In the present context, when the globalisation and liberalisation demands more urban space, and the government agencies are also changing their role from regulator to facilitator, the relevance of Development Control needs to be reviewed. In addition, the concept of urban control has also switched over to the phrase of urban growth management, which calls for a new approach to development system.

The demand for built space in many of the metropolitan cities is growing at a much faster rate than their population growth. Due to gap between demand and supply, there are increasing violations against Development Control Rules and proliferation of unauthorised constructions. The final blame is fixed on the agency which looks after the developmental activities on that area. With the increasing deviations from the plan, the overall urban environment get degraded and planned developments perpetuates to decline.

With the growing awareness among the population, pressure for built space within the central areas with better facilities which are already densely built up and changing requirements of people, there is need to have a new look into the development management through the instrument of Development Control Mechanism.

The focussing of research question was arrived at through the review of existing literature, covering areas of urban growth, Development Control system, outgrowths and its effect on development, parameters of control, measuring growth, landuse models and perception by stakeholders. Based on the materials reviewed, the methodology and parameters of study has been evolved.
The Chennai Metropolis have grown to the present size by the growth and amalgamation of various old settlements. Population density and commercial uses are high in these old settlements. As the increasing population was not able to find accommodation, due to high land cost in the central areas and lack of space, they have moved towards the peri urban areas of the city where the land cost was relatively cheap. The lower cost associated with better transport both rail and road could attract middle and to some extent high income groups to these areas. In the initial stages of the urban expansion, the developments have taken place along the radiating corridors, in the form of legal and illegal sub-division of agricultural lands for urban use. These sub-divisions were after few years occupied by the outward movement of urbanities from city areas. The period between 1975-1990 saw these developments.

Almost in the same period, due to employment generation in city and its surrounding area, the changing social system from one member working family to both husband and wife working, lead to greater need for housing within the city areas. This has lead to construction of flats in the city, many of which were found to violate the prevailing DCR norms. The other areas which seen the variations between the rules and the actual development is the coastal zone along the metropolis. Though the Master Plan for the CMA restricts development along the sea shore, many residential developments have come into existence.

A review of the work done on the Development Control from other Megacities did indicate several interesting features.

In Calcutta, except industries other uses are permitted in residential area which means mixed use concept is being adopted. In the other three cities, Mumbai, Delhi and Chennai, schools, community halls, professional consulting offices are permitted. In Chennai Mixed Residential zone is a unique classification which allows other uses not exceeding 300 sq.mts., except those obnoxious and hazardous industries. On appeal higher institutional uses are also permitted in all the four metropolitan cities.
In Delhi and Mumbai only two distinct classes viz., Light and heavy industrial classifications is adopted, whereas in Calcutta mercantile buildings are also permitted. There is no separate zone for institutional uses. They are permitted in Commercial and residential zones. Also there is no separate zones for agricultural use and non urban use. The use classifications adopted in these metro cities tend to agree that no special classifications are needed for residential, commercial and institutional uses. There are too many classes in the land use classifications and the grouping in these four cities. One group of classification as is being practiced in Calcutta can accommodate uses like Residential, Commercial and Institutional. This may help in simplification and allow for flexibility; Of course care must be taken to prevent environmental degradations, due to clubbing of such uses in residential area.

The height of the building in Delhi is related to the use of the building. For commercial buildings the maximum height is limited to 37.0 mts. In Mumbai, the permissible height of the building depends on the width of abutting road. Normally it is one and a half times the road width and the required front open space. Also there is height restriction in the vicinity of Aerodrome and special areas to provide vista. In Chennai, the maximum height is fixed as one and a half times the road width.

For residential buildings coverage allowed in Chennai is maximum (60%) than the other metropolitan cities. In Delhi, for commercial buildings, coverage limit is fixed at 80% which is the highest compared to other metropolitan cities. In all these cities coverage varies with plot size and use of the building, except in Chennai, where the coverage is controlled by the set backs.

Set back in Delhi are related only to plot sizes for all occupancies. In other cities, there are a variety of considerations. In Mumbai, set backs related to depth of plot and road width for residential and commercial occupancies, besides the height of the building. In Chennai the front set backs relate to road width but rear set back for residential use relates to the depth of plot which is the case in most cities. For very small size plots less set backs are prescribed. In the case of Delhi, no set backs upto 60.0 m plots. and for larger size plots (more than 1000 sq.mts) FSB is high, when
compared with that of other cities. In Calcutta and Chennai, the FSB is the lowest i.e., 3.0 m in Chennai and 2.0 m in Calcutta. The SSB in Calcutta is also lowest (1.2 m). The RSB in Chennai is the lowest (3.0 m). Whereas no FSB for plots of 40 sq.m. in Mumbai. Also no SSBs for row type houses upto 40 sq.m. Also there are special considerations to relax set back for narrow plots. In Calcutta, side and RSB is regulated by the height of the building. Inner Court Yard is also taken into account. Also there is no uniform policy adopted in these cities to relate it to either road width, depth of plot, size of plot and height of the building.

As regards the FSI/FAR it was observed that in Chennai, Delhi and Mumbai a higher FSI/FAR is allowed in the Central Areas against relatively lower FSI/FAR in the suburbs. If FSI/FAR norms have to reflect a policy of decongesting the central areas, then allowing higher FSI/FAR in the core seems to be irrational. Delhi has adopted a table for plotted housing for different plot sizes with restriction in height as well as dwelling density. Group Housing in Delhi is allowed only for plots measuring 4000 sq. mts. and above. However, there is no uniform policy for specifying FSI/FAR, being adopted in these four metropolitan cities. The lowest and highest FSI/FAR for residential building is 75 (0.75) and 300 (3.0) in Calcutta. In Calcutta FSI/FAR 175 (1.75) to 300 (3.0) is adopted for institutional buildings and 175 (1.75) to 275 (2.75) is being adopted in Commercial buildings, which is higher than that followed in other three cities.

Lower FAR for the central core and higher FAR for the new areas are logical for decongesting the city and to accommodate service lines which is easier in the newly developing areas. But how far it is practical to adopt this policy in the Indian Cities, where the land value is decreasing from the core to the outer area, is a moot point.

In Chennai building lines ranging from 3.0 m to 12.0 m have been specified according to specific stretches of major roads and in Mumbai it ranges from 3.0 m to 7.5 m. No building lines have been specified in Delhi and in Calcutta.
Architectural control is popular in New Delhi and Urban Arts Commission is functioning there. Eventhough there are provisions for architectural Control in the DCR of other cities, they are not exercised. Advertisement control is seldom exercised by the local authorities as the validity is subject to be questioned and also on the account that it act as a source of revenue.

The Developer has to specify the two set of rules, one from such Municipal Act and second from development control of Master Plan implemented by Metropolitan Authorities, the set back, are different in both the rules. Clearance from the same angle leads to time consuming and duplication. This is the case with all metropolitan cities in India.

For 300 sq mts. of Plot, parking space is the highest in Delhi for all uses among these Mega Cities. Space requirement for these uses is lowest in Chennai. For bigger plots (more than 300 sq mts.) the space requirement for all uses is maximum when compared with other cities. For bigger size plots (1000 sq mts.) the space requirement for residential and institutional is the lowest in Calcutta than other cities. For commercial use, it is lowest in Mumbai. Car parking space standards are not comparable and there are wide variations in these four cities, since it is based on the car ownership and socio economic conditions.

As far as commonalities are concerned one can observe low FSI is being adopted in all these four Indian cities and high ranges are being adopted-in core areas. Broad land use classification are common but application of such classes are varying depending on the nature and extent.

Regulations should also be related to the desired urban form or the type of development. It is essential now a days to discourage large residential plots in metropolitan areas. A complete revision of the existing provisions of different components of development control is needed to make it simple and adoptable. Sincere attempt must be made to have the confidence of the public in matter relating to policy decisions and framing regulations.
When an analysis of Development Control Mechanism in CMA was made (Chapter 4) the following facts emerged. The enforcement of development control in Chennai dates back to 1940, where in the building rules were first introduced in order to take care of sanitary, light and ventilation of the buildings. In the early periods in order to manage the developments the government made provisions for preparing Town Planning Schemes, which dealt with use of land and type of development. This was possible to follow as the population pressure was less on those days. As the population of the city started exploding especially after Independence due to industrial developments, the Town Planning schemes were not able to cope with the resulting Urban situation. This saw the formation of Development Authority in the year 1974 to control and manage the urban development within the Chennai City Region, which covers an area of 1177 sq.km. The Master Plan for the entire area was prepared by CMDA in the year 1974 which was approved by the State Government in the year 1975. This became the statutory plan because of the Town and Country Planning Act 1971 as amended

This plan, commonly referred as Master Plan, was very comprehensive and intended towards the orderly development within its jurisdiction. The entire area was classified into 10 different uses. Any development proposed by the land owners is governed by the land use given in the Master Plan. Second component of the development control mechanism provided in the plan was the development control rules, which tries to control the bulk and mass of the built environment as well as the overall density. For this purpose, the entire CMA has been classified on to three groups namely, (a) George Town and continuous building areas, (b) rest of the city and municipal areas and (c) the other areas within CMA. In addition the entire city has been divided into 99 planning units, for preparing Detailed Developments, which is the detailing of Master Plan for effective implementation. Though there were concerted efforts by the planning authority to control and manage the urban growth as per the Master Plan, it could not be followed by the people, since they were found to be rigid and did not provide for dynamic changes. Since the landuse was rigid, there was many demand for reclassification of uses which was considered to be time consuming,
as it takes some where 6 months to 18 months. This would have been avoided if the permission of use is based on performance criteria, which could be operated by CMDA itself without getting governments clearance. Further this delay also leads cost and time over run, which will affect the people atlast. Another issue relates to the time taken in the approval of building plans. As such it could be reduced if the entire process of development control is computerised using GIS Data Base. The time consuming reclassification, delay in issue of planning permissions, cumbersome administrative and legal process due to Urban Land Ceiling Act, clearance from plethora of agencies resulted in unauthorised development.

As per the plan the higher FSI was proposed in central areas and lower FSI in the outer areas. This was necessitated in order to promote intensive developments in those areas where there is substantial infrastructural facilities are available to take care of the additional population. However, this worked against the principle of the plan, wherein the deconcentration of activities was one of the main focus so as to reduce the congestion on the roads. To achieve this the FSI fixed should have been decreasing towards the city centre. But this approach should be supported with adequate provision of infrastructure in the other towns in the CMA, which had not happened in the outskirts of the city.

The other issue closely related to implementation of Master Plan is the resource mobilisation. Though, development charges are collected by CMDA, the amount collected is very meagre which is grossly inadequate for taking up any infrastructure projects in the planning area. Given the present approach to urban development the role of central, state and local governments are decreasing day by day in terms of provision of services, which were once the domain of the Governments. Now, it is mostly attempted to provide through participatory approach by the private sector. Even in this approach the local body who is responsible for provision of services are expected to contribute certain percent share of the cost of the project. In order to make provision for this the development and other charges collected needs to be revised in accordance with the cost of service provisions.
Another aspect, which deserves the attention from this study is that there are substantial number of violations in land use, building parameters, layout sub-divisions, which are mostly attributed to outdated regulations, mismatch between land cost and development allowed, above all the socio-economic characteristics of people and various delay involved in the issuing of the permission by the planning authority.

Now the next aspect which was given the top priority in the present research is perception and attitude of the people towards Development Control Rules (Chapter 5). The success or otherwise of the any project/scheme depends on how far it reflects the people’s views on that subject. As the DCR is one of the main aspects, which shape the urban form, it is all the more important to take into account the peoples view on DCR. According to planners and users, the purpose of DCR is to safeguard the public interest in terms of provision of better living environment to the urban population. The perception obtained regarding time consumed for clearance of planning permission is too wide between users, promoters local body staff Vs the CMDA staff. The users feel the time taken is more and officials feel it is only nominal. But an indepth analysis of delay reveals that, if the planning permission is given after two months, the documents provided by the application is inadequate, change of use may be required, accessibility may be lacking. Under these circumstances unless these deficiencies are cleared, the planning permission can not be given in time. But for the outside, the inner details are not known, thus they feel the time taken is too longer.

Many of the local body officials felt that building permission issued by them, needs further simplification of rules, so that it could have helped the lower income households mostly. This aspects merits further consideration as it is expected to improve the housing stock as well as ease among the people in the Municipality and other areas who still feel that getting planning and building permission is a herculean task and thus going for unauthorised developments. Further, the local body in the CMA, requires to be posted with qualified planning staff, who could manage the development in those areas, within the overall framework of CMDA plan.
Many of the deviations indicated that, the owners of the buildings/Promoters, are doing it knowingly to increase the returns to that project. About 30 percent of the promoters accepted that they do violate the DCR but mainly to maximise the returns: This is done mostly by increasing FSI, by either going one floor, or projection of balconies etc. Users and promoters opted for flexible zoning rather than rigid zoning (which was the case in the first Master Plan) Though their perception that DCR delays the project, returns are reduced, etc., in general all the respondents reiterated the need for DCR to provide orderly development as well as built form and acceptable Urban Environment for its residents. From the perception study it is clear that the existing DCR requires revision which should take in to changing socio-economic situation. Possible extent it should be a dynamic one, to incorporate the changing nature of urban system. In addition to flexible planning parameters, the respondents cutting across their position, opined that the infrastructure facilities, needs to be improved if the FSI and spreading of developments is to be realised.

To over come the operational difficulties and for better understanding and application of the stake holders, a simplified approach in adoption of development management rather than development control was evolved. This had two parts. One being the rule for improving operational efficiency by reducing the number of parameters and to reduce violations and the second part being the land use zones to be more flexible to meet the economic development.

The salient points were: Three alternatives have been examined and the following Guide lines for operation of Development Control Rules suit better (i) Front set back varies with abutting road width. (ii) The height is restricted to one and half times to road width. (iii) Side and rear set back depend on the height, more over guided by the type of the building and (iv) FSI is based on the achievable limit, which will not exceed 1.5 in the case of ordinary buildings and there is flexibility in the case of special and multi-storied buildings, (v) All commercial buildings exceeding 1000 sq m in plot extent and FSI exceeding 1.5 shall abut on a road not less than 10.0 m. Wide. It shall have an around set back of 3.5 m. front set back shall vary according to the road width. Maximum height shall not exceed 1 and 1/2 times (one and half) the
road width, (vi) All institutional and Industrial buildings of plot extent more than 1000 sq.m. will have to abut a road not less than 10.0 m. wide. It shall have an alround open space of 6.0 m. but FSB shall vary according to road width. The height is restricted to 1 and 1/2 times (one and half) the road width. Maximum FSI shall be restricted to 1.5. The above guidelines found to be more simple which could increase the operational efficiency and less violative as it has been tested with the appeal cases of the sample.

To reduce number of reclassifications, and allow flexibility a land use model-MIGFU-MIPTRAS matrix was suggested. A broad brush land use plan at the regional level (Master Plan) and detailed land use zoning at local level (Detailed Development Plan) was suggested. Economic Planning and infrastructure improvement can be well integrated for sustainable development. Environment is assured by introducing Environmental Impact Assessment for the activities that are needed before its function or for continuance. An added advantage in the model suggested is that it eliminates the chances of non compatible uses become permissible in certain land uses adopted in the Master Plan.

On the basis of the analysis of the results and on the basis of the emerging issues the following recommendations are made in various chapters. To expedite approval of planning permissions a graded approach in the responsibility of issue of planning permission is more suitable. Delegation of powers and establishing a single window system among the architects, local body officials, planning authority will ensure the confidence among the stake holders and improve the efficiency. Denial of services like water supply, sewerage, electricity for the unauthorised constructions, the policy of which is under consideration of GTN, has to be brought in force. The concept of development has to be changed towards management for taking care of the larger interest of the stake holders and the city as well. Thereby violations can be reduced. The 74th constitutional amendment also give a statutory backing for the local body officials, whom should be trained as local bodies have to be strengthened with qualified personnel. To reduce violations, it is all the more important to levy compounding fee, which will be a deterrent punishment. The compounding fee is to be equated to that of gain by making violations. This levy shall be made attachable for
revenue generation for augmenting needed infrastructure. Apart from punitive measures, it is also necessary to inculcate in the minds of young generation about the building science so that the future generation will be more disciplined in adopting the Development Control Rules.

An Urban Arts Commission has to be established to regulate Architectural Control and Advertisement Control. A strong political commitment is needed towards this approach and to suggest for preserving and improving heritage areas. More attention is needed to create and maintain large open spaces in Chennai Metropolitan Area and parks and play fields to effect micro climate as well as harvesting rain water. Approval of layouts in the flood plains have to be considered carefully, since these areas are needed for flood modulation apart from, acting as a large organized open spaces in Chennai Metropolitan Area.

There is a felt need for evolving a suitable parking standards based on the ownership, idle parking and socio-economic cultural needs of the society. FSI is a leverage for planner to achieve planned development. The concept of transfer of development practised in Mumbai is a good example. Consideration of extra FSI for acquiring land for public purpose, or revenue generation for infrastructure development by auctioning/sale of FSI in certain vulnerable areas will yield good results. By introducing extra FSI one should not think that it will add to congestion. The traffic situation can be better improved by flyovers or by offstreet parking for which the revenue generated out of the extra FSI, which otherwise will not yield good to the community can be better exploited.

Invariably there two school of thoughts about adoption of FSI in core areas one School thinks higher FSI will add to congestion in Indian Cities. The other school postulates, that the lower FSI in core areas where land value is very high, is against the market forces. The arguments puts forth by them is that in most of large cities of the world, the FSI varies between 5 and 20 in CBD areas down to as low as 0.1 in suburbs, whereas in Indian Cities it is restricted to 2. The situations in Hong Kong (FSI 15), Singapore (FSI 10), Washington DC (FSI 7) are well managed. If FSI is
fixed based on land value consumer demand will yield economic liberalisation for infrastructure development. The irony of the Indian situation is that extreme congestion has prevailed in most of the CBDs of Indian cities, inspite of low FSI, which needs further research for evolving suitable policies on FSI. This is a vast area with complex relationship with various internal and external factors and hence suggested for taking up for further research separately. On the basis of the above research findings an alternate model is suggested. The salient features of this model are

(i) simple rules easy to understand.
(ii) reduce delay in processing and increase the operational efficiency; and
(iii) more flexible, encourages development both physical and economic and protect the environment from deterioration.

In this context it is worth to pointout that the methodological frame work developed in the alternative model may be used for other major cities in India, with slight modifications meeting the local conditions.