

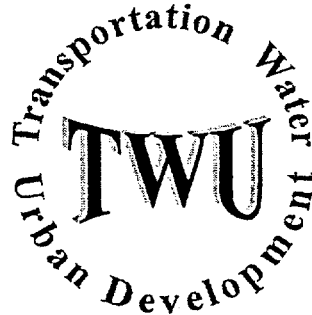
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Road Funds, User Charges and Taxes

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ABSTRACT

(i) The purpose of this paper is to examine the role of non-budget funding arrangements for public road systems. In particular it considers when a Road Fund might be an appropriate instrument, what activities it should be responsible for, what revenue sources it should employ and what is the appropriate institutional structure to reconcile conflicting micro and macro management objectives.

(ii) The major conclusions of the report are as follows:

- ◆ The desirability of establishing a Road Fund depends on the balance between any adverse effect on macroeconomic control and the micro-economic effects on the efficiency of resource allocation to maintenance activities and the efficiency of service supply.
- ◆ That balance should be determined in the context of specific national circumstances and can be informed by reference to a small number of key quantitative indicators, including the proportion of total tax revenue derived from road user taxes and the benefit/cost ratio on expanded maintenance funding.
- ◆ Introduction of user charges or “quasi-prices” as the financial basis of a Road Fund should be assessed in the light of its contribution to the establishment of either better government budgetary and service supply arrangements or a fully commercialized road system.
- ◆ Simple “earmarking of general taxes” should always be viewed as an interim step towards the ultimate solution and subject to periodic review or sunset clauses.
- ◆ “Second generation Road Funds” can satisfy both macro and micro efficiency objectives where they are provided with a strong legal basis, an independent executive authority, user representative management, and expert administrative support to secure efficient resource allocation and operational performance.
- ◆ The more complex the relevant stakeholder interests (including environmental and distributional issues) the broader the necessary representation on a Roads Board and hence the more likely the reintroduction of traditional political considerations in fund management.
- ◆ More needs to be known both about the efficacy, stability and durability of second generation Road Funds before final, categorical, judgment can be made on their proper use and limitations. For this reason it is critical that design of projects incorporating Road Fund components provide for monitoring of institutional effectiveness.

ROAD FUNDS, ROAD USER CHARGES AND TAXES

THE ISSUE

1. Road expenditures fall into five general categories: construction, rehabilitation, periodic maintenance, routine maintenance and operational management. The first two can be classified as capital expenditures and financed through *borrowing* which is discussed in this note. The last three can be classified as current expenditures and financed in a number of ways: *General taxes* are collected by one set of government departments (Treasury, Internal Affairs, Customs and Excise, Energy) and distributed through the budgetary process to another set of government departments (Transport, Public Works, Local Government) for spending purposes. *Earmarked taxes* are general or special taxes committed to support, or fully fund, pre-specified expenditure items. *Tolls* are direct charges for using roads and can affect economic behavior in the same manner as the price of a commodity. *User charges* (or *Quasi prices* are 'indirect' charges for using roads. They are often levied as fees on proxy transactions, such as commodities associated with the use of publicly provided infrastructure. The choice of proxy will vary with the type of the infrastructure. *The more indirect the relationship between the good subjected to charges and the behavior to be influenced, whether of suppliers or consumers, the more the 'user charge' functions as a 'tax' rather than a 'price'.*

2. A *Road Fund* is an institutional device through which a selected stream of revenues is put at the disposal of a government road department or agency without being subjected to general budget procedures and reviews. Many such funds were poorly designed in the past and abolished because they did not deliver a stable flow of funds or acceptable financial management. Recently, however, several new Road Funds have been established in Africa¹ and are being considered for countries as diverse as El Salvador, Guatemala, Jordan, Lebanon and Pakistan. These so-called "second generation Road Funds" are characterized by being funded by levies or surcharges designated as 'user charges' and identified separately from general taxation. These revenues are paid directly into a Fund managed by a Road Board whose membership is 'representative' of users. The Board determines both the level of charges and the allocation of expenditures. *The relationship between expenditure responsibilities and funding arrangements for the Road Fund and that portion of the public road system (secondary, urban, or rural) which falls outside the purview of the Road Fund remains a matter of contention.*

3. In a macro or fiscal crisis, extra budgetary arrangements limit macro flexibility and stabilization thereby leading to inefficient allocation of resources. In a sectoral maintenance crisis, when orderly planning and execution of maintenance is undermined through insufficient and uncertain budgetary allocations, sector-specific assets can deteriorate to the point that national or local production and distribution becomes unnecessarily inefficient and costly. *The critical issue is*

¹. Heggie, I.,. *Management and financing of roads: an agenda for reform*. World Bank technical paper 275. World Bank. Washington D.C. 1995.

the need to reconcile macro and micro efficiency considerations and develop criteria for evaluating trade-offs. This note sets out some general principles for determining when a Road Fund might be an appropriate instrument, what activities it should be responsible for, and what revenue sources it should employ. The more detailed design of Road Funds and associated institutions is dealt with in a separate note.

THE CONSIDERATIONS—A SYNOPSIS OF THE CONTENDING VIEWS ON ROAD FUNDS

4. In an ideal world, where government and budgetary systems are functioning well there is no need for 'off-budget' financing or 'earmarking'. Many European countries provide and maintain roads well without earmarking. At the other extreme, where governance is bad and the government lacks 'self discipline', Road Funds cannot guarantee that the assigned revenue streams will not be raided, or that expenditures will not be misallocated.² Wherever the government retains control over the level of the user charges or over the allocation of complementary funds the total level of funding may be just as vulnerable with a Road Fund as without one. In Colombia, for example, although the 'earmarked funds' for the National Road Fund grew at the same rate as GDP, total funding for roads grew more slowly than GDP and the road network continued to deteriorate unintentionally..³

5. In the real world, many situations fall between these extremes of good and bad governance, so that assigning some revenues and expenditure responsibilities to a Road Fund may actually make some difference. It is in these circumstances that the balance between the macro and micro level arguments becomes critical.

6. The Bank has traditionally opposed Road Funds, primarily on macroeconomic grounds.⁴ Road Funds are usually associated with earmarking of taxation (particularly fuel taxes), which is seen as infringing on the policy making powers of state executives and legislatures and reducing the leverage and flexibility of central governments in managing *macro policy* or reallocating resources in light of changing national priorities. Even *within* the transport sector proponents of competing modes

² An early study of 37 developing countries, over the period 1955-65 showed a positive correlation between earmarked taxes as a proportion of gross investment, and road expenditure as a proportion of gross investment, supporting a tentative conclusion that there is a positive relationship and a likely causality between the amount earmarked and the amount spent on roads. However, the differences in the cross section analysis were not statistically significant. See Eklund, P., "Earmarking of Taxes for Highways in Developing Countries" *Economics Department Working Paper No.1*. I.B.R.D. June, 1967.

³ Dick, M.C., "Earmarking of Transport Funds in Colombia" in *Earmarking, Road Funds and Toll Roads A World Bank Symposium*. Report INU 45. June, 1989.

⁴ See *Road Funds from Earmarked Sources: Interim Guidelines* World Bank. Transportation Note 1. May, 1986.

⁵ Deran, E., "Earmarking and Expenditures: A Survey and a New Test" *National Tax Journal* December, 1965. pp 354-361.

of transportation see the preferential access of Road Funds to lucrative revenue sources (such as gasoline taxes) as blocking the development of a more balanced multi-modal transport system.

7. The support for Road Funds is primarily microeconomic. It can compensate for political or administrative myopia and ensure the allocation of resources to a low profile economic activity with particularly high rates of return. In addition, significant operational efficiency gains can be reaped by overcoming uncertainty in the level and timing of funding, thereby creating a stable and skilled subcontracting industry with appropriate incentives for efficient execution.

8. At the heart of the problem was the fact that traditional earmarking arrangements did not correctly address incentive and governance issues. Earmarked revenue streams were not determined by charges more closely and explicitly linked to the level of road use (i.e. 'Road user charges').⁶ For this reason there were no market signals about the appropriate level of provision associated with the resulting stream of revenue in the same way as there are in the case of deregulated rail or airline tariffs. This undermined the link within the Road Fund between decisions on how to set charges and the priorities for spending. While the combination of public scrutiny and periodic monitoring by a competent central bureaucracy may be some defense against this problem in developed countries, it is less likely to be the case in developing countries.

9. In principle the criterion for the choice of administrative form should be efficiency in achieving the objectives of the state. This raises questions both concerning how the objectives of the state can be operationally defined and how effectively alternative arrangements satisfy these objectives. We distinguish between three types of problems that affect efficiency. The problem of *macroeconomic control* concerns the efficiency with which resources are allocated between activities to maximize the total community welfare. The problem of *management incentives* concerns the efficiency with which the agents of production are using the resources allocated to them. The problem of *rent-seeking* concerns the attempts of individuals or agencies to secure their own specific advantage and can adversely affect both types of efficiency.

The Problem Of Macroeconomic Control and Allocational Efficiency

10. Budgets in developing countries are often very fragmented. The Development Budget is typically a set of separate budgets, 'ring fenced' by sponsoring donors. The Recurrent Budget is also typically fragmented by the prior call of debt servicing and other statutory expenditures, and by the large share of wage expenditures which are difficult to cut. Thus, the general problem of macro control arises where earmarking is so prevalent that all flexibility is lost.

11. The macro argument against earmarking in general, and Road Funds in particular, is based on the assumption that governments are fully informed of the costs and benefits of all alternative expenditure possibilities, and that they are committed to optimizing social welfare; that is, they are omniscient and benevolent. Unitary, and highly centralized states are particularly likely to have

⁶ The World Bank policy review "*Sustainable Transport Priorities for Policy Reform*" (1996) argues that, where there is no other direct charge for road use, fuel taxation should cover the environmental impact costs as well as the infrastructure use costs of traffic.

governments which view themselves in this way. If the government system is not capable of delivering this control (as in the case of Colombia in the 1980s⁷) one of the main arguments against earmarking falls.

12. A different but related issue is that current political pressures and/or the electoral cycle may cause decision makers to implicitly adopt an unreasonable rate of discount of future consequences. This is a serious problem. It fails to recognize that the long term consequence of deferring road maintenance increases not only total costs but also the present value of the future cost stream at any reasonable rate of discount.⁸ Introduction of explicit 'road user charges' directed to a Road Fund in lieu of allocations from the general revenue budget may help prevent this kind of myopia thereby contributing to, rather than undermining, allocative efficiency.

13. However, introducing *explicit* 'road users charges' does not automatically eliminate the need to address trade-offs. Unless there is complete independence between the ability to raise specific 'road user charges' and general taxes there is some price to pay in other sectors for securing funding for roads. For example, in developing countries with low taxable capacity, fuel taxes may be one of the more secure tax sources, accounting for 7 to 30 percent of total tax revenues, and between 1 percent and 3.5 percent of GDP.⁹ The loss of control over this source of revenue may be particularly damaging to central government economic management. Introducing an *indirect* 'road user charge', in the form of a surcharge on fuel taxes, will limit the extent to which taxes on fuel can be increased for general tax purposes. This could increase the gearing effect of any instability of remaining tax revenue on social expenditures such as health or education, for which earmarking is not applied even though the returns may also be very high.

14. The independence is likely to be greatest when there is a well defined group of beneficiaries and a *very direct link* between the payment of 'user charges' and the receipt of services. This is provided for in 'second generation Road Funds' to the extent that the bulk of revenues are generated through the use of vehicle license fees, axle loading or distance fees, toll revenues, and to a lesser extent through the separation of the 'pure tax' element from the ex ante explicit 'user charge' element of public revenues collected from fuels.

⁷ Premchand, A., *Government Budgeting and Expenditure Controls: Theory and Practice* I.M.F., Washington. 1983. pp 158-160.

⁸ The cost of restoring roads allowed to deteriorate to the point at which reconstruction is required is three to five times that associated with a policy of timely and effective maintenance. See Harral, C., and Asif Faiz. *Road deterioration in Developing Countries: Causes and Remedies* World Bank, June 1988. Research on Costa Rica and Chile estimated the ratio at 2.5 to 1. It has also been estimated that it costs about three dollars, in present worth in additional vehicle operating costs for every dollar economized by road agencies in underfunding maintenance. See Gyamfi, P., *Infrastructure Maintenance in LAC: The Costs of Neglect and Options for Improvement* LACTD Regional Studies Program Report No. 17. World Bank. June 1992.

⁹ Gupta, S. and W. Mahler. "Taxation of petroleum products: theory and empirical evidence" *Energy Economy* 17 (2) April 1995. pp 101-116

The Problem Of Management Incentives and Operational Efficiency

15. The life of a highway investment and the benefits accruing from it are dependent on the way in which the facility is maintained. Most appraisals assume 'optimal' maintenance (although they may not explicitly address what this implies). Failure to provide the required maintenance effort means that the return on the initial investment will be lower. *If the requisite maintenance funding is not expected to materialize in the course of normal budgetary practices then either the expected rate of return should be reduced or complementary institutional mechanisms should be put into place.* In the first case, fewer projects will cross the 'hurdle rate' and be selected for implementation. In the second case, establishment of a Road Fund to ensure funding for road maintenance from 'road user charges'(quasi prices) may be the logical corollary of accepting projects with attractive rates of return.

16. The introduction of 'road user charges' payable directly to a Road Fund can improve *managerial incentives* if it facilitates a larger degree of autonomy from "unwarranted" political interference. There is already some relevant empirical evidence. Studies in Latin America show part of the reason for low equipment utilization rates and low number of kilometers maintained per employee is the insecurity or untimely availability of the funding to maintain regular work schedules and to buy fuel and supplies. Even if the total level of funding cannot be immunized against competition from other demands, a Road Fund may enable the executing agency to perform more efficiently by guaranteeing the availability of a secure 'core' of funding. In Ghana the establishment of a Road Fund has substantially reduced the problems of disruption to the planning and execution of maintenance work. These disruptions were caused by delays in budget approval, delays in release of budget allocations, and lack of synchronization between the budget year (the calendar year) and the construction season (September to May). These delays necessitated the awarding of small continuation contracts to contractors to whom the administration was already committed. With the establishment of Road Funds payment delays have been eliminated giving a significant boost to contractor cash flow, and enabling unit costs to be reduced by 15 to 20 percent.¹⁰ The guarantee of a core of finance may also allow road agencies to extend and improve contracting out arrangements with the private sector. The LAC studies suggest that maintenance by 'force account' (i.e. of staff on government payrolls) is little more than half as efficient as maintenance that is contracted out to the private sector.¹¹ In Ghana the greater certainty of funding associated with earmarking allowed effective competitive bidding to be introduced. The general point is that tighter financial discipline leads to better use of resources.

17. Operational efficiency may also be increased if users are more willing to pay for maintenance because payments are seen to be channeled more directly to the provision of a service of value to the users, thereby transforming a public good into a 'club good'. (The availability of additional resources, which might not be forthcoming otherwise, can also improve the ability to manage macro imbalances). Some countries, including many in sub-Saharan Africa, have experienced a crisis of

¹⁰ Pankaj, T., "Road Fund Experience in Ghana" in *Earmarking, Road Funds and Toll Roads* A World Bank Symposium. Report INU 45. June, 1989.

¹¹ Gyamfi, P., op.cit.

maintenance for their main trunk road network, so much so that heavy users such as truckers and other commercial vehicles have demonstrated a willingness to levy a charge on their own use of fuel to finance a Road Fund w/ a primary responsibility to maintain a "core" network. There is no mystery to why the users are willing to pay the surcharge. The surcharge—dedicated to fund better maintenance—is substantially lower than the higher vehicle operating costs (VOC) they are incurring from poorly maintained roads. For example, in Kenya and Tanzania, where only about one third of the paved roads were in good condition, and it was estimated that savings to users in the form of lower vehicle operating costs due to improved road maintenance would be between three to four times the costs of eliminating the underfunding of road maintenance.¹²

The Problem Of Rent Seeking Behavior and Distribution of Welfare

18. Skepticism concerning the way in which the political process translates citizen's preferences into public action is the motivation underpinning public choice theories. Essentially their concern is that citizens' preferences are too diverse to permit of aggregation into a well defined community preference function; that monitoring costs and informational asymmetries may enable public officials to pursue their own concept of the public interest (a lack of correspondence between the interests of the government/administrators and the governed is not merely a question of autocracy. Administrators and regulators in democratic societies have personal interests which they might well project on to their functions in the resource allocation context.); and that budget choices will not be based solely on the inherent costs and benefits of services but also on the ability of one set of taxpayers to pass the costs of programs which benefit them on to another set of taxpayers.

19. Where individual preferences for public goods differ it can be shown that separate earmarked funds could potentially increase general welfare if the payments to those funds by different individuals reflect the relative marginal utilities to the different individuals of the different public goods.¹³ The fundamental weakness of this analysis as a practical policy guide is the assumption that consumers of public goods can be made to truthfully reveal their marginal utilities for consuming pure public goods. This hints at the welfare advantages of "quasi-prices/user charges" which can be levied approximately in proportion to the "demonstrated" benefit of consumption.

20. Public choice theorists argue that a fundamental flaw of general fund budgeting is that it is in the interests of heavy consumers of a general tax financed service to demand larger expenditures on the services that benefits them (thereby transferring welfare to them), whilst non-consumers will argue for low expenditures. The outcome will reflect the respective political power of the parties rather than the value that in aggregate is attached to each individual service. This bias is eliminated where the beneficiaries of a specific service are the ones that pay for it through "quasi-prices". That is achievable in the case of roads and fuel surcharges or vehicle duties (with appropriate corrections for

¹². Heggie, I.G., 1995. op.cit.

¹³. This proposition, derived from Wicksell and Lindahl, is elegantly proved in Johansen, L., "Some Notes on the Lindahl Theory of the Determination of Public Expenditures" *International Economic Review* September, 1963.

agricultural vehicles and fuel not used for road vehicles).¹⁴ Using fuel surcharges as a “quasi price” for road use is thus just a case of ‘special purpose’ government, common in the provision of some facilities such as water. It is not inconsistent with the government having a redistributive intent, which it would exercise through its policies on general taxation and the allocation of merit goods.

21. The argument for earmarking as a way of separating allocational from distributional issues may also be applied spatially. Regional financing of services which are consumed regionally may be a device for avoiding over-provision in some regions at the expense of others as regions compete to maximize their share of a national budget. This argument should be treated with some caution as regional disparities in provision, particularly of road investment, may be justifiable on both efficiency and equity grounds. Operational criteria for the allocation of resources, as have recently been developed for second generation Road Funds in Tanzania and Mozambique, are required whether or not funds are earmarked.

RECOMMENDATIONS

Strategic options

22. In the long term there are two very different ways in which the problem of reconciling the micro and macro economic issues can be addressed. *The first is to move towards commercialization of the roads sector.* This would involve the creation of an independent Roads Authority with wide responsibility and with revenues derived from direct user charges (quasi prices) rather than taxation. This approach is currently being introduced in many countries in sub-Saharan Africa. It usually involves the creation of a Road Fund financed initially by surcharge on fuel taxes. In the longer term this surcharge would be replaced by charges more directly related to the costs imposed by road use (for example, charges based on axle weight and distance traveled) or on a fee for service basis.

23. The second approach is *to rebuild the capability of, and confidence in, the government budgetary processes.* In cases where direct user charges are not feasible, as well as in cases where governance is so bad that public willingness to pay taxes is seriously undermined, earmarking of some special purpose taxes and creation of a Road Fund may be the most practical means for rebuilding public confidence in government. Even weak governments may be willing to accept some impediment against raiding activities of high benefit but low profile. This changes the balance of expediency. . Moreover, in a pluralistic society earmarking of taxation may improve the efficiency of resource allocation through democratic control where the earmarking is referendum based, or where there is a possibility of levying charges or taxes which are closely linked to the receipt of benefits. Whether the establishment of a Road Fund is a sensible *interim* step in either strategy in addressing

¹⁴ Most second generation Road Funds are set up as a “special account” under an existing Finance Act. Money collected under the general taxing powers of government is first paid into a consolidated fund and then transferred to the Road Fund. This arrangement works so long as it has the continuing support of the Ministry of Finance. Legislation under preparation in Ghana, Malawi and Zambia, and the arrangement already in operation in Yemen enables charges to users to be paid directly into the Road Fund.

manifested problems is a complex issue which must be decided on a case by case basis. Three criteria seem paramount:¹⁵

- ◆ does it improve resource allocation by ensuring better funding of economically high return but politically low profile activities (bearing in mind that other services like primary schooling and basic health clinics may also fall in the same category);
- ◆ does it avoid rent seeking by strengthening the link between benefits and payments:
- ◆ does it improve operational efficiency through the introduction of better incentives for managing resources

A Policy for Implementation

24. Three critical questions must be answered before establishing Road Fund schemes.

- ◆ What is the purpose of the fund, i.e., what road expenditure line items are to be “protected”?
- ◆ Which revenue streams should be assigned to the Road Fund to finance the chosen expenditure items?
- ◆ What is the appropriate institutional structure to reconcile the conflicting micro and macro management objectives (particularly how to avoid “capture” of the road funds by interests that are *not* representative or accountable)?

Expenditure Assignments: What expenditures Should Be “Ringfenced”?

Allocation of resources between investment and maintenance

25. The most commonly identified problem is a *systematic bias against maintenance* in regimes where both investment and maintenance are funded through the same channels. For example, there is strong evidence of priority being given to investment over maintenance in Eastern Europe. This is because deferral of maintenance carries a penalty in future costs which is either not properly understood (and hence the decision makers discount rate is greater than the technical rate), or is genuinely greater than that on deferring investment. Such biases become systematic in cases such as Mali where the Road Fund was required to provide the national counterpart funding of foreign lending for road construction as well as to finance past debt servicing. These became the first calls on the Fund, and maintenance suffered accordingly. This suggests that use of Road Funds for maintenance only may be a sensible way to counterbalance a systematic bias, whilst avoiding the danger that low demand elasticity will be exploited to support over-investment in the sector.

¹⁵ See McCleary, W.A., and E.U.Tobon. *Earmarking Government Revenues in Colombia* PRE Working Papers, WPS 425. September, 1990.

26. A different problem arises when the expenditure process is considered. If, as often seems to be the case, road users' price elasticities are low for use of the network as a whole, and if the supplying authority has an effective monopoly power, there is a risk that with earmarking the self interest (or just plain enthusiasm) of the road sector administrators could lead to the sector becoming too large.¹⁶ Hence, funding through user charges cannot be viewed as a substitute for procedures to determine optimal expenditures. Even with quasi-prices for the road use, it is likely that some transactions with the general tax fund will still be necessary to ensure optimal expenditure levels are achieved. Again, however, management by a user representative Road Board is likely to be the most powerful defense against overspending.

27. How *investment* should be treated is less clear. The implication of arguing that there is a systematic bias *in favor* of investment, arising from the political attractiveness of large schemes and easier access to external financing for them, would appear to be good reason for excluding it from any ringfenced allocation. However, investment and maintenance requirements are closely related. Excessive scale of road investment may lead to insupportable combined debt servicing and maintenance funding burdens. In a context where the road agency was managed by user representatives, recouping the costs of investment as well as those of maintenance from users might be a powerful discipline on investment expenditure.

28. Beyond the narrow confines of road maintenance Road Boards dominated by 'user representatives' may not allocate resources optimally. Roads perform social as well as economic functions. In these cases cross subsidies may be justified (i.e. some rural roads are kept in existence and repair even though their users would not be able to pay sufficient to maintain them). It may also be desirable for ecological or aesthetic reasons to spend more on roads in environmentally sensitive areas than users would be willing to pay. One way of handling this would be to introduce the equivalent to the 'public service obligations' (PSO) of transit operators, in which the agency is compensated for meeting an explicit obligation through a contracted payment from the state. But that infringes on the neatness of the separation between the Road Fund administration and the political process, and introduces substantial scope for "game-playing" over where the financial responsibility should lie. An alternative would be to involve representatives of non-commercial, environmental and local interests in the management of the Road Fund. But that again re-introduces an element of politicization.

Allocation of resources between administration and implementation

29. Staff complements for road agencies are often adequate and well protected. But salaries for road agency staff are usually well below the market rate, with the result that the agency tends to be weak and dysfunctional. Allowing a commercialized Road Board to determine the quantity, level and remuneration of staff is therefore likely to lead to a more efficient allocation of resources between administration and implementation than the traditional public sector procedures. Where public sector rules still apply to the agency dependence on central budgets for core management staffing while operational expenditures are financed from user charges or earmarked taxes, will give a strong

¹⁶ Nilsson, J-E., *Institutional Reform of Sub-Saharan Africa's Road Sector; Examination of Recent World Bank Proposals* Center for Research in Transportation and Society. Borlange, Norway. October, 1993.

inducement to management efficiency, especially if the core budget availability is linked to some indicators of performance.

Revenue Assignments: What Revenues Should Be Devoted To The Road Fund?

30. The crux of the argument in favor of 'second generation Road Funds' is the separation of 'road user charges' from general taxes and improved arrangements for governance of these funds. Where 'direct' rather than 'proxy' user charges are feasible there is little conflict with macro control objectives. A potential conflict arises with the use of a 'fuel tax surcharge'. Use of the latter is appropriate where;

- ◆ The surcharge can be based on a transparent and supportable formula ex-ante, i.e. directly linked to the consumption of the service provided. This might be indicated by the ratio between calculated maintenance requirements and current road use related taxes or charges (including fuel and vehicle registration taxation but not general purchase taxes or import duties).
- ◆ There is a well recognized need to subject the road agency to some form of surrogate market discipline to identify expenditures of high productivity (for example, where there is a crisis in road deterioration). A key indicator is if the calculated ratio between increases in road maintenance expenditures and reductions in vehicle operating costs is less than one, and by trends in road condition.
- ◆ The efficiency of highway maintenance planning and implementation has been adversely affected by insecurity of funding (i.e. productivity in road maintenance is low). A key indicator is the costs per mile of road maintained, and by the calculated ERR on road maintenance expenditure.

31. By contrast introduction of a 'fuel tax surcharge' as a "quasi-price" for road use should be approached particularly cautiously where:

- ◆ Taxation on fuel is a high proportion of total tax revenue (say over 15 percent), and any surcharge is likely to detract from general taxing capability;
- ◆ The general fiscal situation is weak and there are many sectors making similar claims for special fiscal treatment.

32. A standard problem of 'earmarking' is that of determining the level of funding to be provided. Defining it in terms of expenditures categories (for example, rehabilitation, periodic and routine maintenance) invites the padding out of these expenditures and the substitution of these items for other categories of expenditure. Defining it in terms of the whole, or a predetermined proportion, of a particular tax runs the risk of ceasing to be appropriate as either tax yields or expenditure requirements change over time. To make them subject to regular review returns the whole issue to the political arena. However, with a Road Board representing user interests there is likely to be a strong downward pressure on spending.

33. Insofar as the efficiency arguments relate largely to the ability to plan and phase a core work program, the benefits of earmarking do not depend on a complete separation of the roads budget from the rest of the budgetary process. However, once there is some earmarking provided there will be a strong resistance to supplementary funding from the general budget. Even where there is a very strong link between payment and receipt of benefits the balancing of budgets is not necessarily desirable on efficiency grounds because there are some external effects of highway use the consequences of which fall on other budgets (air pollution, encroachment on other land uses, public costs of road accidents). Thus it may be appropriate to transfer some of the road user charges to other budgets. Hence the arguments for earmarking do not depend on the earmarked tax being the only source of revenue for the sector, or being spent entirely on road maintenance (or road investment for that matter).

Governance: What Institutional Arrangements Are Appropriate?

34. The first generation of Road Funds often failed after 3-5 years as funds accumulated or were misallocated. Better governance is essential to ensure that budget constraints are hard, and that expenditure decisions are user responsive..

35. The following institutional components should therefore be included in a package.

- ◆ *A strong legal basis:* Road funds should be established by law to ensure clear terms of reference and some minimum protection from arbitrary political interference. The legal instrument needs to guarantee not only the source, but also the automaticity of the channeling of funds to the executing agency¹⁷. Whilst it is unreasonable to expect legal commitment to any particular level of tax or tax yield, the instrument should establish clear procedures enabling the executing agency to have the greatest possible security of a base level of funding, and the greatest possible notice of changes in that base.
- ◆ *An independent executive authority* The need for efficient maintenance suggests that the executing agency should be “accountable” in a clear and transparent framework and given the primary role of formulating maintenance policy, marshaling and allocating funds, and securing effective implementation. Where these functions are clearly stated and well publicized as the responsibilities of a quasi independent executive, as in Chile and Brazil, proper management incentives are established and effective performance is facilitated.
- ◆ *A monitoring system* Whatever the institutional status of the executing agency an adequate external system of performance monitoring must be in place. This will generally take the form of periodic reviews by central agencies and regular audits. It may also include expanding Board representation to include central government, local authorities, and other ‘non-user’ stakeholders, who would have a strong interest in the efficient

¹⁷. The difficulties of ensuring efficient channeling of revenues was exemplified in Mali in the late 70's and early 80's. Almost all of the revenue of the Road Fund was received through a Postal Checking Service, the illiquidity of which prevented effective and timely finance of the routine road maintenance program.

performance of the functions of the agency. The key variables to monitor are that the revenue flows into the Fund are not so low as to result in persistent deficits that will damage performance, or so high as to result in the build up of a surplus that is not accessible by the general budget, or that might result in wasteful spending to avoid showing a surplus. The dependence of the core staff funding of the agency on the general budget allocation <<??>> might be an effective lever for securing efficient management performance.

- ◆ *Administrative competence and proper criteria for expenditure:* Assigning expenditure responsibilities to the Fund does not, *per se*, ensure efficient allocation within the ring fenced area. A necessary condition for the assigning revenues should therefore be that the executing agency has i) well established procedures for allocating funds efficiently, and ii) the necessary administrative competence to administer the allocation and to monitor performance. Successes are being recorded. For example, effective procedures have been developed for allocation between regions in Tanzania and in Mozambique.
- ◆ Whether the fund is established as a temporary arrangement because general budgetary procedures are not functioning well, or as an interim step in the establishment of a commercialized Road sector, *termination criteria and a sunset clause* must be in place to determine when the Fund should be phased out—for example, when general budgetary procedures have improved.

36. As recent African experience shows, where main road systems have failed it is possible to mobilize commercial interests to pay a surcharge on the existing fuel tax so long as it is recognized as a user charges to be devoted to improving the quality of the infrastructure. It remains to be seen whether Road Fund management will be sufficiently immune to the kind of political control problems that presently disturb the flow of funds into road maintenance once the immediate most extreme problems of deficient maintenance are overcome.

37. As has been argued above there may be circumstances in which the establishment of a Road Fund, associated with new 'user charges/quasi prices', is a sensible step in the direction either of re-establishing an effective budgetary system or of establishing a fully commercial road administration. However, experience with 'second generation road funds' is very limited. In the past, neither Road Funds themselves, nor the institutional reforms to which they lead, proved to be panaceas. *Many Road Funds failed to be managed effectively. The alternative of full commercialization has also not yet proven its ability to offer a surviving solution to the problem anywhere in the world.* Thus any recommendations on the role and nature of Road Funds must be viewed as provisional; the developments currently underway in sub-Saharan Africa and elsewhere should be *carefully monitored* (for example, through inclusion of appropriate monitoring and evaluation components in sector programs or investment projects) to confirm or amend initial designs on the basis of experience.

FURTHER READING

1. For discussion of Bank experience with Road Funds and earmarking of taxation during the eighties see *Earmarking, Road Funds and Toll Roads* A World Bank Symposium. Report INU 45. June, 1989.
2. Some of the theoretical issues are set out in greater depth in Teja, R.S., *The Case for Earmarked Taxes: Theory and an Example* I.M.F. Washington., February, 1988.
3. Advice on how to set up a Road Fund is found in Heggie, I.G. (forthcoming)