

Subject Fw: Meeting with World Bank on December 7 - note on Sao Paolo  
From mkaul@worldbank.org  
Date Thursday, December 22, 2011 23:31  
To jamal.kb@nic.in

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O.S.D. (PLG)  
Diary No. 678  
Date 10-1-2012

OFFICE OF UDM  
Dy. No. 4698  
Date 28/12/11

Dear Khalid,

As discussed at the meeting on December 7, please find attached a short note on Sao Paolo's experience with leveraging land and urban densification to finance infrastructure.

Best regards,  
Mandakini

(See attached file: TDR NOTE SAOPAOLOFINAL.docx)

Mandakini Kaul  
Senior Country Officer, India  
The World Bank  
70, Lodi Estate, New Delhi 110 003, India  
Tel: +91 11 41479230; Fax: +91 11 24619393  
e-mail: mkaul@worldbank.org

Director (Plg.) MPR/TC,  
D.D.A. Vikas Minar N. DELHI-2  
Dy.No. 1761  
Dated 28/2/12

OFFICE OF THE DIR (Plg.)  
MPR/TC, D.D.A. N. DELHI-2  
Dy.No. 585  
Dated 1/1/12

Commr. (Plg.) - II  
Despatch 107  
Date 10-1-11  
Dy. No. 1344  
Date 13/1/12

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PS to UDM

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## Leveraging land and urban densification to finance infrastructure: Lessons from São Paulo

### *Background*

Around the world, policy makers use a variety of tools to manage and accommodate urban growth and redevelopment. They typically have three main concerns in terms of land policy:

- (i) Accommodating urban expansion
- (ii) Providing infrastructure
- (iii) Managing density

Together, the planning of infrastructure, land use, and density policies combine to shape the spatial structure of cities. When effective, urban planning aligns land use, population, and employment density and infrastructure to optimize urban form and economic productivity. Density is in fact a key driver of the demand for urban infrastructure and largely determines the functional efficiency of cities. Land based instruments for accommodating growth and financing infrastructure are therefore most useful when aligned within a common framework.

There are several land based instruments that can be used to finance infrastructure and accommodate urban expansion. For example, land sales can be used to generate initial capital to defray one-time infrastructure investment costs. However, in the long run, they do not provide a financial stream to support infrastructure development. In contrast, property tax revenues and other similar levies are a source of revenue streams that cities can tap to maintain and expand public facilities. In the US, property tax revenues provide the largest source of funding for local authorities at the municipality and school district level. In developing countries however, property taxes are still only a small percentage of local revenues, except for the largest cities where property taxes are gaining in importance.

In contrast to sales taxes, property and other ad valorem taxes may often be hard to collect in developing countries where property values are difficult to determine and tax collections remain low. Betterment levies, special assessment taxes, and exactions provide a way around some of these challenges by capturing developed fees that reflect increases in value through infrastructure improvements. The ensuing finances are specifically used to pay for infrastructure projects. While these efforts may not result in infrastructure projects always "paying their own way," they are consistent with local revenue generation and accounting efforts. However, it is important to remember that these instruments are a one-time revenue enhancement that cannot substitute for steady revenue streams that property taxes can provide.

Transferable Development Rights (TDRs) is a related instrument that has been used to accommodate growth and finance infrastructure. The underlying concept is that property can be unbundled into several components including the land and the rights to build in it. Once these two components are separated it is possible to trade the right to build just as it would be possible to sell the right to a piece of land. TDRs take different formats with some designs allowing only trade of building rights between neighboring properties, others allowing rights to trade between non-contiguous areas, while others limit to the sale of the rights in a pre defined plot without implying any re-distribution of rights across the city (RPA and Lincoln, 1998).

While TDRs have mostly been applied in developed countries, there are emerging examples of their application in developing countries.<sup>1</sup> An example is Brazil where the concept of separating building rights from land ownership was introduced in 2001. In what follows, we review Brazil's experience, focusing on the city of São Paulo and its implementation of *Outorga Onerosa do Direito de Construir* (OODC). The city of São Paulo provides an interesting example of how land instruments for accommodating growth, such as the FAR, can be used to finance infrastructure. This example may lead to interesting insights for Indian cities thinking about implementing TDRs today.

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<sup>1</sup> In fact, India has also started to experiment with the use of TDRs. An example is the Bus Rapid Transit corridor in Pimpri-Chinchwad.



## The case of São Paulo

*Initially only height restrictions were used in São Paulo's. The use of FARs started only in 1957*

In the early 1900s urban legislation in São Paulo was very flexible, only imposing constraints on the height of buildings – however these were not binding. Limits in the center of São Paulo were at 80 meters or about 25 floors. It was only in 1957 that the first Floor Area Ratio (FARs) limitations were introduced. The limits were set at a maximum FAR of 6 for commercial areas and 4 for residential uses; the legislation also established a maximum density of 600 habitants per hectare. However, developers often built residential buildings using approvals for commercial buildings. Therefore, while by law the limit in residential areas was set at 4, in practice FAR were around 6 for both residential and commercial buildings.

In 1972, a new set of FARs were introduced as part of the New Zoning Law (Lei 7.805 de 1972). These FARs were set according to the land use and density of an area and followed recommendations of the urban and metropolitan planning instruments (*Plano Urbanístico Básico* and the *Plano Metropolitano de Desenvolvimento Integrado*). These documents were based on in-depth diagnostics of local socio economic characteristics as well as geographic and administrative constraints. Law 7.805 of 1972 proposed a city structure based on the US model with high densities in the city center and medium and low densities in the rest of the city with a strong network of connective infrastructure (815km of expressways). The Law defined 8 land use zones throughout the city and set a maximum FAR of 1 in 4% of the City area (in residential zones); a FAR of 2 in 86% of the city had and 4 in only 10 percent of the city. Increases over the maximum FARs were permitted as long as total occupancy rates were decreased by developers/landowners (see Box 1 for further detail). The law also introduced controls on density of construction not only through FARs but also through occupation rates (percentage of the plot area built), setback limits, and minimum lot size, among others.

A 'big-bang' approach was initially used in São Paulo to introduce the idea of TDRs without much success

While the instrument of *Outorga Onerosa do Direito de Construir* (OODC) was first approved and regulated in 1986, it was only widely used much later. Initially, *Outorga Onerosa* (enhanced development rights) was used as an instrument to award the right to increase development

**Box 1. Calculation of maximum FAR**

As discussed in the text, increases over maximum FARs were permitted as long as total occupancy rates were decreased by developers/landowners. In this case, the formula used to calculate the maximum allowed FAR in an area was  $c=(T/t)*C$ ; where T would be the maximum occupancy rate in the area, t would be the adopted occupancy rate, and C the maximum FAR for the area. As an example, in a zone with a maximum FAR of 2.5 and maximum occupancy rate of 50%, if the developer adopted an occupancy rate of 31%, the effective FAR could go up to 4. This means that even though by law, maximum FARs for different zones in the city were set at 1, 2, and 4, for all practical purposes they could be higher. Further, this formula forced a balance between open-space and built-up area.

densities in specific lots being occupied by *favelas*, in exchange for the responsibility to construct social interest housing. In 1988, the instrument was extended beyond areas occupied by *favelas*, and in 1995 the instrument was further amended to eliminate the social housing and replaced it with cash payments. Increased flexibility in the instrument made it more attractive for private developers; it was estimated that between 1988 and 1998 about 328 operations involving *Outorga Onerosa* took place, producing US\$122.5 million in revenue for the

municipal government (World Bank, 2011).<sup>2</sup>

In the 1990s the city began to think about capturing greater value/revenue from the transfer of enhanced development rights in the form of higher FARs. The idea was to lower the baseline FAR and charge developers for building up beyond this base level. The first effort was under the Erundina Administration in the early 1990s which attempted to reduce base FARs to 1 across the city, charging *Outorga Onerosa* for FARs above this base, but failed.

The failure of *Outorga Onerosa* instruments has been attributed to several factors including (i) problems with the valuation of development rights which led in many cases to undervaluation,

<sup>2</sup> Revenue estimates from Final Report of the CPI on Interlinked Operations, 2002

(ii) low capacity to oversee the revenue stream and guarantee that resources were invested in social housing undermining the credibility of the program; (iii) claims that the program increased spatial segregation within the city; and (iv) legal challenges that indicated that sale of exceptions to zoning law was illegal. In 1998 the use of the instrument to finance housing and other projects was declared unconstitutional (World Bank, 2011).

*A gradual approach to increase FARs started in 2002 under the new Strategic Master Plan of which reintroduced the OODC concept*

The gradual approach described in the Master Plan stipulated that FARs would gradually change between 2001 and 2004 (see Table 1 below). Before this, developers were required to request authorization from the city administration to exceed the FAR set and if such authorization was granted, they would be required to pay a fee, e.g. 50 percent of the resulting increase in value. With the 2001 Urban Development Plan the concept of a development concession mechanism for additional building rights was introduced into the 2002 Strategic Master Plan and Law 13,885, 2004 for Land Use.

*The new laws combined several instruments under a single framework*

The laws introduced included the charging for additional building rights (OODC), the definition of a minimum, basic and maximum FARs, and restricted the amount of land supply in each area of the city. These tools were combined in the attempt of combining under a single framework land management and infrastructure provision with equity concerns while increasing revenues of the municipality.

The basic FAR, which refers to the buildable area that any owner has the right to develop by virtue of ownership, was set to be variable between 1 and 2. The minimum FAR was used to define the minimum expected use from a plot so that it would comply with its expected social function. The maximum FAR was used to reflect the amount of development that could be supported in an area given the existing infrastructure and zoning regulations. Minimum and maximum FAR were defined for all zones in the city except for the areas designated for Joint



Urban Operation.<sup>3</sup> Maximum FARs were set at 1, 2, 2.5 or 4 depending on the area of the city (see Table 1 above). With this law, the right to build became a government allocation and not something attached to private ownership of urban land. If a real estate project exceeds the basic FAR and the developer wants to build up to a maximum of 4, it must pay financial compensation to the government.

Table 1. FARs introduced through 2002 Strategic Master Plan

Non PDE- zones created	Current PLUOS zones	UC		
		2002	2003	2004
ZER	Z1			
	Z9	1.0	1.0	1.0
	Z2, Z11, Z13, Z17 and Z18	1.0 (a)	1.0 (a)	1.0 (a)
	Z3, Z10, Z12	2.5 (b)	2.0 (c)	
ZM	Z4	3.0 (b)	2.5 (c)	
	Z5	3.5 (b)	3.0 (c)	2.0
	Z8, 007-02, 04, 05, 08, 11 and 12	3.0	2.5 (c)	
	Z8, 007-10 and 13	2.0	2.5 (c)	
	Z8, 006-1 and 3	1.5	1.0	
	Z19	2.5	1.5	
ZIR	Z6	1.5	1.0	1.0
	Z7	1.0 (a)	1.0 (a)	

Source: DECRETO Nº 43.232, DE 22 DE MAIO DE 2003.

[http://www.prefeitura.sp.gov.br/cidade/secretarias/habitacao/plantas\\_on\\_line/legislacao/index.php?p=12722](http://www.prefeitura.sp.gov.br/cidade/secretarias/habitacao/plantas_on_line/legislacao/index.php?p=12722)

LAW 13,885 also reduced building heights by setting a coefficient of 1 for areas that previously had a FAR of 2 or more. To address opposition concerns, the law introduced the change in FARs in phases with the base density coefficient gradually being reduced for mixed-use zones (from FAR of 3.5 to 2) and industrial zones (from 2.5 to 1) between 2002 and 2004. Older areas that had a FAR of 4 were to transition towards a basic index of 2.

Developers took advantage of this 'grace' period and submitted approvals for a pipeline of projects that complied with the older regulations and hence were effectively exempt from the new framework. The concept of development concessions was introduced where developers could increase the building potential of areas with FARs of 1 or 2 to a new maximum FAR of 4

<sup>3</sup> Areas identified for their development potential and where tools for capturing added value are used.

**Box 2. Formula for Financial Compensation of Development Concessions**

The law defined formula to calculate the financial compensation of the development concession as follows:  
 $M = F_p * F_s * v / C$ . Where:

- $F_p$  is the planning factor. This is an instrument used to manage densities throughout the city depending on available infrastructure (ranges between 0.15 and 1.4). This coefficient also varies by land use and therefore it is used to extract greater value from the sale of building property rights for business compared to residents
- $F_s$  is the social interest factor which is used to establish exemptions or reductions depending on the type of activity (social housing, education, health among others). This factor varies between 0 and 1. For example, the coefficient for social housing, hospitals, and schools is zero, meaning that developers building for these uses do not pay compensation for additional building rights. Therefore, the social interest factor is used to promote desirable uses and control other that are less desirable.
- $V$  is the value per square meter in the City Property value Map
- $C$  is the Basic FAR. The lower the basic FAR, the higher the compensation fee that will be required

by paying a fee. Developers succeeded in approving a new low-income market housing (HMP) that was exempt of this fee. Box 2 provides detail information about the formula used to calculate the compensation of development concessions.

Table 2. Development concessions for additional building rights: revenues for two<sup>4</sup> Urban Operations in the city of São Paulo (USD \$1,000)

2005	20535
2006	32362.5
2007	49968.5
2008	59063.5
2009	57964
2010	105195

Note: The average exchange rate can be set at 1US\$ = 2R\$. Source: Sandroni (2001) and Secretaria De Finanças, Prefeitura Municipal de São Paulo

The collection of development concessions only started in 2005 since the new land use laws were approved in 2004.

To illustrate the revenues collected after the implementation of development concession, all associated revenues for two (Faria Lima and Agua Espraiada) out of 13 Urban operations in the city of São Paulo are summarized in the table above. It is also important to note that the numbers reported correspond to net revenues.

The 2002 Strategic Master Plan and Law 13,885 of 2004 also limited the supply of land by limiting the building potential in all districts of the city. The Law defined a total limit for buildable area in the city. The limits were set at 6,919 million

<sup>4</sup> Total estimates for revenues from all TDRs through time are not available to the best of our knowledge.



m<sup>2</sup> for residential use and 2,850 million m<sup>2</sup> for nonresidential use. This limit did not include the area within São Paulo's 13 Urban Operations. Once limits by districts were announced, land scarcity was anticipated by developers leading to considerable increases in land prices.

The funds collected through the development concessions of additional building rights and reported in Table 2, are deposited into the Urban Development Fund (FUNDURB) which was created to implement projects defined in the master plan of 2002. Therefore, even though funds may be collected in Faria Lima or Água Esquada, they can be invested in any area of the city. Most of the resources collected through Outorga Onerosa have been allocated to drainage/sanitation works and for housing and support for land tenure regularization. According to André Gutierrez - Chairman of the Urban Policy Committee of the Municipality of São Paulo and Director of the Department of Urban Projects (SEMPA), the drainage and sanitation works have mainly consisted of stream-channel alterations. Investments in housing support were mostly directed to slum upgrading and regularizing inhabited settlements. Further, a large proportion of works have been undertaken in the fringe areas of São Paulo suggesting redistribution of funds throughout the city with revenues being collected in most dynamic areas and invested in most deprived and peripheral areas. Further, some smaller amounts are being invested in the restoration of national heritage sites (World Bank 2011).

*The city of São Paulo also uses a variant of OODC where revenues must be reinvested in the area where they are collected (Certificates of Additional Building Potential)*

There is another variant of Outorga Onerosa being implemented in São Paulo that in fact forces the collected revenues to be reinvested in the area that collects them. The instrument is called CEPAC ('Certificate of Additional Building Potential') and can only be used within the legal framework of Urban Operations. As opposed to 'Interlinked Operations', where financial resources collected in exchange of building rights can be directed to investments outside the area intervened, Urban Operations resources can only be used in infrastructure investments within the perimeter defining the area of intervention. Just as with Outorga Onerosa, CEPACS were introduced in the early nineties without much success and then reintroduced in 2004.

CEPACS are issued by the public authority and traded on the stock market (electronic auctions) with the aim to enable private developers to obtain additional building rights within an Urban Operation. The concept and operationalization of the CEPAC instrument is complex. CEPACs must have a close and well defined relation with the works and interventions within an Urban Operation and their day-of-issue value must correspond to the exact cost of the planned intervention. Therefore, before CEPACs are issued it is necessary to produce a detailed list of the expected expenditures. Further, the law allows two methods for issuing CEPACs. First, through public auctions, and second through payment for actual works or expropriations or as a guarantee for funds obtained from financial institutions for underwriting the cost of urban operation works (private placements). Issuing of CEPACs is limited by regulation. At least one of three conditions has to be met to issue new CEPACs. First, that the intervention (e.g. new road, or other infrastructure) related to previous issuance of CEPACs in the area, has been completed. Second, that the total amount accruing from CEPAC issuance has been used to defray the costs of the previous intervention. And third, that the funds needed to conclude the previous intervention and coming from previous CEPACs have been deposited in the account of a specific Urban Operation. In practice however, the relation between funds collected and investments is not always clear. While information about the number of CEPACs issued and sold, the amount of built stocks, and the total funds raised and utilized is generally available, information about how these resources are invested is deficient (World Bank, 2011).

### *Broader Lessons*

The city of São Paulo provides an example of how a carefully sequenced program of managing densities can be used to generate finances for infrastructure development. However, there are a few lessons that are of broader relevance that merit consideration as policymakers in India employ this instrument:

- *Leveraging finances through TDRs works better in localities experiencing rapid growth*

The applicability of TDRs is most relevant in areas experiencing high demand as developers have incentives to develop more built up area and infrastructure using scarce land. In areas where demand and density is low, developers are unlikely to pay for additional building rights. In addition, it must be remembered that revenues from TDR sales is not continuous, unlike property taxes that provide a stream of revenues to support infrastructure upgrades and maintenance.

- *Establishing a mechanism for land valuation is central to the process of implementing TDRs just as it is in the context of land acquisition for peri-urban expansion*

The experience of São Paulo highlights the importance of institutions for land valuation. Appropriate valuation of the rights to build was one of the main challenges faced by the Outorga Onerosa in its early years. The “value” of the right to build is a function of property and land values in the area, and thus, institutions for land valuation are central to support the successful implementation of these instruments. Developed countries rely on a number of forms of available data and supporting institutions to assess land values including market data on transactions, attributes of the property, as well as ancillary data concerning potential income from land and the cost of inputs into land development. These data are managed to provide up- to-date and reliable information for professional appraisers as well as the general public. In countries where land valuation is successful, techniques are standardized to enable appraisers to arrive at uniform and transparent valuations.

- *It is essential to have a coherent urban planning framework to coordinate the use of multiple planning instruments*

São Paulo’s experience highlights the importance of a coherent urban planning process that brings together multiple instruments. Policy makers have at their hand a variety of tools to manage and accommodate urban growth and development. However, to properly address concerns about urban expansion, infrastructure provision, and managing density, these instruments must be coordinated under an overarching framework. The lack of a governing planning framework may lead to instruments that pull in opposite directions cancelling out their effects or lead to unintended negative



consequences. For example, revenues from TDR sales can be considerably reduced if the city government simultaneously offers an across the board increase in FARs. At the same time, excessive controls on FARs that are not matched by TDR sales can create affordable housing shortages. As an example, supply constraints introduced by rigid FARs in São Paulo led to increases in land prices bringing in serious concerns about affordability and exacerbating the problems of informal development (Sandroni, 2010).<sup>5</sup>

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<sup>5</sup> Even in India, the take up of TDRs in Mumbai was dampened as the judicial system allowed a bonus 0.33 FSI in suburban areas.