ASIAN DEVELOPMENT BANK

Transport and Communications Division West

Regional Workshop on ROAD FUNDS Strategy

"Sustainable Funding for Sustainable Roads: Solving the Problem of Maintenance Neglect"

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Introducing Road Funds in Latin America

— the GTZ Experience —

by

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Summary

The essence of the presentation may be summarised in **8 points**:

1. Roads in Latin America are deteriorating, 1/3 is in poor, 1/3 in fair and only 1/3 in good condition. ***Roads are "big business", as the replacement value of these Latin American roads is appr. 350 billion US$$,*** which have to be preserved and adapted to growing transport needs.

2. Road Funds are important means, but only a ***part of*** the general issue of ***re-establishing financial discipline in the country***. This holds true also specifically for Latin America, where the financial sector in general is lacking stability. The countries of the Latin American continent have undergone severe problems, concerning the stability of the currency and the balance of government spending.
   Furthermore high inflation rates hindered sound accounting in the public and private sector as well and increasing social unrest hampered sound infrastructure development. Thus the ***establishment of road funds has to go hand-in hand with the financial stabilisation of the state.***

3. Therefor Roads Funds generally are established under ***political and economic pressure:*** This pressure may come from the road users together with the local press or mostly it may come also from ***international banks*** aiming at economic growth of the recipient countries and wanting to be sure that the repayment of their loans is secured by an appropriate development initiated by the roads.
   Consequently that means that ***roads*** not only have to serve other economic growth sectors but that they ***must form themselves an economic growth oriented sector***[1], which requires a professional asset management

4. In praxis the ***former project-by project approach*** of traditional roads departments has to be given up in favour of the sector approach, covering whole the country's road network under economic aspects.
   Maintenance with the highest economic yield (Economic Rate of Return for the National Economy ERR) becomes the ***first priority***. Revenues (mostly through fuel fees) have to be adequately high and are earmarked for maintenance.
   Thus a misallocation of funds is stopped, as well as the road network no longer being a burden for the state and the economy, but ***becoming a fully self-financing (and tax paying) sector***[2].

5. Financial reserves to feed the Road Fund, are - with exemptions as of Venezuela and Columbia - basically available in most cases[3].
   The example of **6 Latin American Road Funds** (Honduras, Guatemala, Costa Rica,

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[1] This general concept of the infrastructure and roads sector is by no means new but already established by - Adam Smith (1774) in his "Inquiry into the Wealth of Nations" (cf. GTZ publication, Eschborn 2001).
[2] ECLAC, UN -Economic Commission for Latin America and the Caribbean and GTZ: "ROADS, a new approach for road network management and conservation, Santiago/Chile June 1993.
[3] Details see. "Fuel Prices and Vehicle Taxation" comparative tables for 160 countries, GTZ publications 1999 and 2001.
Note: these 3 publications may be downloaded from: http://zietlow.com/documents

Nicaragua and Brazilian States) is given.
The lessons learned in introducing road funds in Latin America are:

- The spearheading of the initiative has to be **as high-ranking as possible** (preferably Prime Minister, Minister of Finance , the Transport Committee of Parliament and not only the Minister of Works).
- As Road Funds are part of the **General Stabilisation Strategy of public finances** they must find the approval of the Ministry of Finance; otherwise they are bound to fail.
- The **political pressure** has to be harmonised with a well**-planned public relations campaign** to win the support of public opinion.
- The formation and convincing of the lobby group of the **road users (bus, truck, taxi drivers unions** etc.) may be decisive for reaching the acceptance of financial burdens for new transport, vehicle and road fees.
- The **road maintenance charges can only be raised gradually** in line with improvements of the road network and should be introduced constantly, step by step and reflecting the world market prices (and - because of the local inflation - be generally **calculated in US $).**

6. **Additionally -compared with Asian countries** - there is a **vehicle taxation** strategy in many South American Countries, which doesn't exist in the US and in many other countries.

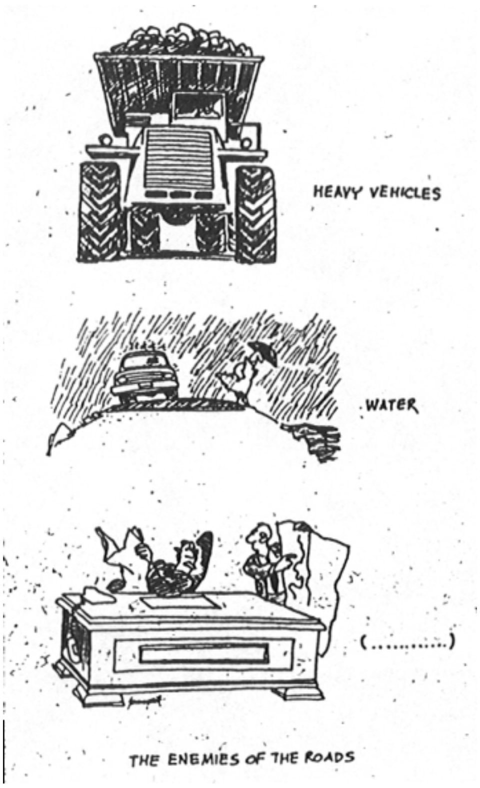
7. Latin American countries are - in the economic field - often following US American examples. Therefor the **US Road Fund** is of major importance for the political and economic change in the hemisphere.
   This US Road Fund secures the **earmarking of the fuel taxes**. The Federal Road Fund of the US provides also for **an internal cross-subsidisation from richer to poorer** States (e.g. California to Alaska).
   At the same time it secures **road safety** measures, some funds for **mass transit** in cities as well as general transport **research**.

8. The **HDM-4 program** may be considered the best method to measure the economic viability of the economic road network approach. It basically measures the cost-savings effect for the road users (according to the lower or higher surface roughness of the roads).
   But a precondition of applying HDM may be - specifically in less or least developed countries LDC and LLDC - first the use of a **road data bank** and a **bridge data bank** by the ministerial road owner, thus securing the (narrower) aspects of safeguarding the financial value of the initial investment and guarantying the best IRR (Internal Rate of - Return) of the initial investment.
   Thus a **careful Asset Management of the state road investment** is a necessary precondition and first step to reducing the total transport costs (including the costs to the road users) to the benefit of the national economy.

Road Funds in Latin America
- The GTZ experience -

THE DIAGNOSIS

Roads in Latin America are deteriorating, 1/3 is in poor, 1/3 in fair and only 1/3 in good condition. ***Roads are "big business", as the replacement value of these Latin American roads is appr. 350 billion US$$,*** which have to be preserved and adapted to growing transport needs.



Thus the **enemies of the road**s are not - as formerly seen by the engineers - the heavy vehicles and the water only - but mainly inadequate financing and inadequate management[4].

Since more than 20 years this issue of **improving government performance** in the roads sector is a mayor concern of the German Agency for Technical Co-operation **GTZ** mbH, which seconds its professional advisory services world-wide, specifically in the framework of German development co-operation on the 3 continents of Asia, Africa and Latin America, but also on a commercial basis to other countries like the accession countries to the European Union in Eastern Europe, the Balkans and the Mediterranean..

The Latin American case: the special efforts of ECLAC and GTZ for a new approach to road maintenance in that region and also the lessons to be drawn from the execution in different countries shall be the focus of this presentation.

To start with, the main lesson may be presented already at the beginning: the financial problems in road management are not unique, but part of a wider problem. Therefor al efforts to remedy the situation -and also the main target to establish road funds - can only be seen in a wider perspective.

[4] Ian Heggie, Financing and Managing of Roads, World Bank Washington 1998

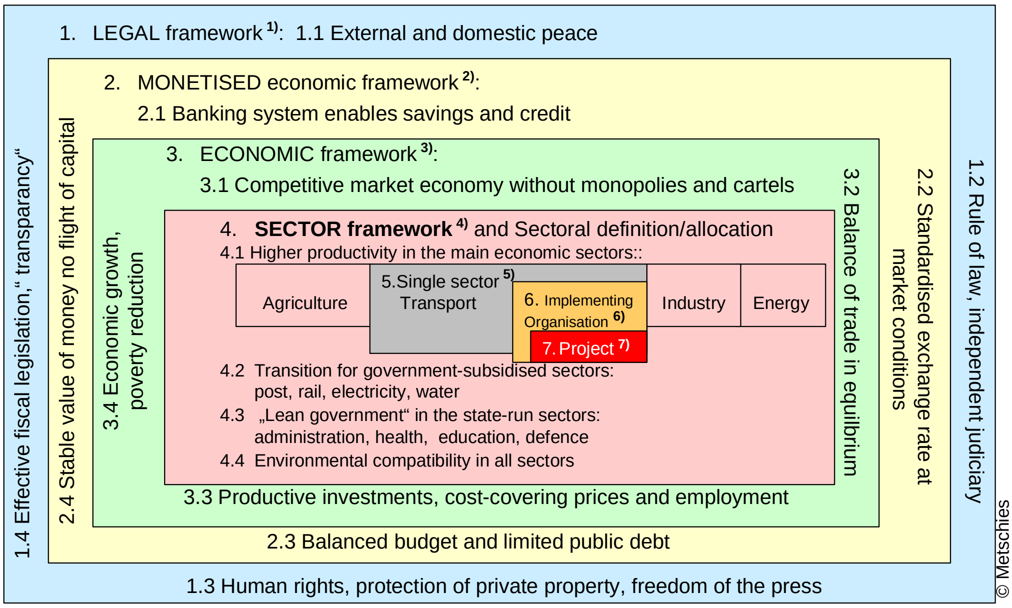
This holds true specifically for Latin America, where the political, economic and financial sector in general are lacking stability. The countries of the Latin American continent have undergone severe problems, concerning the stability of the currency and the balance of government spending.

Furthermore high inflation rates hindered sound accounting in the public and private sector as well and increasing social unrest hampered sound infrastructure development. Thus the ***establishment of road funds has to go hand-in hand with the financial stabilisation of the state.***

How the roads sector is incorporated into the framework of legal, monetary, economic sector policies may be seen from the following graph.

Legal, Monetary, Economic and Sector Policies

as pre-conditions for successful institutional capacity building and project implementation



1) see: accession conditions for membership of the UN and its special organisations
2) see: IMF goals, and in Europe „Maastricht-Convergence Criteria“
3) see: „magic square“ in the definition of the social market economy: growth, stable value of money, balance of trade in equilibrium, full employment
4) relate to: . „transition“ and commercialisation process
5) see: sector studies by international banks
6) relate to: appraisal or privatisation of implementing organisation
7) traditional individual project or programme with Financial Cooperation (e.g. construction of railways, supply of busses) or Technical Cooperation (advisory services, training) funding

Road Funds are important means, but only a ***part of*** the general issue of ***re-establishing financial discipline in the country***.

As may be anticipated from the above graph, Roads Funds generally are established under ***political and economic pressure:***

This pressure may come from the road users together with the local press. But often it may come also from ***international banks*** aiming at economic growth of the recipient countries and wanting to be sure that the repayment of their loans is secured by an appropriate economic development initiated by the roads.

International financial co-operation often is tied to restructuring conditions. This may - e.g. from the IMF side - a condition to limit the budget deficits to a maximum of 8% of GDP only. Under this pressure of contributing to a balanced state budget the infrastructure, transport and road sector have to play a special role:

Generally speaking there is no solution to the state deficit unless at least the road sector covers its own costs, as there is no other sector of the economy who could pay for it..

> Consequently that means that ***roads*** not only have to serve other economic growth sectors but that they ***must form themselves an economic growth oriented sector***[5], which requires a professional asset management

For the Ministry of Public Works as the caretaker of the roads, this means that - as experienced in the Central American Countries - the traditional ***former project-by project approach*** (often also called the "shopping list approach") had to be given up in favour of the ***sector approach***, covering whole the country's road network, specifically ***under economic and financial aspects***.

The Criteria of <u>ECONOMIC efficiency</u>

<u>B) The Economic Rating</u>	
<u>1st PRIORITY</u>: <u>MAINTENANCE</u> Projects (With Intenal Rate of Return:	40%
<u>2nd PRIORITY</u>: <u>REHBILITATION</u> Projects (With Internal Rate of Return:	20%
<u>3rd and last PRIORITY</u>: <u>New Construction</u> (With Internal Rate of Return:	10%

Lessons to be learnt from the 1st Decade on TRANSPORT & COMMUNICATIONS

As for project selection in the roads sector, experience has established some average values to be expected from different kind of projects:

Internal rates of return to be expected:

Maintenance projects with the highest economic yield (Economic Rate of Return for the National Economy ERR) becomes the ***first priority***.

But the sector approach requires that not only expenditures but revenues are considered at the same time: Road user Taxes and Fees are the heart of the matter of the road funds. Revenues (mostly through fuel fees) have to be adequately high and to be earmarked for maintenance.

This required a major turn mainly within the Ministry of Finance, which up to now only full fills the short-term target to balance the annual state budget without considering longer-range economic perspectives.

As Road Funds are part of the **General Stabilisation Strategy of public finances** they must find the approval of the Ministry of Finance; otherwise they are bound to fail. Economically speaking a misallocation of funds is stopped, as well as the road network no longer being a burden for the state and the economy, but ***becoming a fully self-financing (and tax paying) sector***[6].

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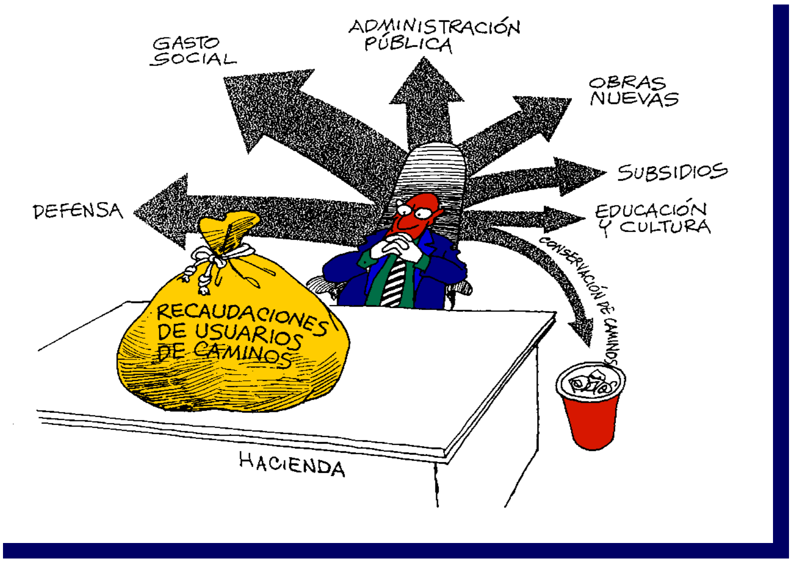
[5] This general concept of the infrastructure and roads sector is by no means new but already established by - Adam Smith (1774) in his "Inquiry into the Wealth of Nations" (cf. GTZ publication, Eschborn 2001).

[6] ECLAC, UN -Economic Commission for Latin America and the Caribbean and GTZ: "ROADS, a new approach for road network management and conservation, Santiago/Chile June 1993.

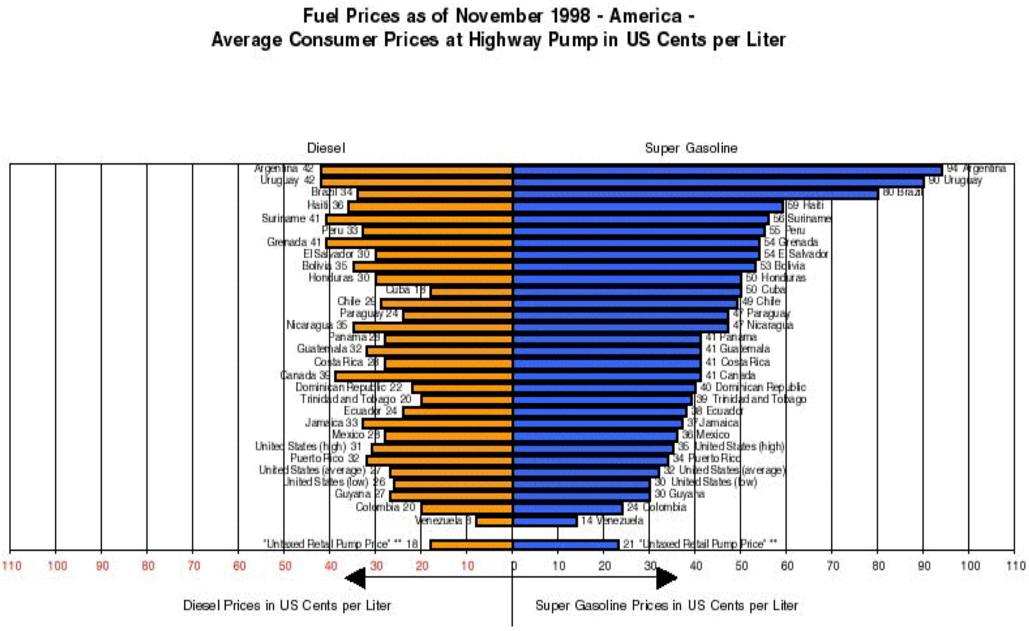
A general progress and change of attitudes is still very slow, but without the consent of the Ministry of Finance no road fund may be established.



To change the traditional practice of revenue distribution of road user taxes and fees, the spearheading of the initiative has to be **as high-ranking as possible** (preferably Prime Minister, Minister of Finance and the Transport Committee of Parliament, but not only the Minister of Works).

The **political pressure** has to be harmonised with a well-**planned public relations campaign** to win the support of public opinion.

But the formation and convincing of the lobby group of the **road users (bus, truck, taxi drivers unions** etc.) may be decisive for reaching the acceptance of financial burdens for new transport, vehicle and road fees, is the tedious task of the politicians, a process which still is going on. .



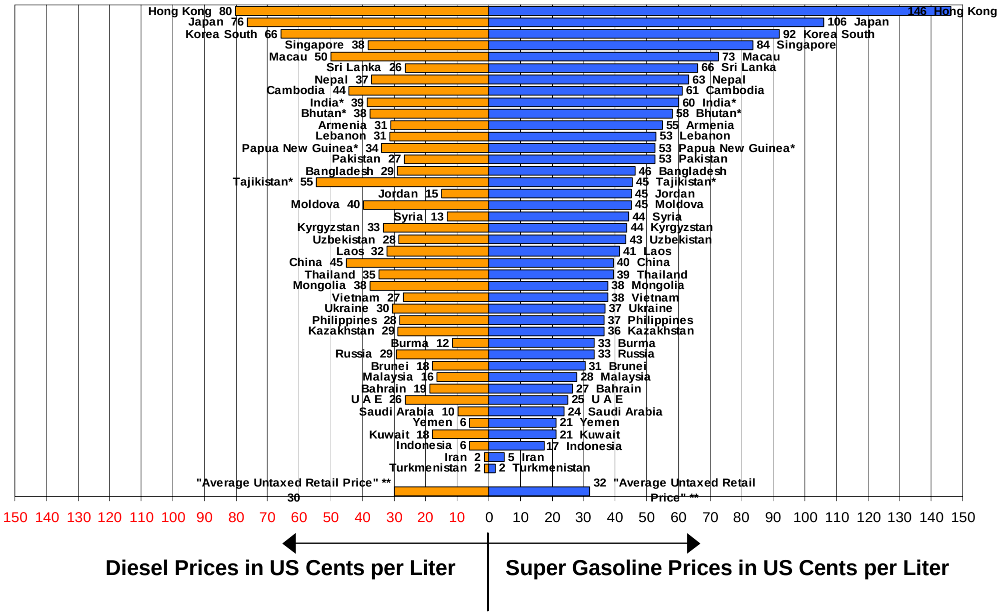
Diagnosis of fuel prices in Latin American countries.

There is a clear difference in the taxation of diesel and gasoline.

Remarkable exemptions in diesel taxation are oil producing countries as Venezuela, Columbia and Trinidad as well as socialist countries like Cuba.

Fuel Prices as of November 2000 – Asia –

Average Consumer Prices at Highway Pump in US Cents per Liter



Asian fuel prices show the same distinction between diesel and gasoline taxation.

Also remarkable exemptions in diesel taxation: Mainly the oil producing countries, while China (and Vietnam also) have given up former low- price policies for diesel.

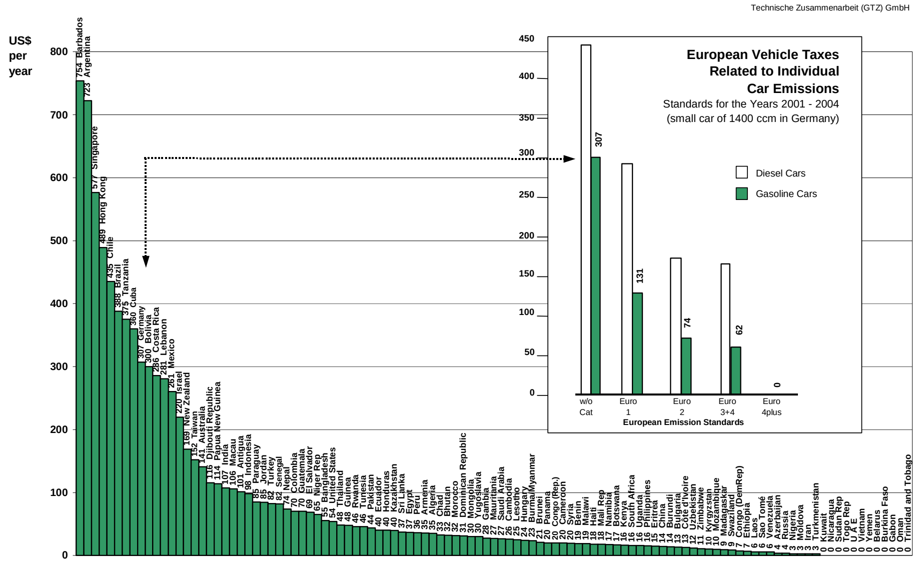
The **road maintenance charges can only be raised gradually** in line with improvements of the road network and should be introduced constantly, step by step and reflecting the world market prices (and - because of the local inflation - be generally **calculated in US $, as shown in the above graph.**

Additionally there is a **vehicle taxation,** a strategy followed by many South American Countries, which doesn't exist in the US. Although road funds generally are supplied by 70 to 80% of fuel taxes, there is a trend to levy increasing annual vehicle taxes as well. **Barbados, Argentina, Chile and Brazil are world leaders in these vehicle taxes**.

World Vehicle Taxation as of November 2000

Annual Vehicle Licence Fee for a Small Passenger Car (Toyota Corolla or Golf 1400 ccm)

gtz Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH



INITIATING ROAD FUNDS IN LATIN AMERICA

In 1993 the UN Economic Commission for Latin America and the Caribic ECLAC started an action program asking its member countries, if they were interested or ready to take part in a reform project for road maintenance.

This program was based on the ECLAC book "ROADS - a new approach to road sector management" and a series of ECLAC-seminars in several countries. All the contact to the individual countries was based on connections to the respective transport ministers.

Parallel to it there were also PROVIAL seminars for the general reform of the roads sector in Latin America organised by the World Bank, the Inter-American Development Bank BID and the Transport Ministers.

Further on special Road Fund seminars, mostly organised by GTZ and the World Bank, as well as high-level seminars were executed at cabinet level of governments, with economic committees as well as members of parliaments.

Generally speaking and as a gtz experience it must be stated that a single of the high-level gatherings isn't sufficient, but that 4 to 6 of them may be necessary to really initiate the reform process in a country.

The main emphasis of the seminars was laid on the potential cost savings to the national economy reached through the establishment of road agencies outside the ministerial administration and commercially managed by means of special road funds and prioritising the maintenance of roads.

A table of the countries participating in the road reform program may demonstrate these anticipated cost savings:

Conservative estimates of cost savings to be reached by road sector reforms

Countries / Federal States	GDP 1997	Savings by Road Agency + Road Fund*		Maintenance costs p.a. *****	Potential Maintenance Savings**	Total Savings Potential p.a.	Potential Savings till end of year 2000***	Potential Savings till end of year 2010
(1)	(2)	(3)		(4)	20% of (4)=(5)	(3)+(5)=(6)	(7)	(8)
	Billion US $	% of GDP ****	Mill. US $	Mill. US $	Mill. US $	Mill. US $	Mill. US $	Mill. US $
Costa Rica	9..3	2.2	204.6	85	17	221.6	20	500-700
El Salvador	10.7	1.5	160.5	33	6.6	167.2	0	500-700
Guatemala	16.6	2.5	415	65	13	428	80	1500-2000
Honduras	4.4	2	88	55	11	99	5	400-600
Nicaragua	1.9	3	57	48	9.6	66.6	0	200-400
Mato Crosso (BR)	8.8	2	176	140	28	204	0	800-1000
Mato Crosso do Sul	7	2	140	105	21	161	0	700-900
Uruguay	20	1	200	160	32	232	10	150-200

(Table acc. to Zietlow GTZ-IRF 2001)

* Savings of vehicle operating costs and time savings, calculated by HDM

** Savings of maintenance costs by private execution and new contract forms (lump sum for end product)

*** Savings mostly not yet realised, as road funds still in its initial phase.

**** Estimation dependent on quality of existing interurban road network (3% of GDP for countries with 50% of roads in insufficient state, 1% of GDP for countries with only 15% of roads in bad shape)

***** Maintenance costs related to a well maintained network, which at present is not yet the case.

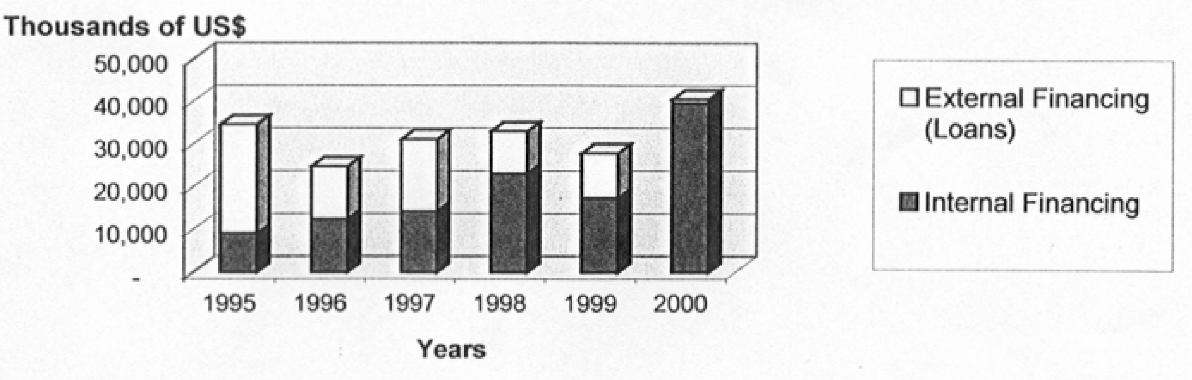
DETAILED CASE STUDIES NOF LATIN AMERICAN ROAD FUNDS

In **Honduras** the legislation to create the Road Maintenance Fund was passed in 1993. The Board that consists of four representatives from the central government, one representative from the municipalities and three representatives from the direct and indirect road users is supervising the fund. The principal financial source of the fund is a levy on motor vehicle fuels in the form of a dedicated tax. The Road Maintenance Fund is responsible for the routine and periodic maintenance of the official road network, excluding urban and municipal roads. Up to 10% of the funds can be disbursed for road rehabilitation works. All works as weil as services have to be contracted out to the private sector. In addition, to avoid creating another bureaucracy, the administrative cost of the fund has been restricted to 2.5% of its annual budget. Presently, the Road Maintenance Fund has 38 staff members, including support staff.

Unfortunately, the law that was created by an outgoing government stipulated that all proceeds from taxes related to road transport, such as fuel taxes, import duties on motor vehicles, licensing fees, etc. have to form part of the income of the fund. This was unacceptable to the new government. In addition, these proceeds would have supplied twice the amount of funds needed for road maintenance. Only in the year 1999 was the issue solved by an amendment to the existing law, stipulating that only a specific portion of the fuel tax be dedicated to the fund.

Actual operation of the Road Maintenance Fund started in January 2000. Since then the financing of road maintenance has been stabilized and is done almost exclusively through the Road Maintenance Fund (see Box 3). From 2001 to 2009 the projected income of the fund will increase from 60 to 84 Million US$ in year 2000 dollars. The road network maintained by the Road Maintenance Fund will go up from 5743 km in 2001 to cover the whole road network of 14602 km in 2009.

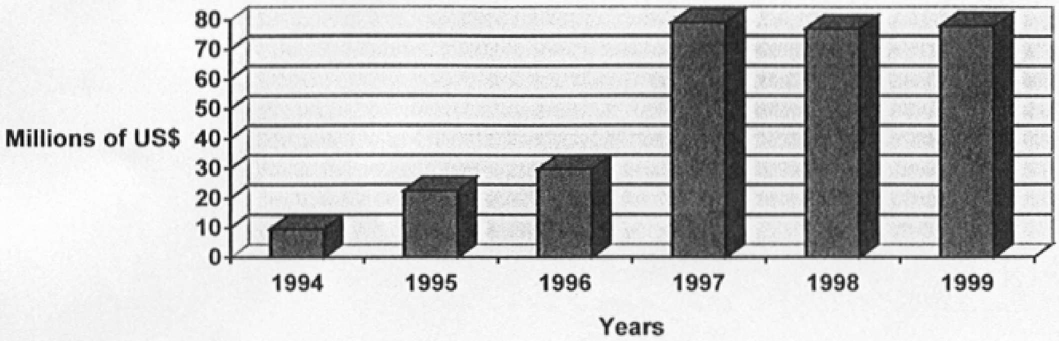
Figure 5: Sources of Funds for Road Maintenance in Honduras



In late 1996 **Guatemala** passed a law increasing the taxes on motor fuel, dedicating this increase and part of the existing fuel taxes to a special fund to be disbursed exclusively for road maintenance and improvement. The body governing this fund was created by government decree in early 1997. Three members of its Board are government officials and three members are from the private sector. As in the case of Honduras all works and services have to be contracted out to the private sector, and the administrative cost of the Fund has been limited to 2% of its annual turnover. The original intent by the Minister of Transport to create an autonomous Road Maintenance Fund had to be abandoned, as it required a 213 majority of parliament for its approval, which the government was unable to secure.

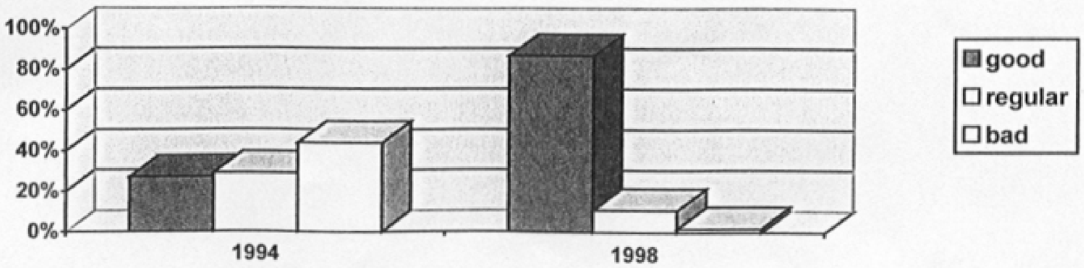
With the introduction of the Road Maintenance Fund the funds spent on road maintenance jumped from 29.5 million U8$ in 1996 to 79.1 million U8$ in 1999 (see Figure 6).

Figure 6: Financial Resources Spent on Road Maintenance in Guatemala



While in 1994 only 11% of the road network of 11100 kilometers received maintenance servicesJ road maintenance coverage increased to 49% of 14340 kilometers of roads in 1999. Priority was given to paved roads that received almost 100% coverage. The condition of the paved roads has improved substantially since 1997 (see Figure 7). This was partially due to the road rehabilitation projects funded by the government and externallending agencies.

Figure 7: Road Conditions of the Paved Roads in Guatemala in the Years 1994 and 1998



So far, the Road Maintenance Fund has worked very effectively, creating a very favorable perception among the general public. Most notable was the disappearance of potholes, which frequently have annoyed road users.

Costa Rica created its National Road Fund in mid 1998, which is mainly funded by a levy on fuel. The fund takes care of the maintenance, rehabilitation and improvement of the national road network. Priority in funding has to be given to routine and periodic maintenance. The Board has three members coming from the central government (all from the Ministry of Public Works and Transport), one member representing the municipalities, and three members from the private sector. The private sector representatives are nominated by their respective organizations. As in the cases of Honduras and Guatemala, the fund is obliged to contract out all works and services to the private sector. Unfortunately, the fund has to abide by the government rules concerning wages and letting of contracts, which might have negative effects on its efficiency.

Although the National Road Fund managed somewhat to improve road conditions, the national road network is still in a fair I y poor state. Funds are not being transferred from the Ministry of Finance as stipulated in the National Road Fund Law. The fund receives rough I y on I y half of the amount due. This practice of the Ministry of Finance once again underlines the necessity for road funds to be financed by road user fees collected by the road fund administration, rather than through dedicated taxes.

Since the National Road Fund does not cover regional and local roads, the government of Costa Rica is planning to create a Municipal Road Fund to cover these roads as weil.

In June 2000, **Nicaragua** passed a law creating its Road Maintenance Fund, an autonomous body governed by a Board. The Board has two members representing the government, one representing the local governments, and three representing direct and indirect road users (see Box 1 on page 8). The Road Maintenance Fund is responsible for the periodic and routine maintenance of the national road network that includes a major part of the rural roads in Nicaragua. Up to 10% of the fund's annual budget can be spent on minor rehabilitation works.

As in the other three countries mentioned above, all works and services will have to be contracted out to the private sector. Besides having internal audits, the fund will be audited annually by an independent auditor. In addition, it is planned to regularly inform the road users about the performance of the fund.

In order to gain public support, the government had undertaken an extensive public awareness campaign prior to creating the Road Maintenance Fund and had decided not to increase the fuel price at the initial stage of the fund. To provide initial funding, part of the existing fuel taxes was supposed to be transformed into a dedicated fuel tax. Unfortunately, the Minister of Finance objected strongly, leaving the financing of the Road Maintenance Fund to the normal budget process. This clearly puts the financing into jeopardy, taking into account the history of resource allocation to road maintenance by the government of Nicaragua.

EI Salvador created its Road Maintenance Fund in November 2000. It is an autonomous body supervised by a Board having two members from the central government, three members representing the indirect road users, and two members representing the direct road users.

The Road Maintenance Fund is responsible for maintaining the national road network that includes most of the rural roads, as in the cases of the other four countries mentioned above. As in the case of Nicaragua, financing also depends on the General Budget and is vulnerable to under-financing. Initially, the Fund will have to concentrate on a core network until the funding situation improves. High fuel prices made it impossible for the government to convince parliament to levy a dedicated fuel tax of approximately 22 US cents per gallon. The government intends to approach parliament again when fuel prices decline and will propose a more gradual increase in the fuellevy .

In **Brazil** three states have created autonomous Road Funds, the State of **Mato Grosso** in June 1999, the State of **Mato Grosso do Sul** in March 2000, and the State of **Parana** in early 2001.

The Road Funds in the State of Mato Grosso and Mato Grosso do Sul have similar characteristics. Both have Boards with a majority of members coming from the public sector, are financing the Road Fund through a levy on motor vehicle fuels and agricultural goods, and are responsible for construction, rehabilitation and maintenance of roads. Since both states are predominantly agricultural, and still need to expand their road networks, it was feit necessary to include road construction and rehabilitation as weil, and to broaden the financial base of the Road Fund through levies on agricultural goods.

The Road Fund in the State of Parana actually is a genuine road maintenance fund. Funding is exclusively provided by a levy on motor vehicle fuels. The Board consists of two representatives of the state government, one representative of the parliament, one representative of the municipalities, and ten representatives of the direct and indirect road users.

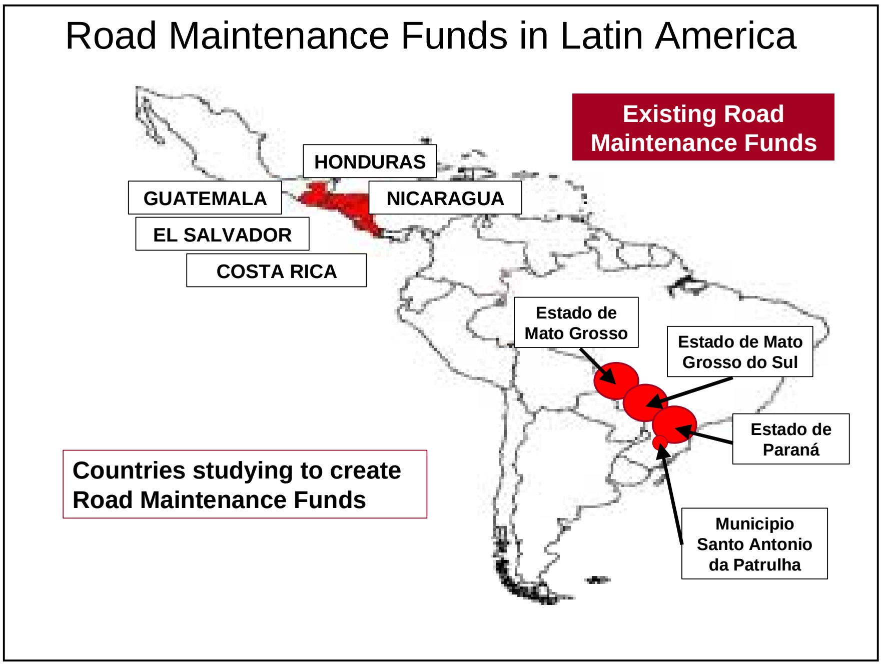


Figure 8: Road Maintenance Funds in Latin America

Several other states in Brazil have shown interest creating similar Road Funds as well.

Other countries such as Brazil at the federal level, Ecuador, and Mexico are discussing the creation of Road Maintenance Funds, but are still far from reaching a consensus (see Figure 8). In Peru and Colombia initial progress towards establishing a road maintenance fund has suffered major setbacks as governments and priorities have changed. Nevertheless, the urgency to reform the present ineffective and inefficient system of maintaining roads in these countries is mounting, increasing pressure to reform the financing and management of their road maintenance.

THE US ROAD FUND

Latin American countries are -in the economic field -often following US American examples. Therefore the **US Road Fund** is of major importance for the political and economic change in the hemisphere.

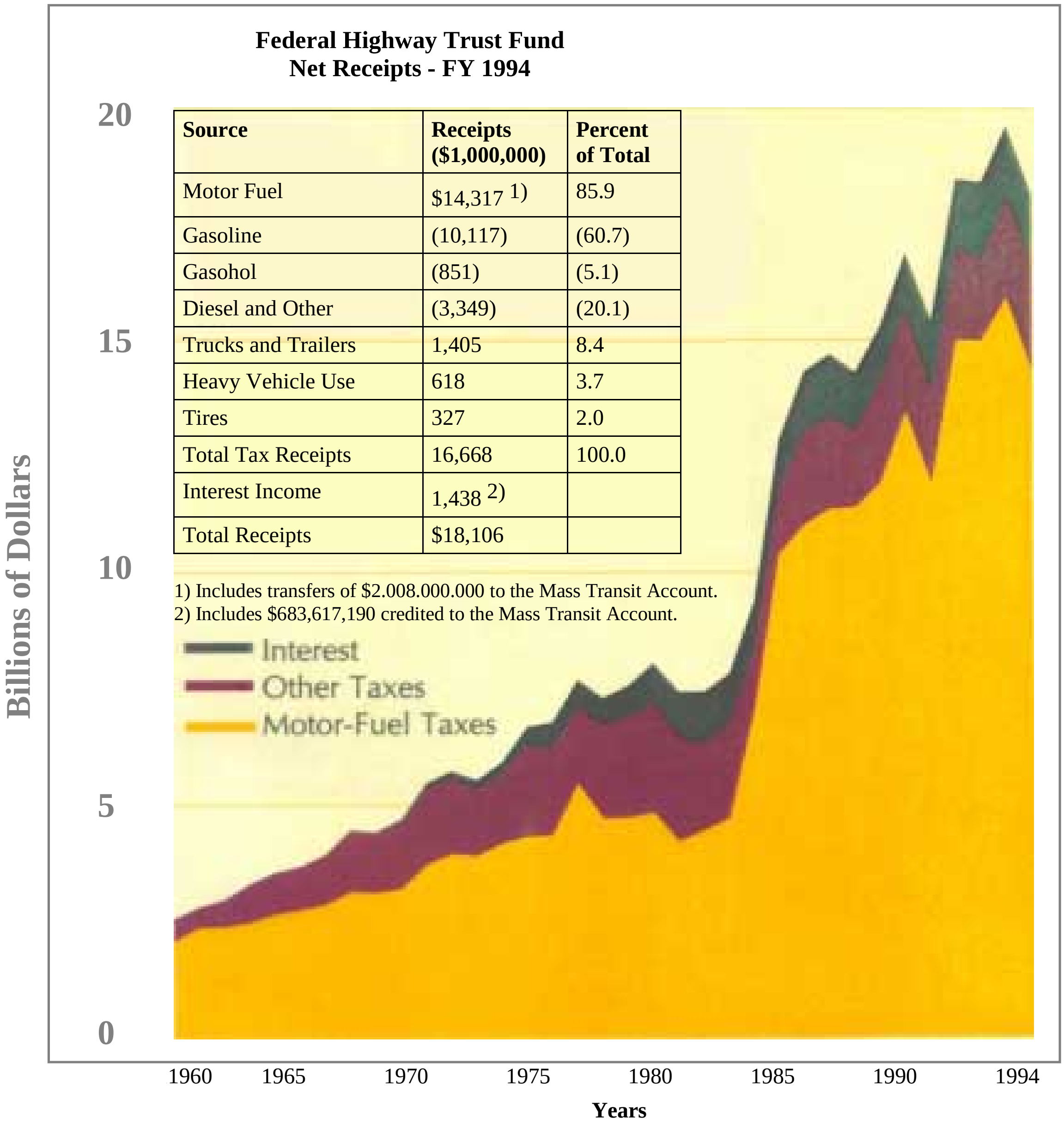
The USA operate two different road funds, one Federal Road Fund and one State Road Fund.

Federal Highway Trust Fund (HTF) Receipts USA

Federal Highway Trust Fund
Net Receipts - FY 1994

Source	Receipts ($1,000,000)	Percent of Total
Motor Fuel	$14,317 1)	85.9
Gasoline	(10,117)	(60.7)
Gasohol	(851)	(5.1)
Diesel and Other	(3,349)	(20.1)
Trucks and Trailers	1,405	8.4
Heavy Vehicle Use	618	3.7
Tires	327	2.0
Total Tax Receipts	16,668	100.0
Interest Income	1,438 2)	
Total Receipts	$18,106	

1) Includes transfers of $2.008.000.000 to the Mass Transit Account.
2) Includes $683,617,190 credited to the Mass Transit Account.



Most receipts from the Federal taxation of motor fuel, along with a number of other Highway-related taxes, are deposited in the Federal Highway Trust Fund. The Trust Fund is made up of two accounts – highway and mass transit – and is dedicated for the funding of Federal surface transportation programs. In this way, taxes on highway users are used to fund highway facilities. The Trust Fund has provided a stable funding source for highway programs since it was established in 1956.

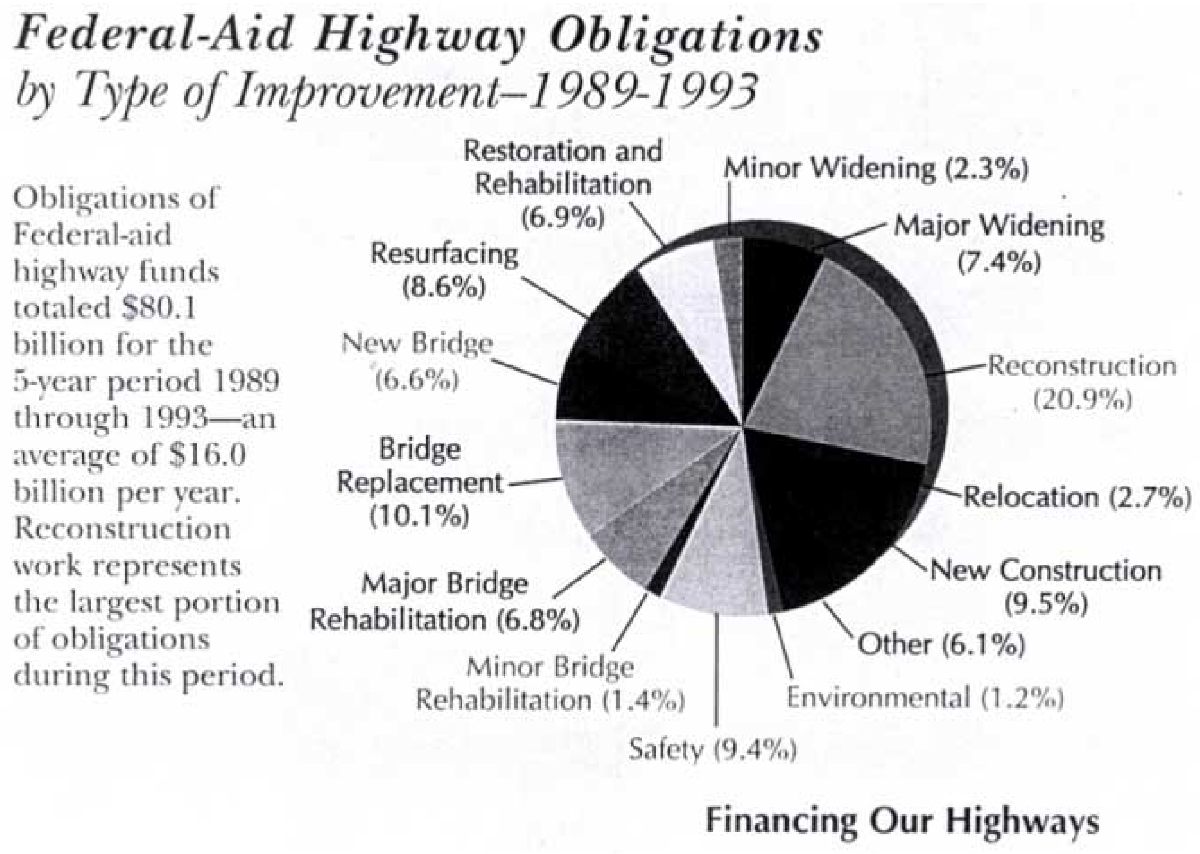
Motor-fuel tax receipts accounted for $14,317 billion in Fiscal Year 1994, of 85,9 percent of all Trust Fund tax receipts. Other taxes accounted for $ 2.350 billion. The balance in the Trust Fund earned interest income of $1.438 billion.

The US Road Fund secures the **earmarking of the fuel taxes**. The Federal Road Fund of the US provides also for an **internal cross-subsidisation from richer to poorer** States (e. g. Califomia to Alaska).

At the same time it secures **road safety** measures, some funds for **mass transit** in cities as well as general transport **research** .

Both the US Highway Trust Funds are mainly financed by a fuel tax of 5 US Cents per liter fuel each, figures that are sufficient because of the high traffic density in the US. They cover maintenance, operation and financial costs of the roads.

Contrary to these figures a fuel fee of 10 US Cents per liter may be sufficient to cover road maintenance only in least developed countries. The distribution offunds with the us Federal Highway Trust fund may be seen from the following graph:



THE HDM PROGRAMM

The **HDM-4 program** may be considered the best method to measure the economic viability of the economic road network approach. It basically measures the cost-savings effect for the road users (according to the lower or higher surface roughness ofthe roads). In South American Countries there is an interest in the HDM-Model at university level, while roads departments seem to be reluctant.

GTZ didn't introduce HDM in Third World countries yet, as it considers -specifically in less or least developed countries LDC and LLDC -it a precondition to have first operational the use of a **road data bank** and a **bridge data bank** by the individual ministerial road owner . By this way the (narrower) aspects could be secured of safeguarding the financial value of the initial investment and guaranteeing the best IRR (Internal Rate of Return).

Thus we think a **careful Asset Management of the state road investment** is a necessary precondition and first step to reducing the total transport costs (including the costs to the road users) to the benefit ofthe national economy.

Commercial Management and Financing of Roads

Table 8.1 Legal and administrative arrangements applicable to selected road funds

Country	Legal basis	Oversight	Type of entry	Own staff	What does it finance	Main source of revenues
Ghana	Decree 1985, legislation 1996	Publlc-private board	Separate agency	Yes	All expenditures	Fuel levy, transit fees, vehicle fees
Guatemala	Legislatlon 1993	Public - private board	Separate agency	Yes	Maintenance of national roads only	Fuel taxes, vehicle fees, tolls, miscellaneous
Hungary	Cabinet decree 1989, state law 1992	Road agency	Division of Road agency	Yes	All expenditures on state roads plus transfers to municipa1ities	Fuel levy, weight-related vehicle tax, donor finance
Japan a)	Special account law 1954	Road council	Division in Road Bureau	Yes	All expenditures on national roads plus transfers to local governments	Gasoline tax, liquid petroleum gas tax, vehicle tonnage tax, general budget
Korea, Rep. of b)	Special account law 1989, amended 1994	Ministry of Construction and Transportation	n.a.	No	All expenditures on national roads, some expenditures on expressways and provincial roads	Fuel tax, excise tax, tolls, general budget
Latvia a)	Cabinet decree 1994	Public-private advisory board	Division of road agency	Yes	All expenditures on state roads plus transfer to municipalities	Fuel tax, vehicle fees, general budget
New Zealand	Legislation 1953 amended 1996	Primarily private board	Separate agency	Yes	All expenditures	Weight-distance charges, fuel levy, vehicle fees
Malawi	Legislation 1997	Public- private board	Separate agency	Yes	All expenditures, maintenance priority	Fuel levy, vehicle licenses, transit fees, overload fines
Romania	Legislation 1996	Ministry of Transport	Division in Ministry of Transport	Yes	All expenditures plus transfers to counties and villages	Fuel levy. vehicle sales tax
Russia a)	Legislation 1992	Federal Highway Department	Division in Highway Department	Yes	All road expenditures plus transfers to regions	Fuel and lubricant tax, vehicle sales tax
South Africa	Legislation 1935, plus amendments	Public - private board	Staff in director's office	Yes	All expenditures on national roads	General budget since 1986
United States a)	Legislation 1956	Committees of Congress	Accounting mechanism managed by Treasury	Yes	Primarily capital works on federal-aided highways	Fuel tax, vehicle sales tax, heavy-vehicle tax
Yemen	Presidential decree 1995, ratified by Parliament	Civil service board c)	Separate agency	Yes	Maintenance only	Gasoline levy, overload fines, general budget

n.a. Not applicable.

Note: In addition to the road funds shown in this table, there are national road funds and earmarking devices in Belgium. Luxembourg, the Netherlands, Switzerland, Benin, Central African Republic, Chad, Kenya, Madagascar, Mozambique, Rwanda, Senegal, Sierra Leone, Tanzania, Zambia, Zimbabwe, Argentina, Guyana, Honduras, Azerbaijan, Czech Republic, Georgia, Kazakhstan, Lithuania, Mongolia, Slovak Republic, Turkmenistan, Ukraine. and Uzbekistan. New road funds have recently been set up in Jordan and Namibia, and Armenia is currently establishing one. The Swedish government is also considering whether the Swedish National Road Administration should in the future be financed solely through vehicle license fees and a fuel levy of about $0.08 per liter.

a. National or federal road fund.
b. Road fund is not a separate account but a mechanism for financing the regular road budget.
c. Includes nonvoting members from the Chamber or Commerce and Ministry of Transport.

Table 8.2 Financial arrangements applicable to selected road funds

Country	Fuel levy	Annual revenues a) (million dollars)	Adjusting charges	Deposit mechanism	Financial procedures, regulations	Auditing
Ghana	$0.05 per liter	60 (1997)	By board	Direct deposit	Yes	Auditor General or independent audit
Guatemala	$0.023 per liter	32 (1997)	By annual budget	Through consolidated fund	Yes	Auditor General
Hungary	$0.095 per liter	233 (1997)	By annual budget	Through consolidated fund	Yes b)	Auditor General
Japan c)	25 percent of gas tax	30.000 (1995)	By tax law every 5 years	Road rund is a line of credit	Yes	Independent audit
Korea, Rep. of d)	67 percent of gas and diesel tax	5.000 (1996)	By tax law	n.a.	n.a.	Auditor General
Latvia c)	50 percent of gas and diesel tax	64 (1996)	By annual budget	Vehicle fee, direct; fuel levy through consolidated fund	Yes	Auditor General
New Zealand	$0.065 per liter	580 (1996-97)	By annual budget	Direct deposit	Yes	Auditor General
Malawi	$0.065 gas; $0.074 diesel	16.0 (1998 est.)	By board	Direct deposit	Yes	Independent audit
Romania	25 percent ex refinery price	250 (1997 est.)	No mechanism	Direct deposit	Yes	Independent audit
Russia c)	25 percent ex refinery price	640 (1993)	By annual budget	Through consolidated fund	Yes	Ministry of Finance
South Africa	None e)	150 (1995)	n.a.	n.a.	Yes	Auditor General
United States c)	$0.032 gas; $0.048 diesel	21.000 (1995)	By annual budget	Road fund is line of credit	Yes	Auditor General
Yemen	$0.004 per liter	7.0 (1997 est.)	By annual budget	Direct deposit	Yes, in draft	Auditor General

n. a. Not applicable.

Note: In addition to the road funds shown in this table, there are national road funds and earmarking devices. In Belgium. Luxernburg, the Netherlands, Switzerland, Benin, Central African Republic, Chad, Kenya, Madagascar, Mozambique, Rwanda, Senegal, Sierra Leone, Tanzania, Zambia, Zimbabwe, Argentina, Guyana, Honduras, Azerbaijan, Czech Republic, Georgia, Kazakhstan, Lithuania, Mongolia, Slovak Republic, Turkmenistan, Ukraine, and Usbekistan. New road funds have recently been set up in Jordan and Namibia, and Armenia is currently establishing one. The Swedish government is also considering whether the Swedish National Raod Administration should in future be financed solely through vehicle license fees and a fuel levy of about $0.08 per liter.

a. Excluding general budget allocations.
b. Standard govemment rules and regulations.
c. National or federal road fund.
d. Road fund is not a separate account but a mechanism for financing the regular road budget.
e. Expected to be $0.044 when fuel levy is reintroduced.