

# GRID LINES

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## Unlocking land values to finance urban infrastructure

### Land-based financing options for cities

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**R**aising capital to finance urban infrastructure is a challenge. One solution is to “unlock” urban land values—such as by selling public lands to capture the gains in value created by investment in infrastructure projects. Land-based financing techniques are playing an increasingly important role in financing urban infrastructure in developing countries. They complement other capital financing approaches, such as local government borrowing, and can provide price signals that make the urban land market more efficient.

Land has a long history as an instrument of infrastructure finance. When Baron Haussmann rebuilt Paris during the Second Empire, he used public powers to acquire the land that was converted into grand avenues as well as excess land that lay along the path of reconstruction. The excess land served as collateral for borrowing that financed new roadways, water supply, and natural gas and sewer lines. Gains in the value of city-acquired land were used to repay the public debt.

Land-based financing is now becoming an important element of urban infrastructure finance in developing countries, especially where cities are growing rapidly. Table 1 summarizes several recent land-based financing arrangements and compares their magnitude with other sources of urban capital investment funds or total capital spending. The scale of land-based financing is surprisingly large.

As part of the capital financing mix, land-based financing has significant practical advantages. Most techniques generate revenue up front, reducing dependence on debt and the fiscal risks that

debt financing can introduce. Land sales and one-time development charges also can be easier to administer than property tax systems that require periodic valuations of all taxable property.

Land-based financing of infrastructure can be divided into three categories: developer exactions, value capture, and land asset management.

#### Developer exactions

Developer exactions require developers to go beyond installing infrastructure facilities at their own site. They oblige a developer to finance part or all of the costs of external infrastructure needed to deliver public services to the site. Thus developers are required to build subdivision roads and also help pay for major access highways to the area. They may be required to help pay for the trunk lines that deliver water and for wastewater removal and treatment systems. In some cases investment responsibilities are assigned through formal public-private partnerships. In the New Cities area outside Cairo a private developer is undertaking \$1.45 billion of infrastructure investments, including many that are traditionally the public’s responsibility, in return for free allocation of desert land (see table 1).

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**TABLE 1**

**Selected cases of land-based financing in developing countries**

| Location and activity   | Amount and use of proceeds   | Comparative magnitude  |
|---|--|--|
| <b>Cairo, Arab Republic of Egypt:</b> Auction of desert land for New Cities (May 2007, 2,100 hectares).   | \$3.12 billion, to be used to reimburse costs of internal infrastructure and build highway connecting to Cairo Ring Road.              | 117 times total urban property tax collections in country; equal to 10% of national government revenue.  |
| <b>Cairo, Arab Republic of Egypt:</b> Private installation of “public” infrastructure in return for developable land (2005–present).                      | \$1.45 billion of private infrastructure investment, plus 7% of serviced land turned over to government for moderate-income housing.   | Will provide infrastructure for a range of basic services covering more than 3,300 hectares of newly developed land, without financial cost to government.   |
| <b>Mumbai, India:</b> Auction of financial center land (Jan. 2006, Nov. 2007, 13 hectares) by Mumbai Metropolitan Regional Development Authority (MMRDA). | \$1.2 billion, to be used primarily to finance projects in Mumbai’s metropolitan transportation plan.                                  | 10 times MMRDA’s total capital spending in fiscal 2005; 3.5 times total value of municipal bonds issued by all urban local bodies and local utilities in India since 1995.                                   |
| <b>Bangalore, India:</b> Planned sale of excess land to finance access highway to new airport built under public-private partnership.                     | \$500+ million. On hold; land will be used instead for ministry buildings and government-built industrial space.                       | Minimum sale proceeds were projected to considerably exceed costs of highway construction and acquisition of right-of-way.   |
| <b>Istanbul, Turkey:</b> Sale of old municipal bus station and former administrative site (Mar. and Apr. 2007).   | \$1.5 billion in auction proceeds, to be dedicated to capital investment budgets.  | Total municipal capital spending in fiscal 2005 was \$994 million. Municipal borrowing for infrastructure investment in 2005 was \$97 million.   |
| <b>Cape Town, South Africa:</b> Sale of Victoria & Albert Waterfront property by Transnet, the national transportation authority (Nov. 2006).             | \$1.0 billion, to be used to recapitalize Transnet and support nationwide investment in core transport infrastructure.                 | Sale proceeds exceeded Transnet’s total capital spending in fiscal 2006; equal to 17% of 5-year transport investment plan prepared in 2006.  |
| <b>Bogotá, Colombia:</b> Betterment levy.   | \$1.0 billion collected in 1997–2007, and \$1.1 billion planned for 2008–15, for financing city street and bridge improvement program. | Betterment fees finance 50% of street and bridge improvements. Other planned sources of financing: \$50 million International Finance Corporation loan; \$300 million international, peso-linked bond issue. |

Source: Peterson forthcoming.

## Land-based financing can generate revenue up front, reducing dependence on debt

Developer exactions have become one of the main mechanisms for increasing private investment in “public” infrastructure. Developers recover the cost of investment when they sell the developed land. Much potential remains for this form of land-based financing. Consider the United States, where impact fees typically are designed to require that growth pay its own way when it comes to infrastructure costs. A subdivision developer may be required to pay as much as \$35,000 per standard housing unit to finance the off-site infrastructure costs associated with growth.

Best-practice impact fees are based on urban development plans that identify the incremental infrastructure costs associated with development at different locations within the urban region. Formal analyses of this type may be impractical in developing countries given their planning and data requirements. But simple versions of development fees likely will be used to shift larger shares of public infrastructure costs to private developers

and ultimately to the purchasers of new housing and new business sites.

### Value capture

Value capture builds on the principle that the benefits of urban infrastructure investment are capitalized into land values. Because public investment creates the increase in land values, many land economists have argued that government should share in the capital gain to help pay for its investment. Public authorities have used a variety of instruments to capture the gains in land value created by infrastructure investment. Betterment levies, which impose a one-time tax or charge on gains in land value, are one such instrument. Most countries in the world have experimented with betterment levies at some point, typically taxing away 30–60 percent of the gain in land value attributable to infrastructure projects.

Under modern conditions, betterment levies have proved difficult to administer. Attempts to identify with precision, parcel by parcel, the gains in land value resulting from public works projects have proved both ambitious and contentious. And the tax rates, at 30–60 percent or even higher, are too high to impose unless accuracy in measuring the tax base can be assured. For this reason, betterment levies have fallen out of favor as a significant revenue source, often in the face of court judgments challenging the assessment process.

Colombia long has used a form of betterment levy, *contribución por mejoras*, to finance public works. But reliance on the scheme declined sharply in the 1980s and 1990s, for the same reasons found elsewhere. Gains in land value due to infrastructure projects were difficult to estimate. The process involved high administrative costs and led to countless legal disputes. In the past several years, however, Bogotá has simplified its approach and converted the betterment levy into a general infrastructure tax more loosely associated with gains in land value.

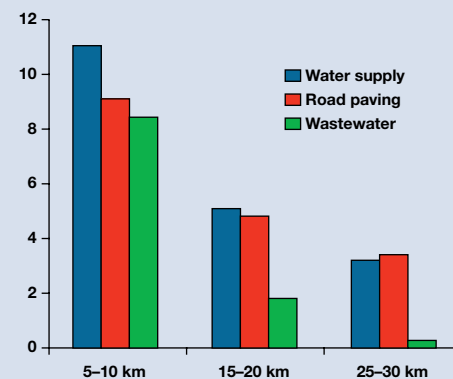
Rather than estimate parcel by parcel the gains in land value due to individual investment projects, Bogotá has packaged its street and bridge improvement program into a citywide bundle of public works projects, all financed in part through a citywide betterment fee that is broadly differentiated by benefit zone and other factors. Thus Bogotá has been able to revive *valorización* as an effective infrastructure financing tool. The approach is being replicated throughout Colombia.

Value capture through public land sale is another vehicle for recouping public infrastructure costs. It involves the sale of land whose value has been enhanced by infrastructure investment. If the public sector owns the land, it can internalize the benefits of public investment and capture the gain through land sales. China has financed a large part of its urban infrastructure investment in this manner. For a major urban highway project, a municipality can transfer the land surrounding the highway to a public-private development corporation. The corporation borrows against the land as collateral, finances highway construction, then repays debt and obtains its profit by selling or leasing land whose value had been enhanced by access to the new highway.

The potential for recouping infrastructure costs from increases in land values is illustrated by metropolitan Recife, Brazil. Figure 1 shows how

**FIGURE 1**

**Infrastructure investments in Recife, Brazil, create clear gains in land value**  
Gains in value by distance from city center  
(US\$ per square meter)



Source: Smolka 2007.

land values are affected by different types of urban infrastructure investments, at varying distances from the city center. The author estimates that, on average, investing in wastewater removal leads to gains in land value 3.03 times the cost of investment, paving roads to gains 2.58 times the cost, and providing piped water supply to gains 1.02 times the cost.

## Land asset management

Value capture seeks to recover gains in land value specifically attributable to infrastructure investment. Land asset management recognizes that the balance sheets of many public entities already are top-heavy with urban land and property assets. At the same time the cities in which the property is located suffer acute infrastructure shortages. Under these conditions it can make sense for public authorities to exchange land assets for infrastructure assets. They do this by selling or leasing publicly owned land and using the proceeds to finance infrastructure investment. Rather than using land-based financing instruments to finance individual investment projects, public entities undertake a strategic examination of their balance sheets and decide to exchange underused or vacant land for infrastructure.

Several of the transactions summarized in table 1 are of this type. As can be seen, urban land sales have the potential to generate substantial revenues. At the same time the sale of valuable,

**Land-based financing also comes with important risks**

vacant land parcels accelerates private investment in locations that are critical to urban development. As important as the revenue yield is the policy rationale underlying the transactions: that municipal governments and infrastructure agencies should adopt more strategic methods of land asset management. A critical element of this approach is to divest noncore land assets so that government can concentrate its financial resources and management attention on core infrastructure responsibilities. The sale of government-owned land has the added advantage of steering private investment to areas where it is most productive and filling in gaps in the urban development pattern.



## Risks of land-based financing

There are important risks associated with land-based financing of infrastructure. Three risks in particular deserve emphasis:

- *Urban land markets are volatile, and recent transactions may reflect a land asset bubble.* Urban land prices in developing countries cannot steadily increase by 20–30 percent a year. So it is critical that proceeds from land sales or other forms of land-based financing be used for infrastructure investment and not be allowed to trickle over to the operating budget, where current spending can become dependent on unrealistic expectations of future land price increases.
- *Land sales often lack transparency and accountability.* Many land sales are conducted off-budget through private negotiation. Studies have shown that competitive auctions can greatly enhance revenues—in some cases increasing the realized land price per square meter by a factor of 10 or more. Equally important is transparent public accounting for the use of revenues. Otherwise the large sums produced by land sales invite corruption or bureaucratic capture by the agency that has legal title to the land.

- *Government authorities may be tempted to use restrictive zoning to drive up land values or abuse developer exactions when strapped financially.* Such practices can harm the local economy, raise real estate

prices unduly, and distort urban development patterns.

## Conclusion

Land-based financing offers powerful tools that can help pay for urban infrastructure investment. For an urban region considering this strategy, a logical place to start is with an inventory of land assets owned by government agencies. Such an inventory would identify current land use and the market value of land. The government can then decide which land parcels would be more beneficial to urban development if sold to private developers, with the proceeds dedicated to infrastructure investment. Where such inventories have been carried out, the government typically discovers that public agencies own far more undeveloped land than it had realized.

Next, public officials should address the potential for developer exactions and related fees. Preliminary analyses for Mumbai, India, for example, have concluded that if Mumbai is to finance its ambitious long-term development plan, developer fees or similar new, land-based financing techniques will have to generate more than \$10 billion to finance infrastructure investment. Developers are receptive to such charges (which will be passed on to buyers) as long as they help streamline the process for development approval.

Value capture then can fill in specific gaps in the infrastructure financing plan. A generalized approach to betterment fees, such as that used in Bogotá, becomes politically acceptable when a majority of the population believes that the benefits of infrastructure improvements outweigh the tax costs. This has been true most frequently of road improvements and other transport projects with highly visible payoffs.

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