

## Transport and Telecommunication

The geographical location of Ukraine from a transport perspective is highly favourable, even though this advantage has been insufficiently used thus far. The efficient operation of the domestic transport system and its connection to the European and global network is of key importance for the performance of a series of contemporary tasks and would allow an expansion of international traffic volumes. The share of enterprises operating in the road and transportation sector account for 6.9% of GDP, and the aggregate value of their fixed assets amounts to 13.4% of the total productive potential of Ukraine.

The country's general transport network includes 43,500 km of main pipelines, 22,100 km of railways, 164,600 km of paved public roads, and 2,200 km of navigable waterways with an exit to the Sea of Azov and the Black Sea (Figure 69). The volume and turnover in the transportation of both passengers and goods are shown in Tables 18 and 19.

In 2004, the volume of freight traffic amounted to more than 1.7 billion tons and turnover was over 480 billion ton kms. The highest share within freight was carried by road (59%), followed by rail (27%) and pipeline (13%). Waterways played a negligible part in freight traffic (1%).

**Road transport** is the most important branch of both freight and passenger (46.5%) traffic. Due to the country's predominantly plain-like topography, the network of public roads displays a uniform pattern over most of its territory. Toward the west their density is somewhat higher. Average density of paved public roads is 273 km per 1000 km<sup>2</sup>. The most important arterial roads are: Kyiv–Zhytomyr–Rivne–L'viv; Kyiv–Poltava–Kharkiv–Debaltseve; Kyiv–Uman'–Odesa; Kyiv–Khludiv; L'viv–Mukacheve; and Kharkiv–Novomoskivs'k–Zaporizhzhia–Simferopol' (Figure 70). The largest road hubs are Kyiv, L'viv, Kharkiv and Khmel'nyts'kyi. Road transport dominates interurban and suburban passenger traffic. With respect to freight traffic, containers and refrigerator lorries are the primary means of transport.

**Rail transport** ranks second in volume for both freight and passenger traffic (27% and 5.6% respectively). It is important in domestic transport and particularly important in international transport. The railway density is 36 km per 1,000 km<sup>2</sup> reaching a maximum in the southeast (Donbas) and in the western part of the country. The most important trunk railway lines are: Kyiv–Fastiv–Koziatyn–Zdolbuniv–L'viv; Koziatyn–Zhmerynka–Odesa; Kyiv–Konotop–

Table 18. Volume of passenger and freight traffic by type

Types of transport	Passenger traffic				Freight traffic			
	1990		2004		1990		2004	
	m. pass.	%	m. pass.	%	m. tons	%	m. tons	%
Transport, total	14,977	100	7,997	100	<b>6,286</b>	100	<b>1,731</b>	<b>100</b>
Land	14,917	99.6	7,982	99.8	6,167	98	1,710	99
Rail	669	4.5	452	5.6	974	15	462	27
Motor vehicle	8,331	56.0	3,720	46.5	4,897	78	1,027	59
Tram	2,007	13.4	1,112	13.9				
Trolleybus	3,232	21.5	1,849	23.1				
Metro	678	4.5	848	10.6				
Pipeline					296	5	221	13
Water	45	0.3	12	0.2	119	2	21	1
Sea	26	0.2	10	0.1	53	1	9	0
River	19	0.1	2	0	66	1	12	1
Air	15	0.1	3	0	0.2	0	0.1	0

Source: Statystychnyi schorichnyk Ukrainy za 2004 rik, Vyd. Konsul'tant, 2005.

Fig. 69

# TRANSPORT NETWORK





Author: Razov, V., Kas'ianova, N.  
 Cartography: Yevronina, I.  
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 Institute of Geography  
 Kyiv, 2008  
 Cartography: Kaiser, L., Keresztési, Z., Kovács, A.  
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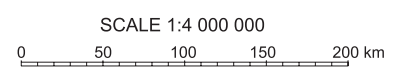
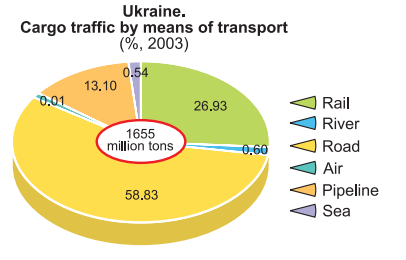
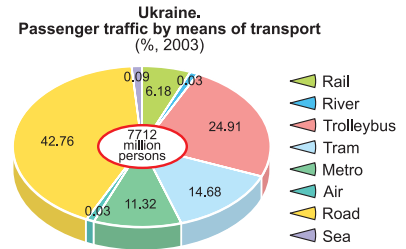


Table 19. Turnover of passengers and freight traffic by type

Types of transport	Passenger turnover				Freight turnover			
	1990		2004		1990		2004	
	billion pass. kms	%	billion pass. kms	%	billion ton kms	%	billion ton kms	%
Transport, total	222.5	100	128.6	100	1,039.3	100	480.1	100
Land	204.7	92	123.0	96	761.7	74	464.9	97
Rail	76.0	34	51.7	40	474.0	46	234.0	49
Motor vehicles (buses)	90.3	41	46.5	37	79.7	8	28.8	6
Tram	13.0	6	6.6	5				
Trolleybus	21.0	9	10.8	8				
Metro	4.4	2	6.4	5				
Pipeline					208.0	20	202.1	42
Water	1.7	1	0.1	0	277.5	26	14.9	3
Sea	1.1	1	0.1	0	265.6	25	9.3	2
River	0.6	0	0.0	0	11.9	1	5.6	1
Air	16.1	7	5.5	4	0.1	0	0.3	0.1

Source: Statystychnyi schorichnyk Ukrainy za 2004 rik, Vyd. Konsul'tant, 2005.

Shostka; Kyiv–Poltava–Kharkiv–Debaltseve; Fastiv–Smila–Dnipropetrovs'k–Donets'k; Kharkiv–Dnipropetrovs'k–Zaporizhzhia–Simferopol'–Sevastopol'; and L'viv–Mukacheve–Chop. Railway hubs with developed railway station networks are Kyiv, L'viv, Kharkiv, Dnipropetrovs'k, Fastiv, Debaltseve, Zhmerynka and Smila. There are six territorial sections in the organisational structure of railway transport in Ukraine: Southwest (centred on Kyiv), L'viv, South (Kharkiv), Donets'k, Pridniprovye (Dnipropetrovs'k) and Odesa. The main goods transported by rail are coal, ores, ferrous metals, oil and oil derivatives, and mineral-based raw materials for construction, together constituting 62.3% of all transport volume. The busiest rail sections are Kryvyi Rih–Dnipropetrovs'k–Debal'tseve, Kryvyi Rih–Fastiv–L'viv, and the lines leading towards the seaports of Odesa, Berd'yansk and Mariupol'.

**Pipelines** have a prominent role to play in the transport of crude oil, natural gas and their derivatives, ranking third with respect to transported freight volumes across all goods (12.8%). Of this amount, 74.2% belongs to gas and 24.9% to oil and its derivative products. This mode of transport is of high significance for the domestic economy and plays an even more important role in international trade. The density of pipeline networks reach their maximum in the west and east of the country, being somewhat lower in the

central regions. The average density of pipeline is 72.4 km per 1,000 km<sup>2</sup> across the country as a whole.

**Waterway transport** ranks far below the above branches in importance, and occupies the last place both in passenger traffic (1.1%) and freight transported (1% or 12 million tons). The latter is overwhelmingly for domestic purposes and is used for international trade only to a lesser extent. Most of the cargo is of a solid nature: coal and coke – 13.4%, mineral raw materials for construction (including cement) – 43.3%, metals – 10.8%, and iron ore – 21.0%. In 2004, the volume of freight traffic passing through the Ukrainian seaports amounted to 131.8 million tons with the following distribution: 50% were exports, 9% imports, 38% were goods in transit, and 3% was domestic traffic. Cargo handled by the Ukrainian river ports equalled 12.4 million tons: 21% exports, 5% imports, 1% transit, and 73% domestic freight traffic.

Within the international export of services, transport represented 76.1% of the sector in 2004. Its value totalled 4.0 billion USD distributed in the following manner: pipelines – 46.7%, sea – 16.2%, rail – 17.7%, air – 11.3%, and others – 8.1%. In the same year, transport made-up 22% of the international import of services.

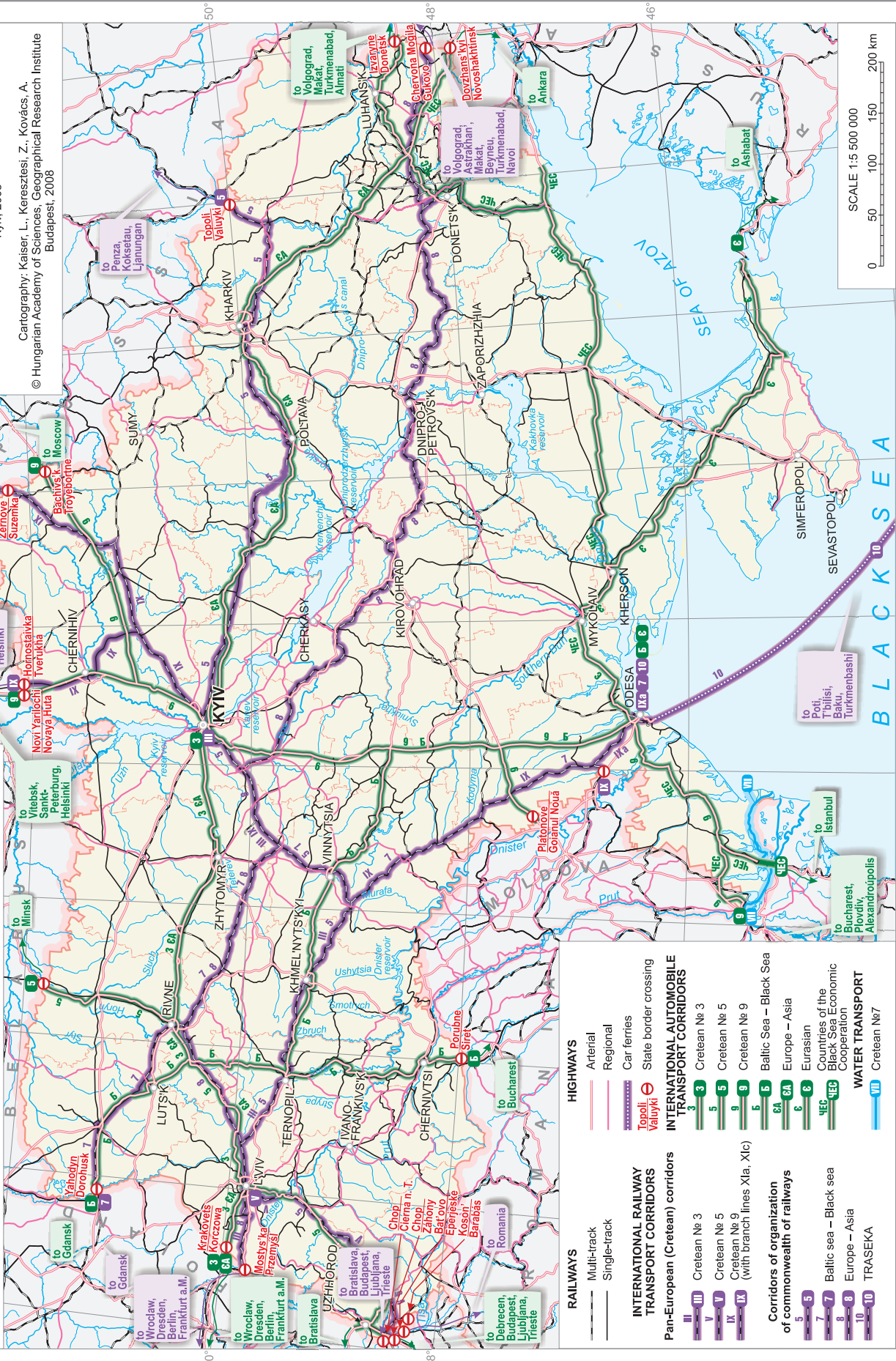
**Telecommunication.** In 2004 the turnover of communications service providers in Ukraine (with a variety of ownership struc-



Fig. 70

# INTERNATIONAL TRANSPORT CORRIDORS

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34° 32° 30° 28° East of Greenwich  
 48° 46°

tures) was 21.1 billion UAH, including services for the domestic population for the sum of 8.4 billion. Revenues from these services were attributable as follows: postal – 4.5%; telephone – 41.7% (28.6% interurban and international calls); broadcasting and the reception of television and radio programmes – 2.5%; I.T. services – 4.4%; mobile telephone networks – 44.9%; and other types of communication – 2%. The sector is characterised by a marked prevalence of operators in shared public-private ownership, providing 92.4% of all services. State ownership is overwhelming for postal services (98.4%) and the supervision and maintenance of electricity networks (100%).

#### **Primary network of telecommunication.**

Today Ukraine benefits from a broad network of communications, and is a predominantly analogue network inherited from the former USSR. In 1992 a radio relay line from Kyiv, up to the satellite receiver station “Azimuth” (Cisrpathia) was put into operation. Its basic task was the establishment and maintenance of contact with Western Europe and North America. The inauguration of the station was the first step toward digitising the primary network in Ukraine.

Until mid-1997, the basic cross-border connection was only provided by this Kyiv–L’viv radio relay line and the satellite link (the latter carried half of the international traffic of Ukraine during the Soviet period). It was only in 1995 that fibre optic technology was utilised to improve and extend the primary telecommunication network. It was during this year that some sections of fibre optic cable were laid from L’viv to Uzhhorod, and also from L’viv to the border with Poland, Slovakia and Hungary. The first line of significant length was laid-down in 1996, when Ukraine became part of the ITUR international project (Italy–Turkey–Ukraine–Russia) – an undersea fibre optic cable line, with a 250 km section belonging to Ukraine and reaching the shore near Odesa.

A logical (and physical) enlargement of the project was a 1,000 km fibre optic cable system called “Pivden” (or “South”, running from Kyiv to Odesa), which started commercial operation in 1997 (*Figure 71*). With its incorporation of 8,000 connectivity channels, the percentage utilisation of the expensive satellite link had been reduced to 5% by the end of 1997. In the same year, the lines “Pivnich” (or “North” running up to the border with Belarus) and the fibre

optic trunk line “Zakhid” (or “West” from Kyiv to L’viv) were put into operation.

This accelerated network development can be attributed to responsibilities undertaken by Ukraine within the projects TEL (Trans European Fibre Optic Telecommunications Line) and TAE (Trans Asian–European Fibre Optic Cable System). Thus, TEL allowed the unification of the Central and Western European networks into a single European system whilst TAE will result in the systems of several Asian countries being linked to Europe, with the ultimate goal as the creation of a transit trunk line from Frankfurt-am-Main (Germany) to Shanghai (China). Currently, the latest project to be completed is an undersea segment of TAE called BS FOCS (Black Sea Fibre Optic Cable System), with the joint efforts of Ukraine and other countries in the Black Sea basin, which would be a double benefit for TAE and provide access to the whole system for the countries of the Caucasus.

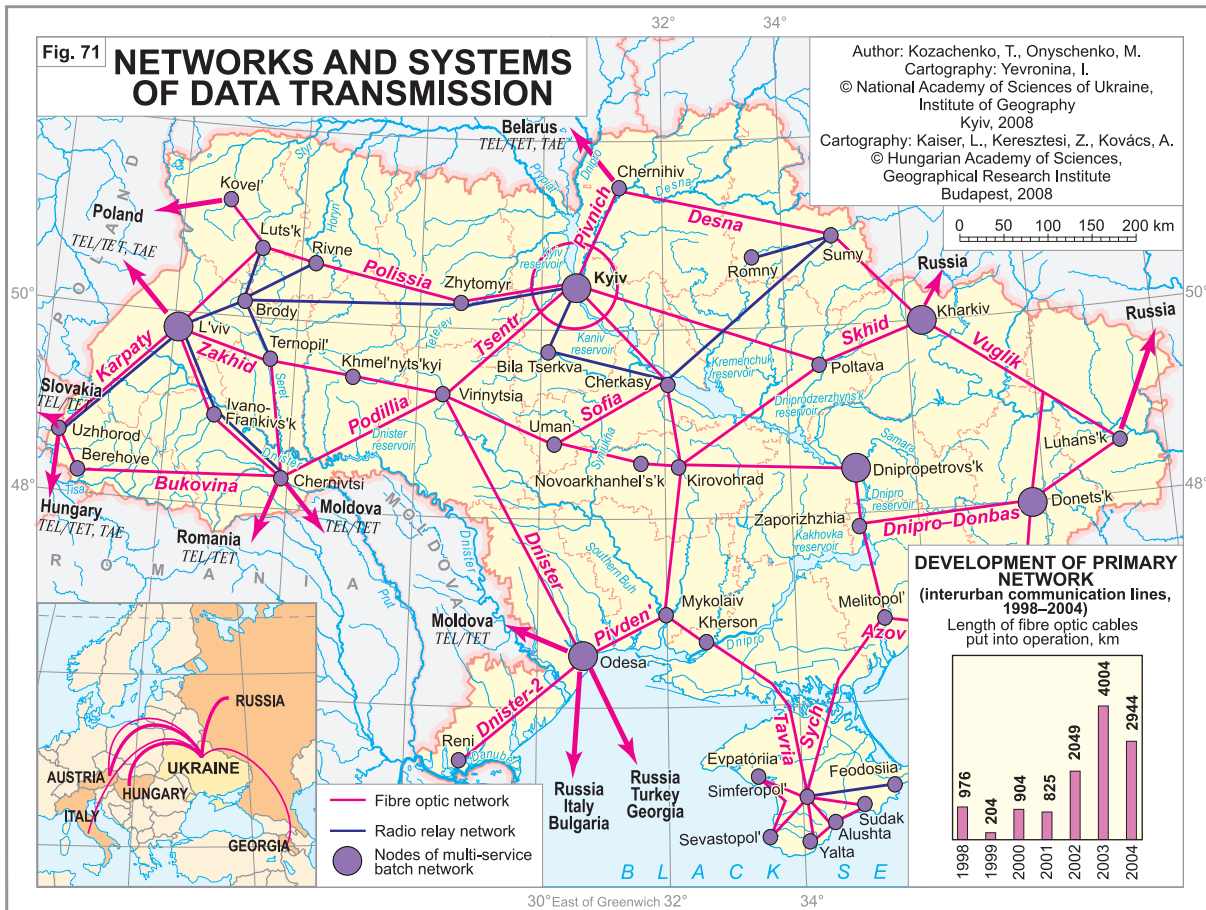
With regards generally to the construction of a fibre optic system, the eastern portion of Ukraine has been lagging behind the rest of the country and the sections crossing the frontier with Russia were only completed in 1999 near Kharkiv and in 2000 near Luhans’k. Nowadays, a dense network of fibre optic and digital relay cables is widespread over the country. By 2003, fibre optic networks covered all regional (oblast) centres of Ukraine. Concomitantly with the completion of the fibre optic cable system at a trunk (magistral’nyi) level, the establishment of “volume rings” started in late 2003 and early 2004. Virtually all fibre optic trunk lines in Ukraine will be interconnected within ring structures.

**Satellite connection** is of utmost importance for the country’s connectivity into the global information sphere. Terrestrial and undersea systems of telecommunication alone are unable to fully ensure the availability of information and to shape the communication and information infrastructure.

Ukraine is found within the service zone of 65 earth satellites set into geostationary orbit; of them 28 are used by various operators in Ukraine. These satellites have a much broader zone of coverage than the territory of the country. They broadcast television and radio programmes, and provide access to the Internet, which is today an equally important function.

**Landline telephone network.** In 2003 15,082 automatic telephone exchanges oper-





ated in Ukraine; of them 4,171 in urban settlements and 10,911 in rural ones. This mode of telecommunication is being gradually replaced by **mobile telephones**. Mobile phone handsets and pagers have become widespread. They are subdivided into: cellular systems for mobile telephones; paging systems; and trunking lines (link aggregation).

Cellular systems for mobile telephones are the leaders in the commercial mobile market in Ukraine. The following operators are presently available: UMC, Kyivstar GSM, Wellkom, DCC and Golden Telecom. UMC, Kyivstar GSM and DCC have the widest coverage. The network of Kyivstar GSM covers 950 urban settlements

(among them the oblast seats) and includes 1,500 base stations, along with a network and switching sub-system.

**Radio and television broadcasting.** An extensive network of radio stations broadcast on long, medium and short wave frequencies, along with AM and FM. Radio stations of the highest broadcasting power are those of Kyiv, L'viv and Mykolaiv. The television broadcasting network consists of TV broadcasting stations with radio relay lines, cable networks and satellites transmitting the signal. The most powerful TV stations are to be found in Kyiv, Krasnohorivk (Poltava oblast), Vinnytsia, L'viv, Ternopil' and Khmel'nyts'kyi.

