



Impact of Outer Ring Road on adjoining Housing Developments

Case study: Hyderabad

¹Devisetti Aparna,

¹Ph.D. Scholar, School of Planning and Architecture, JNA&FAU, Hyderabad, India, Under supervision of

²Dr. D. Vijay Kishore

²Professor in Architecture, School of Planning and Architecture, JNA&FAU, Hyderabad, India & Former Vice Chancellor Dr. YSR Architecture & Fine Arts University, Kadapa, Andhra Pradesh

Abstract: This paper intends to document and analyze the factors involved in the Housing development and typology change observed in the adjoining areas of the Outer Ring Road, Hyderabad as an impact study. The Western part of the ORR is selected as the study area due to its proximity to the major economic hubs and the core city. This study is part of the Doctoral research on the Topic “Impact of Outer Ring Road on adjoining Urban land development”.

Index Terms – Outer Ring Road, Housing, Density, Development control regulations

I. INTRODUCTION

The Ring roads came into existence to solve traffic congestion problems in the urban centers and provide a fast-commuting solution in the growing cities. Ring roads have both positive and negative impacts on the development pattern of the adjoining urban lands. As it encircles a town or city, the area within complements the existing urban land and its connectivity to the suburbs accelerate the development in the adjoining areas. Tim Miller writes in China’s Urban Billion, that ring roads allow the increase of “potential area for urban development in one stroke, as all land within an orbital will quickly become fair game for development” (Miller, 2012) It is observed that the Ring roads have induced demand for developments leading to more private vehicular trips resulting in higher pollution levels. “Ring roads also act as a catalyst for development, leading to urban sprawl and car-centric planning”. (Snell, 2018) Ring roads over the years have split the communities based on accessibility and majorly brought in difficulties for pedestrians and cyclists.

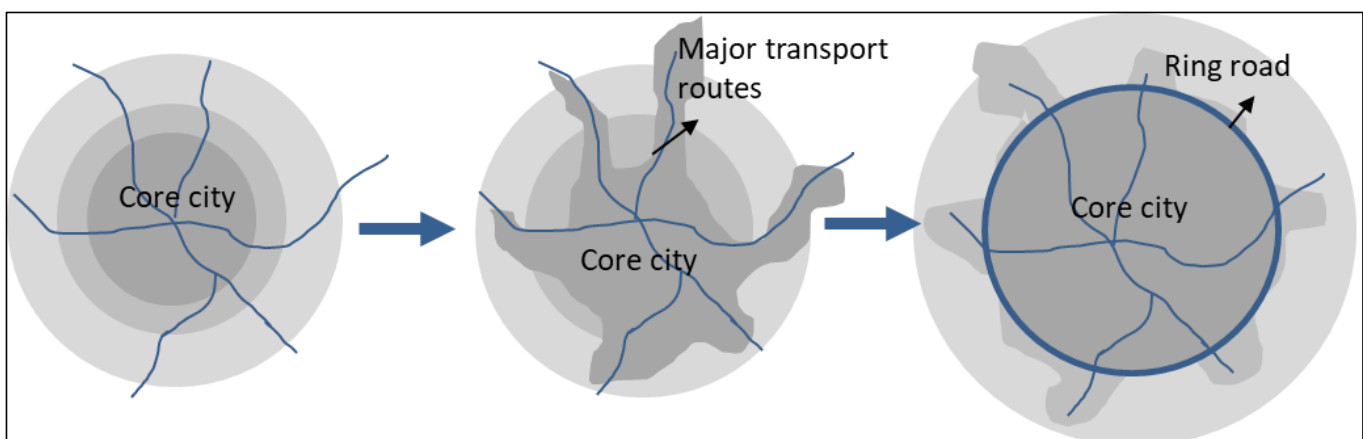


Figure 1: Interdependency of Urban sprawl and Transportation routes
Source: Graphical interpretation

There is always a need to have an integrated approach to planning as transport and adjoining land use are interdependent. This integration has to be done through a perspective lens with sustainable development goals as a primary objective. There is continuous confusion among urban planners while planning major transit routes in suburban areas in understanding the

interdependencies between the two segments. The National Urban Transport Policy, 2006 in India also recognizes “integrated land use and transportation planning” as one of the efficient tools for sustainable development. The decisions on land use transport integration should be long-term, systematic, and lead to a reduction in bias, and informed choices. (Ministry of Urban Development Government of India, 2013)

In most metropolitan cities, a major drift is observed in the housing typologies and their accessibility patterns in the sprawl areas where outer ring roads are implemented. This paper attempts to document the Housing typology change observed in the adjoining lands of Outer Ring Road, Hyderabad.

II. OUTER RING ROAD HYDERABAD

Outer Ring Road, Hyderabad is a unique and first Road cum Area development project launched in 2005 by the erstwhile Government of Andhra Pradesh as an integrated planning policy keeping in a vision of sustainable development. It was launched as a Special Purpose Vehicle known as “Hyderabad Growth Corridor Limited” and aimed at “developing a well-planned and well-connected urban settlement around the Hyderabad Metropolitan area”. (HMDA, 2018) (HGCL, 2022)

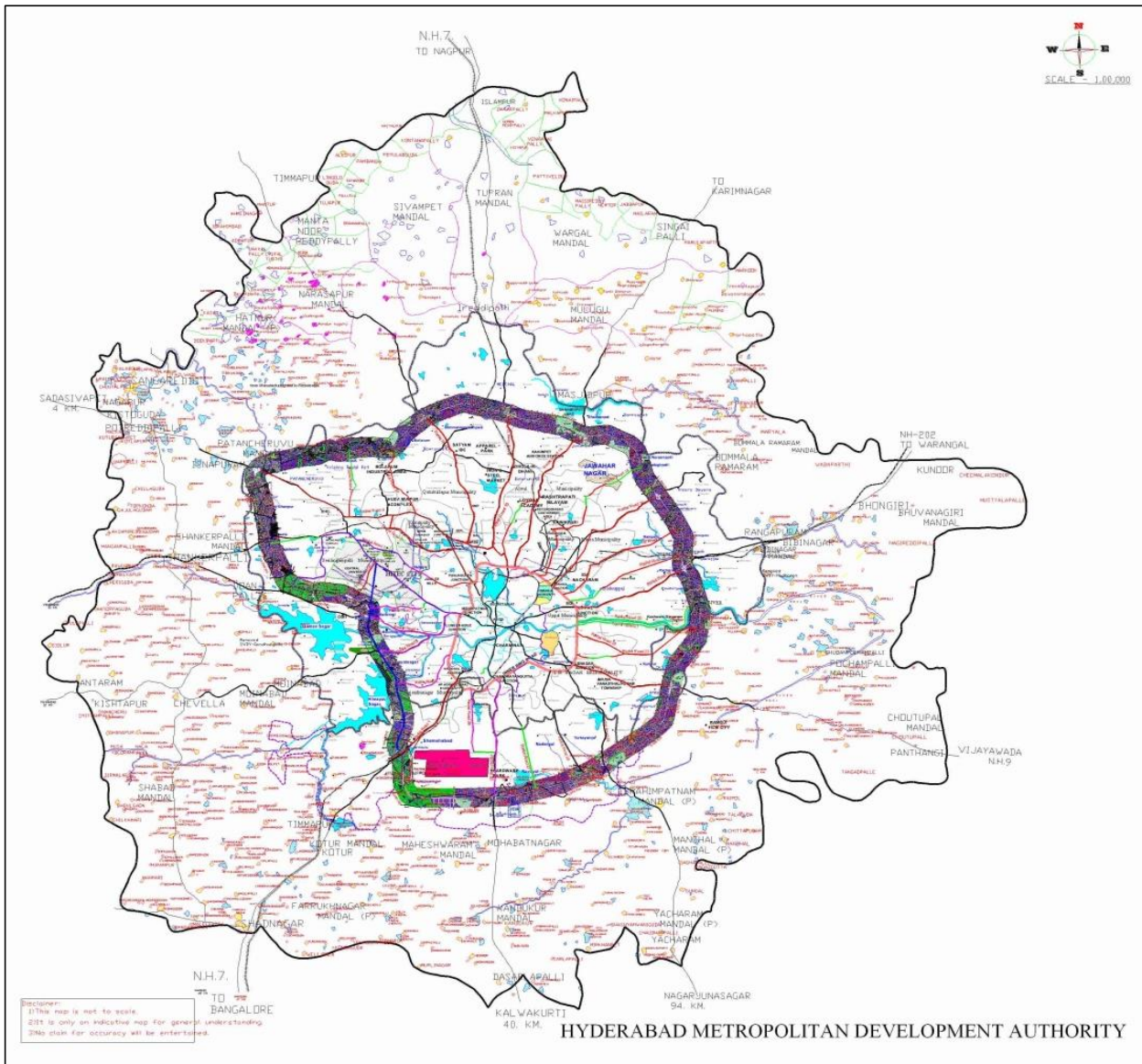


Figure 2: Map showing ORR alignment within HMDA
Source: HMDA

Outer Ring Road Growth Corridor, 1 Km stretch of land on either side of the outer edge of ROW is earmarked and termed as a SPECIAL DEVELOPMENT ZONE – SDZ for land development and building activity. The Land Use of this entire SDZ is classified as Multipurpose Use Zone excluding the areas specifically earmarked for roads, open space, recreational, transportation, public utilities, and amenities. Figure 3 depicts the delineation of SDZ 1 and 2, and Figure 4 depicts the study area.

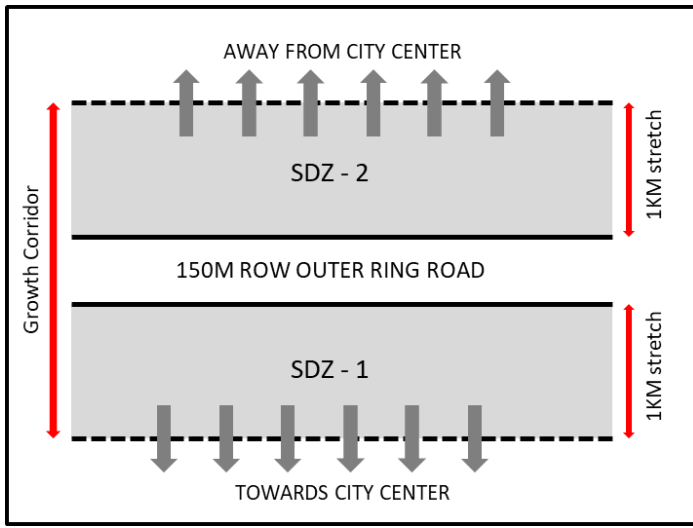


Figure 4: ORR GC and SDZ delineation
Source: Graphical representation

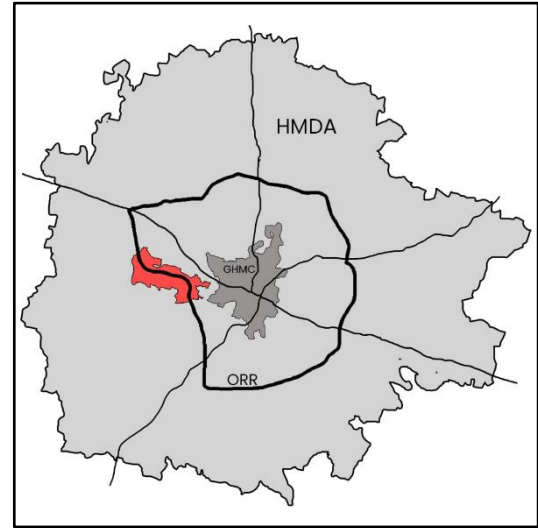


Figure 3: Delineation of the Study area
Source: Graphical representation

III. HOUSING INDUSTRY OVERVIEW- HYDERABAD

The housing segment has taken a huge transformation in Hyderabad city since it started gaining global importance due to the IT/ITES developments in the late 1990s. The growth in the economy and per-capita income has enabled the entry of the luxury housing segment which can be indicated by larger unit size, a higher number of floors, locational importance, and available infrastructure including amenities and facilities. The Housing industry has confronted a major drift in this period where there was a continuous challenge for the suppliers (developers) to satisfy the end users. On the other hand, the city was facing a huge Housing Filtration process due to two major factors; firstly, the migration due to the sudden increase in job availability, and secondly the sudden increase in per-capita income resulting in the raise in affordability.

Figure 5 depicts the housing typology that existed until the late 1990s, it consisted of single-detached houses, semi-detached houses, row/ terraced houses, low-rise apartments, medium-rise apartments, and high-rise apartments which were fewer in number. These typologies were observed both in the city's public and Private housing colonies. Due to the availability of developed lands at lower prices compared to other metro cities in India, Hyderabad witnessed very few High-rise apartment structures. The development control regulations prior to G.O.Ms.No. 86, Dated 3rd March 2006, were pro-control in nature, and this amendment has introduced form-based regulations based on the jurisdiction and abutting road width. This approach was adopted by the development authorities to encourage development activities in urban areas of erstwhile Andhra Pradesh.

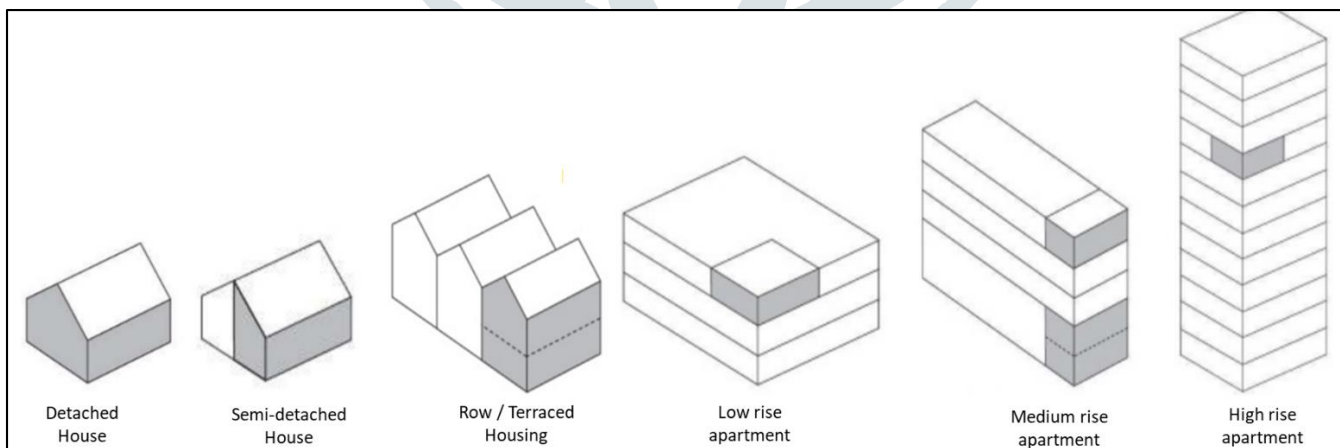


Figure 5: Housing typology existing in Hyderabad city till the late 1990s
Source: Graphical representation

The visionary masterplans and new building regulations have slowly paved the path toward large-scale housing developments letting big-time multicity developers into the city who prior had a hindrance due to the strong resistance of the local developers.

IV. HOUSING IN THE STUDY AREA

The study area is depicted in Figure 3, where the housing segment is studied in detail along with the typology, proposed land use, and building rules which have resulted in the present situation in the adjoining areas of ORR Hyderabad.

Prior to the ORR project: (prior to 2005):

Initially, these areas were village settlements which have single-detached houses and included major livelihood activity spills in the setbacks. New developments also consisted of single-detached houses in a dispersed pattern due to the availability of lands at lower values. The unit sizes had a huge variation as few were built for the purpose of daily livelihood and few were built as weekend homes for the rich who resided in the city areas. Security is observed to be one of the major concerns as these houses were scattered.

During the ORR project: (2005 to 2018):

The ORR Hyderabad project execution and completion took a long-time span of around 13 years due to the changes in the alignment of the road and other parallel issues such as the global recession and the political unrest which led to the state bifurcation. This time period had a huge impact on the housing segment and its evolution in the adjoining areas, as elaborated below.

- Housing filtration was observed in the core city, where HIG groups started migrating towards the western segment due to close proximity to the existing and upcoming economic hubs developing near Gachibowli and Nanakramguda areas.
- The Gated community concept has taken up an interesting spurt in this region creating a niche for the HIG class to access to secured and well-maintained group housing ventures with single-detached units termed 'Villas'. These units had massive unit sizes ranging from 3,000 SFT to 10,000 SFT drifting away from the utilitarian and requirement perspective of the users. This typology came into existence due to land availability and lack of large housing units which were not affordable to major segments within the municipal limits. These Gated communities with villas have state of art infrastructure facilities, and security, most of them are independently tackling their physical infrastructure as the development authority had not extended its trunk lines to these peripheral areas. This typology, 'Gated community Villas' gained huge demand in the market as it was the most preferred segment by the HIG groups.
- Post state bifurcation, 2014, the Hyderabad city has been reinforced by the stable State Government, and its pro-development perspective has induced demand for developments in the study area due to its close proximity to the major economic hubs of the city. This order of events has led to an increase in land values in the study area slowly creating demand for multifamily housing due to affordability.
- Amendments in building rules and high demand for residential units in the study area have slowly reduced the unit sizes (1500 SFT onwards) and brought a major change in the house typology introducing high-rise structures and, in some cases, mixed land-use residential towers.

Post ORR project: (2018 onwards)

Project completion is yet another milestone for the developments in the adjoining areas where most of the upcoming housing projects are high-rise and skyscrapers. The development promotion regulations have encouraged the developers to come up with various housing ventures comprising of a wide range of unit sizes making it affordable to a larger financial segment of end users. SAS Crown is one such residential project in Kokapet which is now the tallest residential tower in South India. Due to the landed project cost, the single-detached houses and Gated community Villas are no more built in the study area, the infill areas are developed as either high-rise buildings or skyscrapers.



Figure 6: Changing Housing typology in the adjoining areas of ORR Hyderabad
Source: Graphical representation

V. BUILDING PERMISSIONS – STUDY AREA

ORR stretch was completed in 2011 in the study area which enabled developments much earlier compared to the rest of the adjoining lands of the project. The study area has witnessed a thrust in developments as it is surrounded by the Financial District and the Bio-conservation zone (GO 111).

Hyderabad Metropolitan Development Authority HMDA was notified in 2013 as an apex body to regulate and permit building developments beyond the GHMC area. In this regard, HMDA has classified the Growth corridor into 3 zones; ZONE A – Muttangi Jn to Bongalur Jn, ZONE B – Bongalur Jn to Upparpalli Jn, and ZONE C – Upparpalli Jn to Muttangi Jn. (HMDA, 2018) the study area falls under ZONE A. Development Permissions Management System (DPMS) was formulated in 2016 by HMDA to provide a single window online system for development permissions.

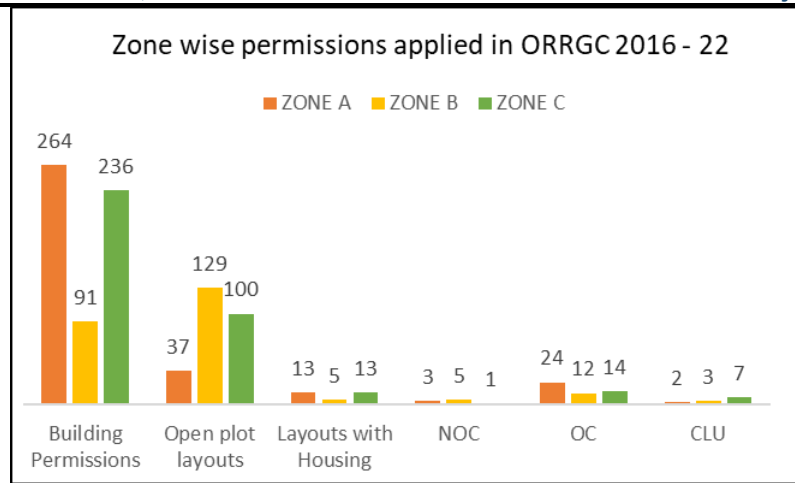


Figure 7: Zone-wise building permissions in ORRGC - 2016 to 2022
Source: DPMS, HMDA

Figure 7 shows the zone-wise permissions applied in ORRGC at DPMS from 2016 to 2022. Zone A has maximum Approved Building permissions and Housing layouts indicating the location preference by developers, and density growth. Open plot layouts applications are observed to be more in Zones B & C which indicates future growth in built footprints with low density. The analysis strengthens the fact that Zone A has more potential for buildings developments due to the following facts:

- Close proximity to the existing economic hub
- Project implementation timeline

VI. BUILDING REGULATIONS

Considering the project's commencement in 2006 till 2022, there are many amendments and new building and layout rules notified in the city of Hyderabad. The ORRGC area had encountered a couple of these changes which were focused on development promotion rather than control in nature. The land regulations and utilization specified in the master plan for the adjoining areas of ORR are also gearing up toward development. Apart from certain non-permissible, and hazardous activities, the proposed land use in ORRGC is termed a Multipurpose Use Zone (MUZ), which permits all the remaining uses. There is no physical demarcation of uses and criteria specified for this zone hence the apex body HMDA allots permissions on a first-come-first-serve basis irrespective of the typology or usage of the building.

After the notification and formulation of ORRGC in 2008 as per G.O.Ms.No. 470 - 09-07-2008 (G.O.Ms.No.470), Andhra Pradesh Building Rules 2012, G.O.Ms.No.168 - 07.04.2012 (G.O.Ms.No.168, 2012), was introduced knocking all the previous existing Building regulations in the Urban areas of the state. The Andhra Pradesh Building Rules 2012 has encountered many amendments in the Growth Corridor area, which was encouraging to the developers, G.O.MS.No. 07 - 05-01-2016 and G.O.MS.No. 50 - 22-04-2019 (G.O.Ms.No.50, 2019) are two such notifications that directly have an impact on the building envelope. In order to document and understand the impact of these amendments on the housing sector an experiment is conducted for residential development, following are the considerations/ assumptions.

Considered plot area and abutting road width:

- As per Building rules min Plot size for Housing development – 4 ha
- Abutting road width – 30 m

Considered building height scenarios:

- A – 17 floors – 50 m (Building rules change from 50 m height)
- B – 33 floors – 100 m
- C – 50 floors – 150 m
- D – 67 floors – 200 m
- E – 83 floors – 250 m
- F – 100 floors – 300 m

Table 1: Building envelop calculations as per GO - 168

Source: Primary data

G.O.Ms.No.168 - 07.04.2012						
	Scenario A1	Scenario B1	Scenario C1	Scenario D1	Scenario E1	Scenario F1
Site area (ac)	9.88 ac	9.88 ac	9.88 ac	9.88 ac	9.88 ac	9.88 ac
Abutting road width (m)	30	30	30	30	30	30
Open / Green space 10% (ac)	0.98	0.98	0.98	0.98	0.98	0.98
Building Ht (m)	50	100	150	200	250	300
Liveable floors (nos)	17	33	50	67	83	100
Setback (m)	14	21	26	31	36	41
Building foot print (Sqm)	19924	15136	12696	10426	8772	7560

Total BUA (Sqm)	332067	504533	634800	695067	731000	756000
Circulation area 25% (Sqm)	83017	126133	158700	173767	182750	189000
Total Saleable area (Sqm)	249050	378400	476100	521300	548250	567000
Amenities area 2.5% (Sqm)	6226	9460	11903	13033	13706	14175
Total saleable area under housing units (Sqm)	242824	368940	464198	508268	534544	552825

Table 2: Building envelop calculations as per GO - 7
Source: Primary data

G.O.MS.No. 07 - 05-01-2016						
	Scenario A2	Scenario B2	Scenario C2	Scenario D2	Scenario E2	Scenario F2
Site area (ac)	9.88 ac	9.88 ac	9.88 ac	9.88 ac	9.88 ac	9.88 ac
Abutting road width (m)	30	30	30	30	30	30
Open / Green space 10% (ac)	0.98	0.98	0.98	0.98	0.98	0.98
Building Ht (m)	50	100	150	200	250	300
Liveable floors (nos)	17	33	50	67	83	100
Setback (m)	14	18	20	20	20	20
Building footprint (Sqm)	19924	15892	15290	15290	15290	15290
Total BUA (Sqm)	332067	529733	764500	1019333	1274167	1529000
Circulation area 25%	83017	132433	191125	254833	318542	382250
Total Saleable area (Sqm)	249050	397300	573375	764500	955625	1146750
Amenities area 2.5%	6226	9933	14334	19113	23891	28669
Total saleable area under housing units (Sqm)	242824	387368	559041	745388	931734	1118081

Above mentioned are the calculations for Housing development in the assumed area under both the GOs, comparison will enable us to understand the change in the building envelope that occurred due to the amendments and how is it beneficial to the developer.

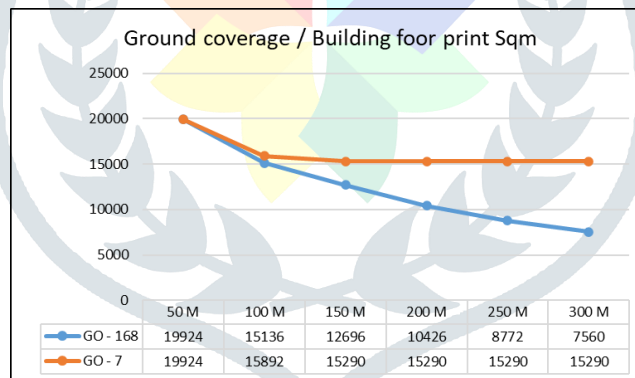


Figure 8: Ground Coverage achieved – comparison

Ground coverage: As per GO 168; the ground coverage is reducing as the building height is increasing; but in the case of GO 7 the ground coverage has reduced up to a building height of 120 m and from there it is constant even though the building height increases. In this case, the builder is able to construct more building footprints on the same site with the amendment in the building rules allowing in more footprints.

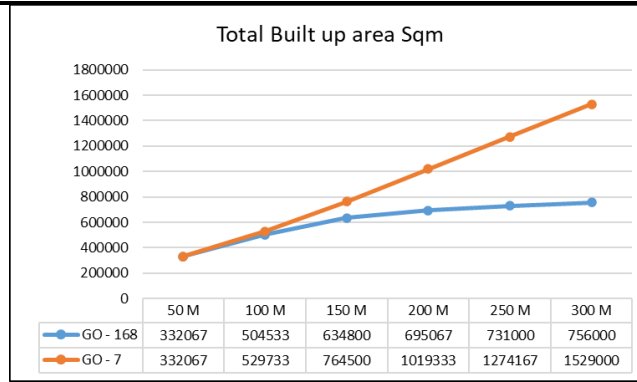


Figure 9: Total Built-up area (Sqm) achieved - comparison

Total Built-up area: The total built-up area achieved in the new bye-law is increasing as the building height increases as seen in figure 9 when compared to the old bylaws.

Population Density: To assess the number of units and population density achieved in the considered site, a market survey is done to understand the unit sizes available and opted by the target groups. Four-unit sizes are considered as follows with 4.5 household size:

- Unit 1: 140 Sqm / 1500 Sft
- Unit 2: 185 Sqm / 2000 Sft
- Unit 3: 232 Sqm / 2500 Sft
- Unit 4: 278 Sqm / 3000 Sft

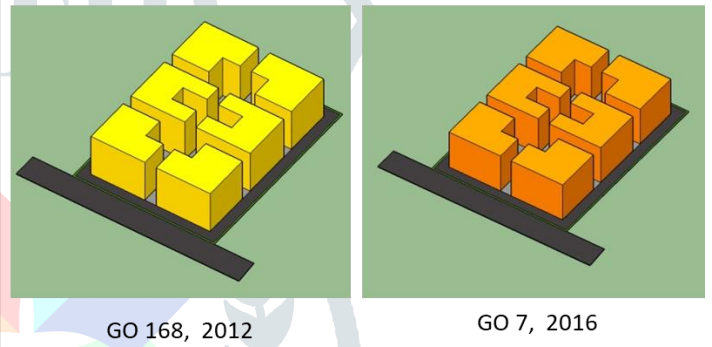
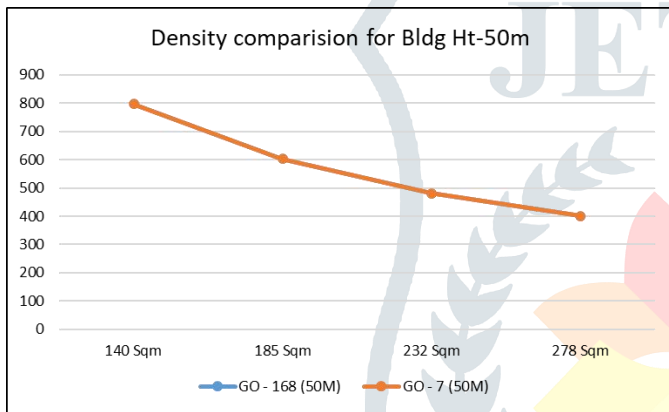


Figure 10: Density comparison for Building height - 50 m

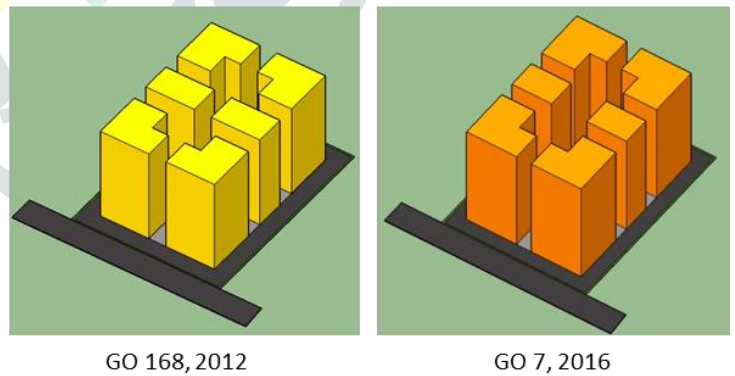
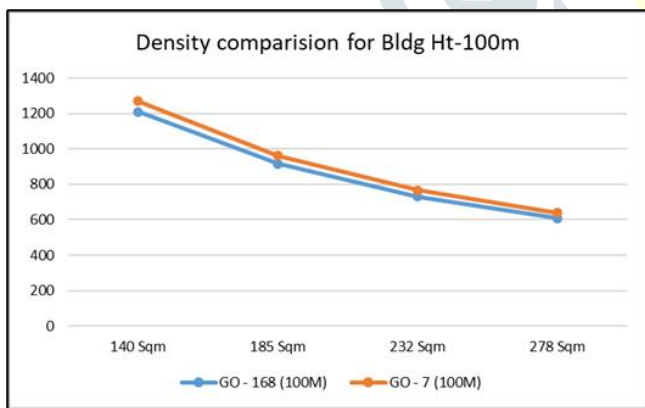
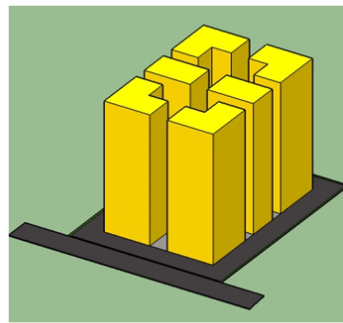
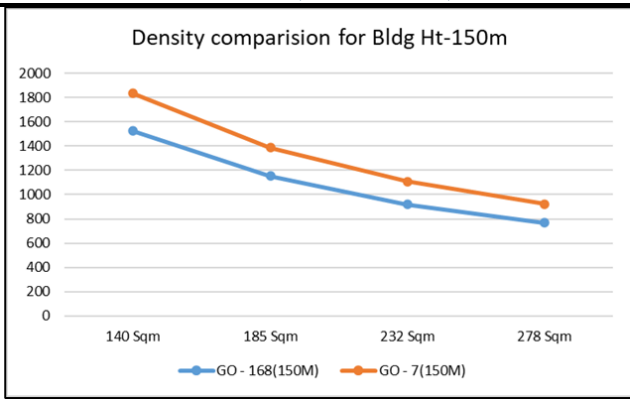
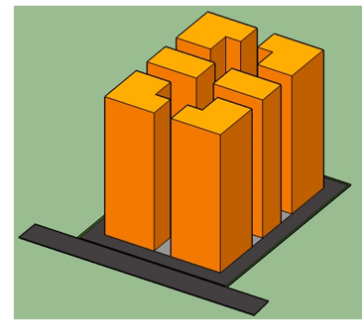


Figure 11: Density comparison for Building height - 100 m

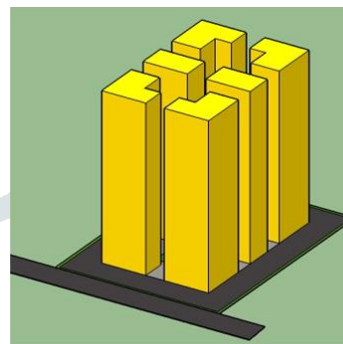
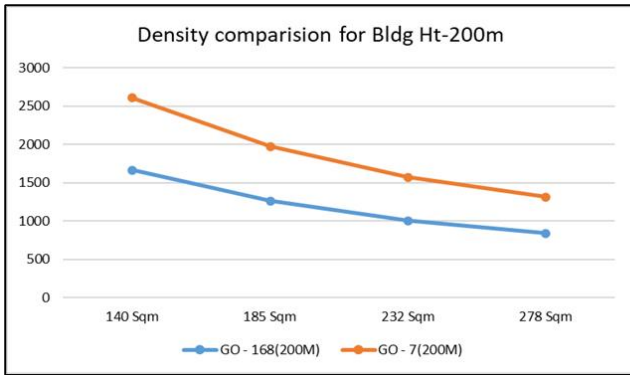


GO 168, 2012

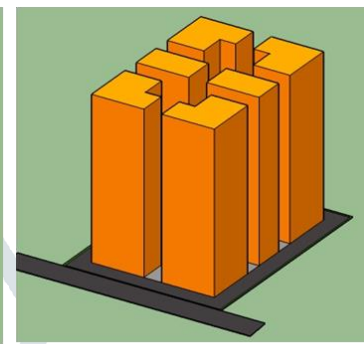


GO 7, 2016

Figure 12: Density comparison for Building height -150 m

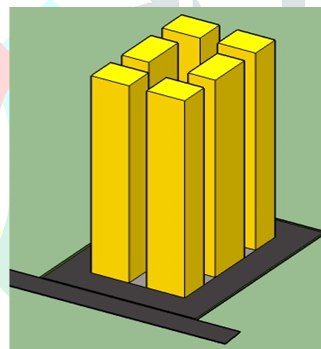
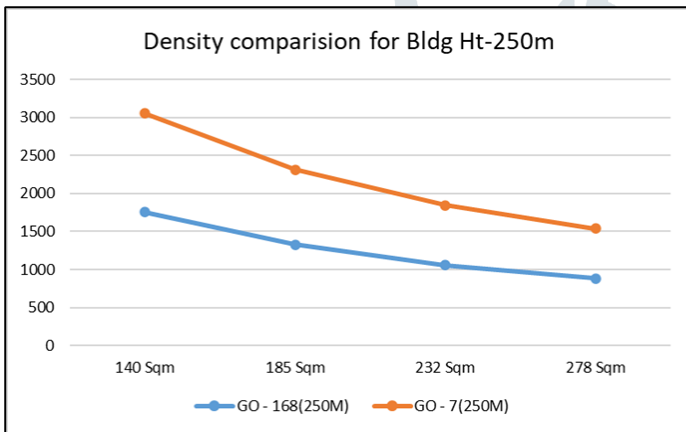


GO 168, 2012

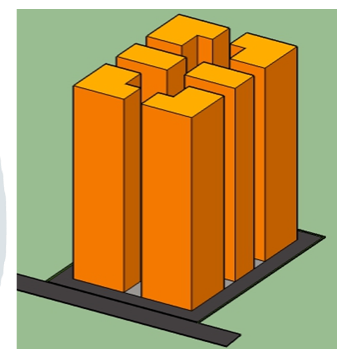


GO 7, 2016

Figure 13: Density comparison for Building height - 200 m

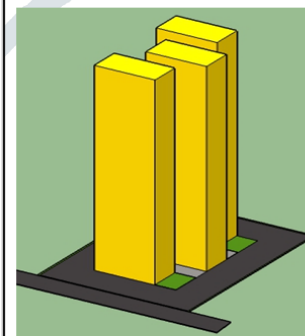
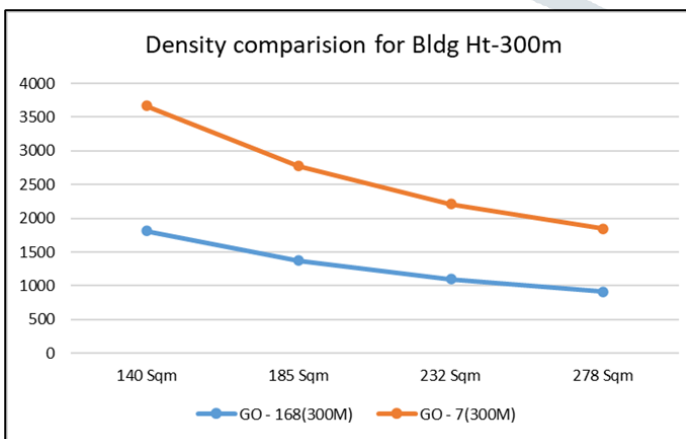


GO 168, 2012

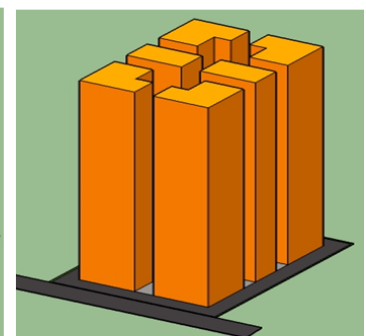


GO 7, 2016

Figure 14: Density comparison for Building height -250 m



GO 168, 2012



GO 7, 2016

Figure 15: Density comparison for Building height - 300 m

The difference in density is increasing in each case as the building height is increasing. In the case of 100 m building the density is growing by 5.9%, for 150 m buildings – 20.3%, for 200 m buildings – 56%, for 250 m height buildings - 74.2%, and for 300 m height buildings - 102.3%. The revision in the bylaws is proven to be more beneficial for the developers as the Total built-up area is increasing drastically.

As per the market demand and affordability criteria in the study area, the developer will be more benefited if he opts for a high-rise structure with a smaller unit size as the parking per unit also reduces, in this case, resulting in lowering the covered parking areas which

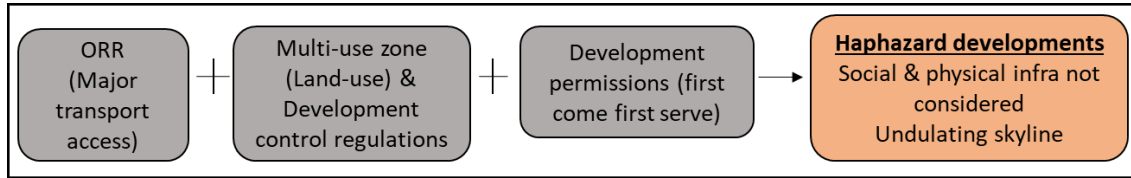
are usually stilt and basement floors. In the case of larger units, though the liveable floor area is the same the number of car parking increases leading to the provision of more covered parking spaces.

VII. KEY OBSERVATIONS:

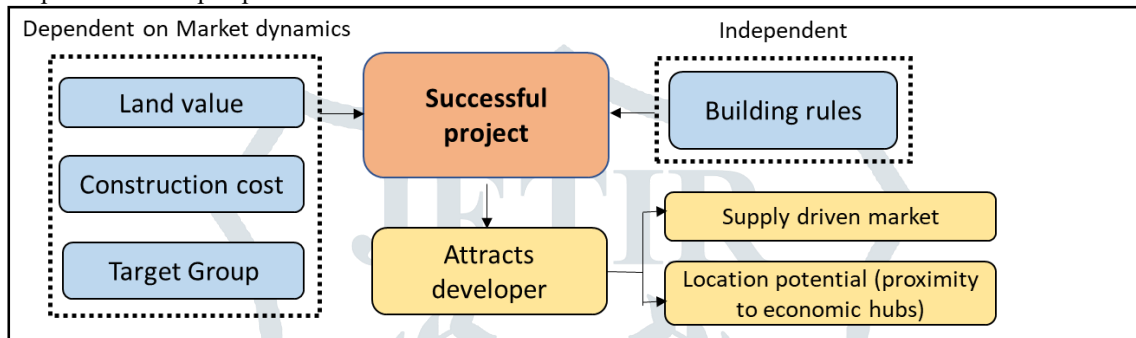
Impact area scenario and their interdependencies:

The impact on the housing sector could be classified according to the interdependencies that lead to the present scenario.

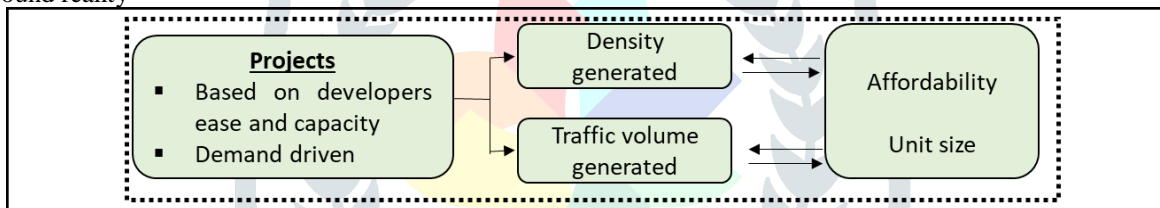
1. Policies and their implementation by the Urban local bodies



2. Developer's scenario/perspective



3. Ground reality



- The revised building bylaw has placed an immense impact on the housing development in the study area.
- Apartment projects have increased predominantly from 38% to 75% indicating the following:
 - Demand for more units
 - Supply and land availability
 - Increase in land value
 - Location potential
 - Enforcement process giving ease to developers
 - Availability of infrastructure
- The No of projects up to 5 acres site area have decreased predominantly from 91% to 55% and projects up to 10 acres account for 84%.
- The DCR change has enabled the promotion of sites up to 4Ha as the sites beyond will have to reserve more land / build space for EWS & LIG which would not be feasible in the location due to high land values.
- Projects with Building height above 50M have increased from 9% to 44% indicating:
 - Demand for more units
 - Supply and availability
 - Location potential
 - Development promotional regulations enabling more floor raise with the same ground coverage
 - Enforcement process giving ease to developers

VIII. CONCLUSIONS:

It is observed from the study and the experiment that there is an immense impact of the Outer Ring Road project on the Housing developments in the adjoining areas. Majorly due to the revision of the building bylaws, the provision of the Multiple-use zone, and building permission criteria has geared up the development activity in the study zone. The presence of conservation & bio-conservation zones has put a thrust on the study area along with the close proximity to Financial District. Increase in land values and availability of

infrastructure have made the study area one of the potential liveable areas. The study area which had sparse housing development is now encountering high-density developments including multi-storeyed structures and skyscrapers leaving the area with a highly undulating skyline. Since most of the area adjoining the ORR is yet in the developing stage, revision in building bylaws can be considered for sustainability.

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