]. Initially, persons nominated by the British rulers governed these municipalities. This continued in the post-independence period as if it is the only way while other options were there more beneficial. This is another instance of an unsatisfactory psychological barrier I mentioned. This marked the beginning of urban governance in India during the British Colonial period not accounting for the earlier experiences of India probably from the prehistoric times onwards. Later, especially after 1882, the municipalities

were opened to more members elected from the city's Indian population as well as restricting their powers by Municipal Commissioners the bureaucrat.

Viceroy Lord Ripon in 1882 extended the principles of local self-government to all municipalities under British rule, but under the strict administrative control of the British under the chairmanship of the municipal commissioner, usually a white. Civic improvement although part of the agenda, the burden of tax collection moved from the British to Indians. Most citizens did not want to pay the taxes, especially when they perceived no benefit for themselves and more benefit flowed to the British populated area or for Britain to syphon out money from India to Britain. This was perceived as the reason for white administered Municipality. Many have noted the shortage of municipal funds and the almost total lack of concern for parts of the city into which poor immigrants moved.

The plague that broke out in Bombay in 1896, following the first Improvement Trust In 1898, was initiated in Bombay [14]. The trust the answer to the poor sanitation in Bombay threatened the city's which was called then a 'cholera nest, [7] and threatened to close their ports to ships passing through Bombay. The threat became a reality in 1896 as the 'plague initially closed the ports of Europe to ships from Bombay, disrupting the city's export trade and virtually paralysing its commercial life' [8]. The Trust was to bring Bombay into compliance with international health standards. The Trust was to save lives through improving housing standards. 'The establishment of the Bombay Improvement Trust in 1898 was the outcome of a firmly entrenched belief that plague was, in the first instance, the direct result of overcrowding in poorly ventilated and filth-ridden dwellings' [15]. Mortality rates, 1896–1900, reached 65.4 per thousand and remained at 64.1 per thousand, in 1901–05. This was more than double its rate in the previous decades and [16] Workers fled. The population of the city which had been 821,764 in 1891 [16] plummeted to 400,000 in 1897–98 [7], although, the city recouped its losses by 1911. Ira Klein points out the absence of building code in most of Bombay, and the census 1901 discuss the grim housing conditions of the period. There were 100,000 homeless, [15] and tremendous disparities in wealth, and urban blight. The Bombay Improvement Trust was therefore charged with invoking the power of eminent domain to destroy slums and improve the living conditions of the poor. The Trust focused on physical planning: creating new streets, decongesting crowded localities, reclaiming land for urban expansion and constructing housing for low-income residents. These improvements were also intended to enhance the city's image as a centre of imperial and commercial power but nothing was done to help the majority of the poor and here is an instance of physical planning as if no human existed in the physical space.

The Trust was not a democratic institution where a citizen has a say but controlled by appointed officials, who could proceed 'unencumbered by accountability to name-sake representatives of local self-governing institutions.' [15]. Subsequently, these Improvement Trusts were extended to other large cities across India—Agra, Kanpur, Nagpur, Delhi, Calcutta and so on. Undoubtedly there was always frictions between the elected municipal governments and the appointed and controlling government servants concerning the division of functions and responsibilities and as a rule, the appointed won. This initiated the process of the multiplicity of authorities that became

a major issue of governance after independence' [17]. For improving slums and for access to better living conditions for the poor, the Bombay Improvement Trust was a failure which I may call under mindless cruel physical planning. In the name of slum improvement, many houses were destroyed without providing any alternatives. The Municipal Corporation had rooms inside houses destroyed to create interior *chowks* through administrative coercion. To create needed urban space, some residents were displaced. Residents compensated for the loss by them build many storeys, resulting in overcrowding. There was also a rise in house prices, so the poor could not afford them eventually. They left or they cramped even more tightly into the remaining space. The Trust was unable to provide adequate new housing on the city's outskirts. Poor residents also could not pay the systematic collection of rent demanded by the Trust; they often preferred private owners with whom they could negotiate or delay payments. There was acute conflict over land and the planning efforts were marginalised and vested interests determined incremental growth in the island city. The state power over land was never dominant to ensure that planning initiatives were implemented.

The condition of Calcutta was unlike Bombay. Richards, the first chairman of the Calcutta Improvement Trust, wrote a report 'On the Condition, Improvement and Town Planning of the City of Calcutta and Contiguous Areas.' revealing his frustration in dealing with the lack of planning. He noted that the city possesses no streets. There are but two small areas in Calcutta having a normal street system. About 2,500 acres are provided only with highly irregular lanes and passages. It would require the creation of 110 miles of ordinary 30–40 Ft streets to bring Calcutta into line with even the old built-up sections of European cities [18]; for a fuller discussion of Richards' report [19]. There was little vacant land to sell off for development. The CIT saw its mission mostly as destroying slums or at least opening them up to circulation of traffic and ventilation of air.

The British Town Planning Act of 1909 began to influence Indian planning, but the context of Britain and India was different. This legislation called for purchasing land on the outskirts of cities and developing it for the "respectable" poor with a steady wage; they would then abandon their inner-city homes for the next generation of the poor. 'It was an idea based on the possibility of rising real incomes for the poor, orderly and controlled administration, and the efficacy of private initiative. ...Conditions in Indian cities could not have been more different' [20].

Industrialisation in India was minimal through most of the nineteenth century. The industrial revolution was allowed to bypass India by British colonialists so that they can suppress India and rule an economically weak Indian colony. Town planning in the late 1880s and 1890s was more 'a matter of asserting the Imperial presence by the construction of impressive buildings for colonial rulers and their officers,' mimicking the buildings the native kings made [20]. In municipalities, extraordinarily little professional expertise existed for drafting and implementing town planning [20]. The key personnel in India were sanitary and civil engineers, who cleared slums or built straight roads through them disregarding dwellings there; filled up tanks to get rid of mosquitoes with no understanding of the ecology of lakes and ponds, and made sure civil lines were well taken care of with water and sewerage services paid

for by taxes on the entire city population a form of exploitative urban development and municipal administration and social planning (not socialist or communist) was virtually non-existent to take care of the majority urban dwellers.

The Bombay Town Planning Act of 1915, the first town planning legislation in India, gave the Bombay Municipal Corporation powers to prepare Town Planning Schemes for urban development or redevelopment and present them to the Governor in Council of the City of Bombay. It called for zoning, building regulations, acquisition of land for public purposes, and the collection of funds for local improvements. The need was felt especially strongly because of the chaotic growth of Bombay's textile mills and the workers' housing that surrounded them. The initiative is vested in the local authorities, although the State Government could in special cases direct the local authorities to undertake Town Planning Schemes [14, 21]. Other provinces followed, UP in 1919, Madras in 1920. All the plans were physical in orientation and had no mention of economic development or social change. The plan implementation got divided into local governments and Improvement Trusts. The local governments were empowered to draw up planning acts that called for the use of eminent domain; compensation for the land acquired would be negotiated, but the government had the final say as per the land acquisition act.

The Bombay legislation (*Vide Bombay, Government of India, (1925) Bombay Town Planning Act, No. 1 of 1915. Town Planning Scheme: Ahmedabad No. 1 (Jamalpur) (Final) (Poona: Yeravda Prison Press)*) for the first time in India called for land pooling made possible. Each landowner to be affected by the acquisition of public facilities would surrender a part of his land to the government and keep other parts. The land remaining after the government's acquisition would be re-parcelled out in proportion to the value of each person's land to the whole. It was presumed that landowners would approve of this process because the value of their land, even though reduced in size, would nevertheless increase under the new road or other facility introduced into the area. No one was completely dispossessed; the value of the land increased; the government did not purchase land or become a landlord. In the short run, this method was time-consuming, requiring a great deal of consultation with the landowners, but, in the long run, it created less resentment and fewer protests. Nevertheless, after some time, the process of land pooling gave way to the use of the eminent domain, even in Bombay Province. Eminent domain appeared so much easier to use. In the last decade, however, Gujarat has returned to using land pooling [21].

The town planning schemes improved the site plan and got more access to electricity and water supply and sewage lines to Jamalpur and Kankaria, areas just adjacent to and outside the walls of the old city, were generally popular and passed easily. On the west bank of the Sabarmati River, however, farmers objected to new development plans that took away their land. Vallabhbhai Patel, who felt that the city had to expand, persuaded them to comply. On the other hand, Patel felt that the plans for pulling down the city walls and replacing them with a ring road and an electric tram line were too expensive. Besides, he appreciated the symbolic importance to the Muslim community of retaining the walls, which had been built in the time of the Gujarat Sultanate, and of preserving the Muslim cemeteries at their base. This

project languished for two decades before it was implemented, without the tram line. Later, Patel also opposed plans for a road through the walled city, on grounds that Indians had not been consulted; road construction was, therefore, put off until 1933. Social and political considerations were also part of the agenda of the Indian National Congress and in 1924 the INC presided over the election to the Ahmedabad Municipality of Kacharabhai Bhagat and two other Dalits, its first 'untouchable' mill worker representatives [22].

In 1915, Patrick Geddes arrived in India, to bring to India his innovative Cities and Town Planning Exhibition. Geddes stayed on in India until 1924, the last six years as a professor of Civics and Sociology at Bombay University. He managed to get the Madras Government in 1915 to appoint the first official town planner in India, H.V. Lanchester, architect and editor of *The Builder* [23]. Geddes' ideas were rooted in planning for the community rather than in the physical planning of buildings and roads by professional engineers. Geddes saw British planning as the problem, not the solution with unrealistic activities of the British engineers and sanitarians with their belief in wide, open thoroughfares, the wholesale destruction of slum areas, flushed sewers, etc.; whilst Improvement Trusts rarely had the powers to make a comprehensive impact on the total environment of the city' [23, 24]. Geddes proposed cheap and ameliorative solutions.

A few of the princes invited Geddes to make new plans for their capital cities, and some did establish Improvement Trusts. Geddes' ideas endured, but they had to wait for a time and place in which community, rather than zoning, would be the focus of planning. A few European trained urban planners came to India after Geddes. Linton Bogle, a graduate of the first British university department of civic design at Liverpool, came and wrote a treatise on Town Planning in India in 1929, following his experience as Chief Engineer of the Lucknow Improvement Trust. Bogle wrote of the need to address the appalling conditions in the slums. He used public health indices—a death rate of 501/ 1000 infants under one year of age in Bombay; 464 in Cawnpore; 330 in Calcutta—to emphasise the need for immediate action. He cited the dense overcrowding in the large cities, the lack of space for recreation and play, the need for larger residences. Bogle was an engineer, and most of the remedies he proposed took the form of physical planning, including zoning and increased room for wider roads [23]. In his introduction to Bogle's manual, Radhakamal Mookerjee, of the University of Lucknow, proclaimed the need for social planning as well as engineering, in part because all of the industrial cities had enormous surpluses of the male population who might be seduced by 'the thought of running away to liquor shops and brothels where there is more room space, more light, and more company' [24].

Depression in the 1930s and then World War II brought about a pause in Indian planning, as elsewhere. The construction of New Delhi as a new national capital, which continued even through the depression, was a major exception.

The publication of a report in 1946 by the Health Survey and Development Committee under the Chairmanship of Sir Joseph Bhore recommended the creation of a Ministry of Housing and Town Planning in every Province, well equipped Provincial Directorates of Town Planning, the appointment of an expert in the Central

Ministry of Health to advise on and scrutinise Town Planning Schemes in different provinces seeking financial support from the centre, and creation of Improvement Trusts in all large cities.

After independence in 1947: the shortage of professionals, the non-existence of comprehensive town planning legislation in almost all the States, and lack of organisation of town planning department were keenly felt. In 1951, the Institute of Town Planners, India, was created with 19 founding members now with more than 5000 members. It is now the most-wealthy professional body in India with the establishment of Institute Buildings in most of the states which was based on clever use of town planning principles of self-generating institutions growth. The central and state governments began establishing planning legislation and town planning departments at the state level. The preparation of Master Plans for major Indian cities began in the 1950s as a coordinated set of proposals for the physical development of the whole city rather than for parts of it—as the Town Planning Schemes had been—and going beyond problems of crisis management into consideration of future as well as present needs.

Town planning emerged in England as a response to the problems posed by the industrial city in the nineteenth century. In India, the town planning and urban development were for reasons of governance, and to reduce threats posed by epidemics, was more piecemeal and partial, hampered by indifference to the problems of indigenous zones of the city, inadequate finances, and ineffective legal measures. By the twentieth century, the influence of professional town planners, the growing nationalist interest in municipal politics, and the interventions of indigenous elites altered the scenario. Many Indian cities, however, continued to bear the marks of a legacy of cities divided on racial and class lines and planned (or not planned) accordingly.

## **4 Cities, Master Planning and Planners in India**

The first Indian Town Planner in the British Colony India was a British citizen, a civil engineer cum editor of a journal appointed in 1915. He is not the first Indian Planner of India. The first and the earliest Harappan cities in the prehistoric era are planned by someone who may be the first planner in India. City planning in the Vedic period is considered a respectable profession meant for people with extraordinary accomplishments, as discussed in Manasara the Vedic treatise on city planning.

In the British colony of India, there existed a demand for urban planners which dramatically increased after independence, but a great shortage is felt in recent decades than any time before. The planning is changing in the digital age and the planners must be re-educated and be made worthy of this digital age. Further, they need to update their professional knowledge base continuously. City Planning was multidisciplinary from the very inception with economists, Sociologists, and other related social sciences and lawyers participate along with Architects and Civil engineers. The current scenario suggests computer scientists, IT professionals, Electronic engineers and manufacturing engineers shall be part of the planning team of a city