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Road Funds, User Charges and Taxes
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ABSTRACT

i. When orderly planning and execution of road maintenance is undermined, through insufficient or uncertain budgetary allocations, road networks can deteriorate to the point that production and distribution costs of other economic activities are significantly increased. Road Funds are a continuing subject of controversy. They are regarded as a boon by highway specialists who see them as facilitating the provision and maintenance of a highly productive asset by means entirely consistent with the general shift away from direct government production of goods and services. Macroeconomists and public finance specialists have tended to regard them as a bane because they reduce fiscal flexibility; do not adequately address problems associated with the provision of public goods or the internalization of externalities; and are often not well managed.

ii. This paper has argued that the issue is not one to be resolved on general principle, but on a case-by-case basis through the analysis of likely micro and macro effects. In general there are two mutually exclusive long term options to reconcile "fiscal prudence" with "asset maintenance:" (a) a fully commercially operated Road Agency (subject to the normal oversight of behavior accorded to privatized monopolies), or (b) a reformed and well functioning budget process. Neither exists at present in most developing and transitional economies. Thus, any recommendations on the role and nature of Road Funds must be viewed as a provisional, case-specific ***intermediate step*** in the direction of one or the other long term solution. This paper lists a few indicators that can be used in specific cases to determine: (i) whether to introduce a Road Fund (Table 2); and (ii) whether to continue it based on periodic reviews (Table 4).

iii. In addition, the paper argues that for the interim arrangement:

- the Road Fund's ***expenditure responsibilities*** be limited to maintenance in order to correct a systematic bias against maintenance despite the link between investment and maintenance;
- Road Fund's ***revenues*** be only from direct charges on road users, except in the case of fuel surcharges (which need to be separated from general taxes in agreement with the Treasury);
- the Road Fund be managed professionally under the direction of a "***user representative" Board,*** and subject to strict oversight and auditing arrangements by third parties.
- there should be explicit ***transition arrangements*** as the Road Fund phases into one or the other long term solution.

iv. As recent African experience shows, when there is a crisis and main road systems fail, 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 charge to be devoted to improving the quality of the road infrastructure. However, experience with "second generation road funds" is very limited and it remains to be seen whether Road Fund management will be sufficiently immune to the kind of political interference that presently disturb the flow of funds into road maintenance once the immediate most extreme problems of deficient maintenance are overcome. *For this reason the recently introduced Road Funds in sub-Saharan Africa and elsewhere should be monitored carefully.* This could be done through the inclusion of appropriate and comparable monitoring and evaluation (M&E) components in sector programs and/or investment projects. The M&E of "second generation" of Road Funds will help, (i) determine the longer term utility and generalizability of such interim arrangements, as well as, (ii) facilitate the amendment of initial designs on the basis of experience.

THE ISSUE

1. This note sets out some general principles and indicators for determining when a Road Fund might be an appropriate instrument; what activities it should be responsible for, what revenue sources it should employ, and key features for its governance.[1] Detailed design of Road Funds and associated institutions is dealt with elsewhere.

2. When orderly planning and execution of road maintenance is undermined, through insufficient or uncertain budgetary allocations, road networks can deteriorate to the point that production and distribution costs of other economic activities are significantly increased. 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. In the 1960s and 1970s, such Road Funds were established in Africa, Latin America and Asia. As an extra budgetary arrangement to deal with economically inefficient asset deterioration, these "traditional" Road Funds, often set up at the behest of the Bank to protect Bank-financed investments, were typically financed by earmarked taxation. Many of the more recent Road Funds being established in eastern Europe (Russia, Georgia) are based on this model. Although they have been used in some form or another in many countries in the past forty years,[2] it is important to note that:

(a) Road funds are not necessary to secure adequate maintenance (viz., Nordic countries),

(b) Nor do they always work (for example, many funds in Africa and Latin America were abolished because they did not deliver a stable flow of funds or acceptable financial management).

3. During the 1980s and 1990s, a new generation of Road Funds was established in several African countries[3] and are being considered for countries as diverse as El Salvador, Guatemala, Jordan, Lebanon and Pakistan as part of an agenda to ***commercialize*** the road sector. Their primary motivation is closely allied to that for the privatization of state enterprises. 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. Revenues are paid directly into a Fund managed by a Road Board whose membership is chosen to represent users. The Board determines both the level of charges and the allocation of

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[1] This paper has benefitted from and incorporates comments made at a workshop of 35+ World Bank professionals working in the road transport sector. We would also like to specifically thank Chris Hoban, Ian Heggie, Gunnar Eskeland, Vinaya Swaroop, and colleagues at the IMF (particularly Barry Potter) for their criticisms of earlier drafts and contributions to clarifying the different perspectives on the issue.

[2] 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.

[3] Heggie, I., *Management and Financing of Roads: An Agenda for Reform.* World Bank Technical Paper 275. World Bank. Washington D.C. 1995.

expenditures. As such, the new generation of Road Funds are similar to specialized "Taxing Districts" (see Box 1).

Box 1. Concepts used in this paper

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 and subsequent debt-servicing which are not discussed in this note. The last three can be classified as current expenditures and financed in a number of ways:

Taxes are public charges which are not necessarily related to the costs of production of a particular transaction. These charges generate revenue which is 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.

Earmarking refers to the pre-commitment of taxes to support, or fully fund, pre-specified expenditure items. These revenues may be channeled through the general treasury or may be paid directly to a dedicated fund.

Special Taxing District refers to limited "special purpose" forms of government to which taxing powers are devolved. In contrast to the earmarking of a part of tax revenues, the allocation of taxing powers includes the ability to set tax rates in a regulated framework.

Tolls refer to ***direct*** charges that can function like prices (analogous to public utility tariffs*)*.

User charges (or quasi prices*)* refer to ***indirect*** charges for infrastructure services that are often levied as fees on proxy transactions. The choice of proxy will vary with the type of 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."*

4. "Earmarked," as opposed to "commercially-oriented" budgetary arrangements have been justifiably criticized when they limit macro flexibility or undermine stabilization programs, thereby aggravating macro or fiscal crises and leading to inefficient allocation of resources. The critical issue is how to reconcile macro and micro efficiency considerations and develop criteria for evaluating trade-offs when they conflict. The general principles developed in this paper would be equally applicable to any other sector where such a conflict arises. The justification for establishing a special fund is not that road maintenance is inherently of higher priority than other uses of public resources but that, given the possibility of charging directly for road infrastructure use and of devising a system of fund governance by users, this is a field where more commercial forms of organization might improve the allocation of resources.

5. Because Road Funds are not always necessary and do not always work, decision to (a) introduce, or (b) close them should be based on relatively "objective" criteria in terms of:

- Context
- Expenditure responsibilities
- Revenue sources
- Mode of governance (representation, autonomy, responsibility/accountability)

THE CONTENDING VIEWS ON ROAD FUNDS

6. In light of the negative experience with the "first generation" Road Funds, the Bank and the IMF have opposed them primarily on macroeconomic grounds.[4] Traditional 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[5] 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 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, and particularly "second generation" Road Funds, is primarily microeconomic. Road Funds 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. The extent of that myopia is indicated by Bank comparisons of actual and recommended road maintenance expenditures under existing arrangements in a number of countries. (see Table 1). 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. These benefits of "off-budget" financing or "earmarking" would not accrue in all circumstances. At one extreme, where governance systems are effective, as in many European countries, road systems are well maintained ***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.[6] The empirical evidence on the effect of earmarking on resource allocation is relatively weak.[7]

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[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.

[6] A more extensive taxonomy of situations in which Road Funds have been established is contained in Potter, B. "Dedicated Road Funds: A Preliminary View on a World Bank Initiative" *IMF paper on Policy Analysis and Assessment*, Series No. PPAA/97/7, 1997.

[7] An early study of thirty-seven 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

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 between 1979 and 1987, total funding for roads grew more slowly than GDP and the road network continued to deteriorate.[8]

Table 1. *Road Maintenance Expenditure for Selected Countries*
(million US $/year, current)

Year	Country	Network	Spent (S)	Recommended (R)	S/R Ratio	"Recommended" means:
90	Bangladesh	R&H Dept.	24.6	42.4	58%	Maintain existing network on a sustainable basis (constant flow of services) in quantity terms
88-91	Honduras	All	11.0	45.0	24%	Id.
92	Nepal	All	2.6	18.1	15%	Id.
88	Nigeria	Fed. Highways	112.3	248.5	45%	Eliminate backlog in 5 years
92	Zambia	Roads Dept.	6.1	32.7	19%	Maintain existing network on a sustainable basis

Sources:
Bangladesh, Second Road Rehabilitation and Maintenance Project, SAR, 1993
Honduras, Transport Rehabilitation Project, SAR, 1992
Nepal, Road Maintenance and Rehabilitation Project, SAR, 1994
Nigeria, Road Sector Strategy Paper, The World Bank, 1991
Zambia, Financial Performance of the Government-Owned Transport Sector, The World Bank, 1992
Road User Charges Model, Version 1.0, Ian Heggie and Rodrigo Archondo-Callao, 1996

9. In the real world, many situations fall between these extremes of good and bad governance, so that assigning responsibility for tax revenues and expenditure to a representative Road Board managing a specific Road Fund may actually make some difference. We discuss below the three main routes through which the establishment of a Road Fund may affect the efficient working of the economy. First, ***fiscal control***, which affects the efficiency with which resources are collected and allocated between activities to maximize the total community welfare. Second, ***management incentives***, which partly determine the efficiency with which the agents of production use the resources allocated to them. Third, ***rent-seeking behavior***, which can adversely affect both previous types of efficiency when individuals or agencies attempt to secure

Eklund, P., "Earmarking of Taxes for Highways in Developing Countries" *Economics Department Working Paper No.1*. I.B.R.D. June 1967.

[8] 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.

their own specific advantage at society's expense.[9] The relative importance and balance between these effects is critical to the judgment about the efficiency of Road Funds.

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 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, a problem of macroeconomic control arises where earmarking is so prevalent that all fiscal flexibility is lost (as in the case of Colombia in the 1980s[10]).

11. The fiscal argument against earmarking in general, and Road Funds in particular, is based on the assumption that governments are well informed of the costs and benefits of all alternative expenditure possibilities, and that they are committed to optimizing social welfare; that is, they are informed and benevolent. Unitary, centralized states are particularly likely to have governments which view themselves in this way. If the government system is not capable of delivering on this objective, 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 discount future consequences excessively. This is a serious problem. Many governments act as if they do not 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.[11] 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 an opportunity cost 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

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9 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, D.C. February 1988.

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

11 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.

revenues, and between 1 percent and 3.5 percent of GDP.[12] 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 of general taxing capacity from the level of road user charges 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.

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 normal budgetary practices will not provide the necessary funding for optimal maintenance then, either the likely benefit stream (and therefore the expected rate of return) should be reduced,[13] or complementary institutional mechanisms should be put into place to ensure appropriate maintenance practices. In the first case, fewer investment projects will meet the criteria for selection. 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. Budget approval and disbursement in many countries is delayed as a result of political wrangling. 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. [14] Even if the "total level" of road funding is open to 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

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[12] Gupta, S. and W. Mahler. "Taxation of Petroleum Products: Theory and Empirical Evidence" Energy Economy 17 (2) April 1995. pp 101-116.

[13] The projected benefit stream might be reduced either through conscious planning of lower maintenance and service standards or by recognition in the evaluation that planned levels will not be achieved through lack of finance.

[14] Gyamfi, P., op.cit.

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.[15]

17. 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. In Ghana, the greater certainty of funding associated with earmarking allowed effective competitive bidding to be introduced. The general point is that more reliable financial arrangements lead to better use of resources.

18. 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 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 an ***additional*** charge on their own use of fuel to finance a Road Fund with 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) that are incurred from poorly maintained roads. For example, in Kenya and Tanzania, where only about one third of the paved roads were in good condition, 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.[16]

The Problem of Rent Seeking Behavior and Distribution of Welfare

19. At the heart of the problem of "traditional" Road Funds was the failure of the associated earmarking arrangements to address incentive and governance issues. Unlike marketable commodities, including deregulated rail and airline services, in the case of the typical traditional Road Fund there was no link between the tax rate (or amount of taxes earmarked) and spending priorities (in light of the level of road use). Road Fund managers had incentives to maximize their discretionary expenditures (including investment in low priority roads or ancillary activities) rather than optimize the level of road maintenance. While the combination of public scrutiny and periodic monitoring by a competent central bureaucracy may be some defense against this

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

[16] Heggie, I.G., 1995. op.cit.

problem in developed countries, it is less likely to be so in developing countries with less developed institutional capabilities.

20. One school of thought, represented by public choice theorists, is even skeptical of the institutional capabilities of developed countries, including the political process by which citizens' preferences are translated into public action. Essentially their concern is that citizens' preferences are too diverse to permit aggregation into a well defined community preference function; that monitoring costs and informational asymmetries may enable public officials (whether or not the latter are responding to organized pressure groups) to project their personal interests on to their functions as resource allocators; 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 transfer the costs of programs which benefit them to others.

21. 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 each of the different individuals reflect that individual's relative marginal utilities for different public goods.[17] Despite the ingenuity devoted to designing ways of getting consumers of public goods to truthfully reveal their marginal utilities, this analysis remains difficult to apply practically. This hints at the welfare advantages of "quasi-prices/user charges" which can be levied approximately in proportion to the "demonstrated" benefit of consumption.

22. 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 lobby for 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." This may be achievable in the case of roads through the use of tolls and vehicle duties. Using fuel surcharges as a "quasi price" for road use (with appropriate corrections for agricultural vehicles and fuel not used for road vehicles)[18] is, on the other hand, a case of establishing a "Special Taxing District," common in the provision of some facilities such as water. It is not inconsistent with the government having redistributional objectives which it would pursue through its policies on general taxation and the allocation of merit goods.

23. 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

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[17] 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* September1963.

[18] 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 as 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 collected from users to be paid directly into the Road Fund.

regionally may be a device for avoiding over-provision in some regions at the expense of other regions as they compete to maximize their share of the national budget. This argument, however, 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.

STRATEGIC OPTIONS

24. The contending views do not support acceptance or rejection of second generation Road Funds cum Road Boards on the basis of first principles. Hence, the decision to introduce or eliminate such arrangements must be based on a practical and systematic assessment of the context and ability to minimize abuse and misallocation of resources over time.

Option 1: Commercial Road Agency

25. 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, but regulated Roads Authority (similar to monopolistic public utilities) with network-wide responsibilities and with revenues derived from direct user charges (quasi prices) rather than taxation. A first step in this direction might involve the creation of an independent Road Board to manage a Road Fund financed through various instruments including a surcharge on fuel taxes. In the longer term, the Road Fund would be replaced by a commercial Road Agency and the fuel surcharge would be replaced by tolls charged on a fee-for-service basis or by charges more directly related to the costs imposed by road use (for example, charges for trucks based on axle weight and distance traveled).

Option 2: Reformed Budget Process

26. The second approach is ***to rebuild the capability of, and confidence in, the government budgetary processes.*** In cases where commercialization is not politically or practically feasible, as well as in cases where there is no public willingness to pay additional general taxes, earmarking of some special purpose taxes and creation of a Road Board cum Road Fund may be the most practical interim means for generating additional funds for a priority economic activity and rebuilding public confidence in government.[19] Even weak governments may be willing to accept some impediment against raiding activities of high benefit but low profile, thereby changing the balance of expediency. In the longer term the Road Fund would be phased out and all revenue and expenditure responsibilities would be returned to the budget.

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[19] 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.

Interim Arrangements

27. Whether the establishment of a Road Fund is a sensible ***interim*** step in either strategy in addressing manifested problems is a complex issue which must be decided on a case-by-case basis. Three principles must guide the decision to introduce (or retain) a Road Fund (see Table 2):[20]

- Will it (or does it) improve resource allocation—for example, 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)?

- Will it (or does it) improve operational efficiency—for example, through the introduction of better incentives for managing resources?

- Will it (or does it) reduce rent seeking—for example, by strengthening the link between benefits and payments?

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

** The "core network" will vary in size over time as "unused" and "lightly used" routes are dropped and emerging "heavily used" routes are included.*

Table 2. Conditions for Introducing a Road Fund

Introduction of Road Funds may be justified if all the following conditions apply:	**Potential indicators**
1. Maintenance is poor due to:	
• ***Insufficiency of funds*:** poor setting of budget priorities with bias in favor of new investments, often donor driven).	• Asset condition of "core network"* is predicted to decline over the next ten year period (increasing percentage in poor condition by road class) • User costs predicted to increase over 10 years (increasing VOC/vehicle/year by vehicle class)
• ***Unreliable timing of funds*:** poor budgetary processes w/ inability to ensure credible commitments and/or disbursements).	• Substantial maintenance foregone (with ERR> 20 percent) • NPV of near optimal program substantially (> 1.5 times) higher than that of current program
• ***Inefficient implementation of works:*** absence of incentives to use resources efficiency in the agency.	• Total costs per mile of road maintained in the core would drop by 25 percent throughout the life of the fund (relative to current expenditures or future benchmarks)
2. There is political commitment to increase maintenance expenditures on roads.	• Cabinet level commitment (acts, regulations, gazetting) to increase road maintenance expenditures • Cabinet level commitment to permit direct user charges (or surcharges on fuel taxation) to generate funds • Cabinet level commitment not to reduce parallel funding
3. There is a political commitment to establish long-term reliable mechanisms for improved allocation and accountability for the "core network."*	• Principles exist for major allocation decisions • Representatives of key user groups are included on Board • Economic criteria are accepted as key to setting priorities

28. Assuming that the conditions justify the creation or continuation of a Road Fund , its charter should explicitly address the following three broad issues:

(1) What road expenditure line items are to be "protected," i.e., what is the primary purpose of the fund?

(2) What revenue streams or revenue authority should be assigned to the Road Fund to finance the chosen expenditure items?

(3) How will the proposed institutional structure ensure responsible governance and appropriate incentives to reconcile the conflicting micro and macro management objectives (particularly what features will ensure that the road funds are not "captured" by interests that are *not* representative or accountable)?

(1) Expenditure Assignments: What Expenditures Should Be "Ringfenced"?

a) Allocation of Resources Between Investment and Maintenance

29. The most commonly identified problem is a ***systematic bias against maintenance*** in regimes where both investment and maintenance are funded through the same channels (with or without Road Funds). Investment is favored because large schemes are politically attractive with easier access to external financing. Maintenance is not favored because deferral of maintenance carries a penalty in future costs which is not properly understood, as a result of which, the decision makers' discount rate is greater than the technical rate. This problem is common in developing as well as transition economies, such as in Eastern Europe. However, the creation of a Road Fund with both investment and maintenance responsibilities does not automatically ensure against such a systematic bias. In Mali, the Road Fund was required to provide the national counterpart funding of foreign lending for road construction as well as to finance the servicing of debt on earlier investments. These became the first calls on the Road Fund, and maintenance suffered accordingly. Both these examples suggest that use of Road Funds for "maintenance only" may be a sensible way to counterbalance a systematic bias.

30. How ***investment*** should be treated is less clear. In a number of countries (US, Japan, Korea, South Africa) Road Funds were introduced to facilitate crash investment programs perceived to be too large for the general budget, and justifying special treatment (including extra special purpose taxation). The danger of such arrangements is that they may continue to generate funds—and the temptation to misallocate to lower priority investments—after the real need which stimulated their creation has been satisfied. However, this problem, combined with the systematic bias in favor of investment, would appear to be sufficient reason to exclude investment from any ringfenced allocation in an interim arrangement. This is not appropriate in the long run. Investment and maintenance requirements are closely related. De-linking them can create problems of its own. Freed from the responsibility of funding the O&M consequences of their investment decisions, governments and donors could continue to indulge in excessive road investments leading to combined debt servicing and maintenance funding burdens that cannot be supported.[21]

b) Resource Allocation Between Regions or Road Types: Single or Multiple Road Funds?

31. Another reason for excluding investment is that, beyond the narrow confines of road maintenance, Road Boards dominated by "user representatives" may not allocate resources

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[21] This concern would argue in favor of a commercialized road agency, recouping the costs of investment as well as those of maintenance from users. A "representative" Board might be a powerful discipline on investment expenditure provided representation is extended beyond direct road users (for example, to include groups displaced or inconvenienced by new construction).

optimally. Roads perform social as well as economic functions. In these cases, cross subsidies may be justified. For example, some rural roads are kept in existence and repair even though their users would not be able to pay sufficient sums 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. There are several ways to approach this issue but all of them will introduce complications in the governance of Road Funds:

(a) Introducing the equivalent to the "public service obligations" (PSO) of transit operators, to enable a commercially oriented Road Fund to be compensated for meeting an explicit public obligation through a contracted payment from the state. This arrangement reduces the neatness of the separation between the Road Fund administration and the political process, and reintroduces substantial scope for "game-playing" over where the financial responsibility should lie.

(b) Expanding the Road Board to include representatives of non-commercial, environmental and local interests in the management of the Road Fund will be particularly important where acquisition of right of way, resettlement and other problems associated with the expansion of the network are at issue. But such a solution again re-introduces an element of politicization.

(c) The creation of multiple agencies, each concentrating on a more restricted set of roads for which representative management might be more easily achieved. The issues created by multiple Road Funds are summarized in Table 3.

c) Allocation Of Resources Between Administration And Implementation

32. 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. A commercialized Road Agency (as well as, a reformed civil service cum budgetary arrangements) is more likely to do a better job at determining the quantity,

Table 3. Single or Multiple Road Funds

Type of road fund	**Single Road Fund**	**Multiple Road Funds**	
	National	**By type** **Rural** **Inter-urban** **Urban road**	**By administrative unit** **@ district** **@ province** **@ city**
Potential benefits	• Potential to cross-subsidize between high use and low use links, particularly if the fuel surcharge applies to all road users irrespective of the specific links they use	• Potential for charge discrimination based on relatively distinct user segments	
Issues involved	• How to design a transparent spatial/functional allocative formula, e.g., by population, length of road network, type of network, priority, etc.? • How to ensure the representiveness of board, especially for the purpose of setting priorities and allocating resources?	• Whether each fund should have its own revenue base, allocative criteria and governnance structure? • How to deal with components of sub-national roads that are part of the national network?	

level and remuneration of staff, thereby leading to a more efficient allocation of resources between administration and implementation. In the interim, Road Fund arrangement there might still be a strong inducement for management efficiency if operational expenditures are financed from user charges (or earmarked taxes), even though core management staffing remained funded through the central budget, provided that the core budget availability is linked to some transparent and public indicators of performance.

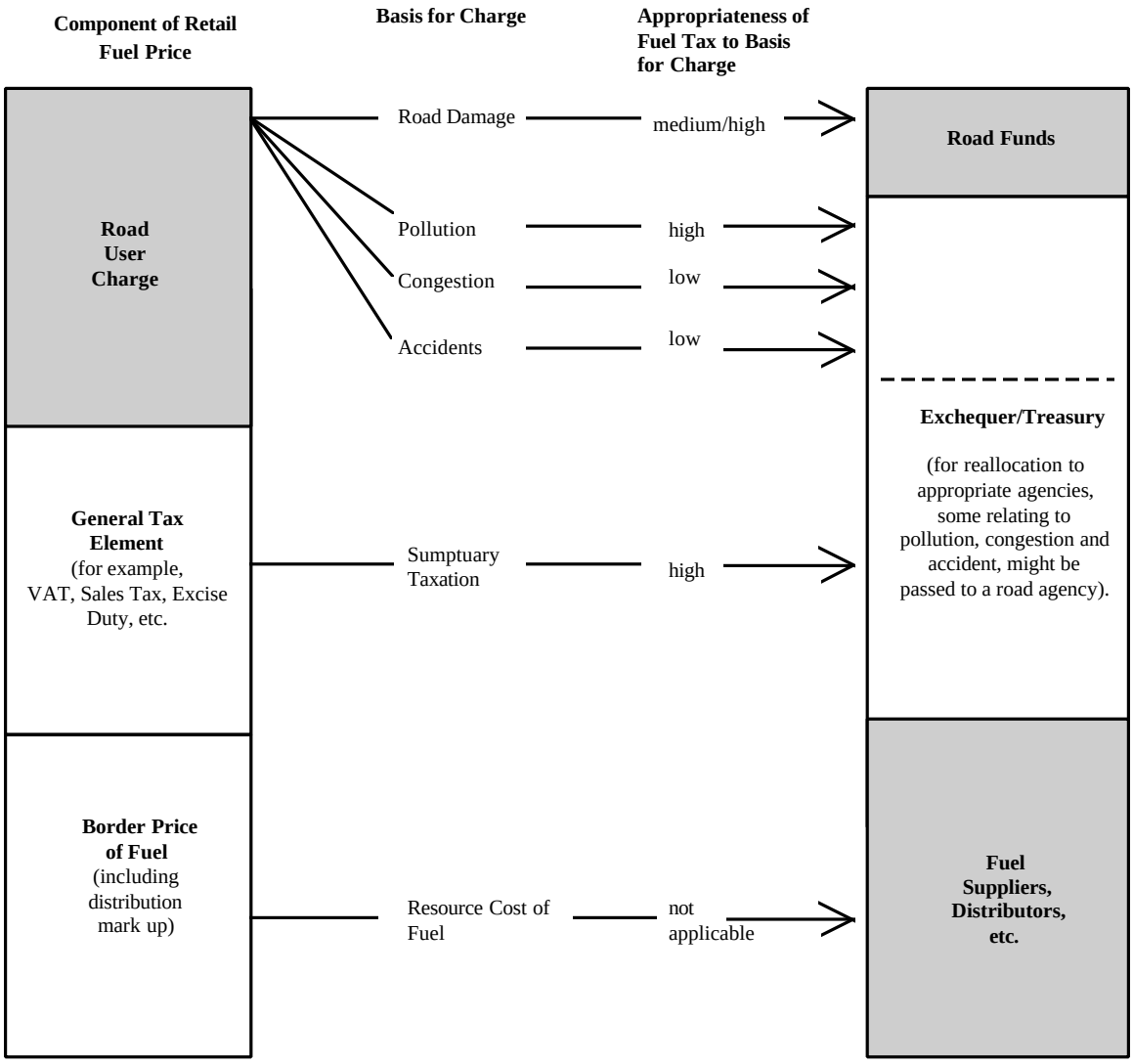
(2) Revenue Assignments: What Revenues Should Be Devoted To The Road Fund?

33. Determining the level and sources of funding is not straightforward. Defining the level 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 relative to each other over time. To make the level of funding 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.

34. Defining the sources of funding is somewhat easier. Where "direct" charges, such as tolls, weight-distance charges, etc., are feasible there is little conflict with fiscal objectives. Annual vehicle taxes, even if weight related, are weaker proxies because they do not reflect distance traveled and hence embody perverse incentives to intensify vehicle use. Similar problems arise with the use of a fuel tax surcharge as a proxy user charge (See Figure 1). The essential point is that road use generates a number of externalities of which road damage—requiring maintenance—is only one. A surcharge on fuel use as a proxy for the road damage externality is reasonable in the case of automobiles and this would imply a modest tax on gasoline. Fuel use is <u>not</u> as good a proxy for road damage by trucks. Hence, a surcharge on diesel would either have to be very high—thereby creating problems for the use of diesel outside the transport sector (as in power generation or in agriculture)—or insufficient to collect the necessary revenue or to modify behavior. A surcharge on fuel may also be appropriate for other externalities such as air pollution but less so for externalities such as congestion (which varies by time and location) or safety. [22] Given the multiple claims on the surcharge, it is not clear why all the revenue should be channeled to a road administration, road fund or a commercialized road agency. It may be appropriate to transfer some of the road user charges to other budgets.

[22] 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.

Figure 1. Fuel (Gas or Diesel) as a Base for Road Maintenance Charges.



35. Therefore, the design of the surcharge on fuel must be based on a transparent and supportable formula ex-ante, i.e., directly linked to the externalities or services consumed. The 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 10 percent), and any surcharge is likely to detract from general taxing capability (as in many small developing countries—Costa Rica 19 percent, Guatemala 16 percent; Nepal 13 percent).

- The general fiscal situation is weak and there are many sectors making similar claims for special fiscal treatment (as in many countries with "internal" deficits in excess of 5 percent of GDP or Tax to GDP ratios of less than 15 percent).

- Diesel is used extensively in power generation and in agriculture (as in many countries in South and East Asia).

36. One danger to anticipate and avoid is the possibility that once a Road Fund has been set up there will be resistance to supplementary funding from the general budget. The latter may still be needed. Insofar as the efficiency arguments in favor of a partially protected budget relate to the ability to plan and phase a "core" maintenance work program, the benefits of a Road Fund do not depend on a complete separation of the roads budget from the rest of the budgetary process. Funding for links outside the "core network" or to cope with unforeseen circumstances (for example, natural disasters) would still require appropriations from the general budget.

(3) Governance: What Institutional Arrangements Are Appropriate?

37. 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. Many traditional Road Funds failed as funds accumulated or were misallocated. Better governance is essential to ensure that budget constraints are hard, and that expenditure decisions are user responsive. The following institutional components should therefore be included in the 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 agency.[23] Where the setting of user charges and taxes overlap between the Road Board and the government, 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, even though it is unreasonable to expect legal commitment to any particular level of tax or tax yield.

- ***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.

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[23] The difficulties of ensuring efficient channeling of revenues was exemplified in Mali in the late 1970s and early 1980s. 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.

- ***A third party monitoring system*:** Given the problems of securing representative governance, a monopoly supplier of road services (the operator of the Road Fund or "commercialized" Road Authority) should be subject to regulatory supervision. The Fund or Authority should be required to inform the public and supervisory authorities of its activities; its accounts should be externally audited and periodically reviewed by an independent review body; and, if corporatized, its net income should be subject to corporate income tax.

- ***Administrative competence and proper criteria for expenditure:*** Assigning expenditure responsibilities to the Road 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 and report on performance. Successes are being recorded. For example, effective procedures have been developed for allocation of funds (in this case between regions) in Tanzania and in Mozambique.

38. Where the Fund is established as a temporary arrangement because general budgetary procedures are not functioning well, termination criteria and a sunset clause must be in place to determine what should occur when effective budgetary procedures are judged to have been re-established. Suggested criteria for the termination of earmarking taxes to a Road Fund based on an independent review are summarized in Table 4.

39. If, on the review, the performance criteria set out in Table 3 are all satisfied, and user charges are already separated from general taxation on road users, and if it is the general objective of government to disengage from the direct production of goods and services, the appropriate action would be the legislative formalization of the Roads Authority as a commercialized public utility with user charges accruing directly to it rather than passing through the Treasury. Subsequently, it should be subject to the same general form of public scrutiny as other privatized monopolies. The response to an unfavorable review should be, as in most countries, a matter for political/legislative rather than simple administrative action.

Table 4. Sunset Provisions for Road Funds

Closure of Road Funds May be Justified if the Following Applies	**Potential indicators**
1. Continued inadequate maintenance of the road network because of:	
• Insufficient revenue base that is not topped up as needed by the general budget, or	• The ratio of revenue flow to the Fund to the required (nearly optimal) maintenance expenditure flow is less than 0.7.
• Raiding of funds by the general budget,	• The ratio of actual expenditures to required maintenance expenditures is less than that of revenue flow to required expenditure *and* the actual expenditure flow is also less than that before institution of the Fund. • Predicted real VOC for the roads maintained increases over time.
• Poor governance due to "incentives" that limits the operational efficiency of the Fund.	• Actual maintenance cost per km. of road greater than comparable benchmark. • Percentage roads in "fair" and "poor" condition is increasing.
2. Misallocation of resources:	
• The fund engages in wasteful spending to avoid showing a surplus,	• The ratio of administrative expenditure to total expenditure is greater than 20 percent.
• High revenue flow into the Fund generates a persistent build up of a surplus that is *not accessible* by the general budget,	• Actual expenditures are greater than the estimated required maintenance expenditures.
3. Poor governance due to "capture" that shifts allocative priorities	• Inadequate representation of stakeholder groups in Board management structure. • Inadequate public reporting of plans, expenditures and road conditions. • Maintenance expenditures on the different links are not in proportion to the corresponding ERRs.

CONCLUSIONS & RECOMMENDATIONS

40. Road Funds are a continuing subject of controversy. They are regarded as a boon by highway specialists who see them as facilitating the provision and maintenance of a highly productive asset by means entirely consistent with the general shift away from direct government production of goods and services. Macroeconomists and public finance specialists have tended to regard them as a bane because they reduce fiscal flexibility; do not adequately address problems associated with the provision of public goods or the internalization of externalities; and are often not well managed.

41. This paper has argued that the issue is not one to be resolved on general principle, but on a case-by-case basis through the analysis of likely micro and macro effects. In general, there are two radically different long term options to reconcile "fiscal prudence" with "asset maintenance:" (a) a fully commercially operated Road Agency (subject to the normal oversight of behavior accorded to privatized monopolies), or (b) a reformed and well functioning budget process. Neither exists at present in most developing and transitional economies. Thus, any recommendations on the role and nature of Road Funds must be viewed as a provisional, case-specific intermediate step in the direction of one or the other long term solution.[24]

42. This paper lists a few indicators that can be used to determine:

- whether to introduce a Road Fund (Table 2); and
- whether to continue it based on periodic reviews (Table 4).

In addition, the paper argues that for the interim arrangement:

- the Road Fund's ***expenditure responsibilities*** be limited to maintenance in order to correct a systematic bias against maintenance despite the link between investment and maintenance;
- the Road Fund's ***revenues*** be only from direct charges on road users , except in the case of fuel surcharges (which need to be separated from general taxes in agreement with the Treasury);
- the Road Fund be managed professionally under the direction of a ***"user representative" Board,*** and subject to strict oversight and auditing arrangements by third parties.
- there should be explicit ***transition arrangements*** as the Road Fund phases into one or the other long term solution.

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[24] This position accords closely with the position recently expressed in an IMF working paper. See Potter, B. *op. cit.*

43. As recent African experience shows, when there is a crisis and main road systems fail, 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 charge to be devoted to improving the quality of the road infrastructure. However, experience with "second generation road funds" is very limited and it remains to be seen whether Road Fund management will be sufficiently immune to the kind of political interference that presently disturbs the flow of funds into road maintenance once the immediate most extreme problems of deficient maintenance are overcome. For this reason:

- the recently introduced Road Funds in sub-Saharan Africa and elsewhere should be monitored carefully.

44. This could be done through the inclusion of appropriate and comparable monitoring and evaluation (M&E) components[25] in sector programs and/or investment projects. The M&E of "second generation" of Road Funds will help:

- determine the longer term utility and generalizability of such interim arrangements, as well as,

- facilitate the amendment of initial designs on the basis of experience.

[25] To evaluate **effectiveness** a case-specific set of indicators needs to be created to track changes for at least five years before and after the introduction of Road Funds. To facilitate **comparison** between countries there should be a subset of indicators that are tracked for all Road Funds. The indicators should include the impact of Road Funds on general fiscal management (overall balances as well as allocations to other sectors) versus their impact on revenues generated and spent on road maintenance, and improvements in road maintenance. Some of the indicators should highlight the positive or negative impacts on incentives and accountability created by the governance structure (including ability to resolve conflicts/withstand political pressures).

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