

## The current state of transportation infrastructure impedes economic growth

### Overview

Poor quality is a common problem seen in every component of Ukraine's transportation infrastructure. The situation is aggravated by insufficient interaction between the various sectors of the transport industry, low investment, an outdated regulatory system and wear and tear on ageing fixed assets.

With this combination of problems, today's transport infrastructure cannot support sustainable economic development and ensure the global competitiveness of the country.

At the same time, infrastructure is a key competitiveness advantage of Ukraine's regions, according to one-third of respondents in the Executive Opinion Survey, which was held in early 2011 to prepare the Ukraine Competitiveness Report. The percentage of executives (including those from key economic sectors) who noted inadequate supply of infrastructure as one of the biggest problems of doing business in Ukraine was noticeably smaller (Figure 4.1).

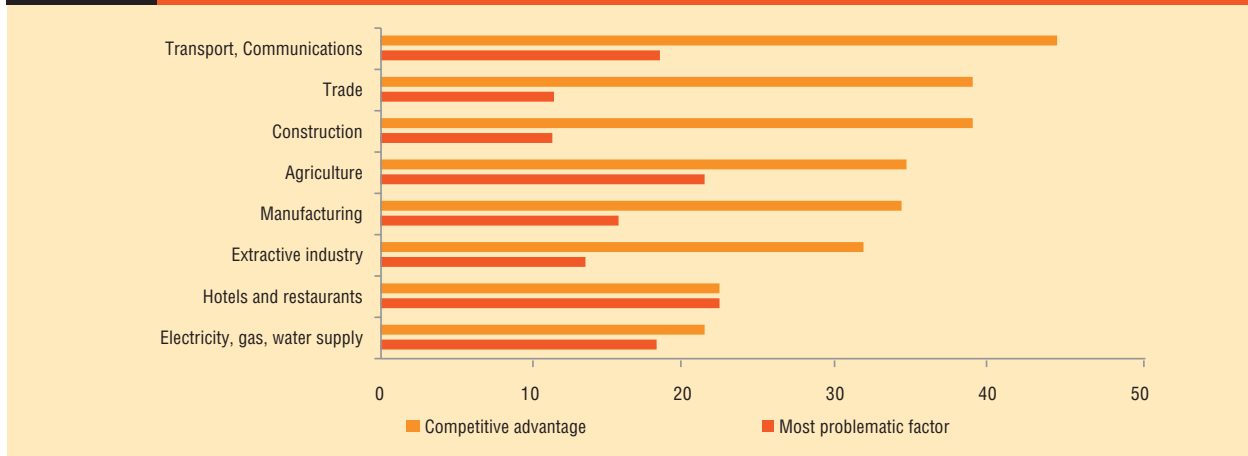
Infrastructure requires careful attention considering its importance as a competitive advantage and the numerous unresolved problems noted in this sector. The competitiveness study shows that transportation is the weakest element of Ukraine's infrastructure system, and this chapter is dedicated to this particular sector.

The special role of infrastructure in the Ukrainian economy comes from its extremely transport-intensive nature. For example, in the last decade, Ukraine had to, on average, move six kilometer/tons of freight to earn one dollar of GDP. In the EU (EU 25), this figure was 0.3 kilometer/tons, or twenty times less [1, 2]. In Ukraine, this ratio is the result of the dependence of the economy on the production of low value-added commodities such as metals, ores and grain. In addition, transportation and communications account for 13% of the nation's GDP.

The financial crisis of late 2008 – early 2009 led to a significant downturn in economic activity. As a result, Ukraine's existing infrastructure appeared to be sufficient to meet the needs of the economy. This is confirmed by a much smaller number of executives, especially from industries that were most affected by the downturn, who were not particularly critical of infrastructure as a problem for doing business (Figure 4.1).

The crisis restrained demand for transportation services, which even led to a slight year-on-year improvement in the number of points earned by Ukraine for its quality of infrastructure (Table 4.1). Yet this improvement cannot be considered sustainable, as the assessment of roads is still low and there is no improvement in the score for port infrastructure.

The economy and thus the transport sector started recovering in early 2010. Growth rates for conveyance of passenger and freight by all modes of transportation varied between 11% and 14%, exceeding even GDP growth rates. The gradual revival of the global economy continues to encourage both the recovery of the Ukrainian economy and additional demand for transit. As a result, demand on the national transport infrastructure is growing.

**Figure 4.1** Infrastructure: a competitive advantage and the most problematic factor for doing business

Source: Foundation for Effective Governance, Executive Opinion Survey 2011

Wear and tear on ageing fixed assets, aggravated by underinvestment, causes even greater gaps between infrastructure supply and demand. Nearly 70% worn out, transport infrastructure is in desperate need of investment. This is substantiated by the Survey's findings: 27% of transport and communications executives mentioned access to financing as one of the gravest hindrances to doing business.

But so far, the sector has not received adequate investment. In 2009, investment in the fixed capital of Ukrainian transportation (except pipeline transport) and transport infrastructure totaled only UAH 14.2bn (USD1.8bn), or 1.55% of GDP.<sup>1</sup> Moreover, because of the economic crisis, investment into the sector has dropped, as demonstrated by a downward trend in new fixed asset start-ups, which has returned to the level of the mid-2000s (Figure 4.2).

Private investors could change the situation for better, but in the transport sector there are numerous investment barriers, primarily regulatory ones. This fact is substantiated by changes in FDI in the transport sector: 2008 saw FDI outflow of USD 20 m, while 2009 enjoyed aggregate investment inflow of only USD 43 m.

Big investors in Ukraine's transport system are in-

ternational financial institutions, first and foremost the EBRD, because of Ukraine's important role as a transit link in the EU's transportation strategy. This being the case, heavy investment is made into the development of a limited number of transit road segments. This process is, however, accompanied by an increase in the country's foreign debt.<sup>2</sup>

The government has maintained a leading role in stimulating investment in the country's transport infrastructure, but it has failed to set priorities among the various elements of the transport system. Investment in the top-priority areas would lessen the load on Ukraine's transport system in general. The existing infrastructure is clearly in need of deep modernization, but there is still no agreement as to who will provide funding for such an upgrade and how.

In general, inefficient regulation and the absence of effective regulators in Ukraine's transport industry suppresses development of the sector, which is reflected in the quality of transport services. In the Survey, 48% of transport and communications executives named irregular government policy, while 31% noted inefficient government bureaucracy, as the biggest hindrances to doing business.

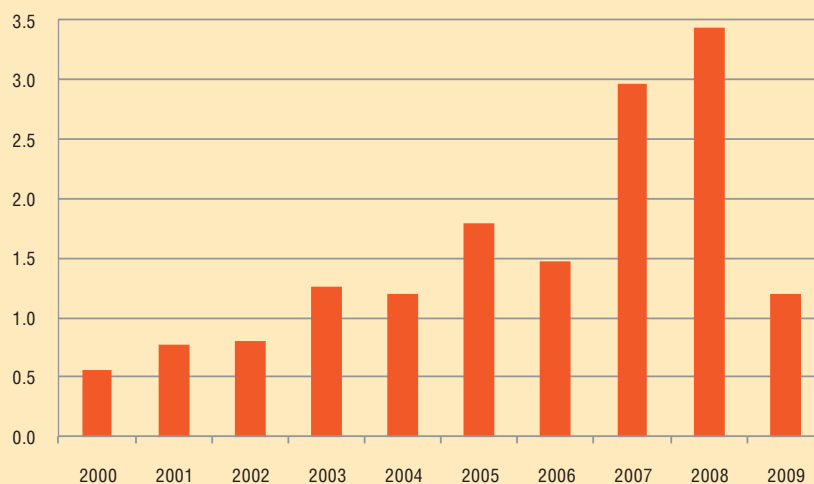
**Table 4.1** Infrastructure pillar and its components for Ukraine

Indicator	2011 (out of 142)		2010 (out of 139)		2009 (out of 133)		2008 (out of 134)	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
<b>2nd pillar: Infrastructure</b>	71	3.9	68	3.8	78	3.4	79	3.1
Quality of overall infrastructure	71	4.2	70	4.1	79	3.5	86	3.1
Quality of roads	138	2.1	136	2.0	125	2.2	120	2.2
Quality of railroad infrastructure	27	4.4	25	4.4	30	4.1	30	4.0
Quality of port infrastructure	96	3.7	94	3.6	80	3.7	87	3.5
Quality of air transport infrastructure	101	3.9	110	3.6	101	3.6	105	3.6

Sources: World Economic Forum Global Competitiveness Reports 2008 – 2011

<sup>1</sup> Russia has a similar ratio, while Central Europe enjoys greater share (up to 2%) and developed countries invest twice as much (7). In addition, the investments have greater dispersion among regions, from \$2 to \$166 per capita (Chernivtsi and Odesa Oblasts, respectively), and investment absorption is often inefficient, with one-third of total investments being channeled into repair rather than upgrade.

<sup>2</sup> During 1998-2008 EBRD invested a total of \$965m (52% into railroads and 39% into motor roads) in Ukraine's transport infrastructure. Unlike new EU member countries, for Ukraine this money is special-purpose loans, not the financial aid. As a result, Ukravtodor, the National Motor Road Agency of Ukraine, says it needs more than UAH 7bn (over \$870m) in debt servicing to meet its obligations under the loan agreements.

**Figure 4.2** Introduction of new fixed assets in transport industry, USD bn

Source: Transport and communications of Ukraine, State Statistics Service, 2010

## Sharp increase in the number of cars lays open poor quality of roads

The poor quality of Ukrainian roads came into focus during the dramatic increase in the number of motor vehicles in the country in the early 2000s. Today, less than 2% of Ukraine's road network can be considered high quality and modern, while more than 50% fails to meet even basic criteria. Poor quality of roads leads to huge losses - about 3% of GDP annually, making the sector particularly needy of heavy investment.

Ukraine steadily receives one of the world's lowest scores for quality of roads in the Global Competitiveness Index. Although assessments of the country's quality of roads by business leaders in certain regions is sometimes not bad, the quantitative and qualitative indicators of the country's overall road network are extremely low by European standards.

### Road quality: four groups of regions

By and large, all regions can be divided into four groups, based on their scores for quality of roads. With Kyiv Oblast on top and Kharkiv and Poltava oblasts at the bottom of the first group (see Table 4.3), the best-performing regions have a combination of high road network density and a comparatively low level of disrepair. They show a relatively high density of category-one roads (i.e., at least four traffic lanes) and often reasonably good indicators for supportive infrastructure (e.g., density of gas stations). At the same time, this group enjoys a high intensity of passenger and freight traffic.

The second group includes four regions to the west of Ukraine's capital with higher-than-average scores. They have moderate road network density, insufficient supportive infrastructure and below average intensity of passenger and freight traffic. Basically, these are domestic transit regions. The next group consists of a few industrial regions in the country's east and south, which are characterized by somewhat low road network density and at times a high

level of disrepair. But this group is also characterized by construction of new roads.

The final group, of the worst performers, includes agricultural regions - a few western oblasts and several central ones. Most of these have a low density of first-category roads, below average supportive infrastructure and often low freight traffic. These regions are outsiders in terms of the number of cars per capita, while almost all oblasts in the first and third groups are leaders in this indicator.

The second half of the 2000s saw a sharp increase in the number of automobiles in Ukraine. Over the first decade of the millennium, the number of motor vehicles grew by 22%, with the average annual growth rate exceeding 140,000 automobiles, of which 90% were passenger cars. The peak was in 2007 and 2008, which saw an annual growth rate of 12%, or 900,000 cars. Car ownership indicators in Ukraine, however, are still low in comparison to other countries: three times lower than in Poland and four times lower than in Spain - a big but not the richest EU country.

In Ukraine, the pace of road development noticeably lags behind growth in the number of automobiles. Unlike developed EU countries, Ukraine cannot boast of high road network density. For example, in France, a country comparable to Ukraine in terms of area, road density is 5.9 times higher. At the same time, Ukraine's technical road standards do not meet EU quality standards. The country has as little as 2,600 kilometers of category-one roads, which feature a mandatory median strip and 2-4 traffic lanes going in each direction.<sup>3</sup>

Other roads (categories 2-5) are of very poor quality: only 40% have road markings, 40%-50% fail to meet other basic criteria (a smooth, hard surface). Ukraine's roadside infrastructure requires particular development. For example, the availability of gas stations across the regions is highly disproportionate (Table 4.3), and there has been a reduction in the number of rest stops and service stations over the past several years.

Ukraine's poor quality of roads has been the cause of

<sup>3</sup> Length of the first-category roads makes less than 1.6% of a total length of all-purpose hard road network (165,800 kilometers, net of city streets under the jurisdiction of local governments). Only 280 kilometers are highways, which meet international standards.

numerous car accidents. Current losses from traffic accidents are estimated at 1.5%-3.5% of GDP (estimates from OECD International Transport Forum). Ukravtodor puts annual losses from poor quality of roads at UAH 32bn (nearly 3% of GDP).

Estimates demonstrate that Ukraine has to repair 37,600 km and build 400 km of road every year to meet modern standards [3]. But in the second half of the 2000s, Ukraine put into operation an average of four times less roads than required by these estimates. The country did upgrade its road network in 2010, opening to traffic about 1,000 kilometers of new and repaired roads. More than half of the repair and upgrade effort was part of EURO 2012 preparations, the reason for Kyiv, Kharkiv, Donetsk and westward roads seeing a higher concentration of improved segments. Ukraine's roads are still insufficiently involved in the transit of freight.

Thus, even individual improvements in road infrastructure still fail to keep pace with the country's growing number of automobiles. The gap between supply and demand, especially in terms of quality of roads, is the biggest issue adversely affecting the competitiveness of Ukraine's transport infrastructure.

## Quantity of railroads does not mean quality

Ukraine can boast one of Europe's longest rail networks. High rail traffic helps to lessen the load on other modes of transport. Yet, the majority of Ukraine's rail network is worn out and outdated. Disproportionate loads on particular routes hamper the development of key directions. The sector can be modernized with the creation of the proper conditions for raising private capital.

The quality of Ukraine's railroad infrastructure received one of the highest scores in the Global Competitiveness index, putting the country in 27th place internationally. The Executive Opinion Survey found that in certain regions local managers assessed quality of railroad infrastructure even higher - at the level of developed European countries and leading Southeast Asian nations.

### Quality of railroad infrastructure: three groups of regions

*Ukrainian regions can be divided into three groups, depending on their scores for quality of railroad infrastructure. The first group consists of regions with main rail traffic flows. They scored high on quality of railroad infrastructure (more than 5 points) and feature high rail density, intensive passenger movement (but moderate freight movement) and a high level of wear on assets (see Table 4.4). These regions include oblasts that contain cities with at least a million inhabitants (except Odesa), that lie between principal transit hubs or contain main transit roads. Also included in this group are Ukraine's two special status cities (Kyiv and Sevastopol)*

*The second group includes inland transit oblasts, which received a high assessment for the quality of their railroad infrastructure and moderate scores for rail density and passenger movements. They combined high speed and heavy weight of trains with high wear and tear on the*

*rail lines. This group includes regions between the country's capital and its western border, as well as two eastern oblasts between the million-plus-population cities and Odesa Oblast, whose ports offer onward transport services.*

*The remaining regions comprise the third group, having low rail density and, as a rule, little passenger traffic flows.*

The development of railroad infrastructure in main industrial and border regions is important for long-distance rail traffic: in 2009 the average distance of moving one ton of freight by rail exceeded

500 kilometers as compared to 46 kilometers by motor vehicle.

Ukraine's rail network of 21,650 kilometers is one of the biggest in Europe, after those of Russia, Germany and France. In aggregate, 46% of Ukraine's rail network is electrified, a figure that meets average European standards. Ukraine ranks 4th among Eurasian nations in terms of rail traffic volumes, yielding only to BRIC countries<sup>5</sup>. However, Ukraine's rail quantity does not equate to rail quality. The railroads have high freight traffic intensity - three to five times higher than in developed EU countries - but significantly lower traffic speed. The country uses the same tracks for freight trains with an average speed of 39 km per hour as it does for high-speed passenger trains, which are forced to move slower as a result.

Most Ukrainian railroads are outdated and nearing their replacement date, two-thirds are single-track, and only 60% of railroads have automatic regulation systems and continuous welded tracks. The average railroad bed is 67% worn out (in high-traffic regions - 74%). Other related infrastructure is also worn out and outdated, including most stations, storage facilities and traffic control systems. The average work life span of the fixed assets of the national railway company Ukrzaliznytsya has been 89% expired for the past five years.

The poor quality of infrastructure of freight shippers (e.g. coal shippers) is of special concern. It leads to increased car detention time and wear and tear. Regional rail operators have hundreds of their cars damaged in ports because of the use of clamshell cranes [4].

On the other hand, Ukraine's bureaucratized rail transport system leads shippers to create their own car fleets. As of today, shippers own and operate 30,000-40,000 freight cars versus the 130,000 cars of Ukrzaliznytsya [5].

The high concentration of freight shippers is another important issue. Ukraine's main export goods and the products necessary to manufacture those goods (coal, coke, ores, metals, fertilizers, grain, etc.) account for two-thirds of the country's rail traffic. Such a concentration creates a heavy burden on certain routes. In Ukraine, the main sections of the railroad make up the country's "strategic railroad network", which accounts for 45% of the total length of the railroad but for 90% of all rail traffic [5]. Other sections are used less intensively.

On the positive side, a full 24% of Ukraine's railroad is used for freight traffic. In comparison, the EU (which uses only 8% of its railways to transport freight) is concerned about the growing use of vehicular transportation (trucks account for 44% of freight traffic in the EU),

<sup>5</sup> BRIC - Brazil, Russia, India, China



so it is implementing rail development programs to reduce the transport asymmetry. Ukraine is attempting to implement projects for combined trailer and container services, which will lessen the load on its roads, but the projects have encountered numerous regulatory barriers so far.

The difference in rail-track widths between Ukraine and Europe is also a pressing issue for westward freight and passenger movements. Ukraine is making every effort to capitalize on its wider tracks, by extending them deeper into Polish territory. Ukraine is also involved in a project for construction of a wide track line to Vienna. Conversely, the narrower European-type railroad network inside Ukraine is still not being used to full capacity.

In summary, Ukrainian railroads are well developed in terms of quantity, but fail to provide the necessary quality. Railroad modernization is being held back by a lack of reforms aimed at creating a competitive rail market and setting up appropriate regulatory system.

## Poor port diversification leaves SMEs overboard

Ukraine has a number of powerful sea ports. However, businesses in most regions cannot fully enjoy this competitive advantage because of poor logistics and insufficient cooperation between different modes of transport. Small and medium-sized business loses because of poor opportunities for container transport. Port infrastructure is little used for internal freight transport. Development of an integrated multimodal logistics infrastructure could change the situation for better.

The scores for quality of port infrastructure in Ukrainian regions differ significantly. The scores for southern seaside regions are four times higher than those of the western oblasts, corresponding to the values of developed nations. The western regions are at the level of the worst performers in the Global Competitiveness Index. For the regions without access to sea, the Survey assessed the port infrastructure through their access to ports via other infrastructure. Thus, the extremely low scores of those regions mean underdevelopment of the entire transport infrastructure as an integrated and inter-related system.

The main problem is related to the concentration of freight traffic. For the past several years, key export goods accounted for at least two-thirds of sea shipments, which is similar to the railroad freight traffic structure. However, the share of container freight, which is often sent by small and medium-sized businesses, is small, decreasing from 9% in the mid-2000s to 1.3% in 2009.

Among the reasons for limited container shipments are relatively high costs and time intensiveness, which are due to underdevelopment of the container infrastructure in the sea port terminals and of the overall multimodal infrastructure. Container freight traffic, even through leading Ukrainian ports, is not focused on the largest containerships of 500-1500 TEU (twenty-foot equivalent units); although since 2007 the ports have been ac-

commodating 5000 TEU ships.

The capacity for development of deep-water ports is determined by container traffic concentration. This is particularly the case in Odesa Oblast, where ports account for almost all container shipments. Since containers are used mostly for imports, there was a big drop in container traffic because of the global financial crisis - from 1.25m TEU in 2008 to 0.52 m TEU in 2009, with the maximum annual capacity of Ukrainian ports being 2m TEU. The dependence on imports causes a situation whereby ships are often one-quarter loaded with empty containers on their way back in the direction of the exporter [1].

The share of internal (cabotage) transport is extremely small: only 3-4% during the 2000s. Although internal freight accounts for about two-thirds of total freight in the river ports, this share is comparable with sea ports in absolute terms.

To fully meet business needs, the port infrastructure should be more diversified. To this end, the country needs to develop new deep-water ports, renew internal routes and create multimodal logistics infrastructure.

## Air transport as an example of monopoly

Fewer than 10 airports account for a large share of Ukrainian air transport. In fact, the other air transport infrastructure is stagnating and often does not meet international standards. Diversification and further development of the industry can be achieved by raising the purchasing power of the population and introducing attractive incentives for investors.

The scores of leading regions for quality of air transport infrastructure are four times higher than those of the outsiders, a dispersion easily explained by the structure of the airports. Out of 36 airports certified by the State Aviation Administration, about 15 (of which fewer than 10 are national airports) provide regular flights. Only seven leading airports account for almost all air traffic: 97% of passenger flights (including all international flights) and 83% of freight movements (in 2010). One leading airport (Boryspil) is responsible for two-thirds of passenger flow and three-quarters of freight flow.

Non-compliance with international standards is a big obstacle for air transport development. Most airports in Ukraine do not conform to the rules of the International Civil Aviation Organization and the International Air Transport Association. Airfields - the runway surfaces, service vehicles and equipment - are becoming worn out and outdated. Extensive modernization has shown benefits in Boryspil (terminals F and D) and Kharkiv, where mechanisms of public-private partnership were applied. Reconstruction is in progress in Donetsk and Lviv, too. However, the international hub project in Boryspil is far from completion.

Inland traffic opportunities remain unexplored. Sporadic cases of inland flights being renewed are the exception. The problems in the industry are aggravated by the fact that monopolistic trends appear at the level of airports, airlines and their alliances.

**Table 4.2** Transport and logistics infrastructure of Ukraine and its neighbors

Countries	Global Competitiveness Index, Infrastructure, 2011		Enabling Trade Index, Infrastructure, 2010		Logistics Performance Index, 2010	
	Rank	Score	Rank	Score	Rank	Score
Hungary	46	4.52	41	4.14	52	2.99
Russia	48	4.52	48	4.00	94	2.61
The Slovak Republic	57	4.23	32	4.69	38	3.24
Poland	74	3.87	51	3.97	30	3.44
Romania	95	3.37	59	3.81	59	2.84
Moldova *	96	3.32	58	3.46	104	2.57
Belarus **	n/a	n/a	n/a	n/a	74	2.53
<b>Ukraine</b>	71	3.87	71	3.56	102	2.57

Sources: WEF Global Competitiveness Report 2011, WEF Global Enabling Trade Reports 2009-2010, World Bank Connecting to Compete the LPI and Its Indicators 2007 & 2010

Notes: \*ETI for 2009;

\*\*LPI for 2007; ETI among 125 countries, max score 7; LPI among 155 countries, max score 5.

## Ukraine loses the competition for transit

Development of transit encourages the development of Ukraine's infrastructure in general. A favorable geographic location is not enough to compensate for problems with internal infrastructure, especially problems with logistics, bottlenecks of routes and archaic and non-transparent customs policy. So far, Ukraine has been losing in the competition for transit routes.

In general, Ukraine has a strong transit potential. Three out of ten Pan-European Transport Corridors, major European automobile highways in latitudinal (E40 and E50) and longitudinal direction (E85, E95 and E105) as well as six corridors of the Organization for Cooperation of Railways go through the country. The regions featuring international transit routes have higher overall scores for infrastructure.

However, transit capacities are held down by a range of problems. Ukraine is behind its neighbors by quality of overall infrastructure and transit infrastructure, in particular. For example, Ukraine scores lower in the infrastructure pillar of the Global Competitiveness Index than its neighbors (see Table 4.2). In the more focused sub-index transport and communications infrastructure of the Global Enabling Trade Index (also based on calculations of the World Economic Forum), Ukraine loses to almost every neighbor in terms of infrastructure development. In the Logistics Performance Index (compiled by the World Bank) Ukraine also has a rather low score, taking 102nd place out of 155.

The excessive concentration of specific goods and freight hubs hampers the development of transit services in Ukraine and infrastructure in general. Expansion of transit routes is limited by a range of bottlenecks, e.g. congested internal routes (from Kharkiv and Donetsk to Lviv and Odesa), railroad tunnels (Beskydsky in Zakarpattya) or capacity of railroad stations near ports in Odesa, Yuzhny and Illichivsk.

Also, the focus on transit could simply lead to a limited use of infrastructure for the country's own needs. This is the case with some sea ports, where in 2009 the transit volumes remained unchanged, yet the freight movements on internal routes fully stopped.

Ukraine could take advantage of part of the transit capacity quite quickly by addressing problems in customs, and border and logistics infrastructure. However, a balanced development of transit capacities in the long run will require more resources, a requirement typical for the transport infrastructure sector in general.

## Conclusions

An excessive concentration of supply and demand for infrastructure resources, an uneven distribution of internal and external routes, and slow investment activity result in big gaps in the state of Ukraine's transport infrastructure across the regions. As a result, multipliers at the regional and industrial levels are inhibited.

The regulatory environment has many problems as well. These relate, firstly, to sea port and railway laws, investment, transit and customs issues. The reformed transport regulatory system should comply with international requirements and standards.

The above problems hamper the development of transport infrastructure, which, in turn, restrains the economic development of the entire country. So, development of the transport infrastructure remains a priority on the agenda of economic reforms. After all, it is the infrastructure that consolidates regions, businesses, Ukrainians into one nation, and integrates the Ukrainian economy into a global marketplace.

**Table 4.3** Motor road infrastructure by region

Regions	Quality of roads score	Density of all-purpose hard roads km per 1,000 sq km	Average all-purpose road wear over 5 years (2006-2010) %	Share of first-category roads in the entire network of all-purpose hard roads %	Ratio of length of all-purpose hard roads to number of gas stations km per 1 gas station
Ukraine (27 regions)	3.29	275	47	1.6	25
Kyiv Oblast	4.29	295	55	4.8	22
Sevastopol	4.11	391	27	2.8	5
Donetsk	4.01	303	42	3.1	13
Kyiv	3.89	n/a	n/a	n/a	n/a
Vinnitsya	3.75	338	34	1.1	35
AR Crimea	3.71	245	20	0.5	18
Kharkiv	3.58	298	35	1.9	23
Poltava	3.58	308	64	1.2	34
Zhytomyr	3.54	278	30	2.8	46
Zakarpattia	3.47	261	51	0.6	15
Volyn	3.42	285	49	0.8	37
Rivne	3.32	252	45	2.2	35
Zaporizhzhya	3.29	251	72	0.5	24
Odesa	3.26	242	26	2.4	22
Sumy	3.23	282	51	0.1	48
Luhansk	3.18	217	49	1.3	23
Cherkasy	3.15	283	39	1.9	28
Dnipropetrovsk	3.10	287	44	3.0	23
Kherson	3.10	175	39	0.8	23
Chernivtsi	3.00	354	55	0.6	25
Khmelnysky	2.97	346	51	0.6	37
Chernihiv	2.93	226	74	1.8	54
Lviv	2.84	376	42	0.6	23
Ivano-Frankivsk	2.69	300	46	0.8	24
Mykolayiv	2.67	195	51	1.6	24
Ternopil	2.52	361	74	0.4	32
Kirovohrad	2.38	252	47	0.6	31

Own calculations, including data of the State Statistics Service and the Ministry of Infrastructure (for 2009, unless stated otherwise).

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Table 4.4 Railroad infrastructure by region

Regions	Quality of railroad infrastructure score	Density of railroads km per 1,000 sq km	Passenger traffic bn pass km	Freight traffic bn ton km	Average rail wear over 5 years (2006-2010) %
<b>Ukraine (27 regions)</b>	<b>4.92</b>	<b>36</b>	<b>48.3</b>	<b>196.2</b>	<b>67</b>
Kharkiv	5.54	48	6.4	18.3	74
Poltava	5.44	30	6.4	18.3	74
Dnipropetrovsk	5.33	48	9.4	41.1	61
Zakarpattia	5.31	47	5.3	15.6	58
Kyiv	5.30	n/a	16.3	37.8	72
Donetsk	5.28	60	3.7	32.1	71
Lviv	5.20	59	5.3	15.6	58
Sumy	5.17	31	11.4	28.1	73
Sevastopol	5.07	n/a	9.4	41.1	61
Rivne	5.00	29	10.8	26.7	65
Zaporizhzhya	4.98	36	9.4	41.1	61
Odesa	4.92	32	7.2	51.3	68
Luhansk	4.92	41	3.7	32.1	71
Zhytomyr	4.91	34	16.3	37.8	72
Khmelnysky	4.83	36	16.3	37.8	72
Ternopil	4.82	41	5.3	15.6	58
Kyiv Oblast	4.81	26	16.3	37.8	72
Cherkasy	4.79	28	7.2	51.3	68
Vinnitsya	4.75	41	11.8	44.6	70
AR Crimea	4.71	23	9.4	41.1	61
Ivano-Frankivsk	4.68	36	5.3	15.6	58
Kirovohrad	4.65	36	7.2	51.3	68
Mykolayiv	4.59	29	7.2	51.3	68
Kherson	4.59	16	8.3	46.2	64
Volyn	4.56	30	5.3	15.6	58
Chernihiv	4.44	27	16.3	37.8	72
Chernivtsi	4.26	51	5.3	15.6	58

Own calculations, including data of the State Statistics Service and the Ministry of Infrastructure (for 2009, unless stated otherwise).