

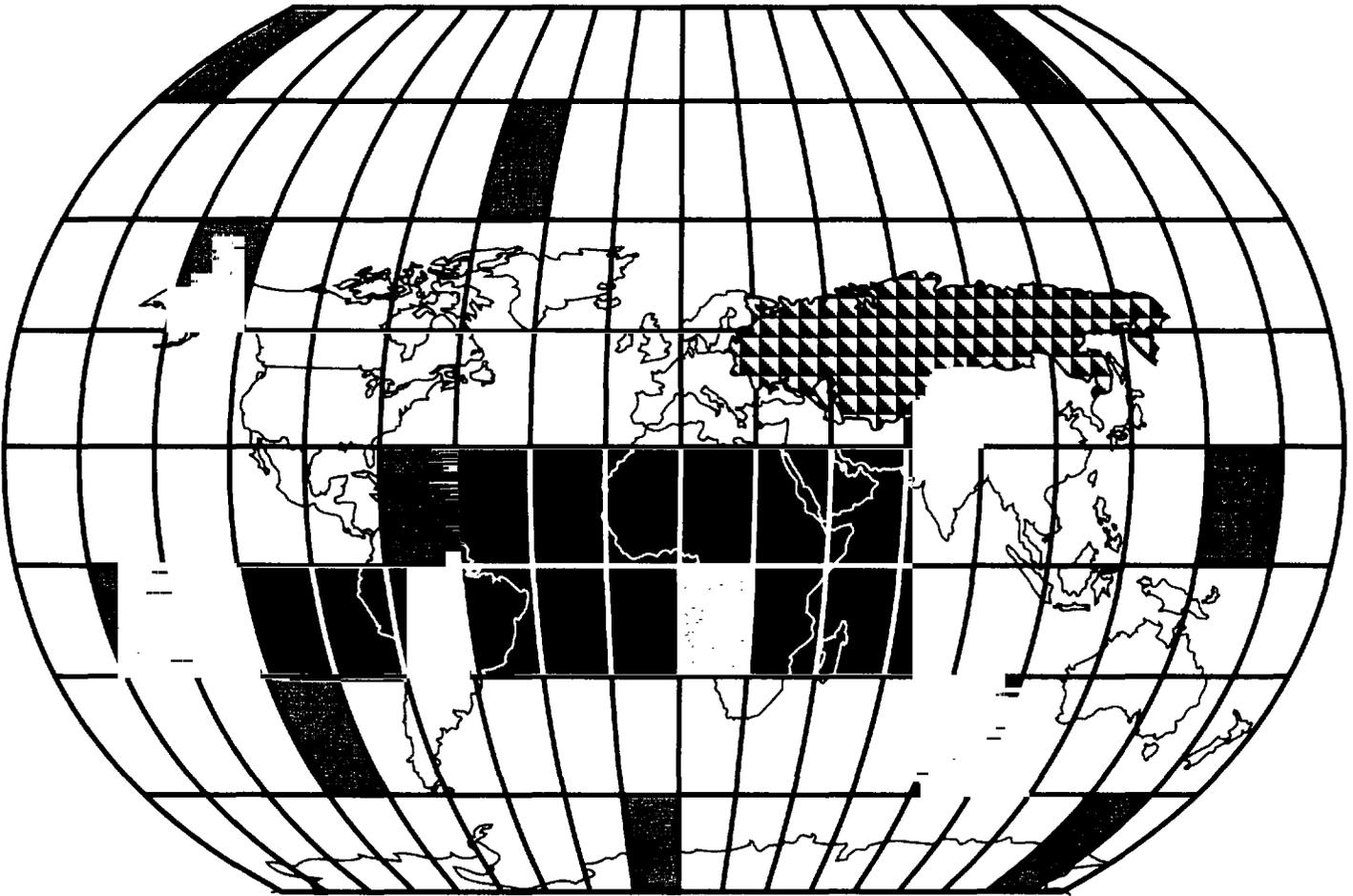


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# Transport Strategies for the Russian Federation

Jane Holt

9



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STUDIES OF ECONOMIES IN TRANSFORMATION  
PAPER NUMBER 9

# Transport Strategies for the Russian Federation

Jane Holt

The World Bank  
Washington, D.C.

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## *Foreword*

Russia's transport system, developed for a command economy, will require substantial restructuring to meet the needs of a market economy. The structure of the industrial and transport sectors, coupled with low energy prices, have led to a far more intensive use of transport in Russia than in other economies: almost six times as high as the United States and four-and-one-half times as China.

Intensifying the need for basic restructuring are problems stemming from the present economic situation and the breakup of the USSR. Lower output reduced the demand for many transport services; and the dissolution of the USSR has had a deleterious effect on the supply of vehicles and spare parts for all modes of transport, particularly for the railway system. The sector's performance is declining as a result and the government is increasingly called on to cover operating losses and finance investments.

The government recognizes the need to restructure the transport sector. It has begun privatizing many transport operations and has taken steps toward freeing prices. But the vertically integrated, centralized and monopolistic structure of the sector has made achievement of reforms more difficult than anticipated. At the same time, the lack of knowledge of how much the coming economic rationalization of the energy and industrial sectors will require changes by the transport sector has led to pressure to return to the old system.

This means that until Russia's economy is restructured and the true level of demand based on

an unsubsidized cost structure becomes clear, careful analysis will be required to ensure that proposed transport investments are justified on economic or social grounds. The downturn of the economy, along with the shift from transporting raw materials and industrial goods to transporting lower-density general freight, will keep transport levels below their peak of 1988 for years. Furthermore, a shift from rail to road transport is inevitable, particularly for time-sensitive shipments and short-haul traffic.

This report on Russia's transport sector reviews the issues and assesses alternatives for improving the efficiency of transport operations and making them more market-oriented. The report also assesses the effect transport reforms and investments will have on economic recovery and of the fiscal impact that transport enterprises may have on the government's budget. The study is intended for policymakers and their advisers in the Russian Federation and other republics of the former USSR. All those interested in transport, in distribution systems, in fiscal reform issues, and in the critical role that privatized transport operators can play in facilitating economic recovery should find this study useful.

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Director  
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## *Abstract*

This report assesses Russia's transportation sector and offers courses of action to arrest its decline and to manage its transition to a system more suited to a market-based economy. The study covers railways, road transport, urban passenger transport, highways, ports, maritime and river transport, airlines and civil aviation, and transport equipment manufacturing. It reports on the infrastructure assets, the institutional framework, and the operating and financial performance of each mode. The study also analyzes the economic role and fiscal impact of each mode on the national economy and assesses how that role may change in the future. On the basis of this analysis, a strategy for change is developed, along with recommendations for the Government of the Russian Federation to help the transport sector adapt to its new market role.

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This report is based on background papers and other chapter inputs prepared by a transport sector team that visited Russia on a number of occasions during 1992 and 1993. Jane E. M. Holt was the leader of these missions and the principal author of this report which was based on contributions from: Kirk Hagen and Werner Hauser (road transport and truck manufacturing); Melody Mason and Cesar Querioz (highways); Hans Peters (maritime, ports and river transport); Louis Thompson and Julie Fraser (railways); Thomas Till (institutional framework, road transport, and urban transport); Richard Podolske (urban transport); Jeff Procak (railways and equipment manufacturing).

The report also relies in part upon economic forecasts, background data and investment analyses contained in consultant studies financed by the European Bank for Reconstruction and Development (EBRD). The report reflects the experience of the International Financing Corporation (IFC) with respect to privatizing trucking in Nizhniy Novgorod. Insights regarding energy demand were provided by Charles McPherson, Doug McKay and David Craig; fiscal data and macro-economic linkages regarding implicit energy subsidies were provided by Philippe Le Houerou, Paulo Vieira da Cunha and Elana Gold. Bert Schacknies of the U.S. Department of Transportation, Federal Highway Administration, provided insights on the highway sector.

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## *Abbreviations and Acronyms*

<b>AAR</b>	Association of American Railroads	<b>EBRD</b>	European Bank for Reconstruction and Development
<b>ask</b>	available seat kilometers	<b>EC</b>	European Community
<b>ASMAP</b>	International Road Transport Association	<b>EMU</b>	electric multiple unit
<b>ATC</b>	air traffic control	<b>ERR</b>	economic rate of return
<b>AvtoUAZ</b>	Ulianovsk Motor Vehicle Plant		
<b>BAM</b>	Baikal-Amur Railway	<b>FAA</b>	Federal Aviation Administration (U.S. Government)
<b>BOT</b>	build-operate-transfer	<b>FOB</b>	free-on-board
<b>bvk</b>	billion vehicle kilometers	<b>FHD</b>	Federal Highway Department
		<b>FSU</b>	former Soviet Union
<b>CBR</b>	Central Bank of Russia	<b>GAZ</b>	Gorki [Nizhni Novgorod] Motor Vehicle Plant
<b>CEE</b>	Central and Eastern Europe	<b>GDP</b>	gross domestic product
<b>cgt</b>	compensated gross ton	<b>GDR</b>	German Democratic Republic
<b>CIF</b>	Cost-Insurance-Freight	<b>GKI</b>	State Committee for the Management of State Property
<b>CMEA</b>	Council for Mutual Economic Assistance	<b>GNP</b>	gross national product
<b>CIS</b>	Commonwealth of Independent States	<b>GOSTROI</b>	State Planning and Construction Committee
<b>CPE</b>	centrally planned economies	<b>Gudok</b>	MPS newspaper
<b>CSD</b>	CzechoSlovak Railways		
<b>CSFR</b>	Czech and Slovak Federal Republic	<b>HDM III</b>	Highway Design & Maintenance Model
<b>DB</b>	German Federal Railways	<b>IBRD</b>	International Bank for Reconstruction and Development
<b>DM</b>	deutsche mark	<b>ICAO</b>	International Civil Aviation Organization
<b>DMU</b>	diesel multiple unit	<b>ICB</b>	international competitive bidding
<b>DR</b>	German State Railways (former GDR)	<b>IFC</b>	International Finance Corporation
<b>DRSU</b>	uprdor maintenance units	<b>IRI</b>	international roughness index
<b>DSC</b>	Directed State Credits		
<b>DSU</b>	uprdor construction units		
<b>dwt</b>	dead weight tonnage		

<b>ISO</b>	International Standards Organization	<b>PPF</b>	Project Preparation Facility
<b>KamAZ</b>	Kamsk Large-Truck Production Association	<b>PTRC</b>	Public Transport Research Council
<b>LCB</b>	local competitive bidding	<b>RF</b>	Russian Federation
<b>LiAZ</b>	Likinsk Bus Plant	<b>RoRo</b>	Roll-on-Roll-off
<b>MAK</b>	Interstate Aviation Committee	<b>RSFSR</b>	Russian Soviet Federated Socialist Republic
<b>MAV</b>	Hungarian State Railways	<b>SNCF</b>	French National Railway Company
<b>MAZ</b>	Belarusian Large-Truck Production Association	<b>SOE</b>	statement of expense
<b>MINPROM</b>	Ministry of Industry	<b>SPA</b>	Scientific Production Association
<b>MIS</b>	Management Information Systems	<b>SZD</b>	Soviet Railways
<b>MOE</b>	Ministry of Economy	<b>TA</b>	technical assistance
<b>MOF</b>	Ministry of Finance	<b>TEU</b>	twenty foot equivalent unit
<b>MOP</b>	Ministry of Planning	<b>tkm</b>	ton kilometer
<b>MOT</b>	Ministry of Transportation	<b>TU</b>	traffic unit
<b>MPS</b>	Ministry of Railways	<b>UGAT</b>	Central Regional Administrations of Civil Aviation
<b>NPO</b>	Scientific Production Association	<b>UIC</b>	Union Internationale des Chemins de fer
<b>NPV</b>	net present value	<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>OBO</b>	oil bulk carrier	<b>UralAZ</b>	Ural Motor Vehicle Plant
<b>OECD</b>	Organization for Economic Cooperation and Development	<b>USSR</b>	Union of Soviet Socialist Republics
<b>pass-km</b>	passenger kilometer	<b>VOC</b>	vehicle operating costs
<b>PCA</b>	Production and Commercial Association	<b>vpd</b>	vehicles per day
<b>PKP</b>	Polish State Railways	<b>ZIL</b>	Likhachev Motor Vehicle Plant

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## *Glossary*

<b>Agroprom</b>	agriculture industry amalgamation
<b>avtodor</b>	oblast-level road administration responsible for federal highway network road maintenance
<b>cabotage</b>	domestic port-to-port cargo transport
<b>demurrage</b>	downtime, or cost of time lost while loading and unloading beyond the scheduled time of departure
<b>krai</b>	administrative region
<b>Mosavtodor</b>	Moscow oblast state highway agency
<b>oblast</b>	region, a Soviet (now Russian) territorial-administrative unit
<b>okrug</b>	administrative district
<b>Rosagroprom</b>	Russian successor to the all-Union Agroprom
<b>Rosavtodor</b>	all-Russian autonomous state entity responsible for road construction and maintenance
<b>Rosavtotrans</b>	the organization overseeing all for-hire Russian truck transport
<b>Sovtransavto</b>	former all-Union international truck transport monopoly
<b>tare</b>	weight of a wagon when empty
<b>Union</b>	USSR
<b>uprdor</b>	highway-specific administration responsible for maintenance and rehabilitation of the specific highway to which they are assigned



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## *Overview and Recommendations*

Developed for the command economy of the former Soviet Union (FSU), Russia's transport system is ill-suited to the needs of a market economy, and the people who run it are not prepared for the massive transformations necessary to meet those needs. At the same time, Russia's economic difficulties and the breakup of the FSU have undermined the ability of the system to operate. The financial performance of the transport system is declining as a result of the widening gap between revenues and costs that stem from declining demand, rising fuel prices, inflationary pressures on wages, and inevitable demands to delay and limit tariffs. To fill the gap, government funds are increasingly being requested to cover losses and to finance investments that can no longer be funded from operating revenues. Unless government takes action to help the transport sector adjust to a market economy, the fiscal and economic burden of increasingly massive operating losses and expensive and unproductive investments will become prohibitive.

To address the fiscal burden, stronger efforts are needed:

- To adhere to the government's objectives to privatize and eliminate monopolies in the transport system.
- To leave the supply and pricing of transport services to the marketplace wherever possible.
- To restructure parts of the system where a natural competitive framework will not easily evolve after privatization and elimination of monopolies.

- To avoid funding unnecessary investments and investments aimed at modernizing sectors that cannot be supported by the beneficiaries.
- To raise fuel prices to world market prices as soon as possible, so that the implicit subsidy now given to transport does not further distort the industrial sector and emerging consumer industries.

Despite progress in privatizing some transport operations, there is evidence that the system continues to try to operate under old rules and to reimpose them where market forces are starting to break them down; it should be adapting to today's economic circumstances and tomorrow's market challenges. For example, the government's decree in December 1992 concerning operational planning for rail movements of freight for export could easily lead to the reimposition of centrally controlled and inflexible operating practices. This would be counterproductive to the inevitable changes in the size and nature of demand that will be placed on the system as reforms take hold in Russia's economy. Over time, these changes will cause a significant shift in market share from rail to road transport. Reliability, speed, and predictable service will become more important to customers than movement of large volumes at low cost in response to pre-determined plans. Such changes are difficult to believe for Russian transport operators and government officials unfamiliar with the nature of customer demands in market-based economies. Indeed, many transport officials believe that demand will return to old levels and transport modes in a year or so and

they continue to call for government to make the same sorts of commitments as in the past.

*Even if transport demand returned to old levels, the historic production focus of Russian transport enterprises would undermine the ability of railways and other transport modes to provide the quality of service required by a market economy.* In the past, freight transport operators focused primarily on producing services to support orders placed months in advance by state-owned enterprises. Not having to compete for traffic, transport operators paid limited attention to providing their customers reliable, efficient delivery of services with little loss and damage. Shipping goods belonging to state enterprises did not demand a sense of accountability for good service. The command economy's predominant orientation toward production was inconsistent with the reliability, flexibility, economy, and attention to reducing loss and damage expected by service-oriented transport systems that serve market economies.

*Understanding that changes in the economic framework will fundamentally change the nature and size of demands on the transport system is essential to counteract inappropriate allocation of resources, such as fuel; the proposal of unnecessary and costly investment projects at the expense of more urgent ones; and declining performance of the transport sector.* Substantial, rapid adjustment is necessary to ensure that transport will respond to the needs of a market-based economy. Without greater efforts to reform and restructure it, Russia's transport system may not be capable of responding to newly emerging private sector users and could slow economic development.

In the case of macroeconomic policies affecting fiscal subsidies – directed credits and lack of controls on the finances of state-owned enterprises – the measures needed are identical to those being applied in other sectors throughout the economy. The government should not be concerned that such measures are too harsh for sectors like transport. Given the volumes of business involved, there is no reason for ports, airlines, railways or road transport to lose money carrying freight or passengers over long distances, except to remote

areas. Ways exist to keep urban transport losses to a minimum. On the whole, this reform is best accomplished by privatizing as many transport functions as possible and letting the marketplace bring expenses and revenues into line. This is true even for urban transport where subsidies may still be required but where a combination of privatization, competition and attention to performance criteria can help keep them to a minimum. In some cases, remedying the basic organizational, structural, and managerial problems of transport enterprises and government agencies may require strategies designed specifically for the entity involved. Substantial restructuring is particularly needed in the railway and port sectors to help them adapt to changing market conditions and become more responsive to private sector users.

*A new regulatory and legal framework is needed.* In accomplishing these changes, the government will concern itself less with carrying out transport operations and more with designing rules under which privatized operators will work. Russia thus needs to think in new ways about its transport problems and to develop a new legal and regulatory structure for acting on them. The legal framework should encompass a set of basic principles, policies, laws, and regulations – perhaps codified in a basic transport act. As the government has recognized, the structure should put as much of the sector's assets and operations as possible in a deregulated, competitively structured private sector, in which determination of prices and investment is left to the marketplace. The government's role would then be limited to one of setting policies to ensure that the market place works, that transport operations are undertaken safely, and that services are available to users on an equal basis.

Only where a monopoly or oligopoly exists would regulations regarding price and performance be brought to bear. This role is far different from the hands-on planning and directing of transport investments and operations that governmental transport institutions played in the past. It may be difficult to change old habits and let the market place function, but this change is of vital importance.

To gain insight, Russia should review the experience of transport systems that have proved effective in market-based economies and to the lessons learned by other countries that have improved their transport sectors: for example, trucking deregulation in Australia and the United States; railway deregulation and restructuring in the United States<sup>1</sup>; urban bus transport deregulation in the United Kingdom; and the privatization of ports in Chile, United Kingdom, and elsewhere. Transport systems that were once highly regulated now work far more effectively after being freed of regulation of price or market entry. Overall, deregulation of railroads, trucking, and air cargo in the United States collectively reduced freight transportation logistics costs from 14.7 percent of GNP in 1981 to 11.7 percent in 1986, saving about US\$65 billion a year.

This report contains recommendations as to how government can help the transport sector adapt to these changes; a summary of these recommendations is contained in the matrix following this overview. Where possible, suggested strategies have been grouped into those that should take place in the near term, the medium term and the longer term.

### ***Fiscal Policy***

*The fiscal burden of transport is large and growing; explicit subsidies for operating losses represented 11 percent of Russia's total budgeted subsidy payments in 1992, and were roughly equivalent to 2 percent of GDP.* The financial performance of transport entities is declining. The single greatest federal fiscal problem in transport is urban transport deficits, but the explosive growth of deficits on suburban commuter railways and airline subsidies are enormous problems as well. To reduce the fiscal deficit, the government will need to reduce transport entities' reliance on the federal budget and impose greater financial discipline on state owned enterprises. No subsidies or directed Central Bank of Russia (CBR) credits should be provided to enterprises to be privatized. To the extent that such subsidies are related to the government's intention to soften the impact of price liberalization – such as fuel subsidies for airlines, tariff and fuel subsidies for urban transport – it would be prudent to link such

financial support to performance improvement and cost recovery measures. To the extent they are related to social purposes – such as support to the northern regions – transport services should be provided under competitive bids as soon as practicable. In all cases involving subsidies, efforts should be made to isolate the revenues and costs of the service into a separate corporation or cost accounting unit, so that the subsidies are transparent and the real nature of the issue is better understood. For example, it is advisable to isolate and treat suburban and commuter railway passenger services as separate units by location.

*Transport's share of the federal investment budget in 1992 represented 12 percent of the total state investment budget, excluding defense. The bulk of the investment budget was for railways (Rb22 billion), aviation (Rb17.8 billion), and road transport (Rb17.4) billion.* To curb the growing fiscal impact of transport, it is important that transport projects financed by the government are sound and of the highest priority. Given current macroeconomic conditions, special care will be needed to guard against superficially attractive investments in new infrastructure and equipment. Such investments may have been justifiable under the old rules but may not cover their operating and capital costs in the new economy. Generally speaking, investments should be devoted to essential reconstruction, maintenance, and training projects rather than to expansion or modernization. Increased transport capacity is not needed in Russia; what is needed is to preserve existing capacity. Unfortunately, in many cases investments aimed at modernization that require foreign currency are also dubious because their rates of return are low and their costs cannot be recovered. The government has already approved investments by railways and airlines, including purchase of rolling stock, continued expansion of new rail lines, extension of electrification, purchase of replacement aircraft, and development of airports. Most of these investments are being approved without assessing their costs and benefits:

- Although considerable evidence exists that the physical condition of essential railway infrastructure is declining, the Ministry of Railways' (MPS) investment plans focus on

passenger reservation systems, foreign-made passenger cars, and high-speed rail systems. (World Bank analysis of a new high speed rail line between Moscow and St. Petersburg indicates that, even given a ridership level of 12 million passengers, a one-way fare of US\$123.00 would be needed to break-even on total costs, assuming construction costs of US\$7.4 billion and a 50 percent operating ratio.) Investments in passenger service may have political merit but should include the means to improve cost recovery; otherwise they will widen the gap between costs and revenues.

- The government is considering investing in a costly air traffic control system (US\$10 billion), while the predicted drop in demand and slow recovery of air traffic would seem to argue for ensuring that the system is not over-designed and that its costs are recoverable from user fees. Ideally, the entire investment should be structured not to rely on government money to subsidize the investment.

- The Ministry of Transportation's (MOT) 1993-95 budget requests Rb7.1 billion and US\$1.2 billion toward the repowering of 1,500 jet aircraft by 2007. Because each engine costs US\$10-12 million, the project would cost US\$18 billion. Such an investment is probably unwarranted, given the age of the aircraft and the current worldwide glut of aircraft. The Ministry of Finance (MOF) has not included this ambitious program in the 1993 federal investment budget, but a program of directed state credits for such a purpose is under discussion.

- Parliament has approved a Program for the Renovation of the Merchant Marine which calls for the acquisition of 7.7 million deadweight tons (dwt) of new ships, roughly half of the current fleet. It is anticipated that financing will be provided from a newly established fund consisting of hard currency earnings of the maritime fleet. Given the slow growth expected for Russia's international trade, however, a maritime support program may not be the best use of such hard currency revenues.

*Existing transport assets should be used more efficiently, and new investments avoided unless required by economic restructuring.* In every element of Russia's transport system except urban

transport, capacity is not expected to be a problem for the next 4 to 5 years. Government and transport managers need a better understanding of when and why they are losing money. Transport accounting systems are currently a major obstacle to correcting structural and operational inadequacies. Enterprises cannot be restructured, costs cannot be isolated and analyzed, and investment cannot be rationalized without properly structured operational and financial information.

*Low Fuel Prices Add to the Fiscal Burden.* Transport's share of the implicit energy consumption subsidy is enormous and represents an even larger fiscal burden. Subsidized provision of energy is by far the largest subsidy in Russia. Its opportunity cost, measured at the market exchange rate, exceeds the gross domestic product (GDP). The subsidy is largely implicit, resulting from the large discrepancy between domestic prices and the value of energy at world market prices. Based on estimates of physical volumes of energy consumed and the GDP equivalent of implied energy subsidies throughout the economy, transport's share of the government's implicit subsidy of oil energy consumption is equivalent to 13 percent of GDP. Similar analysis shows that transport's share of the implicit subsidy of electricity consumption – largely by railways, metros, and trams – is equivalent to 6 percent of GDP.<sup>2</sup> Reducing subsidies and rationalizing the energy sector are essential to stabilizing and restructuring of Russia's entire economy and, if implemented, will help reduce the fiscal burden of the transport sector. Raising energy prices to world levels will thus stimulate reform of the transport sector and encourage larger oil exports, adding revenues necessary for a sustainable fiscal adjustment.

#### *Role of Transport in the Economy*

*Implicit subsidization of energy consumption is one of the underlying reasons why the use of transport in the Russian economy is far greater than in other industrial economies.* Russia's transport system was geared to move huge volumes of bulk commodities among centralized production facilities over long distances according to centralized and fairly rigid annual plans at

prices that did not reflect the real economic cost of energy. As a result, the level of transport intensity and cost to the economy is far higher than in most industrialized countries. Transportation of goods was valued at 9.1 percent of GDP in 1990 compared to 6.3 percent in the United States<sup>3</sup>. The difference is even more dramatic if one compares the transport ton-kilometers (tkm) per dollar equivalent of GDP. According to World Bank analysis, transport ton kilometers per unit of output in the FSU in the late 1980s was almost six times that of the United States and four-and-one-half times that of China<sup>4</sup>. Much of the excess use of transport is by rail, which carries on a tkm basis 96 percent of land freight transport (excluding pipeline shipments), compared to 50 percent in the United States and 30 percent in western Europe. Russia's excessive use of transport is not so much a function of its vast distances as it is of the fact that organization of industrial sectors was usually not based on minimizing costs of transport and total logistics.

*Intensive use of transport will affect the competitiveness of Russia's industries and exports in the future when input, output and fuel prices reach world levels and transport tariffs reflect true economic costs.* Once privatized and put on a competitive basis, Russia's industrial sector will seek to minimize transport costs and may not be able to support the same long distance transport flows of bulk commodities as in the past. For example, it is uncertain whether coal from centrally located fields is commercially exportable to either Europe or the Far East if real production and transportation costs are taken into account.

*The precipitous fall of more than 35 percent in freight transport traffic since 1988 reflects the drop in overall economic activity in Russia and presages a changing economic role. As reforms take hold, market forces will make the economy less transport intensive and will dramatically affect the nature and mix of commodities carried as well.* Much of the excessive freight in basic commodities will simply cease. Russia's industrial sector will seek to minimize the flow of bulk commodities, while newly created consumer-oriented businesses will turn to road transport for the flexible and responsive door-to-door transport

service essential to success. Eliminating uneconomic, obsolete, and environmentally harmful industrial plants and reducing transport movements by the defense sector will contribute to this change. Over time, these trends will reduce the rail share significantly and accelerate the growth of road transport. In international trade, developments in the maritime sector are expected to follow broader economic development trends, and it might take 12 years for Russia's waterborne transport system to achieve seatriade volumes characteristic of the mid-1980s.

*A shift of rail traffic to road is also inevitable, particularly for time-sensitive shipments and for short-haul rail traffic.* Far more rail traffic is carried over relatively short distances in Russia than elsewhere in the world. More than 17 percent of all Russian rail tonnage is carried less than 100 km. As a market economy develops and shippers become free to choose modes of transport, short haul rail traffic will be highly vulnerable to competition from trucking which offers door-to-door service, more flexibility, and greater reliability. These trends will reduce the share and composition of rail traffic and accelerate the inevitable growth of road traffic. *Depending on the rates of overall economic growth, the percentage of non-energy freight carried by road transport will shift from its current 13 percent to between 22 and 41 percent by 2015.*

*Budget allocations and investment plans should not be based on the assumption that traffic levels will rebound.* Government forecasts indicate that transport levels will recover quickly, without much shift from rail to road. As a consequence, transport planners argue for continued investments and budgetary support almost on a business-as-usual basis. Based on experience elsewhere, such forecasts are too optimistic; a decline in transport and a shift in modes is inevitable as government policies move away from a command to a mixed economy. In the course of restructuring their economies, for example, Central and East European (CEE) countries experienced a drastic drop in rail demand. *Lack of understanding that changes in the economic framework will inevitably shift transport modal shares is becoming a serious issue, as it is causing modal administrators to develop policies and investment programs*

*according to historical practices rather than to needs of the future. The result will inevitably delay reforms and lead to the inappropriate allocation of federal resources to the transport sector.*

### **Railways**

*Railways are challenged by the inevitable switch that a market system will bring in freight transport demand from rail to road.* Consultants forecast that demand for railway services will not recover to 1989 levels until well into the next century, while the Ministry of Railroads (MPS) forecasts a sharp upturn in the near to mid term. Officials at the Ministry of Economy (MOE) also believe that when the current economic turbulence is stilled, railways will regain high traffic levels and a large freight market share.

Experience from around the world in similar situations suggests that significant traffic will remain but routes and service needs will be quite different. For example, shifts in locations and quantities of coal production will significantly alter freight routes and volumes. The combination of falling demand, rising costs and reluctance to raise passenger tariffs is causing the traditionally profitable railway system to incur skyrocketing deficits. By late 1992, that deficit was at an annualized level of Rb75 billion, and for the first time in years the government found it necessary to subsidize rail transport. These losses are evidence that fundamental reform is necessary and that the railways need to become more commercially oriented, lower their costs, organize their services more appropriately, and develop corresponding investment plans. Instead, MPS has hired additional workers and its capital plans still focus on constructing employee housing, expanding the network, continuing electrification, and even to promoting a high speed rail line with no chance of financial viability.

Other investments concentrate on improving passenger service at the very time losses are increasing. The railways' request for foreign exchange credits to purchase a US\$200 million computerized passenger reservation system, in particular, could be questioned, given the current fiscal situation. While such a system may make sense in the future, less costly systems are available and one questions why the railways

would allocate such resources to passenger service when fare levels are so far below the costs of providing the service. Little benefit to the economy accrues from such an investment, since passenger trains are already full and service is subsidized, while urgently needed railway equipment, such as track maintenance machines, remains unfunded.

*The railways' present structure impedes their ability to operate in a competitive, commercial, and customer-oriented framework.* Undue centralization by MPS and inappropriate regional decentralization have produced a rail monopoly that is difficult to control politically and unresponsive to shipper's quality and service needs. At the same time, regional railways operate as a fragmented set of individual, entities, each focusing on local traffic. They have no incentive to provide adequate service to traffic that originates or terminates off-line because they cannot control the service provided by others and may not profit from their efforts. It has proven difficult, for example, to get the regional railways to respond consistently to an MPS commitment for Trans-Siberian container trains to be run non-stop coast to coast. This demonstrates how difficult it may be to increase containerized freight movements in the near to medium term.

*Dissolution of the FSU has had an extremely deleterious effect on the formerly all-union railway system.* The breakup has hurt rail operations as well as in such critical managerial functions as rate setting, revenue division and carriage management. Traffic levels and patterns have been disrupted, new borders have delayed transit times, and inter-railway interchanges have increased dramatically as an enormous amount of traffic that was formerly single-line traffic must now cross two or more systems, each with its inevitable delay and processing time. The railway has also been deeply affected by disruptions in equipment supplies. Disintegration has led to the allocation of rolling stock and containers among republics, and arguments have developed over how to divide revenues and charge demurrage. Other republics increasingly complain about sending rolling stock into the "black hole" of Russia. Given so many uncertainties over the future form of railway

management structures, there are no immediate prospects for resolution.

*Overstaffing and ancillary activities contribute to operating deficits and provide scope for improved productivity.* The Russian railway system employs 2.24 million people. About 1.6 million are engaged in railway operations; nearly 500,000 in schools, hospitals and restaurants; and another 200,000 in industrial activities. These ancillary activities eventually should be privatized or separated operationally and financially wherever possible. World Bank analysis shows that labor productivity on the Russian railways is somewhat less half of U.S. railways, which are comparable in size and traffic levels to the Russian system. While it would probably be uneconomic for Russia to attain equivalent productivity figures it should certainly be possible for MPS to operate its freight service with at least 20 percent – roughly 200,000 – fewer employees.

*Russia's railway system needs restructuring to become financially viable and customer oriented for the future market economy.* Russia's problems will not solve themselves. The government needs to initiate a restructuring effort or otherwise risk:

- Further erosion in rail transport service, with its attendant higher cost.
- Possible predatory behavior on the part of the railway as it attempts to defend its market position.
- Continued large, unsustainable deficits which pose a serious macroeconomic challenge for the overall economy.

To restructure the railway system, the government's strategy should begin with two broad efforts:

- Separate the intercity (long-term) and suburban passenger (near-term) services from freight, provide them with clear and direct sources of performance-based public subsidies where essential, and end their cross-subsidy by freight revenues.
- Corporatize and commercialize the environment in which rail freight services are offered and operated.

In the longer term, the government may consider restructuring the railway system to create

intra-rail competition by combining and then redividing regional railways so there is direct competition among them. Except for some areas of the country, this restructuring would enable the government to limit regulation of railway prices and service levels to a large extent. While there is no single or simple approach to creating intra-rail competition, it is possible, for example, to (a) structure parallel-line competition from Lake Baikal to Moscow and the western borders; (b) make the Eastern Siberia, TransBaikal and Far East railways into bridge carriers jointly owned by competing carriers west of Lake Baikal, ultimately yielding intrarail competition over the entire route from Europe to Asia; and, (c) grant the Moscow railway trackage rights of the October Railway to St. Petersburg and the Finnish border to create competition in this vital market. (These are only examples: a great deal of study is needed before any decision is made about restructuring freight activities.)

*Problems afflicting every mode of Russia's transport system make it difficult to achieve the integration and cooperation needed to stimulate growth of an effective container system.* One factor affecting the economy and distribution of Russia's international transport is the low level of containerization. A report undertaken for the European Bank for Reconstruction and Development (EBRD) estimates that containerization in transport is approximately one-fifth of the average level prevailing in international trade.<sup>5</sup> *Efforts to impose an intermodal system on top of the current disorganization of the transport system are not likely to succeed, and the lack of a healthy and growing container-based transport system for both international and domestic trade will present physical and economic barriers to the growth of Russia's international commerce.*

### **Trucking**

*The immediate establishment of a competitive and privatized trucking industry is essential to overcoming Russia's otherwise rigid and unresponsive transport and logistics system.* Slow action in this key policy reform will hinder the rapid and effective transition to a market-based

economy and act as a brake on economic growth. Privatizing and eliminating monopolies in the for-hire trucking industry are moving slowly, although most enterprises have submitted applications to privatize. There is some evidence that the government is reluctant to press forward with eliminating trucking monopolies and assuring that no firms are given geographic or commodity specific monopolies. Except in small rural areas, the government should require that bus and truck operations are privatized into separate firms, since the two are essentially incompatible on an operational and financial basis. To make the industry more competitive and ensure that barriers to entry are minimized, the government should offer incentives allowing enterprises to auction off portions of their fleets to private individuals as part of the privatization process. This will foster the entry of new trucking firms, since new foreign and domestic trucks cost too much for most new businesses. New entrants should also be created by privatizing vehicles owned by Agroprom and by permitting these and trucks owned by industrial firms to compete with those in the for-hire industry so as to ensure enough through capacity for new business entrepreneurs. Government should also act to improve the environment for private, independent trucking firms by ensuring that auxiliary services such as fuel, servicing, and maintenance are available to all road users. Competition should also be fostered by ending existing geographic and commodity-based monopolies, by eliminating control over empty movements, and by eliminating tariff restrictions.

*Continued government influence over trucking rates and contracts threatens trucking reform.* One very serious problem impeding the development of a market-responsive trucking industry is government regulation of rates. Recent reports conflict about whether or not trucking rates are still regulated and, if so, at what level of government. Rate regulation should be removed at all levels to ensure rapid development and efficient growth of a competitive trucking industry. There are some indications that oblast governments are moving toward regulation of rates in a manner that would restrict the free movement of goods among and within oblasts. The old haulage contracts for government

enterprises that specify obsolete rates inappropriate to a free market should also be abolished. MOT officials indicate that such contracts may affect as much as 80 percent of for-hire traffic. These contracts should be replaced by new, freely negotiated contracts that recognize full cost levels, account for demand and carrier performance, and provide adjustments for inflation.

### *Highways*

*The expected growth in road transport traffic will put heavy demands on the road system.* The share of road traffic for non-energy transport could approach 41 percent in twenty years, compared to the present level of 13 percent. If just 10 percent of the tkm now carried by rail is diverted to the intercity trucking industry, the level of truck traffic on Russia's roads will double, causing more than twice the road wear since an estimated 20 to 30 percent of trucks are more heavily loaded than the 6.5-ton per axle load for which most Russian roads are designed. In terms of wear and tear on the vehicle fleet, estimates of the economic cost of not taking immediate measures to improve road and highway conditions on the 1,350 kilometers of the highest priority roads in the first year of deferred maintenance could amount to US\$250 million, with exponential increases in the following three years.

*Deterioration of the highway network, from a growing backlog of deferred maintenance, could result in a complete pavement failure if not corrected soon.* Reduced funding for maintenance has meant poor quality of construction and rehabilitation, inadequate maintenance, and poor quality of bituminous material used in road construction. At least 38 percent of the trunk road system requires rehabilitation or reconstruction; another 25 percent is in fair condition and requires thick overlays. The total cost of restoring these roads to good condition could amount to US\$4.5 billion (at world prices). If roads are not strengthened soon, there is a high risk of complete pavement failure, which would increase restoration costs by at least 50 percent. An equally serious situation exists with the 60,000 bridges on the federal road network, more than a third of

which are in poor condition. The problem of deferred maintenance is important in its own right but particularly important given the expected growth in road traffic as shippers choose to move high-value freight from rail to road.

*Without reforms and additional financing, the highway sector will not be able to respond to the challenge of preventing the collapse of Russia's road infrastructure.* The government has created a number of "concerns" or companies to replace the construction and maintenance organizations previously in MOT, but lack of funding may prevent the concerns from evolving into a sustainable, privatized, domestic contracting industry.

*The need to preserve the highway network is so critical that the government should consider external financing to implement road rehabilitation projects that cannot wait until a road funding mechanism is satisfactorily implemented.* Such financing could be organized to help improve the quality of road rehabilitation works by attracting experienced international firms to collaborate with Russian contractors to undertake civil works contracts. In this way, privatization of road construction concerns could be achieved and a sustainable domestic road contracting industry launched. Such financing is vital to Russia's economic recovery and is in the process of working with the government to implement such a project.

### **Urban Public Transport**

*Urban public transport is essential to the economy and vital to the mobility of the population, but there is simply not enough money to operate or maintain the urban public transport system as presently structured.* Public transport entities are experiencing a general decline in financial conditions caused by low fares, rapid increases in costs, increasingly limited subsidies from local governments, and high levels of passenger fare evasion. These financial straits lead to under-investment in, and deferred maintenance of, aging equipment. The government's strategy should concentrate on finding practicable and affordable solutions to stem the rapid physical deterioration

of the transit fleet, while instituting reforms that will make the enterprises more operationally and financially productive. Russia's urban public transport has historically had 70 percent of its costs covered by subsidies. The 85 percent of the population using the system should improve cost recovery by paying fares that support a higher percentage of the costs. In many areas, completely self-supporting private transit services, perhaps using minibuses or other non-standard vehicles, could be established.

### **Maritime**

*The effective implementation of the government's excellent policy of Maritime Reform and Port Privatization has broken the monopoly between ports and ocean carriers, dramatically reduced government fiscal liability for maritime operations, and set the stage for an effective program of restructuring and privatization of shipping lines and national ports.* In January 1991, Russia's seaports were organizationally separated from national carriers as a first step toward restructuring the maritime and port sectors. This major policy decision was an essential prologue to the application of the basic policy objectives that must be achieved if Russia's ports are to be effectively restructured:

- Private participation, which is essential to the creation of effective competition.
- Maximum freedom from regulatory restraints, without which ports and carriers cannot respond effectively to the marketplace.
- Decentralization, which not only prevents the central government from exercising bureaucratic authority over economic decisions, but also prevents dominant political groups within carriers and ports from forcing non-economic agendas into business operations.
- An anti-monopoly policy, which ensures that economic competition exists and prevents the transfer of a public sector monopoly to private interests.
- A public sector agency with the specific mandate to preserve market freedom through deregulation and anti-monopoly powers.
- Financial responsibility by eliminating access to subsidies.

*Restructuring Ports.* Separating shipping lines from ports enabled MOT to develop a plan for rationalizing and restructuring the port system. Through this process, Russia's ten largest and most diversified ports, which handle most of the international seatriade, were designated on September 30, 1992, as being of national importance and classified as category I ports to be privatized. Another 21 ports, most of which are in the Far East, were considered of regional importance and classified as category II. Ten small ports were classified as category III. The government is planning to transfer all ports in categories II and III to regional or local jurisdiction.

*The need exists for a national port strategy.* The restructuring and privatization of national ports should be done in as competitive a manner as possible to enhance competition among them. To achieve this goal, Russia needs a national ports strategy that serves as a blueprint for an institutional framework to manage port physical assets, and for a regulatory framework within which the public's interest in preserving the physical assets and obtaining efficient port operations can and should be protected. The strategy should work within the decree on port privatization from the Ministry of Transport (MOT) and the Committee for Management of State Property (GKI). This decree calls for retaining real estate and infrastructure ownership in the state providing for private operations – including labor and management participation in ownership of the operating companies – within a planned, competitively-structured framework.

There are pressures for the government to modify this directive and permit privatization of ports under option 2, by which 51 percent of the stock could be owned by labor and management, with state ownership limited to 20 percent. Whichever option is selected, port privatization should take into account a principle that is paramount and that is reflected in the government's privatization law, as modified by decrees issued in September 1992, November 1992, and January 1993: the government should retain ownership of the strategic physical infrastructure and port real estate – including breakwaters, quay walls, and navigable approach

channels – and lease them on a long term basis to private operators. To accelerate the restructuring, it is recommended that the government not finance any port investments nor give sovereign guarantees on loans to port authorities or enterprises in the absence of a financially viable plan for a competitive restructuring of the port.

The strategy should also develop a "port authority" mechanism to be landlord for state-owned assets, to represent the public role in the national ports system, and to ensure that the contract operators of ports facilities meet their financial obligations and provide good service to the world's maritime industry. To this end, the government's port privatization process, as modified by directives of November 1992 and early 1993, provides for the establishment of a maritime port administration to serve as the public steward of each national port. The port authority's board would be the agent for the creation of the port's privatization plan. *In assisting with this restructuring, any framework for analysis or strategy developed by the government for dealing with its national ports should not promote continued control by central authorities of day-to-day matters of port operations and administration. Nonetheless, the government will have to be involved in organizing the institutional framework for managing the ports' physical assets, for developing a regulatory framework within which these ports will operate, and for maintaining – through the port authorities – an appropriate permanent public role in the ownership and use of vital national port infrastructure.*

*Proposed National Port Development Program, based on a strategy of self-sufficiency, is extremely costly and should be weighed against economic considerations.* While accepting the inevitable decline in annual seatriade through the mid 1990s, the government's National Ports Development Plan calls for building new ports to boost the annual cargo handling capacity of the system from 165 million tons to 240 million tons by the year 2000. This would fully replace port capacity lost to the Baltics and Ukraine, and would expand port capacity in the Far East in line with expectations of future trade growth with Pacific Rim countries. The entire program is expected to cost about US\$3.6 billion (1991 prices) over the next ten

years, to be carried out in three phases. The economic rationale for self-sufficiency, however, is questionable, even if currently prevailing political imponderables are taken into account.

- Present and projected traffic levels are so much lower than before the break-up that many of the efforts to replace "lost" general port capacity may be unnecessary. Grain imports have dropped significantly due to good harvests and pricing reforms, and are expected to be 14 million tons in 1993, compared to about 25 million tons in 1992.

- Because current levels of utilization in the remaining ports are estimated at only about 60 percent and productivity in terms of cargo handling is quite low, much of the lost capacity can be recovered by making Russian ports as efficient as those in market economies.

- Although replacing selected specialized facilities in other FSU countries may be rationalized for reasons of national security, the costs and benefits of making the investment in Russia should be carefully evaluated and compared with opportunities for joint ventures or special contracts with ports in neighboring republics, at rates beneficial to both countries.

- If new port facilities are built in Russia, a private, competitive freight forwarding industry might choose not to use them, since it is possible that the cheapest option will be to use existing ports in neighboring republics or to ship by land to European ports.<sup>6</sup> This is particularly so because the investment in ports already built can be viewed as a "sunk cost", and port tariffs need only cover long-range operating costs. If new ports are built, rates will have to cover the full investment as well as long range operating costs unless the government is prepared to subsidize the entire effort.

- The costs of adding new port facilities must also compete with (a) the need to protect and preserve existing breakwaters and quay walls in ports which are apparently in some jeopardy due to lack of maintenance in the past, and (b) the need to resolve land-side constraints and introduce intermediate storage to remedy operational difficulties.

*Fuel subsidies should be eliminated.* In January 1991 the shipping lines were corporatized and permitted to compete with one another for

business. All direct state subsidies were terminated, except those to lines serving remote facilities in the Arctic and the Far East. The shipping lines are in the process of being privatized. Once privatized, it is important for the government to phase out the worldwide provision of bunker fuel to Russian merchant ships at subsidized prices in local currency. Otherwise these companies will be able to earn foreign currency while paying virtually all their operating costs in subsidized rubles.

*Proposals to buy new merchant ships should be resisted.* The government has recently issued a decree to acquire or build additional merchant marine ships to replace those lost to other republics following the break-up of the USSR. The government should resist financing such proposals because the worldwide glut of merchant shipping capacity makes purchase of new vessels much more expensive than purchasing merchant marine services on the international market. Government subsidy for the acquisition of new ships is also inappropriate, given the announced policy of merchant marine privatization.

### *Airlines*

*The structure of the aviation system is in question; airline losses are mounting and becoming an increasing drain on the federal budget.* The demand for air travel has fallen substantially and is likely to fall even further as more subsidies are removed. While lessening the pressure on the carrying capacity the aviation system, decreased demand has exacerbated financial problems and made more urgent the need for the government to devise and implement an effective aviation strategy that will:

- Continue to pursue its initial policy of separating the basic elements of the aviation system – airports, airlines, and the air traffic control system – and making them operationally and financially independent to the greatest possible extent.

- Resist pressures to subsidize airline losses and gradually end fuel subsidies.

- Identify the appropriate role and level of government involvement in each element of the system, whether it is ownership – federal control

of the air traffic control system or local government control of airports – or regulation – federal control of system operations, safety, and fares in situations where there is no competition.

- Redesign the structure of the airline industry and facilitate privatization through a graduated process.

- Ensure that federal support for new aircraft, retrofitting existing aircraft, airport construction and expansion, and other major capital projects is repaid by the newly privatized companies for whom such investments are being made.

*There is no single right answer to structuring of the airline industry. An effective solution would be to encourage all airlines that want to become self-sufficient (there were 174 in June 1993) compete in all markets, then allow mergers and consolidations to take place as the market dictates. The government should ensure that more than one airline is formed and that competition among airlines is encouraged and facilitated. Restructuring the airline sector should be undertaken with the understanding that capacity issues – numbers of airports and aircraft – will be far less an issue than rationalizing facilities and enterprises. Such rationalization should be guided by the marketplace, with government investment and subsidy kept to a minimum. Airports should be supported by concessions for shops and parking, and by landing fees; airlines should be supported by passenger and freight revenues.*

### **General**

*Transport capacity is not likely to be an issue for transport entities in Russia for years. Transport demand is so low that it can be met with existing infrastructure and equipment, even though much of it is in poor repair, out of service from lack of spare parts, not suited to its intended use, or in need of modernization. Except for railways, much of Russia's transport equipment and infrastructure is dramatically under-utilized by world standards.*

Achieving greater levels of productivity with existing equipment is easily possible despite its age, provided it is operated in a competitive private sector environment; doing so is equivalent to purchasing additional capacity at no cost. For

example, the average annual vehicle utilization in common carrier trucking fleets is on the order of 52,000 km, while privately owned vehicles would average at least 80,000 km annually. If the available truck fleet averaged 80,000 kilometers a year as a result of the industry's being fully privatized and deregulated, the gain in capacity would be equivalent to the purchase of more than 56,000 trucks based on projected demand level and fleet size for 1995. In the event of shortage, surplus industry and military trucks can be used.

Another example is the extremely low utilization rates of cargo handling equipment in Russian ports, which undoubtedly would improve with privatization and offset the need for costly new port capacity. That lack of capacity will not be a problem is fortuitous, since major, permanent changes in the transport system's role are coming.

*Russian transport vehicles and equipment are technologically obsolete, fuel-inefficient, and generally inadequate to the market served. Russian manufacturing processes need modern technology to cope with increasingly demanding requirements. When the economy rebounds, transport operators will need to produce more transport service with less – but better – transport equipment. Fuel efficiency is a major concern in this regard, since current transport fleets lag significantly behind the rest of the world and inefficient trucks will drive up the cost of transport intolerably once fuel costs reach world market levels. For example, if Russian diesel locomotives are brought to world levels, Russia could save up to one billion gallons in fuel, or US\$1.0 billion assuming a price of US\$1 per gallon.*

Russia's diesel truck engines are also technologically obsolete and inadequate for the country's needs. The fire at the Kamaz factory in Tartarstan provides an opportunity to deal effectively with this problem. Improving the diesel engines in Russia's trucks could cut their fuel consumption by as much as 30 percent. At world oil prices, this is a significant opportunity cost in lost foreign exchange. Present domestic transport equipment technologies are simply not capable of meeting these demands. The strategy for meeting these needs depends, in the mid to long-term, on

an effective process for integrating critical elements of foreign technology into Russia's domestic manufacturing processes. Foreign firms entering the Russian market should be able to take a long-term view and be capable of withstanding losses in the early stages of their ventures.

*Russia's transport equipment is unsuitable for the marketplace.* Russia's truck fleet lacks small and very large trucks. In the World Bank's view, restructuring the truck and engine manufacturers and privatizing and deregulating the trucking

industry is the quickest and most effective way to create the demand that will cause manufacturers to produce the small and very large trucks that are in shortest supply in Russia. Only when trucking operators and other enterprises that buy and operate their own trucks demand significant numbers of these types of trucks will manufacturers begin to produce them. When trucking operates in a private, deregulated and competitive framework, truck purchasers will be much more likely to have the capital to buy such trucks.

## *Recommended Strategies Matrix*

### *Railways*

#### *Near term (1 year or less)*

- Preserve key parts of the existing rail network that are jeopardized by inadequate maintenance and the disruption in the supply of spare parts and equipment because of the breakup of the FSU and by the railway's increasing financial difficulties.
- Take steps to limit operating losses and strengthen financial performance of the railways, to reduce the railway sector's fiscal impact on the national budget.
- Take immediate measures to curtail suburban passenger losses.
- Allow freight rates to rise to cover cost increases from inflation.
- Reverse investment priorities to meet urgent needs by (a) deferring or eliminating projects with low rates of return, and (b) ensuring that projects related to improving rail operations under a command economy will have a commercial application in a market-based economy.
- Heighten awareness of the changing nature of transport demand and the consequent need to develop long-range views of the railway's role in a market-driven economy.

#### *Medium term (1 to 3 years)*

- Start adapting the structure of the railway to the needs of the emerging transport markets in Russia.
- Establish a labor redundancy program to ameliorate the effect of anticipated unemployment.
- Review the structure and function of intercity rail passenger services to determine if they should be maintained as part of an integrated rail enterprise or established as a separate operating and financial entity.
- Improve the quality of equipment maintenance.
- Lay the groundwork for developing a competitive, private sector industry for repowering and overhauling diesel locomotives.
- Privatize ancillary activities and separate them operationally and financially.
- Devolve the operating and financial responsibility for suburban rail commuter services to municipalities.
- Devise a plan and an administration for the smooth introduction and operation of modern wagon and container tracking system.
- Assess and address environmental problems.

#### *Long term (more than 3 years)*

- Introduce a modern wagon tracking system.
- Upgrade telecommunications.
- Contract out routine maintenance activities.
- Implement changes needed to create intra-rail freight competition, where appropriate, and to regulate railway market power where competition is not sufficient to govern prices and service levels.

## ***Recommended Strategies Matrix***

### ***Road Transport***

#### ***Near term (1 year or less)***

- Complete privatization of road transport enterprises under a modified directive that encourages auctioning a substantial portion of the fleet as rapidly as possible.
- Improve competitive structure by permitting easy entry of new trucking operators: Agroprom, other own-account truckers, freight forwarders, etc.
- Remove or eliminate any geographic or commodity-specific monopolies or other restrictions on effective and efficient operations.
- Maintain present policy against federal rate regulation.
- Privatize and de-monopolize auxiliary services.
- End any MOT or other government-sponsored program of subsidized financial assistance, including leasing, for acquiring trucks.
- To support development of a private trucking industry, the government should lease surplus military or other facilities that can be used as terminals or warehouses.

#### ***Medium term (1 to 3 years)***

- Formalize and expand the program of de-monopolizing the provision of auxiliary services by offering concessions to operate facilities for fuel, spare parts, maintenance, food and lodging along major intercity highways.
- Develop or adapt training manuals and computer software for Russian trucking firms to aid them in such areas as maintenance, operations planning, bookkeeping and marketing.
- Coordinate and implement night-time driving safety measures.
- Reform the allocation of international trucking operating certificates now handled through a non-governmental body, ASMAP.
- Develop a body of vehicle licensing and operating specifications that will not impair the most economical and efficient use of the existing truck fleet or raise the cost of new trucks to uneconomic levels.
- Stop providing terminal and warehouse facilities either through privatization of facilities provided under the stop-gap program or cancellation of existing leases.

#### ***Long term (more than 3 years)***

- Develop an appropriate set of safety and environmental standards for trucks.

## ***Recommended Strategies Matrix***

### ***Urban Public Transport***

#### ***Near term (1 year or less)***

- Implement emergency measures to maintain service levels.
- Formulate a short-term strategy for keeping the existing urban transport fleet operating.
- Develop new specifications for buses suitable to the Russian climatic, service, and operating environment.
- Define and reach consensus on the basic elements of a reform package for the provision, financing, and management of urban public transport.

#### ***Medium term (1 to 3 years)***

- Ensure that the preconditions for effective manufacturing of new urban transport equipment in Russia are in place.
- Implement the reform package to improve the financial and operating performance of urban public transport.
- Refine specifications for improved urban transport equipment.

#### ***Long term (more than 3 years)***

- Privatize intercity buses.
- Complete devolution of transit to municipal or local level.
- Promote manufacturing of improved urban transport vehicles through licensing and joint ventures.
- End parastatal operations; maximize private provision of urban transport services through contracts with private corporations.

## *Recommended Strategies Matrix*

### *Roads and Highways*

#### *Near term (1 year or less)*

- Preserve existing road network.
- Ensure adequate funding for road rehabilitation and maintenance.
- Obtain external financing for road rehabilitation.
- Give priority to road maintenance rather than road construction.
- Improve the quality of road maintenance works.
- Develop an economic road maintenance strategy.
- Review the administrative structure of the highway subsector.
- Strengthen the capacity of FHD.
- Determine the role of avtodors.
- Establish a competitive road contracting industry.
- Introduce competitive bidding for road works.
- Introduce a contract management and supervision system.
- Establish a traffic count system.

#### *Medium term (1 to 3 years)*

- Improve highway subsector planning and evaluation of projects.
- Design and implement a bridge rehabilitation program.
- Review the classification and maintenance of non-public roads.
- Review and revise road design standards.
- Monitor axle loads on roads built to six ton standards.
- Enhance training of highway subsector staff.
- Design and implement a road safety program.

#### *Long term (more than 3 years)*

- Clear federal road maintenance backlog.
- Increase road capacity.
- Develop axle load regulations.
- Contract out routine maintenance activities.

## ***Recommended Strategies Matrix***

### ***Waterborne Transport: Port Sector***

#### ***Near term (1 year or less)***

- Preserve critical operating capabilities in Russian ports.
- Take measures to reduce the dependency of port operations on the availability of rail cars at quayside for unloading and loading of ships.
- Make plans to restructure road and rail access facilities to critical port installations and assess investment costs for these improvements.
- Take measures to ensure self-sufficiency of national ports and to eliminate the government's centralized fixing of port tariffs wherever there is effective competition.
- Permit ports to refuse service to non-paying customers and to auction unclaimed cargo to clear backlogs.
- Reaffirm port privatization policies and launch assistance efforts to help ports implement them, including provision for maritime port authorities to own port infrastructure (such as quays, breakwaters and navigational channels) remaining in state ownership.
- Reassess the national port investment plan and limit any government support of port investments to those justified with cost/benefit analyses and to those undertaken in the context of port specific corporatization, privatization, or restructuring plans with loan agreements structured appropriately between port and government.
- Establish policies for devolving responsibility for the planning, construction and financing of ports to local authorities.

#### ***Medium term (1 to 3 years)***

- Enhance MOT's capacity to undertake economic and environmental assessments of proposed port investments.
- Begin implementing port privatization plans as developed and approved by ports, GKI, MOT, and newly created Port Authorities.
- Assist MOT to revise the legal and regulatory framework in the port sector in conjunction with privatization plans.
- Assist ports in restructuring and privatizing ancillary activities.
- Assist ports in establishing a safety net for managing staff redundancies.

#### ***Long term (more than 3 years)***

- Complete the restructuring of the port sector and continue to lay groundwork for development of a competitive private sector.
- Introduce competitive bidding for the provision of maritime and port service to low density northern zones.

### *Recommended Strategies Matrix*

#### *Waterborne Transport: Maritime and River Shipping Lines*

##### *Near term (1 year or less)*

- Corporatize, cut managerial links with government and put all maritime and river carriers on a commercial footing.
- Permit carriers – in appropriate situations – to diversify into related services such as freight forwarding, trucking, and warehousing.

##### *Medium term (1 to 3 years)*

- Deregulate river and maritime transport: abolish tariff regulation except in cases of monopoly or where subsidies are necessary; ease entry and exit restrictions.
- Let the marketplace allocate maritime capacity. Foster development of transport competition by promoting competition among the several river shipping lines, the several maritime shipping lines, and Russian and nearby foreign ports.

## *Recommended Strategies Matrix*

### *Civil Aviation*

#### *Near term (1 year or less)*

- Continue efforts to reduce the airline sector's negative fiscal impact.
- Ensure that the government fully compensates airlines for provision of services to the state for governmental business or social purposes.
- Encourage airlines to restrict extensions of credit for airline service to state enterprises.
- Take steps to upgrade the clearinghouse for inter-airline settlements, so that it can offer prompt and accurate payments in accordance with clear and agreed accounting practices and standards and ensure that the clearinghouse agency is independently owned and operated.
- The government should reduce and terminate where possible programs that finance investments, including building new airports, acquisition or re-engining of aircraft, or introducing an air reservation system for privatized airline companies.
- Develop within MOT the capability to analyze the financial and operational performance of Russia's domestic and international airlines and the ATC system; develop appropriate policies for the structure and operation of a private, competitive, financially self-sustaining aviation system.
- In the context of privatizing airports, ensure that each airport offers its services on an equal basis to all carriers.
- Ensure that newly privatized airline operations are permitted to compete with each other in the same markets and, as time goes by, to merge and rationalize themselves as market forces dictate.
- In privatizing or corporatizing Aeroflot enterprises involved in international aviation, dissolve the Production and Commercial Association and privatize its individual entities in a way that breaks the ownership linkages of airline and airport and enhances competition.
- Prepare a strategy for how to divide Aeroflot's international operations and international assets among CIS countries that wish to have their own international airline.
- Restructure and federalize activities of MAK that are appropriate governmental functions.
- Privatize airport construction companies and ensure that any airport construction is contracted through competitive bidding.
- Assess safety performance of the airline and aviation system and develop near-term action program to alleviate critical deficiencies.

#### *Medium term (1 to 3 years)*

- Continue restructuring the airline sector.
- Complete the separation of the ATC system from Aeroflot and structure an appropriate system of charges to finance the upgrading of its operation and improvement.
- Establish capability within MOT to promulgate operational and maintenance standards for the airline and aviation system.
- Establish an independent agency to investigate air accidents and incidents and to recommend to government appropriate remedial actions.
- Establish policies for devolving responsibility for planning, construction and financing airports to local authorities in a manner that assures that any federal financing of airports is based on user charges and made available on the basis of equitable apportionment principles.
- Introduce competitive bidding for the provision of airline service to low density northern zones.

Notes

1. Looking at the rail mode in particular, U.S. experience demonstrates that making the railway more directly responsive to market needs brings dramatic change. U.S. railway labor productivity trends, which had roughly paralleled those of the FSU, improved much more quickly than in the USSR after the deregulation and restructuring of bankrupt railways. In fact, improvement was so powerful that railway profits and investment are at their highest levels, even though average freight revenue per tkm has actually fallen (in constant as well as current dollars) every year since 1982. Similar pressures and trends would be felt in Russia if the appropriate competitive and regulatory regimes can be implemented.

2. Calculations of the levels of implicit energy subsidies are clearly very sensitive to the exchange rate used in the analysis. The magnitude of energy subsidies was also calculated using a simulated exchange rate of Rb91/US\$1 proposed by the Research Institute on Prices of the Russian Ministry of Economy. Using this exchange rate, transport's share of the government's implicit subsidy of oil energy consumption was equivalent to 11 percent, and its share of the government's implicit subsidy to electricity was 2.5 percent.

3. Russian Economic Reform, Crossing the Threshold of Structural Change, A World Bank Country Study, August 1992. Table 2-3: Gross Domestic Product by Industrial Origin at Current Prices, 1989-90. According to ATA's *American*

*Trucking Trends* (1991-92 edition), gross freight revenues in the trucking industry in the U.S. totalled US\$272 billion in 1990, representing 78 percent of the nation's freight bill and 4.9 percent of GDP. Accordingly, total transport expenses amounted to US\$349 billion and represented 6.3 percent of GDP. Comparisons are difficult to make because of the heavy distortions in prices throughout the economy compared to the United States.

4. Sources: (a) *World Bank Development Report 1991*, Table 30; (b) L.W. International Financial Research, Inc., [Bulgaria, Czechoslovakia]; (c) *The Economist*, January 12, 1991, p 65 (FSU).

5. Booz·Allen & Hamilton/Travers Morgan. *EBRD Railway Sector Survey of the Railways of Russia, Ukraine, Belarus, and Kazakhstan*, London: July 1992, p 20.

6. The government should leave these decisions to the marketplace, a development made possible by its laudable decision to privatize freight forwarding. Exports may generate more foreign currency for Russia if, for example, enterprises were to ship products by land to ports in Europe, where there are more international carriers available to carry goods worldwide more quickly and cheaply than to insist that all Russian goods be shipped in Russian ships through Russian ports. It would be unfortunate if government's recent drive to re-centralize control of exports were to undercut the development of what can, and should, be a thriving and competitive private industry.



## *Economic and Financial Performance of Russia's Transport System*

### *Geographic and Economic Setting*

The Russian Federation, with a land area of 17.1 million square kilometers, is by far the largest country in the world, stretching across 11 time zones. The country is characterized by three distinct geoclimatic regions: the steppe, the taiga, and the tundra. The steppe, a band of territory west of the Ural mountains with most of Russia's arable land, is where the bulk of agriculture and industry is located, and where 78 percent of the people live. The taiga, a thickly forested zone, and the tundra in the extreme north, cover 67 percent of Russia; most of the country's energy reserves and other natural resources are located in these regions. Russia is divided into 88 administrative-territorial divisions: autonomous republics with their own parliaments; krajs, which have considerable autonomy; oblasts or states; and other administrative districts.

Russia has embarked upon a program of economic reform with a view toward creating a market economy that can become increasingly integrated into the world economy. The process of transition from a command economy to a market-based one has been initiated under difficult economic circumstances, with the added complication that the society is also trying to establish new philosophical, political and administrative structures. The result of these changes in 1991 was a decline in output of 9 percent, with inflation of 142 percent in retail prices and 236 percent in wholesale prices.<sup>1</sup> Despite some efforts to liberalize prices and stabilize the economy, it is estimated that industrial output for 1992 as a whole fell by

approximately 20 percent.<sup>2</sup> The government has reasserted its intention to press forward with reforms but is now moving more slowly than expected on privatization and enterprise reform efforts. It has acceded to pressures to extend credit to financially distressed state enterprises in an effort to postpone unemployment. The consolidated fiscal deficit at the end of 1992 was estimated to be in excess of GDP despite measures to reduce government expenditures and subsidies and to introduce new value-added and excise taxes. The economic situation will be difficult for some time; the most optimistic prognoses for 1993 indicate that industrial output will continue to fall by 7 to 10 percent. The general economic decline, compounded by shifts in production, and rapid inflation, are having an immense effect on the transport sector in terms of demand and supply of essential spare parts and replacement vehicles.

### *Sector Background*

Russia's internal surface transport system includes a vast network of railways, roads, pipelines, and inland waterways, much of which is west of the Urals. Extensive rail and pipeline networks also serve the main industrial areas in Siberia and extend across the southern third of the country to the eastern coast over permafrost and through other harsh climatic conditions. Because much of its population is urbanized and private ownership of cars has been discouraged, Russia has one of the world's largest public transport fleets. Despite its enormous land mass and extensive coastlines, Russia now has relatively few maritime ports, the result of geographic, demographic, and climatic

Exhibit 1.1 Russian Freight Transport Task, 1992 Estimates (billions of tkm)

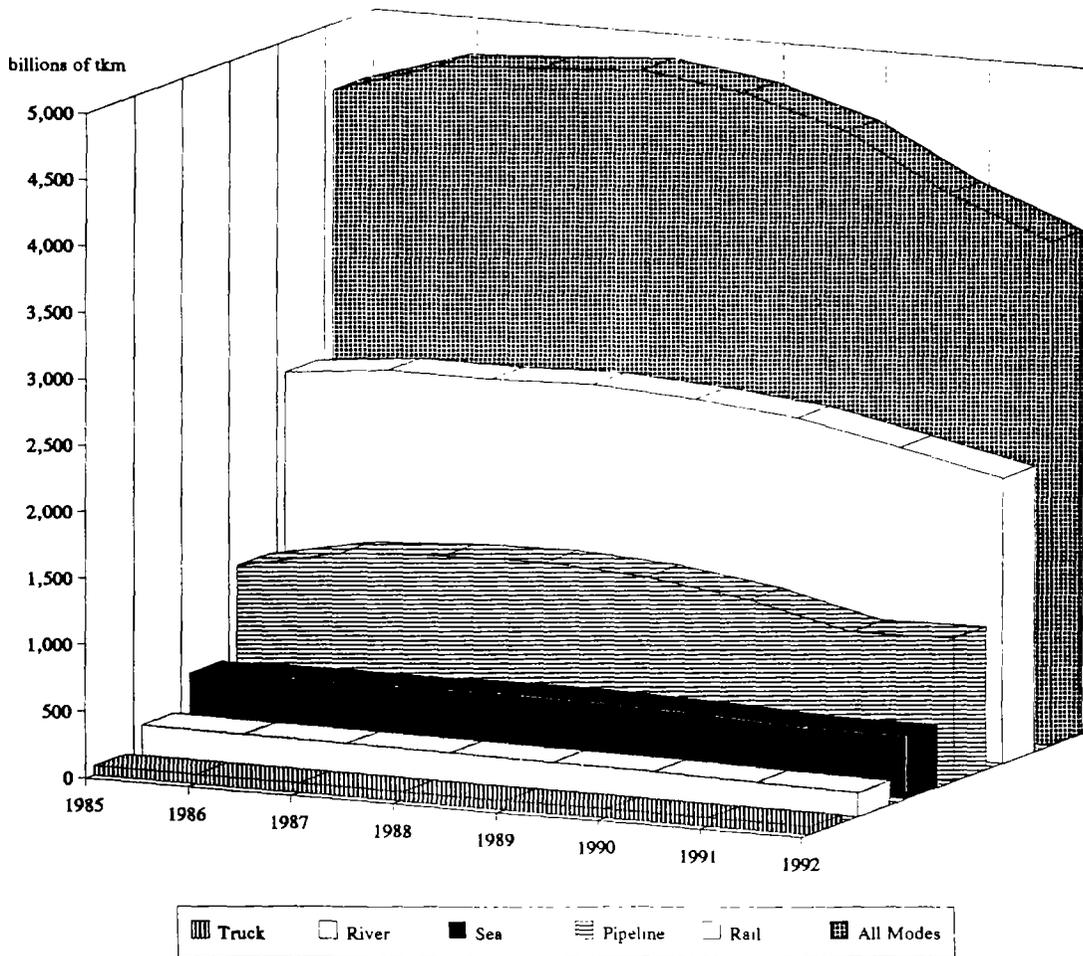
Mode	1970	1980	1985	1986	1987	1988	1989	1990	1991	Est 1992
All Traffic	2,645	4,456	4,748	5,002	5,053	5,117	5,014	4,794	4,388	4,236
including General Purpose	2,523	4,232	4,502	4,746	4,791	4,844	4,731	4,509	4,104	3,800
Railway	1,706	2,362	2,554	2,632	2,631	2,659	2,611	2,526	2,362	2,250
including General Purpose	1,672	2,316	2,506	2,585	2,581	2,606	2,557	2,479	2,319	2,150
Road	116	241	265	275	277	287	295	300	290	263
including General Purpose*	32	67	71	70	70	71	71	68	64	59
including Rosavtotrans**	29	63	67	66	66	67	62	58	55	51
including Own Account	84	174	194	205	207	216	224	232	235	204
River	168	232	248	241	240	237	226	220	200	183
including General Purpose	164	228	243	237	235	233	221	214	195	181
Sea	412	534	503	520	524	539	531	508	470	470
Pipelines	243	1,087	1,179	1,334	1,381	1,395	1,351	1,240	1,057	1,070

\*Includes international, intracity, intercity

\*\*Without Mosavtotrans and St. Petersburgavtotrans. As of 1993.

"Rosavtotrans" will be a Russian joint stock trucking company

Russian Freight Transport Task, 1985 to 1992  
General Purpose Cargo



SOURCE: Ministry of Transport, RF, 4 November 1992

conditions and the loss of more than half its port capacity to other republics following the break-up of the USSR. The break-up has also seriously disrupted the railways and airlines.

*Freight Transport.* Given the long distances within the country, and the number of bulk shippers with annual production plans serving as a basis for pre-planning movements, long and medium distance freight transport relied primarily on the railway, and to a far lesser extent on inland waterways (exhibit 1.1). Road transport was used primarily for short trips as a feeder to the railway and for distribution of goods within urban areas. As a result, the railway system is the most intensively operated in the world, carrying about 90 percent of surface transport in terms of tkm, excluding pipelines.

Although the average length of haul for rail freight is over 900 kilometers (km), almost 17 percent was over distances of less than 100 km, while the average length of haul for road transport is surprisingly low, less than 30 km. By contrast, the share of rail freight in the United States is about 40 percent and in Western Europe well below 10 percent, while the average lengths of

haul for road transport are much greater – over 500 km in the United States. A well-developed pipeline system transports more than 1 trillion tkm of petroleum products annually, representing about 25 percent of total freight.

*Passenger Transport.* Passenger transport in Russia is supplied primarily by public enterprises, with rail providing the largest share of intercity and suburban transport and a variety of buses, trams, trolleys, and metros providing urban transport. Overall, passenger travel in Russia is dominated by short-distance bus travel. Russia is a highly urbanized country, with 70 to 75 percent of the population living in cities. Its urban public transport fleet, the third largest in the world behind China and India, is estimated to carry 90 percent of all urban motorized person-trips, perhaps the highest level among nations with similar levels of income. In large measure, this situation reflects the fact that private car ownership is only about six cars per 100 inhabitants, compared to over 40 in Western Europe.

Russia is also highly dependent upon air service because of its vast distances and a governmental policy of maintaining low air fares. Owner of more than 8,000 aircraft, the world's largest fleet, Aeroflot carried nearly 133 million domestic passengers in 1990 compared to about 500 million in the U.S. and 1.1 billion in the world in 1991.

*Transport's Role in International Trade.* Before its dissolution, the USSR's annual international trade was about 500 million tons and the ratio of imports to exports was roughly 1 to 4. The bulk of the trade was by waterborne transport. Excluding pipeline deliveries of oil and gas, maritime and river-sea transport accounted for more than 70 percent of the international trade tonnage hauled (exhibit 1.2). Nonetheless, Russia's seatriade represented only 4 percent of global seatriade. The freight volumes associated with foreign trade transactions represented less than 5 percent of all cargo movements within the FSU.

Exhibit 1.2 Modal Shares of Soviet International Trade Tonnage, 1988

Mode	Import	Export	Total Foreign Trade	Modal Share of Total (percent)	Total Percent without Pipelines
volume in millions of tons					
Railway	25.6	78.7	104.3	20.0	26.5
Maritime	82.5	193.7	276.2	52.9	70.2
River	1.6	9.9	11.5	2.2	2.9
Automotive	0.5	1.0	1.5	0.3	0.4
Pipeline	1.2	127.5	128.7	24.6	—
Total	111.4	410.8	522.2	100.0	100.0

Source: Nikolai N. Kazanskiy, ed., *The Economic Geography of Transport* (Moscow: Transport, 1991), p 143.

### *Transport Network and Traffic Levels*

Russia's present basic transportation infrastructure includes railways, highways and road transport, ports and maritime shipping, river transport, and airlines.

*Railways.* Nearly 86,000 km of railway line is operated by 19 regionally autonomous railway administrations. Until the breakup of the USSR, 17 of these were organized as a single unified railway system with 15 other railways in the other republics. After the dissolution, two more Russian regional railways were created in Kaliningrad and Sakhalin. The rail system in the FSU is the most intensely used rail system in the world, carrying 3.9 billion tons (3.7 trillion tkm) and 4.2 billion passengers (417 billion pass-km) in 1990. Of this total, Russian railways carried 2.1 billion tons (2.5 trillion tkm) and 3.1 billion passengers (273 billion pass-km). In addition to the principal rail system, there are some 151,000 km industrial railway lines in the FSU belonging to independent enterprises.

*Highways and Road Transport.* The public highway network contains 250,000 km of paved road; road density is slightly above the average for middle-income economies. Traffic levels on the highway network are relatively light since road transport was organized more as a feeder service to railways than as a competing mode and passenger car ownership is low. Total road freight transport is provided by Russia's roughly three million trucks, of which about 1,500,000 belong to state farms and other agricultural entities under Agroprom and about 700,000 to common carrier trucking companies.

*Ports and Maritime Shipping Industry.* The Russian Federation has 41 seaports serving international and cabotage trades. Seven are major maritime ports: one on the Baltic Sea, one on the Black Sea, one in the Arctic, and four on the eastern coast. Only 63 percent (164 million tons) of Russia's seatriade was channeled through domestic ports in 1990; most of the balance was handled by ports in the Baltic Republics and Ukraine. Many specialized port facilities are in other FSU republics, so there is now a shortage of

handling capacity for several types of cargo in Russian ports. Eleven of the FSU's 17 national ocean carriers are under the Russian flag, representing 57.4 percent (13.6 million deadweight tons [dwt] carrying capacity) of the former Soviet merchant fleet. The national carriers accommodate only half of Russia's seatriade, much of which is done with tonnage chartered from foreign shipowners.

*River Transport.* The bulk of the FSU river transport system came under Russian jurisdiction, including 100,000 km of navigable river sections and man-made canals, as well as 9,000 cargo and passenger vessels, 11 key ports, and hundreds of riverine cargo transfer facilities. About 570 million tons of cargo were transported within this system in 1990, including 17 million tons of international traffic with special river-sea vessels. The largest portion of the domestic cargo was construction material. Roughly 75 percent of all river transport takes place within three major river basins west of the Urals. There are 29 principal river transport companies which are registered under the Russian flag.

*Airlines.* Air transport in Russia is provided by Aeroflot, which until the breakup of the USSR, was a vertically integrated state enterprise responsible for airline service and for operation and development of airports and air traffic control. Russia has 6 international, 130 national, and approximately 3,000 local or regional airports. Before the breakup, Aeroflot reportedly owned more than 8,000 aircraft, of which 104 were used in international service. In 1990 it carried 133 million passengers throughout the Soviet Union. In 1991, Aeroflot carried 82 million domestic passengers, a drop of about 5 percent, and 13.8 billion tkm of domestic and international freight. Domestic passenger traffic in Russia fell to 62.6 million in 1992. Internationally, Aeroflot carried about 4.4 million passengers in 1990 and 3.7 million in 1991.

### *Past Performance and Future Prospects*

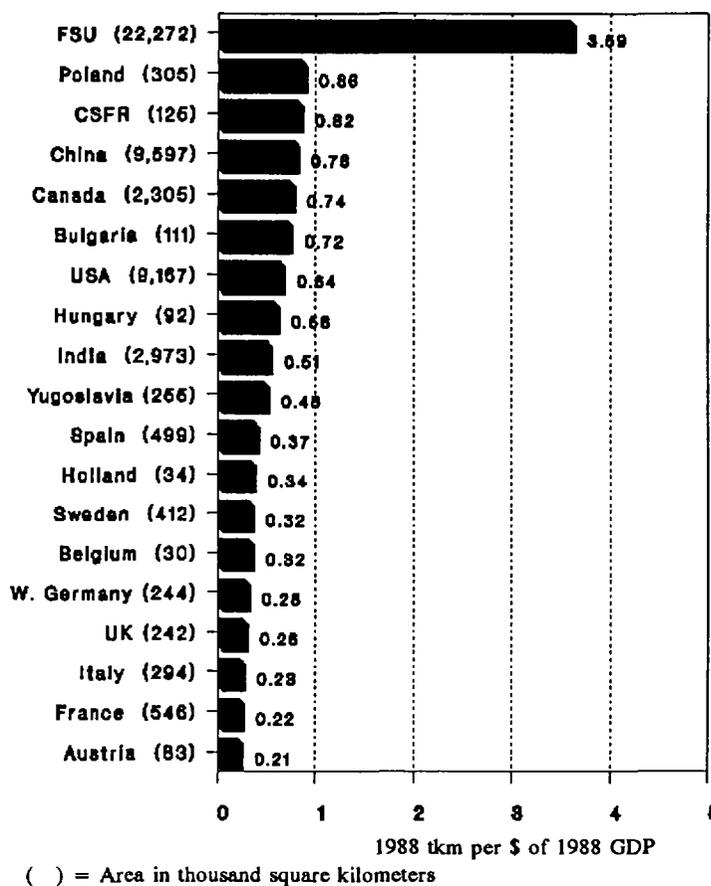
Russia's transport system is critical to the Russian economy, with freight transport representing 9.1 percent of GDP in 1990, far higher than in most

industrialized countries.<sup>3</sup> In the United States, the dollar value of freight transport represented 6.3 percent of GDP in 1990.<sup>4</sup> The difference is even more dramatic comparing the transport tkm per dollar of GDP for a number of countries with the FSU as a whole.

According to World Bank figures, transport tkm per U.S. dollar equivalent of GDP in the FSU in the late 1980s was almost six times that of the United States and four and a half times that of China<sup>5</sup> (exhibit 1.3). The fact that Russia and the other FSU republics relied on transport to a greater extent than other countries is not a function of distance, as one might assume, but of the way its industrial and social sectors are organized. Industrial production is often concentrated in a few number of huge complexes and their location was sometimes based more on social factors than on economic consideration, such as minimizing transport costs. As a result, the proportion of bulk products shipped is unusually high, freight transport is more intense, and there is an extraordinary dependence upon rail transport compared to other countries. Unrealistic costing and high levels of bulk rail shipments causes rail transport to be underpriced and leads shippers to ignore the real value of service quality in logistics costs.

*Relationship of Transport Demand to Gross National Product (GNP).* In general, growth in transport levels is closely related to GNP, although changes in transport demand often anticipate changes in GNP. This relationship holds broadly true for Russia, where total freight transport has declined sharply since 1988, as has the Russian economy as a whole (exhibits 1.1 and 1.4). It would be a mistake, however, to assume that transport's relation to GNP does not shift

Exhibit 1.3 Transport Ton-Kilometer per Dollar of GDP (Road, Rail, and Water)



GDP is based on the purchasing power of currencies factor as presented in Table 30 of the World Bank's *World Development Report 1993*.  
 Source of non FSU rail data: *What Determines Demand for Freight Transport?*, Bennathan, Fraser and Thompson. IBRD PRE Working Paper 998, October 1992, p 11.

over time. Comparisons with other countries show that transport demand is also related to the structure of a country's economy. A study of the historic relationship of *Russian freight transport demand to GNP* shows that transport demand has grown rather faster than the general economic growth.<sup>6</sup> Further analysis, however, demonstrates that a major growth component was associated with energy, particularly with expansion of the pipeline system. Total transport grew at an average annual rate of 4.0 percent between 1970-1990 (exhibit 1.4). Of this total, however, energy

Exhibit 1.4 Volume of Russian Freight Transport (millions of tons)

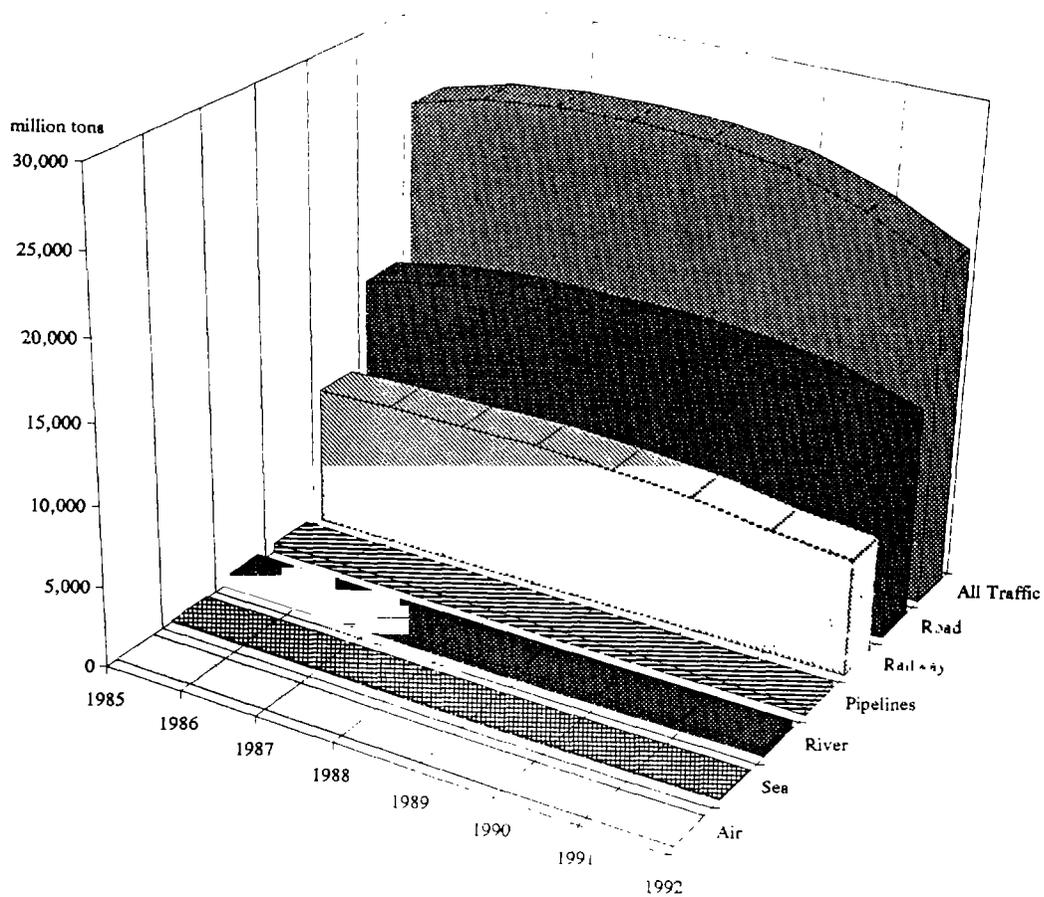
Mode/Type/Organization	1970	1980	1985	1986	1987	1988	1989	1990	1991	Est 1992
All Traffic	14,719	22,967	24,131	25,372	25,867	26,003	25,849	25,130	23,601	21,250
including General Purpose	4,429	6,446	6,123	6,532	6,705	6,807	6,663	6,367	5,855	4,375
Railway	6,089	8,150	8,713	8,924	8,981	9,082	8,865	8,497	7,745	7,350
including General Purpose	1,648	2,048	2,165	2,236	2,228	2,261	2,205	2,140	1,956	1,825
Road	7,853	13,597	14,137	15,124	15,528	15,546	15,629	15,347	14,688	13,250
including General Purpose*	2,004	3,178	2,677	2,972	3,119	3,171	3,103	2,941	2,731	2,550
including Rosavtotrans**	1,848	2,946	2,458	2,748	2,889	2,950	2,675	2,584	2,396	2,350
including Own Account	5,849	10,419	11,460	12,152	12,409	12,375	12,526	12,406	11,957	10,700
River	388	538	592	604	624	638	639	613	564	515
including General Purpose	77	57	55	55	56	56	58	51	50	47
Sea	85	104	111	120	124	126	119	112	103	103
Pipelines	303	576	575	597	607	608	594	558	499	505
Air		1	2	3	3	3	3	3	3	2

\*Includes international, intracity, intercity

\*\*Excludes Mosavtotrans and St. Petersburgavtotrans. As of 1993.

"Rosavtotrans" will be a Russian joint stock trucking company.

Volume of Russian Freight Transport, 1985 to 1992



SOURCE: Ministry of Transport, RF, 4 November 1992

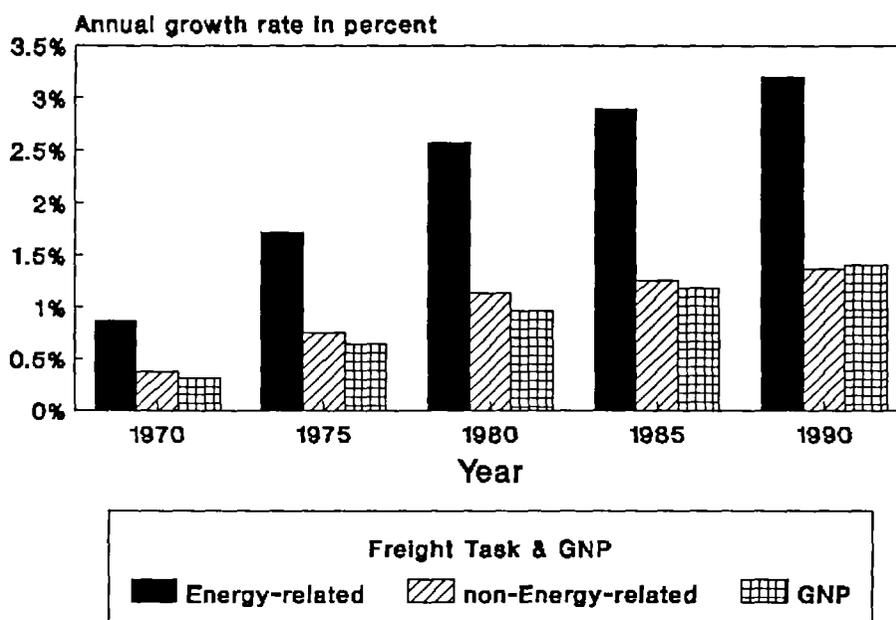
related transport grew by 5.8 percent a year, while non-energy related transport grew by only 2.4 percent; growth in the first decade was far greater than in the second. In the 1970s, energy related transport grew primarily because of increased oil production, which is more transport intensive than coal. In the 1980s there was an absolute decline in the production of coal and oil, but a marked increase in the output and average length of haul of gas. *Over the most recent decade, therefore, non-energy related freight transport grew more slowly than GNP* (exhibit 1.5).

*Future Transport Demand.* In looking to the future, there is a need to assess the range of economic growth likely to occur in Russia, changes in the structural nature of the economy and the mix of output, and the consequent impact of both on the demand for transport. Freight transport demand in the FSU will generally follow economic growth patterns and will continue to reflect overall economic developments for domestic inland traffic and international flows.

Economic forecasts are difficult in any circumstance, but the failure of the government to implement macroeconomic policies that might stem the decline in output and near-hyperinflation creates greater uncertainty than normal. Further uncertainty stems from the undetermined pattern of inter-republic trade flows, the rate of economic recovery, and the degree of structural change within the economy once economic recovery begins.

Structural change and a move to a market economy may eliminate uneconomic, obsolete, and ecologically harmful industrial plants. A move from state-owned industrial giants to smaller consumer-oriented firms is likely to alter transport patterns significantly. The defense sector is also in decline and may never recover to previous levels of GNP. These changes will reduce the transport intensity of Russia's economy, but Russia's size, scale and poor access to sea transport make it unlikely that the relationship of transport demand to GNP will decline enough to match that of other large countries such as Canada or the United States.

Exhibit 1.5 Domestic Freight Transport Demand and Its Relation to GNP Growth Rates



Source: IBRD graph of data from EBRD  
Rail Sector Survey Report, p. 20

Despite such difficulties, consultants financed by EBRD to assess the FSU railway sector used a combination of U.S. and Canadian input-output tables to derive relationships of transport to 18 sectors. They applied these relationships to PlanEcon's forecasts of Russia's economy to prepare low, median and high growth scenarios.<sup>7</sup> Their forecasts examined energy related transport demand separately from non-energy related demand, in part because the two most important sectors in the CIS are agriculture and energy. *Annex A provides detailed statistical projections. Annex B provides details of the demand analysis by commodity, based on the EBRD-financed studies of railways, waterborne transport, and roads. Except as noted, the demand information that follows is based on these studies.*

*Future Transport Demand and Change in Modal Mix.* Looked at as a whole, the forecast of transport demand in the FSU is sobering. The overall downturn of the economy and the shift from raw materials and industrial goods to lower-density general freight *will keep overall transport levels below those of 1988 for years*, probably until 2015. The likelihood of flat or declining demand for the next several years is quite high for every major commodity in the freight transport traffic base. In fact, in view of recent trends and the World Bank's more pessimistic forecast of the energy sector, as discussed below, it is likely that transport demand will be substantially below the EBRD-financed forecast, making it almost certain that demand will continue to decline. The other significant trend expected is an increasing shift from rail to road. *Compared with its present 13 percent share, it is expected that the road transport share of non-energy transport by 2015 will be 22 percent in the low growth scenario and 41 percent in the high growth scenario.*

The dynamics of the shift from rail to road depends upon the onset and vigor of Russia's economic growth. The forecasts assume the ratio of transport demand to GDP will be 1 to 1 for rail and road transport until the economy begins to grow; thereafter, it is assumed transport demand will grow at a 1.25 to 1 ratio, with a general shift to road. The assumption is that transformation to a market-based economy will cause a shift toward lighter industrial and consumer goods and a

corresponding increase in medium-distance hauls. In a privatized, deregulated, market-oriented environment, road transport increasingly will become the mode of choice for shippers of high value or time-sensitive commodities, since road transport offers faster and more flexible service than railways. Although road transport may cost more than rail transport in terms of tariffs, the price is usually less than the production time lost or extra inventory carrying cost associated with slower railway service. Road transport is now competitive on a cost basis alone for distances up to 100 kilometers. Nearly 18 percent of traffic moving today on Russian railways is carried less than 100 kilometers, and as more heavy and articulated trucks enter the road transport fleet and the highway network is developed, the breakeven distance will increase. In the United States, for example, the distance at which rail becomes competitive with intercity trucking is 800 miles.

Several factors affect the pace and size of the shift of freight traffic from the rail system to road transport in Russia:

- The speed at which the economy recovers and becomes more market-oriented.
- The rate of growth in new businesses that generate time and service-sensitive traffic that never will be shipped by rail.
- The speed at which road transport services are privatized and pushed by the drive of self-sufficiency to provide flexible, fast and reliable service.

*Impact of Energy Subsidies.* Offsetting these factors could be the speed at which fuel prices within Russia are brought to world prices and passed on to the transport user through higher tariffs. Rail transport is more fuel efficient than truck transport. More than 70 percent of the tkm transported by rail are moved by electric power, which is theoretically less expensive than diesel-powered train transport. Electricity in Russia, however, is also highly subsidized, because it uses a large amount of subsidized coal and gas. The government is being urged to eliminate its implicit subsidy of all energy production. The degree to which the relative transport tariff between rail and road transport changes as petroleum prices rise to world market levels will also depend upon the

degree to which the government eliminates subsidies to other energy producers.

World Bank analysis shows that the government's implicit subsidization of electricity is almost twice as high as the subsidy of petroleum based fuels. Based on estimates of fuel consumption, rail transport's share of subsidies of oil and electricity in 1992 was equivalent to Rb20.8 billion, using a simulated exchange rate of R91/US\$1, while the for-hire road transport industry's share of oil subsidies is about Rb5.0 billion. These subsidies represent about Rb0.01 per tkm for railways while the road subsidy is on the order of Rb0.09 per tkm, or about nine times that of rail. *This means that the shift from rail to road transport could be slowed by efforts to end fuel subsidies although the degree to which it will do so depends upon the total transport costs of each mode.* At the same time, the shift to world prices of energy will also discourage excessively long distances between industrial sources. This trend will reduce rail traffic and favor shorter distances where trucks have an inherent advantage. In the longer term, those who need to transport freight will make their decisions based on total transport costs including the carrying costs of the merchandise during the period of shipment, the costs of handling and storage, and the transport costs *per se*.

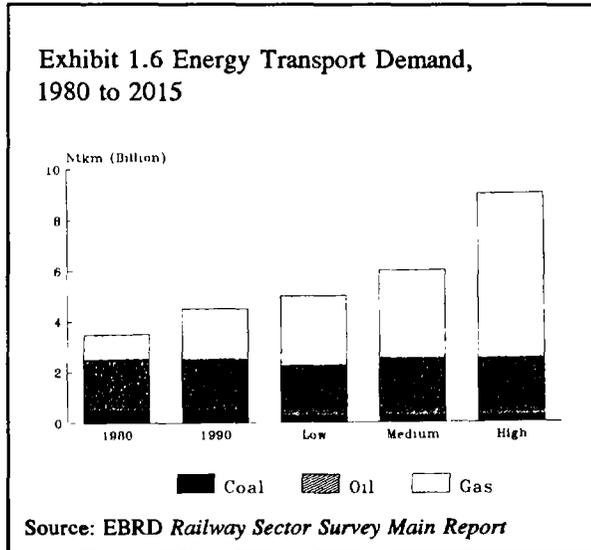
*Energy Freight Demand.* Next to agriculture, energy – comprising coal, oil, and natural gas – is the most important sector in the CIS economy in terms of transport demand. More than half of the work of the country's transport system involves the fuel-energy complex. Rail transport accounts for 97 percent of the coal tkm, making rail indispensable to electric power generation and the steel industry. Rail handles a quarter of the petroleum transport, an inordinately high figure compared to the percent in the United States. The energy sector and the non-pipeline transport sector are inextricably linked in Russia and will be for the foreseeable future.<sup>8</sup>

Coal production has declined 20 to 30 percent since 1989, due principally to: (a) higher mining costs; (b) declining demand from the heavy industry and power sectors; and (c) shifts to alternative fuels (mainly gas). Demand for domestic coal is particularly sensitive to steel

production which has also declined dramatically in the last several years. For the future, coal exports to Eastern European nations are no longer expected to grow, but they may increase from Russia's far east to the Pacific region. The real issue is whether overall coal exports of Russia will increase, since both the production and transport of coal were heavily subsidized.

The driving force in Russia's energy sector now and for the foreseeable future is the dramatic drop in domestic consumption caused by the sharp macroeconomic decline. Based on the decline in domestic demand, the World Bank estimates that energy production will decline by 20 to 30 percent despite the fact that export demand for oil and gas should remain strong. The fall in domestic consumption of oil and gas is likely to continue through 1995 or 1996, with slow recovery in 1996 or 1997. Coal production is expected to continue to decline through the decade, driven largely by both the closure of uneconomic mines and the continuing decline in industrial consumption, and will not be offset by the expected increases in utility demand for coal.

This scenario of future energy demand, based on the World Bank's understanding of the Russian energy sector, contrasts with the forecast of energy production by the consultants who developed the transport demand forecast used in this report. This forecast energy production to grow overall at about 1 percent a year over the next 20 years, with oil remaining stable, coal declining about 30 percent in energy terms, and most of the growth related to increases in natural gas production (exhibit 1.6). The forecast "assumes an increase in the average haul for gas and oil as the more accessible fields are depleted while the average haul for coal remains constant as rationalization and a greater level of on-site preparation balances the development of more distant coalfields".<sup>9</sup> Since the World Bank's energy forecast is more recent and based on a more detailed analysis of the sector than undertaken by the EBRD-financed consultants, it is likely that energy transport demand will be substantially lower than forecast in their studies. For non-pipeline transport of coal and refined petroleum products, the major issue for the future is to ensure that existing rail capacity is utilized efficiently.



**Non-Energy Freight Demands.** The EBRD consultants' projections for non-energy related transport were based on forecasts of GNP that assume an historic elasticity of 1 – as was the case from 1980 to 1990 – until the turnaround in the economy is reached. Thereafter, "the forecast assumed that the transport-intensity declines as the economy restructures until, when the economy has reached a level twice that of 1989, the relative level of transport has reduced by 25 percent"<sup>10</sup> (exhibit 1.7).

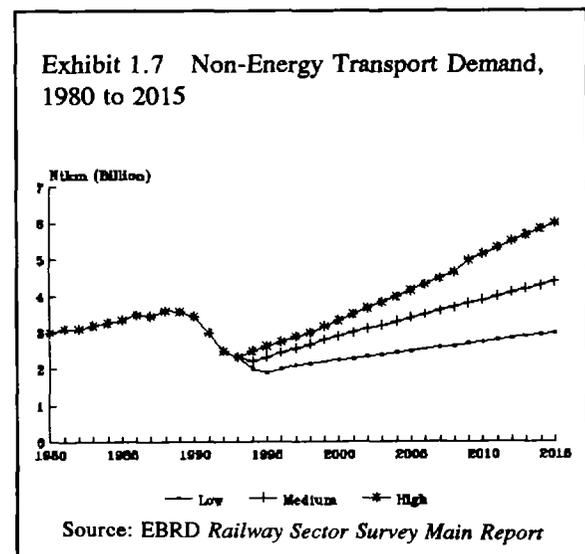
Economic sectors affecting non-energy bulk transport demand include iron ore and steel, minerals and building materials, timber, and fertilizers.

Iron ore and steel transport requirements are likely to fall as Russia (a) becomes more efficient in steel-making by moving away from open-hearth technology, (b) substitutes lighter metals for steel in many manufacturing processes, and (c) reduces emphasis on defense industries. Russia's steel production – two-thirds of all CIS steel – peaked at 94 million tons in 1988 and declined to 78 million tons by 1991. It is likely to continue to decline and may never recover to 1988 levels. Decreased orders from the military will reduce consumption; other republics may also develop their own self-contained steel industry. Rail moves 93 percent of iron and manganese ore mined and about 76 percent of steel tonnage moved.<sup>11</sup>

Minerals and building materials include cement, bricks, stone, sand and gravel, which make up large tonnages by rail, water, and road. Cement production fell to 77 million tons in 1991 from a peak of 85 million tons in 1989. Demand for sand, gravel, and aggregate, hauled predominantly by inland water transport, is concentrated in construction industries and road building. Demand in this sector will follow yet lag somewhat economic growth.

Russia is the world's largest producer of wood products, with forest reserves located predominantly in the far east, east and west Siberia, the northwest, and the Urals. Plywood, chemical pulp, and paper products are increasing as percentages of total wood products. As production moves from the northwest and the Urals into Siberia, rail hauls, which carry 60 percent of wood product tonnage, should lengthen. Combined inland and river-sea transport accounts for about 29 percent of forest product tonnage. Timber is a major river-sea vessel export commodity and a major export commodity from Black Sea and far east ports.

Fertilizer production includes: (a) 7.5 million tons of phosphates; (b) more than 30 percent of the world's potash production (11 million tons in 1988); and (c) the world's largest production of nitrogenous fertilizer. Future demand will depend on export markets, for which there is strong competition. Rail hauls 88 percent of the tonnage. Phosphate exports pass through the port of



Murmansk, while nitrogen fertilizers are exported primarily to Eastern Europe.

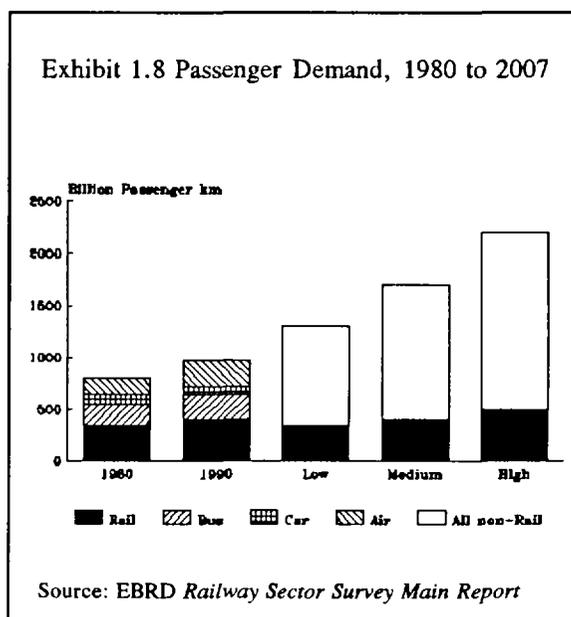
*Agriculture Freight Demand.* For the transport sector, agriculture means grains, to which the CIS countries devote more land than any other region in the world, but at low yields that leave the CIS behind both China and the United States in grain production. CIS grain production in 1989 was 193 million tons, which left them as a net importer of grains for several reasons: (a) difficult climatic conditions in most grain growing areas; (b) widely dispersed grain growing areas; (c) inadequate, poor quality storage; and (d) an insufficiently trained and motivated work force. A 1992 study of the FSU agricultural sector indicates that annual imports of grain into Russia have averaged 19 to 22 million tons, consisting of about 50 percent wheat, 40 percent maize, and 10 percent barley. Only a small portion of Russia's grain imports are from other CIS republics. Grain imports from Kazakhstan have been 1.5 to 2 million tons per year, virtually all of it wheat. Total imports from all other republics have been about 1 to 2 million tons, mostly from Ukraine. The remaining 16 to 20 million tons came from outside the FSU, accounting for nearly half of all grain used as food and about a seventh of all grain used as feed.<sup>12</sup> The same report indicates that if subsidies to beef producers in the form of underpriced feed grain are eliminated, demand for beef in Russia could drop by as much as 25 percent, with a consequent drop in the requirement to import grain.

Agricultural restructuring could virtually eliminate grain imports, and dramatically reduce imports of sugar, milk products, and vegetable oil. While trucking plays the major role in short-haul food movements, 90 to 95 percent of the tkm involved in domestic food transport is provided by rail. Grains made up more than 83 percent of the tonnage for food imports to the CIS in 1989, split almost evenly between Baltic and Black Sea ports. Inland waterway movements of grain average a minor 7 million tons per year, most of which are transshipments at Novorossiysk to river-sea vessels for delivery upstream.<sup>13</sup>

*Containers and International Commerce.* Another factor affecting the economy and

distribution of Russia's international transport is the low level of containerization. Consultants estimate that the level of containerization in Russian transport is about one-fifth of the average prevailing in international trade. In 1990, for example, about 10 percent of the 79.6 million tons of CIS international traffic was containerized. In comparison, by 1989 about 46 percent of the world's 625 million tons of international trade was containerized. Attempts to introduce containerization, such as the SeaLand landbridge, have met with mixed results.<sup>14</sup> Landbridge traffic in 1992 was approximately 55,000 containers, down from a 1989 high of about 100,000. In large part this drop reflected the physical and institutional strains affecting the rail network growing out of the disintegration of the all-Union rail system.

*The difficulties afflicting every mode in Russia's transport system make it difficult to achieve the integration and cooperation needed for an effective container system. Efforts to impose containerization on the disorganized transport system are not likely to succeed. The lack of a healthy and growing container-based intermodal transport system for both international and domestic trade will present physical and economic barriers to the growth of Russia's international commerce.*



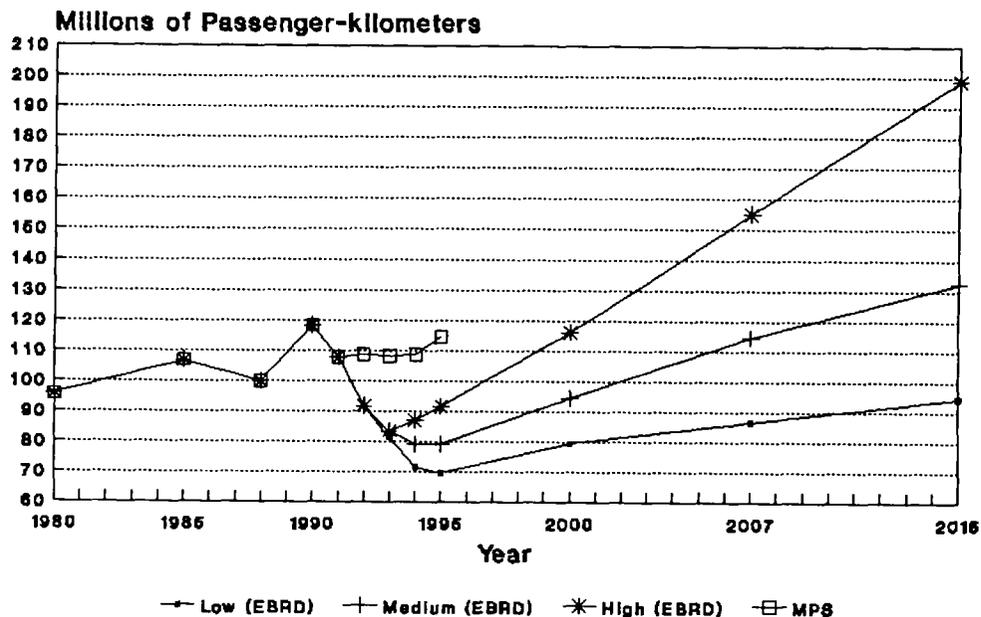
*Passenger Demand.* Passenger travel is expected to respond to changes in income levels and changes in relative prices. According to EBRD consultants' forecast, "given constant prices, the overall passenger market is expected to grow at the rate of growth of the economy with longer distance travel growing somewhat faster and short-distance trips slower. Real price changes would similarly affect long-distance trips more than short-distance trips."<sup>15</sup> The forecasts also take into account suppressed passenger demand within Russia and the FSU (exhibit 1.8) and assume no intermodal distortions regarding tariff patterns or subsidies. In fact, the government is increasingly subsidizing passenger transport, although buried in support to local and regional budgets since responsibility for urban transport has devolved to local authorities. Responsibility for covering the cost of suburban commuter rail transport has been left to individual railways to cross subsidize with freight resources. To improve cost recovery, local authorities have been authorized to impose a tax on enterprises for urban transport and individual

railways are being encouraged to raise local commuter rail fares in consultation with municipal authorities. The political climate for implementing such price increases may vary from place to place and thus introduces intermodal distortions. Nonetheless, demand for passenger traffic should grow significantly.

The forecast described above seems difficult for some transport experts in Russia to find credible. Government forecasts do not incorporate such a slow recovery nor any modal shift. They predict that traffic levels will rebound far more quickly and do not foresee much shift from rail to road. Both Ministry of Railways (MPS) and the government forecast a far faster rebound in rail transport demand than do the EBRD consultants (exhibits 1.9 and 1.10).

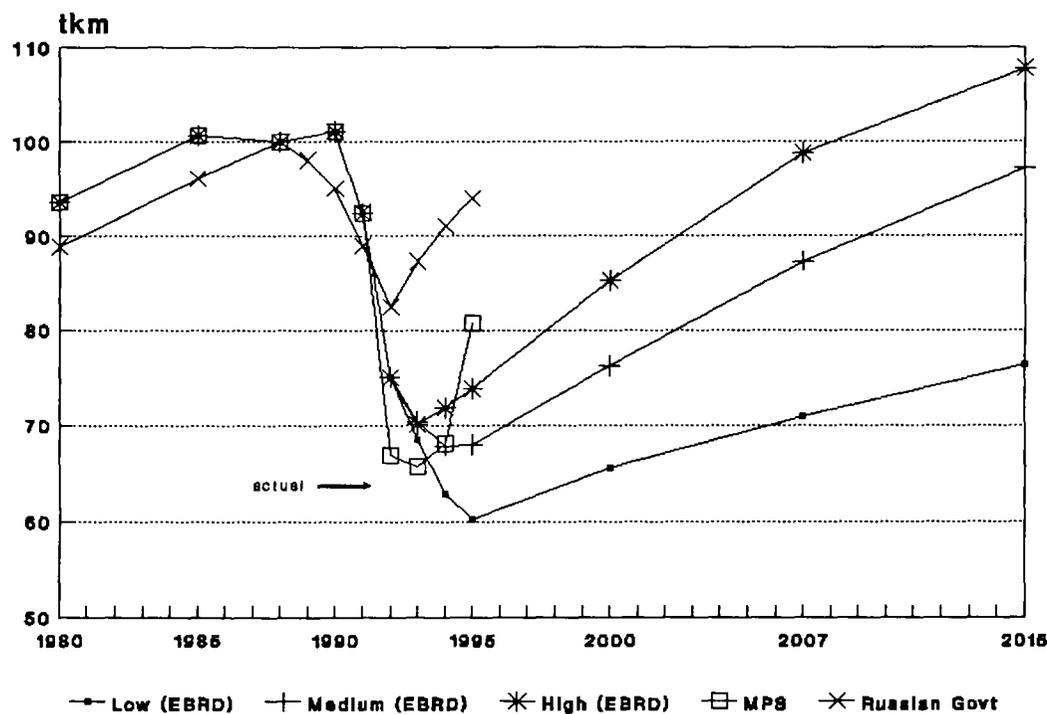
In terms both of transport volume and task, MOT projects recovery in all surface modes except for waterborne and pipeline transport within the context of an overall rebound in demand (exhibits 1.11 and 1.12). By 1995, under the influence of more favorable economic

Exhibit 1.9 Russian Rail Passenger Projections (1988 = 100)



Sources: Data and forecasts derived from EBRD *Rail Sector Survey*, p 35, and from Russian Ministry of Economy.

Exhibit 1.10 Russian Rail Freight Projections (1988 = 100)



Source: EBRD Study, p 35; MPS projection from Mr. Razavaev; Russian Government projection from Ministry of Planning.

developments, the increase in transport demand is expected to continue, having reached by that time levels reminiscent of the 1970s. The volume and task of pipeline transport, however, are projected to decline through 1995.

On the basis of these projected increases, government transport planners argue for continuing investments and budgetary support on an almost business-as-usual basis. The railway investment budget, for example, includes expansion of existing lines, construction of new lines, and continuation of electrification without any analysis as to whether these investments make sense in light of more realistic forecasts, reduced demand and a changing customer base oriented toward fast, reliable service. The Minister of Railways has also endorsed hiring 11,000 more employees for the expected recovery of rail traffic levels. Based on experience elsewhere, the government's forecasts are too optimistic. A further decline in transport and a shift in modal mix is inevitable, as government policies move away from a command to a mixed or market economy as has happened in several other

countries (exhibit 1.13). *Failure to acknowledge that changes in the economic framework will inevitably shift transport demand could lead to the inappropriate allocation of government resources in transport.*

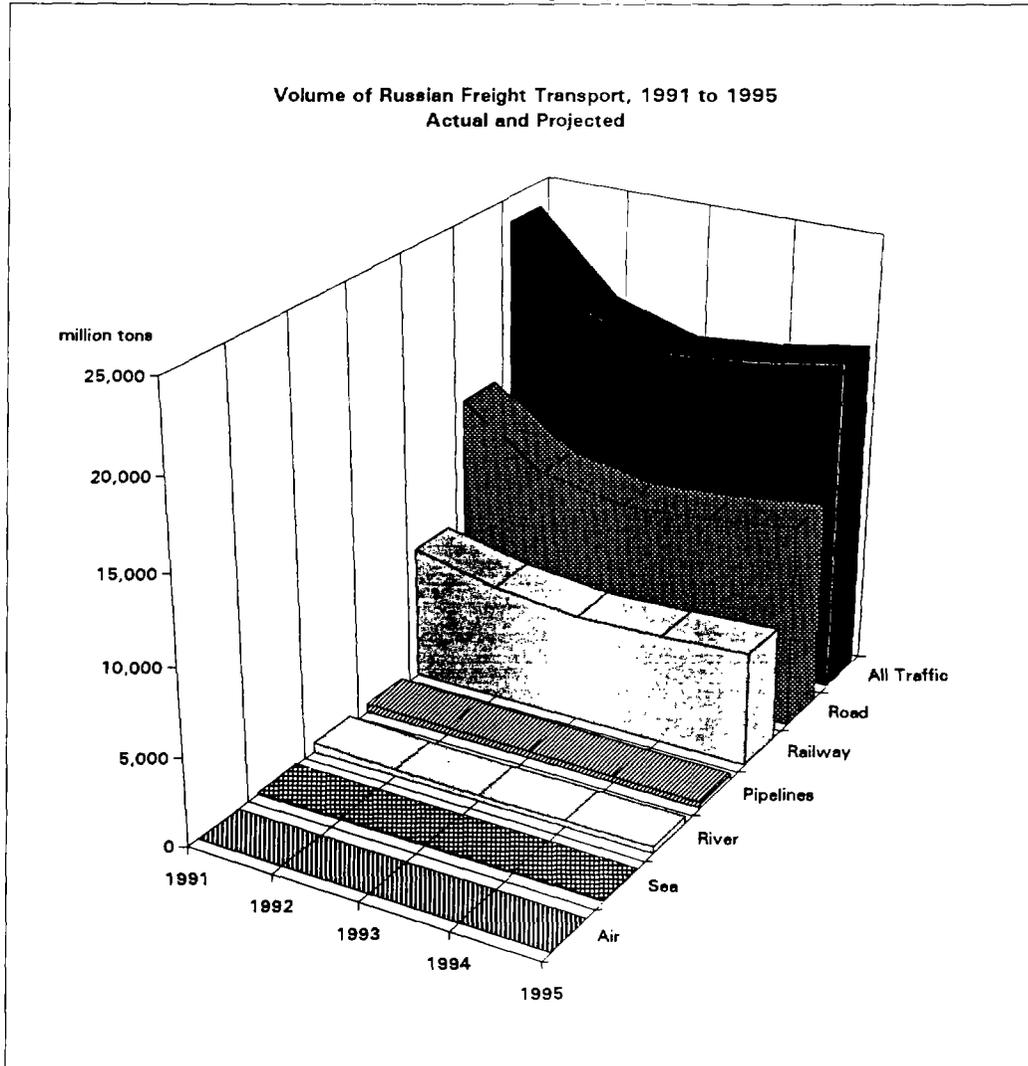
*Impact on the Railway Sector.* In broad terms, the shift to a market economy will significantly reduce the level and composition of rail traffic as the economy as a whole shifts away from the production of basic commodities and toward production of higher value goods. An additional shift will come with the growth of competition from the trucking industry, a shift that will be enhanced by increased shipper choice. The Russian railways system will have to undergo a major change in operations and service in order to be able to respond to coming changes in transport demand. Investment plans should be re-examined to ensure that they still make sense and that they focus more on enhancing the use of available resources than on expanding rail service. More fundamentally, however, planners need to rethink the economic and social role of railways within

Exhibit 1.11 Actual and Forecast Volumes of Russian Freight Transport, 1991 to 1995 (million tons)

Mode	1991	Est 1992	Proj 1993	Proj 1994	Proj 1995
All Traffic	23,601	19,088	17,700	18,201	19,101
including General Purpose	5,855	4,375	4,560	4,725	4,900
Railway	7,745	6,678	6,170	6,300	6,550
including General Purpose	1,956	1,825	1,910	1,975	2,050
Road	14,688	11,504	10,703	11,073	11,724
including General Purpose*	2,731	2,550	2,650	2,750	2,850
including Rosavtotrans**	2,396	2,350	2,250	2,325	2,450
including Own Account	11,957	10,700	10,900	11,100	11,900
River	564	374	339	363	382
including General Purpose	50	47	46	51	55
Sea	103	101	87	90	94
Pipelines	499	430	400	373	348
Air	2	1	1	2	2

\*Includes international, intracity, intercity

\*\*Excludes Mosavtotrans and St. Petersburgavtotrans. As of 1993, "Rosavtotrans" will be a Russian joint stock trucking company.



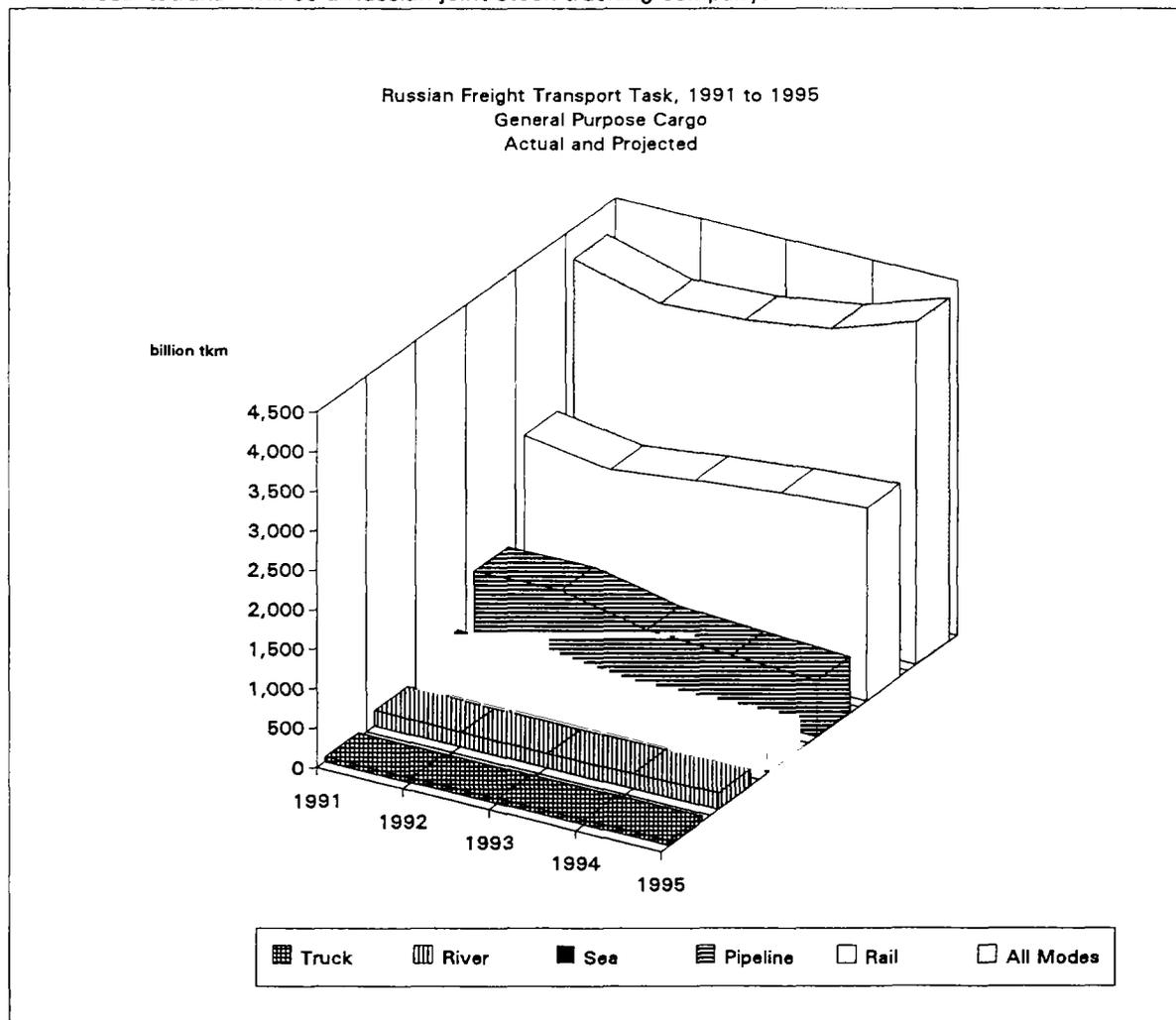
SOURCE: Ministry of Transport, RF, 4 November 1992

Exhibit 1.12 Actual and Forecast Russian Freight Transport Task (billion tkm)

Mode	1991	Est 1992	Proj 1993	Proj 1994	Proj 1995
All Traffic	4,388	4,236	3,385	3,410	3,488
including General Purpose	4,104	3,800	3,850	4,000	4,350
Railway	2,362	2,250	1,861	1,909	1,995
including General Purpose	2,319	2,150	2,275	2,375	2,450
Road	290	263	223	233	249
including General Purpose*	64	59	62	64	67
including Rosavtotrans**	55	51	52	54	56
including Own Account	235	204	206	211	221
River	200	183	137	146	154
including General Purpose	195	181	177	188	205
Sea	470	470	330	350	375
Pipelines	1,057	1,070	832	770	713

\*Includes international, intracity, intercity

\*\*Without Mosavtotrans and St. Petersburgavtotrans. As of 1993, "Rosavtotrans" will be a Russian joint stock trucking company.



SOURCE: Ministry of Transport, RF, 4 November 1992

the context of a changing economy. *A major strategic planning and restructuring effort will undoubtedly be required to position the railway for the future.*

*Impact of Increased Road Transport Traffic.* For the reasons described above, freight and passenger road traffic are likely to increase faster than rail traffic, putting increased demands on the highway infrastructure. *Unless measures are taken to protect Russia's existing highway network from deterioration and collapse, the highway network will constrain the expected growth in road transport.* Poor quality construction or rehabilitation, inadequate maintenance, and the frequently poor quality of bituminous material used in road construction means that at least 38 percent of the trunk road system requires rehabilitation or reconstruction, at an estimated cost of about US\$22 billion in the next five to seven years. Many bridges also need attention.

Without substantial reform and additional funding, the highway sector will not be able to prevent the collapse of Russia's road infrastructure. Efforts to reform the institutional role of highways are encountering difficulties. The government has created a number of "concerns," or companies to replace MOT construction and maintenance organizations and has established road funds to finance works by these newly

created contractors, but the road funds are likely to be insufficient to clear the backlog.

*Impact of Changing Demand on Ports.* The most immediate impact of the dissolution of the USSR on Russian ports was to diminish capacity. For the future, plans to replace that capacity should take several factors into consideration:

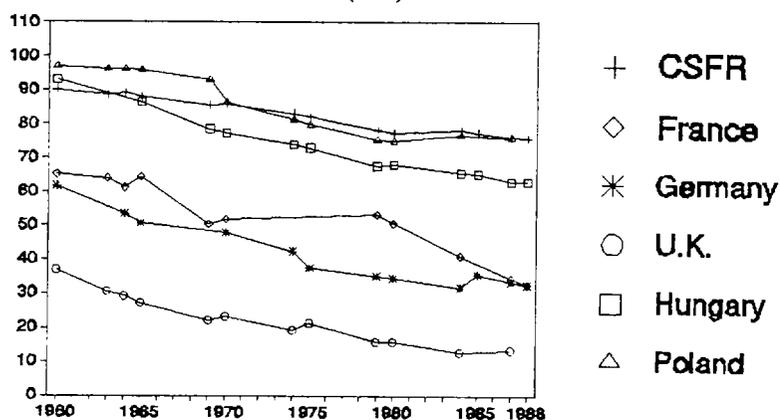
- Russia's grain imports should fall over time as domestic agricultural productivity rises and elimination of subsidies reduces demand for feed grain.

- The evolution and restructuring of the transport system will increase the need for efficient and economical container handling terminals.

In view of the macroeconomic situation, however, it is inadvisable to commit to requested investments without rigorous cost-benefit analyses and without considering individual port corporatization, privatization, and restructuring plans.

*Financial Performance of Transport Entities is Declining.* The decline in transport demand to date, combined with rising fuel prices and inflationary pressures on wages, seriously undermines the financial integrity of Russia's transport system. Until recently, the transport sector showed steady profits in all modes except for urban transport, which was cross-subsidized

Exhibit 1.13 Rail Share of Combined Rail and Truck (tkm)



Source: *Privatization Problems at Industry level: Road Haulage in Central Europe*, Bennathan and Thompson. IBRD Discussion Paper 182, 1992. p 7.

with freight earnings. The single greatest federal fiscal problem in transport has been urban transport, but the explosive growth in deficits on suburban commuter railways and in airline subsidies is also a problem. Public pressure to maintain low prices for urban public transport, intercity passenger air and rail transport, and rail freight transport will be great. Political officials, whose constituencies want to keep rates low in the face of declining individual purchasing power, are under tremendous pressure to let transport wage costs rise along with other enterprise costs, such as spare parts and fuel, while holding down fares. Some highlights are instructive:

- *Railways.* Net income in 1991 for Russian railways was only Rb300,000 compared to an estimated Rb4.6 billion in 1990.<sup>16</sup> Adjusting for inflation makes the situation even worse. The operating ratio eroded from 32 percent in 1988 to 73 percent in 1990 and 99 percent in 1991. MPS is increasingly unable to subsidize losses in passenger traffic, forecast at Rb53 billion in 1992. Total railway losses in 1992 were expected to be Rb73 billion. The Federal budget was revised recently to support capital expenditures for railways, particularly those requiring foreign currency. The 1992 Federal budget included Rb22 billion for rolling stock purchases. The 1993 Federal investment budget includes Rb109 billion for MPS.

- *Airlines.* Aeroflot's operating results are deteriorating in real terms. Although operating income reportedly rose from Rb504.9 million in 1990 to Rb2.5 billion in 1991,<sup>17</sup> expenditures were expected to exceed revenues by R18.6 billion. *As of November 1992, Aeroflot estimated that its revenues cover only 70 percent of its costs.*

- *Road Transport.* Financial data for road transport is difficult to obtain and confusing to analyze since there are so many enterprises that conduct both passenger and freight transport and use the revenues of the latter to support the former. According to figures from the annual statistical compendium National Economy of the USSR, road freight transport was profitable through 1990, total earnings were Rb5.5 million, and it subsidized urban transport. It is not clear whether these figures include freight transported by Agroprom enterprises. In either case, as costs were passed on to customers and there was no

competition among carriers, any normal analysis of profits is irrelevant. Currently, there is no way to assess the financial performance of road transport enterprises accurately, but anecdotal evidence indicates that trucking enterprises are experiencing financial difficulties, particularly as collection of accounts receivable is increasingly difficult.

- *Urban Transport.* Urban transport has historically lost money, but the sector's current financial situation is so poor and worsening so rapidly that funding its increasing deficits is now a major problem for the federal government. According to MOT figures (exhibit 1.14), losses for passenger transport were Rb3.17 billion in 1991, estimated at Rb100 billion for 1992 (October 1992 prices) and expected to climb to Rb1 trillion in 1993. Of these totals, by far the greatest losses are in bus transport.

- *Sea and River Transport, and Ports.* During the Soviet period, ports and water transport companies theoretically covered operating costs out of their service revenue incomes, and the central authorities provided required investment. This objective was hardly ever achieved, and the FSU government had to allocate around Rb20 million a year as operating subsidies to shipping and ports. The Russian Federation not only

Exhibit 1.14 Urban Passenger Transport  
Operational Losses (Rb billions)

	1991	1992	1993 Est.
Buses <sup>a</sup>	1.73	58.3	589.6
Metros	0.34	4.4	11.0
Surface urban electric transport	1.10	23.6	425.0
Total	3.17	100.3	1,014.6
Railway passenger losses			204.0

a. With suburban routes.

Source: Russian Ministry of Transport, given to World Bank mission, November 1992 and June 1993. For railway estimate, Interfax Business Report, No. 29 (432) 11 February 1993, p 3.

Exhibit 1.15 Financing Transport from the State Budget, 1992 (billions of rubles)

Mode	Railways		Aviation		Maritime		Internal Waterways		Road Transport		Total	
	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993	1992	1993
State centralized capital investment	22.0	109	17.80	40.8	2.60	210.4	2.40	14.6	17.40	26.4	62.20	401.2
Education	7.0		2.35		2.00		1.60		0.54		13.49	
Health care	4.0										4.00	
R & D			0.85		0.06		0.06		0.06		1.03	
Maintenance							2.90				2.90	
Hydrographical, rescue & other special services					0.44						0.44	
Subsidy for passenger transport operating losses	1.5		34.80	47.0		2.0	0.40	5.0	81.90	1014.6	118.60	1068.6
Total	34.5	109	55.80	87.8	5.10	212.4	7.40	19.6	99.90	1041.0	202.70	1469.8

Source: Russian Ministry of Transport, provided to World Bank during missions in November 1992 and June 1993.

discontinued such subsidies, but introduced new taxes – 32 percent on ruble profits and 50 percent on foreign exchange income – which now have to be paid by ports and water transport companies. The combined tax and mandatory hard currency transfers to the national treasury are estimated to have reached the equivalent of about US\$400 million in 1992.

*Ability to Make Investments in Equipment and Operations is Declining.* Declining cash flow and inflation is seriously reducing the ability of the transport sector to replace assets and maintain operations. Despite increased expenditures, the ruble's declining value has meant decreasing levels of rolling stock actually obtained. The economic situation in Russia has also lowered the supply side of transport vehicles. The production of trucks decreased by 5 percent from 1991 to 1992, and production and deliveries of rail equipment dropped by even greater levels.

*Transport Losses and Subsidies.* Transport losses have already resulted in the government's

adding provisions to provide subsidy payments in the federal budget (exhibit 1.15), the MOT 1992 budget included about Rb202.66 billion from government to support losses and investments in all modes of transport, excluding highways, for which new road funds were created. Subsidies for operating losses alone were estimated to be Rb118.6 billion, including an estimated Rb89.9 billion to cover losses from municipal urban transport, much of which is financed by the federal budget in the form of subsidies to local and territorial budgets. According to MOT, total urban transport losses are expected to climb to Rb1 trillion in 1993.

*Comparison of Federally Supported Transport Expenditures to the State Budget.* Total expenditures in Russia's 1992 state budget have been estimated by the World Bank to be on the order of Rb7,730 billion. Included in this amount are: state financed investments of Rb459.6 billion, budgeted subsidies of Rb1,315 billion, defense expenditures of Rb855 billion, foreign

expenditures of Rb1,422 billion and other operational expenses, including socio-cultural activities, internal security and administrative costs, of Rb3,640 billion.

Expenditures within any given sector are difficult to compare to the overall budget because costs from each sector are spread among a variety of categories. For comparison, the World Bank has limited its examination to calculating the transport sector's share of budgeted subsidies, unbudgeted subsidies, state financed investments, and implicit subsidies. Comparison of transport subsidy expenditures to the entire federal budget is exceedingly difficult, as the budget categories are being revised and because complete information is lacking regarding transport's share of unbudgeted subsidies from import subsidies or import subsidies through CBR's directed credit programs. Russia's 1992 federal budget expenditures, including defense, directed subsidies, and state investments totalled Rb5.5 trillion, while total revenues were Rb4.7. Total GDP for 1992 has been estimated to be Rb15.7 trillion.

*Budgeted Subsidies.* Based on World Bank analysis of data obtained from the Ministries of Finance and Transport, budgeted transport subsidies totalled Rb143.0 billion including subsidies for operating losses of urban transport and support to airlines and railways for fuel increases and tariff support (exhibit 1.16). *This is equivalent to 11 percent of Russia's budgeted subsidies. World Bank analysis shows that explicit budgetary subsidies throughout the economy are equivalent to 22 percent of GDP; thus, transport subsidies are 2 percent of GDP.*

*Unbudgeted Subsidies.* The federal government also subsidizes enterprises and agencies by subsidizing import and by extending directed credits from the Central Bank of Russia (CBR) through the Ministry of Finance (MOF). These subsidies are estimated to represent 21 percent of GDP. The degree to which such credits are provided to the transport sector is not known, but government support has clearly been given for transport investments where earnings do not cover the cost. "Off-budget" import

subsidies, which in 1992 exceeded the budget deficit as defined by the Ministry of Finance, is another area where the government provides support to the transport sector. Transport's total share of such import subsidies could not be determined, although railways received support for the acquisition of rolling stock imports.

*Implicit Energy Subsidies.* Subsidies – both explicit and implicit – are an impediment to attaining macroeconomic stability and overall economic recovery. Energy consumption is by far the largest subsidy in Russia, and its opportunity cost, measured at the market exchange rate, greatly exceeds total GDP. This subsidy is mainly implicit and results from the large discrepancy between domestic prices and the value of energy at world prices. According to World Bank analysis, implicit subsidies of energy represented 122 percent of GDP in 1992 at an Interbank exchange rate of Rb203/US\$1 (exhibit 1.17). The analysis also attempted to measure the relationship of energy subsidies to GDP, taking into account the effect increased energy exports would have on

Exhibit 1.16 Transport Subsidies Compared to Total State Budgeted and Unbudgeted Subsidies, 1992 (millions of rubles)

	Transport	Total
Budgeted subsidies		677.7
Consumer subsidies		
Public transport	81.9	
Airline tickets, northern regions	24.8	
Railways and aircarriers	36.3	
Subtotal	143.0	
Producer subsidies		637.6
Total subsidies		1,315.3
Percent transport related		11 %
Unbudgeted or partially budgeted subsidies		
Import subsidies		2,721.3
Interest subsidies		3,145.2
Total, unbudgeted subsidies		2,963.1
Total subsidies		4,278.4

Source: Data provided by Russian MOF. Calculations provided by World Bank.

the exchange rate if oil and gas export restrictions are liberalized. The magnitude of energy subsidies was calculated a second time using a simulated exchange rate proposed by the Research Institute on Prices of the Russian Ministry of Economy. The implicit subsidy at the simulated exchange rate of Rb91/US\$1 represented half of GDP. Although the analysis should be treated with caution, it shows the pressing need to rationalize energy prices.

World Bank estimates of the physical volumes of energy consumed show that transport's share of all oil produced in Russia exceeds 22 percent and its share of domestic consumption exceeds 36 percent. *As a share of GDP, therefore, the government's implicit subsidy to transport is between 5 and 13 percent, depending on the exchange rate used. World Bank estimates show that transport's share of electricity consumed in Russia is about ten percent.* As a share of GDP, therefore, the government's implicit subsidy of electricity to transport is between 2.5 and 6 percent (exhibit 1.18).

*State-Supported Investments.* The 1992 federal budget includes Rb62.18 billion for transport investment and 12 percent of the total state investment budget, excluding defense. Railway investments were on the order of Rb22 billion and another Rb42.18 billion supported MOT expenses, including the acquisition of icebreakers. The 1993 federal capital investment budget includes Rb59 billion for MPS to purchase rolling stock and Rb50 billion to construct rail facilities and lines of national importance. The 1993 Federal capital investment budget for MOT totals RB69.4 billion, including Rb14 billion to purchase maritime vessels, Rb14.6 billion for river vessels, and Rb37.9 billion for airplanes. In addition, a Rb196.4 billion fund, to be financed from foreign exchange revenues earned by the maritime fleet, has been established to acquire

new ships. Another Rb26.4 billion is included in the federal capital investment budget, but not within the MOT budget, to purchase buses for urban transport. In determining the priorities for such imports, MOT works closely with MOF. For every dollar spent on imported buses and spare parts, MOF provides eighty cents to cover the exchange rate burden.

*Operating Subsidies.* As inflation continues, these deficits are likely to soar and there will be increasing demands on the federal budget to subsidize various transport operations.

• *Railways.* The revised federal budget of May 1992 estimated railway passenger losses to be Rb53.3 billion, most of which are cross-subsidized by freight earnings; but in mid-year, Rb1.5 billion was added to the federal budget to help subsidize railway passenger losses. MPS' proposed 1993 budget included an allocation of

Exhibit 1.17 Subsidies on Energy Consumption<sup>a</sup> 1992

Type of Energy Used	Subsidy Level (trillions Rb)	Subsidy as Share of GDP (percent)	Subsidy Level (trillions Rb)	Subsidy as Share of GDP (percent)
	Simulated Exchange Rate (Rb91/US\$)		Interbank Exchange Rate (Rb203/US\$)	
Oil	2.1	13	5.5	35
Gas	2.9	18	6.6	42
Coal	0.2	1	0.5	3
Electricity	4.0	25	9.8	62
Total energy <sup>b</sup>	7.9	50	19.2	122

a. Estimates include projections for the fourth quarter of 1992. GDP for the whole year is estimated at Rb15.7 trillion.

b. In order to avoid double counting, Rb3,111 billion (Rb1,408 billion) has been deducted from total subsidies, since 30 percent of coal and 45 percent of gas are consumed by the electric power sector.

Source: World Bank calculations.

Exhibit 1.18 Physical Energy Consumption by Transport Modes, 1992

	Petroleum <sup>a</sup> (million tons)	Electricity <sup>b</sup> (billion kilowatt hours)	Gas <sup>c</sup> (billion m <sup>3</sup> )
Total	91.3	82.89	1.72
Rail <sup>d</sup>	4.3	37.45	
Air (domestic and international) <sup>e</sup>	7.8		
Trucks, intercity buses and automobiles (including Agroprom) <sup>f</sup>	61.0		1.72
Urban buses	2.2		
Inland waterways	10.5		
Maritime fleet <sup>g</sup>	5.5		
Trams, trolleys and metros		45.40 <sup>h</sup>	

a. Total oil production in Russia in 1992 is approximately 399 million tons, of which 250 million tons equate to apparent domestic consumption. Thus, transport's share of oil is in excess of 22 percent of total production and in excess of 36 percent of apparent domestic consumption.

b. Total electricity production in Russia in 1992 was estimated at 852.4 billion kilowatt hours (kWh) by a World Bank/International Energy Agency (IEA) joint mission to Russia in late 1992. Transport's share of electricity in 1992 is estimated to be 10.3 percent, based on the mission's estimates of actual share of electricity consumed in 1990 and 1991.

c. Total gas production in Russia in 1990 was 404 billion m<sup>3</sup>. Transport's share of direct natural gas consumption was only 0.4 percent. Since the number of natural gas powered vehicles remained about the same from 1989 through 1991, it was assumed the 1990 consumption would remain about the same in 1991 and 1992. Transport's share of implicit gas subsidization is accounted for, in great part, in the implicit subsidy to electric power consumption, of which gas is a primary input.

d. Does not include industrial railway energy consumption.

e. Fuel used on international flights (roughly 1.3 million tons) are included since their fuel prices are subsidized by Government. Moreover, as the world price for jet fuel is on the order of US\$188/ton as compared to US\$130 per ton figure for oil used in the analysis of energy subsidies, the estimate of implicit fuel subsidy to this subsector has been understated.

f. Includes 35 million tons/year gasoline consumed by vehicles operating on inter-urban roads and 2.6 million tons/year diesel consumed by vehicles operating on intercity roads.

g. It is assumed that the maritime fleet involved in international trade obtains 50 percent of its fuel (5.1 million tons) while abroad so this difference is deducted from the total maritime fleet of 11.0.

h. 28.1 billion kWh of this total are consumed by trams and trolleybuses (based on 1992 consumption figures). The balance can be attributed to metro system consumption.

Sources: Petroleum information from Interfax reports, PlanEcon data, and World Bank data.

Rail data from *Statistical Report on the World of Railway Transport for 1990*.

Electricity data from *Russia Electricity Demand Forecasts* prepared by IBRD/IEA mission, December 1992.

Aviation data from *Aeroflot Annual Reports, 1990 and 1991*.

Urban transport data from Moscow Resident mission data research.

All others: World Bank analysis of material provided by Russian MOT.

Rb204.4 billion as of November 1992 to cover losses on passenger transport, but the government since decided to require MPS to subsidize passenger losses from freight earnings and has not made any provision to finance rail passenger losses in 1993. This will undermine the railways' long-term sustainability.

- *Airlines.* The government responded to the deteriorating situation of its domestic airlines by providing Rb15.0 billion for airline fuel subsidies in the 1992 budget. The 1993 federal budget also includes Rb25 billion for subsidies for air transport to northern territories. These funds are to be given to the local population rather than the airlines themselves, however, and are expected to at least triple during the year.

- *Urban Transport.* The 1992 budget included Rb81.9 billion for intercity losses of urban transport, most of which appears as unidentified subventions to local governments and in subsidies to territories. MOT officials report total urban transport losses for 1992 to be about Rb100 billion. Although the government allows local authorities to impose municipal taxes to help cover urban transport losses, MOT estimates that such taxes could only cover 40 percent of the losses. The estimated urban transport losses for 1993 are expected to soar to Rb1 trillion.

- *River Transport.* The 1993 federal budget includes Rb5 billion to support inter-regional river transport and the funds are to be given directly to the shipping companies.

- *Ports.* The 1993 federal budget includes Rb1 billion to provide subsidies for about 15 northern ports where trade levels make it difficult for them to be self-sufficient.

- *Maritime.* The 1993 federal budget includes Rb1 billion for subsidies to support about 35 ships in the ice breaker fleet. The subsidy is to pay the difference between costs and revenues of the fleet; tariffs are set by the state commission on tariffs.

- *Air Traffic Control.* The 1993 federal budget includes a first time subsidy for the first year's operation of a newly established air traffic control (ATC) system. The system was previously run as part of Aeroflot and has recently been separated into an autonomous entity. The government is in process of upgrading the system and establishing user fees to finance the operating and capital costs

of the upgrading. It is expected that 70 percent of the fees will be collected in hard currency and the subsidy is expected to be necessary only in its first year of operation.

*Reducing the Fiscal Burden of Transport Losses.* The government is trying to cope with this fiscal crisis by allowing the enterprises to raise tariffs and by introducing criteria for limiting subsidies to specific expenses, such as fuel increases, rather than subsidizing general losses at any cost. Freight transport tariffs have increased frequently in the last two years, by a magnitude of 81.1 for rail, 20 for airline, and 28 for road transport (exhibit 1.19). The tariff increases are not sufficient to arrest the financial decline from high fixed operating costs and the increasing gap between the timing of cost increases and tariff increases. Other specific measures include:

- *Railways.* With respect to increasing losses for suburban and commuter traffic, the government has given responsibility for setting fares to individual railway administrations and local municipalities. Unfortunately, this can put an even greater burden on individual railway divisions which sometime lack the data or clout to push increases through municipal councils.

- *Airlines.* The government has determined to end tariff and fuel subsidies and to permit airlines to raise tariffs to cover costs provided profit does not exceed 20 percent of revenue. It is unlikely the profit ceiling will be a problem, however, as Aeroflot estimated fares would have to be raised 3 to 4 times simply to cover operating costs, and 7.5 times to fully cover costs. Such tariff increases will obviously decrease demand and carriers are reluctant to try to recover capital costs as well as operating costs lest traffic be reduced to what are considered unacceptably low levels. Aeroflot was attempting to balance flight reductions and tariff increases in a manner that maintained about an 80 percent load factor, but now that there are at least 174 domestic airlines, competition and fuel availability are driving the situation. MOT's budget request included provision to subsidize the cost of new aircraft for Aeroflot international and domestic carriers, but no such funds are included in the federal budget. Some sort of directed credits or loans for such purpose are undoubtedly under consideration.

Exhibit 1.19 Transport Tariff Index Adjustments

Freight	from 2 January 1992	on 17 May 1992	from 18 May 1992	Magnitude of Increase from December 91	from 18 September 1992	Magnitude of Increase from December 91
Railway						81.1 <sup>a</sup>
Aviation	5.0		2 <sup>b</sup>	10	2.0 <sup>b</sup>	20.0
Maritime	5.0	1.9	2	19	2.2	41.8
Internal waterway	3.5	1.7	3 <sup>b</sup>	18	2.5 <sup>b</sup>	45.0
Road	3.6	1.9	2 <sup>b</sup>	14	2.0 <sup>b</sup>	28.0
Passenger	from 2 January 1992	on 17 May 1992	from 18 May 1992	Magnitude of Increase from December 91	from 18 Sept 92	Magnitude of Increase from December 91
Railway						13.5
Aviation	3	1.8 <sup>f</sup>	1.5		3.0 <sup>b</sup>	24.3
Maritime	2	1.5 <sup>e</sup>	2.0		1.5	9.0
Internal waterway	2	1.5 <sup>d</sup>	2.0		1.5	9.0
Road	2	2.0 <sup>e</sup>	2.0		2.0	16.0

a. 53.9 for agricultural products

b. free tariffs with rate of return of 35 percent

c. from 1 April 1992

d. from 15 March 1992

e. from 1 March 1992

f. from 27 April 1992

Source: Data provided by Russian MOT to World Bank mission, November 1992.

● *Urban Transport.* The government is trying to reduce the problems of urban transport by devolving responsibility for operations to local municipalities along with the authority to introduce a municipal tax to subsidize transport losses. Some municipalities are raising fares, but it is estimated that only about 15 to 20 percent of costs are currently being covered through the fare box.

To date, however, losses continue and the government has no system of performance criteria in place that would help curb the increases. Subsidies are based on unit costs per kilometer of transport service provided, whether empty or not, without relating them to improvement in performance. MOT reports that losses find their way into the federal budget as subventions to the Federal budget in support of local governments.

● *Waterborne Transport.* River transport operators have now been given complete freedom to fix freight rates and passenger fares. Since early 1992, freight rates have been increased 20 fold and river passenger traffic is rapidly declining. The 1993 budget includes Rb5 billion to cover inter-regional passenger river transport. International ocean transport has also been granted pricing freedom, but the situation is different with cabotage (domestic coastal) trades.

Water transport is not remunerative since cabotage cargo volumes are generally low, and the trade flow is unbalanced. Subsidies may be required to continue cabotage trades serving outlying communities that have no other access to the outside world and thus no way to receive supplies. For this reason, the 1993 budget includes subsidies to ships serving the northern

territories and about 15 northern cabotage ports. Such subsidies now cover the difference between costs and tariffs and have not been designed with an aim at encouraging efficiency and minimizing costs.

### *Improving Fiscal Governance of the Transport Sector*

Reducing subsidies and rationalizing the energy sector are essential to a stabilization and restructuring program in Russia and, if implemented, will help to reduce the fiscal burden of the transport sector. Neither macroeconomic stabilization nor enterprise restructuring can proceed without a rationalization of the transport system and a reduction in the overall volume of its subsidies and transfers. This will require: (a) downsizing and restructuring the system of subsidies and directed credits to enterprises, (b) enforcement of financial discipline on enterprises remaining in the public sector, and (c) reforming energy pricing and taxation, which will yield larger exports and the additional revenue for sustainable adjustment.

- *Limiting Directed State Credits (DSCs).* DSCs represented about half of total bank credit in 1992, yet mechanisms for determining the amounts and recipients of these credits are largely arbitrary and non-transparent. In most instances, no specific, credible conditions for enterprise reform are attached to the credits. DSCs are generally inefficient forms of resource allocation, serving such purposes as compensating for price distortions due to price controls, providing a social safety net, or perpetuating non-viable patterns of production.

To the extent DSCs are aimed at compensating distortions from price controls, the best solution is to liberalize prices. To soften the impact of losses that might result, financial support should be granted to enterprises and conditioned to specific reform measures. For example, where liberalization of fuel prices to urban transport would increase losses, grants should be tied to performance improvement and cost recovery measures. Subsidies to merchant marine fleets operating in the northern zones, transport services to specific communities, for example, should be based on competitive bids.

To the extent that DSCs are given to state procurement agencies, the largest recipients of credits, a federal contract system is needed to bid for needed services and supplies. Where DSCs serve social objectives, such as support for wages in non-profit enterprises, the financial sector should not be forced to assume government responsibilities.

DSCs should be used as little as possible to finance the restructuring or modernization of the economy's productive apparatus, as it is not evident that a recovery in output will require an increase in investment. Such credit decisions should be based on specific proposals with monitorable targets aimed at restructuring enterprises, including downsizing or spinning off ancillary activities, and divesting them of state control. *State owned enterprises to be privatized, closed or liquidated should be denied any access to DSCs.* For example, DSCs should not be used to purchase new aircraft or trucks for soon-to-be-privatized companies, to modernize and expand network capacity for railway freight operations or to expand the merchant marine fleet, unless their full costs are passed on to the newly privatized companies. No directed credits should be provided to the trucking industry or to ports unless they are restructuring.

- *Eliminating Interest Rate Subsidies.* Subsidies to support interest rates should be eliminated entirely to all sectors and the Central Bank's finance rate should be brought into line with market rates.

- *Financial Discipline on State Owned Enterprises.* On a macro level, government should put ceilings on the total amount of subsidies and financial flows available to the whole state owned sector, and then establish borrowing limits and monitor financial flows for each enterprise. To help implement this strategy, the largest recipients of assistance should prepare annual and quarterly business plans, reflecting borrowing limits and targets for financial results. A special entity should be in charge of reviewing and approving these plans and monitoring their implementation. Public investment in these enterprises should, for the most part, be limited to downsizing, passive restructuring, or preparing for privatization.

Railways, airlines, ports, and the merchant marine fleet are increasingly looking to the federal

government for investment support. As the government has decided to privatize airlines, ports, and the merchant marine fleet, investment support to these sub-sectors should be tied to restructuring and privatizing efforts. Where privatization is complete, as in the case of the merchant marine fleet, further credits should not be extended. Recently the government decided to set aside foreign currency earnings of the merchant marine fleet to establish a fund for financing ship replacements. Even if such set asides represented a good use of foreign currency, it is unfortunate that the government will determine which companies are to be eligible for the funds. The railway sector is a large recipient for which periodic plans and performance targets should be set. Within that sector, there is scope for spinning off or privatizing ancillary activities, and it is hoped that government assistance will be linked to such reforms.

*A Sound Investment Policy is Essential to Curb the Growing Fiscal Impact of Transport.* Care must be taken to guard against superficially attractive investments in new infrastructure and equipment that cannot cover their operating and capital costs. MOT is attempting to limit transport investments by permitting airlines and ports to corporatize, ultimately to privatize, and to seek financing for new capital investments from joint ventures. Nonetheless, government has already approved investments by airlines and railways for purchase of rolling stock, continued expansion of rail lines, purchase of replacement aircraft, and development of airports. Most of these investments are being approved in the absence of an assessment of their costs and benefits.

Other investments under consideration involve new generations of aircraft, elaborate air traffic control systems, a new maritime fleet ill-suited to the market, and port investments that duplicate capabilities that were previously part of an integrated FSU port system. Even investments considered for routine replacements of aging aircraft, river vessels, ships, and railway rolling stock should be examined in the face of falling demand and the need to put in place better mechanisms of financial control with parastatals.

Another example is adoption by the government of a decree to establish high speed rail, a project

supported by the Ministries of Economy and Railway. Money has already been allocated for feasibility studies, although MOF reports that the government would permit construction only if it were found to be self-sustainable. Such an investment cannot be self-sustaining and should be discouraged at the outset, particularly in view of current economic conditions and overall priorities for investment. All these investments are being considered seriously by the government. If funded, most donor agencies would consider them major deviations from the government's overall reform efforts.

*Accounting and Financial Management Information Systems.* In order to improve transport, the government and transport managers need to have a better understanding of when and why they are losing money. Current transport accounting systems are a major obstacle to correcting structural and operational inadequacies. Enterprises cannot be restructured, costs cannot be isolated and analyzed, and over investment cannot be rationalized without properly structured operational and financial information.

*Inter-Enterprise Debt.* The government also needs to assist in the restructuring by helping to straighten out inter-company debts and by letting poorly performing enterprises go bankrupt so they do not add to the burden of transport enterprises. MPS spokesmen reported that railways were owed Rb80 billion, whereas other enterprises were owed only Rb40 billion. The problem is exacerbated by the fact that a Central Bank freeze on credits in account number 725 means that many enterprises with positive cash flows have their funds tied up and could not pay their debts even if they were willing to do so. An estimated Rb10.5 billion in credit for all state owned enterprises is in this account.<sup>18</sup>

*Major Restructuring of the Transport Sector Is Needed.* Actions taken by the government to date are not likely to stem the growing gap between revenues and transport costs. The government needs to take a positive decision to resolve the overall problems facing the transport sector. Regarding macroeconomic policies affecting fiscal subsidies, directed credits, and lack of controls on

the finances of state-owned enterprises, the measures are identical to those being applied in other sectors throughout the economy. Regarding specific strategies for remedying the basic organizational, structural, and management problems of transport operating enterprises and government agencies, the measures must be designed to the needs of the entity involved.

In short, major efforts to reform and restructure transport enterprises are needed to control and reduce their claims on state resources. Given the volumes involved, there is no reason for ports, airlines, railways, or road freight transport to lose money and ways exist to keep urban transport losses to a minimum. On the whole, this reform is best accomplished by privatizing as many transport functions as possible and letting the marketplace bring expenses and revenues into line. This is true even for urban transport, but a competitive structure can help keep subsidies to a minimum.

Because of their vertical integration and monopolistic nature, railways, airlines and ports will require specific restructuring and reform to keep them from becoming a major burden. Their current structures are not suited to providing efficient and reliable service in a market economy, nor are their management incentive structures geared to change.

#### Notes

1. *Russian Economic Reform, Crossing the Threshold of Structural Change, A World Bank Country Study*, August, 1992; Table 2-3: Gross Domestic Product by Industrial Origin at Current Prices, 1989-90.
2. *Oxford Analytica* Asia/Eastern Europe 12/31/92. Subject: Political and Economic Prospects for the Former Soviet Republics in 1993.
3. *Russian Economic Reform, Crossing the Threshold of Structural Change, A World Bank Country Study*, August, 1992; Table 2-3: Gross Domestic Product by Industrial Origin at Current Prices, 1989-90.
4. According to ATA's *American Trucking Trends*, 1991-92, gross freight revenues in the trucking industry in the U.S. totalled US\$272 billion in 1990, representing 78 percent of the nation's freight bill and 4.9 percent of GDP. Accordingly, total transport expenses amounted to US\$349 billion and represented 6.3 percent of GDP.
5. Sources: *World Bank Development Report 1991*, Table 30; L.W. International Financial Research, Inc. [Bulgaria, Czechoslovakia]; *The Economist*, January 12, 1991, p 65.
6. Booz • Allen & Hamilton/Travers Morgan. *EBRD Railway Sector Survey of the Railways of Russia, Ukraine, Belarus, and Kazakhstan*, London: July 1992, p 20.
7. PlanEcon is a research and consulting firm founded in 1984 which provides investment advisory services, business consulting, and economic information of Eastern Europe and the former Soviet Union.
8. With 90 percent of energy resources situated east of the Urals, and two-thirds of energy consumption in the European regions of Russia, there has been a systematic growth in the flows of energy from east to west, amounting to 1.15 billion tons of standard fuel in 1990. In the future, these flows will increase to 1.3 to 1.4 billion tons of standard fuel, which will demand a corresponding development in transport. See A. A. Makarov et.al., *Concept of the Energy Policy of Russia in the New Economic Conditions* (Moscow: Energy Research Institute of the Russian Academy of Sciences, September 1992), pp 47-48.
9. *Railway Sector Survey of the Independent States of Russia, Belarus, Ukraine and Kazakhstan*, EBRD Main Report, July 1992, p 21.
10. *Railway Sector Survey of the Independent States of Russia, Belarus, Ukraine and Kazakhstan*, EBRD Main Report, July 1992, p 9.
11. *Russian Economic Reform, Crossing the Threshold of Structural Change, A World Bank*

*Country Study*, August, 1992; Table 2-3: Gross Domestic Product by Industrial Origin at Current Prices, 1989-90.

12. Country Department III, Europe and Central Asia Region, *Food and Agricultural Policy Reforms in the former USSR* (Washington DC: The World Bank, September 1992), p 42.

13. EBRD, *Waterborne Transport Survey: Russian Federation*, Draft Final report, July 1992, NEDECO/HASKONING. pp 4-25.

14. SeaLand, a freight forwarding affiliate of the U.S. transport company CSX, has entered into a joint venture with MPS to operate the "Trans-Siberian Express" Service.

15. Booz•Allen & Hamilton/Travers Morgan, *Railway Sector Survey of the Independent States of Russia, Belarus, Ukraine and Kazakhstan*, December 1992, p 23.

16. The estimate represents 69 percent of the consolidated net income for the entire railway system in the FSU, a figure based on percentage of traffic units hauled on Russian railways compared to the total hauled throughout the system. See exhibit 3.2 for details.

17. Aeroflot Annual Report, 1991.

18. Account number 725 is a special CBR off-balance sheet account for state owned enterprises established to net out receivables against payables reported in the accounts of the banking system and intended to facilitate the settlement of inter-enterprise arrears.

19. L. Kizilova, "Problems and Opinions: Conversion into Joint-Stock Companies. What's Behind It?" Interview with Russian Deputy Minister of Railways K. Kh. Salatov. *Gudok*, 11 September 1992, p 2. Translated as "Deputy Minister on Railway Economic Restructuring" in FBIS, *Central Eurasia* (FBIS-USR-92-130) 10 October 1992, pp 30-31.



# 2

## *Institutional Framework for Transport*

Before reviewing in detail the organization of each transport mode it is useful to have an overall perspective on the organization and the basic institutional issues that transport as a whole faces. This chapter provides that overview, with a brief description of transport organization under the USSR and a discussion of the major institutional anomalies that remain to be resolved. Detailed descriptions of the organizational schemes and institutions for each mode are provided in subsequent chapters.

### *Transport Institutions under the Command Economy of the USSR*

Prior to the breakup of the Soviet Union, annual central plans specified in detail the role of each mode of transport in the movement of passengers and freight. The plan provided the needed funding for investments in fixed facilities and operating equipment, established tariffs for passengers and freight, and coordinated detailed operating schedules for the movement of raw materials, foodstuffs, manufactured goods, and defense shipments. This approach to the organization and operation of the economy obviated the need for an intermediate MOT to coordinate the planning, investment, regulation, administration, and operation of the different elements of the transport sector.

The main elements of the transport sector were fragmented into a variety of ministries that carried out independent transport or transport-related

functions, the financial and operational scope of which was orchestrated by the Ministry of Planning.

- The freight segment of the transport plan was designed to rely primarily on railways to haul freight, except for short hauls and urban distribution.

- For intercity passenger movement, railways and airlines were the principal modes, organized as separate cabinet ministries.

- All aviation services were provided by the Ministry of Civil Aviation (Aeroflot).

- All rail services for freight and passengers, including suburban commuter rail services and major metropolitan subway systems (metros), were provided by MPS.

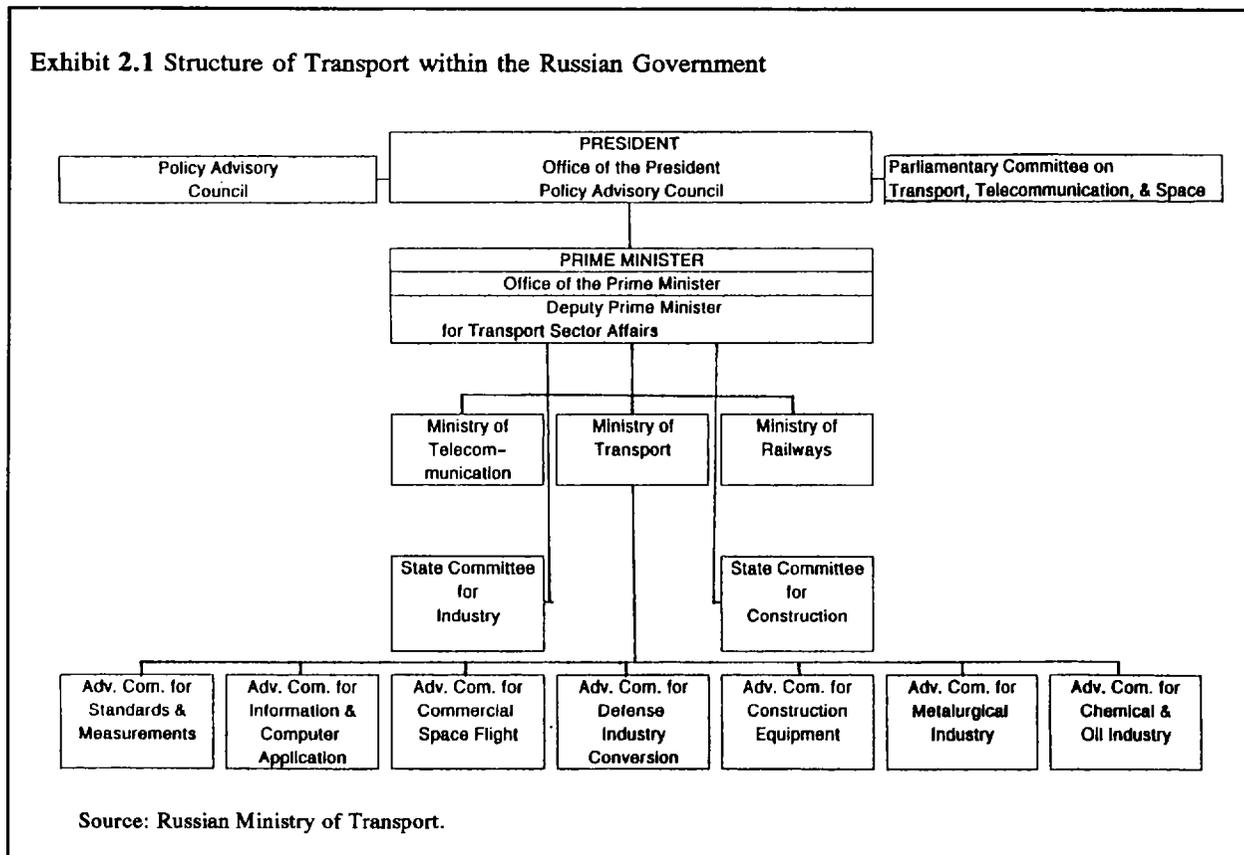
- The waterborne sector was organized into two ministries, the Ministry of Merchant Marine and the Ministry of River Transport.

- Road construction was provided by the Ministry of Construction and the road ministries of the republics.

- Commercial road transport was provided by the Ministry of Automotive Services.

- In addition, most ministries, including those for Agricultural Machinery, Agriculture, Energy, Industry, Finance, Interior, and Defense and Military Industry had transport functions that did, and still do, consist largely of truck transport provided by "own-account" entities – wholly-owned subsidiaries of non-transport-sector parastatal enterprises in sectors such as agriculture and construction.

Exhibit 2.1 Structure of Transport within the Russian Government



Source: Russian Ministry of Transport.

The legacy of the command economy for the transport sector is twofold. First, it left the government completely unprepared to plan and manage a transport sector that could effectively serve a market-based economy. Second, it left the government with a large capital stock of infrastructure and equipment, much of it in poor repair, little of it well suited to effective coordination with other transport modes, and all of it (except railways) dramatically underutilized compared to the standards of the world's best practices.

### ***Current Transport Institutions of the Russian Federation***

In the wake of the dissolution of the USSR and the decision to shift to a market economy, the Russian Federation completely restructured the institutional framework of its transport sector. With the exception of railways which remained as a separate and independent MPS, all the single-mode ministries were incorporated into a new

MOT. In addition to MOT and MPS, there are two State Committees and seven Advisory Committees that still carry out functions related to the transport sector (exhibit 2.1). There are also a number of large, independent, parastatal enterprises; these will be addressed as the organizational framework for each mode is described.

### ***The Ministry of Transport***

The Ministry of Transport (MOT) was formed from the shell of the former Ministry of Automotive Services, which – given the massively increasing role that road transport is likely to play in the reformed Russian economy – may be fortunate. MOT's charter extends to all of transport except railways, although the Ministry has a department to coordinate rail transport policy.

The Ministry consists of three basic organizational clusters: (a) administrative

departments organized along functional lines to exercise authority for regulation, enforcement, training and professional development, research and technology development, international affairs, intermodal transport, and labor relations; (b) small modally-based groups, vestiges of the headquarters of the former independent ministries, which serve as policy advisers to the Minister of Transport and his Deputy Ministers; and (c) large, modally-organized operating administrations that actually carry out the transportation function (exhibit 2.2) In discussions with Ministry officials, MOT's organization was likened by one to a flower, in which the office of the Minister, the policy advisory staffs, and the functional staffs form the center, and the large modal operating administrations make up the petals.

The USSR's command economy was organized and directed through the Ministry of Planning (Gosplan), which coordinated the interaction of production and service enterprises to carry out the economic activity in all sectors called for by the state. The large operating administrations of MOT are large, virtually autonomous, vertically-integrated monopolistic corporate structures of the type that were the principal institutions through which the command economy of the USSR was structured and operated. It is important to set forth a brief account of their structure for two reasons: (a) to understand their massiveness, complexity, and the obstacles they present to change; and (b) to understand the challenge that faces the new MOT as it tries to consolidate effective power over the various elements under its jurisdiction. While most of the modal monopolies have been at least formally integrated into the MOT, some of these organizational remnants of the command economy have proven too politically powerful to be dismembered; it remains to restructure them into smaller, competing enterprises.

*Railways.* The railway system is the only mode over which MOT does not have at least nominal jurisdiction. Russian railways are still organized under MPS. MOT has a small planning or policy advisory staff for railways, but it does not exercise any real power over the railways.

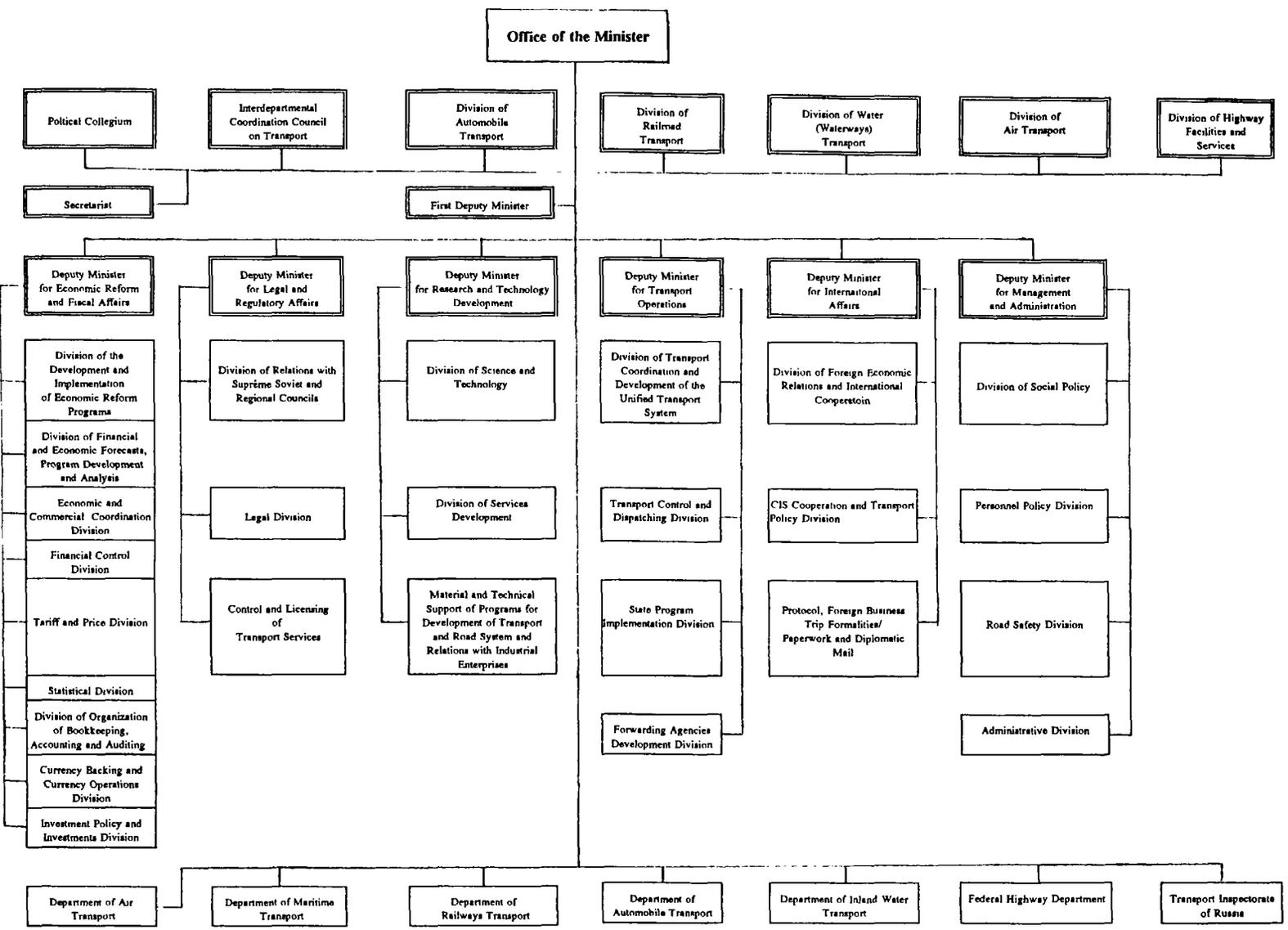
*Road Transport.* The Ministry has organized road transport, which includes both freight and

passenger movement by road, through an umbrella organization called Rosavtotrans, the successor to the former all-union organization Soyuzavtotrans. Rosavtotrans comprises the 78 subsidiary organizations that made up the Russian part of Soyuzavtotrans. These 78 organizations, which were essentially motor transport organizations at the oblast level, in turn controlled some 2,500 separate enterprises and employed 1.3 million people. Since MOT was built on the foundation of the former Ministry of Automotive Services, the Ministry's leadership and core administrative staffs tend to have a more advanced understanding of motor transport issues and operations than of other transport modes. With this greater understanding, however, comes some degree of commitment to preserving traditional patterns of organization, operations, and central direction. For example, MOT has opposed plans to privatize road transport enterprises, which have been supported by the State Commission for the Management of State Property (GKI), to incorporate auctioning off some fraction of the fleets to provide a basis – perhaps under current circumstances the only affordable basis – for starting new, independent, competitive trucking enterprises. Resistance to this plan by MOT is in part responsible for the slow pace of privatization of road transport enterprises.

Within the scope of road transport is urban public transport, which has also been part of the organizational structure of Rosavtotrans. Policy proposals being considered by the Ministry recommend that urban public transport assets be removed from joint passenger-freight organizations, except in cases involving small rural enterprises with only a few trucks and buses. A key to this step is the development of an understanding by MOT of the fundamental difference between trucking and urban public transport operations and the necessity to separate them if each is to be effectively managed.

*Road Construction.* In the USSR, a Ministry of Construction and road ministries in each republic carried out road planning, construction, and maintenance. In 1990, Russia created a single agency, Rosavtodor, to construct and maintain roads and also to be the organizing entity for the

Exhibit 2.2 The Ministry of Transport



Source: Russian Ministry of Transport.

road construction industry. The conflict inherent in this form of organization soon became evident. When MOT was formed, responsibilities for road planning, construction, and maintenance were separated from the road contracting industry and incorporated into the Ministry as the Federal Highway Department (FHD). Rosavtodor became a joint stock company owned by the construction and maintenance companies that were formerly part of it, and it retains – with their support – certain functions such as marketing on behalf of the contracting industry. Rosavtodor, in its new role, is likely to continue to play a major role in determining the structure and function of the road contracting industry, almost certainly serving as a barrier to the reform of contracting procedures and improvements in construction techniques.

FHD and the oblasts carry out road maintenance with autonomous state-owned agencies called uprdors at the Federation level and regional road administrations (avtodors) at the oblast level. Updors maintain about half of the federal road network and regional road administrations maintain the remaining half, plus all regional roads. A major obstacle to rapid privatization and the organization of the road contracting industry has been opposition from some regions in separating administrative and executing functions for construction and rehabilitation projects. At present there is no government policy to privatize routine maintenance activities, given the monopoly position of most of the routine maintenance agencies.

*Aviation.* The Ministry of Civil Aviation was the ministry to which Aeroflot reported in the FSU. Aeroflot was the vertically-integrated, multi-enterprise, monopolistic holding company that included virtually the entire civil aviation sector and which operated as the largest airline in the world. In addition to airline operations, Aeroflot was also responsible for air freight service and development and operation of airports and the air navigation and air traffic control systems. At the regional level, Aeroflot operated through a series of regional directorates based at major city airports throughout the republics.

The key elements of the Ministry of Civil Aviation have been integrated into the Aviation Department of MOT, and some steps have been

taken to restructure the monolithic Aeroflot. The restructuring of Aeroflot into appropriate and separate segments is a major challenge facing the government and MOT. A new Air Traffic Control (ATC) authority has been formed to govern air traffic throughout Russia. Airlines are being separated from airports and permitted to privatize and compete with each other. Aeroflot International has become a joint stock company to be privatized in three years. Domestically there are now 174 carriers, many consisting of regionally based aircraft under the old structure, that are now in the process of corporatizing and competing with each other. The system is still in the process of evolving as described in Chapter 8. Besides the massive political influence of Aeroflot, the complex financial and managerial interrelationships of the different components of the aviation system also present major obstacles to effective restructuring of the monopoly.

*Waterborne Transport.* The historic structure of dual ministries for merchant marine and river transport under the USSR has been reflected in the new MOT by creating a department for each. The Department of Marine Transport incorporates the functions of the former Ministry of Merchant Marine (MINMORFLOT) and also supervises the ports that were part of the maritime transport industry. The new department, however, has less direct authority and fewer financial resources than had MINMORFLOT to finance and control the activities of the maritime sector.

Because river transport in the USSR was handled regionally, the new Department of River Transport is a descendant of the Russian Ministry of River Transport, which was succeeded for an interim period by Rosrechflot, a Russian agency formed to administer Russia's river transport sector. Rosrechflot has been formally dissolved and its functions absorbed into the Department of River Transport. Despite these formal changes, however, the old apparatus that mobilized state resources behind ill-structured and poorly-managed industries is still in place. Plans for large public investments in merchant and river ships and ports should be financed through the private sector, but initial plans for privatizing and restructuring national and river ports are under

attack by interests that seek to preserve them as uncompetitive, worker-owned monopolies. The Ministry faces major challenges and the institutional framework needs basic improvement and reform.

### ***Issues Facing the Ministry of Transport***

Given the revolutionary change in the structure and function of the transport sector in the last two years, it is not surprising that the new Ministry is facing fundamental problems from both internal and external sources. The newness of the Ministry is challenged by strong residues of the old command economy. The modal administrations are much more in control of their operations, plans, and destinies from the financial, planning, and operational standpoints than are the Minister of Transport and his functional and modal policy advisory staffs.

As not only a new but a *new kind* of cabinet ministry for Russia, MOT is charged with a set of responsibilities for which effective institutional capabilities have not yet been developed. The missing or deficient institutional features or capabilities include:

- A clear vision of its proper role and responsibilities, including a proper concept of the fundamental role that the private marketplace should play in the transport sector as a whole, and the governmental framework that is necessary to support effective execution of this role.
- A clear understanding of the structure required for each of the modes of transport to be competitive and efficient in a market economy.
- An internal organization that can create and manage appropriate government policies, programs, and regulations to achieve the transport sector structure and performance required.
- Capability for coordinated planning and budgeting of transport sector investments and Ministry operations.
- An expanded Ministry structure that includes supervision over railways, construction, and other incidental functions essential to the transport mission.

In terms of the framework in which MOT operates, there does not yet exist a coherent governmental process for planning, financing and

managing the transport sector. This means that the interaction of the Ministries of Economy and Finance with the Ministries of Transport and Railways has not yet been structured to make rational plans and decisions about the most efficient manner in which to allocate funds for investment and operations among the various modes of transport.

Another fundamental problem is that the role that the government of the Russian Federation will play is not yet settled in the transport sector in general as well as in each of the various transport modes. This means by definition that regional and local roles also remain to be finally decided.

In this environment, it is difficult to resolve into some final form the structure and function of the various government organizations needed to handle the transport sector at all levels. As a result, a great deal of activity is still taking place within MOT that is, by the standards of most market-based economies, inappropriate for the government or at least for a central government.

The Ministry's leadership clearly recognizes this situation and has expressed an interest in obtaining technical assistance from the World Bank in the broad areas.

- Creating a normative (policy), legal, and regulatory framework for Russia's transport sector suited to the needs of a market economy.
- Making those modifications necessary in the organizational structure of the transport sector at all levels of the government, to equip them to carry out the requirements of the new normative and legal framework.
- Creating a program of professional development and training to provide the education and skills that the transport sector's management and workforce needs to provide efficient and responsive transport services for Russia's economy.

### ***Ministry of Railways***

In the opinion of some Russian officials, MPS is second in importance among ministries in Russia only to the Ministry of Defense. Except for pipeline transport, railways historically moved over 90 percent on a tkm basis of intercity freight, as well as provided indispensable transport for

Russia's armed forces. Viewed by many as the "blood vessels of the country" its importance among transport-related ministries under the command economy was paramount. Following the breakup of the FSU, it was decided after much debate that railways were too important to be made subservient to MOT. Railway transport consequently, is the only mode of transport that has survived with its independent ministry-level status intact.

With the disintegration of the USSR and the integrated system of all-union railways, the size of the Russian MPS has diminished somewhat. Fifteen of the original 32 railways are now in independent republics and Russia's 19 regional railroads have begun to exercise more independent authority over their own assets, operations, and finances.

Despite this erosion of its direct authority over the operating railroads, the power of MPS appears to remain essentially undiminished. In part this is because railway officials have successfully argued their role is so critical that the government should leave the business of running the railways to the experts. No one at the highest levels of the government questions whether shifts in the economy call for a reexamination of the railways' role. Officials at the Ministry of Economy, for example, remain convinced that when the current economic turbulence is stilled, the railways will regain their high traffic levels and their overwhelming freight market share, and that the rest of the surface transport sector will remain in its previous subordinate state. This view is directly contrary to experience in countries around

the world that have undergone the kinds of economic transitions that Russia is now undergoing.

### ***Improvements in the Transport Institutional Framework***

In respect to the institutional framework of Russia's transport sector, there will be prolonged debate over both: (a) the nature and timing of changes needed, and (b) the means through which such changes are implemented. The need for significant changes, however, seems to be widely recognized within the government. Among the types of changes that have been discussed or proposed in recent months are:

- How to restructure airlines, railways, and urban transport to stem rising losses.
- How to privatize the transport sector's vertically-integrated monopolies into properly-sized and competitively-structured enterprises.
- How to establish a coherent process for managing the transport sector, to include setting objectives, deciding government and private sector roles, determining government roles at the federal, regional, and local levels, and creating processes for planning and investment.
- How to develop a new framework of the government policies, laws, and regulations, perhaps codifying them in a basic transport act.
- How to restructure transport institutions and administrative processes to carry out these tasks.

Strategies that the government might consider for designing and implementing these changes will be discussed at the end of each of the following chapters.



## *Railways*

### *The Russian Railway System*

Russia's railway system makes up the bulk of the world's largest and most intensively operated railway system. The former All-Union or Soviet Railways (SZD) was operated as an integrated system across eleven time zones over 148,000 route kilometers with 62,000 locomotives, 1.5 million freight wagons, and 56,000 passenger coaches. SZD carried half of all the world's railway freight traffic and about one-fourth of all the world's passenger traffic. It had the highest traffic density of any railway in the world. If its services were priced at rates charged by U.S. railways in 1990, the total revenue would have been about US\$100 billion. (By comparison, all Western European railways generated only 3 percent of the world's freight traffic and 13 percent of passenger traffic. The United States and Canada combined carry about 23 percent of freight traffic, but generate only about 1 percent of passenger traffic.) Traffic density per route kilometer was 51 million gross tons in 1990. Daily train density averaged 40 trains for freight trains and 20 for passenger trains. The heaviest sections carried over 250 million gross tons annually and 300 trains daily.

With the dissolution of the FSU, SZD was broken up. Independent railways along republic lines were created in February 1992. Except for containers and the fleet of freight cars, all railway installations and assets were allocated among the new administrations, largely according to property location. Locomotives, passenger coaches, and refrigerated cars were allocated according to the location of the depot where the rolling stock was

based. Railway operations were to be coordinated among the Republics by the CIS Railway Transport Council. It was hoped the freight wagon fleet and containers could remain as a commonly owned and operated pool for all the new national railways. In practice, however, the hoped-for integration is in danger of breaking down amid increasing complaints from other republics about sending rolling stock into the "black hole" of Russia. Reluctance among newly-established railways in some republics to finance wagon repairs or make other capital investments that disproportionately benefit others is fuelling a move toward greater independence from Moscow. In November 1992, the CIS council approved a formula by which the freight wagon fleet would be divided among the Republics, and procedures are now being discussed to divide revenues and charge demurrage for interchanged traffic.<sup>1</sup>

The Russian railway system now consists of 19 regional entities operated as an integrated system under the Ministry of Railways (MPS), established by Presidential decree in February 1992 as the legal successor to SZD. Its responsibilities are limited to the ownership and operation of railways within the Russian Federation, two of which were created since the break-up, in Sakhalin and Kaliningrad. The 19 railways within Russia represent roughly 60 percent of the former SZD. Fifteen other railways formerly belonging to SZD but now outside the territory of the FSU are national railways within their respective republics. Of the 32 regional railways, 17 were in Russia, 6 in Ukraine, 3 in Kazakhstan, 2 in Georgia/Armenia, and 1 each in Belarus, the Baltic States, Moldova and Central Asia. Each of

Exhibit 3.1 Coverage and Performance of the Former USSR Regional Railways Compared to Other Major Railways, 1990

Republic/ Country	Railway Name	Line Km	Percent of Russia Total	Percent of USSR Total	Tkm (million)	Percent of Russia Total	Percent of USSR Total	Pass-km (million)	Percent of Russia Total	Percent of USSR Total
Russia	October	10,186	11.85	6.91	160,982	6.38	4.33	42,547	15.57	10.20
	Moscow	9,360	10.89	6.35	178,303	7.07	4.80	80,544	29.48	19.31
	Gorkiy	5,673	6.60	3.85	191,926	7.61	5.16	20,987	7.68	5.03
	Northern	6,027	7.01	4.09	170,977	6.78	4.60	12,091	4.43	2.90
	North Caucasus	6,486	7.54	4.40	142,884	5.66	3.84	17,471	6.40	4.19
	South East	3,648	4.24	2.48	144,906	5.74	3.90	10,044	3.68	2.41
	Volga	4,098	4.77	2.78	74,292	2.94	2.00	7,170	2.62	1.72
	Kuibishev	4,835	5.62	3.28	178,457	7.07	4.80	14,090	5.16	3.38
	Sverdlovsk	7,070	8.22	4.80	186,610	7.28	4.94	15,514	5.68	3.72
	South Urala	4,937	5.76	3.35	258,374	10.24	6.95	10,844	3.97	2.60
	West Siberia	4,181	4.86	2.84	232,994	9.24	6.27	12,999	4.76	3.12
	Kemerovo	1,916	2.23	1.30	68,065	2.70	1.83	4,005	1.47	0.96
	Krasnoyarsk	3,167	3.68	2.15	112,317	4.45	3.02	5,861	2.15	1.40
	East Siberia	2,665	3.10	1.81	132,389	5.25	3.56	6,069	2.22	1.45
	Trans Baikal	3,436	4.00	2.33	163,171	6.47	4.39	5,256	1.92	1.26
	Far East	4,432	5.16	3.01	93,037	3.69	2.50	6,628	2.43	1.59
Baikal	3,853	4.48	2.61	36,231	1.44	0.97	1,056	0.39	0.25	
Total	Amur(BAM)	85,970	100.00	58.34	2,522,915	100.00	67.87	273,176	100.00	65.48
Ukraine	South West	4,681		3.18	94,680		2.55	24,074		5.77
	L'vov	4,521		3.07	50,342		1.35	8,654		2.07
	Odessa	4,242		2.88	78,925		2.12	10,744		2.58
	Southern	3,715		2.52	82,449		2.22	17,538		4.20
	Dnepr	3,254		2.21	88,378		2.38	11,973		2.87
	Donetsk	2,903		1.97	93,469		2.51	9,015		2.16
Total		23,316		15.81	488,243		13.14	81,998		19.66
Kazakhstan	W. Kazakhstan	3,817		2.59	116,076		3.12	7,542		1.81
	Tselinnaya	5,750		3.90	175,767		4.73	5,240		1.26
	Alma Ata	4,581		3.11	115,125		3.10	6,951		1.67
Total		14,148		9.60	406,968		10.95	19,733		4.73
Georgia/ Armenia	Azerbaijan	2,137		1.45	37,076		1.00	1,827		0.44
	Trans Caucasus	2,346		1.59	15,479		0.41	2,813		0.67
Total		4,483		3.04	52,555		1.41	4,640		1.11
Estonia, Latvia, Lithuania	Baltic	6,278		4.26	45,530		1.22	11,778		2.82
Belarus	Belarus	5,507		3.74	75,428		2.03	16,852		4.04
Uzbekistan/Turkmenistan/Tadzhikistan/ Kyrgyzstan	Central Asian	6,330		4.30	110,660		2.98	7,365		1.77
Moldova	Moldova	1,328		0.90			0.40	1,626		0.39
Total for the System		147,360		100.00	3,717,081		100.00	417,168		100.00
U.S.	Burlington/Northern	37,438	43.55	25.41	345,488	13.69	9.29			
	Conrail	20,690	24.07	14.04	124,982	4.95	3.36			
	US All Class I	193,158	224.68	131.08	1,530,743	60.67	41.18			
W. Germany	German Federal RR	27,045	31.46	18.35	61,357	2.43	1.65	43,560	15.95	10.44
France	SNCF	34,070	39.63	23.12	49,677	1.97	1.34	63,761	23.34	15.28
Great Britain	British Rail	16,584	19.29	11.25	15,986	0.63	0.43	33,191	12.15	7.96
Sweden	Swedish State RR	10,081	11.73	6.84	18,756	0.74	0.50	6,076	2.22	1.46
India	Indian RR	62,637	72.86	42.51	229,601	9.10	6.18	295,644	108.22	70.87
China	Ministry of RR	53,378	62.09	36.22	1,060,100	42.02	28.52	263,530	96.47	63.17

Source: EBRD/Booz \* Allen Study, p 67 and World Bank Railway database.

Exhibit 3.2 Soviet and Russian Railway Categories and Employment Levels (thousands)

Category	1989	1990
Transportation (operations)	1,813.6 <sup>a</sup>	1,862.5 <sup>a</sup>
Capital repair (track and buildings)	117.5	108.8
Rolling stock repair by MPS (not in factories)	599.4	598.9
Loading/unloading of cargo for customer account	48.3	47.4
MPS headquarters staff	2.2	2.3
Scientific Research Institutes	6.6	6.4
Specialist training facilities	34.2	34.2
Schools and kindergartens	174.7	177.1
Hospitals	224.8	226.0
Central procurement and supply department	1.0	1.0
Basic rail activity (subtotal)	3,022.3	3,064.6
Main rolling stock repair and spares production	153.5	146.8
Plants of "Soyuzhelavtomatizatsiya" (automation)	13.4	13.0
Plants of "Spetzhelbeton" (concrete sleepers)	9.9	9.6
Plants of "Remputmash" (track repairs)	5.8	5.7
Main department for containers	1.4	1.4
Plants for electrification and electric supply	1.3	1.2
"Transgossnab" (all union supply organization)	0.6	0.5
"Kuskovo" (producing lubricants)	0.1	0.1
Railway shops and depots	29.8	28.6
Metropolitan shops	1.3	1.3
MPS manufacturing enterprises (subtotal)	(217.1)	(208.2)
Metropolitans	46.9	47.7
"Glavpromzheldortrans" (MPS on industrial railways)	53.2	53.0
Other organizations	15.9	15.5
Construction activities	86.1	78.1
Project-related organizations	12.6	12.2
Supply services for employees (groceries)	237.8	234.5
Railway restaurants	81.5	79.7
MPS Total	3,773.4	3,793.5

## Russian Railway Employment Categories, 1992

Basic activity (operations)	1,635.0
Trade and social nourishment (railway restaurants, etc)	141.0
Education	137.0
Health care	126.0
Industry	110.0
"Promzheldotrans" concern (MPS on industrial railways)	38.0
Construction	29.0
Operational activities by specific function	1,351.0
Locomotive operations	324.0
Capital repair (track)	276.0
Wagon operations	193.0
Passenger operations	169.0
Transport operations	145.0
Freight and commercial work	102.0
Signaling, communications and computer technology	87.0
Electrification and electric supply	55.0
Total employment	2,240.0

a. Note that these numbers are slightly different from the amounts of 1,794.8 and 1,873.4 for the years 1989 and 1990, respectively, shown in *Statistical Report on Operation of Railroad Transport* published by the USSR Transportation Ministry. Operational activity employment levels for the 17 Russian Railways in 1990 amounted to 1,129.0

Sources: Data provided to World Bank mission by MPS, November 1992; Railways of the Russian Federation for 1991 and 1992, published by TsNITTEI, MPS' Central Scientific Research Institute of Information and Technical Economic Research of Railway Transport.

the 19 Russian regional railways is a "geographic monopoly", without competition for traffic (map 1). Exhibit 3.1 lists the former USSR railways by name and shows their relative importance in terms of percentage of the total system's traffic levels.

*Organization of MPS.* MPS is an *independent* ministry, reporting directly to the Council of Ministers. MPS has its own budget and policies and is responsible for coordinating all railway operations as well as for determining rail policy, the legal framework governing railway operations, and the planning and allocation of investments including construction of new railways. MPS itself is a coordinating body with a staff of about 2,300. About 2.24 million railway employees, of whom about 1.6 million are actually engaged in railway operations, work for the regional railways, which typically enjoy great independence from the center (exhibit 3.2).

As a coordinating agency, MPS (a) defines general system policies and technical standards, (b) sets tariffs, (c) collects and apportions revenues among the regional railways, (d) schedules trains system-wide (up to one year in advance!) (e) coordinates investment planning among the regional railways (f) allocates centrally controlled investment funds, and (g) generally serves as the interface between central government and the railway system. MPS is also the single buyer of rolling stock, track machinery, and other equipment for the individual railways, on a contractual basis with the railways financing their own purchases.<sup>2</sup>

At the time of its creation, there was considerable discussion of having MPS become an operating entity reporting to MOT. On the grounds that the railway system was too important to the country to be made subservient to another ministry, or put on a level with other transport modes, MPS argued that its ministry status should be continued. Although MPS' view ultimately prevailed and it does not report to or through MOT, the responsibility of coordinating rail policies within the overall government transport policy context rests with MOT. MOT's ability to carry out this coordination is severely limited because MPS has no incentive to share

information openly about its operations or problems.

*Ancillary Activities.* As in most socialist countries with planned economies, SZD was far from being just a railway. Nearly 500,000 of SZD's 3.8 million employees, worked in schools, hospitals, and restaurants for railway employees, and another 200,000 were engaged in activities industrial activities, mostly manufacturing. Essentially none of these employees would be found on a railway payroll in the west. It is questionable whether many of the central functions – including many administrative functions, manufacturing, research and other overhead activities – would be sustainable if the regional railways were asked to pay for them directly.

*Responsibility for Operating the Urban Subway System.* Until 1992 MPS was responsible for operating subways or metros in 13 FSU cities. Approximately 48,000 MPS employees were associated with this effort. The decision to make MPS responsible for all the urban metro systems in the country was made with the belief that profits, primarily from freight, could subsidize metro losses. Following the breakup of the FSU, in 1992 it was decided that responsibility for the metros should rest at the municipal level, and the transfer has been completed.

*Industrial Railways.* Besides the MPS rail system, some 151,000 km of industrial or "own account" railways exist throughout the CIS, making the entire CIS track length about 300,000 km, more than the paved highway network in Russia. Many industrial lines are internal to the industries they serve; others are shuttle lines between raw materials, plants, or main railway lines. The industrial railways hauled some 11.4 billion tons in 1990, but the average length of haul was only 7 km.

### *Traffic Levels and the Importance of Rail to the Economy*

*The Role of Rail in the Economy.* MPS has long played a critical role in the Russian economy, far more than would have been the case in a market economy. Although a significant amount of non-

Exhibit 3.3 Former USSR Railway Data

Year	GDP at Constant Ruble (billions) <sup>1</sup>	GDP <sup>2</sup> Deflator	Freight Tons (000)	Freight tkm (000,000)	Freight Revenue Rubles (000,000)	Passengers (000)	Pass-km (000,000)	Passenger Revenue Rubles (000,000)	Km of Line Total (000)	Km of Line Electric (000)	MPS Total Employees (000)	Transport Operations Employees (000)
1940			605	421			100		106.1	1.9		1,369
1960			1,884	1,504		2,231	176		125.8	13.8		1,916
1970 <sup>3</sup>	382		2,895	2,495		3,354	274		135.2	33.9		1,889
1980	648	0.955	3,728	3,440		4,072	342		141.8	43.7	3,852	2,074
1981	673	0.966	3,762	3,503							3,995	2,101
1982	699	0.991	3,725	3,465							4,020	2,114
1983	730	0.993	3,833	3,600		4,161	362		143.6	46.8	4,014	2,114
1984	760	1.000	3,906	3,639		4,161	364		144.1	47.9	4,004	2,095
1985	777	1.000	3,951	3,718	14,454	4,166	374	3,112	144.9	48.4	3,985	2,077
1986	803	0.968	4,076	3,835	14,893	4,345	390	3,283	145.6	50.6	3,888	1,993
1987	825	1.000	4,067	3,825	15,016	4,360	402	3,403	146.1	51.7	3,816	1,870
1988	872	1.003	4,116	3,925	15,393	4,396	414	3,484	146.7	52.9	3,795	1,847
1989	898	1.029	4,017	3,852	15,004	4,323	411	3,468	147.4	53.9	3,800	1,873
1990	880	1.087	3,872	3,717	20,198	4,274	417	3,574	147.5	54.3	3,781	1,859
1991	730	2.069	3,574	3,365	33,703	3,527	383	5,157	147.5	55.2	3,744	1,877
1992	478	36.305	1,632	1,966	438,000	2,372	253	21,000	87.5	37.8	2,240	1,635

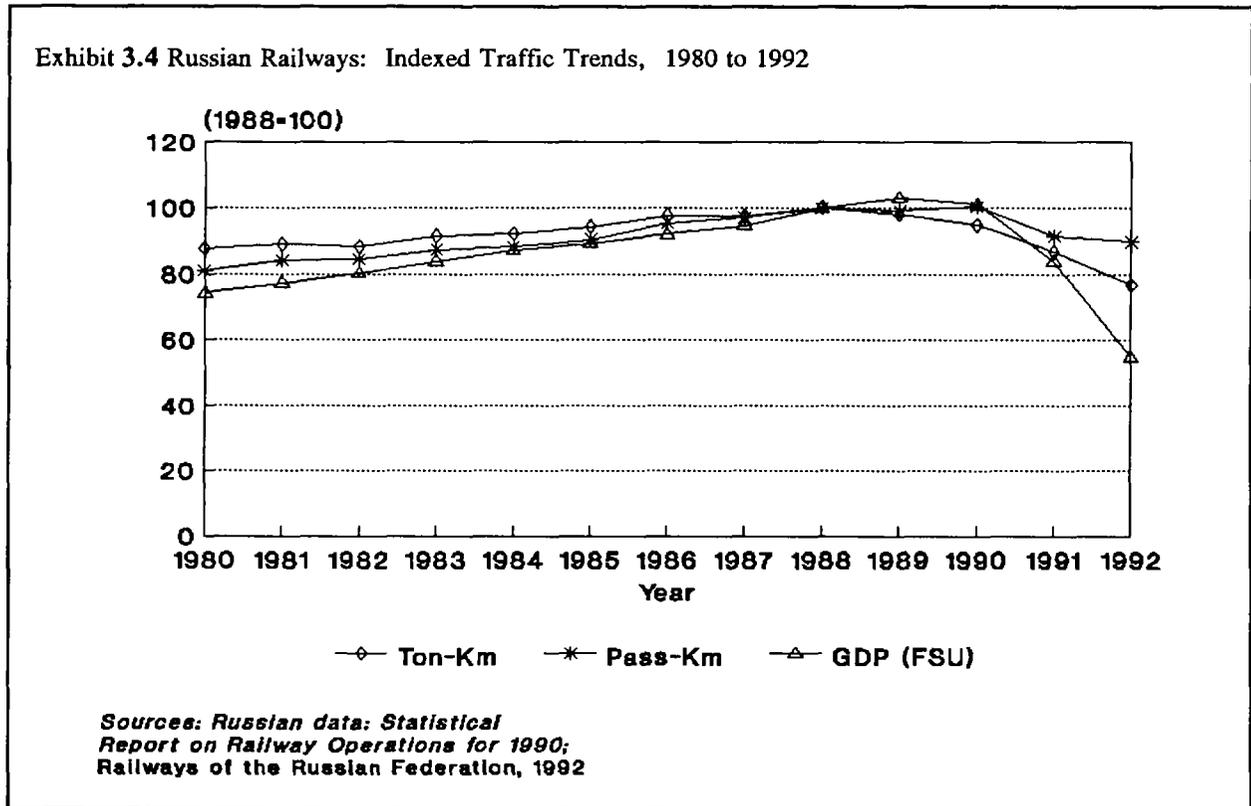
1. GDP at market prices in constant 1987 rubles.

2. Based on GDP at current and constant prices, base year 1987.

3. Transport operations employees (000) in years:

1971	1,908	1974	1,948	1977	1,985
1972	1,922	1975	1,958	1978	2,016
1973	1,935	1976	1,966	1979	2,030

Source: *Historically Planned Economies - A Guide to the Data* by Paul Marer, et al., World Bank 1992, pp 206. 1990 (-2.0 percent) and 1991 (-17 percent) estimates from *Economy of the Former USSR in 1991*, IMF Economic Review, April 1992, Table I, p 41.



water traffic has been shifted from rail to pipeline following the growth of oil production, rail carried 98 percent of the land tkm in 1960, and still carried 96 percent in 1988 (exhibit 3.3). MPS's traffic has grown more or less directly with the economy (exhibit 3.4).

MPS freight traffic, which amounted to 1.95 billion tons on the broad gauge network in 1991, makes up the for-hire, or common carrier, portion of rail freight traffic. Industrial railways that haul their own freight carried 5.789 billion tons, or almost three times the common carrier tonnage, in 1991. *For all practical purposes, surface transport, excluding pipelines, in Russia is rail, and will remain so for the foreseeable future despite an expected shift to road transport.*

*Freight Traffic.* With some exceptions, rail carries at least 60 percent, and often more than 80 percent, of commodity tonnage (exhibit 3.5). Petroleum travels primarily by pipeline: agricultural grain and milling products account for much of the trucking tonnage, since trucks provide the first journey from farm to collecting

point. On a percent of tkm basis, rail's dominance is even greater because the average length of haul for rail is almost 1,000 km, whereas the average length of haul for trucking is barely 30 km. Only for oil products is rail's tkm share less than its tonnage share.<sup>3</sup>

The tkm measure adds particular emphasis to the critical role of the railway in the functioning of the Russian agricultural and energy systems. More than 90 percent of the tkm of Russian agricultural products move by rail, whereas only about 25 percent of the tonnage recorded moves by rail. This is because virtually all trucking tonnage is counted repeatedly as it moves from farm to storage to processing to rail, and from rail to market; rail tonnage is usually only counted once. Virtually all long hauls of agricultural commodities go by rail.<sup>4</sup> Rail's predominance in Russian energy transport is even greater, with over 97 percent of coal tkm moving by rail, and about 25 percent of petroleum tkm, compared with about 3 percent in the United States. The Russian economy would literally not be able to produce electric power or most of its industrial

products if the railway ceased to function properly. The efficiency of railway transport will play a key role in the ultimate efficiency of these sectors.

SZD generated 23 percent of the world's rail passenger-kilometers (pass-km) making it the largest rail passenger carrier in the world, with almost twice the volume generated in Japan, the largest passenger carrier in the developed world. MPS is still the world's largest passenger carrier, with over 15 percent of the world's rail pass-km in three separate markets:

- *Intercity passenger services*, for which MPS had one of the longest average trip lengths in the world and was the largest carrier in passenger volume.
- *Suburban passenger services*.
- *Commuter services*, which in the past included operation of metro subways, now operated by their respective municipalities.

*Rail Traffic in Decline.* Rail traffic in Russia and throughout the CIS has fallen precipitously from its 1988 peak. Since then, freight volumes are about 26 percent lower, and passenger traffic has declined by 17 percent. These declines reflect

the drop in overall economic activity in Russia, but also presage a changing economic role. *Experience in other countries passing through similar periods of restructuring and transition has shown that socialist economies use too much transport, and much of the excess is in the rail mode.* Central and East European (CEE) countries are experiencing a drastic drop in rail demand compared with Germany and France. Use of transport per U.S. dollar of GDP supports the same conclusion (exhibit 3.6).

*Short Haul Truck Transport.* Far more rail traffic is carried over relatively short distances in Russia (nearly 18 percent of tonnage moves less than 100 km) than elsewhere, including China or the United States (exhibit 3.7). As a market economy develops and shippers become free to choose modes of transport, short-haul rail traffic will be highly vulnerable to competition from trucking, which offers door-to-door service, more flexibility, and greater reliability. Moreover, it is probably unprofitable for rail to carry such short distance traffic, a conclusion railways will undoubtedly reach when they measure market costs and revenues according to lines of business.

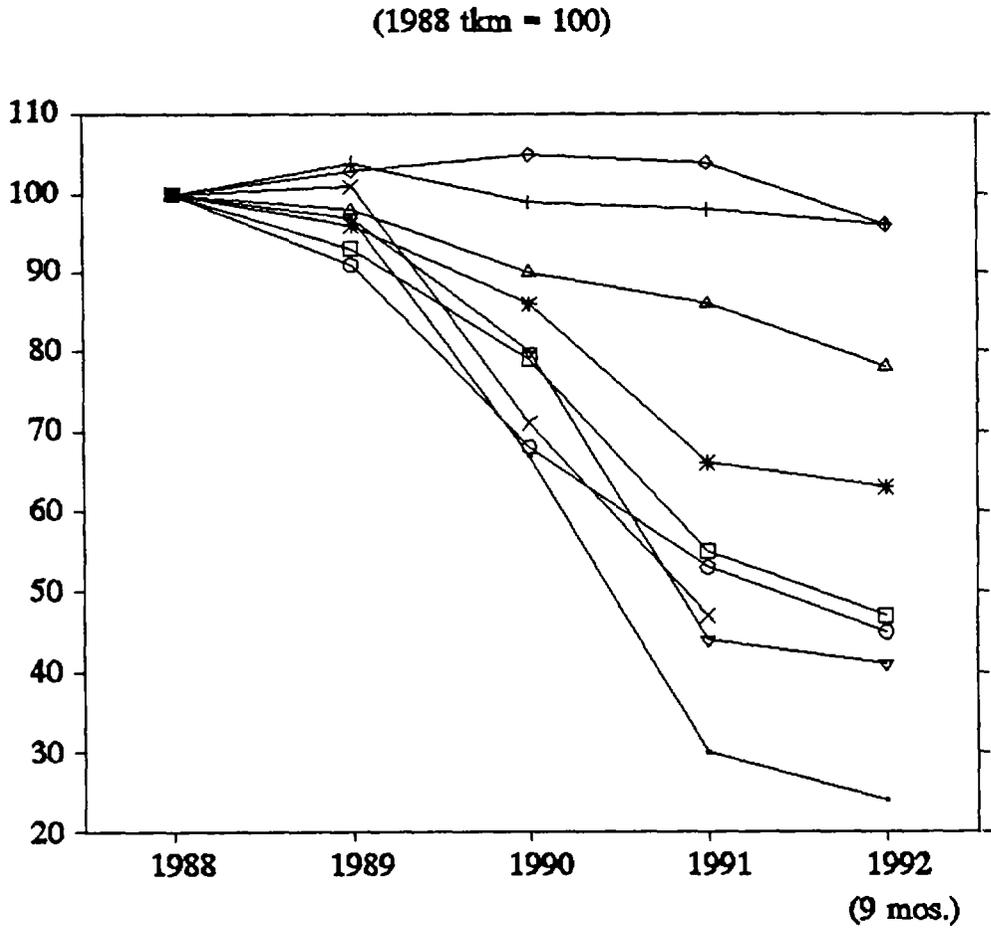
Exhibit 3.5 Percentages of Common Carrier Shipments by Type of Transportation (tons)

Freight Category	Rail	Shipping	Inland Water	Trucking	Pipeline	Total
Coal	90.1	1.3	2.3	6.3		100
Coke	95.8	1.9	0.3	2.0		100
Petroleum products	32.8	7.7	2.9	4.7	51.9	100
Iron & manganese ore	93.2	3.6	2.4	0.8		100
Nonferrous ore & sulphur raw materials	76.0	6.4	3.0	14.6		100
Ferrous metals	75.9	3.6	1.4	19.1		100
Chemical & mineral fertilizers	88.0	4.1	3.0	4.9		100
Cement	85.6	1.7	1.1	11.6		100
Forest products	60.0	4.4	24.4	11.2		100
Perishable food products <sup>a</sup>	95.0	4.9	0.1			100
Grain & milling products	51.4	7.2	2.1	39.3		100
Combined feed	70.5	5.4	1.5	22.6		100

a. Including meat, poultry and animal oil.

Source: Goskomstat USSR, *Transport i Sviyaz, Statisticheski Sbornik, Moscow, 1990, p 36.*

Exhibit 3.6 Rail Freight Traffic Trends in Europe, 1988 to 1992



- ◇ DB Deutsche Bundesbahn (former West German State Railway)
- DR Deutsche Reichsbahn (former East German State Railway)
- \* CSD Ceskoslovenske Statni Drahly (former Czechoslovakia State Railway)
- PKP Polskie Koleje Panstwowe (Polish State Railway)
- MAV Magyar Allamvasutak (Hungarian State Railway)
- △ FSU SZD or old MPS
- + SNCF Societe Nationale des chemins de fer Francais (French Railway)
- ∇ BDZ (tons) Bulgarian State Railway
- × CFR Caille Ferate Romone (Rumanian Railway)

1992 FSU is actually based on Russia for first 5 months. 1992 BDZ is estimate for entire year.

Source: Blackshaw and Thompson, *Railway Reform in the Central and Eastern European Economics*, Transport Policy Research Working Paper 1137, May 1993

*Effect of the Break-Up of the USSR.* Because of its highly integrated operations, few institutions were more heavily affected by the break-up of the USSR and the subsequent troubled relations among CIS states than was Russia's railway system. The breakup has had a number of adverse effects on rail operations, as well as on managerial areas such as rate setting, revenue divisions, and wagon management. Given so many uncertainties over the future of the CIS and the form of railway management structures, there are no immediate prospects for resolution.

- *Traffic Levels and Patterns Disrupted.* Existing traffic patterns, based on traditional sources of supply and consumption, have been greatly disrupted. Much traffic that used to flow as a result of the larger planned economy no longer flows, and traffic will never return to the patterns of the past.

- *New Borders Delaying Transit Times.* Although trains are still scheduled centrally, border formalities have increased and trains continue to be stopped to change crews and

locomotives. These disruptions to schedule are costly, both to the railways involved and to the service needs of the shipper.

- *Inter-Railway Interchanges.* An enormous amount of what once was single-line traffic must now transit two or more systems, each with its inevitable delay and processing time. Exhibit 3.8 shows the daily wagon load flows among states, and among the former regional railways. Although only about 17 percent of Russia's traffic originates or terminates outside Russia, over 40 percent of Kazakhstan's originated traffic, and about half of Belarus' originated traffic, terminates elsewhere. About 60 percent of the traffic terminating in the Baltics, and 75 percent of the traffic terminating in Moldova actually originates in another state. The weakest points of all railway networks are always at the borders, and the CIS has created a large number of interchange points where none previously existed.

- *Freight Wagon Management.* The division of rolling stock among republics has put an end to centralized wagon control and maintenance as well

Exhibit 3.7 Common Carrier Rail Traffic (percentage, tkm)

Kilometers	Midpoint	Frequency Distribution			Cumulative Distribution		
		China	USA	FSU	China	USA	FSU
0-50	25	7.8	3.9	9.6	7.8	3.9	9.6
51-100	76	5.2	4.0	8.7	13.0	7.9	18.3
101-200	151	11.0	5.2	13.3	24.0	13.1	31.6
201-300	251	10.1	11.4	9.3	34.1	24.5	40.9
301-400	351	9.3	5.2	7.7	43.4	29.7	48.6
401-500	451	6.4	4.7	5.3	49.8	34.4	53.9
501-600	551	5.9	7.2	4.4	55.7	41.6	58.3
601-700	651	6.9	7.0	3.4	62.6	48.6	61.7
701-800	751	5.1	4.2	2.7	67.7	52.8	64.4
801-900	851	4.3	4.7	2.7	72.0	57.5	67.1
901-1,000	951	3.2	4.9	2.5	75.2	62.4	69.6
1,001-1,200	1,101	5.3	4.1	4.7	80.5	66.4	74.3
1,201-1,500	1,350	6.0	8.5	5.3	86.5	74.9	79.6
1,501-2,000	1,751	6.5	10.0	6.3	93.0	84.9	85.8
2,001-2,500	2,251	3.9	5.9	3.9	96.9	90.8	89.7
2,501-3,000	2,751	1.7	4.0	2.8	98.6	94.8	92.5
3,001-4,000	3,501	1.2	3.7	3.8	99.8	98.5	96.3
4,001		0.2	1.5	3.7	100.0	100.0	100.0

Source: China - Ministry of Railways as given to World Bank mission.  
 USA - ICC wage bill data.  
 FSU - *Moscow Transport*, 1990, p 100.

Exhibit 3.8 Daily Wagon Loads in CIS by Republic

	Azer- baijan	Baltics	Belarus	Central Asia	Georgia/ Armenia	Kazakh stan	Moldova	RUSSIA	Ukraine	Total	Termination outside CIS	Percent
Azerbaijan	1,131	15	27	34	320	24	3	477	122	2,153	1,022	47
Baltics	53	2,664	180	52	35	52	31	1,060	308	4,435	1,771	40
Belarus	57	496	3,429	131	74	111	162	1,434	947	6,841	3,412	50
Central Asia	19	53	66	4,411	21	386	18	860	146	5,980	1,569	26
Georgia/ Armenia	163	18	27	47	1,623	44	22	537	149	2,630	1,007	38
Kazakhstan	70	69	57	1,136	89	8,586	28	4,950	247	15,232	6,646	44
Moldova	15	40	33	17	14	36	615	415	206	1,391	776	56
RUSSIA	629	2,608	1,370	2,062	1,110	2,941	468	87,776	7,011	105,975	18,199	17
Ukraine	234	674	1,071	345	301	318	1,105	7,387	36,531	47,966	11,435	24
TOTAL	2,371	6,637	6,260	8,235	3,587	12,498	2,452	104,896	45,667	192,603	45,837	24
Origination outside CIS	1,240	3,973	2,831	3,824	1,964	3,912	1,837	17,120	9,136	45,837		
Percent	52	60	45	46	55	31	75	16	20	24		

Horizontal Axis: Wagon Loads To.

Vertical Axis: Wagon Loads From.

Source: World Bank estimates.

as to the former free flow of wagons throughout the system. This breakdown will have a major effect on asset utilization and maintenance costs. The difficulties of coming to grips with this issue were demonstrated at the February 1993 meeting of the CIS Railway Transport Council in Almaty, where reportedly the most heated debate centered on charges for using freight cars and a system for settling those charges between railway administrations. The railways at the council meeting could not even reach agreement on the system for distributing expenses for development of such a system.<sup>5</sup>

- *Disruption in Equipment Supplies.* Sources of equipment and spares critical for MPS, which used to be available within the ruble zone, are now only available for hard currencies. Freight diesel locomotives came primarily from Ukraine, passenger coaches from the former GDR, electric suburban passenger coaches from Latvia, and electric passenger locomotives from the former Czechoslovakia. Although declines in traffic currently enable railways to cannibalize surplus equipment in the near term to cover shortages, the disruptions are highly threatening for the longer term. Out of necessity the situation is prompting development of local sources of supply within each republic.

- *Creation of the CIS Railway Transport Council.* To prevent the total disintegration of rail operations within the CIS, a CIS Railway Transport Council was established early in 1992 to coordinate functions formerly performed mandatorily by the old MPS (exhibit 3.9). The Council, which includes representatives from all member-states and from Baltic countries as observers, has several charges.

- To determine amounts and procedures for dividing revenues among regional and independent republic railways for interline shipment revenue divisions. The Russian MPS actually continues to administer the revenue divisions for all railways, but Ukraine and Belarus intend to take over their own revenue management activities as soon as possible.

- To coordinate rate and tariff setting for traffic among the independent states.

- To set common technical standards and monitor maintenance levels for the wagons used in interchange traffic among CIS railways.

- To ensure that each state keeps an adequate wagon fleet.

- To set interline charges for wagon use.

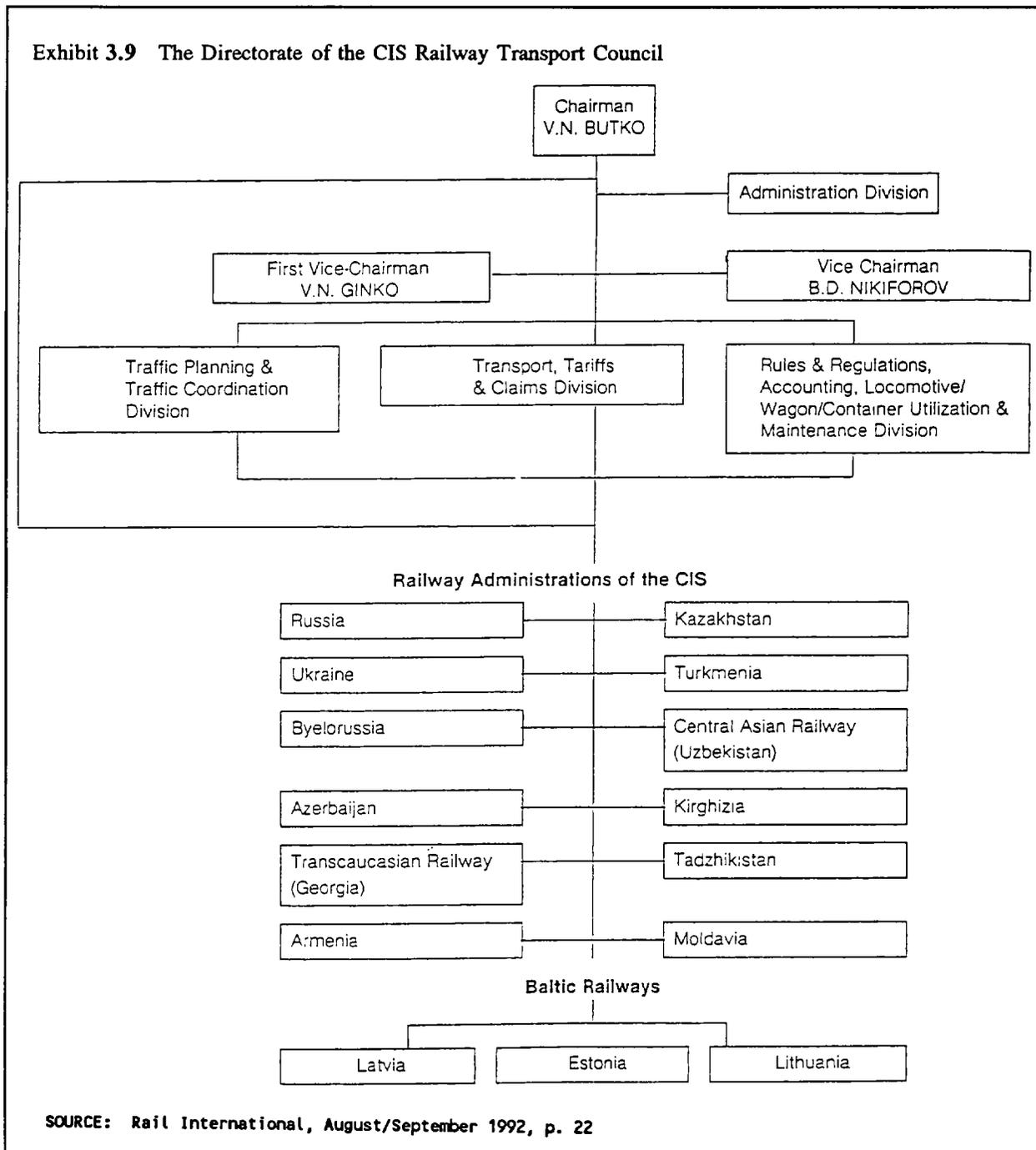
The Council is purely a coordinating body. It has no power to enforce its orders except through the common self interest of its members. While the Council will have a small permanent staff, the Chairmanship rotates among the member railways yearly. The Council is in many ways similar to the railway coordinating councils in the United States, Canada and Europe, such as the Association of American Railroads (AAR) and the Union internationale des chemins de fer (UIC). As such, while it performs a vital function which its members cannot do without, it can enforce only what is unanimously agreed upon. Given the rivalries, disruptions, and increasing financial pressures among the states and their railways, it is difficult to see how the Council can prevent the further segmentation of rail operations.

#### *Financial Performance and Investment Plans*

Declines in traffic levels and increasing costs have rapidly cut into MPS' once steady profits. Despite its virtual monopoly on internal surface traffic, MPS has been caught in an inflationary spiral well known to railways elsewhere: costs go up rapidly, but government pressures, regulatory interventions, or market forces constrain price increases. As a result, financial performance deteriorates. On a consolidated FSU basis, rail freight services, which had always earned a steady profit of about 6 billion rubles (constant 1991 prices) fell to zero in 1991 and are now losing money throughout FSU republics.

Passenger earnings, which used to average about Rb1 billion, collapsed in 1990, fell to a loss of Rb2.6 billion in 1991, and are continuing to deteriorate steeply. The 1993 federal budget estimated MPS' 1992 passenger losses at Rb53 billion. The financial problems are already leading to the well-known railway practice of deferring track and equipment maintenance, calling into question the validity of the financial performance of even the last few years, and creating a deepening problem for the future. After years of stability and a comfortable existence, MPS has reasons for concern as it looks at the future.

Exhibit 3.9 The Directorate of the CIS Railway Transport Council



SOURCE: Rail International, August/September 1992, p. 22

Within Russia, regional railway net income for 1992 in constant rubles is clearly far below customary levels, and anecdotal evidence suggests that the picture they face is far worse than MPS' overall estimates. For example, the Moscow Railway's 1992 freight traffic in the first nine months was 20 percent less than 1991's first nine

months, and net income was 73 percent lower (in constant 1991 rubles). Traffic for the October Railway is down by 25 percent from 1990, and its net income also fell sharply. (The October Railway is the oldest and, in terms of track km, largest of Russia's 19 regional railways.) By late

1992, the annual railway operating deficit was an estimated Rb73 billion.<sup>6</sup>

Aside from loss of traffic, the outstanding cause of the fall in performance throughout the system was the rapid increase in expenses compared with the lack of increases in rates. Notwithstanding the increase in prices for fuel, rolling stock, spare parts, rails, and sleepers, the cost of labor is proving to be an additional burden. On the basis of the 1992 Tariff Agreement between the Russian the government, MPS, and the Central Committee of the rail sector's trade union, transport workers' incomes came under a quarterly indexing scheme beginning April 1992. The fiscal impact of this agreement will be felt in 1993, when wages are expected to be two and one half times those paid in December 1992.<sup>7</sup> This development compounds the effect of significant levels of redundant labor on the MPS payroll (besides non-transport employees), perhaps as much as 30 to 50 percent. Equitable schemes must be developed and implemented if unnecessary employees are to be shifted to more productive activities. Wage indexing makes the task of improving the railways' financial position that much more difficult and restricts management's options.

The financial difficulties of the railways are becoming so serious that increased assistance is being requested from the government. The budget includes support to operations as well as outlays for investments. MPS FY93 budget request included outlays to fulfill the terms of the wage Tariff Agreement as well as an allocation of Rb204.4 billion to cover losses incurred on passenger transport. A request was also made to have the Rb140.4 billion debt amassed by MPS for the purchase of rolling stock imports may be forgiven and absorbed by the

budget. An additional Rb100 billion was requested to be made available at preferential rates to replenish current assets of enterprises in the industry. There has been a substantial decline in the production and delivery of railway equipment (exhibit 3.10). MPS requested capital investment budget totalling US\$490 million for the purchase of 30 reefer cars, some diesel locomotives, 600 passenger cars, and other equipment from Germany; US\$79 million for the purchase of electric locomotives from the Czech republic; and US\$200 million for the purchase of a computerized passenger reservations and ticketing system. Many of these funds will be made available through centralized bank credits. Allocation of raw materials and materials for export will generate US\$250 million more foreign exchange for the production of two-story passenger cars for suburban commuter services.<sup>8</sup> According to MOF, however, the approved

Exhibit 3.10 Railway Equipment Production and Delivery Statistics

Railway Equipment Production			
	1991	1992 (estimate)	Percent Change
Mainline diesel locomotive sections	39	36	-8.0
Mainline electric locomotives	210	126	-40.0
Mainline freight wagons	22,400	14,000	-37.5
Mainline passenger cars	1,013	540	-47.0

Railway Equipment Deliveries to SZD/CIS/Russian Railways					
	1985	1990	1991	1992	Percent Change 1991 to 1992
Electric locomotives	580	316	255	130	-49
Mainline diesel locomotives	647	498	731	—	—
Shunting diesel locomotives	493	367	437	290	-37
Freight wagons	65,453	52,468	37,661	16,537	—
Passenger coaches	2,720	2,592	2,262	2,111	-56
Containers (TEU)	20,863	15,020	12,046	—	-7

TEU = Twenty foot equivalent unit.

Sources: Lukov, B.E., "World's Busiest Network Breaks Up," *Developing Railways 1993: A Railway Gazette Yearbook* (GM Locomotive Group, 1993), p 21; TsNIITEI, *Railways of the Russian Federation in 1992*, (Moscow: TsNIITEI MPS, 1993), p 21.

federal investment budget for 1993 includes only Rb109 billion investment support to MPS. Of this, Rb59 billion was allocated to rolling stock and Rb50 billion for construction.

In addition to budgeted support for equipment and rolling stock purchases, the MPS investment plan includes major capital construction projects aimed at network capacity expansion and further electrification of existing lines. Completion of the AYam spur linking Yakutia to BAM is being contemplated. Construction of an extremely costly high-speed rail link between St. Petersburg and Moscow is also being studied. According to calculations developed by consultants, it would cost roughly US\$7.4 billion to build a new railway between Russia's two largest cities that would permit speeds of about 300 kilometers per hour and cover the 650 km (403 miles) distance in 2.5 hours.<sup>9</sup> Consultants admit that the present living standards in Russia are not adequate to enable the twelve million passengers who travel annually between these two cities to support such a venture. Assuming a capital cost of US\$1.80 million per mile, an average trip distance of 403 miles, a rate of return required by investors of 10 percent, and a 50 percent operating ratio (the French initially reported achieving a 50 percent operating ratio for the TGV line between Paris and Lyon) the one way ticket fare required to break even would be US\$123.00. It is unlikely that Russian travelers could or would be willing to pay such a fare for years to come, nor would many of them ever wish to so long as the cheaper, more conventional service were available. It is likely that the high speed rail service would face stiff competition from airlines as well.<sup>10</sup>

### *Operations*

*Wagon Control.* Compared with North American and European practice where wagons and locomotives can be located and dispatched continuously and in real time, Russian wagon and locomotive management is well behind. Creating an up-to-date management system requires new computers and software which, while complex to specify for use in the Russian environment, would not be particularly difficult to implement. Such a system, however, is also likely to require several generations of advanced communications facilities

and a different approach to wagon ownership and maintenance than now exists.

*The acquisition and installation of a wagon-tracking system for Russian railways should probably be considered a project for the longer term (beyond three years) because of the technical and institutional complexities involved in implementing it. An effective wagon-tracking system requires negotiation of complex conventions among Russia's 19 railroads concerning communications systems, information systems, and the financial, mechanical, and operational treatment of wagons. Where such matters have been resolved in the West, their resolution not infrequently took a decade or even longer and often involved expensive, wasteful trial and error. It would be imprudent to expect that the implementation of such a system should begin in Russia before the basic institutional framework for cooperation among the railways in a market-based economy is in place.*

*Container Service.* Russia will be slow to enjoy the benefits of containerization that have revolutionized trade and reduced transport costs elsewhere. Domestic containers are moved in general service freight trains, normally mixed with other traffic. MPS initiated a three level delivery service for containers in 1988. The first level was for a single wagon load, with minimum haul distance of 300 km, but no service commitment. The second level was for multiple wagon loads, with minimum distance haul of 900 km and minimal service commitment. The third level was for single wagon handling on the rear of passenger trains, with minimum distance haul of 1,600 km. Performance is often poor and penalties are currently being paid. The republics jointly own about 12,000 13.4m container wagons and 20,000 18.5m wagons. All 20 and 40-foot ISO containers are moved on these flatwagons, whose design speed is 120 km/hr, but whose maximum authorized speed is 90 km/hr. The net/tare ratio of these wagon is 2.4, compared to about 3.6 for new container flats in North America. The use of articulated skeleton structure container flatwagons has not been considered. Doublestack container wagons cannot be used because of overhead catenary power line clearance restriction.

Domestic 3 and 5-ton containers are moved in high-side gondolas.<sup>11</sup>

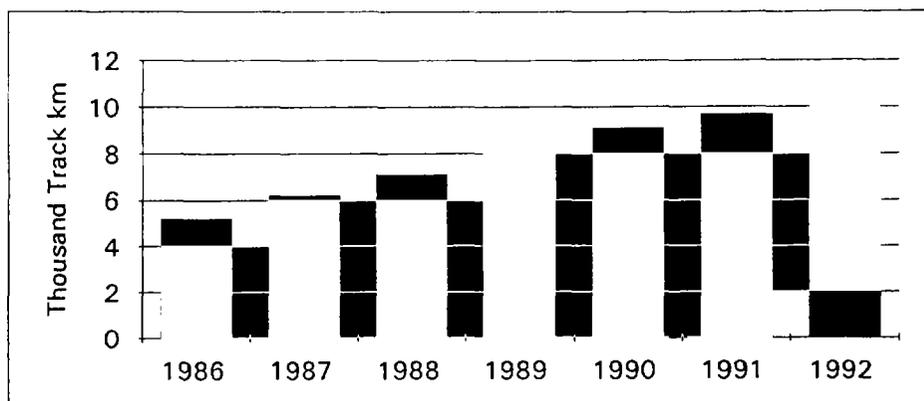
*Physical Infrastructure.* There is considerable evidence that the physical state of the MPS infrastructure is deteriorating as financial and operating problems increase. In a study done for EBRD, consultants rated the need to address deferred track maintenance as the most serious problem facing MPS.<sup>12</sup> World Bank missions have noted the deterioration in track quality (exhibit 3.11). The number of kilometers of track subject to slow orders – where the normal speed has been reduced because of poor track conditions – has increased since 1986, reflecting inadequate replacement of rails and sleepers and inadequate cleaning of ballast (exhibit 3.12). Decreasing funds and the fall in purchasing power are causing serious deferral of maintenance and investment. The rate of locomotive replacement fell between 1989 to 1990, and all evidence points to further declines in 1991 and early 1992 (exhibit 3.13). The average age of diesel locomotives has been increasing – a clear sign of an impending problem.

*The record of the October Railway, the largest in terms of track-km, symbolizes in a very real*

*sense the effects of the network's physical degradation. Every day, about 50 trains are delayed because of problems with the rolling stock, and every fourth diesel locomotive goes on line in need of some sort of repair. Disrepair of the track has an unusually deleterious effect; 21 percent of all defects and accidents registered on the entire network were attributed to the October Railway. These problems are compounded by the attitude of the work force: operating discipline for train movements has deteriorated, with four times the number of violations in 1992 as opposed to 1991. Absenteeism increased in 1992 by 12 percent over 1991, and in some divisions of the railway reached 30 percent. Intoxication on the job has also apparently been a significant problem, but little administrative action has been taken to curtail its incidence.<sup>13</sup>*

*Environmental Problems.* Serious environmental concerns within the Russian railway system are evident, including asbestos in ballast and fuel spillages. On roughly 5,000 km of line, ballast contains between 0.5 and 1 percent asbestos. Studies indicate that this does not, in most cases, pose a serious health hazard, but the issue warrants independent examination and assessment.

Exhibit 3.11 Number of Track Kilometers Subject to Speed Restrictions



(Source: EBRD Study, p. 71)

Exhibit 3.12 Track Material Deliveries

	1986	1987	1988	1989	1990
Rails (million tons)	2.33	2.24	2.27	2.26	2.19
Timber sleepers (millions)	20.20	18.30	16.30	14.70	12.50
Concrete sleepers (millions)	9.40	9.60	10.10	10.10	8.60
Ballast (million cubic meters)	20.90	21.10	21.60	20.60	19.50

Source: EBRD Working Paper, *Track and Structure*, p 11.

Because fuel has always been cheap, a problem that will presumably be corrected through price reforms, careless spillage and overfilling has been rampant at locomotive fuelling facilities. These facilities now have serious groundwater pollution problems. A similar problem may also exist at locomotive maintenance facilities through dumping and spillage of lubricating and insulating oils. Another environmental problem is that Russian passenger trains do not have retention toilets. Although this practice is acceptable in rural areas

where train density is not high, it is an increasing problem in more populated areas, and where passenger train density is high.<sup>14</sup>

#### *Obsolescent Technology.*

Russian railway equipment is justifiably known for being robust: it works, under some of the most severe conditions in the world, although much of it is relatively inefficient to operate and expensive to maintain. Given the trying circumstances MPS will face in the coming years, improvements in railroad

technology could make a significant contribution to reducing costs, providing better services, and dealing effectively with growing truck competition. Moreover, much Russian railway equipment is obsolete.

- Russian diesel locomotives use about 30 percent more fuel than their counterparts in the United States, even though the typical locomotive service cycle in Russia should permit maximum fuel efficiency.<sup>15</sup> If locomotives were brought up to world class levels, Russia could save up to 1 billion gallons in diesel fuel, or US\$1 billion equivalent in annual savings, at US\$1 per gallon.

- The MPS telecommunication system is inadequate even for normal voice communication. Data transmission for a Russia or CIS-wide wagon location and control system like that used in the United States and Europe does not exist.

- MPS' management information system (MIS) is not adequate for a railway operation in a market economy, even if the set of data appropriate to such purposes is available and collected. The MIS currently employed by MPS is designed for public accountability and, most important in the FSU, for reporting progress against an annually approved centralized plan. Computer equipment available to MPS is several generations out of date by

Exhibit 3.13 Locomotive Replacement and Maintenance

	1989	1990
Number of locomotives in existing stock		
Electric (in operation per day, on average) <sup>a</sup>	14,478	14,491
Diesel	11,577	11,500
Number of locomotives added to existing stock		
Electric	330	316
Diesel	571	498
Number of locomotives repaired		
Electric	2,391	2,243
Diesel	6,778	6,342

a. Includes locomotives used in freight and passenger traffic, on long runs and in local traffic.

Source: *Statistical Report on Operations of Railroad Transport for 1990*, MPS.

western standards, and lacks the capacity and speed necessary to handle important problems such as real-time wagon tracking or system-wide passenger reservations. Most important for the immediate future, existing MIS capabilities do not enable the railways to determine revenue and costs by line of business, consequently inhibiting assessment of real profitability for types of traffic or the value of cost-cutting operating proposals. MPS is in no position to undertake the strategic planning necessary to manage its transition to the structure of rail system needed in a market-based economy.

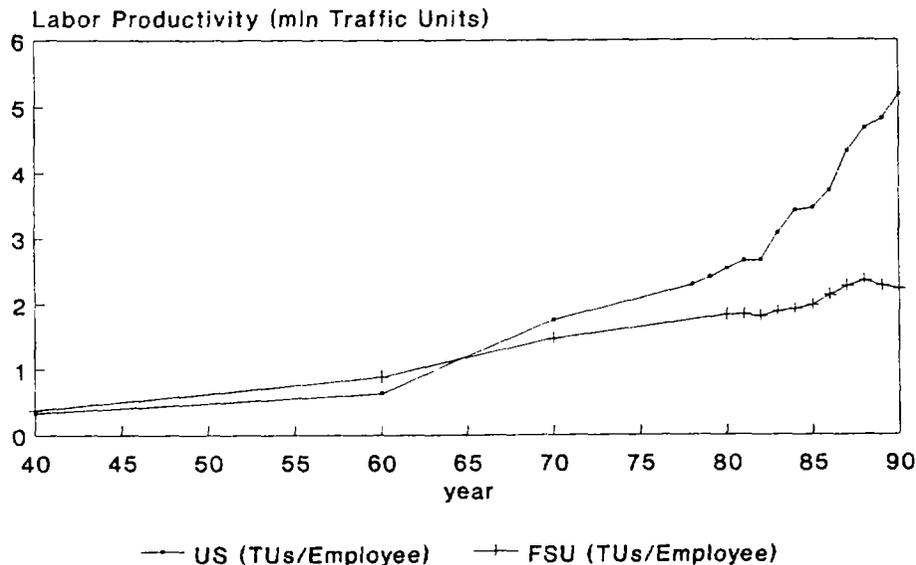
- Equipment available for track maintenance, especially cleaning track ballast, uses excessive track time, does not perform to modern standards, and is not sufficiently mobile.<sup>16</sup>

In sum, although quite well managed in an operational sense, MPS is not well organized to respond to customers demands or market-delivery competition. Moreover, MPS has been weakened by changes in the level and structure of economic

activity in Russia and the CIS. If the natural resistance to change can be confronted and overcome, technical and managerial improvement is possible.

U.S. experience demonstrates that making the railway more directly responsive to market needs brings dramatic change. The U.S. railways' restructuring, based partly on the creation of Amtrak and reorganization and privatization of Conrail, was accelerated by the thorough deregulation of rail and track in 1982. U.S. railway labor productivity, as well as locomotive and wagon productivity roughly paralleled that of the FSU until about 1982. After 1982, U.S. rail productivity and cost management improved more quickly than in the FSU (exhibit 3.14). U.S. railway profits and investment are at their highest levels in history, even though average freight revenue per tkm has fallen in constant as well as current dollars every year since 1982. Similar pressures and trends will be felt in Russia if appropriate competitive and regulatory regimes can be implemented.

Exhibit 3.14 Comparison of U.S. vs FSU Railway Labor Productivity Levels



Sources: US data: AAR, Railway Facts, 1990; Russian Data: MPS, Statistical Report on Railway Operations for 1990

### *Organizational and Institutional Changes*

*Organization for a Market Economy.* MPS' organization was geared to carry out a centralized plan in a disciplined, quasi-military manner. The general quality of SZD's technical management was entirely adequate to this task. On a technical basis, MPS has earned the respect of railways worldwide, but current organizational structure is not suited to providing the flexible, efficient, and reliable service required in a market economy. Because traffic was assigned to it, MPS needed no marketing organization and only limited concern with customer service to maximize its business. This will not suffice in a market economy.

Each MPS enterprise has control over its local resources and is designated a profit center with its own revenue and income statement. Each regional railway (a) owns and controls its own locomotives and (to a lesser extent) passenger coaches, (b) controls a major portion of its capital planning and spending, and (c) controls loading of wagons while on its property. While MPS is charged with assigning traffic and developing system-wide schedules, each railway controls its own operation and is less subject to control from the center than is the case in most other railway networks.

The system actually operates as a fragmented set of individual, geographic fiefdoms, each focusing on its own interests and none fully aware or concerned about the interests of the system. It is also fair to ask whether MPS actually represents the interests of the national transport network the regional railways, or its own interests as a control bureaucracy. Despite the best efforts of central planners and organizers, the MPS system actually does a rather questionable job of delivering reliable and effective service to the customer. MPS has only limited ability to control train operations within a given railway; to track wagons, containers, or unit trains throughout the system; or to offer effective and reliable service to higher paying customers. The fact that the entire system was centralized into a single monopoly has also made MPS difficult to control politically.

The designation of each regional railway in MPS as a profit center is a form of decentralized railway organization that has vanished from the world's market-based railways. Besides an unusual

degree of operating autonomy, this system of regional profit centers has fostered a system of behavioral incentives that cause regional railways to act against the interests of the railway system as a whole. Examples of these questionable incentives include:

- *Locomotive Utilization.* Since locomotives are owned by regional depots, no locomotive can travel farther than its depot boundary. The practice of changing locomotives reduces locomotive utilization, adds unnecessary switching costs, and extends travel times.

- *Traffic Handling.* Revenues are divided among regional railways on the basis of an MPS formula tied to relative work performed. By manipulating this formula, each railway can maximize its profitability at the expense of the system as a whole. Regional railways try to influence the calculation of work on which the revenue is divided. For example, to reduce demurrage charges between railroads, each railroad has an incentive to move trains across boundaries before 6:00 pm, a practice that can undercut the orderly receipt and handling of the cargo. (The daily charge for wagon use is assessed for all wagons on line at 6:00 pm each day. This leads to the so called "18:00 Report.") The solicitation and handling of individual types of traffic is also distorted, because the revenues received are not necessarily related to the costs incurred from handling such traffic.

- *Parochial Focus.* Regional railways inevitably focus on their own traffic, and have limited incentive to provide adequate service to traffic which originates or terminates off line. Because they cannot control the service provided by others, they may not profit at all from their efforts. For example, in the operation of the Sealand Landbridge trains across Russia from the Pacific to Poland or Hungary, it was difficult to get the regions to honor an MPS commitment to run trains from coast to coast as a non-stop unit. This problem can be ameliorated with a better incentive system. The North American railway system has private carriers that compete for traffic and simultaneously cooperate on traffic on a relatively successful basis.

- *Capital Expenditures.* Each regional railway shapes capital planning according to its own interest, and not that of the system or shippers

originating or terminating out of the region. Although MPS tries hard to coordinate investment plans, the system leads to poor asset utilization and higher-than-necessary capital expenditures. Moreover, as financial problems worsen, keeping each railway responsible for its own capital expenditures could lead to the same reluctance to operate a pooled wagon fleet as now being experienced among the republics.

- *Subsidizing Uneconomical Lines.* The suburban commuter rail business and some of the regional railways, especially the Baikal Amurskaya (BAM), lose money, but are operated for social or other reasons. In 1992 the federal budget was amended to provide subsidies to cover the operating losses of commuter services, but generally it is expected that profits generated by the rail freight business will be diverted to keeping the suburban services operational. While

the total construction cost of BAM will probably never be fully known, it was huge; one estimate is US\$30 billion. BAM was built on a crash priority to provide an alternate route for the Trans Siberian railway to the Pacific coast. The Soviet government believed that the existing route was too close to China, and strategically vulnerable to Chinese pressure. In practice, the BAM route is inferior, and has proven to be highly uneconomical. The construction and operation of BAM seriously drains resources of the system as a whole, and reduces funds that should be available for more important purposes elsewhere. In fact, the high cost of building BAM may be one of the explanations for the fact that the rest of the railway has not been as well maintained as it should have been.

Operation of BAM is so uneconomical that it has caused MPS' entire rate and tariff structure to

#### Baikal Amerskaya Railway: Recent Developments

Construction of BAM was largely an outcome of a past conflict with China. The line traverses the permafrost east of Lake Baikal to Vannino several hundred kilometers north of the Trans-Siberian line, which roughly traces the Sino-Russian border. Although the line is not complete, it is argued that further construction is justified to gain access to a wealth of Siberian natural resources.

The AYAM (the north-south line which is to link Yakutsk to BAM) reached Aldan by the end of 1992 despite a number of hardships, including shortages in supplies of sleepers, labor flight, lack of funds and inability to pay for materials needed to complete construction, and even an inability to pay and adequately feed the workforce for several months at a time. Despite these accomplishments, the Amur-Yakutsk line still has some 530 km to go before it reaches Yakutsk. According to the 4 January 1992 Government Decree N°20 "On Measures to Complete the Construction of the Baykal-Amur Railroad Mainline (BAM) and the Construction of the Berakit-Tommot-Yakutsk Railroad Line," goals for 1995 include completion of the Severomuyskiy Tunnel (1324 meters remain to be tunneled out of the total 15,343 meter length; 480 meters were tunneled in 1992), 187 km of secondary main track, plants for the production of ballast and the treatment of wooden sleepers, locomotive depots, warehouses and cargo storage facilities, housing, schools, hospitals, and clubs. The price for all this amounts to Rb2.3 billion in 1991 prices, which requires an annual commitment of 700 million 1991 rubles. For 1993, however, only Rb300 million appears to be available from the State Budget. Meanwhile, a commission is to be dispatched to BAM to decide just exactly what is to be completed and what is to be left unfinished, and a ministry is to be created for the AYAM within the Council of Ministers to act as a contractor and oversee all matters pertaining to the use of the railway.

Completion of the AYAM is thus in question, but most relevant to plans for developing natural resources in Yakutia/Sakha. For example, an international tender has been announced to develop the Udokan copper deposit, which could only succeed with railway access. In view of Government's financial difficulties, efforts should be made to explore ways in which such developments could contribute to railway construction costs.

Sources: "Amur-Yakutsk Railroad to be Completed by 1998", *Interfax Business Report* No. 48 (451), 10 March 1993, p 3. "Russian Government Financing Construction of Railroad in Yakutia", *Interfax Business Report* No. 39 (442), 25 February 1993, p 4.

be distorted. About 8 percent of each railway's revenues is said to support BAM. As financial resources worsen, regional railways will increasingly resist the requirement to cross-subsidize MPS' losing operations. In the future, BAM should be set up as an independent carrier, receiving support from whichever level of government – defense or otherwise – believes BAM's services justify their cost.

Unbalanced centralization at MPS, combined with poorly designed decentralization of regional railways, has led to a rail system that is a huge monopoly, difficult to control politically and yet generally unresponsive to shipper quality and service needs. The railway system operates as a fragmented set of individual, geographic fiefdoms, each focusing on its own interests, and not on the broader interests of rail system as a whole.

While analysis is not yet available to suggest exactly what form a new railway organization should be, it is clear that *if there is to be any effective competition for freight transport services in Russia in the near-term, it will have to be provided by intra-rail competition.* The highway network is too limited, distances too vast and the process of creating both highway capacity and healthy private sector bus, trucking and barge competition will take far too long to provide immediate assistance except in very limited cases.

For many years into the future, most long haul surface freight transport will have to be carried by rail, and the only way to get competition will be through intra-rail enterprise. Without such competition, MPS will face essentially no pressure to serve transport needs effectively, and there will be no effective way of forcing it to do so.

Even if operation and control of rail lines were restructured so that competition among railways could occur, however, continued direct government management would likely prevent the achievement of ideal levels of competition. Nonetheless, restructuring to achieve competition, even if coupled with continued government involvement for some indefinite period, would represent a significant improvement over the current system of regional monopolies.

*Overstaffing and Improved Productivity.* The railway system employs some of 2.22 million people, 1.64 million in transport, the remainder in

ancillary activities such as clinics, schools, manufacturing and so forth. World Bank analysis shows railway labor productivity to be less than half that of U.S. railways, the most comparable in size and traffic levels to the Russian system. While it would probably be uneconomical for Russia to attain equivalent productivity, it should be possible for MPS to operate its freight service with at least 20 percent, – roughly 200,000 – fewer employees. Since transport employment levels fell by more than 10 percent from 1990 to 1992, this may not prove so difficult.

The government should also assist MPS in transferring ancillary activities such as schools, clinics and other welfare related activities, to other appropriate agencies, or sell them off. The magnitude and complexity of this transformation should not be underestimated; it will require time and effort, as well as corresponding reforms in the social security system and a clear delineation of responsibilities and expenditures among different levels of government. In the near term, the social functions of the railways should at least be separated from their core activities and treated as separate account entities. Ancillary activities that are commercially oriented could be separated from the railways and privatized.

### *Future for the Railways*

*Traffic Levels Unlikely to Return to Prior Levels.* Future railway demand is going to differ radically from past demand, both in its eventual level and in its composition. Much short haul traffic will shift to truck. A significant part of the excessive haulage of basic commodities will cease. Enormous amounts of traffic will still remain, but routings and service needs will be quite different from those of today. As a result, the current MPS capital plans are almost certainly wrong, putting money into the wrong assets – network expansion and electrification rather than track maintenance and communications – and in the wrong places – BAM rather than maintaining the Moscow/Minsk main line. A clearer view of the future would not necessarily reduce investment and maintenance, but would certainly redeploy what is available into critical assets that will remain no matter what the railways' future role.

Projections made by EBRD consultants show rail freight demand will not return to 1990 levels before the year 2007 under the most optimistic scenarios, and not before 2015 under the most pessimistic scenarios. Similarly, passenger levels were not projected to return to 1990 levels until at least the year 2000. These scenarios assume an economic turnaround by 1993-94 at the earliest or by 1995-97 at the latest. Given the recent difficulties confronting the Russian government, this could mean that even the "low" scenario is optimistic.<sup>17</sup> 1992 performance data, however, indicate that passenger traffic has not fallen off to the extent that freight traffic has. Available data indicates that the freight task performed in 1992 is 22 percent less than the 1990 rail freight task, but that the passenger task was down by only 7 percent. While rail passenger traffic has declined significantly in Moscow and St. Petersburg, several regions saw an increase in the passenger task in 1992 over 1990, including the South-East, Sverdlovsk, and Southern Urals Regional Railways.<sup>18</sup> Major increases in airline passenger tariffs have served to drive passengers from air to rail, thus maintaining demand for rail transport.

MPS forecasts an earlier and steeper positive upturn for freight, even though its projection for 1992 shows a deeper drop from freight levels than that expected by EBRD consultants – which may itself be too optimistic on energy traffic – a development which would call for even more pessimism than is in this forecast. The MPS estimates for passenger transport are also more optimistic, showing a higher forecast for 1992 and a much flatter estimate of the response of passenger demand to the forces of economic change. MPS's optimism may be attributable to its decision not to raise fares as costs increase to the same extent assumed by EBRD consultants. There would be less falloff in demand than expected by EBRD consultants if cost recovery is not maintained at current levels. The relative unprofitability of passenger services, especially suburban services, means that continued high passenger demand levels will actually further weaken MPS financially.

In broad terms, the shift to a market economy in Russia is expected to have a significant negative impact on the relative amount and composition of rail traffic. The expected decline in the rail freight

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#### A Fragmented System: The Case of SeaLand

The market for trade between Asia and Western Europe is enormous and growing. As a major operator of sea and land containers, the Sealand Company conceived the idea of forming a joint venture with MPS to provide landbridge services using MPS as the connecting carrier between the Pacific port of Vostochniy and the Polish and Hungarian borders.

While simple in concept, implementation posed enormous problems. The primary requirement for container services is fast and highly reliable service. Physical performance estimates indicated that a transit time for containers of around 14 days would be achievable, and would permit a profitable rate in competition with sea transport, which can offer about 26 days to European ports. Sealand developed an agreement with MPS for MPS to provide rehabilitated wagons dedicated to landbridge service as its contribution to the joint venture and to agree to move the containers in unit train service from the eastern coast to the European border within 14 days or less.

In initial operation, actual transit times initially averaged about twice expected. This was because the "unit" train was not given priority handling by the regional railways and because the regional railways, while keeping the container wagons together as a block, tended to add and remove wagons at regional railway boundaries. More recently, slow throughput of containers at the port of Vostochniy has been greatly affecting total transit times. Inadequate communication between modes has also resulted in scheduling delays.

Consequently, lucrative arrangements have been negotiated with rail service providers near port and border crossing areas, and rail transit times are now working at 14 days or less rather consistently.

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share is attributable both to the general economic conditions and to long-term changes in the amounts and types of traffic carried. This is the clear lesson of Western economies, and is the strongly emerging trend in the restructuring CEE economies. Spatial industry distribution will be rationalized in accordance with economic principles. Major regions of the old FSU coal industry will be uneconomical once market prices are applied for inputs, especially energy and labor, and producing areas, especially in Ukraine, will be shut down. More oil and petroleum products are likely to be transported by pipeline, as the industry becomes more profit-oriented and as greater technological investments are made. Currently, about 33 percent of petroleum tonnage travels by rail whereas the comparable figure for the U.S. is only 3 percent.<sup>19</sup> This difference may be the result of site-specific factors and to restrictions from the Cold War placed on FSU access to the most modern oil pipeline technology. If the latest technology is eventually made available, as it should be, a significant part of today's oil traffic will shift from rail to pipelines. Finally, recent World Bank reports have suggested that Russian agriculture, if restructured along the lines of market-based agriculture systems, would greatly shift the location and amounts of grain production, and of resulting grain transport.<sup>20</sup>

Other forces will eventually have even more impact on rail demand than these shifts. The growth of competition from an increasingly efficient private trucking sector, combined with increased shipper choice based on the quality as well as quantity of service, will further erode rail transport. This has been the universal trend in market economies and, because of the increasingly integrated nature of world markets, *it is a trend which no country wishing to compete successfully in those world markets can safely ignore.*

The transition to a market economy will lead to drastic changes in the role of the railway, and will require changes in policy, organization, and labor force which would daunt any western government or enterprise. A total change in management culture will be needed if the railway is to avoid the financial difficulties experienced by almost all western railways as they have made the transition to lightly regulated, market-driven operations. Repeated experience in market economies with

competitive transport systems has shown that MPS and the regional railways as currently constituted simply will not function adequately in a market context because they will not have the proper incentives to respond to either customer or government pressure. The consequences of this malfunctioning could be severe, resulting in (a) poor transport service with its attendant economic cost; (b) predatory pricing behavior on the part of the railway as it attempts to defend its shrinking market position; and (c) huge, unsustainable deficits that pose a serious macroeconomic challenge for the overall economy, as was the case in the United States and Japan, and is currently the case in nearly all western European economies.

*Future of Suburban Services.* MPS suburban passenger rail services are quite large by world standards; only Tokyo and Osaka are larger. These services play a critical role in urban transport, particularly in Moscow and St. Petersburg, and probably in other cities as well. Although these services are the most vulnerable to a shift to bus and automobile, they will be important for the foreseeable future. Suburban services are most responsible for the downward trend in MPS profitability, because costs have risen rapidly while fares have been held down. *These losses cannot be sustained. Measures to improve cost recovery and cost effectiveness need to be taken. Losses will overwhelm the railway if there are no more freight profits with which to subsidize passenger losses.*

*Future of Long Haul, Intercity Passenger Services.* The future of long-haul intercity passenger services is also likely to shift as automobile traffic increases. Currently, 46 percent of intercity passenger traffic is carried by rail compared to one percent in the United States. The type of service offered may also change. Presently, a major portion of long haul services are on sleeper trains that typically depart in the evening and arrive in the morning in European Russia and sometimes several days later on long trips to Siberia. There are, for example, at least five trains of about 18 coaches each leaving Moscow for St. Petersburg between 22:00 and 01:00 nightly. All appear to be heavily utilized by

western standards. Many of these trains could more economically be operated as day trains without sleeping accommodations, a change consistent with Western European and CEE practice, and one which needs analysis.

### *Near-term Recommendations*

*Preserve key parts of the existing rail network that are jeopardized by inadequate maintenance and the disruption in the supply of spare parts and equipment because of the breakup of the FSU and by the railway's increasing financial difficulties.* The government clearly recognizes the enormous importance of the railway system to the economy and therefore should support all efforts to preserve those essential rail facilities and services that will not immediately be rendered obsolete by the coming structural changes in the economy. Priority should be given to those parts of the rail network which are likely to handle large traffic volumes in the future.

Network flow analyses could be used to identify key portions of the network and assess the implications of alternative maintenance plans. In particular this effort would include (a) purchasing western made track maintenance equipment, (b) using it on main lines that are critically under-maintained, (c) purchasing additional passenger equipment for use in suburban areas and (d) assessing on a priority basis potential environmental problems.

*Take steps to limit operating losses and strengthen financial performance of the railways, to reduce the railway sector's fiscal impact on the National the government's budget.* Analytical tools should be developed or acquired as soon as practicable to aid in reducing or eliminating subsidies to particular types of railway services. The government should make direct payments for any non-remunerative passenger service it feels is necessary. The government should also have an explicit agreement with railway management, covering goals for improving cost recovery, lowering costs of operation, and agreeing on any government support that may be required. To do so, railways need to improve their cost accounting and network traffic flow models to enable them to

analyze and project profitability by line of economic activity. In the passenger sector, aside from suburban services, it is common that rural short hauls are unprofitable. In the rail freight sector, the operation of BAM – which is unlikely by any analysis ever to be profitable – should be removed from the operations of the railway system at large and supported by whatever part of government believes it is needed.

*Take immediate measures to curtail suburban passenger losses.* Based on analyses conducted to date, the biggest losses are attributable to railroad suburban passenger services. The size of the existing subsidy should be determined, since losses from performing social services should not be charged against or supported by freight and intercity passenger traffic. As soon as possible, suburban fares should be raised to a level that stems the loss of railway resources. Since the largest suburban services are in Moscow and St. Petersburg, they are the obvious places to begin this analysis. When the nature and amount of these losses have been identified, it will be possible to move toward devolving the financial responsibility to municipalities.

*Allow freight rates to rise to cover costs.* To the maximum extent feasible, railway operations must be placed on a commercially self-sustaining basis. Rail freight rates on all commodities must cover at least the costs of providing them.

*Revise investment priorities to meet urgent needs by (a) deferring or eliminating projects with low rates of return, and (b) ensuring that projects related to improving rail operations under a command economy will have a commercial application in a market-based economy.* These criteria for railways investments would defer or eliminate further projects to build new or electrify existing rail lines, with the possible exception of gaps in the Trans Siberian line, and would minimize further investment in BAM. There should also be no further investments in new industrial lines, such as those supporting natural resources exploration in Siberia, unless the required resources are provided in the context of the development projects and do not burden the railway's scarce resources.

*Heightening awareness of the changing nature of transport demand and the consequent need to develop long-range views of the railway's role in a market-driven economy.* Perhaps no precondition for effective government management of transport sector restructuring is less exciting but more important than raising the awareness of government officials to the wholesale changes that the transition to a market economy will bring. This is especially true for railways. MOT and MPS should be required to provide complete and insightful analyses of the financial and operating performance of the railways at industry levels, by company, and by level of service. High-level policy discussions at the deputy prime minister and cabinet minister level are essential to building this understanding and commitment. The key to supporting this analytical effort is a network traffic flow model for rapid analysis of the profitability of current traffic flows, the impact on the railway of changes in future traffic flows, and evaluation of alternative organizational structures.

#### *Medium-term Recommendations*

*Commence the process of adapting the structure of the railway to the needs of the emerging transport markets in Russia.* The government should sponsor and implement an effort to develop and evaluate restructuring alternatives for the railway system as a whole. This can be achieved by building on the capabilities and experience garnered in analyses that isolate the financial performance of lines of business in order to quantify and reduce subsidies, using the network flow model. The objective should be to introduce a new structure that offers freight customers competitive rail service if possible since effective rail-truck competition will be limited to a relatively small part of freight hauled. This competitive structure is essential to provide incentives for efficient and responsive operation, and to protect railways customers from monopoly power. For customers not served by competing service, regulatory protection will be needed.

*Establish a labor redundancy program to ameliorate the effects of anticipated unemployment.* To cope with the anticipated increase in layoffs associated with adapting the

structure of the railway, a labor redundancy program should be designed to provide transitional assistance to employees declared redundant or wishing to retire. Railways around the world have been striving to reduce employment in recent years in an effort to reduce subsidies and become more competitive. Many of them have introduced labor buy out programs to induce voluntary retirements. Polish railways recently offered staff a year's salary to retire; plans in other railways offered up to 2.5 years' salary.

*Review the structure and function of intercity rail passenger services to determine if they should be maintained as part of an integrated rail enterprise or established as a separate operating and financial entity.* The need for eventual competitive intercity passenger service is less clear, but should emerge from the analysis proposed. Experience in other countries strongly shows that intercity passenger service should be operated as a separate line of business within the railway. Such service should probably be removed to one or more separate institutions that operate largely over lines primarily operated and managed for freight services.

*Improve the quality of maintenance equipment.* Existing MPS track maintenance equipment is highly inefficient, requires too much track time, and does not produce high quality results. Equipment is available in the West that will greatly improve track quality and reduce maintenance costs. This equipment should be acquired by purchase in the near term and produced under license in the longer term.

*Lay groundwork for developing a competitive, private sector industry for repowering and overhauling diesel locomotives.* The Russian market offers a unique opportunity to launch a new, privately managed venture for locomotive rehabilitation and re-engining. Existing diesel locomotives are inefficient fuel users, are not being properly maintained, and are growing old rapidly. Rehabilitation and re-engining would have a high rate of return on the investment. The need for efficient and reliable diesel locomotives is certain to increase in the mid-term, and there would be ample demand for this type of work.

*Ancillary activities should be privatized and separated operationally and financially.* As in all socialist countries, MPS has a number of manufacturing and design activities, ancillary to its rail function but which were provided by the railway in the past. These include the manufacture of signal equipment and running many of the research institutes. Such ancillary activities should now be separated from MPS, managed separately, and eventually established separately or privatized as soon as developments in the economy permit. As elsewhere in the economy, most of the MPS' social activities, such as elementary schools, should be transferred to the social sector for operation.

*Devolve the operating and financial responsibility for suburban rail commuter services to municipalities.* Aside from posing a large financial burden at the national level, commuter services are not properly operated by a national railway because local authorities have a much better idea of local needs and demands, including willingness to pay. Funding responsibility for these services should be transferred to the appropriate local authorities as soon as possible, as was the case with the metros. Shortly thereafter, managerial responsibility should also be shifted to the municipalities, although they may wish to contract with the railway to manage the services for the account of local authorities.

*Devise a plan and an administration for the smooth introduction and operation of a modern wagon and container tracking system.* The division in principle of the former SZD rolling stock fleet was to have been effected by 18 March 1993.<sup>21</sup> A new numbering system for 963,000 railcars of the Russian fleet has been devised,<sup>22</sup> and plans have been drawn up to establish 109 border crossing points – 24 of which have been equipped – at which wagons will be tracked by a computer-based system linked to the MPS main computer center in Moscow.<sup>23</sup> There is little indication that this system created to monitor border crossings and determine wagon ownership is designed or capable of being used for more commercially-oriented functions such as improving wagon utilization and tracking the progress of wagons in transit so customers know

when to expect delivery. A plan is needed to ensure that an effective customer service-oriented system is designed, procured, installed, and operated in as cost-efficient a manner as possible. Of equal importance is the establishment of a similarly-oriented administration, funded perhaps by user fees from railways, shippers, and customers, domestic and foreign, to operate and ensure the smooth functioning of what can be expected to be a complex and expensive system.

*Assess and address environmental problems.* Environmental concerns include asbestos in ballast, groundwater pollution at fuelling facilities, and human waste disposal.

### *Long-term Recommendations*

*Introduce a modern wagon tracking system.* Because of poor communications and computer capabilities, MPS does not have an adequate system for tracking and dispatching wagons in real time. This leads both to poor utilization of a critical capital resource and to poor service to customers who need to know where their shipment is at all times. Wagon tracking systems have become a critical management tool for all western railways, and have made a major contribution to improved capital productivity. Given that the Russian rail system will be short of capital resources for the near future and that new rolling stock will be more expensive and specialized for shipper needs, a better system for wagon and locomotive location and management will eventually be imperative. The wagon tracking system will also be important to the management of wagons interchanged among CIS states. Without such a system to ensure efficient wagons use and prompt return, political tensions are likely to make interchange of wagons difficult and inter-CIS freight flows more problematic.

*Upgrade telecommunications.* Modern railway management is impossible without good communications. Wagon and locomotive location and dispatching systems depend totally on information transfer. Advance blocking and train planning are also impossible without real time knowledge of train consist and location. Passenger reservation and freight billing information require

voluminous and rapid information management. It is difficult to find railways in operation today in which the gap between the quality and volume of basic communications and the overall need exceed Russia's. While it will take considerable time and money to plan and install a modern communications system, this is prerequisite to better management.

*Contract routine maintenance activities.* In market economies, railways are increasingly finding that outside contractors can perform a number of types of maintenance, including that of rolling stock and track more efficiently than can the railway itself. Outside contracting is also an excellent way to promote private sector development because it will be relatively easy to find foreign partners to help with capital requirements. The railway and the Russian government should prioritize the evaluation and eventual development of contracted maintenance activity.

*Implement changes needed to create intra-rail freight competition, where appropriate, and to regulate railway market power where competition is not sufficient to govern prices and service levels.* The railway today carries about 96 percent of the surface freight in Russia, compared to about half in the United States and 30 percent in western Europe. Although this share will ultimately shift toward trucking, there is no possibility of rapid transition because of the time needed to expand the highways' and trucking capacity. Furthermore, because of Russia's continental size, the railway share will always be relatively large. Thus, the only foreseeable way to create transport competition is to promote rail-vs-rail competition. The government should begin now to implement and use the network flow models recommended above to assess ways in which intrarail competition could be created.

Although intrarail competition has not been common in Europe, it is the norm in North America, which has the world's most efficient freight railway system. There is no single or simple approach to creating intrarail competition. It could be accomplished by combining and then redividing the regional railways so there is direct

competition among them. For example, it would be possible: (a) to structure parallel line competition from Lake Baikal to Moscow and the western borders; (b) to make the Eastern Siberia, TransBaikal and Far East railways into bridge carriers jointly owned by competing carriers west of Lake Baikal, ultimately yielding intrarail competition over the entire route from Europe to Asia; and (c) to grant the Moscow railway trackage rights over the October Railway to St. Petersburg and the Finnish border.

#### Notes

1. Translation of N. Davydov "The Effect of Coordination: Results of the Sixth Session of the Rail Transport Council of the Commonwealth Member States in Kishinev," *Gudok*, 2 December 1992, pp 1-2 in *Central Eurasia*, FBIS-USR-92-163, 23 December 1992, pp 4-6. The Railway Transport Council has been caught up with the rolling stock fleet distribution and has not yet had an opportunity to address the Belarusian proposal for direct settlement of accounts with shippers. Inter-line account settlement is a sensitive issue both for the individual railway companies of the newly independent republics in their dealings with MPS and for Russia's own regional railways in their dealings with Moscow. By the end of September 1992, the railways of Latvia and Lithuania had adopted a system of inter-line exchange accounting which required payment in advance for the portion of transit over their respective lines.

2. Translation of "What Should the New Ministry of Railways Be?", *Elektricheskaya i Teplovoznaya Tyaga*, January 1992 (No. 1), pp 2-3 in *Central Eurasia*, FBIS-USR-92-085, 8 July 1992.

3. *Transport i Sviaz*: Statisticheski Sbornik, (Goskomstat USSR: Moscow, 1990), p 36.

4. *Soviet Food Supply and Distribution*, Vol I, Table 1, pp 12, 56.

5. T. Shirshova and N. Davydov, "On the Track of Integration and Unity," *Gudok*, 25 February 1993, p 2, titled "Railway Transport Council Activities Profiled: Alma-Ata Meeting

- Highlighted" in *Central Eurasia* (FBIS-USR-93-031), 13 March 1993, pp 11-13.
6. *Gudok*, November 26, 1992, from a translation in FBIS, December 31, 1992, p 50.
7. Translation of V. Chistov, *A Guarantee of Social Stability: From the Meeting of the Ministry of Railways' Collegium*. *Gudok*, 28 November 1992, p 2 in *Central Eurasia*, FBIS-USR-93-002, 6 January 1993.
8. "Russia Earmarks 204.4 Bn Rubles for Railroads in 1993," *Interfax Business Report*, № 29 (432), 11 February 1993, p 3.
9. Yuriy Kovalenko, "French Propose Travel From Moscow to St. Petersburg in 2.5 Hours," *Izvestiya* (6 February 1993), p 15, translated under "French Propose High-Speed Rail Link Between Moscow, St. Petersburg," *Central Eurasia* (FBIS-USR-93-020), 25 February 1993, pp 110-111; Viktor Belkin and Vyacheslav Storozhenko, "High Speed Can Solve the Rest Problem For Millions of People," *Izvestiya* (26 February 1993), p 4, translated under "Proposed Moscow-Petersburg Rail Improvements Could Aid Tourism," *Central Eurasia* (FBIS-USR-93-027), 10 March 1993, pp 32-33.
10. For any system, the amount of money that must be earned annually to pay back suppliers of capital used to construct the system equals: (the per mile capital costs) x (the length of the system) x (the rate of return required by suppliers of capital). The annual income available for this purpose equals: (the average trip length per passenger) x (the per mile fare) x (1-the operating ratio) x (the number of passengers).
11. Booz • Allen & Hamilton/Travers Morgan, *Railway Sector Survey of the Independent States of Russia, Belarus, Ukraine and Kazakhstan*, December 1992, pp 47-8.
12. *Ibid.*, pp 139-40.
13. Igor Cherevko, "Discipline is Not for the Poor," *Nevskoye Vremya*, 28 November 1992, p 2, titled "October Railroad Safety Record Scored" in *Central Eurasia* (FBIS-USR-92-167), 31 December 1992, p 51.
14. World Bank interview with MPS experts.
15. World Bank calculation.
16. For a discussion of track maintenance issues, see a translation of V. Gitkovich, "The Times Demand a Search for Reserves," *Gudok*, 18 June 1992, pp 1-2, titled "Rail Collegium on Line Maintenance Issues" in *Central Eurasia*, FBIS-USR-92-087, 11 July 1992.
17. Booz • Allen & Hamilton/Travers Morgan, *Railway Sector Survey of the Independent States of Russia, Belarus, Ukraine and Kazakhstan*, December 1992, pp 17-25.
18. MPS Central Scientific-Research Institute of Information and Technical-Economic Research of Railway Transport, *Railways of the Russian Federation* (Moscow: TsNIITEI, 1993), and MPS, *Statistical Report on the Operation of Railway Transport in 1990* (Moscow: MPS, 1991).
19. *Transportation in America, 1992*, 10th Edition (Waldorf MD, USA: Eno Transportation Foundation, Inc, 1992), p 59.
20. *Review of Food Policy Options and Agricultural Sector Reforms*, The World Bank, March, 1992.
21. See translation of A. Loginov, "The Railcar Acquires an Owner," *Gudok*, 13 February 1993, pp 1-2, titled "Dividing the Railcar Fleet, Determining Ownership" in *Central Eurasia*, FBIS-USR-93-029, 12 March 1993, pp 47-49.
22. See translation of unattributed article in *Kommersant-DAILY*, 18 February 1993, p 10, in *Central Eurasia*, FBIS-USR-93-029, 12 March 1993, p 46.
23. See interview with Granit Savvich Ivannikov, chief of the MPS Main Computer Center by I. Kokoulin, "How Do You Divide Up a 'Pie'" in *Gudok*, 27 January 1993, p 2, in *Central Eurasia*, FBIS-USR-93-026, 6 March 1993, pp 46-47.



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## Road Transport

### *Organization of the Road Transport Industry*

There are about 3.2 million trucks engaged in commercial road transport activities in Russia. By comparison, there are 15.2 million commercial trucks registered in the United States, of which 13.6 million are single-unit trucks and 1.6 million are combination units.<sup>1</sup> Before the breakup of the Soviet Union, virtually all of these trucks were assigned to a few giant, vertically integrated organizations operating on a republic-wide level as monopolies within each Republic. Broadly speaking these included freight and passenger organizations to supply road transport services to (a) the commercial sector on a for-hire basis throughout Russia, (b) state and collective farms, (c) the commercial sector for distribution within Moscow, (d) the commercial sector for distribution within St. Petersburg, (e) the commercial sector engaged in international trade, and (f) producer and consumer cooperatives that own their own retail stores.

*Own-Account Trucking.* By far the greatest amount of road transport is carried out by own-account trucking fleets, owned by individual industries or enterprises which transported 11.957 billion tons of freight in 1991. This amounted to 81.4 percent of freight moved by automotive transport for the year.

*For-Hire Trucking.* For-hire trucking is overseen by Rosavtotrans, the Russian successor to what was called Soyuzavtotrans under the FSU. The

Russian part of Soyuzavtotrans consisted of 78 subsidiary organizations which in turn controlled 2,500 separate enterprises and employed 1.3 million people.<sup>2</sup> In 1991, Russian for-hire trucking transported 2.731 billion tons of freight, about 18.6 percent of all tonnage moved by truck in Russia. All of these organizations reported to the Ministry of Road Transportation. This Ministry, like those in the other Republics, was vertically integrated and operated all commercial road transport, including taxis, as well as related services such as vehicle fueling, repair stations, other motorist services, and equipment manufacture for vehicle maintenance and cargo handling. Rosavtotrans was formerly an operational part of the Ministry of Road Transportation and provided most general purpose trucking throughout Russia, with the exception of Moscow and St. Petersburg. While its operations are in the process of being privatized, the Ministry still uses the name to refer to a large sector of general purpose trucking it used to control.

Rosavtotrans's subsidiaries operate about 260,000 trucks and carry more than 500 types of cargo, of which 70 percent by weight is for the construction industry. Rosavtotrans also operates bus passenger services. More than 80 percent of the work is carried out on an annual contract basis and about 250 of Rosavtotrans's enterprises operate on a leasing basis. Many of the enterprises are "mixed," operating both freight and passenger services and using revenues of the former to cross-subsidize the latter. Only about 200

enterprises and 25,000 vehicles are involved in hauling food on a full-time basis. Long distance haulage of perishable food products is particularly small, around 1 million tons per year, and undertaken with 2,500 mostly refrigerated semi-trailers with cargo capacities of 10-12 tons.

*Auto Transport Associations.* Rosavtotrans's constituent organizations are essentially organized at the oblast level. The overall oblast-level organization is referred to as a trucking association which, in turn, controls on average the operations of 35 to 40 trucking enterprises operating within each oblast. Again, many of these enterprises are mixed enterprises structured to cross-subsidize passenger operations from freight revenues. A typical enterprise owns about 200 trucks, employs about 1000 people, and enjoys a commodity-specific or geographic monopoly within the oblast. Usually there is at least one enterprise that distributes fuel and one that is responsible for repairs and the distribution of spare parts within each association. Though there has been a substantial change in the role of the associations since the break-up of the Soviet Union, they still play an important part in preserving within the for-hire trucking industry many of the same characteristics as before.

Developments in the Kursk oblast provide good examples of the changes that are taking place and those still needed. Before 1992, the automobile transport association for the Kursk oblast essentially developed and directed the plans of operations for the automobile transport enterprises in the oblast. Within the last year, the charter of the association has been changed so that it is now an "enterprise trucking commercial firm" as opposed to a "regional production association." With this change, the association has adopted new basic objectives that no longer place it in a supervisory role over individual trucking enterprises in the oblast. At the same time, the association still performs a variety of support and facilitative services on a monopoly basis for the trucking industry in the oblast. These include (a) the provision of spare parts and consumables including fuel, (b) transportation brokerage services, (c) freight forwarding, (d) consignment and leasing operations, (e) consulting services related to repairs and maintenance, (f) the

introduction of new technologies, (g) marketing, (h) insurance, and (i) the manufacture of spare parts. It is important that these be put on a competitive basis to ensure their availability to new entrants. The charter specifies other functions that are appropriate to the role of a trade association, functions that do not involve the exercise of any monopoly powers over the ability to do business of its members. These functions include (a) the provision of public information, (b) advertising on behalf of the association's membership, (c) safety, and (d) government relations. Further changes in the functions of the trucking associations are clearly necessary.

*ASMAP.* The international road transport association (ASMAP), now has 184 members operating more than 10,000 trucks in international commerce. Many of the firms are now subsidiaries of Rosavtotrans. International truck transport hauls were, until recently, the monopoly of Sovtransavto, which was the international trucking company monopoly of the Russian Federation. Since all imports transported by truck to the FSU had to be carried by Soviet carriers and shipment conditions had to be "free Soviet border," Sovtransavto was among the few Soviet enterprises to earn hard currency and, thus, invested in a modern fleet of western-made tractors (such as Mercedes, Volvo, Iveco) and semi-trailers. Whereas the old monopolistic companies such as Sovtransavto are better equipped with modern West European trucks, newly founded companies registered with ASMAP have limited access to hard currency loans or leasing arrangements and will have difficulty entering international haulage without similar equipment.

*Rosagroprom.* The largest of the trucking organizations in terms of vehicles, Rosagroprom, consists of trucking entities that were part of *Agroprom*, and was created in 1985 as an amalgamation of several ministries and charged with various agribusiness responsibilities. *Agroprom* was subsequently divided among the republics and operated as a monopoly in each. Rosagroprom, which operates in Russia, owns and operates about 711,000 trucks for use on the roughly 26,000 state and collective farms in

Russia. On average, there are between 20 and 100 trucks per state or collective farm. The trucks haul agricultural products between farms and to food processing plants and, are used to some degree in intercity transport. Reportedly, nearly half of the Rosagroprom vehicles are small GAZ trucks with less than 2.5 ton capacity. Only 10,000 trucks are used in intercity and longer distance haulage. Rosagroprom has only about 6,000 heavy refrigerated vehicles for transport of perishables over longer distances.<sup>3</sup>

*Agricultural Trucking.* The Russian agricultural trucking industry is burdened with several problems (a) trucking operations are very inefficient and poorly organized, (b) maintenance is concentrated and centralized over large geographic areas, resulting in huge numbers of trucks awaiting maintenance far from users who might press for their more rapid repair, and (c) the problems of agricultural trucking are aggravated by extremely poor equipment and a peak-and-valley pattern of demand related to the planting and harvest cycle. Agricultural trucking is thus likely to exhibit to an even more exaggerated degree the problems of the remainder of the trucking sector. For these reasons, it is important that the principles of deregulation, promotion of competition, and encouragement of the entry of new firms be closely followed in any program to restructure agricultural trucking.

### *Role of Road Transport in the Russian Economy*

*The Freight Task.* Road transport is estimated to make up no more than 7 percent of total Russian freight transport in terms of ton-kilometers (tkm) in 1992 and less than 2 percent of general purpose cargo handled by all modes (exhibit 1.1). This relatively small part of the transport sector's total task reflects the fact that railroads perform more than 54 percent of all freight tkm including pipelines, or 96 percent excluding pipelines.

Own-account trucks, much like private carriers in the United States, are still the dominant part of the road transport sector, with over 77 percent of total volume estimated for 1992. Rosagroprom, which controls most agricultural trucking handled 25 billion ton-kilometers in 1989, about 8 percent of total road traffic. Rosagroprom concentrates in

farm-to-market hauling and Rosavtotrans in distribution to retail outlets and longer hauls. However, about 9 percent of Rosavtotrans volume in 1991 was agricultural products, so there is not a complete separation between these two road haulage sectors.

In terms of tons hauled, truck is the dominant mode, with 60.3 percent of the market estimated for 1992 (exhibit 1.4). Of this, own account trucking accounts for about 80 percent of the road sector. About 4 percent of Rosavtotrans tonnage in 1991 was agricultural products. In addition, Rosagroprom handled 523 million tons in 1989, equal to about 3 percent of other total road haulage.

*Average Annual Utilization and Length of Haul.* Interviews by three Bank missions in 1992 analyzed the operations of several Russian trucking enterprises in detail. Average annual utilization level of trucks was estimated at about 40,000 km per truck, which reflects the short haul, intracity nature of most road haulage.<sup>4</sup> Average lengths of haul are short, typically 20 km for own-account carriers and 25 km for common carriers. Raw materials and containers tend to go by rail to distribution points, so drayage of those commodities is over relatively short distances, like bread and milk deliveries. Manufactured foodstuffs, perishables, and consumer goods have a longer length of haul.

*Trucking in the Intercity Market.* Hauls of 50 km or more are considered intercity traffic. On that basis, general purpose intercity road transport was about 121.6 million tons in 1991, compared with 1,903 million tons for railroads, most of which could be considered intercity. Agroprom and international trucking do some intercity haulage, but Agroprom figures are difficult to obtain and international truckers do very little domestic intercity hauling because it is not as profitable as their primary market. The distance covered by intercity trucking, however, is much shorter than rail. Statistics show that in 1991, rail volume was 2,317.0 billion tkm, compared with 24.8 billion tkm for intercity road.

*Surface Transport Demand.* Overall demand for transport has fallen steadily from 1989-90 levels

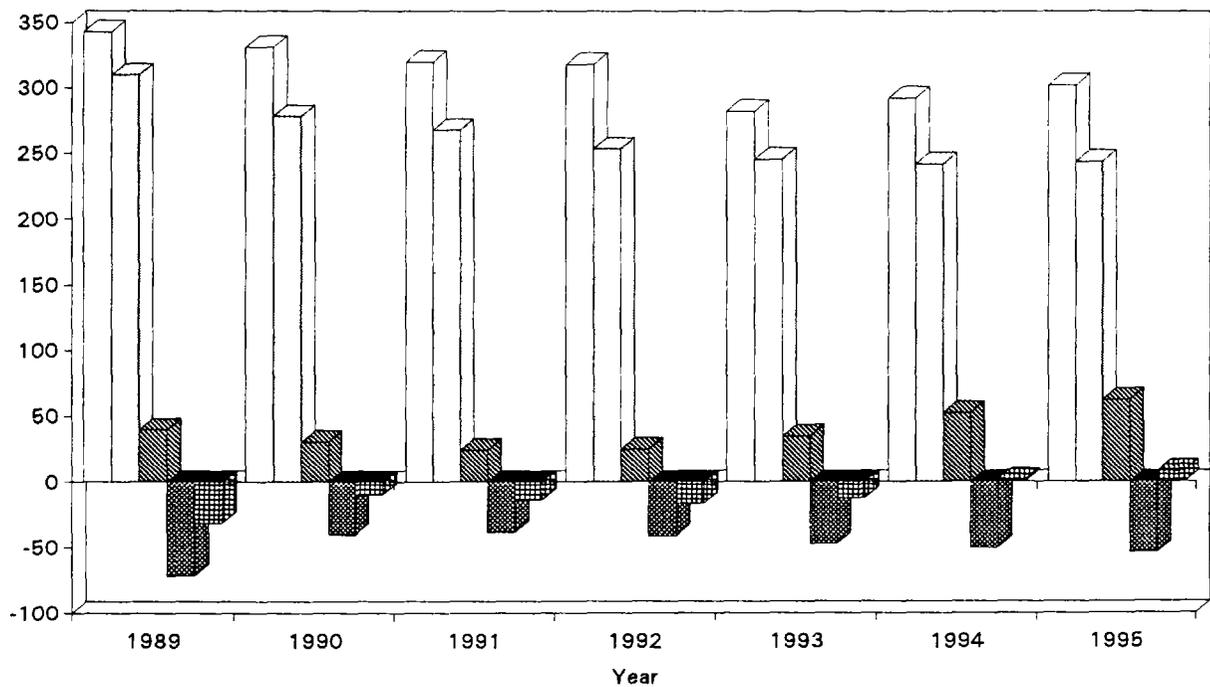
Exhibit 4.1 Russian Trucking Fleet (thousands)

	1989	1990	1991	Est. 1992	Proj. 1993	Proj. 1994	Proj. 1995
Total Fleet		2,646	2,552				2,753
Total Own Account Trucks		2,315	2,232				2,450
Total General Purpose	343	331	320	318	283	293	303
including:							
Rosavtotrans *	310	278	268	254	246	242	244
including:							
Net Truck Additions	-32	-10	-14	-17	-13	2	9
composed of:							
Trucks Acquired(New & Used)	40	31	25	25	35	53	63
including New Trucks	32	24					
Trucks Written Off	-72	-41	-39	-42	-48	-51	-54
includes Defect Rejections	-31	-24					
Agroprom			722				

Note: Missing data not available

\* Without Mosavtotrans and St. Petersburgavtotrans. From 1993, Russian joint stock trucking company, "Rosavtotrans".

General Purpose Trucks (thousands)



□ All Trucks    □ Rosavtotrans    ▨ Trucks Added    ▩ Trucks Written Off    ▤ Net Additions

SOURCE: Ministry of Transport, RF, 4 November 1992

and recovery is not expected in the near term. According to MOT, in 1992, tkm by all modes will have fallen by 30 percent from 1989 to 1993, while total road tkm will have fallen by only 9 percent and general purpose freight by 15 percent. Rail is still the predominant means of long-haul transport for general purpose and own-account freight and the relative increase of the trucking share is almost unnoticeable (exhibit 1.1).

Figures gathered from the Supreme Soviet in January 1993 indicate that motor transport actually carried 1,920 million tons in 1992, one-third less than the forecast level of 2,550 million tons and more than 40 percent lower than the 1991 level of 2,731 million tons. While these figures are more recent than those provided by MOT in 1992, they might not reflect the full range of trucking activity actually underway. The 40 percent tonnage drop might well be overestimated because (a) traffic counts for Federal roads reflect decreases in traffic substantially smaller than 40 percent, (b) staff cuts in the oblast motor transport associations have decreased effectiveness of the reporting system, (c) the reporting system for own-account trucking tonnages has deteriorated, and (d) moonlighting has grown, especially with own-account trucks that are chronically underutilized.

MOT's 1992 forecasts assume the economy bottoms out in 1993 and that the transport sector recovers as industry gets back on its feet. They do not, however, forecast a return of traffic to preperestroika levels until after 1995. The MOT numbers indicate a continued heavy reliance on the own-account sector of road transport and marginally less on the general purpose sector (exhibits 4.1 and 4.3).<sup>5</sup> This seems to indicate little understanding by the Ministry, however, of the growth potential of intercity trucking as a market economy begins to evolve out of the current recession, or it could indicate the Ministry's belief that own-account trucking will be more heavily involved in intercity traffic.

### *Capacity of the Truck Fleet*

A reasonable estimate of the size of Russia's truck fleet is about 3.25 million vehicles, which includes about 2.2 million own-account trucks (68 percent), about 320,000 for-hire trucks (10 percent), and about 720,000 trucks (22 percent)

belonging to Agroprom (exhibit 4.1). A large number of military trucks supplement these fleets and, if needed, could be pressed into civilian service, particularly at harvest time. Average age of the fleet is estimated to range from 3 to 8 years. Statistics on the percentage of the fleet that is out of service are also not kept, but unofficial estimates range from 10 to 30 percent, depending on how out of service is defined. The fuel efficiency of the fleet is about half of western standards for comparable-sized trucks. The majority are powered by gasoline engines, since Russia has had chronic problems with substandard diesel fuel, but a growing share of large trucks used to carry common-carrier freight is diesel-powered. Bank estimates of effective staffing levels for one large auto transport enterprise were 1.7 to 1.8 drivers per truck and 2 mechanics per vehicle under repair, far higher than Western staffing levels.

As far as the carrying capacity of the truck fleet is concerned, MOT figures show a clear shift to larger vehicle capacity over the past 10 years (exhibit 4.2). Vehicles up to 5 tons have declined from 69 percent of the total trucks in 1980 to 42 percent in 1991. The average capacity of Russian trucks and trailers is estimated at 6.4 tons and 7.4 tons, respectively, in 1991. The legal axle load limit in Russia is 10 tons, but many of the roads are designed for axle loads of only 6 tons.<sup>6</sup> In the future, the agriculture and intracity markets will need more lightweight trucks, while the intercity market will require more truck/trailer combinations up to 38 tons to meet market demands and provide better utilization over longer distances.

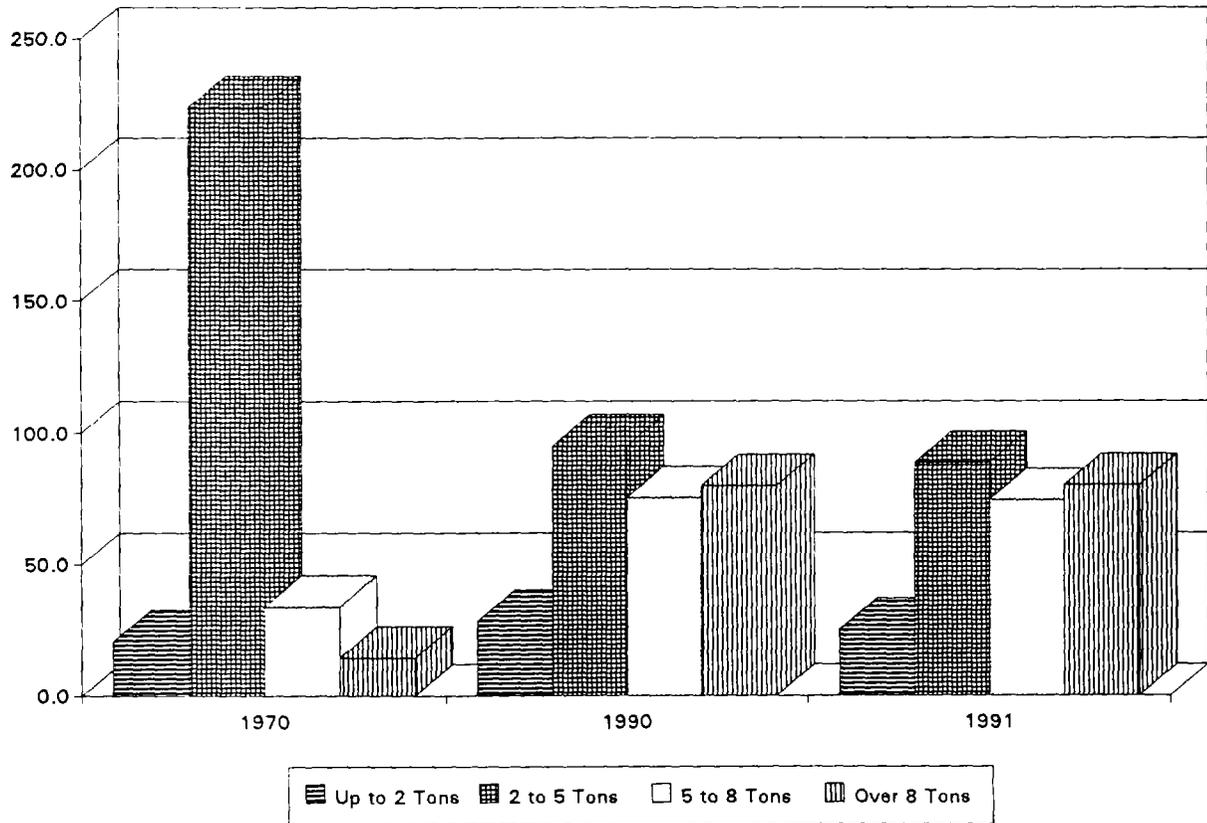
Except for the international segments of the trucking industry which have access to hard currency, however, Russia's trucking companies cannot generally afford to buy new trucks in any significant numbers. This means that any requirement for added capacity will have to come principally through improved availability and utilization of the existing fleet. The Minister of Transport addressed these issues in an interview:

- "[I]n the structure of our motor vehicle stock, we do not have enough small vehicles, dump trucks, and trucks of 14.5 tonnes and larger, while we have a surplus of vehicles of between five and 10 tonnes."

**Exhibit 4.2 General Use Road Transport Vehicle Load Capacity, 1970 to 1991**

Category by Load Capacity	1970	1980	1985	1986	1987	1988	1989	1990	1991
Up to 2 Tons	20.9	32.3	33.9	36.5	37.1	35.9	35.4	28.5	25.2
2 to 5 Tons	223.7	168.3	135.6	130.7	125.8	118.4	108.9	94.9	88.5
5 to 8 Tons	33.9	52.9	62.2	70.7	71.3	74.9	77.8	75.1	74.4
Over 8 Tons	14.4	38.1	70.7	76.4	82.8	84.5	87.7	79.8	80.1
<b>Total</b>	<b>292.9</b>	<b>291.6</b>	<b>302.4</b>	<b>314.3</b>	<b>317.0</b>	<b>313.7</b>	<b>309.8</b>	<b>278.3</b>	<b>268.2</b>
Up to 2 Tons	7%	11%	11%	12%	12%	11%	11%	10%	9%
2 to 5 Tons	76%	58%	45%	42%	40%	38%	35%	34%	33%
5 to 8 Tons	12%	18%	21%	22%	22%	24%	25%	27%	28%
Over 8 Tons	5%	13%	23%	24%	26%	27%	28%	29%	30%
<b>Total</b>	<b>100%</b>								

**Russian Truck Fleet by Vehicle Load Capacity (thousand units)**



SOURCE: Ministry of Transport, RF, 21 May 1992

- "Motor vehicle transportation workers have to worry not about how to buy more motor vehicles, but how...to develop...[a] structure for more effective use of motor vehicles."

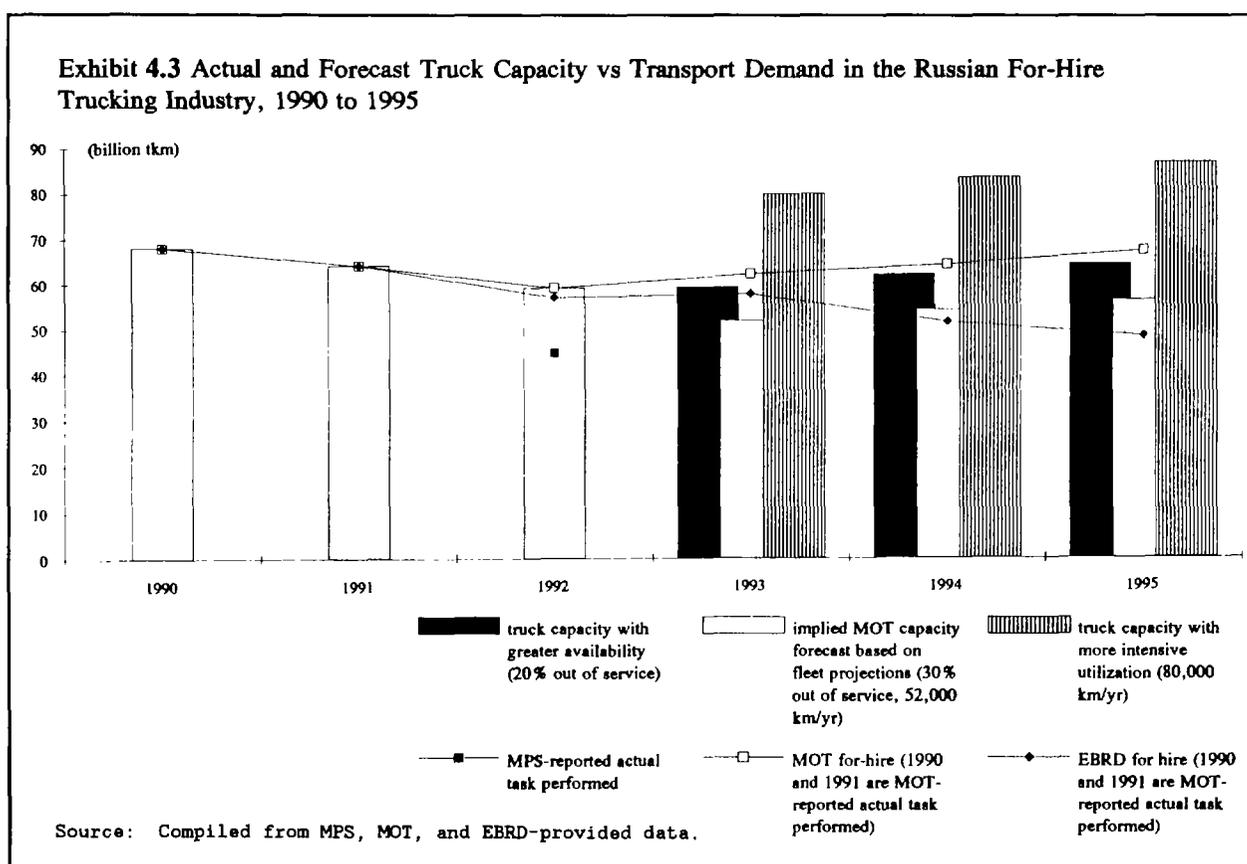
- "Up to 40 percent of the motor vehicles' working time is spent in loading and unloading; statistically, they travel empty a little less than 50 percent, and at both ends they are loaded at no more than 18-20 percent of their capacity. And both their carrying capacity and their trailers are not always fully utilized."

- "As you can see, we have enormous reserves. It is simply a matter of exploiting them quickly and intelligently."<sup>7</sup>

Based on Bank analysis of truck capacity and future demand, truck capacity will be sufficient to cover the expected growth in road traffic through the next few years, particularly since the present level of equipment utilization is low by world standards and likely to improve substantially with privatization. Comparing the truck capacity of the general purpose trucking fleet with demand

forecasts through 1995 shows that capacity is very likely to exceed demand, and probably by margins greater than expected, since the demand forecasts used in the analysis are optimistic judging by more current macroeconomic indicators (exhibit 4.3). The capacity analysis is based on (a) MOT figures regarding the number of trucks by tonnage category, (b) differing out-of-service ratios, and (c) differing annual utilization levels in kilometers per truck. Capacity is compared to two demand forecasts (a) one provided by MOT as detailed in exhibit 4.2, and (b) one derived for the for-hire industry from EBRD railroad consultants' overall forecast of the entire road transport industry.<sup>8</sup>

The operational capacity of the fleet – calculated on the basis of out-of-service ratios steadily worsening from 20 percent to 30 percent over 3 years and an assumed average annual utilization of 52,000 km per year – exactly equals the tkm performed in 1990, 1991 and 1992 (exhibit 4.3). Three levels of capacity are projected for 1993, 1994 and 1995. At these



levels, the fleet is not sufficient to meet either forecast in 1993 but is adequate to meet the EBRD forecast. Instead of buying new trucks to meet demand, however, substantial effective capacity can be added either by reducing out-of-service ratios or by increasing truck utilization. Investment in spare parts, to the extent they are available, will reduce the out-of-service ratio and is clearly an effective way to add capacity. An even more effective way, however, is to obtain greater use from each vehicle in the fleet. Fortunately, the latter is virtually a guaranteed by-product of privatization. Experience throughout the world demonstrates that utilization rates of privately owned vehicles are substantially higher than those of state-owned enterprises. In some countries it is not unreasonable for utilization by private trucks to be twice as high as those publicly owned and operated. By world standards, truck utilization rates in Russia are low. In the United States or Western Europe it is not unusual for utilization to exceed 120,000 miles, or nearly 200,000 km, annually. If average truck utilization were to increase in Russia to only 80,000 km per year, total fleet capacity would far exceed demand levels.

These conclusions are even more likely to hold true in view of the fact that both MOT and EBRD-based forecasts probably overstate future road transport demand. Both misjudged the extent of the 1992 decline in demand, and both predict a turnaround in the economy inconsistent with current conditions and the most recent forecasts in economic activity. The fact that the decline is likely to be lower than predicted is buttressed by the fact that a recently reported figure for the total tkm transported by the for-hire trucking industry is well below the EBRD-derived forecast and MOT's estimated 1992 level. The figure in question appeared in a recent MPS publication and, if accurate, portends an even greater excess of trucking capacity than shown. Given the additional truck capacity available from the military and underutilized own account trucking fleet, it is clear that *trucking capacity should not be a problem in the medium term and possibly not even 4 to 5 years from now.*

The Bank's capacity analysis means that trucking enterprises can rely on increased utilization and private financing to maintain the

trucking capacity necessary to meet demand. The government, therefore, can and should discontinue its programs of directed credits for truck acquisition and other forms of subsidization to trucking enterprises without concern that the market for road transport will not be adequately served.

### ***Structuring of a Private and Competitive Trucking Industry***

Compelling economic evidence from developed and developing countries around the world indicates that Russia's motor freight industry must grow quickly and soundly. Otherwise Russia's transport and logistics system will act as a brake on economic growth in the long term and hinder the rapid and effective transition to a market-based economy in the short term. This evidence also demonstrates that, without successful reform, the motor freight industry will develop neither the type and quantity of services that the new and growing elements of the economy require nor the practices needed to exploit the large reservoir of unused transport capacity in the existing trucking fleet.

There are, however, major problems in the path of motor freight industry reform. One very serious problem impeding the development of a market-responsive trucking industry is regulation of rates by the government.<sup>9</sup> Although conversations with MOT officials indicate that there is not currently any regulation of motor freight tariffs by the central government, there does appear to be some de facto regulation of rates at the municipal level on those contracts that are held by for-hire trucking enterprises and that pre-date privatization. There are also some indications that oblast governments are moving toward regulation of trucking rates in a manner that would restrict the free movement of goods both within and among oblasts. Irrespective of the level of government at which such authority resides, it should be removed altogether to ensure rapid development and efficient growth of a competitive trucking industry.

A part of the privatization process there is a need to cancel the old haulage contracts for government enterprises, which specify obsolete rates inappropriate to a free market. MOT

officials indicate that such contracts may affect as much as 80 percent of for-hire truck traffic.<sup>10</sup> These contracts should be replaced by new, freely-negotiated contracts which recognize full cost levels, take demand and carrier performance into account, and have provisions for inflation adjustments.

*Industry Structure and Privatization.* There is considerable potential for the development of road transport that is more suited than are railways to the transport demands of a market economy. Unfortunately, without a move to private ownership and market competition, it is highly unlikely that an efficient, responsible market in trucking services will develop, or that non-budgetary incentives to improve the quality of trucking services can be brought to bear on the trucking industry.

The privatization process that has been initiated so far carries with it the possibility that the existing mega-enterprises, under which separate trucking units have been allocated geographic or commodity-specific monopolies, will be privatized and remain inefficient. Such monopolies should be broken up and subjected to competition by breaking the link between the holding company and its subsidiary enterprises and by privatizing the subsidiaries and allowing them to compete freely. As part of the privatization process, separate enterprises should be created from those enterprises that operate both buses and trucks, except for very small enterprises in rural areas possessing only a few vehicles. Competition should also be enhanced by encouraging new entrants into the trucking business, by keeping barriers to entry low, and by auctioning part of the existing company fleets to the private sector. Some of the more progressive oblasts are beginning to initiate such reforms, and IFC and the Bank are advising the government on auctioning off part of the existing trucking fleets of the large trucking enterprises. As an incentive for enterprises to auction off trucks during privatization, the government should permit the enterprises to keep the proceeds of the auction, whether in currency or vouchers.

*Current Status of Privatization.* By mid-February 1993, MOT indicated that 314 (or 20

percent) of the 1,500 enterprises under their jurisdiction had been privatized, or plans for privatization had been approved or documented. One major reason for the slow pace of trucking enterprises being privatized was the government's concern that privatization would conflict with the designation of certain trucking enterprises and vehicles were designated as reserves for defense mobilization. Each of these 1,500 enterprises had assets in excess of 1 million rubles (US\$2,500 at the November 1992 exchange rate of 400 Rb=US\$1) and half had more than 10 million. None had assets in excess of 50 million rubles.<sup>11</sup> Not included in these figures are the trucks and enterprises owned by Agroprom or own account trucks. Agroprom did confirm they have privatized trucking operations in every oblast.<sup>12</sup>

The first highly-publicized auction was held in Nizhniy Novgorod in October 1992. Over 200 trucks were auctioned at prices ranging from US\$250 to US\$2,500. No more than five were bought by the same group, so individual owner-operators were created through this method of vehicle redistribution. Local government and the privatization committee, working closely with IFC, required that the general purpose road transport companies being privatized in the oblast put up 20 percent of their trucks for auction. To ensure that not just old or out-of-repair trucks were auctioned, each company had to contribute equipment with the same average life and condition as the vehicles being retained. All of the trucks were successfully sold in the auction, with payment in the form of cash and privatization vouchers.

The auction method of redistribution helps create a level playing field by giving both established companies and new entrants the same kind of equipment at similar price levels, rather than forcing the latter group to pay for new trucks. With the sharp decline in demand for transport, auctions will make unused equipment available for use by those who see an immediate need. It is possible that the new drivers or owner-operators could very well be drivers of company-owned equipment who are not working because of lay-offs or lack of business.

Once the initial privatization process is over, the real challenge will then be to restructure a new trucking industry.

### Description of the Nizhegorodskaya Oblast Freight Transport Organization

TPO "Nizhegorodavtotrans" (TPO) is the common carrier trucking company for the Nizhegorodskaya oblast. Consisting of 42 enterprises, the TPO performs more than 90 percent of the for-hire freight haulage in the Nizhniy Novgorod oblast with more than 10 percent of all trucks in the oblast. According to the charter of the organization, it is a legal entity and a part of "Rosavtotrans".

The TPO employs more than 18,000 people and has over 8,000 trucks and 735 buses throughout the oblast. The TPO expedites a variety of hauls and is the monopoly in haulage of certain goods.

The TPO enterprises are located in the cities of Nizhniy Novgorod, Bogorodsk, Dzerzhinsk, Lyskovo, Pavlovo, Semenov, Uren, Bor, Balakhna, Lukoyanov, Sergach, Shakhunya, Pervomaisk, Viksa, Zavolzhe; in the workers settlements of Kovernino, Pochinki, Voskresenskoye, Navashino, Vetluzhsky, B. Murashkino, Vorotynets, Sosnovskoye; in the Bor and Shatky rural areas, as well as the Kamenishenskoye enterprise.

The local multi-service providers operate all common carriage for a particular region, regardless of the products shipped. Rather than specializing in a type of service, they have defined their business based on the needs of the region.

Within the city of Nizhniy Novgorod, trucking enterprises demonstrate a greater degree of specialization. Although the enterprises often have a geographical focus toward their districts, they specialize in particular types of haulage. For example, POGA 2 transports all the petroleum products in the city, while POGA 1 transports all the milk and bread. The enterprises located in Nizhniy Novgorod are generally much larger in size than in other cities.

Eight support enterprises provide a variety of services: truck maintenance and repair, spare parts supply, communications service, construction, unloading and terminal operations, engineering services, computer services. These enterprises usually have less employees than other truck transport enterprises.

#### Data on the TPO Enterprises:

<i>Enterprises</i>		<i>Number of Trucks</i>	
mixed truck/passenger	21	average number of trucks	286
trucks only	12	highest number of trucks	1,500
subdivision of central services	7	least number of trucks	26
other	3	total number of TPO trucks	8,112
located in Nizhniy Novgorod	18		
located outside the city	25		
<i>Number of Workers</i>		<i>Number of Passenger Buses</i>	
average number of workers	483	average number of buses	38
the highest number of workers	3,000	highest number of buses	71
the lowest number of workers	60	least number of buses	14
total number of TPO workers	18,362	total number of TPO buses	735

Source: International Finance Corporation *Model Privatization of Trucking, First Use of Vouchers in Russia*. pp 3-4.

● *Company Management.* Management will have to change orientation from a command to a market economy at the worst possible time – a world-wide recession with severe internal economic conditions. The difficult tasks of eliminating or reducing social or welfare services,

laying off staff, finding parts, and financing operations are causing management to move slowly, since such steps are foreign to their past policies and practices.

● *Owner-Operator Education.* Individual entrepreneurs in road transport are facing a

different challenge. New truck owner-operators are concerned about competing with, and winning business away from, their former enterprises. Because of the need to accrue depreciation, anticipate taxes, and analyze costs per km to haul freight, new owners need some basic education in how to run their businesses.

- *Transport Service Enterprises.* The evolving private sector for truck parts, repairs, tires and fuel will determine the rate and breadth of development in intercity transport by new and existing firms. For example, today there is neither a private nor a state-owned source of repair parts or tires on the 680-km highway between Moscow and St. Petersburg. Unlighted public repair parks are available, but drivers must be their own mechanics. Food service is generally available only in towns and cities along the way, with business hours from 7 am to 9 pm. Night driving is further hindered by lack of reflectors on roads and on other vehicles, making driving unsafe even on stretches of relatively modern highway like the Moscow-St. Petersburg route. If a trucking company or owner-operator wants to start hauling between those two points, it must ensure that potential repair parts are on board the truck and that the driver knows how to make repairs. In addition, transit will be limited to daylight hours. The government must act to privatize and restructure service areas so that competition can operate effectively and monopoly vendors do not have power over trucking firms, either directly through market power or indirectly through poor services and products. Whenever the government has control over specific franchises, such as the way stations along major roadways, it should act to introduce competition through competitive contracting.

- *Changes in the Associations.* The monopoly powers that remain in the trucking associations must be divested and a private, competitive market structure for these services must be fostered. Associations could remain valuable to newly privatized trucking companies by providing information, representing them before governmental bodies and offering appropriate forms of training.

- *Monopoly Control of International Trucking.* A separate issue from domestic trucking is the control of Russia's international trucking through

a non-governmental association, ASMAP. Control of a restricted entry industry via such a cartel is anti-competitive and will ensure that Russia's beleaguered economy pays much more than it should for transport of exports and imports moving by truck.

- *Other Important Policy Objectives.* A properly structured private trucking industry should also reflect policies that promote (a) dividing the combined freight and passenger operations of mixed operating companies into separate operating companies, (b) extending the auctioning of trucks in the privatization process to Agroprom trucks, and (c) preventing the development of barriers that discourage or restrict entry into trucking.

#### *Near-term Recommendations*

*Complete privatization of road transport enterprises under a modified directive that encourages auctioning a substantial portion of the fleet as rapidly as possible.* The government's policy of moving promptly to privatize trucking as part of the overall privatization program is to be commended. No opportunity should be lost to help restructure the industry on a more competitive basis during the privatization process. This should include ensuring that when buses and trucks are mixed in the same enterprise they are separated in the privatization process.

The most effective way to do this is to encourage the auctioning of trucks as part of the privatization process by permitting the enterprises to keep the proceeds of the auction, in currency or vouchers. To increase effectiveness, the privatization process, including the optional auction, should apply to all own-account trucking, particularly Agroprom, as well as to the for-hire trucking sector. The government should also take measures to promote more rapid and complete privatization by removing the restriction against privatization of companies or individual vehicles with mobilization reserve assignments. These assignments can be maintained easily within the context of a privatized company or privately owned vehicle.

*Improve competitive structure by permitting easy entry of new trucking operators: Agroprom, other*

*own-account truckers, freight forwarders, etc.* Besides fostering entry through truck auctions, the government should remove any barriers that keep truck owners from participating in the commercial trucking marketplace. Own-account truckers, for example, should be permitted to hire out for commercial loads when they are not carrying their enterprise's freight on back-haul movements.

*Remove or eliminate any geographic or commodity-specific monopolies or other restrictions on effective and efficient operations.* Other barriers to efficient trucking include the restriction of competition through limitations on the commodities that can be hauled, the area that can be served, or the ability to move over-the-road at night. Such restrictions substitute the government's decision for that of the trucking operator as to priority or opportunity. Arbitrary restrictions on night driving reduce truck utilization and restrict the ability to serve customers during normal business hours.

*Maintain present policy against federal rate regulation.* Government-prescribed or approved rates serve as another impediment to efficient trucking. They restrict the responsiveness of the trucking operator to the demands of the marketplace by requiring the delay of regulatory approval to set or change rates. They tend also to substitute social or political considerations for economic or financial ones, making it difficult to operate a trucking firm profitably when no competent operator is willing to provide services, the government should let bidders compete to provide services under contract at the lowest cost. The central government's removal of tariff controls is to be commended and it should enforce a similar removal of controls at the oblast and municipal levels.

*Privatize and de-monopolize auxiliary services.* If fuel, spare parts, maintenance and other auxiliary services are controlled by monopolies, they can be used for anti-competitive purposes by those who control the monopolies. The government needs to break up such monopolies and promote competition to improve the quality of auxiliary services provided and to provide

effective support for a private and competitive trucking industry.

*End any MOT or other government-sponsored program of subsidized financial assistance, including leasing, for acquiring trucks.* For a trucking industry to be viable, it must generate true profits that include the cost of capital as a result of its ongoing operations. Grants or other forms of subsidized financing for trucking operators distort this process by (a) allocating trucks on the basis of political or geographic criteria, (b) sending wrong signals to truck manufacturers in terms of the demand for and acceptability of their products, and (c) relieving otherwise strong and useful pressures on trucking operators to extract more use from their existing truck fleets. Such programs also waste scarce the government resources.

*To support development of a private trucking industry, the government should lease surplus military or other facilities that can be used as terminals or warehouses.* Development of a healthy trucking industry requires competition and entry. New operators require terminals and warehouse facilities which are difficult to obtain in the Russian real estate market. The government can provide stop-gap assistance by making available to truckers excess facilities suitable for these purposes. This should be done without government interference into the operations of the users, and the facilities should be available without discrimination to all users.

#### ***Medium-term Recommendations***

*Formalize and expand the program of de-monopolizing the provision of auxiliary services by offering concessions to operate facilities for fuel, spare parts, maintenance, food and lodging along major intercity highways.* Short-term measures to dismantle the monopolies in auxiliary services should be followed up with concrete steps to foster expansion of competitive services throughout the motor transport sector. Such services will aid not only freight transport, but also automobiles and buses. One useful approach is to let contractors bid for concessions to operate

such services along major motorways on well situated parcels of government-provided land.

*Develop or adapt training manuals and computer software for Russian trucking firms to aid them in such areas as maintenance, operations planning, bookkeeping, and marketing.* Managing a private trucking firm requires skills that did not exist under the command economy. The government should assist the associations with developing and disseminating such materials to new and newly-privatized trucking enterprises.

*Coordinate and implement night driving safety measures.* A key requirement for a productive trucking industry is the ability to move over the road at night. To ensure that this can be done as safely as possible, the government should prescribe and enforce reasonable visibility standards for lights and reflectors on vehicles and infrastructure.

*Reform the allocation of international trucking operating certificates now handled through a non-governmental body, ASMAP.* Russia's rights to engage in international trucking operations are gained as a governmental prerogative through negotiations with other governments. The allocation of those rights to private parties, therefore, should be done by the government under fair and open procedures to which all parties are privy. ASMAP, the Russian international trucking association, a private body, should be removed from the role of controlling these government-created rights, and an appropriate government regulatory body should be charged with distributing them.

*Develop a body of vehicle licensing and operating specifications that will not impair the most economical and efficient use of the existing truck fleet or raise the cost of new trucks to uneconomic levels.* Because of the need for dramatic structural and operational reforms in the Russian trucking industry in a time of grave economic difficulties, the trucking industry must be left as free as possible to acquire, license, and operate trucks. Any arbitrary restrictions, other than minimum prudent safety requirements, could gravely raise the cost, and thereby affect the

supply of, trucking and thus the healthy development of the trucking industry.

*Stop providing terminal and warehouse facilities either through privatization of facilities provided under the stop-gap program or cancellation of existing leases.* Government actions appropriate and necessary in a transition period are not necessarily so in a more stabilized environment. To avoid distorting the marketplace for warehouses and terminals, and to get out of a business that the marketplace can handle without government interference, the government should terminate its short-term terminal and warehouse program.

### *Long-term Recommendations*

*Develop an appropriate set of safety and environmental standards for trucks.* An appropriate role for the government when the trucking industry has stabilized is to prescribe reasonable safety and environmental standards for the design and operation of trucks. At this stage it will be possible to understand and quantify the financial performance of private and competitive Russian trucking operations. It will also be possible to quantify the added cost of manufacturing for various alternative levels of standards. With this information the government can base its decision on a judicious evaluation of the costs and benefits of the standards it chooses.

### *Notes*

1. Total registrations, including personal trucks, amount to 44.5 million. There are also 3.6 million commercial trailers registered in the US. Source: *American Trucking Trends, 1991-92 Edition*, American Trucking Associations, Alexandria, VA
2. In the United States, 7.8 million people work in trucking throughout the economy, including 2.6 million truck drivers.
3. O&C/Consultex, *Soviet Food Supply and Distribution, An Overview of Transport and Logistics Support Systems*, Volume I: Summary Report (London: EBRD 1992), p 21.

4. Interviews with trucking enterprise officials, World Bank mission team, Moscow and Kursk, RF, March and July 1993.
5. Agroprom officials' discussions with World Bank mission. Reliable and comparable statistics are difficult to obtain. MOT was not able to provide updated numbers other than freight volumes and fleet size, and both were incomplete. While a solid, current statistical base would be preferable, it is believed the numbers in this report, taken as a whole, accurately portray what is happening in the present, rather chaotic environment.
6. COWI-TecnEcon J/V, *Roads and Road Transport Study - Draft Final Report* (London: EBRD 1992), p 79.
7. Interview of Minister of Transport of the Russian Federation Vitaly B. Efimov with *Automobile Transport* magazine, reported in FBIS-USR-93-015, 10 February 1993, p 48.
8. Booz·Allen & Hamilton/Travers Morgan. *EBRD Railway Sector Survey of the Railways of Russia, Ukraine, Belarus, and Kazakhstan*, London: July 1992, p 20.
9. Interviews with MOT officials, World Bank mission, Moscow, RF, June 1993.
10. Interviews with MOT officials, World Bank mission team, Moscow, RF, March 1993.
11. MOT officials, World Bank mission findings, Moscow, RF, 6 November 1992.
12. World Bank Mission findings, Moscow, RF, 27 October 1992.

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## *Urban Passenger Transport*

### *Nature and Scope of the Urban Public Transport Problem*

With 75 percent of its population living in urban areas and car ownership only about 6 cars per 100 inhabitants compared to over 40 in Western Europe, Russia is more dependent upon public transport services than any other nation with a similar level of income. In 1991, urban and suburban transport, by bus, tram, and trolleybus, carried 41.8 billion passengers, representing about 85 percent of passenger transportation by all modes. This compares to an urban transport share of overall public transport in Western Europe of about 20 percent, and in the United States of about three percent. If public transport companies do not work well, then neither do Russia's cities, households, factories, offices, schools, or stores.

Russian cities are served by a variety of passenger services. Bus services are provided in 1,854 urban settlements throughout the Federation. Some form of electric-powered transport service is provided in 101 cities, including 85 cities with a trolleybus network and 70 cities with a tram network. Five major cities are served by a subway or metro system: Moscow, St. Petersburg, Nizhni Novgorod, Samara, and Novosibirsk. Only the Moscow and St. Petersburg systems capture a high percentage of total trips. Overall, bus services account for an estimated 64.4 percent of all urban passenger trips; trolleybuses and trams 18.5 percent; metros 7.8 percent; suburban rail 7 percent; and taxis and

small buses 2.3 percent. Commuter rail service is a significant form of suburban travel in larger Russian cities, especially in Moscow and St. Petersburg. The Russian urban public transport fleet is among the three largest in the world; only China and India have fleets of similar size.

There are an estimated 300,000 buses in Russia, of which 131,000 are in fleets providing regularly scheduled services. The remaining 169,000 are predominantly owned by enterprises and other entities that provide services to their employees. Approximately 80 percent of the 131,000 fleet buses provide regularly scheduled urban and suburban service; 20 percent have intercity service. There are, in aggregate, 8,700 urban routes, 18,600 suburban routes, and 10,600 intercity routes. In addition there are approximately 15,000 trams and 14,000 trolleybuses.

Despite the large scale of the urban public transport fleet it is small given Russia's high dependence on public transport. The fleet currently averages slightly over one vehicle per thousand population, including a large percentage of vehicles currently not operational. About 70 percent of the fleet is available for operation on any given day. This is less than in the four major European Community (EC) countries where personal means of transport are much more widespread. *As a result, the degree of personal mobility in Russian cities is considerably lower than in Western European and other developed*

*nations. This has an enormous impact on labor efficiency.*

Buses, which account for the bulk of the urban public transport fleet and personal travel, are excessively fuel inefficient and polluting. Over half of the bus fleet is powered by gasoline engines rather than more efficient and less polluting diesel engines. This is one reason why many cities have given priority to electric transport.

In the last two or three years since the government began to limit the use of critically needed foreign exchange for buying new buses, trolleys, and associated spare parts, urban public transportation service has deteriorated sharply. This problem has been accompanied by the breakup of the Eastern European trade block (CMEA), where at least a third of the current urban bus and tram fleets have been manufactured mainly in Hungary and former Czechoslovakia. According to MOT figures, the number of Ikarus buses imported from Hungary dropped from 3,100 in 1988 to a mere 50 in 1992. According to MOT figures, the number of Ikarus buses imported from Hungary dropped from 3,100 in 1988 to a mere 50 in 1992. Overall Russia's passenger carriers received 19,500 buses in 1985, 16,200 in 1990, 14,300 in 1991 and only 8,900 in 1992. The problem has been further aggravated by the breakup of the FSU, causing further disruption in acquisition of additional parts and equipment from outlying republics.

Moreover, transport entities are experiencing a general decline in financial conditions caused by rapid increases in costs, increasingly limited local government budget allocations available for transport subsidies, and passenger fare evasion, presumably all caused by the overall decline in economic conditions. The historically high dependence on subsidies – typically at least 70 percent of operating costs – and the legal exemption of one third of the population from paying any fare will not make the current situation easy to correct. In some localities, additional exemptions enacted at the oblast and municipal level reportedly have brought exemptions closer to 70 to 80 percent of the population.

*Increasing Out-of-Service Ratio for the Transport Fleet.* As a result of these foreign

exchange and general financial conditions, an increasingly significant percentage of basically sound public transit vehicles are being sidelined because of a lack of critically needed spare parts. This is particularly true of the significant number of Ikarus buses imported from Hungary and Tatra trams from former Czechoslovakia. A further significant percentage of vehicles is aging beyond a reasonable service life. As a result, many transport entities have lost as much as a third of their daily operating bus fleets. A minimum of a 10 percent annual attrition rate – more likely 20 percent for buses – can be expected under current conditions unless action is taken to correct the situation. The implications for a nation that is over 70 percent urbanized and already suffering from a lack of mobility are serious.

Central and local governmental officials are aware of the issues outlined above, but a clear and practicable strategy for dealing with the continuing decline of urban public transport services has yet to emerge. The central government, through MOT, continues to provide some funds to local governments for the purchase of new buses and spare parts, but these funds are minimal in relation to needs. Laws and decrees providing for transfer of urban transport assets to local governments and permitting the privatization of assets are steps in the right direction, but these provisions are only in the formative stages of implementation.

The Russian government, through the Ministry of Industry, is continuing a program begun by the former Soviet government to develop local manufacturing capacities to provide adequate urban buses and other public transport vehicles. This program, however, suffers from a lack of public funds. The potential for foreign investment is not high given the absence of both a convertible currency and a legal, commercial, and financial framework in which such investments can be secure. Local governments, having only recently inherited the authority and responsibility for providing urban transport services, are trying to cope, but are having only marginal success. Lacking spare parts, many local transport entities have resorted to *ad hoc* manufacturing arrangements and cannibalization of vehicles to keep their existing fleets operating. The major

underlying problem, however – a lack of funds generated by the transport entities, and the lack of alternative subsidy sources – has not been meaningfully addressed by any level of government.

*What Government Must Do.* To cope with this situation and then solve it, government must achieve three principal objectives.

- Increase bus, trolley, and tram service capacities through repair, rehabilitation, and replacement of their fleets on both an emergency and a permanent basis.
- Assist urban public transport systems to improve their operations to a financially sustainable basis through a variety of reforms.
- Spur indirectly the development of a stronger domestic industry for manufacturing public transport vehicles through a series of carefully structured steps.

### *Options for Government to Consider*

To mount an effective attack on the massive problems facing Russia's urban public transport industry, the government should consider a number of potential ways to reform the financing, management, operations, and structure of the industry. The major potential approaches are outlined below.

*Improving Cost Recovery.* At present, at least one-third of the total population in Russian cities legally rides public transport free of charge, and in some locations, exemptions are reportedly available to 70 to 80 percent of the population. An additional one-third of the population is apparently illegally evading payment of fares – Moscow authorities reported that during the past year fares were tripled while collections only increased 60 percent. Moreover, fares are set very low relative to costs. As a result, passengers of most urban public transport systems are paying at most only 20 to 30 percent of total operating costs; when capital costs are taken into account, passengers' share of costs covered by fares may be as low as 10 to 15 percent. This share would be even lower if highly subsidized fuel costs and other hidden subsidies were taken into account. Consequently, the level of public transport subsidies is very high

even compared to high income market economies that can better afford them and that have much lower levels of ridership. Given current and foreseeable future economic conditions it is clear that urban transport systems cannot be maintained with high subsidies, and that the services they provide will continue to decline unless a much greater reliance is placed on recovering costs from riders.

*Implementing Cost Containment.* Based on preliminary mission investigations, there is scope for realizing substantial savings through cost containment measures. These measures will likely include (a) route rationalization among buses, trolleys, and trams, (b) higher vehicle maintenance productivity, (c) reduced staffing levels, and (d) implementation of cost accounting.

*Developing Effective Organizational Structures and Improving Capacity to Manage Costs.* Numerous organizational reforms are needed to enhance the financial independence, accountability, and efficiency of urban public transport entities. These reforms should include establishing independent transport enterprises outside oblast and municipal governments, divesting non-transport commercial activities, privatizing taxi services, and separating operational and regulatory functions to encourage competing public transport services. Severing urban bus services in major cities from their parent oblast level auto transport operations – which also handle inter-city bus and trucking services – is a particularly important. Once urban bus operations have been corporatized as separate operating entities, a concerted effort is needed to improve their cost accounting systems and to enable their managements to better calculate and understand the full costs of bus operations.

*Designing an Effective Emergency Program for the Remanufacturing and Re-Engining of Buses.* Implementing these policy measures will stabilize and reverse the financial crisis of urban public transport. To reverse its physical crisis, an emergency program is needed to reverse the shrinkage of the urban transport fleet, particularly buses. Specific attention needs to be given to re-engining the fleet, since low-quality engines are

one of the major causes of out-of-service buses. If a coordinated program were developed among the cities, it might be possible by effectively tendering for large orders to re-engine and remanufacture bus fleets, particularly if hard currency were available to finance any necessary foreign imports. Federal financing may be necessary to initiate this process.

*Creating a Domestic Equipment Manufacturing Capability.* With the demise of CMEA, and the breakup of the USSR, Russia is left with a domestic public transport equipment manufacturing industry that is not able to meet acceptably even half its needs. Particularly critical is the need to either manufacture or import sufficient quantities of basic urban buses with acceptable environmental and fuel efficiency standards. A fundamental issue is how Russia should address this problem. The choices are

- Direct investment in one or more manufacturing facilities.
- Encouraging foreign-local joint ventures.
- A combination of the first two options.
- Importing large numbers of the needed vehicles and equipment.

To date the government has developed plans to increase manufacturing capacity for three types of buses as part of an overall program aimed at increasing production of equipment for the road transport sector.<sup>1</sup> Direct investment by the government in particular manufacturing activities, could undercut efforts by others to participate in this potential market.

A more productive result might be achieved if the government were to use its financial backing to encourage competition among possible manufacturers, including foreign local joint ventures. Importing large numbers of vehicles is really only a short-term option since the cost of doing so is prohibitive to local bus companies that are not even able to cover much more than 30 percent of their operating costs. In the longer term, the domestic bus manufacturing industry will be stimulated most effectively if urban bus operations became more efficient, more cost

effective, and more capable of covering capital costs.

The set of reforms comprising cost recovery, cost containment, and organizational improvements is essential if urban public transport systems are to be sustained at acceptable standards as Russia moves to a market economy. A unifying approach for marshalling solutions to the problem is needed. The approach for agreeing upon and, if agreement is reached, for ensuring the implementation of such reforms is discussed in terms of short, medium and long-term measures.

### *Near-term Recommendations*

*Implement emergency measures to maintain service levels.* The Russian population depends ultimately upon urban public transport for the vast bulk of its local passenger transport needs. Some essential requirements for spare parts are being met through the World Bank's First Rehabilitation Loan (Ln. 3513-RU). Other emergency approaches to consider include developing and implementing an effective program for the emergency rehabilitation and re-engining of new buses, and opening the market to new entrants, such as jitneys and taxis, to provide more capacity and greater efficiency.

*Formulate a short-term strategy for keeping the existing urban transport fleet operating.* Russian and international experts should begin at once to perform a prompt and thorough review of the scope of the immediate requirements for retrofitting, overhauling, or remanufacturing existing urban public transport equipment and the most promising options for meeting these requirements.

*Develop new specifications for buses suitable to the Russian climatic, service, and operating environment.* A precondition to the manufacture of significant numbers of new urban passenger transport vehicles is the development of specifications that correct the inherent deficiencies of existing Russian equipment while meeting the requirements of the difficult Russian operating environment.

*Define and reach consensus on the basic elements of a reform package for the provision, financing, and management of urban public transport.* The structure, management, operations, financing, and maintenance of urban public transport need reform. The World Bank is working with Russian transport officials to develop a reform package that will address these needs.

### **Medium-term Recommendations**

*Ensure that the preconditions for effective manufacturing of new urban transport equipment in Russia are in place.* Though not directly a responsibility of MOT, ensuring effective bus manufacturing capacity and quality is a matter of vital concern to those responsible for urban transport. MOT should be a strong advocate for creating the necessary preconditions for effective manufacturing; specifically by supporting a legal and regulatory framework that fosters investment, licensing, and joint ventures, and a purchasing process that promotes a private, competitively-structured transport equipment manufacturing industry.

*Implement the reform package to improve the financial and operating performance of urban public transport.* A sound reform package should accomplish the following goals:

- De-monopolize the urban public transport organizations.
- Rationalize the structure of subsidies.
- Adopt transparent accounting procedures.
- Implement cost recovery measures.
- Implement operating cost reduction procedures.
- Introduce competitive bidding among private companies for services on marginal routes and for general services such as maintenance.

*Refine specifications for improved urban transport equipment.* With the perspective available by this time, it will be possible to evaluate the adequacy of the bus specifications that were developed earlier, to determine if revisions are required. Preliminary analysis shows a need for improved fuel efficiency and better

engines, improved transmissions, and rustproofing of underbodies.

- Introduce competitive bidding for the purchase of more fuel efficient and longer lasting buses than those now domestically manufactured.
- Use government support to the sector in the form of capital grants to reduce operating subsidies and bring about greater cost recovery of urban transport operations at the local level.

### **Long-term Recommendations**

*Privatize intercity buses.* For the level of passenger densities that Russia generates, there is no reason why intercity passenger transport cannot be privatized. In cases where service cannot be self-sustaining, the private companies serving profitable route systems can compete to provide services under government contract.

*Complete devolution of transit to municipal or local levels.* With the most turbulent of the social, political, and economic adjustment completed, it should be possible to transfer responsibility for urban public transport.

*Promote manufacturing of improved urban transport vehicles through licensing and joint ventures.* MOT should continue to advocate policies that will result in the effective private development of the transport equipment manufacturing industry.

*End parastatal operations; maximize private provision of urban transport services through contracts with private corporations.* Implementing policies designed to maximize private participation in urban transport should enable disestablishment or disintegration of many of the large, vertically-integrated parastatal monopolies involved in transit operations. Even in cities such as Moscow, St. Petersburg, and Nizhny Novgorod where integrated systems such as metros operate, it is possible within a framework of integrated operations to contract out some bus routes to private mini-buses and to use private garages for equipment maintenance and rehabilitation.

*Note*

1. *Program for Increasing Production of Buses, Specialized Rolling Stock, Equipment, and Spare Parts for General Use Automobile Transport of the Russian Federation.* Summary of program objectives provided to World Bank mission, Moscow, RF, November 1992.

# 6

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## Highways

### *The Highway Network*

Currently Russia's public road network totals only 453,000 km, of which 38,700 km or 9 percent are classified as federal roads. All but three percent of federal roads are paved (exhibit 6.1). 414,000 km, or 91 percent, of public roads are classified as regional, of which 47 percent are paved. Only 2,600 km of roads are four-lane or more. In addition, there are 450,000 km of enterprise roads that belong to the Ministries of Agriculture and Forestry, gas and oil companies, and to other enterprises. Some 700,000 km of other roads, many of which are not included in the official statistics, are primarily earth access roads or tracks to agricultural farms and forests. There is increasing local pressure for many of the enterprise roads (of which maybe more than 100,000 are paved) to be transferred to regional road authorities since they are more public than private roads. However, the regional authorities are reluctant to accept the responsibility for these roads since many do not meet public road design standards, most are in poor condition, and there might not be additional funding for their maintenance.

In terms of population, paved road density is about 1,700 kilometers per million people (km/mn), typical of mid-income countries. The level increases to 4,700 km/mn if non-public access roads are included in the network. This is still considerably below the average for most EC countries – Austria, Belgium, France, Germany,

and Denmark (10,000 km/mn) and the United States (14,300 km/mn).

By western European standards, traffic volumes on the Russian public road system are quite low because of low car ownership and the small amount of freight transported by road. Private car ownership was severely restricted in the past and current free market prices put car ownership beyond the means of most people. Traffic on federal roads averaged 4,500 vehicles per day (vpd) in 1991, while traffic on regional roads averaged 1,050 vpd. Trucks made up about two thirds of total traffic and buses a further 6 percent. Traffic growth has been quite low over the past six years, averaging only 2.6 percent from 1985 to 1990 on the federal road network and less than 2 percent on the regional network, with no growth in 1991. Problems arise with the reliability of these data since the traffic count system has not been carried out in a systematic way in the past. However, FHD is in the process of setting up a more reliable system.

Reduced funding for road maintenance and rehabilitation over the last few years and the poor quality of road works has caused deterioration in Russia's road network and a growing backlog of road rehabilitation. For example, about 38 percent of the federal road network is poor condition and requires rehabilitation or reconstruction; another 25 percent is in fair condition and requires thick overlays.<sup>1</sup> Many of the roads classified as "good" also require overlays because of their high roughness levels. *The total cost of restoring these*

federal roads to good condition could amount to US\$4.5 billion at international prices. Little information is available for the regional and rural road network, but the condition of these roads is thought to be at least as poor and probably worse.

If roads requiring overlays are not strengthened soon, there is a high risk of complete pavement failure, which would increase restoration costs by two to three times. *Estimates of the economic cost of not taking immediate measures to improve road and highway conditions on the 1,350 km of priority roads indicate that the first year of deferred maintenance could cause US\$250 million of wear and tear on the vehicle fleet, with these costs increasing exponentially over the following three years.* The benefit-to-cost ratio for rehabilitation of the higher trafficked roads is 10 to 1 or more.

An equally serious situation exists with bridges. FHD estimated in 1992 that *more than a third of the 60,000 bridges on the public road network are in poor condition* and that older bridges are in danger of collapsing within the next five years if not strengthened. Every year about one percent of bridges collapse, resulting in considerable diversion of traffic. On the federal road network, about 2 percent of bridges are in emergency condition and another 26 percent are in poor condition; only 10 percent are classified as being in good condition.

Unfortunately, the design standard to which many of Russia's paved roads were built may not be able to handle the increase in road traffic that is likely to occur with the emergence of a market-based economy. About 35 percent of federal roads and a large part of the regional road network was designed only for 6.5 ton axle loads rather than the legal 10 ton axle load. Much of the road network needs strengthening to adequately handle heavier and longer loads of road transport. Although no axle load surveys have been carried out, FHD estimates that 20 to 30 percent of trucks operating on roads built to 6.5 ton standard are already overloaded, particularly during the harvest period. *The problem is likely to become much worse as the number of heavy vehicles increases and as private ownership leads to more overloading unless enforcement is strengthened.*

The network's numerous railway crossings, narrow bridges and main roads routed through rather than around towns and cities also present bottlenecks that have been largely eliminated in other industrialized countries. Present road construction methods lead to premature pavement cracking with the result that well over half the federal road network has high roughness levels measured by the International Roughness Index (IRI), with consequent high operating costs (exhibit 6.2). For example, vehicle operating costs on a road that is in poor condition are about one-third higher than on roads in good condition.

The poor quality of road works appears to be due to (a) inadequate paving equipment, (b) inadequate control of paving operations, and (c) the low quality asphalt mixture and cement. Pavement roughness is also high because of poor maintenance operations, including inadequate crack sealing, pothole repair, and application of bituminous surface dressings. The past failure to adequately supervise road rehabilitation and other maintenance works is a major contributor to the low quality, which then

Type of Roads	Paved	Unpaved	Total	Percent
<b>Public roads</b>				
Federal highways	38,200	500	38,700	2
Regional highways	217,100	197,300	414,400	46
Subtotal	255,300	197,800	453,100	50
Enterprise roads	NA	NA	450,000	50
<b>Total</b>	NA	NA	903,000	100

NA = not applicable.

Source: Rosdornii Highway Institute and COWI-TecnEcon. *Roads and Road Transport Study*. Draft, July 1992.

requires overlays to be applied far more frequently than when initial road work is properly done.

Data on road maintenance through 1992 is unreliable since the reporting system for maintenance agencies did not require filing separate data for federal and regional roads, and there was little monitoring of data reported. FHD is trying to rectify this situation by requiring filing separate data on federal road works and introducing a monitoring system, although lack of sufficient funds may slow down its introduction.

*Road Safety.* Russia has one of the world's worst road safety records. Fatality rates are extremely high at 135 deaths per billion vehicle kilometers (bvkm), about five times higher than in Western Europe and the United States. Moreover, the number of accidents is increasing at an alarming rate: over the five year period 1986 to 1991, the number of accidents rose by 43 percent, deaths by 82 percent and injuries by 43 percent, compared to an estimated traffic growth of about 9 percent. 30,000 persons perished on Russia's highways in 1991 alone – twice the number who died in Afghanistan.<sup>2</sup> Surprisingly, the accident rate is as high on non-public as public roads, even though traffic volumes are much lower on the non-public roads. According to FHD statistics, 16 percent of accidents are due to poor road conditions, but the almost complete absence of road markings and signs, and the failure to install medians on high speed four lane highways, must also be major causes of accidents. MOT has drafted a law on road safety which will give it the statutory responsibility to coordinate activities and develop a road safety program for the country. The draft also proposes that the government set up a commission of representatives from ministries involved in road safety issues, headed by a deputy Prime Minister.

*Environmental Assessment System.* The government requires an Environmental Impact Assessment (EIA) be conducted for all highway projects and that an Environmental Impact Statement with similar content and format to Western models be submitted to the Ministry of Ecology and Natural Resources for approval. Normally, highway design institutes carry out

such environmental assessments for road works, but now there should be more competition from independent environmental consulting groups.

### *Highway Investment and Financing*

The relative sparsity and low standard of Russia's highways reflects the low priority given by Soviet planners to strengthen and expand the road network, particularly compared to the large-scale development of railways and waterways. Investment decisions were oriented to railway transport because it better fit the structure of the command economy, based as it was on large primary industries with heavy requirements for shipping bulk commodities. Moreover, transport decisions in the past rarely took into account value of service considerations that might have justified development of a modern road system.

Ostensibly, the central government exercised tight control over investments in roads, which were traditionally tied to 20-year road development programs based on rolling five year traffic forecasts. The projections reflected production plans of the most important enterprises and general traffic growth indices, but did not allow for network considerations or economic assessments. Before major works were carried out, a more detailed technical and economic analysis was prepared by independent design institutes, in accordance with official guidelines based on a variant of standard cost-benefit methods. The methodology was applied using financial prices, disregarding substantial distortions between economic and financial prices. In most cases even this limited project evaluation was bypassed; construction projects were proposed and executed without going through the central planning process, usually by dividing major projects into numerous smaller projects of 2 to 10 km subject only to local approval. Contractor organizations practically dictated technical policy in the road sector so that little attention was paid to alternative solutions. FHD is in the process of developing new road project evaluation guidelines, using models such as the World Bank's Highway Design and Maintenance Model III (HDM-III).

*Investment Priorities.* In the past, road investments have been made with a view to

Exhibit 6.2: Federal Road Conditions (two-lane equivalent)		
Road Conditions	Km	Percent
IRI = 3 to 5 million/km cracking < 15 percent	15,210	37
IRI = 3 to 5 cracking $\geq$ 15 percent	5,127	13
IRI = 5 to 7 cracking < 30 percent	4,979	12
IRI = 5 to 7 cracking $\leq$ 30 percent	2,525	6
IRI $\geq$ 7	13,190	32
Total	41,031	100
Note: IRI = International Roughness Index		
Source: Rosdornii Highway Design and Technical Institute.		

developing a network of feeder roads to rail heads and to widening highly-trafficked federal roads. The government also gave priority to the development of agricultural roads because of its concern that the inadequate rural road network was a major deterrent to increased food production, although many roads that need to be built or improved are on-farm roads normally regarded in Western countries as the farmer's responsibility. A "Road Construction in Agricultural Areas Program" to build 256,000 km of agricultural roads was begun in 1991. Lack of funds meant that very few roads were constructed over the past few years, with none in 1992. Considerable emphasis has been placed on the development of agricultural, industrial, and other "private" roads, resulting in an increase in the private road network by nearly 80,000 km from 1983 to 1990 (nearly 2 percent a year). Over the past few years the reduction in road funding has particularly affected road construction, with the kilometerage of roads constructed and reconstructed in 1992 only half of that in 1989.

While there do not appear to be serious congestion problems on the federal or regional road network at present, apart from a few

international road links and some links near major urban centers, diversion of traffic from rail to road could rapidly change the situation. For example, if just 10 percent of freight ton kilometers shifts from railways to roads, road freight would nearly double and much of the road network could be seriously jeopardized as a result. The increasing privatization of trucking will also result in higher traffic as more high-value goods are shipped by road. Traffic growth rates will have to be closely monitored, particularly on the 20 percent of the federal road network where current traffic volumes are approaching the level at which upgrading from two to four lanes could be economically justified.

*Financing Road Expenditures.* Historically, funds for construction and maintenance of federal roads and roughly one-third of roads in the republics – 102,000 km in total – came from the federal budget and a collection of road user charges, including an enterprise tax. In 1991, 55 percent of the funding came from the federal budget and 45 percent from road user charges. Funding for the remaining 353,000 km regional public roads came from regional budgets. One third to one half of funding for agricultural roads came from federal ministry budgets, and the remaining non-public roads were financed from individual state collective farms or enterprises.

As of October 1991, the government decided to eliminate all budgetary funding of roads and replace it with a road user taxation system. Road funds were established to fund construction and maintenance activities for both the federal and regional public road networks, but the funds did not become operational until April 1992. The road funds consist of a variety of road user taxes including (a) an 18 percent federal and 7 percent regional tax on gasoline, diesel fuel, oils, compressed and liquefied gas; (b) an enterprise tax (for road use) of 0.4 percent of gross revenues for all enterprises offering goods and services; (c) an annual registration tax for vehicle owners; (d) a 40 percent tax on the production value of vehicles paid by vehicle manufacturers; and (e) vehicle sales tax of 20 to 40 percent of the retail price. Nearly all taxes are ad valorem and therefore should be automatically adjusted for inflation, although the decline in domestic fuel

consumption and output of Russian industry does not necessarily mean that funding will keep up with inflation. Regions have been given more flexibility in 1993 to raise the level of taxes earmarked for regional road funds.

There were substantial problems with the collection of taxes for the road funds in 1992 because most taxes, including the fuel tax, were collected at the regional and local level. Many of the taxes were never collected, in part due to the inadequacy of the tax collection system, reluctance to remit taxes to Moscow, and the poor financial situation of many enterprises and mounting inter-enterprise indebtedness. After amendments to the road fund legislation at the beginning of 1993, fuel taxes are now collected at the refinery level, resulting in substantially increased revenues in 1993. All fuel and vehicle excise taxes are allocated to the federal road fund, and all vehicle sales and registration taxes to regional road funds. FHD does not therefore have to rely on local authorities to remit taxes owed, and regional governments can put more pressure on enterprises located in their region to pay their taxes.

Real expenditures on the public road network declined by over 40 percent between 1989 and 1992. Priority has been given to road maintenance so funding for overlays, surface treatments and routine maintenance has not decreased by as much as for road construction and reconstruction. Consequently, the kilometerage of roads receiving overlays and surface treatment in 1992 was just about 75 percent of that in 1989 compared to only 50 percent for road construction and reconstruction. The figures for 1992 and 1993 only include regional road works funded from road funds: an estimated Rb40 billion was allocated from the federal budget for regional roads, but little is known about the road works undertaken with these funds. Budget allocations were for predominately agricultural regions where the level of taxes collected is low because of the exemption of collective farms from paying road user taxes. Total expenditure in 1992 was Rb176 billion, including Rb142 billion for regional roads. Expenditures financed by road funds for 1993 are projected to be slightly less than for 1992, although the Supreme Soviet may vote additional funds for regional roads directly from the federal budget (exhibit 6.3).

FHD projects that for 1993 there will be Rb120 billion in January 1993 prices available from the federal road fund for federal road works. Another Rb144 billion will be allocated from the fund to regional roads, which together with the Rb182 billion to be collected for the regional road funds, will make Rb326 billion available for regional roads. However, the funding for federal roads for 1993 still has to be approved by the Supreme Soviet which decides each year how much of the federal road fund should be allocated as grants for state roads, a form of compensation for roads formerly maintained by FHD but now maintained by the regions. Naturally, there is considerable pressure from local interests and the agricultural lobby to allocate more funds for regional and agricultural roads (exhibit 6.4).

Other uncertainties about the funding for federal roads include:

- Problems with tax collection from refineries located in autonomous republics claiming more independence from central government and which withhold taxes due the federal government.
  - Problems with tax avoidance.
  - Pressure from the energy lobby and other lobby groups to remove or lower the fuel tax.
- Given that the 1993 budget has not yet been approved and the recent strong lobbying efforts to reduce the fuel tax, considerable uncertainties remain about funding levels for federal roads.

In general, the World Bank's experience with road funds has been disappointing. Funds have often been diverted to other uses under severe budgetary constraints, and priority has often been diverted to new construction rather than to more economically justified maintenance. It has also been the World Bank's experience that road funds are more supportable and sustainable if they are tied to the concept of road user charges. Whether or not Russia continues with road funds from taxes earmarked for road construction and maintenance, it is imperative that the government ensures funds are sufficient to maintain the network. At the same time, the government is rightly interested in trying to put in place an organizational and contracting framework within which road maintenance can be achieved efficiently at the least possible cost. To this end, the government is trying to decentralize responsibility for road maintenance to local

## Exhibit 6.3 Public Road Network Expenditures

	1989	1990	1991	1992	1993 <sup>a</sup>
<b>Billions of rubles</b>					
<b>Expenditures on public road works:<sup>b</sup></b>					
current	5.539	6.171	10.883	135.118	446.500
constant <sup>c</sup>	5.539	5.510	4.752	3.142	2.997
<b>Expenditure on federal road works:<sup>d</sup></b>					
current	--	--	--	32.800	120.000
constant	--	--	--	0.762	0.805
<b>Expenditure on public road construction &amp; reconstruction:</b>					
current	3.125	3.624	5.904	61.668	192.000
constant	3.125	3.236	2.578	1.434	1.288
<b>Expenditure on federal road construction &amp; reconstruction:<sup>d</sup></b>					
current	--	--	--	16.200	62.000
constant	--	--	--	0.376	0.416
<b>Expenditure on public road maintenance &amp; repair:<sup>e</sup></b>					
current	2.414	2.546	4.979	73.450	254.500
constant	2.414	2.274	2.174	1.708	1.708
<b>Expenditure on federal road maintenance &amp; repair:<sup>d</sup></b>					
current	--	--	--	16.600	58.000
constant	--	--	--	0.386	0.389
<b>Km</b>					
Public road construction & reconstruction	12,533	13,019	10,085	6,191	5,800
Federal road construction & reconstruction	--	--	--	460	550
Public road overlays & surface treatment	40,527	38,393	35,733	30,598	29,400
Federal road overlays & surface treatments <sup>d</sup>	--	--	--	4,840	4,700

a. Projected expenditures, January 1, 1993 prices.

b. The expenditure figures for 1992 and 1993 are not complete since they do not include funds allocated from the federal budget to the regions, or expenditure on equipment and miscellaneous items. Expenditures refer only to road and bridge works.

c. 1989 prices.

d. No data available before 1992 on the split between federal and regional roads.

e. Includes routine maintenance.

Source: Federal Highway Department, MOT.

authorities and to privatize and introduce competition among entities engaged in road works.

While dedicated road user and enterprise taxes are meant to cover all financial road construction and maintenance costs, they cover only a small part of economic costs. Given that ex-refinery product prices represent only one third of international prices, the subsidy on fuel is about three times the total projected road user taxes in 1993. Nevertheless, energy prices have been increasing in real terms, and the attainment of international prices for oil and fuel products is part of the government's reform program.

*Consideration of Toll Road Financing.* The lack of public funds for major road projects has made private investment in toll roads appear an attractive source of alternative financing for road authorities. The government has entered into preliminary discussions with foreign companies about private financing of toll roads for two major highways. Legislation is presently being prepared to allow foreign investment in toll roads, with the proviso that there must be some local participation *and* a non-charging public road running parallel to the toll road. The latter proviso will be a deterrent to potential investors since traffic would be decreased on toll roads.

Currently, few if any roads in Russia carry sufficient traffic to make any toll road viable. In the present economic and political circumstances, it is highly unlikely that international investors would construct and operate toll roads without considerable guarantees from the government to obtain a satisfactory return on their investment. Such guarantees frequently prove more costly over the long-term than if the government had raised the capital itself.<sup>4</sup> Therefore, the government should ensure that a comprehensive analysis of any financing plan for toll roads should be carried out by an independent authority, involving a detailed economic analysis and estimation of the

Exhibit 6.4: Projected Funding for Public Roads to be Financed from Road Funds, January 1993 (billion rubles)

Source of taxes	Federal Road Fund	Regional Road Funds	Total	Total in Percent
Fuel and lubricants tax	189.0		189.0	42
Enterprise tax		138.4	138.4	31
Vehicle production tax	61.0		61.0	14
Vehicle sales tax		22.1	22.1	5
Vehicle registration tax		22.0	22.0	5
Other	14.0		14.0	3
Total	264.0	182.5	446.5	100
Transfer of funds	(144.0)	144.0		
Total projected funding	120.0	326.5	446.5	100

Source: FHD, March 1993.

long-term financial cost to the government compared to alternative sources of funding.

### *Highway Organization In Transition*

Before the breakup of the FSU, responsibility for construction and maintenance of roads lay with both a central Ministry of Construction and with republic road ministries. After a brief transition period, when responsibility for the construction and maintenance of all roads was given to the autonomous state entity Rosavtodor, the road subsector was reorganized at the beginning of 1992. FHD was established within the newly created MOT and given responsibility for administering the federal road network and management of the road subsector as a whole, including development of a legal framework for roads, design and promulgation of road standards and technical policies, and preparation and implementation of the government policy for development of the road network. FHD serves primarily an administrative role, with a staff of only 150. All maintenance and construction is carried out by autonomous enterprises.

Responsibility for carrying out road rehabilitation and maintenance of federal roads is divided among (a) 17 uprdors which are autonomous federal highway corridor management agencies, each with a regional office covering four to six oblasts; and (b) 86 regional road administrations. Administration of the regional road network was decentralized to the regions, with local road administrations (avtodors) reporting to regional governments.

Major construction works were undertaken by two large national contractors but these have now been broken up into separate agencies, many of which have become, or are in the process of becoming, joint stock companies. Road construction units also belong to other ministries, including military road construction units that have recently been established as a separate agency, regional industrial organizations, and private enterprises. Bridge construction and maintenance is carried out mainly by two specialized large companies.

#### ***Decentralizing and Contracting Out Road Maintenance***

The highway subsector is undergoing fundamental restructuring, like most parts of the economy, and the process is still far from complete. Substantial progress has been made developing the central policy and management structure of the road subsector, although functional and organizational issues concerning the newly established FHD still have to be resolved. The reorganization of both uprdors and avtodors is still in transition and subject to some uncertainty. The government has declared that those agencies engaged on routine maintenance, patching operations, and emergency works will not be privatized. This is justified on the grounds that it is too early to contract out routine maintenance activities, given the monopoly position of many of the uprdors and regional maintenance units and the lack of resources for administering and supervising such a system.

The organization of regional road administrations is also proving to be a complex and largely unfinished task. At the beginning of 1992, the government mandated that all administrative functions of avtodors should be

separated from the executing functions, thereby allowing construction and rehabilitation works to be contracted out. This new program was to be completed by the end of 1992 but, by the end of May 1993 41 avtodors had made the necessary reforms and two were in the process of making the transition. Local political resistance and difficulties establishing and staffing the new authorities has delayed the process in the remaining 43 avtodors. The policy of the government is still to complete the privatization of road construction activities.

Even in those regions where separation of administration and execution of works has been carried out, it is mostly business as usual. Privatized road construction and maintenance companies do the same work as before privatization with little, if any, competition. Contractors rarely work outside of their local area, do not enter into competitive bidding for contracts, and are still very much under the influence and direction of the regional highway agencies. The ties between highway administrations and contractors remain close, particularly in the Moscow oblast where the newly privatized road construction company, Mosavtodor and Partners, provides technical personnel to the state highway agency to carry out the various government functions of planning, budgeting, collection and disbursement of funds, assessment of road conditions, issuance of contracts, and supervision of contracts.

The way in which road construction and maintenance companies have been privatized varies considerably from one region to another. Based on information from a small sample of contractors, it would appear that many road construction agencies have become joint stock companies with the majority of shares held by the employees. In some cases, companies have purchased, or are in the process of purchasing, their construction equipment from regional privatization agencies (for example, Vologda oblast), while in other cases the regional highway administration has retained control of the equipment and leases it to private construction companies (for example, Moscow oblast). The number of companies established varies substantially from one region to another. For example, in Vologda, the former avtodor for the

oblast was privatized, and the company retained most of the former construction units and all the maintenance units; only three construction units decided to break away and become separate companies. In Moscow oblast, 45 road construction (formerly district) contractors own Mosavtodor and Partners, which act on behalf of the district contractors. The company allocates all road construction and rehabilitation works in the oblast and provides all materials and other supplies to the 45 contractors.

FHD is already taking steps to introduce competition in the subsector by developing its own competitive bidding system; the system is being tested in 1993 and is intended to be used for all road construction and reconstruction works in 1994. A few of the regions also are interested in developing such a system. The extent to which a competitive bidding system is adopted at the regional level will vary considerably, and much will depend on the local political climate. Clearly, the organization of the highway subsector is still in an early transition phase and it remains to be seen whether the real objective of the privatization program – increased competition among contractors – is realized.

### *Near-term Recommendations*

*Preserve the existing road network.* The highest priority in the highway subsector is to prevent further deterioration of the road network and to begin clearing the maintenance backlog; for federal roads this represents more than half the road network. Not only is maintenance of the network necessary to avoid later and more costly reconstruction, usually at two to three times the cost of overlays, it also reduces vehicle operating costs because of smoother roads.<sup>3</sup>

*Ensure adequate funding for road rehabilitation and maintenance.* The present road fund system is an effective means of channelling funds to road maintenance if the measures to improve collection of taxes prove successful, revenues keep up with inflation, and funds are not diverted to other uses. Decisions about the allocation of resources for road construction projects, especially for regional roads, should be organized in a manner to minimize political interference and ensure

adequate funding for road rehabilitation and maintenance. Priority should also be given to improving the road monitoring system for both the federal and regional roads to ensure that funds allocated for specific roads have actually been spent on those roads.

*Obtain external financing for road rehabilitation.* The need to preserve the network is so critical that the government should consider external financing to implement road rehabilitation projects. Besides helping reduce the maintenance backlog, such funding would have two major benefits:

- Improved road rehabilitation quality by using experienced international firms working with Russian contractors. Such improvements would result from higher specifications for road works, the use of imported paving equipment, closer monitoring of the quality of materials in order to meet higher levels of specification, and supervision of works by consultants.
- The use of competitive bidding procedures to introduce more competition in the road construction industry and assist with the privatization of the road contracting industry.

The World Bank considers such financing to be vital to Russia's economic recovery and is in the process of working with the government to prepare such a project.

*Improve the quality of road maintenance works.* The poor quality of road construction and rehabilitation has resulted in high roughness levels and premature pavement aging. Techniques and work methods for patching and resurfacing should be improved to produce consistently even surfaces. This will require improved supervision of road works, the training of highway engineers and other staff, introduction of equipment for in-place recycling of asphalt layers, and improved equipment for bituminous surface treatment. Given the high cost of imported equipment, it is unlikely that contractors will be able to replace locally manufactured paving equipment in the short to medium-term. Therefore, immediate steps should be taken to determine whether existing equipment can be modified, or at least new locally manufactured equipment redesigned to lay road surfaces with minimum roughness levels.

Immediate measures should also be taken to ensure that locally produced bitumen meets higher specifications, to improve the quality of bituminous surface treatments.

*Give priority to road maintenance rather than road construction.* Despite the low road density, there is little traffic congestion on the road network. The net economic benefits of upgrading highways, although positive in many cases, are generally nowhere near as high as for maintenance. Therefore, priority should be given to road rehabilitation, strengthening, and maintenance; new construction and upgrading projects should be deferred until substantial progress has been made on clearing the maintenance backlog. This applies equally to regional as well as federal roads. Therefore, emphasis should be put on rehabilitation for regional roads funded by the federal road fund rather than new construction or upgrading, unless an economic evaluation clearly shows such works to be of higher priority.

*Develop an economic road maintenance strategy.* At present, annual maintenance work programs are based on engineers' subjective judgements, which often do not take account of vehicle operating costs or future availability of funds. Consequently, federal, regional and local road authorities need to develop optimal maintenance strategies which minimize future rehabilitation and maintenance costs as well as vehicle operating costs, and which consider short and long-term budget constraints. In view of the high economic benefits to be gained from developing optimal maintenance strategies, priority should be given to collecting road condition and other data and developing a highway management system based on road conditions. FHD intends to develop such a system over the next two years. In the meantime it needs to concentrate on preparing a short-term maintenance strategy in case funding for road maintenance is severely reduced. The development of such a strategy will also assist FHD in making a good case for road maintenance funding by demonstrating the impact on road condition and the cost of vehicle operating and future reconstruction. Consistency between the amount

of funds planned for road maintenance and the funds actually received is essential, otherwise assumptions upon which maintenance strategies are based will become invalid, leading to the adoption of uneconomic maintenance standards.

*Review the administrative structure of the highway subsector.* The reorganization of the highway subsector in 1992 resulted in a clear demarcation of responsibilities, giving FHD responsibility for federal roads and the oblasts responsibility for regional roads. Further review of the duties and activities of federal, regional, and other highway entities is necessary. Particular attention should be given to improvements in several areas:

- Monitoring works funded from the federal road fund, and establishing an effective auditing system for the Fund.
- Improving the administration of regional road agencies and ensuring adequate cost control and monitoring systems, and determining whether or not this should be under the responsibility of FHD.
- Monitoring the role of the uprdors, both in the short term while they retain responsibility for routine maintenance and in the long term if routine maintenance is privatized and contracted out.

*Strengthen the capacity of FHD.* FHD is taking a lead role in this transition phase of the highway subsector by giving priority to (a) road rehabilitation and maintenance, (b) improvement of road construction and maintenance standards, (c) introduction of competitive bidding for road construction and road rehabilitation works, (d) improved monitoring and supervision of road works, and (e) development of a road planning system. Other possible roles for FHD include setting and enforcing road design standards, disseminating highway research and technological developments, and training highway personnel, especially for managerial and supervisory positions. To carry out these tasks and to help the regional road administrations develop planning, bidding and other systems will require additional staff and resources. FHD is currently funded from the federal budget so obtaining approval for additional funds is difficult. Alternatively, the

possibility of funding FHD from the Federal Road Fund should be examined, especially since the administrative expenditures required only would involve less than one percent of annual revenues.

*Determine the role of avtodors.* Government policy to separate the highway administrative functions of the avtodors from the executing functions has met with considerable resistance at the regional level. However, the government should continue to pursue such a policy as a first step to establishing autonomous road maintenance units to eventually establishing competition among maintenance contractors, either as publicly owned or privatized entities. Such measures are essential to improve the quality and efficiency of road construction and maintenance.

*Establish a competitive road contracting industry.* The government policy of privatizing all entities engaged in road construction rehabilitation and periodic maintenance is proceeding slowly, and some regions are resisting. Nevertheless, the government should remain firm on its privatization policy, because the present force account system does not encourage competition or accountability nor provide incentives for good performance. There is a danger, however, that many construction units will be replaced by quasi-commercial enterprises partially owned or controlled by national and regional highway entities. At present, many of these enterprises do not have to compete for road contracts, have limited access to financial resources, and have very little managerial freedom.

If the government truly wishes to separate client and contractor, no government transport agency should have ownership in road construction enterprises. Even if the government ownership is retained, force account units should be reorganized into autonomous road contractors with their own equipment fleets, who are held accountable and have to compete among themselves and with the private sector for road contracts. The development of a competitive construction industry will also require a number of other problems to be addressed:

- Familiarizing construction enterprises with such commercial practices as accounting and cost control systems, and contracting practices.

- Breaking up monopolies that control access to or supply of such essential goods as bitumen, cement, fuel, and construction materials.

- Making local supplies of essential goods and services available to all contractors on an equal basis, until the monopoly position of suppliers is broken.

*Introduce competitive bidding for road works.* The development of a truly competitive construction industry will require the introduction of a competitive bidding system for federal and regional road works. Because Russia does not have the legal, administrative, and traditional infrastructure of market-oriented economies, introducing a competitive system with complex laws, regulations, and administrative procedures will necessarily take time. Assistance with developing such a system will be provided under the proposed Highway Rehabilitation and Maintenance Project (HRMP) to be financed by the World Bank.

*Introduce a contract management and supervision system.* Contract management and supervision of road construction and maintenance has been very weak in the past, and both functions were undertaken by the contractor. Supervision was mostly visual and involved few measurements and tests. Therefore, at both the federal and regional level, an adequate contract management and supervisory system needs to be established which will require training of FHD and regional staff and improved laboratory facilities.

*Establish a traffic count system.* The development of a sound planning system requires reliable data on traffic volumes. Such data will be particularly important to identify those roads where traffic growth increases significantly as more traffic is diverted from rail to road. FHD is in the process of establishing a traffic count system for the federal road network, and such efforts should be duplicated at the regional level.

### *Medium-term Recommendations*

*Improve highway subsector planning and evaluation of projects.* In the past, methodologies used in highway planning did not allow for any

network considerations or economic assessment. Therefore, network planning models should be adapted to Russian conditions. Guidelines for highway planning and the economic evaluation of individual road projects should be prepared, with emphasis on the introduction of the concept of economic prices in project appraisal and improved traffic forecasting. Guidelines should be applied at all levels for planning federal, regional, local and private roads. FHD is in the process of developing such guidelines and will be applying them to plan for the federal road network.

*Design and implement a bridge rehabilitation program.* An adequate bridge inspection system is in place for the federal and regional road network, but insufficient resources are allocated to the reconstruction of bridges in imminent danger of collapse. Given the under design and poor condition of many bridges on the road network, including pavements, a comprehensive multi-year bridge rehabilitation program should be developed based on economic evaluation. The proposed HRMP will include assistance for such a program. Priority should be given to (a) reconstruction of bridges in dangerous condition on critical main roads; (b) bridges with traffic restrictions; and (c) narrow bridges with long traffic delays – although there are few of these, better traffic signalling could alleviate the problem.

*Review the classification and maintenance of non-public roads.* More than half of the road network lies outside the responsibility of public road agencies and is poorly maintained. Very little maintenance of enterprise and other rural roads has been or is now being carried out, causing the loss of several thousand kilometers of roads. Because many enterprise roads serve as public roads, a plan for maintaining them and the remaining 700,000 km of other mostly rural roads should be drawn up. The World Bank's proposed HRMP will study this problem with a view to recommending institutional and financing arrangements.

*Review and revise road design standards.* Road design standards have not been based on any considerations of cost-effectiveness and therefore need to be reviewed and revised. Particular

emphasis should be put on rationalization and improvement of geometric standards and development of guidelines allowing cost flexibility for designs based on local requirements and conditions.

*Monitor axle loads on roads built to six ton standards.* Axle loads should be monitored to determine if roads presently designed for six tons are carrying significant numbers of 10-ton axle load trucks. If so, the most critical road sections will require strengthening to prevent widespread failure. This work should only take place after detailed analysis of optimal timing has been carried out.

The government needs to find ways of meeting increased funding requirements to clear the backlog of road maintenance and to increase road capacity once the economy recovers and congestion becomes more of a problem. Economic efficiency criteria should be taken into consideration in structuring road user charges, so that users carry the cost that they impose on the network. Road user charges based on the economic principle of short-run marginal costs include only (a) pavement damage costs from vehicle use, mostly trucks and buses, which may be only half the costs in wet freezing climates, (b) the costs such damage imposes on other vehicles, (c) congestion costs, which are not yet significant, and (d) environmental and accident costs.

Most countries, including Russia, adopt the principle that road user charges should be designed to cover most road rehabilitation and new construction in addition to road maintenance as well as to contribute to general revenues. Any road user charge study, therefore, must carefully evaluate the effects of cost recovery on demand for road use. It is essential that the development of a road financing system is carried out by MOT or such other staff as in road design institutes, as well as by Ministries of Finance and Economy. This ensures greater understanding of the objectives and process of such a study and a policy dialogue within the government. Assistance for MOT to develop the financing systems is included in the World Bank's proposed HRMP.

*Enhance training of highway subsector staff.* Training staff at all levels of the highway

subsector is required in many key areas, such as cost-accounting, procurement of goods and civil works, contract management, supervision and monitoring of road construction and maintenance works, "least cost" design and planning, and modern construction, rehabilitation and maintenance techniques. Twinning arrangements with western highway agencies are recommended at the federal, state, and local level to facilitate on-the-job training in organizational, management, financial, technical and other areas; overseas courses, training programs and familiarization study tours are also recommended. FHD and the regional road administrations need to form some kind of association responsible for disseminating information and facilitating the sharing of relevant experience. FHD has already signed an agreement with FHWA of the United States to enter into such a twinning arrangement.

*Design and implement a road safety program.* Russia has a very poor road safety record, and the number of accidents has increased at an alarming rate since the breakup of the FSU. The Road Safety Commission that the government is establishing is a good first step to developing of a road safety program. The secretariat for the commission will require a director who should be appointed as soon as possible. A large training program will be required for all personnel involved in road safety work at both the federal and regional level. Priority should be given to road marking and signing, installing road barriers and median separators, as well as to a program to improve "black spots".

### ***Long-term Recommendations***

*Clear federal road maintenance backlog.* Clearing the backlog of rehabilitation and maintenance on federal roads within ten years would involve the overlaying, extensive rehabilitation, and reconstruction of up to 4,000 km of roads a year. Additional resources are required to carry out such a program and these resources must be used more efficiently than in the past, particularly to ensure longevity of rehabilitation works by improving quality. Priority should be given to improving road drainage, the quality of materials and paving equipment, reducing road roughness,

and supervising road works. Considerable uncertainty also surrounds the future availability of funds for road maintenance, but every effort should be made to convince the government of the high priority of road maintenance.

Since its size is not known, no estimate can be made of how long it will take to clear the backlog of regional road maintenance. Priority should be given to obtaining this information and embarking on a regional rehabilitation and maintenance program. Other priorities are to complete the bridge rehabilitation and widening program; replace some railway level crossings, and improve surface condition, signing and marking of other crossings.

*Increase road capacity.* The trunk road network needs improvements in terms of quality and extension to meet the expected growth in traffic once there is more economic stability and a free market. Substantial diversion of traffic from rail to road is expected over the next ten years, resulting in congestion on major highway routes. Therefore, road agencies should closely monitor traffic levels and develop models to predict major bottlenecks on the network. Sufficient preparation time for feasibility studies and detailed engineering for road projects will prevent costly delays in project implementation. Other important areas to study are the need for urban by-passes, upgrading unpaved local roads, and the extent to which rural roads are a bottleneck to development of agriculture.

*Develop axle load regulations.* At present, there is no system for monitoring or controlling axle loads. To carry out economic design of roads, it is essential to systematically monitor axle loads on different parts of the network. An axle control system is necessary to prevent overloading – currently estimated at 8 percent – especially if there is significant diversion of traffic from rail to road. An axle load monitoring system requires expensive equipment, the use of which has not always proved effective in enforcing load limits because of the many ways in which the system can be by-passed. Therefore, the government is more likely to adopt the low tech alternative of spot inspections to weigh loads, using typical specific weights for different types of load.

*Contract out routine maintenance activities.* MOT policy is to retain the government control of routine maintenance activities, while ensuring separation of administrative functions from executing functions. Such a policy may be most practical over the short to medium term, given that many of the maintenance contractors who have been privatized are effectively in a monopoly position. Road agencies would be advised to first develop a competitive market for such works as road construction and rehabilitation before embarking on privatizing routine maintenance, which requires more intense supervision.

Over the long run, many activities now being done by force account would be more effectively carried out by small private contractors: they include many winter maintenance activities, surface treatments, and some, if not all, routine maintenance tasks – except possibly in remote areas where there might be little competition. Such a system should be based on the results of pilot projects to test alternative approaches. According to recent studies, contract maintenance should be more cost effective than maintenance by

direct labor, provided contracts are properly administered and supervised.

#### *Notes*

1. Rosdornii Highway Design Institute, 1992.
2. L. Kizilova, "Show Me Your Roads....," *Gudok*, 31 January 1992, p 2. Translated in *Central Eurasia* (FBIS-USR-92-023) under "Highway System, Problems Examined," p 99.
3. For more discussion of the real costs of toll roads see: P. Blackshaw, J. Flora and R. Scurfield. *Motorways by BOT: Political Dogma or Economic Rationality?* Paper to PTRC Annual Meeting. September 1992.
4. Details of the economic benefits of road maintenance for countries with similar problems can be found in IBRD ECA and MENA Technical Department: *Road Rehabilitation and Maintenance in Central and East Europe*. September 1992.

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## Waterborne Transport

### Overview

The waterborne transport system of the Russian Federation encompasses three segments: international ocean, national cabotage, and river transport. Activity in each of these is further divided into geographic areas of activity based on water basins. Each segment is composed of fleets, supporting industries, and physical infrastructure such as ports, rivers, and canals. In 1992, the three segments' collective share of the total freight tonnage transported by Russian common carrier transport was 2.6 percent: ocean transport carried 83 million tons; cabotage, 29.6 million tons; and river transport, 374 million tons, of which nearly 17 million tons were international trade. Excluding oil and gas trades through pipelines, about 70 percent of Russia's international cargo transactions were transported by ocean and river-sea transport.<sup>1</sup>

Although such a large percentage of Russia's non-petroleum trade cargo is transported by sea, *the annual volumes of seatriade and port throughput represented only about 4 percent of global seatriade in 1992.* Total Russian international seatriade was 165 million tons in 1992, of which 83 million tons, or about half, was carried on Russian ships. Imports represented 30 percent of the total and exports 70 percent, of which 57 percent were liquid, almost exclusively oil. To put Russia's maritime trade in perspective, the total freight throughput in all of the Federation's seaports in 1992 was equivalent to the cargo handled by Shanghai, China, or in two of Western Europe's principal ports, Antwerp and

Hamburg. The Federation's containerized seatriade in 1992 was no more than the container traffic through Indonesia's Tanjung Priok port. *These figures reflect the fact that most of the Russian economy's production was traded internally among the FSU. Its international trade was largely undeveloped and with the exception of petroleum, coal, wood exports, and grain imports, limited primarily to Eastern Europe, Cuba, and other allies in Asia and Africa. Thus by international standards Russia's seatriade is minuscule and it is declining.*

In keeping with socialist goals and philosophy, Soviet international trade was managed centrally, and all foreign earnings and expenditures were subject to the strict control of the Ministries of Economy and Finance. To control shipping centrally, most trade was handled by the monopolistic freight forwarding agency, Soyuzvneshtans (SVT) in ways that maximized the use of Soviet ships. Sovmortrans and several other freight forwarding agencies created in the 1980s also participated in this effort. Domestic exporters had to arrange international cargo transactions on a Cost-Insurance-Freight (CIF) basis; importers were to execute freight contracts on Free-On-Board (FOB) terms. Such practices were designed to ensure that Soviet transport carried virtually all Soviet trade and would be contracted for sea transport, thereby maximizing control of goods and international contacts and minimizing foreign exchange outlays for ocean freight. An exception applied to countries with which the FSU had preferential trade agreements providing for a 50-50 split for carriers from each

trading partner. Compensation for cargo transport was negotiated, mostly in non-convertible currencies. Commodity bartering often replaced cash flows as a form of freight payment.

*Merchant Marine Fleet.* As a result, the FSU Merchant Marine Fleet was big but not particularly efficient. Even after the breakup, Russia's fleet remains large (exhibit 7.1); the Federation has 1,433 ships with a total deadweight tonnage (dwt) of 13.6 million. Unlike Russian practice, shipowners in many countries have "out-flagged" a number of their vessels to other countries, making the total tonnage of beneficial ownership larger than national flag fleets would suggest (exhibit 7.2). For example, the total tonnage under beneficial ownership in Greece is now over 100 million dwt; in Japan it is 83 million dwt; in the United States 62 million dwt; and in Norway 57 million dwt. The ratio of Russia's dwt to its total trade tonnage is high.

Russia's existing fleet capacity is roughly 84 million tons per year (based on an average 6.2 tons per dwt a year), consisting mostly of general cargo ships: 793 ships represent 28 percent of the total fleet's dwt. Their size and configuration is not well-suited to international competition, partly because they were geared to the pick-up and delivery trade among Russia's small ports, as well as to international trade to and from specific ports.

The fleet's carrying capacity represents about half of Russia's annual trade, equivalent to the percentage of Russia's maritime trade carried by Russian vessels in 1992. A number of countries are more than satisfied if their trading figures approximate what has been called the 40 percent to 40 percent to 20 percent standard promulgated by the UNCTAD. The government seems to want as much Russian trade as possible carried in Russian ships. Given the glut of ships worldwide, the fact that only half of Russian cargo is being

Exhibit 7.1 Status of the Former Soviet Merchant Fleet (July 1, 1992)

Category	Russian Federation		Other CIS Republics		Baltic States	
	dwt ('000)	# of Ships	dwt ('000)	# of Ships	dwt ('000)	# of Ships
Ships of 300 grt/gt and Over						
Oil tankers	3,908.9	(239)	1,165.7	(153)	904.3	(47)
Chemical tankers	32.8	(9)	20.8	(7)	--	
Liquid gas tankers	--		139.4	(3)	--	
Bulk carriers	1,505.0	(74)	2,490.1	(75)	419.9	(17)
OBO carriers	1,611.6	(18)	120.1	(42)	--	
Container vessels	484.6	(40)	145.8	(20)	18.3	(2)
General cargo ships	3,923.9	(793)	3,065.2	(420)	416.7	(104)
Reefer vessels	1,055.1	(190)	350.9	(68)	332.7	(51)
RoRo ships	1,072.5	(70)	385.1	(37)	128.8	(24)
<i>Total</i>	<i>13,594.4</i>	<i>(1,433)</i>	<i>7,883.1</i>	<i>(825)</i>	<i>2,220.7</i>	<i>(245)</i>
Share in dwt	57.4 %		33.3 %		9.3 %	

Source: Institute of Shipping Economics and Logistics, 1992. *Statistical Yearbook*, Bremen.

Exhibit 7.2 Merchant Fleets of the World

Nation	Ships	000 dwt
China	1,281	19,611
Greece	914	36,537
Japan	1,007	36,237
Liberia	1,409	88,275
Panama	3,189	70,537
United States	407	20,439
Russia	1,433	13,600

Source: U.S. Department of Transportation.

carried on Russian ships is not necessarily bad, however, since the service and costs provided by non-Russian carriers may be relatively advantageous. Foreign lines are essentially replacing capacity lost to other republics.

*Monopolistic Shipping Companies.* The merchant marine fleet was designed to meet the cargo needs of each port rather than the overall needs of Russia's international trade. Each shipping company was assigned a specific set of ports to serve, with little overlapping or competition because, until recently, ports were owned by the shipping lines they served. Russia's major seaports were subordinated to the regionally based national carriers. Smaller ports were subdivisions of the carriers and were, as such, fully integrated into a carrier's organization. The central authorities decided the role a port had to play, and directed predetermined types of ships and cargo to each port. As a result, most ports became highly specialized, and each ship was responsible for carrying most of its cargo for the home port. There was little scope for diversification, and questions of competitive strategy and service improvement hardly ever arose.

*River Transport.* The annual volume of cargo transported on Russia's river and canal systems is

modest, in 1992 representing only 4.04 percent of total tkm transported in the country and 1.9 percent of tonnage (exhibit 1.2). River transport's share of freight transport is far greater in other parts of the world with similar resources. For example, tkm river transport in the United States was 13 percent and in 1992 more than 600 million tons of cargo were transported by river in the United States, as well as in a European region that includes the Benelux countries, France, and Germany. Excluding local traffic, Russia's 11 principal river ports each handled about 2.2 million tons of longer distance general cargo in 1992, less than 20 percent of the average trade volumes of similar ports in Western Europe.

River transport potential in Russia is limited by a number of factors:

- The rivers tend to flow north-south while most transport requirements are east-west.
- River traffic is seasonal and limited by weather conditions.
- Rail services and prices are more competitive than river transport, whose tariffs favored large volume cargos such as sand and gravel.
- River transport is a subsidiary business of each river port. Besides owning its own vessels that transport general cargo, each port is responsible for dredging, organizing storage and transportation, and providing cargo handling services.

For reasons of price and performance, more and more long-haul commodities typical of river transport elsewhere have been diverted to the railway. As a consequence, most river transport in Russia today consists of sand and gravel aggregates dredged from rivers and used locally in construction. The average length of haul for these materials is less than 200 km.

Excluding sand and gravel, river transport is responsible for only eight percent of total transport in tkm. Nonetheless, Russia's river fleet is far too large for the volumes of freight available to it. The 9,000 river vessels have an estimated annual carrying capacity of 850 billion tkm at 50 percent utilization, yet in 1991 the total tkm transported by the river fleet in Russia was only 200 billion tkm. By this measure, the number of vessels is at least four times more than

currently needed. *Given the substantial surplus of river transport vessels, investments proposed to replace or expand capacity in this sector will be difficult to justify and should be considered only against reductions in operating costs.*

Even if prices were changed and river transport made more competitive, the commercial river fleet in Russia is ill-suited to the sort of low-cost river transport provided elsewhere in the world. This is because so many of Russia's river fleet are self-propelled vessels, rather than the pusher and barge system used elsewhere. In Europe and the United States, the pusher operates almost continuously, picking up and dropping off barges. Self-propelled vessels must wait while cargo is loaded and unloaded and work less than half of total navigation time. According to the EBRD-funded report on Russia's Waterborne Transport Sector, "currently the self-propelled vessels comprise about 35 percent of the total deadweight tonnage [dwt] of the fleet, assume 77 percent of the fleet costs and carr[y] 23 percent of the traffic volumes and 60 percent of the ton/km."<sup>2</sup> The report cites the River Transport Research Institute in Moscow as having calculated that the costs of the self-propelled fleet are 3 to 6 times higher than the pusher/barge system (exhibit 7.3).

#### *Past and Future Levels of Waterborne Trade*

Russia's seatriade volumes historically have been relatively small and trade flows generally unbalanced. Moreover, annual cargo volumes in each waterborne transport segment have declined significantly in the last few years; 1991 ports levels were 25 percent below peak levels of 1988, cabotage trade down by 14 percent in 1990 from 1987 peak levels, and inland waterway traffic down by 12 percent in 1991 from 1989 peak levels. Total Russian seatriade was 260 million tons in 1990, 129 million tons in 1991, and 165 million tons in 1992. The increase in 1992 reflects the partial recovery of trade with former CMEA partners, as well as Russian efforts to channel

**Exhibit 7.3** Cargo Turnover in Russian Seaports (millions of tons)

	1989	Percent	1990	Percent	1991	Percent
Dry cargo	111.2	65	101.7	62	90.7	71
General cargo	35.7	21	34.8	21	31.9	25
Bulk cargo	47.4	28	43.8	27	35.9	28
Grain	16.7	10	15.8	10	17.4	14
Liquid cargo	58.7	35	61.9	38	37.8	29
Total	169.9		163.6		128.5	

Source: Soyuzmorniproekt.

trade flows through Russian ports. In 1990, 63 percent or 164 million tons went through Russian ports. In 1991, virtually all Russian cargo was channelled through Russian ports (exhibit 7.3).

*Imbalance of International Seatriade.* Russian maritime exports are substantially greater than imports. Exports totalled 145 million tons in 1990 but dropped to 115 million tons in 1992. Imports totalled only 37.22 million tons in 1990 but increased to 49.26 million tons in 1992, of which grain represented half, or 25 million tons. 1991 figures were drastically below these totals, reflecting the disintegration of CMEA trade relations and the political upheavals preceding the final dissolution of the FSU (exhibit 7.4).

*Current Commodity Mix of Russian Imports and Exports.* Some decline in post-CMEA trade flows was to be expected, since trade within the USSR and CMEA was not based on economic principles of comparative cost and location advantage, explaining in part the inordinate degree of transport intensity within the USSR. Recent studies indicate that the FSU and former CMEA states can be expected to trade less with each other and more with other countries, notably those in Western Europe, to import more machinery, and to export more raw materials and metal products.<sup>3</sup> Nonetheless, preliminary figures for 1992 and the first part of January 1993 indicate that, as before, East European and Baltic countries are among the most active buyers of Russian

Exhibit 7.4 Russian Seatrade Volumes by Type of Cargo (millions of tons)

Year	Total Russian International Seatrade	Imports	Percent of Which Grain	Exports	Percent of Which Liquids*
1990	182.6	37.22	37.4	145.37	62.9
1991	67.2	17.27	66.5	49.95	56.7
1992	164.8	49.26	50.8	115.51	57.0

\* For 1991, petroleum = 100 percent of liquid exports.

Source: Russian Ministry of Transport, Department of Maritime Transport. *Freight Throughput of Sea Ports and Inter-Port Freight Exchange* (Moscow: Department of Maritime Transport Main Computer Center, 1992), and Ministry of Transport data, provided to World Bank mission, Moscow, November 1992.

products; in terms of the total number of export contracts, Bulgaria, Latvia, and Poland were Russia's top customers. The type of commodities exported to these countries remained unchanged – simple manufactured goods, foodstuffs, and products of the machine-building and chemical industries.<sup>4</sup>

*Level and Balance of Future International Trade Flows.* Future overall developments in the maritime sector are expected largely to follow broader economic development trends. Trade growth projections for the Russian Federation suggest that declining trends can be expected to persist until the mid-1990s. Thereafter, traffic is expected to increase slowly as the economy recovers. The government forecasts annual cargo growth beginning in 1995 of 4.5 percent for ocean transport, 3.5 percent for cabotage and river-sea transport. The annual incidence of river transport cargo, on the other hand, is expected to decline to about 300 million tons in the next few years, and not to increase until after the turn of the century.

At these growth rates, it is likely to take about 12 years for the annual cargo volumes in Russia's waterborne transport system to reach levels which were characteristic of the mid-1980s, so external trade is likely to remain depressed for years. Much trade with Cuba, Vietnam and Eastern Europe has been lost. The projection of a slow recovery for the economy as a whole means that

replacement trade will also be slow to develop.

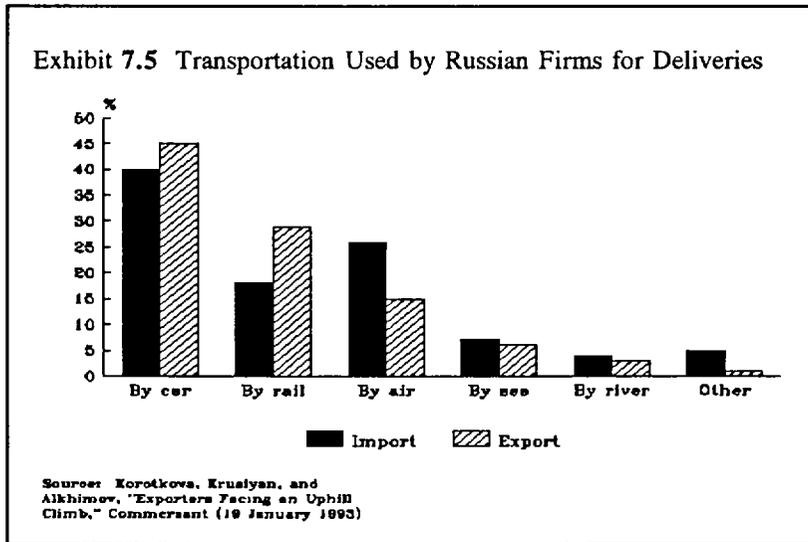
In 1991, 13.8 percent of all Russian international commercial seatrade was with socialist countries, of which 67.9 percent was with CMEA member states. Bulgaria was Russia's primary CMEA export target, primarily for petroleum products. Cuba was the primary source of CMEA imports, largely sugar. Commercial seatrade with developing countries accounted for 10.7 percent of the total, India being the primary importer of Russian sea shipments, with petroleum and paper. Argentina was the primary source of

imports, a relatively small amount of grain and metals.

Trade with developed and market-oriented countries accounted for 75.6 percent of overall commercial seatrade. Leading purchasers of Russian goods were Japan which imported coal and wood, and Italy which imported petroleum, coal, and wood. Canada was the leading exporter of goods to Russia, shipping mainly grain, ore, and other goods.

When the economy improves, new trading partners are likely to emerge. Long-term forecasts call for significant growth in trade to Pacific Rim countries. Japan and other Asian countries are interested in developing or expanding trade with Russia for timber, oil and other natural resources. Trade in Russian manufactured goods to Europe may gradually increase, but the greater growth is likely to be in the export of raw materials and the increase in imports of finished goods. As borders to Europe through Ukraine and Belarus open, it is likely that trade previously brought into Russia on Russian-owned ships may instead be brought by truck and rail, particularly high-value items. Russian forecasts project a continued decrease in movement of oil and oil products, wood in rafts, and construction materials by internal waterway, but anticipate increases in river-seatrade and wood carried on river craft.

In an analysis of trade in 1992 and early January 1993, certain modal shifts had already



become apparent. During this period nearly half of all Russia's foreign trade was carried by road transport, because of its higher reliability, lower costs relative to other modes, and the large number of firms offering international transportation service (exhibit 7.5). Sea-going ships were not widely used, despite low cost, essentially because ties with countries outside Europe and the Middle East were not extensive.<sup>5</sup>

*Future Containerized Freight Transport Demands.* Of the 403 million tons of cargo through CIS ports in 1990, only 9.4 percent, or 38 million tons, moved by container or RoRo vessel. Only 8 million tons, or less than 2 percent, moved in containers. Only two ports – Ilichevsk and Vostochniy – handle more than one million tons a year in containers. Because of the disintegration of the unified rail network, the poor quality of rail service, and the low state of development of the road network and the intercity trucking industry, significant increases in intermodal movements of containerized freight are not expected in the near to medium term.

#### *Effect of the FSU Breakup*

Waterborne transport services and infrastructure have been substantially influenced by the effects of the breakup of the FSU. The old system was organized under the premise of specialization with each carrier and port developed to manage a

specific part of the all-Union trade. The breakup has left the republics with somewhat disjointed water transport and infrastructure assets.

*Ports.* The breakup reduced Russia's port capacity by 53 percent as only 7 of 18 major ports handling over 6 million tons of cargo annually remain in Russian territory. Perhaps more important, Russia lost specific facilities as a consequence of the USSR's penchant for specialization. For example, in the Baltic area, the New Tallinn (Novotallinn) Port in Estonia,

which became operational only in 1986, was the FSU's primary grain port and site of the main grain storage facilities, with a 370,000 ton storage capacity. Riga, Latvia, was one of only two ports in the FSU with modern container facilities. Ventspils, Latvia, was the FSU's major oil export terminal. In the Black Sea, where most of the ports now belong to Ukraine, Odessa served as the major southern grain facility. The share of Russian cargo handled by these ports in 1991 was large, with about 25 percent of Russian cargo passing through ports in the Baltic basin and 40 percent through ports in the Black and Azov Sea basin. According to official statistics for 1990, 63 percent of Russian seatriade was channeled through what are now Russian ports; most of the balance was handled at ports in the Baltic republics and Ukraine (exhibit 7.6). These ports have begun charging foreign currency to Russian customers.

Russia now has seven major ports, only two of which are multi-functional national ports, St. Petersburg on the Baltic Sea and Novorossiysk on the Black Sea. These and six smaller ports handled more than 70 percent of all Russian maritime trade tonnage in 1991. Exports from Russia's busiest port, Novorossiysk, were shipped mostly to Italy, India, and Bulgaria (crude oil) in 1991. Primary imports routed through Novorossiysk came from Canada and the United States (grain). In addition to these major ports, there are a number of smaller ports along Russian coasts, particularly along the Arctic Ocean and

Exhibit 7.6 Cargo Turnover in FSU Ports, 1990 and 1991 (million tons)

Representative Russian Federation Ports	Total Cargo 1990	Liquid	Dry	Bulk	Container	Vessel Calls 1990	Total Russian Cargo 1991
Novorossiysk	41.4	34.2	7.2	7.18	0.02	1,176	23.6
Nakhodka	13.3	5.6	7.7	7.70	--	1,901	11.3
Vostochniy	11.0	--	11.0	9.10	1.90	1,218	8.6
Vannino	10.0						7.8
Tuapse	13.4	10.8	2.6	2.60	--	851	7.8
Vladivostok	5.0						6.8
Kholmsk	6.7	--	6.7	6.70	--	4,721	6.2
St. Petersburg	9.9	0.1	9.8	8.90	0.90	1,776	4.9
Murmansk	7.3	--	7.3	7.00	0.30	578	4.6
Archangelsk	5.4	0.6	4.8	4.50	0.30	863	4.0
Kaliningrad							2.4
Astrakhan							2.2
Korsakov	2.0	0.5	1.5	1.50	--	520	2.0
<i>Total</i>	<i>217.2*</i>	<i>50.3</i>	<i>60.0</i>	<i>55.20</i>	<i>3.50</i>		<i>92.2</i>
<i>Key ports in other FSU republics</i>							
Ventspils	30.1	25.7	4.4	4.4	--	2,136	0.20
Odesa	37.9	18.7	19.2	18.8	0.4	1,595	1.30
Klaipeda	14.4	7.6	6.8	6.8	--	2,308	0.12
Ilyichevsk	12.9	1.0	11.9	10.9	1.0	2,097	0.08
Mariupol	10.0	0.1	9.9	9.6	0.3	1,644	0.06
Baku	7.8	4.7	3.1	3.1	--	3,285	
Yuzhny	10.2	--	10.2	10.0	--	356	0.08
Reni	7.7	0.3	7.4	7.4	--	863	
Krasnovodak	8.5	3.6	4.9	4.9	--	1,457	
Izmail	7.9	0.2	7.7	7.5	0.2	1,632	
Riga	6.0	0.1	5.9	5.3	0.6	1,524	1.00
Batumi	5.1	4.6	0.5	0.5	--	461	
Novotallinn	3.8	--	3.8	3.8	--	404	0.70
Kherson	4.5	0.4	4.1	4.1	--	500	0.09
Poti	3.8	--	3.8	3.8	--	622	
Tallinn	3.5	--	3.5	3.3	0.2	1,433	0.07
<i>Total</i>	<i>170.9</i>	<i>65.1</i>	<i>105.8</i>	<i>70.5</i>	<i>2.9</i>		
Total for about 40 smaller ports in the entire FSU	85.0	12.8	72.2	42.6	1.7		
<i>Total all FSU ports</i>	<i>403.4</i>	<i>128.2</i>	<i>238.0</i>	<i>151.6</i>	<i>8.1</i>		<i>129.00</i>

a. Total Russian port throughput for 1990.

Sources: 1991 data: *Freight Throughput of Sea Ports and Inter-Port Freight Exchanges* (Moscow: MOT, Department of Russian Sea Transport, 1992).  
1990 data: Ministry of Transport data, provided to World Bank mission, Moscow, November 1992; also: EBRD Waterborne Transport Sector Survey, Draft Final Report, p 4-2.  
Vessel Calls: Morskoy Flot Journal, Quarterly Supplement *Soviet Shipping* No. 3.91. Moscow.

Pacific Rim, where seatriade is often the only means of transportation to industrial and timber sites and to small communities. Altogether, the Russian Federation's national ocean and cabotage transport infrastructure system includes 41 ports of significant size and an additional 30 or so smaller maritime ports.

*The Maritime Sector.* In terms of shipping capacity, the Russian Federation inherited 57.4 percent of the combined Soviet merchant fleet with a fair share of all specialized tonnage (exhibit 7.1). Of the FSU's 17 ocean carriers, nine have become Russian.

The former Ministry of Merchant Marine (MINMORFLOT) has been integrated into the new Russian MOT as the Department of Marine Transport. The Deputy Director of this new department supervises five major divisions organized to carry out:

- Coordination of transport activities.
- Economic policy and management.
- Development of regulations.
- Navigation safety.
- Management of social policy and resources.

The functional responsibilities of these divisions cover – in some form – all of the functions that MINMORFLOT performed, but the Department of Marine Transport has less direct authority to finance and control the activities of the maritime sector and a much smaller amount of financial resources.

Within this policy framework, the government has decreed that the old shipping concerns should be broken up and their constituent enterprises made independent of their old parent shipping concerns and of the financial resources of the Department of Marine Transport. To help ensure that this new independent status is achieved, the government has dissolved MORFLOT, which was the agency that provided the central administrative and commercial management functions for the merchant marine of the USSR. The government has taken a number of specific steps to implement these policy changes:

- Making most shipping companies independent business units, and suspending most subsidies and funding from the central budget.

- Establishing most significant ports and shipyards as independent business entities responsible directly to the Department of Marine Transport for their business activities.

- Establishing an independent Commercial Seaports Association to represent all large Russian ports.

- Placing the state educational, training, and research institutions directly under the management of the Department, although some trade institutions have been left under the supervision of the shipping companies.

- Retaining a direct management role for several key strategic business enterprises that include: (a) Morbank, a bank that provides investment capital and credits for the maritime sector; (b) Sovfracht, the agency that carries out vessel chartering and brokerage and performs agency functions outside Russia. This agency was supplemented by the creation of several other brokers in the late 1980s; (c) a satellite navigation and communications enterprise known as Morsvyazputnik, now a public-private partnership; and (d) Sovbunker, which acts as the purchasing agent for foreign technologies under the World Bank's First Rehabilitation Loan (Ln. 3513-RU) and which sells bunker oil and other fuels; (e) the Soviet Registry of Shipping, an independent agency through which marine vessel construction and operating standards are set and monitored.

- Establishing privatization procedures for maritime and inland waterway ports, shipping lines, and shipyards.

*River Transport.* The effect of the breakup on the river transport sector was less disruptive. The bulk of the FSU river transport system remains under Russian ownership. It consists of about 9,000 craft, more than 100,000 km of navigable waterways serviced by 16,000 km of man-made canals, 11 key river ports, and hundreds of smaller riverine cargo transfer facilities. Most river transport in the FSU uses a widespread canal system that connects the Don, Kama and Volga river systems in Russia. The system has a general north-south orientation and connects ports of the Baltic, Azov, Black and Caspian Seas. River transport also plays a significant role in northern

regions of Siberia and the Dnieper river system, now in the Ukraine.

Before 1991, when Soviet river transport was managed regionally, Russia had the Ministry of River Transport, reporting directly to the Council of Ministers. The central government provided technical assistance to the republics and funding for major capital expenditures. In an organizational and institutional sense, the breakup of the USSR has affected the river shipping sector less than the maritime sector. The former Russian Ministry of River Transport has been reestablished as the Department of River Transport in the Russian MOT. During an interim transition period, Rosrechflot was formed to manage and administer Russia's river transport, but since the formation of MOT, Rosrechflot's role is to rationalize and promote river transport.

The breakup has precipitated some important changes in the government's policy toward the river shipping industry:

- Removal of government-prescribed inland waterway tariffs.
- Freeing firms to negotiate contracts for goods and services with other all other businesses.
- Separating shipping companies from other enterprises.
- Relieving the enterprises of responsibility for past obligations and debts of their predecessor enterprises.
- Making the enterprises financially independent by stopping subsidies.
- Having enterprise heads report directly to MOT and giving them the authority to hire and fire their own management teams.
- Funding maintenance of waterways and locks through user fees administered by independent waterways associations, not through government subsidies.
- Forming an association of newly-independent shipping companies to promote the industry.

### ***Restructuring and Reform***

The Russian government's response to the changed circumstances has been to launch all-out efforts to overcome a perceived dependence on what are now foreign ports and shipping assets. Russian carriers complain about the necessity of

making foreign currency payments for port charges and for additional time lost moving in and out of a neighboring country. Russian carriers now also charter ships to carry trade once handled by ships owned by other republics or their own lines that have flagged out ships to other countries, paying in foreign currency. The resulting payments of an estimated US\$1.5 billion hard currency equivalent in 1992 are reinforcing the government's determination to break this dependency.

*Maritime Reform and Port Classification.* As a first step toward restructuring the maritime and port sectors, in January 1991, Russia's seaports were organizationally separated from the national carriers. The shipping lines were corporatized and permitted to compete with one another for business. All state subsidies were terminated, except to those lines serving remote facilities in the Arctic and the Far East. This measure enabled MOT to develop a classification scheme for rationalizing the port system.

Through this process, Russia's ten largest and most diversified ports, which handle most of the international searade, were designated as being of national importance and classified as Category I ports. Another 21 ports considered of regional importance, most of which are in the Far East, were classified as Category II. The government is planning to transfer all ports in this category to regional jurisdiction. Under such arrangement, the regional administrations can decide how the management and operations of the ports in their domain should be organized. Finally, ten small ports, most of which are located in the White, Azov and Caspian Seas, constitute Category III. These small ports are considered to be of narrow local importance.

The government intends to give local authorities a free hand in organizing and managing these ports, which might conceivably include decisions to close some facilities. *The effective implementation of this excellent policy has broken the monopoly between ports and ocean carriers, dramatically reduced the government fiscal liability for maritime operations and has set the stage for an effective program of restructuring and privatization of shipping lines and national ports.*

### Russia's Port Sector

Russia's ten Category I ports, each with an annual throughput of over 4 million tons, carried 76 percent of Russian international seaborne trade in 1990, and 66 percent in 1991. Russia has 31 smaller ports, making a total of 41 seaports with 248 berthing complexes 41,500 meters in total length and a theoretical throughput capacity of 165 million tons (exhibit 7.7). Total Russian trade in 1990 was 260 million tons of which total throughput in Russia ports was 164 million tons or 63 percent. The Baltic ports handled 47 million tons, of which 33 million were liquid goods, Ukrainian ports handled 42 million tons, of which 20 million were liquid goods, Finnish ports handled 5.5 million tons and ports in the Caucasus handled 1.5 million tons. Russian throughput dropped to 129 million tons in 1991 but this amount represented virtually all Russian trade, including cabotage. In 1992 Russian trade increased to 165 million tons, and most of it was routed through Russian ports, although precise figures were not available.

Statistics for Russia's maritime sector are kept on the basis of water basins comprised of the

Arctic and Pacific Oceans, and the seas bordering the country (the Baltic, Azov, Black and Caspian Seas). Including cabotage, cargo throughput data by basin at Russia's largest ports in 1991 show that most cargo flows are in the Black Sea and the Far East. Russia's two Black Sea ports accounted for 24 percent of the total throughput through Russian ports in 1991; the Far East ports on the Pacific accounted for 32 percent. Two ports in the Arctic accounted for 6.7 percent and St. Petersburg in the Baltic only 3.8 percent. Liquids were handled only at the ports of Novorossiysk and Tuapse, which have traditionally been among Russia's oil export terminals. Efforts will be made to channel more exports through these ports because of the loss of the oil facilities in Klaipeda, Lithuania and Ventspils, Latvia. Novorossiysk is now also Russia's main grain port and the government wishes to increase its capacity to make up for the loss of grain handling ports in Odessa, Ukraine and Novotallin, Estonia. In the Pacific, most of the trade at Vannino and Vostochniy is with Japan. Vannino contains the rail ferry to Sakhalin. Vostochniy is opposite Nakhodka in the Sea of Japan at the Southern most point of Russia, not far from Vladivostok which until recently was solely a military port. Nakhodka's port is served by a monopoly liner service jointly owned by Japan and Russia called the Japan Nakhodka line. Modern container facilities are available at St. Petersburg port, Vostochniy and Nakhodka.

Declining port productivity and increasingly obsolete equipment and facilities have reduced the cargo handling productivity of Russia's ports and increased ship waiting times. Lack of storage space compounds the problem and contributes to declining handling rates (exhibit 7.8). Russian ports also suffer from basic design problems. Capabilities for handling containers are adequate, but long dwell times related to documentation and an imbalance of empty containers point to a need for an inland container depot. Another limitation, although not a major one, is that 60 percent of Russian ports are too shallow to accommodate vessels more than 40,000 dwt. Since Russia's geographic location makes it likely that it will be served by feeder vessels and smaller container ships that service the transshipment trade, this is not likely to be a major problem. A number of

Exhibit 7.7 Tonnage Throughput of Russian Maritime Shipping Basins and Major Ports, 1991 (millions of tons)

	Basin Percent of Total Cargo Throughput	Total Cargo	Percent of Total Russian Cargo
Black & Azov Seas	24.0		
Novorossiysk		23.6	18
Tuapse		7.8	6
Pacific/Far East	32.0		
Nakhodka		11.3	9
Vostochniy		8.6	7
Vannino		7.8	6
Vladivostok		6.8	5
Kholmsk		6.2	5
Arctic	6.7		
Murmansk		4.6	--
Archangelsk		4.0	--
Baltic	3.8		
St. Petersburg		4.9	4

Source: MOT.

factors contribute to the problems in Russian ports:

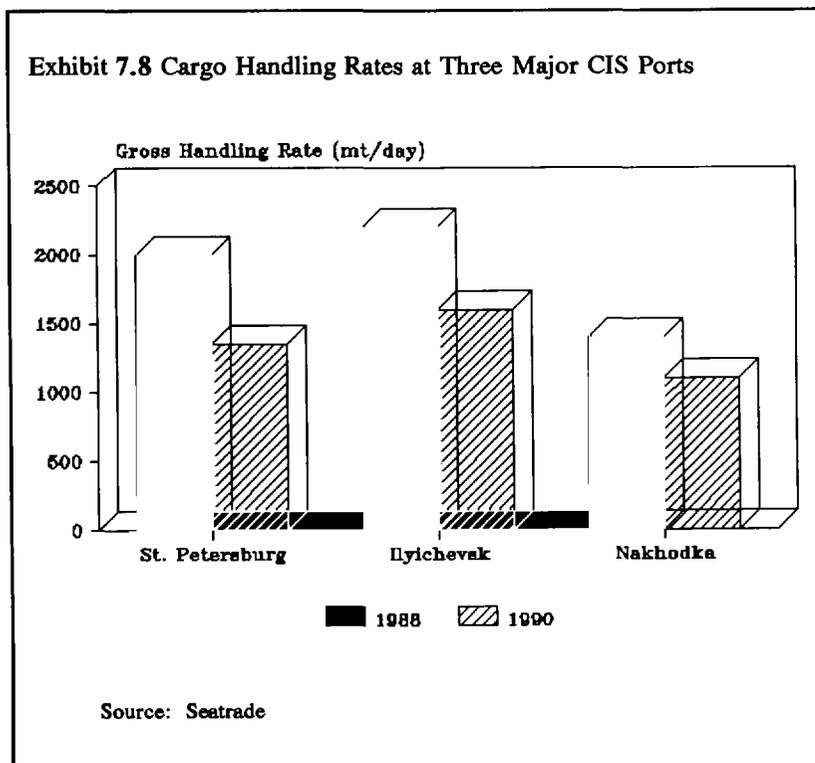
- *Port Equipment.* More than 31 percent of all gantry cranes, including those used for the transshipment of grain and foodstuffs, have been active for more than 20 years and have reached the end of their effective service life. More than half of the forklift fleet and yard tractors are older than six years. The situation is similar with nearly 65 percent of the imported straddle carriers, holding machines, and port tractors.<sup>6</sup> Analysis has shown that equipment utilization in Russian ports is extremely low by world standards. EBRD-financed consultants estimate that in St. Petersburg the utilization of available handling equipment is less than 50 percent; in Novorossiysk utilization of port cranes is less than 50 percent, and the actual daily handling capacities at Port Vostochniy's three terminals are also well below established capacities. In large measure, low equipment utilization is a reflection of overly conservative standards of equipment-employee ratios and of outmoded cargo handling practices.

- *Land-side Access Infrastructure.* Port accessibility is limited not only for incoming

ocean-going vessels, but also for land transport, which is designed to have the railway come along side the pier so that ships can be loaded or unloaded directly into rail cars. This practice inextricably links port performance with railway performance. Ports continuously complain that sufficient rail cars are never available to unload the ships. The shortages are worse during harvest time, when rail capacity is diverted inland to agricultural areas. The EBRD Waterborne Transport Survey consulting team looked at three Russian ports: Novorossiysk, Vostochniy, and St. Petersburg. All three ports are at the mercy of the railways for cargo traveling to and from the port. This is due in part to the nature of Soviet transport policies and also in part to the fact that access roads are narrow and in bad condition, and roads within the port are in bad condition as well, causing damage to rolling equipment. The shortage of rail cars for port transshipment of cargo has been ascribed not so much to an actual shortage of rolling stock (except tankers) but more to poor communications between railway operators, port operators, and freight consignors/consignees (see box).

- *Lack of Storage.* Storage facilities for a wide mix of commodities are scarce, partly because of the outmoded practice of off-loading ships directly into rail cars and – excepting for investment in the Far East Basin – to the fact that investment in storage was for grain and oil, at what are now non-Russian ports: New Tallinn and Ventspils. More efficient off-loading of ships would result from better storage facilities and by ending direct rail access to the quay area.

- *Seasonal Operations.* Harsh winter freezes shut down operations in most Russian ports. In Novorossiysk and Tuapse the ice-breaker fleet permits a minimum of activity to proceed year-round, but port operations are often curtailed by high winds in the winter months.



### Operations and Management in Russia's Ports: the Record of Over-Staffing

Since the mid-1980s, the Port of St. Petersburg had to accommodate annual cargo volumes between nine and 10.5 million tons. Typically this included seven million tons of cargoes in bulk form (of which 70 percent was grain), between 2.5 and 3 million tons of breakbulk cargo, roughly 100,000 twenty-foot containers, and about 100,000 tons of processed timber.

The port presently employs 5,356 staff who attend to all the activities related to vessel and cargo management. A public port in Western Europe with similar volume, mix of cargo, and frequency of ship movements requires less than one-third of the payrolled staff that is involved in the operations and management of St. Petersburg's port. In addition, much of the daily labor in West European ports is drawn from privately managed pools.

Excess staffing prevails in almost all segments of St. Petersburg's organization scheme. With 2,898 workers, stevedoring represents the most significant group, followed by 1,201 employees who are assigned to operating port-based auxiliary vessels and cargo handling equipment. Facility maintenance and repair crews comprise 665 staff, and 231 watchmen guard the port's assets and cargo in transit. About 400 staff are assigned to accounting duties. The harbor master's office employs 127. There are 30 middle and top management positions in the port. Housing and communal services, health care centers, and other facilities supporting port labor add easily another 400 to 500 employees to the port's payroll. Thus, altogether the port of St. Petersburg has a total payroll of more than 6,000.

The other Russian seaports are similarly over-staffed, and the proportion of employees assigned to the provision of communal infrastructure and services is even higher – up to 25 percent of the entire payrolls. For instance, in the Port of Vostochniy, 3,176 employees are involved in transport and cargo management, and 692 payrolled staff look after housing, schools, nurseries, medical assistance, produce farming, and manufacturing of materials for construction and other port personnel needs. Unlike St. Petersburg, the places in which the other ports are located do not have sufficient communal social infrastructure, and food supplies are less abundant. Both facts have forced ports to reach for total self-sufficiency.

These practices, born out of social need, have served their purpose. But the price was high in terms of low transport infrastructure efficiency and high cost burdens on national trade. New arrangements are urgently needed to meet the growing demand for streamlined ports services, while at the same time attending to the social needs of the local populations. Ports cannot – and should not – be expected to do both.

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● *Deterioration of Physical Infrastructure.* Port structures generally are in bad shape as a result of many years of intensive operation without repair and renovation. It is estimated that deferred maintenance on port infrastructure amounts to US\$500 million, although this figure does not represent any analysis of the economic or financial return for correcting these problems. At present, 14,500 meters of the overall 41,500 quay wall berthing are reportedly in unsatisfactory condition and some sections are close to posing hazards to safety. About 87,000 tons of special sheet piling will be needed but is not available through domestic production. The ports of

Novorossiysk, Tuapse, Sochi, and others have breakwaters – built almost 100 years ago – that need repair. The breakwater structures of all Sakhalin ports, built by the Japanese in the 1930s, are in urgent need of renovation and reconstruction. Overall, it is estimated that more than a third of all quay walls are in imminent danger of collapse. Internal roads and rail tracks, as well as land-side access infrastructure are also badly deteriorated. This condition hampers cargo movements and equipment utilization to a significant degree.

● *Over-staffing.* Russia's seaports are severely over-staffed because they fulfill a variety of

### Exclusive Reliance on Railways for Land-side Access: A Major Constraint

**ST. PETERSBURG:** In a very real sense, ports can process freight only as efficiently as the railways are able to (rail transports nearly 95 percent of all cargo passing through the port), and with a maximum daily throughput capacity at the port of 600 wagons (of which 500 are grain hoppers), the maximum tonnage amounts to 36,000 - 38,000 handled daily. The bottleneck is the shortage of rail cars and the time wasted in shunting those available. This shortage results in long ship turn-around times and a high proportion of idle time at berth. As a consequence, only 18 vessels can be handled simultaneously in St. Petersburg Port, and only 26 of 38 berths available for cargo handling are actually used. The oversupply of berthing space is expected to become more pronounced in the future as traffic volumes decline, but, pending reform of land-side port accessibility, will not improve ship turn-around times on its own.

**NOVOROSSJSK:** In Novorossiysk, practically all cargo passing through the port is handled by rail. Being Russia's busiest port, the situation is somewhat more complicated in that the maximum daily rail car throughput capacity is 350 to 400, thus limiting the port's daily throughput capacity to 21,000 to 24,000 tons. The practice of direct cargo transshipment from ship to rail car at the quay is time-consuming and impacted as well by rail car shunting and non-availability of rolling stock. This practice has long since been abandoned in countries with more efficient ports, where cargo is off-loaded into storage facilities from which rail cars are subsequently loaded as they become available. Direct rail access to the quay area does nothing more than impede the off-loading process and should be prohibited.

**VOSTOCHNIY:** In Vostochniy, on the other hand, most barriers to realizing maximum daily throughput capacities seem to spring from port operational shortcomings. Although the land connection is by a single rail line with an annual capacity of 30 million tons, average daily railway throughput capacity is 590 cars, or 35,400 tons. In practice only 21,547 tons are processed by the port. Maximum port capacity, however, is 84,300 tons per day, so in the event that maximum throughput capacities are reached, the railway connection looms as a major bottleneck. Irrespective of this, maximum annual throughput to date (11.6 million tons) was registered in 1989 and required less than 40 percent of existing rail throughput capacity. With plans on the part of local mining interests as well as the state to extend rail line capacity, it is unlikely that a railway bottleneck will develop in the near term, and the government would be well-advised to avoid sinking any investment funds into rail throughput capacity expansion projects and simply permit local mining interests to seek other partners and form a consortium of both domestic and foreign investors toward this end.

communal needs and social services, like schools and hospitals, farms and factories that cater for employees and their families. In many instances, these services – which are totally unrelated to trade and transport – represent up to 40 percent of a port's activities. The cost of managing such services consume a high proportion of operational income (see box).

- *Heavy Silt.* About 60 percent of the Federation's seaports are subject to heavy silting. Inadequate budget allocations for maintenance dredging – and shortage of appropriate dredging equipment – have led to a situation whereby many port basins and access channels have become too shallow to accommodate large vessels.

#### *Financial Performance and Related Issues*

Russia's main ports traditionally had a positive cash flow because tariffs were set high enough to

cover costs and there was no competition among ports. Investments were, however, a different matter. The basic arrangement was that ports and water transport companies were expected to cover all operating costs out of their service revenue incomes, and the central authorities provided required investment funds. This objective not only made it more difficult for the government to ensure that port tariffs covered fully allocated costs but, in fact, was hardly ever adhered to, and the FSU government had to allocate around Rb20 million each year as operating subsidies to shipping and ports.

After the breakup of the FSU, the government not only discontinued such subsidies but introduced new taxes and charges – 32 percent on ruble profits – and required 50 percent of foreign currency earnings to be surrendered and exchanged for rubles at prevailing market conditions. More recently, the government is

requesting the ports to turn over all foreign currency to the Central Bank at ludicrously low exchange rates. The combined tax and mandatory hard currency transfers from shipping and ports to the national treasury in 1992 were estimated to have reached a level of about US\$400 million, equivalent.

Ports were particularly hard hit by these changes, and by delinquent payments by users for services rendered. The resulting insufficiency of funds makes correcting deferred maintenance of infrastructure and equipment more difficult. Required dredging operations cannot be regularly scheduled. Capital investments are limited to a few ports, are of small scale and insufficient to repair ship and cargo handling equipment and damaged quay walls.

### ***Government's Goal of Independence and Self-Sufficiency***

In response to the loss of port facilities after the break-up of the FSU, ambitious development plans were conceptualized at a high the government level to replace many ports by expanding the entire national seaport system. Russian planners estimate that the existing maximum established throughput capacity of the Federation's port system is on the order of 170 million tons per year. Port traffic generated by Russian seatriade was about 260 million tons in 1990, of which only 164 million tons were handled in national ports, while the rest was accommodated in ports of the Baltic States (47 million tons), Ukraine (42 million tons), and Finland (seven million tons). Russia's international seatriade fell to 165 million tons in 1992, almost all of which were handled at Russian ports, and is not expected to return to 1989-90 levels until the next century. With trade figures now roughly equal to overall port capacity, the government can see the possibility of overcoming any dependency on foreign ports. The goal of becoming self-sufficient in port services in the long term is now seen as a real possibility and has become a pressing concern within the government.

The government has taken measures to address this issue by re-centralizing the freight-forwarding functions that were slowly beginning to gravitate toward more market-oriented practices. This

Interim Statute on Operational Monthly Planning for Rail Movements of Freight for Export, confirmed by Russian Federation the government Decree No. 936, dated 4 December 1992, seeks to reimpose state control over freight movements. The result is likely to be reimposition of inflexible operating practices maintained previously on the basis of State Orders for transport of freight, thereby driving private sector shippers into the hands of road transport enterprises, and, in turn, worsening the financial performance of the railways in freight operations. How this will affect land-side port access bottlenecks is evident: further procedural delays will exacerbate an already congested situation. A better alternative is to allow the market to determine the demand for transport and permit ports to set tariffs that adequately cover costs of organizing last-minute service rather than to state-imposed penalties.

*Investments to Replace Lost Port Capacity.* While accepting the inevitable further decline in annual seatriade volumes through the mid 1990s, the government's national ports development plan is driven by the objective to boost the annual cargo handling capacity of the system to 240 million tons by the year 2000. This would fully replace port capacity lost to the Baltics and Ukraine as well as expand port capacity in the Far East in line with expectations of future growth of trade with Pacific Rim countries. The entire program is expected to cost about US\$3.6 billion (1991 prices) over the next ten years. The preliminary plan provides for three phases.

*Phase I, 1992 and 1993.* The main emphasis will be on efforts to switch Russian cargo from foreign to national ports. It is intended to achieve this objective through centrally directed routing of cargo, reforms in the operations and management of individual seaports, and the use of river ports fishery ports, and industrial terminals, to provide extra capacity. The plan is to re-direct 17 million tons of cargo (exported coal, metal, imported grain) from the Baltic ports to St. Petersburg, Vyborg, Kaliningrad, Murmansk and Arkhangelsk. Commodity flows currently handled by Ukrainian ports (exported coal and ore, imported coal and metals, crude oil) will go Novorossiysk, Tuapse and Taganrog (exhibit 7.9).

Exhibit 7.9 Characteristics of Key Russian Seaports and Proposed Investments, 1991

	Novorossijsk	St. Petersburg	Vannino	Vostochniy	Petropavlovsk
Cargo turnover (million tons)	43.0	12.5	8.5	10.5	3.0
Service revenues (million rubles)	146.6	280.0	121.9	134.3	86.6
Operating expenditures (million rubles)	67.2	163.0	96.8	97.6	80.7
Operating profit (million rubles)	79.4	117.0	25.1	36.7	5.9
Number of employees (port operations only)	3,809.0	5,356.0	4,028.0	3,176.0	1,943.0
Proposed investments in rubles and in US\$	(during period 1992-1995): 54.0 mn 173.0 mn	(during period 1992-1995): 256.5 mn 43.0 mn	(during period 1993-1997): 1,800.0 mn 350.0 mn	(during period 1992-1995): 1,250.0 mn 225.0 mn	(during period 1989-1996): 250.0 mn 30.0 mn

Cost estimates are based on 1991 prices.

Source: MOT, Merchant Marine Department, and Soyuzmorniproekt.

*Phase II, 1994 to 1998.* The proposal is to build 14 new berthing complexes and to rehabilitate 48 existing ones. Construction of a new port in the Baltic at Ust Luga and one on the Black Sea is also scheduled to begin. Ust Luga is intended to provide a 50 million ton crude oil export terminal to replace Ventspils, Latvia. This port may include a 20 million ton dry bulk handling facility to replace the grain terminal at Novotallinn, and an 8 million ton container terminal to replace the one at Riga. The government is contemplating building a grain facility at Rostov-on-the-Don to store grain brought in through Novorossijsk, new container facilities at Novorossijsk, and possibly new oil and grain terminals nearby.

*Phase III, 1999 to 2005.* Several new ports will be built to accommodate forecast rapid growth and regional shifts in annual seatriade volumes. Major expansion of key existing ports, and a concerted effort to improve drastically the interfaces between ports and inland transport modes requiring substantial investment in new rail trackage and facilities, are planned.

Based on this plan, the government estimates the capital requirements (based on 1991 prices) between 1993 and 1998 as follows:

Northern Basin Ports: Rb150 million + US\$ 42 million  
 Baltic Basin Ports: Rb869 million + US\$176 million  
 Southern Basin Ports: Rb530 million + US\$194 million  
 Pacific Rim Ports: Rb855 million + US\$469 million.

The drive to become fully self-sufficient in the provision of water transport and related infrastructure, however, is burdened with difficulties. A number of the proposed investments to replace lost port assets cannot be justified on economic grounds and they should be compared with making lower cost arrangements to use ports in adjacent countries that are already built, well equipped, and likely to offer cheap rates to attract traffic since so much of their previous volume was Russian trade. Investment in ports already built can be viewed as a "sunk cost," and port tariffs need only cover operating costs and any additional investment needs. Tapping the capacities of existing, neighboring ports for the trade would be beneficial in many respects. Such a decision

would force the Russian ports to become more responsive to user demands, which would require fast and effective management reforms and adjustments to operational practices, which are presently inefficient. It is unfortunate that the perceived need to curtail foreign exchange payments for the use of foreign maritime assets is used to justify such high-cost investment alternatives. Foreign costs of building new ports are likely to far outstrip the costs of hard currency port tariffs in neighboring countries. Unless government is prepared to subsidize the entire effort of building new ports, rates will have to cover the full investment as well as annual operating costs. The drive for an independent port system, however, is related to the demand by governments in which these ports are located that Russian troops be withdrawn. At the moment it is difficult to predict how and when these problems can be overcome. The economic cost of the policy of port self-sufficiency is very high.

The economic rationale is questionable, even if currently prevailing political imponderables are taken into account. Present and projected traffic levels are so much lower than before the breakup that, efforts to replace lost general port capacity may be unnecessary. For example, it may not be necessary to replace facilities to import grain when imports have dropped from 25 million tons in 1992 to an expected 14 million tons in 1993. The government hopes grain imports will be reduced further to only 5.6 million tons in 1994. In 1991, almost all Russian international trade flowed through Russian ports. In 1992, although trade increased from 129 million tons to 165 million tons, again most of it was handled in Russian ports – precise figures by port not yet available. The government is concerned, however, that existing ports cannot handle the higher trade levels experienced in the past and expected in the future as the economy recovers. As current levels of utilization of Russia's remaining ports are estimated only about 60 percent, it is likely much of the lost capacity can be recovered through measures aimed at making Russian ports as efficient as those in market economies.

The need to replace specialized facilities may theoretically be more legitimate but the costs and benefits of doing so must be carefully evaluated and compared with opportunities to make joint

ventures or special contracts with ports in neighboring republics at mutually beneficial rates. Even if such facilities were built, there is no guarantee that they would be used. The freight forwarding industry has been privatized and open to competition in Russia. As more and more industries and enterprises are privatized, their managers will wish to make international cargo transactions that minimize total costs, including transportation, inventory carrying costs, shipping costs and the time between shipment and sale. They will turn to freight forwarders to arrange the cheapest, most efficient transport, which may involve existing ports in neighboring republics or even overland freight to European ports. The government is wise to leave these decisions to the market place, a development made possible by the government's laudable decision to privatize freight forwarding. Exports may generate more foreign currency for Russia if, for example, enterprises were to ship products via land to ports in Europe where there are more international carriers available to carry goods worldwide more quickly and at cheaper costs rather than to insist that all Russian goods be shipped in Russian ships and Russian ports.

The investment plans need tempering for two other reasons. Managers of individual ports were practically excluded from these deliberations, yet their expertise might have reduced overly ambitious and ultra-conservative assumptions and design parameters that carry the inherent danger of unwarranted over investment. The plans do not adequately take into account the tremendous opportunities available for improving throughput and expanding capacity at existing ports, particularly the productivity gains that could be realized from the introduction of private and competitive operations within ports.

Proposed port investments should be based on realistic projections of economic activity and trade development in individual ports. They should also incorporate assessments of shortcomings in infrastructure and service regarding land-side connections between ports and their different users.

In terms of investment planning for the sector, the costs of adding new port facilities must also compete with the need to protect and preserve existing breakwaters and quay walls, which are

apparently in some jeopardy from lack of maintenance in the past, as well as to the need to resolve land-side constraints and introduce intermediate storage to remedy operational difficulties. These investments are likely to be far more justified, possibly essential, than investments in new capacity.

The Association of Russian Commercial Seaports estimates that about US\$500 million is required to correct the most operationally important defects in the Federation's ports which, because of increased taxes, the ports have been unable to self-finance. In 1991 there was a reported need to mobilize Rb250 million to finance required maintenance of port buildings and other on-shore infrastructure; only Rb40 billion was actually available. Not more than 35 percent of the funding needed to replace equipment could be met. If these basic needs cannot be met, how can the government afford to invest in new port facilities?

*The government is hardly in a position to finance unnecessary port capacity and, in any case, if ports are to be privatized, investments should be financed from individual port earnings. Clearly, careful thought and analysis must be given to determine what investments are justified and what role the government might play in financing necessary investments.*

In view of the importance of the sector and the huge investments being proposed, there is a need to review and reassess the ambitious investment agenda developed by the government. Any effective strategy must take into account the efficiencies that a private and competitive industry could bring, along with considerations relating to the changing structure of Russia's economy, international trade patterns, and possible improvement in relations with adjacent countries. The strategy should also encompass how to assist privatizing and restructuring each port, to introduce an environment fostering competition while allowing the national government to ensure that the development of national ports is consistent with national interests. Although the government's original intention was to let each port develop its own privatization plan and decide its own fortunes, the realities have turned out to be different. Central authorities continue to decide

which role a port should play and which kinds of investment are to be made. They have also continued to fix service tariffs to be applied in all ports, although tariffs are now indexed to inflation and no longer fixed for five-year periods.

The strategy should not be a blueprint for continued control by the central authorities in the day-to-day matters of port operations and administration. Instead, the strategy – once established – should become a framework for organizing the ownership of the land and physical assets of ports, setting up operating companies to provide services, and preparing expansion schemes in individual ports. The present investment approach is wasteful and unnecessary because many of the needed investments could be provided by private sector investors with long term interests in maintaining port operations. Such a strategy cannot be developed by Soyuzmorniiproekt, the State Agency for Port Planning and Design, as it does not support the drive toward self-sufficiency and privatizing of port operations in a competitive framework. Rather, the strategy should be developed by MOT, in concert with GKI and MOF. Development of the strategy must involve a rigorous economic analysis of existing capital investment requirements, both for rehabilitating existing port facilities and for new port infrastructure investments. Individual ports should be encouraged to participate by developing their own privatization and investment plans, based on realistic demand forecasts, incorporating support from the private sector wherever possible. Efforts to develop revenue sharing programs among ports should be resisted since they usually lead to each port spending more than is needed in an effort to keep its own funds. The government should also resist establishment of a state-sponsored port development fund which would create dependency and would in all likelihood not be conducive to managerial discipline and independence of individual ports.

### ***Port Restructuring and Privatization Program***

A major objective of the government is to devise an effective policy to privatize the ten Category I ports. The government was intending to privatize ports under a September 1992 directive that

### *A Policy Context for Government's Port Restructuring and Privatization Program<sup>1</sup>*

To ensure that the commercial environment in the port provides for the competitive provision of services in a free market atmosphere by private companies, Government must provide for the reassignment of operational, planning, and administrative functions among public-sector agencies and private interests. Essential to this process is the adoption of a comprehensive regime of investment laws to foster private investment. A UN report on port restructuring states: "The major elements of such a framework include statutory authority for private participation, deregulation, decentralization, an anti-monopoly regime and a public-sector agency which balances competing interests to ensure that no one group can utilize market mechanisms to obtain a monopoly position" (Emphasis supplied). Taken together, these elements are necessary and sufficient for an effective legal framework, as described below.

(a) *Private participation is essential to create a basis for competition that will advance the objectives of reducing costs and improving the quality of goods and services offered. The nexus between private enterprise and competition is strong: "Competition achieves those objectives by compelling such enterprises to face commercial risks, the possibility of financial losses and the threat of bankruptcy. Without competition, privatization would amount to little more than a transfer of port services and port facilities from the complete control of governments to a similar degree of control by private interests. This would permit private interests to increase profits without any service or technical innovations or improvements in productivity and cost-effectiveness."*

(b) *Achieving maximum freedom from economic regulatory constraints is critical to success:*

*"The statutory authority should clearly define standards for approval of private-sector proposals and establish a strong presumption that increased participation will benefit the nation through increased competition, in order to avoid the endless problems and delays of trying to satisfy imprecise regulatory requirements.*

*". . . However, the total absence of regulations could lead to non-commercial abuses by private interests. As a consequence, governments must retain sufficient control over port activities through anti-monopoly regimes to ensure that no group of the port community is able to insulate itself from market forces and extract monopoly rents."*

(c) *Decentralization relates not only to the question of transferring power over non-national aspects of public ports away from the central government to local bodies, but also to: ". . . a balancing of the interests of the public sector, dominant groups, and users so that commercial goals might be achieved. Decentralization does not mean the elimination of government involvement, but it should be structured to ensure on-site port administrators, boards of directors, and private interests have sufficient commercial freedom to set their own tariffs and to adjust quickly to changing market conditions. A decentralized national port system should be structured to provide such groups with the flexibility to operate their facilities commercially, to plan for and make needed investments, and to work with urban authorities so that competing land-use problems might be resolved."*

(d) *The anti-monopoly policy serves to ensure that economic competition exists so that effectively competing private interests "can contribute to the commercial viability of the nation's international trade relations." A sound framework of anti-monopoly policy and law is essential to ensure that the transfer of a public sector monopoly to private interests does not confer monopoly powers and benefits on private owners.*

(e) *The public sector agency must balance competing interests in the port and provide "an institutional framework which emphasizes freedom of entry instead of protection, managerial autonomy to earn a profit through competition instead of access to the national treasury, laws of the marketplace instead of day-to-day bureaucratic involvement, and anti-monopoly regimes instead of the political influence of dominant groups."*

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1. Transport and Communications Division of the Economic Commission for Latin America and the Caribbean, "The Restructuring of Public-Sector Enterprises: The Case of Latin American and Caribbean Ports" (Santiago, Chile: U.N. Economic Commission for Latin America and the Caribbean, 1992), pp 8-10.

encourages the creation of competitive operating companies within Russia's major national seaports. Initially there were pressures for the government to modify this directive and permit privatization under Option 2, by which 51 percent of the stock could be owned by labor and management with state ownership limited to 20 percent. More recently, it appears that port labor and management prefer Option 1, in which workers and management can own up to 40 percent of shares, but 25 percent of the workers' share are non-voting. In deciding which approach to take, two principles are important:

- The government should retain ownership of the strategic physical infrastructure and port real estate, including breakwaters, quay walls and navigable approach channels. It should lease the port's quays and operating assets on a long term basis to private operators.

- The government should not finance any port investments nor give sovereign guarantees on loans to port authorities or enterprises in the absence of a financially viable plan for a competitive restructuring of the port.

Modifications of the September 1992 port privatization directive issued in November 1992 and early 1993 appear to be consistent with these two recommended principles.

*Privatization or Self-Sufficiency of Category II and III Ports.* The majority of national water transport and related port assets serve communities in outlying regions, most of which are located along the Arctic Ocean rim and the country's northeast. Here cargo volumes are small, and much of the trade flow is unbalanced and too small to enable the outports to earn enough revenue to cover their costs. The government has decided to devolve responsibility for these ports to local and regional authorities. Such a decision is laudable, but pressures may ultimately be brought to bear on the Federal government to assist in subsidizing some of these operations where local and regional funds are insufficient to do so. Any such subsidies should be considered at the Federation level only if the services meet an essential national need, cannot be met otherwise, and do not harm Category I ports. Moreover, care should be taken to ensure that any such subsidization scheme minimizes investment

and maximizes efficiency. The danger is real that pressures will be brought to bear on the government to subsidize provision of shipping services and assist ports that serve this low-level trade to maintain basic infrastructure and to keep basins and access channels sufficiently dredged and ice-free. The current cost of attending to these needs exceeds revenue incomes by considerable margins in more than 70 percent of Russia's seaports.

*Introducing a Port Authority.* In a directive issued in early 1993, the State Property Committee established maritime port administrations that will own the port infrastructure – berths, breakwaters, entrance channels, railway tracks, and roads – and lease the operating facilities to private companies. This directive represents an excellent and consistent modification to the pattern of sound policies on port privatization that the government established with the decrees of September and November 1992. Amending the port privatization directive to introduce a port authority function will clarify and institutionalize the proper roles of the government and the private sector in the ownership and operations of Russia's strategic national ports.<sup>7</sup>

The port authority framework provides the ideal mechanism for achieving the twin objectives of retaining state ownership of key infrastructure assets and fostering effective competition among private sector interests for the provision of port services. The need for private sector participation is well expressed in the United Nations report on port restructuring:

"The fundamental reason for the participation of private interests in public-sector enterprises is to create a basis for competition so that costs might be reduced and the quality of goods and services improved. Competition achieves those objectives by compelling such enterprises to face commercial risks, the possibility of financial losses and the threat of bankruptcy. Without competition, privatization would amount to little more than a transfer of port services and port facilities from the complete control of governments to a similar degree of control by private interests. This would permit private interests to increase profits without any service or technical innovations or improvements in productivity and cost-

effectiveness. Put another way, even though private investors usually equate success with profits, competition would limit their freedom to unduly raise port charges."<sup>8</sup>

It is important that there should be several competing operating companies, if possible, awarded concessions on the basis of a performance contract that keeps profits to a justifiable level and rewards improvements in productivity and efficiency. In some ports, for example, there may be enough business to have several stevedoring companies that compete for work at the various berths owned by the authority. In others, it may be that operation of all the berths is contracted to a private company after competitive bids. Other ports may have separate and competing break bulk or container terminals, depending on the nature of the port throughput and physical possibilities of each port.

### *Implementing the Restructuring Process*

Complementing the policy framework must be a restructuring process rapid enough to avoid foot-dragging by dominant groups such as labor or public port managements that have an incentive to retain the status quo. In the words of the UN report:

"The logic of piecemeal restructuring of public-sector ports appears at first unchallengeable [since] it would permit all those in the ports community to slowly implement changes in order to reduce political and social costs. Nevertheless, the unavoidable rigors of global trading will require governments to continually restructure their public-sector ports so that productivity might be improved and costs reduced in order to enhance the competitiveness of their goods in international markets. In addition, if dominant groups have an extended period of time to comply with market-oriented changes, they will have more than enough time to influence the laws, regulations, and policies which are utilized to create the commercial framework. Thus the piecemeal implementation of private participation in public-sector ports could result in a self-defeating regulatory strategy which achieves objectives precisely opposite to those intended."<sup>9</sup>

Under the Russian privatization law as amended by directives issued in September 1992,

November 1992 and January 1993 each national port is requested to develop, within two years, a plan for privatizing its operations in the context of a competitive framework (see Annex D). The port authority approach described above would fit easily into the framework of this privatization law. Each "maritime port administration" could establish a Board of Directors that would offer its assets for independent operation by private sector interests through contracts. Federal and local governments would be represented on the Board of the Port Authority along with key shippers, other transport officials, bankers and representatives of other parties interested in ensuring that the port is effective and efficient and that the operating companies to whom the assets are leased are meeting the requirements of their performance contracts. The Port Authority's Board would be the agent for the creation of the port's privatization plan. Given the lack of knowledge within each port as to how to formulate such plans, the government may wish to consider obtaining assistance for each port to develop its port privatization plan. Such assistance could be provided to ports through bilateral grants or multi-lateral institutional loans. Ideally, this consulting assistance would be provided through highly-qualified professional service firms and through specialized firms affiliated with western ports operating on worldwide "best practices" standards.

When the plans for privatizing each port are completed, they should be reviewed by the government. As part of an effective review process, the Minister of Transport, GKI and other government bodies involved in implementing privatization plans for the ports should ensure that pro-forma traffic and financial projections are realistic and are consistent with forecasts for the Federation's overall seatriade volumes. *In assisting with this restructuring, any framework for analysis or strategy developed by the government for dealing with its national ports should not be considered as a blueprint for continued control by central authorities of the day-to-day matters of port operations and administration. Nonetheless, the government will have to be involved in organizing the institutional framework for managing the ports' physical assets, for developing a regulatory framework within which*

*these ports will operate, and for maintaining – through the port authorities – an appropriate permanent public role in the ownership and use of vital national port infrastructure.*

In devising a competitive framework within which port privatization should take place, consideration should be given to the fact that the major seaports are far apart. This means that the concept of letting ports privatize and compete for trade with each other, with little need for the government to oversee their activities beyond ensuring that collusion does not exist, (a course of action quite successfully applied in other countries) cannot be completely relied on in Russia. In the case of the country's main gateway ports there is little scope for Russian-based port to port competition, as the ports are either singular in their region – St. Petersburg in the Baltic and Novorossiysk in the Black Sea – or too specialized in particular types of cargo.

On the Pacific coast, Nakhodka, Vladivostok, and Vostochniy are located within a radius of 70 km in the southeast along the Pacific rim and are ice-free. This setting is ideal for inter-port competition, but the prospects are dampened by the fact that each port was developed and is equipped for mutually exclusive types of cargo. Nonetheless, some competition will emerge if one port becomes too greedy in its charges for any particular type of traffic because it will lead to building new facilities at other ports to compete for this traffic. Even though the possibilities may seem limited, the government should be encouraged to set policies that encourage competition between their own ports. Even more important, the government should set policies that permit competition with ports in neighboring countries in order to put pressure on their own ports to be as efficient as possible.<sup>10</sup> In the case of St. Petersburg, there is of course potential competition from Finnish and Baltic ports, to the extent these countries make custom procedures and transit arrangements simple for Russian trade. *Faced with these geographic realities, it is all the more important for the government to support port privatization plans that result in the setting up of competitive companies within ports but also to retain its voice in the overall evolution of its national ports in this process. At the same time it*

*is important for the government to foster such competition to the extent possible by, for example, carrying through with the privatization of freight forwarding so that shippers can choose the least cost route in and out of Russia, including, if cheaper, the use of ports in neighboring countries.*

Once ports have been privatized and a competitive framework develops, perhaps using a system of port authorities as the stewards of the government's interests, ports should be free to keep their earnings to ensure their long term self-sufficiency. If this is not done, then the new tax regime that applies to ports and the continued requirement of exchanging hard currency earnings at artificially low rates should be reconsidered. Furthermore, ports should be free to refuse service to delinquent customers and the government should take steps to settle the substantial arrears owed to ports by state enterprises.

*Who Should Own the Ports?* Port managers and unions are pressing to modify the September 1992 port privatization directive to permit privatization under Option 2, in which 51 percent of the stock of the port joint stock company would be owned by labor and management. While this option is not inherently incompatible with permanent the government ownership of the national port infrastructure, either directly or through a system of port authorities, it does pose problems for the effective development of a port restructuring plan that creates competitive operating companies within the port during the two-year period specified by the privatization decree. More recently, port managers and workers are adopting Option 1, under workers receive as a gift 25 percent of the preferential non-voting shares and they can purchase as much as 10 percent (in actual subscription) of the common shares. Managers can purchase as much as 5 percent of the common shares, with 60 to 75 percent of common shares available to investors. Option 2 has no provision for either a gift of preferential shares to workers or for purchase of common shares by managers, but provides for purchase of as much as 51 percent of the common shares by workers in a closed subscription with the remainder available to investors.

The lack of funds available to workers is one factor influencing recent decisions to choose Option 1. Under both options, the availability of significant amounts of common shares for public sale should permit substantial foreign investment in Russian ports, which would be beneficial within the context of a properly run port governed by a Russian maritime port administration. Given an equity position, foreign investors are potential sources of modern equipment and port management practices. The port of Vostochniy is in the process of preparing such a plan. The existing managements and labor forces will certainly be needed to continue the operations of the ports during this two-year period, and there is no reason that they should not compete for operating contracts as part of a competitively-structured port complex.

### *Near-term Recommendations*

*Preserve critical operating capabilities in Russian ports.* Maintaining the minimum essential level of service needed to ensure the movement of cargo through Russia's national ports has high priority. To this end, critically needed equipment and spare parts should be purchased; the World Bank is assisting in this area with US\$10 million for port equipment at St. Petersburg and Novorossiysk. Efforts should be made to remove physical and operational bottlenecks. Port areas should be cleaned up and unclaimed cargo auctioned off. Cargo handling operations could be more efficient if managed in accordance with world practices, but effective implementation of these practices will depend upon the adoption of fundamental reforms that put ports on a commercial and competitive basis. Storage rates should be raised for cargo left in the port longer than five days as an incentive to shippers and consignees to document shipments in a timely fashion and stop using scarce port acreage for storage.

*Take measures to reduce the dependency of port operations on the availability of rail cars at quay-side for unloading and loading ships.* The practice of loading and unloading ship cargo into railway cars is becoming a bottleneck in the ports because railway cars are not always available when needed. As a result, ship waiting time is too great

and port capacity inefficiently and under-utilized. To alleviate the problem where practicable physically, port operators should permit, and even encourage, for-hire trucking companies to compete for drayage at ports as a measure to ease the shortage of rail capacity for loading and unloading of ships. In addition, ports should consider establishing temporary storage facilities at off-port sites, possibly including floating grain storage, to expedite deliveries and reduce ship waiting times. Several specific projects of this nature have been evaluated by EBRD-financed consultants and appear worthy of serious consideration.

*Make plans to restructure road and rail access facilities to critical port installations and assess investment costs for these improvements.* To alleviate longer term problems, plans and cost estimates should be prepared for changing the quay-side dependency on direct railway loading and unloading. These changes will require (a) removing railway tracks from the quayside and moving them behind the port pavement, (b) repaving quays, and (c) possibly purchasing more appropriate cargo handling equipment. Attention should be given in the near term for assessing the costs of making changes to port infrastructure necessary to ensure more effective handling of port cargo in the longer term, since these costs will have to be factored into port privatization and investment plans.

*Take measures to ensure self-sufficiency of national ports and to eliminate the government's centralized fixing of port tariffs wherever there is effective competition.* The once profitable financial performance of ports has begun to deteriorate in the wake of rapid inflation, the decline of the ruble vis-a-vis foreign currency, the failure of tariffs (determined centrally by the Russian MOT) to keep up with inflation, and the requirement that ports remit all foreign currency earnings to the central government. The tariff issue can best be addressed by introducing competition within and among ports so as to leave rate setting to the market place to the extent possible; a second best solution is to permit tariffs that enable ports to earn a sufficient rate of return to attain self-sufficiency in the long term. Although

determining the extent and value of assets necessary to essential port operations is often difficult, as a near term measure it makes more sense than having the government subsidize port operations and investments on a case-by-case basis. The government also needs to permit ports to retain foreign currency sufficient to cover the foreign costs of necessary recurrent and investment expenditures. These financial issues are an integral part of the operating and corporate structure adopted by each port and the port sector as a whole.

*Permit ports to refuse service to non-paying customers and to permit auctioning unclaimed cargo to clear backlogs.* Ports cannot be expected to subsidize customers and survive in the long term. Thus ports should be permitted to refuse service to non-paying customers and to restrict extensions of credit for port services to state enterprises. Ports should be permitted to auction off, or hand over to GKI for auctioning, assets left unclaimed in ports for long periods.

*Reaffirm port privatization policies and launch assistance efforts to help ports implement them, including provisions for maritime port authorities to own port infrastructure assets (such as quays, breakwaters and navigational channels) remaining in state ownership.* The port privatization policies prescribed in a joint October 1992 directive from MOT and GKI are an excellent framework for launching the privatization of Russia's national ports. Unfortunately, opposition to these policies began forming within ports, as labor and management preferred to privatize under Option 2. The government should try to address the issues in a way that permits privatization of port operating companies to go forward, reserving port assets as part of government-owned maritime port authorities. The use of the port authority approach will provide an institutional framework, within the purview of the MOT/GKI directive, for an initial step in corporatizing the port's assets, as a basis for the development of a proper port privatization plan.

Technical assistance in areas of institutional development and enterprise reform will be required. Planning assistance to help ports develop long-term plans based on raising productivity

levels to worldwide best practices standards and sizing facilities to demand-related levels may also be required as part of their efforts to develop privatization plans. Several seminars discussing modern port practices, cargo handling, accounting and managerial practices have already been given, most recently by EDI in conjunction with the Finnish Port Authority, but actual needs are very much related to the developments in each port. In any case, efforts to assist with restructuring port organization and ownership of Russia's national ports should be provided where requested. The EC is supporting technical assistance for the modernization of St. Petersburg. The EC is also supporting consultancies for master planning of St. Petersburg. According to MOT, the United States will assist in reorganizing some Black Sea ports and possibly with some expansion of several Far Eastern ports. Unfortunately, in some cases the multitude of donor-supported studies may cause confusion and do more harm than good (there are eight consulting firms studying problems in St. Petersburg alone). It is recommended that some effort be made to coordinate such efforts. Most importantly, all such assistance should be geared toward assisting these ports in becoming privatized.

*Reassess the national port investment plan and limit any government support of port investments to those justified with cost/benefit analyses and to those undertaken in the context of port specific corporatization, privatization, or restructuring plans with loan agreements structured appropriately between port and the government.* The government's proposed port investment plan is too ambitious and unwarranted in view of (a) the potential for improving utilization of existing ports, (b) the possibility that the plans are overly designed and (c) the need to measure investments against the opportunity to use existing ports in adjacent countries. Even where investments are found to be worthwhile, the government should terminate programs that finance investments, including the expansion of port facilities or the acquisition of new port equipment for ports unless they are done in the context of restructuring the ports into commercial operating companies, in a way that ensures that the government's investment is repaid over time with port earnings. To the

extent such investments have already been made, the government should organize some formal transfer of the responsibility for repayment of existing debts incurred on their behalf to the benefitting enterprise.

*Establish policies for devolving responsibility for the planning, construction and financing of ports to local authorities.* For Category II and III ports, the government intends to devolve responsibility for their operation and development to local and regional authorities. To this end, the government will need to develop procedures by which the transferring process will take place, as well as policies for establishing a subsidy program, if necessary, to support these smaller ports in a manner that encourages efficiency and minimizes costs. In the course of devolving these ports, the government may wish to establish policies by which any local and regional governmental subsidy program necessary to operate them is set up in a way to minimize cost and promote efficiencies. In the near term, such policies might involve the need for subsidies, introducing measures that tie payments to services rendered according to certain throughput, average cargo handling figures, ship waiting times, or berth occupancy rates. In the longer term, the provision of maritime/port services to Northern Zones should be put to competitive bid.

### **Medium-term Recommendations**

*Enhance MOT's capacity to undertake economic and environmental assessments of proposed port investments.* Develop within MOT the capability to analyze the financial and operational performance of Russia's international ports and of their vessel traffic control systems, so that it can develop appropriate policies for the structure and operation of a private, competitive, financially self-sustaining ports system. Many proposals are being discussed in Russia that involve the building of new ports, new container terminals, deepening of existing ports and so forth; each raises environmental issues associated with the building of a new port anywhere. In addition, there is a need to ensure that all Russian ports comply with MARPOL conventions regarding the disposal of wastes from ships. Assessment of these

environmental problems is essential, and it is possible that the recently-formed MOT may need some assistance to develop its capability for undertaking these assessments. On the other hand, appreciation of MARPOL requirements at the port level is high, so it may be that little outside assistance is needed and that MOT can undertake environmental assessments on its own.

*Begin implementing port privatization plans as developed and approved by ports, GKI, MOT, and newly created Port Authorities.*

*Assist MOT to revise the legal and regulatory framework in the port sector in conjunction with privatization plans.* The legal and regulatory framework under which ports will operate is a crucial issue but cannot be defined in the absence of an effort to restructure the port sector nor in the absence of knowing each port's privatization and restructuring plans, each of which should be tailored to the specific potential for competition, within and among neighboring ports. In the course of developing this framework, an effort should be made to establish a capability within MOT to promulgate operational, environmental, and maintenance standards for the ports and maritime industries. In the context of privatizing ports, ensure that each port offers its services on an equal basis to all carriers.

*Assist ports in restructuring and privatizing ancillary activities.* Ancillary activities should be privatized and separated operationally and financially. As in all socialist countries, the waterborne transport sector is burdened with a number of manufacturing and design activities, ancillary to its operational functions but provided by the sector in the past. Such ancillary activities should now be managed separately and eventually established separately or privatized as soon as developments in the economy permit. Ports should not be required to provide and maintain community services and infrastructure.

*Assist ports in establishing a safety net for managing staff redundancies.* There is substantial over-staffing at most ports by world standards, and substantial redundancies may result from privatization that involves competition. The degree

to which there is a problem from redundancies depends on retirement/redundancy packages and on the value of the stock in the port companies left behind. If the workers own the stock of the ports that become efficient and financially solvent, and if the ports are permitted to retain foreign currency to maintain their self-sufficiency and become profitable, perhaps they will not mind losing their jobs. The degree of the problem is entirely dependent upon the nature of the port restructuring and of the framework of competition for the entire port sector. It is possible, however, that dockers will require some sort of organized staff reduction scheme in order to get them to accept the same sorts of changes that have occurred in the western world.

### *Long-term Recommendations*

*Complete the restructuring of the port sector and continue to lay groundwork for development of a competitive private sector.* In the long term, port restructuring should continue to develop through various steps that include (a) continuing the rationalization of unnecessary port capacity, (b) continuing to develop policies and practices to promote competition within and between ports, so that regulation by the government can be minimized; and (c) integrating the development of streamlined customs procedures and electronic data processing of custom and trade information with modern port and maritime practices.

*Introduce competitive bidding for the provision of maritime and port services to low density northern zones.* The government must provide for essential maritime service and port capacity to the remote northern zones and Pacific Rim communities for which there is no other type of access. To provide this service more efficiently, MOT should offer service packages for bid to competing liners and organize port subsidies on a performance contract basis.

### *Russia's Maritime Transport and Inland Waterways Sectors*

During the Soviet period, management of the ocean, cabotage, and river transport fleets was centralized in two government agencies, the

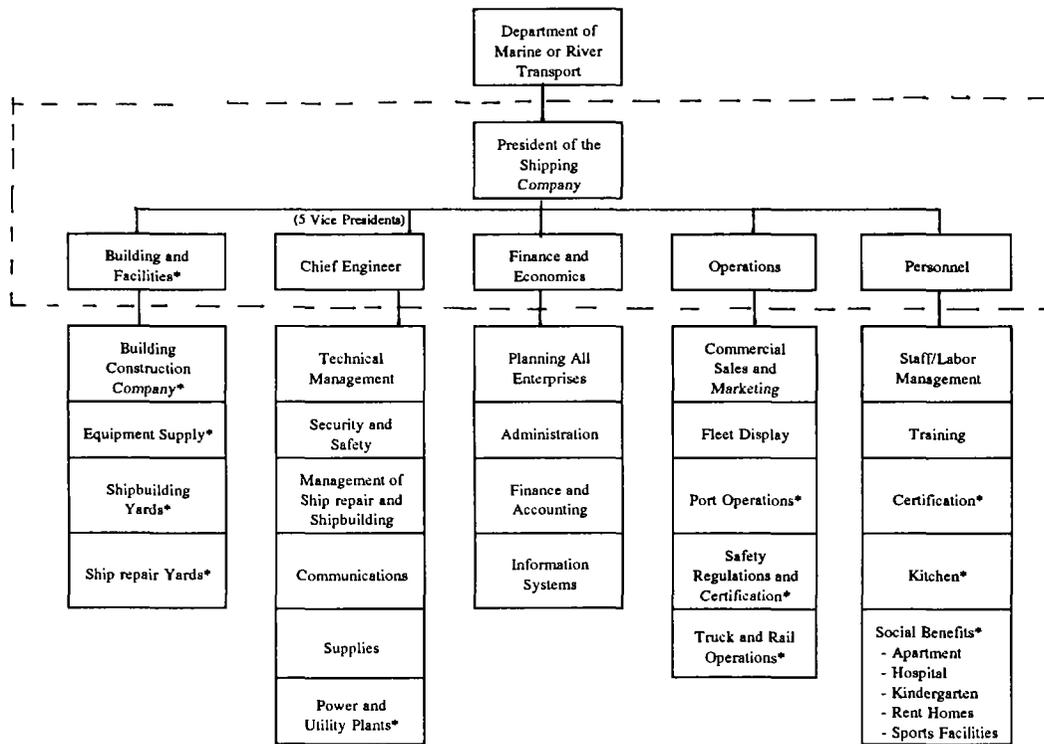
Ministries of Merchant Marine (MINMORFLOT) and River Transport, which also controlled the provision of port services. Investment decisions, service arrangements, productivity targets, and service charges were centrally determined, and each unit followed instructions according to a centralized plan. The rationale for this central direction was the strategic importance of the maritime sector earning hard currency, its defense support role, and its importance as a low-cost source of transport for Soviet overseas trade.

Within this government-organized framework, the maritime and river sectors were operated by huge commercial shipping companies, called "concerns," that were organized on a port basis and held virtual monopolies for water transport operations within the regions served by those ports. Responsibilities of the concerns included the construction, fabrication, maintenance (including dredging), and operations of waterways, port and terminal infrastructure, non-rail land transportation companies, vessels and support equipment, manufacturing and repair activities, commercial agencies such as freight forwarders, and vessel operating companies. Concerns in the river sector were also responsible for inland waterways and locks. These massive, vertically-integrated shipping companies in effect owned and controlled all the assets and operations in the maritime and river sectors, including a wide array of social services for their employees which included housing, hospitals, kindergartens, and recreational facilities (exhibit 7.10).

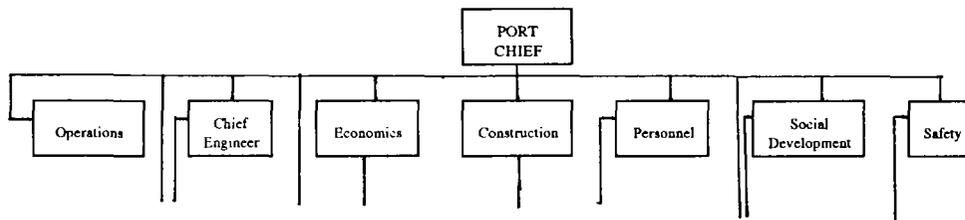
### *Maritime Transport*

Russia's merchant marine fleet of nine ocean carriers (described in detail in Annex E) comprises 57 percent of the former all-Union merchant marine fleet. This capacity enables it to handle roughly half of Russia's international seatriade. In line with efforts to privatize transport operations where possible, the government dismantled the Ministries of Merchant Marine and River Transport and permitted the ocean, cabotage and river transport carriers to become independent, self-accounting, commercial undertakings. Although still state-owned, they are free to establish and follow their own corporate strategies, with a few important exceptions: rate

Exhibit 7.10 Typical Shipping Company and Port Operations Organizational Structures



\* = Non-Core Maritime Enterprises and Functions Controlled and Managed by the Shipping "Concern"



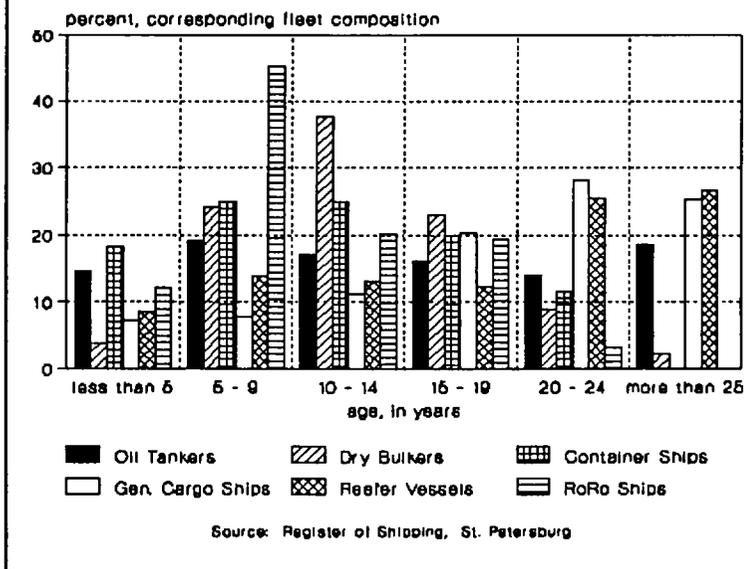
Source: EBRD Waterborne Transport Sector Survey, July 1992, p. 4-67

setting, tonnage disposal and ship acquisition. Some of these carriers are increasingly engaged in cross trades or in flagging out ships to other countries, in an effort to earn foreign currency and become financially self-sustaining. About one-third of the Russian-owned fleet was engaged in cross trades during 1992, more than double the tonnage two years earlier. Many of their ships are

old and technologically outmoded. The average vessel age in the Federation's merchant fleet is 16.8 years (exhibit 7.11).

To generate foreign exchange income to alleviate these problems, Russian shipyards are also serving foreign clients. Almost half the output of the Federation's shipyards is for foreign clients (exhibit 7.12). In contrast, almost 70 percent of

Exhibit 7.11 Merchant Fleet Age Distribution, 1992



new building orders for Russian fleet renewals are presently placed with foreign yards (exhibit 7.13). Russian carriers also prefer foreign yards for repair, upgrading, or conversion, admitting that such practice is costly. The higher expenses, even if in foreign exchange, are considered to outweigh the perceived risk of technologically inferior and tardy services offered by local yards. These developments demonstrate the effectiveness of corporatizing and making independent the shipping lines.

In theory, central authorities retain the right to fix service charges and to authorize ship scrapping or acquisition. A growing number of national carriers and yards have started to disregard these rules because of the demise of the former supervisory agencies, the Ministries of Merchant Marine and River Transport. The present administrative chaos among the new government entities to which sector responsibilities were transferred has created a situation where, fortunately, no effective control arrangements are exercised. As a result, carriers turn over their shipping assets to flags of convenience, and organize and charge for their services as it seems to best fit their interests. The fact that many Russian trade organizations are in substantial arrears to national carriers for services rendered contributes to such corporate behavior. Payment

obligations were estimated to have reached a level of about US\$300 million in 1992. Their independence should be encouraged, as the necessity to be self-sufficient is obviously pushing restructuring at a far faster pace than if the government tried to manage the transition. Even in the cabotage trades, much tonnage is now carried by chartering-in foreign-owned tonnage. *The government should be encouraged to end all effective control over the decisions of shipping line managers regarding ship scrapping and acquisition and regarding the setting of service charges by shipyards.*

These trends result in part from the fact that the commercial maritime fleet is not suited for the work it is expected to perform. Most of the ships were ordered by central procurement agencies that committed serious errors of judgment in ordering different types of new tonnage. These decision-making processes took place without input from the carriers. As a result, specialized tonnage for which there is no productive use was ordered on a massive scale.

Exhibit 7.12 Ships on Order in Russian Yards, January 1993

Yard	Tonnage on Order dwt	Russian Interests Percent Share	Foreign Interests Percent Share
Admiralteiski	68,170	58	42
Baltic	59,080	23	77
Volgograd	63,000	44.*	56
Vyborg	95,359	100	--
Yantar	67,500	11	89
Total	353,109	52	48

\* under Maltese flag.

Source: Fairplay, 1993 *Newbuilding Supplement* No. 17, London.

Exhibit 7.13 Ships on Order by Russian Interests, January 1993

Interested Party	Shipyard (Nationality)	Vessel Type (Number)	Total Capacity dwt
Baltic SC	Yantar (RUS)	General Cargo (5)	7,500
	Baltic (RUS)	RoRo (1)	13,480
	Warnow (GER)	RoRo (2)	34,910
			<b>Subtotal 55,890</b>
Northern SC	Vyborg (RUS)	General Cargo (1)	4,069
Sakhalin SC	Sedef Gemi (ROM)	General Cargo (7)	28,000
SOVCOMFLOT	Miho (JAP)	General Cargo (2)	19,190
Government	Howaldt (GER)	Container (3)	120,000
	Viana (PORT)	General Cargo (7)	21,000
	Galatz (ROM)	General Cargo (2)	8,000
		RoRo (4)	12,000
	Vyborg (RUS)	General Cargo (17)	91,290
	Malta (MALT)	General Cargo (3)	23,100
	Kvaerner (NOR)	Ice Breaker (1)	5,200
		RoRo (1)	10,850
	Rousse (BULG)	Tanker (1)	2,100
		Product Tanker (1)	3,330
	Turnu (ROM)	Tanker (6)	44,400
	Kherson (UKR)	Product Tanker (5)	137,592
		General Cargo (1)	20,000
Szczecin (POL)	Support (2)	2,794	
Nervian (ESP)	General Cargo (2)	14,160	
			<b>Subtotal 515,816</b>
Undisclosed	Volgograd (RUS)	General Cargo (10)	27,500
	Admiralteiski (RUS)	Tanker (1)	39,760
	Kherson (UKR)	Special Purpose (1)	7,640
	Sterkoder (NOR)	Reefer (2)	6,000
			<b>Subtotal 74,900</b>
<b>Total</b>		<b>(88)</b>	<b>709,865</b>
Foreign yards		(53)	492,266

Source: Fairplay. 1993. "Newbuilding Supplement No. 17". London

Understandably, shipping lines do not want to allocate their scarce funds to buy new vessels unsuited to their needs. The only remedy now available to the shipyards to ensure that some revenues are earned is to charter these vessels out to foreign interests on a long-term basis at relatively low costs.

Although the government has established a policy of privatizing shipping companies, the pace of privatization has been slow. Since most shipping assets are still state-owned, most water transport companies are still public carriers, even if they are corporatized. Within the latitude of the privatization decree, managements can decide on

the details of their privatization plans. Some carriers have already decided that joint ventures with foreign partners are attractive propositions. Such joint ventures can be service-specific, within defined trade regions and for limited periods. They can also take the form of permanent partnerships. In the light of current financial constraints, the latter form of joint venture may gain particular attractiveness. The foreign partners would finance the cost of vessel repair or technological upgrading, or even of new tonnage acquisition.

The lack of effective domestic financing institutions for the water transport industries has been critical for national carriers. The observed growth in Russian tonnage transferred to flags of convenience is due in large part to these circumstances. Since national water transport assets historically could not be mortgaged, foreign banks have made out-flagging a condition of lending for the acquisition of new ships. And although the government passed a special law in 1991 that permits the mortgaging of national assets, including ships, there is no perceivable trend among Russian ship owners to take advantage of the law since there is no private banking industry to finance the mortgage. During the Soviet period, state agencies were set up, either to provide financial assistance to the water transport industry, like Morbank, or to centrally manage tonnage acquisition, like Sovcomflot or Sudoimport. Under a market economy, such agencies no longer carry out functions appropriate for the government. Nonetheless, these agencies are still owned by a multitude of interest in the FSU's maritime republics, they are located on Russian territory, and the government is intent on taking them over. The issues associated with their current multinational ownership are proving difficult to resolve.

These special financing and procurement agencies should be discontinued and the vessels under their ownership should be fairly distributed among the different shareholders, which could be expected to ease the resolution of the issues related to multiple ownership. Morbank, which was set up in 1989 as a specialized financing institution for the Soviet maritime industry, has not lived up to expectations. It has a poor reputation among Russian carriers and its

corporate structure and operations are complicated by multiple associations with entities in the different CIS republics. Instead of trying to keep Morbank alive at any cost, the government should design a process for the orderly liquidation of this inefficient financial institution, in cooperation with the concerned interests in the other republics. In place of Morbank, ship mortgage banking should be carried out in Russia as a line of business of a reformed, vital, and private investment banking industry.

In spite of the overwhelming evidence of falling traffic and excess capacity in the fleet, the Federation's President issued a decree in June 1992, "The Program for Renovation of the Merchant Marine". Parliamentary committees have already approved expansion plans that provide, among other provisions, for 7.7 million dwt of new ship acquisition. To mobilize funds for such purpose it appears the government has decided to create a fund consisting of a Rb196.4 billion fund to be financed from foreign exchange revenues earned by the national carriers. An additional Rb14 billion is provided in MOT's approved investment budget for fleet replacement. *Given the slow growth expected for Russia's international trade, however, the government may wish to reconsider the earmarking of foreign currency for such purposes. At the very least, funds used to purchase vessels for privatized shipping lines should be fully repaid by the beneficiaries.*

Moreover, the companies should be free to select their own vessels. Any continuation of centralized fleet renewal or expansion planning, likely as it might be to be based on executive arrangements and the old style tonnage allocation, would turn out to be counterproductive and would deprive individual carriers of their much needed freedom in corporate decision-making. Central authorities initially may be concerned that the national shipping companies will desert the country, once they are given complete freedom to dispose over their fleets, but this is unlikely to happen. Most of the Russian fleet consists of tonnage with relatively low carrying capacities, which also applies to the majority of ships on order by the national carriers. In addition, general cargo ships represent the largest portion (41.5 percent) of the Russian fleet, which is to be

explained by the types of cargo and trading patterns in which the fleet was – and largely remains – involved. Vessels of such configuration and size are not very suitable for effective competition in the international seatriade markets. Most managers of the national shipping companies have indicated that they have no ambitions to compete against the well-established international carriers with their extensive service networks. The national carriers remain dedicated to serve national waterborne trades but expect an enabling environment as a precondition.

Another factor diminishing the competitiveness of Russia's carriers is their aging fleet. Many ships are equipped with engines, communication facilities, and cargo handling gear that reflect technologies of the 1960s. This condition causes low productivity, reduces asset reliability, and forces individual ships to spend an increasing number of days in repair and maintenance yards each year. The apparent need for the renewal of some part of the fleet, must be weighed against worldwide demand for shipping and the degree to which this demand absorbs the present oversupply of ships in the world maritime market. *The government should resist the urge to finance these renewals. The proposed intensification of joint ventures with foreign partners is possibly the most effective immediate solution, in view of the Federation's and its carriers' current financial constraints.*

A key impediment towards realizing such fleet renewal is the unresponsiveness of national shipyards that specialize in ship repair and construction. The yards are caught between the need to generate hard currency income – which is why they are increasingly devoting their repair and building capacities to orders from foreign ship owners – and the need to modernize. The consequences for Russian carriers are that there is not sufficient capacity for their orders, and the often antiquated installations and arrangements in remaining local yards result in poor work, so they have to resort to foreign yards. The government may wish to assist the process of restructuring and privatizing the shipyards by designating them as eligible for assistance under the Privatization Implementation Assistance Project.

Many of the river and maritime carriers now own shares in several of the trade and industry service organizations alongside with different government institutions. Complex cross-ownerships materialized with the result the some carriers are effectively competing against themselves. More importantly, however, there is the imminent danger that many of the untraceable cross-ownerships and management arrangements may effectively lead to the formation of cartels, whose members are more interested in their financial fortunes than in the facilitation of national trade. The urgency for the government to probe into these developments and to intervene if required has become apparent.

Despite the generally salutary direction of reform, the Department of Marine Transport continues to carry out functions in the maritime sector that the government should not perform. These functions cannot be curtailed all at once; many of them must be phased out over a period of time. These functions include:

- In the economic policy field, tariff regulation, setting financial performance targets for enterprises, setting targets for productivity and capacity, establishing targets for freight transport to the Arctic and Far Eastern regions, and managing the leasing of properties.
- In the field of social and personnel policy, employing and appointing senior managers to all enterprises, setting employment standards, wages, and benefits, and setting labor productivity and compensation standards.
- In the field of marketing and logistics management, developing fleet and industrial capacity growth and new building plans, developing marketing plans for enterprises, setting port development and growth targets and developing port plans, attempting to coordinate and optimize cargo carriage and cargo handling between shipping companies and ports based on national objectives, and developing, implementing, and controlling investment and growth policy, primarily through control of hard currency disbursements.
- Management of ancillary businesses, particularly those set forth in the paragraph above.

### *Inland Waterways*

Russia's inland waterways system accounts for only 3 percent of total domestic freight transport in tkm. About 9,000 vessels in the inland waterway fleet with an average age of 20 years, an average capacity of 5,860 tons, and an average productivity of 90 ton-km per ton per vessel-day according to EBRD consultants, sailing only 180 days a year for a total of 850 billion tkm. By comparison, the total tkm transported by river transport in Russia in 1991 was only 195 billion.

About 35 percent of the vessels are self-propelled. The self-propelled segment of the fleet performed 60 percent of the overall river freight task. The system is expensive to operate because self-propelled vessels must remain idle while its cargo is loaded and unloaded. More efficient and less costly barging arrangements, wherein the powered vessel (the most capital intensive) is kept moving pulling barges that can be dropped off for loading and unloading, have become common practice in Western Europe and North America.

The decision to build so many self-propelled ships appears to have been related to the fact that most of the river ports have adjacent shipbuilding yards, not to reasons related to operating costs, speed of delivery, or economies of scale. Keeping the yards working on expensive vessels was more pressing than the need to maximize river transport earnings. Moreover, since river carriers each had a monopoly on local traffic within about a 100-mile radius, it was always possible to earn a profit on the transport of local construction materials. In any case, the total fleet-invested capital increased by more than three times in the last fifteen years, creating a tremendous over-capacity of river transport vessels.

Since the combined carrying capacity of the river fleet exceeds current demand by substantial margins, the further decline in river transport demand projected in the near term is likely to expand excess capacity. There is no notable participation of foreign carriers in Russia's river transport system.

Investments in new river transport assets will be difficult to justify because demand for such transport has changed considerably over the past

decades. In the 1930s almost two-thirds of the river fleet carried relatively diverse general cargoes. River transport was not only complementary but also an effectively competing mode to the land transport carriers, particularly to the railways. The Soviets constructed a widespread canal system to provide east-west connections between many of the country's main rivers, which generally have a north-south orientation, allowing river transport to serve a large number of urban areas and industrial regions. Starting in the 1960s, however, the mix of cargoes transported on Russia's rivers and canals changed. By 1991, more than 80 percent of the tonnage deployed was used to transport construction materials, generally gravel and sand, for relatively short distances. The average length of haul in river transport has been less than 400 km since 1986. Sand and gravel for construction account for 81 percent of total tonnage carried on inland waterways. Timber, oil, and coal together add another 15 percent (or about 100 million tons). Nine other commodities comprise the remaining 4 percent of the traffic (exhibit 7.14).

According to EBRD economic forecasts, activity for the primary user of sand and gravel – the construction industry – is likely to continue to decline over the next 3 to 5 years. Based on experience in other economies, it is safe to say that even as the economy recovers, traffic is likely to lag behind GDP growth for some time to come.

**Exhibit 7.14 Inland Water Transport  
Tonnage, 1990**

Commodity	Millions of Tons	Percent of Total
Sand and gravel	542.0	81.0
Timber	50.7	7.6
Oil	34.0	5.1
Coal	17.2	2.6
All others	25.1	3.7
<b>Total</b>	<b>669.0</b>	<b>100.0</b>

Source: MOT.

*The River-Sea Fleet.* About 500 vessels engage in river-sea operations, a specialized form of inland waterway transport performed by the same enterprises that engage in inland waterway transport. River-sea transport tends to be more profitable than conventional inland waterway transport because of the lengths of haul and the fact that vessels can often be redeployed in the winter season away from the frozen rivers of Russia's North.

By 1995, it is expected that almost half of Russia's river-sea fleet will be written off. Current MOT plans expect to replace about 45 to 50 of the 237 vessels to be retired by 1996. MOT hopes to obtain donor financing of US\$200 million to finance the purchase of imported vessels. Another 52 vessels are expected to be replaced by domestic manufacturers by 1996. The 1993 federal investment budget includes Rb14.6 billion for investment in the river fleet. Given the current excess of river vessels, it would seem that many of these orders are unnecessary.

Following the demise of the Ministry of River Transport, all river carriers, ports, shipyards, and

other ancillary services were combined under the newly formed concern Rosrechflot, whose objective is to rationalize and promote river transport in Russia. Given the sheer number and diversity of entities under its umbrella, there can be little hope that Rosrechflot will succeed in achieving such objectives. Different strategies are required for carriers, ports, yards, and dredging companies. At present there are still many binding organizational and operational links between all these entities that impede required system reforms. Yards own most river craft, and river transport companies are responsible for the operation of riverine ports.

Unlike ocean and cabotage carriers, for whom freight tariffs are still nominally fixed by the central authorities, river transport operators have been given complete freedom in rate setting. Only in the eastern part of the Federation do restrictions still apply because there are only a few companies active and they often enjoy monopoly status. River freight rates have increased 20-fold since early 1992, largely because of rising fuel prices.

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#### Banking on Russia's Expertise in River-Sea Transport: Two Companies Set Directions

Several Russian river transport operators have developed far-flung service networks that extend beyond inland waterways. They carry diverse cargoes between upcountry origins and destinations along the Arctic and Pacific Ocean rims. More importantly, they engage in foreign trade with countries throughout the Baltic region, in Western Europe, the Mediterranean, and as far as West Africa. The vessels in these trades are of standard design in the 1,500 to 4,000 dwt range; they are versatile and can carry different types of cargo simultaneously. Of the river companies engaged in international trade, the more important ones include the North Western Shipping Company and the Volgotanker River Shipping Company, which have different organizations, service bases, and corporate strategies.

North Western is a diversified carrier with a fleet of over 250 vessels and a domestic service network that extends over 10,000 km of waterways beyond its operating center in St. Petersburg. In 1992, the company's fleet carried 47 million tons of cargo, of which six million tons were coming from or were destined for 22 foreign countries. The technologies applied by North Western have attained so much international repute that orders are increasingly placed by foreign operators for ships of the same type as North Western's. Company management has decided to diversify into designing and building river-sea vessels. Passenger transport with special tonnage is another facet of the company's business agenda.

Volgotanker, in contrast, is a specialized carrier with a fleet of 90 special-purpose vessels. The company carries around 26 million tons of crude oil and petroleum products annually along the Russian inland waterways – from the Caspian Sea to the Arctic islands – and to destinations all over Western Europe. The company's trading patterns have changed drastically in recent years. In the late 1980s about 30 percent of its business was done with foreign charterers, which increased to over 90 percent in 1992. Volgotanker is a shareholder in the Urals Group, Russia's biggest crude exporter.

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Apart from inadequate technologies and the growing age of the river fleet, low productivity of river ports is another factor that renders the system's performance suboptimal. On average, individual river craft spend annually about 60 percent of the time in ports waiting to be loaded or unloaded. Inefficient port management organizations, pervasive limitations of cargo handling and storage facilities, and poor physical and operational connections with other transport modes are responsible, plus the common practice in all Russian ports to transfer cargo directly from ship to or from rail wagons. Ports were designed around this management principle, which implies narrow aprons and limited availability of warehousing space.

A major factor contributing to the high overheads and inefficiencies is excessive staffing levels. Most of the companies have far too many non-essential staff on shore. East European carriers which in similar conditions reduced their payrolls by up to 65 percent as one of their first steps in corporate restructuring. Like ports, Russian shipping companies were burdened after the FSU breakup with a colossal variety of other activities, assets, and social obligations. Before becoming dissociated from ports, some of Russian carriers had to look after 50,000 or more employees and their families. Shipyards, entities responsible for dredging and navigational aids, and a multitude of other types of service and infrastructure were part of their responsibilities. The most efficient decision would be to separate the shipping companies from all non-transport-essential obligations and privatize them as soon as possible.

Despite the progress to date, changes must be made to achieve a structure that will effectively promote a private, competitive, efficient river shipping industry. These include:

- Eliminating the monopoly of each port to serve local customers within a 100 mile radius of each port.
- Promoting competition among river carriers.
- Phasing out the responsibility of the river shipping companies for the social welfare of their employees.

- Stripping MOT of the authority to appoint the president and senior management of all river shipping companies.

- Restructuring the river shipping companies to eliminate any vestige of their former role as holding companies, which included responsibility for the welfare and business coordination of all the enterprises.

### *Near-term Recommendations*

*Corporatize, cut managerial links with the government and put all maritime and river carriers on a commercial footing.* All existing national water transport carriers—ocean, cabotage, and river—should be put on a commercial footing and corporatized. Integral to this process should be a complete severance of managerial links with the government, whose role should be limited to ensuring that seaworthiness standards are met and maintained. Carriers should be free to develop and market services in line with their own corporate strategies, which should extend to freedom to scrap obsolete vessels, to refurbish existing assets, acquiring new tonnage, or to charter in foreign-owned ships. They should also be entitled to fix service charges in line with appropriate accounting standards and at levels that ensure full coverage of their operating cost, adequate asset depreciation, and sufficient funds to meet all overheads. Whether these overheads should continue to include social infrastructure and productive assets for their employees should be left at the discretion of the companies' management.

*Permit carriers – in appropriate situations – to diversify into related services such as freight forwarding, trucking and warehousing.* In many situations throughout the world, it is not unusual for merchant marine carriers to diversify into land-side value-added services, such as freight forwarding, terminal operations, warehousing, and trucking. Given the historic role of Russian shipping concerns as monopoly owners and operators of ports, however, their participation in such activities should be strictly limited to situations where effective independent competition exists. The fact that a few of the principal Russian maritime carriers have already begun to engage in such activities on a limited basis indicates their

interest. It is in the government's interest to ensure that their participation takes place within a framework of competition and open access for all carriers to port facilities.

### ***Medium-term Recommendations***

*Deregulate river and maritime transport: abolish tariff regulation except in cases of monopoly or where subsidies are necessary, ease entry and exit restrictions.* The basic policy conditions for the development of adequate water transport services through national carriers are transparency and ease of entry and exit. All tariff regulations and central fixing of freight charges should be abolished. Exceptions should apply for situations where monopolies prevail, or in cases where the provision of shipping services on the basis of charges that cover all fixed and variable vessel cost would result in negative social impacts. The latter case relates to services in the Arctic Ocean and the northern end of the country's Pacific rim. The best solution for these situations is to tender for the provision of service, to select a carrier through competitive bidding, and to conclude a long-term service contract with the successful bidder. The contract should include fixed service charges in line with the government's social objectives, and indexed allowances – effectively subsidies – to cover the difference between the fixed charges and the actual cost of providing and operating vessel assets.

*Let the marketplace allocate maritime capacity – foster development of transport competition by promoting competition among the several river shipping lines, the several maritime shipping lines, and Russian and nearby foreign ports.* The debate over what is the right policy decisions about the right to carry Russian waterborne cargoes or to what extent carriers should provide services with their own or chartered tonnage should be left to the marketplace. Continuing the Soviet tradition, the government is not a proponent of the international Liner Code of Conduct, which provides for a 40-40 percent split of the freight exchanged between two trading nations, with the remaining 20 percent left to cross traders. With the exception of the Baltic-Australia service by the Baltic Shipping Company, no Russian carrier

participates in official seatrade conferences. Where cargo sharing arrangements exist, they are based on voluntary agreements. These policies are sound and should be left in place.

The majority of tonnage under Russian flag competes with foreign carriers on a cost and quality of service basis under unrestricted conditions. Similar behavior by the FSU carriers during the 1970s and 1980s caused much consternation among western governments. However since then most of these governments have adopted a policy of open competition in seatrade. Few of their carriers remain active in conferences. The benefits for trade have been substantial. Thus an international climate has developed in which unrestricted competition and cooperation among carriers prosper. The previous antagonism versus the Russian carriers has disappeared, and effective partnerships between them and many foreign carriers are on the increase.

The only foreseeable way to create transport competition is to promote competition among the several river shipping lines, the several maritime shipping lines, and Russian and nearby foreign ports. Competition depends in part on the ability to market the services offered, but current Russian performance adversely influences business development. Seeking foreign partnerships in an effort to improve operations, to secure needed assistance in major investment programs, and to attract long-term business is a low-cost alternative. Port and shipping line management to develop contacts and pursue this line of approach should be encouraged and supported by the government.

### ***Notes***

1. Sea transport accounted for nearly 81 percent of Russia's international trade in 1991, excluding railway and pipeline shipments/deliveries (*Russian Federation Transport and Communications 1992*).
2. EBRD, *Waterborne Transport Survey: Russian Federation*, Draft Final report, July 1992, NEDECO/HASKONING. p 4-34.
3. Constantine Michalopoulos and David Tarr, "Energizing Trade of the States of the Former

USSR," *Finance & Development* (Vol. 30, No. 1), March 1993, pp 22-25. See also Michalopoulos and Tarr, *Trade and Payments Arrangements for States of the Former USSR* (Washington DC: The World Bank, September 1992).

4. T. Korotkova, A. Krusiyani, and S. Alkhimov, "Exporters Facing an Uphill Climb," *Commerzants* (19 January 1993), pp 14-15.

5. T. Korotkova, A. Krusiyani, and S. Alkhimov, "Exporters Facing an Uphill Climb," *Commerzants* (19 January 1993), pp 14-15.

6. MOT data, provided to World Bank mission, November 1992.

7. Yevgeniy Solomenko, "The Petersburg Maritime Port on the Eve of a Strike," *Izvestiya* (23 February 1993), p 4, translated as "St. Petersburg Seaport Workers Form Strike Committee," *Central Eurasia* (FBIS-USR-93-027) 10 March 1993, pp 55-56.

8. Transport and Communications Division of the Economic Commission for Latin America and the Caribbean, *The Restructuring of Public-Sector Enterprises: The Case of Latin American and Caribbean Ports* (Santiago, Chile: United Nations

Economic Commission for Latin America and the Caribbean, 1992), pp 8-9.

9. Transport and Communications Division of the Economic Commission for Latin America and the Caribbean, *The Restructuring of Public-Sector Enterprises: The Case of Latin American and Caribbean Ports* (Santiago, Chile: United Nations Economic Commission for Latin America and the Caribbean, 1992), pp 13-14.

10. There have already been experiments with providing different services through third parties in Russian ports, and some have turned out to be very satisfactory. For instance, the Port of Vladivostok has contracted ten enterprises, some of which are cooperatives, that manage different port services under leasing arrangements. The lease contracts are for fixed periods and oblige these third parties to operate and maintain the specific facilities during that time, subject to accepted productivity levels. In return the lessees have the right to establish and collect service charges within contractually agreed ceilings. These arrangements have turned out to be mutually beneficial to lessor and lessees, and the port's user community has been generally happy with the types and quality of service that are being offered. Vladivostok's model could be easily applied in other Russian ports.



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## *Airlines and Civil Aviation*

Air transport traditionally has played an extremely significant role in passenger transport within Russia and other FSU countries. Air transport represented 37 percent of all intercity passenger traffic in 1990, a staggeringly high proportion compared to economies in the West. In the United States, for example, only about 17 percent of intercity travel is by air. The high dependence on airline travel in Russia results from a combination of factors: (a) the vast distances of the country, (b) exceedingly low air fares, and (c) the relative scarcity of intercity bus and automobile transportation.

More than 138 million passengers were transported by air throughout the Soviet Union in 1990, making Aeroflot, the umbrella holding company for all airline operations in the FSU, the world's largest airline. Russia and the United States together accounted for approximately 46 percent of the world's total air traffic (exhibit 8.1).

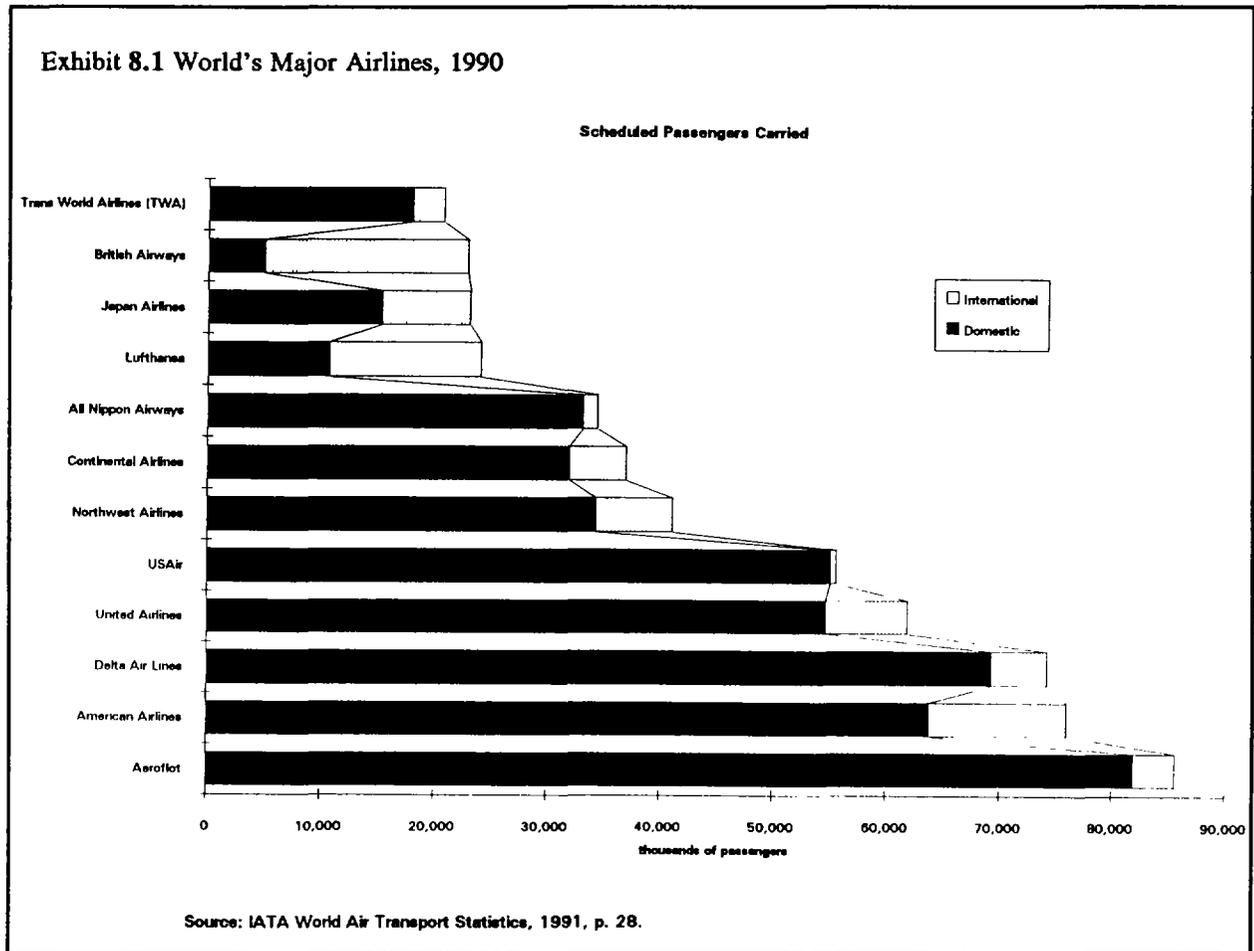
Organized as a vertically-integrated, multi-enterprise, monopolistic holding company reporting to the Ministry of Civil Aviation, Aeroflot, under the USSR, provided service according to an all-Union schedule organized and controlled from Moscow but operated as a series of regional directorates at major city airports within the country. Airline operations were strictly divided between domestic and international service, with separate organizations and accounts for each.

Domestic service included both scheduled and chartered passenger and freight service among

3,600 cities and towns of the Soviet Union. Each regional Directorate of Civil Aviation conducted airline operations according to Aeroflot's all-Union schedule and operated the airports and air traffic control (ATC) systems within their regions (exhibit 8.2). Each airport was organized as a hierarchical managerial and separate cost center with the airport head responsible for all activities. Each airport's revenues included ticket revenues from enplaned passengers at that airport, revenues from chartered aircraft and crop dustings, landing fees and ATC charges. On the expense side, the administrative costs of running an airport were commingled with those of airline and ATC operations.

Aeroflot Soviet Airlines, the international enterprise within Aeroflot, was created and incorporated in 1971, with headquarters at Sheremetevo, Moscow's international airport. Aeroflot Soviet Airlines is the designated carrier in all 113 bilateral agreements covering international service and operates into more than 70 foreign airports. Over sixty foreign carriers fly into Russian airports. Prior to the breakup of the FSU, Aeroflot's international network covered 134 locations in 102 countries. The need to maintain centralized control over the earnings and expenses in foreign currencies and to ensure that Aeroflot complied with International Civil Aviation Organization (ICAO) regulations probably explains why it was organized as a separate entity along the lines of its international competitors.

Aside from airline operations, Aeroflot was also responsible for air freight service, development



and operation of airports, and development and operation of the air traffic control system. Aeroflot owned more than 8,000 aircraft for domestic service, of which about 60 percent were active, including about 1,500 commercial jets, as well as small aircraft, crop dusters and helicopters.<sup>1</sup>

*Impact of the Breakup on Aeroflot.* Following the breakup of the Soviet Union, aircraft, airports, and air traffic control facilities were divided among republics according to each aircraft's geographic location. Aeroflot's fleet was divided among the republics according to their home base airport, taking into account traffic demand and operating schedules. The republics subsequently set about organizing independent airlines.

In addition, many of the regional departments within Russia formed joint stock companies and

applied to MOT for authority to operate as independent airline enterprises under the new policies in Russia. More than 174 individual applications have been received from emerging domestic airlines. At the same time, Aeroflot tried to coordinate the operations of these new airlines, including those in other republics, so as to continue to operate as an all-union airline according to the old Aeroflot routes and schedule.

As in the past, revenues and cost records continue to be kept for each airport. A central accounting branch within Aeroflot distributes revenues and clears accounts among the airline enterprises. International flights were maintained by requiring the newly formed airlines to fly the Aeroflot flag and conduct operations under the control of Aeroflot Soviet International, the single designated carrier in bilateral negotiations. To help coordinate this effort, the CIS formed an

Exhibit 8.2 Regional Aeroflot Administrative Departments circa 1990

IBRD 25152



SEPTEMBER 1993

Russian Federation	Administrative Center	Other Republics	Administrative Center
1. Central Department of International Air Services	Moscow (Sheremetev)	17. Ukrainskoe	Kiev
2. Moscow Transport Department	Moscow (Vnukovo)	18. Belorusskoe	Minsk
3. Department of Central Region	Moscow (Bykovo)	19. Moldavskoe	Kishinev
4. Northern	St. Petersburg	20. Georgian	Tbilisi
5. Arkhangelskoe	Arkhangelsk	21. Armenian	Erevan
6. Komi	Syktykvar	22. Azerbaijani	Baku
7. Uralskoe	Yekaterinburg	23. Kazakhskoe	Alma-Ata
8. Privoljskoe	Kuibyshev	24. Turkmenskoe	Ashkhabad
9. Northern Caucasus	Rostov	25. Uzbekskoe	Tashkent
10. Tyumenskoe	Tyumen	26. Kyrgyzskoe	Bishkek
11. West Siberian	Novosibirsk	27. Tajikskoe	Dushanbe
12. Krasnoyarskoe	Krasnoyarsk		
13. East Siberian	Irkutsk	Previously USSR	
14. Yakutskoe	Yakutsk	28. Lithuanian	Vilnius
15. Magadanskoe	Magadan	29. Latvian	Riga
16. Far Eastern	Khabarovsk	30. Estonian	Tallinn
		Miscellaneous	
		31. Special division for governmental and VIP flights	Moscow (Vnukovo)

Source: Aeroflot.

Interstate Aviation Committee to develop unified procedures and requirements regarding airspace management and control, airline certification, aircraft, airways, and aircraft accidents.

Air traffic levels in Russia and the FSU as a whole were extraordinarily high, largely due to the fact that Soviet domestic air tariffs were *the lowest in the world for many years*. Soviet citizens were free to travel anywhere in the Soviet Union, and air transport became the most popular means of transport in the USSR. In 1990 Aeroflot carried about 133 million passengers on its domestic operations, roughly 86 million in Russia, and another 5 million internationally (this compares to about 1.2 billion passengers world wide for all air travel).

Airline traffic declined about 5 percent in 1991, and another 27 percent in 1992. International flights suffered a substantial reduction in tourist volume among the republics of the former USSR and other socialist countries because of the transition to mutual accounts in convertible currency. Domestically, air travel declined as fares were increased to cover rising fuel costs and political upheaval altered traditional domestic travel plans. In 1991 Aeroflot carried only 82 million passengers in Russia, a drop of about 5 percent over 1990 levels. Load factors per flight also dropped from 89 percent to 85 percent despite cancellation of many flights. Traffic fell even further to 62.6 million in 1992, with load factors slipping below 80 percent. Total domestic pass-km flown in Russia were about 133 billion in 1991 and 117.6 billion in 1992, about 18 percent of total U.S. airline performance. The average trip length in Russia in 1992 was about 1,878 kilometers.

Efforts to maintain Aeroflot's status quo continue to be increasingly undercut by financial and general economic difficulties related to the breakup of the FSU. Besides the declining passenger and freight traffic, increased fuel costs, wage raises and disruption in the supply of aircraft and spares resulting from trade problems have added to Aeroflot's difficulties. The financial impact of these factors is immense. Aside from the loss of revenue the decline in volume, Aeroflot has not been able to recover the full

impact of cost increases through fare hikes. Although prices have been raised, the increases have driven away enormous numbers of passengers, despite the fact that price increases have lagged far behind cost increases.

Average revenue per pass-km was about 0.026 rubles (about 3 kopeks) in 1991, or about Rb42 per trip. Aeroflot fares were traditionally low and were related to average weekly pay to make air travel easily affordable. An average ticket price in February 1992 was about Rb250 (the equivalent of US\$2.50 at the then-current exchange rate of Rb100 to the dollar). Fares have been raised numerous times since then, but overall cover only about 70 percent of costs according to Aeroflot in November 1992. At that time, Aeroflot also estimated that if fuel were raised to world prices, passenger fares would have to be raised 3.4 times to cover operating costs and 7.5 times to cover all costs, including capital costs.

According to published results, Aeroflot recorded a profit of Rb30 million in 1991 after paying income taxes of Rb2.4 billion on operating results of Rb2.5 billion (exhibits 8.3, 8.4, and 8.5). Since then, however, margins are disappearing and losses are beginning to occur among many of Aeroflot's individual enterprises.

*Subsidies.* In 1992 Russia's federal budget predicted airline expenditures would exceed revenues by Rb18.6 billion and provision was made to include airline subsidies for price, fuel and investment. A total of Rb34.8 billion was provided to subsidize operating losses and Rb17.8 million to finance investments. Of this total, Rb15 billion was for fuel subsidies. The government has taken a decision not to subsidize airline passenger service after January 1, 1993 and has granted airlines full tariff freedom, provided profits do not exceed 20 percent.

In view of the declining financial situation and growing levels of subsidy in the airline sector, the government also decided to subsidize passengers where necessary for social purposes. The 1993 federal budget includes Rb25 billion for subsidies for air transport to northern territories. These funds – the need for which is expected to triple in 1993 – are to be given to the local governments, however, rather than to the airlines.

Exhibit 8.3 Aeroflot Profit and Loss, 1988 to 1991 (Rb 000)

Description	1991	1990	1989	1988
<b>Revenues</b>				
Scheduled services	3,928,938	1,353,068	1,133,888	979,210
Non-scheduled services	—	60,941	56,519	11,000
Incidental revenues	242,944	543	652	17,409
Total operating revenues	4,171,882	1,414,552	1,191,059	1,007,619
<b>Expenses</b>				
Flight operations	778,245	204,033	193,298	166,930
Maintenance & overhaul	150,313	128,293	100,577	99,176
Depreciation & amortization	258,291	94,140	89,689	89,459
Station & other ground expenses	247,484	124,679	106,766	53,273
Passenger services	69,006	64,804	50,673	31,238
Ticketing, sales & promotion	7,218	4,616	4,580	7,000
General & administrative	67,383	38,046	29,432	18,882
Other operating expenses	124,858	251,001	116,064	2,427
Total operating expenses	1,702,798	909,612	691,079	468,385
Operating result	2,469,084	504,940	499,980	539,234
Non-operating				
Other non-operating items		(104,428)	(162,565)	(141,829)
Non-operating items (balance)		(104,428)	(162,565)	(141,829)
Profit or loss before income tax	2,469,084	400,512	337,415	397,405
[Income taxes]	[2,438,961]	[394,332]	[325,159]	[392,567]
Profit or loss after income tax	30,123	6,180	12,256	4,838

Source: *Aeroflot Annual Report, 1991*.

The implicit subsidy stemming from the fact that domestic oil is sold at far below world prices is, of course, far greater. Nonetheless, fuel is an increasing problem for the airline sector in Russia, even at subsidized prices. According to ICAO figures, world scheduled airlines' share of fuel and oil in operating expenses was about 15 percent in 1990. By contrast, fuel now represents about 40 percent of all costs for Russian airlines (it was 80 percent until a recent increase in wages). It is estimated that Russian airlines are paying approximately 25 percent of the market price for fuel in early 1993.<sup>2</sup> As fuel prices are increased to world price levels, the percentage of costs attributable to fuel is expected to increase dramatically and put greater pressure on airlines

to reduce service, or on the government to subsidize air transport.

The government is also being pressured to support air infrastructure, and approximately Rb37.9 billion has been included in the 1993 budget to purchase airplanes. MOT's original budget requested far higher levels of support for investments and operating subsidies, including US\$430 million for acquisition of aviation engines and technology. Ultimately, some of this request may be provided through directed state credits.

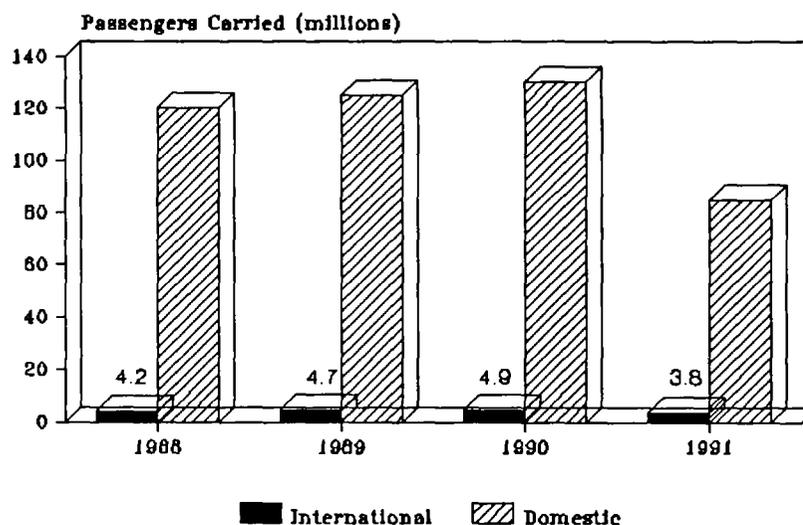
Fiscal reform of the airline sector is necessary but will depend upon restructuring of the sector, petroleum pricing reforms, social safety net issues and greater prudence in investment planning.

Exhibit 8.4 Aeroflot Traffic Performance &amp; Operational Results, 1991 (Domestic)

Revenue Flights	Unit	1991 <sup>a</sup>	1990	'989	1988
<b>Scheduled service (including all-cargo flights)</b>					
Passengers carried	thousands	81,879.5	132,766.7	127,300.3	120,797.80
Freight tons carried	thousands	2,120.5	2,831.4	3,161.8	3,195.87
Pass-km flown	millions	133,428.6	224,310.2	211,137.5	198,653.60
ASK	millions	157,434.4	252,691.4	237,760.8	226,054.40
Passenger load factor	percent	84.8	88.8	88.8	87.90
<b>Tkm performed</b>					
Passenger (including baggage)	millions	12,008.6	20,187.9	19,002.4	17,878.82
Freight (including express)	millions	1,567.8	2,141.3	2,279.3	2,374.34
Mail	millions	298.3	511.0	521.2	486.64
Total	millions	13,874.7	22,840.2	21,802.9	20,739.80
Available tkm	millions	20,280.6	32,518.8	30,671.7	27,947.08
Weight load factor	percent	68.4	70.2	70.4	74.20

a. Domestic flights include Russian Federation only.

Source: *Aeroflot Annual Report, 1991*.



While the government's position to stop further pricing subsidies will force some restructuring in and of itself, there are some markets, such as northern areas where air transport is the only means of transport, where such policies cannot prevail in the long run. The government subsidization being provided to the northern territories might become productive if tied to a process through which air transport is provided under competitive bid.

These financial pressures are beginning to undermine adherence to Aeroflot's integrated operating schedule. The drastic drop in demand has led to the cancellation of as many as 30 to 40 percent of flights. The disruption of fuel supplies has stranded planes throughout the system, played havoc with operating timetables and occasionally left regional managers with hundreds of distraught passengers on their hands, sometimes for days. The need to raise fares to cover costs has become

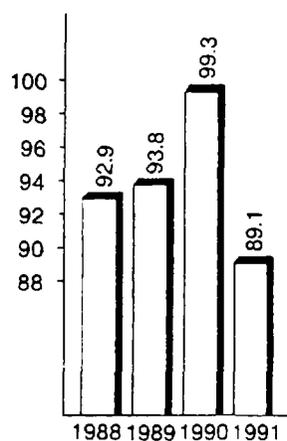
Exhibit 8.5 Aeroflot Traffic Performance &amp; Operational Results, 1991 (International)

Revenue Flights	Unit	1991	1990	1989	1988
<b>Scheduled Services (including all-cargo flights)</b>					
Kilometers flown	thousands	143,012.8	161,014.1	147,229.0	132,555.50
Aircraft departures	number	53,525.0	62,053.0	56,201.0	53,573.00
Hours flown	number	180,487.0	199,784.7	184,045.0	167,133.00
Passengers carried	thousands	3,760.5	4,431.5	4,307.5	3,814.10
Freight tons carried	thousands	53.9	69.1	68.0	64.21
Pass-km flown	millions	15,569.2	17,863.6	16,590.1	14,480.60
ASK	millions	22,558.2	25,388.4	23,028.0	20,796.40
Passenger load factor	percent	69.0	70.4	72.0	69.60
<b>Tkm performed</b>					
Passengers (including baggage)	millions	1,401.2	1,613.7	1,493.1	1,303.25
Freight (including express)	millions	346.0	391.4	366.1	345.14
Mail	millions	13.4	29.2	34.0	38.71
Total available	millions	1,760.6	2,034.3	1,892.2	1,687.10
Tkm	millions	3,816.6	2,997.8	2,701.4	2,459.05
Weight load factor	percent	46.1	67.9	70.1	68.60
<b>Charter Services</b>					
Kilometers flown	thousands	27,577.7	27,583.1	23,363.0	22,649.30
Aircraft departures	number	9,825.0	12,648.0	10,797.0	10,721.00
Hours flown	number	36,428.0	36,958.3	29,992	28,881.00
Passengers carried	thousands	405.6	543.5	443.2	399.20
Freight tons carried	thousands	35.2	30.2	25.8	28.72
Pass-km flown	millions	1,436.2	1,672.4	1,246.9	1,094.80
ASK	millions	2,495.4	2,512.7	1,927.8	1,698.20
Passenger load factor	percent	57.6	66.6	64.7	68.50
<b>Tkm performed</b>					
Passengers (including baggage)	millions	129.3	144.6	112.2	98.53
Freight (including express)	millions	163.8	141.8	114.8	110.62
Mail	millions	2.9	0.4	0.2	8.35
Total available	millions	296.0	286.8	227.2	217.50
Tkm	millions	838.3	516.4	451.2	435.97
Weight load factor	percent	35.3	55.5	50.3	49.90

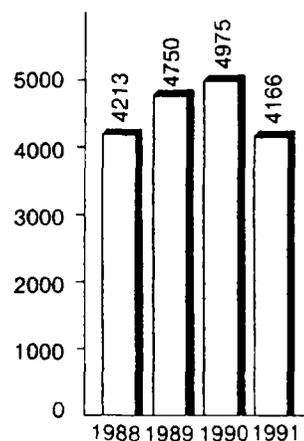
Source: *Aeroflot Annual Report, 1991.*

### SCHEDULED AND CHARTER SERVICES

Freight  
Tonnes  
Carried  
(thousands)



Passengers  
carried  
(thousands)



more important to each airline since it can no longer count on financial support from more profitable sections of Aeroflot. The newly formed airlines are increasingly expressing a desire for independence from Aeroflot and particularly from Aeroflot's centralized control of accounting and operations.

### *Evolving Structure of the Aviation Sector*

The current organization of the civil aviation sector in Russia is in flux. While Aeroflot remains the umbrella company for domestic and international airline service, it is no longer a regulator of civil aviation and a new authority has been created to own and operate Russia's ATC system. Separation of ownership and operation of airports from that of airlines is also a stated goal of the government, but one that the government is apparently having difficulty trying to implement. The government has not decided how the industry should be structured, and Aeroflot itself seems bent on maintaining as much of the old system as possible on the grounds of avoiding disintegration of the system. Nonetheless, the government has stated that it wishes to cease subsidizing air travel and permit development of a number of privatized airlines to compete with each other in the domestic market.

### *Regulation of Civil Aviation in the Department of Air Transport*

Aeroflot's previous role as the regulator of the civil aviation sector has been assumed by the Department of Air Transport in MOT. This department has about 400 employees and is responsible for developing economic and structural policies for the aviation sector. The department is trying to organize the "denationalization and privatization of property and technical facilities in stages on the basis of legal and economic regulators, with provision for appropriate flight safety." In this connection, according to its director, the government is trying to form new competitive structures based on existing civil aviation enterprises, administrations, and associations, to "operate as free entrepreneurs with maximum economic independence and full responsibility for the results of economic

operation, flight safety, the quality of transportation and passenger service."<sup>3</sup>

In line with the government's goal of de-monopolizing air transport, the department of air transport is charged with, among other functions, promoting the establishment of independent airlines within Russia. This effort is limited to creating competition within Russia by permitting the regional administrations to operate as individual "home base" airport cost centers (the regional administrations) and other air enterprises and associations created as subsidiary ventures of Aeroflot in the past to operate as self-sufficient enterprises. To some degree the impetus for the creation of these airlines stems from the desire of airport managements, particularly those with sizeable fleets, to corporatize and form a joint stock organization pursuant to new policies and laws in Russia. According to MOT, there are 174 registered non-state aviation companies, joint stock companies and other commercial structures to which operating licenses have been issued.<sup>4</sup>

At the same time that it is encouraging competition, the government recognizes that many of these new airline enterprises are losing money and may never be self-sufficient as presently constituted. Their changing circumstances are causing the government to rethink the situation. In July of 1992, the director of the newly formed Air Transport Department indicated that the government would promote development of 30 competing airlines. In November 1992 the Minister of Transport indicated that the government might favor the creation of only about four competing airlines within Russia and possibly even try to maintain operations under a single airline. Despite these reservations, as of June 1993 there were 174 airlines registered.<sup>5</sup>

The present number of domestic carriers is unlikely to survive in the long term and the government's decision to cease subsidizing fuel or ticket prices will probably hasten the bankruptcy of many of them. The government should stand by its decision not to subsidize fuel or ticket prices. Given the tremendous number of carriers now licensed to fly domestically, however, it may be better to avoid many bankruptcies by facilitating the merger of many loss-making local airlines into a reasonable number of viable competitors. In

setting policies that will affect the structure of the industry, the government needs to have a clear understanding of the number of competing domestic airlines that could be self-sufficient given realistic forecasts of demand. These same studies are also essential to assess the need for airports and airport upgrading. Unfortunately, there are presumably a number of master plans and airport expansion plans being undertaken on an ad hoc basis without reference to assessments of overall air traffic levels or in the absence of agreements on the legal and regulatory framework for the sector.

If air travel is to be self-sufficient in Russia the real price of air travel will be far greater than it has been and the price relative to rail and automobile travel will undoubtedly increase. Such price increases will depress the demand for air travel, particularly at a time when (a) real wages are not likely to increase for much of the population, (b) unemployment levels may rise, and (c) the economy as a whole is not likely to return to 1989/90 levels until well into the next century. At the same time, the air travel market to and from other republics may decline further if put on a hard currency basis. Based on these factors, and taking into account the fact that air travel levels were artificially high in the first place, it is highly unlikely that the air travel market will reach 1990 levels for decades. A consultant forecast estimated that the number of millions of revenue pass-km in the year 2015 would be 144,280,<sup>6</sup> which is less than the actual level of 159,519 million revenue pass-km in 1990.

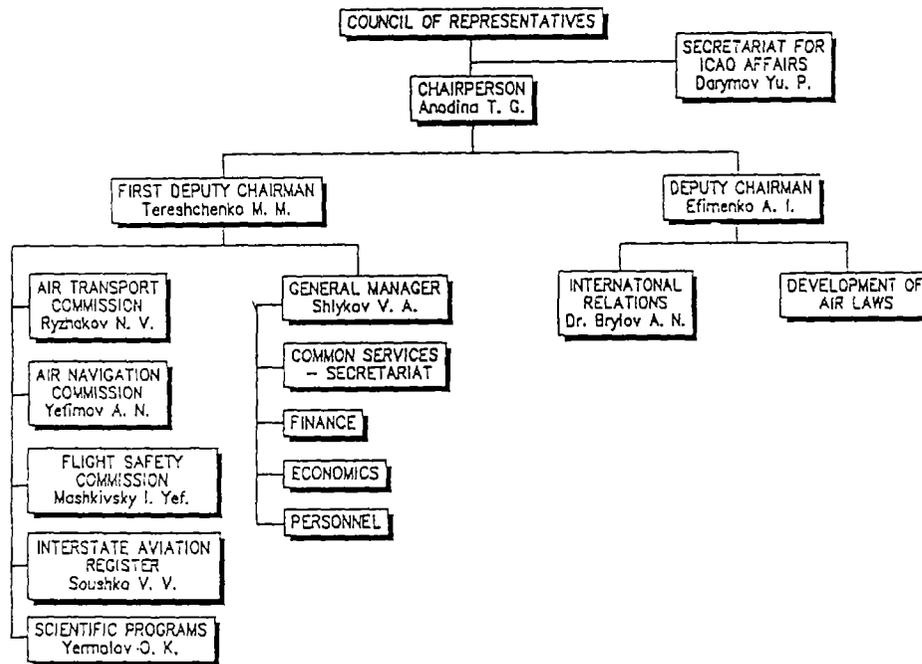
*CIS Interstate Aviation Committee.* The newly formed independent airlines in other republics conduct international operations under the Aeroflot flag. According to Aeroflot, most of the new airline operators have no experience in commercial activity in air transport markets, are economically insolvent, and possess practically no legal competence in the field of international contractual relations. For this reason Aeroflot continues to direct their efforts through a new coordinating body called the CIS Interstate Aviation Committee (MAK), which was created on December 30, 1991 in anticipation of the breakup of the FSU. The council is composed of:

- The directors of each republic's Civil Aviation Administration.
- The director of MOT's Air Transport Department.
- The chairman of the new ATC organization, Rosaeronavigatsia.
- Commanders of the CIS Air Force and military representatives from other republics.
- Aeroflot's Director of Flight Operations.

MAK has about 350 employees and its primary function is to coordinate inter-republic issues related to civil aviation including: (a) coordinating CIS interests with respect to bilateral negotiations on landing rights; (b) aircraft certification; (c) licensing of airports, crews, and air traffic controllers; (c) promulgation of civil aviation flight standards; (d) management of airspace and coordination of overflights; and (e) accident investigations and other safety matters (exhibit 8.6).

*There is no single right answer to the structuring of the airline industry within Russia, but an effective solution would be to encourage all entrants that wish to try to become self-sufficient to ensure that they are permitted to compete in all markets and then allow mergers and consolidations to take place as the market dictates. Whatever else, the government should take steps to ensure that at least several domestic airlines are formed and that competition among airlines is encouraged and facilitated.* Of course, it should be clear that some minimal criteria for assessing the fitness of potential entrants in the airline sector is advisable to protect consumers from unsafe airplanes or unfit companies. Entrants should be "fit", willing and able, which means they should be able to demonstrate they have the financial capability, the managerial expertise and the proper compliance disposition to operate in a safe manner and in the public's interest. Russia's air market is so large, even with the recent drastic declines in traffic volume, that more than one carrier can certainly be self-sufficient provided it is permitted to do business on a freely competitive basis throughout the country. The experience of China may be of some relevance. China's domestic airline travel transports about 26 million passengers annually, compared to the 62 million carried in Russia in 1992. Scores of new small Chinese airlines are now starting up, spurred on

Exhibit 8.6 Inter-State Aviation Committee, 1991



Source: EBRD Aviation Sector Survey, Draft Final Report

in part by a 1992 government decision to permit foreign investment in and cooperation with its domestic carriers. *With respect to airports, it should be understood that issues in terms of numbers of airports or expanding capacity will be far less of an issue than how to rationalize the sector's facilities and enterprises. To the extent possible, such rationalization should be guided by the market-place and government investment and subsidization kept to a minimum. Airports should be supported by concessions for shops, parking, and revenues for landing fees, and airlines should be supported by passenger and freight revenues.*

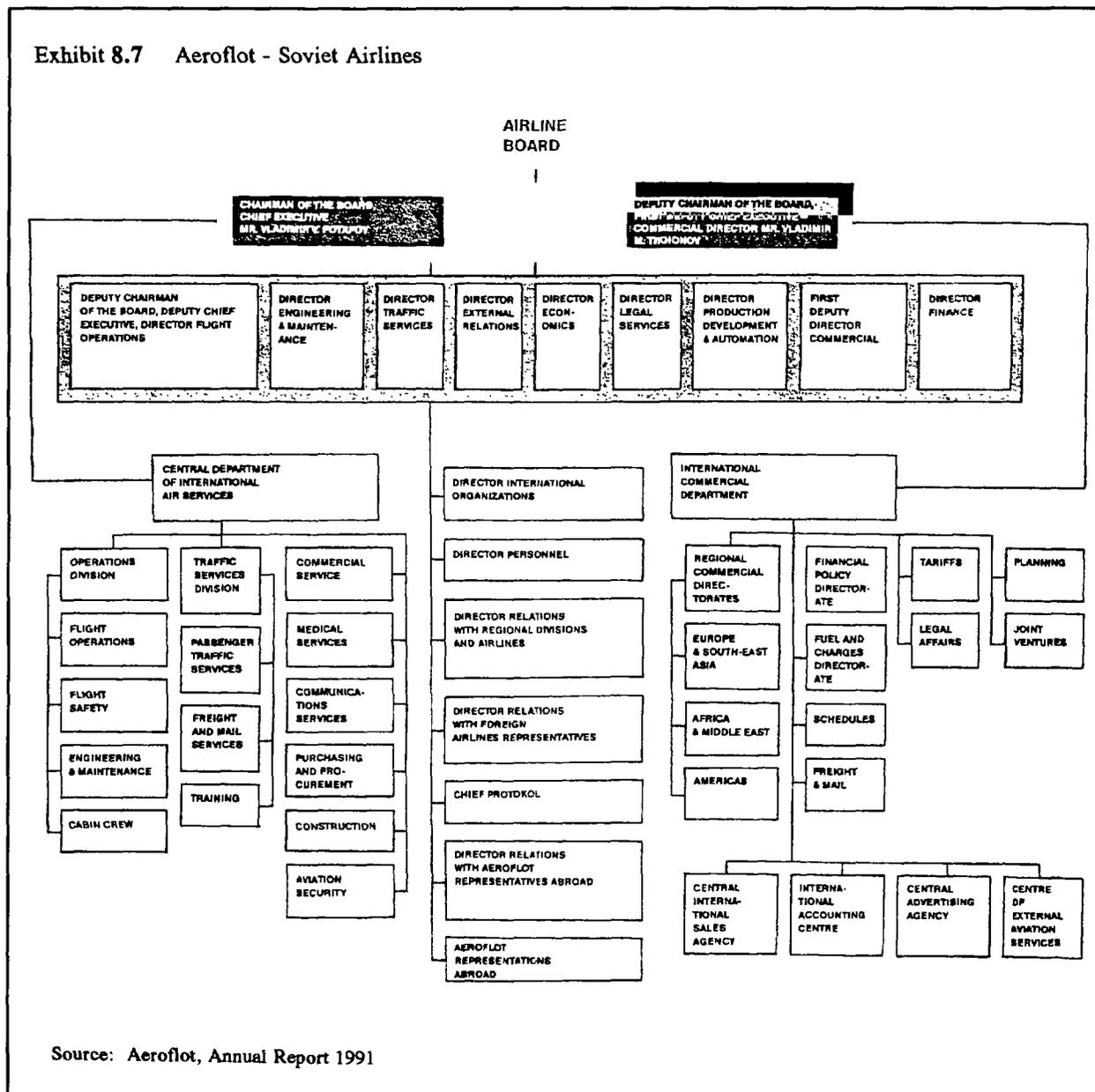
### International Airlines

**Production and Commercial Association.** In July 1991, international airline operations were grouped together under a united enterprise called the Production and Commercial Association (PCA) or Aeroflot-Soviet Airlines (exhibit 8.7). The main objective of PCA was to ensure the preservation and transfer of the former all-Union

Aeroflot rights and obligations under inter-governmental air transport agreements to a newly organized company covering international operations. The PCA performs about 90 percent of Aeroflot's total international operations with a fleet of about 100 aircraft and 17,000 employees. The PCA structure is still a vertically integrated corporation with respect to international operations, however, with the following list of enterprises.

- Sheremetevo-2 International Airport
- Sheremetevo Aircraft Maintenance and Engineering Center
- Flight Operations
- Ground Handling and Other Service
- International Commercial Department
- Russian International Airlines
- Moscow Airline
- Golden Star Airline
- Russian Vityaz Airline
- The Inter-regional Agency of International Sales Services (called "Russia")
- The International Accounting Center

Exhibit 8.7 Aeroflot - Soviet Airlines



- The Central Advertising and Information Agency
- The Center of Automation of Commercial Activities
- The Center of External Aviation Services.

The government has indicated its intention to permit Aeroflot Soviet International to privatize in about three years. To this end Aeroflot Soviet International has already formed a joint stock company and been renamed Aeroflot Russian International Airlines in anticipation of further divorce from other CIS airlines, and because

roughly 72 percent of Aeroflot's international business was generated in Russia. As Aeroflot Soviet International is the only Russian carrier engaged in international air transport, it is not clear how the government intends to ensure that privatization of its operations would not allow its new owners to abuse this monopoly. Although there are 60 foreign carriers serving Russia, these carriers have neither the same access to domestic passengers nor the scheduling frequency of Aeroflot. Moreover, Aeroflot owns the international airport and its cargo handling

services at that airport. It is not clear whether the privatization will be at the airline level or at the PCA level. Aeroflot has requested assistance to develop a strategic plan and restructure Aeroflot Soviet International under IBRD's proposed Privatization Implementation Assistance Project, but to date the government has not formally endorsed the request.

If the government goes forward with privatization, it should be encouraged to split up the PCA holding company, particularly with a view toward separating ownership of the airport from the airline, and permitting the formation of competing cargo handling companies. Instead, the government has agreed to permit Aeroflot International to retain ownership of Sheremetevo so that Aeroflot's earnings can finance improvements being made there. The joint venture to rehabilitate the airport calls for a German company to invest DM800 million worth of improvements, of which DM45 million has been spent.

In addition to the above subsidiaries, according to Aeroflot's 1991 Annual Report, "about 20 joint ventures have been set up in cooperation with foreign partners engaged in various forms of activities to improve the services rendered to Aeroflot services."<sup>7</sup> Unfortunately, several of these joint ventures are also counter-productive to the notion of demonopolization and fostering of competition and new market relations. For example, the new Russian airline, Air Russia, is a subsidiary of Aeroflot Soviet International. As such, it seems unlikely that it will compete head-to-head with Aeroflot Soviet International. As presently structured, it appears to be a means of getting British Airways to contribute western aircraft and capital for airport improvements in exchange for shares in a new airline that will own Domodedovo Airport. Since there are plans to transform Domodedovo airport into an international airport, perhaps British Airways hopes to be able to fly international flights into Domodedovo and provide transfer service to domestic destinations in Russia.

The government should ensure that other carriers have access to Domodedovo on the same

basis as Air Russia. MOT's proposed 1993-1995 budget includes US\$750 million to support Air Russia's equipment requirements (exhibit 8.8). If this airline is to be privatized, it should be able to pay for its own aircraft.

*If Aeroflot's Russian international airline service is privatized as expected, CIS airlines will no longer be able to fly under the Aeroflot symbol. The process of segmenting Aeroflot's international operations is likely to be long and difficult since it may invoke disputes over ownership of foreign-owned facilities as well as landing rights. Current landing right agreements in Ukraine, for example, give foreign carriers the right to land in Ukraine for five years, with payment going to Aeroflot in Moscow.*

### ***Separation of Airports from Airlines***

When Aeroflot owned and operated the airports from which its planes flew, each large airport was organized as a cost center. As the regional Aeroflots have chosen to corporatize and eventually privatize, a major problem is that the airport assets are still co-mingled with the airplane assets under one administration. The Russian air transport system badly needs to separate ownership and operation of its airports from its airlines. The government has stated that it favors such a separation, but is already finding it difficult to accomplish. In some cases, joint ventures to upgrade airports have already been entered into and the government does not want to assume the burden of financing the improvements.

*Airports and the ATC Authority.* Prior to the breakup of the Soviet Union, ATC and management of airspace over the FSU involved both the Ministry of Defense and the Ministry of Civil Aviation; the civil portion was managed by Aeroflot. Since the breakup, the government has separated management of the use of air space from that of airline operations by establishing a new authority to own and operate an ATC system. The new authority, the Commission for Airspace and Air Traffic Management of the government of the Russian Federation (Rosaeronavigatsia) was established February 27, 1992, by Presidential decree.

Exhibit 8.8 Budget Request for Financing Federal (Interstate) Air Transportation

	1993	1994	1995	Subtotal	Total
<i>Volume of appropriations for financing the current year's installment</i>	69,900	83,000	92,000		244,900
Capital investments	25,300	35,000	40,000		100,300
Subsidies for current expenses	44,600	48,000	52,000		144,600
<i>Substantiation of capital investments</i>					
<i>Construction</i>	7,100	12,000	16,000		35,100
Sochi Air Terminal Complex	622			622	
Domodedovo Airport	99			99	
Vnukovo Airport	906	1,700		2,606	
Anadyr Airport	57	650	700	1,407	
Syktyvkar Airport	282	850	730	1,862	
Vorkuta Airport	219	720	1,200	2,139	
Runways, repair facilities, and other air transportation systems	4,915	8,080	13,370	26,365	
<i>Aviation technology</i>	18,200	23,000	24,000		65,200
Airplanes					
IL-96-300	2,000	4,000	5,000	11,000	
TU-204	1,800	3,600	3,600	9,000	
IL-86	4,000	4,000	4,000	12,000	
IL-86	2,500	3,000	3,000	8,500	
TU-154M	1,600	800	800	3,200	
YaK-42					
Helicopters	900	600	600	2,100	
Jet engines	3,100	2,000	2,000	7,100	
Air navigation equipment	2,300	5,000	6,000	13,300	
In addition, convertible currency funds in U.S. dollars for the acquisition of imported aviation technology & spare parts	\$430	\$510	\$510		\$1,450

Source: MOT.

**Aviation Investment**

The government of the Russian Federation is the target of many pressures to invest in the various elements of the aviation system. Four investments in particular are important:

- ATC systems.
- Repowering aircraft with Western-manufactured engines.
- Airports.
- Computer reservation systems.

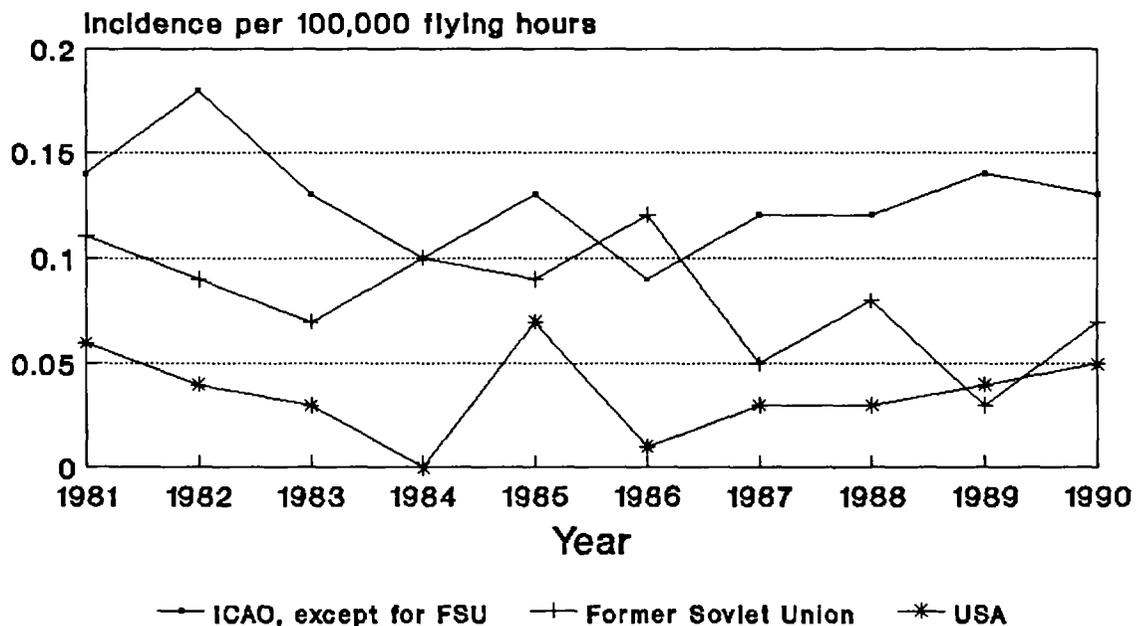
The ATC system operated by Rosaeronavigatsia is reported to be inadequate to handle the density of air traffic in Russia. Russia's ATC system manages 100,000 flights per day, including those of 500 foreign airlines. Air traffic controllers in Moscow alone deal with over 2,500 flights per day.<sup>8</sup> Some critics point to the poor ATC as one of the reasons why Russia's air safety record is not particularly good although many accidents are related to other causes, such as the increasing age of Soviet aircraft or pilot error. In fact, Russia's air safety record had improved substantially until relatively recently (exhibit 8.9).

Officials also say that Russia's ATC system is obsolete in some airports and that not enough airports are covered. According to MOT, the six international airports in Russia – Sheremetevo, Domodedovo, and Vnukovo in Moscow, and the

main airports in St. Petersburg, Ulianovsk, and Mineralnye Vody – are adequately covered in that they are categorized as ICAO II. Of Russia's 130 national and approximately 3,000 local or regional airports, only 18 are categorized as ICAO Category I airports but nearly 500 are equipped with technical systems and means for the support of flights. ATC in the airspace beyond airports is performed by 68 regional and 62 auxiliary regional centers of the Consolidated System of MOT. MOT is concerned that the remaining ATC regions and airports of Russia are equipped with obsolete equipment not responding to the demands of ICAO standards.

Actually, Russia's figures are not dissimilar to the United States, where only 27 airports averaged more than 275 commercial flights per day and thus were in need of the most sophisticated ATC

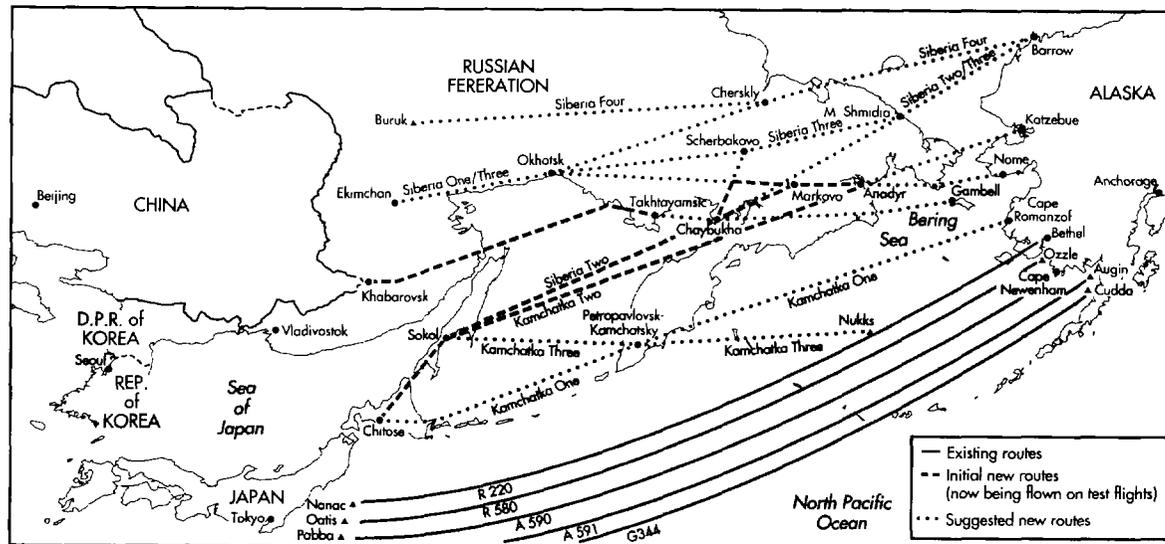
Exhibit 8.9 Accident Rates (Passenger Service)



Source: *Business in the Ex-USSR*,  
February 1992, p.38.

Exhibit 8.10 New Airline Routes over Russia

IBRD 25153



SEPTEMBER 1993

Source: Guy Norris, "North by Northwest," *Flight International* (2-8 December 1992), p. 38

systems. Airport volume is obviously related to the population density of surrounding areas, and it is not necessary to invest in costly ATC equipment in places where there are only a few flights per day. In the United States, 63 airports account for 82 percent of commercial jet operations and 72 percent of commuter operations. Yet overall, the United States has about 3,200 airports eligible for funding from the Federal Aviation Administration (FAA), an indication of some minimal importance, and only 400 of these have FAA towers to provide ATC.<sup>9</sup> Based on this comparison, it is likely that in Russia obsolescence is more of a problem than insufficient airport coverage.

*Government Interest in Upgrading the ATC System.* To enable it to better manage its airspace, the government believes it needs an upgraded ATC system to permit foreign air carriers to fly

great circle routes over Russia and reduce flying times.

There is also demand for air carriers flying from Alaska to Japan to fly over rather than around the Kamchatka peninsula (exhibit 8.10). A trans-Siberian air route would be 1,426 kilometers shorter for a Los Angeles to Bangkok flight and 4,191 km shorter from New York to Seoul according to an article by Gennadiy Bocharov in *Izvestiya*, Jan. 27, 1992. The same article reports that 100 km of orthodromic space is worth US\$56 for a Boeing 747. Overall, according to an article in *Flight International*, December 1992, it is estimated that carriers flying the great-circle routes from the eastern and mid-western USA to Tokyo, Beijing, Seoul and other destinations in southeast Asia would save about US\$20 million per year per carrier in direct operating costs.

Suppliers of western-made ATC systems are making the case that fees charged to airlines flying

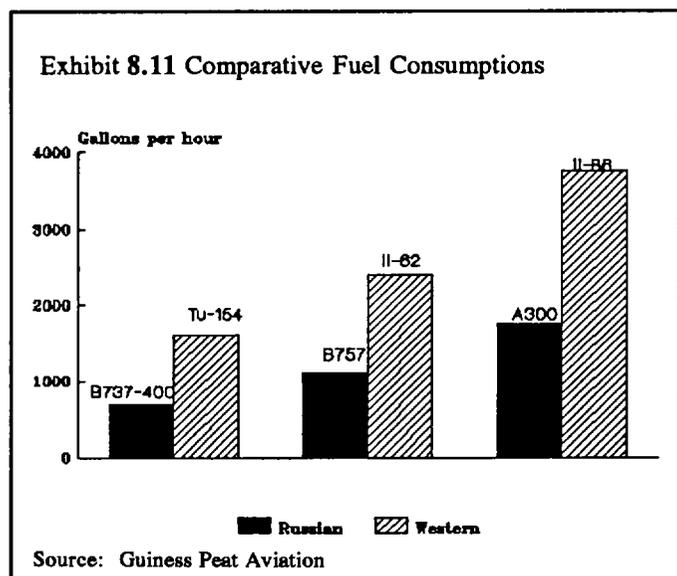
over Russia can finance the costs of installing a modern ATC system. The government is now considering making such an investment. According to Aeroflot, the total cost of the system being considered would be on the order of US\$10 billion, of which US\$500 million would be invested as a first stage, US\$750 million as a second stage and the remainder would be spread over 15 years. MOT's proposed budget for 1993 - 1995, includes US\$354.4 million for the ATC system. Aeronavigatsia projected that there would be about 55,000 foreign flights per year<sup>10</sup> by the year 2000. If each flight saved an average of 1500 km, about three hours per flight fuel savings at world prices would represent about US\$150 million per year. "According to the estimates of the independent Thompson firm, the total income from the use of the air space over the countries of the CIS - under certain circumstances - could exceed 200 million dollars."<sup>11</sup> By comparison, IATA reports that total airport and air navigation charges collected from world airlines in 1991 amounted to US\$6.4 billion. Eurocontrol alone accounted for US\$2.4 billion in revenues.<sup>12</sup>

Before any investments in new ATC systems are made, therefore, it is essential to assess the real need for such systems, given the lack of growth predicted for air transport in Russia and the fact that it would appear that obsolescence rather than capacity expansion is the real problem with Russia's present ATC system. To avoid the purchase of more equipment than is really necessary to manage air traffic over time, the government may wish to consider structuring the ATC investment on a concession basis, in which suppliers would be repaid only to the extent air traffic fees are realized. In this way suppliers of the equipment are forced to ensure that the equipment invested is suited to the market place.

The government guarantee should be limited to ensuring that the collection of fees takes place in a fair and efficient fashion according to published rules and procedures. *Given the tremendous drop in demand and slow recovery of air traffic predicted for Russia, therefore, caution is in order with respect to designing and financing any new ATC system. The system should be tailored to safe operations for realistic capacity requirements. The cost of*

*the system should be recoverable from user fees, and the entire investment should be structured in a way that does not rely on government money to subsidize the investment.*

*Re-engining and Replacing Aircraft.* Russia's aircraft equipment is old, its engines at least 20 percent less fuel efficient than aircraft in industrial countries, and its avionics are technologically obsolete (exhibit 8.11). Western-made equipment can be retrofitted to existing Russian aircraft only at considerable cost. Modernizing and making more technologically efficient equipment within Russia is required, and may become justified in the longer term. Technical assistance or government investment aimed at helping Russian authorities to retrofit aircraft should be carefully analyzed and geared to the marketplace. Ideally such assistance should be offered in the context of a commitment on the part of an aircraft maintenance facility to privatize and to offer retrofitted aircraft in competition with other suppliers to privatized airline enterprises. Russia's new airline enterprises will be more interested in investing in re-engining their fleets once Russia's energy prices are brought to world price levels. At the same time, the drop in demand for air transport will produce a surplus of equipment that may make it worthwhile for airlines to use existing aircraft, even with poor fuel efficiency,



for years. *The goal of any efforts to improve Russia's aircraft should be to provide sustainable airline and aircraft manufacturing industries in the long term. Such technical assistance should be provided in the context of broader restructuring projects.*

Given the drop in demand of air transport, there is currently such a glut of supply of aircraft that, unless air travel is heavily subsidized or until existing aircraft become grounded for lack of spares or old age, subsidized, there will be little demand for new aircraft. Worldwide, there are about 650 aircraft in storage compared to a normal level of about 100 to 150 aircraft.<sup>13</sup> Neither government nor Aeroflot have firm estimates of how much airline service could be provided if all subsidies were ended, since the entire cost structure of the domestic airline service is intertwined with that of operating airports and ATC. How many new or retrofitted aircraft could be supported is dependent upon the cost structure that would prevail in streamlined domestic new carriers or remnants of old Aeroflot divisions with their unnecessary staffing and overhead costs.

These trends notwithstanding, the government is already supporting the repowering of Russian aircraft and the purchase and lease of western aircraft. According to MOT's budget request for 1993-95, MOT has requested Rb7.1 billion to support repowering, Rb50.9 billion to acquire new aircraft, Rb12.5 for upgrading of on-board ATC equipment, and Rb36.9 billion for measures to help develop domestic manufacturers of aviation equipment (exhibit 8.8). The budget request also includes US\$1.2 billion toward repowering 1,500 commercial jets, virtually all of Aeroflot's commercial jet fleet by the year 2007. Reportedly 95 planes are already repowered and are supposed to save US\$30 million in fuel costs annually. If re-engining one plane costs US\$10-12 million, the budgeted amount could only finance the first 95 planes. To repower all 1,500 jets would require US\$18 billion. Few of these requests, Rb22 billion for financing the ATC system and Rb37.9 billion to purchase new equipment, have been approved by MOF for inclusion in the federal budget. Consideration is being given to provide directed state credits for other items in the agenda.

Such expenditure is unwarranted, given the age of the aircraft and the current worldwide glut of

aircraft. Moreover, estimated annual fuel savings do not warrant the expenditure. If US\$1.2 billion represents the price of retro-fitting only 95 to 100 planes with annual savings in fuel costs of US\$30 million, the implied payback period is 40 years, which hardly seems worthwhile. Aeroflot's 1991 Annual Report, however, claims that the economic savings in fuel costs from re-engining the international fleet (95 to 100 planes) would be more on the order of US\$75 million. – 30 percent savings of 1.34 million tons of fuel annually at world prices of US\$188 per ton. If so, the payback period would be 16 years. These figures imply a need to proceed cautiously with any re-engining program and to design any such program with as little foreign currency costs as possible.

It is not clear whether the government or the airline owners will be expected to finance the hard currency investment associated with the re-engining. Some re-engined planes may be leased or sold to other countries for freely convertible currency. If so, and if the aircraft are to be used in the international markets, Aeroflot will be able to earn hard currency and could theoretically pay for the investment with revenues and from savings in fuel otherwise purchased in hard currency. The government should not have to subsidize such a program for Aeroflot International. But since Aeroflot International has only about 100 aircraft, it is likely that this program is designed to extend to Aeroflot's entire fleet. The capacity of domestic Aeroflot enterprises to finance these hard currency expenditures is questionable. *If such support is granted from the federal budget, arrangements should be made to lend the funding to new companies, through subsidiary loan agreements or otherwise, to remove any the government subsidy. In this way, airline companies will be forced to make investment decisions that can be supported by the marketplace.*

*Airport Investments.* Russia has six international airports categorized as ICAO Category II airports, 130 national and approximately 3,000 local or regional airports. Some airport facilities are inadequate and in poor condition, in some cases with railway tank cars serving as fuel storage facilities because of limited on-site storage. With more foreign carriers coming into Russia, there is great interest in improving and modernizing

### Privatizing Air Traffic Control

Australia, Germany, Switzerland, and New Zealand, have restructured their civil aviation Air Traffic Control (ATC) functions along commercial lines, although still owned by the state, these entities function as for-profit companies, paying their operational costs and planning investments out of their own revenue. In Germany, revenue sources are ATC takeoff and landing fees; in Australia, revenues come from airway and terminal use fees and aviation gas proceeds from sales to private pilots. Since privatization, reductions in airspace system/enroute charges (which both collect) partially offset increases in ground service and terminal fees in both cases. More efficient and streamlined operations combined with, at least in Australia, a tripling in the rate of capital investment since 1988, has led to a reduction in delays and in enroute charges. Although ATC workers made redundant by reductions in the workforce were on the receiving end of some A\$57 million in severance pay in 1992, Australia's CAA paid A\$16 million in taxes and a A\$1.5 million dividend to the federal government, its sole shareholder. In Germany, which has to contend with a fragmented airspace complicated by large chunks reserved exclusively for military use (both NATO and, until sometime in 1994, Russian) integration of civil and military ATC is to be accomplished in full by 1996.

There are lessons to be had in these experiences for Russia, the most important ones being that not all state-owned enterprises have to be funded from the federal budget, and that civilian and military functions are, in this instance, compatible. The fact that the privatized ATC authorities in Germany and Australia are making their investments without the benefit of support from State Centralized Capital Investment funds should encourage the government to consider converting the Commission for Airspace and Air Traffic Management of the Government of the Russian Federation (Rosaeronavigatsia) into such an entity. Potential suppliers (GATSS consortium and others) point to the potential of ATC revenues for funding investments in ATC equipment which they propose to sell. There is no need, however, for the government to make hasty decisions (perhaps leading to inappropriate, unnecessary, or excessive investments) without first creating an independent for-profit ATC authority capable of assessing the real requirements for Russia's present and future ATC needs. There is a need, on the other hand, to ensure that the equipment invested in is suited to the market place Government guarantee should be limited to ensuring that the collection of fees takes place in a fair and efficient fashion according to published rules and procedures. Technical assistance aimed at improving Russian ATC, if properly focused and managed, could lead to the rapid creation of an effective, efficient, and financially-sound ATC authority to manage Russia's airspace.

Sources: Leonard Hill, "It's a Private Matter," *Air Transport World* (February 1993), pp 88-92 Paul Proctor, "Australia Reaps Benefits of CAA Restructuring," *Aviation Week & Space Technology* (January 18, 1993), p 41.

airport facilities. At the same, time a number of the regional Aeroflot enterprises or associations that have formed joint ventures and wish to privatize are pressing the government to improve their airports. Municipal governments and cities are also pressing to upgrade their airports with a view toward attracting tourists and new businesses. Airports are seeking donors to prepare master plans for future development, and a number of these have been financed. Many plans being suggested are probably premature, and it is questionable whether any consultant could forecast the likely number of flights or airlines at a given terminal before the government has made a

decision about the structure of the industry.

Given the continued decline in air traffic, it is advisable that the government proceed slowly with any decision to provide funds for any airport and first ensure the separation of ownership between airline and airport. Airports must be financially autonomous and self-sufficient, and must allocate access on a non-preferential, freely competitive basis as determined by market demand. If there truly is a demand, airport improvements should be financed from a combination of concessions, providing land terminal space to airport users, and landing fees or ticket surcharges. Moreover, any financing or concessionary deals should be made

in a way that provides access to a number of competing airlines. All airports should provide services on equitable terms to all airlines having rights to land in them. Unfortunately, the government is apparently already considering financing a number of airports according to MOT's budget request for air transport. Of the Rb7.1 billion budgeted for airport construction by MOT, however, only one, is an air terminal complex at Sochi, has been included in MOF's approved federal investment budget. Sochi is a resort on the Black Sea built recently that has no roads leading to it, and which the government wants to complete so the resort can be used. The cost included in the federal budget is Rb2.9 billion.

Where airport construction, modernization or runway rehabilitation is justified the airport should be financed by the private sector, with fees from passengers, landing fees and freight forwarders, and construction done under contract after competitive bidding. There is some indication one or two new cargo airports could be viable somewhere in the middle of Russia, such as Novosibirsk.

In the past, construction of airport facilities and air navigation/ATC structures was performed by a number of government-operated construction enterprises (GlavStroi, PromStroi, and TransStroi, among others) each of which had particular specialties that prevented competition among them. Airport design and economic studies were often undertaken by the GosAeroProekt enterprise. These enterprises should be privatized if possible, and made to compete for business. Given the likely decline in the number of new airports needed, it is not clear that all these firms will survive.

*Air Carrier Reservation Systems.* MOT is planning to upgrade existing reservations systems through the introduction of modern technology, possibly in cooperation with international lending institutions. The proposed system, being developed by a consortium and based on the existing Sirena-II reservation system, is to be compatible with U.S. and European full-service systems, allowing for flight bookings, hotel reservations, and interline payments. An agreement has been concluded with the parent

corporation of American Airlines, owner of the Sabre reservations system, to develop this system. Questions concerning the funding of development, ownership, and access rights have yet to be addressed adequately. An estimated cost of US\$150 million (Rb1.5 billion) has been derived, but sources of funds have not been identified, and the ability to repay foreign currency debt hinges on the ultimate convertibility of the Russian ruble since revenues from the proposed system are likely to be collected in rubles. In any event, this is not an area where further public sector involvement is essential.

A travel industry is beginning to develop in Russia, and any carrier reservations system should be developed with the needs of this service industry in mind. Air transport companies owning such systems frequently provide favorably-priced long-term leasing arrangements for the necessary equipment and software, and some provide low or no-cost training.<sup>14</sup> Therefore, it appears that some opportunity for establishing a joint venture exists. Deregulation of the Russian air transport and travel industries would allow interested private investors to pool resources and ensure that their particular demands are satisfied in the financing and development of a new reservations system. Care must be taken to see that the system developed fosters rather than inhibits both domestic and international competition.

#### *Near-term Recommendations*

*Continue Efforts to reduce the airline sector's negative fiscal impact.* Maintaining existing measures to limit airline operating losses is essential. The government is well aware of increasing losses from air transport and is trying put a cap on the growing subsidies by (a) ceasing all direct airline subsidies as of January 1, 1992, (b) granting airlines freedom to raise tariffs up to a ceiling on profits of 20 percent, (c) gradually raising fuel prices to world levels, and (d) first cutting fuel subsidies to 50 percent and subsequently eliminating them. Such measures aim at pushing airline companies to become self-sufficient, by forcing them to shape their operations to those that can be supported in the marketplace. To do so, airlines have had to drastically reduce the number of flights offered, as

higher prices have reduced demand. The government should be congratulated for taking these steps and should be prepared to resist pressures from newly established airline companies and their constituencies to reverse these policies. These pressures are likely to be intense as, on average, revenues are currently covering only 70 percent of costs.

Further rationalization and retrenchment of airlines and associated enterprises is undoubtedly necessary. To assist the airlines in shaping their organizational and cost structures to levels supportable by revenues, the government may have to undertake to provide assistance to redundant labor and subsidize related social services for a limited transitional period.

*Ensure that the government fully compensates airlines for provision of services to the state for governmental business or social purposes.* One of the most pernicious sources of poor financial performance is requiring airlines to grant free or subsidized travel to government officials. Such privileges are usually abused by overuse, occupying seats that could otherwise be generating badly-needed revenues. This practice also promotes an attitude of financial irresponsibility that affects the performance of the entire airline.

*Encourage airlines to restrict extensions of credit for airline service to state enterprises.* A practice contributing to the erosion of fiscal discipline and artificially inducing a higher demand for transport in the process is the routine extension of credit to customers and other enterprises who do not and will not have the means to pay. Airlines need to require customers to pay for services up front and offer only services supported by such payment until sound credit status is reestablished.

*Take steps to upgrade the clearinghouse for inter-airline settlements, so that it can offer prompt and accurate payments in accordance with clear and agreed accounting practices and standards and ensure that the clearinghouse agency is independently owned and operated.* An interline settlements agency is essential to an integrated, competitive airline industry. To be effective, all participating carriers must have

confidence that its services are carried out accurately, fairly, and promptly.

*The government should reassess and terminate wherever possible programs that finance investments, including building new airports, acquisition or re-engining aircraft or introducing an air reservation system for privatized airline companies.* To the extent such investments have already been made, the government should organize formal transfer of the responsibility for repayment of existing debts incurred on their behalf to the benefitting enterprise. Investment decisions for essentially commercial systems should be made by private companies.

*Develop within MOT the capability to analyze the financial and operational performance of Russia's domestic and international airlines and of the ATC system so that it can develop appropriate policies for the structure and operation of a private, competitive, financially self-sustaining aviation system.* Understanding the performance of the airline industry and the ATC system are critically important capabilities for MOT to develop. If the government is to build a policy framework in which a competitive private airline industry can thrive, it must understand how the industry is performing and modify policies as required. It has been reported that over 100 small local airlines are operating at a loss. In due course, there may be pressure to consolidate some of these firms, and MOT needs to be able to assess the extent to which such mergers should be facilitated. Given the government's financial strictures, providing high quality policy and financial analysis of airlines and the ATC system is essential.

The government should also prepare a strategy for de-monopolizing and privatizing Aeroflot, to ensure the separation of airlines from airports and to introduce competition within Russia's domestic airline markets. The strategy should include the following elements:

*In the context of privatizing airports, ensure that each airport offers its services on an equal basis to all carriers.* There cannot be competitive airline service without equal access to airport facilities by all carriers. An airline-owned airport system is

inconsistent with that goal. Generally speaking, airports should be owned and operated by local authorities in a fashion that will ensure competitive airline service to the community and efficient operations of the airport and its concessions. The ideal process through which to achieve these goals is one of competitive bidding by contractors competent in airport operations and management.

*Ensure that newly privatized airline operations are permitted to compete with each other in the same markets and, as time goes by, to merge and rationalize themselves as market forces dictate.* A major challenge facing the development of a competitive domestic airline industry in Russia is the transformation of a set of regional airlines that are essentially administrative entities into functioning, competitive airline enterprises. Two problems are involved. The first is to create a corporate – rather than an administrative – atmosphere within the entities. The second is to change their service patterns so that they begin to compete with one another in appropriate markets, thereby producing the efficiency-producing benefits of competition. At the same time, the declines in traffic and financial pressures will inevitably lead to proposals for merger between smaller regional carriers; any such proposals should be examined carefully by the government before approval, to ensure that competition will be enhanced, not reduced.

*In privatizing or corporatizing Aeroflot enterprises involved in international aviation, dissolve the Production and Commercial Association and privatize its individual entities in a way that breaks the ownership linkages of airline and airport and enhances competition.* The PCA was formed to combine under a united enterprise a number of organizations connected with international airline operations. If privatization were to take place at the association level, the vertical integration and monopolistic nature of the enterprises would be left in place. This would be harmful to the development of efficient airline service. For example:

- A cargo handling company should not be a single operator owned by Aeroflot International Airlines.

- Cargo handling should be undertaken by several companies that compete within each airport, and airlines should be free to contract with any of them.

- Ownership of Sheremetevo-2 International Airport should be separated from Russia International Airlines.

- The Central Advertising and Information Agency could be put on a private basis, and all airlines should be free to choose whether or not to use its services.

*Prepare a strategy for how to divide Aeroflot's international operations and international assets among CIS countries that wish to have their own international airline.* The process of segmenting Aeroflot's international operations among CIS countries will require settling disputes over ownership of foreign-owned facilities as well as landing rights. These issues are complex and will require careful analysis and patient, good-faith negotiation. As an illustration of the complexities, the current landing rights agreements in Ukraine give foreign carriers the right to land in Ukraine for five years, but the landing fees are paid to Aeroflot in Moscow.

*Restructure and federalize activities of MAK that are appropriate governmental functions.* MAK, the CIS Interstate Aviation Committee, performs many functions, such as bilateral negotiations on landing rights, aircraft certification, promulgation of civil aviation standards, accident investigations and other safety matters, licensing of airports, and certification of air traffic controllers, that are properly the functions of individual governments. While it is not unreasonable to have such a committee perform functions such as planning for airspace management near republican boundaries or coordination of overflights, such a body should not exercise authority that is the appropriate sphere of MOTs of the individual republics. As Russia develops its MOT organization for aviation, it must integrate these functions into its new statutes and regulations and assign them to appropriate agencies.

*Privatize airport construction companies and ensure that airport construction is contracted through competitive bidding.* The old structure of

the airport construction industry was fragmented and anti-competitive, with each of the three major enterprises focusing on a different specialty. For major repair and rehabilitation of airport facilities to be efficient, Russia needs a competitive airport construction industry. To assist in structuring new capabilities, Russian firms could participate in joint ventures with Western firms.

*Assess safety performance of the airline and aviation system, and develop a short-term action program to alleviate critical deficiencies.* Because of the resource constraints of Russia's current economic situation and their potential impact on sound safety practices, the government should immediately direct resources to an assessment of critical safety issues in the airlines and aviation system.

#### **Medium-term Recommendations**

*Continue the restructuring of the airline sector.* In the medium-term, airline sector restructuring should continue to develop through various steps that include: (a) maintaining the government's policies designed to limit airline operating losses, (b) continuing the rationalization within a competitive structure of Russia's domestic regional airline system, and (c) continuing to develop policies and practices to integrate the Russian aviation system more effectively into the international aviation system.

*Complete the separation of the ATC system from Aeroflot, and structure an appropriate system of charges to finance the upgrading of its operation and improvement.* In the medium-term period, the government should complete the institutional and financial separation of Aeroflot and its successor airlines from the ATC system. This is necessary both to complete the restructuring of the airline industry in the private sector and to establish appropriate institutional and financial mechanisms for the design, operation, maintenance, and upgrading of the ATC system. The operation and maintenance of the system should be financed by the users on an equitable basis.

*Establish capability within MOT to promulgate operational and maintenance standards for the*

*airline and aviation system.* As part of the exercise of its responsibility for safety, MOT must fashion an organization that can create or adopt and enforce appropriate standards for aircraft and aviation system design, performance, and maintenance.

*Establish an independent agency to investigate air accidents and incidents and to recommend to government appropriate remedial actions.* Following up on the emergency assessment of safety issues in the short-term, the government needs to develop an independent capability to investigate air accidents to ensure that it can identify the causes of accidents and incidents and recommend remedial measures without the bias of having the agency that operates the aviation safety program try to assess and criticize its own performance.

*Establish policies for devolving responsibility for planning, construction, and financing airports to local authorities in a manner that assures that any federal financing of airports is based on user charges and made available on the basis of equitable apportionment principles.* For reasons of efficiency and prudence, in the course of establishing policies for the development of the airport system, the government might set up some national-level user-charge-based mechanism to aid in financing improvements to the airport and airways system.

Even if this is done, however, it is important that the ultimate authority for planning, constructing, and financing airports devolves to local authorities. In this context, there must be clearly stated, fair principles for allocating any national-level funds to aid in the airport-construction process.

*Introduce competitive bidding for the provision of airline service to low density northern zones.* The government must provide for essential airline service to the remote northern zones for which there is no other type of access. To provide this service most efficiently, MOT should offer service packages to competing air carriers to bid, so that subsidy levels for providing such service are kept as low as possible.

## Notes

1. Aerodevco, *EBRD Aviation Sector Survey*, p 12; Aeroflot, *Annual Report 1991*.
2. The January 1993 price for one metric ton of aviation fuel was Rb30,000 (Valeriy Geyshevik, "There Are 103 Independent Airlines Under Aeroflot's Flag," *Vek* (15-22 January 1993), p 8, translated under "Independent Air Companies Highlighted," *Central Eurasia* (FBIS-USR-93-016), p 61), while the spot cash market average price of jet fuel in Europe as of mid-January 1993 was US\$188 per ton. At an exchange rate of Rb650 per US\$1, Russian airlines were paying only 25 percent of world prices for fuel.
3. Translation of an interview with A.A. Larin, Russian first deputy Minister of Transport and Director of the Department of Air Transport, in *Grazhdanskaya Aviatsiya*, No. 6, June 92 pp 2-4. (FBIS-USR-92-127 3 October 1992).
4. MOT *Concept of the Development of the Transport Complex in Conditions of the Transition to Market Relations*, Moscow 1992, p 12.
5. Viktor Belikov, "Competition and Free Prices Come to Air Transport," *Izvestiya* (Morning Edition, 19 December 1992), p 3, translated under "Air Fare Hikes Expected," *Central Eurasia* (FBIS-USR-92-167), 31 December 1992, p 49. Also data provided to World Bank mission in June 1993.
6. Russia Aviation Survey, Final Draft Report, p 56, Prepared by Aerodevco Consultants, Ltd., August 1992.
7. These include: Aeromar, (on-board catering); Aerofirst (duty free shop); Aeroservice (airport services); Sherotel a venture with Sheraton to build and operate the Hotel 'Novotel' at Moscow Sheremetevo-2; a Russian-Canadian joint-venture to open the Aerostar Hotel; a Russian-German joint venture Aeroport Moscow to construct a new international air terminal on the basis of Sheremetevo-1 Airport; and a joint venture with British Airways to set up a new airline, Air Russia, at Moscow's Domodedovo Airport.
8. *Business in the USSR*, February 1992.
9. *Deregulation* (Winds of Change - p 203).
10. As reported in the EBRD-financed study, *Russian Aviation Survey, Draft Final Report, Appendices*, Volume 1 of 2, p 25, prepared by Aerodevco Consultants, Ltd., August 31, 1992.
11. *Izvestiya*, Jan 27, 1992, Morning Edition, p 3 by Gennadiy Bocharov.
12. Anthony Vandyk, "IATA Warns of Higher Charges for Airlines," *Flight International* (3-9 March 1993).
13. Stanley W. Kandebo, "Stable Engine Sales Seen in Late 1994," *Aviation Week and Space Technology* (15 March 1993), p 77.
14. Transportation Research Board. *Winds of Change* (Washington DC: National Research Council, 1991), p 286.



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## *Transport Equipment Manufacturing*

When the USSR dissolved, it disrupted the industries that manufacture transport equipment for the Russian transport system. Those industries had been developed with component manufacturing facilities in CMEA countries of Eastern Europe and various FSU republics. The impact was particularly heavy on Russia's railway, trucking, and bus industries, which suffered the loss of major manufacturing facilities and long-term commercial arrangements.

While diverse in many respects, the equipment manufacturing industries for the various modes share a common set of problems since the dissolution of the USSR.

- Economic dislocation, which has disrupted formerly integrated markets through lowered demand, political strife, divergent economic interests, and new international boundaries.

- Poor design of many critical equipment components, especially motors, and inadequate systems for quality control in manufacturing and assembly.

- Economic collapse, which has raised prices of new equipment, erased the profits of the old system's enterprises, and lowered currency values so that few are able to afford new equipment.

The immediate problems facing Russia's transport companies call less for new equipment than they do for effective measures to repair, rehabilitate, upgrade, and use more intensively the equipment now on hand.

In those cases where current equipment needs are large and urgent, and where demand is certain either to be stable or to increase – such as for

buses for urban public transport – emergency measures must be taken now to keep the existing fleet running, by replacing critical components, rebuilding, and remanufacturing. In areas such as railways, trucking, and aviation, where demand has fallen substantially and current stocks of operating equipment are utilized at a low level, there is more time to restructure, redirect, and upgrade the processes and technologies of the equipment manufacturers through licensing and joint ventures with western firms. These measures will take years to implement, if done properly, and can only be implemented effectively if the proper framework of financial and intellectual property laws is first put in place. In the meantime, dramatic changes should be fostered to create a vital and competitive intermediate level industry, between enterprise-level maintenance and the manufacturers, to provide sophisticated services ranging from heavy maintenance to remanufacturing and rebuilding transport equipment components and vehicles.

The consequences of the dissolution of the USSR and of the CMEA economic structure have been felt severely in the area of machine-building and manufacture of equipment for the Russian transport sector. Trade relations between CMEA member states were based essentially on a politically-driven barter system as spelled out within the framework of the Five Year Planning process. Under this process, certain countries or USSR republics were charged with manufacture of certain items not having an implicit military application, for example diesel multiple units

(DMU) and electric multiple units (EMU), which they had traditionally produced, had existing capability to produce, or were designated to produce for political reasons, for the entire socialist marketplace. Russia's wealth of natural resources, including primary energy resources, were used to bind Eastern Europe and the other republics of the USSR firmly to Russia, creating in many productive sectors a quasi-mercantilist system with Russia as the primary supplier of raw materials. The countries of Eastern Europe and the southern and western parts of the USSR were the primary manufacturers and suppliers of many light industrial and non-military finished products. As a consequence, Russia today finds herself scrambling to diversify the capabilities of her manufacturing base to serve the needs of all modes of Russian transport. The impact of the transition to a market economy has affected the several transport modes differently, and actions taken to ameliorate the impact have varied across modes.

### *The Transport Equipment Manufacturing Base*

*Railways.* Although the Soviet MPS was a vertically integrated organization, its railways performed only a small portion of their own manufacturing. Nevertheless, most major workshops and many large depots have extensive manufacturing capabilities, including foundries, blacksmith shops, motor rewinding facilities, sheetmetal and sheetsteel fabrication, machining centers, carpentry shops and similar facilities. The track administration manufactures some of its own equipment, sleepers, building and bridge materials. Of the 19 plants in the three Slavic republics that produce signalling and communications equipment for the railways, Russia is home to 11. Of the two plants that manufacture electric traction supply materials such as overhead catenary, one is located in Moscow. In addition, 15 sleeper impregnation plants, 40 producers of crushed stone for ballast, and 23 rail welding enterprises are situated in Russia, as are the eight mechanical repair plants of the Remputmash Association, which maintains track maintenance equipment.

The bulk of major manufacturing has been performed by other ministries. In terms of

railroad supply, the most important ministry was the Ministry of Heavy Machine Building, responsible for producing diesel locomotives, engines, some track machines, wagons, and other major components. Other ministries were the Ministry of Communications Equipment, now part of the defense ministry; the Ministry of Metallurgy for rails and other steel structures; the Ministry of Forestry and Paper for wooden sleeper manufacture, but not sleeper treating, since treatment plants are operated by the railroads; and the Ministry of Electrotechnical Instruments and Computers for electric locomotives, computers, and some instruments.

In addition, the railroads purchased equipment and various other railroad materials from other CMEA countries: East Germany produced compartmented sleeper cars, thyristors and other components; Czechoslovakia produced passenger electric locomotives; Hungary produced DMU equipment; Finland produced some wagons; Latvia produced suburban EMU passenger equipment; and Romania supplied grain freight cars (exhibit 9.1).

*Supply Disruptions.* The CMEA model served as the pattern for developing a railway support industry in the USSR. Plants located in the various republics operated on the basis of cooperation and specialization, with plants manufacturing their components according to plan and shipping their output elsewhere, either for component assembly or installation. In December 1987, this network was formalized within the framework of the Union Railway Automation Scientific Production Association (NPO). Until the dissolution of the Union, anywhere from 60 to 90 percent of the equipment manufactured by the NPO's subsidiaries was produced and distributed through this network.

Along with the USSR, this supply network dissolved. MPS has approved a program that restores this sort of operation within Russia and also arranges for the development of a domestic production capability, within the subsidiary enterprises of the NPO remaining in Russia, of basic product elements such as rail fasteners, produced almost exclusively at the Druzhkovskiy Plant in Ukraine, now manufactured in Belarus and Ukraine.

The dissolution of the USSR has disrupted much of the previous manufacturing and sourcing of component parts. Supply outside a republic is tenuous at best and often depends upon barter. Supply outside the CIS is nearly impossible because of the lack of foreign exchange. In addition, Soviet planners believed strongly in economies of scale. The few engine manufacturing facilities, for example, were big. Now many of those big plants making critical components are in republics outside of Russia and require hard currency or much higher prices than was customary in the past from other republics.

This is especially true in regard to the production of EMUs used for suburban passenger service in many major metropolitan centers of the FSU. The sole producer of these units is in Riga, and the price of a ten-car consist has increased from Rb1.3 million in January 1991 to Rb53 million as of June 1992. This situation has prompted Russia to search for a domestic manufacturer of this equipment. The Demikhovskiy Machine Building Plant, situated in the Moscow Oblast east of the city, has been identified as the first plant to diversify its production into this field, and Rb42 million has been invested in preparing the plant for this new role. The first five non-motorized wagons were to be produced by December 25, 1992; manufacture of motorized units is to begin later.

Except for EMU manufacture, final production of many items has stopped because critical components cannot be procured, despite the nearly vertical integration found in many manufacturing facilities. For example, the electric locomotive manufacturing facility in Novochoerkassk (near Rostov-on-Don, Russia) manufactures most, but not all of the components, involved in electric locomotives of the 10,000 kw VL80, and the 12 axle 10,000 kw VL85 type. It purchases steel, wire, thyristors, wheel tyres, locomotive radios, light bulbs, paint and plastic resin. From this, it makes nearly everything else required to make an electric locomotive – from traction and blower motor cores and armatures, to seats, circuit breakers, wheel castings, bogies, and suspension systems. Locomotive manufacture at this facility in the Russian republic has been significantly reduced, however, because the main transformer assembly and the air compressors used in the

locomotive are produced in Ukraine. Further complications in production have arisen as a result of the disruption in commercial contacts between the Novochoerkassk plant and a similar plant in Tblisi, Georgia. Combined production of these two plants was expected to be 500 units in 1991; deliveries amounted to 255. As a consequence, the diesel locomotive manufacturing plants in Lugansk, Ukraine, and Kolomna, Russia, are diversifying their production bases to include an electric locomotive manufacturing capability. In addition to Kolomna, Russian diesel locomotive manufacturers include the plants in Briansk and in Liudinovo.

Additional disruptions are arising from the political uncertainty in the government. Many manufacturing facilities are now nearly independent entities; not private, but not receiving state backing or much direction. The Railcar Repair Plant in Voronezh, for example, was the traditional supplier of rubber components used in the repair of EMUs and other railcars. This production facility was transferred to a cooperative, which identified a more lucrative

Exhibit 9.1 Railway Asset Manufacturing Sources in FSU Countries

Product	Source
Communications	East Germany
25kV transformers	Ukraine
Thyristors	East Germany
Tank wagons	Russia
Flat wagons	Russia
Containers	Russia
Grain cars	Romania
Gondolas, hoppers	Ukraine
Electric locomotives	Russia, Georgia, Czechoslovakia
Diesel locomotives	Russia, Ukraine
Locomotive engines	Russia
EMUs/suburban carriages	Latvia
DMUs	Hungary
Track equipment	East Germany
Passenger carriages	East Germany, Russia, Yugoslavia

Source: EBRD *Rail Sector Survey* and IBRD research.

market in the production of various gaskets, sealing rings, and other items for the Zhiguli, Moskvich, and Volga automobiles, and shifted its manufacturing base accordingly.

Further diversification of production is taking place in response to changing market conditions. The Tver Railcar Building Plant is contemplating the production of DMUs in conjunction with the Liudinovo Diesel Locomotive Building Plant, for domestic use and for export, and of compartment passenger sleeper cars previously supplied exclusively by German and Yugoslav manufacturers. In other cases, manufacturers are concentrating on manufacturing for export or on consumer products. For example, the electric locomotive manufacturing facility at Novocherkassk now produces desk lamps, small electric heaters, and washing machines, and electric irons, which it had produced for some time prior to dissolution of the FSU. Last year, much of its production went to Finland and China. At the same time, work continues on the new VL-65 electric locomotive, serial production of which is scheduled to commence in 1993.

As existing manufacturing plants are privatized, there will be greater opportunity to enter into joint ventures with western and former military suppliers that have capacity or advanced technology. In fact, through the Conversion and Transport program, the Ministry of Heavy Machine Building plant in Bryansk, which produces diesel locomotives, is scheduled to begin the manufacture of grain hoppers previously obtained from Romania.<sup>1</sup> Further diversification is already underway, as the "Progress plant in Samara, which manufactures the Energiya booster rocket used with the Soviet space shuttle program, is adding a passenger coach and motorized EMU wagon manufacturing capability to its production base.<sup>2</sup> In addition, the Ural Railcar Plant, Uralvagonzavod in Nizhniy Tagil near Ekaterinburg, which manufactures the T-72 tank, is slated to begin production of 1,000 tank cars annually.<sup>3</sup>

In many cases, manufacturers are making barter or loan arrangements with former suppliers to fill existing orders. One manufacturing facility had supplied equipment worth over Rb125 million to the railroads while borrowing materials worth over Rb100 million from various suppliers. The

railroad has not yet paid, nor has the manufacturer paid his suppliers. This is becoming very common because many facilities have significant cash flow problems. A further consequence of this insolvency is that materials being produced for the railways are not being delivered for lack of ability to pay. Thus, by June 1992, more than 20,000 tons of rail had accumulated at the Nizhniy Tagil Metal Combine, which refused to allow the rails to be loaded until payment was received.

Because of these supply problems, the railways are performing more rebuilding than normal. In fact, it is likely that the greatest single source for the development of an effective long-term locomotive remanufacturing capability for Russia will be underutilized railroad shops. The development of this capability should be fostered by Government. In the meantime, however, many functions are delayed or stopped for lack of appropriate materials. In addition, many railroad facilities are attempting to develop a capability to manufacture critical components. While this may be a feasible short-term solution, it is unlikely to be very economical in the long term, especially since the level of technology of the final manufactured items should be changed for a variety of reasons.

*Road Transport.* The Soviet truck manufacturing industry was designed to meet the requirements of the military and the large companies in the centrally planned economy. The mix of trucks in Russia today reflects this task: more than 70 percent of the production capacity is for medium-sized, unspecialized units with 4 to 10 ton capacity, manufactured in standard designs for a wide variety of assignments. In contrast, small trucks of less than 2 tons payload account for 88 percent of the vehicle fleet in the United States and 67 percent in Germany. MOT, Agroprom and Supreme Economic Council authorities interviewed all confirmed there is no production in Russia of this important segment to serve local distribution requirements. Also in short supply are heavy trucks and manufacturing capacity for them. Fleet and production capacity for heavy trucks are expected to fall short of demand in the medium to long-term. Real needs for small and large trucks are unmet and are expected to remain unmet for

some time. The demand in the marketplace for large and small trucks should drive the truck manufacturing industry in Russia toward the production of such models.

The truck fleet manufactured by the Russian manufacturing industry today accounts for 86 percent of the truck production of the FSU and reflects the perceptions of the centrally planned economy and the Five Year Plan cycles. Information is not readily available for past years because trucking industry production used to be classified on military grounds.

Russian truck production is concentrated in five large factories: ZIL in Moscow, GAZ in Nizhniy Novgorod, AvtoUAZ in Miass, Ulianovsk, and KamAZ in Naberezhnie Chelny. Although the theoretical production capacity of the Russian truck manufacturing industry is 719,100 units a year, the Ministry of Industry's (MINPROM) Department of Automobile Industry reports actual output of 585,400 and 529,800 units in 1990 and 1991, respectively, and a projected output of 522,900 in 1992 (exhibit 9.2). The truck manufacturing capacity of Russian industry is also

Exhibit 9.2 Russian Truck Production Capacity

Company/Truck Type	Prod. Since	Capacity	Production (000)			Actual Jan.-Sept. 1992
			Actual 1990	Actual 1991	Proj 1992	
<i>ZIL, Moscow</i>		200.7	184.2	158.1	150.0	112.5
ZIL 4331, 5 ton 4x2 gen purpose, diesel ZIL	1975	5.0	4.0	4.4		
ZIL 133 5 ton 4x2 gen purpose long platform, diesel KAMAZ	1975	10.0	3.9	3.3		
ZIL 157 6x6 off road, gen purpose <sup>1</sup>	1958	15.0	10.3	0.8		
ZIL 131 6x6, 4 ton military <sup>2</sup>	1968	50.0	49.8	43.3		
ZIL 130, 4314, 4x2 gen purpose <sup>3</sup>	1962	120.7	116.2	106.3		
<i>GAZ, Nizhniy Novgorod</i>		294.0	249.3	199.5	228.7	167.1
GAZ 52, 2.5 ton <sup>4</sup>	1967	54.0	55.1	21.9		
GAZ 5312, 4.5 ton, agricultural use	1965	200.0	154.0	139.5		
GAZ 66, 2.5 to 3 ton, 4x4 military/civilian/agri dumpers	1963	40.0	40.2	38.1		
<i>URALAZ, Miass</i>		31.6	31.6	31.4	23.3	17.5
URAL 4320, 5 ton 6x6 gen purpose, gas engine <sup>5</sup>		26.0	26.2	25.9		
URAL 5557, 5 ton 6x6, agricultural dumpers		5.6	5.4	5.5		
<i>UAZ, Ulianovsk</i>		42.8	40.8	38.1	40.8	30.6
UAZ, .8 ton 4x4 light truck		42.8	40.8	38.1	40.8	30.6
<i>KAMAZ, Naberezhnie chelny</i>		150.0	116.4	102.7	80.1	60.1
KAMAZ 5320 8 ton 6x4 general purpose		30.0	32.0	28.0		
KAMAZ 4310 7 ton 6x6 agricultural dumpers		40.0	18.4	14.0		
KAMAZ 5511 6 ton 6x4 agricultural dumper		40.0	43.0	40.0		
KAMAZ 5410, 11 ton 6x6 heavy truck <sup>6</sup>		40.0	23.0	20.7		
<ol style="list-style-type: none"> <li>1. Production to stop in 1992.</li> <li>2. Presently being converted to civil use. Negotiations under way with Caterpillar &amp; Perkins for diesel engines.</li> <li>3. 25,000 produced with special platform and hydraulic dumpers.</li> <li>4. Smallest GAZ truck; reconstruction underway to 1.5 ton model; planned 75,000 units a year.</li> <li>5. Cooperation with IVECO/FIAT, Italy, diesel engine KHD 8 cyl type BF8L513; license production Kustanai, Kazakhstan.</li> <li>6. Engine produced by Cummins joint venture; truck for international transport; production capacity 10-12,000 engines a year, Russian competition for Belarus' SuperMAZ.</li> </ol>						
Source: Ministry of Industry, Russia, Department of Automobile Industry, October 1992.						

described in further detail by class of truck (see Box).

**Buses.** The vast majority of urban transport buses were manufactured in Hungary by Ikarus, while buses assigned to suburban routes were manufactured for the most part by Ikarus and the Lwow Bus Plant in Ukraine. Of the 84,380 buses manufactured in the USSR in 1990, a 6.9 percent decrease from the 90,618 produced in 1989, the Lwow plant, which specializes in medium-size intercity and local or rural route buses, accounted for 14.5 percent of overall production. The Riga Bus Plant, which specializes in a line of minibus models, accounted for 20.3 percent of total 1990 bus production.<sup>4</sup> Russian bus manufacturers include the Likino Bus Plant LiAZ, which manufactures large city buses (6,002 in 1990); the Pavlovo Bus Plant PAZ, the main producer of small-size buses (8,600 in 1990); and the Kurgan Plant KAvZ, a producer of small general purpose buses (19,360 in 1990).

AvtoUAZ and KamAZ are also in the bus manufacturing business, having accounted for 15 and 5.8 percent, respectively, of overall bus production in 1990. The domestic trolleybus producer is the Uritskiy Trolleybus Plant, which registered an output of 2300 vehicles in 1990. Soviet-era programs in existence as of 1991 foresaw increasing bus production in the USSR under the auspices of the Avtrokon Concern, an association of bus and trolleybus producers. Under this plan, three additional bus manufacturers were to come on line – the Davydovka, Golitsyno, and Tula Bus Plants – while all other manufacturers were expected to increase output. After the dissolution of the USSR, Russia has developed what could be viewed as a successor program to the Soviet-era Passenger Transportation program. It is likely that some components will be preserved and even expanded, such as Avtrokon's series of contracts with Mercedes Benz to manufacture 2500 inter-city tour buses under license at the Golitsyno plant.<sup>5</sup>

Russian-manufactured trucks are largely outdated in design and suffer from poor quality, which results in high downtime, costly repairs, and poor fuel efficiency. The Russian automotive industry, aware of these problems, has started to take advantage of new privatization laws by

reorganizing themselves into joint stock companies and allowing foreign partners to obtain share interests. For example, KamAZ reorganized, formed a more independent management, and signed a joint venture agreement with a U.S. based engine manufacturer to create KAMDIZEL.

Apart from the technical problems with truck design and manufacturing, Russian industry is experiencing severe shortages of raw material and components. Both the Supreme Council and MINPROM anticipate a further reduction in truck output, but data provided by the Russian State Statistics Committee is the most pessimistic by projecting truck and trailer production to be off by 9 percent and 77 percent, respectively, in 1992 from 1991.<sup>6</sup>

### ***Alternatives for Technology, Productivity, and Quality Improvements***

***Implementation of Diesel Engines.*** Diesel engine use is relatively low compared with western countries: 41 percent of Russian trucks are diesel powered compared with 85 percent of all Western European trucks. The Russian manufacturing industry is trying to solve this problem through joint ventures and cooperations with western suppliers. Western partners are hesitant about providing hard currency loans or equity, however, without a legal framework that protects intellectual property, provides a realistic operating basis for joint ventures and manufacturing contracts, provides for bankruptcy, and without improvement in the macroeconomic framework.

***Joint Ventures and Licensing.*** The privatization process has made possible extensive cooperation talks between Russian manufacturers and western companies. However, these agreements and initiatives are still burdened with legal inefficiencies, such as property rights.

### ***Major Obstacles to Truck and Trailer Production and Distribution***

***Production.*** The output of the Russian truck industry fell by 15 percent in the first quarter of 1992 and demand fell by more than 80 percent. While shortage of raw materials and components will not impact overall production as a result of

### Capacity of the Russian Truck Manufacturing Industry by Class of Truck

**Small Truck Capacity - 2 Tons.** Before the collapse of the CMEA trading arrangements, the former Soviet Union imported small trucks of up to 2 tons from East Germany (ROBUR), Poland (FSD) and Yugoslavia (IMV). According to MINPROM, production of light trucks is planned as follows:

-GAZ (Gorki Automobile Factory): Light trucks of 1.5 ton capacity; 75,000 units a year, but production is not expected to start before 1995.

-BAZ (Brianski Automobile Factory): Light trucks of 1.5 ton capacity, designed by the British company IAD (International Automotive Design); production of 500 units to start in 1992 with annual production of 10,000 units by 1994-95.

-MOSKVITCH (Krasnoarmeysk): light trucks of 1 ton capacity; production to start in 1997.

It is uncertain if these plans will prove successful. Further delay in production is anticipated because of the economic situation of the country. With background studies, the western automotive industry might be encouraged to invest in this segment because of the huge, unmet demand.

**Light Trucks - 2 to 5 Ton Capacity.** According to the Supreme Economic Council at the Presidium of the Supreme Council of the RSFSR, the Russian manufacturing industry covers 76 percent of the demand for this size truck. The balance of Russian demand was supplied by former CMEA countries, primarily Poland, the former Czechoslovakia, and the GDR. The shortage should be met in the future by the Russian manufacturing industry by a change in mix, but that will require an expansion of existing capacity.

**Medium Trucks - 5 to 10 Ton Capacity.** This size truck was common in the former Soviet Union and supplied in large quantities to the military. The 5 to 8 ton segment covers 109 percent of the Russian demand, and it can be assumed that demand for medium sized trucks will decrease in favor of large/articulated trucks.

**Heavy Trucks - 10 to 15 Ton Capacity.** Russian manufacturing covers 82 percent of demand for heavy trucks, with the balance coming from Czechoslovakia (LIAZ). Demand is expected to grow, especially for the 15 ton capacity models and other special models such as refrigerator units, livestock rigs, and liquid tankers.

One of the former Soviet truck factories, KamAZ, is situated in Tartarstan, which has separatist tendencies toward Russia. It is the most important production facility since most of the new, large diesel trucks were assembled there. The other CIS producers are MAZ (Belarus) and KrAZ (Ukraine).

**Heavy Trucks - Over 15 Ton Capacity.** Because of the use of rail for long distance haulage in the past, very few heavy trucks were produced in this sector. As a result, Russian manufacturing meets only about 89 percent of demand. The relatively slow delivery by rail means a huge demand for this category, along with such special equipment as refrigerator units, container semi-trailers, dry (silo) trailers for grain and cement.

the fall in demand, the industry is not well situated to meet future needs. The demand for heavy trucks for long distance haulage is estimated at 16,000 a year, with a 1.5 percent growth rate. The industry is short of cash, indebted to Russian suppliers and banks, and has difficulty getting components from CIS suppliers without hard currency. It does not have the capital to retool for major model changes. Moreover, a devastating fire on April 7, 1993, that destroyed the KamAZ Engine and Transmission Plant has dealt a severe blow to Russia's productive capacity. In short, the industry is expected to produce, at less than capacity, the same models it has for past decades,

and customers must be willing to accept the existing quality.

Under central planning, both output and demand were planned within the context of the Five Year Plan. Trucks and trailers were allocated under the control of Gosplan. The central planning system did not provide for such vital systems as sales organizations and customer service such as maintenance, repair, and parts. Customers must still arrange to pick up their vehicles at the factory, and may find the vehicles cannot be driven away because of the lack of parts or components. The deficiencies in the distribution system have not yet been fixed and a deep distrust

still exists between the manufacturers and their customers.

Only with technical and managerial help from western companies will Russian manufacturing be able to meet the urgent quality requirements expected by the buyers of trucks and trailers. *The availability of modern diesel engines and increased quality in vehicle electric and brake systems are the most urgent needs.* Russian manufacturers will require capital to maintain existing production lines and invest in new machinery and licensing with western suppliers. Western truck equipment suppliers together with their component production systems should be ideal partners provided the financial aspects can be satisfied on both sides. Through these efforts, the Russian truck manufacturing sector should be able to develop a capability to produce both lightweight (1 ton and under) and heavy (30 tons and over) trucks, the critical capacity areas not now available in Russia. Filling this need through imports from western manufacturing sources is not practicable over the near term, given the number of vehicles and hard currency required.

*Aviation.* The exception to the CMEA practice of locating transport-related manufacturing and production facilities in countries other than Russia is in the area of aviation. All but two of the former USSR's design bureaus and production facilities are found in Russia, and one manufacturer of aircraft components, the Chkalov engine manufacturer, is in Tashkent, Uzbekistan.

The Russian aircraft fleet is aging, obsolete, and on the verge of wearing out. Dozens of aircraft orders for the Il-86, Tu-154M, and the Yak-42 have gone unfilled. Other slips in the production and delivery schedules of Tu-204, Il-96-300, which are twice as economical in terms of fuel efficiency compared to the Tu-154 and the Il-62, respectively, and Il-114 aircraft are compounding the situation. There is also a severe lack of spare parts and engines, especially for the Il-62M, Tu-154M, Yak-42, and the Il-86.

To remedy this demand for aircraft, the purchase from Poland and the Czech Republic of Il-62 and Tu-134 aircraft with remaining service life, as well as the transfer of military versions of the Il-62, Tu-154, and Il-76 to civil aviation operators is being negotiated. The Zolotaya

Zvezda Aviation Company, a subsidiary of the Central Administration for International Air Services, is an aircraft leasing firm that also operates charter flights using Tu-154 equipment exclusively. Another subsidiary, Russian International Airlines, is using Airbus A-310 equipment. Fortunately, the decline in demand for air travel resulting from higher fares means that there is substantial overcapacity in the fleet. This means many of the oldest aircraft can be retired without replacement.

Despite the shortage of aircraft available for revitalizing the Russian fleet, many design bureaus and manufacturers are active participants in a number of joint ventures to re-equip Russian aircraft and to exchange technology with western aircraft designer/manufacturers and manufacturers of aviation equipment (avionics, air traffic control systems).

Throughout the CIS, there are a number of repair and overhaul facilities that specialize by aircraft type, resulting in a maintenance monopoly. In Russia, maintenance facilities are wanting: according to the civil aviation authority, only 19 percent of needed hangar space is available and only 30 to 35 percent have been provided with adequate production areas.

### ***Shipbuilding and Repair Yards***

The Russian fleet is aging rapidly, and many ships are equipped with propulsion engines, communication facilities, and cargo handling gear that reflect technologies of the 1960s. These circumstances cause low productivity and reduce asset reliability. Individual ships have to spend an increasing number of days each year in repair and maintenance yards. Assuming continuation of the demand for Russian vessels, officials estimate that about 500 vessels of the Federation's merchant marine would have to be replaced during the next three years. Much of the remaining older tonnage needs to be technologically upgraded. The annual requirement for vessel overhaul and repair will be equivalent to 3.5 to 5 million dwt of diverse types of tonnage.

Thirteen major shipyards that specialize in building and repairing merchant vessels remain under the Russian Federation's jurisdiction. Russia's national flag carriers are skeptical about

these yards' reliability and their ability to provide services and manufacture hardware to meet the individual carriers' technical requirements. As a consequence, a growing portion of Russian new shipbuilding orders are being placed with foreign yards. Russian carriers are equally skeptical regarding the ability of Russian shipyards to undertake vessel overhaul and repair. The time to complete such jobs in Russian yards significantly exceeds that in west European yards for similar orders. Furthermore, Russian carriers reported that the cost of such jobs in domestic yards was between 30 to 40 percent higher than in foreign yards.

The Russian yards, faced with declining business and a need to generate foreign exchange income, are increasingly devoting repair and building capacities to orders from foreign shipowners. These pressures are leading to joint ventures with foreign shipyards eager to combine relatively inexpensive but skilled Russian shipbuilders with modern technology. Such ventures should be encouraged because the payoff could be substantial.

The Russian yards have a theoretical maximum capacity of 625,000 compensated gross tons (cgt), the internationally common denominator for yard capacity, which represents about 3 percent of the current global shipbuilding capacity. At a worldwide average of US\$2,500/cgt, the production potential of Russian Shipyards represents possible annual earnings of US\$1.4 billion. Shipbuilding is an assembly industry with linkages to steel production and equipment manufacturing. Based on international experience, the split in activities between yards and their supplies is about 40:60, which would mean that about US\$850 million worth of business would accrue to other domestic industries.

None of these earnings will materialize, however, if Russian shipyards are not able to build ships suitable to the demands of today's shipowners in an efficient manner. Shipyards seeking to be restructured and privatized should be encouraged to do so, possibly, with Government support through such measures as the World Bank funded Privatization Implementation Assistance Project.

### *Cargo Handling Equipment*

In most Russian facilities where cargo is handled – ports, airports, railway terminals, intermodal transfer points and warehousing complexes – the required equipment park is overaged. For instance, in the Federation's ports almost one-third of all gantry cranes have been in service for more than 20 years and are now in a condition of advanced deterioration. Over 50 percent of the forklift fleet and yard tractors are more than six years old. These items are literally worn out, require constant repair work, and are only available for cargo handling 35 percent of the time. Similar situations prevail in all other segments of the Federation's freight transport system.

A particular problem is caused by the limitation of indigenous capacities to manufacture required replacements. This limitation results from industrial specialization arrangements that existed among the former CMEA countries. For instance, cargo handling equipment and special steel for sheetpiling – two items of most urgent need in Russian ports – were manufactured in other CMEA countries. Under today's altered conditions, foreign exchange is required to purchase such items. At present Russia's industry can meet no more than 20 percent of the demand for new equipment and spare parts for equipment rehabilitation and upkeep. In addition, the domestic industries' line of production is technologically outmoded and expensive to operate. Because of these system constraints, a component of the Bank's first loan to Russia (Ln. 3513-RU, the First Rehabilitation Loan) included provisions for acquiring up to US\$50 million of port cargo handling equipment for several of Russia's ports of national significance.

Foreign manufactures of cargo handling equipment have become aware of the excessive demand, and the national industries' inability to meet such demand. Some initiatives have already been taken to establish joint production arrangements with local manufacturers. Several domestic firms have applied for licenses from foreign specialized manufacturers. The government estimates that the total cost of required replacement and rehabilitation of essential cargo handling equipment throughout the

Federation is presently on the order of US\$1.3 billion. Moreover, ports, airports, railways and other international intermodal ports have the potential to earn foreign currency and the possibility of replacing old Russian cargo handling equipment with more reliable and efficient foreign made equipment. Assuming that productivity of port operations is likely to improve greatly with privatization, however, these replacements needs are probably severely overstated.

### ***Roads and Highways***

The CMEA structure left Russia without the capacity to manufacture asphalt spreaders. The only producer in the USSR was situated in Ukraine, and it produced only 500 units annually. Russia is in the process of creating a domestic production capability and expectations are that 400 to 500 units will be produced annually by 1995, which should satisfy demand.

Even when road construction and maintenance procedures are automated, the poor design of road maintenance equipment means that even after road rehabilitation, road roughness levels are high, resulting in high vehicle operating costs, and there is premature cracking of the pavement. Key items of equipment will have to be replaced by imported equipment, or Russian-made equipment will have to be redesigned. Either option requires considerable investment that is not likely to be available for the next few years. Consequently, road maintenance will continue to depend for the most part on Russian made equipment.

Road equipment – traffic signs, guard rails, etc. – are generally scarce and in poor condition, particularly outside the approaches to urban areas. There are few road signs, and they are often poor. A 1991 survey of a 20,000 km sampling indicated that 65 percent of required barriers, 10 percent of traffic signs, and 86 percent of road markings were missing. The production capacity for reflective film used in making road signs is insufficient and the quality poor. Consequently, the film often has to be renewed annually.<sup>7</sup> A Western manufacturer has established a factory for producing road signs, traffic light sets, and other road furniture and is assisting FHD with the

overall design of a safety program, but the program has not yet been tailored to Russian conditions. There are no programs to identify and improve particularly dangerous "black spots" on roads, develop appropriate safety standards in vehicle design or vehicle inspection, ensure proper vehicle maintenance, or educate the public on the need to wear safety belts.

### ***Inland Waterways***

The Krasnoyarsk Shipyard manufactures river-sea dry cargo ships, platform barges, sectional oil tanker barges, and extended platform barges. The shipyard's major customers are the Lenskiy Association and the Enisey River Shipping Company. They are interested in obtaining barge-carrying ships, non-self-propelled tourist and passenger vessels, floating shops, and self-powered bilge collectors. Delivery of the prototype river-sea dry cargo ships, which required some modernization of the production facilities, is scheduled for 1993-1994.

The production of many types of domestically-manufactured equipment has been discontinued and spare parts have become unavailable. Despite comparatively low productivity, all river shipping companies involved in river-sea transport report a need for expansion of the river-sea fleet capacity. In spite of excess local shipbuilding capacity, river-sea craft appear often to have been imported from Poland, Hungary, Yugoslavia, and the former GDR, or to have been built on locally-manufactured hulls and fitted out with imported propulsion units, electronics, and equipment from abroad particularly from Poland or GDR.

### ***Evolving Requirements for the Transport Equipment Manufacturing Industry***

*Near-Term.* The state should withdraw from the manufacturing sector and should allow private sector manufacturers to determine the market demand for future transport equipment, rather than fostering the development of additional state-owned manufacturing installations.<sup>8</sup> Modernizing existing manufacturing facilities and technologies will take considerable investment, time, and effort. That is best done by market forces in a contested free market rather than by vertically-

integrated state-owned transport equipment manufacturers.

Within this new context, the current crisis in meeting selected transport equipment needs can be confronted in part by the restoration, across international or inter-republican boundaries, of previous supplier relationships on a commercial basis rather than on the basis of the old barter system. Taking this step, however, is not likely to address effectively the technological deficiencies that plague the sector's equipment base. Tapping the resources of the military-industrial NPOs seeking to diversify their production base could provide access to more affordable technological enhancements in the near term.

For more urgent problems, such as those in urban transport, measures to extend the effective service life of existing fleets should be examined as a near-term alternative to procurement of new equipment. A variety of activities of this sort – some well-advised and some not – are underway in various transport modes throughout the former CMEA. For example, Russian-manufactured locomotives owned by the railways of the GDR are now being repowered with western-manufactured engines. Discussions are underway concerning the outfitting of Russian aircraft with western avionics and engines. Estonian Railways are actively seeking to repower their aging DMU fleet with western-manufactured engines. And the World Bank's proposed Urban Public Transport Project is looking at options for repowering with new engines the Hungarian-manufactured city bus fleet of several Russian cities.

*Medium and Long-Term.* Proposed and ongoing measures to address the transport equipment crisis in the near term make clear the need to attract western investment to modernize Russian industry. This has been recognized not only by Russian reformers but also by Russian industrial interests, who in practice have genuine reservations about the impact of foreign investment in their own spheres of operation. Until unrestricted currency convertibility and properly functioning capital markets are introduced, however, both foreign and domestic investment in industrial modernization in European Russia is less likely to occur than is investment in the resource-rich areas, particularly Siberia, where hard currency profits will be

generated by the sale of locally-produced natural resources.

Russian manufacturing processes are in need of more modern technology simply to cope with the increasingly more demanding requirements of Russian transport operators. When the economy rebounds, they will be faced with the need to produce more transport service with less – but better – transport equipment. Present domestic capabilities are simply not sufficient to meet these demands. Solutions to meeting the equipment needs of Russian transport depend in the mid- to long-term on an effective process for integrating critical elements of foreign technology into Russia's domestic manufacturing processes. Because this is such a difficult situation, foreign firms entering the Russian market should be able to take a long-term view and be capable of withstanding losses in the early stages of their ventures.<sup>9</sup>

### *Conditions for Reform*

There is a broad consensus among western firms operating in the former communist countries that the difficulties of establishing and operating joint ventures in Russia are substantially more onerous than in Eastern Europe. In a recent survey of western businesses operating in the region, 63 percent of respondents rated the FSU as presenting the greatest obstacles to successful business dealings.

For cooperation with foreign manufacturers to be effective, it must be honest and reciprocal, with full respect and compliance given to existing international agreements and norms concerning respect for ownership of intellectual property. Russia must also develop a financial and legal framework that protects investors and financiers, so that their investments and their property are secure within the context of normal business risks.

### *Notes*

1. Translation of Anatoliy Tkachenko, "The Railways Attempt to Reduce their Losses," *Moskovskiy Novost* (No. 51-52) 20 December 1992, p B-8 under "Railway Activities Highlighted: Preventing Financial Losses,"

*Central Eurasia* (FBIS-USR-93-009) 27 January 1993, pp 71-72.

2. Translation of V. Grechanin, "From 'Energiya' to a Passenger Railcar," *Gudok*, 20 February 1993, pp 1-2 under "Former Defense Plant to Produce Railcars," *Central Eurasia* (FBIS-USR-93-029) 12 March 1993, pp 51-53.

3. Translation of an interview with Vladimir Savelyevich Vernik by A. Tashbulatov, "Tank Cars Through Conversion," *Gudok*, 29 January 1993, p 2 under "Ural Tank Plant Produces Special Railcar Assortment," *Central Eurasia* (FBIS-USR-93-026) 6 March 1993, pp 49-50.

4. "Just Statistics," *Za Rulem*, No. 12 (Moscow: December 1991), pp 6-7. English translation: "Motor Vehicle Statistics Detailed," *Central Eurasia* (FBIS-USR-92-023), 5 March 1992, pp 96-99.

5. R. Asatryan, Avtrokon Concern, "Bus Production Today and Tomorrow," *Avtotransport Kazakhstana*, No. 11 (Almaty: November 1991), pp 1-3, 35. English translation: "Bus Production Highlighted," *Central Eurasia* (FBIS-USR-92-023), 5 March 1992, pp 102-105.

6. Ministry of Industry Official, World Bank Mission findings, Moscow, RF, 3 November 1992.

7. EBRD, *Roads and Road Transport Study Draft*

*Final Report*, (COWI-TECNECON Joint Venture, July 1992), p 28-29.

8. Re: privatization of Uralmash, the Ural Heavy Machine Building Plant (UZTM), see a translation of Boris Alekhin's "A Joint-Stock Company Cannot be Formed Without Help from the Top," *Nezavisimaya Gazeta* (Moscow: 6 November 1992), p 4 under "Uralmash Plans Conversion into Joint-Stock Company," *Central Eurasia* (FBIS-USR-92-152) 27 November 1992, p 11.

Re: privatization of ZIL, see RFE/RL Daily Report (No. 43), 4 March 1993.

Re: privatization of AvtoVAZ, the Volga Motor Vehicle Plant built by Fiat, see a translation of Vladimir Kadannikov's "What is Good for VAZ is Good for Russia," *Delovoy Mir* (Moscow: 4 November 1992), pp 1, 7, under "Auto Plant Economic Status Examined," FBIS, *Central Eurasia* (FBIS-USR-92-167) 31 December 1992, pp 43-6, and Sergey Zhigalov, "Who Will Own the VAZ? The Largest Auto Works in Russia Becomes a Joint-Stock Company," an interview with Vladimir Kadannikov, general director of the Volga Auto Works, *Izvestiya* (31 December 1992, Morning Edition), p 2, translated as "Auto Plant Director on Privatization" in FBIS, *Central Eurasia* (FBIS-USR-93-010) 29 January 1993, pp 37-8.

9. "RUSSIA: Joint Ventures." *Oxford Analytica, East Europe Daily Brief*. January 20, 1993.

# Annex A

## *Statistical Summary of Transport Demand Forecasts*

Exhibit A-1 Energy Related Domestic  
Transport Demand, 1980 to 2015

	(billion Ntkm)		
	Low	Medium	High
1980	3,061	3,061	3,061
1985	3,683	3,683	3,683
1990	4155	4155	4155
1991	3,919	3,919	3,919
1992	3,567	3,567	3,567
1993	3,521	3,521	3,521
1994	3,496	3,496	3,552
1995	3,481	3,481	3,680
2000	3,645	4,006	4,553
2007	4,164	5,023	6,109
2015	4,911	6,254	8,962

Source: EBRD *Rail Sector Survey*.

Exhibit A-2 Non-Energy Related Domestic  
Transport Demand, 1980 to 2015

	(billion Ntkm)		
	Low	Medium	High
1980	3,071	3,071	3,071
1985	3,448	3,448	3,448
1990	3,432	3,432	3,432
1991	3,200	3,200	3,200
1992	2,508	2,508	2,508
1993	2,248	2,338	2,338
1994	2,006	2,248	2,459
1995	1902	2,274	2,587
2000	2,235	2,754	3,310
2007	2,582	3,441	4,522
2015	2,975	4,215	6,065

Source: EBRD *Rail Sector Survey*.

Exhibit A-3 Domestic Freight Transport Demand and Its Relation to GDP Growth Rates

Year	Freight Task (bn ntkms)			Energy Output <sup>(2)</sup>	GNP Index <sup>(3)</sup>
	Energy	Non-Energy	Total <sup>(1)</sup>		
1970	1,337	2,121	3,458	17.8	56.1
1975	2,094	2,830	4,924	22.8	67.4
1980	3,061	3,071	6,132	27.6	76.9
1985	3,683	3,448	7,131	31.0	89.9
1990	4,155	3,432	7,587	33.3	96.0
Annual growth rates (percent per year.)					
1970-80	8.6	3.8	5.9	4.5	3.2
1980-90	3.1	1.1	2.2	1.9	2.2
1970-90	5.8	2.4	4.0	3.2	2.7

1. Excludes overseas shipping
2. Million barrels per day of oil equivalent
3. 1989 = 100.0

Source: EBRD *Rail Sector Survey*.

Exhibit A-4 Non-Energy Freight Task by Mode (billion tkm)

Year	Low Growth			Medium Growth			High Growth		
	Rail	Road	Other	Rail	Road	Other	Rail	Road	Other
1990	2,631	471	354	2,631	471	354	2,631	471	354
1991	2,461	441	298	2,461	441	298	2,461	446	293
1992	1,925	350	233	1,925	350	233	1,925	358	225
1993	1,723	317	208	1,792	330	217	1,782	341	215
1994	1,534	286	186	1,720	320	208	1,857	378	225
1995	1,452	274	176	1,735	353	210	1,934	419	234
2000	1,663	371	201	2,034	474	246	2,336	691	283
2007	1,858	500	225	2,417	732	292	2,854	1,324	345
2015	2,050	677	248	2,774	1,105	335	3,171	2,511	383

Source: EBRD *Rail Sector Survey*.

## *Annex B*

### *Compilation of Primary Transport-Dependent Industry Economic Forecasts for Railways and Waterborne Transport*

#### *Economic Planning Regions and Production*

The territories of the former USSR were divided by Gosplan into twenty Economic Planning Regions. Russia has inherited eleven of these regions, Ukraine three, and one each for Belarus and Kazakhstan. The boundaries of the economic planning regions always coincide with those of the republics, but only coincide precisely with railway borders in the case of Belarus. In Russia, a distinction was made between the Siberian and Far East regions, and those regions west of the Urals. This placed three economic planning regions in the Siberian and Far East category and the remaining eight regions in the European category. Exhibit B-1 summarizes the main activities of each economic planning region and the railways by which they are served.

For Soviet economic planning purposes, European Russia consisted of the Northern, North-Western, Central, Volga-Viatski, Central Black Earth, Volga, Northern Caucuses, and Ural planning regions. Siberia and the Far East contains the Western Siberian, Eastern Siberian, and Far East planning regions (exhibit B-2).

Transport demand in the FSU has generally followed economic growth patterns. For the short to medium term future, demand determinants will continue to reflect overall economic developments for domestic inland traffics and for international flows. Individual commodity flows will, however, strongly influence the pattern and volumes of cargo movements through the seaports.

The purpose of this section is to briefly review the main trends and anticipated development patterns for the major commodity flows of Russia and the CIS. The relative strength of the industries and activities which generate these commodity flows are of relevance both to the strength of the economy as a whole and to the transport sector. The impact of the reformation and restructuring process in the various sectors will be of considerable significance in setting transport demand influences for the future, whether in terms of cargoes through ports, as coastal and/or transshipment traffics, as sea-river traffics, as rail traffic, or as pure inland waterway traffics.

The two most important sectors in the CIS are agriculture and energy. In agriculture, grain is the dominant product, although the CIS is a net importer. In the energy sector, oil, gas and coal are the prime commodities. Further, iron ore, steel products and timber are major commodities for the waterborne and rail transport sectors alike.

#### *Sectoral and Regional Changes*

*Coal.* Coal production levels fluctuated during the 1980s, with an overall decline in the decade. Production will continue to decline because of the replacement of coal by gas, reduction in steel production, the ending of subsidies, increasing extraction costs and environmental concerns. In 1988 only 32 out of a total of 564 mines and pits operated without state subsidies; 245 required subsidies of more than 50 rubles per ton and 200 subsidies of over 100 rubles per ton, against an

Exhibit B.1 Characteristics of Economic Planning Regions				
Region	Coverage	Population (million)	Economic Activity	Railway
Northern	Arkangelsk, Vologda, and Murmansk oblasts. Komi and Karelian ASSRs	6	Lumber, timber, and other raw materials; coal from the Pechorsk Coal Basin.	Northern and October
North Western	St. Petersburg (Leningrad), Novgorod, and Pskov oblasts (St. Petersburg 4.6)	8	Machinery, shipbuilding and power plant equipment	October
Central	Moscow, Briansk, Vladimir, Tver, Kaluga, Kostroma, Orel, Riazan, Smolensk, and Yaroslavl oblasts (Moscow 9)	30	Textiles, chemicals, and automobile assembly.	Moscow, October, Northern, Gorki, Kuibyshev, and South-East
Volga-Viatski	Nizhegorod and Kirov oblasts and the Chuvash, Mordovski, and Marinski ASSRs	8	Phosphorus, construction material minerals, and processed timber/lumber.	Gorkiy and Kuibyshev
Volga	Tatar and Kalmyk ASSRs and the Ulianov, Penzensk, Samara, Saratov, Volgograd, and Astrakhan oblasts (70 percent urban)	16	Petroleum refining and automobile and truck manufacturing (VAZ and KamAZ respectively).	Kuibyshev, Volga, Northern Caucasus, and South-East
Ural	Sverdlovsk (Ekaterinburg), Cheliabinsk, Perm, Kurgansk, and Orenburg oblasts and the Bashkir and Udmurt ASSRs	20	Ferrous metals, steel and steel pipes, aluminum, metallurgical supplies, and petroleum.	Sverdlovsk, Southern Urals, Kuibyshev, Gorkiy, and Western Siberia
Central Black Earth	Belgorod, Voronezh, Kursk, Lipetsk, and Tambov oblasts	8	Iron ore and agriculture (flour, sugar, vegetable oil, dairy products).	South-East, Moscow, Southern, Volga, and Kuibyshev
Northern Caucasus	Rostov oblast, the Krasnodarsk and Stavropol districts, and the Kabardino-Balkarski, North Ossetian, Chechen-Ingush, and Dagestan ASSRs	16	Agricultural machinery, electric locomotive, and shipbuilding manufacturing plants, and agriculture. The region's agricultural production accounted for 10 percent of the former USSR's total output.	Northern Caucasus, South-East, Donetsk, and Volga
Western Siberia	(South) Omsk, Novosibirsk, Kemerov, and (the southern part of the) Tomsk oblasts and the Altai district. (North) Tyumen and (the larger part of the) Tomsk oblasts	14	Coal (from the Kuzbass), petroleum, lumber, ore, salt, chemicals, and railway ballast.	Western Siberia, Kemerovsk, Krasnoyarsk, Southern Urals, Sverdlovsk and Tselinnaya
Eastern Siberia	Krasnoyarsk district, the Tuvinsk and Buriatsk ASSRs, and the Irkutsk and Chitinsk oblasts	9	Coal (45 percent of the former USSR's reserves), non-ferrous metals, asbestos, magnesium, iron ore, metallurgy, chemicals, lumber/timber, and paper mills.	Krasnoyarsk, Eastern Siberia, Transbaikal, and BAM

Source: EBRD Rail Sector Survey and Waterborne Transport Sector Surveys.

average price of 15 rubles per ton and an equivalent world price of around 30 rubles per ton.

With the exception of Neryungri coal from Eastern Siberia and the Kuzbass fields, Russian production will continue to decline and some

fields (notably the Moscow Basin) will close. The Kuzbass field is the most important and cheapest in Russia, but is located far from the smelters located in Magnitogorsk, European Russia and the Urals. Production dropped by 20 million tons (12 percent) between 1988 and 1990 and will continue

IBRD 25154



RUSSIA FEDERATION  BELARUS  UKRAINE  KAZAKHSTAN 

SEPTEMBER 1993

Source: EBRD Rail Sector Survey, December 1992, p. 27, adapted from Kazanskiy, ed., The Economic Geography of Transport, p. 37

to decline for some years as reductions in military expenditure and technological and structural changes in the consuming sectors reduce demand. Some efforts are underway to find export markets via Novorossiysk. Japan may also be potential market for Russian coal.

Other coal basins in Russia include the Pechora Basin, above the Arctic Circle, the Moscow Basin, Kansk/Achinsk Basin and Neryungri. The Pechora basin produced 25 million tons of coking coal in 1990 (20 percent down on 1988). It serves the St. Petersburg region and Baltics and is the main source for Cherepovitz steel works. Only 10 percent of the St. Petersburg region output was military but the Cherepovitz mill may be converted to a mini-mill powered by natural gas. Overall, production is expected to continue to decline, to perhaps 20 million tons a year, with future growth dependent on the steel mill. Production from the Moscow Basin has declined from 36 million tons in 1970 to 10 million tons currently. It produces low-grade coal and is likely to be phased out. The Kansk/Achinsk Basin produces low-grade coal used by regional power plants. The Neryungri Basin produces 13 to 16 million tons of high-grade coking coal for local and export markets, with generous subsidies, of which 2 to 5 million tons a year is exported to Japan; production is expected to remain stable. Coal is an important waterborne transport commodity for inland water transport (17.2 million tons in 1990), for Russian cabotage trades (4.7 million tons in 1990) and for port traffic (44 million tons of imports and exports in 1990).

The mining and domestic utilization of coal has been both a significant domestic industry and consumer energy source and export commodity in the past. The outlook for coal, however, is not so certain. Coal production has dropped by 20-30 percent since 1989 with overall production down by 20 million tons between 1988 and 1990 in Russia, by 29 million tons in Ukraine, and 11 million tons in Kazakhstan. These decreases are due to the main structural trends, notably:

- extraction becoming more difficult and costly;
- shifts to alternative fuels, particularly gas;

- a decline in demand from heavy industry and power sectors.

Domestic demand is particularly influenced by lower steel production. Also exports are declining (exhibits B-3 and B-4). Likely future trends in exports are unilateral concentration on former centrally planned economies in Eastern Europe will decrease, and exports from the Far-East to the Pacific Region will increase.

Whether the overall export potential of the CIS can be maintained is an open question, also for the international Energy Agency. Both production and transport of coal have been heavily subsidized, directly and indirectly, in the USSR. Very few coal fields have been able to operate without any state subsidy at all. Of the 564 coal mines, 200 required subsidies of over Rb100 per ton of product, which is currently "sold" to the state at some 70 rubles per ton [*Moscow Times*, June 17, 1992]. If the subsidies were removed, there would be a significant reduction in output, at least in the older mines. On the other hand, the removal of the coal export monopoly in 1989 gives some new opportunities for the more modern mines to consolidate production in part for domestic markets and leaving the balance for export.

It is uncertain whether exploitation from the centrally-located fields for export to either Europe or the Far East is commercially viable if real cost of production and transportation are taken into account. The inland transportation distances for Russia are significant. Note, moreover, that the world-market outlook is not entirely favorable for the CIS: other major competitors in foreign trade of coal (Australia, the United States and South Africa for hard coal and Australia and South Africa for steam coal) face much lower production and inland transport costs for the exports. Competition from Indonesia, Venezuela and Colombia is also increasing. Current spot export prices are in the order of US\$38/ton fob Hampton Roads, USA; US\$27/ton fob Richards Bay, South Africa and US\$26/ton fob Port Kembla, Australia. CIS-based exports will need to at least match or undersell these rates, which are inclusive of production, transport and loading to vessel at the export port.

The expected overall impact on waterborne transport can be split between domestic, cabotage and port traffics. With the exception of cabotage trades (where the supply is primarily dictated for input to relatively remote areas for heating and other mainly non industrial energy purposes), the outlook is for a further decline of overall volumes during the next few years. This will be particularly so for the inland waterway sector, where the downturn in economic demand and predicted closures of mines is likely to lead to a situation where volumes will not exceed the 1990 level (17.2 million tons) until 2007.

For port throughput, the outlook is for a less significant decline followed by a slow recovery. Steam coal and coking coal exports to Japan and Asia are expected to remain relatively stable when exports to Eastern Europe and other European countries are expected to undergo more significant change. Markets in the Middle East and Africa

may show some increase but total demand from these areas is comparatively small, a total of 12 to 14 million tons annually.

Coal production in the Donets Basin in Ukraine, is reported to be relatively costly. Output for domestic and export markets is expected to decline by up to half by 2007.

Kazakhstan does not have any significant export trades and the main production areas, (Ekibastuz and Karaganda, supply relatively low grade hard and steam coals. Most importantly, they are located a considerable distance (2,000 to 2,300 km) inland from port and shipping outlets on the Caspian or Black Seas.

*Oil and Gas.* Overall, production will level off or decline slightly because of the depletion of the supergiant fields, the location of new fields in more remote and severe regions, shortages of equipment, increasing production costs and

Exhibit B.3 World Coking Coal Trade, 1990 (million tons)

Exporters	Importers								
	North America	OECD Europe	Japan	South America	Asia	Africa & Middle East	Former CPEs	Baltics	World
Canada	0	2.7	17.5	1.3	5.5	0.3	0	-0.4	26.9
USA	4.5	27.3	9.6	5.9	3.3	1.1	2.6	3.3	57.6
Australia	0	9.8	29.6	1.6	14.1	0.9	1.6	-0.7	56.9
other OECD	0	3.3	0.2	0	0.1	0	0.1	0.7	4.4
OECD	4.5	43.2	56.9	8.8	23.0	2.4	4.3	2.6	145.7
Poland	0	3.8	0	2.2	0.4	0	1.0	0	7.4
USSR	0	1.8	5.5	0	0	0	12.1	0	19.4
China	0	0	1.3	0	0	0	2.7	0	4.0
Colombia	0	0	0	0	0	0	0	0	0.0
South Africa	0	0.2	3.4	0	0.9	0	0	0	4.5
other non-OECD	0	0.8	0.3	0	0	0	0.9	0	2.0
TOTAL	4.5	49.7	67.3	11.0	24.3	2.4	21.0	2.8	183.0

CPE = centrally planned economy.

Source: EBRD Rail Sector Survey and Waterborne Transport Sector Surveys.

Exhibit B.4 USSR Hard Coal Exports by Destination (million tons)										
Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	
Hard coal	22.5	24.3	26.3	28.0	31.8	35.5	39.4	39.8	38.5	
Coking coal	10.4	8.7	8.1	11.2	12.8	19.4	28.4	19.7	19.3	
<i>Exports to:</i>										
Austria	1.0	1.2	1.1	1.0	1.2	1.2	1.3	1.3	0.6	
Belgium	0.1	0.1	0.1							
Finland						0.3	0.5	0.5	0.5	
France			0.1	0.1						
Germany			0.2	0.4	0.3	0.3	0.2	0.3	0.2	
Italy		0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	
Japan	1.1	1.5	1.6	2.8	4.2	5.2	5.2	5.5	5.5	
Spain			0.1							
Sweden	0.1	0.1	0.1							
<b>Total OECD</b>	<b>2.3</b>	<b>3.0</b>	<b>3.4</b>	<b>4.4</b>	<b>5.8</b>	<b>7.1</b>	<b>7.4</b>	<b>7.8</b>	<b>7.2</b>	
East Europe	6.3	4.4	4.4	3.9	4.7	9.5	10.2	8.9	12.1	
other non-OECD	1.8	1.3	0.3	2.9	2.3	2.8	2.6	3.6		
Steam coal	12.0	15.6	18.2	16.7	19.0	16.1	20.5	21.2	19.1	
<i>Exports to:</i>										
Austria	0.1		0.2	0.1	0.1	0.2	0.1	0.1		
Belgium	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.2	
Denmark	0.1	0.4	0.3	0.3	0.6	0.8	0.9	0.9	1.1	
Finland	0.8	0.9	0.9	0.9	1.6	1.9	1.8	1.7	1.9	
France			0.2	0.1	0.1	0.1	0.2	0.7	0.8	
Germany	0.3	0.3	0.3	0.5	0.5	0.3	0.2	0.3	0.2	
Greece		0.3	0.3		0.1	0.1	0.1	0.2	0.3	
Italy	0.1	0.1	0.2	0.2	0.1	0.3	0.3	0.4	0.4	
Japan	0.2	0.5	0.9	1.0	0.9	1.0	2.1	2.5	2.9	
Spain				0.1		0.1	0.2	0.3	0.3	
Sweden	0.2	0.2	0.3	0.4	0.6	0.4	0.5	0.6	0.6	
UK		0.1	0.1	0.1		0.1	0.4	0.2	0.5	
<b>Total OECD</b>	<b>1.9</b>	<b>2.9</b>	<b>3.8</b>	<b>3.8</b>	<b>4.7</b>	<b>5.3</b>	<b>6.9</b>	<b>8.4</b>	<b>9.4</b>	
East Europe	9.8	11.2	10.5	12.7	14.0	10.7	12.3	10.7	9.7	
other non-OECD	0.3	1.5	3.9	0.2	0.3	0.1	1.3	2.1		

Source: EBRD Rail Sector Survey and Waterborne Transport Sector Survey.

decreasing subsidies. However, the export market will remain strong. Future production capability will depend on international investment and technological modernization. Transit and other legal issues will become increasingly important as provinces and regions stake their claims.

There are 51 operating refineries (exhibit B-5). Total throughput in 1989 was 472 million tons, with output static during the 1980s. Over 90 percent of crude oil comes to refineries via pipeline, and refinery location reflects oil field history.

Russia possesses ten oil-refining regions, of which the Volga and Urals regions are the most important, together accounting for 25 percent of total production. The Volga has been the top refining region of the FSU since the early 1960s, almost without exception, and in 1989 throughput totalled 62 tons, down from a peak of 71 million ton in 1980. Only one of the five Volga refineries has experienced a rise in output over that time. The Urals have historically been the second region in FSU but output has fallen through the 1980s and now is only 52 million tons.

Next to agriculture, energy is the most important sector in the CIS economy. This comprises coal, oil and natural gas and the immediate energy products derived from these raw materials. Valued at world market prices, the 1990 output equalled US\$240 billion or 15 percent of the CIS' GNP.

Energy is estimated to account for 60 percent of hard currency earnings. The CIS is still the largest producer of energy in the world. In view of CIS' increasing needs for imports, a sustained level of energy exports will remain essential. However, there are several factors which indicate that the outlook for sustained or increased production may be more pessimistic over the short and medium term. These are:

- The cost of exploitation has been rising and will continue to increase in real and relative terms as a reflection of the depletion of easily accessible fields.
- The increasing age of wellhead and associated equipment operated in harsh conditions.
- Increased costs associated with deeper wells and the need to bring a larger number of smaller fields into production.

- Oil production has actually decreased during the 1980s. For example, the largest producing region, western Siberia, had peak output in 1988 of 8.28 million barrels per day, declining to 7.5 million in 1990, and some 6.5 million in 1991.

- Production, transportation and refinery capacities are inefficient.

- Health, safety and environmental aspects are generating resistance to further exploitation.

- Energy wastage is alarming, the ratio between the energy consumption and the GNP being four times as high as in Western Europe.

- Domestic resources available for investments are decreasing. Most oil production hardware has been manufactured by plants in Azerbaijan, with the consequence that most equipment delivery has effectively halted over the past year.

Modernization of production, and transport of oil and coal industries will take considerable time. A series of domestic energy price increases and efficiency measures in production and consumption will temper growth of internal demand. On balance, export potential would appear to be rather stable or increasing. The main difficulty in evaluating future export volumes is with the impact of plans in hand, or still under negotiation, with foreign firms, and the extent to which output will be dedicated to export markets for refined or crude oil.

In the short to medium term, Ukraine authorities plan to import crude and refined products directly from the Middle East, rather than remain dependent on Russian crude oil supplies and local refining capacity.

Various sources expect that in total energy production, consumption and exports, the share of natural gas will steadily increase, and the production of oil and coal will only slowly recover from the present downfall. Practically all gas transport, including exports, is by pipeline.

*Iron Ore.* CIS output has declined since the 1988 peak, and is continuing to decline. A drop in domestic demand is due to reduced steel production, and production will continue to shrink unless foreign markets can be developed.

In Russia, republic-wide output peaked at 109 million tons in 1988, but dropped to 107 million tons by 1990. Production for the period to 1997

and beyond will be closely linked to domestic demand for steel and the ability to develop new markets. The main field is the Kursk Magnetic Anomaly, which has 100 years' of reserves and provides ore for steel centers in Moscow, Novo-Lipetsk, and Magnitogorsk in the southern Urals. Domestic demand for Kursk ore will drop as south Urals mills decline. Any export market will depend on exporting ore either via Black Sea ports or by rail to Europe. Demand for Bratsk ore will continue from the Siberian Novokuznetsk mill, which supplies products to North and East Siberia. The Kola/Karelia field produces 21 million tons of ore annually, of which Karelia supplies 11 million and Kola 10 million. The fields serve the Cherepovets works near St. Petersburg, which will continue to supply the machine building industry in St. Petersburg and the Baltics.

The production of iron ore in Russia has fallen steadily since it peaked at 109 million tons in 1988. Ukrainian output peaked at 125 million tons in 1980 – 105 million tons were produced in 1930. Kazakhstan has two fields which produce some 25 million tons annually. The decline in Russian and Ukraine areas is mainly due to a reduced domestic demand from steel production. However, exports are also declining. The trend in ores and steel production is a reflection of macro-economic performance.

*Steel.* The majority of steel mills are based on outdated open-hearth technology and many plants are highly inefficient and polluting. A very large volume of steel scrap is generated by inefficient manufacturing processes. Per capita steel consumption in the FSU has been up to 2.5 times higher than in the United States. Three smaller and more efficient mini-mills using scrap metal are already in production. Increased efficiency from alternative, lighter metals, technological improvements and improved industrial practices will minimize waste and exert a downward pull on demand. Decreased orders from the military will also reduce consumption, and it is likely that each republic will develop its own self-contained steel industry.

Russia produces two-thirds of all steel produced in the CIS. Output peaked at 94 million tons in 1988 and declined to around 78 million tons in

Exhibit B.5 Major Oil Refineries in Russia

Region	Refinery	Throughput (million tons)
Volga	Kuibyshev	30
	Syzran	10
	Volgograd	9
	Nizhekamsk	8
	Saratov	5
Urals	Ufa	30
	Ishimbay-Slaavat	9
	Perm	9
	Orsk	4
Central	Ryazan	20
	Yaroslavl	12
	Moscow	11
East Siberia	Angarsk	23
	Achinsk	8
West Siberia	Omsk	25
Volga-Vyatka	Novogorkiy	23
North	Ukhta	1
North West	Kirishi	22
North Caucasus	Oroynny	13
	Tuapse	1
	Krasnodar	1
Far East	Komsolosl'sk	5
	Khabarovsk	4
Total Russia		283

Source: EBRD Rail Sector Survey and Waterborne Transport Sector Survey.

1991. Steel production will continue to decline and may never recover to 1988 levels. There are three major steel-producing regions in Russia, of which the Urals (42 million tons in 1991) is the largest with four major plants. Urals steel serves the Ural machine-building industry, particularly the Uralmash complex in Ekaterinburg, but

Exhibit B.6 Major Russian Steel Plants

Plant	Throughput (million tons)
Magnitogorsk	16
Nizhniy Tagil	8
Chelyabinsk	7
Novotroitsk	3

Source: EBRD *Rail Sector Survey* and *Waterborne Transport Sector Survey*.

demand will decrease with the decline in military orders and other factors. It also provides steel to major plants in the Central industrial region – Moscow, Nizhniy Novgorod and the Volga automobile plant. In the short-term, a decline to around 30 million tons a year is expected, after which recovery will depend on the replacement of obsolete steel centers in 1995 to 1997, and on the development of replacement markets for the military sector (exhibit B-6).

The majority of steel mills in the CIS still use open hearth technology. Restructuring of the steel industry is currently underway aimed primarily at basing production of raw steel on more effective processes by improving the efficiency of rolling operations, by manufacturing products with greater value added, by increasing the efficiency by cutting manpower and by reducing energy consumption and pollution. However, problems with financing and hard currency availability, the environment, and the procurement of scrap metal and high quality coal may well result in a sharper fall in steel production than anticipated.

*Grains.* The CIS republics plant more land to grain than any other country in the world but net yields are low and production is less than in either China or the United States. Total production in 1989 was 193 million tons. No significant changes in production or consumption are expected for the next decade unless there is major investment and restructuring. Production will remain steady at

around 200 million tons until 2000. The CIS will remain a major grain importer.

In Russia, production fell sharply from 127 million tons in 1990 to 89 million tons in 1991. If investment and restructuring occur, the 1990 production levels could be regained by 1997, after which significant increases could occur. The main grain producing areas are in the lower Volga and Kuban, the southern Urals, parts of western Siberia, the steppes of eastern Siberia and the Far East, and in the Nonchernozem region of European Russia.

Despite an extensive acreage of producing areas, the CIS has experienced a deficit in domestic grain production and consumption requirement levels over many years. These deficits reflect a number of main factors concerning domestic production and output:

- Difficult climatic conditions in most grain growing areas.
- Extensive cultivation methods.
- Lack of storage, poor storage, and low quality inputs.
- Insufficiently trained and unmotivated work force.

Most grain is grown in the Russian Federation, Ukraine and Kazakhstan, which account for 90 percent of total grain production.

The grain growing area is gradually declining, particularly outside the black earth zone of Russia, because of competing infrastructural land use, shortage of labor and machinery, declining soil fertility from erosion, and operational farm losses.

Efficiency improvement is recommended in a number of studies, and rapid implementation seems feasible from an agro-technical point of view. However, it is believed that institutional reform in the agricultural sector will take time and that the CIS will remain a net importer of grain for years to come. This has implications for the provision and utilization of port facilities.

The grain market is broadly segmented into wheat and coarse grains – barley, corn, maize, oats, rye and sorghum (exhibit B-7). Human consumption of wheat is approximately 140 kg per capita. This is relatively high because of extensive state subsidies on grain products. The total annual

Exhibit B.7 Composition of CIS Grain Consumption		
	Wheat (percent)	Coarse Grains (percent)
Seeds	11	11
Industrial demand	1	3
Food (human consumption)	37	6
Animal feed	41	71
Dockage, waste	10	9

Source: OECD, *The Soviet Agro-Food System and Agricultural Trade*, 1991

requirement for wheat can be estimated at 100 million tons, while demand for coarse grains (120 million tons in 1988/89) is mainly for animal feed. The feeding efficiency is low, representing an excess consumption of about 30 percent. CIS wheat production stabilized in the 1980s at approximately 80 to 90 million tons a year. The production of coarse grains varied in the same period between 80 to 100 million tons a year.

The CIS grain demand is based on food needs as well as the inability of domestic producers to satisfy nutritional requirements of increasing livestock numbers. This growing feed gap is an explanatory factor for the upsurge in grain imports. The present CIS grain import requirement for seed, industrial and food demand is estimated at 45 million tons, of which about 20 million tons are of wheat and 25 million tons coarse grain.

Of the total CIS grain production, the Russian Federation accounts for 55 percent, Ukraine 24 percent and Kazakhstan 13 percent. While Kazakhstan and Ukraine are reported to be self sufficient – Ukraine even exports grain to Russia – the Russian Federation represents some 70 to 80 percent of all import demands. Average yields per hectare in Ukraine can be compared with European standards. They are approximately twice the production yields attained in Russia and three times the productivity level in Kazakhstan.

Losses in agricultural products are reported to be high in the CIS. For grains, the losses have been estimated at 30 to 40 million tons, about 20 percent of the harvest, compared to about 2 percent in the United States. These losses occurred mainly during transport and storage. It is also estimated that the CIS could already approach self sufficiency if it were not for losses experienced in production, transportation, storage, and utilization.

*Demand Perspectives.* Per capita consumption of cereal products, mainly wheat, is anticipated to decrease as prices rise to cover a reduction in subsidies, and as general welfare improves in the longer term; the estimated income elasticity for cereal is -0.5. This is comparable to the level calculated for development in the Netherlands between 1958 and 1980. Total human consumption in 2000 is, therefore, anticipated to be some 90 to 95 percent of 1988 levels.

Demand for livestock feed grain will rise. Total feed consumption in million tons oats units is expected to rise from 445 in 1988 to 490 in 1995 and 540 in 2000. This means that the demand in 2000 will be about 120 percent of the 1988 demand (exhibit B-8).

Exhibit B.8 Projected Grain Demand in Year 2000 (million tons)			
	Wheat	Coarse Grains	Total
Seed	11	13	24
Industrial use	1	4	5
Food	34	7	41
Feed	50	104	154
Waste	10	11	21
Total	106	139	245

Source: EBRD *Rail Sector Survey* and *Waterborne Transport Sector Survey*.

*Supply Perspectives.* A number of negative factors are relevant in consideration of potential supply levels for the future: (a) many financially non-viable farms; (b) restructuring of production units; (c) declining soil fertility, especially in Ukraine; (d) inefficient transportation and distribution; and (e) decreasing acreage for grain production.

Conversely, a number of positive factors could substantially reduce the losses: (a) efficiency gains in harvesting and transport; (b) high potential increase shifting from wheat area to coarse grains; and (c) higher potential yields/productivity from agro-industrial restructuring.

Only very modest or no increase in total feed production is expected. Indeed, during the restructuring period over the first half of the 1990s, stagnation or further decrease is foreseen. Production levels fell sharply in 1991 in Russia and Ukraine. From 1995 onwards, after accounting for significant crop storage and distribution losses, it is anticipated that production and actual marketplace supply will recover and then pick up slowly. Assuming no shift from wheat to coarse grains within the growing areas, the total supply in 2000 is estimated to be in the order of some 210 to 220 million tons, 100 to 110 percent of late 1980s levels. Variations within these figures may still be caused by climatic circumstances and in specific local and/or regional circumstances.

Overall agricultural production will likely recover from its downturn in the last years of this century, and will show accelerating production improvements in the first decade of the 21st century. The best estimate at present is that the CIS as a whole will not become a net grain exporter before 2005. The regional picture may differ, for example, in Ukraine and Kazakhstan, where surpluses may occur in overall crop production and supply (Ukraine) or in production and supply of specific types of grains (spring wheat from Kazakhstan), which could be traded with surrounding deficit areas.

The grain import demand in 2000 can therefore be estimated at 25 to 35 million tons, mainly consisting of coarse grain for animal feed. The World Bank, however, predicts a more rapid reduction of the grain imports if the CIS

economies succeed in reducing excess livestock production.<sup>1</sup>

*Ports.* The main ports for grain entry have been the Baltic Sea Ports (handling between 40 to 50 percent of imports during the mid to late-1980s) and the Black Sea Ports (handling also between 45 to 50 percent of imports over the same period). Clearly, a shift from grain importing to exporting could, over time, result in a shift to the Black Sea Ports since they are closer to the grain production areas. The distribution of grain cargo throughputs (wheat and flour and coarse grains) in the various regional port basins in 1990 is presented in exhibit B-9.

*Inland Water Transport.* The volume of grains moved by inland water transport, including grain products and mixed feeds, has fluctuated between 6.7 and 7.4 million tons during 1980 to 1990. These cargo flows appear to be quite stable. The volume of grains handled within the cabotage trades has varied more significantly, from 0.58 million tons in 1980 to 1.61 million and 0.72 million tons in 1985 and 1990, respectively. The overall share of inland water transport and

Exhibit B.9 Grain Imports to the CIS, 1990

Basin	million tons
Northern	0.5
Baltic	14.4
Black Sea/Danube	15.6
Far East	3.4
Total grain throughput	39.5 <sup>a</sup>

a. includes some double handling of imports in cabotage trades

Source: EBRD *Rail Sector Survey* and *Waterborne Transport Sector Survey*.

cabotage in the distribution of grain and milled products was approximately 2.3 percent (based on total tonnages) in 1988/89.

*Minerals and Building Materials.* These include cement, bricks and stone, sand and gravel. These commodities (particularly sand and gravel) represent very large tonnage on rail, water and truck. Activity will primarily be affected by the level of fixed capital investment in the residential, commercial and industrial construction industries. Demand is likely to grow substantially as the economy recovers. These commodities represent a major proportion of inland water transport flows and the activities of the river shipping companies have been dominated by extraction of sand, gravel and aggregate from river beds and adjacent quarries, together with the transport and supply of these materials over their local regions.

Demand for sand, gravel and aggregate is concentrated on the construction industries and roadbuilding. The relative scarcity of available material, particularly for high impact resistance aggregate for concrete, ballast and road surfacing, has meant that transport distances are often relatively long. For example, sand and aggregate is required for construction works to support oil and gas exploration, production and accommodation in Siberia, with the main supply sites of suitable material over 1400 km to the north west (by sea and river vessel) and west (by rail).

Cement production in Russia reached 85 million tons in 1989, dropping to 77 million tons in 1991. Production is dispersed across the country to serve local markets and large quantities are also produced as a byproduct of metal processing. Major producers are at Novorossiysk, Belgorod, Stariy Oskel, Samono, in the Urals and at Spassk-Dalnyi in the Far East.

Cement output is concentrated at a number of major production sites. Much is based on production from slag, as a byproduct of the steel industry. The largest limestone based cement plants are located around Novorossiysk and the port has been used for exports of up to 1.4 million tons, but exported just 0.4 million tons in 1990. Very little cement is moved by inland waterway: 1.3 million tons in 1990 and a peak of 2.2 million

tons in 1980. Annual cement production in Ukraine is about 22 million tons and in Kazakhstan is some 8 million tons.

Future demand for these commodities will be primarily influenced by the level of capital investment activity in the commercial, industrial and domestic construction industries, including roadbuilding. Some further decline in demand is anticipated for the coming three to five years, but then will grow as the economy recovers. During the economic recovery period the elasticity of demand for building product transport will remain stable, later falling by as much as 15 percent. The experience of the Netherlands, where sand, gravel, clay and slags represent a rather stable 50 to 60 percent of waterway traffic, is for traffic to follow GDP developments closely, but slowly.

The CIS can expect overall long-term growth in commodity and transport demand. However, the role of inland waterways for transport may be influenced by environmental considerations, to the extent that riverbed dredging may be restricted or very strictly controlled. The process of privatization may see river companies separating activities such as extraction of sand and gravel from transport and river port functions. A readjustment may then occur in terms of pricing and distribution according to supply contracts. Whether this will lead to a relative increase of efficiency and a reduction in overall movement demand is difficult to predict. Experience elsewhere indicates that movement distances may decline as smaller waterside terminals linked by road access are established to serve more localized demands.

*Timber.* Russia is the world's largest producer of wood products. Almost all of the resource is located in the Far East, East and West Siberia, northwest, and Urals regions. Negligible amounts are produced in Ukraine, Belarus and Kazakhstan. Production has traditionally been dominated by roundwood and sawn timber, although production of plywood, chemical pulp and paper products is increasing as a proportion of the total. The largest production is from the north west. East Siberia has the largest timber resources and its production has increased significantly in the last decade. Production declined sharply in 1991 but should

recover in line with the construction sector and overall GNP. The timber sector should do relatively well because of anticipated domestic and foreign demand.

Traditionally, the main flows have been from north to south in the western part of Russia, to the northern ports for export, and from eastern Siberia to the Pacific ports. Rail task should grow slowly as hauls lengthen. Timber is also a significant inland water transport flow. It represents one of the main export cargoes carried by river-sea vessels from inland river ports and is a major export item in the Baltic ports and the Far East.

The CIS remains a major producer and exporter of timber and forest products. Some 15 million tons of roundwood and sawn wood was exported in the peak year of 1988, together with 1.1 million tons of paper and cardboard. Other exported forest products include woodchips, plywood and paper pulp. Exports of most products, particularly paper and cardboard products, have declined in recent years, from the 1988 peak to 0.85 million tons in 1990 (exhibit B-10).

Most forestry resources are located in the Far East and in Siberia. The northwest and Urals also have significant forestry areas and the northwest has also been the center for production of plywood, pulp and paper products. Ukraine and Kazakhstan have negligible production levels and rely on Russian production and limited imports.

Production levels declined in 1990 and again, sharply, in 1991. However, the outlook for the sector is for recovery and relative growth for domestic and export markets. GDP based elasticities for timber and wood products for comparable per capita income levels are in the order of 0.68 and for printing paper and newsprint between 0.7 and 0.9.<sup>2</sup> However, supply availability may be restricted in the medium term because of overcutting in the northwest and the Far East are expected to result in production limitations and to force a change in output and products, with more processing and value added to timber and paper goods.

Exhibit B.10 Forest Products Trade, 1988

Baltic/White Seas	million tons
Saw/veneer logs	0.81
Pulpwood	3.95
Sawn wood	2.54
Wood chips	0.04
Wood pulp	0.22
Paper/paperboard	0.05
Total	7.52
.....	
Pacific	
Saw/veneer logs	4.98
Pulpwood	1.38
Sawn wood	0.34
Wood chips	0.31
Wood pulp	0.10
Total	7.11
.....	
Black Sea	
Pulp wood	0.34
Sawn wood	0.85
Wood pulp	0.26
Newsprint	0.17
Paper/paperboard	0.33
Total	1.95

Source: Fearnly, *Demand for Forest Product Carriers*, 1991

It should be noted that timber traffic does not always fully appear within port statistics. Much of the timber volume floated in rafts rather than was carried on vessels. The Ministry of Forestry also controls its own river and seaport terminals which are separate from the areas controlled by the river and seaport authorities. The most notable of these terminals is in St. Petersburg and handles both domestic and international timber traffic.

Inland water transport volumes are expected to fall further in line with the decline in the domestic construction and paper industries to the mid-1990s and may not recover beyond the 50.7 million tons moved in 1990, even by the end of the planning horizon.

Timber as a construction material also enters the cabotage trades in the Far East, particularly Sakhalin and Kamchatka, but levels have declined steadily from 1.5 million tons in 1980 to 1.0 million tons in 1990. However, cargo requirements appear quite steady and future levels are anticipated at around 1.0 million tons annually.

*Fertilizers.* Major apatite (phosphate) deposits are located on the Kola peninsula: 5.5 million tons a year are shipped to plants in European Russia and 2 million tons a year are exported through Murmansk. There is a large superplant at Voskresensk which also produces ground rock, as do Shchigry and Kingisepp. Domestic demand will reduce and production levels will thus depend on export demand. New reserves are being explored in Khabarovsk, Kusva in Ekaterinburg, Zima in Irkutsk and Ulan Ude. Major super plants in Ukraine are located at Konstantinovka, Gorlovka, Sumy and Vinnitsa. Besides the Kola peninsula, another source is Karatsu in Kazakhstan.

The FSU was the world's largest producer of nitrogenous fertilizers, with the main production at Novgorod, Shchekino, Novomoskovsk, Cherepovets, Togliatti, Nevinnomysk and Berezniki. A new fertilizer plant at Rossosh, Chernozem supplies fertilizer to Chernozem, North Caucasus and the Volga. Recent production expansion is tied to commodity exchanges and the future will depend on continued demand from Central Europe.

The FSU produced over 30 percent of the world's potash (11 million tons) in 1988, primarily in Solikamsk-Berezniki – now declining because of competition from Belarus – and Kalush-Strebnik. Potash is primarily produced for export.

*Containers and Unitized Cargoes.* Unitization of cargoes in the CIS is at a relatively low level. Of

403.4 million tons of cargo passing through CIS ports in 1990, only 38 million tons was moved by container or RoRo vessel. Of this, 8 million tons was by container and 30 million tons by RoRo ferry. The majority of the RoRo trades are concentrated on the cabotage routes in the Far East to Sakhalin Island (11.7 million tons).

Other RoRo ferry trades are concentrated at Ilichevsk (the rail ferry service to Bulgaria, with some 5.2 million tons in 1990); and on the Caspian Sea, where rail RoRo ferry services to and from Baku and Krasnovodsk, combined handled 5.3 million tons in 1990. The Bulgarian rail ferry service continues today, but Baku services have been interrupted or halted. Some RoRo traffic moves to and from the Baltic region (trailers and block stowed cargoes, not rail wagons) through St. Petersburg, but very little deep sea trade is moved by RoRo mode.

Also in the Far East Seabee or LASH type barge carrying operations are conducted, including a nuclear powered barge carrier vessel. These services do not provide full unitization, and the benefit of the operation is primarily to provide access to remote areas without full port facilities.

Of the ports handling containers, only Ilichevsk and Vostochniy have cargo volumes exceeding one million tons annually. Vostochniy is significant because of the connection with the Trans Siberian Landbridge. St. Petersburg is also a major container handling port moving 0.9 million tons of containerized cargo in 1990. In all cases, the main direction of cargoes is for imports. The development of further unitization of cargoes, particularly containers, is dependent on trade levels for general cargo commodity groups as a whole and not for any single commodity.

#### Notes

1. World Bank Commission for Technical Cooperation with the World Bank. *Review of Food Policy Options and Agricultural Sector Reforms*. Working Draft, 20 March 1992.
2. International Timber Trade Federation.

## *Annex C*

### *Derivation of Estimates of Physical Consumption of Energy in the Russian Transport Sector*

#### *Derivation of Oil Energy Consumption by the Rail Sector*

Based on actual monthly and annual energy consumption figures for all Russian railways in 1990, excluding the Kaliningrad division of the Baltic railway and the Sakhalin's narrow gauge railway, oil consumption was derived based on the ratio of transport ton-km to actual consumption for the first five months of 1990 as compared to transport ton-km (tkm) for the same months in 1992. The five month total for 1992 was annualized, and that the 19 percent decline in the rail freight task registered in the first five months of 1992 as compared to the same period in 1990 would be indicative of the year as a whole.

#### *Derivation of Electric Energy Consumption by the Rail Sector*

Rail's share of actual electricity consumption in figures for the entire transport sector for 1990 was 45.2 percent. It was assumed that rail's share of transport's 1992 electric energy consumption remained about the same, because most of rail's electric consumption is associated with passenger service, which had not fallen to the same extent as freight transport demand.

#### *Derivation of Oil Energy Consumption by the Air Transport Sector*

For international flights, the estimate is based on fuel consumption characteristics of Russian

aircraft by type, per hour of flight, and the total hours flown in international service since 1991. It is further assumed the hours flown by each type of aircraft is proportional to the number of that type of aircraft to the total aircraft in the international fleet. The result yielded an average of 6.2 tons fuel per flight hours; the total fuel consumed for the international aviation sector was estimated to be 1.34 million tons in 1991.

The fuel consumption of the domestic fleet was estimated by assuming that the ratio of available seat kilometers (ASK) to hours flown by the international sector would also prevail in the domestic airline sector:

<u>ASK (million)</u>	=	<u>22,558.2(sched) + 2,495.4 (chartered)</u>
Total hours		216,915
	=	115,499 ASK/hr
Total Domestic	=	1,363,000 hours flown by domestic aircraft
Seat kilometers		@ 115,499 ASK/hr
@ 6.2 tons fuel/hr	=	8.5 million tons fuel consumed in 1991 by domestic aircraft
Total estimated fuel consumed by the air sector in 1991		
		= 9.8 million tons
Estimated 1992 fuel consumption, 80 percent of 1991 levels		
		= 7.8 million tons

Exhibit C.1 Estimated Aircraft Fuel Consumption

Aeroflot's International Fleet	Number of Aircraft	Percent of Fleet	Total Hours <sup>a</sup> by Type of Aircraft	Tons/hr in Fuel Consumption <sup>b</sup>	Annual Fuel Consumption (million tons)
IL-62M	28	27	58,567	9.0	.53
IL-86	19	18	39,045	10.6	.07
TU-154M	23	22	47,721	5.4	.26
TU-154 B	4	4	8,677	6.2	.05
TU-154 C	3	3	6,507	5.4	.04
TU-134A-3	8	8	17,353	2.0	.04
IL-76	19	18	39,045	9.0	.35
Total					1.34

a. Based on total hours flown by Aeroflot International which was 216,915 in 1991, including 180,487 in scheduled service and 36,428 in chartered service.

b. EBRD-financed Aviation Sector Study, Aerodevco, Appendixes M-S, volume 2.  
Source: *Aeroflot Annual Report, 1991*.

### Derivation of Fuel Consumption by the Road Transport Sector

#### Fuel consumption by vehicle type:

avg. medium-sized truck (diesel) 0.36 liters/km  
(average load factor 0.45)

avg. medium-sized truck (gasoline) 0.43 liters/km  
(average load factor 0.45)

heavy truck (diesel) 0.63 liters/km  
(average load factor 0.6)

heavy truck (gasoline) 0.76 liters/km  
(average load factor 0.6)

car (gasoline) 0.095 liters/km

Intercity buses have been grouped with medium trucks since they represent a very small percentage of total traffic; separate fuel consumption figures for these particular buses are not available.

#### Federal roads:

length of federal road network: 39,000 km

Average traffic: 4,500 vehicles per day (vpd)

Medium trucks: 2,250 vpd (60%) x length of network  
= 87.75 million veh-km/day

Heavy trucks: 900 vpd (20%) x length of network  
= 35.1 million veh-km/day

Cars: 1,350 vpd (20%) x length of network  
= 52.65 million veh-km/day

#### Diesel consumption on federal roads

Consumption of medium truck on assumption 45 percent diesel engines<sup>1</sup>:

$$87.75 \times 0.45 \times 0.36 \times 365 = 5,190 \text{ m liters diesel/yr}$$

Consumption of heavy trucks on assumption 60 percent diesel engines<sup>2</sup>:

$$35.1 \times 0.6 \times 0.63 \times 365 = 4,840 \text{ m liters diesel/yr}$$

Total diesel consumption, federal roads

$$= 5,190 + 4,840 = 10,032 \text{ m liters/yr}$$

## Gasoline consumption on federal roads

Consumption of medium truck on assumption 45 percent gasoline engines:

$$87.75 \times 0.45 \times 0.43 \times 365 \\ = 6,200 \text{ m liters gasoline/yr}$$

Consumption of heavy truck on assumption 40 percent gasoline engines:

$$35.1 \times 0.4 \times 0.76 \times 365 \\ = 3,895 \text{ m liters gasoline/yr}$$

Consumption of cars:

$$52.65 \times 0.095 \times 365 \\ = 1,825 \text{ m liters gasoline/yr}$$

Total gasoline consumption, federal roads

$$= 6,200 + 3,895 + 1,825 \\ = 11,920 \text{ m liters/yr}$$

## Regional roads:

length of regional road network: 414,000 km

Average traffic: 1,050 vpd

Medium trucks: 690 vpd (66%) x 414,000  
= 285.7 million veh-km/day

Heavy trucks: 75 vpd (7%) x 414,000  
= 31.05 million veh-km/day

Cars: 285 vpd (27%) x 414,000  
= 118 million veh-km/day

## Diesel consumption on regional roads

Consumption of medium truck on assumption 45 percent diesel engines:

$$285.7 \times 0.45 \times 0.36 \times 365 \\ = 16,890 \text{ m liters diesel/yr}$$

Consumption of heavy trucks on assumption 60 percent diesel engines:

$$31.05 \times 0.5 \times 0.63 \times 365 \\ = 3,570 \text{ m liters diesel/yr}$$

Total diesel consumption, regional roads  
= 16,890 + 3,570  
= 20,460 m liters/yr

## Gasoline consumption on regional roads

Consumption of medium truck on assumption 45 percent gasoline engines:

$$285.7 \times 0.45 \times 0.43 \times 365 \\ = 20,180 \text{ m liters gasoline/yr}$$

Consumption of heavy truck on assumption 40 percent gasoline engines:

$$31.05 \times 0.5 \times 0.76 \times 365 \\ = 4,305 \text{ m liters gasoline/yr}$$

Consumption of cars:

$$118 \times 0.095 \times 365 \\ = 4,090 \text{ m liters gasoline/yr}$$

Total gasoline consumption, regional roads:

$$20,180 + 4,305 + 4,090 \\ = 28,575 \text{ m liters/yr}$$

## Enterprise roads:

length of enterprise road network: 450,000 km

Average traffic: 50 vpd (Bank estimate)

Medium trucks: 45 vpd (90%) x 450,000  
= 20.25 million veh-km/day

Cars: 5 vpd (5%) x 450,000  
= 2.25 million veh-km/day

## Diesel consumption, enterprise roads

Consumption of medium truck on assumption 45 percent diesel engines:

$$20.25 \times 0.45 \times 0.36 \times 365 \\ = 1,200 \text{ m liters diesel/yr}$$

## Gasoline consumption, enterprise roads

Consumption of medium truck on assumption 45 percent gasoline engines:

$$20.25 \times 0.45 \times 0.43 \times 365 \\ = 1,430 \text{ m liters gasoline/yr}$$

Consumption of cars:

$$2.25 \times 0.095 \times 365 \\ = 78 \text{ m liters gasoline/yr}$$

Total gasoline consumption, enterprise roads:

$$= 1,430 + 78 = 1,508 \text{ m liters/yr}$$

Total consumption of gasoline on inter-urban roads:

$$11,920 + 28,575 + 1,508 \\ = 42,000 \text{ m liters/yr} \\ \text{OR} \quad 35 \text{ m tons/yr}$$

Total consumption of diesel on inter-urban roads:

$$= 10,032 + 20,460 + 1,200 \\ = 31,692 \text{ m liters/yr} \\ \text{OR} \quad 26 \text{ m tons/yr}$$

Total direct consumption of natural gas by transport  
= 1.72 b cu m/yr

### ***Derivation of Fuel Consumption by the Urban/Suburban Bus Transport Sector***

#### **Diesel-powered fuel consumption**

Buses which run on diesel fuel include the IKARUS-280, the IKARUS-260, and the LIAZ-5256. The total number of these buses servicing urban and suburban routes in Russia is 8,700. The standard consumption of diesel fuel per 100 km for the IKARUS-280 is 42 liters, and 38 liters for the IKARUS-260. The average kilometrage per day per bus is 217 km. Average bus fleet availability is 78 percent. Annual diesel fuel consumption using this information amounts to 0.2 million tons, assuming 365 days per year operations.

#### **Gasoline-powered fuel consumption**

Buses which run on gasoline include the LIAZ-677, the PAZ-672, and the PAZ-3205. The total number of these buses servicing urban and suburban routes in Russia is 113,000. The standard consumption of diesel fuel per 100 km is 54 liters. The average kilometrage per day per bus is 157 km. Average bus fleet availability is 76 percent. Annual gasoline consumption using this information amounts to 2.0 million tons assuming 365 days per year operations.

### ***Derivation of Fuel Consumption by the Waterborne Transport Sector***

The Russian Federation's merchant fleet presently comprises 1,433 vessels of 300 or more grt/gt, with a combined carrying capacity of 13.6 million dwt. In addition, 350 to 400 smaller vessels of less than 300 grt/gt trade in national waters only. The inland waterways fleet includes about 9,000 units with individual carrying capacities between 200 and 1,000 dwt.

The majority of ocean-going deep sea and cabotage vessels use 180 centistoke bunker oil for propulsion and diesel oil to drive auxiliary equipment on board. The daily rate of bunker consumption per vessel depends on the type of engine (turbines, high, medium, or slow-speed diesels) and the operating speed. The differences in consumption patterns can be substantial, as

shown below for vessels typically employed by Russian carriers.

#### ***General Cargo Ship of 15,200 dwt***

*Daily Fuel Consumption (low-speed diesel engines):*

at 15 knots average speed - 25 t bunker and 1.5 t diesel

at 13 knots average speed - 19 t bunker and 1.5 t diesel

at 8 knots average speed - 8 t bunker and 1.5 t diesel

#### ***Multi-Purpose Carrier of 22,400 dwt***

*Daily Fuel Consumption (medium-speed diesel engines):*

at 15 knots average speed - 23 t bunker and 2.5 t diesel

at 10 knots average speed - 10 t bunker and 2.5 t diesel

#### ***Dry Bulk Vessel of 65,000 dwt***

*Daily Fuel Consumption (low-speed diesel engines):*

at 15 knots average speed - 35 t bunker and 2.5 t diesel

at 12 knots average speed - 18 t bunker and 2.5 t diesel

#### ***Tankers of 80,000 dwt***

*Daily Fuel Consumption (low-speed diesel engines):*

at 15 knots average speed - 60 t bunker and 2.0 t diesel

at 12 knots average speed - 35 t bunker and 2.0 t diesel

#### ***Log Carrier of 2,400 dwt***

*Daily Fuel Consumption (medium-speed diesel engines):*

at 11 knots average speed - 26 t bunker and 1.5 t diesel

**RoRo Vessel (Shortsea Ferry) of 2,500 dwt****Daily Fuel Consumption (medium-speed diesel engines):**

at 15 knots average speed - 35 t bunker and 2.0 t diesel

**Container Ship of 25,000 dwt or 1,282 TEU carrying capacity****Daily Fuel Consumption (slow-speed diesel engines):**

at 18 knots average speed - 45 t bunker and 4.0 t diesel

at 15 knots average speed - 32 t bunker and 4.0 t diesel

It is estimated that 75 percent of all vessels that are operated within the Federation's inland waterway systems use standard-grade diesel oil for propulsion, and that the remaining 25 percent can operate with bunker fuel. Furthermore, it is assumed that they are equipped with medium-speed diesel engines. Their average operating speed is about five knots. The daily fuel consumption is estimated to be of the order of nine tons in the case of diesel oil (7.5 tons for propulsion, and 1.5 tons for auxiliary equipment), and 11 tons in the case of bunker fuel.

Considering Russia's merchant fleet of vessels in excess of 300 grt/gt, 36.2 percent of all registered vessels have a carrying capacity of less than 10,000 dwt; 44.4 percent of the fleet ranges between 10,000 and 50,000 dwt; 10.8 percent between 50,000 and 100,000 dwt; only 8.6 percent of the fleet is composed of tankers and combination carriers that exceed 100,000 dwt in their individual carrying capacity. With this fleet composition, it is assumed that the average daily fuel consumption per vessel is 30 tons of bunker fuel and 2.0 t of diesel oil.

Furthermore, it is assumed that Russian ocean-going ships are actually sailing 60 percent of the time during each year, that they are 30 percent of the time in ports, and that they are 10 percent of the time out of commission because of repairs, overhauls. Such scenario implies that each ship in the fleet consumes  $(365 \times 0.6) \times 30 =$

6,570 tons of bunker fuel per year, and 600 tons of diesel oil, including 438 tons while sailing and 162 tons while using auxiliary equipment during port calls. Consequently, the entire maritime fleet of vessels above 300 grt/gt consumes 9.42 million million tons of bunker fuel  $(1,433 \times 6,570)$  and 860,000 tons of diesel oil  $(1,433 \times 600)$ .

As regards inland waterway transport, it is assumed that presently only 65 percent of the current fleet is actually employed, and that the active vessels sail half of the year, while spending 40 percent of the time being loaded, unloaded or waiting for cargo, and 10 percent out of commission for repair and overhauls. It is estimated that of the 5,850  $(9,000 \times 0.65)$  employed vessels, 4,390 units are propelled with diesel oil, and 1,460 are propelled with bunker fuel. By implication, the annual diesel oil consumption within the inland waterway transport sector is 7.2 million tons  $[(365 \times 0.5) \times 9] \times 4,390$  plus 400,000 tons  $[(365 \times 0.5) \times 1.5] \times 1,460$  to account for the operation of auxiliary equipment on vessels that are propelled with bunker fuel. The latter category is estimated to consume 2.93 million tons  $[(365 \times 0.5) \times 11] \times 1.460$  of bunker fuel per year.

The smaller sea-going vessels of less than 300 grt/gt, all of which are involved in the cabotage trades) are each estimated to consume annually about 1,752 tons  $(365 \times 0.6) \times 8$  of bunker fuel, and 233 tons  $(365 \times 0.85) \times 0.75$  of diesel oil. Assuming 375 vessels in this category, the annual fuel consumption of this fleet segment is estimated to be of the order of 657,000 tons of bunker fuel, and 87,400 tons of diesel oil.

**In sum, the annual fuel consumption of Russia's waterborne transport industry is estimated to amount to about 13 million tons  $(9.42 + 0.66 + 2.93)$  of bunker fuel, and 8.55 million tons  $(0.86 + 0.09 + 7.2 + 0.4)$  of diesel oil.** The international market price, in February 1993, for bunker fuel was US\$80.00/ton, and for diesel oil US\$165.00/ton. Thus the present annual fuel cost – at international market prices – of operating Russia's waterborne carriers is estimated to be:

- in ocean transport: US\$806 million for bunker fuel, and US\$156 million for diesel oil;

- in inland waterways transport: US\$234 million for bunker fuel, and US\$1,254 million for diesel oil.

The total estimated annual fuel bill for the operation of Russia's water transport carriers is therefore currently on the order of US\$2.45 billion.

According to information provided on April 19, 1993 by Vladimir Bortsov, the Maritime Attache at the Russian Embassy in Washington, all fuel subsidies to national water transport operators have been discontinued except for the cabotage sector. It is estimated that about 1.5 million tons

of bunker fuel and 200,000 tons of diesel oil are made available in this context at about half of the current prices in the world market. This would imply subsidies on the order of US\$80 million, equivalent.

*Notes*

1. Medium trucks: 45 percent diesel, 45 percent gasoline, 10 percent gas.
2. Heavy truck 60 percent diesel, 40 percent gasoline

## *Annex D*

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### *Compilation of Privatization Acts in the Transport Sector of the Russian Federation*

MINISTRY OF TRANSPORT OF THE RUSSIAN FEDERATION

Moscow 1992

COMPILATION OF PRIVATIZATION ACTS IN THE TRANSPORT SECTOR OF THE RUSSIAN FEDERATION

This publication contains normative acts on privatization of enterprises of the transport and roads complex of the Russian Federation, which were prepared by the Ministry of Transport of the Russian Federation and approved by the State Committee on Management of State Property of the Russian Federation in the third quarter of 1992.

This publication is intended for senior personnel and experts of management bodies and enterprise managers of all types of transport and roads complex, staff of the Soviets of peoples deputies and regional executive branch structures, peoples deputies of Russia, professors of higher and secondary educational institutions, engaged in training specialists in the field of transport and roads complex, engineering and technical personnel of enterprises and organizations of the transport and roads complex.

STATE COMMITTEE OF THE RUSSIAN FEDERATION  
ON MANAGEMENT OF STATE PROPERTY

O R D E R

N 444 - r

16 September 1992

On the specific features of aviation,  
maritime, river, automobile transport and  
roads complex enterprises transformation into  
joint-stock enterprises and their privatization

In accordance with the State Program of Privatization of State and Municipal Enterprises in the Russian Federation for 1992, the Decree of the President of the Russian Federation of 1 July 1992 No. 721 "On Organizational Measures for Transformation of State Enterprises, Voluntary Associations of State Enterprises into Joint-Stock Companies", with the purpose of guaranteeing safe and stable functioning of aviation, maritime, river automobile transport and roads complex, establishing conditions for acceleration of privatization of enterprises of these types of transport, account taken of their industry specifics, it is hereby ordered:

1. Privatization plans, property value estimates and charters of joint-stock companies, established on the basis of enterprises (or their units) of aviation, maritime and river transport, as well as enterprises (or their units) of automobile general use transport and roads complex, which contain units subject to mobilization, or enterprises which have a dominating position on the federal or local markets of goods, activities and services, are presented by commissions on privatization of these enterprises for approval directly to the State Committee of the Russian Federation on Management of State Property and in a copy - to the Ministry of Transport of the Russian Federation.

The Ministry of Transport of the Russian Federation examines these documents within a 7 day period, prepares and submits a motivated opinion (conclusions) on them to the State Committee of the Russian Federation on Management of State Property.

2. In case of transformation of enterprises (or their units) of aviation, maritime, river automobile transport and roads complex, specified in Annexes 1 - 5 to this Order, into unlimited responsibility joint-stock companies, typical additional conditions, reflecting transport and roads complex specifics and the procedures for government executive bodies participation in joint-stock companies management, adopted jointly by the Ministry of transport of Russia and State Committee of the Russian Federation on Management of State Property, are included on a mandatory basis into the Charters of such companies.

If necessary, on the request of the Ministry of Transport of Russia the State Committee of the Russian Federation on Management of State Property places controlling block of shares of the mentioned joint-stock companies in state property.

3. Privatization of enterprises, specified in Annexes 1 - 5 to this Order, is carried out only through the sale of these enterprises at a contest (in accordance with the State Program of Privatization of State and Municipal Enterprises in the Russian Federation for 1992) either by blocks of shares of joint-stock companies, established on their basis, containing no less than 5 percent of their authorized capital. Contest terms and conditions include buyer's obligations to provide transportation services for the state purposes in the interests of the Russian passengers, shippers and consignees within the limit of 60 percent of the total volume of freight, as well as to carry out mobilization tasks.

In case of privatization of aircraft repair facilities and ship repair yards 25.5 percent of their shares are placed by the State Committee of the Russian Federation on Management of State Property into authorized capitals of the aviation and maritime companies, serviced by these enterprises, proportionately to the quantity (tonnage, power) of air, marine and river craft, repaired at the mentioned facilities.

4. Taking into account strategic interests of the Russian Federation auctioning of aviation, maritime and river ports, roads complex facilities are carried out subject to special conditions.

When these enterprises are put for auction ports are excluded as independent enterprises.

Transformation of the mentioned enterprises into joint-stock companies without exclusion of the ports is allowed upon request of the Ministry of Transport of Russia.

The State Committee of the Russian Federation on Management of State Property and the Ministry of Transport of Russia within a two week period develop terms of privatization of these sites, including principles of enterprises division.

5. In a period of time when controlling blocks of shares of joint-stock enterprises, established on the basis of transport and roads complex enterprises, are placed in state property, appointment by the State Committee on Management of State Property of its representatives on the Boards of Directors of the mentioned joint-stock companies takes place upon request of the Ministry of Transport of Russia.

6. Enterprises and units of public aviation, maritime, river, automobile transport and of roads complex, listed in Annex 6 to this Order, are not subject to privatization, including transformation into unlimited responsibility joint-stock enterprises (are not included in the authorized fund and excluded from the enterprises property list).

7. Auctioning and privatization of transport enterprises and units, 25 percent or more of the activity of which is foreign economic activity and of enterprises, which dominate the relevant transportation services market, is carried out subject to terms and conditions, developed and adopted by the State Committee of the Russian Federation on Management of State Property with the participation of the Ministry of Transport of Russia and the State Committee of the Russian Federation on Anti-Monopoly Policy and Support of New Economic Structures before 15 October 1992.

8. While putting organizational and legal form of concerns, corporations and other associations of aviation transport enterprises in accordance with existing legislation by way of their transformation into unlimited responsibility joint-stock companies, aircraft of the first and second classes, on the balance of these associations as of 1 July 1992 and being used by enterprises on a cooperative basis, are included in the authorized capital of joint-stock companies, being established, as deposits of enterprises - founders, which are directly engaged in transportation.

CHAIRMAN

A.B.CHUBAIS

to the Order of the State Committee  
of the Russian Federation on  
Management of State Property  
of 16 October 1992 No. 444-r

R E G I S T E R

OF AVIATION TRANSPORT, SUBJECT TO TRANSFORMATION  
INTO UNLIMITED RESPONSIBILITY JOINT-STOCK ENTERPRISES,  
CHARTERS OF WHICH MUST ON A MANDATORY BASIS INCLUDE  
TYPICAL SUPPLEMENTARY PROVISIONS, ADOPTED JOINTLY  
BY THE STATE COMMITTEE OF THE RUSSIAN FEDERATION ON  
MANAGEMENT OF STATE PROPERTY AND THE MINISTRY  
OF TRANSPORT OF RUSSIA

1. Civil aviation producing associations.
2. Aviation companies, air-technical complexes.
3. Central international air service agency.
4. International commercial agency.
5. Central international agency.
6. Center of international settlement of accounts.
7. Aviation enterprises.
8. United aviation units.
9. Testing enterprises.
10. Aviation technical enterprises (complexes).
11. Technical maintenance and repair centers.
12. Air service agencies.
13. Aviation material and technical supplies enterprises.
14. Training centers.
15. Civil aviation aircraft repair and pilot plants.
16. Construction and assembly organizations of the Industrial  
Construction and Assembly Association "Aviastroy".
17. Scientific research, development and information enterprises  
and organizations, other than listed in Annex 6.

to the Order of the State Committee  
of the Russian Federation on  
Management of State Property  
of 16 October 1992 No. 444-r

## R E G I S T E R

OF MARINE TRANSPORT, SUBJECT TO TRANSFORMATION  
INTO UNLIMITED RESPONSIBILITY JOINT-STOCK ENTERPRISES,  
CHARTERS OF WHICH MUST ON A MANDATORY BASIS INCLUDE  
TYPICAL SUPPLEMENTARY PROVISIONS, ADOPTED JOINTLY  
BY THE STATE COMMITTEE OF THE RUSSIAN FEDERATION ON  
MANAGEMENT OF STATE PROPERTY AND THE MINISTRY  
OF TRANSPORT OF RUSSIA

ENTERPRISE SHIPPING COMPANIES	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
Northern	852.9	9,582
Murmansk	2,104.5	8,659
Baltic	1,847.5	14,643
Novorossiysk	1,825.7	9,702
Far Eastern	2,624.7	18,360
Primorsk	576.3	4,550
Kamchatka	370.0	4,244
Arctic	113.3	1,437
Sakhalin	629.1	6,054
SHIP REPAIR YARDS		
Ship repair yard "Red Farriery"	75.8	2,474
Murmansk	71.1	1,822
Novorossiysk	165.1	2,878
Tuapsinskiy		
named after Dzerzhinskiy	55.2	1,724
Vladivostok	30.5	1,310
Nakhodka	125.6	4,092
Slavyanskiy	223.2	2,981
Ship repair yard in the city of Sovetskaya Gavan	101.4	2,730

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ENTERPRISE SHIPPING COMPANIES	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
Layskiy	6.9	227
Rostov shipyard "Red Sailor"	4.4	278
<b>OTHER ENTERPRISES</b>		
Scientific research, development and information enterprises and organizations, listed in Annex 6.	84.0	3,233
Enterprises and organizations "Torgmortrans"	67.4	6,329
Specialized construction and construction assembly organizations on port, hydrotechnical, and underwater technical activity	131.4	3,694

to the Order of the State Committee  
of the Russian Federation on  
Management of State Property  
of 16 October 1992 No. 444-r

## R E G I S T E R

OF RIVER TRANSPORT, SUBJECT TO TRANSFORMATION  
INTO UNLIMITED RESPONSIBILITY JOINT-STOCK ENTERPRISES,  
CHARTERS OF WHICH MUST ON A MANDATORY BASIS INCLUDE  
TYPICAL SUPPLEMENTARY PROVISIONS, ADOPTED JOINTLY  
BY THE STATE COMMITTEE OF THE RUSSIAN FEDERATION ON  
MANAGEMENT OF STATE PROPERTY AND THE MINISTRY  
OF TRANSPORT OF RUSSIA

ENTERPRISE	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
"Volgotanker" Shipping company	975.1	14,161
Shipbuilding and repair plant named after the III International	40.6	1,452
Shipbuilding and repair plant named after 30 anniversary of October	23.75	980
Shipbuilding and repair plant named after Lenin	39.87	1,157
N/fleet repair and maintenance base named after Kuybyshev	24.47	442
Volga united river shipping company	2,645.10	42,710
Gorodetz ship repair and mechanic plant	41.21	1,619
Shipbuilding and ship repair plant named after the 40 anniversary of October	36.21	1,311
Toliatti ship repair and mechanic plant	24.46	1,087
Balakovskiy ship repair plant	35.28	674
Shipbuilding and ship repair plant named after Butyakov	31.81	1,030
Borskaya repair and maintenance fleet base	41.85	587

ENTERPRISE	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
Samarskaya repair and maintenance fleet base	15.7	557
Kriushinskaya repair and maintenance fleet base	53.43	739
Krasnoarmeyskiy ship repair plant	14.86	503
Volzhskaya repair and maintenance fleet base	18.0	532
Ship repair mechanic plant named after Uritskiy	19.5	740
Moscow river shipping company	714.9	14,502
Khlebnikovskiy machinery and ship repair plant	22.192	638
Belgorod shipbuilding and ship repair plant	13.0	780
Moscow shipbuilding and ship repair plant	36.0	1,405
Kama river shipping company	726.5	12,988
Chistopolskiy ship repair plant	23.4	904
Repair and maintenance fleet base in the memory of Dzerzhinskiy	29.9	944
Vyatka river shipping company	84.87	2,062
Repair and maintenance fleet base named after Stepan Khalturin	4.9	141
Belsk river shipping company	153.9	3,413
Volga - Don river shipping company	330.7	3,209
Aksayskaya repair and maintenance fleet base	7.1	214
Kalachevskiy shipbuilding and ship repair plant	25.74	950
Northern river shipping company	397.9	9,161
Limenskiy shipbuilding and ship repair plant	35,586	835
Veliko-Ustugskiy shipbuilding and ship repair plant	20,671	896

ENTERPRISE	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
Sukhonskoye river shipping company	105.6	2,754
North-Western river shipping company	1,269.9	16,730
Nevskiy shipbuilding and ship repair plant	39,826	2,500
Cherepovetskiy shipbuilding and ship repair plant	25,502	1,030
Leningradskaya repair and maintenance fleet base	20,252	560
Belomorsko-Onezhskoye shipping company	682.5	7,665
Petrozavodskaya repair and maintenance fleet base	19,319	722
Medvezhyegorskaya repair and maintenance fleet base	37,628	2,400
Pechora river shipping company	115.0	2,058
Pechora repair and maintenance fleet base	17.5	770
Western river shipping company	79.9	2,098
Ob-Irtysh river shipping company	1,014.1	11,563
Tyumen shipbuilding and ship repair company	35,007	1,045
Tobolskaya repair and maintenance fleet base	38,317	843
Irtysh river shipping company	494.5	9,221
Omskiy shipbuilding and ship repair plant named after 60 anniversary of October	44,446	1,514
Irtyshskaya repair and maintenance N/fleet base	23,473	978
Western Siberia river shipping company	611.1	11,731

ENTERPRISE	BALANCE CAPITAL ASSETS VALUE (millions of rubles)	AVERAGE NUMBER OF PERSONNEL
Samusskiy shipbuilding and ship repair plant	42.2	1,121
Yenisey river shipping company	697.5	11,409
Krasnoyarskiy ship repair plant	50.28	1,083
Krasnoyarskaya Shipyard	12.72	585
Podtesovskaya repair and maintenance fleet base	44.82	1,117
Lena united river shipping company	1,706.4	21,040
Kirenskaya repair and maintenance fleet base	156.6	1,974
Osetrovskaya repair and maintenance fleet base	146.2	1,307
Osetrovskaya shipyard	10.18	492
Alekseevskaya repair and maintenance fleet base	101.39	2,062
Paleduyskaya repair and maintenance fleet base	210.33	2,011
Zhatayskaya repair and maintenance fleet base	347.9	2,859
Eastern Siberia river shipping company	1,823	2,902
Irkutskaya repair and maintenance fleet base	22.39	527
Amur river shipping company	581.02	8,565
Khabarovskaya repair and maintenance fleet base	20.5	836
Kubanskoye river shipping company	73.9	1,627
"Teplokhod" plant	91,292	3,434
Saratov ship repair plant		
Shipbuilding and ship repair plant named after Uliyanov - Lenin		
Kashirskiy shipbuilding and ship repair plant		
Zhigalovskiy shipbuilding plant		

Expedition of special sea routes

Trade and worker supplies enterprises and units

River transport supply enterprises and units within "Snabrechflot"

R E G I S T E R

OF AUTOMOBILE TRANSPORT, SUBJECT TO TRANSFORMATION  
INTO UNLIMITED RESPONSIBILITY JOINT-STOCK ENTERPRISES,  
CHARTERS OF WHICH MUST ON A MANDATORY BASIS INCLUDE  
TYPICAL SUPPLEMENTARY PROVISIONS, ADOPTED JOINTLY  
BY THE STATE COMMITTEE OF THE RUSSIAN FEDERATION ON  
MANAGEMENT OF STATE PROPERTY AND THE MINISTRY  
OF TRANSPORT OF RUSSIA

Numbered automobile pools - automobile transport enterprises, having permanent mobilization tasks.

Automobile transport enterprises, which service municipal and suburban bus routes, except those listed in Annex 6.

Producing associations of automobile stations and passenger automobile stations in national-state, national and administrative-territorial entities of the Russian Federation

Material and technical supply and sale enterprises, comprising the "Autoresurs" association:

- Moscow territorial material and technical supply and marketing agency,
- Nizhny Novgorod territorial material and technical supply and marketing agency,
- Western Siberia territorial material and technical supply and marketing agency,
- Northern Caucasus territorial material and technical supply and marketing agency.

Scientific and scientific services organizations, design bureaus and information supply enterprises:

- State institute for designing automobile repair and automobile transport enterprises and buildings (Giproavtotrans),
- Center of scientific organization of labor and production management at automobile transport (Tzentroorgtrudavtotrans),
- Central design technological bureau on introduction of new equipment and scientific research at automobile transport (Tzentroavtoteks),
- State enterprise "Informavtotrans".
- Nizhegorodskoye complex transport service enterprise of the peoples enterprise "Nizhegorodavtotransobsluzhivaniye".

Annex 5  
to the Order of the State Committee  
of the Russian Federation on  
Management of State Property  
of 16 October 1992 No. 444-r

R E G I S T E R

OF ROADS COMPLEX ENTERPRISES, SUBJECT TO TRANSFORMATION  
INTO UNLIMITED RESPONSIBILITY JOINT-STOCK COMPANIES,  
CHARTERS OF WHICH MUST ON A MANDATORY BASIS INCLUDE  
TYPICAL SUPPLEMENTARY PROVISIONS, ADOPTED JOINTLY  
BY THE STATE COMMITTEE OF THE RUSSIAN FEDERATION ON  
MANAGEMENT OF STATE PROPERTY AND THE MINISTRY  
OF TRANSPORT OF RUSSIA

Design and industrial association for production of highly durable stone materials "Granite"

Automobile road construction trust No.1  
Automobile road construction trust No.2  
Automobile road construction trust No.3  
Automobile road construction trust No.4  
Trust "Sibdorstroy"  
Trust "Dorpromstroy"

Enterprises, comprising industrial association for production and repair of road vehicles and equipment "Remdormash"

Amur road vehicles and equipment plant  
Vologda road vehicles and equipment plant  
Irkutsk road vehicles and equipment plant  
Krasnodar pilot experimental plant  
Volgodon pilot experimental plant  
Kamyshlovskiy road vehicles and equipment plant  
Vyshnevolotskiy pilot experimental plant  
Verkhneufaleyskiy pilot experimental plant

"Rosdorindustria" enterprise, including:

Nalchinskoye карьер agency  
Yeletskiy pilot experimental plant of bridge and reinforced concrete assembly units  
Asbestovskoye карьер agency  
Obidimskiy road construction materials plant  
Kaluzhskoye construction and assembly agency  
Design and technological bureau

Enterprises, comprising scientific industrial association "Rosdormekhanizatsia"

Mytyshinskiy pilot experimental plant  
Yurginskiy road vehicles and equipment plant  
Mordovskiy road vehicles and equipment plant  
Novosibirskiy road vehicles and equipment plant  
Smolenskiy pilot experimental plant  
Tyumen road vehicles and equipment plant

State road design and scientific research institute "GiprodorNII", including:

Barnaul branch  
Voronezh branch  
Irkutsk branch

Moscow production system  
Nizhny Novgorod branch  
Novosibirsk branch  
Northern Caucasus branch  
Saint-Petersburg branch  
Saratov branch  
Ural branch  
Smolensk branch  
Khabarovsk branch.

Republican center of organization of labor and economic management methods in the road complex "Tzentroorgtrud DH", including:

Moscow production system,  
Krasnodar branch,  
Krasnoyarsk branch,  
Rostov branch.

Information center on automobile roads "Informautodor".

Annex 6  
to the Order of the State Committee  
of the Russian Federation on  
Management of State Property  
of 16 October 1992 No. 444-r

L I S T

OF ENTERPRISES AND FACILITIES OF  
AVIATION, MARINE, RIVER, AUTOMOBILE  
TRANSPORT AND ROAD COMPLEX, SUBJECT  
TO AUCTIONING AND PRIVATIZATION IN 1992

1. Systems and means of controlling the air traffic of airports and aviation enterprises, connected with the unified system of controlling the air traffic of the lower and higher air space, including:

The center of radiotechnical equipment and communications (Moscow)

The center of radiotechnical equipment and communications operation (Rostov-on-Don)

The center of radiotechnical equipment and communications operation (Krasnoyarsk)

The center of radiotechnical equipment and communications operation (Samara)

Aeronavigation information center (Moscow)

Moscow center of automated control over air traffic,

Northern Caucasus center of automated control over air traffic "Arrow" (Rostov-on-Don)

Tyumen regional enterprise for the usage of air space and air traffic control "Tyumenaeronavigatsia"

2. Independent civil aviation unit (Moscow)
3. Meteorological centers and flight testing stations, including Meteorological center of the "Sibavia" concern.
4. Satellite communication stations for marine transport.
5. Facilities and structures, included in the systems of controlling ship traffic (SCST).
6. Port facilities and structures, including:  
hyrotechnical structures, (БОЛНОЛОМЫ), fences, piers, channels, lighthouses, navigational signs; port surveillance inspections, their structures and facilities.
7. Nuclear-powered fleet and special purposes fleet, including:  
nuclear-powered icebreaker fleet,  
nuclear-powered transport ships,  
nuclear technological servicing ships;  
training and hydrographic fleet;

fleet to carry out rescue operations and to eliminate oil spills in the sea and in internal water routes, including:  
sea rescue tugboats  
ships to eliminate oil spills  
boom-positioning boats

roadstead fleet, including:  
flagship icebreakers  
port icebreakers.

8. Ship repair plant facilities: floating and dry docks 8.5 tonnes load and higher

9. Marine transport enterprises and organizations:

Main maritime rescue-coordination center (Moscow)

Main communication and satellite systems center (Moscow)

Electroradionavigation and satellite communication association "Morsvyazsputnik" (Moscow)

Main Register agency (St. Petersburg),  
Register inspections

Hydrographic facility (St. Petersburg),

hydrographic bases,

Repair technological enterprise "Atomflot" (Murmansk)

Main maritime accident prevention and rescue specialized service (Moscow)

basin accident prevention and rescue specialized agencies,

expedition accident prevention, rescue and underwater technical works units,

Maritime routes agency "Baltmorput",

Office of the Responsible Representative for the Saimenskiy Channel (Vyborg),

Rescue coordination centers and rescue subcenters.

10. River transport enterprises (or their units) and organizations:

Producing association "Rechsvyazinform" (Moscow),

Basin river transport communication and radionavigation agencies and other enterprises,

Main shipping safety inspection (Moscow),

Water routes and channels producing associations,

Podvodrehty units and enterprises.

11. Transport technological communications operational links, which contain main (cable and relay), regional and municipal communication units, used in shipping management networks.

12. General use automobile roads and organizations, responsible for their maintenance.  
"Kama-Granit" consortium, Pudozhskiy quarry

13. Civil defense and mobilization facilities, mobilization stocks, including:

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Material values of the second group  
Reserve command centers  
Civil defense protective facilities  
Separate specialized storage areas for storage of the second group material values

14. Buildings, structures, means of transport and communications, other assets and equipment available and used by the government services, responsible for technical and other shipping safety controls.
15. Fire-fighting and paramilitary units, their buildings and facilities.
16. Maritime, river ports, airports, transport junctions, other types of transport terminals land plots. Automobile roads shoulder sections. Maritime and river enterprises basins.
17. Engineering infrastructure (electrical, heating, water-supply, sewage networks) structures and facilities of enterprises and organizations of all types of transport and roads complex, included in this list.
18. Enterprises of regular municipal fixed routes passenger transport. (Autotransport enterprises, share of municipal and suburban fixed-route bus transportation of which, for general use routes exceeds 50 percent, as well as municipal electric transport enterprises.)
19. Industry scientific research centers:
  - State Civil Aviation Scientific Research Institute (GosNII GA)
  - State Aeronavigation Scientific Research Institute (GosNIIaeronavigatsii)
  - State design and scientific research civil aviation institute (AEROPROEKT)
  - State design and scientific research sea fleet institute (SOYUZMORNII PROEKT)
  - Central water transport economics and operation scientific research institute (TZNIIEVT)
  - State automobile transport scientific research institute (NIIAT)
  - Roads scientific research and production technological association (RosdorNII), including:
    - Moscow scientific research and production complex, production and technological complexes.
20. Main computer centers of all types of transport and roads complex.
21. Separate medical facilities and organizations in accordance with the joint decision of the Ministry of Transport of Russia and State Committee on Management of State Property of Russia, account taken of the opinion of the transport enterprises and roads complex employees, who are getting medical services at these facilities and organizations.

"APPROVED"  
Deputy Minister of  
Transport of Russia

V.G.Artukhov  
30 September 1992

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Deputy Chairman of State  
Committee on Management  
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P.P.Mostovoy  
30 September 1992

SPECIFIC CONDITIONS FOR  
AUCTIONING AND PRIVATIZATION  
OF AIRPORTS

These specific conditions were developed in accordance with paragraph 4 of the State Committee of the Russian Federation on Management of State Property order No. 444-r "On the specific features of aviation, maritime, river, automobile transport and roads complex enterprises transformation into joint-stock enterprises and their privatization" and shall be mandatory taken into account in the course of airports privatization plans and joint-stock companies, established on their basis, charters being prepared.

When air transport enterprises are being auctioned airports are taken out of their structure as independent enterprises.

The above mentioned process is carried out with the following conditions being observed:

- airports, capable of taking in airplanes of the 1 and 2 class and with the annual passenger traffic of over 0,5 mln.people (as of 1991) are taken out of the aviation enterprises structure (united aviation detachments, producing associations) on a mandatory basis;
- as to other enterprises, selection of airports as independent enterprises is carried out prior to holding an auction based on the request of the employees (of the aviation enterprise, airport or flight technical complex) on the basis of the decision by the State Committee on Management of State Property at the suggestion of the Ministry of Transport of Russia.

The date of mandatory submission of documentation for privatization, in case airports and aviation companies (flight technical complexes) are apportioned from the aviation enterprises are set no later than 31 December 1992.

Division of aviation enterprises when independent airports are established is carried out in accordance with principles, listed in the Annex.

Airports are privatized only by way of their transformation into unlimited responsibility joint-stock companies in accordance with the procedure, laid out in the Decree of the President of the Russian Federation of July 1, 1992 No.721 "On organizational Measures for transformation of State Enterprises, Voluntary Associations of State Enterprises into Joint-stock Companies", on condition that:

- airport employees are provided with benefits only in accordance with variant 1, specified in the State Program of privatization of state and municipal enterprises in the Russian Federation for 1992;
- equipment, assets, property of the air traffic control centers (DPR, SDP, VSDP, PDP, DPSP, DPK, DPK MVL, DPP, RS ES UVD, VRC, MDP, KDP, KDP MVL, ZS ES UVD, VZC, ADP, GC ES UVD); facilities, structures systems and means of the flights radiotechnical maintenance and communication (with the exception of internal airport communication and computers); federal value airports (of he A, B, V, G, D classes in accordance with the approved classification), runways (take-off and landing runways, side-by and terminal safety runways, taxi runways, airplane parking sites, aprons), airport fences, radio and lighting equipment facilities, UVD energy-supply systems and airport communication systems;
- controlling blocks of shares of the joint-stock companies established are placed into state property.

The mentioned facilities and structures (with the exception of air traffic control structures and facilities) are used by the established joint-stock company on the long-term lease basis (10 - 50 years). Air traffic control structures and facilities are transferred to joint-stock companies for temporary use prior to their transfer to appropriate federal service unit. Personnel of the Ministry of Internal Affairs units are eligible for benefits, provided for in the privatization legislation to employees.

The charter of the joint-stock company established at this stage of privatization shall contain a provision that the representative of the State Committee of the Russian Federation on Management of State Property, appointed (part time) by this Committee on the proposal of the Ministry of transport of Russia to perform the functions of the owner of state property at stockholders meetings, as well as in the Board of Directors of the joint-stock company, has the following rights:

- the right to veto decisions to change the organizational and legal form of the Company, as well as its charter, and the appointment of the Director General;
- a permanent seat on the Board of Directors of the Company.

The charter of the joint-stock company, established on the basis of an airport, must on a mandatory basis include typical additional conditions, reflecting industry specifics and the procedure for state executive bodies to participate in the management of the joint-stock company, adopted jointly by the Ministry of Transport of Russia and the State Committee of the Russian Federation on Management of State Property.

When decisions are made concerning privatization of aviation enterprises with their division to an airport and an aviation company employees of enterprises undergoing transformation continue to get benefits, specified in existing legislation for privatization of each of the enterprises, being established.

The charter of the joint-stock company, established on the basis of an airport, states that within a two year period starting from the establishment of a company, the airport is subject to reorganization, which must include:

- sale on the basis of a contest of separate airport facilities, to reduce the state's property share in the joint-stock company's authorized capital;
- establishment of production and commercial structures (private enterprises), servicing airplanes, passengers, including trade and meals.

Reorganization is carried out upon agreement of the State Committee of the Russian Federation on Management of State Property and Ministry of Transport of Russia. If by the start of reorganization more than 50 percent of the company's capital is placed in state property, the decision on reorganization is taken by the State Committee of the Russian Federation on Management of State Property upon agreement of the Ministry of Transport of Russia.

Mentioned production and commercial structures use the territory, capital structures and airports durable facilities on the basis of a lease, are buying airport property, subject to privatization, on the basis of a contest, gain access to the airports production processes on the following terms:

- the existence of no less than two private enterprises - competing in every type of work and services;
- contest character of getting work or the right to carry out such work;
- preservation of work places for the period, established in the contest terms.

Treaties for the lease of airport property and facilities shall on a mandatory basis include conditions of their proper maintenance and observation of the technical operation requirements, as well as, if necessary, obligations with respect to modernization and development of the mentioned property and facilities. Drafts of the lease treaties are on a mandatory basis coordinated with the Ministry of Transport of Russia or, upon its instructions, with the regional air transport agencies.

**MAIN PRINCIPLES**  
of apportioning independent airports  
from the air transport enterprises

**1. GENERAL PROVISIONS**

Division of the enterprises of the air transport (OAO, PO - hereinafter referred to as - enterprises) into an airport and an air company is directed at excluding the monopoly position of aviation companies on the air transportation market, at establishing the conditions for their competition, the overall increase of the air transport system effectiveness.

Aviation company is a unified flight, technical and commercial complex, carrying out air transportation of passengers, cargoes, post, PANH works, in it's own or leased airplane fleet, sale of aviation transportation, work and services, technical and commercial servicing of airplanes and flights, services to passengers in flight.

Airport is a unified engineering, technical and commercial complex, designated for arrival and departure of airplanes and servicing air transportation, which operates the airfield, air station, storage and refuelling facilities, maintenance of technological processes in the airport zone - heating, electricity, transportation and communications, provides for take-off and landing of airplanes, their technical and commercial servicing, passenger and client service, air traffic control within the airport area, various types of unrelated activity, lease in the form of a concession to aviation companies and other enterprises facilities, structures and equipment for production and commercial activity.

Aviation companies may rent or have in the airports their own technological lines for meals preparation, passenger service, cargo and post processing, own or rent facilities, buildings and equipment necessary to carry out this activity.

**2. UNITS (SERVICES) APPORTIONING**

Aviation company must on a mandatory basis include the following typical units of the air transport enterprise (hereinafter referred to as enterprises):

- \* flight detachments (wings)
- \* aviation technical base
- \* flight attendants service
- \* air communication agency
- \* part of the personnel, responsible for commercial, supply functions, etc.
- \* other enterprise services, as a rule, are included into the airport structure.

Aviation company may use its own personnel at registration counters, arrival and departure assistance for it's flights and at other technological lines and facilities. The relevant technological equipment of an airport is used by the aviation company on the basis of rent (including an hourly rent).

Certain enterprise units may be transformed into unlimited responsibility joint-stock companies in accordance with paragraph 2 of the Provisions for Commercialization, approved by the Decree of the President of the RF of July 1, 1992 on the proposal of the Ministry of Transport (Department) of the RF.

**3. APPORTIONING OF PROPERTY**

Airplanes, aviation engines, spare parts and materials for them, facilities, buildings, structures, special transport and equipment, designated exclusively for operation of aviation company airplanes, account taken of their effective operation.

Remaining equipment is allotted to the airport.

Airport must provide right of equal access to aviation companies, including leasing to them the necessary equipment, territory and premises without detriment to other aviation transportation carriers in case of lack of production capabilities.

#### 4. APPORTIONING OF ENTERPRISES FUNDS, ASSETS AND LIABILITIES

Means on a clearing account, stocks, payments, debit and credit debt, loans, bank deposits and joint-stock companies authorized capital, established by the enterprise, are apportioned between the aviation company and the airport in the following way: assets to pay salaries, stimulate employees activity and for social needs, are apportioned proportionately to the number of employees (basic salaries fund); remaining assets, intended for production modernization, as well as various long-term investments are apportioned proportionately to the value of capital funds.

#### 5. APPORTIONING OF SOCIAL INFRASTRUCTURE FACILITIES

Social and cultural infrastructure facilities are, as a rule, causing losses and belong equally (proportionately to the number of employees) to each of the established new enterprises. The following decisions are possible with regard to these enterprises:

- transfer on balance of local bodies of government (as they are ready);
- transfer under the airport's authority with the responsibility of the airport to grant access to the aviation company employees, formalized in a treaty form, provided that the aviation company takes part in their financing proportionately to the number of employees.

Inclusion of social and cultural facilities in the airports property, or right of enterprises to use this property is specified in existing legislation.

#### 6. DETERMINATION OF RATES AND RENT PAYMENTS

The amount of rates, passenger fees and rent payments, charged by airports from aviation companies, is approved by the government executive body upon submission to it of calculations and other background information, which were in advance provided to the interested aviation companies.

#### 7. SECURING OF A LAND PLOT

Aviation company is allotted the territories of a hangar, hangar-related structures, land plots for servicing airplanes near the hangar, buildings, occupied or used primarily by the aviation company personnel, and adjoining areas with land plot securing procedures carried out. The remaining territory, used by the aviation enterprise, is included into the airport's land plot, account taken of the perspectives for its development plans. Airport provides on an equal access basis land, buildings, equipment and services to the aviation companies.

#### 8. SUCCESSION RIGHTS

At the stage of a state air transport enterprise transformation into an airport and an aviation company with their simultaneous auctioning, the relevant joint-stock companies become its successors. Relations of succession are laid out in a bilateral or multilateral treaty.

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Deputy Minister of  
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V.G.Artukhov  
30 September 1992

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30 September 1992

#### MODEL AMENDMENTS

to Articles of unlimited responsibility joint stock companies created on the basis of transport and road services enterprises, reflecting their branch specifics and order of participation of government bodies in management of joint stock companies.

These model amendments were worked out in accordance with paragraph 2 of the Goskomimushestvo of Russia executive order of September 16, 1992, No. 444-p "On specifics of transformation into joint stock companies and privatization of air, sea, river, road transport and road services enterprises", and they are subject to obligatory inclusion in Articles of joint stock companies being established on the basis of enterprises included in the lists of enclosures 1 - 5 to the above-mentioned executive order.

I. Amendments to Model Articles of unlimited joint stock company reflecting branch specifics of the main activity of transport and road services enterprises.

The following additional article is subject to inclusion in Model Articles of unlimited joint stock company.

#### Article 14 ADDITIONAL TERMS REFLECTING BRANCH SPECIFICS OF THE COMPANY

14.1. Additional terms reflecting branch specifics of transport (road services) are included in the Articles in accordance with the executive order of the State Committee of the Russian Federation on Management of State Property of September 16, 1992, No.444-p "On specifics of transformation into joint stock companies and privatization of air, sea, river, road transport and road services enterprises", and they determine Company commitments as applied to preservation of status of public carrier and execution of socially required functions in industrial and social infrastructure, including activities to secure transport and ecology safety, as well as in case of need at the expense of Company's own capital (profits reduction).

14.2. Company is obliged to:

fulfil all requirements concerning safety of air flights, navigation, road traffic and transportation;  
preserve and develop corresponding safety systems (provide operation of transportation safety system in accordance with the acting branch standards, including preservation of staff quantity, offices, transportation means and equipment which are attached to traffic safety service);

fulfil all requirements of transport means ecology safety, as well as of technology processes of their storage, repair and technical maintenance;

provide training (re-training) and certification of personnel within the scopes specified by qualification requirements which apply to corresponding types of transport; maintain and develop corresponding systems of personnel training;

insure transportation means and personnel in accordance with the order envisaged in the requirements which apply to corresponding types of transport;

preserve type of activity;

transport cargos and passengers, carry out other works and services if corresponding licenses as well as enterprise certificates (certificates of air transport operator) are available;

transport cargos and passengers, provide works, services and production of goods in accordance with charters (codes) of corresponding types of transport, license terms as well as with rules for transportation of cargos, passengers and luggage and other standard documents;

secure equal rights for carriers access to infrastructure and terminal facilities which are owned or managed by the Company;

provide integrated technology of transportation and transfer of cargo by cooperating transport enterprises, including those at junction points and direct mixed communication;

use prices and tariffs in accordance with price lists currently applied in the Russian Federation for works and services which are subject to regulated and fixed prices and tariffs; observe acting tariff rules and regulations with respect to other types of transportation.

14.3. Company is entitled to provide up to 60% of existing transportation opportunities (production capacities) for government needs and in the interests of Russian consumers (passengers, consignors and consignees) in accordance with the order established by the acting Law, as well as by orders of Ministry of transportation of Russia and local administration and executive bodies.

Company has no right to relinquish conclusion of a production contract with authorized government bodies for execution of the above-mentioned works. The production contract shall include mutual obligations and responsibility for providing transportation, services, orders for state needs which have social value, and in particular it shall envisage that joint stock company is provided with state subsidies, benefits and capital investments under condition that it carries out works and services, specified in the contract, in accordance with determined quality and at regulated and fixed prices and tariffs which do not guarantee refund of expenses.

II. Amendments to Model Articles of unlimited joint stock company reflecting branch specifics of transport and road services enterprises which are mobilization objects, possess permanent mobilization tasks or comprise property designed for execution of mobilization tasks.

The following additional article is subject to inclusion in Model Articles of unlimited joint stock company.

#### Article 15

#### ADDITIONAL TERMS REFLECTING BRANCH SPECIFICS OF THE COMPANY WITH RESPECT TO IMPLEMENTATION OF PERMANENT MOBILIZATION TASKS

15.1. Company is obliged to:

fulfill obligations on mobilization training and mobilization tasks in accordance with the acting Law and approved mobilization plans which represent orders for the republic government needs in accordance with the Decree of the President of the Russian Federation of March 21, 1992, No. 288;

conclude agreements on implementation of approved mobilization task in accordance with the attachment No.2 to the letter of Goskomimushestvo of Russia of April 29, 1992, No. АИ - 13/2253;

use civil defense and mobilization facilities, mobilization reserves which are not subject to auctioning and privatization (further - Property) under the terms of agreements concluded by Company with corresponding regional government executive bodies according to the order determined by the Goskomimushestvo of the Russian Federation.

15.2. Agreement on implementation of approved mobilization task and use of civil defense and mobilization facilities, mobilization reserves, shall include obligations, rights and responsibility of a new owner, terms of closing down or reorganization of the Company.

1) Obligations of the new owner:

use Property, keeping to operational rules and secure its technical condition at an established level specified by acting operational standards and regulations;

maintain Property, which represents mobilization reserve, safely and in the order specified by acting operational standards and regulations;

provide mobilization training and fulfillment of mobilization tasks in accordance with the acting Law and approved mobilization plans;

by instruction of a special body and in accordance with approved mobilization task, supply Property in complete and serviceable condition, keeping to established schedules and technical data;

in case of technical malfunction, deterioration or loss of Property, make its equivalent replacement in coordination with bodies which set and control mobilization tasks;

provide reproduction and use of Property at the expense of the owner.

2) Rights of the new owner:

use Property (with the exception of mobilization reserve property) proceeding from his Articles' aims and tasks;

get full profits of Property use;

receive funds for financing mobilization training activities in accordance with the order established by the government of the Russian Federation.

3) Responsibility of the new owner:

if obligations to provide mobilization training and implementation of mobilization tasks are not fulfilled, enterprise and its managers bear responsibly in accordance with the acting Law.

4) Terms of closing down or reorganization of an enterprise which was made private:

reorganization or closing down of an enterprise is carried out with the participation of representatives of the bodies which set and control mobilization tasks, and under terms which preserve mobilization training and guarantee implementation of mobilization tasks, set for this enterprise;

amendments and additions to constitutive documents, agreement between seller and buyer are included in accordance with the established order providing preservation of the above-mentioned obligations and terms.

III. Amendments to Model Articles of unlimited joint stock company reflecting order of participation of government bodies in management of joint stock companies, established on the basis of transport and road services enterprises.

In order to reflect branch specifics of government bodies participation in management of operation and development of joint stock companies established on the basis of transport and road services enterprises, Model Articles of joint stock company shall include the following amendments and additions.

Article 6.3. shall be added with paragraph 14):

14) conclusion with the State, represented by the Ministry of Transport of Russia, of agreements which comprise long-term development plans of the most important facilities and systems, consistent with the state transport policy.

(Agreements are concluded in order to ensure development (modernization) of transport - road network enterprises and they shall envisage share contributions by the State and joint stock company in financing and other actions aimed at fulfilling tasks envisaged by the long-term plan, as well as order of utilization of allocated funds and resources.)

Article 6.6. of the Model Articles of joint stock company is set forth in the following wording.

6.6. Authority of the owner of state property at meetings of joint stocks holders, as well as at the Board of directors of joint stock company is exercised by the Goskomimushestvo of Russia representative, appointed upon presentation of the Ministry of transportation of Russia.

During the whole period when joint stocks of joint stock Company are kept in government property, Goskomimushestvo of Russia representative appointed upon presentation of the Ministry of transportation of Russia has the right:

to put veto upon decisions on changing organizational and legal form of Company, as well as articles 14 and 15 of this Articles, and on appointment of general director;

to occupy permanent seat at the Company Board of directors.

Article 8.1. of the Model Articles of joint stock company is set forth in the following wording.

8.1. Board of directors is composed of: general director of Company (or his representative), Goskomimushestvo of Russia representative appointed upon presentation of the Ministry of transportation of Russia, representative of personnel and representative of local administration body.

General director of Company (his representative) has 2 votes, all other members of the Board of directors - one vote each.

Article 10.1. of the Model Articles of joint stock company is set forth in the following wording.

10.1. General director shall exercise operational management of the Company activities and is empowered, in accordance with the Law of the Russian Federation, with all required authority to fulfill that task. General director shall conduct his activity in strict conformity with the acting Law, the Articles and production contract concluded in accordance with paragraph 14.3. of the Articles.

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Deputy Minister of  
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\_\_\_\_\_  
V.G.Artukhov  
30 September 1992

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\_\_\_\_\_  
P.P.Mostovoy  
30 September 1992

SPECIAL TERMS  
of auctioning and privatization of seaports

These special terms are worked out in accordance with paragraph 4 of the Goskomimushestvo of Russia executive order of September 16, 1992, No.444-p "On specifics of transformation into joint stock companies and privatization of air, sea, river, road transport and road services enterprises", and they shall be without fail taken into account in the course of compiling seaports privatization plans and Articles of joint stock companies, established on their basis.

Privatization plan of seaports shall envisage the following 2 stages.

At the first stage seaport is subject to transformation into unlimited joint stock company in accordance with the order specified by the Decree of the President of the Russian Federation of July 1, 1992, No.721 "On organizational measures of transforming state enterprises, voluntary companies of state enterprises into joint stock companies "; in this case:

controlling blocks of shares of joint stock companies, which are being created, are consolidated in state property;

seaport personnel is provided with benefits exclusively under option 1, envisaged by the State program of privatization of state and municipal enterprises in the Russian Federation in 1992;

authorized capital shall not include port facilities (breakwaters, fence constructions, wharfs, approach channels, lighthouses and navigation signs) and installations (approach railroad lines and automobile roads, engineering infrastructure installations, other installations, list of which is approved within privatization plan), constructions and installations of seaport inspections; above-mentioned constructions and installations (with the exception of constructions and installations of seaport inspections) are used by created joint stock company on the terms of renting.

Articles of joint stock company which is being created at this stage of privatization, shall envisage that Goskomimushestvo of Russia representative appointed (enlisted) by this State committee by presentation of the Ministry of transportation of Russia to exercise authority of owner of the state property at meetings of joint stock holders, as well as at the Board of directors of joint stock company, has the right:

to veto decisions on changing organizational and legal form of Company, as well as its Articles, and on appointment of general director;

to occupy permanent seat at the Company's Board of directors.

Articles of joint stock company specifies that joint stock company on the basis of seaport is created for the term of no longer than 2 years, during which its reorganization is conducted in accordance with the second stage of privatization plan.

Reorganization is conducted in coordination with the Goskomimushestvo of Russia and the Ministry of transportation of Russia. If by the moment of reorganization more than 50% of the company's capital is held in the state property, Goskomimushestvo of Russia in coordination with the Ministry of transportation of Russia takes a decision on reorganization.

The second stage of seaport privatization plan shall envisage:

reorganization of joint stock company accompanied by the creation of competitive production and commercial structures in the form of stevedore, terminal, ship - chandler, transport and dispatch, agents, intermediary and other companies;

creation in seaport of the state enterprise and transfer to its balance of the property which is to be used for communications, ship traffic control, port inspections, technical and other control over implementation of the requirements of international treaties and Law of the Russian federation with respect to sea transport activities.

The above-mentioned production and commercial structures use territory, major constructions and seaport installations of long-term use on the terms of long-term rent (10 - 50 years), buy at contests seaports property, which is subject to privatization get access to operational processes of seaports under the following terms:

availability of no less than two private enterprises - competitors in each type of works and services;

competing, contract way of getting works or rights to conduct these works;

preservation of personnel employment for a period specified by contest terms.

Control over implementation of terms of agreements on property rent and seaports installations with regard to property's maintenance in serviceable condition, and over keeping to technical standards of operation, is executed by the Ministry of transportation.

STATE COMMITTEE OF THE RUSSIAN FEDERATION  
FOR MANAGEMENT OF STATE PROPERTY

ORDINANCE

No. 700-p

November 4, 1992

On Peculiarities of Corporatization and  
Privatization of Sea Ports

Given a special role of sea ports in the uniform transport system of the Russian Federation, to establish the following conditions for corporatization and privatization of sea ports:

1. While corporatizing sea ports, 20% of shares of a stock company to be established (controlling block of shares) shall be state owned for the period of 3 years from the date of its registration.

To establish that the management of a controlling block of shares shall be executed in accordance with para 9.4 of the State Program for Privatization of State and Municipal Enterprises in the Russian Federation for 1992.

2. Selection of a preferential option for corporatizing sea ports shall be determined by work collectives in compliance with para 5.4 of the State Program for Privatization of State and Municipal Enterprises in the Russian Federation for 1992.

3. In programs for sea port privatization to stipulate the establishment, on the basis of harbor inspection, as well as on the basis of structures and facilities which are part of vessel navigation management, of state enterprises for managing navigation of vessels.

4. To stipulate in Statutes of stock companies to be set up, within 1 year of their restructuring according to one of the options:

4.1 Establishment of competitive production and commercial entities in the form of stevedore, terminal, shipchandler, forwarding, agency, intermediary and other companies where the share of the stock companies in their authorized capital would be no more than 20%.

4.2 Distribution of port terminals according to cargo flows and lease of respective property out to established companies and partnerships which handle cargoes, execution of loading operations shall be excluded from statute activities of the stock companies to be established on the basis of sea ports.

To establish that statute provisions stipulated in paras 4.1 and 4.2 shall not be amended as long as this stock company has state owned shares.

5. To establish that port structures and facilities, namely berths, access channels, breakwaters, railways and highways, engineering infrastructure shall not be included in authorized capitals of stock companies to be established and shall be used on lease conditions.

The Main Methodological Department and the Main Department for Privatization of Enterprises for Construction, Transport and Communications of the GKI of Russia shall develop, before 01.01.93, terms and conditions for leasing and methodology of determining lease payment which would provide possibility to reproduce leased property.

6. Sale of shares of the stock companies to be established on the basis of sea ports shall be carried out based on competition and in blocks of up to 10% of the authorized capital beginning from 01.01.93.

The Main Department for Privatization of Enterprises for Construction, Transport and Communications of the GKI of Russia, with attraction of the Ministry of Transport of the Russian Federation and the Association of Sea Ports shall develop conditions for competition before 01.01.93.

STATE COMMITTEE OF THE RUSSIAN FEDERATION  
FOR MANAGEMENT OF STATE PROPERTY

ORDINANCE

No. 19-p

January 10, 1993

On Establishment of Sea Port Authorities

On the basis of Article 33 of the Russian Federation Law "On Enterprises and Entrepreneurship Activities", with a view of ensuring the state transport policy and in order to perform para 5 of Ordinance No. 700-p "On Peculiarities of Corporatization and Privatization of Sea Ports" of the GKI of Russia dated November 4, 1992:

1. To establish based on sea ports' property which is not subject to privatization, state enterprises - Sea Port Authorities. To assign this property to established state enterprises with the right of full economic management and conclusion of appropriate agreements.

Establishment of Sea Port Authorities shall be carried out by respective territorial agencies of the GKI of Russia as applied by the Ministry of Transport of Russia.

2. Sea Port Authorities shall play the functions of state supervision over the safety of sea navigation in port harbors, technical maintenance of sea structures and facilities remained state owned, provision of their reproduction, as well as control over the performance of International agreements and Russian law in the sphere of sea navigation.

Financing of the activities of sea port authorities in accordance with para 72 of the Code of Marine Navigation shall be arranged at the expense of port charges (tonnage, anchorage, berthage, canal, light dues), lease payment for state property leased out and payment for services rendered to outside customers.

Operations of the Sea Port Authorities shall be regulated by existing law of the Russian Federation and regulatory acts of the Ministry of Transport of Russia .

3. Leasing of state property which is under economic management of Sea Port Authorities shall be arranged on the basis of a standard leasing contract approved by the GKI of Russia.

4. Approval of statutes of the established Sea Port Authorities shall be made by territorial agencies of the GKI of Russia on the basis of standard statutes approved by the GKI of Russia with due regard for proposals of the Ministry of Transport of Russia.

Contracts with managers of the Sea Port Authorities shall be concluded by the Director of the Sea Transport Department and the First Deputy on the instructions of the GKI of Russia.

Territorial agencies of the GKI of Russia shall ensure that offices required for the staff of Sea Port Authorities are allocated in established manner with their transfer to the balance of these enterprises.

5. To make following amendments and additions to Ordinance No.700-p of the GKI of Russia dated 11.04.93:

- para 3 shall be amended to read as follows: "To stipulate in privatization programs for sea ports, the establishment, based on the property which is not subject to privatization, of state enterprises - Sea Port Authorities".

Para 6 after words: "... beginning from 01.01.93." to add: "Shares of stock companies based on Archangelsk, Vaninsk, Vladivostok, Vostochny, Murmansk, Nakhodka, Novorossijsk, St.Petersburg, Tuapse Sea Ports shall be subject to sale after they have been restructured according to para 4 of this Ordinance. "

First Deputy Chairman

P.P.Mostovoi



## *Annex E*

### *Russia's Principal Sea Carriers: Their Fleets and Trading Patterns in 1991*

The *Arctic Shipping Company* was previously known as Yakutsk Production Organization which was reorganized in March 1991 into the new company. The company's headquarters is in Tiksi which is located in the Lena river estuary in East Siberia. Its gross revenues in 1990 were Rb40 million. Payrolled staff involved in transport operations and cargo management comprises 1,660 employees. The fleet consist mainly of general cargo ships, many of which are 'ice-class'. The average vessel cargo carrying capacity is under 4,000 dwt.

The *Baltic Shipping Company* became Russia's first independent ocean carrier in late 1990. It is a diversified – and Russia's most sophisticated – sea transport undertaking and is as such involved in bilateral trade. The company is probably the best known for its presence in the cross trades and as an operator outside the freight conference framework. Its network of services is constantly being expanded. Of note is the return to the cross trades from North American ports as a result of the U.S.-U.S.S.R. maritime agreement, whose provisions were extended to the Russian Federation after the FSU breakup. Following the severance from the central authorities Baltic Shipping wound up in leasing much of its tonnage from the Federation Government. The company offers 12 regular liner services, and

engages in several joint services with other international carriers. Baltic Shipping is headquartered in St. Petersburg but maintains a growing number of permanent offices overseas. Payrolled staff comprises 13,400 employees, of

**Exhibit E.1 Performance Indicators of Russia's Principal Sea Carriers**

Company	Fleet size		International Trade Tons (000)	Cabotage Trade Tons (000)
	dwt (000)	Number of ships		
Arctic	94.4	25	220	445
Baltic	1,920.6	78	11,328	*
Far Eastern	1,846.2	28	10,082	6,481
Kamchatka	220.4	53	325	2,893
Murmansk	929.3	78	5,586	2,850
Northern	673.0	135	5,216	650
Novorosijsk	5,321.8	112	45,368	778
Primorsk	597.8	53	2,137	4,810
Sakhalin	419.4	88	2,534	10,070

\* negligible

Source: Ministry of Transport, Merchant Marine Department; and Seatrade. 1992. *The Maritime Industries of the Former Soviet Union*. London.

whom only 2,100 are involved in transport operations and cargo management. A substantial portion of Baltic Shipping's fleet has container capacity, including 16 cellular container carriers, and 36 vessels with different RoRo configurations. But with less than 15,000 dwt, the average capacity is comparatively low. Furthermore, the fleet includes 61 general cargo ships (12,600 dwt average capacity), 34 timber carriers (4,350 dwt), and four dry bulk vessels (36,000 dwt). Until 1991, the company was functionally responsible for the ports of St. Petersburg, Kaliningrad, and Vyborg, and continues to maintain managerial links with the Kanonersky shiprepair yard.

The *Far Eastern Shipping Company* is involved in domestic sea transportation service along the Pacific coast from Posyet in the South to Pevek in the Arctic Ocean (28 percent of all activities), in bilateral trade (62 percent), and regular liner cross trade (ten percent). Second to Baltic Shipping, the company is another well established – and regarded – carrier with a diversified organization and service network. It has its headquarters in Vladivostok, and employs close to 19,000 staff. The fleet includes 21 container vessels (less than 15,000 dwt average capacity), 88 general cargo ships (3,000 to 12,000 dwt), 39 timber carriers (4,000 to 6,000 dwt), 15 reefer vessels (5,500 dwt average), and seven dry bulk carriers (12,000 to 15,000 dwt). Until 1991, the company was functionally responsible for the ports of Nakhodka, Vladivostok, and Vostochniy, and continues to maintain managerial links with the Nakhodka, Slavjanka, and Vladivostok shiprepair yards.

The *Kamchatka Shipping Company* provides regular liner services from the Kamchatka Peninsula to Japan (timber) and the Koreas (cement). However its main activities involve services from and to ports in the Federation's Northeast. The company's headquarter is in Petropavlovsk-Kamchatsky and employs about 4,500 staff. The fleet consists mainly of general cargo ships with ice-strengthened hulls and an average carrying capacity of under 4,000 dwt. Although officially freed from port responsibilities, the carrier continues to be managerially involved in the ports of Petropavlovsk-Kamchatsky and Ust-Kamchatsk, as well as in the Petropavlovsk shiprepair yard.

The *Murmansk Shipping Company* has a sizeable fleet of ice-class vessels which provide supply services to the Arctic region and assists in keeping sea routes open. The company has a diversified service network that extends all over Western Europe and the Mediterranean. It is headquartered in the City of Murmansk, and has about 9,000 staff on its payroll. The fleet does not include cellular container tonnage but nine rather large RoRo carriers (about 20,000 dwt average) that provide container carrying facility. The fleet distinguishes itself also by 31 dry bulkers of 18,000 to 22,000 dwt, which are large by Russian standards. Furthermore, there are 24 general cargo ships in the 4,000 dwt range. Before 1991 Murmansk Shipping was functionally responsible for the ports of Kandalaksha and Murmansk; the ties with both ports remain strong.

The *Northern Shipping Company* is mainly involved in the transport of sawn timber, cardboard and pulpwood from northern latitudes to Western Europe, the Mediterranean, Africa, and the United States. Limited quantities of dry bulk and general cargo are also carried. More recently, the company has started to engage in regular container services to Western Europe. Northern Shipping's seat is Archangelsk; about 9,800 employees are involved in transport operations and cargo management. The fleet is relatively large and includes nine dry bulkers of around 14,000 dwt, and more than 100 general cargo ships in the 2,500 to 6,000 dwt range, which is typical for the Russian multi-purpose fleet. Before 1991, the company was functionally responsible for the ports of Anderma, Archangelsk, Mezen, Naryan, and Onega. With the exception of Archangelsk, it remains closely involved in the management of the other ports, and also in the operations of the Krasnayaknuznitsa and Layskiydok shiprepair yards.

The *Novorossiysk Shipping Company* is Russia's premier – and world-class – bulk operator with emphasis on the oil trades, although there is also substantial involvement in the shipping of dry bulk cargoes. The company is well managed and has a diversified business agenda, which includes trading with primary and processed goods, and the provision of management services. During the last few years, Novoship has been able to team up

with several foreign partners under joint service arrangements. Together with Scandinavian interest it has established successful off-shore shipping businesses. The company is headquartered in Novorossiysk; its staff totals 9,000. The fleet is largely composed of oil and product tankers with almost 50,000 dwt average capacity. Several tankers and combination carriers are in the 120,000 to 150,000 dwt range. Before 1991, Novoship was functionally responsible for the ports of Novorossiysk, Sochi, and Tuapse. While it has disengaged from the management of the former, it remains involved in the day-to-day operations of Tuapse and Sochi, as well as the Novorossiysk and Tuapse shiprepair yards.

The *Primorsk Shipping Company* is a carrier of oil and petroleum products, vegetable oils, molasses, and similar cargoes to Japan and South Asia, East Africa, and Europe. It is also involved in cross trading, particularly in the Far East. However its main activities are related to cabotage services along Russia's Pacific rim. Headquarters are in Nakhodka. About 4,500 staff are involved in transport operations and cargo management. The fleet consists exclusively of oil and product tankers. Of these vessels, 20 have a capacity between 14,000 and 20,000 dwt, and the balance is in the 4,000 - 6,000 dwt range.

The *Sakhalin Shipping Company* is the Federation's key cabotage operator, with much emphasis on sea-rail ferry services. Its service network comprises all of Russia's Far Eastern provinces and the Arctic region. The company is also providing regular services to ports in China, Japan, and Southeast Asia. In external trading Sakhalin Shipping is a typical 'tramp operator' and is as such not participating in any freight conference. Its administrative seat and home base are in Holmsa, on Sakhalin Peninsula. Payrolled staff comprises almost 6,250 employees, of whom only 1,455 are assigned to transport and cargo management functions.

The fleet includes several gas carriers of 1,500 dwt, a variety of vessels with mixed cargo-passenger configurations (usually less than 3,000 dwt), two 20,000 dwt RoRo vessels, and a pool of general cargo ships in the usual 3,000 to 5,000 dwt range. Although nominally freed from port responsibilities in 1991, Sakhalin Shipping continues to provide much management cohesion in the ports of Alexandrovsk, Kholmsk, Korsakov, Krasnogorsk, Nikolayevsk, Poronaysk, Ulegorks, and Vannino.



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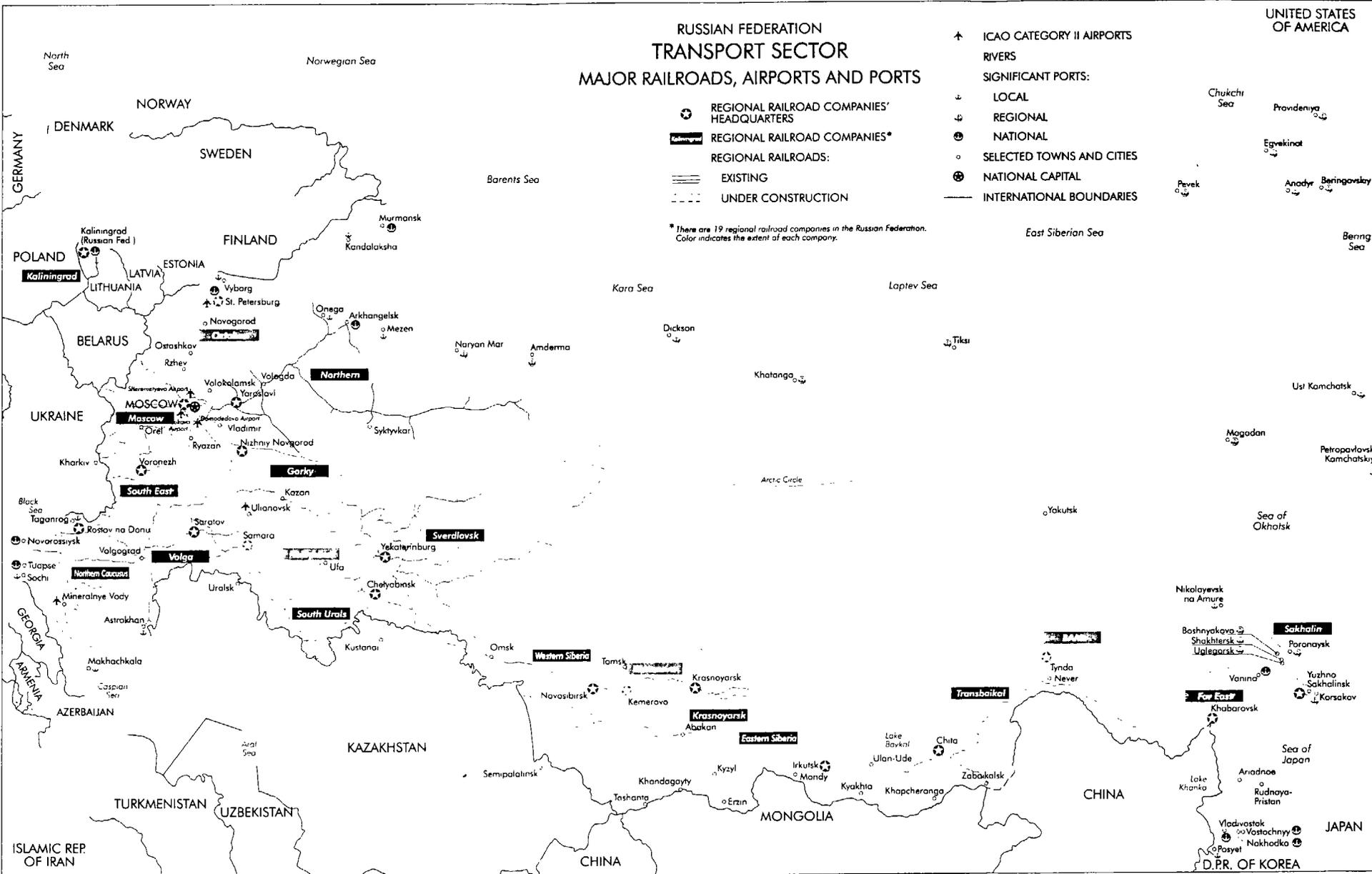
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- REGIONAL RAILROAD COMPANIES' HEADQUARTERS
- REGIONAL RAILROAD COMPANIES\*
- REGIONAL RAILROADS:
  - EXISTING
  - UNDER CONSTRUCTION

\* There are 19 regional railroad companies in the Russian Federation. Color indicates the extent of each company.

- ICAO CATEGORY II AIRPORTS
- RIVERS
- SIGNIFICANT PORTS:
  - LOCAL
  - REGIONAL
  - NATIONAL
  - SELECTED TOWNS AND CITIES
  - NATIONAL CAPITAL
  - INTERNATIONAL BOUNDARIES

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- Chukchi Sea
- Provideniya
- Egvekinat
- Anadyr
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- Ust Kamchatsk
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- Nikolayevsk na Amure
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- Shakhtersk
- Liglegorsk
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- Yuzhno Sakhalinsk
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- Sea of Japan
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- Vladivostok
- Vostochnyy
- Nakhodka
- Posyet
- D.P.R. OF KOREA

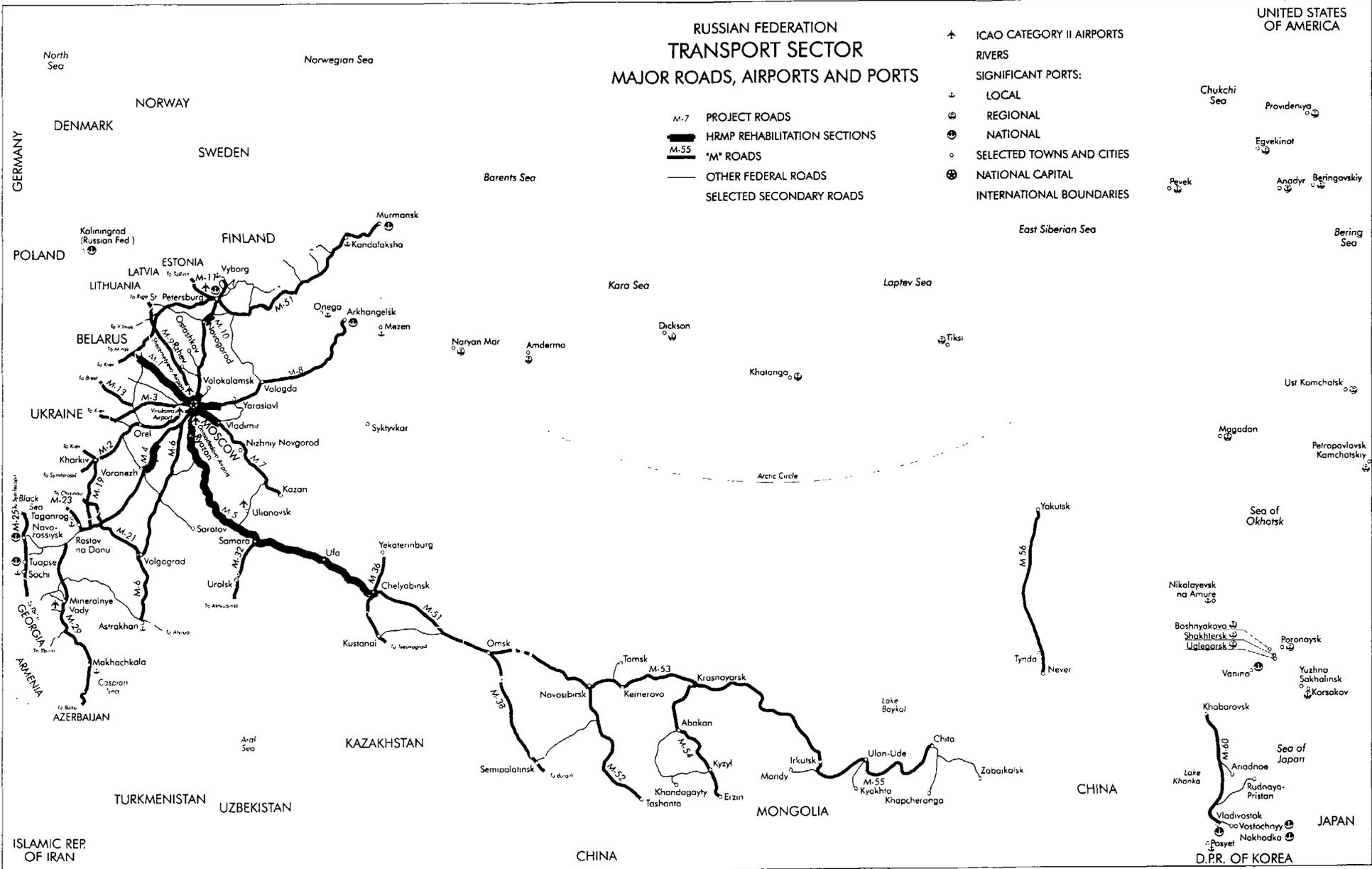


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- SELECTED SECONDARY ROADS

- ICAO CATEGORY II AIRPORTS
- RIVERS
- SIGNIFICANT PORTS:
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  - NATIONAL
- SELECTED TOWNS AND CITIES
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