

Transportation in Transition Economies: a Key to Carbon Management

Meredydd EVANS, Pacific Northwest National Laboratory

1 - OVERVIEW

The transportation sector will play a major role in future greenhouse gas emission trends in Russia, Ukraine, and other transition economies. The former Soviet Union has significantly reduced its greenhouse gas (GHG) emissions through years of economic hardship. Despite these major reductions in total carbon emissions resulting from economic collapse, the transportation sector's emissions decreased at a more moderate rate or remained steady in recent years. Competition will force heavily polluting sectors, like industry, to become more modern and efficient. Emissions from the transportation sector, however, threatens to reverse overall emission trends: Poland and the Czech Republic, for example, have experienced dramatically increased use of cars and trucks since 1990, and large increases in transportation-related greenhouse gas emissions.

At the same time, transportation is one of the few sectors in the former Soviet Union (FSU) experiencing significant capital investment. Improving efficiency and environmental controls in most economic sectors is often difficult in Russia and Ukraine because of the lack of financing and investment. It is also easier to build for efficiency rather than to retrofit with expensive additions, yet if there is no investment, there is no building. While much of this investment in transportation is fuelling the rising transportation emissions, well-thought-out policies could have a significant impact in reducing future emissions.

This paper concentrates on Russia, Ukraine, and Poland, while drawing some examples from other countries as well. It is divided into three parts. The first part discusses the link between transportation and greenhouse gas emissions globally. The second part describes the trends, structure, and problems of the transportation sector in selected transition economies. For example, most former Soviet states rely heavily on rail for freight, and public transit in cities. While these services are more energy efficient than other transportation modes, they are often poorly managed by large state structures, which threatens their long-term viability. Finally, the third part outlines policies that could avoid a carbon-intensive transportation future in this region. Current policies often promote car use through subsidies and low-interest loans for highway construction and car manufacturing. More carbon-friendly policies might include better balancing foreign subsidised loans to promote sustainable transportation and expanding municipal transportation planning to incorporate modal comparisons, land use, strict financial analysis, and environmental impacts.

2 - THE IMPORTANCE OF TRANSPORTATION

The transportation sector is a major source of global greenhouse gas emissions. This is particularly true in the West, where cars and trucks are dominant modes of transportation and populations are highly mobile. As table 1 illustrates, the transportation sector accounts for about a third of carbon dioxide emissions in many developed nations. In Central Europe and the FSU, though, the transportation sector has historically been a much smaller contributor to carbon dioxide emissions. The Polish transportation sector accounted for 7% of total Polish carbon dioxide emissions in 1991. Poland, though, has seen 30% growth in transportation-related emissions from 1991 to 1996, reflecting the large increase in car travel.¹ Transportation's proportion in total Russian greenhouse gas emissions has held relatively steady since 1990: growth in car emissions has offset the drop in production and shipping. Private car emissions in Russia have grown by over 50% since 1990, which is remarkable in a country experiencing severe economic decline. Freight emissions have declined with the drop in overall economic output, but as output rebounds, so may emissions.² The large volume of transportation-related greenhouse gas emissions, however, also provides an important and sizeable opportunity to mitigate these emissions.

Table 1. Transportation's Role in National CO₂ Emissions in 1990

Country	Transportation as % of Total Emissions
France	35
U.S.	33
Italy	27
Japan	18
Russia	10
Ukraine	8
Poland	7
Source: ECMT. <i>CO₂ Emissions from Transport</i> , pp. 135 and 161; Country Study on Climate Change in Ukraine, pp. 5-65 and 5-74; Second Polish National Communication, p. 25.	

Controlling greenhouse gas emissions from the transportation sector has proved challenging in the West, both because of the number and inherent mobility of the emission sources. Policies that promote or subsidise the use of cars and trucks have intensified the problem by focusing transportation sector growth on the systems with the highest energy intensity and, hence, the greatest emissions per unit of transportation. A good example of this is U.S. funding of inter-state highways. In many transition economies, on the other hand, the transportation sector is concentrated in the least energy-intensive modes. For example, ridership on Russia's urban public transportation systems is the largest in the world. This could change, though, as more private citizens buy cars and attempt to drive on the crowded, poorly maintained roads.

In the early part of this century up until World War II, small, private trolley systems were the major means of urban transportation in the United States. Most of these systems went bankrupt when highways were subsidised and people shifted to cars for transportation. It has taken decades for U.S. cities to rebuild their mass transit systems, often at great expense to taxpayers. The Russian, Polish, and Ukrainian transportation sectors are in a critical transition period. Funding for mass transit and railways has dropped, forcing these systems to cut service, which in turn encourages more people to use the roads and other less environmentally-friendly means of transportation. Many mass transit systems in Russia are technically insolvent, though they continue to operate. In short, Russia, Poland, and Ukraine have well-developed public transportation and rail networks that could decay if they are neglected in favour of more energy intensive modes of transport.

At the same time, transportation is one of the only sectors in the FSU attracting major capital investments. Severe economic decline and the risky investment environment have contributed to low capital investments in other sectors. Transportation investments can be divided into two categories: purchases of cars, trucks, and aeroplanes, and investments into the transportation infrastructure (new or improved roads for the most part). Reducing pollution and energy waste in the FSU is made more difficult by the lack of capital invested to finance improvements. Improvements in energy efficiency and carbon mitigation are easier and more cost-effective to attain when they are designed into new systems than when they are retrofitted into existing systems. The transportation sector, thus, may afford some unique opportunities to direct investment toward cleaner, more energy efficient technologies. Targeting growth sectors through innovative policies could have a major impact on future emissions in the FSU because the growth sectors, transportation included, represent the nexus of emission increases and new investment.

3 - STATUS OF THE TRANSPORTATION SYSTEM

3.1. Urban Transportation

Urban transportation in Central and Eastern Europe has seen tremendous changes in the past decade. Use of cars has risen, while ridership on metro and bus lines has dropped. Public transit service is declining because of lack of financing. This modal shift, and the technologies used in each mode, will shape future urban transportation emission trends. The type of transportation system that emerges in cities of this region will impact not only emissions, but also the mobility,

quality of life and character of the cities these systems weave together. This section examines the changes taking place in urban transportation, highlighting trends that likely will cause emissions to grow. These areas of change often provide us with the best opportunities to shape future emission trends in this sector.

Russia has one of the most comprehensive public transit systems in the world. Ridership on the Moscow subway system, with 3.1 billion passengers annually, is the largest in the world.³ Most Russians rely heavily on public transit for their mobility. Yet as the Russian economy becomes more market-oriented, Russian transit systems are slowly crumbling. Substituting highways for public transit can be extraordinarily expensive, given high real estate values and lack of free space in most larger cities.

The situation in Ukraine is similar. Bus systems in particular have been hard hit by the economic decline and have experienced service cutbacks. Rather than consolidating routes, though, most Ukrainian cities reduce the number of diesel and electric buses that run on each line, making passengers wait for long periods even at rush hour. This has encouraged more passengers to abandon the public transit system in favour of cars.

Use of mass transit in Poland has dropped significantly since the fall of the Iron Curtain. Only 38% of passenger journeys in Poland in 1995 were by public transportation, compared to 53% by car, representing a significant shift toward cars. Bulgaria, Hungary, Latvia, Lithuania, and Slovenia all saw the passenger-kilometre volumes on diesel and electric buses cut approximately in half from 1989 to 1994. In Budapest, public transit's share of passenger travel fell from 80% in 1985 to 60% in 1995.⁴ These declines in public transit usage will cause emissions from automobiles to continue rising, unless steps are taken to reverse or slow the trend. The car is appealing because it symbolises freedom—something which Central and Eastern Europeans have lacked for too long. However, this symbol can be somewhat misleading, particularly when cars lead to development paths that spread out and divide communities, consume valuable open space and threaten the environment. Public transit can provide freedom too in that it offers a choice, but convincing consumers of this is not always easy. Cars, for example, also symbolise status, something which public transit rarely does.

The decline in ridership has aggravated the financial problems of mass transit systems in transition economies. Other factors that are placing financial pressure on the mass transit systems include:

- High percentage of fare evaders, particularly on bus and tram routes that use the honour system;
- Large number of riders who are eligible for free transportation coupled with inadequate government compensation to the transit organisations for this service;
- Lack of financial planning and well-trained management.

Outdated and inefficient equipment often further exacerbates the problem by driving costs up and customers away. Buses and subway trains manufactured in the former Soviet Union have lower fuel efficiency than their Western counterparts, though the former are more common in Russia and Ukraine.

Public transportation systems often have limited marketing, finance, and management capabilities. They are typically slow to react to changing conditions. For example, it would likely be much less expensive in the long run to require all riders to pay upon entering the transit system, rather than to use the honour system, which has been tested and has failed in the former Soviet Union. Low-income riders could be provided targeted subsidies, which would be less expensive than subsidising all fare evaders. Decisions regarding routes and equipment are made based on rigid central planning techniques, and not on customer needs and financial results. While public transportation is a public service, this does not mean that rigorous financial accounting is irrelevant; rather, it is particularly pertinent in order to meet the public service and financial goals of the organisation. Improved transportation and business planning skills could help public transportation organisations better serve their customers and encourage them to continue riding, which in turn would improve the fiscal viability of these organisations.

An interesting new transportation phenomenon is occurring throughout Russia, Poland, Ukraine and other countries: entrepreneurs are setting up minivan service along existing bus and commuter train routes to compensate for the lack of bus and train service. This is evidence that mass transit is feasible and profitable, even under the harsh economic conditions prevalent in the former Soviet Union. If more roads are funded and built, though, car transportation may reduce the competitiveness of these private services. More congestion on the roads means that private van services will provide a slower, less convenient service; van costs will rise with commuting times; and subsidised cars and roads will make driving a less costly alternative. Van services are not subsidised. Despite this, state mass transit officials often feel threatened by van services because they are taking away the few, prized paying customers. Ironically, state transportation companies have not tried to emulate the success of these services by improving fare collection rates and

offering more comfortable and regular service. Instead, the state transportation companies, which hold monopoly licenses, are attempting to use the Anti-Monopoly Committee to force these services out of business in Kiev.⁵

As public transportation systems become less functional, the number of cars on Russian, Polish, and Ukrainian streets is growing. Even in relatively-affluent Moscow, though, private cars provide under 10% of local trips, so the majority of passengers rely on public transit for their mobility despite the system's condition. Car ownership in Russia grew by almost 60% between 1990 and 1995. Likewise, greenhouse gas emissions from Russian cars have grown steadily since 1990. In fact, if current trends continue, growth in emissions from cars could overshadow much of the emission reduction caused by the shrinking Russian economy.⁶ The situation in Poland is similar. When Communism fell in 1989, Poland had 193 cars per 1,000 inhabitants, but in 1998, this number had more than doubled to 411. While Poland's total carbon dioxide emissions decreased from 478 million tonnes in 1988 to 373 million tonnes in 1996, its transportation-related carbon dioxide emissions rose from 28 million to 36 million tonnes over the same period. Polish carbon dioxide emissions from automobiles have gone up even faster than transportation emissions as a whole. In the Czech Republic, transportation accounted for 4.8% of carbon dioxide emissions in 1990 and 7.5% in 1996. In the U.S. by comparison, there were 1.8 people for each car in 1992, and transportation-sector greenhouse gas emissions grew by about 9% from 1990 to 1996.⁷

Car sales have also grown rapidly in recent years. According to the U.S. Commerce Department, Russian annual car sales doubled between 1985 and 1996. Poland has experienced the highest car sales growth in Europe: sales grew by 42% in 1996 and have increased steadily since. Many new car factories have been built in Poland to satisfy the domestic demand; there is a risk that ultimately this production growth will outpace the demand, resulting in layoffs, like those now facing the Polish coal industry.⁸

Daewoo is now the largest foreign investor in Ukraine, primarily because of its investments in car manufacturing. Ukraine made major tax concessions to attract Daewoo; these concessions constitute an implicit subsidy for drivers. Russia has also granted foreign car manufacturers numerous incentives and discounts for investing in Russia. Most of these incentives are not offered to companies investing in more climate-friendly industries producing energy efficiency equipment, environmental controls or trains, for example. The Moscow and St. Petersburg governments have further subsidised the car industry in Russia both through direct subsidies and by requiring that all government cars be purchased from certain domestic producers. Despite the subsidies, domestic car production has plummeted in recent years in the former Soviet Union. In Ukraine, for example, car production in 1997 was just 3.3% of the 1990 volume.⁹

The Russian, Polish and Ukrainian governments pay for road construction as well. Poland, for example, has planned to construct 2,600 km of new toll roads. The total cost of these new roads would be about \$8 billion.¹⁰ Originally, the Polish Government had hoped to attract private financing for these roads, but since no private financiers have stepped forward, the Government is considering providing greater subsidies and financing.

These subsidies for highways and car production provide travellers and shippers a financial incentive in favour of road travel. It is expensive to provide these subsidies, and their marginal costs and benefits are rarely compared to those of public transit subsidies or no subsidies at all. Transportation planning based on more thorough cost-benefit analysis might change some of these funding decisions and, at the same time, help shift transportation trends away from the most carbon-intensive modes.

3.2. Long-Distance Passenger Travel

Unlike in North America and Western Europe, roads have not been a major mode of long-distance passenger travel in the FSU. Cars account for less than 10% of total passenger travel in Russia, as opposed to more than 80% in most of Western Europe and the U.S.¹¹ In Russia, distances between cities are often too great, and in both Ukraine and Russia, roads are not very developed by Western standards. Russian and Ukrainian highways are usually two-lane roads with limited shoulders, markings and lighting. Many Russians and Ukrainians prefer to travel by rail to nearby cities. This preference may change as more roads are built, particularly if modernisation of the rail networks does not receive as much attention as the roads, allowing the railways to slowly decay. In Poland, the shift from rail to roads has already begun to occur, and likely will increase in the future when new highways are opened. Distances between cities are also smaller in Poland, making intercity car travel more feasible.

Table 2 below shows the modal split between transportation sector emissions from several countries in transition.

Table 2. Base Year Transportation Emissions of Carbon Dioxide

Country	Total Emissions (Mt)	Transportation Emissions by Sector (thousand tonnes)				Transport Emissions (Mt)	Percent Transport
		Road	Rail	Shipping	Air		
Czech Republic	168.6	6,840	738	54	294	7.9	4.7
Hungary	75.1	8,132	495	27	532	10.3	13.8
Latvia	23.6	3,826	881	955	168	5.6	24.0
Lithuania	36.6	3,681	242	133	442	4.5	12.3
Poland	372.3	20,016	7,328	588	566	28.5	7.7
Russian Fed.	2,443.7	146,900	1,840	18,100	52,100	234.6	9.6
Slovak Republic	53	4,501	377	143	276	5.3	10.0

Source: *CO₂ Emissions from Transport*, p. 135; *Second Polish National Communication*, p. 23. Notes: Base year means base year under the Framework Convention for Climate Change; it varies by country. Polish data are for 1995, except total emissions (1994). Numbers may not add up due to omission of «other» category and rounding. Ukrainian data were not available.

Air travel is convenient in Russia for long hauls and essential for cities and towns with no road or rail access. Many cities and regional centres in the Russian Far East and Northern Siberia are accessible only by plane or boat. Consequently, air transportation represents a high proportion of intercity travel.¹² Airfares, however, have gone up sharply in recent years as airlines have been privatised and subsidies removed. As a result, more passengers are using trains, even for long distance travel. Ukraine is a smaller country with a more concentrated rail network that serves major cities and many smaller towns. In Poland, air travel accounts for less than 2% of transportation sector carbon dioxide emissions; in Russia this figure is over 22%.¹³

Ships are not a major form of passenger travel in Russia, Ukraine, or Poland. Ukrainian ship travel is concentrated primarily on the Dnieper and Danube rivers and in the Black Sea. Russia relies even less on waterways because much of the country is land-locked and distances are great. River travel is, however, the major means of transportation in some remote areas of Siberia. (The shipping emissions listed in table 2 are primarily from freight shipping.)

While the volume of long-distance passenger travel is lower in transition economies than it is in the European Union or North America, people in transition economies are likely to travel more as their incomes rise. Policymakers and ordinary citizens are creating the future long-distance transportation systems through their choices today. Planning wisely and fully analysing the costs and benefits of various options can provide very cost-effective and simple means of reducing future emissions while providing for passenger mobility.

3.3. Freight Transportation

Freight transportation in Russia and Ukraine has dropped dramatically since 1990. This decline mirrors the decrease in economic output. Polish freight volume has also seen fluctuations in recent years: in 1985, total freight except for sea shipping was 176 billion tonne-kilometres; by 1992, this figure had dropped to 112 billion, though it rebounded to 126 billion in 1994. By comparison, German and U.S. freight volumes in 1996 were 347 and 4,660 billion tonne-kilometres, respectively.¹⁴

Freight transportation in the region has also seen large modal shifts, much as urban passenger transportation has experienced. These shifts simultaneously provide a challenge and an opportunity. The challenge arises because structural changes are rarely painless. Balancing the need for efficient trade with environmental and safety concerns is not easy. (Shipping is the least energy-intensive mode of freight transport, followed closely by rail. Trucks are several times more energy intensive, which means they also emit several times more GHG emissions per tonne-kilometre of freight activity.¹⁵) However, these changes also present an opportunity to make investments and decisions that will lead to sustainable growth, and avoid large increases in greenhouse gas emissions.

Rail is the primary freight mode in Russia, Ukraine, and Poland. Rail accounts for over half of domestic freight activity in Russia. (Pipelines account for another 25%). While rail's modal share remains large, it dropped from 65% to 53% between 1970 and 1992; overall freight activity in Russia increased during this period.¹⁶ Rail also plays a major role in Poland where it accounted for 52% of freight activity in 1994. In Western Europe, trucks dominate the freight market and railroads are having difficulty sustaining themselves. North America is similar to Russia in that rail garners the largest share of freight traffic. This is particularly true in Canada with its vast, often unpopulated expanses comparable to those in Russia.

Several policy analysts and policy makers have argued that Russia, as a European nation, should follow the path of Western Europe in encouraging a large modal freight share for trucks. A 1993 World Bank report entitled *Transport Strategies for the Russian Federation* is a prime example of this. Such analyses fail to take into consideration both the geographic dissimilarities between Russia and Western Europe, and the tremendous capital and environmental costs of extensive trucking. Almost all Russian and Ukrainian factories, for example, have invested heavily in rail infrastructure to ship their goods. Retooling this infrastructure for trucking would be an enormous burden at a time when most industrial plants lack capital even for basic production upgrades.

This is not to say that Russian, Ukrainian, and Polish railways are without flaws. They are inefficient, but powerful state monopolies. Ukrainians, Poles, and Russians often call their railway companies «states within a state» to emphasise the amount of power they have accumulated. Railways are not always the most flexible means of transporting goods either, since routes are not easily changed and door-to-door service is available only for the largest customers. Railways need to adapt to the new market conditions in order to survive. The railway system needs more competition on its lines, so that, for example, different railway companies could compete directly with one another in a given service territory. Competition will force these railway companies to improve their service and efficiency, and as such, may be key to their survival. The flaws in the Russian, Ukrainian and Polish railway systems, however, do not by themselves justify significantly reducing the systems, and doing so is not very realistic because of the huge cost this would entail. A new reform package in Russia is introducing competition and privatising the railway companies; this package was approved in February 1998, so it will some take time to see the results.¹⁷

The Russian trucking industry is dominated by trucks owned by individual enterprises or industries, as opposed to «for-hire» trucks. This is typical of the vertical integration of Soviet-style industry. Rosavtotrans oversees most contract trucking in Russia, and it does most of its business hauling construction materials. Recently, Russia has imposed large tolls on foreign truckers to help protect the domestic trucking market and generate revenue for road construction and repairs. While road tolls can be an effective means of recovering part of the cost of roads, they are not very effective if only one limited class of users needs to pay.¹⁸

Ship and air account for a relatively small and, for the most part, decreasing proportion of freight activity in Russia, Poland and Ukraine. In Ukraine, sea shipping has been dropping sharply for several years, with annual decreases of over 40% in most years. Ukrainian river freight, on the other hand, has grown since 1996. Polish freight on inland waterways has dropped from 1,413 million tonne-kilometres in 1985 to 793 million in 1994. Shipping and air freight have decreased in Russia. Air freight is primarily used for long-distance hauls of specialised goods, or in shuttle trading.

3.4. Traffic Safety and Local Environmental Concerns

Planning transportation systems for sustainability involves more than considering the climate impacts of transportation.

In many cases, designing a transportation system to minimise local air pollution or maximise safety will also lead planners to low-carbon policies. Mass transit, for example, has a much lower accident fatality rate than car travel. Rail shipments also generally result in lower lead, particulate and sulphur dioxide emissions than truck shipments. In most countries in transition, automobile accident fatality rates are very high compared to the U.S. and Western Europe, and accidents are rising with car ownership. Likewise, most formerly Communist countries use a relatively high proportion of leaded gasoline.¹⁹ By incorporating externalities such as accidents, local air pollution, and noise pollution into their decision making, policy makers may be able to address several local problems while reducing greenhouse gas emissions.

3.5. Foreign Investment Trends

Most private foreign investment in the transportation sector supports modernisation of automotive factories. Ford, Daewoo, GM, Renault, Fiat, and Kia have projects or facilities to manufacture vehicles in the former Soviet Union; many of these projects involve hundreds of millions of dollars. Poland has actually become a regional centre for car production because of the large volume of foreign investment it has attracted. Numerous other foreign car manufacturers have distribution networks in Russia, Poland, and Ukraine to tap the growing demand for cars.

Export finance institutions have also played a role in promoting transportation investments in countries in transition. The U.S. Export-Import Bank (ExIm), for example, has recently approved a \$334 million guarantee for Boeing to sell aircraft to Aeroflot. ExIm has also financed other airline industry exports, such as an IBM airline reservation system (\$90 million) and United Technology aircraft engines (\$20 million). Additional transport-related ExIm investments include over \$105 million for car factory paint lines and a small guarantee for tour buses and police cars. The U.S. Overseas Private Investment Corporation has little involvement in the transportation sector. Both the World Bank and the European Bank for Reconstruction and Development have made sizeable loans in the Russian and Ukrainian transportation sectors.

Table 3 below describes many of these investments, the overwhelming majority of which support roads and the automotive sector. Sixty percent of the World Bank and EBRD investments listed go toward these two purposes, both of which effectively promote the use of cars and trucks. Shipping accounts for most of the remaining investments, particularly on the part of EBRD. Only 9% of the planned transportation investments are for public transportation, and neither the World Bank nor EBRD has made any investments in public transportation in Ukraine. Only two World Bank projects in Russia deal with public transport, and neither of these projects has been implemented yet: one project was only recently approved and the other is still under development.

Poland has also received financing from EBRD and the World Bank for transportation sector projects. EBRD has invested in three projects: a 920 million Euro joint venture between Fiat and a Polish car manufacturer; a 487 million Euro railway modernisation project and an 82.6 million Euro motorway development project. EBRD is also considering lending 45 million Euro project to the City of Cracow for fast trams. The World Bank is implementing three transportation projects in Poland: two for roads (\$350 million total) and one for port development (\$67 million).

Table 3. World Bank and EBRD Transportation Investment in Russia and Ukraine

Project Title	Bank	Year Approved	Sector	Project Cost (million \$)
Russia				
Fiat-GAZ Joint Venture	EBRD	1998	Automotive	854
Siberia and Far East Highway	WB	under develop.	Roads/bridges	500
Bridge Rehabilitation	WB	1996	Roads/bridges	466
Urban Transport	WB	1998	Public transport	391
Kamaz Stabilisation Refinancing	EBRD	1995	Automotive	333
Novorossisk Shipping Company	EBRD	1995	Shipping	318
Moscow Urban Transport	WB	under develop.	Roads/bridges public	307
GAZ-Volga	EBRD	1996	Automotive	228
PRISCO	EBRD	1994	Shipping	206
Russian Railways Modernisation	EBRD	1996	Railways	154
Volgotanker Vessel Acquisition	EBRD	1996	Shipping	133
Far-East Air Navigation Systems	EBRD	under develop.	Air	76
Sakhalin Shipping Company	EBRD	1996	Shipping	71
SFAT (Environmentally-Friendly Rail)	EBRD	1996	Railways	62
North West Shipping Company	EBRD	1994	Shipping	56
FESCO	EBRD	1994	Shipping	47
GAZ Corporate Loan	EBRD	1995	Automotive	33
Tolmachevo Airport Upgrade	EBRD	1998	Air	16
Ukraine				
Ukraine Highway	WB	under develop.	Roads/bridges	304
Yuzhny Oil Terminal	EBRD	under develop.	Shipping	216
Railway Commercialisation and Track	EBRD	under develop.	Railways	94
Iveco-Kraz	EBRD	1995	Automotive	60
Ukrshipping	EBRD	1995	Shipping	33
Refurbishment of Borispol Airport	EBRD	1993	Air	15
Yuzhny Fertiliser Terminal	EBRD	1995	Shipping	5
Sources: World Bank and EBRD on-line project databases. Notes: Data do not include pipeline investments. No data were available on total project costs for the Yuzhny Fertiliser Terminal; the data provided are for EBRD's portion only.				

Both EBRD and the World Bank feel that public transportation is an important priority for Poland, Ukraine, and Russia, despite their lack of action in this area. The World Bank writes about urban transportation that «action is needed to avoid a socially and environmentally unsustainable modal split.»²⁰ EBRD's most recent *Transport Operations Policy* states that:

Rapidly increasing motorisation is one of the biggest environmental challenges facing the region. Poor performance by public transport encourages private car ownership and use, which leads to increased road traffic congestion that delays public transport vehicles, and so reinforces the well-known downward spiral. This phenomenon aggravates urban air pollution problems, which have been identified by Ministries of Environment as one of the main environmental issues in Europe.²¹

EBRD acknowledges that it has made few investments in public transport, but blames this on the lack of creditworthiness of public transportation institutions.

Public transportation organisations face great financial pressure because of social subsidies and fare evasion (or what are called non-payments in other sectors). Yet non-payments and social subsidies affect many sectors in which EBRD invests. Energy is a prime example: most district heating and power companies have tremendous non-payments problems and they often provide a subsidised service. Energy sector arrears are difficult to resolve both because poor billing practices have allowed the problem to expand and because energy users often cannot be disconnected individually without shutting off all the other users on a particular line. EBRD and the World Bank recognise these problems in the energy sector and make improved billing and collections a condition for project approval; they have also required improved financial accounting and reduced subsidies as loan conditions. The same could happen in public transportation. Another option for international financial institutions (IFIs) is to help private mass transit services expand; these organisations usually have excellent fare collection records. The alternative--continuing to favour roads and cars--is creating an unhealthy subsidy that could exacerbate the urban transportation problems these banks have correctly identified.

The governments in the transition economies often support these foreign investment allocations. The World Bank requires a government request to initiate a project appraisal, and a sovereign guarantee from the borrowing nation to begin implementing the project. Thus, all World Bank projects are conducted with the full knowledge and consent of the national governments. Public-sector EBRD projects follow the same procedure, as do many projects financed by export finance banks, such as U.S. ExIm. The ability of countries to provide sovereign guarantees, and ultimately to repay financing, is limited, so ultimately, projects for new roads or new rail cars may compete for the same funds. Private-sector projects do not necessarily involve government participation, but they often do. A good example are the tax breaks and conciliatory conditions many governments have provided to foreign car manufactures with local factories.

4 - RECOMMENDATIONS

Countries in transition have significant potential to affect global greenhouse gas emissions through their transportation sectors. Effective policies can help control the growth of emissions while helping the region transition to a market economy. Currently, however, transportation policy has mixed objectives with little co-ordination or reflection on the ultimate implications of the package of policy measures. National and local governments and IFIs all face this problem. A co-ordinated transportation policy should incorporate full capital and operating costs, as well as external costs such as pollution and accidents. Table 4 below describes policies that could promote transportation, while minimising transportation emissions.²² These recommendations fall under three basic themes: transportation planning, market-based incentives for reducing transport's impact on the environment, and balanced investment strategies.

Table 4. Environmentally-Friendly Transportation Policy Recommendations

<i>Urban Transport</i>
<ul style="list-style-type: none"> • Expand municipal and regional transportation planning to cover modal comparisons, strict financial and cost analysis, environmental impacts and other externalities, such as safety. • Train public transit officials in finance, business planning and marketing. • Help public transit systems develop realistic strategies for improving collections and rationalising subsidies. • Improve the energy efficiency of public transit systems with more efficient trains and buses. • Introduce automobile tariffs that reflect the total cost of the car to society, whereby larger or less efficient cars will accrue higher tariffs. • Enact CAFE-like standards to ensure that the average vehicle mix is more efficient and less polluting over time.¹ • Encourage IFIs to focus more on financing environmentally-friendly transport, such as public transit. • Decrease generic subsidies to car manufacturers.
<i>Long-Distance Passenger Transport</i>
<ul style="list-style-type: none"> • Increase highway tolls to more fully reflect internal and external costs. • Encourage privatisation and competition on passenger railways. • Promote better understanding of the linkages between climate protection, improvement of local air quality and passenger safety.
<i>Freight Transport</i>
<ul style="list-style-type: none"> • Encourage privatisation and competition among freight rail and trucking companies. • Publish and distribute statistics on speed, accuracy and efficiency of competing freight companies. • Ensure that foreign and domestic trucks pay full cost of road use through taxes or fees.

While many of these points mirror transportation policy trends in the West, the point of departure in countries in transition is quite different. For example, the theory behind incorporating externalities into transportation planning is based on market economics, and so it is not surprising that policymakers and planners in the former Soviet Union have little experience with this type of analysis. Likewise, the accounting system and chronic non-payment problems throughout the Ukrainian and Russian economies make it more difficult for policymakers and transportation planners to account for full costs and assess subsidies.

Transportation planning, the first theme of these recommendations, is a basic building block of good transportation policy. While countries in transition have a long history of transportation planning, most of this planning has focused on transportation supply, without consideration of actual demand, customer needs or alternative transportation modes. The current rush to build new highways is reflective of this supply-side mentality. The volume of highway traffic in most cases does not demand new roads; in fact, traffic volumes have decreased in recent years. Transportation planning should include several important elements:

- Integration and comparison of full costs and benefits of various transportation modes in supply and demand assessments;
- Adequate consideration of environmental and other external factors;
- Strategy for financial viability;
- Assessment of size and impact of direct and indirect subsidies in transportation sector;
- Acknowledgement and use of strong transit and railway design skills in the region (Russia has the most extensive and heavily-used subway system of any nation on Earth);
- Consideration of specific geographic and demographic features of the planning region.

¹CAFE stands for Corporate Average Fuel Economy. The U.S. CAFE standards requires all automobile makers to meet sales-weighted minimum fuel economy standards on cars and other light-duty vehicles. The standards went into effect in 1978 and several studies have shown that the standards have both improved fuel efficiency of cars in the U.S. and reduced the growth in car emissions.

Portland, Oregon is a good example of what careful transportation planning can achieve. In the 1950's and 60's Portland was rapidly expanding its network of highways. Over time, though, Portland's inner core began suffering economically as jobs, people and stores moved to the suburbs--a familiar story throughout North America. Portland then did the unusual. Local and state officials developed a plan for renewing the city, two cornerstones of which were a new transit system and development around a transit mall. The government officials worked closely with the private sector and other key stakeholders to define goals and develop a feasible implementation plan that relied on both government and private financing. By concentrating growth in the urban centre, greater Portland has been able to accommodate a 50% increase in population since the early 1970's, while using only 2% more land. The city found that its compactness made mass transit more accessible and convenient, which in turn encouraged increased ridership. Portland's air quality has also improved as transportation emissions have dropped.²³

Just as transportation planning has been key in Portland's development, these skills and processes could help shape the future of cities in Central and Eastern Europe. Bilateral assistance organisations could, for example, work with one or more municipalities to develop a transportation plan and then help the city or cities identify financing for specific elements of the plan. This work could also involve concentrated training and assistance to public transportation authorities to help them improve their skills in transportation assessment, business planning and marketing. These skills could help public transit entities increase fare revenues, customer satisfaction, and ridership. Such a program would also better enable these public transportation organisations to qualify for financing from development banks by putting them on the path to financial viability and creditworthiness.

The second theme is instituting market incentives for environmentally-friendly transportation. Reducing subsidies for polluting technologies is an important step in this direction. In the past, transportation subsidies occurred as the state made allocations of goods and services between various economic activities. Because subsidies of all sorts were such an integral part of the economy, moving away from them has proved a difficult. Understanding the environmental and other impacts of these subsidies will help countries in transition rationalise and reduce subsidies, which in turn should improve fiscal management.

Other steps beyond subsidies include structuring car and road taxes and fees to account for the environmental costs of road transport. These fees could be imposed when a car is purchased, based on the fuel efficiency or weight of the car. (Several European nations have had success in devising such creative fees to account for environmental and safety costs, and the U.S. has had success in the past at raising fuel economy through CAFE standards.) The fees should also, however, be related to vehicle use. Russia, Poland and Ukraine already have gasoline taxes and use part of these taxes to pay for roads. Another example is an annual registration fee that takes into consideration both the efficiency of the car and car use (mileage on the odometer). However, taxes and fees not tied directly to purchases are easier to evade. Given the serious problems with tax evasion and non-payments in the former Soviet Union, taxes levied on gasoline and road tolls may be a more viable alternative to annual registration fees. In Central Europe, where tax collection is less problematic, incorporating external environmental costs into annual registration fees may be a more viable option.

Balanced investment strategies are the third theme. Publicly-funded banks, such as development and export finance banks, should not skew their investments toward transportation paths that will result in greater GHG emissions in the future. It is understandably difficult to find good investments in the public transit sector. Publicly-funded banks, however, were not created to finance the easy projects that the private sector has an interest in anyway. They were created to tackle difficult problems by creating new approaches that can be replicated by others. Public transit's financial problems are tractable, though complex. Partnerships with donor organisations could help address some of the financial management issues that currently stand in the way of investment.

In addition to solid and balanced transportation planning, transportation policy should also rely on measurable objectives for reducing externalities such as carbon emissions. In fact, few nations have undertaken monitoring and measurement of the real-world impacts of specific policies and measures on carbon emissions. The European Conference of Ministers of Transport has published a volume on carbon dioxide emissions from transport with an extensive listing of national policies to reduce emissions, yet few countries provided a quantitative impact assessment of their policies.²⁴ Thus, an important recommendation for all countries is to design measurable goals and monitoring programs into their transportation policies and plans. It is complicated to measure the results of transportation policies on carbon emissions because of the large number of emission sources and transportation modes to cover. Better monitoring, though, will help policy makers the world over make more informed transportation policy decisions.

Countries in transition present a unique opportunity because their economies are not yet heavily based on the car and its incumbent pollution. They have passenger travel trends somewhat like Western Europe, with public transit and pedestrian travel accounting for the overwhelming majority of urban trips. Freight transport, on the other hand, is more similar to the North American model, relying on the least energy-intensive modes: rail and ship. These trends are changing though, and policies and public investments since 1990 are fuelling the changes. The decrease in GHG emissions, brought about by years of economic hardship, could be reversed eventually by imprudent transportation policies. Wise transportation planning, consideration of the full costs of transportation and subsidy reductions could play a significant role in reducing or stabilising emissions in countries in transition.

5 - ENDNOTES

-
1. European Conference of Ministers of Transport. 1997. *CO₂ Emissions from Transport*. OECD, Paris, p. 139; Central Statistical Office. 1998. *Statistical Yearbook of the Republic of Poland--1998*. Central Statistical Office, Warsaw, p. 27.
 2. Agency for Rational Energy Use and Ecology. 1998. *Economy and Energy Sector of Ukraine in the First Half of 1998: Dynamics of the Main Indicators*. ARENA-ECO, Kiev, August.
 3. New York City Transit Authority web site: www.mta.nyc.us.
 4. European Conference of Ministers of Transport. *Statistics of Passenger and Freight Transport*. As published on the OECD's web page at www.oecd.org/cem/stat/transport/; European Conference of Ministers of Transport and Organisation for Economic Co-operation and Development. 1995. *Workshop on Transport and Environment, Bucharest, 28-30 June 1995: Summary Report*. ECMT and OECD, Paris, p. 4; Andrzej Rudnicki, Włodzimierz Czuczula, Jan Gertz, and Tadeusz Kopta. 1998. *Options for the Development of the Transportation System in Poland*. Institute for Sustainable Development, Warsaw, p. 10.
 5. Alex Barankevich. 1998. «Hard Times Have City Bus Companies Going in Reverse.» Kiev Post. 28.08.98.
 6. European Conference of Ministers of Transport. 1997. *CO₂ Emissions from Transport*. OECD, Paris, p. 155; Russian Federal Service for Hydrometeorology and Environmental Monitoring. 1997. *Russian Federation Climate Change Country Study*. Roshydromet, Moscow, p. 15.
 7. Central Statistical Office. 1998. *Statistical Yearbook of the Republic of Poland--1998*. Central Statistical Office, Warsaw, p. 27; Peter Finn. 1998. "Warsaw Concerto, 1998: Honk, Honk, Honk, Honk." The Washington Post, 14.12.98; Climate Protection Centre, Institute of Environmental Protection. 1998. *The Republic of Poland. Second National Report to the Conference of the Parties to the UN Framework Convention on Climate Change*. Institute of Environmental Protection, Warsaw, pp. 23-27. UN FCCC Secretariat. 1998. *Review of the Implementation of Commitments and of Other Provisions of the Convention. Summary Compilation of Annual Greenhouse Gas Emissions Inventory Data from Annex I Parties*. UN FCCC Secretariat, Buenos Aires; OECD. 1997. *Transportation Statistics Annual Report 1997*. OECD, Paris, p.219.
 8. Letter from Andrzej Kassenberg, Director, Institute for Sustainable Development, Warsaw, dated March 3, 1999.
 9. US Embassy in Poland. 1998. *Country Commercial Guide: Poland 1998*. US Embassy, Warsaw; European Conference of Ministers of Transport and Organisation for Economic Co-operation and Development. 1995. *Workshop on Transport and Environment, Bucharest, 28-30 June 1995: Summary Report*. ECMT and OECD, Paris, p. 4; Russian Federation. 1998. «Decree of the President of the Russian Federation on Additional Measures for Attracting Investments to the Development of the Domestic Automotive Industry,» No. 135, 05.02.98; Nikoulichev, Michael. 1997. «Russian Car Market Overview.» BISNIS, U.S. Department of Commerce, Washington, DC; Agency for Rational Energy Use and Ecology. 1998. *Economy and Energy Sector of Ukraine in the First Half of 1998: Dynamics of the Main Indicators*. ARENA-ECO, Kiev, August; Interfax USA. 1998. «Car Production Statistics.» BISNIS, U.S. Department of Commerce, Washington, DC.
 10. Petr Pospisil. 1998. *Public-Private Partnership in TEM Financing*. European Conference of Ministers of Transport, Warsaw, p. 3; Monika Bak. 1997. *Selected Elements of Polish Transport Policy in the Light of Activities of ECMT New Member States*. European Conference of Ministers of Transport, Gdansk; US Embassy in Poland. 1998. *Country Commercial Guide: Poland 1998*. US Embassy, Warsaw.
 11. Jane Holt. 1993. *Transport Strategies for the Russian Federation*. The World Bank, Washington, DC (as adapted from EBRD's *Railway Sector Survey Main Report*), p. 33; IEA. 1997. *Transport, Energy and Climate Change*. IEA, Paris.
 12. OECD. 1997. *Transportation Statistics 1997 Annual Report*. OECD, Paris, p. 245.
 13. European Conference of Ministers of Transport. 1997. *CO₂ Emissions from Transport*. OECD, Paris, p. 135.
 14. Lee Schipper. 1998. *Transport, Energy, and Climate Change*. IEA, Paris; Stacy Davis. 1997. *Transportation Energy Data Book*. 17th Edition. Oak Ridge National Laboratory, Oak Ridge, TN.
 15. European Conference of Ministers of Transport. 1996. *Statistical Trends in Transport 1965-1994*. ECMT, 1996.
 16. OECD. 1997. *Transportation Statistics Annual Report 1997*. OECD, Paris, pp. 251-252.

-
17. Michael Nikoulichev. 1998. «*Restructuring of Russian Railways.*» BISNIS, U.S. Department of Commerce, Washington, DC.
 18. Jane Holt. 1993. *Transportation Strategies for the Russian Federation*. The World Bank, Washington, DC, p. 87; 1998. «*Tolls for Foreigners Expected to Give Boost to Russian Truckers.*» Interfax Daily Business Report. 02.04.98.
 19. The World Bank. 1998. *Infrastructure Sector Strategy. Living by Serving. New Directions for the Transition Economies*. The World Bank, Washington, DC, p. 35.
 20. The World Bank. 1998. *Restructuring Transport Systems in the ECA Region to Meet the Demands of a Market Economy: the Bank's Role*. World Bank, Washington, DC.
 21. European Bank for Reconstruction and Development. 1997. *Transport Operations Policy*. EBRD, London.
 22. The Institute for Sustainable Development in Warsaw has also prepared an interesting compendium of policy recommendations called *Instruments of the Sustainable Transportation Policy*, published in May 1998.
 23. Greg Baldwin. 1988. «*Portland and Its Unique Traditions.*» *Transit, Land Use and Urban Form*. ed. by Wayne Attoe. Austin, Texas, University of Texas at Austin, pp. 73-80; F. Kaid Benfield, Matthew D. Raimi, and Donald D.T. Chen. 1999. *Once There were Greenfields*. New York, Natural Resources Defence Council.
 24. European Conference of Ministers of Transport. 1997. *CO₂ Emissions from Transport*. OECD, Paris; Stephen Perkins. 1998. «*CO₂ Emissions from Transport.*» *Oil and Gas Journal*. 19.01.98, p. 39.