

**ROADS ARE NOT FREE:
A MODERN APPROACH FOR FINANCING
TRANSPORT INFRASTRUCTURE IN ROMANIA**

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"When the carriages which pass over a highway or a bridge [...] pay toll in proportion to their weight or their tonnage, they pay for the maintenance of those public works exactly in proportion to the wear and tear which they occasion of them. It seems scarce possible to invent a more equitable way of maintaining such works. This tax or toll too, though it is advanced by the carrier, is finally paid by the consumer, to whom it must always be charged in the price of the goods.

As the expense of carriage, however, is very much reduced by means of such public works, the goods, notwithstanding the toll, come cheaper to the consumer than he could otherwise have done; their price not being so much raised by the toll as it is lowered by the cheapness of the carriage. The person who finally pays this tax, therefore, gains by the application more than he loses by the payment of it. His payment is exactly in proportion to his gain. It is in reality no more than a part of that gain which he is obliged to give up in order to get the rest. It seems impossible to imagine a more equitable method of raising a tax."

Adam Smith,
An Enquiry into the Nature and Causes of the Wealth of Nations, 1776

ABSTRACT

Financing road infrastructure through public budgets, in particular in the context of soaring fiscal deficits in developing countries, is not sustainable and leads to poor road infrastructure. Are there more efficient ways to finance maintenance of and investments in the road network, such as linking benefits with pay? Is user charging politically possible and could it decrease possibilities for corruption in the sector? Would such a mechanism take long to implement? These are the questions the thesis aims to answer in the context of Romania. The thesis advocates the introduction of road user charges in Romania in the long run as part of a larger strategy to put the sector on a commercial basis, and, in the meanwhile, proposes a mixed system of road user charges and the medium term expenditure framework as an intermediary step. The thesis, utilizing existing theoretical literature and examples, shows how creating adequate conditions for future user charging clarifies institutional arrangements, stimulates better planning, and improves the transparency of the sector.

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LIST OF ABBREVIATIONS

CNADNR	Romanian Roads Company
EC	European Commission
EU	European Union
MT	Ministry of Transport
MTEF	Medium Term Expenditure Framework
RUC	Road User Charges

INTRODUCTION

Transport infrastructure plays a crucial role in supporting trade and economic development, as no movement of goods or people could be conceived in the absence of roads, railways, air or water transport. The roads network bears the majority of transport and road expenditure typically represents over 70% of total outlays in transport sectors around the world (Heggie, 1999, p.105), making the sector as politically visible as it is indispensable for the economy.

The means of financing costs of maintaining and expanding the road network vary in time and place, according to the principles of efficiency, fairness, and expediency generally accepted within a country at a given time. Inevitably, the ideology of ruling political parties influences the final design of the roads sector administration even to a greater extent than other factors, such as effectiveness in spending. Various countries have different solutions to finance roads in a sustainable manner: either committing money through the budget, preferably for several years in advance (the medium-term expenditure framework used by countries like France) or making users pay for their use and manage the sector directly (US, New Zealand, Japan and developing countries like Azerbaijan) (World Bank, 2000b).

No matter what the ideology behind the final approach, before anything else, it is critical that roads be financed in a stable and predictable manner to ensure a coherent long-term planning of infrastructure works. The major crisis of Romania's road sector, analyzed in the paper, is currently due to insufficient and unpredictable financing, leading to arbitrary expenditure allocations to projects that are not necessarily a technical priority (Nuțu, 2008). The thesis analyzes two methods of ensuring proper road financing in Romania, through budget or through road user charges, with a stronger emphasis on the latter. This focus is connected to

the fact that the political will of Romania's government is to manage roads through a company structure, in a business-like manner (Steering Committee, 2007). Given this political option, the thesis touches only briefly upon the alternative, rejected by decision-makers, of organizing the roads administration as a bureaucracy (agency or department within the Ministry of Transport) and financing roads fully through state budget mechanisms.

However, what Romanian government understands by commercializing roads is largely different from the views of donors and consultants on this process. A generalized confusion on the roles and accountabilities in Romania's road sector, with profound implications on planning and programming of road management is caused by the mixed agency-company arrangement under which Romanian roads are managed. In law, Romanian roads are managed by a company; but in practice, they are managed by an organization without sufficient funding, with little operational autonomy and functioning more like an agency subordinated to the Ministry of Transport even for day-to-day decisions.

In short, the Romanian government wants to commercialize roads¹, but without charging users and also without giving up full political control over operational and investment decisions in the sector (Nuțu, 2008). However, it must be clearly understood from the beginning that true commercialization means "bringing roads into the market place, putting them on a fee-for-service basis, and managing them like any other business enterprise" (Heggie, 1999). The will for commercialization cannot be disentangled from a clarification of roles of different institutions, or from the politically-sensitive decision to charge users. In what concerns user charging, a further political "push" towards its implementation would rather be the European Commission's Eurovignette Directive (38/2006), imposing a road user

¹ Mainly in order to gain direct access to private loans from the capital market (Talvitie, discussion, 2005).

charge system from 2012. Romania's government gradually acknowledges these constraints and has already attempted to prepare a study on the amounts users should pay².

Inescapable as it is for the Romanian government, user charging is at the same time based on complex rationale, prerequisites, and conditions and has significant implications. The purpose of the thesis is to clarify these aspects, within the general frame of road commercialization. The government needs to understand why the system is justified, how to design it properly, what costs should be included in the charge and how the measure should be fit into a comprehensive road sector reform.

As will be explained, introducing a road user charge system is not the only condition to transform the roads sector into a business, and major reforms are needed in “four building blocks of roads sector commercialization” (Heggie, 1999). The end-result of the process is actually a major shift in the way roads have been traditionally managed and financed: it is no longer the entire society that is responsible for the roads network, but the road users as a compact, distinct community. This community will manage and finance roads. The “revolution” has been caused by very prosaic needs: budget revenues expand at GDP growth rates, whereas traffic and new road construction needs grow faster particularly in developing countries, the whole process leading to increasing fiscal gaps (World Bank, 2000a).

This completely revolutionary system, attracting more and more governments, can be implemented only through complex and integrated measures in the four key areas, and Romania makes no exception. Until the full implementation, intermediate mechanisms are needed to ensure a stable and predictable financing and provide appropriate accountability for

² The EU-financed report produced inconclusive results contested by all stakeholders, government and donors.

fund management and works. Piecemeal measures and incomplete reforms have caused misallocation of funds, sheer bankruptcy of the sector, and serious accusations by the media of corruption in the transportation sector (for example, a series of articles in *Cotidianul*, 2004-2008). For a transitional period, the best solution in Romania's case would be a mix of budgetary systems and user charges, to ensure financing stability and accountability, while giving the Romanian government enough time to prepare sound institutional arrangements for the full implementation of the commercialized model.

The thesis is organized in six sections. The first part describes briefly what has been written on the topic by various academics and practitioners, to clarify the approach used in the thesis. The second section describes budgetary arrangements and introduces the concept of commercializing the roads sector, as described by the World Bank, and the four “building blocks” of the reform to the new business-like structure, placing the idea of user charging within this context. In the third part, a special attention is given to the principles that justify road user charging and the implications of introducing such a system on the capacity to finance and rationalize a roads program, constraining expenditure to what is affordable to payers. The fourth chapter examines the implementation of user charging considering the theoretical justifications and practical constraints. The fifth section examines closer the case of Romania, analyzing the problems caused by the lack of a stable and predictable flow of funds, and explaining the prerequisites of introducing a RUC system. The thesis concludes with a sixth section of recommendations on the actual implementation of the model in Romania.

CHAPTER 1. LITERATURE REVIEW

The scope of the thesis is to properly define the elements of a road user charge system for Romania, the key first step to implement the commercialized approach in the roads sector. While political expediency plays a key role in the final system design, there are sound justifications and rationales for the implementation of such systems analyzed in detail by several authors.

Because of the World Bank's involvement in the promotion of roads user charges systems, it has inevitably employed the majority of key specialists in the field and compiled the largest series of valuable books and articles on the topic. One of the earliest works, summarizing the theoretical considerations for charging road users, is "The Economics of Road User Charges", by A.A. Walters (1968). While the paper focuses mostly on the economics of congested roads – a feature of urban roads rather than inter-city routes–, it provides useful insights on the general principles that justify charges on the users to regulate the access to a scarce and costly infrastructure. Walters argues convincingly that road users should pay the short-run marginal cost (that is, variable maintenance costs and congestion), which in equilibrium, supposing perfect divisibility of road investment, should equal long-run marginal cost (p.33). He assumes the roads company is an entity which is not profit-oriented, but simply wants to cover its costs in full³. This happens because 1) the roads company charges users at full cost recovery, and 2) the roads company invests in an increment of infrastructure only if the revenue obtained exceeds (equals) investment costs, the revenue being valued at the going price for the already existing infrastructure.

Walters' analysis is a useful starting point for the thesis, but has a strong limitation. His argument is based more on the issue of congestion applicable to urban infrastructure rather than inter-urban highways, and he usually neglects the costs with variable maintenance or externalities. Intercity roads are less congested, but used by heavier traffic with a larger impact on variable maintenance costs. However, as demonstrated by further work on the topic (both Newbery and Heggie), the theory is applicable to inter-urban highways as well.

Newbery (1988), active supporter of user charging, even claims that all maintenance is variable with traffic, so road users should cover the full costs of maintenance. He argues, for example, that the effects of weather and traffic cannot be clearly separated from each other, and he treats road maintenance cost as a means to recover road damage externalities. He demonstrates that the efficient road user charge, assuming no traffic growth (and implicitly no new investment) is equal to the marginal social cost of road use and to the average maintenance cost apportioned to vehicles according to their damage (1988, p.6). In other words, he gives an economic theory justification of full maintenance cost recovery through user charges, assuming no network expansion.

The bankruptcy of road networks in Africa caused by under-financing and crippling backlogs in maintenance, have prompted the publishing in 1999 of what is today considered the most authoritative practical manual on RUC for inter-urban highways: Ian Heggie's "Management and Financing of Roads: An Agenda for Reform", 1999. The paper builds on Walters' theory, adapts it to inter-urban roads, and highlights positive and negative experiences with various forms of road funds in Africa. The pool of experiences led to important conclusions: road

³ This assumption is reasonable if one pursues reforms in all four "building blocks". As will be explained, the

users can be charged, even in poor countries, to improve road financing, but a comprehensive reform is needed to complement user charging (the so-called “four building blocks” of commercializing roads), in order to avoid corruption or inefficiencies. Regarding what costs should be included in the road charges, Heggie (1999) suggests that these should consist of costs covering maintenance, new constructions, and externalities. Even though a large part (about half) of the costs with maintenance have no direct relationship with traffic, he explains that all these costs should still be paid by road users. In his opinion, Walters’ economic justification of setting charges to the short run marginal costs and financing the rest from the public budget leads to unsustainable fiscal deficits, the most serious issue with African roads. In addition, a poorly maintained road with potholes leads to large, quantifiable increases of vehicle operating costs (p.15), so it would make sense that users pay for all repairs (based on opportunity costs). Heggie (1999, p.62) also demonstrates that user charges should be defined as a two-part tariff: licence fees representing an access tax to the network (for the fixed costs, non-variable maintenance, new constructions) and fuel levies for the actual use (variable maintenance costs). The same principles appear in the European Commission Handbook on estimation of the external costs in the transport sector (EC, 2008), and in EU’s “Eurovignette” Directive 38/2006.

Thus, there exists strong support from all authors for the inclusion of all costs associated with maintaining the existing infrastructure in the road user charge; the World Bank and the European Commission argue the inclusion of new investments, whereas Newbery assumes zero investment and does not analyze the impact of new constructions. As the thesis examines the case of Romania, in which significant new investments are planned, Newbery’s assumption of unchanged network state does not hold, and a solution must be found to

board of the roads company should be in majority composed of representatives of road users. Their primary

finance new investments as well (the investment portion not covered by EU grants, and not neglecting the increased maintenance costs in the future). Following Heggie's approach explained below, the thesis proposes inclusion of all costs in the theoretical charge (even though this could be partly subsidized for a transitional period). Both maintenance **and** investments should be part of the cost, considering the wider framework of commercialization of roads in which roads are to be taken out completely from the general public sector. Under these assumptions, the following part of the thesis addresses briefly the prerequisites for the successful introduction of a road user charge system and the general commercialization reform framework, building on World Bank's experiences.

interest is to minimize costs at a reasonable level of quality for the road network, not to maximize profits.

CHAPTER 2. PRACTICES AROUND THE WORLD: BUDGET SYSTEMS VERSUS COMMERCIALIZED ROADS

Worldwide experience shows that the administration of the roads sector can be organized in two ways: as a bureaucracy or as a business-like entity (Kerali, discussion, 2005). A bureaucratic agency works under general budget financing; a business survives based on what the consumer pays on the market. In both cases, road costs that should be financed are largely from the same categories: maintenance of existing network, repairs / rehabilitation, new constructions. In addition, road use causes costs, associated with pollution, accidents and congestion, which are either a cost on society not internalized by the consumers and therefore paid by the whole society (in the budget case), or internalized and paid directly by users (in the road user charging mechanism). In order to understand the practical necessity to introduce user charging, the following paragraphs explain the principles of financing roads through budgetary mechanisms, the disadvantages of this system for supporting road infrastructure, and the resulting pressures to implement roads commercialization as a solution for increasing fiscal gaps caused by the use of budget mechanisms in the roads sector.

2.1. GENERAL BUDGET MECHANISMS

Under this system, roads expenditures are financed through allocations from the general budget. Financing roads follows the customary budget process: the agency / department prepares a budget based on assessed needs and programs, requests funds from the Ministry of Transport, and the Ministry applies for budget allocations from the Ministry of Finance. A stable financing under this budget mechanism is ensured by the increasingly popular

medium-term expenditure framework, implemented nowadays by all EU countries. Under this arrangement, the budget for the next year is prepared and approved as a law, and accompanied by credible forecasts for the next three to five years. The difference from the previous budgetary mechanisms is the preparation of forecasts for several years; at the beginning of this year, the budget forecast prepared last year must be formally reconciled with the current budget, and differences (new projects; abandoned plans etc) have to be justified. As a consequence, forecasts must be well thought through and consider the entire budget impact of current projects (e.g. not only investment costs in the current year, but also the increment in maintenance costs in the following years, prompted by today's investments). The MTEF has the advantage of being clearly linked with a rolling multi-year planning system (Ron Hood, discussion, 2006). This system is still used for the roads sector in a number of developed countries in the EU, which administer their road networks in the form of agencies or departments within the Ministry of Transport or equivalent (e.g. the Road Directorate within the Ministry of Transportation in France) (www.ec.europa.eu/transport, 2008). However, many developed liberal countries (US, UK, New Zealand or Japan) prefer business-like entities which use a system of covering their roads expenditure based on payments from the users instead of budget allocations.

A drawback of the budget system is that it charges users and non-users alike, and does not link benefits with pay. However, as compared to user charging, it has the advantage of stimulating more competition in the roads sector financing. Funds are not “earmarked” (i.e., spent through a different channel than the rest of the budget), and roads enter a competition with other sectors – education, health, water infrastructure etc. – for budget allocations. The roads sector must propose a coherent plan, solidly backed by indicators of efficiency, to justify the roads program, a process that has the potential to improve the quality of projects.

This should happen at least in theory, even though it is not clear how the projects in the road infrastructure sector could be compared in terms of efficiency indicators with ones in the health sector or for social assistance (World Bank, 2000a). Despite the shortcomings, the system is still widely used in countries with a strong tradition of bureaucratic management in the public sector, namely in the continental Western Europe; there is however a clear commitment from the European Commission to change the current arrangements and introduce user charging (Directive 38/2006).

The reason behind the EC's pressure for change in Europe, as well as the reason behind the World Bank's support for the introduction of road user charging systems in developing countries has to do primarily with **sustainable financing** (World Bank, 2000b). Fiscal revenues grow at GDP rate, whereas traffic grows faster, particularly in developing countries, by a factor of 1.2-1.5 (Sector Operational Plan for Transport, MT, 2007)⁴. To contain fiscal deficits, a better rationalization of roads expenditure plus a better prioritization was deemed necessary and urgent. Growing fiscal deficits increase the pressure to "commercialize roads", that is, to manage road assets in a business manner, prompting payments from users and create a market mechanism for the use, management and financing of roads. Different countries implemented various arrangements, more or less successful, and with various lessons learned; inevitably, countries in which road financing has caused major fiscal deficits and maintenance has been severely underfinanced for years have experimented the most radical reforms (transition countries, African states) (World Bank, 2000a).

⁴ Even if the traffic were to grow slower than GDP, which could be expected with the recent oil price increases, the principle does not change. Road financing based on general tax would lead to an over-investment in road networks, in excess of real needs, and there would be better alternatives to allocate public money, for sectors such as health or education. What really matters is to link road investments to traffic instead of GDP growth.

2.2. FOUR BUILDING BLOCKS OF COMMERCIALIZING ROADS

Recently, there have been successful experiences in Africa and some CIS countries with more refined mechanisms of user charging (World Bank, 2000; Kerali, discussion, 2005). The commercialization of roads gains more and more support, including the EC which is imposing user charging for trucks starting from 2012 (Directive 38/2006; ECMT 2006). The most important finding from Heggie's (1999) cross-country comparative analysis is that commercialization of the roads sector is a complex process needing simultaneous reforms in four key areas, and it is the failure to pursue a comprehensive approach in all four aspects below that leads to unsatisfactory results (adapted from Heggie, 1999, p.5):

1. Road users must have ownership of the sector, and practically “manage” it themselves. Roads are a natural monopoly. In order to ensure user satisfaction and avoid the risks a monopoly poses over consumers (overcharging, low quality), roads management should be controlled **by** road users **in the benefit** of the road user;
2. The financing of roads must be stable and predictable, to ensure adequate planning of investments and maintenance;
3. Responsibilities must be clarified in order to establish who does what; and, finally,
4. The management of the sector must be strengthened, by improving effective management systems and enhancing accountability.

Looked upon in an integrated manner, these reforms would be equivalent to a successful transfer of management responsibility and financing from the general state budget to the road users as a separate “community”, who would take full responsibility of the road network use and administration. Empowering users to manage the roads, and not only pay as consumers,

has the additional benefit of avoiding a monopoly situation, which would appear if the roads company would still be managed by the state.

The four points are inter-related and difficult to implement stepwise. Thus, the reform should be designed coherently since partial measures would lead to worse results than no reform at all. The most telling example of the failure of piecemeal reform was the case of the so-called “first generation road funds”, implemented in countries which created a partial RUC system with road funds managed either by the roads administration or the Ministry of Transport. Partially, these funds were actual user charges (such as excise fees on fuel), but the deficits were covered through earmarked budget funds. The major problem with the earmarking was, in the opinions of both the International Monetary Fund and the Ministries of Finance of the countries in which these funds were implemented, that such arrangements evaded sound financial discipline and took away funds from other sectors without proper economic justification. Such systems were introduced in the ‘60s and ‘70s in Asia, Africa and Latin America, and in the ‘90s in Eastern Europe (including Romania). There have been numerous charges of corruption and misallocation of funds, as well as redirection of funds from the road works to salaries of civil servants or other urgent needs (World Bank, 2000a).

2.3. SECOND GENERATION ROAD FUNDS – BEST PRACTICE IN ROADS COMMERCIALIZATION

As a reaction to the disadvantages of earmarked budget allocations distributed without proper supervision, new institutional arrangements were proposed. The so-called “second generation road funds” were introduced in several African states around 1992 and in Latin America in

the mid '90s (World Bank, 2000a), as an attempt to solve the issues RUC seemed to respond to well, without losing the benefits of the budgetary mechanisms (appropriate supervision of public spending). They take the form of a specialized formal organizational arrangement (on the model of Transfund in New Zealand) which constitute an agreed, transparent and well designed procedure applied consistently. Transfund is a separate road fund administration, financed through fuel taxes and vehicle license fees, managed by an independent board in which there are representatives from all stakeholders in the road infrastructure sector: road users and government departments with a vested interest in the sector to be well managed (World Bank, 2000a). This requires either a solid existing institutional framework, or consistent reforms emerging after a deep crisis – which is why they are applied in either very developed countries (US, UK, New Zealand, Japan) or countries which struggled with corruption and bad governance and introduced groundbreaking reforms, such as several African states during the '90s.

Viewed in the context of Heggie's four-block reform to commercialize roads, these funds ensure not only stable financing (2) but, maybe even more importantly, ownership of the sector (1). The fund is a majority user-managed, user-financed purchaser of services from the roads company⁵. Thus, the roads company prepares the road program (maintenance, rehabilitation, new constructions), for which the fund allocates money in accordance with the interests of the board managing the fund: mainly road users (who should have the majority in the board), but also, possibly, government departments represented in the board. RUC should

⁵It was argued that the only important aspect is that the roads sector be financed and managed by users. The question arises, then, why should the road company be separated from the fund, if both are managed by users who care for their interests? Indeed, organizational separation and different boards are necessary only when funds are collected from a different category of payers than the users of the roads considered. This happens when roads management is separated on national, regional and local roads, whereas user charges are collected from fuel taxes paid by users of all roads. Then, the fund should be managed by a board of users of national, regional and local roads, whereas our road company's board should contain only users of intercity highways. In Africa, small countries with one-tier governments like Sierra Leone have the fund incorporated in the roads

cover all infrastructure costs and no money is earmarked from the state budget for any constructions. The fund board (users) checks the quality of road programs, demanding “value for money” from the roads company, and auditing its performance and spending. The additional fuel excises collected for the roads sector and other charges are completely taken out of the consolidated public budgets and of the fiscal sector (Heggie, 1999).

As can be seen, the process is completely different from the case of budgetary systems or the “first generation road funds”. Funds are managed completely outside the normal budget process, and user charges in the form of fuel excises or taxes are a “top-up” of taxes collected for the state budget. Thus, no fiscal revenues are taken away from other sectors; and also, the government has no or little political control over the sector, which would be the case if it contributed financially with budget allocations (Kerali, discussion, 2007). Users set priorities, check allocation of amounts collected from themselves, and corruption is practically eliminated. But while apparently convenient for practical purposes, can theory validate this mechanism as also efficient? This is the question to be addressed in the following chapter.

company; whereas two- or three tier government countries like Tanzania or Nigeria have separate entities. (Heggie, 1999)

CHAPTER 3. THEORETICAL JUSTIFICATIONS OF ROAD USER CHARGING

The previous section has explained why user charging has gained ground around the world as a practical means to ensure the financing of road infrastructure. But beyond the practical advantage of reducing fiscal deficits by implementing a RUC, there are sound reasons that justify the system also in principle. The following enumeration details the most frequently mentioned theoretical principles behind user charging which are generally accepted as valid among academics and practitioners.

3.1. PUBLIC OR PRIVATE GOODS?

Probably the most important discussion in terms of the acceptability of introducing road user charging is whether roads are or not **public goods**. If roads were public goods, they should be simultaneously non-rival and non-excludable in their use. In this case, one could argue roads should be managed by a government body providing “free” (or in reality budget financed) access to anybody interested, and taxing everybody for the provision⁶. Thus, it is only if roads are in reality not public goods, but private or some intermediate category between public and private, that one can justify a move away from government financed roads to paid access and a charge proportionate to the actual usage.

⁶ In microeconomic theory, for public goods the marginal social benefit equals the sum of individual benefits; no individual is willing to pay for the provision of the efficient quantity of the public good because the individual’s marginal benefit is less than the marginal social benefit. This means the government has to tax everybody for the provision (Krugman, Wells, 2004).

In reality, roads are generally not public goods, and some, though few, are outright private goods (congested toll roads). Most roads are commons, that is, non-excludable, but rival. The most obvious example for the rivalry in consumption is congestion (generally a local cost, so justified mostly for urban roads), but there are also other aspects that would lead to rivalry: damage to the road, congestion and need for additional infrastructure once the traffic exceeds some limits, accident costs (Walters, 1968). These are negative externalities produced by road users on each others, and whose existence is one justification for why users should be charged for roads, assuming a constant road network (Rolle, 2005; Newbery, 1988). Thus, RUC would compensate for the externalities by covering costs associated with **road damage; accidents; congestion.**

Road damage translates into maintenance and overhaul / repairs works (“rehabilitation”). Roads “wear and tear” is directly linked to the volume of traffic, where heavy vehicles cause more damage than smaller ones (Rolle, 2005; Heggie, 1999). Periodically, roads need resurfacing or overhaul works to mitigate depreciation. These costs, directly linked to traffic, should be charged to those that produce the damage. Heavy trucks generate the largest damages, whereas the marginal damage of a small car is almost negligible (Newbery, 1988). In addition, congestion creates the need for new investments, necessary when estimates of traffic justify them⁷.

⁷ This is the theoretical argument to include new investments in user charges. However, in practice (also in Romania) investments in new roads may occur when the existing capacity does not allow for enough traffic speed, safety etc., and not because of congestion per se. Based on this aspect, some policy advisers exclude investments from user charging, with the implicit assumption that these should be financed from the budget and not by users (for a list of relevant studies and costs included, see table on p.128, Handbook on estimation of external costs in the transport sector, EC Transport, 2008). However, if in the end the final purpose of reforms is to “commercialize” roads completely, as assumed throughout the thesis, investments should be fully covered by users, who should also manage the network. This approach also matches an efficiency argument: only investments for which users are willing to pay should be undertaken.

In addition to the aspects examined above, road use generates **pollution**, a cost borne not only by other road users, but by the society in general. There are good international estimates for these costs (for example, on <http://ec.europa.eu/transport/>), and these costs should be extracted from road users. The charge could either be included in the road user charge, or instituted as a general tax for fuel collected from the state budget. The most important aspect is compliance with EU's "polluter pays" principle, so that this charge as well forms part of the transport costs.

3.2. VEHICLE OPERATING COSTS

The benefits to road users from a good quality network are large and quantifiable: Heggie illustrates a computation of additional costs for a truck transporter using a damaged road, measured as the need for replacement of vehicle components, lower speed, and higher consumption of fuel. He obtains an astonishing result of 17% higher transportation cost for the truck using the road in poor condition (Heggie 1999, p.15). As drivers (passengers, cargo transporters) are the beneficiaries of roads, existing or new, and the benefits are measurable (time, transport cost, better air quality), charging directly the users seems more acceptable than spreading the costs over the whole society through a general tax mechanism.

3.3. NO FREE RIDING FROM INTERNATIONAL TRAFFIC

A "fairness" argument concerns the charging of international transit traffic. International transporters do not pay taxes in the countries they transit and thus "free ride" the roads (Rolle, 2005). This ties-in with the principles of transport competitiveness among countries

behind the road charging system imposed by the EC, which attempts to create comparable charging mechanisms among EU members (EC Transport Handbook, 2008).

3.4. ECONOMIC EFFICIENCY

Expressed in the simplest terms, charging efficiency means that “the ideal road price would only allow cost justified trips to be undertaken” (Rolle, 2005, p.3). The equilibrium condition is that the marginal social cost of a trip should be equal to the marginal social benefits.

An individual is concerned by covering his private cost (vehicle maintenance, fuel, time, transport taxes etc.). However, externalities such as road damage, capital investment costs, congestion, environment, should be internalized in the users’ cost, and the decision to undertake the trip or not should be the result of the computation of the total cost. Thus, undertaking a trip with large social costs would become inefficient for the user himself, and force him/her to seek alternatives. This argument ties in with the principles of inter-modal competition, particularly the competition of roads with railways. Since the two modes are close enough substitutes, disparities in charging influence the choice of transporters, who choose the minimum cost alternative⁸.

An argument that could be formulated against user charging is the fact that the entire society benefits the existence of roads (for example, by the possibility to purchase goods produced in a different city), and therefore the entire society should pay for roads through the general taxes. This view is probably more politically acceptable, as politicians are afraid of

⁸ In reality, however, there is one limitation to the informational role of user charges, which could arguably affect user choices: road users have no information in real time on the prices they pay (Rolle, 2005).

introducing a more visible system of road taxation (ECMT Politician's Guide to Efficient Pricing, 2006). However, the benefits to society can be quantified and extracted in a more efficient manner if the transport infrastructure costs are included in the final price of goods and services traded on the market.

At the same time, the outcome of the inclusion of transport infrastructure costs in the total transport cost has the benefit of revealing road user preferences (Nuțu, 2008). Transport infrastructure pricing and user charging provides crucial information on actual priorities for the maintenance and new investments in the roads sector; drivers would use more the roads for which the benefits exceed the costs and funds will be channeled primarily to those routes that are more economically efficient⁹.

While of less relevance for the inter-city roads, the impact of pricing on rationalization of use – that is, reducing congestion by discouraging use – is also a very popular argument for user charging (ECMT, 2006; Walters, 1968).

⁹ Drivers use the most cost-effective routes: benefits from using the road must exceed vehicle operating costs plus the infrastructure or social costs paid as vignette (access fee) and fuel tax (variable infrastructure costs). The roads company invests in roads a sum which results by apportioning fund proceeds based on traffic counts. Priority is given to roads for which the allocation equals (exceeds) the cost of maintenance. This requires good traffic counts and reliable management information systems.

CHAPTER 4. COMBINING THEORY AND PRACTICAL EXPEDIENCY: IMPLEMENTATION

The final structure of RUC systems today is determined by numerous factors: the principles behind user charging (fairness and efficiency); technological constraints; and, to a great extent, the costs of introducing the system, which could be prohibitive (Walters, 1968, p.14). The “market” for road infrastructure (if one could call it that way) is characterised by rigidities: from the fact that a new road investment is not infinitely divisible (Walter’s “putty” road assumption), to the fact that users do not have real time information on the prices they pay in order to make rational choices. Therefore, existing user charges systems are a complex compromise of textbook principles and political expediency. Most charges consist of (adapted from SAR, 2007):

- a. *Vignettes*, or vehicle license fees, are average estimates of “road usage”, paid by consumers regardless of the number of trips or distance traveled within the validity period of the license. Such charges are already levied by most road companies in Europe, and the EC proposes the introduction of a unified system (“Eurovignette” Directive 38/2006). The amount of the vignette can be refined to adjust to different user types (one year, one week; more vehicle load categories). In his two-part tariff proposal, Heggie argues that license fees should cover fixed expenditures: non-variable maintenance costs and investments (1999, p.62). However, in practice, since fuel taxes tend to undercharge heavy trucks for the road damage, vignettes are used to compensate this limitation.

- b. *fuel taxes* could be a good indicator for road usage, as they increase in direct proportion to car use. Fuel taxes can be divided between local and central governments to account for the average vehicle use within cities, regional, local and national roads. Other fuel consumers which are charged even though they do not use roads (tractors, diesel trains) could be compensated through targeted subsidies. Fuel tax accounts only to a limited extent for the vehicle weight and corrections must be made through the vignette system to charge heavy trucks according to their damage. In Heggie's view, fuel taxes are quite good proxies for variable maintenance and operational costs of road infrastructure (Heggie, 1999, p.62)
- c. *electronic charging*, used in developed countries (US). It requires significant technology investments, but identifies the true road use of each individual driver and allows a more precise charging, unlike the other categories which are rather imperfect proxies for road use (Rolle, 2005). However, this mechanism is used in few developed countries because of the outright unaffordable cost (particularly the fixed costs with implementing the system)
- d. *barrier tolls and taxes* on bridges, tunnels etc. are generally used to cover costs with maintenance or even construction of a particular motorway, bridge, or tunnel. Tolls, excises and vignettes are used together to finance different operations. Tolls are used exclusively for a particular point in the network such as a road or bridge, and for a particular operation (e.g., a specialized utility maintenance system for motorways). These are not yet used in all countries and pose a serious question of affordability in states where income per capita is low. The EC tries to balance the objective of "removing physical and technical barriers to free movement" (EC Transport Policy, 2007) with user charging for roads. Thus, the EC allows tolls to be levied only for roads (e.g. motorways) for which there is a non-tolled alternative, financed either

through the budget or by other user charges (a. and b.). For the scope of the thesis, tolls are of rather limited interest: they concern a specific portion of the road network, which could be considered completely separately, and tolled roads will probably not appear very soon in Romania.

In practice, road works (maintenance, new constructions, repairs) are initiated once they seem justified in terms of a cost-benefit analysis; the costs of repairs are known (from previous similar works), and the benefits consist of how much road users are willing to pay, through the charges above. The underlying principle is that all road works which are economically justified should be undertaken and paid for by the different categories of users. The charges described are actually apportionments of total costs on various categories of users (Talvitie, discussion, 2006).

All these charges vary in practice from country to country, depending on the practical constraints, technical aspects of road structures (paved, non-paved, surface material; vehicles used etc.). No model is like the others, and for each country there is a unique system that works best. Given the lack of a universally best solution, the thesis explores the case of Romania.

CHAPTER 5. THE CASE OF ROMANIA

The previous chapters introduced the theoretical underpinnings of road financing mechanisms and examples from countries in which these systems have been applied. To understand the necessity and urgency to ensure the prerequisites for user charging, this section investigates the current situation of the roads sector in Romania, the capacity constraints and challenges of managing the significant road maintenance and investment needs in the country.

5.1. CURRENT SITUATION

Roads infrastructure is seriously lagging behind quality and density standards in the EU. Romania has under 300 km of motorways, of poor quality, which represents 25 times less than EU-25 average (measured as motorway density / 1000 km²). Total roads density is below one third of EU 25 average. 30% of the 16,000 km of national roads are in poor condition, and 60% need repairs and rehabilitation, mostly caused by maintenance backlog. The number of fatalities per 1,000,000 passenger cars is three times higher than in EU-25. Average speeds are 60-70 km/h, caused by lack of by-passes and the large number of black spots. On top of this, regional and local roads add up to another 64,000 kms, most of which is unpaved (over 35,000 km) and in poor condition (figures from Sector Operational Plan for Transport, 2007). These are managed by counties and municipalities and there is no coordination with national roads.

A further complication is that, Romanian national roads were initially designed at standards lower than those in EU (10 t/axle vs 11.5). Since Romania's roads have to become accessible

to European traffic after accession (on European corridors from 2007, on all routes from 2013), they need urgent upgrading. A rehabilitation program was started in 2000, with financing from national, European and other donor sources. To date, because of delays of 3-4 years on all major projects, less than 3,300 kms were upgraded of a total of 6,000 on the European corridors opened since 2007 and heavy European traffic damages the network – with effects to be fully seen in the years to come (Sector Operational Plan Transport, 2007).

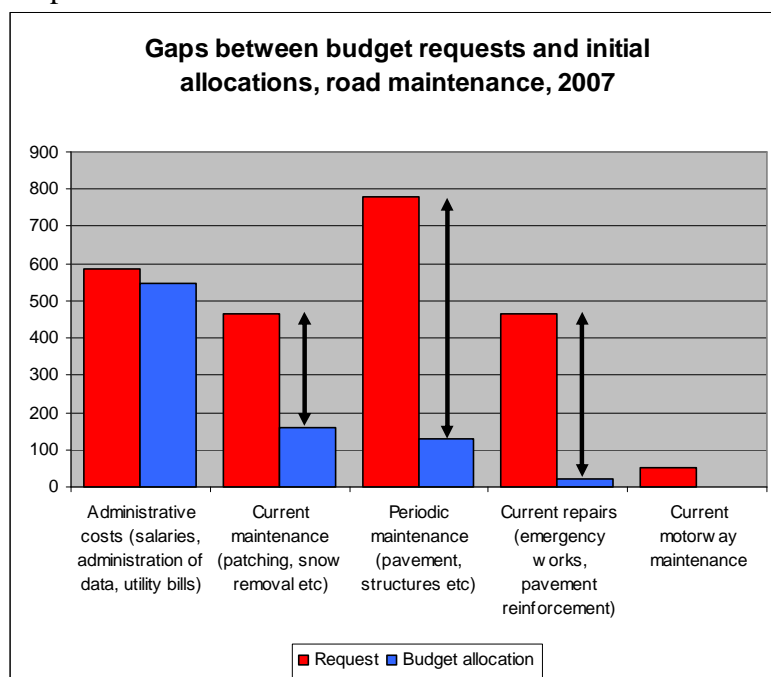
These delays in implementation have multiple negative effects: opportunity costs related to deferral of economic development; direct costs with commitment fees from the unused portion of loans; plus the risk of having to reimburse portions of pre-accession funds which were disbursed for projects that cannot be completed in the agreed deadline (informal discussion with CNADNR experts). Without the latter, the estimated opportunity cost reaches almost 150 million EUR per year, using very conservative assumptions (Nuțu, 2008). Therefore, tackling the cause of delays is critical to avoid further accelerated depreciation of the roads network.

Among these causes, the most important are: the lack of a coherent strategy (of projects in different phases, including land expropriations and relocation of utilities, but also of retaining qualified staff); poor project designs, changed during actual construction; and inability of CNADNR to prioritize investments and of MT to set general transport objectives (Nuțu, 2008). In the end, all these can be traced back to a disastrous institutional setup, criticized by all consultants and donors, which resulted from a piecemeal attempt to commercialize roads in an inappropriate manner (informal discussions with consultants, 2006-2008)¹⁰.

¹⁰ A detailed analysis of capacity constraints in the roads (and railways) sector is made in two reports: “Roads to Nowhere”, SAR Policy Brief 26, 2007; and Nuțu, A., “Capacity Constraints in Romania’s Transport Sector”, forthcoming, CEROPE, 2008. The thesis is focusing on treating one of the fundamental causes of the current crisis in the sector, but there are numerous other measures to be implemented immediately, as explained in the

The increase in maintenance backlogs (with two thirds of the network needing repairs) and the practice of poor prioritization of works is also a symptom of deep institutional crisis. While this backlog is caused by chronic under-financing, apparently the maintenance in Romania is three times more expensive per km than in France (30,000 EUR vs. cca. 10,000). In addition, there is a huge gap between the requests of CNADNR's units from the budgets for maintenance and the final budget allocations (including the vignette). All these show not only the lack of available funds from the budget in the absence of an adequate system of user charging, but also inefficiencies, possibly resulting from corruption and incapacity to prioritize as user preferences are not adequately known.

Graph 1.



Source: SAR, 2007; Chris Britton, 2007

two papers: putting a halt to the high staff turnover, stabilizing top management, compensating previous staff departures by hiring internal consultants and an external project management company (NEA, 2007), eliminating the practice of entering large projects without a strategy. Introducing user charging is a long-term

Among its ambitious plans, Romania's government intends to pursue major projects outside the scope of EU grant financing; because of financial constraints, the only manner in which these constructions could be undertaken (at least in the government's opinion) is by engaging in complex public private partnerships, for example for the construction of certain sections of motorways (e.g. the controversial, expensive and environmentally costly Sibiu-Pitești). Without a clear prioritization and a correct assessment of user preferences, these contracts are potential financial disasters (Nuțu, 2008). Under these contracts, the private contractor would build the road and operate it (maintain the road and the motorway utilities and possibly charge tolls, unless the government decides to fully subsidize the costs of maintenance) (Gressier, 2007). The government has not clarified yet whether tolls would be a politically acceptable solution. If they are not, the final costs would be fully covered from the budget – an option that cancels all benefits Romania's government expects of a public private partnership, not to mention that the impact on the fiscal deficits should be carefully considered. If they are, tolls would be a user charge and at least in principle would have to be included in a wider framework of user charging¹¹. This also requires a clarified institutional framework to define how the contractual relationships should be established between CNADNR, MT and the private partner and how the financial flows would be designed.

As if the existing problems were not enough, roads are in a competition with railways and the disparities of taxation between the two modes of transport shifts traffic from rail to roads, contrary to EU objectives to stimulate the safer and more environmentally friendly rail transport. Train operators pay a track access charge for their use of the railroad, whereas the use of infrastructure for road transporters is virtually “free”. Railways in Romania have lost

measure, to be fully implemented within 5-10 years, which will help rationalize operations in the long-run, better define projects and stabilize strategies.

¹¹ Expectations are these roads will not be built soon, and for practical purposes tolls can be excluded from the user charges design in Romania. See Note 17.

more market share in favor of roads in the past 18 years than Western European railways in 50 years. If the trend continues, there will be no rail traffic for passengers in Romania by 2017 (Gressier, 2007).

5.2. CAUSES OF SYSTEMIC FAILURE: ROMANIA'S FLAWED IMPLEMENTATION OF THE FOUR-BLOCK REFORM

Aside from several circumstantial conditions which have worsened the functioning of the roads sector in recent years, the underlying cause of the major issues in the sector is the institutional confusion. Partly, the current situation is caused by major deficiencies in an attempted roads commercialization reform, started in 1996¹². The reform consisted mainly of the establishment of an earmarked road fund from the “first generation” type. This specialized Road Fund, under the direct authority of the MT was in place until 2002, with mixed results and selection of projects on political clientelism (Talvitie, 2004). It was composed of 45% of total fuel excises; the amount was split into 65% for national roads and 35% for local roads (World Bank Aide Memoire, 2003). The amounts were not sufficient for roads financing and the audit of expenses was weak. As a result, the International Monetary Fund insisted in the end for the Road Fund to be abolished, and proceeds to be channeled within the consolidated budget in order to be subject to an increased budgetary accountability (Talvitie, discussion, 2004). A new system of vignettes was introduced gradually by 2008. Under the new system CNADNR collects the funds directly without an independent

¹² The reform itself was an idea of the national government and not of donors at that time. From the point of view of the donors, including EU, Romania can organize its roads sector in any way it pleases, “bureaucracy”, or “commercialized” structure. The only unacceptable option is a hybrid, because this creates structures which cannot be held accountable for their performance (informal discussion with donors). Thus, in the current structure, it is not clear whether the responsibility of not performing an activity, like road construction, is the

monitoring body of efficient allocation, which practically means another type of “first generation of road funds” with all its disadvantages, this time because of weak legal basis and no independent supervision (World Bank, 2000a).

At present, the physical infrastructure of the national roads is in state ownership, represented by the Ministry of Transport (MT). According to its statute, the Ministry should prepare long-term strategies for the network development, coordinated with railways and other modes of transport (www.mt.ro, 2008).

Works and operations on the road infrastructure (maintenance and constructions of national roads) are managed by the company CNADNR, which undertakes these operations based on a concession agreement with MT. According to the law, the relationship between MT and CNADNR should be detailed in contracts specifying the annual work programs; however, in reality, the contracts are rarely signed and then poorly enforced (for example, there was no such contract in 2007) (Nuțu, 2008).

From an organizational point of view, CNADNR is legally a company, but in reality it resembles more a hybrid between a company and a government department. It has own revenues mainly from vignettes which cover only roughly 30% of maintenance costs (SAR, 2007). For the rest of financing needed, CNADNR drafts yearly a program which is submitted to MT for budget approval. The Ministry allocates a budget that is much smaller than the needs, which causes maintenance backlogs. Because of the uncertainty of funding (which depend exclusively on the will of MT, just like in the case of a government department), the company has been practically declared bankrupt by all financial audits since

fault of the MT, which does not allocate enough resources, or of CNADNR, which cannot monitor a

2004, the year in which CNADNR was legally transformed from an agency into an independent commercial entity (World Bank aide memoirs 2004-2008). If CNADNR were a true company, charging its consumers (road users) and possibly a clear partial subsidy per passenger/distance, it would have a stable flow of revenues, with which it could implement its business program in line with users' preferences¹³. Because of the current financing arrangements, the Ministry has all the incentives to interfere in operational decisions within CNADNR, pushing projects with higher immediate political visibility instead of allowing CNADNR to follow a coherent strategy and implement its economically justified priorities.

While Romania's government is actively pursuing the transformation of the roads sector in a business-like structure, the reform is largely incomplete and has skipped several necessary steps (World Bank, 2006). In Romania's case, shortcomings in the implementation of all points from Heggie's four-block reform (user ownership, predictable financing, clarified responsibilities and management strength) lead to a systematic failure of current operations in the sector, with the consequences explained above (Nuțu, 2008). In short, thus, MT must have the overall strategic vision of the whole transport infrastructure and provide long-term vision to the sector, whereas CNADNR should simply prepare and implement the operational programs that meet the general objectives of the Ministry. This is closely inter-related with the financing source – as long as the Ministry has the discretionary, unilateral power to allocate funds, making financial sources unpredictable, CNADNR cannot be held accountable for the failure to implement programs and the ultimate responsibility should remain with MT. However, in this case, the Company loses operational autonomy and acts as a Ministry

construction contract properly (Nuțu, 2008).

¹³ For the transitional period in which, as will be explained, CNADNR should use a mix of user charging and medium-term expenditure framework, CNADNR would work based on a contract with MT, in which MT sets the overall transport policy and CNADNR implements operational programs to achieve the general goals of MT's strategies.

department, which fully contradicts the principles of commercialization of the sector (Nuțu, 2008, p.16).

In what concerns the first block, CNADNR must become a “provider” of construction and maintenance services to a Roads Fund. The latter should be an independent organization having a board in which the majority is composed by roads users as described in Chapter 2 and which collects funds directly from users. With this money, the Fund contracts works from the Company and becomes the latter’s (only) customer. CNADNR itself should be managed by a board in which the majority would be composed by road users (transport companies, associations of car owners etc.), different from the Fund’s board because the Fund collects also revenues for local and regional roads (see below).

5.3. LARGER CONSTRAINTS: A UNSATISFACTORY BUDGETARY SYSTEM

Looking at the broader context of public sector financing in Romania, there is another aspect that inhibits sustainable planning and long-term financing in the roads sector under the current budgetary system. Romania has introduced in 2003 the MTEF, but it is still applied inconsistently (Public Expenditure and Institutional Review, World Bank, 2006; OECD, 2005). Budgets are approved for the next year and with forecasts for the following years. However, forecasts are not formally reconciled with future budgets and differences are not explained (for example, why were additional projects introduced? why was the increase in maintenance expenditure not expected? etc). The reconciliation requires good planning, which lacks in Romania because of insufficient institutional capacity; in addition, the introduction of unplanned projects has raised suspicions of corruption in the sector

(Cotidianul on Bechtel contract, 2005). Thus, in the roads sector there is little incentive to prepare a long-term plan.

The implementation of the MTEF for the public budgets is an EU obligation, and would be a first real planning exercise, determining Romanian decision-makers to think carefully and coherently for a few years in advance. It would also avoid suspect practices of introducing unexpected programs and require planning of investments only if adequate maintenance can be ensured in the future (Nuțu, 2008).

Based on the above, the most reasonable solution is to implement a phased reform towards full commercialization. This phasing is not an easy task, and requires concerted actions in all the four blocks at the same time. One cannot charge users if users do not have a say in the construction and maintenance of the roads or in the network management Responsibilities cannot be clarified unless financing is predictable; otherwise, the accountability for poor performance would be endlessly passed on from MT to CNADNR, as they are today. Predictability would be enhanced by the implementation of an effective medium-term expenditure framework. Management can be strengthened only when good managerial information is available, and the market information from pricing mechanisms is extremely valuable (adapted from Heggie, 1999).

CHAPTER 6. A PROPOSED SOLUTION: MIX OF BUDGET AND USER CHARGING SYSTEMS

Considering the above, what would be then the solution for a sustainable reform towards full commercialization of roads? One must conceive an approach in which the most obvious risk is minimized: mismanagement of funds. Funds management (whether from the budget or user charges) must always be under close scrutiny of legitimate observers: the public in the budget case, or the users in the latter. **Creating an appropriate financing mechanism that allows proper accountability and allocation of funds is the most important component in implementing the full commercialized model and the starting point in applying the Heggie's four-block reforms.**

6.1. STEPS TO ENSURE THE PREREQUISITES FOR IMPLEMENTATION

There are several key steps that must be followed in order to smoothly implement the commercialized model.

1. A **computation of the RUC** would help identify the potential for introduction of the commercialized model: for example, if the amounts needed to support current investment projects are too high, the commercialization process could take longer and the Ministry could contribute a general subsidy to be phased out in several years (Talvitie, discussion, 2007). What is important is to know the users' ability to pay, on one hand, and the network needs. Thus, even a rough initial estimate of the RUC (how much users would have to pay for the

Government's current plans) would provide invaluable information on the first priorities in order to include them in an agreed long-term strategy.

This computation should follow four steps (adapted from Heggie, 1999), detailed below. One must remember that the computation is made before the actual system is implemented. At this point, investment and maintenance plans are those of the Ministry, not the actual priorities of users which would be revealed gradually by the actual implementation of the system in the future. Traffic estimates would be initially used to split the costs, and update priorities of MT and CNADNR. For example, maintenance is a recurrent cost. If the computed charges for maintenance of the planned investments are unreasonably high to be covered in future in full by users, the investment plans have to be reduced to affordable levels. The approach matches the funding: gradual shift from budget system to full cost recovery from user charges.

1. The first step is an estimation of costs with sustainable operation and maintenance of the road network. In Romania's case, there is one plan for investments which represent commitments to the EU (Sectoral Operational Plan for Transport, 2007). However, this is considered as overly optimistic and a realistic scenario (according to donors and experts) must consider the current capacity constraints. There are reasons to believe that only about one fifth of this plan can be actually implemented in the time horizon of the plan (2007-2013) (Steering Committee meeting for improving administrative capacity in the transport sector, 2007).
2. Secondly, one must prepare a financing table containing total costs to be covered by user charges (maintenance, investments, repairs etc., for the entire road network, including local and regional roads). Initially, these are based on international averages per type of work and quantities, and current plans (maintenance, investment according

to the sector operational plan for transport and the realistic scenario). To these costs one must add the environment and accident externalities. European estimates are that such costs exceed 2% of Romania's GDP (material costs and growth in healthcare spending) (World Bank, 2004).

3. Then, traffic estimates on the road network should be prepared, to indicate the future charges and the split of revenues to national, regional and local roads.
4. Fourthly, an estimation of variable fees per each category of vehicle is made. This consists of fuel levy plus, as explained, a part of license fee (vignette) that would account for the weight differences not covered by variations in fuel consumption. Each traffic category must cover its variable costs, and the whole network traffic covers through charges also the fixed costs, including investments, through the remaining of vignettes. That is, along with the computation, one must determine the instruments that can be used to collect the charges (vignettes, tolls or fuel taxes). With regards to congestion, local road congestion should be separated altogether from the RUC calculation since it is primarily a local cost and local authorities should have freedom to regulate the congestion within their own jurisdiction. As for national (inter-city) roads congestion, one can make a separate calculation on the bottleneck areas, and the amount collected from road users should be used to build bypasses. The RUC must also consider the growth of car stock and traffic. For the estimate of fees per each category of vehicle, the World Bank has prepared a computation spreadsheet, available at www.worldbank.org/transport (ruc30.zip).

Even before the full implementation of the model, introducing a partial charge for the users for maintenance, rehabilitation and constructions would reveal the real preferences of the users, providing crucial information on actual priorities for the roads sector, to be introduced

in the mixed budget – user charge system. Because of the visibility of charges, costs would become more transparent, users start demanding value for money and monitor the proper allocation of money collected from user charges.

2. The second crucial measure (undertaken simultaneously with the first) would be to **prepare a long term strategy**, a carefully designed plan that fully integrates the operations of the roads sector, including the aspects related to competition with other modes of transport. A General Transport Master Plan has just been finalized in May 2008 by Louis Berger consultants under EU financing, but there is no certainty it would be implemented. Moreover, it is rather vague. Commitment to such a strategy from both the Ministry of Finance and the Ministry of Transport could be guaranteed in Romania at the moment by connecting the strategy with the MTEF, which is a legal requirement though inconsistently applied (OECD, 2005). The identified pool of projects must be formally adopted in the budgets and forecasts. They could be changed in the future if the revealed preferences of users indicate other priorities, because the differences between budgets and previous years' forecasts could be reconciled with a sound justification. In addition, since now prioritization and spending efficiency are a problem that could be reduced by competition, the MTEF would stimulate competition between the roads sector and other sectors seeking financing from the state budget. The budget system, properly applied, would be best combined in the following years with the RUC, because the state would contribute part of the infrastructure costs in the next years (see below).

3. Introducing RUC is extremely unpopular and politically difficult to accept, so it is probable, as mentioned in 1), that the resulting road user charge would be too high to be introduced at once. In the case of Romania, these charges would probably be high due to the

need to catch up with the EU infrastructure levels, build motorways, upgrade the existing national roads, all of which have only partial support from EU grants and the rest would be co-financed from national sources or repayable loans. In this case, the most reasonable action would be to design a **gradual implementation schedule**, with a general subsidy from the state in the first years, gradually decreasing until the users can actually take the full load of the cost. Since maintenance is a recurrent cost, the Government must take into consideration that it should be affordable to users even after the subsidies are phased out; so subsidies should cover primarily the part of the cost introduced by new investments, and only part of the maintenance costs which would become affordable in the future once income per capita catches up with EU levels.

Equally important, user charges must be **computed as full cost recovery**, and the budget support should be in the form of a per-user/distance reduction of charge. The principle would be similar to the subsidies in the railways sector: operators (trains) pay a full-cost recovery price for the use of the infrastructure (track access charge), and receive a per-passenger subsidy from the state, stipulated in a clear contract between the operator and the MT.

This aspect (temporary subsidies from the state, until charges can be paid in full by users) is a critical reason why it is needed to implement a transitional arrangement in form of a mix of existing budgetary (medium-term expenditure framework) system and the RUC. This “mix” should provide, for the time being, the benefits of both MTEFs and RUC systems (SAR, 2007), until the user charges system becomes “mature” enough to be fully implemented in the final commercialized model.

6.2. ACTUAL IMPLEMENTATION

The proposed transitional arrangement is not difficult to implement. Users will pay the charges in form of, mostly, vignettes and fuel taxes. Both should be collected by the government, not by CNADNR, in a separate account. The subsidy would appear as a reduction by X% in the fuel excise or vignette to the consumer, and the total amount of reduction (subsidy), appearing in the contract to be concluded between MT and CNADNR, will be provided by the state budget. Since some of the money come from fuel taxes, collected on national, regional and local roads, the account should have clear procedures on how the amounts will be split among CNADNR and the entities that manage regional (counties) and local roads (municipalities). This separate account would be subject to full audit, according to the practices of general budget revenues. The fund must be managed by a “board” of MT (who provides subsidies), CNADNR (who has to give up collecting vignettes on its own), and, optimally, some representatives of users (unions of transporters). This would ensure increased transparency and ownership over the process.

Based on expected revenues from charges including the subsidized part, CNADNR will prepare the roads program, within the general transport policy objectives of MT, and submit it to MT’s approval, since part of this program is to be subsidized by the state and must follow the normal budget procedures. The program should not be changed substantially during the year unilaterally by one of the two entities (MT or CNADNR). One of the major problems in Romania’s roads sector is the volatility of strategies, stimulated at present also by MT’s financial power and its temptations to impose politically visible programs, such as motorways, without a strategy or clear plan (SAR, 2007).

Thus, the contract to be concluded between MT and CNADNR should include (enhanced from Nuțu, 2008):

- Total funding available, including (clearly identified) the amounts of subsidies, similar to the “public sector obligation” contract for railways;
- Program proposed by CNADNR and approved by MT, within available funding; this should be part of the MTEF, with detailed program for the next year and forecasts for the following years. The program would contain economic justifications of projects, with indicators of efficiency (e.g, internal rate of return), which makes the projects comparable with other state-financed projects, stimulating competition;
- Clear allocation of responsibilities between MT and CNADNR. Thus, if MT unilaterally decides to use the fund for other purposes, it will bear full responsibility for the fact that the road program will not be implemented as agreed. If, on the other hand, CNADNR cannot undertake the full program, it will be responsible and funding would be reduced; in the following years, based on actual implementation capacity of CNADNR, charges from users could be reduced to match a realistic program.

In this manner, MT and CNADNR will both be accountable to citizens and users for the management of funds; what is more roads enter a competition with other sectors for budget allocations. If the roads sector cannot absorb the funding, the share of the state (subsidies from the budget) will be allocated in the future for other purposes: health, education etc., and roads programs and strategies would be constrained to what is feasible and economically justified.

Crucially, funds should not be managed by CNADNR, not now and not when the RUC would cover the full cost, until CNADNR would be managed by a board in which users have the

majority. This is because until then, CNADNR would not be fully accountable to users and there are risks of funds mismanagement and lack of user ownership. As explained, the fact that CNADNR collects directly the vignettes (cca. 120 mil. EUR in 2007), is a case of “first generation road funds” where the use of the funds is non-transparent and partly evades public scrutiny¹⁴. These amounts should be collected in a separate account / fund, pooled with the temporary subsidies. The fund must be subject to independent audit and from it, money should be disbursed based on clear procedures (as explained, the road fund must be a “purchaser of services” from CNADNR). As CNADNR loses control over its sole source of own financing by the transfer of vignettes to a different account, it should be still represented in the board of the Roads Fund.

4. The proposed fund will evolve in time, as MT’s support through subsidies will decrease in the gradual implementation schedule of user charges. The structure of its board should match the change; when users take over eventually the full burden of payments, the board should be composed in majority of representatives of users¹⁵. CNADNR, which in that future period will not undertake any state budget financed projects, would be “privatized”: its board must also be composed in majority of users. In Romania’s case, where roads are national, regional and local, and CNADNR manages only national roads, the Fund probably cannot be merged in the future with the Company. This is because the fund’s board includes users of all three categories of roads, whereas CNADNR’s board will include users of national roads only¹⁶.

¹⁴ They can be checked by the Court of Accounts, but public information about fund use is scarce (SAR, 2007).

¹⁵ The question arises how the pollution charge should be included and properly managed. There are two possible solutions: either include environment agencies in the board, or create a separate regulation to transfer an amount equivalent to a pollution fee to the state budget.

¹⁶ This aspect is not necessarily true. In another paper (“Roads to Nowhere”, SAR, 2007), I argue that CNADNR could manage the maintenance of the regional roads, by contract with County Councils, in order to gain economies of scale. County Councils could conclude a concession contract for the management of county roads with CNADNR, just like MT does for the national roads. See also Talvitie, 2004, p. 3

As can be observed, the proposed solution is in fact a transitory agreement towards the “second generation of road funds”, a combination of RUC and MTEF. In summary, CNADNR would be able to spend in reality up to a theoretical total RUC (the amount that would be spent by users without the subsidy which would be phased out), but only if it can prove its projects are of good quality, compared to other sectors (a characteristic of the MTEF). This creates the prerequisites for the major reform which is the true “commercialization” of roads, and already improves the quality of projects selected. In this transition period, knowing the full cost and charging a part of the cost to users (the rest being subsidized by the state budget) provides the necessary information on user preferences and priorities. These are vital to ensure that users would be able to maintain in the future investments that are made now. When users are deemed capable of bearing the full burden of the cost, a modern Fund structure can be fully introduced and the transitional agreement will be discontinued. Users will be ready for full charging once the major construction programs needed to catch up with the EU are completed; after that, only roads which are “affordable” to the users should be financed.

There are good reasons to believe that implementation of such a system would be feasible. As the charge would be a top-up of the existing fuel tax (excise), it is encouraging to see that the current level of excises is about half of EU average and there is still room for increase. There are also opportunities to revise the vignette system, refining it to better match actual road use, by introducing more categories of vignettes.

Tolls, which are currently used on a negligible scale in Romania, could be explored, particularly since an assessment of availability to pay of road users has been prepared; testing the results on a pilot road section would further refine the results¹⁷.

However, the unsatisfactory condition of the road network today and the gloomy perspectives for tomorrow call for immediate action. Perpetuating current practices of maintenance under-financing accelerates the deterioration of road infrastructure. Lack of transparency on how road projects are selected and prioritized concerns public opinion and raise suspicions of corruption. Uncertainty and changes of policies from one year to another also affects potential investors and lenders, including donors. Predictability is therefore a must to ensure viability of the roads sector; and viability means primarily a stable source of financing allocated for the priorities of the payers (SAR, 2007).

¹⁷ Tolloed motorways, not likely to be built soon, can be treated completely separately from the road user charges system in the thesis. In principle, tolls would be introduced on motorways built and operated by a private partner and cover probably maintenance and possibly some or all construction costs. If tolls are too high, but the government considers it is justified to support traffic, subsidies can be introduced: either “availability fees” (lump-sum budget transfer covering the tolls for a certain traffic volume, the equivalent of a “minimum traffic guarantee” to the private partner) or “shadow tolls” (subsidy per vehicle, like for railways) (Nuțu, 2008).

CONCLUSION

The thesis has analyzed the theoretical, political and practical justifications of a new trend in transport policies around the world: the complete transfer of roads management and financing from state bureaucracy to a commercialized system administered by users. In Romania's case, this appears as feasible, necessary and (at least partially) politically supported model. Based on the theory and international practices, the paper has shown how the model can be designed in Romania and how to avoid traps that open windows of opportunity for corruption and inefficiencies.

There is still a lot to be refined in this analysis. For example, only when user charges are computed and a study of users' availability to pay is made can one know for sure how much state support is still needed, for how many years, and how long the proposed transitional arrangement (combination of existing budgetary system and user charging) should be in place. Alternative scenarios and proposals could be prepared for the commercialization of Romania's roads sector, depending on the future political context and willingness to pursue this model, the possible introduction in the meanwhile of new technologies for user charging, or further theoretical work on the topic. The theory on road user charging and commercialization of roads is still developing fast, and the future results of the introduction of this model in Romania may provide useful insights. Heggie's model, applied in this thesis, starts from a very different set of countries than Romania, with other road conditions and structure. For example, a possible and expected result from the implementation in Romania could be that Heggie's two-part tariff (fuel taxes for variable costs, vignettes for fixed costs) is no longer valid: for Romania's roads, fuel taxes would probably not be enough to account for the large difference in damage to paved roads caused by heavy traffic compared with light

family cars. A new model may emerge, or a different charge could be introduced to account for this result. Applying the model in Romania could provide vital information for similar attempts in neighboring countries.

However, it is remarkable how, more than two hundred years after their initial formulation, the simple principles described by Adam Smith are as relevant as ever for the sustainable financing of roads in modern states.

References

- Chris Britton Consultancy (2007) Interim Report: Technical Assistance for Evaluation of the Pavement Management System for Romania's Roads, Bucharest: CNADNR, internal report
- Compania Națională de Autostrăzi și Drumuri Naționale din România (2008), road infrastructure and fatalities statistics, available at: www.andnet.ro [Last accessed July 28, 2008]
- Cotidianul daily (2006-2008) on-line version, available at: www.cotidianul.ro [Last accessed July 28, 2008]
- European Commission (2008) International Organizations and Institutions in Road Transport: State Authorities, Research Institutes and Other Sources for Road Safety. Available on-line at: http://ec.europa.eu/transport/road/links/index_en.htm [Last Accessed on July 27, 2008]
- European Commission (2008) Statement on Transport Policy objectives: http://europa.eu/pol/trans/overview_en.htm [Last Accessed on July 29, 2008]
- European Commission (2006) Transport Directive 38/2006/EC, available at: <http://ec.europa.eu/transport/> [Last Accessed on July 29, 2008]
- European Conference of Ministers of Transport (2006) A Politician's Guide to Efficient Pricing, available at: <http://www.internationaltransportforum.org/europe/ecmt/pubpdf/07GuidePricing.pdf> [Last accessed on July 17, 2008]
- Gressier, A. (2007) Implementation Capacity in the Roads Sector, internal unpublished report, Bucharest: CNADNR consultant reports
- Heggie, I., Vickers, P. (2000) Earmarking versus Commercialization: World Bank and Ministry of Finance Views, Technical Paper 409, Washington, D.C.: World Bank, available at <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTROADSHIGHWAYS/0,,contentMDK:20474459~isCURL:Y~menuPK:1054485~pagePK:148956~piPK:216618~theSitePK:338661,00.html> [Last Accessed on July 10, 2008]
- Heggie, I. (1999) "Management and Financing of Roads: An Agenda for Reform", Technical Paper 275, Washington, D.C.: World Bank
- Heggie, I. (1992) "Selecting Appropriate Instruments for Charging Road Users Infrastructure and Urban Development Department, Report 95, Washington, D.C.: World Bank
- Informal discussions with road sector experts from CNADNR, MT, JASPERS, European Investment Bank, European Bank for Reconstruction and Development (2005-2008)¹⁸

¹⁸ These experts have kindly shared sensitive information in confidence, on the assumption that their identity would not be made public.

- Informal discussions with World Bank specialists (2003-2008): Talvitie, A., Consultant and former Task Team Leader on Transport Projects, Kerali, H., Task Team Leader on Transport Projects, Senior Transport Sector Specialist
- Krugman, P., Wells, R. (2004) Economics, New York: Worth Publishers
- Louis Berger Consultancy (2008) General Transport Master Plan, Bucharest: MT, unpublished report
- Metschies, G., ed. (2001) Adam Smith and the Principles of a Sustainable Road Policy, Eschborn: Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ), International Road Federation (IRF), available at: <http://zietlow.com/docs/adamsmith.pdf> [Last accessed July 29, 2008]
- Ministry of Transport (2007), Sector Operational Plan for Transport 2007-2013, available at: www.mt.ro [Last accessed June 23, 2008]
- Ministry of Transport (2008), road infrastructure statistics, available at: www.mt.ro [Last accessed June 23, 2008]
- NEA / INFRAM (2007) Final Report Immediate Technical Assistance for Management Review CNADNR, Rijswijk, Bucharest: CNADNR, unpublished report
- Newbery, D. (1988) Road Damage Externalities and Road User Charges, *Econometrica*, Vol. 56, No. 2, pp. 295-316, available on JSTOR at: <http://www.jstor.org/stable/1911073> [Last Accessed on July 6, 2008]
- Newbery, D., Hughes, G.A., Paterson, W.D.O, Bennathan, E. (1988) Road Transport Taxation in Developing Countries, Discussion Paper 26, Washington, D.C.: World Bank
- Nuțu, A.O. (2008) Capacity Constraints in the Transport Sector in Romania, forthcoming, Bucharest: Centrul Român de Politici Economice
- Ruffner, M., Wehner, J., Witt, M. (2005) Budgeting in Romania, Organization for Economic Cooperation and Development, available at: <http://www.oecd.org/dataoecd/24/8/39997341.pdf> [Last accessed on July 11, 2008]
- Rolle, C. (2005) Road Pricing: The Case For and Against, available at: <http://www.maths.tcd.ie/local/JUNK/econrev/ser/html/road.html>
- Romanian Academic Society (2007) Roads to Nowhere, Policy Brief 26, available at: <http://www.sar.org.ro/index.php?page=articol&id=213>
- Steering Committee (2007) Meeting for Improvement of the Institutional Capacity of the Transport Sector, Bucharest: MT
- Talvitie, A. (2004) Experience With Road Financing in EU Accession Countries, Latin America, and Africa, Birmingham University Senior Road Executive program, republished Washington, D.C.: World Bank

Walters, A.A. (1968) The Economics of Road User Charges. Baltimore: The Johns Hopkins University Press. Available also at: http://www-wds.worldbank.org/servlet/main?menuPK=64187510&pagePK=64193027&piPK=64187937&theSitePK=523679&entityID=000178830_98101902175637 [Last Accessed on July 26, 2008]

World Bank (2003-2008) Aide Memoires on Transport Missions - status of implementation of Transport Sector Support Project and Transport Restructuring Project, Washington, D.C., unpublished reports

World Bank (2001) Commercialization of Road Agencies, Washington, D.C., available at www.worldbank.org/transport [Last Accessed on July 29, 2008]

World Bank (1999) Road User Charges Template, Washington, D.C., File ruc30.zip, available at www.worldbank.org/transport [Last Accessed on July 29, 2008]

World Bank (2000a) Road Funds 1: What Went Wrong? World Highways, Vol. 9, Issue 6. Washington, D.C., available at <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTROADSHIGHWAYS/0,,contentMDK:20474459~isCURL:Y~menuPK:1054485~pagePK:148956~piPK:216618~theSitePK:338661,00.html> [Last Accessed on July 14, 2008]

World Bank (2000b) Summaries of Road Fund Administrations in Japan, New Zealand, and USA, Road Financing Learning Series, Washington, D.C., available at <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTROADSHIGHWAYS/0,,contentMDK:20474459~isCURL:Y~menuPK:1054485~pagePK:148956~piPK:216618~theSitePK:338661,00.html> [Last Accessed on July 12, 2008]

World Bank (2006) Summary of Legal, Institutional and Financial Position CNADNR and Review of Options, Washington, D.C., internal document

World Bank (2004) Transport Restructuring Project, Project Appraisal Document, Washington, D.C., available at: <http://www.worldbank.org/ro/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=275154&menuPK=287327&Projectid=P083620> [Last Accessed on July 12, 2008]

World Bank (2005) Transport Sector Support Project, Project Appraisal Document, Washington, D.C., available at: <http://www.worldbank.org/ro/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=275154&menuPK=287327&Projectid=P093812> [Last Accessed on July 12, 2008]

World Bank (2006) Public Expenditure and Institutional Review, Washington D.C., available at: http://www.worldbank.org/ro/external/default/main?pagePK=51187349&piPK=51189435&theSitePK=275154&menuPK=64187510&searchMenuPK=287323&theSitePK=275154&entityID=000090341_20061205101152&searchMenuPK=287323&theSitePK=275154 [Last Accessed on June 10, 2008]