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List of acronyms

CIS	Commonwealth of Independent States (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan)
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ECMT	European Conference of Ministers of Transport
EU	European Union
GNI	gross national income
ITS	intelligent transport system
OECD	Organisation for Economic Co-operation and Development
ppp	purchasing power parity

1. The Crisis of Sustainability in Urban Transport: The Case of Transitional Countries

1.1. Introduction

This report discusses issues related to transport in urban areas in the 28 transitional countries¹ located in Eastern Europe and Central Asia. Because of significant political, economic and social differences they can be divided into 4 groups:

- Eastern Europe: new EU member states (10 countries),²
- Eastern Europe: former Soviet Union republics, except 3 new EU member states (4 countries),³
- Western and Central Asia: remaining former Soviet Union republics (8 countries);⁴ and
- Remaining South-Eastern European countries: Balkan region (6 countries).⁵

The **economic situation** in each of these groups of countries differs substantially (Table 1). For example, GNI ppp⁶ per capita of the new EU member states are in the order of \$12,000–\$26,000; in Russia it is \$18,000; in the Balkan states in the range \$8000–\$19,000; and in the former Soviet Union republics of Western and Central Asia, \$2000–\$10,000.⁷ The five poorest countries of the region are Georgia, Kyrgyzstan, the Republic of Moldova, Tajikistan and Uzbekistan.

Table 1. Population and gross national income (GNI) (2009)

Country	Population millions	Urbanization per cent	GNI ppp per capita ^a	Capital city
Albania	3.2	47	8,640	Tirana
Armenia	3.1	64	5,410	Yerevan
Azerbaijan	8.8	52	9,020	Baku
Belarus	9.7	74	12,740	Minsk
Bosnia and Herzegovina	3.8	48	8,770	Sarajevo
Bulgaria	7.6	71	13,260	Sofia
Croatia	4.4	58	19,200	Zagreb
Czech Republic	10.5	74	23,940	Prague
Estonia	1.3	69	19,120	Tallinn
Georgia	4.3	53	4,700 ^b	Tbilisi
Hungary	10.0	68	19,090	Budapest
Kazakhstan	15.9	58	10,320	Astana
Kyrgyzstan	5.3	36	2,200	Bishkek
Latvia	2.3	68	17,610	Vilnius

1. In this report, term ‘transitional country’ means country covered by this regional report.
2. Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia.
3. Belarus, Republic of Moldova, Russian Federation, Ukraine.
4. Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.
5. Albania, Bosnia and Herzegovina, Montenegro, Serbia, Slovenia, TFYR Macedonia.
6. Gross national income per capita taking into account ‘purchasing power parity’ (ppp).
7. See Table 1.

Country	Population millions	Urbanization per cent	GNI ppp per capita ^a	Capital city
Lithuania	3.3	67	17,310	Riga
Montenegro	0.6		13,110	Podgorica
Poland	38.1	61	18,290	Warsaw
Republic of Moldova	3.6	41	3,010 ^c	Chisinau
Romania	21.5	54	14,540	Bucharest
Russian Federation	141.9	73	18,330	Moscow
Serbia	7.3	52	11,700	Belgrade
Slovakia	5.4	57	22,110	Bratislava
Slovenia	2.0	48	26,470	Ljubljana
Tajikistan	7.0	26	1,950	Dushanbe
TFYR Macedonia	2.0	67	10,880	Skopje
Turkmenistan	5.1	49	6,980 ^d	Ashgabat
Ukraine	46.0	68	6,180	Kiev
Uzbekistan	27.8	37	2,910 ^d	Tashkent

a: GNI per capita, PPP (current international US\$). b. Excludes Abkhazia and South Ossetia.

c. Excludes Transnistria. d. Based on regression; others are extrapolated from the 2005 International Comparison Program benchmark estimates.

Source: World Bank, 2011.

1.2. The crisis of sustainability in urban transport

The crisis of sustainability in urban transport, observed in cities of the region during the period of transition, was caused mostly by changes in the spatial structure of cities and their surroundings, the rapid growth of motorization and the deterioration of public transport.

*‘The salient point distinguishing the communist from the capitalist city is that in the former the allocation of land use and infrastructure investments took place with little regard for market-based principles’.*⁸ An urban spatial structure was, amongst others, characterized by (i) ‘a high-density urban fabric dominated by a strong centre in which the majority of the main retail, office, and government functions were concentrated’; (ii) ‘a core of older high-density residential neighborhoods surrounding the city centre, intersected by commercial uses along main corridors radiating out to the urban periphery’. These zones were surrounded by ‘large mono-functional districts comprised mainly of housing estates, industrial zones, and large peripheral parks’.

*‘While the articulation of this rigid spatial structure spanned nearly a half century, its transformation, particularly in the most dynamically reforming countries in the region, took significantly less time to accomplish’.*⁹

‘The introduction of market-based principles in the allocation of real estate investments during the transition period has triggered a massive realignment of land uses and residents within the metropolitan fabric. This has resulted in significant restructuring of urban space’ taking the form of 1) exclusive high-income suburban communities, primarily in Central Europe, the Baltic States, and in more economically advanced urban areas and 2) emerging low income

8. Hirt and Stanilov, 2009, p. 23.

9. Hirt and Stanilov, 2009, p. 23.

squatter settlements in Central Asia, the Caucasus states, and some countries in Southeast Europe.'

The process of changes in urban structures, such as suburbanization and the public policies which support it:

*'have contributed not only to the erosion of the social fabric of the transitional cities, but have caused further environmental degradation. Urban sprawl has led to an increase in air pollution as suburbanization has **induced greater travel demand** [emphasis by author]. The haphazard, low-density pattern of suburban growth has made public transit service to the growing suburban areas a very difficult proposition. This, coupled with the newfound love of the emerging middle-class for a suburban lifestyle (including heavy reliance on personal modes of transportation and a preference for suburban shopping, work, and entertainment environments), has wreaked havoc on the urban transportation system and, ultimately, increased the levels of air pollution.'*¹⁰

This list has to be supplemented by impacts such as congestion, high increase in number of accidents (and victims). All these aspects are discussed in the report.

Figure 1. Arterial street, Belgrade (Serbia)



Photo: Piotr Pecelik, Moldava.

1.3. Structure of the report

Chapters 2–6 presents an overview of conditions and trends in urban transport (non-motorized, public, informal, private, and goods). The situation in land-use and transport planning is overviewed in Chapter 7. Three chapters (chapters 8–10) deal with social, economic and environmental questions and Chapter 11 is devoted to questions of institutions and governance. Chapter 12 outlines future policy directions for sustainable urban transport at the local, national and international levels on the basis of the assessment of conditions and trends and related policy responses described in previous chapters.

10. Hirt and Stanilov, 2009, p. 93.

2. Non-Motorized Transport

2.1. Importance of non-motorized transport

Walking is the simplest and most natural form of movement by human beings. Its role depended and still depends on the availability of other means of transport, public and private. But even in cities with very high motorization rates and well-developed public transport walking is still common. Walking trip rates and share (modal split) are difficult to measure and compare because of differences in definitions.¹¹ Defined by the often used value of a trip length above 100 metres, walking trips constitute 20–30 per cent of trips made in urban areas. This percentage depends not only on availability of motorized transport means but also on the city structure. And these numbers do not encompass those parts of movements (trips) made with motorized means of transport (walking to the nearest public transport stop or vehicle parked at some distance from the trip origin/destination).

In the past, the use of **bicycles** was very limited in most transitional countries. In many countries (and cities) it was justified because of climatic conditions and terrain configuration. And, generally, road infrastructure was not favourable for cyclists. For example, in Riga (Latvia), where 65 per cent of households has a bicycle available, only 3 per cent of citizens ride a bicycle every day and 66 per cent never. The share of cycling in trips is between 1 and 3 per cent (depending on the season).¹² In Polish cities Lodz and Warsaw this share is also around 1 per cent.

In transitional countries, the **role of animal drawn carts** is very insignificant. However, there are some cases of cities in which animal drawn carts are used for transporting goods and people, for example tourists in historic parts of the city.

Figure 2. Non-motorized goods transport, Georgia



Photo: Piotr Pecenik, Moldava.

11. In UK, walking longer than 45 metres is considered as a walking trip, in other countries distances such as 100 metres or above are used (Olszewski, 2007).

12. Kļaviņš and Zujevs, 2010.

Figure 6. Bus on congested ring road – ‘before’ and ‘after’, Warsaw (Poland)



Photo: Scientific Club of Transportation Engineering, Warsaw University of Technology (KNIK).

As in other regions, even in cities with well-developed rail transport (suburban railways, metro, tram), **bus and minibus** play important roles in transitional countries. There are significant differences between groups of countries, in particular between the new EU-member states and the former Soviet Union republics. This is especially reflected in the ways of organizing and financing public transport, including the treatment of small and medium sized private operators.

Changes in Tbilisi (Georgia) serve as a good example of transformation. Financing problems (very low fares) and poor maintenance led to a deterioration of quality and reliability of the publicly operated trolleys, tram and bus systems. Whilst the city could still take advantage of an underground metro, it was not capable of meeting all users' needs. Gaps were filled by privately owned (but highly uncontrollable) buses and minibuses. The municipality made efforts to improve the bus/minibus system, amongst other things through importing 'yellow' buses with the intention of replacing privately owned low-standard minibuses. But the private minibus sector still remains strong.²⁵

The **role of small and medium size operators** has been changing. At the beginning of the transition period, when economic liberalization took place, in some countries the creation of small and medium size companies (including sole proprietorships) was allowed and encouraged. Providing minibus services was permitted after registration (flexible route and schedule, fares not regulated). Simple taxation rules were applied. These entrepreneurs were self-financing and filled the gaps in conventional public transport services. Gradually, the legal framework was amended, with the tendency to make services more regulated (e.g. quality licensing). For example, operators had to register transport services with detailed definition of routes and schedules. The standard of service is controlled through technical inspection of vehicles amongst other things. In several cities of the new EU member states this form of transport still plays important role, especially in serving suburban areas including commuting to city centres. Regulations have been adjusted to those of the EU.²⁶

In most CIS countries the role of small and medium size operators is greater and services less regulated. For example, in Yerevan (Armenia) the role of metro, trolleybus and conventional bus has significantly reduced and the tram system was closed. In 2006 the

25. Tkhilava and Karanadze, 2006.

26. This is discussed in Chapter 11.

5. Private Motorized Transport

5.1. Importance of private motorized transport

A very high growth of motorization observed in most transitional countries in the last decades (Table 1) had a strong impact on the modal share of private motorized transport (car, motorcycle). The share of trips made by these means of transport was rapidly increasing. For example, in new EU member states, where the fastest growth of car ownership has been noted (see Table 2), the share of commuting trips made by cars and motorcycles increased to around 30 per cent (Bratislava, 26 per cent; Tallinn, 33 per cent; Vilnius, 31 per cent; and Warsaw, 33 per cent).

In general, the role of motorcycles and other motorized two-wheelers is not significant. There are, however, great differences between countries. In Turkmenistan motorcycles constitute 18 per cent of all motorized vehicles, in the Czech Republic 15 per cent and in Belarus 12 per cent. In contrast, motorcycles constitute less than 2 per cent of all motorized vehicles in Azerbaijan, Georgia, Kazakhstan, TFYR Macedonia, Serbia and Romania.³³ These differences cannot be easily explained by factors such as income level or natural conditions (land configuration, climate). Initially, motorcycles served obligatory trips (commuting, work). Nowadays, there is increasing interest in using high-class motorcycle for recreational purposes. This has been noted, firstly, in wealthier countries of the region.

Table 2. Growth of car ownership, 1993–2008

Country	Number of passenger cars			Cars per 1000 population 2008	Growth 1993–2008	Annual growth rate (%)
	1993	2000	2008			
Albania	56,728	114,532	264,828	83.2	4.67	10.8
Azerbaijan	263,315	332,026	700,080	79.2	2.66	6.7
Bulgaria	1,505,451	1,992,700	2,366,000	310.4	1.57	3.1
Croatia	646,210	1,119,000	1,551,000	349.6	2.40	6.0
Czech Republic	2,833,143	3,438,870	4,423,000	424.3	1.56	3.0
Estonia	317,425	463,900	551,800	411.5	1.74	3.8
Kyrgyzstan	188,200	189,827	316,787	60.3	1.68	3.5
Latvia	367,475	556,800	932,830	411.7	2.54	6.4
Lithuania	597,735	1,172,400	1,671,065	497.6	2.80	7.1
Poland	6,770,557	9,991,300	1,608,000	421.8	2.37	5.9
Slovakia	994,933	1,274,200	1,544,900	285.7	1.55	2.98
Slovenia	632,563	869,000	1,045,180	517.2	1.65	3.40
TFYR Macedonia	289,979	300,000	263,112	128.5	0.91	-0.65
Ukraine	4,235,700	5,250,129	6,393,903	138.8	1.51	2.78

Source: UNECE 2010.

33. WHO, 2009b.

Table 3. Car ownership in relation to growth national income (GNI), selected countries (2008)

Country	GNI per capita, PPP* (current US\$ international)	Passenger cars per 1000 inhabitants	GNI per car owned (US\$)
Denmark	37,530	377	99,549
Germany	35,920	502	71,554
Ukraine	7,210	138	52,246
Georgia	4,920	95	51,789
Serbia	10,380	202	51,386
Poland	16,710	422	39,597
Latvia	16,010	412	38,859
Bulgaria	11,370	310	36,677
Republic of Moldova	3,270	101	32,376

* purchasing power parity

Source: World Bank 2010, 2011.

5.2. Trends and conditions

5.2.1. Car ownership

As noted in section 5.1, all transitional countries have experienced a very high growth in motorization over the last two decades. The fastest growth has been observed in the number of passenger cars (see Table 2). In most countries car ownership rates³⁴ are much higher than can be explained by income. In general, Eastern European cities rank first in the world for the number of passenger cars per dollar GNI (see Table 3).³⁵

In spite of the fast growth of motorization, in the countries of the former Soviet Union republics, car ownership rates are still much lower than in other groups of transitional economies. The fastest growth was observed in the Russian Federation, (+107 per cent increase in the period 1995–2007), with most of the increase occurring in urban areas. In 2006 car ownership in Moscow was 268, while for the whole Russian Federation it was 207.

In the lowest-income countries much lower rates of car ownership are still noted, in some countries well below 100 vehicles per 1000 inhabitants (e.g., Uzbekistan, 81; and Republic of Moldova, 89). In Georgia the rate of motorization in the first decade of the transition period decreased by almost 50 per cent. In the second decade slow growth has been observed and in 2007 car ownership rates reached levels close to those which had been noted in 1993.³⁶

In the whole region, car ownership rates in cities are much higher than in suburban and rural areas. Furthermore, in several large transitional country cities they are higher than in some cities of the wealthiest developed countries. In particular, this has been noticed in new EU member states and in some Balkan countries. Examples include: Prague (Czech Republic), 496; Vilnius (Lithuania), 370; and Ljubljana (Slovenia), 504. These rates are

34. Number of cars per 1000 inhabitants.

35. UN-Habitat, 2009.

36. UNECE and WHO, 2008.

higher than cities such as Amsterdam (Netherlands), 286; Copenhagen (Denmark), 290; Hamburg (Germany), 370; and Vienna (Austria), 398.³⁷

When comparing statistical data, it is necessary to take into account that quality of vehicles (technical standards, age and technical repair depending on maintenance) is generally low. A considerable part of the vehicle fleet consists of second-hand cars, minibuses, buses and trucks imported from countries of Western Europe and East Asia. This is particularly true for the former Soviet Union countries (CIS). For example, in 2007, the percentage of passenger cars over 10 years old in the Russian Federation was 51 per cent; Azerbaijan, 58 per cent; Uzbekistan, 76 per cent; and Georgia, 83 per cent.³⁸ The rates for buses, trucks and light duty vehicles are even higher.

Age and quality of vehicles, reflected in their prices, explains to some extent, why car ownership rates are much higher than can be explained by GNI per capita. High age and the poor technical condition of most of these vehicles also have a strong impact on traffic safety and on pollution of the environment.

5.2.2. Road infrastructure

At the beginning of the post-war period the provision of essential infrastructure in cities, including roads, was a clearly stated public goal. *‘The basic elements of the socialist urban infrastructure systems – roads, water and sewer mains, power and telephone lines, educational, recreational and health facilities—were completed during the first decades after World War II.... During the last decades before transition started, the communist regimes concentrated the lion share of public investments in the construction of new large-scale industrial facilities and housing estates at the urban periphery... This strategy led to prolonged disinvestment in inner-city neighbourhoods, where the infrastructure began to crumble.’*³⁹ The situation was worsened because of emphasis on quantity rather than quality. Because of low technical standards (such as carrying capacity of road pavements) road infrastructure was not only unprepared to serve growing road traffic volumes but also to serve heavy weight good vehicles.

From the beginning of the transition rapid growth was noted in traffic volumes. In cities and their surroundings congestion became one of the main problems, this being exaggerated by the configuration of urban road network system. In many cities the prevailing road scheme is the radial system. This means that through traffic crosses the central, high density parts of cities. As well as increasing congestion on urban roads there has been a negative impact on living conditions, on the number of accidents, and accelerated deterioration of road infrastructure (pavement, bridges) which was inadequately maintained and not prepared for increased loads. However, on the basis of public opinion polls the list of problems is headed not by the poor state of repair of pavements and other road infrastructure, but by traffic congestion. This is the reason why many local, regional and national governments concentrate the majority of public investments on increasing road capacity through improvement and expansion of road networks. Focus is on high-speed arterial roads, urban and suburban rings (by-passes), and connections to the main intercity and international routes. Growing traffic congestion, caused by the rapid increase in motorization, would justify application of advanced intelligent transport systems (ITS) solutions in traffic and transport management systems. Unfortunately, these solutions are rarely placed on the priority lists.

37. http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban_rankings.

38. Donchenko, 2008.

39. Hirt and Stanilov, 2009.

As may be predicted, this policy of increasing capacity actually has a limited impact on improving traffic conditions, because under saturation conditions⁴⁰ the increase in capacity often generates additional traffic (latent demand). At the same time, inadequate resource allocation for maintenance and repair of remaining roads dramatically worsens their condition.

5.3. Impacts and challenges of private motorized traffic

As in other regions, rapid motorization, accompanied by suburbanization, have resulted in the increase of traffic volumes and congestion. Public opinion surveys show that in the transitional countries congestion has been moving to the top of the list of urban area problems.

- As could be expected, the development of road infrastructure in urban areas is slower than required to meet the growing demand from local and through traffic. While this may be expected with regard to local traffic (with high car ownership rates, in larger cities, meeting all needs of road traffic is not possible), through traffic deserves special treatment. Analysis of selected cases has shown that many cities are suffering because of the lack or insufficient development of roads by-passing central urban areas. This is particularly seen in small and medium size cities where the share of through traffic (passenger cars and goods vehicles) is especially high. This traffic is especially arduous for the city residents.
- Growing traffic volumes leading to congestion have strong negative impact on the urban environment. These impacts (noise, air pollution) are heightened because of the low technical standards of vehicles. In many transitional country cities levels of air pollution are much higher than is accepted in the EU or the US. In particular, this concerns *nitrogen oxides*, *ozone* and *particular matter*. There is lack of regulation or weak enforcement.
- With high car-ownership rates the supply of parking facilities is below demand, particularly in large cities. Obviously, meeting demand may be impossible in central areas, but in other urban parts it is both desirable and demanded by the public.
- Motorization and auto-dependency have strong social and economic impacts (costs and benefits). This is further discussed in Chapter 9.
- Very high accidents rates place transitional countries among regions with poor traffic safety.

This last point deserves special attention. National statistics show that in transitional countries traffic accident rates are much higher than in the rest of Europe. In the WHO region – Europe (this region includes countries of the former Soviet Union) 26 of the worst 28 countries ranked by fatality rates⁴¹ are transitional countries, the 12 worst being the former Soviet Union republics. Kazakhstan and the Russian Federation have the highest rates at 30.6 and 25.2 (see Table 4). For the whole WHO region, the average rate is 13.4. A high proportion of accidents take place in urban areas. Road death rates for these countries are 2–4 times higher than in most Western European cities.⁴² Causes of this situation are a subject of discussion. Common opinion is that this is the consequence of the low quality of road infrastructure, poor vehicle safety and regulatory practices which have not kept up with the growth of motorization. Alternatively, it is claimed that the behaviour (driving style) of drivers is the main cause of high accident and fatality rates.

40. Traffic volume equal to capacity.

41. Fatality rate: number of deaths from road traffic injuries per year per 100,000 population.

42. ETSC, 2008.

Table 4. Fatality rates for road users

Country	Death rate per 100,000 population	Percent of road users' deaths			
		4-wheel vehicles	Motorcycles	Bicycle	Pedestrians
Albania	13.9	45.3	9.0	5.7	40.0
Armenia	13.9	60.3		0.3	39.4
Azerbaijan	13.0	59.7	1.2	0.9	38.1
Belarus	15.7	47.3	3.8	9.1	39.8
Bosnia	10.9	61.0	4.7	5.8	23.7
Bulgaria	13.2	65.0	0.0	4.5	26.3
Croatia	13.6	49.9	18.8	4.5	20.0
Czech Republic	12.0	59.4	11.4	9.5	19.2
Estonia	14.7	66.0	6.0	9.0	19.0
Georgia	16.8	–	–	0.3	27.7
Hungary	12.3	54.4	10.1	11.7	22.7
Kazakhstan	30.6	–	–	–	16.2
Kyrgyzstan	22.8	55.0	–	1.0	43.0
Latvia	17.9	50.4	4.2	8.1	37.3
Lithuania	22.4	53.7	4.5	6.9	31.9
Montenegro	20.4	75.4	4.1	–	20.5
Poland	14.7	51.0	5.0	9.0	35.0
Republic of Moldova	15.1	57.3	4.1	2.4	34.3
Romania	12.7	74.5	8.0	6.8	10.8
Russian Federation	25.2	62.0	2.1	–	35.9
Serbia	9.8	58.6	5.6	9.2	25.1
Slovakia	15.1	49.6	8.0	8.5	33.9
Slovenia	14.6	64.5	18.1	5.8	11.3
Tajikistan	14.1	48.7	1.1	6.0	43.6
TFYR Macedonia	6.9	41.4	10.7	3.6	34.3
Turkmenistan	18.6	–	–	4.6	28.9
Ukraine	21.5	44.3	–	–	55.7
Uzbekistan	9.7	–	–	–	–

Source: WHO, 2009a.

Growing congestion, accidents, lack of parking facilities and environmental impacts of road traffic are amongst the main challenges faced by city authorities, but with growing understanding that it is not possible to meet all roads and parking facility needs. Examples of cities which have formulated transport policies and adopted measures such as access restrictions, public transport priorities, and parking policies (limits/requirements, zoning, etc.) are presented in Chapter 12.

6. Commercial Goods Transport

6.1. Importance of goods transport in urban areas

For the purposes of this report the term commercial goods transport encompasses:

- The delivery of consumer goods (not only for retail, but also by other sectors such as manufacturing or construction) in city and suburban areas, including the reverse flow of used goods in terms of clean waste;⁴³ delivery of consumer goods is only a part of the whole logistics chain, therefore issues relating to urban freight logistics such as handling and storage of goods, the management of inventory, waste and returns as well as home delivery services will be covered.
- Through freight road transport, if this is crossing the urban area; in many cases this has a strong negative impact on traffic conditions and the environment; contrary to this, railway freight transport has small impact on the natural and human environment.

As in other groups of countries, in all transitional countries goods transport is a crucial issue in urban areas as a considerable part of goods vehicles movements are within urban areas. It is common that a growing economy and increased consumption causes growth in local delivery and service operations. Rapid growth of long distance freight transport (national and international) contributes to problems experienced by cities, because of through traffic in cities where by-passes do not exist or are partially located in urban areas. As was mentioned in Chapter 5, in many transitional country cities bypass roads are lacking, forcing long-distance transport vehicles to use radial and internal ring roads through urban areas.

6.2. Trends and conditions in commercial goods transport within urban areas

Road traffic volumes of commercial goods vehicles within urban areas are to a considerable degree conditioned by general trends in freight transport. In the beginning of the transition period, in most countries of the region, two main features of these trends were: (i) fundamental political and economic changes (e.g. reduced role of heavy industry and growth of consumption) and (ii) modal shift from rail to road transport.

There are significant differences between groups of transitional countries. According to ECMT data,⁴⁴ in 15 transition countries of the Central and Eastern European countries and the Baltic States,⁴⁵ rail has lost the dominant position it held in 1990 – and the even more dominant one of 1970 – to road transport, which in 2005 carried over 60 per cent of the combined tonne-kilometres conveyed by the three main modes of inland transport.⁴⁶ On the contrary, in the seven CIS member states, rail retained its position as the dominant mode for freight transport, accounting in 2005 for practically 87 per cent of the market in tonne-kilometres, with road transport carrying only a little more than 9 per cent.

It is obvious that the growth of transport volumes (tonne-kilometres) was accompanied by the growth in the number of trucks. In the period 1993–2008/2009 the number of lorries

43. This part of definition is similar to this formulated in OECD, 2003.

44. ECMT, 2007b.

45. According to ECMT classification, this group encompasses twelve Central and Eastern European Countries and three Baltic States – Albania, Bulgaria, Bosnia and Herzegovina, Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, TFYR Macedonia, Poland, Romania, Serbia and Montenegro, Slovakia, and Slovenia; the second group is composed of six members of the Commonwealth of Independent States – Azerbaijan, Belarus, Georgia, Republic of Moldova, Russian Federation, and Ukraine.

46. Rail, road and inland waterways.

increased by the following percentages: Albania, 154 per cent; Bulgaria, 47 per cent; Croatia, 213 per cent; Czech Republic, 247 per cent; Latvia, 28 per cent; Lithuania, 44 per cent; Poland, 165 per cent; Romania, 107 per cent; Slovakia, 67 per cent; and Slovenia, 120 per cent.⁴⁷

On the contrary, in the CIS countries, in which road freight transport volumes decreased substantially during the 1990s, the number of trucks decreased sharply from 1990 to 1995 and then remained stable. Between 1990 and 2002, the number of trucks decreased by 22.7 per cent in Azerbaijan, 46.4 per cent in Georgia, 66.0 per cent in Kazakhstan and 69.3 per cent in the Republic of Moldova. This had significant effect on road traffic volumes which did not grow as had happened in other countries of the region.

The increase in volumes of goods transport in urban areas has had a significant impact on traffic and parking conditions as well as on the environment. In addition, the latter is compounded by the technical characteristics of vehicles. There is high proportion of vehicles which are aged, of low technical standards and not properly maintained. As in other matters the situation between countries differs. The highest age of vehicles is noted in the CIS countries. For example, in Georgia, in 2006, over 70 per cent of trucks and light duty vehicles were older than 15 years. Similar percentages in Uzbekistan and Moldova were 64 per cent and 56 per cent respectively.⁴⁸

The situation has worsened by goods transport inefficiency. In most countries, much of the freight traffic movements within urban areas are not economically efficient, due to low load factors. This increases road traffic volumes and means that efficiency from an environmental point of view is also relatively low. This has serious consequences since urban areas are particularly sensitive to emissions and noise problems. In many cities of the region actions are taken to reduce negative impacts of freight traffic on human and natural environment. The case of Moscow (Russia) is an example of a complex solution (see Box 3 below). Other cases are discussed in Chapter 9.

Box 3. Traffic control in Moscow, Russia

In Moscow, in 2002, a restriction on the entrance to the central part of the city (within the Garden Ring-road) in the daytime for all vehicles with carrying capacity over 1 tonne was introduced. This restrictive measure did not include vehicles of operational and emergency services, special vehicles of urban services dealing with street cleaning as well as trucks for international transport as indicated in shipping documents. In 2004, the zone was expanded to the Third Transport Ring with a pass entry system implemented for trucks needed for daytime deliveries. In 2009, the procedure for getting a day delivery pass to enter the centre of the city was simplified. A pass issued to small enterprises is valid within one year, with no route or time specification. From September 2008, the central part of the city within the Third Transport Ring is open exclusively for trucks meeting Euro-2 emission standards.

Source: 'Freight Transport in Moscow, Autobusiness, No. 5-6/2010, pp109-110.

6.2.1. Logistics operations

In transitional countries there is a growing understanding that increased goods transport efficiency can be achieved and impact on the environment and living conditions reduced through development of **freight transport logistics**. In many countries plans have been prepared to promote the development of large inter-modal terminals and logistic centers serving all categories of goods transport: international, national and local. In national spatial

47. UNECE, 2010.

48. Donchenko, 2008.

and transport development plans locations of such centres have been proposed. However, there are only few cases when such plans have been implemented, because of inadequate coordination of actions undertaken between public and private sectors and limited financial resources in the public sector.

But there are many cities, most often large cities and metropolitan areas in which small and medium scale storage and warehousing facilities, as well as logistics and distribution centres have been created. They proved to be a successful investment. In many cases they were built and are operated by large, international companies and serve road transport only. Only some of them enable consolidation of goods delivery, which increases efficiency of the system. With increasing demands for frequent and just-in-time delivery, and with limited capacity of urban road infrastructure and environmental demands, the consolidation of goods is one of the best ways of improving the efficiency of goods transport and of achieving the objectives of sustainable urban transport.

The situation in CIS countries deserves special attention. Freight forwarding, warehousing and other logistics-related services have been privatized almost entirely in these countries. But 10 years after the transition period started these countries were behind other Central and Eastern European countries that managed to start market consolidation and international cooperation much earlier. *‘Compared to international standards the supply of these services is poor, and the quality of the services is often low. The freight forwarding industry’s own associations are weak, if they exist at all. In Kyrgyz Republic, Turkmenistan and Tajikistan, for example, there is no single FIATA recognized association. Forwarders lack international experience and the sector has not yet grown mature. Only a few forwarders are able to offer a full and global service to their clients. The legal framework is also weak and international standards are not yet incorporated.’*⁴⁹ This situation is gradually changing but that is still not satisfactory.

6.3. Impacts of commercial goods transport and challenges

A visible impact on traffic conditions (congestion, accessibility, worsening traffic conditions from parked goods vehicles delivering goods, etc.) and on the environment have attracted public attention in many countries of the region. Restrictions in access or even elimination of goods vehicles were demanded and introduced in some cities.

However, very often there has been a serious lack of awareness of the benefits of urban goods transport, which is crucial for maintaining the economic and social functioning of cities. Awareness of urban goods transport still seems to be rather one-sided, focusing more on negative impacts and problems it creates rather than on its importance. This has led to a negative perception of the importance of urban goods transport.

This was confirmed by surveys completed in 6 of the new EU countries (Czech Republic, Estonia, Hungary, Poland, Slovenia and Slovakia),⁵⁰ which joined the EU BESTUFS project⁵¹ in 2003. A city inquiry on *‘issues, requirements and innovative measures for transport and delivery of goods in urban areas’* was carried out in 23 cities of various sizes. Opinions were expressed by the city authorities. The results of the survey are summarized as follows:

49. Molnar and Ojala, 2003.

50. Countries applying to access the European Union.

51. Best Urban Freight Solutions – EC funded thematic network in the 5th framework program; more information on <http://www.bestufs.net/>.

accessibility, when the city hosts the 2014 Winter Olympics. No specific actions have been identified in other countries of Central and Western Asia. Unfortunately, in some cities of this part of the world, persons with disabilities are nearly invisible, for two reasons: limited accessibility of the world outside their homes and the social stigma associated with disabilities.

Box 5. The Warsaw Transport Strategy, 2009

Among six main objectives pursuant to the overall goal of the transportation policy, two were related to safety, security and the needs of impaired persons: (i) improving travel standards, including improved access to the transportation system by the disabled, (ii) improving traffic safety and the personal security of transportation system users. This is to be achieved through '*improvement in the comfort of waiting and travel, cleanliness, aesthetics, safety, and full access for the disabled*'. All stops and stations should guarantee access to the disabled. Audits of transportation solutions in terms of the needs of the disabled shall concentrate on the safety of people with disabilities with respect to pavement use, with special emphasis on the movement of people with impeded eyesight.

Source: Warsaw, 2009.

8.2.4. Traffic safety

As was stressed earlier (see Table 4), mortality rates (number of deaths per 100,000 population) are extremely high in transitional countries. In the CIS countries the rates are nearly four times higher than in the Nordic countries. Kazakhstan, the Russian Federation and Kyrgyzstan are on the top of the list. Among the new EU countries, Lithuania and Latvia are the most 'unsafe' countries.⁷¹

From the beginning of the transition period various actions have been taken in countries which are now EU members. In built-up areas, a maximum urban speed limit of 50 kilometres per hour has been set instead of 60 kilometres per hour, which was common in Soviet block countries. Lower speed limits are used in residential areas (e.g. to 30 kilometres per hour). The police have started strict enforcement of speed limits. Additionally, the use of helmet for riders of all motorized two-wheelers has become obligatory. Moreover, traffic engineering solutions such as traffic-calming measures, upgraded marked pedestrian crossings are widely used. All this is resulted in the reduction of the accident and mortality rates in city areas. For example, in Bratislava, Bucharest, Sofia and Warsaw average annual percentage change in road deaths per 100,000 residents over the period 1997–2007 was in the order of 5–7 per cent while the average for the EU27 was 4.1 per cent.⁷²

Because of the seriousness of the problem, various actions are taken by international organizations. For transition countries, joint UNECE and WHO efforts are of a great value. Actions include data collection and analysis and formulation of recommendations. In most countries of the region national policies to improve traffic safety have been formulated. However, at the local (city) levels this is less common.

8.2.5. Security

In EU new member states, to counter the present situation described in section 8.1, local authorities carry out comprehensive programmes to improve safety in urban and suburban transport and social campaigns, raising awareness of society and instructing how to act in emergency situations. In many cities trams, buses, railway stations and metro monitoring

71. UNECE and WHO, 2008.

72. ETSC, 2009.

systems have been installed. Municipal public transport operators often sign contracts with security companies in order to protect passengers of public transport around the clock, especially in means of transport that operate at night.

8.3. Challenges for future policy development

Urban development (urban sprawl) and car-oriented transport development exacerbated social and economic disparities in transition countries. There are possibilities to reduce or totally eliminate social gender, age and physical ability differences in transport access and mobility through actions and measures concerning the urban development and transport sector. Politicians and professionals are facing the following challenges:

- How to stop or reverse urban sprawl and car-oriented development of urban areas?
- What norms/standards of accessibility of public transport should be adopted having in mind the needs of mobility impaired citizens as well as economic and financial consequences of these standards?
- How much public transport fares should take into account the needs of low income users and which groups should be privileged through reduced fares?
- How to make transport infrastructure and services more friendly for mobility impaired users?
- How to improve traffic safety with special attention paid to the most vulnerable groups, being pedestrians and cyclists?
- How to improve security of transport users and providers?
- How to integrate transport-related psychological effects into sustainable urban transport policies?

In addition, in countries where uneven treatment of women is noticed, changing this situation in the transport belongs to the main challenges.

9. Urban Transport and the Environment

9.1. Impacts of transport on urban environment

Development and transformation processes described above have significant impacts on the urban environment. In following points focus is on air pollution and noise.

At the beginning of the transition period, due to the economic recession, **concentrations of air pollutant** in the CIS countries decreased. However, with economic recovery, this decline has ceased. In many large cities of CIS countries, transport is now the dominant source of air pollutants (more than 80 per cent of the total in capital cities Ashgabat, Dushanbe, Moscow, Tbilisi, Tashkent and Yerevan) and it is a major source in other large cities, such as Baku, Bishkek, Chisinau, Kiev and Minsk.⁷³ Road transport in Russian cities accounts for 70–75 per cent of total air pollutants and more than 90 per cent in large city centres. Even though the use of leaded petrol was banned in the Russian Federation in 2003, almost all lead emissions were generated by road transport, due to the black market for leaded fuel.⁷⁴

In Central and Eastern Europe, transport consumes about 22 per cent of total energy and in the CIS countries 17 per cent. Growing energy consumption caused that carbon dioxide (CO₂eq) emissions from transport sector have also continued to increase.

High increase of **air pollution** has been caused not only by the growth of motorization and mobility. It was also increased by the low standard of vehicles, considerable part of which were used, aged vehicles imported from Western European and Eastern Asia countries.

In built-up areas of the transition countries the WHO guidelines for **noise** are often exceeded. In 2004, about 38 million people in the Russian Federation (out of a population of 144 million) were exposed to annoying levels of transport related noise. In Moscow, 60 to 80 per cent of the population lives in areas with levels of transport noise above WHO standards. Especially harmful is heavy traffic (with high proportion of very heavy vehicles) on national and regional roads, often in main international corridors, crossing small and medium size cities.

9.2. Policy responses

Policy responses of different countries can be divided into two categories: national and local. National responses have to take into account international regulations and recommendations (depending on their character). For the new EU member states, EU regulations are essential. In fact, some of these countries started to take the EU strategy for urban transport and the environment into consideration even before the start of accession process.

9.2.1. Impact of the EU policies, regulations and initiatives

The EU Strategy concerning urban transport and environment has been formulated in several policy documents such as the Citizen's Network Green Paper⁷⁵ and the subsequent Communication on Developing the Citizens' Network.⁷⁶ Environmental objectives have been set as a priority in the urban transport policy agenda. The 'Communication on transport and

73. All numbers are for the mid-2000s.

74. UNECE and WHO, 2008.

75. CEC, 1995.

76. CEC, 1998a.

CO₂,⁷⁷ identified a series of urban specific measures to reduce greenhouse gas emissions. In the 2001 White Paper ‘European transport policy for 2010: time to decide’⁷⁸ breaking the link between growth of economy and transport intensity (‘decoupling’) was among the main objectives. In the 2006 mid-term review of the White Paper increasing use of clean vehicles and improvement of public transport were on the list of priorities.⁷⁹ The Green Paper, titled ‘Towards a new culture for urban mobility,’ placed ‘greener towns and cities with reduced impacts of traffic on the environment and on citizens’ among five main challenges.⁸⁰ ‘The European Commission’s Thematic Strategy on the Urban Environment’ described a number of common environmental challenges and problems faced by most European conurbations. These issues comprise: ‘*poor air quality, traffic volumes and congestion, high levels of ambient noise, neglect of the built environment, high level of greenhouse gas emissions, social exclusion and urban sprawl.*’⁸¹ It was stressed that urban mobility contributes significantly to these pressures, and is why the development and implementation of sustainable urban transport plans was recommended. Guidance to help local authorities in preparing such plans was published in 2007. White Paper – ‘Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system’, published in 2011, concentrated on long-distance transport. In the short section devoted to transport in urban areas, the following policy directions have been mentioned: increasing population density, improving public transport and biking and walking conditions, promoting the use of clean vehicles and fiscal measures such as ‘*road pricing and the removal of distortions in taxation*’.⁸² Last but not least, environmental legislation setting up quality standards was also important for urban transport.

Among the main initiatives that have been launched at the EU level was the CIVITAS programme which started in 2002 in order to help realize innovative projects on clean urban transport across Europe. Many transition country cities have already benefited from this programme. Several EU supported R&D projects, included or concentrated on urban transport and environment issues.

All these actions are important not only for the new EU member states, but also for other countries of the region. Some of them are introducing similar standards or solutions. Transfer of knowledge/solutions from EU to remaining transition countries is supported by various technical assistance actions undertaken by non-governmental organizations such as the Regional Environmental Center for Central and Eastern Europe (REC).⁸³

9.2.2. Measures reducing air pollution

Air pollution standards in the UNECE region have been defined in the Convention on Long-range Transboundary Air Pollution and its eight protocols. Each Party to the Convention is required to develop relevant policies and strategies, including air-quality monitoring and management systems. Until 2007, all CIS and South-Eastern European countries had signed the Convention. Some countries have signed other acts regulating level of emissions of various pollutants.

For the EU countries, standards for air quality were formulated initially in the EU air-quality framework directive (EC 1996/62) and its daughter directives. They have now been

77. CEC, 1998b.

78. CEC, 2001.

79. CEC, 2006.

80. CEC, 2007a.

81. CEC, 2005.

82. CEC, 2011.

83. REC (2007) is a good example.

replaced by the EC 2008/50. These directives set out maximum acceptable levels of certain pollutants. For example the air-quality directives require member states to define the areas where limit values are exceeded and set programmes to attain the limit values within a time limit. And urban authorities are required to formulate local action plans wherever there is a risk of exceeding standards. In 2009 the directive on procurement (Directive 2009/33) aimed at the promotion of clean and energy-efficient road vehicles was adopted. Technical and legal measures implemented since 1990, such as the ban of lead petrol, a decrease in the sulphur content of fuels and emission standards for vehicles have led to reduction of some vehicle exhaust emissions in all EU countries, including new EU member states.

Several non-EU member countries undertook specific actions aimed to reduce negative impacts of road transport as well. It is done through renewing the vehicle fleet, regulating imports of vehicles, enforcing the use of catalytic converters, and improving and controlling more strictly vehicle maintenance. They are gradually applying the strategies and higher standards through improving fuel quality, phasing-out leaded petrol, reducing fuel sulphur content, introducing and strengthening vehicle emission regulations, and improving vehicle inspection and maintenance. The degree of implementation differs between countries but the overall effect is visible.⁸⁴ Adoption of the high EURO vehicle emission standards (EURO IV in 2010) by the Russian Federation and Ukraine was of a special importance.⁸⁵

In several cities local authorities introduced measures aimed at the reduction of air pollution (and traffic congestion) caused by road traffic. Limited access for heavy goods vehicles (permanent or at defined time) is a common measure. In most cases its aim is to reduce traffic congestion, but it serves also pollution control objectives. The case of Moscow, presented in Chapter 6, is a good example. Low emission zones is a less popular solution but has been introduced in some cities, such as Prague (see Box 6 below).

Box 6. Traffic control in Prague, Czech Republic

In the Czech Republic, local authorities were allowed to set up conditions for vehicle access to the city centre, both by regulating access of freight vehicles and by establishing access fees. The main aim of these measures is to protect the city centre from heavy traffic and regulate the movement of freight vehicles during peak hours. For example, in the capital city, Prague, two environmental zones with restricted access to inner centre and centre, were introduced:

- Inner centre: access restriction for vehicles with total weight over 3.5 tonnes in effect Monday to Friday (08:00–18:00), except for vehicles with permits issued by the city council.
- Centre: access restriction for vehicles with total weight over 6 tonnes in effect daily, except for vehicles with permits issued by the city council.

In 2003, in the framework of the CIVITAS project Trendsetter, the environmental zone for vehicles over 6 tonnes was extended to almost double size. Before/after analysis has shown the following reduction emissions from freight vehicles: particulate matter, 4.7 per cent; nitrogen oxide, 9.1 per cent; and carbon dioxide, 4.6 per cent.

Source: Kadlec and Šuta, 2007.

9.2.3. Noise control

In comparison to actions to reduce air pollution from transport (mostly road transport), actions concerning noise were undertaken with some delay. There are several relevant UNECE, WHO and EU agreements, but there are gaps in road transport regulations concerning noise.

84. UNECE and WHO, 2008, p.49.

85. Ban on production and import of vehicles not complying with EURO standard.

*'A holistic and integrated approach to reducing human exposure to noise is lacking at the international level. The monitoring of noise exposure and the exchange of information among states are strongly handicapped by the large variety of noise indicators and assessment methods used in the different countries.'*⁸⁶

Locally implemented measures mentioned earlier and aimed at the reduction of congestion and air pollution (access restrictions for vehicles of selected categories) are beneficial from the point of view of noise level control as well. But there are not sufficient to prevent noise problems in proximity of heavy road traffic, railways and airports.

In many transition countries the analysis of present and predicted noise levels in land-use/transport plans and transport projects is common practice. Measures such as acoustic screens are designed or controls on land use (e.g. housing) are implemented.

9.2.4. Other measures

Several other measures are not directly environmental. However, they indirectly serve environmental objectives. The list of these measures includes: demand management, fiscal measures (e.g. internalizing transport costs, congestion charging), land-use planning and wide application of technological innovations.

Demand management. Decoupling economic growth from transport intensity⁸⁷ is considered as one of most promising measures to reduce negative impacts of transport on the environment and energy consumption. It has been a subject of many EU R&D projects⁸⁸ and was placed on the list of EU policy objectives many years ago. It is also mentioned in national and local transport policies of some new EU member states.⁸⁹ However, in general, in transitional countries only limited progress has been made in implementing measures aimed to reduce the need to travel through land-use planning, mobility management, parking policies, pricing systems and other means of limiting car traffic in urban areas or the use of logistics and telematics systems (ITS) to reduce freight vehicle movements and empty runs.

Internalizing the external costs of transport. The existing transport price structures does not take into account costs of environmental damage and accidents. There is no real incentive to use the cleanest transport modes and/or less congested networks.⁹⁰ *Internalizing the costs of transport relies on placing monetary values on the associated externalities. This is a complicated issue due to the diverse nature of many of the health and environmental impacts.*⁹¹ But considerable progress has recently been made in developing the methodology for valuation of transport externalities,⁹² creating the opportunity to begin implementation of this promising measure.

9.3. Challenges for future policy development

Analysis of the present situation and predictions of changes in transport demand and its impact on the environment gives a basis for identifying challenges to formulation of urban and transport policies. Some require action at the national level, others are the task of local

86. UNECE and WHO, 2008.

87. Measured with numbers of passenger-kilometres and tonne-kilometres.

88. E.g. POSSUM (Policy Scenarios for Sustainable Mobility); project funded by EC, 1996–1998.

89. E.g. National Transport Policies for Poland (2001 and 2005).

90. UNECE and WHO, 2008.

91. OECD, 2006.

92. ECMT, 2003a.

authorities and society. Some challenges are region specific, other have a global character (and importance). For example, reducing transport dependence on coal and oil-based energy or reducing noise generated by vehicles are global challenges. However, reducing the negative impacts of transport on the environment and energy consumption at the local level depends, to a high degree, on: (i) transport intensity (passenger-kilometres, tonne-kilometres); (ii) modal share in serving passenger transport; (iii) effectiveness of freight transport system (logistics).

Decoupling economic growth and growth of transport demand can be encouraged through: (i) avoiding the urban sprawl observed in a majority of transition country cities; (ii) encouraging mixing of functions; (iii) changes in behaviour of urban citizens.⁹³ Reversing the trends is probably the most challenging task for national and local governments.

Innovative transport technologies, such as alternative fuel and ‘quiet’ vehicles, will soon be widely available. Their wide introduction requires policy by central and local governments.

Rapidly growing **dependence on private car and reduced share of public transport** has a negative impact on the human and natural environments as well on living conditions (congestion). Stopping and reversing this trend is another challenge. Improvement of the quality of public transport and introducing measures such as advanced traffic management and congestion charging are known as effective measures. Wider use of such measures in transition countries depends on political will.

Environmental impact of goods road transport serving the city can be reduced by wider development of **logistics systems**. So far, this is done only at the small scale. Changing this situation is another challenge.

Noise generated by transport is a major cause of nuisance in urban areas. Reducing noise levels in urban areas belongs to difficult tasks.

Development of transport infrastructure often **reduces open green spaces**. In the situation where there is a strong pressure to develop this infrastructure, ways of enforcing open green space standards have to be defined.

93. E.g. through wider use of the Sustainable Mobility Planning described in section 9.2.

10. The Economics of Sustainable Urban Transport

10.1. Impacts of urban transport on cities' economies

Before the transition period, across the whole region economic and financial aspects of transport in urban areas were not considered as a basic premise to decisions concerning financing, investment, maintenance and operation of the transport system (infrastructure and public transport operation). It was fully acceptable that public transport was not financially self-sufficient. Low tariffs were the main reason for substantial operating deficits. Fares were kept at low, acceptable levels, because mobility was considered a common good and public transport, among others,⁹⁴ was used as a tool for income redistribution.

At the beginning of the transition period, most Eastern Europe national policies concerning the economic/financial aspects of urban transport changed radically. Central governments practically withdrew from supporting cities in addressing problems of financing, capital investment, maintenance and operation of transport systems. The radical reduction of central government subsidies to public transport was of special importance. Cities now have to pay the entire operating subsidy for public transport (except for some short-distance suburban railroad services). In some countries **compensation** for reduction of farebox revenues arising from fare privileges for disadvantaged groups is paid by the government level which introduced the privileges.

The situation for capital subsidies has changed over time:

*'In recognition of a desperate need to renew aging rolling stock and improve deteriorated rights of way, some central governments have established special infrastructure funds with varying degrees of modest assistance. In the Czech Republic, for example, the central government offered to cover 30 percent of vehicle and infrastructure costs for electric trams and trolley buses, and 10 percent of bus purchase and rehabilitation costs. As in many countries, however, the local Czech governments were not able to raise the necessary matching funds, and the central government could not afford to offer the promised contribution. Central government subsidy programs in most countries have been completely eliminated and those remaining are often revised, subject to the vagaries of annual budgets. Metro systems in the large capital cities Prague, Warsaw and Budapest receive some central government subsidies for extensions and modernization, but those special programs have varied from year to year according to annual parliamentary budget agreements. In general, the overall funding contribution of central governments is small and focused on rail projects.'*⁹⁵

In some countries, for example Poland, in the early 1990s cost recovery from fare revenues was increased through raising fares and introducing measures to improve the efficiency of public transport operators. Service agreements between municipal governments and public-owned operators, as well as competitive tendering of services to both public and private-owned operators were introduced. However, cost recovery in major cities appeared to be too low to generate sufficient funds for replacing and modernizing bus and tram fleets. It led to worsening of the quality of public transport and was another reason (after the growth of fares and car ownership rates) for undesirable modal shifts.

94. Low rent rates and water and energy tariffs.

95. Stead et al, 2008.

In the Russian Federation:

*'railways losses on passenger services have been reduced by higher efficiency, by a more flexible pricing policy and by replacement of in-kind benefits with cash. Beginning in 2005, the train fare for passengers eligible for federal benefits when traveling on suburban trains, is being paid on a contractual basis by the Federal Agency for Healthcare and Social Development... The suburban passenger companies can be supported at least partly by Federal funding and partly by local funding on a continuing basis... Agreement has been reached on at least partial local support in a few areas (e.g. Moscow), but has not been reached in most areas because of a lack of funding at the local level. The Federal Government continues to support the losses associated with privileged travel that is mandated at the national level.'*⁹⁶

In other CIS countries the problem of financing of urban public transport was also not solved. For example, in Bishkek (Kyrgyzstan) at the end of the last decade:

*'over 60 percent of the passengers of the public bus and trolleybus companies were privileged and travel either free or at a discount fares, which were insufficient to cover costs. The operators were not compensated for their losses and were unable to cover even their operating costs, let alone the maintenance and renewal of their dilapidated fleets.'*⁹⁷

In Chisinau (Moldova) public transportation continues to be a drain on the municipal budget:

*'Many problems with public transit in Chisinau stem from the old system that was in place under totally different economic conditions. Although the country has made the transition from a command economy to a free-market economy, the management and policies of the public transport system have not changed.... The efficient distribution of social protection and subsidies is hampered in Chisinau because the old Soviet system of granting extensions still holds sway. This means that decisions about who should receive subsidies for traveling on mass transit are not linked to economic need. The current mechanism for granting social subsidies in mass transit suffers from a series of shortcomings, including: (1) there is a lack of distinctly defined policies and mechanisms for implementing fare subsidies and for funding public transit; (2) the mechanisms for social protection and subsidizing fares is inappropriate to the current economic conditions.'*⁹⁸

In general, in the whole region urban public transport is still subsidised. Fares are kept at low, acceptable levels, because - with a high motorisation rates and inability to meet all demand for roads and parking facilities - one of main objectives of transport policy is to attract passengers to public transport.

Policy responses

EU regulations have a strong impact on urban transport financing in the new EU member states. Adjusting to these regulations started well before joining the EU. These regulations have also impact on other countries, first of all these being potential EU members. Directive 1370/2007⁹⁹ had a great impact on rephrasing principles of public transport financing. The

96. ECMT, 2007a, pp. 14–16.

97. CEC, 2007a.

98. Guess, 2008, pp. 105–106.

99. CEC, 2007b.

principle of regulated competition and public service obligation is crucial. Operators contracted by the transport authority can be subsidized (compensation) if they are providing services which (with the acceptable fare level) could not be provided without loss. But they can also provide services at commercial basis (without compensation). In most countries national legislation regulating collective public transport (national, regional, local) has already been amended.

International finance institutions have significant impact on incorporating economic efficiency aspects in national and local policies as well. This is done through both technical assistance and criteria used in selection of projects co-financed with loans. Nevertheless, it does not mean that projects which are not financially efficient are excluded. Even if the financial rate of return is negative, the project may still show a robust economic rate of return and meet the requirements of the EIB.¹⁰⁰

In any case, international finance institutions have a generally positive impact on reformulating national and local policies in urban transport organizing and financing. For example, increased involvement of the EBRD in financing the urban transport sector in Russia was conditioned by progress in the development of supportive regulatory policy in this sector (e.g. ensuring the ability for urban transport companies to secure long-term contracts for servicing transport routes).

Moreover, funding projects through public-private partnerships is supported by the EIB. Thanks to EIB the number of projects funded through public-private partnerships is constantly increasing. The vast majority of the public-private partnerships lending of the EIB is in the transport sector, including urban transport.¹⁰¹

However, informal transport, which – at the beginning of the transition period – started to play an important role in many countries of the region, still operates in some of them. Policies adopted in the transition countries varies between total elimination of informal transport (in new EU member states) and accepting this form of transport to avoid losing positive sides of it (e.g. Bishkek, Kyrgyzstan, mentioned in section 4.2), such as providing services to areas not served by formal public transport; self-financing (also because of effective operation) and employment generation.

In transition country cities, pricing is limited to parking fees, which is popular in many cities. Riga (Latvia) and Znojmo (Czech Republic) are the only cities where cordon (old city area) pricing has been introduced. However, in several cities the introduction of congestion charging has been placed on the list of policy measures which will be applied in the more distant future. For example, it was mentioned in the Warsaw transport policy document adopted in 1995, and was repeated in the last policy document adopted in 2009. However, the date of implementation has not yet been defined.

10.2. Challenges for future policy developments

In transition economies, challenges for future policy developments are related to the main issues of financing, development and maintenance/operation. These issues are listed below:

- With an eye on the ecological and social aspects of public transport and its importance in alleviating congestion, how far should public transport be subsidised?
- How should limited financial means be shared between public transport and roads?

100. EIB, 2009.

101. EIB, 2009.

- There is enormous social/political pressure to improve transport in cities through heavy investment in new infrastructure, primarily roads; the question is how to share resources between new infrastructure and rehabilitation/maintenance/operations?

However, transport pricing structure is the most challenging issue. The existing transport price structures generally fail to reflect all the costs of infrastructure, congestion, environmental damage and accidents. There is no real incentive to use the cleanest modes or less congested networks.¹⁰² As it was mentioned in point 9.2.4., there are high potentials in internalizing the costs of transport which relies on placing monetary values on the associated externalities. Methods for valuation of transport externalities are available. This and other tools (such as technologies of electronic fee collection systems) are available. **The main question** is: should pricing such as congestion charging (cordon pricing, bridges/tunnels fees, etc.) be introduced in large cities? And if yes, when? It is obvious that the answer to this question is crucial not only for transition countries.

102. EIB, 2009.

11. Urban Transport Institutions and Governance

Information on and assessment of the present situation with regard to institutions and governance structures has been presented in earlier chapters. In this chapter an overall look at these topics is made with emphasis on impacts of transformation processes on urban transport, policy responses and challenges.

11.1. Impacts of transformation in institutions and governance on urban transport

In transitional countries significant changes in the institutional structures and governance of transport in urban areas have been taking place. They are caused by three main processes: democratization, privatization and decentralization. The combined effects were both positive and negative. The transformation of the construction industry and the organization of public transport are good examples. Competition in the construction industry increased the effectiveness of transport infrastructure investment and its maintenance.

In the past the public sector was totally responsible for providing **public transport** services by publicly owned operators. The central government was very active as the supervising entity. At the local level there was a lack of separation of functions (organizer and operator). In many cities the functions of public transport organizer and of service provider were integrated in one agency (for example a municipal transport company). Generally, public transport had strong support from the central government (financial, legal, etc.). Then at the beginning of transition period, in many countries, the process of separating urban public transport organizing and operation was initiated. In many cities urban public transport authorities have been created and a process of privatization has started. There were two ways of urban public transport restructuring. First, transformation of publicly owned operators, and second, creation of new private companies.

Privatization of a considerable part of the former publicly owned transport operators, and the opening of the market for new service providers, improved the chances of increasing the effectiveness and efficiency of public transport operations which had been absorbing a considerable part of city financial resources. At the same time, more complicated decision-making stretched the process of project implementation and service providing. Tendering additionally lengthened the duration of infrastructure construction processes. Increased requirements concerning environmental aspects of transport contributed to this as well.

Decentralization was expressed, amongst other things, in transferring total responsibility for regional and local infrastructure and public transport to regional and local governments. This led to central governments ending assistance to local governments in coping with problems such as deteriorating of infrastructure, congestion, traffic safety or tackling environmental problems. There is reluctance of state governments to formulate national urban development strategies or to finance R&D works and providing technical assistance. It was assumed that cities should be able to manage their own problems.

This approach was critically assessed, amongst others by the World Bank. The opinion was expressed that in some countries (e.g. in Poland) *'the State has gone too far in decentralizing all public transport responsibilities to the cities and has not faced squarely the complicated issues related to urban roads and traffic issues'*.¹⁰³ It has been recommended that the ministry responsible for transport *'should build its capacity to assist cities in making strategic decisions, in areas such as competitive tendering, subsidy reform, road and public*

103. World Bank, 1999.

transport investment policies, and road use pricing, as well as getting access to capital in the period before cities reach financial self-sufficiency.'

In many countries of the region (e.g. Latvia, Lithuania,) *'the municipal sector remains fragmented and suffers from poor administrative capacity. Despite extensive investment and operational needs, there is limited private sector participation in municipal sectors including water and sewage, urban transport and in the development of state transport infrastructure.'*¹⁰⁴

The situation in Russia and other CIS states is similar. In the early 1990s, with abandonment of central planning and governing, municipal governments have been given full responsibility for these services, but could not provide the requisite subsidies.¹⁰⁵ Furthermore, weak cooperation between independent local governments is observed. It is particularly harmful for effective solving of transport problems in agglomerations (metropolitan areas) in which good cooperation between central city and suburban municipal governments is crucial.

11.2. Policy responses to the challenges of urban transport institutions and governance

Actions and solutions implemented or planned in transitional countries for improving the performance of urban transport institutions and for enhancing governance can be divided into following categories:

- determining institutional and regulatory framework of urban transport planning and operation;
- policy formulation (character of document, scope, way of approving etc.);
- organizational structure (for example integration of urban road and public transport authorities);
- agreements and delegation of authority, for example, authorizing local government to manage roads of all categories (national, regional, local) located within the city boundaries; and
- agreements between several local governments (authorities) in metropolitan areas to govern selected regional transport subsystems (for example through establishment of metropolitan transport authority).

In transition countries the regulatory framework for urban transport planning and operation is rather weak. Of course, general rules concerning public institutions and enterprises, public finances etc. are used, but there is often a lack of: (i) national regulations concerning the structure of local governments responsible for transport, and (ii) uniform planning procedures similar to that concerning land-use planning. In spite of the lack of national regulations concerning transport planning, the central governments, regional governments and many cities are elaborating short, medium and long term transport plans or transport strategy documents. And, in the last years, these plans usually take into account principles of sustainable urban and transport development.

In Poland the formulation of policies with regard to cities and local transport is not considered as the responsibility of the central government. The national transport policy document¹⁰⁶ recommends adoption of sustainable transport policies which assume, amongst

104. EBRD, 2008.

105. Rat, 2004.

106. Suchorzewski, 2005.

other things: priority for public transport and pedestrian and bicycle traffic along with limits on car use in selected zones (city centres and some high density areas); parking policy measures (parking charging, limiting number of parking spaces) and applying fiscal measures, in the first phase parking charging, in the second congestion pricing. Urban transport policy should be encouraged and enabled by national financial and fiscal policies as well by promotion and education. **Mobility management** is mentioned amongst the most important measures. It should lead to the reduction of travelling and, in relation to trips which are made, to choosing public transport or non-motorized means of travelling.

Furthermore, the location of generators of traffic and the limiting of parking capacity are mentioned as critical elements of urban development strategies influencing transport intensity and modal split. It was stressed that the development of large commercial centres (hypermarkets with accompanying shops and services) in suburban areas (located along main radial highways and poorly served by public transport) have a negative impact on travel behavior patterns, reinforce urban sprawl and, generally collide with sustainable development policies.

Efforts made in some CIS countries are also worth mentioning. In Uzbekistan, the government has initiated a number of important reforms in the urban public transport sector. They include the separation of regulatory and operational responsibilities in the provision of services; corporatization and privatization of bus companies; introduction of competition through adoption of a programme of bus route franchising and development of an appropriate regulatory framework; and creation of an enabling environment for private sector participation in the provision of transport services. The Government's strategy in the transport sector included establishing an appropriate policy, legal, and regulatory framework for the sector. However, although some progress has been achieved on the economic side, there was no improvement in Uzbekistan's political environment and the prospects for a quick political liberalization remain remote.¹⁰⁷

In the Russian Federation, the process of establishing distinct companies for managing suburban and regional passenger entities is fully underway. Thus far, ten suburban and regional passenger companies (Moscow and Moscow Region; St. Petersburg; Altai, Primorye, and Krasnoyarsk territories; and Sverdlovsk, Volgograd, Novosibirsk, Omsk and Kemerovo regions) have been established. On 15 March 2006, the federal government established procedures for licensing these companies to operate services, and for licenses the above ten companies have been granted.¹⁰⁸

The first urban transport strategies by Croatian cities were adopted and are being implemented in Pula and Dubrovnik.

Rules formulated by the European Commission for co-financing of qualifying projects by EU funds have a positive impact on formulating national and local transport policies in new EU member states. Adoption of such a policy or strategy is among the requirements for project approval. Accompanying environmental impact assessment is needed as well.

Recent EU regulations concerning public transport¹⁰⁹ have obliged EU transition countries to regulate the contracting of public service transport. For some governments, this was an incentive to create a legal framework for transport planning. For example, in Poland, the Public Transport Act of 2010 obliged certain levels of government to elaborate a so-called 'transport plan' (see Box 7 below).

107. EBRD, 2005.

108. ECMT, 2007a.

109. CEC, 2007a, Directive 1370/2007.

Box 7. Public Transport Act of 19 December 2010, Poland

In case of contracting public transport operators, cities and counties with population exceeding given limits and metropolitan areas are obliged to prepare 'sustainable development transport plan' (transport plan). Such a plan must contain: traffic demand forecasts, public transport network with preferred transport means, principles of organizing and financing public transport (in case of public service obligations with pre-defined standards of services). Plan has to be coordinated with land-use plans and be supplemented by the environment impact assessment). Local governments are obliged to elaborate and approve such plans till the end of the year 2013.

Source: Public Mass Transport Act of 16 December 2010 (Ustawa z dnia 16 grudnia 2010 r. o publicznym transporcie zbiorowym).

11.3. Challenges of urban transport institutions and governance

On the basis of analysis of the present situation, the following challenges were identified:

- How to achieve a compromise between the independence of local governments and their organizations/institutions, and the necessity of meeting the requirements and principles of national/global policy (subsidiarity principle)?
- How to ensure coordination between various units of local government (for example road authority, public transport authority, land-use planning and other bodies and units) to find good solutions to often conflicting objectives?
- How to ensure coordination between governing bodies of specific sector of the transport system (for example national, regional and local road authorities)?
- How to ensure good cooperation between governing institutions, the public and non-governmental organizations in solving conflicts?
- How to improve the governance / management of the municipal sector which, in many countries of the region, remains fragmented and suffers from low administrative capacity?

12. Towards Sustainable Urban Transport

12.1. Trends and challenges

There are significant differences between groups of countries of the Eastern and South-Eastern Europe and Western and Central Asia. But there are some common features of transformations of urban structures and transportation. Suburbanization (urban sprawl) is one of the most important processes affecting transport provision. Motorization was and still is growing faster than can be explained by disposable income level. Growing congestion has forced governments to devote more attention to investing in roads rather than in public transport. Relatively efficient – in pre-transition period – public transport systems have tended to fall into decline. There are cities and transport companies in the region which have managed to cope with financing problems and improved their services substantially. This was noticed mostly in the new EU member states (e.g. Budapest, Krakow, Ljubljana, Prague, and Tallinn). However, *‘in summary, urban sprawl, car-oriented development and lowering the accessibility and standard of public transport have been exacerbating social and economic disparities in countries of the region.’*¹¹⁰ Strong, negative impacts on the environment and extremely high road accident rates are another features of the present situation.

General objectives of sustainable urban transport in the whole UNECE-WHO European Region¹¹¹ have been formulated in the Amsterdam Declaration, which was adopted in January 2009.¹¹² In transition countries, some of them are especially difficult to meet. Assessment of the present situation served as a basis for identifying main challenges:

- **Urban sprawl:** How to stop it, or at least slow it down?
- **Uncontrolled motorization growth:** How to reverse the process of fleet aging (import of old, used vehicles) and promote environmentally friendly vehicles?
- **Urban roads congestion:** To what extent it should be reduced?
- **Deteriorated transport infrastructure in cities:** How to share scarce resources between investing in new infrastructure and maintenance, rehabilitation of existing infrastructure?
- **Limited resources for the development and operation of public transport:** How to increase attractiveness of public transport through promoting the most effective and efficient transport means? How to reform informal transport and not lose its positive features at the same time?
- **Social inequality, gender issues:** With great differentiation of incomes, how to provide access to public transport for low-income groups?
- **Dramatic, low level of safety:** How to reduce rates of fatalities, especially for the most vulnerable urban citizens: pedestrians and cyclists?
- **Low support for local governments from the central level:** Which forms of assistance should be used?

110. Bruggeman, 2004.

111. UNECE-WHO European Region encompasses 54 countries, among them all 28 countries dealt with in this report.

112. UNECE and WHO, 2010.

12.2. Recommended practices, policies and strategies

The characteristics of individual cities differ considerably across the region, so there is no one universal set of policies and measures which would alleviate identified problems and ways of improvement. The choice of most appropriate measures may be made from the ones described below. Most of them have already been successfully implemented in some countries of the region:

Demand management. Decoupling of economic growth and transport intensity is considered as one of the most promising measures to reduce negative impacts of transport.¹¹³ Demand management can be implemented through land-use planning, mobility management, parking policies, developing pricing systems and other means of limiting road traffic in urban areas and by broader use of logistics and telematics systems. It has been mentioned in the national and local transport policies of some EU new-member states. Whilst, so far, limited progress has been made in this area, demand management should be placed on the top of urban and transport development policies.

Impact on modal choice, for example stopping the growth of share of road transport and shifting to a more sustainable means of transport (public transport, railways) is another objective of demand management. Generally, it can be achieved through measures listed in the following points.

Properly formulated and implemented **land use/development policy** is one of the most effective ways of reducing urban sprawl and resulting transport demand. The Global Report on Human Settlements 2009 stated that *‘strategic spatial plans linked to infrastructure development can promote more compact forms of urban expansion focused around public transport.’*¹¹⁴ *‘Ideas about compact and public transport-based cities are ways in which cities could impact less upon climate change. Retrofitting existing car-based cities with public transport- and pedestrian-based movement systems would go a long way towards reducing fuel demands’.*¹¹⁵ It also suggested that: *‘cities planned in this way are more equitable in terms of providing good accessibility to both wealthier and poorer urban residents and overcoming spatial marginalization’.*¹¹⁶

However, in transition countries, controlling urban development appeared to be extremely difficult. Privatization and decentralization weakened the power of local governments. Changing this situation is one of the most important tasks of central and local governments in this region.

Priorities in investment. In transition countries, growing congestion resulted in a greater emphasis on building new roads, bridges and parking facilities than on the improvement of public transport. In addition, priority given to construction of new infrastructure leads to draining scarce resources which could be used to maintain and upgrade the existing deteriorated infrastructure and public transport fleet. *‘There is a preference for capital-intensive projects. Instead of upgrading existing, but dilapidated systems with great potential (e.g. segregated tram tracks), cities often prefer investments in unaffordable systems such as metros.’*¹¹⁷ With an increasing share of roads and rails in bad condition, delays in repair of infrastructure lead to dramatic increase in the costs of its rehabilitation. This was the reason for formulating the following EC recommendation. *‘New infrastructure is costly and making*

113. UNECE and WHO, 2010.

114. UN-Habitat, 2009 p.210.

115. UN-Habitat, 2009 p.14.

116. UN-Habitat, 2009 p.14.

117. Bruggeman, 2004.

the optimal use of existing facilities can already achieve a lot with more limited resources. This requires proper management, maintenance, upgrading and repair of the large infrastructure network that has so far given Europe a competitive advantage. Upgrading the existing infrastructure – also through intelligent transport systems – is in many cases the cheapest way to enhance the overall performance of the transport system.’¹¹⁸ This recommendation should be taken into account by the national and local governments of all transition countries.

Improving **public transport serving cities and surrounding areas** is considered as the most important measure in meeting objectives of sustainable transport. This can be done by:

- improving the existing systems through fleet renewal and better operation;
- retrofitting the system through upgrading infrastructure;
- introducing traffic priority for public transport means (tram, bus, trolleybus) in road traffic management; and
- building new lines.

Rail transport (railways, metro, and trams) was and is popular. In many large cities of transition countries, **metro** systems have been built. These systems are very effective, but high investment costs had the effect that other forms of public transport were suffering because of lack of financial resources. For instance, dense network of neglected **railways**, which could be used for serving suburban areas, were and often are underutilized. This should be changed.

Tramways appeared to be a highly effective and efficient solution. Contrary to the situation in the post-war period, it is now not considered as out-of-date. It offers high capacity at reasonable investments and operation costs.¹¹⁹ Higher standard trams, called light rail, offer a high quality of service and are very cost-efficient. Bus rapid transit, highly valued in South America cities, has not been implemented in Europe but is considered by some cities of the region. In any case, cities in transition countries should not close down their tram systems (as some of them did), but should maintain and modernize them.

To sum up, there are great opportunities for improving public transport in large cities of the region through employing the potential of developed rail transport networks (railways, trams). This requires allocating more resources to rehabilitation of infrastructure, fleet renewal and increasing quality of service, for example through adjusting facilities to the needs of mobility impaired and integrating rail transport with other means of transport (e.g. ‘park-and-ride’ and ‘bike-and-ride’).

Rapid growth of **informal transport** served as a temporary solution for providing public transport services in the region. They played and – in some cities – still play an important role. In a number of cities, private minibuses still operate without any restrictions, resulting in unfair competition and uncoordinated services. The task now is to improve service quality and reliability by introducing franchising systems adapted to local conditions and by facilitating the development and growth of private operators.

Financing public transport is a crucial issue. In the pre-transition period public transport was co-financed by the central governments. At present it is often one of the largest city budget burdens. Financial relationships between municipalities and transport operators are often unclear. Separation of functions of organizer and operator proved to be a good

118. CEC, 2009.

119. Bus rapid transit is another effective and efficient mean of urban public transport but still it was not widely used in Europe so far.

solution. Similarly, privatization and introduction of competition facilitated efficiency improvements and the reduction of subsidies. Channelling these subsidies through public service contracts has been successfully used in cities of the new EU member states. These solutions should be widely used in cities of the other transition countries. Operators should receive compensation from the decreeing authority for servicing privileged passengers (such as students, civil servants, or pensioners) eligible for free travel or low price fares.

Integration of all transport modes is beneficial to passengers and the organizers of transportation. The necessary financial outlay is relatively small. Integration is also highly valued by public transit users. Means of integration include:

- a common ticket valid for all means of public transport in the city and suburban areas;
- creating 'park-and-ride' and 'bike-and-ride' systems;
- improving or creating hubs serving different modes of transportation, among other through adjustment to the needs of mobility impaired users;
- dynamic passenger information systems; and
- use of telematics solutions.

Freight transport is one of the crucial problems of transport in urban areas. Effective organization is crucial not only for successful supply chain management and servicing urban areas (e.g. waste collection) but also for sustainable development. In transition countries various solutions have been tested and implemented. At the beginning, because of public pressure, drastic measures were considered and implemented in some cities, such as total ban on all heavy vehicles to some areas. This appeared to be so costly (in financial and social terms) that less rigid measures have been applied, such as temporal (nights and/or peak-hours) restrictions on selected roads or in some areas. At the same time, by-passes are built, mostly on roads with high percentage of long-distance traffic. Development of logistic distribution centres is encouraged. Some countries and cities are involved in international pilot projects dealing with goods transport in urban areas. There is a need for complex solutions and transfer of new technologies, such as advanced logistics and ITS solutions.

Advanced traffic management systems which have already been successfully installed in some cities of the region (e.g. Prague, Czech Republic) proved to be highly effective. However, in competition for scarce financial resources this solution usually loses against costly heavy infrastructure projects. Wide application of advanced traffic management systems in all large and medium size cities of the region is highly recommended.

Traffic and parking restrictions in selected city areas are common in Western Europe, but they are still less common in transition countries. Some cities did implement these measures many years ago (e.g. Krakow, Poland). The city can be divided into zones with different access restrictions and parking standards. In zone I (downtown), public transportation fills the primary role in serving the area. Access by automobile can be limited and even totally eliminated from selected streets and areas. Parking standards are based on 'no more than' principle (limited number of places, e.g. per 1000 square meters of offices or shops). Pedestrian, public transport and bicycle traffic are privileged. In outer zones other principles are applied, such as 'no less than' standard of the number of parking spaces for different uses of land.

Low emission zones are another form of access restriction. This solution has already been applied in some cities and is considered as promising measure which should be applied, first of all, in countries with still high proportion of aged vehicles not meeting even moderate emission standards.

Congestion pricing has been successfully applied in various cities throughout the world, e.g. Singapore, Oslo, London and Stockholm. In transition countries, pricing is limited to parking fees applied in many cities. Cordon pricing was introduced only in Riga (Latvia). In some cities introducing congestion charging has been placed on the list of policy measures which will be applied in more distant future. For example, it was mentioned in Warsaw transport policy documents adopted in 1995¹²⁰ and 2009.¹²¹

When cordon/congestion pricing is introduced it is crucial that rates are not regulated by the state law (e.g. fixed rates or maximum rate level), but should take into account the price sensitivity of demand. In any case, congestion pricing is one of the most promising measures alleviating congestion problems and meeting environmental goals.

Creating good **conditions for pedestrians** was treated formerly by transportation planners and policy makers as an unimportant task. Nowadays, walking is finally getting the attention and recognition it deserves. Because of negligence in meeting the needs of pedestrians in planning, in the design and operation of urban roads and in public transport, more attention is needed to improve walking conditions. Pedestrian environment should be improved through applying higher standards in planning/design of footpaths (network, pavement, etc.), elimination of barriers and improving access to buildings and public transport stops. This is the task of both national government (regulations, instructions, and guidelines) and local governments.

Wider **use of bicycles** is encouraged in many cities of region. Creation of public bicycle systems, initiated in some cities of the region, is a highly recommended measure.

Traffic safety is amongst the crucial transport problems of transition countries. In most transition countries accidents and fatality rates are much higher than in Western Europe. This is especially noticed in urban areas. In the whole region, improving traffic safety should be placed at the top of the list of transport policy priorities. Most measures are applicable in all conditions, but some are country or region specific. In the case of transitional countries some attempts have been made to define country specific actions. Examples of these actions include:

- reduction of speed limits in urban areas in the CIS countries; in most of them there is still a 60 kilometres per hour speed limit;
- improvement/development of speed management;
- wider application of 30 kilometres per hour speed limit and other traffic calming measures;
- focus on driver's education and training; and
- introducing a formal procedure for the assessment of road and traffic management design from the point of view of traffic safety (safety audit).

Innovative technologies and successful practices and approaches are particularly important for improving service quality and effectiveness of transport system as well as minimizing the environmental impacts of urban transport. Attractiveness of technological innovations and the **best available technologies** is unquestionable. However, in countries with limited resources and competing needs investing in the best available technologies immediately after their offering is not always viable. Choice of **appropriate technologies** should be made taking into account marginal costs of adopting a particular standards confronted with social and economic benefits. Opportunity cost of the capital in transition

120. Warsaw, 1995.

121. Warsaw, 2009.

countries is still very high and often it can be rational to apply broadly tested and implemented technology, cost of which is substantially reduced some time after first applications.

In most of the transition countries **central governments** have totally or significantly withdrawn from assisting cities in solving their problems. Central governments must take on more responsibility for urban transport. They should help cities by supporting research, disseminating information about best practices, and establishing a legal framework for public transport systems. Moreover, many local governments desperately need the financial assistance of central governments for crucially needed capital investment through direct subsidies or loan guarantees.

Institutional changes and capacity improvements, particularly in municipalities, are essential to supporting integrated land-use and transport planning and effective management of urban transport.

Public acceptance of policies and strategies is an important success factor. Policy changes in the transport sector in transition countries also have a psychological dimension. More than in Western Europe, the car is seen as a symbol of social status, wealth and self-confidence, not just as a means of transport. Opinions are expressed that, in transition countries, policies and actions that affect car ownership and use and give priorities to public transport do not have public support.¹²² But this is not always true. For example, surveys indicate that the majority of urban citizens in the new EU member states support giving public transport traffic priority (e.g. bus lanes) even though that requires restrictions on car use.¹²³ Proper recognition of the preferences of transport users is crucial for political decisions concerning transport in the city. At the same time, it is necessary to inform well the client (urban citizen) about the weak and strong points of alternative solutions. Therefore, communication with society is essential.

122. Stead et al, 2008.

123. Suchorzewski, 2007.

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