

An Overview of the Russian Road Financing System

FRANCK BOUSQUET, CESAR QUEIROZ, AND OLEG SKVORTSOV

The maintenance of highways in Russia has been seriously neglected in recent years with widespread adverse effects on the general economy. Both the federal road network and the regional roads have deteriorated because of inadequate maintenance. As a result, there is a large backlog of road maintenance that should be undertaken as soon as possible to bring the roads up to a good condition. Historically, funds for construction and maintenance of federal roads and about 15 percent of regional roads (formerly designated as republic roads) came from the federal budget and earmarked road user charges, including an enterprise tax. Funding for the remaining 353,000 km of roads came from regional budgets. In April 1992, road funds were established to fund both construction and maintenance of federal and regional roads and in 1993 amendments to the Law on Road Funds earmarked specific taxes to each type of road fund. This study provides information on the Russian road network, describes the road funds at the federal and regional levels, and outlines possible changes in the road financing system, along with the weaknesses of these funds. The cost of overcoming this backlog during the period 1994–2000 is estimated at \$4.8 billion (U.S.)/year, whereas the resources available to the federal and regional road funds are roughly \$2 billion annually, thus a deficit of about \$2.8 billion/year. Possible measures to overcome this deficit would include increasing collection of road user charges and raising financing by multilateral and bilateral agencies.

The Russian Federation, with a land area of 17.1 million km², is by far the largest country in the world, stretching across 11 time zones. According to the new Constitution of the Russian Federation (December 12, 1993), Russia is divided into 89 regions, called "subiukti" of the Russian Federation, comprising 21 republics, 10 okrugs, 49 oblasts, 6 krais, 1 autonomous oblast, and 2 cities (Moscow and St. Petersburg).

Russia has 489,059 km of public roads, of which about 274,609 km (56.1 percent) are paved. Only outside-town roads are considered public roads and classified as being in (i) federal property or (ii) regional property. Federal roads comprise 40,622 km (8.3 percent) of the public road network and 89.4 percent of them are paved, whereas regional roads make up the remaining 4,448,437 km (91.7 percent), and 56 percent of them are paved. In addition, there are about 450,000 km of unclassified enterprise roads and 700,000 km of mainly access roads. There is some local pressure for many of the enterprise roads to be transferred to regional authorities since they are more public than private roads. However, the regional authorities are reluctant to accept the responsibilities for these roads as many of them do not meet public road design standards and also because of the additional funding required for their rehabilitation and subsequent maintenance.

Due to reduced funding for road maintenance and rehabilitation over the last few years, and the poor quality of road construction and maintenance works, there is a growing backlog of road rehabilitation. According to Rosdornii, a Russian Scientific Research and Production Highway Institute, about 25 percent of federal roads are in fair condition and basically do not require rehabilitation, and 38 percent are in poor condition and require rehabilitation or reconstruction.

DESCRIPTION OF THE RUSSIAN ROAD FINANCING SYSTEM

The federal road network is under the responsibility of the Federal Highway Department (FHD) which is a department of the Ministry of Transport (MOT). Federal road construction and large rehabilitation works are carried out by mainly regional contractors. Of the federal road network, 39 percent is maintained by autonomous federal road maintenance agencies, called *uprdors*, and 61 percent of this same road network, plus almost all regional roads (42,000 km), are maintained by regional highway administrations, called *Avtodors*, Regional Road Committees or Regional Road Administrations, through contracts with FHD.

In the Former Soviet Union (FSU), funds for construction and maintenance of federal roads and roughly one-third of roads in the republics, came from both the federal budget and a collection of road user charges, including an enterprise tax. In 1991, 55 percent of road funding came from the federal budget and 45 percent from road user charges; funding for the remaining 353,000 km of regional public roads came from regional budgets. About 30–50 percent of funding for agricultural roads in that year came from federal ministry of agriculture budgets, and the remaining non-public roads were financed by individual state collective farms or enterprises.

In recent years, a number of federal Extrabudgetary Funds (EBFs), including the federal road fund were created (1). In 1992, 17 federal EBFs operated in the Russian Federation. In addition, several hundred regional and local EBFs were created throughout the year. No data are available on these EBFs and the federal government is unable to keep track of them. The gross revenues of the federal EBFs amounted to 3.3 trillion Rb or 18.2 percent of the gross domestic product (GDP).

In October 1991, the Russian government decided to eliminate all budgetary funding of roads and replace this system with an expanded road user taxation system. The Federal Road Fund (FRF) and 87 Regional Road Funds (RRF) were thus established by the Law No. 4226-I, dated December 25, 1992, to fund construction, maintenance and rehabilitation of public (federal and regional) roads (2). The combined budget is approved annually (by the

F. Bousquet and C. Queiroz, The World Bank, 1818 H St. NW, Washington, D.C. 20433. O. Skvortsov, Federal Highway Department, 4 Bochkov St., 129301 Moscow, Russia.

Supreme Soviet in 1992 and by Presidential Decrees in 1993 and 1994). The first full year of operations for both FRF and RRF was 1993.

FRF

The FRF consists of a nationwide fuel and lubricant tax; a vehicle production tax; and enterprise, vehicle sales, and vehicle registration taxes in the cities of Moscow and St. Petersburg. The detailed sources for FRF are:

1. Fuel and lubricant tax: This is a 25 percent tax on gasoline, diesel fuel, lubricant oil, and compressed and liquefied gas. The tax is levied on 32 Russian refinery firms which are located in 20 oblasts, and on all their resellers (including cooperatives and small plants). In case of resale of oil and lubricants, corporations, enterprises, organizations, and entrepreneurs pay the tax on the difference between their price of sale [less value-added tax (VAT) and their purchasing price (less VAT)].

However, a recent decree No. 1008 (3), dated May 23, 1994, establishes that "in assessing the tax on fuel and lubricant sales, the tax base shall exclude turnovers of producing enterprises as well as of other economic entities involved in selling products to non-CIS countries at prices close to world levels." Therefore, there should be no tax on exported fuels or lubricants for the FRF, a decision which is supposed to have reduced the amount of FRF resources by about 8 percent.

2. Vehicle production tax: The six Russian vehicle manufacturing firms, VAZ, AZLK, GAZ, YAZ, IXE, and OKA are taxed (the tax rate is 35 percent). This tax is paid three times a month (on the 10th, 20th, and 30th), and the mechanism used to collect this tax is similar to the one for the FRF.

However, a new decree No. 2268, dated December 22, 1993, regarding the Budget of the Russian Federation in 1994, changed the allocation of this tax. Starting from the beginning of the second quarter of 1994, this excise on sales of cars to private persons goes to the Federal Budget of the Russian Federation and no longer to the FRF.

3. Enterprise, vehicle sales, and vehicle registration taxes in the cities of Moscow and St. Petersburg: Generally, enterprise, vehicle registration, and vehicle sales taxes go to regional road funds. The cities of Moscow and St. Petersburg, however, collect these taxes for the FRF. These contributions are significant, representing 54.9 billion Rb in 1993 (January 1993 prices).

Total FRF collections in 1993 were 311 billion Rb (in January 1993 prices), about \$642 million (U.S.) equivalent. Of these taxes earmarked for the FRF, 204.1 billion Rb came from fuel and lubricants tax, 52.1 billion Rb from vehicle production tax, and 54.9 billion Rb from the enterprise, vehicle sales, and vehicle registration taxes in the cities of Moscow and St. Petersburg. The 1993 actual collection of 311.1 billion Rb compares favorably with the 1993 budget of 264.0 billion Rb (January 1993 prices). Table 1 shows the FRF collections in 1993, by month and by tax, taking into account the inflation.

FHD has a three-level collection system, corresponding to the three different administrative-territorial divisions. Tax collection is enforced by Rosnalogsloujba, an organization located in Moscow and in each oblast and rayon in Russia, with roughly 200,000 employees on the whole and 570 in Moscow.

Federal Tax Service (FTS) and the corresponding regional tax agencies and inspections are responsible for collecting all kinds of taxes and controlling this process in accordance with the existing laws and regulations. Each quarter, FTS submits to FHD a report on

TABLE 1 Federal Road Fund Collections in 1993 (in Billions of Rubles)

Month	Fuel and lubricant tax	Vehicle production tax	Moscow and St Petersburg Collections	Total	Inflation index*	Total January 1993 Prices
January	10	1.7	4.6	16.3	126	16.3
February	15.1	4.8	4.4	24.3	162	19
March	28.9	9.7	9.5	48.1	190	32
April	39.8	14.4	19.9	74.1	221	42
May	32.8	9.9	7.7	50.4	264	24
June	38.9	10.2	9.6	58.7	310	24
July	37.8	10	8.6	56.4	370	19
August	76.6	17.8	16.3	111	478	29
September	70.8	17	13.4	101	578	22
October	128.8	30.4	27.7	187	693	34
November	137.8	28.7	28.7	195	832	30
December	128.7	12	17	158	998	20
Total (current prices)	746	166.6	167.4	1,080		311
Total (January 1993 Prices)	204.10	52.14	54.92	311		

* December 1992 = 100

In January 1993, 1 US\$ = 484.2 Rb

Source: Road Fund Division

tax collections into RRFs and FRF by region. FRF's money is entered in accounts No. 750xxx in regional state banks and transferred to the account No. 750001 in the Central Bank of the Russian Federation. FHD receives data from this Bank on the entry of FRF's money to the account and compares these data with those given by FTS. The explanation of the differences is that almost all regions transfer FRF's money with delays.

RRFs

Taxes for the RRFs come from the following:

1. Enterprise tax: Most enterprises are taxed a minimum of 0.4 percent on sales, except commercial firms, for which the tax rate is 0.03 percent or higher. In most regions, this rate is now between 1.5 percent and 3.5 percent. This is a tax paid by all enterprises, organizations and entrepreneurs having the status of a "legal entity" in the Russian Federation. This status includes all enterprises with foreign investments, international corporations, and organizations involved in activity in Russia through their permanent representations. The following enterprises are exempt from the enterprise tax: collective farms, farms, corporations, joint-stock companies, and enterprises producing agricultural products provided that their receipts gained from farm produce sales constitute more than 70 percent of their gross receipts.

2. Vehicle sales tax: This tax is paid by enterprises, organizations which acquire vehicles through purchase, exchange, and leasing. The rate of this tax is set as a percentage of the sales price (less VAT) at: (i) 20 percent for trucks, vans, minivans, buses, and cars and (ii) 10 percent for trailers and semitrailers.

3. Vehicle registration tax: Levied on both firms and citizens, this tax ranges from 30 kopeks per horsepower to 7.15 Rb per horsepower per year. Because of inflation, these rates have been increased by the regions. This tax applies to all vehicles, including cars, motorcycles, scooters, and buses and other self-propelled machines using pneumatic tires. Tax enforcement comes mainly from the road police, called Gai. The Regions have the right to increase the rate of this tax. The date of the tax collection is fixed by Republican parliaments and corresponding authorities of the autonomous okrugs, kraies, regions, and cities of Moscow and St. Petersburg.

RRFs also receive subventions and grants from the FRF (Figure 1). Moscow oblast, for example, receives 20 percent of all the collections from FRF (47,160 million Rb out of 223,637 million Rb). RRF grants, called "dotatsii," are based on the importance of the local economy of the region road network and the length of its network. RRF subventions, called "subventsii," are based on the number of kilometers of former republican roads which became regional roads, and the particular projects for which the region is requesting federal funding. With the breakup of the FSU, some former republican roads were reclassified as regional and are now under the oblasts' responsibility.

The State Duma annually votes the global amount of subventions and grants for each oblast. In 1993, the corresponding total amount was 537.8 billion Rb (current prices) and should be approximately 1540 billion Rb (January 1994 prices) in 1994. However, in some regions where the Updors are not only in charge of federal roads but also of regional roads, the Oblast Road Administrations have to redistribute to the Updora a part of the subventions received from

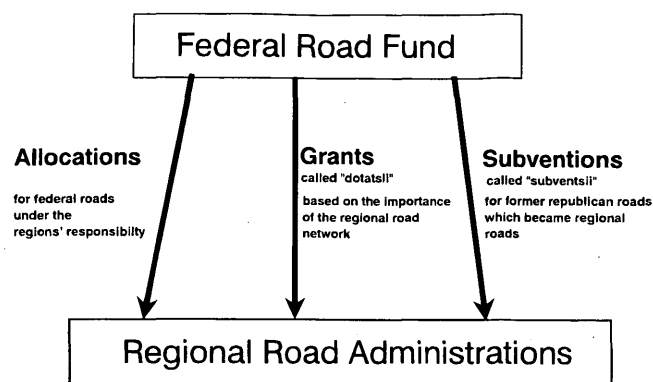


FIGURE 1 Financial transfers from Federal Road Fund to the regional road administrations.

FRF. This is for instance the case of Mosavtodor, the Moscow Oblast Road Administration.

The federal roads under the Updors' responsibility are financed by the FRF whereas the federal roads under the Regional Road Administration's responsibility are financed by the RRF through allocations from the FRF.

The regional roads under the region's responsibility and which were republican roads before the breakup of the FSU are financed by the subventions to the Regions from the FRF; lastly, the regional roads under the Updora's responsibility are financed by the Updors, which receive allocations from the regions for specific works.

The 1993 total RRFs actual collection was 417.9 billion Rb (in January 1993 prices), whereas the budget estimate was 182.5 billion Rb. Of the 417.9 billion Rb collected, 304.1 billion Rb came from enterprises tax, 90.3 billion Rb from vehicle sales tax, and 23.5 billion Rb from vehicle registration tax. Table 2 shows RRF Collections in 1993 by month, taking inflation into account.

CURRENT PROBLEMS IN ROAD FINANCING

Problems at the Resources Level

Tax Collections

There were substantial problems with tax collections when the new Road Fund system was introduced in 1992 because most of the taxes, including the fuel tax, were collected at the regional and local level. Many of these taxes were never collected, in part because: (a) the system of tax collection was inadequate, (b) some regions were reluctant to remit taxes to Moscow, and (c) many enterprises were in poor financial condition, and inter-enterprise indebtedness mounted rapidly. To meet the shortfall in funds for federal roads during the construction season, FHD borrowed from the Central Bank. Most of these loans have been repaid. Fuel taxes presently are allocated to the FRF and taxes described as "road user" (enterprise) taxes, vehicle sales taxes and registration taxes are allocated to RRFs. Therefore, FHD does not need to rely on local authorities to remit taxes owed, whereas regional governments can put more pressure on enterprises located within their regions to pay their taxes. As of 1993, the regions were also given authority to raise the level of road user tax, vehicle sales tax and registration tax. These

TABLE 2 Regional Road Fund Collections in 1993 (in Millions of Rubles)

Month	Enterprise tax	Vehicle sales tax	Vehicle registration tax	Total	Inflation index*	Total January 1993 Prices
January	20203	4546	505	25254	126	25254
February	18689	7208	801	26698	162	20765
March	27076	16062	2753	45891	190	30433
April	64096	21060	6410	91566	221	52205
May	54926	19385	6462	80773	264	38551
June	65386	17914	6270	89570	310	36406
July	100054	25366	15502	140922	370	47990
August	86842	24123	9649	120614	478	31794
September	116525	28573	4512	149610	578	32614
October	162790	44870	5342	213002	693	38728
November	184571	39640	5829	230040	832	34838
December	175481	44071	4898	224450	998	28337
Total (current prices)	1076639	292818	68933	1438390		417914
Total (January 1993 prices)	304099	90295	23519	417914		

* December 1992 = 100

In January 1993, 1 US\$ = 484.2 Rb

Source Road Fund Division

various measures improved the 1993 collection of taxes for the federal and RRFs.

Nature of Taxes Collected

Current taxes collected for the road fund are not based on the real economic costs of road use attributable to different kinds of vehicles. Under normal conditions, heavy vehicles, together with environmental factors, are the principal cause of road deterioration. Therefore, it is not fair to charge all road users a uniform rate.

Road User Charges

Some taxes, such as the enterprise tax, are not user charges and therefore there is no rationale for their inclusion in the Road Fund. The regions receive subventions and grants from the FRF which amounted to 537.9 billion Rb (current prices) in 1993. Subventions to the regions from the FRF are essentially based on the number of kilometers of regional roads that were formerly Republican roads. Grants are based on "the importance" of the local economy served by the regional road network. However, the State Duma annually votes *only the global amount* of the subventions and grants. Therefore, the exact criteria for allocating these funds to the regions are not explicit enough.

Complex Flow of Funds

The system of revenue collection is rather complex, involving major intermediaries in the flow of funds. The revenues through

FRF to road expenditure agencies are largely determined by the various categories of roads and the level of government (federal and regional) under which they are. The introduction of a new road classification constitutes an aspect of the decentralization reform process (4). The decentralization (if accompanied by accountability) can provide substantial benefits in terms of public sector efficiency; however, and conversely, it can result in financial instability, waste of resources, and social inequities. Therefore, in the highway subsector, the flow of funds has to be clarified and simplified as much as possible to improve transparency and accountability.

Delays and Tax Avoidance

The remaining obstacles affecting the FRF include the withholding of fuel taxes from refineries located in one or two autonomous republics which assert a relatively large degree of independence from central government. Another problem is the delay, averaging 1 month, for transfer of funds from banks in the regions to the FHD bank accounts in Moscow. There are also problems with tax avoidance (for example, by falsifying figures on exports of fuel). Opposition to the energy tax originates mainly with the energy lobby and other interests which want to see fuel taxes reduced or eliminated altogether.

Problems at the Expenditures Level

Availability of funds is only one side of the road financing equation; funds need to be allocated and used efficiently which implies an efficient road agency and adoption of appropriate strategies.

Transparency, Monitoring, and Accountability

Transparency is a necessary condition for an optimal allocation of funds in any economy. Currently, there is a need to detail and break down road and bridge expenditures at both the federal and regional levels. The assignment of detailed expenditure responsibilities between the federal and regional level has not been formalized. The road fund is not audited or monitored by any independent agencies.

Quality of Works

Quality of works and materials is uneven. Updrors and Avtodors spend much of the funds available on poor quality road rehabilitation and construction works which ultimately leads to increased road expenditure requirements. Most complaints focused on the quality of materials and the outdated technology of material production facilities. Moreover, continuous and permanent site supervision has not been customary, oversight activities being carried out on an erratic basis. Contract management and supervision of road construction and maintenance have also been very weak in the past and both were generally undertaken by the contractor himself. Supervision was mostly visual and involved few measurements and tests.

Competition

Execution of road works under competitive bidding has not been used in the past. The various obstacles to the introduction of a competitive bidding system for road contracts have been the following:

- Lack of experience with preparation of bids since contracts for all road works are based on standard designs and bills of quantities, with unit prices which are adjusted for inflation and the inclusion of a generous profit margin (up to 30 percent in some cases);
- Poor monitoring of actual bills of quantities since there is no compensation for any changes in contract quantities of work unless there are additional activities clearly outside the scope of the original contract;
- An accounting methodology which only partially takes account of inflation and does not depreciate based on replacement value; and
- Inefficient organization of road works, difficulty keeping to work schedules, and no penalties for late completion of contracts.

PROJECTED ROAD FINANCING NEEDS AND AVAILABLE RESOURCES

Federal Roads

The expenditures on rehabilitation and maintenance of the federal highway network in 1993 were \$138.2 million (U.S. equivalent), or 46 percent of total expenditures in that year. Total collection of funds in the FRF in 1993 was \$704.1 million (U.S. equivalent). Not all of the \$704.1 million was allocated to federal highways; about half of these funds or \$352.9 million was allocated as subventions to oblasts for the purpose of maintaining certain regional roads that were formerly part of the federal network. The remaining \$351.2 million was allocated to (1) federal roads for both highway reha-

bilitation/maintenance and construction/reconstruction (\$298.6 million) or (2) reserves (\$52.6 million).

The estimated cost of bringing the federal road network up to a reasonable standard during the next 6 years, that is to the year 2000, is roughly \$5,200 million (U.S.) to \$7,600 million (say \$6,000 million), or about \$1,000 million/year over the 6-year period. The basis for this estimate is summarized here. The present condition of the 41,000 km of federal roads is as follows: 15,200 km are good, 10,100 km are fair, and 15,715 km are poor. The cost per km of returning the fair roads to good condition is estimated at \$100,000–180,000 and the cost per kilometer of returning roads from poor to good condition is \$250,000–350,000. Routine maintenance of all federal roads for 6 years is about \$246 million, based on an average \$1,000/km/year.

The size of the FRF in 1993 was \$704.1 million (U.S.). If this fund were to increase at the rate of 6 percent/year, the fund would rise gradually to a level of \$1,058.7 million in the year 2000. Assuming that a continuing 50 percent of the FRF is allocated for subventions to oblasts, the available resources from the FRF for federal road works would average about \$500 million/year over the period. Thus the funds would fall substantially short of the \$1,000 million annual requirement for overcoming the backlog of maintenance of federal roads. It appears that the annual average shortfall would be about \$500 million, assuming that all road fund resources would be applied to maintenance and rehabilitation (that is, no new construction would start before the year 2000).

Regional Roads

The expenditures for rehabilitation and maintenance on one category of the regional roads in 1993 was \$548.6 million (U.S.). In addition, \$352.9 million was expended on "former federal roads," and we estimate that half of that amount, or \$176.8 million, was used for rehabilitation and maintenance of these roads. Thus the total expenditure on this activity was \$725.4 million. The overall expenditures on regional roads was \$1,409.4 million. The total collection of revenues in the regional road funds from various taxes in 1993 was \$945.5 million.

In addition to these funds, the regions have access to subventions from the FRF which in 1993 amounted to \$352.9 million (U.S.), as indicated above. Thus in that year the regions had available for regional roads a total of \$1298.4 million. Of this latter total, \$725.5 million, or 56 percent, were used for road rehabilitation and maintenance. Since the regional funds had \$1298.4 million and the expenditures were \$1409.4 million, it appears that the funds had a small deficit of \$111 million or about 9 percent of the total amount collected including subventions.

The estimated cost of bringing the regional road network up to a reasonable standard during the next 6 years is roughly \$20,700 million, or about \$3,500 million/year. The basis for this estimate can be summarized. The present condition of the 414,000 km of regional roads is presumably similar to that of the federal road network. The cost per kilometer of returning the fair roads to good condition is approximately \$40,000 and the cost per km of returning roads from poor to good condition is about \$100,000. Routine maintenance of all regional roads for 6 years is about \$207 million, assuming an average cost of \$500/km/year.

The amount of regional road funds in 1993, as indicated above, was \$1298.4 million including subventions. If these funds were to increase at the rate of 6 percent per year, the level of the funds

would rise gradually to \$1959 million in the year 2000. Since the estimated average annual cost of regional road maintenance in the next 6 years is about \$3500 million/year and the projected average regional road funds available are only \$1500 million per year, it appears that there will be a shortfall of about \$2000 million a year during the 6-year period to overcome the backlog of regional road rehabilitation and maintenance. These estimates assume, as in the case of federal roads, that no new construction would start before the year 2000.

Bridges

Bridge rehabilitation and replacement works also need large financial funding. A total of 4,468 bridges are located on federal roads, and 32,430 bridges are on regional roads. Of a total of 36,898 bridges on the public road network, 11,504 are wooden bridges which may require more frequent maintenance.

Surveys that started in 1991 indicate how the bridges on federal roads as classified into four categories:

1. Emergency condition: A total of 3.4 percent of the federal bridges belonged to this category in 1993. These bridges have serious structural damage and pose a serious danger to road users.
2. Poor condition: In 1993, 27.7 percent of the federal bridges were classified as being in poor condition. The type of damages involved is mainly concrete deterioration and cracking. Rehabilitation work would involve redecking.
3. Fair condition: 59.6 percent of the federal bridges were found to belong to this category in 1993.
4. Good condition: 9.3 percent of federal bridges.

The estimated cost of bringing the federal bridges up to a reasonable standard during the next 6 years is about \$1100 million. This estimate assumes half of the bridges are replaced and half are widened while rehabilitating the existing portion. An average bridge size of 50 m by 20 m was assumed. Routine maintenance of federal bridges will also be necessary at an estimated level of \$15 million to \$40 million/year. The FHD bridge data indicates there are 32,400 regional bridges. Based on a field review of a sample of local bridges carried out in mid-1994, their condition is similar to the federal bridges. The same standard designs are used and the bridges are roughly of the same age. The estimated number of regional bridges requiring replacement is 6,800. Another 6800 require widening and major rehabilitation. The cost of bringing these regional bridges up to a reasonable standard during the next six years is roughly \$6.1 billion. This estimate assumes half the bridges needing work within 6 years are replaced and half are widened with major rehabilitation of the existing portion. An average bridge size of 31 m by 11 m was assumed. An average cost for replacement of \$650/m² of bridge was used. The estimate does not include costs to upgrade timber bridges. Routine maintenance of regional bridges will also be necessary at an estimated level of \$10 million to \$40 million/year.

Roads and Bridges

Taking into account both roads and bridges at the federal and regional levels, the total needs up to the year 2000 amount to about \$28.8 billion (U.S.), estimated as follows:

1. Federal: \$6.0 billion (roads) + \$1.1 billion (bridges), or a total of \$7.1 billion
2. Regional: \$20.7 billion (roads) + \$1.0 billion (bridges), or a total of \$21.7 billion
3. Total needs at the federal and regional levels: \$7.1 billion + \$21.7 billion = \$28.8 billion.

Therefore, the estimated cost of bringing the Russian road and bridge network up to a reasonable standard during the next 6 years is roughly \$4.8 billion/year. Given the available resources per year being estimated at about \$2 billion/year, approximately an additional \$2.8 billion/year is required to eliminate the backlog by the year 2000.

CROSS-SECTION ANALYSIS

Road transport is an important sector of economic activity. The lack of accessibility or poor road conditions are real barriers to agriculture, industry and trade, and may hinder the entire development effort. Following this idea, an investigation of the association between road expenditures (RE) and gross national product (GNP) was carried out. Cross-section analysis of data from 36 countries indicated a consistent and significant association between these two variables. The data used in this analysis were gathered from different sources: population from the World Tables 1994 (5); road expenditures compiled from different World Bank reports; and GNP from the International Monetary Fund. Figure 2 shows the results of the regression analysis carried out for the year 1992, using GNP as the dependent variable.

The resulting correlation equation is: $RE = 0.013 \times GNP - 1309.3$ where RE = annual road expenditures in million dollars, and GNP is expressed in million dollars (both in 1992 prices). The R^2 value, which can be interpreted as the proportion of the variance in road expenditures attributable to the variance in GNP, is equal to 0.95; the number of degrees of freedom is 35, and the t statistic of the coefficient is 25.5. The Durbin Watson test indicates that the residuals are independent, which makes the regression result more reliable. If we force the equation through the origin, the resulting regression equation is still significant: $RE = 0.012 \times GNP$, with an R^2 of 0.94. This indicates an average ratio RE/GNP of 1.2 percent, which gives a basis to assess the situation of each country in terms

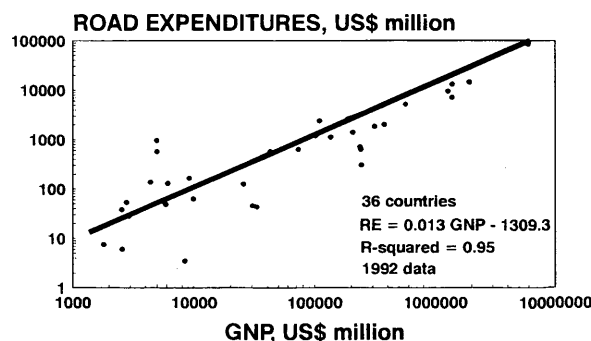


FIGURE 2 Relationship between road expenditures and GNP in 1992.

of annual road expenditures. For Russia, this ratio was 0.54 percent in 1992, substantially lower than the average.

The coefficient in the above equation (1.2 percent) can be used as a rough indicator of the relative adequacy of road expenditures in a country. Although correlation does not imply causality, it is significant that economic development and road expenditures are closely associated. As stated in the 1994 World Development Report, many studies have concluded that the role of infrastructure in growth is substantial, significant, and frequently greater than that of investment in other forms of capital.

POSSIBLE EVOLUTIONS OF THE ROAD FUND

Incorporation of the Road Fund into the Budget

A recent government decree indicates that the FRF may soon be incorporated into the Federal Budget of the Russian Federation. Decree No. 1008 of the President of the Russian Federation, dated May 23, 1994, "on the Federal Road Fund of the Russian Federation," states that the Government of the Russian Federation shall incorporate as a separate line in drafts of the federal budget, starting from 1994, revenues and expenditures of the FRF of the Russian Federation and recommends that the regional authorities consolidate regional road funds within budgets, retaining their target-oriented nature.

The principal objections to earmarking are that it: (a) hampers effective budgetary control, (b) leads to a misallocation of resources by concentrating too many funds on the earmarked activities regardless of other needs, and (c) tends to make the budget inflexible. The large proliferation of extrabudgetary funds in Russia since mid-1991 presents some problems for effective budgetary management at the macroeconomic level (6,7). Extrabudgetary funds are said to function as parallel budgets, implying a loss of control and information.

In the case of an integration of the Road Fund into the Budget, the Ministry of Finance (MOF) would have to negotiate with the MOT an action plan which should serve as a basis for future understandings between the MOF and the MOT. If the road fund is kept as a separate line in the budget, the MOT and MOF have before to agree on a fiscal plan to cover the cost of road rehabilitation, maintenance, and reconstruction. This agreement between the two ministries would consist in avoiding the underfunding of maintenance and in improving the allocation of resources in the short run. The integration of the road fund into the budget must not lead to an irregular highways funding. Many countries' experience indicates that the failure to assign appropriate priority to road maintenance often explains the deterioration of national road system. Needed road maintenance has to be reliably funded.

Road Fund Envisaged as an Extrabudgetary Fund

Adherents to the road fund concept, that is, an off-budget fund, argue that earmarking: (a) gives more assurance of minimum levels of financing for public services that governments consider worthy, (b) provides more stability and continuity of funding since more irregularity is introduced when the activity is part of the normal budgetary process, and (c) establishes a strong link between taxation and spending and therefore can give authorities "appropriate

signals" for the efficient allocation of resources. Also an extrabudgetary fund helps to reduce uncertainties during the budgetary process (8). Consequently, at both the federal and regional levels, the authorities use these funds to shelter revenue from sharing arrangements. Earmarking can help preserve critical expenditures on high priority needs and bridge the gap between economic benefits and political indifference; a reduction in road rehabilitation and maintenance expenditures has, for example, not the same political costs as a reduction in the allocation for the public sector wage bill. Therefore earmarking of funds should be used for the expenditure items which are generally associated with high rates of return but which are also politically less visible. In any case, keeping a road fund is a short-term solution to a long-term problem and needs to be reviewed periodically.

RECOMMENDATIONS

Recommendations at the Resources Level

The collection system would be improved by giving greater effect to economic efficiency in road user charges. Although the Russian road fund collections have increased in recent years, the 1993 resources represent only about \$2,450/km of public roads, well below the requirements of some \$15,000/km. A road user charge system should be based on the economic efficiency principle that prices should equal the short run variable cost of road use, including the damage to road pavement caused by different types of vehicles, the cost of road congestion and road accidents, and environmental costs that vehicles impose on society.

The present system of road user charges needs to be reexamined and a new system established which more effectively promotes the efficient use of the road network, does not adversely affect vehicle efficiency, and does not distort other sectors of the economy.

Recommendations at the Expenditures Level

Maintenance and Rehabilitation versus Construction

As stated in the World Development Report 1994 (9), inadequate maintenance is an almost universal (and costly) failure of infrastructure providers. For example, a well maintained paved road surface should last for 10–15 years before needing resurfacing, but lack of maintenance can lead to severe deterioration in half that time. Failing in maintenance is often compounded by ill advised spending cuts. Curbing capital spending is justified during periods of budgetary austerity; but reducing maintenance spending is a false economy. Such cuts have to be compensated for later by much larger expenditures on rehabilitation or replacement.

Transparency in Road Expenditures

Transparency has also to prevail at the expenditures level. The road fund, if kept in its current form, needs to be audited or monitored by an independent agency. The establishment of a road fund also involves more than just earmarking revenues to road maintenance and rehabilitation. It should also include reforms to improve the efficiency of road agencies and the establishment of road boards.

Quality of Works, Supervision, and Competition in the Highway Subsector

Both quality and prices of road works could be improved by increasing competition in the highway subsector. An adequate contract management and supervisory system needs to be established for the federal road network. This will require training of FHD staff and local consultants, and improved laboratory facilities. In order to guarantee good road construction work it is also important that each party (client, designer, engineer, contractor) has clear functions, roles, and responsibilities. The development of guidelines, procedures and regulations is a first priority. It should be followed by a transfer of information and training of personnel. It is clear that a major emphasis should be put on training of supervisors, including not only construction supervision, but material testing and certification, both at the source of manufacture and on site.

New Ways of Financing

The MOT of the Russian Federation began in 1992 taking the necessary organizational and legal actions to provide for the construction of toll highways. By Decree No. 1557 of December 8, 1992, "On the Construction and Operation of Automobile Roads on a Commercial Basis" (10), the President of the Russian Federation authorized FHD to contract for road construction and operation and monitor their implementation. Legislation, still under preparation, would allow foreign investment on such programs, with the proviso that there must be some local financial participation and there must be a non-toll public road running parallel to the toll road. FHD's proposals "On the possible involvement of foreign investments for the road construction in Russia" were submitted to MOF on July 7, 1994.

The government has indicated interest in considering, for toll road financing, at least two major highways: Moscow-Minsk (the section near to Moscow) and Moscow-St. Petersburg (the two sections on the approaches to Moscow and St. Petersburg). A section of Moscow-Nishnii-Novgorod highway, on the bypass around the city of Balashikha could also be tolled. Currently, there is one toll bridge in operation in Russia, located in Voronesh Oblast, across the Don river.

Traditional government financing of infrastructure is proving vastly inadequate to meet the huge demand. Today's resurgence in toll road construction reflects practical reality: roads are needed for economic development, but the financial and managerial capacity of the public sector is limited. The new approaches to organization and management of transport infrastructure which are beginning to emerge include (11): breakup of vertically integrated monopolies, mixed public/private ownership, separation of the ownership from the operation of facilities, private concessions or operations of the infrastructure facility under contract, and in some cases even private ownership. The extent of involvement of the private sector in the partnership can be placed anywhere along the continuum from purely public to purely private. Approaches in common use include: contracting out, leasing, joint ventures, concessions, BOT, BOO, and full private ownership. Given the enormous financing needs projected for the future in Russia, it may prove a feasible option to complement public sources with private risk capital.

CONCLUSION AND RECOMMENDATION

This report presented an overview of the existing system to finance roads in Russia, including a description of perceived deficiencies and recommendations for improvement. Recommendations have to be given at both the resources and expenditures levels since the availability of funds is only one side of the road financing equation; funds need to be allocated and used efficiently, which implies an efficient road agency and adoption of appropriate strategies. A major step will consist in clarifying and detailing both the road tax collections and road expenditures. Transparency is a necessary condition for an optimal allocation of funds in any economy. Currently, there is a strong need of detailing and breaking down road and bridge expenditures at both the federal and regional levels. The assignment of detailed expenditure responsibilities between the federal and regional level has to be formalized.

It might be interesting to explore new ways of financing since traditional government financing of infrastructure is proving vastly inadequate to meet the huge demand. However, public/private partnerships, especially those involving private finance, are more complex than traditional project finance mechanisms, and require significant support from independent legal and financial advisory services.

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