

Transport in the Russian Federation and CIS - A Review

The aims of this report are restricted to an attempt to make an assessment of the current state of the transportation systems of the fSU and of their likely capabilities over the next 2-3 years - a long time in Russian geo-political and economic affairs. The paper attempts to assess the capability of the system to support:

1) Commercial trade, including transport of bulk agricultural and mineral produce both for internal use as well as for import and export which are both important, bearing in mind the current need to import large quantities of food and manufactured equipment for civilian, industrial and military purposes.

2) A subsidiary issue relates to the state of the transport system providing genuine reasons or excuses to prevent withdrawals of military forces from disputed areas and the continued trade with or through independent countries upon which those countries are dependent to any significant degree. This includes the potential for serious social unrest and an extension of strikes.

Methodology and Conclusions

In common with other observers, the author of this report has travelled widely in the former USSR and during the ten years since its collapse. He has also used the literature of the Soviet and post Soviet period to supplement his own assessments of the shape and state of the transportation system. Much of the literature from Soviet/Russian sources is tendentious. It is therefore extremely valuable to have had access to technically objective reports by competent western specialists in the various aspects of transportation that were published around 1992-3. These reports provide a view of the situation inherited by the country shortly after the collapse of the USSR. They present in some detail an unvarnished picture of the weakness of Soviet planning, technology and operation; to which the consultants have added in conversations during August-October 1998 their comments on the deteriorating state of the system due to further neglect and lack of proper maintenance, part of which is due to the lack of will and the means to ensure that it was done.

Using his own experiences, the author draws his own conclusions about the present state of the transport infrastructure and the likely consequences of its further deterioration, which seems to him to be the most likely outcome of present events in Russia, the Ukraine and Belarus. The comprehensive reports by specialist consultants were financed by and delivered to various international bodies such as the EU, World Bank and EBRD. This author has chosen to dismiss the optimistic prognoses that were assumed by these bodies in the underlying economies of those countries and their potentially beneficial effect on the improvement, growth and development of the transportation systems. These seem currently to be unrealistic and unachievable in practice. Consequently it is to be assumed that no major investments by international bodies will be or should be undertaken on economic grounds, because the assumptions for the business plans are wrong. It is to be hoped that foreign

investments will not be undertaken for reasons other than economic ones, if only because the investors will lose their money. There may, however, be some specific cases where foreign interests might support useful investment from the private sector.

It is evident that little, if any, real progress has been made in the basic economy of Russia, Ukraine and Belarus which would support the optimism suggested in the 1992-3 reports for the projected investments, which relied upon sustainable growth. This paper, however, attempts to assess the present state of these means of transport and the likely consequences of their further deterioration.

Readers with special interests, whether strategic or tactical, or those whose interests are regional or more generally through the fSU should draw their own conclusions from the detailed sectors set out below. They may also wish to consult the literature cited. While the studies were completed several years ago now, there are no more up-to-date comprehensive analyses. Reports in the Russian press are optimistic, tendentious and unreliable. It is all too obvious from these and other reports and personal observations that projects launched with much flourish make little or no progress.

The transportation system of the fSU was designed primarily to serve the purpose of the military and the armaments industry that supported it. It was also able, through heavy state subsidies, to provide basic, though inefficient, transportation for the population. It was notoriously bad at conveying the staple foodstuffs such as grain off the fields, to storage and processing plants to the shops. But it worked along the lines of a third world country, improving till perhaps the 1970s when, as everything else in the fSU, it began to deteriorate, return on investment dropped and the economy spiralled downward.

Every objective, professional report demonstrates the weakness of Soviet and post Soviet planning, policies, performance in design, development, commissioning, operation and maintenance of the transportation system, including the basic equipment it relies upon. It was ill-coordinated, projects were undertaken for reasons other than sound economic and business ones, domestic equipment was not up to the mark and the systems relied heavily on imported products, whether from Comecon partners or paid for in hard currencies from the capitalist world.

The process of deterioration has accelerated during the ten post-Soviet years. There is no countervailing force to stop the further deterioration of the system. Nothing that one observes is destined or is likely to drive along the roads needed for improvement. Reports of the professionally competent westerners, some of which form the basis of this paper, confirm the evidence of other competent observers across the CIS. Reports and recommendations follow field studies. Some of them predicate useful changes and investment in the transportation system upon a positive improvement in the general state of the economy. As of September 1998 it is perfectly clear that this is not about to happen in the near future. This has consequences, both short term and as far forward as one can reasonably be expected to predict, for the military and for the commercial state of the CIS.

Transportation Support for the Military

Whatever the colour and intentions of future Federal Governments it seems likely that the transportation system, especially that of the main roads and railway network will stand up to the needs of the military, whether in repression of civil disobedience within the Russian Federation or in the CIS. It would be capable of defending its borders

with China or Afghanistan, whence possible insurgency might emanate. It is also likely to be capable of supporting limited military irredentist adventures, say in Northwest Europe against the Baltic States, against Caucasian republics and its immediate neighbours in the Caspian and Black Sea areas. This assumes almost total priority for military traffic and logistic support at the expense of foreign trade and of the needs of the internal population.

It is very likely that there will be a continuation of social unrest, such as unpaid miners blocking the railways. Strikes by railway workers are also possible. Such actions will undoubtedly disrupt transport. If this threatens to interrupt military movements, the first step would be for the military to use their own railway troops. However, these troops are reported to have been transferred from MOD to "another ministry". They would be sufficient to ensure limited movements, even if these interfere with civilian transport. Were disorders to become widespread or threaten those sections of the economy that the authorities consider essential, then they have the option of declaring martial law. Conscription and threats against civilians, in a repeat of post-1917 actions, are unlikely to produce the required results in current circumstances.

Movement of Materials, Goods, Food and Manufactures

Pipe-lines

The main export trade that earns foreign currency is in pipelines carrying oil and gas. This supports much of the wealth of the oligarchs and therefore of the Federal, regional and City governments. Oil and gas extraction and transport is also heavily supported by foreign expertise and investment; foreign firms risk little in this trade where the products can be sold quickly for cash on world markets. This is likely to survive any "economic dictatorship" threatened by the government or red-brown factions.

Rail

The rest of the export trade is in the form of bulk products, minerals, ores, timber, wood pulp, metal pig, rolled steel strip, scrap iron, etc. This is typically served by railways, which are the least badly run sector of the transportation system, although they too suffer heavily from deterioration in the routes, bridges, signalling systems and rolling stock. There can be little chance of the heavy financial and technical investment needed to improve them. But they will almost certainly muddle along if only because so much personal and corporate wealth depends upon the railways, especially in the arc from Finland to Iran.

The ambitions for improvement between St.Petersburg and Moscow may come about, if only because of the loss of prestige that would accompany a failure to upgrade the existing lines between the two cities that are the wealthiest and the most visible to foreigners. One may forget the planned so-called "high speed link".

Given an absence of unfavourable political developments in the southern and southeastern republics of the CIS, it is possible that the much talked about southern rail link, the so-called Euro-Asian link between the Black Sea States and China, may come about. Russia will of course do its best to slow that down and to promote its own upgrading of the Trans-Siberian and BAM railways. It seems unlikely that the venture involving the US Sealand, Finnish and other west European firms will, in the near future, be progressed on the ground. This, even on paper, as shown in the reports quoted here, provides little enough advantage in transit times and cost

between Europe and Japan. This advantage is almost certain to vanish when faced with Russian realities.

Road

Commercial road traffic is important between Russia, Belarus and Ukraine and out to the West. The conditions of the roads, and more especially bridges, is superficially adequate but they suffer from poor, short-lived basic engineering materials and obsolete bridges and a lack of basic services such as drainage, road markings, rest and service stations. The road system is designed for Soviet cars and trucks with lighter axle loads than those used by foreign firms. Heavier axle loadings are increasingly used in this traffic and will accelerate the deterioration of the system, with little likelihood of the essential regular repair and maintenance work being undertaken. The fSU made none of the equipment needed for the maintenance of either the railways or the road system. Consequently they will have to find a means of financing the purchase, lease or hire of the gear. There are no signs that governments will adopt the obvious course of inviting the foreign manufacturers of this equipment to set up shop in the fSU, using their own skills to provide a much needed long term substitute for ill-afforded imports.

Water

The consultants' reports expose the hollowness of Soviet attempts to exploit their inland waterways, rivers, lakes and coastal shipping. The Soviets squandered millions at a huge cost in human life to create canals, with locks and hydro-electric schemes to join the inland system to the sea and to provide an extra means of serving the agricultural and industrial needs within the country. Figures show that in spite of all the efforts of the infamous Five Year Plans of the 1930s, the proportion of goods carried through the system has been insignificant. It suffers from the familiar failures of Soviet planning, bureaucratic operations and poor technical and commercial performance. All of this has got worse in post Soviet Russia and Ukraine. The North Sea Route from Europe via the Kola Peninsula to the Barents Sea and the Pacific is hugely costly, relying as it does on icebreakers, some of which are nuclear powered. All of these, together with the merchant ships involved, relied on foreign manufacture either totally or in part. This route has a romance attached to it but little else. There seems to have been little use by the military of this part of the system.

Civil Aviation

The deficiencies in this sector are well known in the west. Nothing is up to internationally accepted standards. Everything needs huge investments and modernisation. This applies to airfields, terminal buildings, communications, air traffic control, computerised reservation systems, design, manufacture, operation and upgrading and maintenance of aircraft. The consultants comment that post Soviet developments require serious rationalisation of carriers, routes, etc, as well as basic improvements which can only come from abroad in the management, operation, regulation and legislation applicable to a modern and safe, environmentally sound, civil aviation system.

Things were bad enough in Soviet times when the accident record was kept secret and when everything was heavily subsidised. Things are now in the open and are seen to be unacceptable by western standards. Poor air traffic control and communications will also have a continuing negative effect on military operations, since they share the same air space and often enough the same airfields.

Introduction

The economy and military capabilities of any country depend significantly upon the extent, state and efficiency of the transport systems. This is especially true for the former Soviet Union and its successor republics. In this huge land mass the railways are the most important asset from the viewpoint of the military and for the transport of heavy commercial freight, which dominates the economy. The RF is still dominated and constrained by Stalinist principles, which involve a concentration upon heavy industry, which is seen as the backbone of a military industrial system. The regions of the far North and East and the Ural Mountains are of primary importance in ore and oil and gas extraction.

Recent exploration has uncovered the importance of oil and gas further west in the RF, and of even greater importance in the smaller Republics around the Caspian.

Because the USSR was and the RF still is technologically backward in non-military sectors and uncompetitive in engineering manufactures, they have largely imported technology and, from time to time, food. Traditionally in Tsarist and early Soviet times imports have been paid for by massive exports of minerals and also grain. During the later Soviet periods and the post Soviet era, agricultural performance has declined significantly, but it is no longer politically possible to deprive the people of food by massive exports of grain. Consequently the main exports - almost 90% of the total in recent years - are in minerals, such as oil, gas, gold, diamonds and semi-precious stones and ores, semi-finished metals such as rolled steel strip, pig iron, aluminium billets, scrap, timber, wood pulp. There is also a big trade in fertilisers and simple chemicals such as sulphates. All of these are voluminous and require many, large freight wagons. Most of these are unspecialised. This traffic is very visible through the ports of the Baltic States, Poland and Finland. Heavy freight trains also supply the main factories of the fSU as well as exports to China and two-way trade with the former east European partners in Comecon.

In the Soviet economic system, the manufacturing of military and civilian goods was allocated over the whole territory of the USSR and its Comecon partners. This exploited the capabilities of each partner. For example, Hungary played a large part in design and supply of urban buses, Czechoslovakia supplied trams, Latvia made much of the rolling stock for suburban railways, Hungary, Poland, Czechoslovakia and East Germany contributed locomotives, diesel and diesel-electric as main line traction units. Belarus and Lithuania were assemblers of electronically based products. Tank and aircraft factories were distributed around the Union, submarines were made inland on main rivers as well as in the naval yards, which also made large warships, in the North, St. Petersburg and Nikolayevsk in the Ukraine. East Germany and Poland also made the more modern types of merchant ship.

Such consumer goods as were made, were manufactured in military plants all over the Union. Transport of consumer goods and of agricultural produce was and still is primitive, largely unspecialised, inefficient and wasteful of both product and transport resources. The share of nationally produced consumer goods in total freight is small. Since 1991, there has been a marked increase in imports of such goods and basic, as

E100

well as advanced, foreign equipment. It seems that the leadership assumed that the old Soviet Empire and the division of labour within it was stable in perpetuity and that no steps need be taken toward a policy of domestic manufacture to replace imports. They also assumed that they could pay for top level technical equipment, even in essentials, from the capitalist countries by export of gold and other valuable minerals. In this they and their post-Soviet successors have also been mistaken.

Oil and gas increasingly contribute to mineral exports; these in today's Russia and in the other republics provide the wealth of the oligarchs who dominate the governments of the fSU. These people have managed to gain power over the oil, gas producing and transporting organisations through manipulation of the privatisation process that followed the collapse of the USSR. They are now seriously rich and are responsible for the salting abroad of an estimated two or three hundred billions of US Dollars. Consequently, their main concern in the field of transportation has been to develop pipelines for export. Politics play a major role in securing rights of passage. Republics such as Kazakhstan, Turkmenistan as well as other States on the Caspian littoral seek lines that will be secure from disruption by political, military or other means. For these reasons lines are projected that bypass Russian territory.

The main investment within the transport sector is to be found in pipe-lines, the ports and terminal facilities for export. These projects are owned and managed by native firms but the new developments are more usually carried out in consortia with major foreign oil and gas companies which are investing money, equipment and managerial and technical expertise. Because oil and gas are current commodities on the world markets, provided their flow is managed with good commercial sense and with operating competence, profits can be made in the relatively short term and are reasonably risk free.

The same can not be said about road, rail, air and water transport. In these sectors there is hardly any investment. There are a lot of projected developments that are discussed between the Russian and other national authorities and the main financial institutions of the world. But there is little to show for the early optimism, discussions, plans and premature celebrations for the proposed high speed line between St. Petersburg and Moscow by the Russian authorities. Had the forecasts for passenger traffic proved correct, this line, had it worked to plan, would have provided valuable extra capacity. But Soviet and Russian forecasts are rarely correct. The regional links between China, Russia, the southern and Caucasian republics are of great significance, politically, militarily and commercially. EBRD published a very useful report¹, with maps, on this project amongst others, on transport, telecommunications and energy in those regions. Most of the report is reasonably credible, with the exception of figures claimed for GNP per capita in some of the republics, including Russia. The EBRD report admits the need for caution in using the data. Were the mines still working, one would be advised to take all figures originating in the fSU with a cart load of salt.

The current paper provides as accurate an overview of the situation in transport, sector by sector, as can be gleaned from publications - see end notes for literature cited - and discussions with those ostensibly in positions of authority within the fSU, as well as with those foreign experts who have written up their field studies.

The three maps in this paper are taken from *USSR In Maps* by J C Dewdney, Hodder

and Stoughton, 1982.

The State of Public Road Transport Systems

Our review is largely based on an excellent report² by Anglo-Danish Consultants written for EBRD in 1993 supplemented by personal investigation. This work suggests that the main roads leading from Western Russia to the northwest, west and south to the Caucasus are no less capable than they were in Soviet times of transporting military wheeled and tracked vehicles. The most critical current issue, according to the Consultants, is that of quality in road construction and maintenance. There is no proper road management system, nor are the contractors good enough.

The main roads are built with reasonably good foundations, they are wide, with long straight sections, curves with large radii and well graded. The surfaces of strategically important roads were designed for 10 tonne axle loads, those of less importance for 6-tonne loads. Even in 1993 the road authorities reported that 5-8% of trucks exceed the 10-tonne design limit.

These roads are usually surfaced with thick layers of bitumen. Their defects lie, as in so much else of Soviet technology, in the poor quality of the materials used, in this case bitumen and also in the methods of application. The British and Danish road transport specialists, following field work in the republics, showed that the surfaces crack and are liable to break up after a few years due to the brittle nature of the bitumen. Asphalt concrete surfacing is also poor, due, according to the findings of the consultants, to poor compaction. This in turn is due to ineffective compaction equipment. The consultants comment further that the recent use of these highways, which also serve as the main road routes for foreign imports from the south, west and north west of European Russia, by foreign commercial vehicles with higher axle loadings and speeds, accelerates the wear and roughness of the roads. This also causes extra wear and costs to the hauliers. There will be an accelerated need for repairs and, in the not too distant future, of major reconstruction of these highways. There is a need to institute proper supervision of materials and of the works. There is a lack of both the required laboratory instrumentation and of proper procedures. Investment would be massive. However, doing the job properly would lead to massive savings in costs of both the highways and the transport using them. But like so much else in the fSU, such considerations have been ignored by the planners and executive authorities.

One has to ask wherein would lie the return to foreign international, national or commercial authorities were they to contemplate, as some seemed to be doing just two or three years ago³, to make the required investment. Indeed who would supervise the work to ensure it was properly done? Furthermore there is little or no suitable Russian road-making and maintenance equipment for doing the work efficiently; it will have to be imported or licensed from abroad. The alternative of getting a foreign manufacturer to collaborate with a local heavy engineering factory would seem the obvious way to proceed. Experience over the past ten years of trying this match-making, however, shows the problems: those of confidence, politics, finance, fiscal policy, and of management reluctance to change. These all remain to be satisfactorily resolved. If, furthermore, the operation of this equipment is to lie with Russian staff and labour a formidable effort will be needed to change their culture and competence. Otherwise the plant, like so much other high-tech foreign equipment already imported, will deteriorate.

The consultants report other serious problems. Most of the bridges in western Russia were built just after the Second World War and are reported to be approaching the end of their functional life. Most of these ought to be closed to traffic within the period 1998-2000. The bridges have received little or no maintenance for some years; many of them have to be rebuilt or replaced. In the areas sampled by the consultants, Russian surveyors have managed to catch most of the critical deficiencies before they have led to failures. A high degree of computerised condition monitoring for bridges was noted in all four republics studied. The problem lies in implementing the results of those studies. The roads mostly lack adequate drainage, road markings, lane separation and service facilities. As a result of deteriorating roads, poor road marking, old and badly maintained vehicles and poor discipline by drivers, accident rates are very high. For 1990 in Russia there were 135 deaths per billion vehicle kilometres, compared with a UK figure of 11. In Belarus and Kazakhstan there were 62 and 64 respectively for 1991. Recorded accidents in Russia rose by 42% between 1985-90, deaths by 50% and injuries by 45%, with an estimated traffic growth of 10-15%. The figures are bound to be much higher now.

Roads Other Than The "Magistrals" Outside the main roads, much of the track is unmetalled. About 40% of the total road kilometrage belongs to enterprises and is not the responsibility of the national authorities. Presumably these enterprises maintain them themselves, if at all. In present circumstances this is doubtful.

Military and Strategic Issues One may conclude that these factors will not have much effect on military supply and operations within the CIS, nor upon any possible excursions into foreign territory. The state of the bridges may prevent transit of tank transporters and the like. However the Army has its own transport engineers with good bridge building equipment and competence.

Commercial Issues The above picture would certainly provide a commercial transport lobby in any developed or developing country with some important points to place in front of the relevant authorities, with the expectation of amelioration within a few years. This is unlikely in the CIS. Commercial road traffic occupies a low share of total commercial freight movement. Most of it goes by rail. A countervailing impetus may, however, be found in the (presumably profitable) trade across the borders with Finland, the Baltic States, Poland and to the southwest. Trade in consumer goods and food through Finland, Poland and the Baltic States is important both to western firms and to the wealthier Russians. For this reason it is not impossible that some of the commercial interests may fund road improvement schemes directly or indirectly. However this is unlikely unless the political, fiscal, legal and similar aspects of government in the CIS begin to approach the normalities to which a developed market economy is accustomed.

But there are other constraints in development of the road transport system:

- 1) The border crossings are extremely slow, clogged by paperwork, officials of various kinds, poorly designed crossings and facilities.

- 2) A poor network of road services, but this is slowly being developed by foreign firms such as Neste Oy and BP in the northwest and north. The Georgian government recently put out feelers to foreign firms to buy the state-owned road services within the state leading to the Black Sea Port of Poti.⁴

3) As the consultants report, Soviet/Russian commercial vehicles have special characteristics. They are designed to suit the road conditions that they encounter as well as the low level of technical service that is supposed to support them. The vehicles are simple enough to be capable of repair at the side of the road by a competent driver; most Russians are excellent improvisers. The stock of vehicles lacks both small pick-up trucks and articulated vehicles; the average load was reported to be 6.4 tonnes. Vehicles run more slowly, are fuel inefficient, cause too much pollution and generally lack the necessary specialisation to respond to developing market needs. There are estimated to be around five million commercial vehicles in the CIS, excluding special and military vehicles. Rates of unserviceability are high, operators are commonly reported to be forced to spend 2-3 months resolving defects in new vehicles. Vehicle utilisation rates lie between 30-50 thousand km/year; these figures are roughly half those experienced in the West. If the trucking business is to become competitive it will need new designs, manufacturing know-how, improved technology and a major restructuring of the operating and repair businesses. In present circumstances it is difficult to contemplate the participation of foreign firms in this long-term endeavour. The domestic firms are as unlikely to make the transformations in the foreseeable future as they have been over the last century.

Rail Transport

This report relies firstly on material provided by Murray Hughes and of his reporters as well as on their personal judgements. Hughes is the Editor of *Railway Gazette International* (RGI), and has experience of services and operations in many countries. His work is quoted, with permission, extensively in this report. A second valuable source is the EBRD report dealing with east-west trans-fSU communications in general.⁵

The EBRD in its 1997 "Transport Operations Policy" set out its roles in railway developments in the territories. It has financed studies aimed at providing a policy for reconstructing the Russian railways. The EBRD has, so far as I can ascertain, not yet financed any actual work for improving the railways, although it is financing private rail tank wagons in Russia. It would like to assist with development of intermodal transport and reports that some is operating between Berlin and Moscow. The EBRD and the World Bank have agreed that EBRD will concentrate on aviation and railways in Russia and the World Bank on highways, bridges and urban transport.

Preface

It has to be remembered that railways came to Russia in 1834, not long after their introduction in Britain where they began. Their 164 year old development owed much to British engineers and businessmen, who not only exported the early rolling stock, traction engines and railway lines but also assisted materially in setting up factories in Tsarist Russia. The arms factories and iron works established as early as the reign of Peter the Great, as well as the later factories in St. Petersburg such as the "Putilov" works, were well placed to turn out railway lines and locomotives. The State Railways were the main civilian customers for these state and privately owned works before the Revolution of 1917. Indeed Russian-designed locomotives were in widespread use during the first years of this century. One famous engineer, George Lomonosov, not only was the chief engineer responsible for building the first Trans-Siberian Railway

E100

but also designed a robust, efficient and long-lived range of locomotives. After the

Revolution he was placed by Lenin at the head of a Commission to purchase 1000 of them from abroad to establish Soviet Power throughout the remains of the Empire. He emigrated shortly afterwards to England, where his technical designs, notebooks, photographs and diaries are to be seen in the Russian Archives of Leeds University.

The Soviet railway system was served by a corps of dedicated professional railwaymen who were largely kept on by the Soviets from Tsarist times; they were augmented by other professionals who did well to maintain standards in the face of political interference. As a result the railway system functioned well and was probably the best of all the transport systems in the fSU. It was claimed to be the largest network in the world, with 86,000 km in service. It still struggles to maintain the system. Its recent problems after the collapse of the USSR stem in large part from the very severe decline in the national economies, which of course result in dramatic drops in income.

The Rail Network

Table 1 shows the basic figures; it is taken from a discussion between Murray Hughes and the then Minister of Railways Gennadiy Fadeyev, a life long railwayman, in RGI, December 1994, p 795.

Table 1: Russian Railways in Figures

	1985	1990	1991	1992	1993	1st half 1997	1st half 1998
Tonnes	106	1956	2140	1957.3	1640.1	1347.8 520	485
Tonne km (Bn)		2506	2523	2325.9	1976.1	1607.7 n/a	603
Passengers (Mn)		3035	3134	2676.6	2372.3	2325.5 941	884
Passenger km (Bn)		246.3	274.4	255	253.2	272.2 n/a	94.5

Other forms of transport slumped between 1989 and 1996; so rail remains dominant, handling 49% of freight by tonnage excluding pipe-lines. They handle 78% in terms of tonne. km and road transport handles only 1.2% of tonne. km.

Fadeyev claimed that the government recognised the importance of railways and they "always received the necessary investments". Fadeyev claimed that the railways returned to the government more than they received. Failure to link charges to inflation pushed the operating figures into the red; but freight rates were index linked in May 1994. However, since then the Government has played games with the rates, bowing this way and that to industrial lobby groups. The current picture is not disclosed. The passenger business was reported in the interview as being unprofitable then; it almost certainly still is.

They have made "special arrangements with metal, coal, oil industries to try to stabilise rates". However even in 1994 barter formed 40% of the sums due to Russian State Railways (RZD), much of it in goods that are no use to them. So the 19

E100

operating divisions formed a subsidiary to sell on such goods. (In this context one should note that a recent Minister of the Economy stated that barter goods received in payment for exported arms was "only 30% efficient"; it is to be assumed that this means that the final receipt is 30% of the original face value of the goods supplied.)

RGI March 1998 p 159 reports a discussion with V. I. Kovalev, First Deputy Minister of RZD. The St. Petersburg line to Moscow is, according to Kovalev, the premier route in Russia. It carries 40 million gross tonnes/year. Much needs to be done to upgrade it. The work addresses bridges and relaying much of the track. He also reports that very few lines are run separately for freight and passenger services; the latter consequently have to be side-lined to allow freight to pass. A single (at present) high speed passenger train occupies the track equivalent required by 8-10 freight paths. The much-reported new high speed line was effectively shelved in July 1998. Estimates of potential passenger traffic had been exaggerated, according to a new study by a rail research institute. The level expected in 1989 will only be reached by 2010 if there is constant economic and social growth. That will not be possible. The whole project was a typical Soviet-Russian fantasy with premature celebrations but little if any real progress in the work planned.

It was claimed by E. Aksyonenko, Minister of Railways, on January 13 1998 that RZD had made a profit of 10 trillion rubles in 1997 (10 Bn new rubles). Freight traffic increased by 19 Mn tonnes, whilst operating costs decreased as a result of 6% increase in productivity. 476 divisional managements were eliminated, together with reduction in staff numbers. It is intended that freight and passengers will be handled by separate businesses.

RGI in its March 1998 issue, p 138, reported that the Cabinet headed by Chernomyrdin approved a package of structural reforms for RZD. The first two phases of the reform programme will take 5-7 years. This expected to cut staff by another 40,000. In 1997 the total fell by 135,000 to 1,440,000. Freight tariffs were planned to halve by 2005.

Route Developments

Fadeyev was also the head of the Independent Council of Railway operations in the CIS. The council early on agreed to maintain the old standards to preserve the legislative basis and the timetables for railway operations in order to keep freight running smoothly. However RZD now faces 160 frontier crossings, whose formalities result in long delays. Where possible traffic is re-routed to stay in Russia.

Since many of the Soviet ports are now in Ukraine, there is an increasing load on Russian Black Sea ports such as Tuapse and Novorossiysk. Passenger traffic to the resorts in the Caucasus and on the Black Sea are also causing congestion; the Volgograd-Krasnodar, Rostov-Krasnodar and Rostov-Armavir routes are also affected. Fadeyev stated that RZD will have to reinforce the Volgograd-Tikhoretsk, Enem-Krivenkovskaya, Timashevskaya-Krimskaya and Timoshevskaya-Krasnodar sections as well as making major changes at Krasnodar, Krimskaya and Tuapse.

Traffic is also being re-routed to avoid Kazakhstan. Three routes formed the main Trans, Central and South Siberian railways; the main Trans-Siberian is now heavily overloaded. There may have to be a new line from Karasuk via Tatarskaya to Ishim and Perm. Projected new lines have been severely curtailed since 1991 but work is stated to be in progress to double-track and electrify the busiest lines. The hopes were

for expansion of freight trade with the Far Eastern, Asiatic and Pacific countries, requiring development of the ports of Vladivostok, Vostochoy, Nakhodka and Vanino as well as the railway system. There has been no detectable public mention of projects concluded to undertake these works. The Belgian consulting group *Transurb Consult* has been awarded the contract to supervise track rehabilitation on 207 route km of track on three unspecified regional railways, The work is funded by EBRD. The state of the Ukrainian railways is not good. In spite of achieving high productivity with 1930s equipment, the railways are losing ground with the need to undertake serious maintenance, so conditions will worsen.

The Baikal Amur Magistral (BAM)

This has been much publicised. An article "BAM conquers Siberia" in the July 1983 issue of RGI, pp 524-527, sets out its long history, beginning in 1967, routes and description. The article claimed that work would be complete at the end of 1984 and by the end of 1985 regular passenger and freight trains would be running on all sections - a typical piece of Soviet prognosis. Fadeyev in his 1994 interview stated that construction was practically complete but the (final) stretch of the 15.3 km Severomuisky Tunnel remained to be completed (60m have to be dug through complex water-bearing strata and tunnelling is possible only when the ground is frozen artificially). In the meanwhile a by-pass was in use but it presented operational difficulties. On completion BAM will relieve the first Trans-Siberian line, allowing that to be substantially upgraded and electrified from Khabarovsk-Bikin to Shmakova.

BAM was claimed to be profitable as a result of coal exported from the Neruyev and Yakutsk basins to Japan. This report, even if true, may well be adversely affected by failure to pay the miners in recent years.

The Trans-Siberian Line - The Land Bridge

There has been much talk about the advantages of this route for traffic between the Far East and western Europe. An American Company, Sealand Services has been involved. The EBRD study shows, however, that the transit times are not much improved: they give 26 days from Japan to Rotterdam by sea and 24 days from Japan-Nakhodka, thence by rail to Brest, the Baltic or Black sea ports. The EBRD report also suggests that the northwest provinces of China are fast growing and that their trade with the Central Asian republics, especially in view of their ethnic and historical links, will grow apace. The report mentions that passenger traffic has grown rapidly since 1989. In 1993 passengers were reported to be around 110,000 a year, a six fold growth. The "shuttlers" are likely to form most of this new traffic. The report also makes the interesting point that the capital cities of the (Islamic) southern republics are all built on oases. Plainly they are dependent upon proper management of their water resources; this, especially in Uzbekistan, deteriorated in the Soviet era. The decline is possibly irreversible, for example in the case of rivers feeding the Aral Sea. The report provides the same depressing picture of Soviet & Russian sloppiness in planning, execution, renewal and neglect in the railway system, as elsewhere in FSU.

Caucasian Railways

An article by Maurice Howard in RGI, July 1998 p 474-5 describes them. The independence of Georgia, Armenia and Azerbaijan led to civil strife in the former and a war between the two latter states. The economy shrank, as did normal freight, to almost nothing. Local economies are marked by industrial dereliction, unemployment is high, communications often remain cut. The borders between Azerbaijan and Armenia are still closed, cutting off the Nakhichevan enclave. The Abkhazian rebellion

E100

against Georgia has cut the main line from Tbilisi to Moscow; the Caspian coast line from Baku to Dagestan reopened in 1997. Armenia still has no communication with and through Turkey but has free communications only with Georgia. In the period between 1988-95 rail freight in Georgia fell from its peak of 45 million tonnes a year to between 2 & 3 million tonnes a year. Azerbaijan lost 90% of its freight traffic whilst in Armenia it fell from 38 to 2 million tonnes. Most of the rolling stock became redundant, spares were unobtainable, when equipment failed it was dumped. Much of the equipment, such as components in communications and signalling cables, was stolen.

However, trade is picking up, mainly due to developments in the oil business. Chevron have contracted to send crude oil from the Tengiz field in Kazakhstan via Baku to Batumi on the Black Sea. Refineries in Baku also receive crude oil and their processed products are also sent by rail to Batumi. Commercial ferries across the Caspian are moving food to the east and cotton to the west. Currently freight has risen to a rate of 8 million tonnes a year in Georgia and to 10 million in Azerbaijan. Oil makes up around 50% of Georgian freight and 60-70% in Azerbaijan.

All three countries are now considering upgrading the railways in discussion with foreign suppliers; an early target is to instal modern signalling and communications gear. A joint venture is under discussion to build a new link between Akhalkalaki in Georgia and Kars in Turkey.

In July 1997 the first section of the Chechnya by pass went into service; the first freight train ran from Kizlyar to Karlan Yurt. Work is due to be completed in 1999, when it should be able to handle 16 trains a day each way.

The Southern "Silk-Route" Euro-Asian Corridor

There is also a project sponsored by the EU's TACIS programme - Transport Corridor Europe Caucasus Asia (TRACECA) which aims to create a link between China, across Central Asia, the Caspian and the Black Sea to provide a reliable transport route between Europe and the Far East. This would seem to be in competition with the Trans-Siberian and BAM rail links through Russia. The Caucasian countries have maintained close contact with China on this project, backing construction of the Kashgar-Osh section. Georgia and Azerbaijan in particular are reported to be keen on the TRACECA project because it is seen as a means of linking them more closely to the EU, which they are keen to join. Turkmenistan and Uzbekistan are also members of the agreement.⁶

The locomotive works at Tbilisi has an agreement with a similar one at Novocherkassk in Russia; this will promote the repair of locomotives and the building of new ones. Other projected investments are focussed on removing bottlenecks along the corridor. EBRD is involved in some of these, which are concerned to upgrade the railways, ports and terminals. A train ferry service is reported as being established between the Black Sea ports of Poti and Ilichevsk near Odessa. Existing train ferry terminals at Baku and Turkmenbashi are to be reconstructed because of the rise in the level of the Caspian Sea. Facilities at Aktau in Kazakhstan also have to be improved, and when that is done the train ferry to Baku can be restored. New container terminals at Baku and Poti are also planned.

A 1998 report "Future Prospects for the Eurasian Corridor" on this project is published by Harvard University.⁷ The contributors discussed mostly predictable generalities

and hopes rather than useful facts or judgements on the project.

Maintenance and Modernisation Issues

V. I. Kovalev, in his March 1998 interview with RGI, gives the following figures: in 1996 RZD handled over 1,100 Mn tonne/km of freight and 180,000 million passenger km. This was 75% of all freight and over 40% of all passenger traffic. More than 45% of the 87,100 km network is electrified, of which 39,000 route km have two or more tracks. Export traffic accounts for 28% of total railway business. Density is very high; in 1988 some lines carried over 100 million gross tonnes a year and the average volume was 43 million tonnes/km. This was achieved due to electrification, high axle loadings and reducing intervals between trains. Planned spare time in scheduling was not maintained, due to shortfalls in technical equipment resulting in delays. Furthermore not all essential maintenance and renewal was done. The huge growth in traffic up to the early 1990s was unmatched in yard and station capacity, where there was serious congestion in winter. Since then traffic has fallen, but there is now an additional requirement to upgrade some busy lines to deal with faster passenger transport. This plainly presents a major problem. Average speeds on the main lines, about 40% of the network, are typically 100-120 km/hr (60-70 mph), but "in the near future some routes will be cleared to a maximum speed of 140 kph (87.5 mph)."

Track maintenance and other engineering work represents 29% of total costs. 65% of these are fixed costs, so the fall in traffic does not save much. Fixed costs could be reduced by closing low density routes (remember British Rail?) and lifting tracks in some yards and stations, but "this has not been possible so far". Presumably there is no political will. Railways can stand a good deal of neglect in track maintenance; the result, however, leads to enforced lower running speeds of trains and more derailments.

In its issue of October 1997 RGI reported that Mr Nemtsov stated that the Government had ruled out privatisation of RZD. The article lists the priority investments. These include a bridge over the Amur, completion of the Severomuisky tunnel (see above); the total further investment on BAM is claimed to be \$1bn. The Khabarovsk-Ussurisk and the St. Petersburg-Murmansk routes are to be electrified and the Moscow-Krasnoe-Brest line is to be modernised. RZD intended then to spend \$1.8Bn on new communications equipment. Siemens and AT&T have been selected to work on southwestern and eastern sections respectively. Anti-crisis measures are reported in RGI 16 September 1997 issue, p 575. In 1995 they introduced a new track maintenance scheme, but this will take about 10-12 years to implement fully. To do so requires new equipment for which credits from EBRD have been requested. Amongst requirements from abroad are: ballast cleaners, undercutters, levelling and lining machines and formation renewal machines, and equipment to cut and clean side drainage channels. 1998 should see the completion of an agreement with a Swiss firm to make their rail grinding trains in Russia. Russian sources are providing new track inspection equipment, dynamic stabilisers and rail straightening equipment. These two latter are aimed at reducing the time for speed restrictions on the track.

The impression of the interview with this minister is one of sober sense, frank admission of Russian deficiencies and of an absence of domestic sources of essential equipment, which is sad in a country with the world's largest rail network. This is typical of Russian policies. All their science and engineering could have been directed to designing and producing this sort of equipment, but it was not. The report reinforces the view that the railways are run by people who are competent technically

E100

(but not commercially or operationally), who have had to struggle against handicaps imposed from above and against attitudes inherited from the past. An obvious prognosis is that the current performance, let alone improvements to the railway system, will depend on foreign financial loans and credits as well as foreign technology, for basic equipment, systems and methods.

In April 1995 a delegation from the centre parties in the European Parliament met General Lebed in Tiraspol, Transdnistria, Moldova.⁸ He told the delegation that it would be difficult to withdraw the 14th Army back to Russia for several reasons. The one that concerns this report was his statement that the rail track and bridges in the Ukrainian network, as well as 15 km of track between Tiraspol and the Ukrainian frontier, needed much maintenance work and that he doubted that they were strong enough to take heavy military or "dangerous" cargo (munitions). He added that there were few wagons in the system large enough or with adequate braking to carry the traffic.

His strictures concerning deterioration of track and bridge may well be true, especially in the area under discussion, for which there is no unitary political authority or railway management. His remarks may well apply to other similar frontier areas, such as those in the Caucasus. However, these difficulties also relate to withdrawal of the Russian Army from temperate climes and appropriate barrack and other facilities to worse climates and a lack of facilities. The technical issues may mask a reluctance to carry out the operation; it remains to be seen how rapidly they might be overcome were the requirements to be to proceed in the opposite directions. One need not be deterred by the absence of suitable wagons belonging to the state railways; the army has its own large transporters.

Rolling Stock

Russia is now attempting to become self-sufficient in design and manufacture of traction wagons and passenger cars which were supplied from outside Russia. The holding company RAO-VSM for the, now suspended, high speed link between St. Petersburg and Moscow is charged with finding domestic suppliers (see Appendix for detailed information). At least one car for the high speed train has been built, and a prototype may well be tested for use on RZD's existing lines.

A senior consultant from one of the firms reporting to EBRD told me that the wagons that were employed in carrying crushed ore from the northern mines to be processed in Moscow are now in such a bad condition that this has had to be discontinued because so much freight was lost through spillage from gaps in the wagons. Ore is now carried in the form of rocks and is crushed in Moscow. One result, of course, is that the tonnage carried per wagon is reduced.

Conclusions

1) The railway system is run by people who are technically competent, but who have no competence in commercial management of a railway. They are also handicapped at every turn by politicians, by the continued downturn in the economy and by having to rely on inexperienced domestic firms to design and produce relatively sophisticated equipment for rolling stock, locomotives, signalling and track renewal and maintenance. The alternative of continuing to buy large amounts of this expensive equipment abroad in current economic conditions is becoming more unlikely.

2) Its present state would not prevent military movements on a modest scale in northwest and western Russia.

3) The trans-Siberian routes which are very important for vital commercial, especially export and import traffic are in a poor state by western standards and look as if their development will be severely restricted. However, they are of prime importance for bulk freight, therefore the authorities will probably give their condition a high priority and not allow them to deteriorate significantly.

4) If western financial and business interests are undeterred, the southern route (TRACECA) bypassing Russia between Europe-Caucasus-China may well proceed and take traffic away from Russia. In the long term, this may become a cause for friction between Russia and the former Soviet republics taking part in the projects. Russia may well see their trade with China in a negative light. RF authorities may well be tempted to put commercial pressures on those parties or indeed foment other disturbances within their territories, along the lines of encouraging separatists such as Abkhazia in Georgia.

Internal Waterways and Coastal Shipping

This section relies mainly upon "Waterborne Transport Survey, Russian Federation, Ukraine, Kazakhstan", a Summary Report dated April 1993 to EBRD by an Anglo-Dutch consortium of consultants. It is correlated with other reports, including those already cited in the road and rail sections above, as well as with other information available to the author. The Consultants and the EBRD exhibit a certain charming but implausible optimism and naivete concerning the gradual recovery of economy and the increase in bulk commercial freight they assume as a result.

Maritime Ports

The USSR had 70 recognised ports, of which 26 are classed as major ports, Table 2.3 of the EBRD report, shows the 18 located in RF, Kazakhstan and Ukraine. These 18 handle over half the foreign trade of the FSU.

These ports are those upon which the logistics of any military expedition requiring sea movement must rely. The strategic importance of the commercial traffic through these ports would seem not to be high, judging by the modest trade reported through them. *The USSR in Figures* reported that in 1989 only 400 million tonnes were moved; this is to be compared with the figures for other means. The EBRD report cites rail - 3,870 million tonnes, road 6,369 million tonnes and pipeline 1,225 million tonnes. However these figures do not reconcile with those quoted in the sections above, which are also taken from other reports to EBRD.

Limitations to Traffic Through these Ports

The consultants highlight the following deficiencies and weaknesses.

* Increase in bureaucratic cross-border procedures and customs dues across new and old frontiers alike. Cargo documentation follows rigid requirements, it is slow and uncoordinated by international standards.

E100

* The speed of handling grain and other bulk cargoes is low by western standards, partly due to the use of old fashioned equipment such as grab cranes,

E100

inadequate undercover storage facilities; this is especially true at Ilyichevsk in Ukraine.

* Inadequate depth of water in the ports to handle large bulk carriers. This necessitates the use of mid-stream lighterage.

* Sea access to many ports is also limited and requires constant dredging; most ports within the Russian Federation in northern waters and even in the Black Sea are not, as claimed, ice free the year round.

* Although much of the dockside equipment is still serviceable, foreign currency will be required to buy the necessary spare parts. 80% of all mechanical handling equipment is imported, mostly from Eastern Europe and Finland. Currently port operators resort to cannibalisation of some equipment which is under-used, so they can get by for a while without the need to buy parts.

* Due to poor facilities, cargo has to be stored for long periods.

* For this and other reasons mentioned above available berth space cannot be fully utilised.

* Most of these faults are attributed by the consultants to the Soviet decision to design ports for direct delivery of dry cargo to and from rail wagons.

* Only 10% of general cargo is currently handled in containers; the current world average is 45%. The consultants think it will take 25 years for the fSU to reach that level. The merchant fleet of the USSR, which carried over two-thirds of all Soviet trade, has relatively few container ships; these are used outside the CIS to earn foreign currency. As has already been noted, the railways lack facilities for inland distribution of containers. Around a quarter of all port container movements are associated with the Trans-Siberian land-bridge and do not involve CIS trade. Vostochny is for this reason the leading container port in the CIS.

* Most ports were designed to handle general cargo. There is substantial capacity of this type which would become redundant if the use of container ships grows. But this presents an opportunity to redevelop the areas devoted to this trade for other, more efficient services.

* Unfortunately this opportunity is handicapped by the limitations in rail facilities; rail access is restricted, wagons are tied up in poor marshalling systems, causing their misuse. Rail transport is poorly coordinated with the ports. This results from failures in and between Soviet-era ministries which still run those affairs. The consultants highlight limitations in railway capacity as the single most important problem affecting port operations. This author's recent experiences in the Baltic States confirms this opinion.

* Even though there is no general shortage of wagons, they are not available at the ports when and where required because of poor communications between port and rail operators and the owners of cargo. This is because of the lack of clear understanding of responsibilities, incentives for efficient operation, electronic data networks, an efficient forwarding system. The break up of the Soviet rail system has added to poor communication and the retention of rolling stock within individual

republics.

* The ports use a lot of labour; this results in low productivity and has obvious financial consequences. Direct labour accounts for 35-40% of the total operating costs of the ports; social costs add a further 15%.

* Current practice results in environmental degradation due to spillages of dangerous substances, other discharges, disposal of spoil from dredging and air pollution and dust. There is confusion concerning the standards required for handling dangerous cargoes; this results in lack of awareness of potential problems and is typical of the casual attitude to such hazards that persist in the post-Soviet Union.

These shortcomings are self imposed by the Soviet system of economic planning, its sloppy, unprofessional industrial performance and operating methods. As in every other aspect of the post Soviet economy, it will take a great deal of willingness to improve; freedom for the relevant authorities to make changes even if they are granted delegated authority to do so; ability and competence; as well as large financial investments in foreign currency for the purchase of equipment and spares; and the necessary managerial and supervisory work to survey the needs, plan them properly, present them to investors in a plausible form, to carry out the works and to audit their results. These deficiencies apply also to inland waterways, river-sea routes and coastal shipping, which are discussed below.

The Northern Sea Route

According to a paper by Lawson Brigham⁹, at great expense the USSR acquired a range of ice breakers, some diesel powered. But the most powerful are nuclear powered because they can stay at sea for long periods and require no fuel, whilst the conventionally engined ones may use 100 tonnes a day and develop insufficient power to break through ice 8-12 feet thick. With the help of these vessels, commercial vessels may traverse the Arctic from West, at the Kola inlet, to East at the Bering Straits. 20 were built in Norway and USSR between 1959-93. 15 remain in service in 1998. In Soviet times the annual volume of cargo shipped was around 6 million tonnes; it is now about 2 million tonnes. This operation was plainly uneconomic; Brigham states that since the collapse of USSR, the shipping companies have attempted to balance the books by chartering to westerners for adventure sailing. However this is plainly a potential link between the Pacific Ocean and Europe. There is in being an International Northern Sea Route Programme, owned by a consortium of Japanese, Norwegian and Russian research institutes.

Port Organisation and Management

Although the Russian ports have mostly been established as independent businesses, they still report to the Ministry of Transport which, as can be seen from the following list, retains a range of duties which in capitalist countries is the responsibility of the port operators. The Ministry was intended to retain only regulatory functions and industrial promotion.

Responsibilities of the Russian Ministry of Transport (June 1992)

Economic policy	* traffic forecasting and investment planning
	* marketing (including some allocation of traffic between ports)
	* control of foreign currency expenditure

E100

	<ul style="list-style-type: none">* regulation of some tariffs* operational and financial targets* taxation and subsidies* property leases and privatisation policy
Social policy	<ul style="list-style-type: none">* appointment of senior managers* employment standards, wages and benefits* labour productivity and manpower planning
Technical Standards	<ul style="list-style-type: none">* navigation* environmental protection* legislation* commercial regulation (insurance, documentation, settlement of claims)

Although some of these responsibilities have since been abandoned, the attitudes of mind have not: management is still in the hands of Ministries and not of professional managers.

Ukraine

Ukraine has established a Ministry of Transport but executive control is reported to remain with the Black Sea Shipping Company. It is reported in September 1998 to be in liquidation and its operations are run by about a dozen private firms. A holding company was planned in 1993 to link ports and shipping; it was supposed to report direct to the Council of Ministers, bypassing the Ministry of Transport. The new company was reported to replicate many of the old features of the Soviet Ministry of Merchant Marine. However by September 1998 the planned steps had not been put into effect.

Kazakhstan

Its port, Aktau, is on the Caspian Sea. The Aktau International Sea Transport Company was set up May 1992. The Ministry of Transport owns 27%, and there are 20 other shareholders each with less than 8%. These include Dutch, Turkish and Iranian firms and the Russian Volga Tanker Shipping Company.

Consultants' view of the competence of managements in all three republics

Whilst technically competent the local managements lack: the understanding of working in a competitive environment; in particular they fail to understand the need to improve quality of service and to lower costs. They lack a sense of accountability and initiative at any level. They resist reforms which would lead to a reduction in the labour force. The consultants add that the transition from state controls for the ports to the present semi-autonomous system has been rapid but the necessary institutional arrangements to allow them to develop as efficient self-financed enterprises have not yet taken place. Nor is there a system to provide adequate safeguards for foreign investors, who are essential to future developments. None of the ports has adequate reserves to finance their own future. In short, the ports are no better managed than they were under the Soviets and there is little prospect for them to improve and to attract foreign investment.

Inland Waterway Transport

The Waterways

There are just over 100,000 km of navigable waterways in the three republics, but

these account for only 3% of total domestic freight. There are also ship-building facilities which even built submarines. The most important waterways were the result of intensive effort, mostly slave labour under inhuman conditions guarded by NKVD troops during the 1930s. Large rivers such as the Volga, Kama and Don were provided with a series of reservoirs, dams and locks. A general operating draught is between 3.5 and 4.0 metres. Canals were also built to link these three river systems with each other and with sea ports. These include the Volga-Don, Don-Balt, Moscow and Belomor canals. The first three are circuitous and are uncompetitive with road and rail transport in cost and time.

In Siberia some large rivers provide important supply lines to the north but are frozen for much of the year; dredging cost is excessive. In any case the main supply routes run east-west whilst the rivers run north-south. There is also an extensive system of secondary waterways, but these are even more difficult to maintain and are only lightly used. They therefore lack strategic importance.

Ukraine has a much smaller system, which is based on the Dnepr, with similar reservoirs and hydro-electric power plants. River traffic between Belarus and Ukraine has almost ceased because the Chernobyl disaster has caused the cessation of dredging in about 30 km of the Pripjat Marsh area. The cost of dealing with the environmental problems to restore this river would be prohibitive; it would necessitate the safe removal and storage of thousands of tons of highly contaminated spoil. The Dnepr river and the adjacent aquifers are heavily radioactive (as well as carrying iron and manganese suspended and dissolved solids); these feed various cities such as Dneprodzerzhinsk in Ukraine. Interstate traffic will continue to use road and rail transport.

Most of the freight in all three republics consists of building materials; this is in decline along with that of the building industry in those countries. Other traffic includes timber, coal, oil and grain. In Kazakhstan the system consists of four rivers and one lake and is not reported in the EBRD survey.

Inland Ports

There are around 3,000 river ports in Russia, of which the 11 largest handle less than 5% of the total traffic on the waterways. Ukraine has many fewer and the 10 largest account for over 80% of all public use berths; additionally there are 195 industrial berths on the Dnepr. Principal problems are:

- * lack of storage space at the ports
- * shortage of self discharging rail wagons for bulk cargo
- * predominance of low capacity cranes (under 5 tonnes)
- * shortage of small bulldozers and forklift trucks.

Soviet made equipment provided most of the handling equipment, but many of the manufacturing plants have ceased production so spares are not readily available. The ports are unable to buy imported equipment; this results in even lower productivity. Port congestion and slow handling rates cause vessels to spend too much time in port and the practice of keeping tugs permanently coupled to their barges results in them spending 55% of their time in port compared with 10% for river tugs in Western

E100

Europe. There is much idle time in port because they wait for port services such as rail wagons and storage.

Inland River and Canal Fleet

There are about 9000 vessels in the RF, 800 in Ukraine and 400 in Kazakhstan. Around 35% are self-propelled vessels, their use is far more expensive than barge tows of equivalent capacity and they offer no relative advantages in scale or faster transit times. The Russian fleet is old but due to surplus capacity will not be replaced. Ukraine in the 1980s bought large numbers of barges.

Financial and Managerial Issues

The management system for the inland waterways follows that described above for sea transport. Provision of support from central budgets has been withdrawn in Russia and Ukraine; some income is derived from sale of dredged aggregates but this is likely to fall with the slump in building activities. The main needs of the system are for maintenance, such as dredging. Major works are essential to the Kochevsky Dam to allow vessels of 3.5m draught to use it and to provide the structural safety of the lock. The dams in both Dneproderzhinsk and Dnepropetrovsk also need engineering work. The waterways face more complex problems than do the sea ports; the consultants recommend some reform processes to allow them to play a more significant role in transport within the CIS.

The River-Sea Fleet

The consultants' report to the EBRD distinguishes River-Sea Transport from the above. They report that these operations are specialised and differ from those using canals and exclusively rivers because the vessels have to traverse open water, including large inland lakes in the North. Such vessels have to access directly industrial production and consumption facilities. They require a different hull shape with better sea-keeping capabilities. The consultants reported that in 1993 there was a growing interest in this traffic because:

- * It is more profitable than other inland waterway operations. It accounted for 35% of net revenues whilst carrying only 16% of tonne km of activity and only 4% of cargo in tonnage.

- * It can earn foreign currency not only in CIS-foreign trade but also for third party business, which occupied 5-10% of capacity.

- * Its vessels can be used in winter when many inland waterways are frozen.

Given enterprising management this transport could reduce the monopoly of the railways to and from the sea ports, few of which have direct links with the inland waterways.

In Russia these vessels handled (early 1990s) 17 million tonnes of international trade and 5-6 million tonnes of domestic cargo. In Ukraine the figures were 2 and 4 million tonnes respectively. International routes are - in the North to Scandinavia, Poland and Germany; and from the Black Sea to Bulgaria, Yugoslavia, Turkey and Greece.

In Russia there are 500 vessels with a total capacity of 1.3 million dwt; the Ukrainians have 71 vessels with a dwt of 184,000 total. Most vessels are between 2-5000 dwt, and average 2,600 with a draught of 3.5-4.0 m. Other republics own vessels plying

the Caspian: The Caspian Sea Shipping Company based in Baku; the Volga Tanker Company based in Samara; and the Kazakh Aktau Company which intends to build its own river-sea fleet. Ukrainian vessels are relative young (8 years old) whilst the Russian vessels are reported to be 20 years old. However Lloyds Register covers about a third of such vessels in the fSU; this shows that 80% of the tonnage registered with Lloyds is under 18 years old and 30% less than 9 years old (in 1992/3). Most vessels were made in Poland, Hungary, Yugoslavia or East Germany; some have locally made hulls but are fitted with imported engines. Productivity is again low, for the same reasons described above, which result in long turn round times in port.

The consultants concluded that there was a growing demand for this type of transport but that the development plans envisaged were too optimistic. Better use of existing assets could be achieved by better management and maintenance; they saw little point in investing in new vessels. Inter republican and foreign trading should form a growing part in trade and may provide a plausible reason for investment. They suggest that these inland waterways could be opened to international shipping and any efficient local entrepreneurs who might be found and relied upon might attract credits to charter suitable foreign vessels. In Chapter 7 of their report, the consultants provide a list of projects which might be worth studying.

Coastal Shipping

Coastal shipping was important in fSU: it provided the only links to remote areas of the Arctic North and Far East. In the Black Sea region it was used for redistribution of bulk cargoes, especially grain. The total annual trade came to 29 million tonnes. Table 5.1 p 27 in the EBRD report analyses it. There is also speculation about developing the northern routes.

Matters Common to All Water Transport

The EBRD report discusses the need to establish proper legislation for restructuring, possibly privatising ports, shipping and other facilities. It identifies Priority Investments for Water Transport (Table 7.1, p 37). It admits that nothing sensible is yet in place. In my view all the talk from foreign or local sources along these lines falls into the "pie in the sky and in practice unattainable" categories. They will, as usual, be talked about, maybe even receive funding for studies from abroad, more consultants will write recommendations, but little if anything will happen and that which does will not prove to be attractive to competent professional operators in the foreign private sector, nor will it lay the ground work or advance the essential steps away from the Soviet approach. It would be wise to make our appreciations based on that which there is, namely the old Soviet structure, systems, state of equipment, etc, but all of them degenerated by the passage of time and the depredations of the self-centred people in power.

Aviation

Civil aviation, of all the forms of transport in the USSR, was the first of which the Soviets boasted. It was, understandably in view of the size of the country and the isolation of many communities, the largest national system in terms of route mileage. It is therefore of special importance. However the system suffered from the now familiar faults of the USSR including price distortions, which resulted in a larger

industry than that which could be afforded in a market economy and which required heavy subsidy by the State. This was exacerbated by the irrelevance to the operators of high costs, as well as by the relatively poor technical equipment of airfields, terminals, buildings, passenger and freight handling facilities, air traffic control equipment and communications. All this came into the category of "that is good enough for *hoi polloi*".

Aircraft were based on military designs. This led to inefficient engines which were based on afterburners; there were no engines, so far as I am aware, that were designed with high bypass systems, the basis of fuel efficient operation. One or two smaller engines with by-pass were shown at Farnborough Air Show in September 1998. Gas turbines suffered from a lack of proper engineering materials with a long life at high temperatures, consequently they have to be re-bladed at very short intervals. The weakness of engineering materials is also reflected in overweight structures. Aircraft suffer aerodynamic deficiencies, as can be seen by the numerous "spoilers" on the wings. This argues haste in the design stage. Haste to complete projects is evident from the memoirs of leading aircraft and aero-engine designers; prestige took priority over thorough professional design and development work. The industry suffers from the general poor state of design and manufacture of Soviet electronics components, as well as the sloppy state of assembly plants and workmanship.

These are the facts which led, together with a lack of emphasis on professional air traffic control, flying management and poor equipment, to a much higher accident rate than the world average. Nevertheless the propaganda of the Soviets and the post Soviet apologists, both domestic and foreign, ignores all these defects and boasts of their high technical excellence, which is illusory. It has deteriorated even further since the collapse of the USSR.

The old Aeroflot monopoly airline has disintegrated into many separate airlines, some private some State owned and run. However, none of the aspects - airfields, terminal buildings, air traffic control, aircraft, computer reservation systems, technical and regulatory supervision, re-integration of system control - can be addressed separately, it is a continuous interactive loop whose problems cannot be addressed and improved except with an overall, professional approach over a long period. The authorities of the CIS lack this professional expertise, approach and even, one suspects, intent which will have to be supplied from abroad. Without ICAO and other experts to oversee the whole development process, no amount of narrow consultancy or sectoral investment will be beneficial. The EBRD report of 1993¹⁰ discusses the main requirements. It lists its conclusions and recommendations. It estimates that total aviation investments during the 1990s could reach \$16Bn, divided between: aircraft \$4Bn; air traffic control \$2Bn; airports \$10Bn. By the year 2015, the report concludes, these figures will rise to: aircraft \$23.5Bn; air traffic control \$11Bn, airports \$65Bn; a total in excess of \$100Bn.

Experience in these and other spheres shows that these investments will be allowed to become ineffective, unprofitable, even dangerous unless the local people at every level not only learn how to do the job properly but have the self-motivation to continue to be competent professionals. Above all they will need to pursue their job without adverse political, technical and financial influences. The report reinforces this point; the strategies recommended in its section 6.3 "were prepared to give insight into the inter-relationships which could serve investors if the projections were performed with more rigor as they should and would be in civil aviation master planning." Current

performance in fSU suggests that this desirable state is unlikely to be achieved. It would be useful if a current assessment were made of the hopes of the Consultants that should have been achieved by 1999; progress or more likely the lack of it toward their sensible objectives will provide a more realistic assessment of the ability of the civil aviation sector in the CIS to perform to international norms and to be able to serve its commercial purposes properly.

Section 6.3 of the report sets out very thoroughly the priority initiatives it recommends as essential. These cover the following areas:

Airline rationalisation and mergers

In 1993 in Russia there were 21 regional airlines, with a further 114 subsidiary airlines throughout the 21 regions. There is one existing international carrier with two more planned, as well as Transaero, a private shareholding company. This recently has had a very poor reputation amongst foreign travellers. It is essential for these operators to produce a coordinated business plan, especially for the sparsely populated North and North East. The report recommends that the following cities should be considered as candidates for merged inter-regional carriers: St. Petersburg, Moscow, Ekaterinburg, Novosibirsk, Krasnoyarsk, Irkutsk, Khabarovsk and Ufa. The report recommends that in the three smaller republics they surveyed, market forces would probably lead to the emergence of a single national airline including international operations. It comments that Air Ukraine International provides a good basis for transfer to it of foreign expertise and that it could provide a single national domestic airline based on its current experience.

Fleet composition

Replacement of old, inefficient and noisy Soviet aircraft must await profitable operation by the carriers; inevitably this is going to take a long time. However the continued operation of unmodified Soviet aircraft is uneconomical and self-defeating. The consultants draw attention to the option of leasing modern, noise certificated secondhand western aircraft; the costs are listed.

Airport management systems

The report recommends that each airport with a future makes a comprehensive assessment of its traffic and facilities in order to create a Master Plan, without which no foreign investor is likely to be interested. Experience in the defence industries shows that Russian promoters of their own business plans are naive, extravagantly optimistic about return on capital and the pay back period. Foreign investors must make their own assessments and estimates or undertake "due diligence" of a high order in checking everything they are told by the locals.

Major Gateways

The report lists its choices. Freight is not mentioned in the Consultants' report; however in Soviet times air freight included perishable food stuffs and even flowers from the south to Moscow. The northern carriers will almost certainly carry some essential freight including equipment and spare parts.

Conclusions

Only the poor state of air traffic control, amongst all the factors in civil aviation, will affect military operations. The coordination of military-civil airspace operations is, to judge by recent events, less than adequate or safe. Given the indifference to safety

E100

and to hazards to life or the environment of the Russian authorities, whether civil or military, this would not provide a brake to any military operations undertaken by the Russian military, whether planned or undertaken on a sudden decision, as it was in Chechnya.

The civil aviation system is unlikely to reach western norms of performance, economy, profitability, safety, comfort or attractiveness for a long time to come. Progress will depend on development of the economy, to which it itself contributes, on the willingness and competence of the people involved, from government down to the baggage handler and immigration officers at airports to learn from foreigners how to do their job professionally. Until that happens flying within the fSU and especially by domestic airlines will remain a relatively unattractive experience. Mercifully foreign carriers increasingly serve the leading capital cities of the fSU, but that does not, of itself, improve the airport experience. However some of the main airports are being modernised by western contractors and things are slowly improving.

ENDNOTES

Appendix

Domestic traction developments: Contractors for the Moscow Metro

Electrical motor units (EMU) comprise traction and often the rolling stock as well. They were previously supplied for suburban lines by Riga Carriage Works, Latvia. Possible suppliers in defence industries mentioned are the Torzhok factory that previously made military freight wagons, or the Transmash factory at Tikhvin, which was the main plant for Kirovets tractor frames and axles. It had no railway experience but it had "a solid machine base, 20,000 staff and 1.1 million cubic metres of covered workspace. It has its own metallurgical plant." This plant is charged with producing wheel sets and powered bogies. The well-known "Rubin" bureau that produced nuclear submarines, tanks, supersonic aircraft and moon walkers will develop rolling stock and high-speed trains.

New trains for the Moscow metro

This project is described in RGI December 1993, p 804. It is summarised here. The competition for the design was won by Avtovaz. The asynchronous 3-phase control system was developed by "Foton", the power equipment by the "Dynamo" works, the pneumatic system and brakes at Transmash, Moscow. Body-shell construction and fitting were done at Metrovagonmash at Mytishchi. Five prototype cars were completed in 1991 and went on trial at a test track at Shcherbinina. Political problems of that year caused a suspension of trials, problems with the inverter gear caused further delays.

On June 6 1993, eight months after the order, the first 10-car 3kv DC suburban EMU was rolled out at Torzhok. This equipment, designated ET-2, has six power cars and four trailers capable of 130km/hr. It is in service on St.Petersburg suburban railways.

Organisations listed as involved in the project:

- Lenengiprotrans Project Research Institute, St. Petersburg,
- Mosgiprotrans Project Research Institute, Moscow,
- Lennilproject Architectural Design Institute,
- St. Petersburg State University of Communications,
- All-Russian Scientific Research Institute for Railway Transport,
- Rubin Central Construction Bureau of Marine Engineering,
- Transmash Tikhvin Factory,
- Torzhok Rolling Stock Assembly Plant,
- Granit Central Scientific Research Institute,
- Sofrerail Consultants (France),
- Andrew Communications (USA),
- Hellmuth, Obata and Kassabaum, Architects (GB),
- Sila Shareholding Co, St. Petersburg,
- Nalex Construction Co (USA),
- Lonhro.

Other Russian firms are now building railway equipment to substitute for past imports. There were no plants in Russia building electric traction units for passenger use; these came from Czechoslovakia. Multiple-units were built in Riga. These countries required trade to be carried out in hard currency, which proved to be impossible, according to Dr Mityushin, deputy director general of the Central Scientific Railway Research Institute, reported in RGI April 1998, p 233. He also mentioned that The Ludinovo Diesel Locomotive Factory will produce electric passenger locomotives (EMU) as well as Diesel Motor Units. EMU will also be built at Demekhovo, Torzhok

and at Novocherkassk.

1. "The Euro-Asian Corridor: Strategic Issues in the Transport, Telecommunications and Energy Sectors", July 15 1993. Prepared by Gavan McDonell.
2. "Road and Road Transport Study - Russia, Ukraine, Kazakhstan and Belarus". April 1993.
3. See for example, the "Transport Operations Study" published EBRD 1997. This is an excellent review of the bank's work and intentions in the transport sector within the CIS and outside it. It seems to this author, however, that its intentions for the CIS will not be financially viable.
4. In fact early in 1997, the Georgian Vice President of the Russian Academy of Sciences in Moscow, who acts as Shevardnadze's facilitator specifically asked me to arrange this. I informed the Department of Trade, who passed the request on.
5. See Note 1 above.
6. "Traceca Conference Participants Converge on Baku", reported RFE/RL on September 8 1998. 'The presidents of Turkey, Romania, Bulgaria, Ukraine, Georgia, Moldova, Uzbekistan and Kyrgyzstan arrived in Baku on 7 September to attend an EU-sponsored conference that will discuss the creation of road, rail and ferry network linking Central Asia and Europe via the Transcaucasus. Representatives from a total of 38 countries and 16 international organisation are attending. The Russian delegation is headed by CIS Executive Secretary Boris Berezovskiy. Iran is represented by a deputy transport minister. Earlier, Iranian President Mohammad Khatami had said he would attend the meeting, according to Turan.'
7. *Future Prospects for the Eurasian Corridor*, a series of round-table discussions, April 23 1998. J. F. Kennedy School of Government, Harvard University, Strengthening Democratic Institutions Project.
8. I thank Stephen Biller, a member of that delegation, for a copy of his report.
9. British East-West Journal, September 1998, with his source paper quoted therein.
10. "Summary Report - Aviation Sector Survey, Russia, Belarus, Kazakhstan and Ukraine" by Aerodevco Consultants Ltd, Canada.