

## THE USE OF FLOOR SPACE INDEX

### IN THE DEVELOPMENT OF LAND AND HOUSING MARKETS IN MUMBAI

Uncontrolled building construction gives rise to a variety of problems. Concerns regarding poor light and ventilation, inadequate water and sanitation facilities and also the structural safety of buildings have led many municipalities and governments to adopt building codes to control, guide and monitor building construction. Building bye laws of Mumbai used parameters like ground coverage, maximum height, light angle, height in relation to width of the road to control the volume of built up area on a given plot of land. In 1964, the concept of Floor Space Index (FSI) was introduced for the first time in the Development Control Rules (1964 DCRs) of Mumbai formulated under the then Bombay Town Planning Act, 1955:

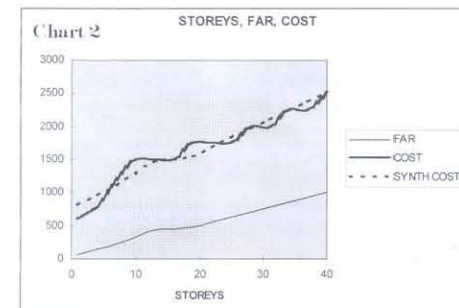
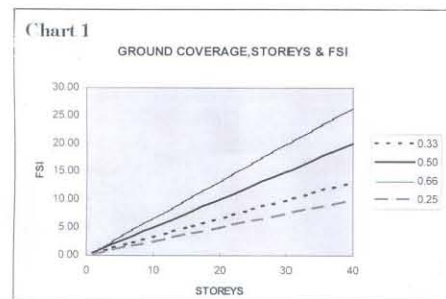
With the emergence of reinforced cement concrete and high-speed lifts, control of building volume through the parameters mentioned earlier was seen to be too restrictive. Instead, FSI was seen to be flexible as it only specified the ratio of total floor space (on all storeys) to the plot area. This gave architects adequate flexibility in designing individual buildings. This simple physical ratio, however, soon acquired many connotations; some explicitly stated, some imputed. It would be interesting to sketch this growing complexity since 1964.

#### Evolution of DCRs regulating FSI

The 1964 DCRs prescribed the highest FSI for the Nariman Point reclamation of 4.5 based on the dual rationale that high land and property prices and high cost of construction (for example, piling in the reclaimed land) justify higher FSI. However, in already developed areas like Colaba and Marine Drive, an FSI of 2.45 which was a product of an earlier set of DCRs was maintained. Surprisingly, however, for more densely built up areas like Kalbadevi, Girgaon and Mandvi an FSI of 1.66 was prescribed as against the consumed FSI of over 3. This was perhaps because by specifying an FSI lower than the existing one, planners expected redevelopment of these areas at lower densities. For areas around Worli, Dadar and Sion, an FSI of 1.33 was assigned. This was done perhaps with a view to allowing one additional floor where buildings were constructed according to earlier rules with 1/3rd ground coverage and 3 storeys (implicit FSI of 1). For the rest of Greater Mumbai FSI of 1 was adopted. In fact, this legacy of 1/3 ground coverage explains why FSIs of 1, 1.33 and 1.66 were chosen. Later, in 1991, for the Island City of Mumbai, an uniform FSI of 1.33 was adopted.

**Environmentalists love to believe that FSI is an effective technique for a town planner to achieve a balance between development and available or planned infrastructure - water, sanitation, roads, schools, parks, etc. Sometimes it is also elevated as a technique of containing the development within the carrying capacity of the environment.** Heated debate, therefore, ensues whenever a proposal to increase FSI is moved. First of all, it should be realised that cities do not grow because of higher FSI or stop growing because of lower FSI. Surprisingly, however, this modest tool in the hands of a city engineer has acquired the status of public policy that is presumed to have the capacity to serve many goals.

It was witnessed that instead of reforming the basic legislative framework, which is within the domain of the State or National Government, the tendency of late has been to use FSI as the main policy instrument to influence land



Source: Pankaj Joshi

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## V.K. Phatak

and real estate markets. This is apparently because FSI related policies could be adopted without any legislative changes. It should therefore be of interest to see the evolution of FSI in this fashion in some detail and also analysing its limitations.

#### Relaxations in FSI

Within five years of introduction of FSI, a major deviation had to be granted. Many rent controlled tenanted buildings in the Island City were in dire need of repairs as the land owners had chosen to neglect these assets which did not yield them any returns. In 1969, the government decided to step in and constituted what was called Bombay Building Repairs and Reconstruction Board. The Board could not have reconstructed these buildings within the stipulated FSI and at the same time accommodated all the existing tenants.

The Board was allowed 2.4 times the permissible FSI. This was the first casualty to FSI as an instrument to shape the city pattern particularly in terms of bringing about "decongestion".

**As conceived in 1964, FSI was based on an assumption that the city's land is divided into two domains. The domain where buildings can be constructed within permissible FSI and the domain where no building can be constructed.** The land from the second domain if in the private ownership will have to be compulsorily acquired under the Land Acquisition Act, 1894. However a minor exception was introduced in the early seventies when FSI was assigned to road land, and was allowed to be used on the adjoining buildable plot if the road land is given free of cost and free of encumbrances to the municipal authority. This was for the first time that FSI was used as a way of attaching "Development Rights" to land, which according to the plan was not supposed to have any rights, and granting them as transferable rights in lieu of monetary compensation for land acquisition.

#### Transfer of Development Rights (TDRs)

The second Development Plan of Mumbai proposed to extend this principle, for acquiring land reserved for public purposes like schools, parks and gardens and was called Transfer of Development Rights. This has been codified in the 1991 DCRs. By this, though the division of the city land into two domains mentioned earlier became blurred, the development right was still tied to the land. The 1991 DCRs went a step further and proposed what is called accommodating reservation. Simply stated, a landowner whose land is reserved for a school can offer to build the school free of cost for the municipality and still retain his entire development rights at the permissible FSI at the same location. Thus for the first time development rights were brought out of the "thin air" not related to land in any fixed proportion. This was the beginning of FSI becoming a public policy tool in the hands of the state not confined to land. 1991 DCRs also allowed twice the permissible FSI to schools, star hotels and institutional buildings on payment of premium related to the market price of land. Thus, FSI also acquired the colour of a public finance mechanism.



Offering extra FSI or development rights is now being seen as a panacea for many urban problems - obtaining land for public purpose, providing free houses to slum dwellers and the tenants of old rent controlled buildings and generating financial resources. There are in fact six types of TDR or incentive FSI currently available.

- Road TDR
- Reservation TDR
- Slum TDR
- Heritage TDR
- Dilapidated Buildings Incentive FSI
- Schools, Hospitals and Hotel Incentive FSI

These measures appeared credible when real estate prices were increasing unabated. However, the recent slump in the market has exposed the limitations of these approaches. In deciding the receiving zones for the TDRs, planners have tried to see that the TDRs flow from congested areas to relatively low-density areas. The TDRs have in practice flowed from low-density, low price, areas to high price areas. By implication, the land for public use has become available from where there is no pressure of development, to areas which are under pressure of development. Moreover, TDRs are being used on existing buildings by sacrificing the setbacks required for light and ventilation, provision of parking or the adequacy of road width to support development of resultant intensity.

Fundamentally, though FSI was initially seen as a physical planner's tool of controlling the extent of built-up area on a given plot, it has emerged as an instrument of intervention in the real estate market. To examine it in that perspective, it would be instructive to first understand the rationale of investment decisions of a real estate investor. The investors are also of two types - first, those who are driven by the use value in self-use and second, those who are driven by the urge to maximise the exchange value. Both such investors coexist in a city. The process that leads the urge to maximise exchange value takes over the satisfaction in use value seems to be a complex phenomenon. Pedder Road and Juhu in Mumbai or Prabhat Road in Pune have seen slow conversion from bungalows to apartments spread over decades. Even after the FSI was increased, not everybody craved to reach the maximum permissible FSI. However, it is relatively simple to seek explanation of an investor's behaviour that intends to maximise his returns in real estate investment by taking recourse to micro economic theory.

Micro-economic analysis of FSI determination

As is obvious, this rational investor would be interested in maximising his returns as distinct from minimisation of cost or investment. In case of real estate development, particularly in the context of FSI, we, therefore, have to consider behaviour of both cost and price. First, the cost: It is obvious that the cost of construction is related to the number of storeys. But FSI is not

FSI free-flow challenged in HC Development Control Regulations Rules Questioned

By Nauzer Bharucha/TNN

Mumbai: The controversial rule of the development control regulations that allows builders to redevelop dilapidated buildings in the island city in lieu of unlimited Floor Space Index (FSI) has been challenged in the high court.

This rule, No 33 (7), which got its present form after modification by the Shiv Sena-BJP government six years ago, has resulted in a rash of skyscrapers coming up on narrow plots in highly-congested localities.

Former municipal commissioner J B D'Souza, civic activist Cyrus Guzder and urban planner Shrish Patel have filed a public interest litigation against this un-planned construction. The matter is to come up for hearing in the chief justice's court on Wednesday.

The PIL will be watched with keen interest by many. It was only recently that builders undertaking such projects got a bonanza from the finance minister, who granted them 100% tax exemption from the profits they make from selling the flats. The sop given in the last Union budget was ostensibly because these builders are executing a public housing scheme to redevelop old and dilapidated cessed buildings.

It was in 1997-98 that the then chief minister Manohar Joshi brushed away suggestions of experts like former state secretary D M Sukthankar and gave developers unlimited FSI to encourage them to undertake the redevelopment

ment of 19,000 old, cessed properties.

Under the policy, builders had to first re-house existing tenants in a new building free of cost by giving them the same space they had occupied. As incentive, they are then allowed to exploit a portion of the plot to construct a residential tower and make profits from it.

The scheme also gave unheard of concessions in the compulsory open space between two buildings (restricting it to only five feet) and condoning the mandatory parking area. In the past, there have been serious allegations of how some builders inflated the number of existing tenants living in these dilapidated buildings so that they could avail more FSI in order to construct even taller skyscrapers. A case in point is the 38-storey Suraj Apartments at Breach Candy where the high court observed how a prominent architect and his mother showed themselves as tenants living in a dilapidated structure before it was demolished to make way for the high rise.

Over the past four years, residential towers as high as 30-40 floors have started springing up in areas like Girgaum, Nana Chowk and Grant Road where the civic infrastructure is already in poor shape.

In Girgaum, within a kilometre radius around the Harkisondas hospital, there are five to six major projects coming up. At Nana Chowk, the PIL refers to a recent TOI report about ten towers coming up in a radius of 500 metres.

FAULTY TOWERS

directly related to the number of storeys. The relationship depends upon the ground coverage, which in turn, depends upon the Development Control Regulations regarding the setbacks. The relationship between the number of storeys and FSI is shown in Chart 1 for a range of ground coverage. If ground coverage of 0.5 were achieved, 6 storeys would give an FSI of 3. This is the pattern in Marine Drive or Ballard Estate. But present setback regulations do not permit (and also the plot size and configuration) attaining such proportion of ground coverage.

Second, the cost of construction is obviously related to number of storeys and not directly to the FSI. This is probably a step function, with average cost increasing significantly with addition of lifts, refuge floors, fire fighting equipment, resistance to wind pressure and seismic forces, cost of haulage of materials, etc. Neither an analytical nor a statistical exposition of relationship between storeys and cost of construction is available. However, in Chart 2 such a relationship is depicted without claiming great degree of certainty. The chart also shows a smoothened cost curve based on the stepped function assumed in the chart.

Chart 3 then represents the average cost of construction plus cost of land per sq. ft. of floor space at various levels of FSI, the marginal cost and the property price. In this chart, it is assumed that the property price will not change with the FSI,

Slum TDR rates go into free fall

By Nauzer Bharucha/TNN

Mumbai: In Mumbai's construction industry, slum TDR (transfer of development rights) certificates are the equivalent of the stocks of blue-chip companies. But a Bombay high court stay against its use in three large suburban corridors coupled with the state government's recent ban on adding additional floors on existing buildings all over the city has badly jolted the TDR market.

Several developers and traders have been left holding slum TDR certificates

TDR in the market. TOI has learnt that almost 5 lakh sq mt of slum TDR worth close to Rs 300 crore has been issued between April and August 2004 to developers, mainly by the Mumbai Metropolitan Region Development Authority (MMRDA) and the Slum Rehabilitation Authority (SRA).

While builders may be cursing their fate, the court stay has been widely welcomed by civic activists and town planners. Since long they have been protesting against the indiscriminate use of slum TDR as it led to skewed development and put a burden on the already fragile civic infrastructure in the suburbs.

It was in 1997 that the government allowed TDR generated from slums to be transferred and used for construction purposes in the once-restricted zone between the Western Railway and S V Road on one side and Western Express Highway on the other, and areas between Central Railway line and LBS Marg in the eastern suburbs.

These are considered extremely prime areas in the real estate market. However, the court recently stayed the use of slum TDR in these corridors following a public interest litigation (PIL) against the hazardous development in areas like Santa Cruz and Andheri.

In the past 18 months, most of the slum TDR has been issued by the MMRDA, which is constructing over 60,000 tenements to rehouse project-affected persons under the Mumbai Urban Transport Project and Mumbai Urban Infrastructure Project. Said MMRDA joint commissioner T Chandrashekar, "Last year we were issuing up to 40,000 sq mt of slum TDR a month to developers. Now it is barely 10,000 sq mt a month."

THE SLUMP	
Year	Rate
1997-98	Rs 3,600/ sq ft
1998-99	Rs 1,200/ sq ft
1999-00	Rs 850/ sq ft
2000-01	Rs 700/ sq ft
2001-02	Rs 750/ sq ft
2002-03	Rs 850/ sq ft
2003-04	Rs 821/ sq ft
2004	Rs 580/ sq ft

Market sources said that some of the developers left holding a huge stock were Rehab Housing, Videcon-Atithi Shelters, Shivshahi Purnavasan Prakalp Limited, Sumer Corporation, Natwar Parikh Company, Akuruti Nirman and Atithi Builders and Contractors.

Slum TDR is generated when the developer/owner surrenders his land to the government and agrees to rehouse slum-dwellers or project-affected persons free of cost. In turn, he is issued a TDR certificate that gives him additional construction rights in the suburbs, but only to the north of the plot he surrendered.

Slum TDR is currently available at a price ranging between Rs 540-Rs 575 a sq ft, down from the whopping Rs 820 a sq ft fetched till last October. "At this price too, there are very few takers because of the court stay," market sources said.

Moreover, there is also a glut of slum

though it is possible to expect that the price will begin to decline with increase in FSI.

Microeconomic theory or simple calculus will indicate that the optimal FSI for the investor will be at a point where the marginal cost equals the marginal price. Because at this point the returns will be maximised.

The use of FSI as an instrument of policy can now be examined on the basis of this Chart. Assume that on policy considerations, we decide to specify 5 as the FSI. The investor will not build to that level of FSI, as it will lower his returns. This is why some properties remain undeveloped or

Less developed as compared to the permissible FSI. Conversely, if we specify FSI which is less than optimal, the investor will make overt or subtle efforts to attain optimal PSI. In case of Ahmedabad, despite having the specified FSI of 1, the actual FSI of nearly 2 to 2.5 has been documented. In case of Mumbai, FSI of 1 prior to 1991 and after 1991 does not mean the same thing, as the post 1991 regulations do not count staircase and balcony areas for FSI calculation.

Impacts of low FSI

What is paradoxical and somewhat counter-intuitive is the impact of FSI on land and property prices. It may appear that if FSI of an individual plot is increased, its land and property prices may increase. However, if permissible FSI is increased across the city, land and property prices may increase and the optimal FSI for the investor would also reduce. On the other hand, if the FSI were reduced across the city, the land and property prices would increase. In that case, the specified FSI may turn out to be sub-optimal and the investors would attempt to reach the optimal FSI. Thus, what influences the intensity of development is the property price and not the FSI. The policy objective if at all should, therefore, be to restrain excessive price rise, certainly not to have measures like very low FSI that would prove to be counterproductive.

The FSI pattern first introduced in 1964 in Mumbai varied according to location attributes. FSI at Nariman Point was highest at 4.5 followed by Colaba and Marine Drive (2.45), Kalbadevi and Mandvi (1.66), Malabar Hill, Worli, Dadar and Sion (1.33) and suburbs (1). In 1977, MMRDA attempted to restrain the PSI in the entire Island City to 1.33. This was later incorporated in the DCRs of 1991.

However axiomatic, the objective of bringing about decongestion of inner city areas has led to prescription of very low FSI. Treating the FSI prescription as an inter-personal equity issue, such low FSI has been prescribed for the entire city. The implications of prescribing uniformly low FSI are:

- (a) redevelopment of inner city areas is inhibited (in addition to the effect of the Rent Control);
- (b) this, in turn, implies unwarranted spread of the city, giving rise to longer trips and related extra cost; and
- (c) rent seeking behaviour amongst those who grant FSI through favourable interpretations.

In the context of such low uniform FSI, the use of TDRs then implies first creating an artificial scarcity, which among other things would give rise to increase in price. Such a situation is then attempted to be exploited for serving various planning objectives. Apart from the rent seeking behaviour that this policy may encourage, the seeds of long term failure are sown in the short-term success of such policies.

Source: The Times of India

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