

Impact of Outer Ring Road on Adjoining Urban Land Development

Case Study Hyderabad

Devisetti Aparna, Ph.D. Scholar, School of Planning and Architecture, JNA&FAU, Hyderabad, India

Under Guidance: Dr. D. Vijay Kishore. Professor 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 aims to document and understand the impact of Outer Ring Road Hyderabad on the adjacent lands. Surveys and studies are conducted as a part of the Doctoral research on the topic “Impact of ORR on adjoining Urban land development” in the western part of Hyderabad to establish and understand the relationship between land use, densities, and transportation. This Paper also attempts to comprehend the development pattern of the selected study area and suggests a comprehensive plan for the development of the rest of the area.

Keywords:- ORR Hyderabad; Growth Corridor; Density; Building footprints; Traffic volume; Transportation

I. INTRODUCTION

Ring roads/beltways have evolved to address traffic congestion of the core city and also provide speedy connectivity to the dispersed clusters in the suburban areas of Metropolitan cities. This phenomenon puts forth the need to understand the relationship between 'Transportation and Land-use and is considered to be retroactive to 'activities' which are Land-use related and Transport related. “These relationships have often been described as a ‘Chicken - and - Egg’ problem since it is difficult to identify the triggering cause of change” (Rodrigue, 2020). 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).

Outer Ring Road Growth Corridor Hyderabad is one of the first road cum area development projects launched by the erstwhile Andhra Pradesh State Govt as a Special Purpose Vehicle called “Hyderabad Growth Corridor Limited” in 2005. The project is aimed at the "development of a well-planned and well-connected urban settlement around the Hyderabad Metropolitan area". (HMDA, 2018)



Fig 1 Map Showing Hyderabad ORR & Radial Roads
Source: (HGCL, 2022)

II. ORR HYDERABAD

ORR Hyderabad was launched under Special Purpose Vehicle “Hyderabad Growth Corridor Limited” on 26th December 2005 and completed in 2018, during this course period it underwent major alignment changes followed by Global Recession and Telangana State formation.

The total length of ORR is 158 Km with 150 m right of way, 8 lanes, 2 lane service roads on either side, and 19 interchanges. It is designed for a speed of 120 mph. A Growth corridor of 1km on either side of the ROW of ORR is proposed by HMDA as called Special Development Zone which covers 330 sq km. The SDZ has two divisions namely SDZ-1 which is towards the inner city and SDZ-2 on the outer side. SDZ has specific land-use specifications which majorly is multipurpose in nature except for the Conservation and Bio-conservation zones.

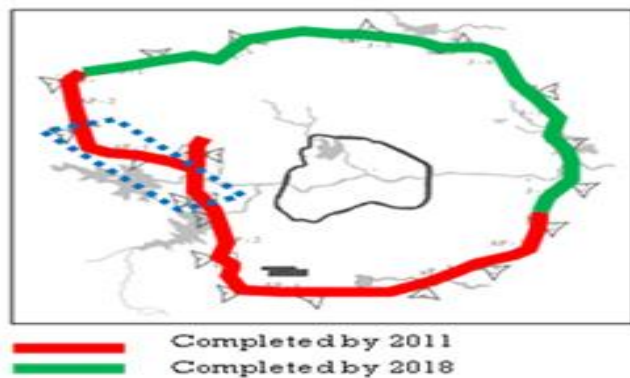


Fig 2 Project implementation timeline map

Due to the delay in project implementation, the impact is heterogeneous and more observed in the initially completed stretch shown in red in figure 2. The reconnaissance survey and Service Road widening proposal from 2 lanes to 4 lanes by HGCL have imposed a question on the objective of ORR as it is designed for high-speed traffic and decongest core city traffic. Though the ORRGC is a road cum area development project it has failed to achieve its goal. This paper intends to document the relationship between the traffic generated due to the developments on the adjoining land.

The area considered for surveys and documenting the impact is earmarked in blue dotted line as shown in figure 2., it includes 9 villages from Kollur to TSPA covering 89.97 sq km and 22 km length. The sample size considered for the study is 13% of the total length of the ORR. The study area's traffic volume survey and Land use survey are done, apart from the satellite imagery interpretation of the building footprints depicting the growth and sprawl of the core village settlement areas.

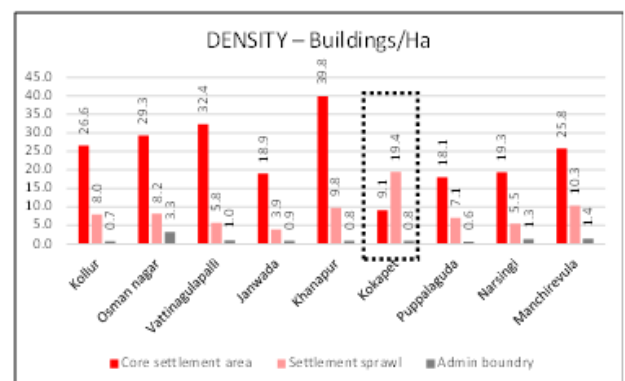
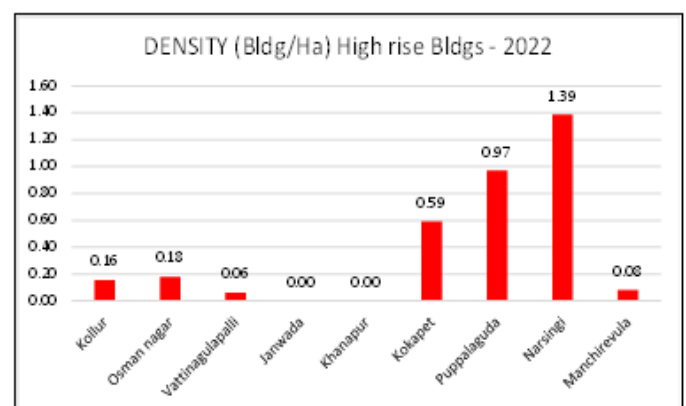
III. ASSESSING THE BUILDING FOOTPRINTS AND THEIR GROWTH FROM THE ORR INCEPTION

Building footprints are mapped chronologically from ORR project inception 2005 to 2022 by interpreting satellite imagery to understand the pattern and scale of growth in each village of the study area. Building heights are also documented to perceive the typology of built form evolving in the delineated area. Based on the achieved data, each village is delineated into 3 zones: zone 1- Core settlement, zone 2- Settlement sprawl, and zone 3- Administration boundary. Settlement sprawl is the spatial spread of the core area that occurred from the ORR inception till Nov 2022 and the Administration boundary is the village jurisdiction delineated in the Masterplan.



Fig 3 Interpretation of zones

- **Density Calculation:** The number of buildings per hectare is calculated in each zone where it is observed that maximum density is in zone 1 and fades out in zone 2 and accordingly zone 3. Kokapet is the only village in the study area where the density of zone 2 is more, double than that in zone 1. In other villages, though the density of zone 1 is more than the other two zones, the number of buildings is more in zone 3 except for Khanapur, Puppallaguda, and Narsingi.

Fig 4 Density as per zones
Source: Primary dataFig 5 Density of High-rise buildings
Source: Primary data

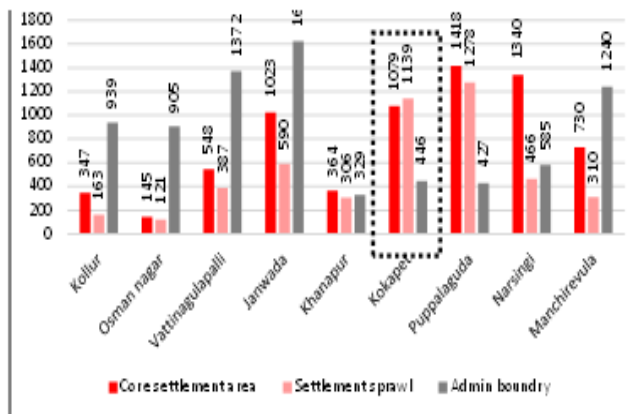


Fig 6 Number of buildings as per zones
Source: Primary data

The density map below depicts the spatial growth pattern of the settlement and its proximity to the ORR. Proximity to the financial district and the bio conservation and Conservation lands has imposed thrust on these villages for development.

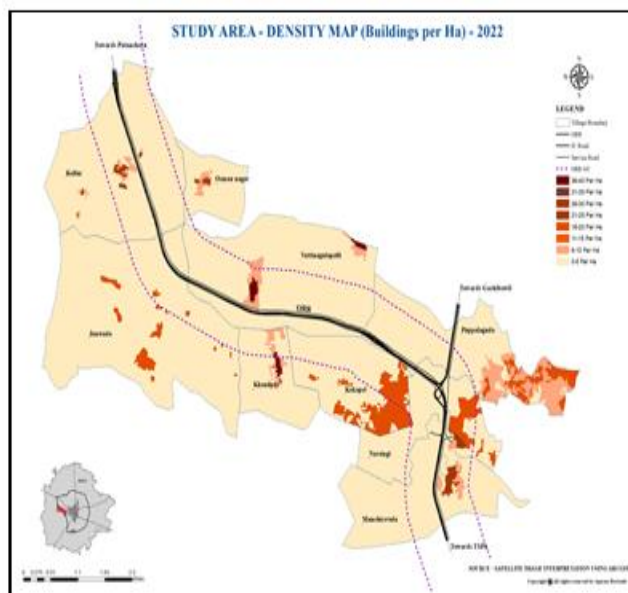


Table 1 shows the identification of morning and evening peak hours and the v/c of every midblock, and it is observed that mid blocks A, B, E, H, and J have v/c > 1 and midblock C has 0.92. These mid blocks and their v/c values are earmarked on the map in figure 8 which shows a close association with the density patterns developing in the study area.

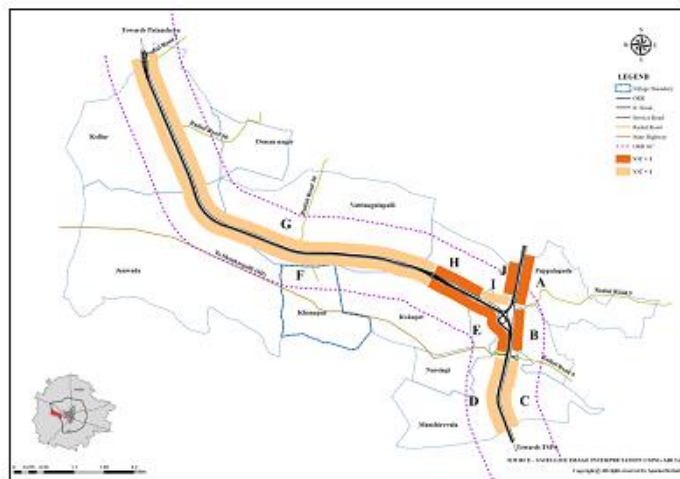


Fig 9 Map showing v/c values achieved in peak hours
Source: Primary data

Mid-block A: Cars in the evening peak hour have increased by 25% and Autos have decreased by 40%. Two-wheelers have a consistent volume presence at both peak hours.

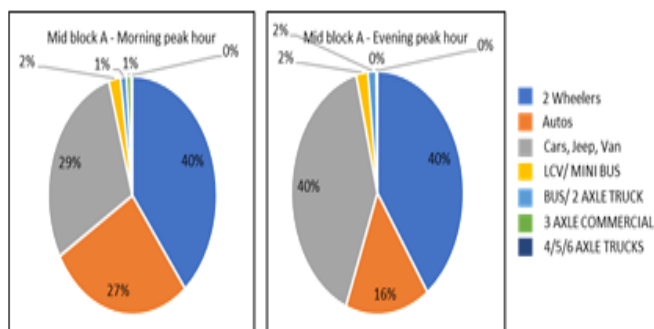


Fig 10 Vehicular typology breakup -Mid-block A
Source: Primary survey

Mid-block B: Two-wheeler volume has reduced by 50% in the evening peak hour. Buses, and 2,3,4,5,6 axle trucks have shown presence in the evening peak hour.

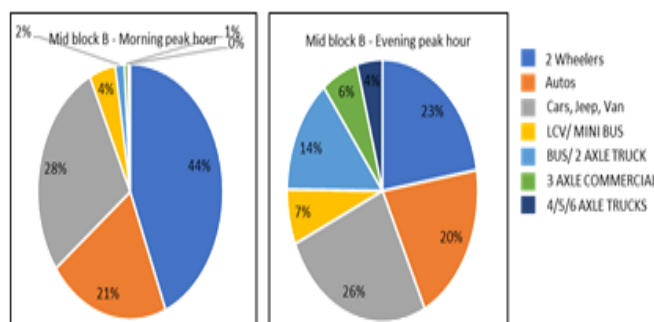


Fig 11 Vehicular typology breakup - Mid-block B
Source: Primary survey

Mid-block E: Cars have a consistent presence at both peak hours. Two-wheeler volume has reduced by 33%, while Autos volume has increased by 58% in the evening peak hour.

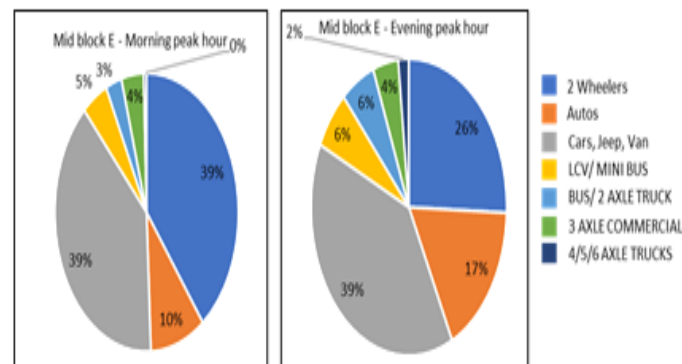


Fig 12 Vehicular typology breakup - Mid-block E
Source: Primary survey

Mid-block H: Cars in the evening peak hour have increased by 12% and Two-wheelers have decreased by 27%. 3,4,5,6 axle trucks have shown presence in the evening peak hour.

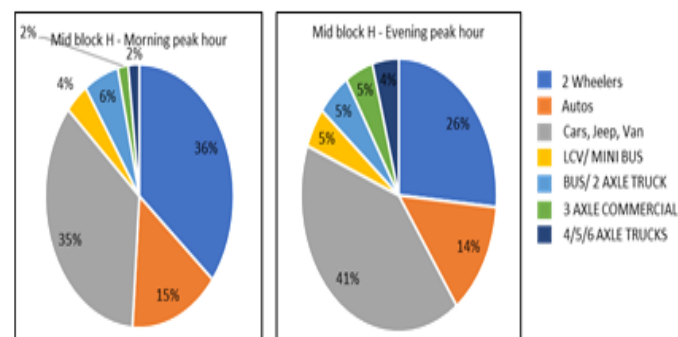


Fig 13 Vehicular typology breakup - Mid-block H
Source: Primary survey

Mid-block J: Both peak hours have similar vehicular break-ups.

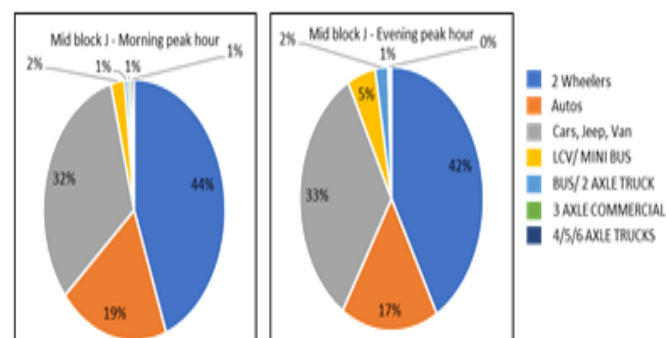


Fig 14 Vehicular typology breakup - Mid-block J
Source: Primary data

V. DEVELOPMENT TYPOLOGY IN THE STUDY AREA

- There are three major factors observed, which have resulted in the tremendous growth in the study area when compared to other parts of the Ring.
- Located close to major economical hubs of Hyderabad i.e.; the Financial District, Gachibowli, and Hitech city, which are a result of the chronologically induced developments in the niche of SEZ policy by the ULB since 1995. And the presence of GO 111 area and Conservation areas in the immediate surroundings.
- ORR project implementation timeline and its delay due to the then political unrest resulting in State bifurcation and Global recession.
- The Land governing policies and form-based Building Development control regulations supported by the encouraging urban development authorities have accelerated the development scale.

➤ Land governing policies:-

Special Development Regulations for the Hyderabad Outer Ring Road Growth Corridor, 1 KM Belt on either side of the ORR was notified by Govt Order 470. (G.O.Ms.No.470 dt:09.07.2008, 2008). "The Land Use of this entire Special Development Zone is classified as **Multipurpose Use Zone** excluding the areas specifically earmarked for Roads, Open Space, and Recreational, Transportation, and Public Utilities and Amenities Zone." (G.O.Ms.No.470 dt:09.07.2008, 2008).

The permissible uses in MUZ are Residential (new growth as well as existing settlements), Commercial (Commercial activity shall be allowed at all locations only on roads 18 meters wide and above), Social Infrastructure, Institutional, Work Centres excepting industries, and any other nonpolluting nonhazardous use. Residential and Commercial uses are opted for by most of the developers as these projects have high revenue generation.

➤ Form-based Building Development control regulations:-

These regulations were first introduced in the combined state of Andhra Pradesh by G.O.Ms.No.86 dt:03.03.2006 and later ammended a couple of times to encourage building development activity in the Urban areas. The latest amendment was done in 2019 G.O.Ms.No.50 dt: 22.04.2019 which enables the construction of more built-up space due to certain relaxation of setbacks beyond 120m building height. (G.O.Ms.No.50, 2019)

➤ Development Permission Management System:-

HMDA is the apex body assigned to provide building permissions in the study area. The complete ORRGC area is divided into 3 zones to ease the procedure, and the study area falls in zone A. Zone A has maximum Approved Building permissions and Housing layouts, whereas Open plot layouts applications are observed to be more in Zones B & C which indicates future growth in built footprints with low density.

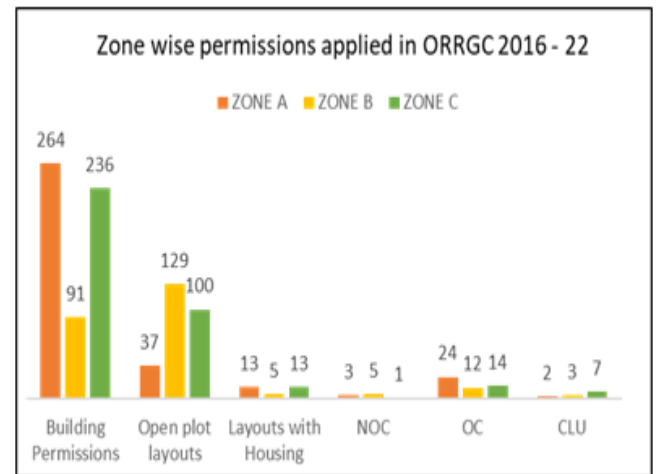


Fig 15 Building permissions in ORRGC - zone wise
Source: (HMDA, 2018)

The building permissions are issued on a first come first serve process for projects adhering to all the prevailing Land and Building regulations. Due to the permissible uses in Multiple Use Zone, form-based Building regulations, Location potential, and Real estate market dynamics, the development witnessed in the study area is very haphazard where there is no control over the density pattern.

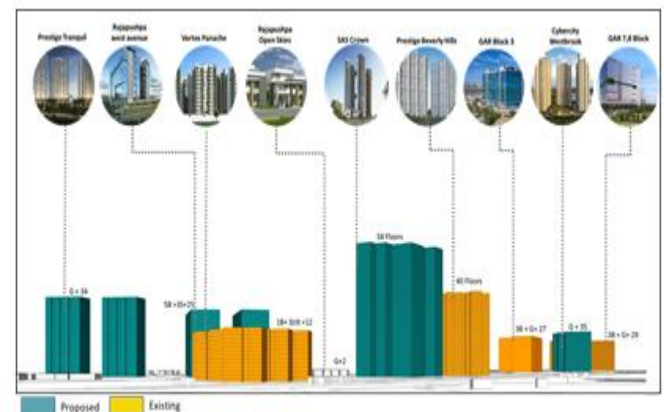


Fig 16 SKY LINE view from Narsingi junction towards Kokapet

Source: Primary data

VI. KEY OBSERVATIONS

- Regular growth and density patterns are not observed in the study area, the areas close to the economic hubs have more density in the settlement sprawl compared to the core settlement area.
- Due to the connectivity of service roads and the presence of 4 ORR Inter Changes within the study area, the potential for development is increasing paving the path for the requirement of physical and social infrastructure.
- Density of high-rise buildings is observed to be more in Kokapet, Puppallaguda, and Narsingi compared to the rest of the villages in the study area due to connectivity and the presence of the Financial District nearby.

- Density mapping and the Service Road v/c analysis of the peak hour have complemented each other depicting the necessity of more road capacity in the study area.
- Vehicular typology study depicts the adjacent land utilization.
- Heavy vehicle volume is observed in developing areas such as Kollur and Osman nagar where many housing projects are in the construction stage. These areas witness a very low volume of cars, autos, and buses as the habitat population is low in this belt comprising mid-blocks: G, H, D, & C.
- It is observed that the adjacent areas of mid-blocks with v/c >1 have residential and commercial developments. Residential developments in these areas were mostly layout developments with villas and high-rise group housing with 18 to 30 m building height, Commercial developments were also observed to be of similar building heights up to 2019. Post notification of G.O.Ms.No.50 MA&UD. Dt 22.04.2019, a major change is observed in the heights of high-rise buildings due to the relaxation of setbacks for buildings beyond 120m height. Later it is observed that the building height of new ventures has tremendously increased to 150m and beyond.
- Development in the adjacent lands to the ORR is very haphazard with no control over density, skyline, and typology. The Land policies and the Building rules in the growth corridor area are pro-development in nature attracting developers to build more and creating demand in the market.
- The present scenario of development and growth in the study area has already put thrust on the service road leading to widening from the existing 2-lane to 4-lane and which in a very short span will get congested despite the existence of conservation (GO 111) areas in the near surrounding.

VII. CONCLUSIONS

The Outer Ring Road Hyderabad was launched as a road cum area development project where the major objective was to decongest the inner city. This very objective of the project is not achieved as the widening of any ring road loses its primary nature transforming it into yet another urban road.

In this 'Road Cum Area Development Project' the transport sector is taken care but the incorporation of area development has many unaddressed perspective policies leading to haphazard development creating yet another unsustainable chaotic ring around the existing city. Though the land policy encourages development in the growth corridor, there has to be strict implementation of location-specific densities, and strict allocation of a percentage of land for social infrastructure at regular intervals. The development permission enforcement laws must be stringent to achieve the maximum prescribed densities in Growth Corridor.

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