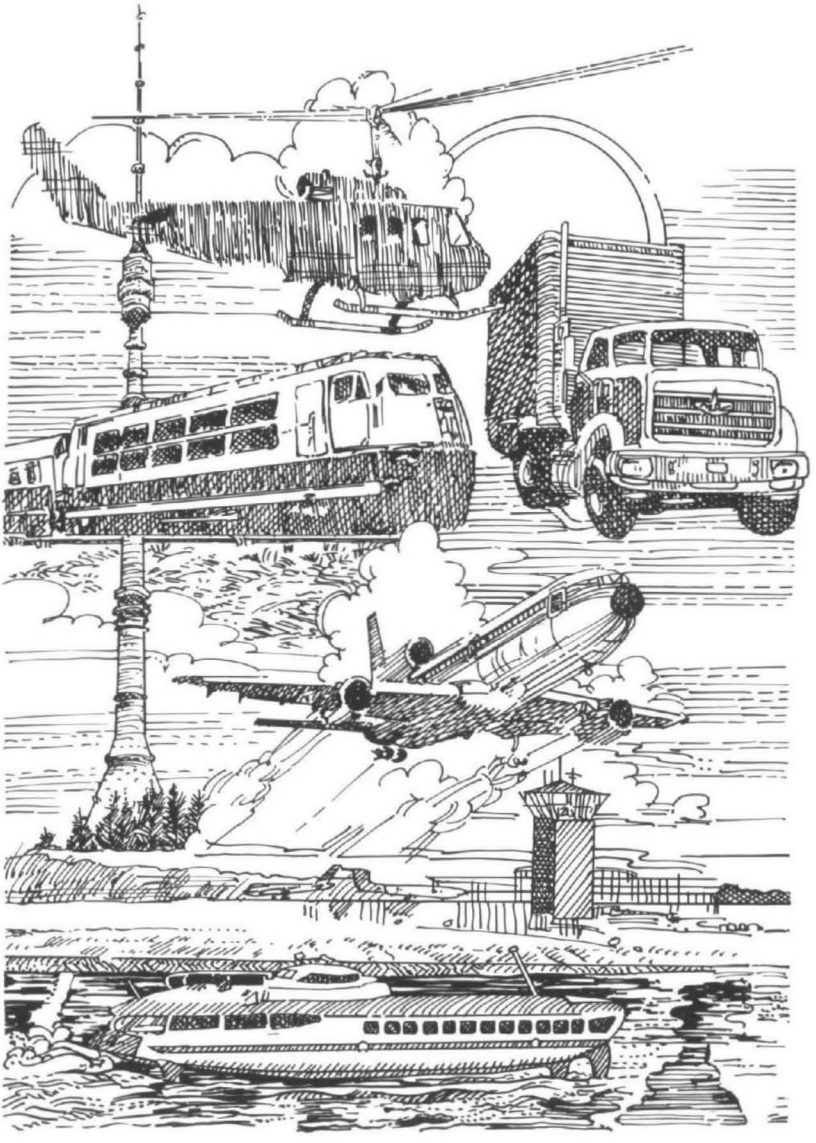
Chapter 14. Transportation and Communications



Elements of the Soviet Union's transportation and communications networks

THE TRANSPORTATION AND COMMUNICATIONS systems of the Soviet Union were owned and operated by the government primarily to serve the economic needs of the country as determined by the Communist Party of the Soviet Union (CPSU). In addition to being influenced by the policies of the regime, the development of transportation and communications also has been greatly influenced by the country's vast size, geography, climate, population distribution, and location of industries and natural resources. Although the population and industrial centers were concentrated in the European part of the country, which has a more moderate climate, many of the mineral and energy resources were in sparsely inhabited, climatically inhospitable expanses of Siberia and other remote areas. Hence, the transportation and communications networks were much denser in the European part than in the Asian part of the country.

In 1989, and historically, railroads were the premier mode of transportation in the Soviet Union. Railroads played significant roles in times of war, and they accelerated industrial development. They also facilitated the normal flow of raw materials, manufactured goods, and passengers. Government policies provided for extensive trackage and large numbers of locomotives, rolling stock, and support facilities. Although railroads carried more freight and passengers over long distances, trucks and buses carried more cargo and people on short hauls. Because automotive transport was not generally used for long hauls, many roads outside of urban areas had gravel or dirt surfaces. The lack of paved roads in rural areas seriously hampered the movement of agricultural products and supplies. Privately owned automobiles, on a per capita basis, were few in number compared with those in the West and therefore were of limited importance in transportation.

Inland waterways, comprising navigable rivers, lakes, and canals, enabled a wide variety of ships, barges, and other craft to transport passengers and freight to their destinations inexpensively. Commuters in urban areas often used hydrofoils on rivers for rapid transport, while freight moved on the waterways more slowly over much greater distances. Waterways were subject to freezing in winter, although a fleet of ice breakers extended the navigable season. Most rivers in the Asian part of the country flow northward into the Arctic Ocean and thus were of little help in moving raw materials to the European part of the country. At some river ports

in Siberia, raw materials were loaded onto ships for delivery to domestic and foreign ports via the Arctic to the Pacific or the Atlantic oceans.

A large, modern, and well-diversified fleet of merchant and passenger vessels conveyed not only freight and passengers to the world's maritime nations but also Soviet political influence. Many cargo vessels, often highly specialized, were designed to off-load freight and vehicles in foreign countries not having modern port facilities. Although the world's largest fleet of passenger liners belonged to the Soviet Union, the voyagers were mainly Western tourists. Extensive fishing and scientific research fleets, together with several international ferry systems, added to the already substantial worldwide maritime presence of the Soviet Union.

The civilian air fleet was primarily a fast transporter of people but was often the only mode of transport available to some areas in the Far North, Siberia, and the Soviet Far East. Using the international airports of Moscow and other major cities, Soviet airplanes flew to almost every country of the world. The air fleet also had many specialized aircraft performing various missions not associated with airlines in the West, such as agricultural spraying, medical evacuations, and energy exploration.

As a means of efficiently conveying oil, natural gas, and some other materials, pipelines played a significant part in the transportation system. Major pipelines stretched from northern and Siberian oil and gas fields to refineries and industrial users in the European part of the country. Pipelines supplied energy to Eastern Europe, which was heavily dependent on Soviet gas and oil, and to Western Europe, which exchanged hard currency (see Glossary) for Soviet natural gas.

Using a communications system that incorporated advanced satellite technologies, the government transmitted its radio and television programming throughout most of the Soviet Union. Telephones were mainly used by government or party officials or others having official responsibilities in the economy.

Railroads

Railroads were the most important component of the Soviet transportation system. They carried freight over great distances, and historically they have contributed to the economic development of the Soviet Union as efficient carriers of materials between producers and users, both domestic and foreign.

Historical Background, 1913–39

On the eve of World War I, imperial Russia had a rail network extending 58,500 kilometers. In 1913 it carried 132.4 million tons

of freight over an average distance of 496 kilometers, and 184.8 million passengers boarded its trains. In 1918, following the Bolshevik Revolution (see Glossary), the new regime nationalized the railroads. During the Civil War (1918–21), the railroads played a strategic role in the Bolshevik government's struggle against both White forces and invading foreign armies but suffered serious losses and damage in tracks, locomotives, rolling stock, yards, and stations. In 1920 Vladimir I. Lenin directed the first plan for nationwide development of the economy, which created the State Commission on the Electrification of Russia (Gosudarstvennaia komissiia po elektrifikatsii Rossii—Goelro). It called for the electrification of the country over a ten- to fifteen-year period, the development of eight economic areas, and the reconstruction of the transportation network. Railroads were assigned the task of linking the economic areas and of transporting raw materials to industrial producers and finished goods to users. To that end, the regime provided for the electrification of the most important main lines and the construction of new lines.

During the 1920s and 1930s, transportation, and in particular the railroads, played a leading economic role and experienced rapid development. Feliks E. Dzerzhinskii, the chairman of the dreaded Vecheka (see Glossary) and the commissar of internal affairs, was also named the commissar of railways. Because of his first two positions, Dzerzhinskii ensured a rapid development of the railroads. New rail lines were built between the eastern regions and the industrial areas in the west. By 1925 some 4,000 kilometers of new lines had been laid in both the European and the Asian portions of the Soviet Union, including the first electrified line, an industrial spur from Baku to Surakhany completed in 1926.

During the First Five-Year Plan (1928–32), the railroad network was repaired, improved, and expanded. The plan recognized that industrial complexes (see Glossary), such as the Ural-Kuznetsk coal and iron complex, needed transportation links. Plans called for connecting the Siberian and Central Asian areas, rich in natural or agricultural resources—ores, timber, coal, cotton, and wheat—to manufacturers and consumers in the western portions of the country. Thus the Turkestan-Siberian Railway, 1,450 kilometers long, was built, along with the Central Kazakhstan and the Caucasus railroads, among other lines. The European portion of the country also saw new lines laid, connecting industrial areas with their sources of raw materials.

In the 1930s, the railroads introduced new rolling stock and locomotives that contributed to better performance. In the mid-1930s, diesel-electric locomotives began to be used. Although

more costly to produce and to maintain than the electric locomotives and also less powerful and slower, diesel-electric locomotives had several advantages over the steam locomotives in use, particularly under existing operating conditions. Fuel-efficient, diesel-electric locomotives covered long distances between refuelings, required minimal maintenance between runs, sustained good speeds, damaged tracks less, used standardized spare parts, and offered operating flexibility. In contrast to the United States and Canada, two countries also employing railroads to cover vast expanses, the change from steam to diesel-electric traction in the Soviet Union was initially very slow, in large measure because of a scarcity of trained manpower, maintenance facilities, and spare parts.

During the Second Five-Year Plan (1933–37), new rolling stock, including freight cars of new design, was also produced. Although most freight cars were still of the two-axle type with a payload varying between twenty and sixty tons, specialized four-axle cars, such as hoppers and tippers of up to seventy tons, began to enter service. The new rolling stock was equipped with safety and labor saving devices, such as automatic braking and automatic couplings, which increased safety and allowed more efficient train handling at classification yards. The higher speeds and heavier train weights made possible by more modern traction and rolling stock in turn required heavier rails, improved cross ties, and ballast. The automatic block signal system and centralized traffic control increased the operating efficiency of trains.

Despite the modernization program, Soviet railroads lagged behind the performance levels set by the plans. Ineffective management, labor problems, such as poor work attitudes, and a high accident rate contributed to the failures. On the average, railcars and locomotives were idle about 71 percent and 53 percent of their operational time, respectively. Yet industrialization efforts placed increasing demands on the railroads. The military authorities were also concerned about the poor performance of the railroads, fearing their inability to support national defense requirements.

From 1928 to 1940, the length of operating lines grew from 76,900 kilometers to 106,100 kilometers and included 1,900 kilometers of electrified lines. Freight traffic more than quadrupled from 93.4 billion ton-kilometers to 420.7 billion ton-kilometers. Passenger traffic also increased in the same period, from 24.5 billion passenger-kilometers to 100.4 billion passenger-kilometers. This growth in freight and passenger traffic was made possible by track improvements, new rolling stock, locomotives, signaling and control equipment and procedures, and new and more efficient classification yards.

Passengers buying food at a stop on the Trans-Siberian Railway
Women painting a center line on the main highway
between Khar'kov and Kiev, Ukrainian Republic
Courtesy Jimmy Pritchard

World War II

After the Nazi-Soviet Nonaggression Pact of 1939, the Soviet Union occupied Estonia, Latvia, Lithuania, eastern Poland, and portions of Finland and Romania (see Prelude to War, ch. 2). Consequently, before Germany's 1941 attack on the Soviet Union, the size of the Soviet rail network increased by the assets located in these areas and countries. During the Soviet-Finnish War (November 1939 to March 1940), Soviet railroads supported military operations. Over 20 percent of the rolling stock was used to supply the operations against the Finnish forces. Although military cargo shipments originated in many parts of the country, they all fed into the October and Murmansk railroads in areas where few highways were able to handle motor transport. This fact and the distance that freight had to travel to the front combined to cause unloading bottlenecks at final destination stations and yards. Although delays were substantial, civilian and military railroad authorities learned important lessons from the Finnish campaign.

During World War II, railroads were of major importance in supporting military operations as well as in providing for the increased needs of the wartime economy. Because of their importance and vulnerability, trains, tracks, yards, and other facilities became the prime targets of the German air force and, in areas close to the front, of German artillery.

Railroad operations during the war corresponded to the main phases of military operations. The first phase extended from the German offensive on June 22, 1941, to the Red Army's counteroffensive, which culminated in a Soviet victory at Stalingrad in February 1943. During this phase, the railroads evacuated people, industrial plants, and their own rolling stock to the eastern areas of the country. From July to November 1941, some 1.5 million carloads of freight were moved eastward. The railroads also carried troops and military matériel from rear areas to the front. All of the operations were accomplished under threatened or actual enemy fire.

The second phase extended throughout most of 1943, when the Red Army slowly advanced against strong German resistance. The railroads coped with increasing demands for transportation services as industrial plants increased production. In addition, the Red Army relied heavily on the railroads to move personnel and supplies for major operations. Thus, during the first three months of the Kursk campaign (March to July 1943), three major rail lines averaged about 2,800 cars with military cargo per day, reaching a daily peak of 3,249 in May. Moreover, as the Soviet forces regained territories,

Metro station interior, Moscow
Passengers on the Moscow metro
Courtesy Jimmy Pritchard

military and civilian railroad construction teams restored and rebuilt trackage destroyed by the retreating enemy.

In the third phase, from early 1944 to the end of the war in May 1945, the Red Army rapidly extended the front westward, causing the distances between production facilities (in the Ural Mountains and Siberia) and military consumers to grow accordingly, thereby further straining railroad resources. The Red Army's Belorussian offensive, which was launched on June 23, 1944, required, during its buildup phase, 440,000 freight cars, or 65 percent of Soviet rolling stock. In early 1945, the Red Army pursued German forces into neighboring countries, requiring the railroads to cope with different track widths, which went from 1,520-millimeter-gauge track to 1,435-millimeter-gauge track in Romania, Bulgaria, Hungary, Poland, and eventually in Germany itself.

Despite the effort made to haul men and matériel to the front and to provide at least some service to the civilian sector, as well as to restore operations in war-damaged areas, the Soviet Union managed to build 6,700 kilometers of new lines during the war years. The new lines tapped areas rich in the mineral resources that were required for the war effort or shortened the distances between important economic regions. Of the 52,400 kilometers of Soviet main track roadway damaged during the war, 48,800 kilometers were restored by May 1945. About 166,000 freight cars were destroyed, and the number of locomotives decreased by about 1,000, although almost 2,000 were furnished by the United States as part of an agreement authorized by its Lend-Lease Law (see Glossary).

The Postwar Period, 1946–60

During the postwar recovery period, the railroads played a key role in rebuilding the national economy, in both the industrial and the agricultural sectors. To enable the railroads to carry out assignments, improvements had to be made in traction equipment, rolling stock, roadbeds, stations, yards, and traffic control equipment. New diesel-electric and electric locomotives were produced, and heavier rails allowed increased axle loads and train speeds. Automatic block signaling systems also contributed to higher speeds and better traffic control. Electrified lines were slowly extended. Although the Fourth Five-Year Plan (1945–50) provided for the restoration of damaged rolling stock and rail facilities, the Fifth Five-Year Plan (1951–55) emphasized new construction. The plan's goals were severely underfulfilled, mainly in production of freight cars, trackage, and other equipment, but freight turnover was 57 percent above plan. This achievement was made possible by increased train loads, higher operating speeds, more efficient loading

and off-loading procedures, and higher labor productivity. The higher speeds and higher number of average daily runs of locomotives hauling freight were made possible by growing numbers of diesel-electric and electric locomotives coming into service.

At the urging of CPSU first secretary Nikita S. Khrushchev, in the late 1950s electrification proceeded on some high-density passenger and freight lines. Khrushchev gave priority to railroads in the Ural Mountains area and to those connecting the Urals with southeastern and central European areas and with Siberia and other eastern regions. By the end of 1960, the railroads had a network of 125,800 kilometers of lines, some 13,800 kilometers of which were electrified.

Beginning in the early 1960s, the railroads experienced a period of prosperity. Freight traffic grew rapidly, by 59 percent between 1961 and 1970, while passenger traffic increased by 50 percent. New equipment improved labor productivity. More electric and diesel-electric locomotives entering service, combined with improved tracks and roadbeds, increased net train weights and speeds. In the late 1960s, as the growth of net train weights and speeds leveled off, train density—the number of trains moving on a given track—increased, thus allowing further increases in freight carried. Nevertheless, in the early 1970s train productivity continued to grow, but at declining rates. By 1975 the railroads reached their limits in terms of traffic density and train speeds and weights. Subsequently, the railroads strained to satisfy the demands of the national economy. Between 1977 and 1982, the total tonnage of shipments stagnated, increasing only from 3.723 billion tons originated (see Glossary) to 3.725 billion tons originated. Other indicators dropped—such as the average daily distance traveled by locomotives and cars, and speeds—the result of ever increasing track congestion. Additional factors contributing to poor railroad performance in the late 1970s and early 1980s were a deteriorating labor discipline and a decline in the quality of repairs and maintenance.

In 1983 recovery from the slump started when managers reduced traffic congestion and made train and other operations more efficient. Use of electrically synchronized double and triple engines made running heavier trains possible and reduced traffic congestion.

In the late 1980s, railroads carried a larger share of freight and passengers longer distances than any other transportation system in the Soviet Union. In 1986 railroads transported 3.8 trillion ton-kilometers of freight, or a 47 percent share of all freight carried by all systems (see table 39, Appendix A). At the end of 1986, the

railroads reached a length of 145,600 kilometers, of which 50,600 kilometers, or almost 35 percent, were electrified.

Organization and Equipment of the Railroads

The Soviet Railroads (Sovetskie zheleznye dorogi—SZD) were managed and operated by the all-union (see Glossary) Ministry of Railways. The ministry was divided into twenty-three main administrations, each responsible for an overall segment of the railroads' operating or administrative management. Directly under the ministry were the thirty-two regional railroads, which in fact constituted the SZD. The railroads were named after republics, major cities, river basins, or larger geographic areas. The October Railroad, headquartered in Leningrad, was of course named in honor of the October (Bolshevik) Revolution. Each regional railroad, except the Moldavian, was subdivided into divisions. The divisions were generally named after their headquartered stations (see table 40, Appendix A).

In 1989 the most important lines carried heavy freight and passenger traffic and were electrified. Among them were lines linking industrial areas, maritime ports, and foreign countries. Also, major population centers were interconnected and linked to vacation areas. Lines with steep grades, as in mountainous regions, were often electrified (see table 41, Appendix A).

The railroads had about 7,000 marshaling yards, of which 100 were of major importance. Computer technology has gradually increased the efficiency and quality of train handling at the yards, many of which had centralized hump release controls and automatic rolling speed devices. Such automated procedures as checking a train's weight and composition, as well as modernized communications facilities, have sped train formation and dispatch and provided yard management with advance information on the composition of arriving trains. Nevertheless, in the mid-1980s classification yards were unable to process efficiently the required number of trains.

Automated signaling equipment and devices helped improve traffic control and train safety, although the latter remained a problem in 1989. Some 20 percent of track lines were under centralized train control. This enabled the railroads to increase track capacity substantially, particularly over long distances. In 1989 more than 60 percent of the network was equipped with the automatic block system, which regulated distances between trains, as well as with automatic cab signaling.

Electric and diesel-electric locomotives were the basic categories of traction. Within these categories were about twenty versions of

Streetcar taking on passengers in Leningrad, Russian Republic
Courtesy Jonathan Tetzlaff
Kirov Factory metro station, Leningrad, Russian Republic
Courtesy Jimmy Pritchard

electric locomotives and about twenty-five versions of diesel-electric locomotives. In 1981 some 1,377 electric locomotives and 6,870 diesel-electric locomotives were in mainline freight service. The self-propelled ER 200 train set operated on limited-schedule service on the Moscow-Leningrad line in the mid-1980s. Composed of traction units at each end and between three and six married sets of powered cars, the ER 200 had a maximum speed of 200 kilometers per hour and was the Soviet counterpart to French, Japanese, and American high-speed trains.

In 1982 the railroads had an estimated 1,856,000 freight cars. The fleet consisted for the most part of four-axle (two bogies) cars of sixty-two- to sixty-five-ton capacity. Nevertheless, six-axle (three bogies) and eight-axle (four bogies) cars of 120- to 125-ton capacity were increasing in numbers. These high-tonnage cars raised train weights without extending train lengths. Maximum axle-loads ranged from twenty-three to twenty-five tons. In 1989 all cars were equipped with automatic couplers and brakes, and over half had roller bearings. New freight cars were designed for maximum speeds of 120 kilometers per hour, but normal operating speeds were limited to 90 kilometers per hour at full load and 100 kilometers per hour when empty.

In addition to the basic types of freight cars—boxcars, hoppers, gondolas, and flatcars—the inventory included specialized types for transporting specific cargos, such as automobiles, dry and liquid bulk materials, grain, perishables, and materials under pressure. Several types of cars transported passengers. Depending on train sets, their passenger capacity ranged from 384 to 1,484. Long-distance and international trains were composed of compartmented cars, sleepers, and dining cars. New cars were designed for maximum speeds of 200 kilometers per hour. Most of the passenger rolling stock was of foreign manufacture, primarily from the German Democratic Republic (East Germany).

Passenger Operations

Since 1975 passenger transportation by train has been second to bus in terms of total fares boarded. Nevertheless, in 1986 trains carried more than 4.3 billion passengers, of which more than 3.9 billion were on suburban lines (see table 42, Appendix A). Suburban and short-haul passenger volume represented about 90 percent of the passengers carried by train. In 1985 the railroads ran nearly 10,000 passenger train pairs, about 500 of which were long distance, another 500 were local (trains not crossing the boundaries of a given line), and nearly 9,000 were suburban or other types. During the peak summer season, daily passenger train traffic

increased dramatically, to approximately 19,000 long-distance and 17,000 local trains. To resolve, or at least alleviate, congestion in the summer, train lengths were increased. Thus, eighteen-car trains were extended to twenty-four cars on heavily used lines from Moscow, while in 1986 test trains of thirty-two cars were run out of Moscow and Leningrad to Simferopol' in Crimea.

The most important passenger railroads in the mid-1980s were the Moscow, October, Gor'kiy, Southern, Donetsk, Dnepr, Sverdlovsk, and Northern Caucasus. These served the Soviet Union's most densely populated areas. The two most heavily traveled axes were the Leningrad-Moscow-Donetsk to Crimea or the Caucasus area and the Moscow to Khabarovsk (8,540 kilometers) and Vladivostok (9,300 kilometers) areas. On the latter axis, most passengers traveled distances of only 500 to 700 kilometers, rather than the full length. The seven major passenger rail centers in the European part of the Soviet Union were in Moscow, Leningrad, Tbilisi, Khar'kov, Kiev, Simferopol', and Adler; the major center in the Asian part of the country was at Novosibirsk (see fig. 18).

The Baykal-Amur Main Line

The vast Siberian region between Lake Baykal and the lower Amur River, called the Transbaykal (or Zabaykaliye), is rich in natural and mineral resources. Yet until recently, it lacked adequate transportation to the rest of the country. Its main communication artery was the overburdened Trans-Siberian Railway (see Glossary), running well south of it. Although providing the Transbaykal region with a railroad was considered in the nineteenth century, work on the Baykal-Amur Main Line (Baykalo-Amurskaya Magistral'—BAM; see Glossary) did not begin until 1974. The BAM was finally opened in 1989.

Survey and construction crews overcame formidable geological, climatic, topographic, and engineering challenges, including rivers, ground ice, unstable soil, seismic areas, mountains, and extremes of cold and heat. About two-thirds of the BAM trackage crossed areas of ground ice that caused frost heave and other unstable soil conditions. In the summer, permafrost created large bogs that hampered roadbed construction, and embankments sank into the marshy terrain during the summer thaw. To prevent such problems, engineers insulated the strip of marsh along the tracks to keep it in a continuously frozen state. Seismic activity along some 1,000 kilometers of the line also caused problems, triggering avalanches and landslides. Topographic obstacles were formidable as well. To cross the mountains, crews had to pierce over thirty kilometers of tunnels. The BAM also crossed more than 3,000 streams, and

because of the permafrost new bridge construction techniques had to be devised. On average, the roadbed for the BAM required moving 100,000 cubic meters of earth—either cutting or filling—for each kilometer of track.

The mean annual temperature along the BAM ranges from −10°C to −4°C, with extremes of −58°C in the winter to 36°C in the summer. To operate their trains under these severe climatic conditions, the railroads used special equipment, locomotives, rolling stock, and fixed installations. Snow plows, snow-melting machines, switch heaters, and other specialized equipment were indispensable in the winter. Rails made of special steel that does not become brittle at the very low temperatures of the Siberian winters were also used.

From its western terminus at Ust'-Kut to its eastern end at Komsomol'sk-na-Amure, the BAM stretched for 3,145 kilometers, between 180 and 300 kilometers north of the Trans-Siberian Railway. It had a total of 5,000 kilometers of main line and yard track. In addition to the east-west main line, a 402-kilometer perpendicular line, the "Little BAM," ran from Bamovskaya on the Trans-Siberian Railway north to Tynda on the BAM and thence to Berkakit to serve the important mining and industrial area of Neryungri. In the late 1980s, an extension to the Yakutiya region, rich in timber and minerals, was under way.

The BAM and its feeder routes, both rail and highway, served an area of approximately 1.2 million square kilometers. Although track laying was completed in 1986, it was not yet in full operation in 1989. The projected freight traffic on the BAM was planned at 35 million tons per year, with trains of up to 9,000 tons. Moreover, the government planned for the BAM to become an important part of the Siberian land bridge from Japan, via the port of Sovetskaya Gavan', to West European destinations, saving 20 percent in time over the maritime route.

Other New Construction

Important new railroad construction was under way in the Arctic regions, Siberia, the Far East, and the Caucasus. Thus, the Urengoy-Yamburg rail line was being built to serve the Yamburg natural gas deposits north of Urengoy. In the Pechora River area, a line from the town of Synia, on the Moscow-Vorkuta road, was being extended about 120 kilometers to the Usinsk oil fields. Plans were made for a 540-kilometer spur from Labytnangi, southeast of Vorkuta, to the gas fields at Bolvanskiy Nos on the Yamal Peninsula. The project has been hampered by summer thaws. Engineers laying the rail line resolved the problem by insulating the strips

Figure 18. Major Railroads, 1986

of marsh along the track, thus keeping them in a continuous state of permafrost. In the Caucasus area, a new electrified line, almost 200 kilometers long, was planned from Tbilisi through the Caucasus Mountains to Ordzhonikidze. Plans called for the Caucasus Mountain Pass Railroad to shorten by 960 kilometers the distance for trains from Tbilisi to Ordzhonikidze via Armavir. Several tunnels, totaling forty-two kilometers, and numerous bridges have been planned. Originally scheduled for completion by the year 2000, the project was being stalled in 1989 by environmental groups.

A 450-kilometer rail line from Makat, in the Kazakh Republic, to Aleksandrov Gay, in Saratovskaya Oblast in the Russian Republic, was started in 1984 and was nearing completion in 1989. It was projected to cut over 1,000 kilometers from the route between Central Asia and Moscow.

Metropolitan Railways

The Ministry of Railways also operated metropolitan railway systems, or metros, in major cities. In 1987 eleven cities had one or more metro lines in operation, and ten others were either building or planning to build lines (see table 43, Appendix A). In late 1986, the length of all lines on the metro systems was 457 kilometers, and over 4.6 billion passengers rode on the combined metro systems in that year. The eleven cities' operating systems had a fleet of about 5,950 passenger railcars in 1986.

Automotive Transport

Trucks, buses, and passenger automobiles were important primarily to local transportation systems. Trucks carried freight on short hauls except in areas not served by railroads or inland waterways. Almost all freight started or finished its journey on trucks but was carried greater distances by rail, ship, airplane, or pipeline. Buses carried substantial numbers of passengers, for the most part on urban or short runs. Transportation by privately owned passenger automobiles, which were relatively few on a per capita basis, was not significant compared with public means.

Development of Automotive Transport

In 1910 a railroad car factory in Riga began producing the first passenger automobiles and trucks in imperial Russia. Under the Soviet regime, automotive transportation developed more slowly than in western Europe and the United States. As early as the 1930s, problems of poor road infrastructure, shortage of spare parts, and insufficient fueling, repair, and maintenance facilities plagued

automotive transportation. Some manufacturing plants were set up with Western help.

During World War II, automotive production concentrated almost exclusively on trucks and light, jeep-like vehicles. Their chassis were also adapted for armored cars and amphibious and other types of military vehicles. During major battles and operations, automotive transportation carried needed troops and matériel to the front. While Leningrad lay besieged (1941–44), trucks, driving over the frozen surface of Lake Ladoga, brought in about 600,000 tons of supplies and brought out over 700,000 persons. During the entire war, Soviet automotive transport carried over 101 million tons of freight in support of military operations. A sizable portion of the Soviet vehicle fleet was provided by the United States as part of the lend-lease agreement.

Since 1945 Soviet authorities have continued highway construction, so that by 1987 the public road networks, which excluded roads of industrial and agricultural enterprises, amounted to 1,609,900 kilometers, of which 1,196,000 kilometers were in the hard-surfaced category—concrete, asphalt, or gravel. Nevertheless, about 40 percent of this category of roads were gravel. In addition, there were 413,900 kilometers of unsurfaced roads.

The road network varied in density according to the geographic area and the industrial concentration. Thus, the Estonian Republic had the highest road density while the Russian and Kazakh republics had the lowest. The latter republics, however, contained vast, economically underdeveloped and sparsely populated areas. Overall, the European portion, excluding the extreme northern and Arctic areas, had the densest road network, particularly in areas having concentrations of industries and population (see fig. 19).

In 1989 many roads were not all-weather roads but rather were unimproved and unstable in bad weather, especially during thaws and rains. Except for 25,000 kilometers of all-weather surfaces, all rural roads in the European and Central Asian parts of the country, as well as all roads in Siberia and the Far East, were little better than dirt tracks. Trucks, carrying light loads (fewer than four tons) and traveling at low speeds, broke down frequently. These roads caused delays in shipments, high fuel consumption, and increased tire wear. In marshy and permafrost areas, unsurfaced roads were usable only when the ground and rivers were frozen, from about November to May. Russians have coined a word, *rasputitsa,* to describe the time of year when roads are impassable. Repair and refueling facilities along rural roads were rare or nonexistent. Nevertheless, in rural areas, roads were the prime arteries for shipping farm products and bringing in the required equipment and

Figure 19. Major Roads, 1981

supplies. Poor road conditions were a major factor in the Soviet Union's serious agricultural problems, particularly the one of perishables spoiling before they reached the market. Rural populations relied on bus transportation over poor roads for essential access to urban areas.

Freight Transportation by Trucks

Without a developed network of highways and service facilities, Soviet authorities have essentially relegated trucking to local and short hauls, except in remote areas not having rail or ship transport. In 1986, in terms of freight turnover, trucks ranked fourth among all transportation systems, with a 6 percent share. Nevertheless, trucking had 81 percent of the tons originated by all freight transportation systems combined (see table 44, Appendix A). This anomaly indicated that trucks were primarily used on short hauls, averaging about eighteen kilometers. Long-distance or intercity hauling was mainly by railroads and inland waterways. The agricultural sector accounted for about 80 percent of freight originated on trucks. In 1986 freight transported by trucks amounted to almost 27 billion tons originated and 488.5 billion ton-kilometers (see Glossary). Common carrier trucks accounted for 6.7 billion tons originated and 141 billion ton-kilometers. Trucking's most important customers were agriculture, industry, construction, and commerce.

Trucking enterprises were not able to meet the strong demand for their services. Among the contributing factors to the industry's failure were inadequate roads, inefficient traffic organization—some 45 percent of vehicles traveled empty—and prolonged periods of unserviceability resulting from shortages of spare parts, drivers, tires, and fuel. Even in the largest metropolitan areas, refueling and repair facilities were scarce by Western standards. In rural areas, particularly in Siberia and the Far North, such facilities were often nonexistent. Repair and maintenance of vehicles belonging to transportation enterprises (see Glossary) and collective farms (see Glossary) were performed at central facilities, which sometimes belonged to manufacturing plants. Repair was hampered by a chronic shortage of spare parts. Given the extent of poor roads, even the absence of roads, many cargo vehicles were of the rugged, cross-country type, with all-wheel traction similar to those used by the armed forces as tactical vehicles. Many vehicles were specially designed for cold weather operations.

Passenger Transportation

In the mid-1980s, buses were the primary means of passenger transportation, accounting for almost 44 percent of traffic on all

transportation systems in 1986 (see table 45, Appendix A). Indeed, in 1986 public transportation buses carried the most passengers—48.8 billion passengers boarded—of all means of transportation. Most passengers traveled short distances on intracity and suburban runs. In 1986 the average distance traveled by a passenger was 9.5 kilometers. In that year, taxicabs carried more than 1.4 billion fares. In the 1980s, private automobiles were rare compared with most Western nations. In 1985 the Soviet Union had 11.7 million automobiles. Some Western authorities believed that about one-third of them were owned by the CPSU or the government.

Inland Waterways

The Soviet Union used an extensive inland navigational network, both natural (rivers and lakes) and man made (canals and reservoirs). The waterways enabled a variety of general and special-purpose river craft to transport the output of mines, forests, collective farms, and factories to domestic and foreign destinations. Some Soviet ships took on cargo at river ports located well inland and delivered it directly to ports on the Arctic, Atlantic, or Pacific oceans or on the Baltic, North, or Mediterranean seas. An inland passenger fleet transported millions of commuters, as well as business and pleasure travelers. Inland waterways were of prime importance to the economic viability of remote Arctic, Siberian, and Far Eastern regions, where they constituted the main, and often the sole, means of surface transportation.

Development of Waterways

Following the Bolshevik Revolution, the new regime decided first on reconstruction and then on expansion and modernization of the inland waterway system. The plan encompassed opening to navigation, or expanding navigation on, major rivers, particularly in the Asian part of the Soviet Union, and included new infrastructure ashore.

In the 1930s, two major canals were constructed: one connecting the Baltic and White seas, 227 kilometers long, with nineteen locks; the other connecting Moscow to the Volga River, 128 kilometers long (see fig. 20). Both were built using prisoners, the first at a cost of about 225,000 lives. By 1940 about 108,900 kilometers of river and 4,200 kilometers of man-made waterways were in operation, which allowed movement of 73.9 million tons originated of freight. During World War II, most of the inland fleet was converted to landing craft for river-crossing operations. As a result

of hostilities, inland navigation suffered losses in vessels, canals, and shore installations.

The Fourth Five-Year Plan provided for the restoration of navigation on major waterways in the European part of the Soviet Union after World War II. It included repair of the fleet, construction of new vessels, and rebuilding and expansion of port installations. In the 1950s, construction of the 101-kilometer canal connecting the Volga and Don rivers, also built using prisoners, brought all the major inland river ports within the reach of the Black, Baltic, Caspian, Azov, and White seas. The navigable length of the inland waterway network reached its peak of 144,500 kilometers in 1970. Thereafter, it began to decline as, on the one hand, distance-cutting reservoirs and canals were opened to navigation and, on the other hand, navigation was discontinued on rivers with a low traffic density. Thus by 1987 the length of inland waterways under navigation was reduced to 122,500 kilometers, exclusive of the Caspian Sea. Navigational channels were deepened, and canals and locks were widened. New waterways, including tributaries of major rivers, were developed in Siberia and the Far East. As part of that process, the ports of Omsk and Novosibirsk were expanded, and new ports were built at Tomsk, Surgut, and Tobol'sk. Equipment capable of handling twenty-ton containers was installed at Krasnoyarsk, Osetrovsk, and ports in the Yakutiya region. The most heavily navigated sections of Siberia's Ob', Irtysh, Yenisey, and Lena rivers were deepened to the "minimum guaranteed depth" of three meters.

Further development of navigation on smaller rivers in the Far East was begun in the early 1980s, and navigation increased on other waterways serving industrialized areas. By 1985 the Volga and Kama river locks had reached their traffic limits and required widening. To respond to increased demand and to replace obsolete vessels, 1,020 dry bulk and oil barges, 247 passenger vessels, and 945 pusher tugs, freighters, and tankers were put into service between 1981 and 1985.

The Waterway System

In 1987 the Russian Republic's Ministry of the River Fleet and the main river transportation administrations of the other republics were, among them, responsible for the 122,500 kilometers of navigable rivers and man-made waterways. Soviet inland waterways are divided into four main categories by depth: super main line, with a guaranteed depth of four meters; main line, with at least 2.6 meters of depth; local, with up to 1.4 meters of depth;

Figure 20. Major Inland Waterways, 1984

and small river, with a water depth of up to one meter. In the European part of the country, the Volga, Kama, Don, and Dnepr rivers and their reservoirs formed the 7,400-kilometer-long United Deep-Water Network. This network had thirty-six water reservoirs, ninety-two locks, and a "guaranteed depth" of four meters on 90 percent of its length. Although many tributaries of large rivers fall generally into the local and small river categories, they nevertheless contributed importantly to many regions' economies, and they

represented about 55 percent of the navigable rivers in Siberia and the Far East.

The river fleet was composed of a wide variety of cargo and passenger vessels and special-purpose ships, such as tugs and icebreakers. Dry cargo river ships ranged from 150 to 5,000 tons in capacity, whereas oil barges ranged up to 9,000 tons. Barge sets, that is, motorized barges pushing one or more "dumb" barges, totaled up to 16,000 tons on Siberian rivers and up to 22,000 tons on the Volga-Kama waterways.

Among the ships, boats, and motorized and "dumb" barges were specialized vessels designed to carry fruit, grain, ore, cement, containers, automobiles, and refrigerated cargo. A variety of passenger vessels, including hydrofoils and air-cushion vehicles, had a passenger capacity from a few dozen to 1,000 people. In a special category were the river-ocean vessels, which included dry bulk carriers (2,700 to 3,000 tons) and liquid tankers (4,800 to 5,000 tons). They made possible direct shipments between domestic inland ports and some 300 maritime and river ports in twenty-six countries in Europe, North Africa, and Asia, including Iran and Japan, as well as Soviet ports on the Arctic Ocean. The fleet of tugboats, both pullers and pushers, the latter equipped with automatic couplers for barge trains, was well adapted to general and specialized operations, including towing huge timber rafts. The tugboats' engine power ranged from 110 kilowatts to 2,940 kilowatts.

All navigable rivers in the Soviet Union are affected by ice. Depending on the region, the yearly navigation season has been as short as 60 days on northern rivers and as long as 230 days on rivers in warmer climates. Icebreakers were therefore an essential component of the Soviet inland fleet in order to extend operations beyond the onset of ice. They were particularly important in the mouths of rivers flowing into the Arctic Ocean, where ice tended to accumulate because of differences between the thawing seasons of rivers and seas. Icebreakers also helped river vessels to reach their wintering ports before the end of the navigable season.

River Ports and Facilities

River ports facilitated the transfer of cargo from one mode of transportation to another. Port facilities, such as piers on free-flowing rivers, have been constructed to account for the seasonal fluctuations of water levels, which sometimes reach several meters. In 1985 the Russian Republic's inland waterway ports had 162 kilometers of mooring facilities, half of which were provided with mechanized transloading equipment. The basic portal cranes were of five-, ten- and fifteen-ton lifting capacity, while container-handling cranes,

having capacities of up to 30.5 tons, were available in major ports. Floating cranes, conveyor belts, and pneumatic loading/unloading devices for grain, granular materials, and bulk cargo were in use. In 1985 river ports in the Russian Republic had 2,220 pier and floating cranes.

Passenger Transportation

Passenger transportation constituted an important function of the river fleet, although its share of the overall passenger traffic was small. In 1986 river boats carried 136 million fares. On major deep-water rivers, intercity or suburban passengers traveled on rapid—up to ninety kilometers per hour—hydrofoils. On small or shallow rivers, service was provided by surface skimmers and air-cushion vehicles.

The bulk of river travel was, however, for excursions and cruises. Big river liners, some of a catamaran type, equipped with cabins, dining rooms, and recreational facilities, took from 120 to 1,000 passengers on one-day excursions and on cruises of longer duration. On major summer holidays, the Moscow Navigation Company has transported between 80,000 and 100,000 passengers daily to and from recreational and tourist areas.

Merchant Marine

The Soviet Union has the world's most extensive coastline—along two oceans and twelve seas—which has served as a transportation link to the rest of the world. The Arctic Ocean and its seas provided international as well as domestic lines of communication to the economically emerging northern areas and constituted a water bridge between the Atlantic and Pacific oceans. The Pacific Ocean opened the Soviet Far East areas to trade with Japan and the Pacific rim countries. Although access to oceans was more restricted, the Baltic and Black seas provided the Soviet Union with outlets to the North Atlantic and South Atlantic and to the Mediterranean Sea, respectively. A fleet of modern coastal vessels provided an essential, and frequently the sole, transportation link between the extreme northern and the Far East parts of the country and the industrialized base. For foreign trade, the Soviet Union relied on a well-equipped and specialized fleet of vessels calling at the ports of practically every maritime nation in the world. Besides carrying over half of the country's export-import freight, the Merchant Fleet (Morskoi flot—Morflot) was an effective adjunct to the Soviet Naval Forces and served the country's political and military needs.

Initial Developments

Between the early 1920s, when the Soviet regime consolidated its power, and the end of the 1950s, when the merchant marine and ports had recovered from the damage of World War II, the Soviet merchant fleet ranked well below those of the major seafaring nations of the world. In the 1960s, however, new economic and political realities caused the Soviet Union to dramatically expand its merchant fleet, ports, shipyards, and related facilities. First, the regime decided to expand its foreign trade, and thus its influence, with the growing number of newly independent African and Asian nations. Second, the 1962 Cuban missile crisis, the widening conflict in Vietnam with Soviet support for Hanoi, and the relationship with China demonstrated the need for a merchant fleet ready to respond to foreign policy and military requirements. For example, in 1960 Soviet merchant ships carried 45 million tons of freight, but by 1965 they carried more than double the tonnage, almost 92 million tons, and two years later, in 1967, they transported nearly 141.5 million tons of freight. In terms of units and tonnage, the merchant fleet went from 590 ships of 3.3 million deadweight tons in 1959 to 990 vessels of 8 million deadweight tons in 1965, thereby rising from twelfth to sixth rank in merchant fleets of the world. The new freighters ranged from 9,000 to 13,500 deadweight tons and were acquired from domestic as well as East German, Polish, Yugoslav, and Finnish shipyards.

The 1970s saw a continued expansion of the merchant fleet, but the vessels put into operation were generally specialized types that had been introduced by Western shipowners in the second half of the 1960s: container carriers, roll-on/roll-off (RO/RO), lighter-aboard-ship (LASH), roll-on/float-off (RO/FLO), RO/RO-container carriers, very large crude carriers (VLCC), and very large bulk carriers (VLBC). They were put into service on expanding lines to the Americas, including the Great Lakes, and to Asia, Africa, and Australia. New Soviet ports and shore installations capable of handling these ships were built or expanded (see fig. 21). Between 1970 and 1980, the number of freight and passenger vessels grew from about 1,400 to 1,725, while their collective tonnage went from almost 12 million to almost 19 million deadweight tons.

In the 1980s, the Soviet merchant marine continued to expand, although at a less frenetic pace than before. By the end of 1985, the merchant marine had 1,741 freight-carrying vessels, of which 290 were tankers, reaching a total of about 20 million deadweight tons. The main types of cargo ships were general and bulk cargo freighters, multipurpose freighters, container ships, timber carriers

and wood waste carriers, bulk carriers, ore-bulk-ore (ORO) carriers, various tankers, refrigerator ships, and RO/RO, RO-FLO, and LASH vessels.

Fleet Operations

In an effort to attain the highest labor productivity and cost efficiency, maritime authorities embarked on a policy of standardization. For vessels, this meant standardization not only by mission and areas of operation but also by major components: engines, cargo-handling equipment, and electronics. The results were higher fuel efficiency, improved and more efficient repair and maintenance, increased cargo-carrying capacity (thus decreasing the relative per ton construction and operating costs), and increased speeds (thereby ensuring faster delivery and increased vessel productivity). New ship designs allowed speedier cargo handling and better space utilization and resulted in a higher carrying capacity per ship. Automation and mechanization of shipboard operations increased labor productivity. For instance, automated control devices enabled operation of a large cargo ship's engine room by one crewman.

Most seas adjoining the Soviet coastline, particularly the Arctic Ocean, the northern Pacific Ocean, and the Baltic Sea, have short navigable seasons. To keep the sea-lanes open and prolong the navigable season, a sizable and diversified fleet of ice-breaking vessels was required. The vessels ranged from small harbor tug-icebreakers to large, nuclear-powered, oceangoing icebreakers, as well as Arctic freighters and tankers of up to 35,000 deadweight tons.

Arctic freighters were especially constructed with reinforced hulls, resembling those of icebreakers, to enable the ships to proceed through ice up to one meter thick. Arctic freighters' superstructures were protected against the severe weather to allow the crew to move from one part of the ship to another without being exposed to cold and ice. Deck de-icing equipment allowed them to operate at temperatures of as low as – 50°C.

In the late 1980s, the Soviet Union had the world's largest passenger vessel fleet. One of its major tasks was to provide transportation to the Arctic and Far Eastern coastal areas, where ships were frequently the sole means of travel. Small vessels, such as hydrofoils seating about 120 passengers and reaching speeds up to forty kilometers per hour, operated in the coastal areas of the Baltic, Black, Azov, and Caspian seas. Old passenger liners, some built prior to World War II and acquired as war reparations, catered to foreign cruise clientele, generally in contiguous waters. Modern and well-equipped cruise ships, however, either were built expressly for Morflot in foreign yards, mainly in East Germany, or were built

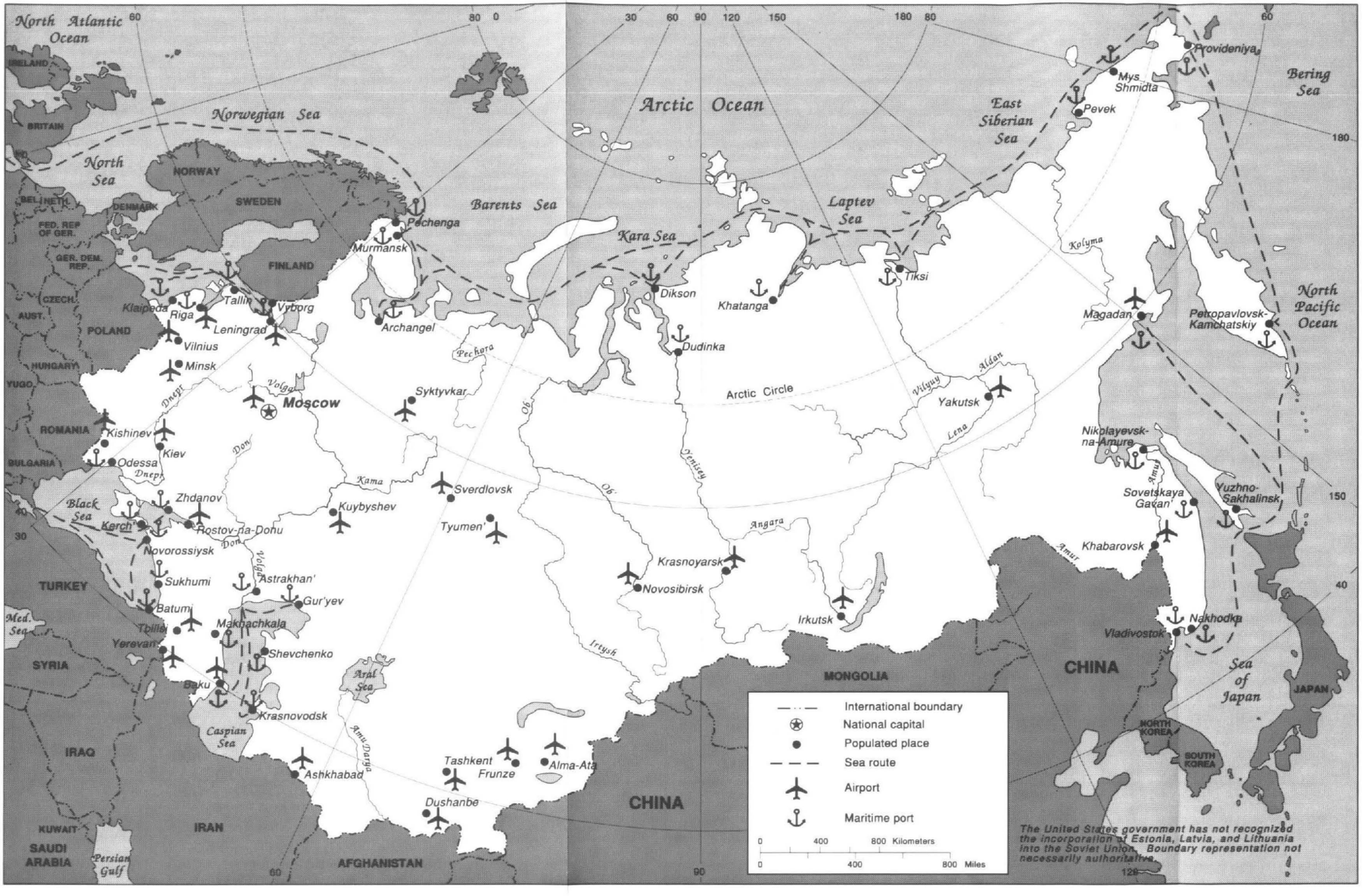


Figure 21. Major Maritime Ports, Airports, and Sea Routes, 1986

chiefly in the Federal Republic of Germany (West Germany) and Britain for Western cruise lines and were subsequently acquired by Morflot in the 1970s and 1980s. With cabin accommodations for 250 to 700 passengers, they catered to Western tourists and plied the world's oceans from the Norwegian fjords to the South Pacific islands. In the mid-1980s, Morflot's oceangoing passenger fleet numbered some eighty liners with a total of about 25,000 berths.

Morflot operated several major ferry lines, both international and domestic. In 1988 two important international train ferry lines were jointly operated, one with Bulgaria, the other with East Germany. The lines had been put into service to avoid transiting Romanian and Polish territory, respectively. The Soviet-Bulgarian ferry between Il'ichevsk and Varna began service in 1978. It has used two Soviet and two Bulgarian ships, each with a capacity for 108 seventy-ton freight cars on three decks. This line has shortened by six days the delivery time between the two countries.

In 1986 the Soviet-East German ferry service began between Klaipeda, in the Lithuanian Republic, and Mukran, on the island of Rügen in East Germany. When in full operation (scheduled for 1990), the line was to use six Mukran-class ferryboats, three belonging to each country. Each boat was designed to carry 103 freight cars of up to eight-four tons each that could roll on and off directly from the shore, thus reducing each boat's turnaround time to only four hours. The round trip between the two ports has taken only forty-eight hours. The annual peak capacity of the six ferries by 1990 was projected at 5 million tons. Since 1984 a Baltic automobile ferry has been operating between Leningrad and Stockholm.

Among the domestic routes were the Caspian Sea ferry lines, the Crimea-Caucasus lines, and the Sea of Japan line between Vanino and Kholmsk. Some automobile ferries in the Far East had trips lasting up to fifteen days and had cabin accommodations for 432 passengers.

The Soviet Union's freight and passenger fleets were supported in ports and at sea by a large diversified fleet of auxiliary craft. They included harbor and ocean tugs, oceangoing salvage and rescue vessels, fire boats, various service craft, and floating cranes, as well as civil engineering craft, such as dredges, used in the construction and maintenance of harbors and navigational channels.

In 1986 the Soviet Union had the world's largest oceangoing fishing fleet, comprising about 4,200 vessels under the jurisdiction of the Ministry of the Fishing Industry. Research and surveying ships numbered more than 200. They were for the most part not operated by Morflot but by various institutes of the Academy of Sciences

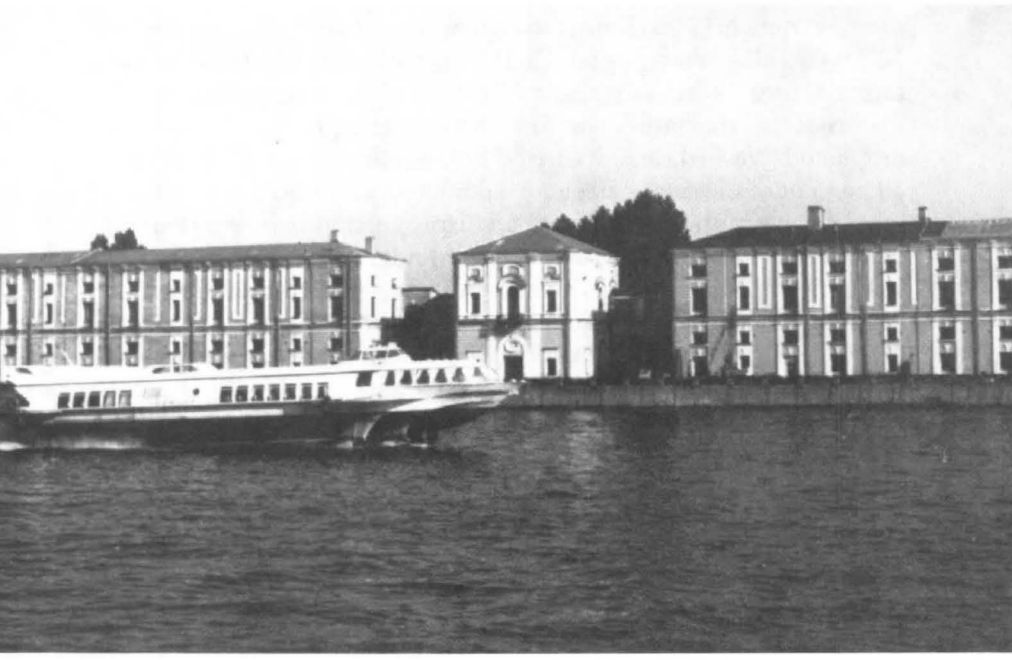
(see Glossary) for oceanographic research and surveying, such as fisheries, marine biology, and oil and gas exploration. According to Western authorities, however, many of these ships were manned at least in part by naval crews and performed work for the Soviet Naval Forces. Usually, these were modern units outfitted with sophisticated equipment, including intelligence-gathering devices.

Most Soviet ports fell into one of three categories. General cargo ports handled a variety of break-bulk, container, RO/RO, LASH, or bulk cargo ships at the same type of pier. Specialized ports transloaded dry or liquid bulk cargo, such as ores, coal, grain, petroleum, and chemicals. They had automated transloading equipment suitable for a particular type of cargo. Major ports, and some smaller ones, had facilities and equipment to handle both types of ships.

The merchant fleet's cargo, passenger, and auxiliary vessels constituted an indispensable logistical component of the Soviet Naval Forces and provided the armed forces with strategic sealift capabilities. According to the United States Department of Defense, Morflot ships, particularly RO/RO, RO/FLO, LASH, and combination RO/RO-container ships, were fast, versatile, and capable of handling combat and combat support vehicles and equipment. Moreover, the majority were able to enter most of the world's harbors. LASH and RO/FLO ships were capable of unloading their cargo at sea and could thereby support amphibious operations. RO/ROs and container ships required minimally prepared shore facilities to discharge their cargo. Nearly half the cargo ships were equipped with cranes capable of lifting the heaviest military armor and vehicles, thereby reducing the dependence on prepared port facilities. Morflot's tankers and cargo vessels were also used for out-of-area refueling and replenishment of Soviet naval vessels operating far from home waters. Merchant ships were sometimes equipped with sophisticated communications and navigational devices, served as intelligence gatherers, and had protection against chemical, biological, and radiological hazards. According to some Western naval authorities, many Soviet merchant and fishing vessels possessed mine-laying capabilities. In the event of hostilities, the Morflot passenger fleet, with a total of about 25,000 berths in peacetime, was capable of transporting several times that number of troops into operational areas.

Civil Aviation

The civilian Air Fleet (Aero flot—Aeroflot) played a major role in transporting passengers but a minor role in transporting cargo. Civil aviation was the third most important transporter of passengers



Potemkin Steps leading to the main sea terminal, Odessa, Ukrainian Republic
Hydrofoil on the Neva River, Leningrad, Russian Republic
Courtesy Jimmy Pritchard

and other scientific and exploration missions, Aeroflot used specially equipped airplanes and helicopters. Medical assistance and evacuation, especially in remote areas, was provided by aircraft such as the An-14 and An-28 and by the Ka-26 and Mi-8 helicopters, which were able to operate from most level surfaces. Various types of agricultural missions were performed by the work horse, the An-2, and its updated version, the An-3, as well as the Ka-26 helicopter.

Aeroflot was also responsible for such services as ice patrol in the Arctic Ocean and escorting of ships through frozen seas, oil exploration, power line surveillance, and transportation and heavy lifting support on construction projects. For the latter tasks, Aeroflot used, in addition to smaller helicopters, the Mi-10 flying crane, a twin-turbine aircraft with a lifting capacity of 11,000 to 14,000 kilograms, depending on the engines. Hauling of heavy cargo, including vehicles, was performed by the world's largest helicopter, the Mi-26. Its unusual eight-blade rotor enabled it to lift a maximum payload of some twenty tons.

In 1986 Aeroflot served over 3,600 population centers and had a route network, excluding overlapping routes, that extended 1,156,000 kilometers, of which 185,000 kilometers were international routes. Aeroflot's share of total freight transported by all means of transportation was only 0.01 percent, or 3,157,000 tons originated. Nevertheless, it carried 116.1 million passengers (almost 19 percent of the total passenger-kilometers), of whom 3.4 million were on international flights. The disproportion between domestic and international air travel reflected not only foreign travel restrictions imposed on Soviet citizens but underscored the importance of aircraft as an essential—sometimes the sole—link to remote cities, towns, and settlements. Thus, in 1986 Siberia, the Far North, and the Far East, although sparsely populated, accounted for 26 percent of Aeroflot's cargo and passenger transport.

Aeroflot also connected the Soviet Union with ninety-seven foreign countries; the main international hub was Moscow's Sheremetevo Airport. Other cities with international airports included Leningrad, Kiev, Minsk, Yerevan, Tashkent, Irkutsk, and Khabarovsk.

Aeroflot's domestic flights frequently have become harrowing experiences for both Western and Soviet passengers, who have complained of long waits and indifferent service at ticket offices, seemingly interminable waiting at airport terminals poorly equipped with food and toilet facilities, passengers forced to sit in hot airplane cabins without air conditioning, and indifferent cabin crews. Shortages of fuel and spare parts were among the major causes of

after the highway and railroad systems in terms of passenger-kilometers. Although it transported only a small fraction of the cargo shipped on the other modes of transportation, Aeroflot was the preferred carrier where speed was essential. Aeroflot provided many services not performed by Western airlines, such as the spraying of fertilizers and pesticides over fields and forests, forest fire detection and control, pipeline inspection, medical evacuation, logistical support for oil and other exploration and extraction ventures, construction projects, and scientific expeditions to polar regions. Frequently, Aeroflot airplanes or helicopters were the sole means of reaching remote Siberian or northern settlements. Lastly, Aeroflot's crews and aircraft constituted the strategic air transport reserve of the Soviet armed forces.

Postwar Evolution of Aeroflot

During World War II, Soviet civil aviation was infused with new technology, consisting of transport airplanes, such as the American DC-3 and DC-4, supplied under the lend-lease agreement. As a result, Aeroflot experienced rapid growth in the postwar years. Between 1950 and 1955, a major route expansion occurred when the capitals of the constituent republics and major administrative centers were interconnected by air service. By 1955 the Soviet Union had established air links with neighboring communist countries in Europe and Asia.

Aeroflot entered the jet age in 1956, when it put into service the world's first jet airliner, the twin-engined Tu-104. It carried seventy passengers or twelve tons of cargo at a range of up to 4,000 kilometers. Other jet or turboprop aircraft were soon acquired by Aeroflot: the An-10, Il-18, and Tu-114 turboprops; the short-range Yak-40; the medium-range Tu-134A; the medium- to long-range Tu-154; and the long-range Il-62M jet liners.

Aeroflot Operations

In the mid- and late 1980s, Aeroflot operated a diversified fleet of both jet and turboprop aircraft, designed for either cargo or passengers and adapted to the geographic and climatic conditions of the country and to its economic needs. Many of the aircraft had raised wings to operate from unimproved airstrips, including frozen marshes or Arctic ice floes, and capable of lifting tall, wide, and heavy vehicles, including medium and heavy tanks (see table 46, Appendix A).

For tasks other than conventional passenger and cargo transportation, Aeroflot had available many types of general and special-purpose fixed and rotary-wing aircraft. For geological, weather,

delayed or canceled flights. According to the head of the Ministry of Civil Aviation's Main Administration for Aviation Work and Transport Operations, a shortage of fuel was expected to keep at least 15 million people from flying on Aeroflot in 1988.

The close relationship between Aeroflot and the Soviet armed forces was underscored by the fact that the minister of civil aviation has been a high-ranking general or marshal of the Air Forces. Aeroflot pilots held reserve commissions in the Air Forces. The 1,600 medium- and long-range passenger and cargo aircraft of Aeroflot were also part of the strategic air transport reserve, ready to provide immediate airlift support to the armed forces. Indeed, many aircraft in Aeroflot's inventory were of the same basic design as military aircraft and, even when loaded with bulky cargo and vehicles, were capable of operating from unimproved fields. They were characterized by high wings, low fuselages with cargo/vehicle loading ramps, and landing gear suitable for unimproved or marshy terrain. Short-range airplanes and helicopters were available for appropriate military support missions. Civil aviation also served as a cover for military operations. According to a Western authority, military aircraft belonging to the Military Transport Aviation (Voennaia transportnaia aviatsiia) have been painted in Aeroflot colors for use as food relief and arms or personnel transports to foreign countries.

Pipelines

Although oil pipelines were first laid in Baku in 1872, the use of pipelines to move liquids and gases over long distances was essentially a post-World War II development, with most use occurring since 1970. In 1988 about 95 percent of crude oil and over 20 percent of refined petroleum products, as well as nearly 100 percent of natural gas, were shipped by pipeline. In 1986 almost 653 million tons originated of crude oil and refined petroleum products were transported by a large-diameter pipeline network of 81,500 kilometers. About 616 billion cubic meters of natural gas entered the 185,000-kilometer gas pipeline system in 1986. Other products shipped by pipelines included chemicals, petrochemicals, salts, coal, ores, and construction minerals.

The main oil pipelines were relatively new and of large diameter—1,020 and 1,220 millimeters. About 65 percent of the oil pipelines, however, were of medium diameter—530 and 820 millimeters or smaller. They linked oilfields with refineries, and in turn the refineries were linked with main user areas or export outlets, such as the port of Ventspils on the Baltic or the towns

Moscow's Central Telegraph Office, decorated for the seventy-second anniversary of the Bolshevik Revolution
Courtesy Jimmy Pritchard

of Brest (near the border with Poland) and Uzhgorod (near the borders with Czechoslovakia and Hungary).

The major gas pipelines ran from the principal natural gas producing regions of Central Asia, western Siberia (twelve large-diameter lines), and the Volga-Ural, Baku, and North Caucasus regions to major domestic and foreign industrial zones (see fig. 22). Natural gas pipelines were of 1,420 millimeter, 1,220 millimeter, 1,020 millimeter, and smaller diameters, the latter representing just over half the total length.

Among the better known pipelines were the Northern Lights line from the Komi petroleum deposit to Brest on the Polish border, the Soiuz line running from Orenburg to Uzhgorod near the Czechoslovak and Hungarian borders, and the Export pipeline from the Urengoy gas field to L'vov and thence to West European countries, including Austria, Italy, West Germany, France, Belgium, and the Netherlands. The 1,420-millimeter Export pipeline was 4,451 kilometers long. It crossed the Ural and Carpathian mountains and almost 600 rivers, including the Ob', Volga, Don, and Dnepr. It had forty-one compressor stations and a yearly capacity of 32 billion cubic meters of natural gas.

Communications

Communications systems were controlled by the regime and were primarily used by it to convey decisions and to facilitate the execution of directives affecting the economy, national security, and administrative governmental functions. The Ministry of Communications, a union-republic ministry (see Glossary), was responsible for radio, telegraph and telephone transmissions, communications satellites, and the postal service. Several other governmental organizations were concerned with communications, including the State Committee for Television and Radio Broadcasting, the Ministry of Defense (for military communications), the Ministry of Culture (for educational broadcasts), and others that controlled and operated electronic communications for their own needs. Communications organizations were also on the republic and lower administrative levels.

Electronic communications systems in the Soviet Union, especially radio and television broadcasting, experienced a rapid growth in the 1960s and 1970s (see Radio; Television and Video Cassette Recorders, ch. 9). Although telephone communications were also expanded in the same period, the rate was slower. By 1989 the Soviet Union had a powerful telecommunications system that sent radio, television, and telephone messages to almost any location in the world.

In 1965 the Soviet Union launched the Molniia (Lightning) satellite communications system linking Moscow to remote towns and military installations in the northern parts of the country. The Molniia system, the world's first domestic satellite communications network, retransmitted radio and television broadcasts originating in Moscow. It was used as the initial back-up teleprinter link for the "hot line" between Moscow and Washington. The system also transmitted signals to spacecraft in the Soiuz, Saliut, and other space programs. The Molniia system employed several satellites following elliptical orbits and several ground stations that exchanged signals with them as they came into range.

In 1971 the Soviet Union launched Intersputnik, an international satellite communications network, with thirteen other member nations: Afghanistan, Bulgaria, Cuba, Czechoslovakia, the Democratic People's Republic of Korea (North Korea), East Germany, Hungary, Laos, Mongolia, the People's Democratic Republic of Yemen (South Yemen), Poland, Romania, and Vietnam. Algeria, Iraq, Libya, and Syria became members subsequently, and Nicaragua and Cambodia agreed to the construction of ground stations in 1986. Headquartered in Moscow and governed by a

Figure 22. Major Petroleum Deposits and Pipelines, 1982

board representing the member nations, Intersputnik employed Molniia communications satellites to link the telephone, telegraph, television, and radio systems of member nations. Each member nation was responsible for building and operating its own ground station, and the Soviet Union had two dedicated stations—at Vladimir and Dubna. Intersputnik participants used centrally located ground stations to relay communications when they did not have direct access to the same satellite.

Communications satellites in geostationary orbits, i.e., the satellite's position remained fixed relative to a point on the earth, were first launched by the Soviet Union in 1975. In 1985 the geostationary, or Statsionar, system employed several different kinds of communications satellites, including the Raduga (Rainbow), Gorizont (Horizon), and Ekran (Screen). Since 1975 the Raduga satellites have been generally used to relay domestic message traffic between distant locations in the Soviet Union. They have also electronically transferred the daily newspapers *Pravda* and *Izvestiia* from Moscow to Khabarovsk for same-day printing in the Soviet Far East. The Gorizont satellites' main functions have been international communications with ground stations, selecting global, regional, zone, or spot beams as needed. Several Gorizont satellites have relayed electronic versions of *Pravda* and *Izvestiia* to Irkutsk and Krasnoyarsk for printing and distribution. Some Western authorities considered Gorizont satellites capable of providing Soviet television programs inexpensively to Third World countries. Ekran satellites were used to relay radio and television signals to community antenna systems in remote areas.

The Ministry of Communications operated almost 92,000 post and telegraph offices and telephone exchanges, most of which were in rural locations. In 1986 it forwarded about 8.5 billion letters, 50.3 billion newspapers and magazines, and 449 million telegrams. In addition, it processed 814 million money orders and pension payments. Despite constitutional guarantees of privacy of personal correspondence, telephone conversations, and telegraph communications, in the late 1980s the regime continued to authorize extensive eavesdropping. Domestic and international mail was subject to being opened and examined by government censors. Foreign publications "which may cause political and economic prejudice to the Soviet Union" were generally prohibited, and parcels from foreign addresses were routinely searched for a wide variety of prohibited articles, including consumer goods and food products, and were returned or "lost."

Since the 1960s, the government has tried to expand and update the telephone system, which, by Western standards of availability

and service, was woefully underdeveloped. In 1988 semiautomatic and automatic telephone exchanges were coming on line within urban centers, and direct long-distance dialing was expanding. To respond to a growing demand for better telecommunications, in the 1980s the Soviet Union turned to Western communications firms to acquire digital telephone switching equipment, for which the need was rapidly growing.

At the end of 1986, an estimated 33 million telephones were connected with, or had access to, the Ministry of Communications network. However, the total number of telephone sets connected to Soviet networks was 39.5 million, which indicates that 6.5 million sets were on separate networks not belonging to the Ministry of Communications. Of the 33 million sets within the Ministry of Communications system, 27.7 million were on urban and 5.3 million on rural networks. Furthermore, of this total, 18.5 million telephone sets were classified as residential, which meant not only sets in private residences but also ones located in communal areas, such as hallways of multifamily residences or in housing projects. Indeed, according to official Soviet data, only 28 percent of urban and 9.2 percent of rural families had telephones in 1986. In early 1987, for instance, 13.3 million requests were made for installations of telephones in cities alone.

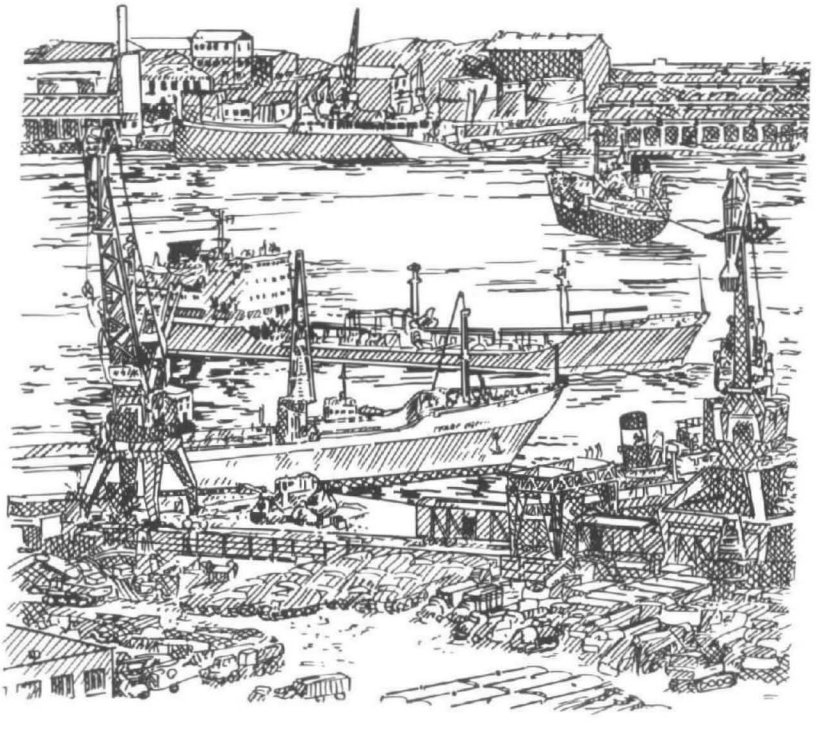
Other telecommunications systems, using both cable and microwave carriers for facsimile and data transmission systems, although under expansion by governmental authorities, still lagged behind the user demand for their services. User needs, however, determined neither the availability nor the quality of communications services in the Soviet Union. Government planners, following directives of the CPSU, allocated resources for communications and transportation with little reference to individual users. The regime gave precedence to the communications needs of decision makers and to the transportation needs of the national economy. Thus, it favored development of railroads, which served as the major long-distance transporter of freight. It also emphasized pipelines, as well as the maritime and air fleets, all of which grew substantially during the 1970s and 1980s. In contrast, the regime limited development of private automobiles and maintained a road network that primarily served areas with substantial industry and urban populations.

* * *

The overall Soviet transportation system is analyzed by Holland Hunter and Vladimir Kontorovich in "Transport Pressures and

Potentials." A detailed study of the transportation of extracted energy resources by rail, water, and pipeline can be found in Matthew J. Sagers and Milford B. Green's *The Transportation of Soviet Energy Resources.* A brief but useful transportation overview is also found in J.P. Cole's *Geography of the Soviet Union.* An insight into Soviet urban transportation services is provided in Paul M. White's *Planning of Urban Transport Systems in the Soviet Union.* Holland Hunter and Deborah Kaple's *The Soviet Railroad Situation* assesses railroad operations, and *Soviet and East European Transport Problems,* edited by John Ambler, Denis Shaw, and Leslie Symans, treats Soviet railroads within the East European context. For current reporting on Soviet railroad developments, the following trade publications may be consulted: *Rail International, Railway Gazette International,* and *International Railway Journal.* For a comprehensive summary of Soviet railroads including operating statistics, locomotives and rolling stock, trackage, new construction, and technical data and characteristics, the latest yearbook of *Jane's Railway Systems* is an excellent source. A useful evaluation of rural trucking problems is in Judith Flynn and Barbara Severin's "Soviet Agricultural Transport," as well as in Elizabeth M. Clayton's "Soviet Rural Roads." D.M. Long's *The Soviet Merchant Fleet* is a good work to consult on the state of Morflot. Useful background material on the Soviet civil airline from its inception to its maturity can be found in Hugh MacDonald's *Aeroflot.* For Aeroflot operations in the 1980s, including service, flight crew proficiency, accidents, and handling of hijackings, the two-part article by Michael York, "Flying with Aeroflot," is helpful. For information about aircraft, the latest *Jane's All the World's Aircraft* should be consulted. (For further information and complete citations, see Bibliography.)

Chapter 15. Foreign Trade



A merchant ship being loaded in a Soviet port

TRADE HAS TRADITIONALLY played only a minor role in the Soviet economy. In 1985, for example, exports and imports each accounted for only 4 percent of the Soviet gross national product. The Soviet Union maintained this low level because it could draw upon a large energy and raw material base and because it historically had pursued a policy of self-sufficiency. Other foreign economic activity included economic aid programs, which primarily benefited the less developed Council for Mutual Economic Assistance (Comecon) countries of Cuba, Mongolia, and Vietnam, and substantial borrowing from the West to supplement hard-currency (see Glossary) export earnings.

The Soviet Union conducted the bulk of its foreign economic activities with communist countries, particularly those of Eastern Europe. In 1988 Soviet trade with socialist countries amounted to 62 percent of total Soviet foreign trade. Between 1965 and 1988, trade with the Third World made up a steady 10 to 15 percent of the Soviet Union's foreign trade. Trade with the industrialized West, especially the United States, fluctuated, influenced by political relations between East and West, as well as by the Soviet Union's short-term needs. In the 1970s, during the period of détente, trade with the West gained in importance at the expense of trade with socialist countries. In the early and mid-1980s, when relations between the superpowers were poor, however, Soviet trade with the West decreased in favor of increased integration with Eastern Europe.

The manner in which the Soviet Union transacted trade varied from one trade partner to another. Soviet trade with the Western industrialized countries, except Finland, and most Third World countries was conducted with hard currency, that is, currency that was freely convertible. Because the ruble was not freely convertible, the Soviet Union could only acquire hard currency by selling Soviet goods or gold on the world market for hard currency. Therefore, the volume of imports from countries using convertible currency depended on the amount of goods the Soviet Union exported for hard currency. Alternative methods of cooperation, such as barter, counter trade, industrial cooperation, or bilateral clearing agreements were much preferred. These methods were used in transactions with Finland, members of the Comecon, China, Yugoslavia, and a number of Third World countries.

Commodity composition of Soviet trade differed by region. The Soviet Union imported manufactured, agricultural, and consumer goods from socialist countries in exchange for energy and manufactured goods. The Soviet Union earned hard currency by exporting fuels and other primary products to the industrialized West and then used this currency to buy sophisticated manufactures and agricultural products, primarily grain. Trade with the Third World usually involved exchanging machinery and armaments for tropical foodstuffs and raw materials.

Soviet aid programs expanded steadily from 1965 to 1985. In 1985 the Soviet Union provided an estimated US$6.9 billion to the Third World in the form of direct cash, credit disbursements, or trade subsidies. The communist Third World, primarily Cuba, Mongolia, and Vietnam, received 85 percent of these funds. In the late 1980s, the Soviet Union reassessed its aid programs. In light of reduced political returns and domestic economic problems, the Soviet Union could ill afford ineffective disbursements of its limited resources. Moreover, dissatisfied with Soviet economic assistance, several Soviet client states opened trade discussions with Western countries.

In the 1980s, the Soviet Union needed considerable sums of hard currency to pay for food and capital goods imports and to support client states. What the country could not earn from exports or gold sales it borrowed through its banks in London, Frankfurt, Vienna, Paris, and Luxembourg. Large grain imports pushed the Soviet debt quite high in 1981. Better harvests and lower import requirements redressed this imbalance in subsequent years. By late 1985, however, a decrease in oil revenues nearly returned the Soviet debt to its 1981 level. At the end of that same year the Soviet Union owed US$31 billion (gross) to Western creditors, mostly commercial banks and other private sources.

In the late 1980s, the Soviet Union attempted to reduce its hard-currency debt by decreasing imports from the West and increasing oil and gas exports to the West. It also sought increased participation in international markets and organizations. In 1987 the Soviet Union formally requested observer status in the General Agreement on Tariffs and Trade and in 1988 signed a normalization agreement with the European Economic Community. Structural changes in the foreign trade bureaucracy, granting direct trading rights to select enterprises, and legislation establishing joint ventures with foreigners opened up the economy to the Western technical and managerial expertise necessary to achieve the goals established by General Secretary Mikhail S. Gorbachev's program of economic restructuring (*perestroika*—see Glossary).

Development of the State Monopoly on Foreign Trade

The government of the Soviet Union has always held a monopoly on all foreign trade activity, but only after the death of Joseph V. Stalin in 1953 did the government accord importance to foreign trade activities. Before that time, the Bolsheviks' (see Glossary) ideological opposition to external economic control, their refusal to pay Russia's World War I debts, and the chaos of the Civil War (1918–21) kept trade to the minimum level required for the country's industrial development (see Revolutions and Civil War, ch. 2). Active Soviet trade operations began only in 1921, when the government established the People's Commissariat of Foreign Trade.

The commissariat's monopoly on internal and external foreign trade was loosened, beginning in 1921, when the New Economic Policy (NEP) decentralized control of the economy (see The Era of the New Economic Policy, ch. 2). Although the commissariat remained the controlling center, the regime established other organizations to deal directly with foreign partners in the buying and selling of goods. These organizations included state import and export offices, joint stock companies, specialized import and export corporations, trusts, syndicates, cooperative organizations, and mixed-ownership companies.

The end of the NEP period, the beginning of the First Five-Year Plan (1928–32), and the forced collectivization of agriculture beginning in 1929 marked the early Stalin era (see Stalin's Rise to Power, ch. 2). The government restructured foreign trade operations according to Decree Number 358, issued in February 1930, which eliminated the decentralized, essentially private, trading practices of the NEP period and established a system of monopoly specialization. The government then organized a number of foreign trade corporations under the People's Commissariat of Foreign Trade, each with a monopoly over a specific group of commodities.

Stalin's policy restricted trade as it attempted to build socialism in one country. Stalin feared the unpredictable movement and disruptive influence of such foreign market forces as demand and price fluctuations. Imports were restricted to factory equipment essential for the industrialization drive that began with the First Five-Year Plan.

World War II virtually halted Soviet trade and the activity of most foreign trade corporations. Trade was conducted primarily through Soviet trade representatives in Britain and Iran and the Soviet Buying Commission in the United States. After the war, Britain and other West European countries and the United States

imposed drastic restrictions on trade with the Soviet Union. Thus, Soviet foreign trade corporations limited their efforts to Eastern Europe and China, establishing Soviet-owned companies in these countries and setting up joint-stock companies on very favorable terms. Comecon, founded in 1949, united the economies of Eastern Europe with that of the Soviet Union (see Appendix B).

Soviet trade changed considerably in the post-Stalin era. Postwar industrialization and an expansion of foreign trade resulted in the proliferation of all-union (see Glossary) foreign trade organizations (FTOs), the new name for foreign trade corporations and also known as foreign trade association. In 1946 the People's Commissariat of Foreign Trade was reorganized into the Ministry of Foreign Trade. The Ministry of Foreign Trade, through its FTOs, retained the exclusive right to negotiate and sign contracts with foreigners and to draft foreign trade plans. The State Committee for Foreign Economic Relations (Gosudarstvennyi komitet po vneshnim ekonomicheskim sviaziam—GKES), created in 1955, managed all foreign aid programs and the export of complete factories through the FTOs subordinate to it. Certain ministries, however, had the right to deal directly with foreign partners through their own FTOs.

On January 17, 1988, *Izvestiia* reported the abolition of the Ministry of Foreign Trade and GKES. These two organizations were merged into the newly created Ministry of Foreign Economic Relations, which had responsibility for administering foreign trade policy and foreign aid agreements. Other legislation provided for the establishment of joint enterprises. The government retained its monopoly on foreign trade through a streamlined version of the Soviet foreign trade bureaucracy as it existed before the January 17 decree.

Structure of the Foreign Trade Bureaucracy

In 1988 the foreign trade bureaucracy reflected the monopoly specification system created by the 1930 Decree Number 358. the authority of the Communist Party of the Soviet Union (CPSU) and the Council of Ministers, six central bodies, the Ministry of Foreign Economic Relations, and numerous FTOs together planned, regulated, monitored, and carried out all Soviet foreign economic activity (see fig. 23).

Administration

Although the CPSU had ultimate authority over all foreign economic activity, in the late 1980s administrative control was centralized in the Council of Ministers. More specifically, the council's

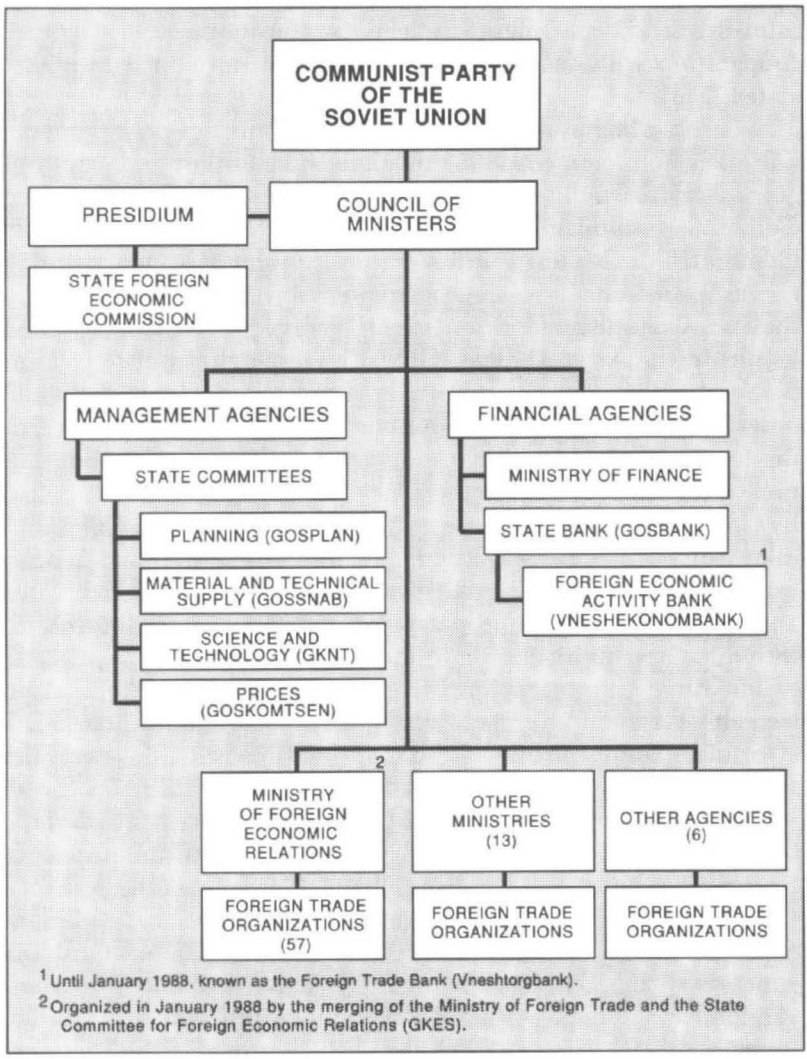
State Foreign Economic Commission coordinated the activities of ministries and departments in the area of economic and scientific cooperation with socialist, developing, and developed capitalist states.

Six central bodies under the Council of Ministries played important roles in foreign economic relations. The import and export of goods, services, and resources were managed by the State Planning Committee (Gosudarstvennyi planovyi komitet—Gosplan), the State Committee for Material and Technical Supply (Gosudarstvennyi komitet po material'no-tekhnicheskomu snabzheniiu—Gossnab), and the State Committee for Science and Technology (Gosudarstvennyi komitet po nauke i tekhnike—GKNT). Gosplan formulated all import and export plans, coordinated the allocation of investment and other resources, and had final authority over all decisions concerning foreign trade, including trade levels and commodity composition. Gossnab coordinated the allocation of resources not handled by Gosplan and, as the central agency responsible for matching supplies with customers, played a major role in selecting and allocating imports. GKNT negotiated technical cooperation agreements and monitored license and patent purchases and sales in order to introduce new technology into the Soviet economy.

The State Committee on Prices (Gosudarstvennyi komitet po tsenam—Goskomtsen), the Ministry of Finance, and the State Bank (Gosudarstvennyi bank—Gosbank) held jurisdiction over the financing of foreign trade. Goskomtsen established prices for all imports and some exports. The Ministry of Finance controlled the balance of payments (see Glossary) and monitored the impact of foreign trade on the state budget. Finally, Gosbank set the exchange rate for the ruble (for value of the ruble—see Glossary) and managed the system of exchange within the Soviet Union. Gosbank supervised the Foreign Economic Activity Bank (Vneshnii ekonomicheskii bank—Vneshekonombank; until January 1, 1988, known as the Foreign Trade Bank), which provided international banking services for Soviet FTOs.

Operation

Until 1988 the two operative bodies involved solely and directly in foreign economic operations were GKES and the Ministry of Foreign Trade (see fig. 24). The Ministry of Foreign Trade formulated draft import and export plans and regulated commodity trade. GKES supervised foreign aid programs and the export of complete plants. The Ministry of Foreign Trade or GKES had jurisdiction over most FTOs, which negotiated and signed commercial contracts with foreigners on behalf of individual enterprises



Source: Based on information from United States, Central Intelligence Agency, Directorate of Intelligence, *Directory of Soviet Officials: National Organizations,* Washington, 1988; and H. Stephen Gardner, *Soviet Foreign Trade,* Boston, 1983, 3.

Figure 23. Foreign Trade Bureaucracy, 1988

(see Glossary). FTOs were generally organized by product, as had been the foreign trade corporations of the 1930s.

Some industrial ministries or other agencies, however, had their own FTOs. As of early 1987, for example, forty-eight FTOs were under the jurisdiction of the Ministry of Foreign Trade and nine

under the GKES, whereas the Ministry of the Maritime Fleet, the Ministry of the Fishing Industry, and the Ministry of Trade, among others, had their own FTOs. In addition, certain other agencies had their own FTOs: the Chamber of Commerce and Industry, which handled international trade exhibitions; the State Committee for Physical Culture and Sports; the Central Union of Cooperatives; the State Committee for Publishing Houses, Printing Plants, and the Book Trade; the State Committee for Cinematography; and the State Committee for Science and Technology.

Structural Reforms, 1986 to Mid-1988

The cumbersome foreign trade bureaucracy contributed to a number of problems that hindered the efficiency and effectiveness of foreign trade. The lack of direct contact between Soviet enterprises and their foreign customers or suppliers frustrated both parties by unnecessarily delaying contract negotiations and the specification of technical details. In a May 1986 interview with *Izvestiia,* the general director of the Ministry of Foreign Trade's All-Union Association for the Export and Import of Technical Equipment, Boris K. Pushkin, reported that after an enterprise submitted a request for a foreign item, two to three years were required before it was included in the import plan and funds were allocated for its purchase. In the interim, the needs of the enterprise had often changed. Pushkin stressed the need to free enterprises from unnecessary petty supervision and excessive regulation.

Taking such problems into account, the Twenty-Seventh Party Congress in February–March 1986 declared that the party anticipated a step-by-step restructuring of [the country's] foreign trade in order to make exports and imports more effective. In August of the same year, the CPSU Central Committee and the Council of Ministers adopted the decree "On Measures for Improving Management of External Economic Relations," which outlined drastic steps to change the structure of the foreign trade bureaucracy.

Also in August 1986, the Council of Ministers' State Foreign Economic Commission became a permanent body within the council, giving more authority and visibility to the commission, the domestic activities of which previously went largely unreported. The staff was augmented, and the chairman acquired a rank equivalent to that of deputy prime minister. The new charter stated that the commission's role was "to formulate and implement the country's foreign economic strategy so as to enhance its potential contributions to acceleration [*uskorenie*—see Glossary], strengthen the Soviet position in the world economy, and promote structured and

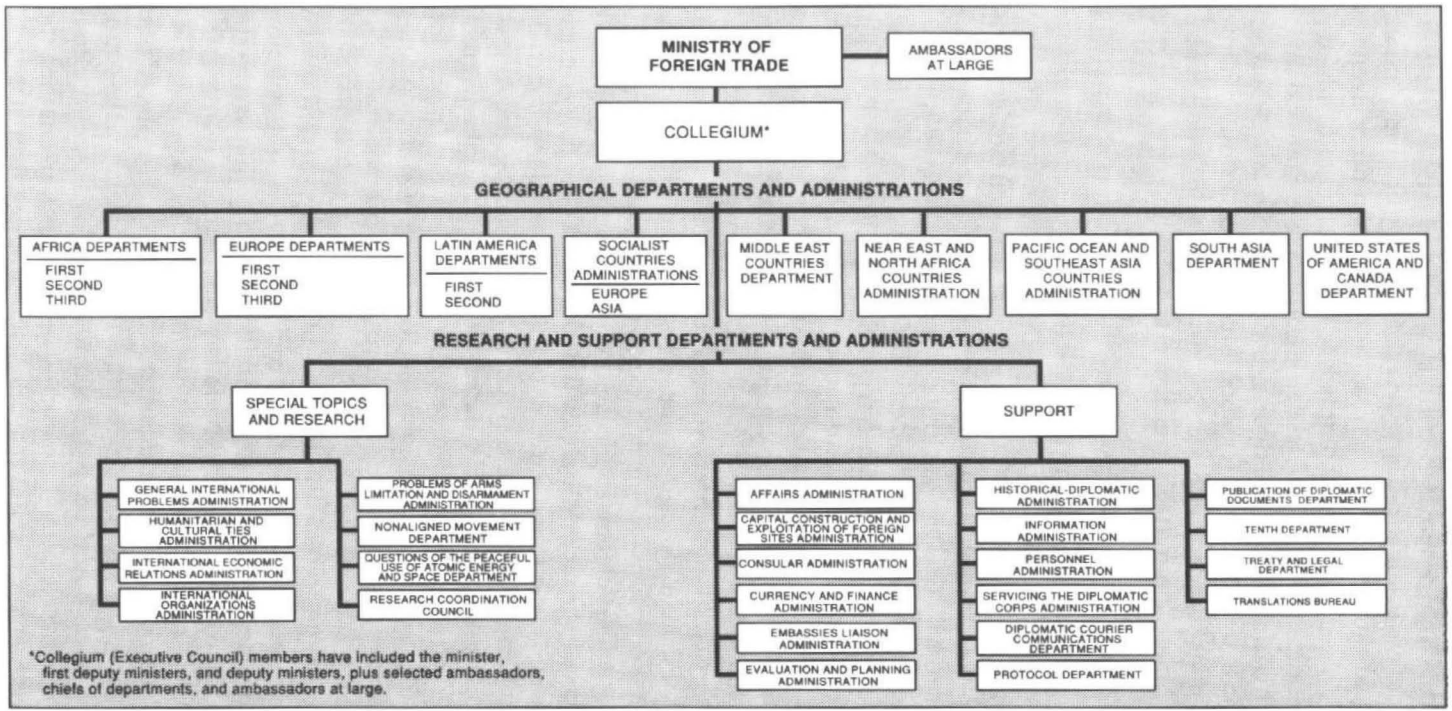


Figure 24. Organization of the Ministry of Foreign Trade, 1987

organized development of economic cooperation with all groups of countries."

Until 1987 the forty-eight FTOs subordinate to the Ministry of Foreign Trade administered more than 90 percent of Soviet foreign trade turnover. In 1987 the ministry lost control of 20 percent of Soviet foreign trade turnover. The government granted direct foreign trade rights to twenty-one ministries and state committees, sixty-seven industrial enterprises, and eight interbranch scientific production complexes. Exporting enterprises gained the right to retain part of their hard-currency earnings. Each ministry or enterprise was to pay for its investment imports with its own hard currency, and the heads of ministries and enterprises became personally responsible for the efficient use of hard-currency funds. These measures gave enterprises more influence in import decision making.

On January 13, 1987, the Council of Ministers adopted the resolution "On Questions Concerning the Creation, on U.S.S.R. Territory, and the Activities of Joint Enterprises, International Associations, and Organizations with the Participation of Soviet and Foreign Organizations, Firms, and Management Bodies," or, more simply, a law on joint ventures. This legislation opened up enterprises inside the Soviet Union for the first time since the Bolshevik Revolution (see Glossary), to foreign participation. Joint ventures were to facilitate the acquisition and assimilation of Western technology, managerial know-how, and marketing abilities. Optimistic about the economic effects of their new undertaking, Soviet officials declared that 85 to 90 percent of "the most important types of machinery" would meet world technical standards by 1990. The Soviet Union's vast natural resources and its lucrative, previously closed, domestic market attracted Western companies. By August 1988, more than 50 joint ventures were registered in the Soviet Union, and approximately 300 were under negotiation.

Nevertheless, numerous obstacles arose in the first eighteen months after the government adopted the joint venture law. Complaints by Western partners dealt with uncertainties concerning Soviet trade regulations, problems with the supply of goods, the dilemma of the nonconvertibility of the ruble, difficulties finding qualified Soviet managers, problems in projecting production costs (as of 1989 Soviet domestic prices were administratively set and not based on market forces), and even complications finding office space in Moscow. Soviet trade officials' efforts to accommodate these complaints have included the decentralization of the foreign trade bureaucracy, the establishment of a management institute in Moscow, price reforms, and various legal reforms.

Before Western businessmen could recover from the confusion and disruption caused by this series of reforms, a second series began in early 1988. Effective January 1, 1988, the Foreign Trade Bank (Vneshnii torgovii bank—Vneshtorgbank) was renamed the Foreign Economic Activity Bank (Vneshnii ekonomicheskii bank—Vneshekonombank). The name change did not signify a major change in the bank's duties but simply more accurately reflected the nature of its operations. Vneshtorgbank had branched out from the simple management of foreign trade transactions to provide currency, credit, and accounting services as well. In a change from its previous duties, Vneshekonombank was required to administer new procedures dealing with Soviet firms that had recently acquired direct foreign trade rights.

Also on January 1, 1988, the New Enterprise Law went into effect, making enterprises economically accountable for their own business operations by 1989. According to this law, the government had the power to disband unprofitable businesses, and each ministry and its subordinate enterprises gained the responsibility for their own foreign trade activities. In addition, Gosplan, Gossnab, and GKNT relinquished some of their rights to allocate money and goods. Finally, the Ministry of Foreign Trade lost control of 15 percent more of its foreign trade turnover when fourteen additional enterprises and four other ministries acquired direct foreign trade rights.

Yet probably the most significant change in the foreign trade mechanism occurred on January 17, 1988, when *Izvestiia* announced the abolition of the Ministry of Foreign Trade and the GKES. The Ministry of Foreign Economic Relations, headed by Konstantin F. Katushev, former head of the GKES, assumed the duties of the two agencies. "Thus, the state monopoly on foreign trade and its state-wide aspects remains centralized," reported the Soviet foreign trade monthly *Vneshniaia torgovlia* (Foreign Trade), "while operational functions are continually being shifted to the business level." In March 1988, the journal reported that approximately 20 percent of foreign trade turnover was handled by the eighty-one firms that had been granted the right to deal directly with foreigners.

Other reforms followed in April 1988, when the Central Committee and the Council of Ministers agreed on a new charter for the Chamber of Commerce and Industry. In general, the chamber monitored foreign trade conducted outside the new Ministry of Foreign Economic Relations. In addition, the chamber assisted Soviet production enterprises in locating Western partners and learning foreign trade practices.