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Impact of Building Regulations on Choice of Real Estate Projects

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ABSTRACT

Choice of real estate project is highly influenced by the building regulations stipulated by the designated competent urban authority. Role of building regulations is to manage the optimum population density in a built environment for different zones and planning principles. A study of past projects brings to light those crucial building regulations such as FAR do not influence the type of real estate project; residential or commercial, whereas neighbourhood character and abutting road width decide its choice. Use of flexible FAR and carefully implemented building regulations can improve quality of urban built environment and achieve planning efficacy.

Keywords:- FAR, LID

I. INTRODUCTION

Real estate markets are capital driven, opportunist and highly complex to dissect. The visibly intense market has deep rooted strategy of collective ethos that critically affects decision making on an investment either a success or a failure. Rise in real estate values influences the potential use of land as developers focus on most profitable use by using building byelaws with dexterity. Stable real estate values makes real estate developer take lower risks and low real estate values drive real estate developers to construct projects which have the most potential use (purpose). Early returns on an investment are of utmost priority for every real estate developer (builder) since the returns are to be invested in a new project (land) in an expanding market.

The key question is what will make a real estate project a success? A successful real estate project may have different parallels for every real estate developers. Some developers may believe that the highest Return on Investment for a project in the long term will qualify it as a success; others may argue that the earliest return on the investment irrespective of the type of project or its lifecycle is more important. Several case studies have been observed when luxurious, prime, low dense residential projects abutting on narrow city roads have been demolished and redeveloped into a commercial shopping and office complex due to rapid urban changes within a span of less than two decades. While this can be a result of rapid urbanization in a growing city, the fact remains that if these projects had been planned carefully, such a quick redevelopment situation could have been avoided.

Developers choose to quickly exit a project to enter a new investment opportunity. In the process there is hardly any best use studies done. Acquiring an urban land with a marketable title is their biggest challenge. Due to this there is hardly any location analysis done with a project planned ahead and only after acquiring the land parcel the project is conceptualized. Instead of proposing a project that would suit the best possible use for a neighbourhood, the project proposed is based on the best potential use; where available building byelaws, restrictions and incentives dictate the type of development. It

is a common observation to find a commercial project coming in a distant sparsely developed neighbourhood, and a residential project being proposed on prime land located at a corner of a major crossroad. The building byelaws permit it and the market investors are often ready to invest in such skewed strategy. Input value of land highly impacts choice of development. Moreover, price of land acquisition is crucial when it comes to appropriateness on choice of a project. Unless the developer has a higher holding capacity, the decision to choose otherwise is highly influenced by it. Building regulations more often dictate the choice of project, type of construction and category of end users

II. LITERATURE REVIEW

An interesting study done in New Zealand indicates that, almost 90% of surveyed developers have been affected by delays or uncertainties related to regulation. Regulations that have had major effects on the actual building costs of apartments include: building height limits, balcony requirements, conforming to Council's desired mix of apartment typologies and minimum floor to ceiling heights. [1] While this is a cost-benefit aspect, the aspects regulations playing a major role in land-benefits is far more severe.

In year 2014, the new Building regulation System as directed by the United Kingdom, suddenly meant a great concern for private homeowners who had made extensions to their homes admeasuring more than 40 Square meters. The process for certification for such homes is ardent tasks for majority of home owners who are inclined to self regulate their home extensions and refurbishments. The new building Regulations have definitely strengthened the self regulation process but it is clear that more work needs to be done to protect the non-professionals (the home owners). [2]

For the rural development United Kingdom has drafted and implemented Low Impact Developments (LID) which regulates the construction of housing in rural areas such that it has minimal impact on the natural environment. Many rural home owners believe that if these regulations were fully

implemented than majority of rural houses would fail to comply with these regulation measures. [3] The study is interesting as it highlights the impact of building byelaws in the rural areas, when one normally believe only the urban city areas are usually affected by them.

Another research done by American Public Health Association concludes that the design choices made in our homes, schools, workplaces, communities, and transportation systems can have major effects on health. [4] The paper subtly outlines a need for clearer building regulations to extend to communities rather than just buildings and urban land.

A case study done in city of Karachi, Pakistan, suggests that regulations regarding building design and space requirements impose a higher impact on construction costs of a building than other groups of regulations. [5]. This would lead us to speculate that building byelaws also impact the overall cost of the building, impact its quality and design, resulting into a higher or lower price for the end user-property buyer.

As per Canada Mortgage and Housing Corporation, When it comes to choosing land and type of project choice on a land parcel; the location, dimensions and condition of the site, as well as the design of the building and individual units, will have a significant impact on the costs of construction and operation. These factors also can influence liveability and marketability, ultimately determining the viability of a real estate project [6]

III. STUDY OBJECTIVES

The objective of the study was to evaluate the critical factors affecting decision making on choice of project with respect to location and its attributes. The key questions were;

1) What physical elements of the location are crucial for making a decision on choice of project via Commercial or Residential for a real estate developer?

2) Are the planning regulations detrimental in choice of project or is the decision taken is purely on basis market choice for a given location?

IV. CRITICAL FACTORS

City of Ahmedabad, Gujarat, India was taken as case study to understand which factors influence the choice of the project, A survey of 60 established (prominent and proficient) developers (members of Gujarat Institute of Housing and Estate Developers) was conducted to shortlist the most critical location aspects associated with a land parcel for real estate development decision. Using the Analystical Heirarchial Processing (AHP) technicque six critical factors were shortlisted or study. Factors most critical included; Frontage length of the plot to its abutting road width, Floor Area Ratio (FAR/FSI) assigned for the development zone, Size/Area of the land parcel, Neighborhood character, and distance of the land parcel from a nearby slum area. Further on, a study of these factors will also give market insights into the modus operandi of real estate developers as a collective group to estimate how theese factors relate to each other and the amout of impetus each one has on the choice of development

decision. A brief discussion on each factor considered for research is given below.

TABLE I
CLASSIFICATION OF DEPENDENT VARIABLE; PROJECT CHOICE

Land Value	Choice of Project	Classifi-cation
High (7x-10x)	Retail/Commercial/Hotel/ Class A	4
Medium (4x-6x)	Retail/Commercial/Class B	3
Affordable (2x-3x)	Luxurious Residential/Apartment/Condominium	2
Urban Fringe (x)	Detached Bungalow/Row House/Villa	1

1) Road Frontage to Depth Ratio (F/D ratio): It is an accepted fact among real estate developers that a higher Frontage on the road will give more visibility and access to their project and hence are likely to choose Commercial developments on land parcels having longer road frontage. Conversely, longer depth will impose restrictions for the same. For commercial developments, the building should not exceed twice the length of frontage in depth.

2) Abutting Road Width: As per the building byelaws (GDR) of Ahmedabad Urban Development Authority (AUDA) and Ahmedabad Municipal Corporation (AMC) there are restrictions on type of developments allowed on a land parcel depending on its abutting road width.

3) Floor Area Ration (FAR or FSI): Total built-up allowable on a Land parcel is dependant on the Zone in which it is located as FAR is assigned by the Zone. It gives a measure of optimum profits that can be availed from a real estate project but not necessarily the real value that can be derived from a choice of development.

4) Area of Land Parcel: The total land area is critical to the development as there are selective incentives and restrictions attached with it. Land parcels above 1 Acre (4200 M2) were under incentive of section 80 (I) B from 2005 to 2011 all over India. For the purpose of study Land parcels above 600 M^2 were considered as they provide both commercial as well as residential choice of development. Similarly land parcels above 50,000 M^2 are not included in the study sample as their spatial value is difficult to ascertain.

5) Neighbourhood Character: A simple way to measure the availability of amenities and services such as transport, marketplace, banking, hospitals, etc. is to measure the percentage of development in a surrounding neighbourhood. It is practical to believe that a developed neighbourhood in terms of total Built up vs. Open land available will have higher services available in present and near future. For the purpose of this study, neighbourhoods were measured for existing development in 1 kilo-meter radius from the edge of the land boundary at the time of project announcement.

6) Presence of Slums in the Vicinity: Slums and unauthorized developments do cause nuisance and majority of

developers and buyers want to stay away from such settlements.

7) Choice of Project: Real estate developers have an option to choose a Residential or Commercial project in the Residential Zones. There is a restrictive choice of development of projects for land parcels abutting to 9m to 12 m road. As the abutting road width increase choice of commercial projects supersedes the decision against a residential project. The decision is based on the logic that commercial projects reap high profits as yields due to mark up value. As a real estate developer is primarily operating on capital gains the choice of a Commercial project is always more lucrative in returns as compared to a residential project; given, majority of the built space is absorbed (sold) in the market.

TABLE II
VARIABLES IN REGRESSION ANALYSIS

Predicting Project Choice
Dependant Variable
Choice o Project (*Ty*)
Independent Variables
1. Frontage to depth Ratio (*Fd*)
2. Abutting Road width (Rd)
3. Floor Space Index (*Far*)
4. Area of Land parcel (*Ar*)
5. Percentage of Neighborhood Development (*Dev*)
6. Distance from slum (S*l*)

V.   DATA COLLECTION AND ANALYSIS

To understand the relation of choice of real estate project using location attributes, a perimeter an area of about 900 km^2 within the Development plan of AUDA, 2011 was considered. Real estate projects were identified in different clusters; North, North West, West, South West, South, East and central, within the 900 km2 of Ahmedaad city. The details of neighborhoods and clusters is given in Figure 1. Figure 2. shows locations of the real estate project sample collected for the purpose of the study. The timeline for data collected was for 15 years (2001 to 2016). During this timeline the real estate market cycle had witnessed all the phases of the market cycle; recession, recovery, expansiion, and hypersupply. Further on, all the selected obseration samples that were collected were part of either an active or previousiy implemented Town Planning Scheme (TPS). The activiity of construction and real estate development was varied among different clusters. Thus the numer of samples in the most active TPS was more as compared to less active TPS.
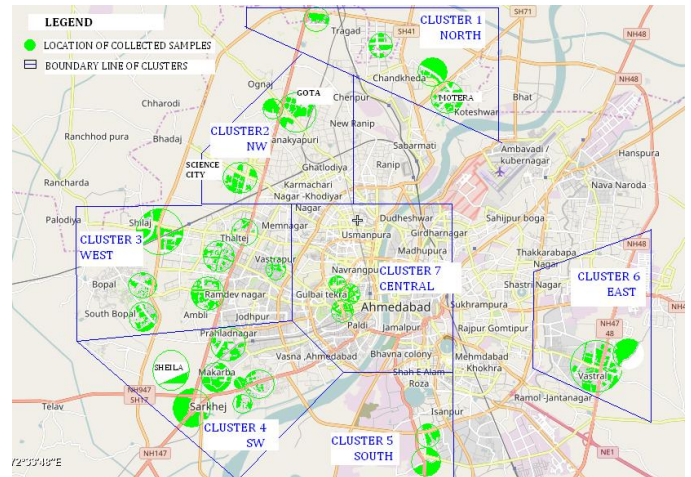

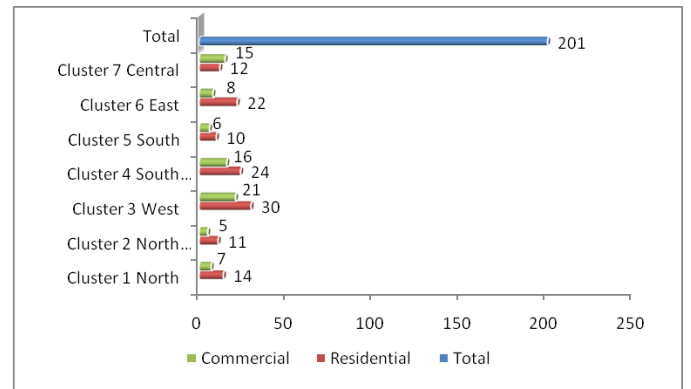Fig. 1 Location of clusters for data collected

Fig. 2 Project Data Clusters

Ahmedabad has witnessed a rise in registered real estate developers from 320 to 1050 in a span of 15 years, A stratified sample size of 201 real estate projects, announced and developed successfully (completed with occupancy certificate) was collected. The size or the area of land parcels were limited in the range of 600m2 to 50,000m2. The reason for this selection was that land parcels smaller than 600m2 have restrictions on choice of development including other development restricitons such as height of the building, thus impacting the available FSI. Land parcels above 50,000m2 are difficult to measure as Road frontage to road width ratio becomes less important since real estate developers choose to create an internal envirroment in design to generate value. Due to this very reason all township projects of 25 Acres were excluded in the study sample. In cases when there was presence of more than one slum in the neighborhood of 1 sq. kms, the nearest one was taken for measurement irrespective of its size as compared to the other slum from the nearest point on the edge of the land parcel. In cases where two roads are abutting to a land parcel, the road with wider road width is used for measurement. The percentage of development includes all built-up including slums or any other unauthorized developments.

TABLE III
REGRESSION OUTPUT

Regression Statistics						
Multiple R	0.27					
R Square	0.07		**PREDICTING PROJECT CHOICE**			
Adjusted R Square	0.04					
Standard Error	0.88					
Observations	201.00					
ANOVA	df	SS	MS	F	Significance F	
Regression	6.00	11.77	1.96	2.52	0.02	
Residual	194.00	151.23	0.78			
Total	200.00	163.00				
	Coefficients	Stand. Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	2.37	0.41	5.77	0.00	1.56	3.18
x1(Fd)	0.06	0.05	1.18	0.24	-0.04	0.16
x2(Rd)	0.01	0.00	2.10	**0.04**	0.00	0.01
x3(Far)	-0.27	0.18	-1.50	0.14	-0.63	0.09
x4(Ar)	0.00	0.00	0.91	0.36	0.00	0.00
x5(Dev)	0.01	0.00	2.81	**0.01**	0.00	0.01
x6(sl)	0.00	0.00	1.02	0.31	0.00	0.00

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1) Variables and Attributes: For a stratified sample size of 201, a total of 7 variables were chosen for analysis. Among these 7 a total of 6 independent variables and their denotations are; 1Frontage to depth ratio - Fd, 2. Abutting Road Width - Rd, 3. Floor Space Index FSI -Fsi, 4. Area of Land - Ar, 5. Neighbourhood (percentage of development- Built vs. Non Built//Open) -Nr, 6. Distance of the Land Parcel from

surrounding slum- Sl. Remaining variable is the dependant or predictor variables in the study; Choice of Project – Cp Table 1.0 shows how dependent variables are classified and ranked for purpose of analysis in order of precedence, hierarchy and Priority. Table 2.0 shows the variables chosen for the study.

2) Measuring Dependancy: Decision on choice of project is predominantly decided by possible buyers/demand for the built units in the selected location. Decisions on choice are often percieved differently by every real estate developer as they have thire own understing on market dynamics and risk taking confidence. Every real estate developer goes through a learning curve in terms of capital investment, its returns and market feedback. With experiece they get trained to take more accurate decision on timing and choice of the project.
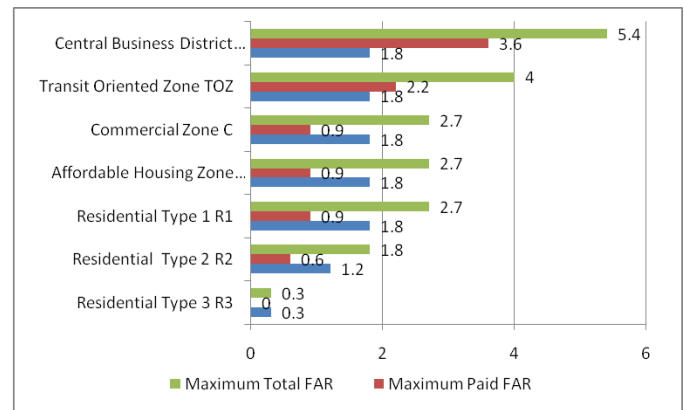

Fig. 3: FSI/ FAR in Zones of AUDA Development Plan 2021. [7]

VI.   DISCUSSION & CONCLUSIONS

The regression output as shown in Table 3. gives P value for abutting road with is 0.04. This suggests a high dependency on choice of project with abutting road width. For a given land parcel, real estate developers are likely to choose Commercial Class A and Class B projects more often than residential projects. Similarly, narrower road will most likely see residential developments. The existing building byelaws restrict commercial developments below 12m abutting road width but there is no restriction on residential developments on a land parcel irrespective abutting road width. This result falls in line with the traditional real estate modus operandi followed by majority of real estate developers. Percentage of neighbourhood development is strongly related with the type and choice of project. Neighbourhoods that are more developed in terms of urban built development have more Commercial Class A and Class B projects, while neighbourhoods with fewer urban establishments are likely to witness more residential projects. This is especially true in the initial phase of development or urban land cycle especially in neighbourhoods on urban fringe where new Town Planning schemes are being implemented. The other variables *Fd, FAR, Ar*, and *Sl* seem to have no significant impact on choice of

project which clearly indicates that commercial projects are planned and built in vicinity of slums and does not seem to have a high bearing on the project choice.

There is an evident conclusion that FAR/FSI has no significance relevance with type of real estate project. In a stark contrast the newly implemented building byelaws for AUDA Development plan 2021 (Figure 3) indicates Central Business District zone and Affordable Housing zone which have been allotted higher FAR of up to 5.4 and 2.7 respectively. This clearly justifies that AUDA encourages highly dense commercial development in the CBD zone by providing a high incentive through FAR of 5.4, and similarly it is providing a FAR of only 2.7 for affordable housing development. Higher FAR would ideally increase the value of land but also conversely bring down the value of the individual built unit. The conclusions of the study clearly indicate that as FAR has no relevance with the type of development, AUDA should consider using the option of flexible FAR based on the location of land, shape, neighbourhood, and type of development. Higher FAR can be given on a land where developer wishes to construct an affordable community housing project whereas a luxurious housing project can have a discounted FSI. This will ensure that the density of population will even out by using such mechanisms and improve the efficiency of urban land and realize its best possible use.

Similarly, Residential developments can be avoided on land abutting to 30m and higher as it stands a high chance of being redeveloped in a short time span due to rapid urban changes. Moreover, housing located on wider roads do suffer from problems of noise and air pollution along with parking and traffic problems. A high FAR of 4.0 up to depth of 200m from the abutting road width of Transit Oriented Zone encourages mixed use projects such as commercial ad residential which is a positive stop forward and apt. This will encourage redevelopment of dilapidated housing on these routes with an option to newer and better housing on the same location without requiring relocating.

The model building bye-laws published by Ministry of Urban Development addresses similar issues. It has a detailed blueprint on minimum area of land required for different type of residential and commercial developments. Further on it has also proposed the concept of Flexible FAR, linked to the land and the project being proposed which enhances the best potential use for urban land. [8]

The true value of urban land can only be realized by permitting planning directives oriented towards real estate since developers invest their capital to provide housing and space infrastructure. Their contribution should be incentivized to encourage developments which are best impact and support the land parcel, neighbourhood, and city civil amenities. Building byelaws and regulations should ideally work in promoting a sustainable development for betterment of a larger community and should not be purely aimed at controlling population density and archaic town planning measures.

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