EXPLORING COMPACT CITY: RECONFIGURING THE COMPACT CITY

A THESIS

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1.0 Introduction

1.1 The Problem

When I perceive the development around me, I find that it is occurring haphazardly. There is a lack of components that make the development well organized and garnished with the best possible usage of an inch of space. Cities are spreading in an uncontrollable manner. The growth is leading to one of the common seen problems of sprawl. Random growth and inadequate use of space is leading to a multitude of problems which are affecting human life. Compactness is one of the components which are required in order to save limited land, natural resources, time, nature and other valuable things which are required to contribute to attainment of the ideal city. There is a need of compact cities, where everything is readily accessible with minimal effort. There is a need of cities to be sustainable, in order to leave a better future for the following generations. There should be a high intensity of development that curtails geographical spread and thus permits consumption of less land and resources. It provokes me to reflect on the city as a collection of coherent, compact urban districts and a compact form. There should be a proactive approach toward underutilized urban areas. There should be a mixed-use environment which caters to a variety of roles such as recreation, commercial, residential, institutional, and corporate. Its response would be fine grained and contribute images and vitality to the environment. These all appeal to have the Compact City model which would
be able to solve the problems in the best possible way with a grace covering every inch of space that is functional and at the same time in tune with its context.

1.2 Defining Compact Urban Development

The Compact City is multi-functional dense development. It is the development that encompasses varying uses such as residential, commercial, institutional and corporate, connected with a well-planned transport system. The entire city is well organized. Every component is connected with public transportation. Basic needs of life are at walking distances. Functions are mixed all over the city instead of being separated. The environment encourages social interaction.

1.3 Intent of the thesis

The primary intent of this thesis is to explore compact urbanism and to define an approach towards low density, mono-functional precincts in the city that lie underutilized in their potential towards a positive contribution to the city. Exploring compact urbanism will lead to a new model of the Compact City that will answer the challenges and problems that are unanswered within existing development. The reconfigured compact city will build the environment in a way to support the best quality of life.

Everyone wants to be free of the urban pollution and can directly sense: the smog, grime, smoke, litters, odors, city heat, and the slum conditions. But the environmental degradation associated with urban development can also be measured in terms of disrupted ecosystems and wasteful use of green space and natural resources. The approach illustrates how and why the compact city is the way of redesigning an urban
environment so as to get rid of these negative aspects and to preserve and enhance the qualities of urban life that we have come to accept as desirable. The new model of the Compact City will make neighborhoods more lively, safe and relevant for children; and so the city itself becomes a more exciting center for personal interactions in today’s fast moving world.

1.4 Main Concerns and Issues

Concern rises from the observation that there are city structures and areas that are inefficient and underutilized which have a lower intensity of use and untapped potential to absorb new functions, activities and housing stocks. As a by-product of mono-functional use and low density these areas lack identity, character and a vibrant public domain. A renewal process is important for such city precincts that are located near city centers or work centers and occupy large areas at low densities in relation to its context and potential. The notion of the Compact City is a reaction against the city structures in most developed cities – dense cores accommodating most of the city’s workplaces, retail, entertainment, commerce, services and amenities and sprawling low-density, single use suburbs – a city structure which by default produces the need to travel long distances and as a product, car dependency, large energy consumption and pollution.

1.5 Challenges

The city is a platform where humans meet, interact, collaborate, exchange their views, make new relationships, work and compete with each other. The city forms a shell in which all lives survive and develop. It moulds lives of its inhabitants. It is a web where
people of varying religions, ethnicities and race reside together. The city interlocks its citizens and makes a mass of living and nonliving objects.

People are moving in and out of cities. Each day somebody is transferred to some other place. Families are breaking up because of job transfers or the splitting-up of parents. New construction is demanded by this moving of people. Whether the new construction is required or not people are building it up without giving a thought as to how it will be beneficial to the environment. Because of all these impacts of improper planning, land value in the city raises up to prices where eventually people are left with no option but to move to the outskirts of the city. New tracts of land are being occupied. Green places are disappearing. The challenge has to do with conservation. The fast growing development is gulping up valuable green fields, which are highly essential for human life in order to get food for uncontrollable populations. A need exists to get control over the growth of the city. There should be more functional and organized planning which can curtail sprawl. We have to comprehend the significance of land as it is not infinitive, it is limited. The city should be redesigned or proper measures and considerations are to be made in order to conserve land, water, energy and waste. If irresponsible spreading of the city is not controlled and compact cities are not implemented than we will lose valuable land and will not be able to acquire benefits of the natural environment as it will be destroyed. Compactness has to be achieved to build the environment to support the best quality of life.
1.6 Characteristics of Compact City

Most of the compact city concepts are based on aspects of ecological and social sustainability. Compact City thinking promotes:

1. Mixed use environments (overlapping areas of living, working, leisure and shopping)
2. Well defined public spaces
3. Community character
4. Easy access to transit (public transport oriented urban design)
5. A responsive built form
6. Compact building typologies
7. Pedestrian friendly public realm (development patterns dictated by walking/cycling distances)
8. Community interaction

1.7 Compact City agenda

A Compact City model will be proposed after undergoing research on the topic. The Compact City model proposed will have a definitive size, and it will be applicable to any part of the world. The number of people the Compact City will accommodate will be clarified. The Compact City model proposed will satisfy high intensity of development which will reduce geographical spread. This will help in minimizing consumption of less land and resources. There will be planned high residential densities. It will offer opportunities for accommodating increased density area and contribute to greater social interaction. Average journey trips will become shorter, leading to reduced fuel
consumption and lower emissions. The Compact City will be energy efficient. The Compact City proposed will ultimately contribute to achieving a sustainable city.
2.0 Literature Survey

2.1 Compact City
Compact City is a model of development which promotes a form of space consisting of high-density settlements, less dependence on automobiles and clear boundaries from surrounding areas. It builds space characteristics which are classified with mixed land use, diversity of life and clear identity. It encourages functions like social interaction and self-sufficiency of daily life. There is a focal point where development of the compact city begins and around which neighborhoods develop. The compact city is a hub which will embrace neighborhoods, each with its own parks and public spaces. The compact city is a combination of precincts, overlapping private and public activities.

Initially there was a vision of the intense medieval city, whose boundaries are clearly visible, where the entire activities essential for daily life will be confined within the city’s walls. The compact city is the product of a certain form, scale, and mix of activities (source: Girouard, M.(1985) cities and people, p.36).
Elkin describes it as an intensification of the use of space in the city with higher residential densities and centralization. Several authors describe the compact city in contrast to other competing settlement patterns as centralization and decentralization. Breheny et al. describes five scenarios for accommodating growth; urban infill, urban extension, key village, multiple village extensions, and new settlements (DoE, 1993a).

There has been so far a search on models that offer a high degree of user-friendliness in terms of mobility. User-friendliness is access to services and facilities by walking and cycling or by public transport. Various macro structures of city development have been proposed before in order to achieve qualities which depend upon the city’s overall form and development pattern. They are The Core City, The Star City, The Satellite City, and The Garden City.

**The Core City:** The core city is the most extreme concept of compact city in which all activities are locked in to one body with very high density and intense peak of activities at the centre. Lynch suggests that, owning to the compactness, the extension of the built-up area of the city would be relatively small in comparison with more fragmented models (1985,pp.373-4). Green spaces in the core city are generally small and take the form of local pockets, supported perhaps by the intensive greening of some streets and squares. There are multi-storied housing structures instead of single family houses, but are limited in number. According to Kevin Lynch, the core city has high
overall density of around 350 persons per hectare. Lynch recommends that the core city has a highly specified system of almost entirely public transport rather than individual vehicles (source: Designing the city: Towards a more sustainable urban form, pg 46). Distances between facilities, work places and residences are short. Special activities are placed at the edges of the city. The problem which I feel would occur with the core city is it is designed for a specific population. If the city core grows beyond a certain dimension that has been suggested, the whole system turns into massive congestion. It is a kind of centralized development. So when the city expands there will be chances of activities that are not easily accessible. A high level of pollution and excessive land and property values can arise because of the expansion which would make it socio-economically exclusive.

**The Star City:** Another of Kevin Lynch’s models is the star city. The star city has a single dominant centre of high density and mixed uses. Transportation systems radiate out of the centre which contain public transport systems and main vehicular traffic routes. Centres of high to medium density are located along the public transport routes. Less intensive uses occupy spaces in between the high to medium density areas. The centre contains the most intensive types of city activities; subcentres along the radial transport routes have activities on a less intense level. The transport flow is organized on the radial pattern in the form of a primary system, with supplementary concentric rings that form a secondary system which enables public transportation to the lower density areas (source: Designing the city: Towards a more sustainable urban form, pg 48). The problem with this kind of layout is the accessibility
and connectivity. The chances of main radials becoming overloaded increases with continuing growth. The increase happens because all the activities are located around the radials. There is vast open land between the radials which will be ever increasing in size. This space will not be utilized. It will act as a buffer between the radials. By such planning activities there would be connection with the transport system but would be inconvenient and inaccessible as the distance would be ever increasing and setting the radials further apart.

**The Garden City:** English planner Ebenezer Howard came up with this model of development. He proposed a group of small cities, each having industries and those who work in them live close by. People are supposed to work in their own city so the population is controlled. Every city is surrounded by green areas which act as a green belt around a city. All the small cities are connected by highways. The notion behind scattering the development was to have green areas in between the cities, which in the future could be used for growing populations. So if the city expands there will be no transition of population, the city itself will enlarge. All the work places and human life will be buffered by the green belt. If the new city grows it will develop in the various node points of a connecting network of highways. The cons with this kind of layout is there would not be any uniformity to the development. Cities will develop randomly. There would not be any growth form or pattern which any new upcoming city follows. So wherever there is a green area which is close by a highway will be vulnerable to development. The social interactions will be functioning
well among the city itself. There will not be any interaction held between the cities as they are located far away. There would not be any exploration among people as they will be confined to work and live in their respective city. Cities should be placed close together and should have some things in common that tie up the whole region and unite it (source: Compact city; A plan for a liveable urban environment, pg 18).

**Satellite city:** Satellite City is a different kind model which consist of a number of garden cities located around a larger central city. all the garden cities are assumed to be different from each other some how. Every garden city will have industries within them and people will be allowed to work and stay in their respective city. The major central city will have the main administrative and commercial functions that would be served by commercial and cultural centers. The concept is analogical to a planet system. The central larger city will act as a Sun around which other planets will be placed. The Sun, or central city, will be the main source of all functions. All planets, or garden cities, will be oriented around the Sun, or central city. The central city will be the main core area from where everything initiates. There will be no expansion of the satellite cities. If there is a need for more development it would be located close to the central city instead of further developing garden cities in order to preserve the greatest amount of green space around the the central city. It appears to me to be a centralized settlement. People might be required to commute to the central city in order to get their specific work done. In the future, due to the implementation of new garden cities, there will be complexity observed in this model of development. Industrial
development always occurs where there is a potential for large employment. If new developments are occurring it seems wiser to develop the new required industry in new areas instead of relying on the central city to meet the demand of that industry. So instead of a centralized layout it would be better to decentralize it and provide industries wherever there are resources to accommodate it (source: Compact city; A plan for a liveable urban environment, pg 20).

**Linear city**: The name itself describes how the city is laid out. The city basically grows along a continuous transport line or a parallel series of lines. The intensive uses of commerce, residence, production and services are located along and on either side of the line(s) and forms dense nodes where transport stops. These strips are the ones that have the most compactness. On either side of the dense lines are lines that are less dense and less compact. Rural areas are located immediately beyond the parallel series of lines. The linear city model has no central core. So basically high rise buildings will be found along the intensive use strips and gradually there will be low rise buildings along the secondary bands. Linear development doesn’t allow interaction between the people and activities. There should be overlapping of different functions so that it enhances social interaction. There will be high dependency on car as there is a linear development. People have to use car to commute to their uses as the compact primary strips would not be intersecting or overlapping. There should be primary strips interwined so that people have various ways of reaching their destination. They don’t
need to mandatory follow the longer routes (source: Designing the city: Towards a more sustainable urban form, pg 52).

2.2 Advantages of compact city

The compact city provides social interaction and diversity as everything is placed close to each other. The industries like commercial, residential and institutional are placed close to each other, which improve the accessibility of them by people who will be living in the compact city. The housing will be high rise, low rise and bungalows with different capacities of serving people and will lead to an integrated living ambience.

In the compact city there will be a higher density area which offers an affordable option and provision of community facilities within a reasonable distance, so it can conserve the use of land. High intensity of development will reduce geographical spread and will permit consumption of less land and resources. The planned higher residential densities will offer opportunities for accommodating more people on the same land area and contribute to greater social interaction.

Average journey trips will become shorter as all functions will be placed close to each other. This will lead to have less fuel consumption and emission. It will also conserve the use of time.

In the compact city there will be a mixed use environment. People will get a variety of options in fulfilling their daily needs of life as areas of living, working, leisure and shopping will overlap. Public places will be well defined and well organized. Community
will be well organized. Everything will be placed according to their demand and need. This all will help in giving character to the community.

All places will be well equipped with public transportation. Public transportation will be delivered to every place. There will be easy access to transit. Compactness will be achieved by this model which will help in making things at walkable distances. Pedestrian walkways will be more in use by people as they will provide easy access to various facilities. People will get pedestrian friendly in the public realm. Developments will be done keeping in mind the development pattern dictated by walking/cycling distances.

There will be compacted development as every inch of space will be utilized in as possibly as proper way. This will help in eliminating urban sprawl. The city will develop in an organized way, it will not spread randomly. Every space will be designated according to required functions. There will be no haphazard planning. In the compact city model as most of the facilities will be served round the clock there will be less congestion and people will not need much dependence on automobiles as most of the basic necessities of life will be located close by. Most of the parking will be underground so more land would be left for development. People will rely more on using public transport to commute to their work places, as both destinations will be easily accessible by public transportation. This will reduce car parking demand.
2.3 A Sustainable Compact City

A city has various functions involved. The density of these various functions shapes the character of the city. The compact city is not a concept that indicates the scale of a city such as its open space, area or population. It refers to a state in which the density of the city functions are constituted adequately, neither excessive nor lacking, with the environment loads. The growth of the city will be kept well balanced with the surrounding environment.

2.3 Concept of compact high density urban areas

It has been observed that at a city scale higher density areas in general offer affordable options and provision of community facilities within a reasonable distance. The areas are more coherent, offer opportunities for interaction and possess character. Higher density development promotes using the limited valuable land at the best possible way. It gives an opportunity to leave behind privilege of using land to following generations. It saves green land from getting used up for satisfying human life.

There are many benefits of higher densities. Socially higher density encourages positive interaction and diversity as of social proximity. It enables more and better integrated social housing. It enhances economic viability of development. It provides economies of infrastructure. It plays an important role in supporting public transport as everything is placed near to each other and are readily accessible. It reduces car travel and parking demands. It makes underground and basement parking economically viable. It increases energy efficiency. It decreases resource consumption a lot. It creates less pollution. It
preserves and helps fund maintenance of public open spaces. It reduces overall demand for development land avoiding sprawl.

2.4 Compact city variants

“Smart growth” is sweeping the U.S. Virtually every organization in the country remotely interested in community planning issues has a smart growth policy or program, and every media account of planning issues seems to use the term. Numerous organizations such as the Smart Growth Network and Smart Growth America exist solely to promote smart growth principles. Thousands of other agencies and organizations have their own smart growth programs, including the federal government, virtually every state, countless regional and local governments and private organizations.

A good encapsulation of the mainstream consensus of smart growth is offered by the United States Environmental Protection Agency. Their ten smart growth principles seem to embody the ideas that have the most commonality among the array of smart growth ideas promoted by various organizations. Following are those principles:

1. Mixed land uses
2. Take advantage of compact building design
3. Create a range of housing opportunities and choices
4. Create walkable neighborhoods
5. Foster distinctive, attractive communities with a strong sense of place
6. Preserve open space, farmland, and natural beauty in critical environmental areas

7. Strengthen and direct development toward existing communities

8. Provide a variety of transportation choices

9. Make development decisions predictable, fair and cost effective and

10. Encourage community and stakeholder collaboration in development decisions.

(source: Current planning issues: smart growth-by Greg Dale)

2.5 Concept of inner growth and compaction

Inner growth can be defined as the rehabilitation, re-use, infill and rebuilding of existing urban areas. The urban design should be flexible to accommodate any kind of future changes. It can adapt different functions without much demolition. It should encourage the integration of functions, coherence, composition, the mixing of zones and the construction of blocks of houses rather than isolated ones. Inner growth doesn’t promote dispersion, it puts forth compaction in the development. It never prevails to stop the development or expansion of the city, but it focuses on utilizing the inner available space first. Existing buildings should be well occupied with the functions. The intermingling of urban activities and housing activities is essential for a better built environment. There should be proper growth from the core of the city. Without utilizing the given inner space, new development spreading outside of the city should not take place. Varieties should be achieved in the outer appearance of the buildings. The architectural treatment of
the facades will bring the legibility and identity for each of the buildings. All buildings should be accessible to each other and recognizable. Each new development should offer good identification characteristics so that the people can orient themselves.

2.6 Sustainable design by spatial scale

Compact urbanism is a perfect translation of sustainable urban development. It promotes establishing a visual, social, perceptual and functional city. It satisfies human needs by supporting innovation and artistic expression in design. It designs to human scale and visually makes buildings interesting. Compact development helps to reduce heat gain and energy consumption. It makes defunct buildings in use again. Renewable materials are promoted to use. The compact city provides high quality public spaces, combats crime through space design and enhances safety. It reduces pedestrian and vehicular conflict and design for social contact and interaction. There is less space used for roads and parking. It creates socially mixed communities. It intensifies around transport intersections. It raises density standards and avoids low density buildings. Built up mass is flexible and supports a viable range of uses and activities. There is privacy maintained and security too. The compact city enhances legibility through neighborhood identity. It enforces urban containment and reduces expansion. The development is mainly concentrated along the transport corridors. City centers of high activity are linked visually and socially (Source: Carmona, M. Sustainable urban design—a possible agenda chapter11. Planning or a sustainable future. 1999).
3.0 Methodology

3.1 Introduction

A Compact City model has been practiced by many planners and architects earlier. There are strenuous efforts made in meeting human needs in the built environment. The model was given distinctive shapes in order to enhance the legibility, image, identity, pride, safety and proximity to public transport to the city. The perseverance for establishing an ideal city by approaching the compact city model has always raised questions which are still unanswered. This section is an effort to get a closer view of already installed models and approaches from all possible angles in making better living environments keeping with the spirit of compaction.

3.2 Choosing the case studies

Case studies have always been viewed as a stepping stone in making better the existing element. I will present two precedent studies. The Compact City model which I am going to propose will act as an ideal city model, satisfying the sustainability and compaction advantages. I will cover the precedent studies from different countries having applied the same compaction model. The motive is to comprehend the approach towards Compact
City models in different physical, religious, and social contexts. I will cover Vidyadharnagar Township, Jaipur, India as the first precedent study. The aspect of the study was to have a contextual approach towards compact urbanism using traditional built form planning responses. The project promotes integration through activity spines, open spaces, and compact built typologies. The second precedent study is on Greenwich Millennium Village, London, England. The aspect of study was to comprehend analytically an attempt made to create high density housing as a part of the Compact City plan for London.

3.3 Development of questions

While performing the literature review on the Compact City model I ran across several questions which were required to be focused on. The questions put forth after getting an analytical approach towards the proposed variety of Compact City models by planners, if answered, will make a compact city an ideal city for human needs. The basic questions which came up as I started with my case studies were as follows:

1. What is an issue and overall vision of the project?
2. What is the basic formation and layout of the project?
3. What physical, social and environmental impacts did the project render?
4. What is the quality of responsiveness the projects delivers?
5. Does the project offer legibility?
6. Does the project succeed in making its identity?
7. What are the measures taken for the safety of the development?
8. How has the social goals and infrastructure been carved out?
9. How is the transportation network been setup and what level of comfort does it provide in serving human needs?

10. Visually, what stimulating environment does the project possess?

The basic analysis started with prime questions and later it spread its arms as the perspective expanded. The projects had their own goals in achieving advantages of the Compact City. They have been analyzed to verify whether they are satisfied or not. The precedent studies have been practiced at different locations, in different countries having distinctive contexts. They are brought out as strenuous efforts by the great planners in implementing Compact City aspects to enhance the lives of the people. The imposing contribution in progressiveness of the respective cities by the project has been judged. What the projected compact sustainable model provides for physiological, safety and security, affiliation needs (belonging and acceptance), esteem and self-actualization (expression and fulfillment) renders will be analyzed.
4.0 Case Studies

4.1 Vidyadhar Nagar Township, Jaipur, India

The Project

The brief was to practice plan the new city of Vidyadhar Nagar, about 3.5 kms, North West of the parent city of Jaipur, to accommodate a population of over one hundred thousand people on a 400 hectare site. The site had its own set of ecological and connectivity issues and was a challenge because of the northeast periphery of the site was bordered by hills which were all forested at one time. The project was named Vidyadhar Nagar after the architect of the old Jaipur city.

Aims of the Master Plan

The aims of the master plan as prepared by the design firm were as follows:

1. Environmental quality – resource energy conservation, a healthy and pleasant environment
2. Efficiency – of resources, ease and convenience
3. Imageability – creating a unique identity
4. Flexibility – ease and efficiency with which growth and change can be accommodated
5. Feasibility – the desired urban form to recognize the behavioral consideration of both people and public sector within the financial resources and organizational frame.

Issues

The challenge was to positively link the site with the old city and the environment. The fundamental premise was to develop this project as an energy conscious city that would be sensitive to the greater forces of nature. The design emerged from the parent city of Jaipur and a detailed study was done to analyze the built-form relationship, open space connectivity and typological collage that existed in the city of Jaipur. A city layout is introvert with a dense central spine which acts as the activity hub for the entire city. A compact city model has been implemented with a linear centre which has easy access to all parts of town through pedestrian and open space networks.

(Source: Doshi, B.V. (1986) Vidhyadhar Nagar master plan, pg.12)
Qualitative Parameters

The energy conscious plan of Vidyadharnagar Township follows the nine square mandala of the old city and the main axis runs north-east to south-west, crossed by a secondary axis on the main transversal road. The residential buildings are designed as compact, high density, low rise structures with internal courtyards, based on the principles of thermal comfort through passive means. Recreational, civil and commercial facilities are located around a network of linear open spaces. The main axial pedestrian spine contains the major public and commercial offices, which are within walking distance of the residential areas. A recreational sports complex, an educational/institutional complex, and a regional activity center with wholesale markets, an intercity bus terminus, hospital, fire station and other uses are proposed within and on the periphery of the township.

Qualities of Responsiveness

The entire social infrastructure is situated along pedestrian links and will generate pedestrian activity and movement on these spines. Important nodes are created where the city arterials cross the central spine. Important vistas and scenic views are incorporated in the plan for the city.

Presence of Functional Mix Activity Spine

The central spine or the work area of the town is in a linear form to provide easy access to maximum number of people and provide an identity.
and image to the heart of the town. Within each sector the amenities and services like schools, health centers and playgrounds will be located along the linear open spaces.

**Ecological Sustainability**

The design team had come up with a plan of reforesting the hills nearby the site. Therefore all the water used by more than one hundred thousand inhabitants of Vidyadhar Nagar was to be collected at the sewage plant and treated to green hill range and also green the city itself.

**Public Transport and Access**

The other concern of the project was about energy efficiency, and the transportation network was conceptualized keeping this in mind. The main aim here was to establish a network which would provide access such that nobody is more than 250 m from a bus stop. Then if the bus frequency is adequate, the tendency to use personal vehicles would be discouraged, implying reduced congestion and consumption of energy. Further, this network was interlinked to the green pathways to get a city form with Central Business District along the pedestrian networks. From this emerged an implicit organization and hierarchy of street network and land use suitable for the cooperative housing to cater to a diverse mix of socio-economic groups of people that was envisaged in the city.
The built form seems inspired from the principles of a courtyard, and open spaces and tress and gardens. The idea was to create a variety of open spaces, such as the courtyard, the terraces and balconies overlooking the gardens, to eventually evolve a street as a cluster of houses with courts, gardens and public buildings. An energy efficient system that ensured that people spend less time commuting and less energy in cooling their houses with an appropriate orientation giving less sun in summer and yet assuring the sun in winter and the cool breeze in summer.

Image, Identity and Character

In the preparation of master plan, images were generated of the new city which comprises of vernacular and modern architecture, to make it a place to arrive. A city is centered by a retail arcaded bazaar and activity spine, with generous open spaces and trees, and provision of recycling the rain water collected in a tank in the courtyards. Design is basically inspired from the notion of combining traditional ways of living with provision for mechanical, modern changes for the future.

Inferences and Designs

The attempt of exploring the idea of high densities and typologies suitable to the climatic and social patterns of the inhabitants is practiced. The linear spine offers interaction and agglomeration of various activities and helps itself in forming a typical Indian street. Moreover benefits of public transportation can be achieved from all over the concentrated nodes. A spatial ordered hierarchy of progression and variety in the sector layout provides a variety of choices in the available housing. There is a progression observed
from the macro to micro scale of the open space (i.e. from the public open space to private courtyards which are linked with pedestrian walk ways). Mixed use pedestrian spines are explored to serve formal and informal marketing activities. The residential buildings are designed as compact, high density, low rise structures with internal courtyards, based on the principles of thermal comfort. Recreational, civil and commercial facilities are located around a network of linear open spaces. An integration of residence-activity needs–leisure space is attempted. The spine in Vidyadhar Nagar is proposed to become a lively center of galleries and cultural centers, vats pavilion like areas for informal shopping, and recreational gatherings dotted by food stalls (Source: Doshi.B.V.(1986) Vidyadharnagar Master Plan).

4.2 Greenwich Millennium Village, London

Location- Greenwich Peninsula, London SE10

Architect Master plan- Ralph Erskine

Client-English Partnerships

*The Vision*

The Greenwich Millennium Village is an important attempt to create higher density sustainable housing in one of London’s largest brown field sites – the Greenwich peninsula. The Millennium Village is the first of a set of plans to make a sense of compact, sustainable urban communities. The objective of government sponsored competition

(Source: Barker, D. Architecture Week, np)
was to create a compact, high density, environmentally and socially sustainable form of urban development that set new standards of design, building on the peninsula’s good transport connections.

The Millennium Communities’ Initiative was launched to challenge the development community to rethink their approach to housing and living in the 21st century. Erskine’s Millennium Village: It is an ambitious mixed-use development being built according to a master plan by architect Ralph Erskine using the latest sustainable methods and materials. The program aims to deliver somewhere between 5,000 and 6,000 dwellings over the course of a six to ten year period. Located on the eastern side of the Greenwich peninsula, the village will eventually comprise of 1,377 homes, 1,079 apartments and 298 houses, as well as approximately 5,000 square meters of commercial space, all of which will be linked through a local communications network.

**Qualitative Parameters**

The master plan delivers a clear hierarchy of streets and public spaces arranged around a large central park that allows having vistas of the river Thames to the east. A curved pedestrian spine acts as the main route linking the major commercial and social center to the housing quarters. The residential units – apartments and individual homes – are loosely organized in perimeter blocks with (source: Batsford, B.T. (2002) A Guide to Recent architecture, pg 105) landscape courts.
The organic massing of the blocks creates a varied environment, with individual units benefiting from views of the park, the river or the landscaped courts. The design maximizes natural light and space, with external balconies, generous internal dimensions and architecturally varied spaces, creating highly livable homes in a relatively compact development.

**Social Infrastructure**

It includes a community center, a primary school, a health center, shops, cafes, bars and offices. The village, covering 72 acres (29 hectares), is grouped in communities around a large village green and an artificially created lake which is linked to the river of the Greenwich Peninsula via green corridors.

**Pedestrian and Public Transit Orientedness**

Car parking is either provided below ground (i.e. basement parking) or in two structures placed on the edges of the development. Due to this the main routes of the village are predominantly car-free, with safe parking within a few minutes’ walk from every front door. A bus system provides access to North Greenwich underground station and local retail and leisure facilities. The North Greenwich underground station connects the millennium village to the center of London in just 14 minutes. The communal facilities, spaces and social (Source: Batsford, B.T. (2002) A Guide to Recent Architecture, pg 125)
Housings are provided and distributed throughout the development to generate social integration between the 

Diversity, connectivity and choice: the design makes an effort at maintaining the diversity of the village housing, the new homes range in size from studio apartments up to three and four bedroom homes and from three to 11 stories. Thus creating a variety of housing options the projects provides choices to the prospective inhabitants, who want an affordable well connected locality.

The village lights up the traditional appeal of high density housing based on a new approach to the traditional London square. The squares are common area to be enjoyed and used by the residents and are designed to foster the neighborly spirit which all thriving communities require. The village is designed around the concept of a London square enclosed by housing to create streets and spaces that are human, lively and secure. Pedestrians are given priority over the car.

The residential design is bold and offers dramatic elevations of barrel-vaulted roofs. To maximize connections to the environment they sport balconies, terraces, or sundecks, some fronting the lake, other dramatic views toward the Thames barrier. The new homes have been designed to be flexible and adaptable. Sliding walls and transitional space
between living and sleeping areas enable apartment’s layouts to be either open-plan or cellular, encouraging a variety of uses.

Inferences

The initiative demonstrates the value of mixed use developments as a model for communities, helping to promote sustainable development. A compact high density development on a brown field site aiming towards the London plan proposal for the city as a collection of compact, multi-use, high density developments. The proposed buildings lend color and vibrancy to the entire development and have features that create individual identity. Large open community space is centralized and a segregation between the pedestrian pathways (internal) and vehicular (peripheral) reinforces the community character. To give a strong sense of place, the heart of the Greenwich Millennium Village will be a central square, which will create a strong focus to the village.


4.3 Curtitibia, Brazil: Structural Axes

Background

In the ‘60s, an attempt was made to impose a 1942 plan by the French town-planner Agache. He proposed widening the road system, demolishing the borders of avenues and radically transforming the city on behalf of the private car. This plan was rejected by architects, engineers and by the Development Bank, who requested a study of a new and more realistic proposal. As early as 1966, a new plan was prepared by the Mayor Jamie
Lerner’s team and was accepted, then frozen in ’71. This latter plan closed the main road to private traffic. The earlier plan was concentric: to go from one district to another, traffic, both public and private, had to pass through the centre, which would certainly soon become choked. Therefore the streets had to be widened and the spiral of demolition and bottlenecks began. The new plan was linear radiating from the core of the city along five identified structural axes.

**Objectives**

Following are the main objectives of the master plan:

- Changing the radial expansion model to a linear one, integrating transportation, street system, and land use.
- Freeing the downtown area from heavy traffic and preserving its traditional features.
- Containing the city’s population into its territorial boundaries.
- Creating economic support to urban development.
- Ensuring urban equipment for the whole city.

Flying into Curitiba today one sees the success of this approach, five ridges of high buildings stretch from the cluster of tall buildings downtown reaching out along the transport axes to the clearly defined edge of the city. The city of Curitiba is a case of a hybrid (linear finger like)
Compact city plan.

The Vision

Curitiba has been successful in integrating land use and transport to ensure an efficient, and self-sustaining, transport system. Its mixture of incentives and controls applied to land use planning often are with less success. Collectively, Curitiba has achieved a transit-oriented land use pattern and continued ridership growth.

Qualitative Parameters

1) Ordering Principles

Land use and transport are integrated; the ‘structural axes’ concept of high-intensity development has created corridors with a travel demand that is well suited to be met by transit (high demand, short walk distances to the transit facility, etc.)

Land within two blocks of the busway has been zoned for mixed commercial and residential uses. Beyond these two blocks, zoned residential densities taper with distance from the busways.
2) Land Uses and Transport Coordination

Curitiba is one of the few cities worldwide that has successfully implemented a policy of integrated land use and transportation supply over a long period. It has been stated that Curitiba chose to integrate land use and transportation at a very opportune time in its development, just prior to a very significant population surge. Mass transit has become more than just a transportation system; it is an instrument to control and guide city growth.

3) Compact Typologies

High density apartment blocks along the main arterials lend some enclosure and image to the very wide road reservation. This large grain gradually grows smaller in size and comes down to individual housed and row houses in the interiors. Thus a density concept is adopted which is reflected in the built-form response.

4) Public Transit Orientedness

The busway system has been instrumental in driving land use development and has been used to stimulate development along the structural axes. The city plan is linear; the town was authorized to spread only along specified lines. The historical center, situated somewhat apart, could then become quietly pedestrianized. A ring-road connected the fast north-south and east-west bus routes, four concentric lines were added with

(Cervera, R. (1995) Creating a linear city with a surface metro, np.)
stations at intersections with the earlier lines.

5) Ternary System

The device adopted in the plan was to divide the traffic flow intelligently between three neighboring parallel streets, the first and the third being one-way for private travel and the centre being reserved for the express bus and later for the tremor surface railway when the means were available. All this was co-ordinate with very little expropriation. The routes gave a structure to development without allowing it to occur anywhere at random and without impossible traffic conditions.

6) Social Infrastructure, Public Nodes and Interconnectivity

Curitiba’s public policy has been eco-socio-friendly and innovative with approach to public life. Public transportation is not seen in isolation but as an element which links the city functions and people together. Other aspects of the planning process complement the integrated transport network. For example in 1995, the first of five citizenship streets was implemented. Located near the bus terminals, citizenship streets are the headquarters of the so called regional administration centers. They concentrate services provided by municipal departments, public service offices, regular stores, cultural spaces, and sports and arts facilities for community use. Also created were pedestrian malls and pedestrian streets.
Development Framework

The zoning prescribed by the structural axes has been realized by a combination of control and incentives. This combination includes various bonuses to develop as planned; incentives to transfer development rights; firm control over large scale development (such as large shopping centers, which are limited to the structural axes); provision of incentives to developers to increase residential density close to the transit corridors; and development of transit terminals with a wide range of facilities (both public and private sector).

Inferences

- Articulation of strong, local core values in a city plan. Developing new models that provide inexpensive, creative urban solutions and reflect local values are an alternative to standard, often higher cost approaches.
- Integrated planning processes structured to assure that planners in all areas know the strategy and are working with a shared vision and developing their plans together. This way, many problems of unlinked development (e.g. not enough provision for green space) can be provided.
- Establish a close relationship between public transportation and land-use legislation as a guidance and development tool. Cities’ environmental quality and economic efficiency are highly dependent on transportation systems that are well-integrated with urban form because this lets them avoid weak transportation systems and unsustainable dependencies on private cars.
• Curitiba has been able to sustain land use development by a mixture of controls and incentives and has used the transport system both to sustain and to encourage development (e.g. around terminals).

• Transport support activities should be encouraged in busway transit corridors, and, where new development is scheduled, integrated development of busway transit and land use can bring great benefits.

(source: From UPPUC, Rabinovitch and Hochn, 1993 and Creating a Linear City with a surface metro, R. Cervera, UC Berkeley, 1995)
5.0 Social Implications in the Compact City

5.1 Reflection on the Research

I indulged myself on gaining understanding about “Compact City” model. The Compact City could be effective as well as affective to the urban environment and its inhabitants. I diverted myself to the aspects of the Compact City model to understand the roles it plays on the social economic structure of the city. The Compact City model meets most of the criteria, standards, and goals that inhabitants reasonably hope for their city of optimum design. Three precedent studies helped to understand installations of the Compact City model in three different ways. The outlook for all three case studies in applying the Compact City model was distinctive. The precedent studies carried out had their own perspectives in the Compact City model applications and justice in approaching the project goals.

Vidyadhar Nagar Township, Jaipur, India was the project which briefed to plan the view of Vidyadhar Nagar. It’s about 3.5 km northwest of the parent city of Jaipur and would accommodate over a hundred thousand people on a 400 hectare site. The aim of the master plan was to have environmental quality, a healthy and pleasant environment, efficiency of resources, ease and convenience, imageability, flexibility and feasibility.
The fundamental premise was to develop this project as an energy conscious city that is inbuilt with recovering to the greater forces of nature. A Compact City model with a linear centre that has easy access to all parts of town through pedestrian and open space networks was implemented in the Vidyadhar Nagar project.

The Greenwich Millennium Village, London project was an important attempt to create higher density sustainable housing in one of London’s largest brown field sites – the Greenwich peninsula. The objective of government sponsored competition was to create a compact city; high density, environmentally and socially sustainable forms of urban development set new standards of design for buildings on the peninsula’s good transport connections.

Curitiba, Brazil was an attempt made to impose a 1942 plan by the French town planner Alfred Agache. The earlier plan was concentric: to go from one district to another, traffic, both public and private, had to pass through the center, which would certainly soon become congested. The new plan was set up on the principles of linear radiation from the core of the city along five identified structural axes.

All of these three case studies focused on different ways of implication of the Compact City in the city to reflect the optimum environment for its inhabitants. An optimum environment reflects individuals’ needs for happiness, satisfaction, leisure, knowledge, freedom, and an exciting creative life that challenges their capabilities. The well-designed Compact City might do justice to bring multiple goals together on the same
platform. They are aesthetic environment, a suitable climate, rapid access to any part of the city, low cost living, conservation of agricultural land, reduced pollution, the elimination of auto accidents, the prevention of sabotage and the minimization of the possibility of being trapped in the city in case of disaster.

5.2 Cultural Effect on Human Nature

General City Plan: the first consideration that arises is how many people will be accommodated in the compact city. What would be the size of it? How many inhabitants will be served in it? Should the Compact City be large or small? The Compact City proposed is going to be small comparatively, as it appears to be. The smaller the city, the more accessible is its various parts and lesser are the problems of transportation. The Compact City will act as a prototype which will set a benchmark for any future development with a requirement of comfortable as well as optimal life. The Compact City model would be repeated on tracts of land and would be able to coalesce with each other. The Repetition of the prototype will establish harmony in the development of the region as a whole and mentally, physically, socially and economically will help to gain unity and less discrimination. This will help in the development of the region as a whole, though separated in row of multiple compact cities.

The term culture to me arrives from the development of the surroundings. Culture is a state of intellectual development or manners. The social and political forces that influence the growth of a human being are defined as culture. It gets shaped in an
individual according to the environment a Compact City establishes. Culture motivates and directs an individual to set their duties and affection towards their surroundings. If the city grows with a notion of oneness, it will psychologically develop feelings of bringing up inhabitants with each other in unity and reconciliation. In the Compact City, as inhabitants will be close to each other they will always encountered opportunities to interact with each other. The interactive environment will develop inhabitants with a culture, which is rich, diverse and unique in its very own way. There will be a social gathering and no more place for lifestyle where one family doesn’t know who is living next to them.

The units in the Compact City model will be stacked together and developed compactly to show initiatives for higher “Z” development pattern. Walking instead of driving around for a single errand will foster more local community association in the Compact City. The compactness of the city will allow the inhabitants to participate in a wider variety of activities that interest them.

In the Compact City, women will get an opportunity to liberate themselves from daily activities which prevent them from participating in using their time in other productive works. In the Compact City, as play area and indoor games will be nearby, women will no longer need to chauffeur their children. They don’t always need to keep an eye on their children. A mother and a very young child might walk together to the neighborhood center or playground. Main roads having high vehicular traffic will be located away from the neighborhood. There would not be a fear developing in a mother about her children
getting run over by a car when they are playing. The playgrounds and gathering space will be all at walking distances where there won’t be any vehicular movement. This will give women more time from their daily lives looking after their children, which they may be able to utilize in engaging themselves in doing part time or full time jobs.

5.3 Conservation

Human activities have jeopardized the environment most of the time. Man doesn’t foresee the consequences of his activities on the environment. Man’s incessant need of utilizing natural resources has already started endangering the future of the city. He has to comprehend and optimize the limited resources being offered by nature. If the environment problems have to resolve, then there has to be alteration brought in certain human customs and modifications of some of man’s industrial practices.

The population should be stabilized. We have been acting selfishly to the environment by taking away from it whatever we like and dumping what we don’t want. We have tried before to control the environment abuse by doing patchwork and other kind of plans. By doing so, we get success in eliminating one type of pollution but on the other hand creating other pollutions.

If for instance, a free way is designed for the betterment of the transportation facility for people, it will encourage unwanted development. If a freeway is developed, it will automatically foster suburban development as it can be accessible. This will increase
more traffic on the road system and hence more smog and accidents. It will add peak hour congestion and demand for more cars which will increase the usage of gas. The freeway development will hike the price of gas. Such patch work planning is not going to find good solutions to solve the problems of urban crisis.

As a matter of fact, the use of insecticides and pesticides are controlled or almost banned. By using insecticides and pesticides, man imperils ecological balance. The use of chemical fertilizers on agricultural land has deprived the soil of its natural ability to fix nitrogen. This disturbs the balance of necessary gases in the atmosphere. This chemical fertilizer also reaches underground waters, making them hazardous for human life. The waste product of the pesticides, paints and paper often contains a harmful mercury compound which reaches waterways. They undergo biological processes and become harmful to humans, who eat seafood. It is barely possible for humans to eat seafood as it contains mercury compounds.

Human beings are day by day lessening forest by cutting its product and burning it to meet their incessant demands. This indirectly is increasing the proportion of carbon dioxide in the atmosphere. The vegetation on the land and in the sea helps to convert Co2 in to oxygen by photosynthesis. It’s good to have more land area for the growth of vegetation and unspoiled sea. We are lagging way behind in meeting both requirements. This area of concern focuses on the urge of preserving forest and limiting our development physically in order to have more space for vegetation. If we keep continuing burning fossil fuels or nuclear sources, we are increasing the amount of heat received on
the earth’s surface. Whatever energy we are using to fulfill our basic needs of life is converted into heat and warming up the earth. One day will come when the earth’s temperature will rise so much that it will be inappropriate place for existence of living organism.

“Solid waste” is a term created by human beings. If it doesn’t produce foul smell and look dirty nobody would ever care about it. People dump solid waste near their houses and it becomes a municipal function to take it to the outskirts of town. The result of it is that there are huge piles of stinking and ugly solid waste, both industrial as well as domestic. Nobody cares where the solid waste accumulates or what happens with it once it is removed from their houses. In the United States of America, solid waste is converted into sanitary landfill. This is a systematic burial of compacted garbage. The landfill of compacted garbage is utilized for the developments of new buildings. By such a process there is no misuse of land but the dumping sites keep on changing and leave suburbia with a foul smell. Nobody wants to live on top of the land which has the foul smell of garbage. In the proposed Compact City, the household refuse will be sent for combustion in incinerators. The refuse will be combusted and will turn into ashes. The resulted heat energy can be used to generate power and to heat houses. This entire system will not contribute to existing air pollution. By doing so, the solid waste will be reduced to ashes which will be very less in volume, comparatively. The ashes will be biologically sterile and odorless and will be easy to bury or dispose of.
About half of the solid household waste is paper. We are completely reliant on the usage of paper for our daily activities. It’s very rare in today’s world to complete any activity without the interference of paper. For each ton of paper recycled, 17 trees are saved. Newsprint has become the most common use of it. Papers are mostly used in packages. Every other thing today comes in paper wrapped package. In the Compact City, a single newspaper can serve the whole family or whole block. Everyone has his own section in the newspaper which he is interested in to know. If the particular sections of newspaper are only transferred or ordered by special automated delivery system, this will encourage having control on paper waste and will give us an opportunity to pay our debt to the world.

Television is in use, but it has not been substantially effective in lessening the waste of paper. Instead of paper wrapped packages, plastics can be used. Plastic should substitute paper usage. Plastic be melted two to three time into liquid which can later be used to create plastic. In the Compact City, there will be a specialized automated delivery system which will be connected to nearby stores. These stores will send things in glass jars or plastic through automatic delivery system to individual houses. Every house will have an opening in them to receive this delivery and send back the empty glass jar or used plastic cans for recycling them for later usage. The same automated delivery system can be put into use for sending particular newspaper sections to individual houses.

Newsprints are not only the product which can be made out of used paper. Used paper can be recycled to produce tissue products and other papers. Such alternatives are
desirable not only to maintain the fiber quality but also to conserve the water and power required for conversion. Hand dryers in bathrooms used to dry wet hand. It functions to eliminate considerable amount of paper from being used. It is more sanitary than paper and save the forest from being cut to make paper towels. Such kind of functions will be encouraged to be placed in the Compact City as per the need.

We have to not only be concerned about paper, water and other natural resources being recycled, but also be concerned on the usage of automobiles. Automobiles are mostly responsible for endangering our environment. They increase severe air pollution and the incessant use of gasoline, diminishing the limited quantity of it and hiking its price day by day. Electric powered cars should be promoted for daily activities. Gasoline cars should be used only for long distance travelling. For other purposes, the Compact City will have electric powered vehicles. They will be eliminating a substantial amount of gasoline from being used and will reduce the pollution of air. The use of electric powered cars in the Compact City will discourage the use of gasoline powered vehicles in order to conserve the lead and other metals in the production of cars. There will be reduction in noise pollution also as the noises produced by electric powered vehicles is very minimal and negligible compared to gasoline powered vehicles. Most of the work will be done using electric powered vehicles in the Compact City.

A current example of Man’s harmful effect on his environment through fulfilling his dream of having a car in each family is recently launched NANO car by TATA Company in India. The car is rolled out in the Gujarat state in India and claims to cost 1,00,000
lakhs Indian rupee. People take it as a big achievement to the society and their country. But they don’t understand that they are indirectly aggravating their own ecological balance. The idea of this project is to have a car in each house which runs on gasoline. Imagine how much air and noise pollution will be generated by having this cheapest car in the world running on the roads. As it is the cheapest car in the world, it will fulfill the dreams of lot of families in India, but endangers the ecosystem with its harmful effects. India is the second most populous country in the world. It is growing irregularly. The rapid development is letting urban sprawl fit in the physical development with full strength and making human life depended on vehicles for small purposes.

In the Compact City, both problems will be tackled efficiently by the prominent usage of electric powered car. It will be economically cheap and pollution free as well. There will not be as many accidents as observed in today’s world, as the speed of an electric powered will be less. There won’t be any screeching of the break which annoys the surrounding areas. As the city will be compacted and most of the amenities will be placed close to each other, most of the needs of life will be taken care of by using electric powered vehicles.

5.5 Principles for the Development of the Compact City

The Compact City is an attempt at an inclusive design approach. Handicaps and disabilities are affecting countries very badly. Proper measures to make this world equivalent in terms of movements and rights for disabled people are not been carried out
perfectly. Handicapped people or disabled people still in this twentieth century struggle to move around in wheel chairs all by themselves. They have to rely on others for stepping into buildings or vehicles. What if the building doesn’t discriminate between disabled and enabled person? Every amenity should treat and entertain all individuals equally, no matter sound people they are physically. Slope with proper ratios will be implemented in the Compact City where it is needed for disabled people. Prosthetic equipments shall be encouraged in order to make disabled inhabitants accessible to the amenities in the Compact City. Disabled persons with an incorporation of prosthetic equipment would be no longer be dependent.
6.0 Compact City Guiding Principles

6.1 The Region: City Level

- The region is a finite territory, which demarcates the Compact City with geographical boundaries and is derived from green spaces, water bodies, zoning, neighborhood, corridors, block, street, individual buildings and climate.
- The development of the Compact City should respect the historical patterns and boundaries of the place where it is built.
- The development pattern should be implemented with proper recognition to the context.
- The city level planning should be well maneuvered in order to establish a good relationship between cultural, economic, environmental, social, and physical development.
- Later developments should be integrated to the physical fabric of the Compact City, without exploitation of the existing context and the planning system.
- Peripheral expansion would not be encouraged in the Compact City. If the need arises than similar Compact City would be constructed. The multiplicity of the
Compact City development will establish harmony and unity throughout the entire development.

- The shape of the Compact City should not be very particular. It must be flexible enough to accommodate all the planning features which are required to certify it a Compact City.

- The zoning and the placement of the industrial, residential, commercial, corporate and business areas is what should matter. The zoning of these areas should be seen repeated in each Compact City. They should follow the same footprints for the development of new areas.

- The physical development of the Compact City should be supported by a framework of transportation alternatives.

- Transit, bicycle and pedestrian paths should promote the accessibility and mobility throughout the region and should reduce the dependence upon the automobile.

- Decentralized planning should be initiated in the Compact City in order to avoid the outshining of one zone over the other or one amenity over the other. It will reduce congestion on the roads because of the dependency on all zones.

- The integration of the amenities within the Compact City should strongly foster establishment of visual and physical linkages.

- Harmony throughout the development of the Compact City should be noticed. Each development unit should coalesce with each other in order to grow together to one single body.
• Concentration and compaction should be implemented to enforce urban containment and to reduce the peripheral expansion.

• The Compact City should exhibit equity through land use disposition.

• The Compact City should be well connected with other parts of the state through less accessible but very essential freeways. There will be no physical development encouraged along the freeways.

• Transit oriented development should be encountered throughout the Compact City planning. Each amenity and zone should be easily accessed by a common man. People should not be made to walk for a long distance. Everything should be placed and planned by giving more importance to the accessibility of it.

• An inclusive and active public realm, democratic and open minded spaces should be put into the action in the development of the Compact City.

• Each place should be connected to each other in a very dignified way in order to avoid delays in accessibility.

• Throughout the development of the Compact City there should be a reduction in the travelling distance for “live-work-play” environments.

6.2 Division: Zoning

• Zoning defines the district, forms an essential element in providing the importance to development of the city. It gives an identity as well as discriminates each part of the city, allotting different function and use to it.
• The juxtaposition of each functions and amenities should be counted. The commercial area if placed in the core as it has been placed in some of the compact cities projected earlier; it brings out a sense of competition amongst them.

• Every zone has its own value which cannot be superimposed on another. They should rather have magnetic personalities which enable them to attract to each other.

• If you draw a bubble diagram, it works more like a cycle where every zone is somehow dependent on the other zone. For instance, the commercial zone should be placed near to the residential zone in the Compact City as there should be walking distance between them.

• Residential zones occupy a heart place in a human body. As the heart enables a human body to work even if other parts are not working, a city having residential zones which are safe could run if other zones are abandoned. But the perfect human body performs outstanding only when all parts are functioning well. Similarly, a city can only achieve prime success in running itself when all its zones are well maintained and functioning.

• For the movement of a human body, limbs are zoned in coordination to each other, for viewing, hearing and speaking; eyes, ears and mouth are placed in the zoned called face. Similarly, in the Compact City, corporate, commercial, industrial, institutional and other zones need to be located close to each other in co-ordination.

• Corporate, institutional and commercial activities should blend with residential areas. They should not be isolated in single areas. These are the places which are
not demanding to be used during specific times. They are being in use all day. They should be embedded into the neighborhoods.

- Different zones blending to each other will promote a mixed use environment. This will not allow the domination of one activity over another. It will reduce the competition between different zones regarding their importance. There are no criteria about the size of zone in the Compact City. A zone can be 2 to 3 buildings grouped together in a small place. This will help in making the public transit a significant viable alternative to private automobiles.

- Residential zone should consolidate a broad range of housing types and price levels. This will help people of different race, income, creed and class to live close to each other. It will facilitate interaction and social gathering, required to create a friendly and comfortable environment in the Compact City.

6.3 Neighborhood

- The neighborhood is a social community where people communicate and interact with each other.

- The neighborhood is a place which indulges itself in creating intersectoral linkages in the form of mixed use spines, on which there is preference given to pedestrians.
• It is composed of physical bodies like houses, streets, offices and other functions, but attains its true meaning and accomplishes its purpose only when all these physical bodies arouse social interaction.

• No neighborhood is bad or good. It’s the amenities which make it responsible for its status. In the Compact City, neighborhoods should exhibit strong multifunctional layouts to increase vitality through activity concentration.

• Neighborhoods should have the ability to sustain facilities and animate streets.

• Neighborhoods in the Compact City should establish a hierarchy of open spaces and linkages. The larger green areas are linked to the neighborhood green areas which further lead to immediate greens around the residential fabric. There should be a transition practiced in green spaces in the neighborhood.

• Neighborhoods should have sculptures & landmarks to dispense an experience of walking, full of excitement and curiosity to know what is going to come further along the roads in neighborhood.

• All the activities in the neighborhood should be linked physically, in order to generate pedestrian friendly patterns.

• Neighborhoods in the Compact City should be more inclined and dedicated towards using the “Z” direction. The concept of using height of the building as one of the main elements in making an identity and statement of architecture should be implemented and reflected in the neighborhood. Tall structures, overlapped with different functions throughout the elevation should be incorporated in the neighborhood to make it a versatile place.
• Neighborhoods should be versed with patches of residential, commercial, corporate and institutional places to offer the variety in choices to its inhabitants. These places, as demands their own territory can be differentiated by buffering them using green spaces.

• Parks and community gardens should be distributed in the neighborhoods.

• Neighborhoods should flourish with a legible environment where people can read it with less stress.

6.4 Corridor

• A corridor is the path to connect each neighborhood.

• It is very essential to be conscious on the development of corridors which leads one neighborhood to another. The transition between neighborhoods juxtaposed should be interesting as well as welcoming.

• They would not be like freeways in the Compact City, which lead to sprawl or unnecessary expansion of the city. There should be amenities located along the corridors connecting the neighborhoods to develop a mixed use environment.

• Defined paths should be allotted to the bicycles, pedestrian and automobiles in the corridors.

• In the Compact City, corridors should not be long. They should be short and multi-functional.

• Trams should run along the corridors to kindle the dependency upon the public transportation. This will help in getting rid of reliance on private automobiles.
I perceive corridors as a metaphor of plant, where the stem plays a role of connecting different leaves, acting as neighborhoods. It physically connects neighborhoods and helps in coalescing them. It makes the Compact City experience oneness.

6.5 Block

- Block is a term used to identify a place, composed of three to four buildings grouped together.

- A block is a smaller version of zoning in the Compact City. One block should have residences incorporated in it. The second one should have only offices in it. Similarly other blocks should have other functions. This will help in generating social interaction between different uses as well as between the same functions.

- There should be common areas shared by buildings grouped with each other to form a block. This common area should act as a community garden or a play area. By having this children will play with in reachable sight. They will be always in the front of an eye and safe as it won’t have any automobiles. They will be away from their mothers, allowing them to have spare time in some other activities and also eyed by them as being close to them.

- The chances of getting run over by a car will lessen considerably. In office blocks the common area should be cafeteria, where people can take a break from their work to pacify their nerves.
• The common area should act as a platform to interact between different professionals. This arrangement will enforce people to talk to each other after regular intervals of break. This will encourage a socialization instinct in each individual which will make the community a better place to live.

• Buildings in the blocks should not be discriminated by possessing different architectural styles. They should have same pattern of architecture, so as to blend with each other. This will generate harmony in each block and repetition of blocks will congregate neighborhoods.

• Each block should be easily accessible. Compact typologies will be implemented in each block so as to reduce heat gain and create shade and a positive micro-climate.

• The common area will also be showing vertical elongation, where the bottom floors will be used for parking with proper safety measures.

• The center for cultural functions, common retail and recreational facilities should be indulged in the common area shared between the residential buildings in a block.

• Blocks should be an attempt to create appealing and visually interesting networks of spaces and enclosures.

6.6 Street

• Streets are the paved pathways engraved in the built environment utilized by the public.
• It forms the way for people to fulfill their daily requirements to make a living.

• Streets should be narrow and should show initiatives for being used as a public thoroughfare.

• Streets will connect the blocks, and most of the time occupied with bicycles and people.

• Automobiles running on electric sources should be allowed to use the streets in order to transport people and other small goods.

• Streets should be marked with all traffic rules and regulations properly which need to be highly followed by the public.

• Streets to me perceived as a channel of movements are always occupied by the public, generating small pockets of interaction by informal gatherings. It is the medium to reach and meet our destinations every day.

• It gets life when the day starts and gets silent when the sun goes down.

  Metamorphically, it also has a life. It also runs along with the people. During the peak hours, it flows and slows down as the activities weaken. Cities appear all rich and as healthy environments when streets are being utilized.

• In the Compact City, streets should be used in the morning, noon, evening and night. It will be at peak in the morning as people will go to their works, schools, stores and other places. Along the street there should be multifunctional places in order to be used with the same movements throughout the day. During nights it should be used for walk. People after having a meal and knocked off for the day, come out of their dwelling units and go for a walk, which will initiate social interaction among different races and communities.
• Streets should be fringed with plantations and trees in order to welcome a pleasing homely environment to be around it.

• Streets are one of the main features which play an important role in the beautification of the neighborhood. If the streets are well groomed with sit outs and greeneries, it will reflect effectively on the betterment of the community. The community will achieve a level of achievement and high standards, if the streets are safe, comfortable, and interesting to the pedestrians.

• Streets will stitch the fabric of urban environment into one piece of cloth. They consolidate all blocks together and tie them all together physically in order to give the sense of uniqueness and unity.

• Where the streets conjoint, they form nodes. Nodes in the Compact City should be well versed with different functions, instead of being planned with one function.

• Commercial and retail store components should show initiative in enclosing the nodes, as they generate social interaction effectively.

• Nodes should exhibit more enclosed feelings as they psychologically tend to have an impression of a place to hang out, take a break from hectic schedules and get together. They should promote socialization among the different communities, races and classes of people.

6.7 Building

• A building is a closed volume with walls, punctured to regulate the illumination level of inside the volume.
• It serves as a shelter to the inhabitants of a city, to abide them and protect them from harsh climatic conditions. It acts as a buffer between the private and the public life of an individual. It sets physical division between the public and private domain.

• A building forms the physical boundary for an individual to restrict his limits in expanding his freedom. A building should change its architectural appearance according to its use. Institutional buildings should differ with residential buildings and so as with civic buildings too. In the Compact City, buildings should exhibit a legible environment where people can comprehend the function of the building from the outside of the building and to not get lost.

• Buildings should be more inclined towards modernism architecture theory which emphasizes mainly on function. It emphasizes to be restricted to deliver function rather than imitate nature.

• Buildings in the Compact City should be tall using “Z” directions. There should be cluster of tall buildings in the block in order to save land.

• There should be diverse functions, overlapping each other as the building goes up. This will encourage experiencing diversity throughout the building.

• In the Compact City, one place should be used by different functions not at one time. In the Compact City, in a building one level if acting as a shop for jewelry can be adapted to a function of clothes sale later in a day. This will increase the demand and usage of the space. It will not make the monotonous feeling, getting settled over the place. This will captivate people’s attention to visit the place.
• Place, if occupied with different function, will allow people living at far distance to come there. If there are fewer places of satisfying the same functions in the neighborhood, then people will push themselves to pay a visit to other places in their neighborhood. This will facilitate social interaction and friendly environment in the community. Such kinds of initiatives will not allow a monopoly of one place in the community to develop, as there will be choices everywhere in the availability of products.

• Buildings should be well equipped with fast moving elevators which can take heavy loads. As the buildings will optimize the tallness feature in the Compact City, they should have multiple fast moving elevators to reduce the wasting of time.

• Buildings should have garbage chutes in each floor to dispose of house residue, instead of residents coming down to the first floor and dumping in the dumpster. This will save the energy and time which could be spent by making trips.

• Cross ventilation should be given consideration in each floor in order to reduce the dependency on the electricity consumed.
7.0 Literature Cited

Batsford, B.T.(2002), pp310-14 A guide to recent architecture

Barker, D. Architecture week

Carmona, M. (1999) Sustainable urban design- appositive agenda


Dantzig, George B. (1914) Compact city; a plan for a liveable urban environment

Doshi, B. V. (1986) Vidyadharnagar master plan

Frey, Hildebrand (1940) Designing the city: towards a more sustainable urban form


Jacobs, J. (1961) Urban visionary

Jenks, M. The compact city: a sustainable urban form?


Laquian, Aprodico A. Beyond metropolis: the planning and governance of Asia’s mega-urban regions.


Trancik, R. (1943) Finding lost space: theories of urban design