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Infrastructure Finance

Volume 3:

Roundtable on Urban
Infrastructure Financing

March 1991

OFFICE OF

HOUSING AND URBAN

PROGRAMS

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The third volume of this report , "Roundtable on Urban Infrastructure Financing," summarizes the presentations and discussion of the roundtable held in Washington, D.C. Ma March 20, 1991. The eleven participanta' comments on the topics of mabilizing and alloca allocating capital for urban infrastructure, and cost recovery strategies and applications are highlighted in this 15-page report.

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Volume 3:

Infrastructure Finance: Roundtable on Urban Infrastructure Financing

March 1991

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ABSTRACT

This three-volume report on Infrastructure Finance is a comprehensive look at issues surrounding the financing of urban infrastructure in less developed countries.

"Volume I: Financing Urban Infrastructure in Less Developed Countries," discusses the public roles in infrastructure finance and examines the gap between funds available for financing infrastructure and the level required to adequately serve urban needs. Currently-utilized options for financing infrastructure are outlined, including self-financing through user charges, capping land values, and borrowing and financing through local government. The special issues of private sector financing of infrastructure and protecting the poor are also explored.

"Volume II: Institutional and Macroeconomic Issues," explores the macroeconomic issues associated with infrastructure finance. This volume also identifies some of the critical issues surrounding capital investment planning and budgeting, and defines a range of possible cost reduction strategies while examining the impacts of each. The final chapter of this volume addresses the use of private capital to finance infrastructure.

The third volume of this report, "Roundtable on Urban Infrastructure Financing," summarizes the presentations and discussion of the roundtable held in Washington, D.C. March 20, 1991. The eleven participants' comments on the topics of mobilizing and allocating capital for urban infrastructure, and cost recovery strategies and applications are highlighted in this 15-page report.

**ROUNDTABLE
URBAN INFRASTRUCTURE FINANCING**

Wednesday, March 20, 1991
Room 1408 New State

INTRODUCTIONS

9:30 A.M.

- **Introduction**

Peter Kimm
Director, Office of Housing and Urban Programs, A.I.D.

- **Opening Remarks**

- **Objectives of the Roundtable**

Sonia Hammam
Assistant Director, Urban Policy and Programs Division
Office of Housing and Urban Programs, A.I.D.

URBAN INFRASTRUCTURE FINANCE: WHAT ARE THE ISSUES?

- George Peterson
Senior Fellow, The Urban Institute

MOBILIZING AND ALLOCATING CAPITAL FOR URBAN INFRASTRUCTURE **10:00 A.M.**

- **Municipal Credit Institutions--Have They Worked**

William Dillinger
World Bank, Urban Development Division

- **Financing Informal Settlement Upgrading**

Mona Serageldin
Associate Director, Housing and Urbanization
Harvard Graduate School of Design

- **Discussion**

- **Reforming the Capital Grants Structure**

Larry Schroeder
Director, Metropolitan Studies Program
Syracuse University

- **Privatization as a Strategy of Capital Financing**

William Reinhardt
Editor, *Public Works Financing*

- **Discussion**

LUNCH

12:15 P.M.

COST RECOVERY: STRATEGIES AND APPLICATION

1:15 P.M.

- **Consumer Willingness to Pay and Charges for Water Services**
Dale Whittington
Department of Urban and Regional Planning
University of North Carolina
- **User Pricing and Other Cost Recovery Strategies for Roads**
Jeffrey Gutman, Division Chief
Transport Division, Policy and Research
World Bank
- **Discussion**
- **Tapping Urban Land Values and Land Appreciation for Capital Finance**
David Dowall
City and Regional Planning
University of California, Berkeley
- **Financing Municipal Services: Privatization Experience**
Andy Cao
Director, International Privatization
Price, Waterhouse
- **Discussion**
- **Concluding Remarks**
Sonia Hammam
Assistant Director, Urban Policy and Programs Division
Office of Housing and Urban Programs, A.I.D.

ADJOURN

3:30 P.M.

NOTE: Summary papers are available upon request for the presentations by Serageldin, Reinhardt, and Cao. For the other presenters, background papers by the authors were distributed at the roundtable and are available upon request.

**SUMMARY OF DISCUSSION AT
INFRASTRUCTURE CONFERENCE:
IDEAS FOR NEXT STEPS**

Prepared by George E. Peterson

The main message from the Conference was that "infrastructure finance" involves much more than identifying revenue-generating techniques which, if implemented, could finance infrastructure projects. Rather, the principal challenges are:

1. To design financing strategies that reinforce program goals, by providing the right incentives for individual and collective choice.
2. To design financing strategies that can actually be implemented. This requires recognizing the full local context--including the institutional setting, local public service and financing traditions, local market realities, and the reasons for past financing failures.
3. To design project financing strategies that can be generalized to other locations and other investments, so that financing policy throughout an entire sector is consistent. Financing strategies also need to be consistent with national macroeconomic management.

This perspective implies logical next steps for the Office of Housing, if it is to further develop the area of infrastructure finance. What is needed is a series of sectoral "manuals" that provide guidance on how to select an infrastructure financing strategy for different types of projects within the sector, taking into account the local institutions and market setting. These manuals would not attempt to prescribe a financing strategy *a priori*, but would show how such a choice should be made, and how to obtain and analyze the information needed to select a strategy. Each manual would also contain a number of case studies of successful and unsuccessful financing applications, presented with sufficient institutional discussion to understand why the applications succeeded or failed. Each manual might be structured as follows:

- I. Basic Theory of Infrastructure Finance for (Sector)
- II. Matching the Finance Strategy to Program Objectives
- III. Institutional Setting and Implementation (built around case studies)
- IV. A Practical Agenda for Designing a Financing Strategy

One series of manuals would approach these questions sector by sector; another series would look at types of financing approaches, cutting across sectors. An example of the first type would be "Urban Water Supply." An example of the second type would be "Municipal Credit Systems: What Works and What Does not Work?"

SUMMARY OF PRESENTATIONS AND DISCUSSION

William Dillinger of the World Bank assessed the role of *municipal credit institutions (MCIs) or municipal development banks*. These institutions have been set up to channel greater amounts of borrowed funds to local governments to finance infrastructure investment. Some 38 national institutions of this type have been identified by the Bank; given the recent rate of growth, this total probably significantly underestimates the actual number now in existence.

The theory behind MCIs is that they will help substitute lending for central government capital grants, thereby stretching central funds to support more projects. Lending also confronts local governments with the approximate cost of capital, inducing them to make more efficient project selection. As independent or quasi-independent institutions, the MCIs are intended to reduce the political element of capital finance and provide a more responsive administration than is possible with loan funds directly administered by government agencies. Finally, it frequently is hoped that MCIs will tap private sector savings, and serve as an intermediary between private capital markets and local government investment.

Have the MCIs succeeded?

1. By and large, they have worked fairly well as disbursement agents for international donors. They provide a convenient institutional setting for receiving and relending international funds.

2. In terms of project selection, many of the MCIs appear to have increased the quality of project assessment and fund allocation. The Jordan Cities and Villages Development Bank and the Calcutta Metropolitan Development Authority lending programs, for example, have improved project appraisal procedures, and appear to have increased the average rate of return to local capital projects.

3. The broader objectives of MCIs have not been achieved.

--There are no examples in the developing world of MCIs tapping significant amounts of private capital on market terms or near market terms, even when there are special guarantees. Indeed, most of the funding comes from donor programs.

--The record of debt repayment is extremely poor in all MCIs. As a result, to stay afloat they have to receive regular injections of new capital from Government or external donors. These can occur either directly, in the form of capital contributions, or indirectly by having the Government assume the responsibility for repaying municipal debts.

--The MCIs very rarely have spread beyond their particular project financing to affect the way capital allocation decisions are made in other parts of a sector, financed from Government's own funds.

What accounts for the failure to achieve the broader objectives? Some perspective can be gained by comparing LDC experience with that in Europe, where municipal credit institutions have been a successful part of the credit system for more than 100 years.

1. In most LDCs, the municipal credit institution does not enjoy practical autonomy in management and institutional organization, as it does in Europe. This means that the MCIs end up serving the same political purposes as other types of central government infrastructure financing. This risk can be reduced by having a separate legal basis for the MCI, as well as an independent Board of Directors representing a broad range of interests (municipalities, pension funds, private banks, as well as central government.)

2. The MCIs in developing countries do not have a clear commercial mandate--i.e., there is no sense that they must survive on their own commercial operations. The risks in lending are not clearly assigned, and ultimately still fall to central government. Among other consequences, this makes access to private sector financing almost impossible--since there is no tradition of commercial repayment.

3. Very few projects are rejected because of commercial infeasibility or because of a municipality's failure to repay past loans. MCIs are under government, local and international donor pressure to disburse funds. In Kenya, for example, the Local Government Loans Board keeps "lending" money to local authorities under World Bank financing, even though repayment of past loans has been minuscule.

4. Local governments often do not have the authority to adjust local fees or tax rates. Therefore, they do not have control over the resources necessary for repayment, even when they take their debt obligations seriously.

Upgrading

Mona Serageldin examined the financing of integrated settlement upgrading packages, based on her review of a large number of such projects in different parts of the developing world.

The typical upgrading project earned high rates of return--in the range of 20 to 30%. These returns were markedly higher than those generated by sites and services projects. On average, upgrading projects used about 40 percent of their funds for infrastructure. The rest was used for housing credits, land acquisition, community institutions, etc. Of the infrastructure portion, 40-50 percent involved foreign exchange for purchases of equipment, materials, and expertise from abroad.

Most projects are designed to achieve full cost recovery for on-site (household and neighborhood specific) costs. Off-site costs (system-wide investments or area infrastructure) are not subject to cost recovery. On average, some 50-65 percent of project costs are designed for cost recovery. In reality, however, an average of only 10-30 percent of this amount is

actually recovered in practice. The cost recovery record is much worse than in sites and services projects, despite higher economic returns.

Settlement upgrading projects have had a history of extreme cost and time overruns, largely because of the complexities of overlapping institutional responsibilities, land ownership and tenure, and a tendency to underestimate the costs of off-site infrastructure needed to accommodate neighborhood upgrading.

Why is the cost recovery record so poor? Primarily, because of residents' perceptions of *equity*. In Jordan, for example, only 5 percent of nonpayers gave "high costs" as the reason they did not pay. The principal reason was that other neighborhoods in similar circumstances did not have to pay for improvements, so why should they? In the Philippines, cost recovery came in at 40 percent, less than half the level projected. Poor collection performance accounted for most of the shortfall. Again, perceptions of inequity in payment requirements between neighborhoods was the principal reason for nonpayment. This emphasizes the importance of introducing uniform cost recovery practices throughout a sector.

What are the main options besides user fees for financing settlement upgrading projects in the future?

1. One possibility is to dispense with cost recovery altogether. In the Jakarta kampung improvement program, there has been no attempt at local cost recovery. This has made it easier to target on the poor. Residents make their contribution by accepting lower and less expensive infrastructure standards. These serve as a "minimum entitlement" which neighborhoods have a right to without additional charges. The upgrading projects are financed out of general Government funds; one disadvantage of this approach is that activity fluctuates in line with available budgetary resources.

2. An alternative is to look to the general tax system for indirect recovery. Where projects add to property values, cost recovery can occur through general property taxes as well as specially designed instruments for capturing land appreciation. The problem here is that land registration and fiscal cadastres are so poor that the scope for cost recovery is limited. Moreover, the effective property tax rate generally is extremely low.

3. Neighborhood upgrading usually has a high payoff for private business investment. One of the most dramatic impacts is on small business activity. An upgrading strategy can take advantage of this, by using business payoff as one of the criteria in selecting projects, and by using business taxes or fees as a source of cost recovery income.

4. Sites and services projects have better cost recovery records because infrastructure costs get built into the cost of land or housing and the whole bundle is sold to a purchaser. Where the public sector owns land in upgrading areas, the increase in parcel values can be used to recover part of the costs.

The trade-off between targeting to the poor and needy, on the one hand, and good cost recovery performance, on the other, has to be recognized. A program that requires substantial cost recovery has to be targeted to areas where the rates of return are highest, and where there is the potential for business activity. These can still be relatively low-income neighborhoods but usually not those where need is the greatest.

Capital Grants

Most of local capital financing now comes from central government transfers, and is likely to continue to do so over the foreseeable future. Thus it becomes critical to rationalize the grant structure insofar as possible. Larry Schroeder addressed these issues.

In local public choice models, it is desirable to have local governments raise revenues on their own from local sources so that they feel the tax costs of their expenditures. However, given the limitations of personnel and institutions, there may be only one level of government--the central government--that is credible as a tax collector. In this case, it makes sense to have the central government collect revenues and return them to the local level through a grant-in-aid system.

In addition to this "tax administration" argument for grants, there can be incentive reasons for grants (i.e., the central government may want to provide fiscal incentives for certain kinds of local activities) as well as equalization reasons (i.e., society may want to reduce the inequalities between local governments in taxable resources).

Every grant system has to deal with three basic issues: what mechanism will be used to establish the size of the grant pool; how will the total amount of grants be allocated among jurisdictions; and to what extent will grants be tied to certain uses of funds by recipients. There is a constant trade-off between efficiency criteria of allocation, where funds are allocated to jurisdictions that reach certain performance standards or are allocated in ways intended to establish incentives for efficiency, and equity criteria, where grants either are allocated in proportion to need or used to fill fiscal deficits.

A number of developing countries now use tied capital grants. That is, the grants must be used for capital investment purposes. These can either be structured as capital block grants, where use of the funds is discretionary as long as they are employed in capital financing, or as grants that subsidize the cost of certain types of capital projects. There is a good deal of empirical literature on the effect of tied capital grants. Although the findings differ from one country to another, there always is some degree of substitutability. That is, nominal requirements to use all of a grant for capital purposes can be subverted by the recipient through the simple procedure of cutting back own-source funding. In some cases, substitution has been found to be 100%. The addition of new capital transfers in these cases results in no net increase in local capital spending; the full amount of the grant is offset by reduced spending from own resources.

Privatization

William Reinhardt and Andy Cao considered the potential for privatization in infrastructure investment and finance. There are two principal motivations for privatization. First, most developing countries find themselves unable to finance all the investment that the country "needs" and that citizens or firms are willing to pay for. Privatization is a means of tapping the greater pool of private capital to help finance this investment. Secondly, privatization can be a strategy for improving cost efficiency in service provision. Private provision of services or capital financing may promote efficiency at any of the various stages of infrastructure management: construction, operations and maintenance, pricing reforms, revenue collection, or investment planning.

Reinhardt examined developing country use of Build-Operate-Transfer (BOT) systems, drawing particularly upon the experience of Malaysia. Since 1984, Malaysia has built a number of key road projects through BOT. These range from a Malaysian \$2.5 billion private investment in the North-South Highway (running from Thailand to Singapore) to a series of road projects in Kuala Lumpur, each involving some M\$100 million of investment costs. The magnitude and speed of road construction would have been impossible to achieve through the public sector alone.

What accounts for Malaysia's successful use of BOT, and what lessons are there for application elsewhere?

(1) BOT was introduced at a time of strong recession (by Malaysian standards). The boost to economic activity blunted political and bureaucratic opposition.

(2) There has been great flexibility in the way Government uses BOT. In some projects, the prospects for fee revenues are high enough that no type of guarantee or subsidy is required from the public sector. In other projects, certain links in the road system have low projected returns. The Government has been willing to offer (fixed) subsidies for these parts of the system, in order to enhance returns.

(3) The Government has made progressively greater use of competition to keep down costs. Initially, the priority was to draw private capital into the field. Thus, the Government originally granted 6-month monopoly negotiating rights to developers that submitted proposals for private financing of publicly needed infrastructure projects. During this time, the Government and development consortium hammered out details of a contract without competitive bidding. Once BOT was established as an acceptable practice, the Government introduced competitive bidding on all projects from the beginning. It has used many variants of competition. For example, in one case, the type of road to be built was fully specified by Government, including the road's dimensions and the construction materials to be used. The tolls to be charged were also specified. Competition was along a single dimension: the length of the franchise period for the operator before the facility was turned over to Government.

(4) Malaysia's strong currency has helped make international private financing feasible. Much of the capital involved in these projects has been provided by international banks and development consortia, particularly from Japan. All of the revenues generated are in local currency. The ability of the project to pay off international (private sector) loans and provide a competitive return to internationally provided equity depends upon the stability of the local currency.

As one surveys the BOT field internationally, it is clear that there are a limited number of sources of international capital for these projects. Principal among these are large European and Japanese banks and development consortia, which are more accustomed to being partners with the public sector in projects than are U.S. banks. These banks not only are financing BOT projects in developing countries but are financing the principal road privatization projects in the United States, including the initial BOT projects being sponsored by the State of California, the circumferential highway proposed for private financing in Denver, and the Dulles extension road in Northern Virginia. In effect, there is a single worldwide market in which projects must compete with one another for private financing, regardless of nationality. International capital usually is critical to projects, especially for a country's initial efforts in privatization. However, it can be supplemented substantially by private capital raised on domestic markets. In fact, one of the great payoffs to privatization, because of the scale of projects involved, is the expansion of the private domestic capital market. In Thailand, financing of the second Bangkok beltway is the largest capital project ever undertaken by the private sector, and has led to multiple new capital instruments.

One problem common to many attempts at privatization is the long-term horizon of public works investments. In Indonesia, for example, the Government has been exploring private investment in urban water supply and distribution systems. These projects typically have a minimum 30-year planning life over which cost recovery would take place. In contrast, financial instruments in Indonesia rarely extend longer than 7 years. To develop private financing alternatives will require developing long-term financing instruments, shifting the perspective of private capital holders to the long term, and attempting to define protections against the political risk that can materialize over such a long planning horizon. Given the rates of return available to less risky, shorter investments, this will be a formidable task.

Cao pointed to different types of options for privatization in infrastructure services. These ranged from partial privatization, such as contracting out for maintenance or other specialized services, to privatization of specialized hospital services, where private suppliers absorb both investment and operating costs. The advantages of privatization lie not merely in the transfer from public to private operation, but in the cost efficiencies that can be gained by competition for franchise rights. Privatization often also makes it easier to reform pricing systems that are in need of change. That is, a private investor will commit capital only if he is free to set prices appropriate to market conditions or guaranteed a regulated price that recovers the cost of capital. To attract private capital, public authorities often are willing to revise

pricing regulations in ways that make them much more efficient, but which they would be unwilling to do if the services remained vested in traditional public agencies.

Estimating Willingness to Pay and Using It in Investment Choices

Dale Whittington examined the willingness to pay for sanitary waste removal; the types of survey and analytical approaches that can uncover this information; and their use in infrastructure planning. For illustrative purposes, he analyzed sanitary waste collection and disposal in Kumasi, Ghana, a city of some 600,000 population.

At present, about 40% of the population use public latrines. Users pay 1 cent per visit, but must wait in queue for 15-20 minutes. The latrines for the most part are kept in abysmal conditions. They are emptied by hand by buckets into side-loading trucks. Health hazards are extreme. However, the public latrines are money makers for the public sector. Only about half the funds collected go to pay for latrine managers, operations and maintenance of the latrines, and toward financing of the desludging trucks. The remainder is contributed as "profit" to the Committees for the Defense of the Revolution.

Another 25% of the population use bucket latrines at home. Wastes from these latrines are collected by private cleaners or conservancy workers. Health risks here are also large, with the difference that the unattractive aspects of the latrine are localized at the home.

About 25% of the population are connected to the public sewer system, and their wastes collected through a piped system. The remainder of the population (10%) use traditional pit latrines or the bush.

The team used contingent valuation surveys to get households to reveal their willingness to pay for different types of solutions. They found, first, that even at the same cost to households people did not have a preference for the most costly solution, a full sewer system. In fact, preferences were split about 50/50 between improved pit latrines and sewer connections. Sewer collection was seen to be more convenient, but households expressed concern about higher water bills, fear that the toilets would break, and were suspicious of the unreliability of the water distribution system.

Households were willing to pay an average of about \$1.50 per month for a ventilated improved pit latrine, and somewhat less for connection to the public sewer system. The willingness to pay for an improved pit latrine was 20-30% greater than the average payments of the same households for public latrines. This willingness to pay was not sufficient to cover the full costs of any of the alternative sanitary solutions. However, while only 5-10% of the costs of a public sewer system could be recovered, some two-thirds of the cost of improved pit latrines could be recovered.

The distribution of the willingness to pay creates a series of public choices. Coverage rates and the corresponding health benefits must be traded off against subsidy costs. For example,

at a subsidy cost of \$100 per household, essentially every household using bucket latrines would switch to the VIP system. At a subsidy cost of \$150 per household, a significant number of users of the public latrine system would also switch. At a subsidy cost of \$200 per household, nearly all households not on the sewer system would change.

Another way of looking at the public options is in terms of total cost. In return for a one-time subsidy of \$1 million, all households now using bucket latrines could be converted to the VIP system. At \$ 4 million, everyone is converted. In contrast, it would cost roughly \$100 million to build a standard sewer system.

This survey and others like it reveal that most rules of thumb about household willingness to pay are erroneous and overstate actual willingness to pay. For example, the World Bank has assumed that households will pay 3-5% of household income for sanitary waste removal, but the contingent valuation surveys in Kumasi reveal a willingness to pay of half this level. In African villages, households have been found to be willing to pay well under half the amount the common rule of thumb says households should be willing to pay for potable piped water supply, 5% of household income. This was true in part because during half the year households could rely on catching rainwater. Deductions about willingness to pay for piped water supply, based on the cost of water sold from trucks, also overstate households' actual willingness to pay. Although the cost per unit of water delivered is much higher in the case of tanker trucks, households value the flexibility that tanker sales provide them. When water can be collected free from rainfall, households do so; when household budgets run short, water purchases can be cut back. In contrast, a public water system usually involves a relatively fixed charge that households must pay regardless of need.

The capital investment system is not always well positioned to take advantage of cost-effective alternative solutions. In the case of Kumasi, both the mayor and the World Bank originally favored a full sewer system. As the costs of this solution became clear, however, the mayor was quicker to re-orient his thinking to lower-cost solutions than the Bank. A program to install VIP latrines at a cost of \$1 to \$4 million in public subsidy was seen as too small-scale to be administered efficiently by the Bank.

In terms of methodology, experience shows that households take the contingent valuation surveys seriously and give generally reliable information, as long as the research team does careful preparation in understanding the current system and its institutional setting. Economists have tended to be skeptical of household expressions of willingness to pay, because of the motivation to under-report, given households' fear that they will be actually required to pay the amount they identify. This phenomenon is present, but follow-up studies reveal it to be less severe than frequently assumed.

User Pricing and Other Issues Associated with Road Investment

Jeffrey Gutman reported on the draft policy paper on Road Pricing and Road Investment that the World Bank has prepared.

At the heart of controversy over road pricing is the trade-off between allocative efficiency and financial cost recovery. To achieve allocative efficiency, roads should be priced according to short-run marginal costs (SRMC). There are two types of costs imposed by road usage: surface damage to the road from the wear and tear of vehicle use, and congestion costs. For congested networks, when users are charged according to these two SRMCs, there generally is enough revenue generated to fully finance the economically optimal level of capital investment in roads. That is, allocatively efficient pricing also allows for full financial cost recovery, and sometimes can generate a surplus to help defray other costs of government.

Conflict arises when the road network is not congested. Then, the allocatively optimal level of congestion pricing is zero. That is, there should be no user fees charged, because these will discourage use of a productive facility that has excess capacity. Without congestion charges, however, the revenue generated by user fees will not cover the cost of desirable road investment. Therefore, a system that is dependent on user fees for road financing will have too little investment and repair. Traditionally, economists have emphasized SRMCs and allocative efficiency in their analysis, while budget and institutional analysts have emphasized the importance of having the road system generate enough revenue to be self-sustaining.

Road user charges are potentially an important part of fiscal resource mobilization more generally. On average in the developing world, road user charges account for 10-12 percent of total government revenues. This percentage could be considerably higher. In Jakarta, for example, 65% of public revenues are raised through road user fees or vehicle taxes. Some analysts have argued that other countries should increase their reliance on this revenue source: vehicles are easily identified and relatively easy to tax, they are owned primarily by the wealthy, and well-designed taxes can have environmental and other benefits.

The options for charging are:

- Fuel taxes. These account for 55-75% of total road user revenues, but are still significantly lower than in Europe.
- Registration fees
- Mass-distance taxes (primarily for trucks)
- Road/bridge specific tolls
- Network tolls

The main difficulty with placing heavier taxes on fuels involves diesel fuel and kerosene. These are used in manufacturing and for household consumption, as well as for vehicles. Thus, attempts to tax vehicle fuel use can distort household and manufacturing choices and sometimes place extra burdens on low income households.

No LDCs have attempted to impose mass/distance taxes. These are theoretically important instruments, since road deterioration increases exponentially with the axle weight of

trucks. However, sophisticated systems are needed to administer them. In New Zealand, truck operators have to buy a continuing license to use a truck of a certain weight for a certain distance. "Hubometers" are used to measure use against the licensed authorization.

The Bank historically has discouraged use of road or bridge specific tolls. These are thought to encourage diversion of traffic to unpriced, free alternatives, when it is economically more efficient to use the new facility. There are also many cases where the high collection costs make tolls administratively inefficient. Toll can help foster a sense of accountability, however, with consumers and Government demanding better maintenance of systems that are supported by toll charges.

The Bank's position on earmarking has evolved over the years. It is clear that earmarking is not a universal solution. Earmarked funds in practice are not as independent as they may seem. When general budget resources deteriorate, governments usually can find ways to divert funds from earmarked sources to the general budget. Earmarked funds frequently outlive their original programmatic purpose, generating revenues that are then used inefficiently because they are protected from competing expenditure claims.

Nonetheless, earmarking can help make road charges more like a benefit tax, to ensure that fees from road use are reinvested in the road system. This institutional approach can help support accountability. The Bank now believes that the strengthening of accountability systems--strengthening road user organizations, requiring road departments or parastatals to submit performance reports to Government--is key to sustainable improvement in road facilities. Imposing specific charges for road use and earmarking funds for maintenance and reinvestment can be effective devices for strengthening accountability.

The Bank's position on road construction standards also has evolved over the years. It now believes that, despite the higher initial capital costs, it is cost-effective to build roads to higher physical standards. In part, this strategy protects against poor maintenance practices. It also avoids the cost of replacing low-standard roads with higher-standard construction as traffic use increases. A commitment to higher-standard construction, however, means that some road surfacing should be delayed. That is, it becomes allocatively efficient to continue to use dirt roads for a longer period of time, until investment in higher-quality improved roads is justified.

Tapping Land Values and Land-Value Appreciation for Capital Finance

David Dowall looked at land price appreciation as a source of capital finance. Land values in the urban areas of LDCs are generally increasing at a rapid rate. Moreover, a good part of this capital appreciation is directly attributable to public infrastructure investment. Therefore, it would seem to be both equitable and feasible to capture part of the increase in land values for the public sector, and use the revenue to finance part of the infrastructure budget.

A practical impediment to this approach has been the absence of information on land values in many developing countries. Dowall's work demonstrates that basic information on land prices can be accumulated at modest cost.

Some of the advantages to benefit assessments based on land appreciation are:

- They can provide a guide to beneficiaries' demand for capital facilities, and restrain uneconomic demands**
- They broaden the revenue base**
- They encourage efficient land development**
- They can discourage land speculation, by increasing the carrying costs of undeveloped land benefited by public investment**

Land charges can be imposed either on a cost basis or a benefit basis. With a cost-based system, landowners split the cost of infrastructure facilities, with each owner paying in proportion to frontage or some other principle. With a benefit-based system, landowners pay in proportion to the benefits they receive, usually estimated in relation to the increase in parcel value of property. The total amount of revenue raised may be more or less than the cost of the infrastructure facility

These land assessments are best suited for financing roads, bridges, drainage, and other improvements with clear location-specific payoffs.

Empirical studies in many countries show that land values increase by more than the full cost of infrastructure facilities when these are installed. For example, in Jakarta a standard package of infrastructure improvements increased land prices by about \$32 per sq. meter or \$4,000 per average-sized plot. Total land value appreciation exceeded total infrastructure investment costs. Paved roads and electricity were the most valued improvements.

Despite the sound economic basis for greater reliance on land value recapture in infrastructure finance, no countries seem to be moving in this direction. No country has recently adopted a strong benefit assessment system. Countries that traditionally have used the mechanism, like Colombia and the countries of Central America, have seen its importance diminish in recent years.