CONTEXT

PROBLEMS

ACTIONS

CONCLUSIONS

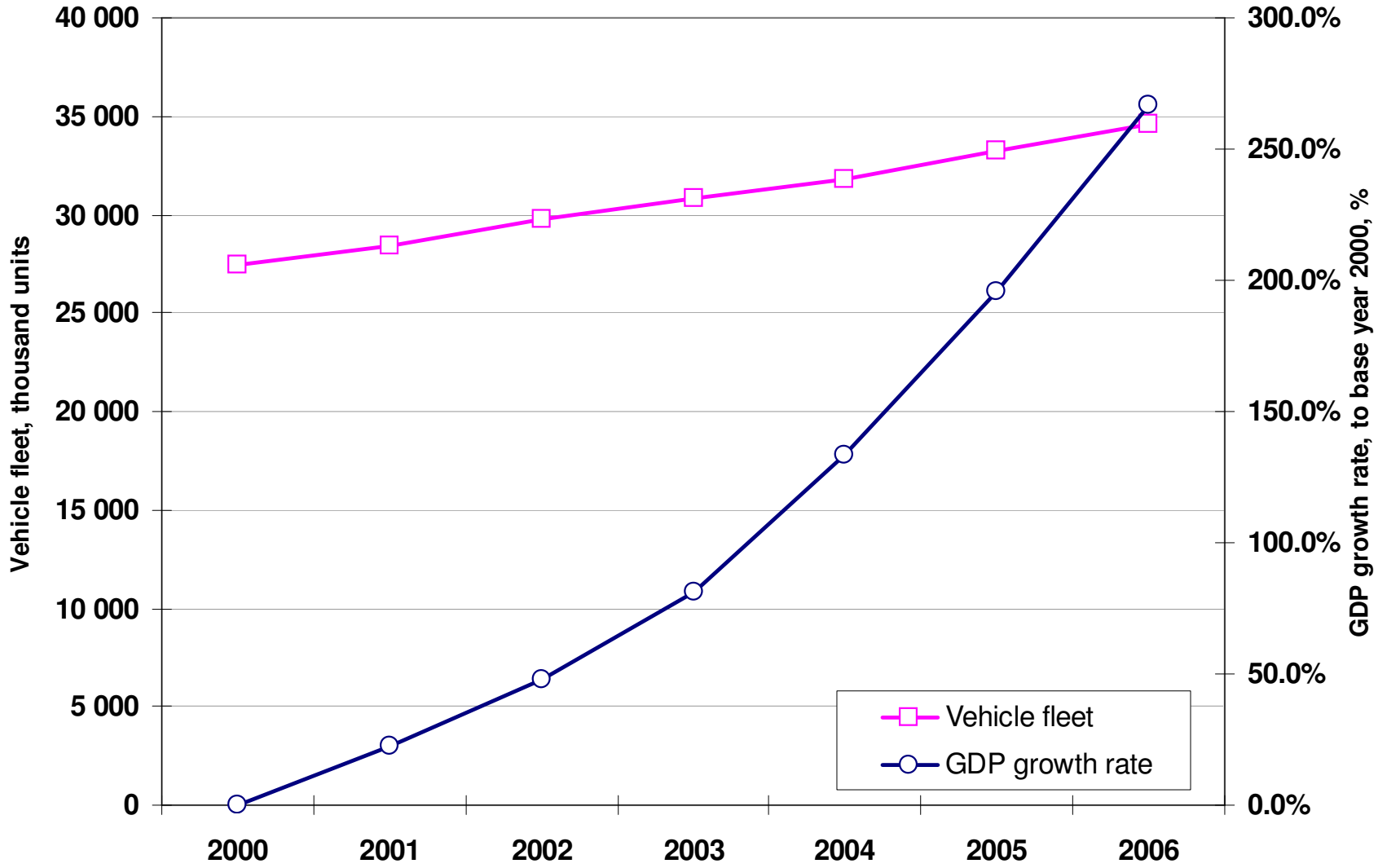
Scientific and Research Institute of Motor Transport (NIIAT)

Challenges of achieving urban transport sustainability in Russian Federation: a case of Moscow

Presentation for
CIVITAS Forum 2007

Prof. Vadim Donchenko,
Director General

Russian vehicle fleet and GDP dynamics



CONTEXT

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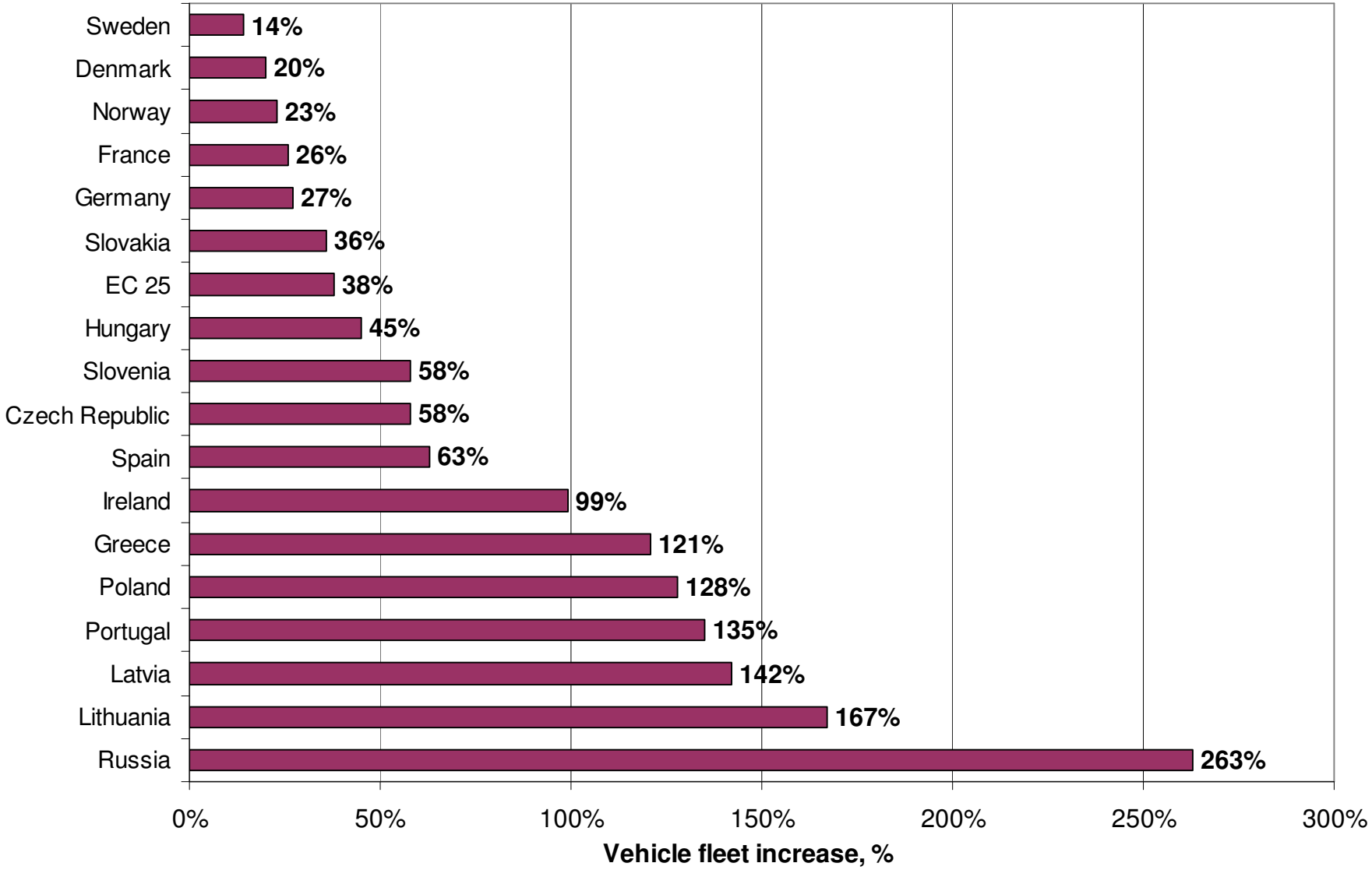
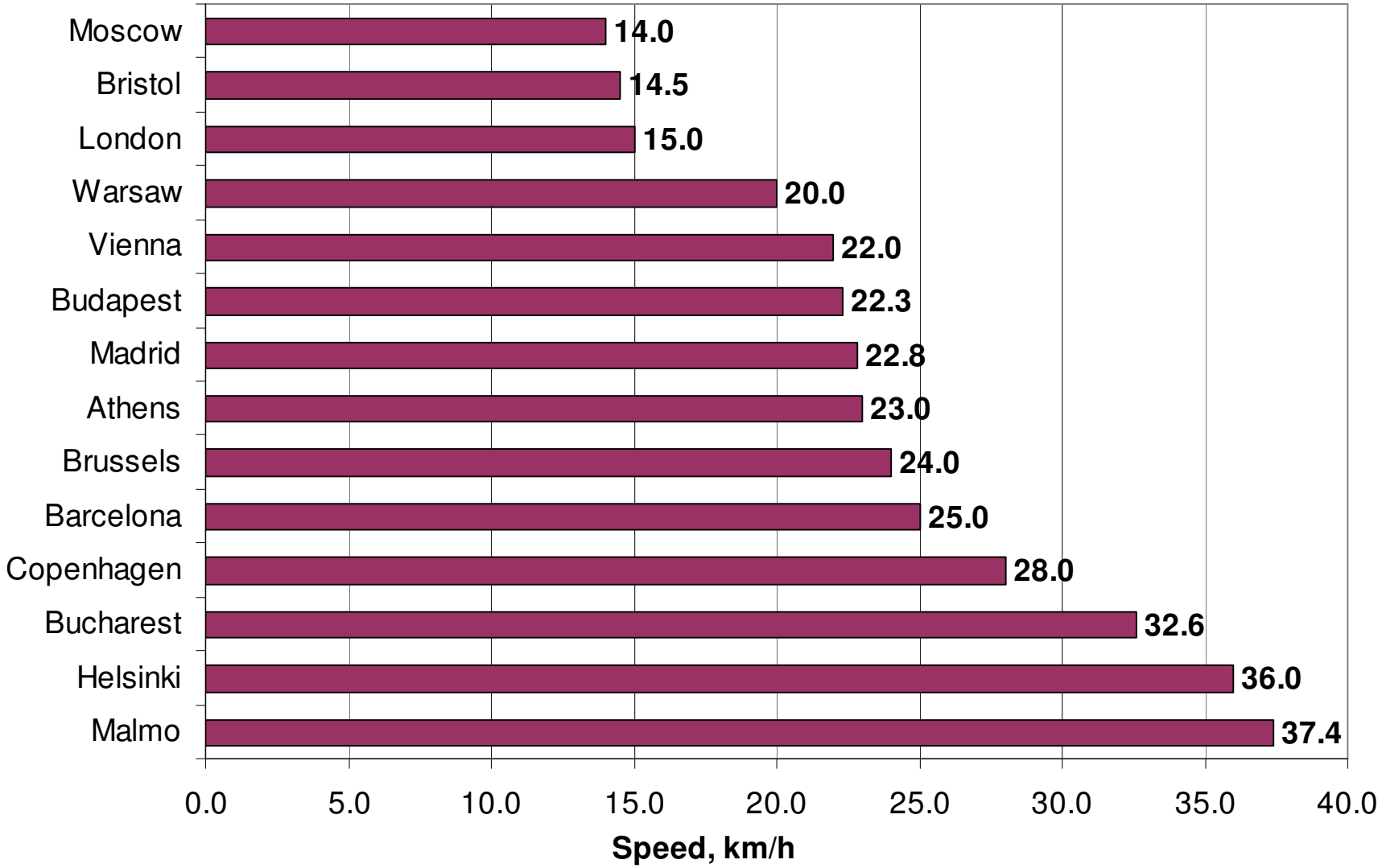
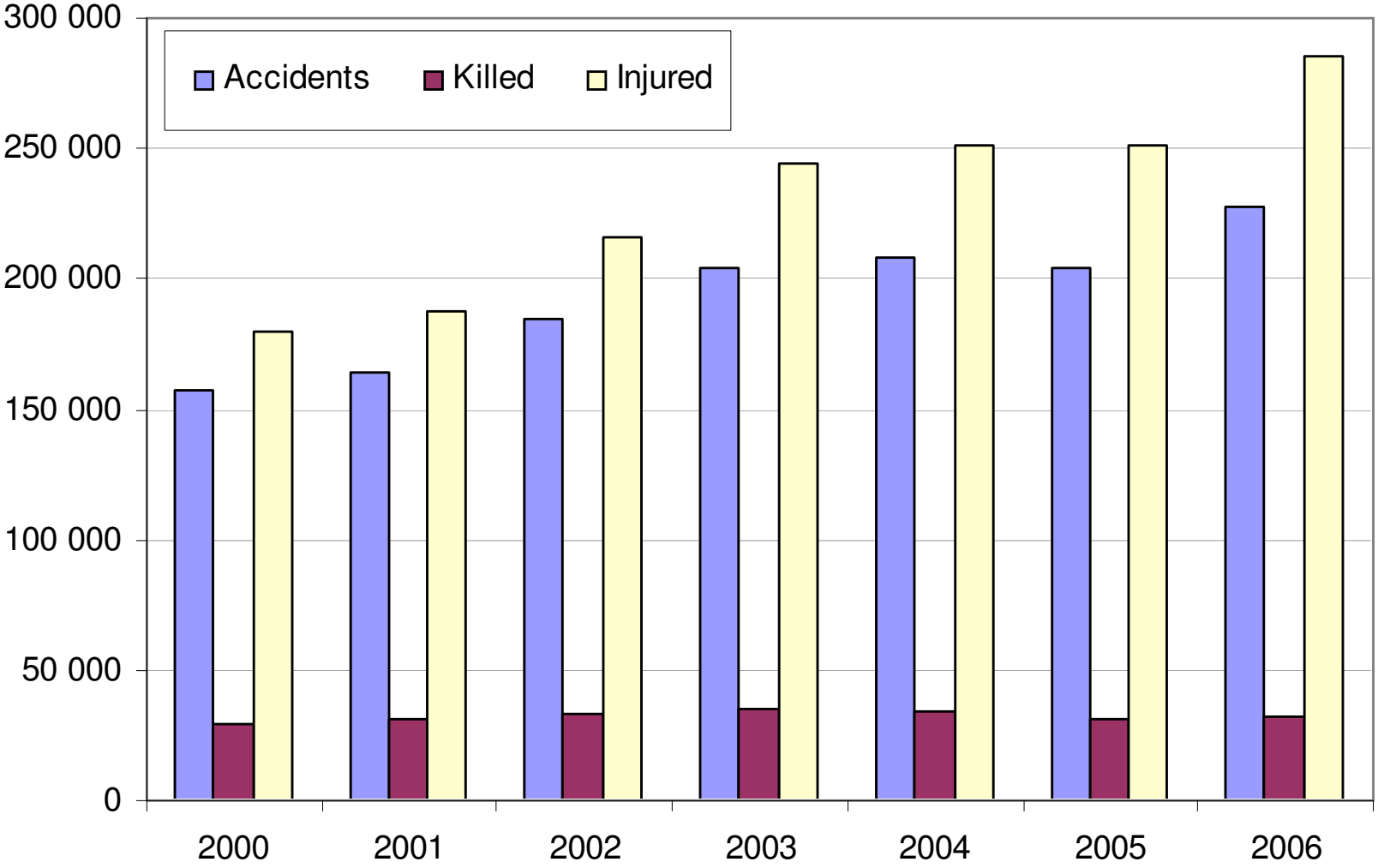
Increase of motor vehicle fleets across Europe (1990 – 2004)



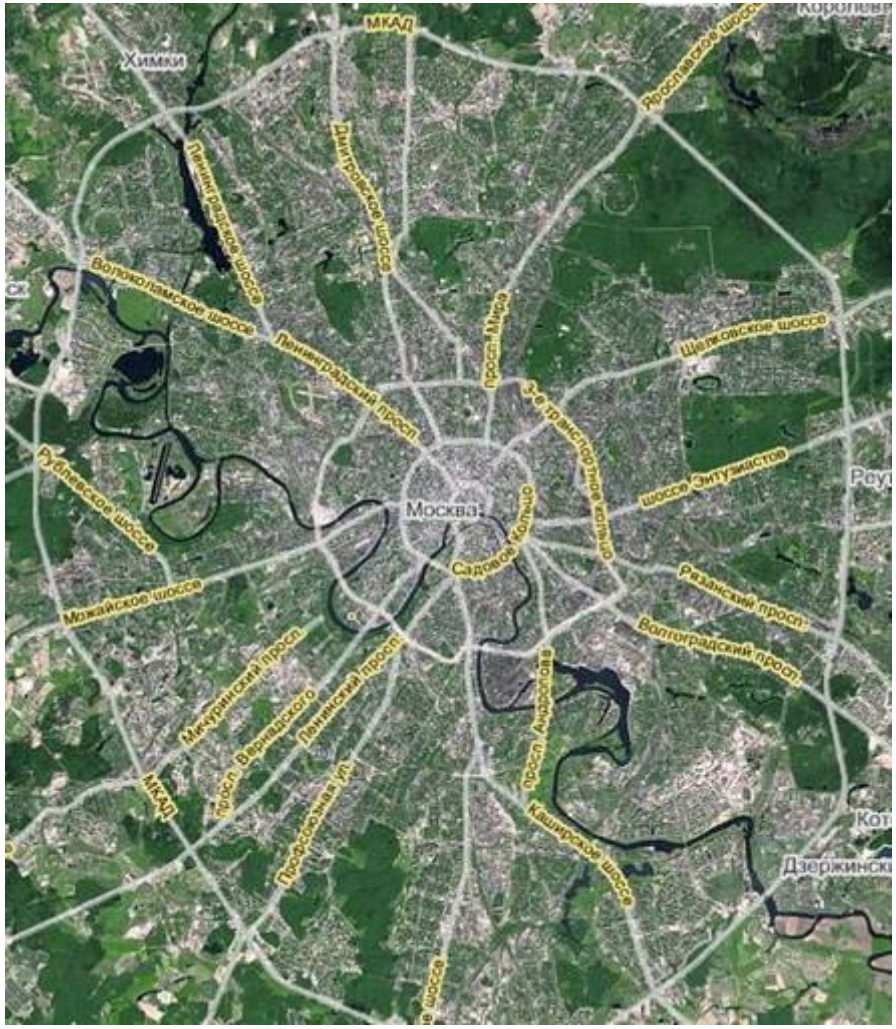
Average peak period traffic speed in European cities (2005)



Traffic accident dynamics in the Russian Federation



Moscow: facts and figures



- **Area: 1081 km^2**
- **Population: 10.4 million**
- **Road network length: 4 525 km**
- **Road network density: 0.07 km^2/km^2 or 4.2 km/km^2**
- **Motor vehicle fleet: 3.1 million**
- **Vehicle ownership: 297 per 1000 people**
- **Car ownership: 267 per 1000 people**

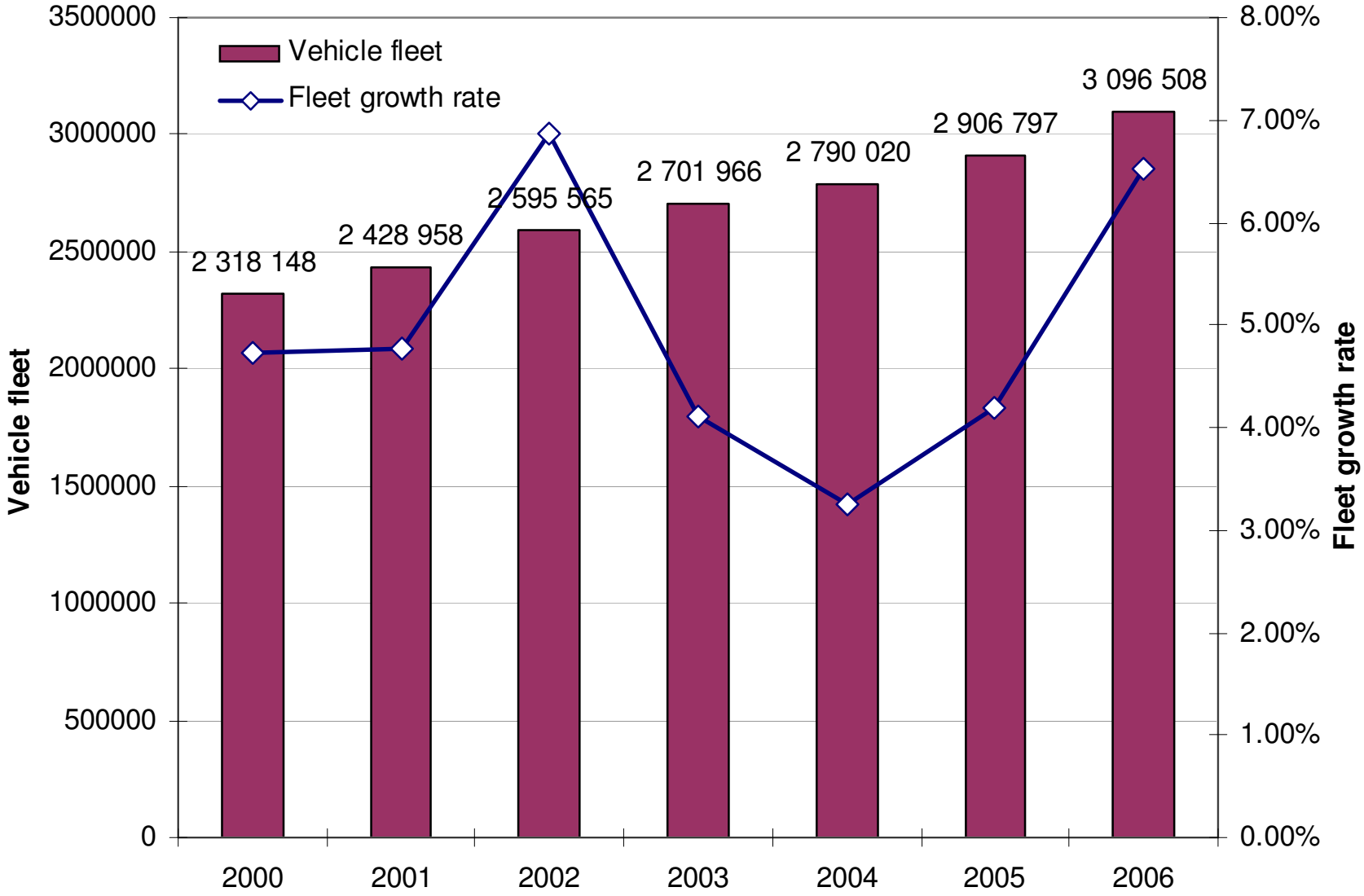
Features of Moscow transport system

- **radial road network structure** (twelve radial arterial roads emerging from the city's centre, and the three main inner ring roads).
- **rapid increase in vehicle ownership** (over 3 million vehicles currently, and keeps increasing yearly by about 200 thousand).
- **major role of public transport**, which provides over 70% of the yearly passenger transportation volume (metro including).
- **well-developed rapid transit system (metro).** Providing over 30% of the city's passenger transportation volume, metro has high working speed (40 km/h) and short intervals (0.8 – 3 minutes);
- **high volumes of freight traffic passing through the city.** According to some estimates about 70% of the goods transported by road in the European part of Russia, come through the numerous freight terminals and customs warehouses which are situated either within the city or in the near suburbs.

Road network density in some biggest cities of the world

City	Road network density, km/km^2
Chicago, Tokyo, Osaka	>16
New-York	13,3
Greater London, Los-Angeles, Philadelphia	8-9
Budapest, Berlin, Warsaw, Hamburg, Vienna, Milan	5-7
Moscow	**4,2**

Moscow vehicle fleet dynamics, 2000-2006

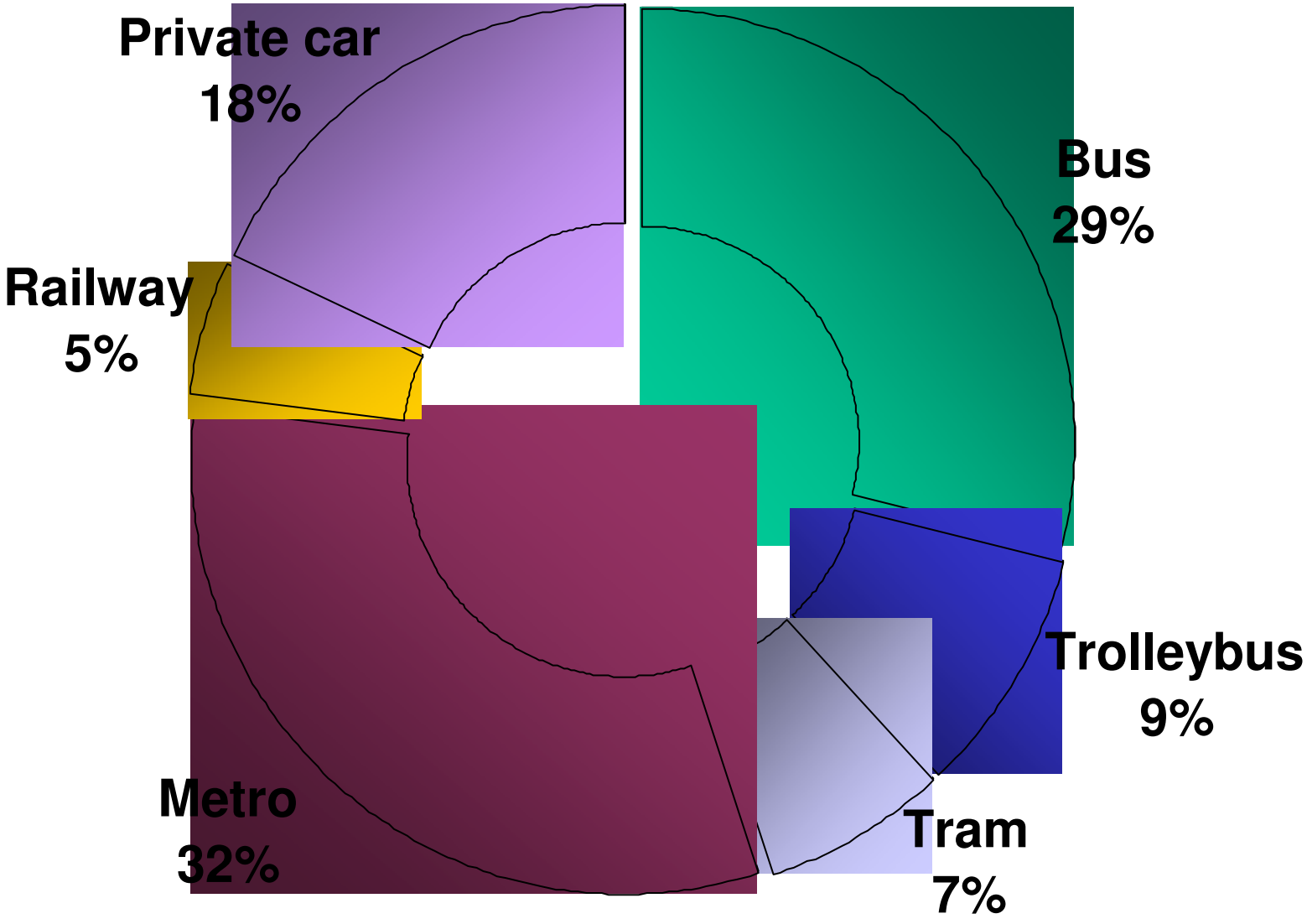


Parameters of Moscow public transport modes (2005)

	Bus	Trolleybus	Tram	Metro*	Railway
Fleet, units	5 485	1 603	896	510	-
Route length, km	5 997	939	419	278	395
Annual transportation volume, mln. pass.	2 309	722	522	2 600	408

* - a number of trains is mentioned in the “Fleet” row.

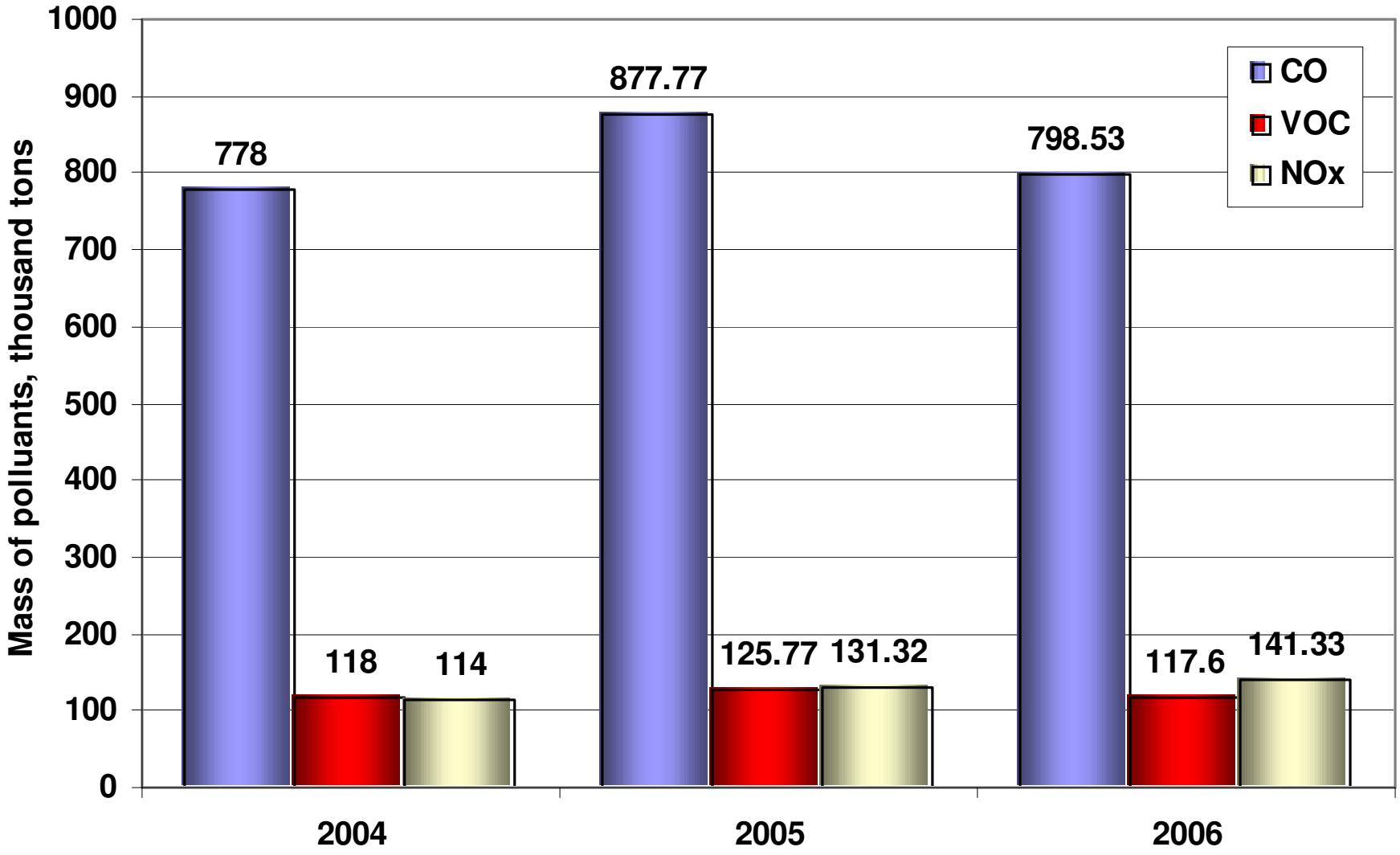
Modal shares in total passenger transportation volume (2005)



Consequences of congestion in Moscow: facts and figures

- Average peak period intervals on 65% of the surface public transport routes exceed 15 minutes;
- Average working speed of surface public transport is around 13-15 km/h;
- Average travel time for home to work trips exceeds 1 hour, while city planning requirements demand that it should be no longer than 50 minutes;
- Public opinion survey (2006) shows that 56% of the citizens consider traffic congestion a major problem. (In 2003 only 21% were concerned with congestion);
- According to Moscow Research and Design Institute of City Planning, 55% of the road network have approached their capacity limits;
- Links with average daily speed of less than 20 km/h constitute about 70% of the road network;
- A rough estimation shows that the annual congestion costs in Moscow (only time loss and over-consumption of fuel were considered) exceed 9 % of gross regional product of the city.

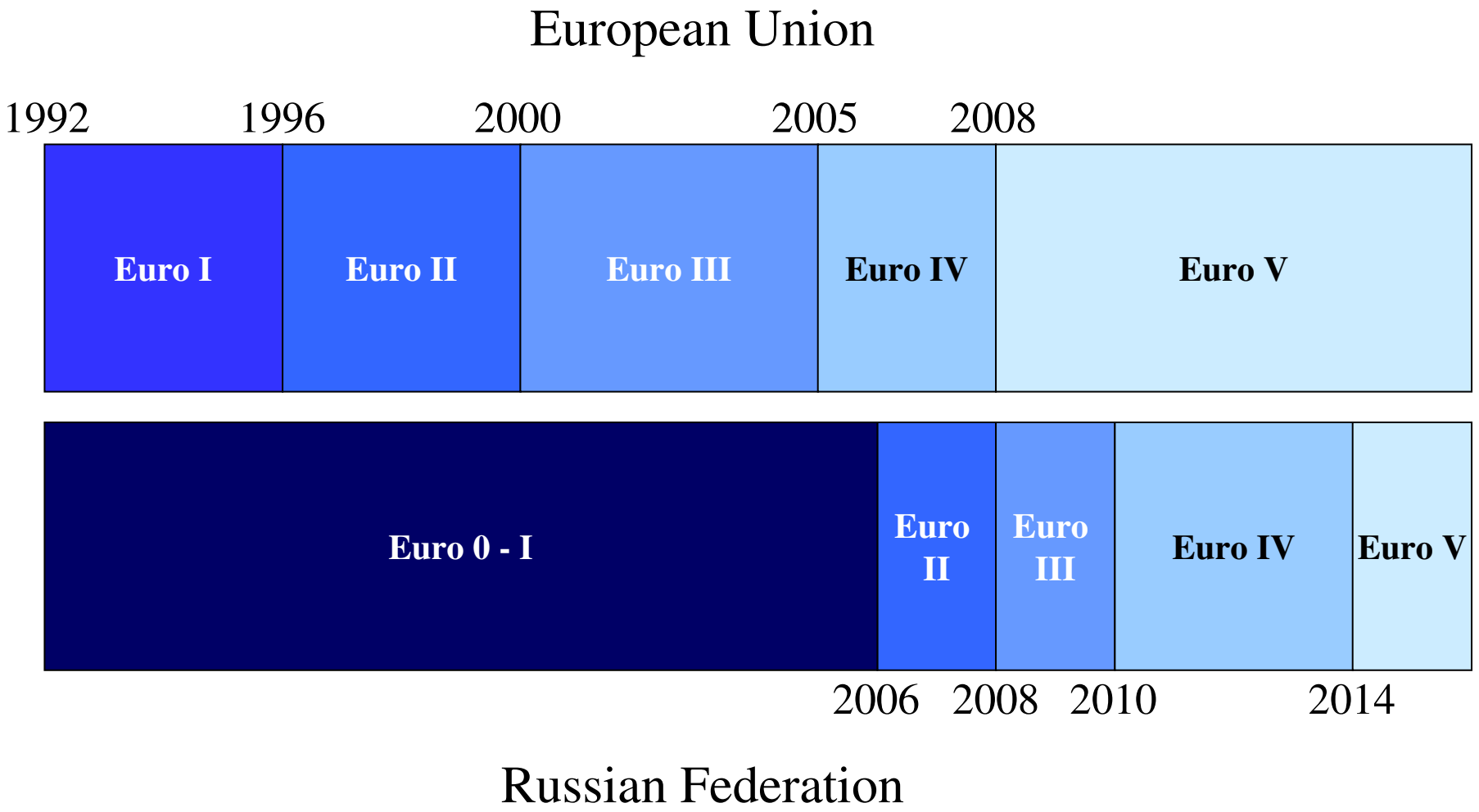
Emissions from motor transport (Moscow)



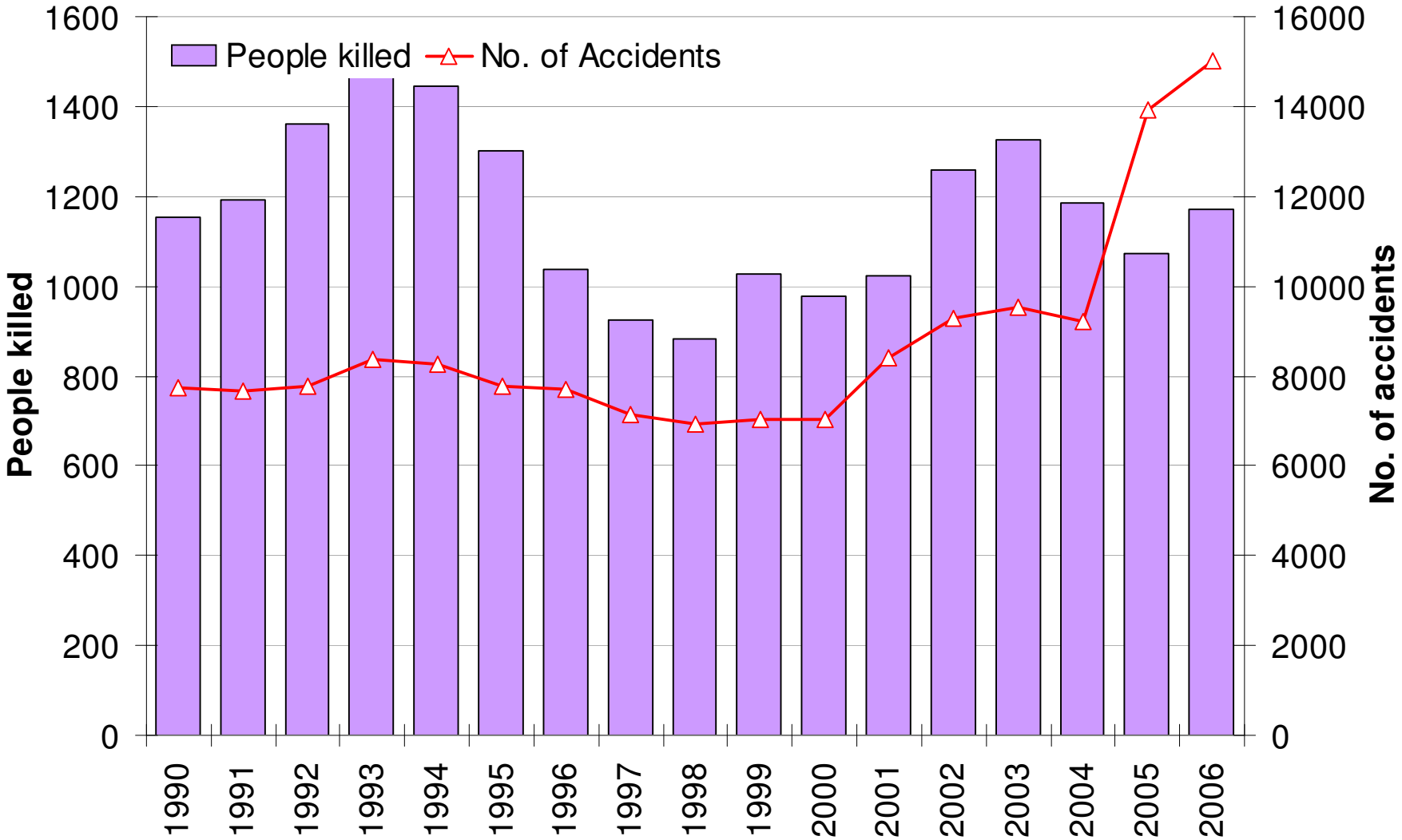
Average concentration of pollutants in the atmosphere (Moscow, 2006)

Pollutants	Average yearly concentrations, % of maximum allowed			
	At the roadside	City center	Residential areas	Average value for Moscow
CO	45%	40%	27%	30%
NO_2	135%	97%	95%	110%
NO	120%	75%	67%	70%
Atmospheric pollution index (ISA-5)	7.1	5.8	5.6	6.1

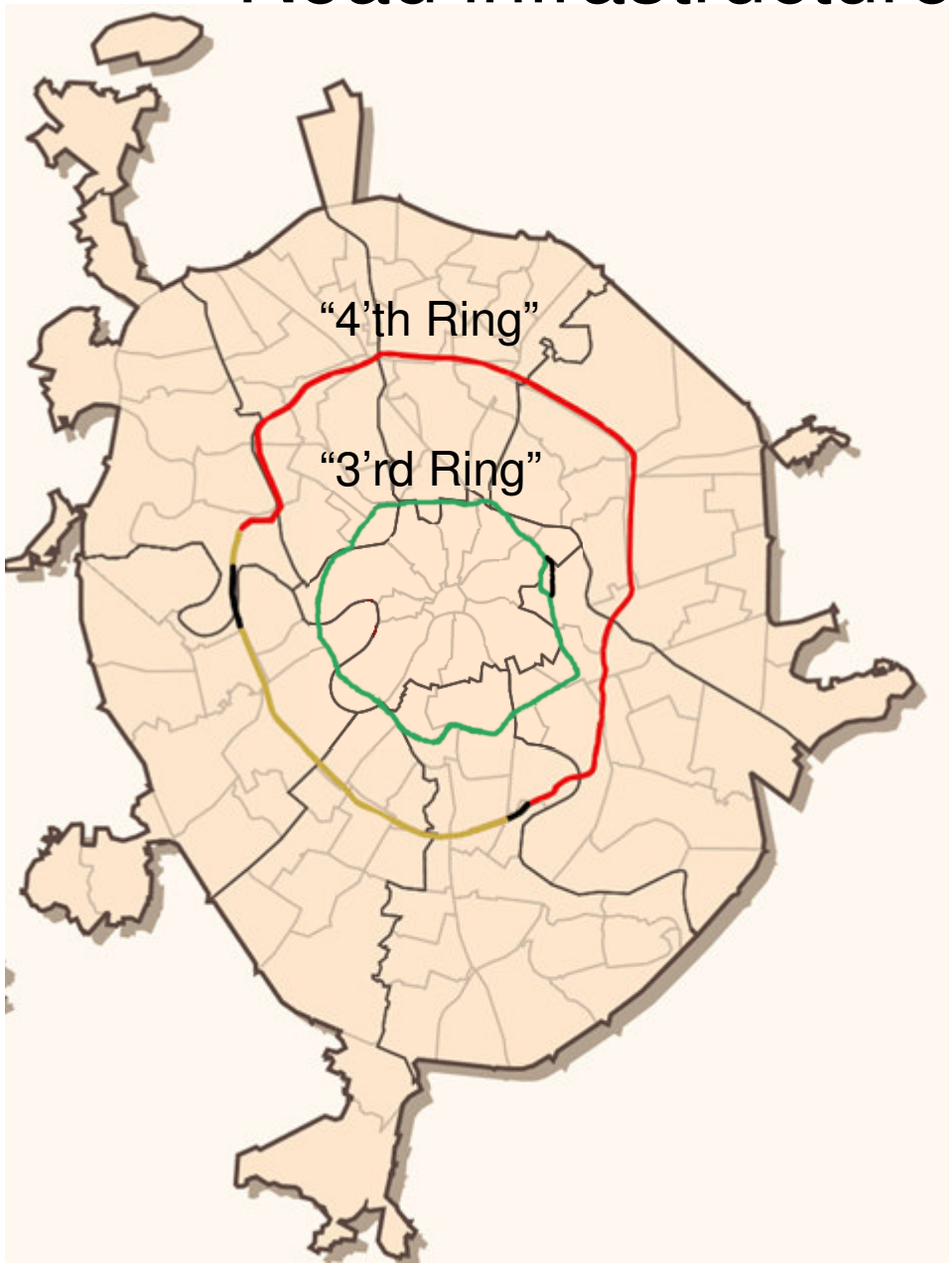
Vehicle environmental requirements: schedule of introduction



Traffic accident dynamics in Moscow



Road infrastructure development



- During last decade over 100 km of roads were built in Moscow, including 59 km of highways. Still, car ownership increase rate is 4 times as high as the rate of road network growth;
- 35-km “3’rd Ring” completed in 2003;
- Construction of a new 61-km “4’th Ring” has begun.

- existing roads (3’rd Ring);
- existing roads (4’th Ring);
- planned roads;
- tunnels.

Surface public transport development

Target Programme of Surface Public Transport Development for 2007 – 2009 contains the following measures:

- Introduction of the public transport priority lanes which are expected to achieve 30 km/h average speed for public transport;
- Conversion of the 575 city-owned buses for the use of CNG is planned for 2007-2009
- Purchase of 3042 new Euro III buses and 420 trolleybuses;
- Construction of the 2 new trolleybus depots and 1 new tram depot;
- Opening of the 4 new trolleybus routes (54 km in total) and 1 new tram line (9 km).

Development of Moscow Metro till 2011

- Moscow metro has 272 km of metro lines and 173 stations;
- Currently Metro operates at maximum capacity, and is overcrowded during peak periods;
- 13 new stations and 27 km of tunnels are to be built till 2011.

- existing radial lines;
- existing ring line;
- planned lines;
- planned stations;
- planned stations, financed by PPPs.

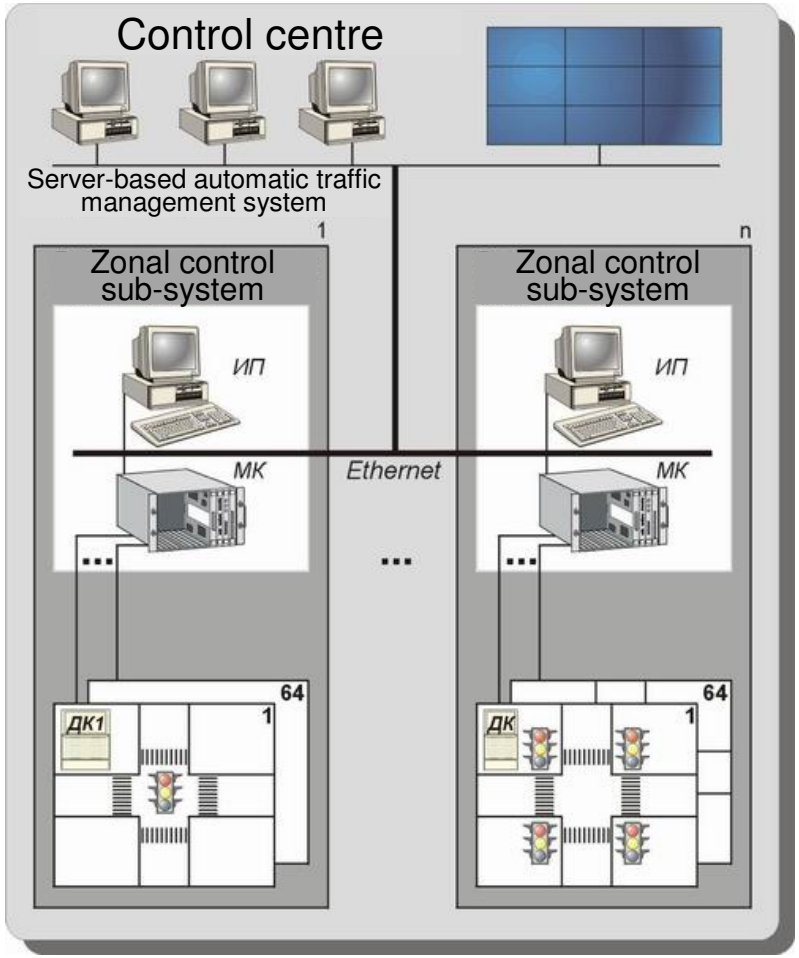
Moscow monorail and light rail experiments

4,8 km monorail line with 6 stations opened in 2004

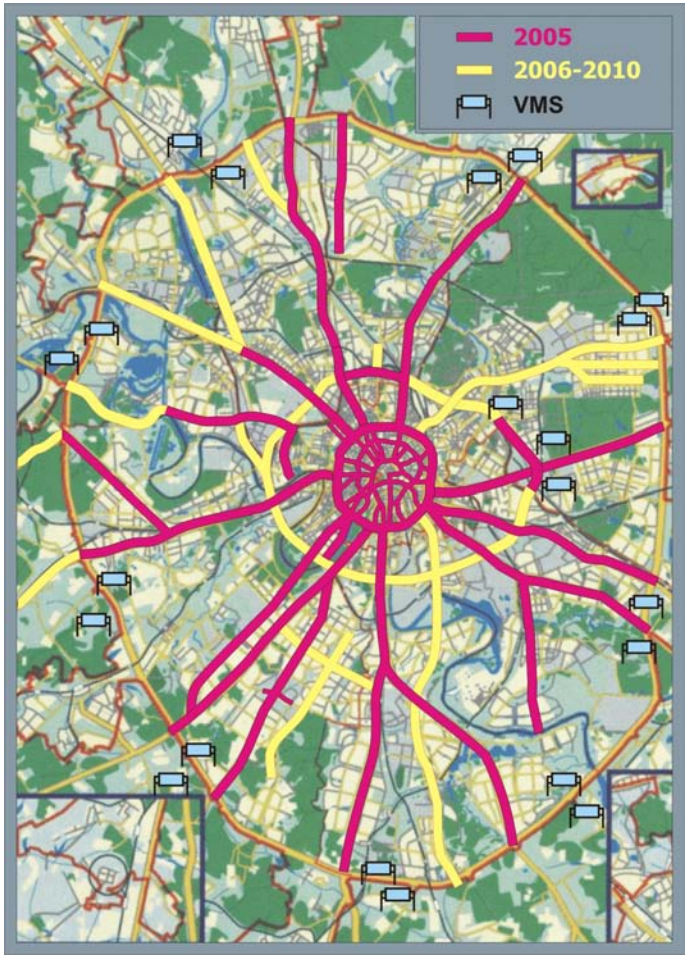
5,5 km light rail line with 5 stations opened in 2003

START traffic light control system

Components of the START system



Placement of the START traffic detectors



Parking policy

- **Currently dedicated parking facilities are only available to about 1,05 million motor vehicles** (42% of the city's vehicle fleet). The rest of the vehicles are parked either at the roadside or in living areas;
- **Congestion is made worse by a shortage of off-street parking places**, as many car drivers park their vehicles along the roadside thus reducing the road network capacity. At present the city's authorities have no coherent parking policy and no effective means to enforce parking restrictions.

Parking policy

Target programme "Unified Urban Parking Space", currently being developed by the authorities, has the following goals:

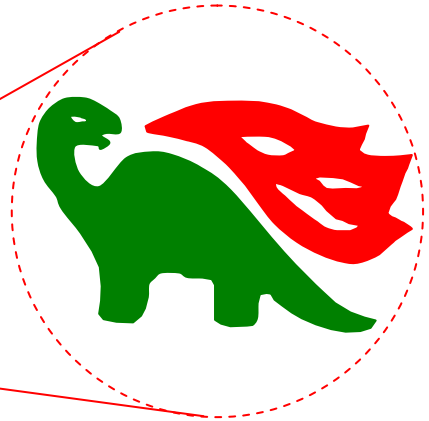
- to provide parking space to 2,5 million vehicles by 2020;
- to introduce Park&Ride facilities;
- to introduce automatic parking fee collection;
- to establish minimum parking space requirements to new buildings;
- to develop legislation necessary for effective enforcement of parking rules and restrictions.

Fuel environmental requirements

- While draft of the national Technical Regulations setting fuel quality requirements is still being discussed, Moscow introduced its regional requirements from 2004;
- Euro III requirements to petrol retailed in Moscow are in force since 01.01.2006;
- Euro III requirements to diesel fuels were introduced in the beginning of 2007;
- Euro IV diesel fuel is available on the market (mostly produced by LUKOIL Company);
- “Eco Fuel” sign is awarded to filling stations which voluntarily submit to, and successfully pass, fuel quality inspections.

Switching to alternative fuels

A city-owned bus fueled by methane



- In 2006 a share of alternative fuels (natural gas, LPG and dimethyl ether) was 3% of total consumption by the city's vehicle fleet. By 2010 the authorities plan to raise this share to 5%;
- Currently LPG is available at 24 filling stations, and compressed natural gas at 12 stations;
- Conversion of the two city-owned bus fleets (575 vehicles in total) for use of CNG is planned for 2007-2009;
- According to the authorities' plans for 2008 – 2010, CNG, LPG and dimethyl ether will be made available on 25, 36 and 3 additional filling stations, respectively.

Policy problems on the Federal level

- **Insufficient priority of transport sustainability problems** compared to other priorities of federal authorities (development of economy, safety of the population, etc.). Lack of the targets at a level of the Government of Russia and lack of responsibility of authorities for achieving these targets.
- **Lack for the present moment of the strategic documents defining state policy** in the field of the complex solutions of urban transport problems, providing, first of all, coordination and agreement of decisions and measures implemented in various sectors of economy (coordination with industrial, and environmental policies, policies in the field of public health services, a town-planning policy, a financial and economic policy).
- **Lack at a federal level of necessary legislative base in the field of road and urban transport**, The legislation, giving enough powers to local (city) authorities to introduce restrictions on motor vehicle use (such as road and cordon tolls, parking fees, etc.) is currently absent.

Policy problems on the local (city) level

- **Insufficient understanding by the authorities of complex character of urban transport sustainability problems.** As a rule, all the attempted solutions contain only simple engineering or administrative measures and decisions (road building, conversion of the vehicles to alternative fuels, fitting them with catalytic converters, etc.).
- **Poor coordination of efforts and actions by various city structures** responsible for road building, public transport, city planning, environment, etc..
- **Prevalence in urban transport policy of approaches and decisions aimed at increasing road network capacity**, which, in turn, leads to increase in transport demand and, accordingly, to the further increase of traffic volumes ("induced traffic"). Thus administrations practically ignore various measures restricting vehicle use, which are unpopular among vehicle owners.
- **Lack of interdepartmental coordination of decisions on complex problems of urban transport sustainability.**