



INSTITUTE OF TRANSPORTATION ENGINEERING
OF THE CITY OF PRAGUE

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THE YEARBOOK OF TRANSPORTATION

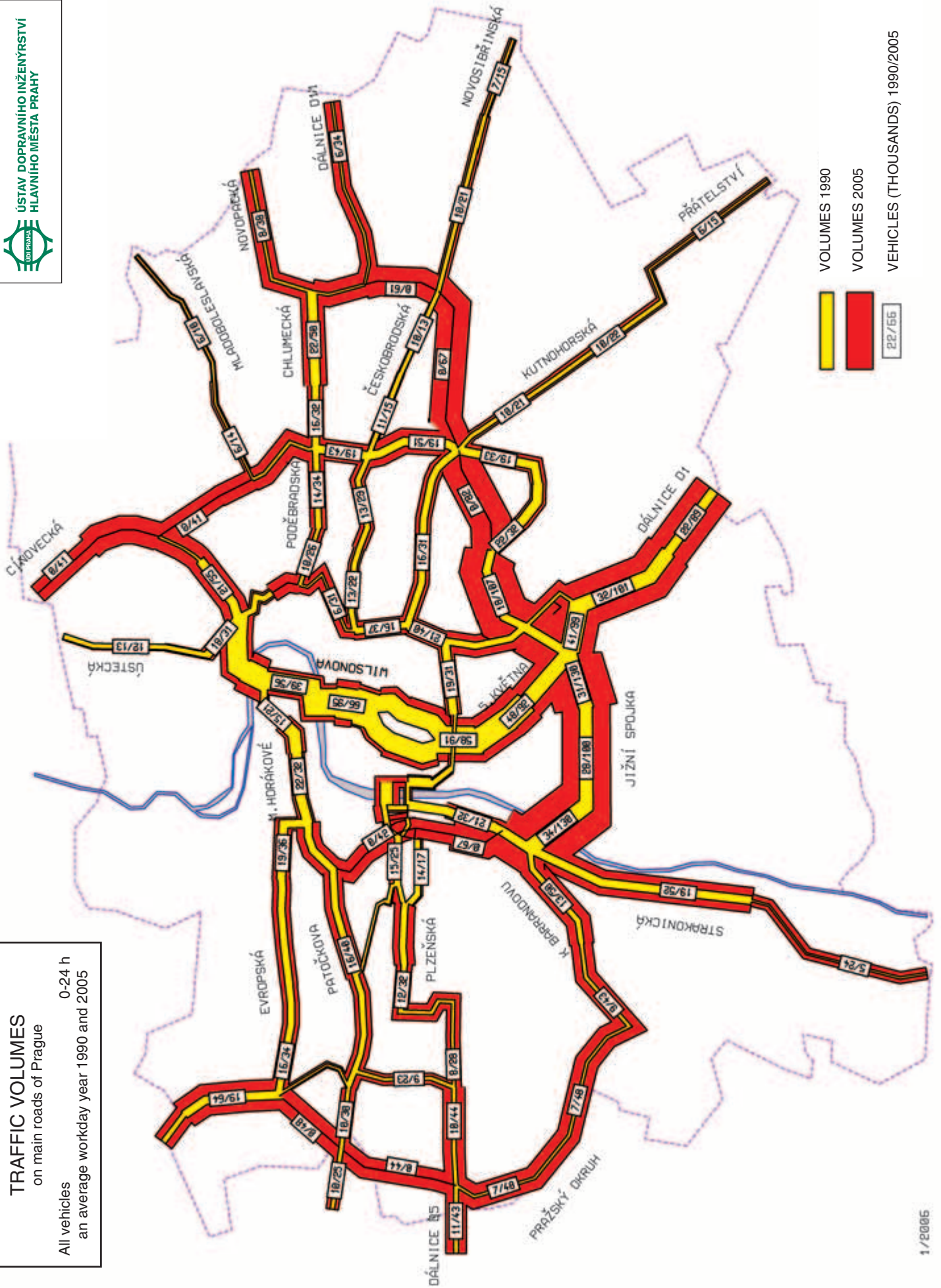


PRAGUE 2005

TRAFFIC VOLUMES
on main roads of Prague
0-24 h
an average workday year 1990 and 2005

All vehicles

1990
2005



THE YEARBOOK OF TRANSPORTATION

PRAGUE 2005



**INSTITUTE OF TRANSPORTATION ENGINEERING
OF THE CITY OF PRAGUE**

ABBREVIATIONS

AADT	Average Annual Daily Traffic (a 24 h average, with seasonal correction)
ADT	Average Daily Traffic (a 24 hour average, no seasonal correction)
av.	average
AVO	Average Vehicle Occupancy
bn.	billion(s) (1×10^9), thousand(s) of millions
B+R	Bike & Ride
cca	approximately
CTP	Children's Traffic Playground
Coll.	Collection of Laws and Ordinances
CZ	Czech Republic, Czechia
CZK	Czech crown (Kč)
DP hl. m. Prahy	Prague Public Transit Co. Inc.
GVW	Gross Vehicle Weight
h	hour(s) (unless specified by a.m./p.m., the 24 h cycle is used)
HQ	headquarters
IT	information technology
Kč	Czech crown (CZK)
K+R	Kiss & Ride
MHD	municipal public transport (i.e. PT)
MPR	<i>Městská památková rezervace</i> (see also PCA)
mill.	million(s)
PID	Prague Integrated Transport
PC	Passenger car
PCA	Prague Conservation Area (see also MPR)
PT	public transport service (i.e. MHD)
P+R	Park & Ride
TSD	Traffic Signal Device
TSK	Prague Road Maintenance
ÚDI Praha	Institute of Transportation Engineering of the City of Prague
veh.	vehicle
VKT	Vehicle Kilometres Travelled
VPD	Vehicles Per Day
y-o-y	year-on-year
yr	year
ZPS	Zones of Paid Standing
000s	thousands
%	per cent

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Dear readers,

in the last five years we have been observing a positive development in number of public urban transportation users. Following a sharp drop in the early 1990s, we have seen a slow, steady growth of number of passengers in public transport, rising by as much as 15 per cent from 2000. The 6,2 per cent increase in 2005 as compared to 2004 has disproved apprehensions that the rise in fares would reduce numbers of persons transported. The average 3.77 million passengers in the public transport system of Prague every day help maintain the very positive 57:43 modal split which other large European cities can envy.

These results could not come, however, without efforts and investments. The municipality of Prague is steadfast and consistent in preferring public transport by all means. One of the financially very demanding ways is the Metro construction, still underfinanced by the state budget contribution. The stage Two construction of the section IV at the Metro line C from Ládví to Letňany continued last year, the driving of line tunnels finished in November 2005 and the whole line is expected to be opened in 2008, improving the public transport throughout the north of the city. Another construction on the Metro network that went on in 2005 was a new station on the line A named Depo Hostivař. The A line is going to be extended by 1 km and 1 station toward the east in May 2006. The new terminus outside the residential areas enables a construction of a large bus terminal and another new Park-and-Ride facility with the capacity of 180 parking bays.

The funds of the City of Prague were directed also to the public transportation's fleet renewal. Deliveries of new M1 trains for the Metro were carried out in 2005. Currently, there are 45 of them in operation. Another example could be two brand-new low-floor 14T trams manufactured by Škoda Transportation Plzeň. Their impressive design created by Porsche cannot be overlooked in the streets of Prague.

A testimony to the particular interest the municipality of Prague has in supporting the public transportation is the 8 billion CZK of urban transport operation subsidies in 2005 which is almost 80 per cent of total operational expenditures of Prague public transport system.

The data our yearbook provides are witnessing that the City of Prague is aware that creating a quality traffic system in and around the city is a necessity. The public administration of Prague reflects this necessity in its efforts to fulfil the objectives of its long term traffic policy.

A handwritten signature in black ink, appearing to read 'R. Šteiner'.

Radovan Šteiner
Councillor of the City of Prague

May 1st, 2006



Dear readers,

this yearbook we offer to you annually provides fundamental data concerning the transportation in Prague, this time for 2005. While the vehicle traffic volumes are virtually stagnant or slightly decreasing in the city centre during the last 7 years, the middle and outer urban zones meet a continuous traffic increase, by 3 to 6 per cent in the last year. The total volume of middle zone car traffic rose on some roads as much as four times since 1990. 250 thousand vehicles enter Prague each day, which is over three times as much as in 1990. The road carrying the heaviest load in Prague (and the country) is *Jižní spojka* (City Ringroad on its southern section) with 130 thousand vehicles passing on each day. Over 100 thousand vehicles move daily along the drive *Brněnská – Jižní spojka – Barrandovský most – Strakonická* which substitutes a yet to be built Outer Ringroad and is a link between the D1 and D5 motorways, in fact between European East and West. Hence it has been and still is of utmost importance to finish the Outer Prague Ringroad, the construction of which is needlessly being blocked and delayed by misled environmentalists.



In 2005, many traffic constructions or function units were put in operation, improving the urban mobility. The key railway project “New Link”, the railway connection of *Hlavní nádraží* and *Masarykovo nádraží* stations with *Libeň* and *Vysočany* stations, has seen a 300 m segment of elevated road *Krejčárek – Palmovka* being completed. Another function unit is the new grade-separated junction on *Strakonická* road at *Malá Chuchle* neighbourhood which eliminates a dangerous spot on the radial road. Related to the completion of the new shopping centre *Chodov*, access ramps to *Brněnská* road were adjusted and substantially modified and, most notably, a new Park & Ride facility of almost 700 parking places was built. A new airport terminal, *Sever 2*, was constructed at the *Ruzyně* airport, further enhancing air services.

An ongoing effort for improved efficiency in urban road traffic arrangement and control, designs of traffic engineering measures to reduce traffic accident rate, monitoring and evaluating the development of traffic as well as systematic preparation for future development of urban mobility, these are basic assignments of traffic engineering. The traffic engineering needs of the Capital of Prague and also other cities and regions have been supplied by the **Institute of Traffic Engineering of the City of Prague** (*ÚDI Praha*) for as many as 40 years. The *ÚDI Praha* was established by municipal authorities due to a government decree No. 34/1966 beginning from February 1, 1966, with the purpose of systematic monitoring of traffic relations, suggesting traffic measures to enhance road safety and flow as well as processing traffic strategy in all stages of mobility network construction in Prague. The traffic and transportation engineering team in Prague has followed the pattern and experience of similar entities in western Europe and USA where the explosive growth in traffic volumes during the first half of 20th century demanded rapid advancement in the specialization. Prague felt the need later, during 1960s, and more seriously after 1989 when many fields saw unprecedented expansion, business was in boom, trade and services improved radically, national border opened, with all that contributing to a massive build-up in vehicle counts and traffic volumes in Prague. One could even say the car traffic in Prague has increased in the last 15 years more than during the preceding 100 years of motoring. Such a dynamic development of traffic reflecting the economic growth entails also its drawbacks. The more important seems the quality of traffic engineering in order to help solve urban mobility as a whole, focusing on the safe flow of traffic, high and efficient use of public transport as well as environment consideration.

May 1st, 2006


Ing. Ladislav Pivec
Director

1. BASIC DATA

1.1 The Capital of Prague

Selected data on the Capital of Prague as of 31.12.2005

City area	.....	496 km ²
Population	.....	1 180 000
Total road network	.....	3 538 km
specifically, motorways within the city	.....	10 km
other urban motor roads	.....	76 km
Number of bridges in road network	.....	591
specifically, bridges across the river	.....	27
grade-separated intersections	.....	210
underpasses	.....	123
Number of tunnels (total length 4 553 m)	.....	7
All motor vehicles	.....	749 786
including passenger cars	.....	602 339
Motor vehicles per head		
in vehicles per 1 000 inhabitants	.....	635
Passenger cars per head		
in cars per 1 000 inhabitants	.....	510
Metro (underground) network (in operation)	.....	53.7 km
Tram network	.....	140.9 km
specifically, dedicated trackbed	.....	52 %
Public Transport bus network	.....	675.7 km
Traffic lights	.....	473
specifically, co-ordinated into "green waves"	.....	265
with traffic-actuated control	.....	245
with tram and bus priority	.....	102
separate pedestrian crossings	.....	66
Vehicle kilometres travelled (VKT) in motor car traffic		
in an average workday	.....	19.9 mill. VKT
annually	.....	6.6 bn. VKT
Modal split (based on all trips in the city in a workday)		
public transport	.....	57 %
car transport	.....	43 %
Traffic accidents	.....	33 349
Traffic accident injuries		
fatal	.....	61
serious	.....	393
slight	.....	2 603
Relative accident rate (accidents per 1 million VKT)		5.1

1.2 Prague compared with the Czech Republic

	Prague	CZ	Prague/CZ (%)	
Area (km ²)	496	78 864	0.6	
Population (mill.)	1.18	10.25	11.5	
specifically, the workforce	0.601	4.707	12.8	
Motor vehicles (000s)	750	5 402	13.9	
specifically, passenger cars (000s)	602	3 955	15.2	
Motor vehicles per head	(motor vehicles per 1000 persons)	635	527	
	(persons per 1 motor vehicle)	1.6	1,9	
Passenger cars per head	(passenger cars per 1000 persons)	510	386	
	(persons per 1 passenger car)	2.0	2.6	



Vehicle kilometres 1990 – 2005 (millions VKT / avg. workday 0-24 h)

Year	Prague*	CZ+
1990	7.3	80.9
2000	16.6	131.2
2003	18.8	138.4
2004	19.7	143.3**
2005	19.9	148.0**
Index 05/90 (%)	273.0	182.9**
Index 05/04 (%)	101.1	103.3**

* the whole road network

+ motorways & roads, class 1, 2 & 3, incl. sections inside Prague

** preliminary data

2 CAR TRAFFIC

2.1 Development in number of motor vehicles and cars

The total number of motor vehicles registered in Prague rose steeply until 1999. During 2000–2004, the rise slowed down. The substantial share in the build-up of motor vehicles is brought about by passenger cars.

Registered motor vehicles in 1961 – 2005

Year	Prague					Czech Republic (Czechoslovakia till 1971)				
	Popul. (000s)	Motor vehicles ^x number	%	Passenger cars ^x number	%	Popul. (000s)	Motor vehicles number	%	Passenger cars number	%
1961	1 007	93 106	22	44 891	13	13 746	1 326 801		291 680	
1971	1 082	203 519	48	133 129	40	14 419	2 931 629		1 041 137	
1981	1 183	367 007	86	284 756	85	10 306	3 449 300	85	1 872 694	79
1990	1 215	428 769	100	336 037	100	10 365	4 039 606	100	2 411 297	100
2000	1 181	746 832	174	620 663	185	10 267	5 230 846	129	3 720 316	154
2001	1 170	760 726	177	627 891	187	10 270	5 357 727	133	3 788 627	157
2002	1 152	775 014	181	639 000	190	10 182	4 961 169	123	3 619 374	150
2003	1 166	654 700	153	534 100	159	10 211	5 041 255	125	3 702 153	154
2004	1 171	735 350	171	594 143	177	10 221	5 185 218	128	3 815 547	158
2005	1 180	749 786	175	602 339	179	10 247	5 401 917	134	3 954 769	164

100 % = 1990

^x data from 2003 are contaminated with a registration error as explained in the note

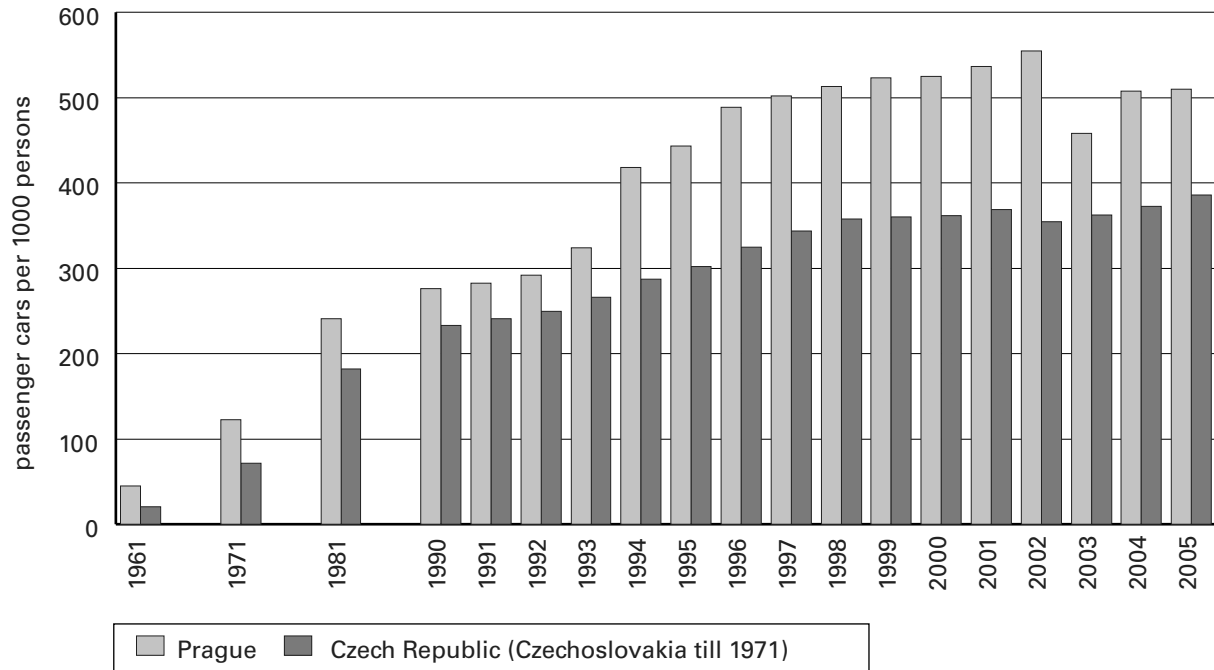
Please note that the figures concerning registered motor vehicles both in Prague and nation-wide were obtained from the Police of the Czech Republic up until 2001. Since 2002, the data are obtained from new administrators of the data: the Traffic Administration Department of the Prague Municipality, and the Traffic Administration Department of the Czech Ministry of Transport, for the city and the nation respectively. The figures in this overview used for 2003 and 2004 are in keeping with what regional registers could offer then.

Numbers of motor vehicles and cars per head, 1961 – 2005

Year	Prague				Czech Republic (Czechoslovakia till 1971)			
	Vehicles per head ^x		Passenger cars per head ^x		Vehicles per head		Passenger cars per head	
	Veh. per 1 000 pers.	Pers. per 1 vehicle	Cars per 1 000 pers.	Pers. per 1 car	Veh. per 1 000 pers.	Pers. per 1 vehicle	Cars per 1 000 pers.	Pers. per 1 car
1961	92	10.8	45	22.4	97	10.4	21	47.1
1971	188	5.3	123	8.1	203	4.9	72	13.8
1981	310	3.2	241	4.2	335	3.0	182	5.5
1990	353	2.8	276	3.6	390	2.6	233	4.3
2000	632	1.6	525	1.9	510	2.0	362	2.8
2001	650	1.5	537	1.9	522	1.9	369	2.7
2002	673	1.5	555	1.8	487	2.1	355	2.8
2003	561	1.8	458	2.2	494	2.0	363	2.8
2004	628	1.6	507	2.0	507	2.0	373	2.7
2005	635	1.6	510	2.0	527	1.9	386	2.6

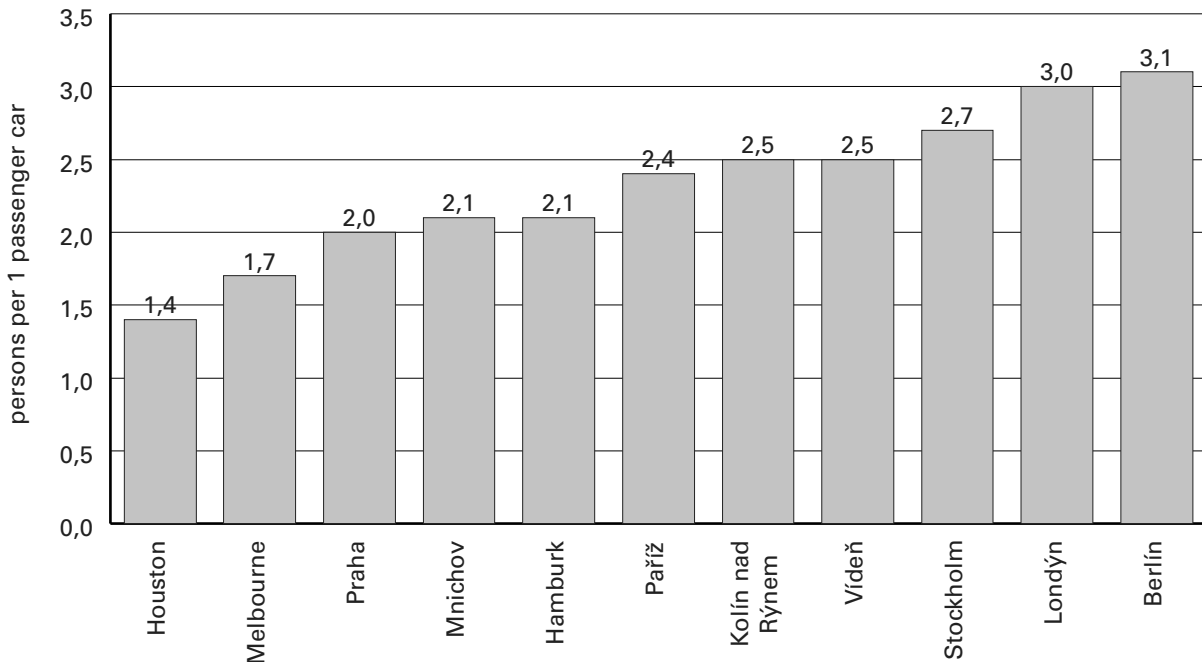
^x data from 2003 are contaminated with a registration error as explained in the note above

Passenger cars per head, 1961-2005



By the end of 2005 one passenger car was shared by 1.96 inhabitants of Prague. In this respect Prague surpasses even the most motorized West European cities, where the motorization usually varies between 2.1 to 2.3 persons per 1 car.

Passenger cars per head – an international comparison



2.2 Motor car traffic volumes on workdays

The motor car traffic in cities is a phenomenon which increasingly affects both the people and urban environment as the number of vehicles and the traffic grow. This is especially true in the last decades for larger Czech cities and particularly Prague. The position of the Capital of Prague in car traffic in the Czech Republic is specific, as evidenced in outstandingly high volumes and vehicle kilometre values in comparison with other Czech cities or countryside motorways and highways.



The basic aggregated parameter of motor car traffic development in Prague is the vehicle kilometres travelled (VKT) indicator covering the total road network. The VKT have been monitored by the Institute of Transportation Engineering since 1978, utilizing an in-house database software "IDIS" (Information Traffic Engineering System).

In addition to VKT, Prague car traffic development trends are monitored by means of cordon surveys, i.e. periodic traffic counts taken on spots which together make a rounded-off cordon over all the important in-roads entering a defined area. The inner city traffic development is monitored via the central cordon, the extra-urban traffic development is monitored through the outer cordon. The two cordons' time arrays have been collected and available at the Institute of Transportation Engineering since 1961.

Note: all VKT data relate to a 24 h average of a normal workday; all car traffic data exclude public transportation buses.

The traffic counts lead to the fundamental conclusion that **in 2005 the vehicle traffic in the central area was stagnant (or slightly was decreasing) while in the rest of the city territory it kept growing. The total of vehicle traffic throughout the City of Prague increased in 2005 – according to the VKT covering all the networks – by an average of 1.1 per cent, compared to the previous year.**

Motor cars covered the total of 19.899 million vehicle-kilometres throughout the Prague area around the clock on an average workday. The passenger cars' share was 18.023 million vehicle kilometres, i.e. 91 per cent. Comparing with the previous year, it means that in 2005, motor cars covered in Prague daily by 208 thousand vehicle-kilometres more than in 2004.

In the greater central area of the city (according to counts on the central cordon), the car traffic volume slightly decreased - by 2.2 per cent. In 2005, about 287,000 vehicles entered the greater inner city area during an average workday between 6 a.m. and 10 p.m., including 273,500 passenger cars.

The traffic volumes in the extended inner city area grew each year until the peak in 1998 and that level is kept the same, with mild fluctuations. The interrupted growth seems to be due to traffic demands already reaching its capacity limits on many key crossroads during peak hours so that the road network overload is no more local, but rather sweeping in character.

In the middle zone of the city, the car traffic volume increased by 3 to 6 % over the previous year. The traffic has been continually increasing. As compared to 1990, it intensified three to four times on some roads.

In the outer zone of the city (according to counts on the outer cordon), the volume of car traffic grew by 3.4 % over the previous year. The car traffic in the outer zone of the city has been rising steadily since 1990. About 229,000 vehicles entered Prague between 6 a.m. and 10 p.m. on an average workday of 2005, including 197,000 passenger cars.

Traffic volume on central and outer cordon, 1961-2005

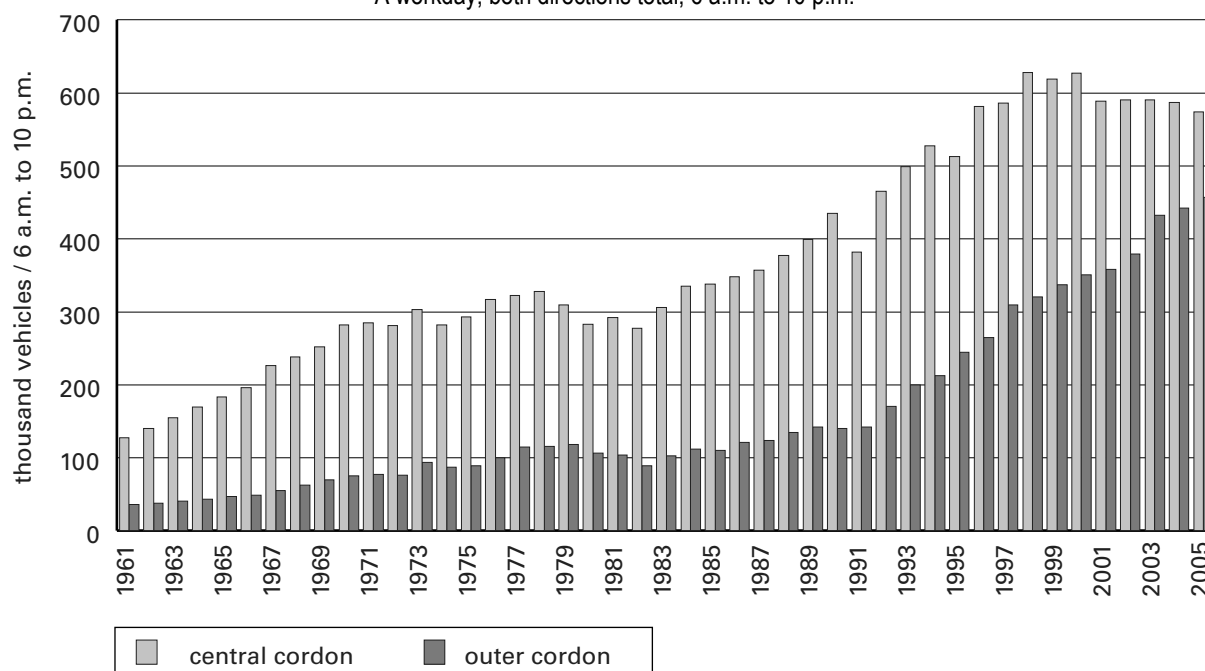
Average workday, both directions total, 6 a.m. to 10 p.m.

Year	Central cordon						Outer cordon					
	Passenger cars		Lorries		All vehicles		Passenger cars		Lorries		All vehicles	
	number	%	number	%	number	%	number	%	number	%	number	%
1961	69 000	18	32 000	82	128 000	29	14 000	14	14 000	41	36 000	26
1971	241 000	63	38 000	97	299 000	69	50 000	50	23 000	68	77 000	55
1981	247 000	64	39 000	100	292 000	67	67 000	66	31 000	91	104 000	74
1990	385 000	100	39 000	100	435 000	100	101 000	100	34 000	100	140 000	100
2000	594 000	154	23 000	59	627 000	144	304 000	301	43 000	126	351 000	251
2001	556 000	144	21 000	54	589 000	135	310 000	307	43 000	126	358 000	256
2002	560 000	145	18 000	46	590 000	136	329 000	326	45 000	132	379 000	271
2003	561 000	146	18 000	46	590 000	136	376 000	372	50 000	147	432 000	309
2004	558 000	145	18 000	46	587 000	135	382 000	378	54 000	159	442 000	316
2005	547 000	142	17 000	44	574 000	132	394 000	390	56 000	165	457 000	326

100 % = 1990

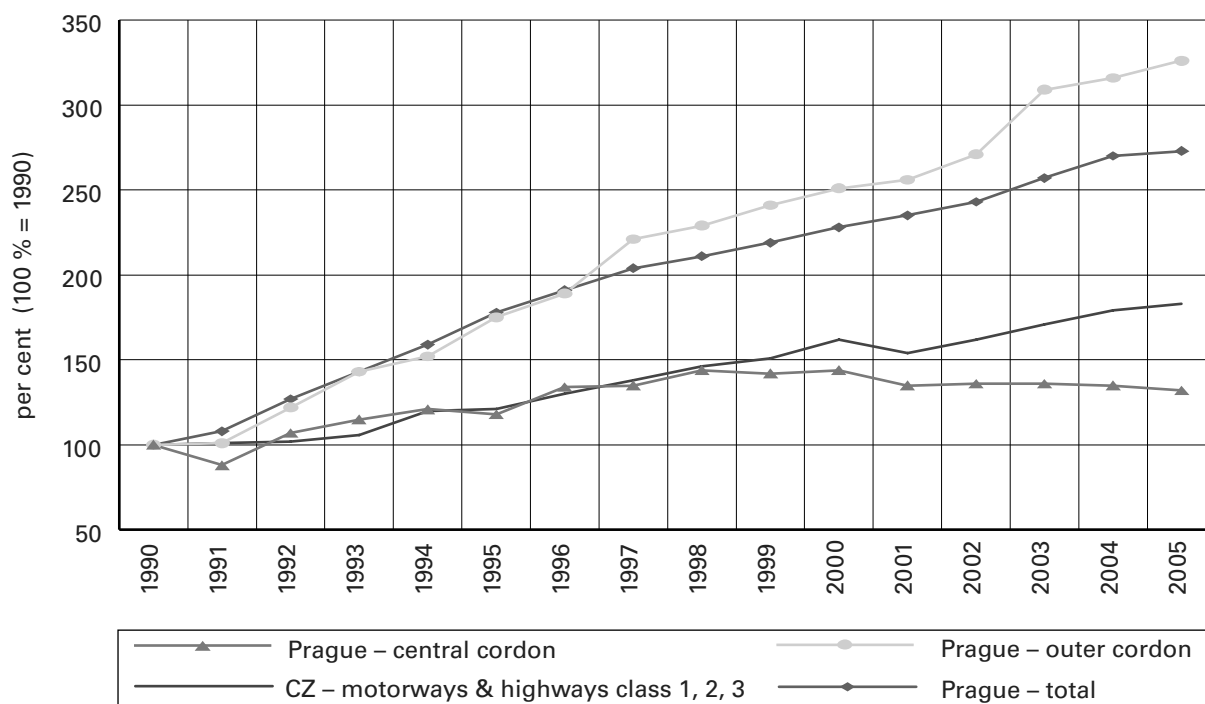
Traffic volumes on central and outer cordon, 1961-2005

A workday, both directions total, 6 a.m. to 10 p.m.



Car traffic volume development in Prague and the Czech Republic, 1990-2005

An average workday



Sections with the heaviest traffic on Prague road network in 2005 were the City Ringroad on its southern section with 130 000 vehicles daily (0-24 h) The City Ringroad grade-separated junction with the 5. května street was the most heavily used fly-over (215 000 VPD). The heaviest ADT level junction was *Anglická – Legerova* (74 000 VPD).

Average Vehicle Occupancy (AVO) – persons per passenger car

Year	Inner city (central cordon)	Outer zone (outer cordon)	all-Prague average
1990	1.57	1.90	1.71
2000	1.37	1.49	1.44
2003	1.37	1.43	1.41
2004	1.36	1.44	1.41
2005	1.35	1.42	1.40

The development of car traffic in the Capital of Prague area since 1991 is characteristic for the following basic trends:

Since 1991, the numbers of cars and volumes of traffic in Prague have shown an explosive growth that has been without parallel anywhere in Europe, except cities of the former East Germany.

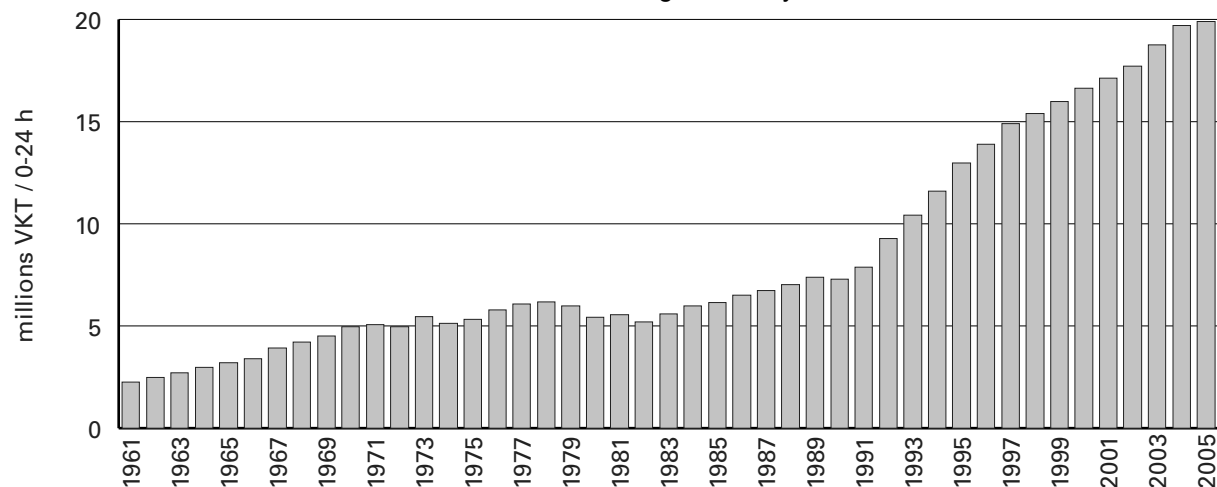
The pace of the VKT growth in car traffic in Prague is shown by setting side by side the average year-on-year growth of the daily VKT throughout the overall road network:

1981–1990	y-o-y	+ 192 000	VKT/day
1991–1995	y-o-y	+ 1 134 000	VKT/day
1996–2000	y-o-y	+ 736 000	VKT/day
2001–2003	y-o-y	+ 710 000	VKT/day
2001–2005	y-o-y	+ 706 000	VKT/day
specifically, 2001		+ 480 000	VKT/day
2002		+ 597 000	VKT/day
2003		+ 1 053 000	VKT/day
2004		+ 920 000	VKT/day
2005		+ 208 000	VKT/day

The daily VKT grew in the last 15 years (1991 to 2005) in all from 7.3 mill. VKT per day to 19.9 mill. VKT per day, i.e. by 12.6 mill. VKT per day. Thus the car traffic in Prague has swollen within the recent 15 years more than during the previous 100 years of motoring (from the end of the 19th century up to 1990).

The increase in Prague during the specified period was approximately 1.5 times higher than the increase in car traffic on national motorways and highways.

Vehicle kilometres travelled, 1961-2005
All roads, an average workday



Most of the rise in the car traffic in Prague following 1990 has been due to passenger cars. During 1991 to 2005, the VKT per vehicle in Prague went up as follows:

passenger cars	+ 208 %
lorries and buses	+ 30 %
all vehicles	+ 173 %

Vehicle kilometres travelled, 1961–2005

All roads, an average workday, 0-24 h

Year	All motor vehicles		Passenger cars		VKT percentage of passenger cars
	millions VKT	%	millions VKT	%	
1961	2.273*	31	1.273*	23	56
1971	5.061*	69	3.543*	65	70
1981	5.562	76	4.338	79	78
1990	7.293	100	5.848	100	80
2000	16.641	228	15.131	259	91
2001	17.121	235	15.585	267	91
2002	17.718	243	16.191	277	91
2003	18.771	257	17.123	293	91
2004	19.691	270	17.815	305	91
2005	19.899	273	18.023	308	91

100 % = 1990

* an estimate from volume trends on the central and outer cordon (VKT is monitored in Prague only since 1978)

The car traffic grows differently in different city zones. From 1991 to 2005 the car traffic increased in the following way:

all-network average	+ 173 %
the greater inner city	+ 32 %
the outer zone	+ 226 %
the middle city zone	+ 100 to + 300 %

A specific phenomenon in the traffic development was a steep rise in lorries in 2004, mainly due to a build-up of heavy haulage trips across the city area following May 2004, the date of accession of the Czech Republic to the European Union with lifting customs procedure on the frontiers. While in 1991 – 2003 the lorry transport in Prague grew by an annual average of 1 per cent (an average year-to-year increase in kilometres travelled used to be only 15.6 thousand VKT per day), in 2004 it was 14 per cent (the year-to-year increase in vehicle-kilometres was by 210 thousand VKT per day). In 2005 no additional growth was seen in haulage VKT.

The explosion of car traffic in Prague during the 1990s has brought about a qualitative change in condition:

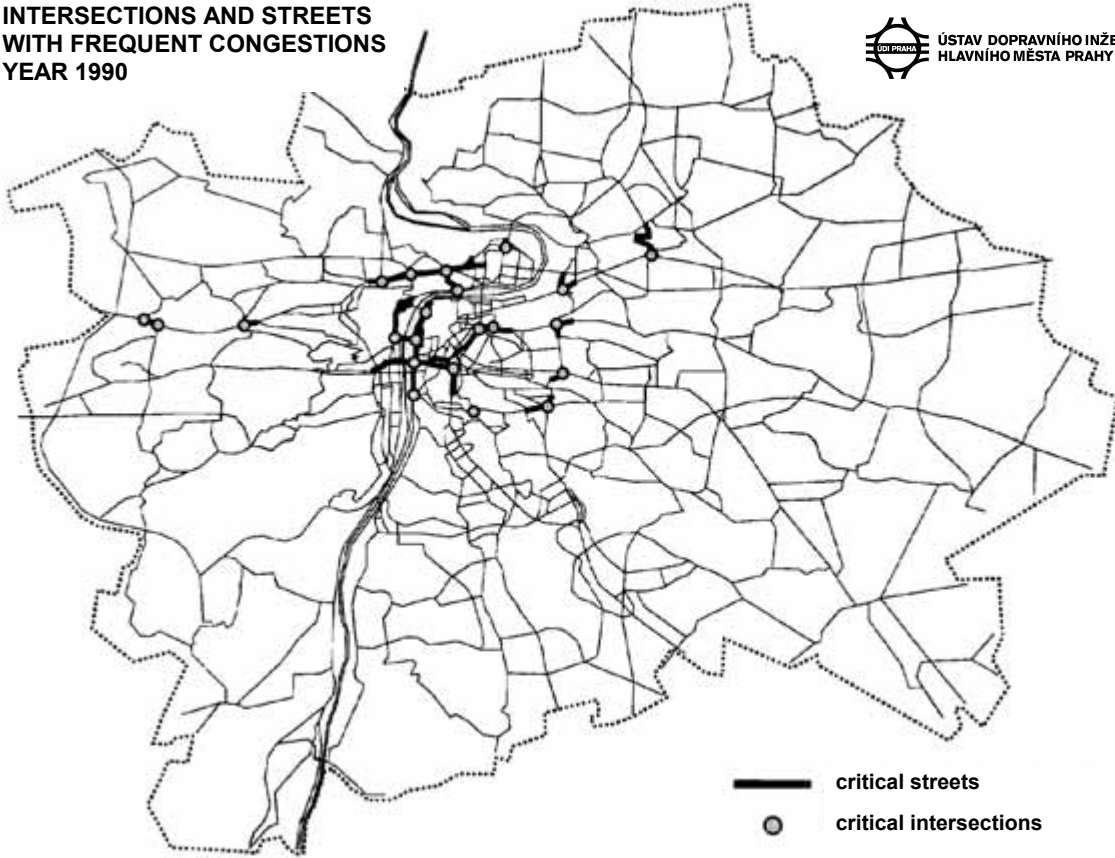
- The excessive load on the road network has no more a local, but zonal character. It is now spread across the whole of the centre and adjacent middle city zone having the size about 7 by 6 km.
- Congestions form ever more often in the centre and on many other locations throughout the road network. Traffic jams can develop even on capacity arteries (e.g. on the *Barrandov* bridge or the southern part of City Ringroad).
- The difference between peak and valley periods diminishes as traffic volumes can grow only during off-peak hours in many places since there is no additional capacity available during peak hours.
- The used-up capacity period grows longer with key intersections during the day, congestions are more frequent, larger and longer. Their environmental impact, especially in the city centre, is obvious.



**INTERSECTIONS AND STREETS
WITH FREQUENT CONGESTIONS
YEAR 1990**



ÚSTAV DOPRAVNÍHO INŽENÝRSTVÍ
HLAVNÍHO MĚSTA PRAHY

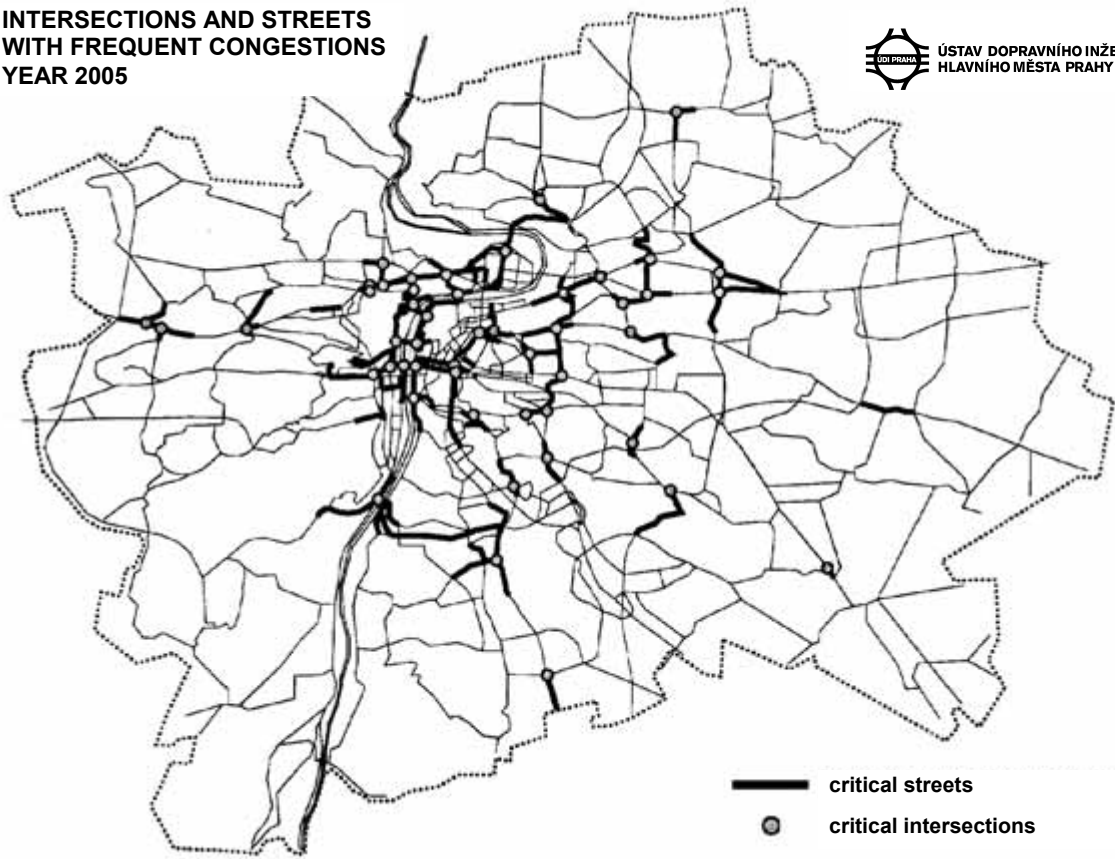


- critical streets
- critical intersections

**INTERSECTIONS AND STREETS
WITH FREQUENT CONGESTIONS
YEAR 2005**



ÚSTAV DOPRAVNÍHO INŽENÝRSTVÍ
HLAVNÍHO MĚSTA PRAHY



- critical streets
- critical intersections

2.3 A workday mode share

The traffic flow is made up largely of passenger cars. The car traffic volumes grow due to a rise in passenger vehicle trips. The resulting average mode share of passenger cars in the traffic flow has been growing (the figures show network averages):

- in 1961 56 %
- in 1971 70 %
- in 1981 78 %
- in 1990 80 %
- in 2000 91 %
- **in 2005 91 %**

Concerning the local distribution, the passenger cars get the greater share the closer they are to the city centre. The share in 2005 was:

- in the central cordon 95 %
- in the outer cordon 86 %
- the network average 91 %.



Percentage of mode share, 1961-2005

A workday, both directions total, from 6 a.m. to 10 p.m.

Year	Central cordon				Outer cordon			
	Passenger cars	Moto-cycles	Lorries	Buses (exc. PT)	Passenger cars	Moto-cycles	Lorries	Buses (exc. PT)
1961	53.7	19.4	29.4	2.0	38.6	22.1	34.4	4.9
1971	79.3	5.6	13.3	1.8	63.2	8.6	25.1	3.1
1981	84.3	0.4	13.2	2.0	65.1	0.6	30.3	4.0
1990	88.6	0.7	9.1	1.6	72.1	0.5	24.0	3.4
2000	94.7	0.6	3.7	1.0	86.5	0.2	12.1	1.2
2001	94.4	0.9	3.6	1.1	86.5	0.3	12.1	1.1
2002	94.9	0.9	3.1	1.1	86.6	0.3	11.8	1.3
2003	95.0	0.9	3.1	1.0	86.9	0.3	11.5	1.3
2004	95.0	0.9	3.1	1.0	86.4	0.2	12.2	1.2
2005	95.4	0.7	2.9	1.0	86.2	0.4	12.2	1.2

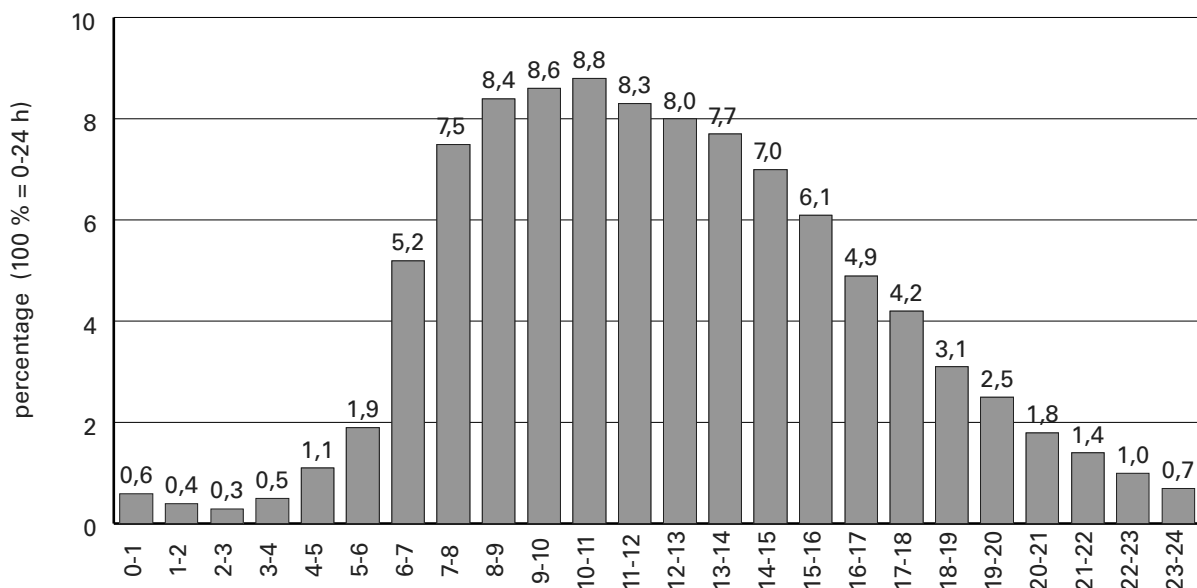
2.4 Temporal patterns in motor vehicles traffic

Workday volume variations in motor vehicles traffic show the following characteristics.

- The bulk of the daily traffic volumes is carried out during daylight (75 % from 6 a.m. to 6 p.m., or 80 % from 6 a.m. to 7 p.m.) while the period from 6 a.m. to 10 p.m. covers about 91 %.
- Following 5 p.m., the traffic volume displays a steep and largely linear drop till midnight.
- The morning peak hour comes at 7-9 a.m., the afternoon peak hour is between 4-5 p.m.
- The morning peak hour's share is 6.9 %, the afternoon peak hour's share is 6.9, too (100 % = 0-24 h).
- The differences between peak hour share and off-peak share are not very sharp. The noon sag hour (from noon to one o'clock) is 5.8 per cent of the whole day.
- Daily traffic density variation in lorries and buses (excluding public transportation) displays a different characteristic from the overall profile. Their peak hour is 10-11 a.m., making 8.8 % of the all-day goods vehicle and bus volumes. Following 11 a.m. there comes a mild and more or less regular decrease without any sag or next peak until midnight.
- Consequently, the share of lorries and buses in the traffic flow changes significantly during the day:
 - the all-day average is 9 %
 - it rises up to 15 % in the morning
 - it descends to 7 % in the afternoon
 - evening and night values range between 4 to 10 %.

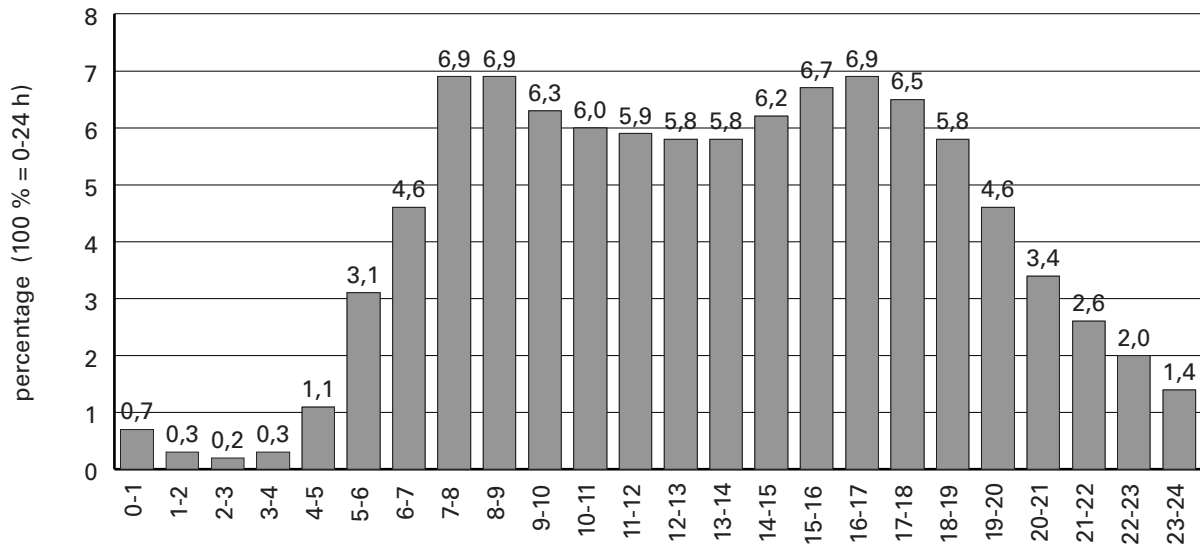


Daily variation – lorries and buses (exc. PT)

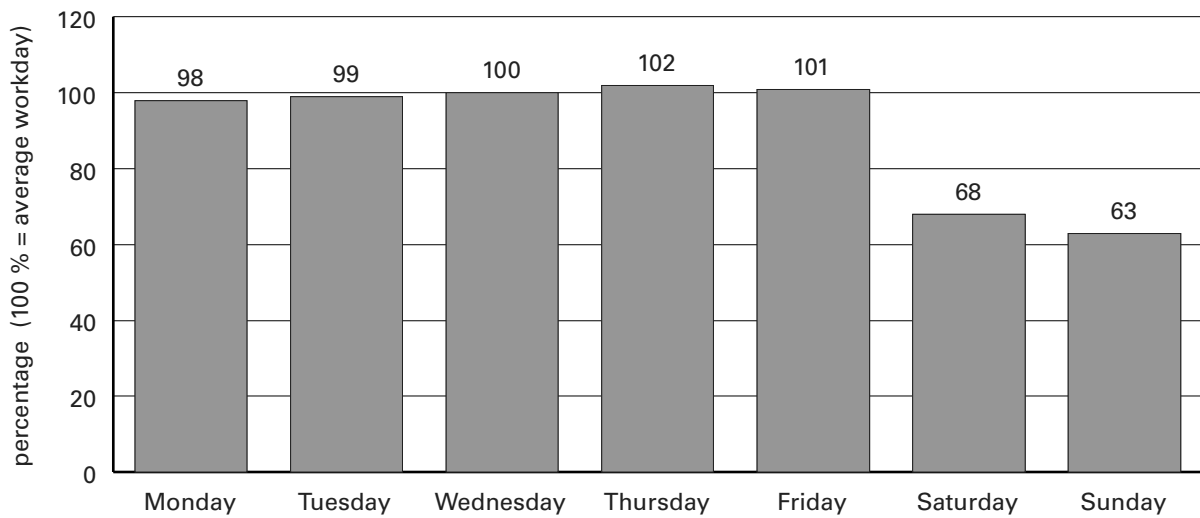


Temporal patterns in motor vehicles traffic, Prague, 2005 (all network)

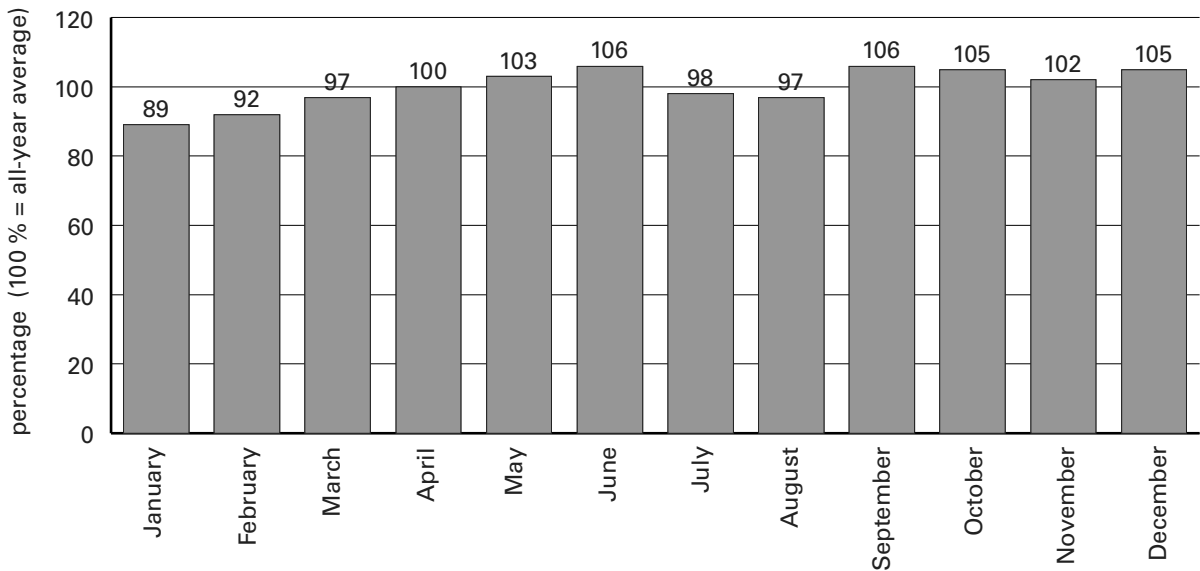
Daily variation



Weekly variation



Annual variation



2.5 Weekend car traffic

The *ÚDI Praha* Institute's annual traffic volume surveys include monitoring weekend traffic on the urban outer limit. Weekend departures occur mostly on Friday afternoons between 3 to 7 p.m., on Saturdays between 8 to 11 a.m. and partially also on Sunday mornings. On the other hand, weekend arrivals concentrate in a narrow band of Sunday return time from 2 to 10 p.m. This is also the frequency of periodic holiday traffic monitoring during spring survey time on the outer cordon. The *ÚDI Praha* has been registering the weekend car traffic since 1973.

The **weekend traffic modal share** is dominated by passenger cars. They made 96 % in 2005. The **Average Vehicle Occupancy (AVO)** in weekend traffic in 2005 was 2.05 passengers per car.

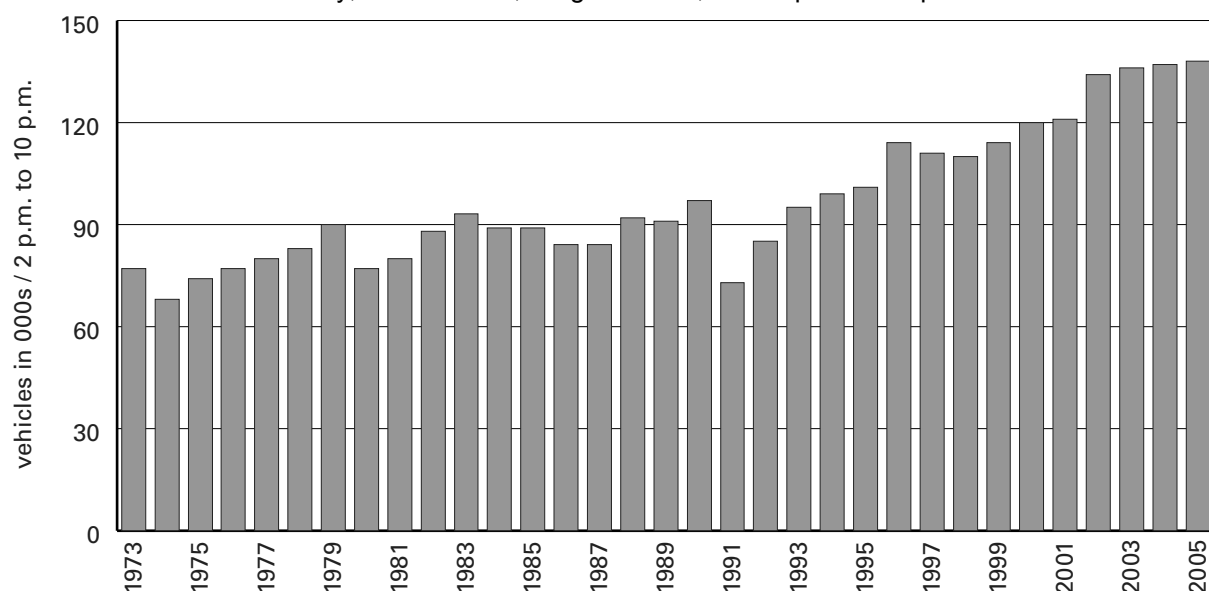
Weekend traffic volumes, 1973-2005

Sunday, outer cordon, Prague bound, from 2 p.m. to 10 p.m.

Year	Passenger cars		All types of vehicles	
	number	%	number	%
1973	70 000	74	77 000	77
1981	77 000	82	80 000	80
1990	94 000	100	100 000	100
2000	116 000	123	120 000	120
2001	117 000	124	121 000	121
2002	130 000	138	134 000	134
2003	131 000	140	136 000	136
2004	133 000	141	137 000	137
2005	132 000	140	138 000	138

100 % = 1990

Weekend traffic volume development, 1973-2005
Sunday, outer cordon, Prague bound, from 2 p.m. to 10 p.m.



3 PUBLIC TRANSPORT

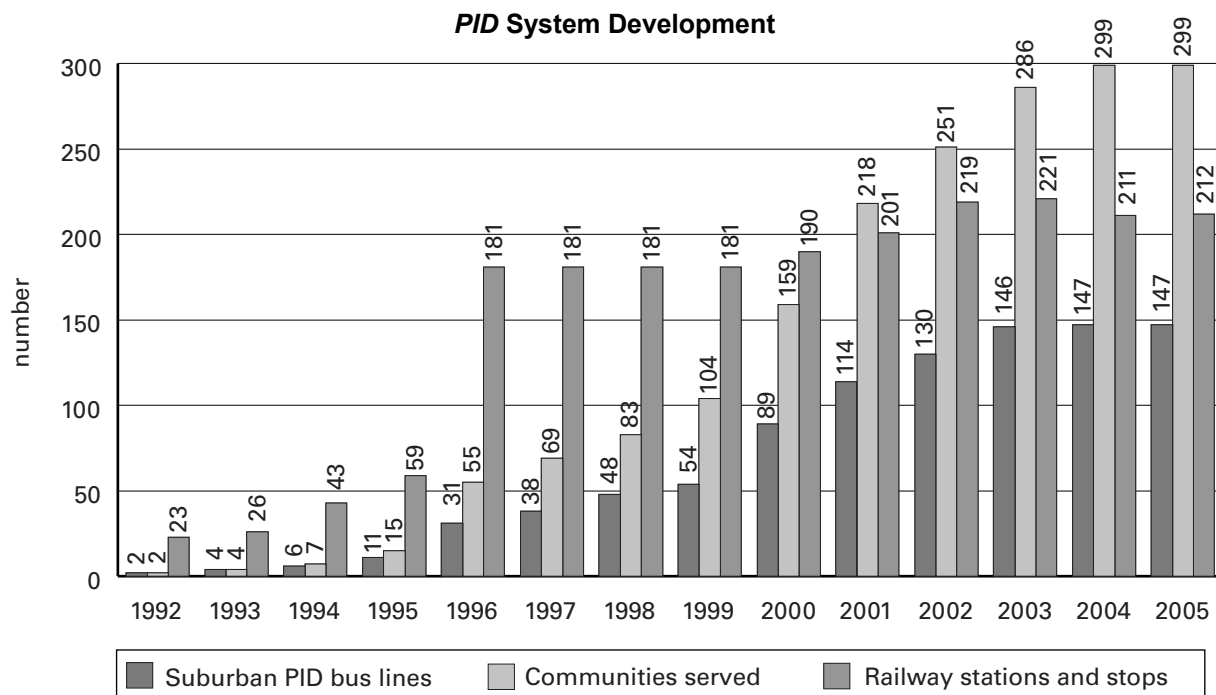
3.1 Prague Integrated Transport

3.1.1 Basic data

Prague Integrated Transport System is organized by Prague Integrated Transport Regional Organizer (*ROPID*), an allowance organization established by the Municipality of Prague.

Prague Integrated Transport (*PID*) System comprises the City of Prague and several communities outside of Prague, which help support (including the Central Bohemia county) operation of bus lines outside the territory of the Capital. The operators include Prague Public Transit Co. Inc. (*Dopravní podnik hl. m. Prahy, a. s. – DP*) operating the Metro (underground), tram lines, funicular railway and most of the bus lines; Czech Railways (*České dráhy, a. s.*) operating the railways; and 14 other carriers sharing in bus line operation. The integrated transport includes a river ferry.

The blueprint for an integrated passenger transport system in and around Prague was ready as early as in late 1970s, nevertheless it was launched only in 1992. Its development continued with the gradual linking-up of railway routes with the integrated system, by increasing the range of suburban bus transport with a number of lines, by increasing the size of the territory covered and the number of communities served by the suburban *PID* buses. Simultaneously, the tariff system also developed, a zoned tariff has been implemented, with the number of tariff zones gradually increasing. The gradual development of the *PID* system is shown on the following graph:



In 2005, the integrated system saw further development. The railway lines *Praha – Kolín*, *Praha – Vrané nad Vltavou*, *Praha – Nymburk* and *Praha – Beroun* where different tickets are accepted and the night suburban transport was extended. In the end of 2005, the total of 147 regional bus lines were in operation. Out of these, 88 lines offered city-to-country transport and 59 lines were led outside of the city.

Numbers of operated bus lines

Operator	city territory*	region territory**
DP hl. m. Prahy, a. s. (incl. night and school lines)	179	18
Others	16	129
Total	195	147

* lines within the territory of the city

** city-to-region lines and lines outside the city territory

Basic data about Prague Integrated Transport (PID), 1997-2005

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of communities served by suburban PID buses	69	83	104	159	218	251	278	299	299
Number of railway stations and stops linked up with PID	181	181	181	190	200	219	221	211	212
Number of suburban PID bus lines	38	48	54	89	114	133	146	147	147
Millions of VTK in suburban PID bus lines	4,12	5,03	7,99	9,36	12,91	15,79	18,48	20,20	23,6
Millions of VTK in all the PID lines except railway (i.e. Metro + tramway + city and suburban buses)	150	149	156	157	163	161,6	172,9	177,8	178,9
Share of travel PID tickets in the railways integrated into the PID system (% of the total)	32,5	35,6	37,2	39,2	43,0	52,1	56,5	57,7	59,7

3.1.2 Municipal Public Transport

The **Metro** (underground) makes a backbone network of the Municipal Public Transport (*MHD*). The Metro consists of three lines with a total operational length of 53.7 km and 53 stations (including three interchanges). The trains travel at an average commercial speed of 34.6 km/h with the average distance between stations 1,074 m. Its share in persons transported was 43.5 per cent of all the passengers of public transport in 2005. Barrier-free access was available in 29 stations by the end of 2005. Vertical or staircase elevators are to be installed in more stations.



In 2005, additional new M1 Metro trains were delivered, increasing the number of new trains in operation to 45. The fleet is 727 cars in stock, (front and middle) and 3 cars of the EČs vintage type. The fleet stock includes 502 cars of the type 81-71 (including 215 modernized ones) and 225 of the M1 type. An average age of the operated cars is 9.8 years. The age of 21 cars in operation is over 20 years.



The **tramway network** is 140.9 km long. Out of the total tramway network, 52 % run on a dedicated trackbed (a raised embankment in roads, and in some places, on separate track lanes led outside of road), 48 % of the tracks are embedded in the roadway. The average stop distance throughout the network is 529 m. The trams share 28.6 % of all the persons transported. The tramway fleet comprised of 954 cars, including 901 standard cars (T3 and T6A5 type), 51 articulated cars (KT8D5, KT8N2 and RT6N type) and 2 new low-floor cars (14T type). Tram operating fleet is 926 cars. An average age of the fleet is 15.4 years. The age of 333 trams in operation exceeds 20 years.



The buses make a complementary network to the Metro and trams. They provide a spread coverage of the area and selected tangential links especially in the outer zone of the city. The operational length of the network within the city territory is 675.7 km on the urban territory and 134.9 km outside the territory. An average distance between stops is 628 m. The Prague Public Transit Co. Inc. (DP) bus fleet registers 1,239 buses, operated are 1,223 vehicles including 566 standard types, 319 low-floor, 279 articulated buses and 53 articulated low-floor, 4 small ones (midi E91) and 2 coaches. The bus share of the total transported persons is 27.9 %. An average age of operated buses is 6.2 years. The age of 518 buses (including 167 articulated ones) exceeds 7 years.



The funicular railway provides a connection between *Újezd* street and *Petřín* hill (via a mid-point stop, *Nebozízek*). Two carriages with their capacity of 100 persons travel on a 510 m long railway with an average commercial speed 6.12 km/h climbing to the height of 130.45 m. In 2005 the funicular transported almost 1.36 million passengers.



The ferry across the *Vltava* river between *Sedlec* and *Zámky* has been included in the tariff *PID* system in 2005. It provides an easier link of the *Bohnice* neighbourhood with the *Praha 6* quarter.



Basic data about Prague Integrated Transport, 2005 (operated by Prague Public Transit Co. Inc., "DP")

	Metro	Trams	Buses	Total
Operational network length (km)	53.7	140.9	675,7	870,3
specifically, dedicated trackbed (%)	100	52	-	-
Operational network length outside Prague (km)	-	-	134,9	134,9
Average stop distance (m)	1 074	529	628	-
Average commercial speed (km/h)	34.6	18,7	25,9	-
VKT in Prague per year (000s)	46 602	49 330	62 858	158 790
VKT outside Prague per year (000s)	-	-	1 434	1434
Passengers transported in Prague per year (000s)	515 098	339 525	330 297	1 184 920
Passengers transported outside Prague per year (000s)			47 434	47 434
Prague Public Transit Co. Inc. employees	12 716			
Revenue from tickets (mill. CZK)	3 341			
Operational costs (mill. CZK)	13 911			
Revenue/costs ratio (%)	24,02			

Development of selected characteristics of public transport (operated by DP hl. m. Prahy, a. s.)

Year	Operational network length (km) ⁺			Average commercial speed (km/h)			Public Transport performance on an average day	
	Metro	Trams	Buses	Metro	Trams	Buses	Seat-km (mill.)	Passengers (000s)
1981	19.3	122.9	545.0	32.2	15.7	23.8	46.7	3 638
1990	38.5	130.5	607.3	34.6	18.7	23.7	57.6	4 189
1995	43.6	136.2	671.4	34.9	19.0	23.3	53.4	3 409
1996	43.6	136.2	724.6*	34.9	19.0	23.8*	54.5 ⁺⁺	3 423 ⁺⁺
1997	43.6	136.4	745.6*	34.9	18.9	24.0*	54.1 ⁺⁺	3 393 ⁺⁺
1998	49.8	136.4	759.7*	34.9	18.7	24.3*	54.4 ⁺⁺	3 349 ⁺⁺
1999	49.8	136.4	797.5*	34.9	19.0	24.3*	56.1 ⁺⁺	3 302 ⁺⁺
2000	49.8	136.4	812.4*	35.7	18.9	25.2*	56.0 ⁺⁺	3 290 ⁺⁺
2001	49.8	137.5	806.8*	35.4	19.2	25.9*	56.8 ⁺⁺	3 468 ⁺⁺
2002	49.8	137.5	818.0*	35.4	19.5	25.9*	56.4 ⁺⁺	3 492 ⁺⁺
2003	49.8	140.9	819.8*	35.7	19.6	26.3*	58.3 ⁺⁺	3 530 ⁺⁺
2004	53.7	140.9	822.1*	34.6	19.3	26.1*	61.3 ⁺⁺	3 599 ⁺⁺
2005	53,7	140,9	810,6*	34,6	18,7	25,9*	62.8⁺⁺	3 774⁺⁺

* The operational length is the total length of regularly operated lines that are available to passengers (i.e. without service tracks, sidings, lay-bys, depots, yards, etc.), measured along the line axis, or street axis with bus lines. With *Metro*, it is the total length of the lines from terminal to terminal platform midpoint.

* incl. suburban *PID* lines operated by Prague Public Transit Co. Inc. (*DP hl. m. Prahy, a. s.*)

⁺⁺ performances and passengers transported by Prague Public Transit Co. Inc. (*DP hl. m. Prahy, a. s.*), within the Prague territory

3.1.3 Suburban public transport in the *PID* system

The suburban public transport that is included in *PID* (i.e. the transport which extends beyond the territory of the Capital) is provided by railway and bus lines.

The railway transport is operated by Czech Railways (*České dráhy, a. s.*) on all the 10 railroads entering Prague. The length of the railroads throughout Prague territory is 145 km. The highest volumes transported are achieved by the *Praha – Kolin* and *Praha – Benešov* railway lines.

Number of passengers in Prague transported by *PID* railway

Year	1999	2000	2001	2002	2003	2004	2005
Passengers (000s)	8 093	10 048	14 932	15 700	16 032	15 998	16 584

The bus transportation covers mostly region-to-city transport relations. On an average workday, the city limits are crossed in both directions by over 3,300 buses on 88 lines of regional *PID* bus operators carrying 75 thousand passengers in both directions. All suburban *PID* lines transported the total of 140.5 thousand passengers a day. The length of the operated *PID* bus network in the region was 1,548.4 km. The performance of the suburban *PID* bus lines reached 23.6 mill. VKT.



3.2 Long-distance passenger transport

3.2.1 Railway transport

The railways offer transport connections between Prague and other places by means of local and long-distance trains. The transport is operated by the Czech Railways Co. Inc. (*ČD*), the rail network is run by a government agency Railway Track Authority (*Správa železniční dopravní cesty – SŽDC*).

10 railway lines enter Prague, including 7 lines fully integrated into the municipal transportation system. The municipal territory has 65 railway stations and stops. The data provided by the Czech Railways HQ (*GR ČD, a. s.*) show the railways including suburban lines transport a daily average of 152 thousand passengers in both directions. It represents 28.5 million incoming and 27.2 million outgoing passengers across the city throughout the year.



The railway transport development across Prague in volumes

		2002	2003	2004	2005
Total passengers transported (000s persons)		46 296	47 481	52 739	55 727
Average usage of lines (000s pers./km)		2 359	2 211	2 686	2 786
Trains dispatched from Prague	outgoing	162 578	170 706	159 681	159 524
	incoming	162 990	170 324	160 888	160 731
	total	325 568	341 030	320 569	320 255

Number of passengers getting aboard in Prague stations and stops in 2005

Railway line	<i>Praha – Kolín</i>	<i>Praha – Benešov</i>	<i>Praha – Beroun</i>	<i>Praha – Kralupy</i>	<i>Praha – Lysá n. Labem</i>
000s pers.	6 905	4 395	3 894	2 405	3 095

Performances of Prague key railway stations in 2005

	incoming passengers (000s)	outgoing passengers (000s)	dispatched trains
<i>Praha-Hlavní nádraží</i>	8 099	7 012	77 472
<i>Praha-Masarykovo nádraží</i>	3 946	3 663	43 080
<i>Praha-Smíchov</i>	2 574	2 337	10 860
<i>Praha-Vršovice</i>	658	591	9 720
<i>Praha-Libeň</i>	475	317	5 724
<i>Praha-Vysočany</i>	383	393	240
<i>Praha-Holešovice</i>	170	129	7 428

Development in volumes at key Prague stations from 2002 to 2005 (incoming and outgoing passengers in 000s)

	2002	2003	2004	2005
<i>Praha-Hlavní nádraží</i>	12 522	13 152	14 854	15 111
<i>Praha-Masarykovo nádraží</i>	6 789	6 420	7 694	7 609
<i>Praha-Smíchov</i>	4 778	5 232	6 123	4 911
<i>Praha-Vršovice</i>	804	528	865	1 249
<i>Praha-Libeň</i>	745	684	826	792
<i>Praha-Vysočany</i>	829	828	916	776
<i>Praha-Holešovice</i>	162	175	177	299

3.2.2 Coach services

Public coach services connecting Prague with other territories are offered by many operators from all over the Czech Republic, and some international lines are also offered by foreign operators. It is estimated that on an average workday from 5 a.m. to 10 p.m., Prague is entered and left by over 2,500 regional buses and long-distance coaches (in addition to *PID*). The terminal with the heaviest load is *Florenc*. Over 780 links frequents the terminal from 5 a.m. to 10 p.m. on an average workday. Other links are dispatched and terminated on coach terminals, mainly next to Metro stations *Černý Most*, *Roztyly*, *Zličín* and *Nádraží Holešovice*.



PRAHA

NETWORK OF TRUNK ROADS AND METRO (UNDERGROUND)



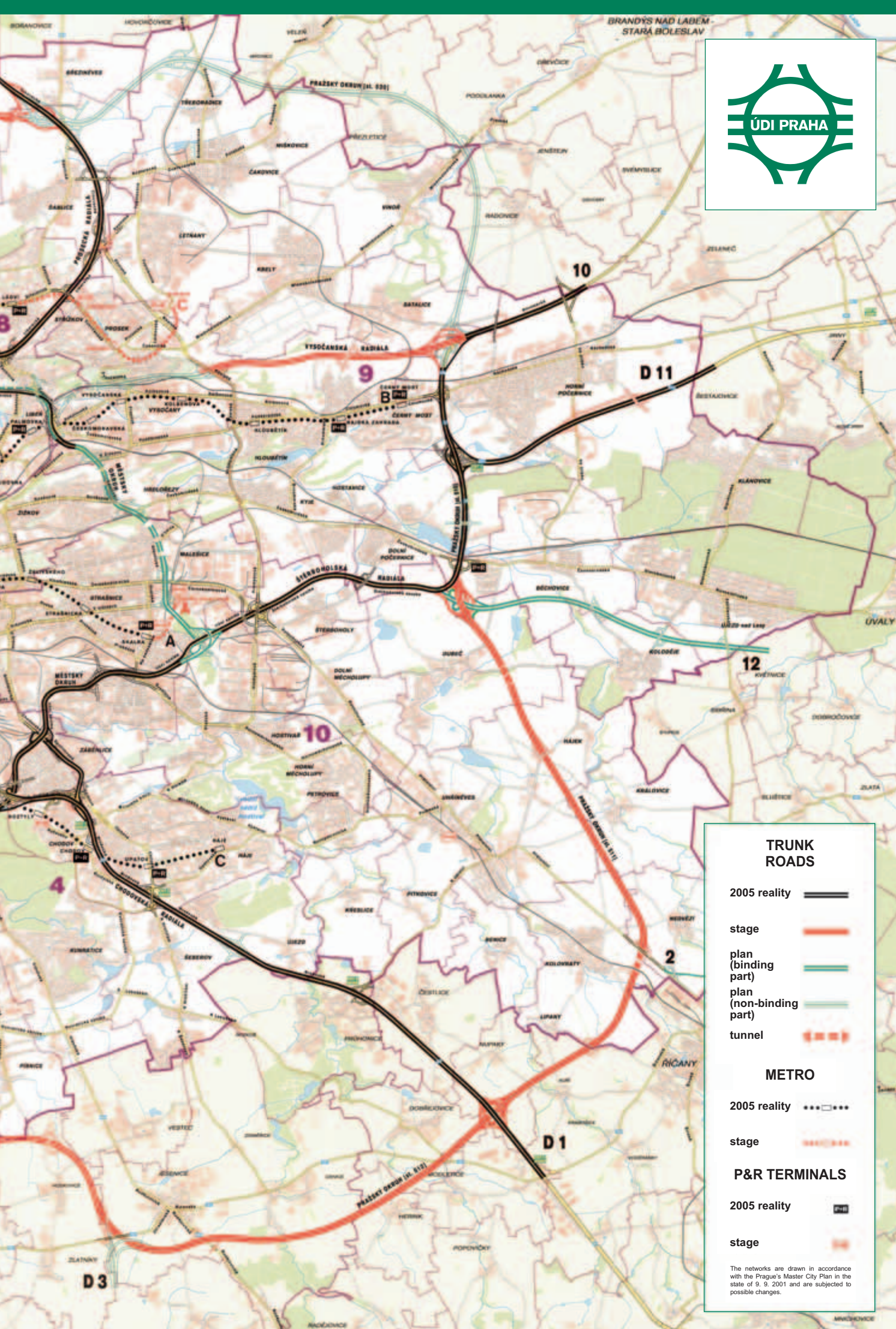
ÚSTAV DOPRAVNÍHO INŽENÝRSTVÍ
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1 : 90 000





TRUNK ROADS

2005 reality

stage

plan (binding part)

plan (non-binding part)

tunnel

METRO

2005 reality

stage

P&R TERMINALS

2005 reality

stage

The networks are drawn in accordance with the Prague's Master City Plan in the state of 9. 9. 2001 and are subjected to possible changes.

4. TRAFFIC SIGNAL CONTROL AND TELEMATICS

4.1 Construction and reconstruction of traffic signals

The purpose for the development of traffic signal devices (TSD) and bringing the technology up-to-date is to support safer street condition and make the control simpler and more flexible. These objectives were followed also in 2005. The largest area of reconstructed TSDs was the *Smíchov* neighbourhood – 12 TSDs. New TSDs were put on 6 separate pedestrian crossings in order to offer better walking conditions.

At the end of 2005, the City of Prague operated 473 TSDs. The total includes 265 crossroad TSDs interlinked in co-ordinated groups with signal programmes synchronized so as to minimize the need to stop the vehicle. The TSD total includes also 66 separate TSD operated pedestrian crossings, in most instances equipped with push-buttons. 360 TSDs work with acoustic signals to enhance safety for blind people.

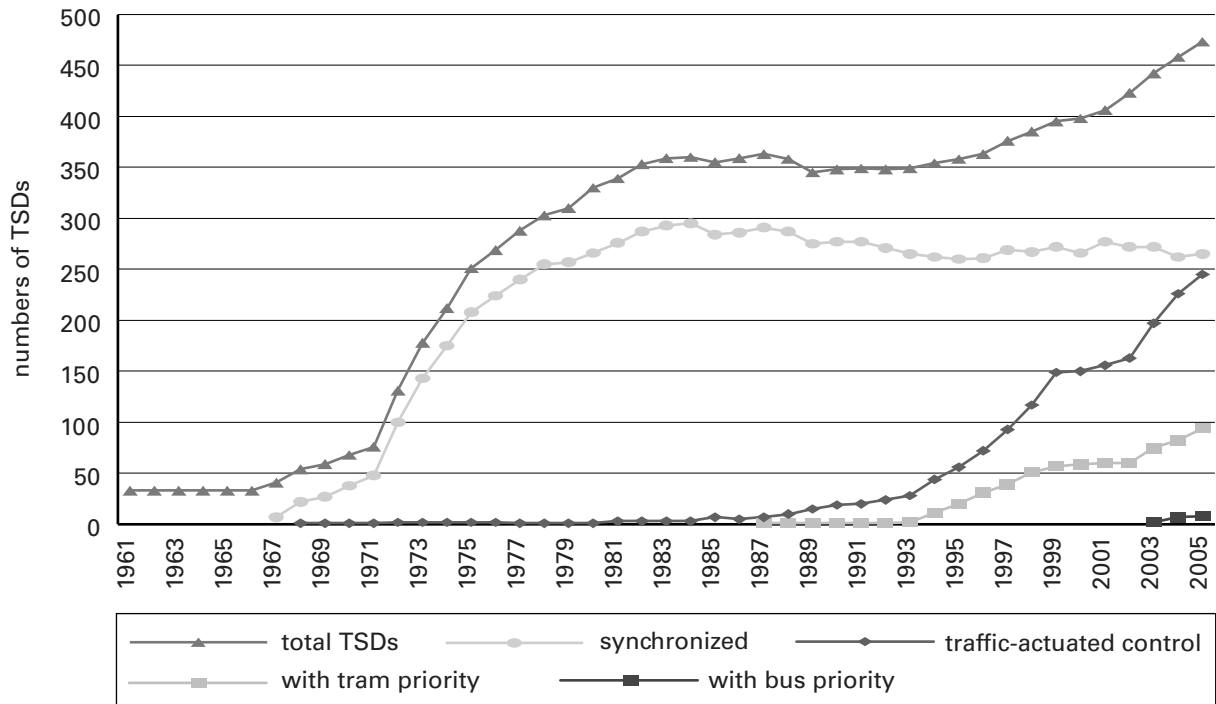


In 2005, 16 new TSDs were built in Prague, 15 TSDs reconstructed, controllers were replaced in 3 TSDs, 1 makeshift TSD was made permanent and 1 TSD was dismantled.

Basic data concerning TSD, 1961 – 2005

Year	1961	1971	1981	1990	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
TSDs total	33	76	339	348	366	376	385	395	398	406	427	445	458	473
incl. pedestrian crossings	-	9	37	45	49	51	54	55	57	55	56	61	60	66
in green waves	-	48	276	277	263	269	267	272	266	277	272	272	262	265
traffic-actuated	-	1	3	19	72	93	117	149	150	156	163	197	226	245
with tram priority	-	-	-	1	31	39	51	57	59	60	60	75	82	94
with bus priority	-	-	-	-	-	-	-	-	-	-	-	2	8	8

Traffic Signal Devices, 1961 – 2005

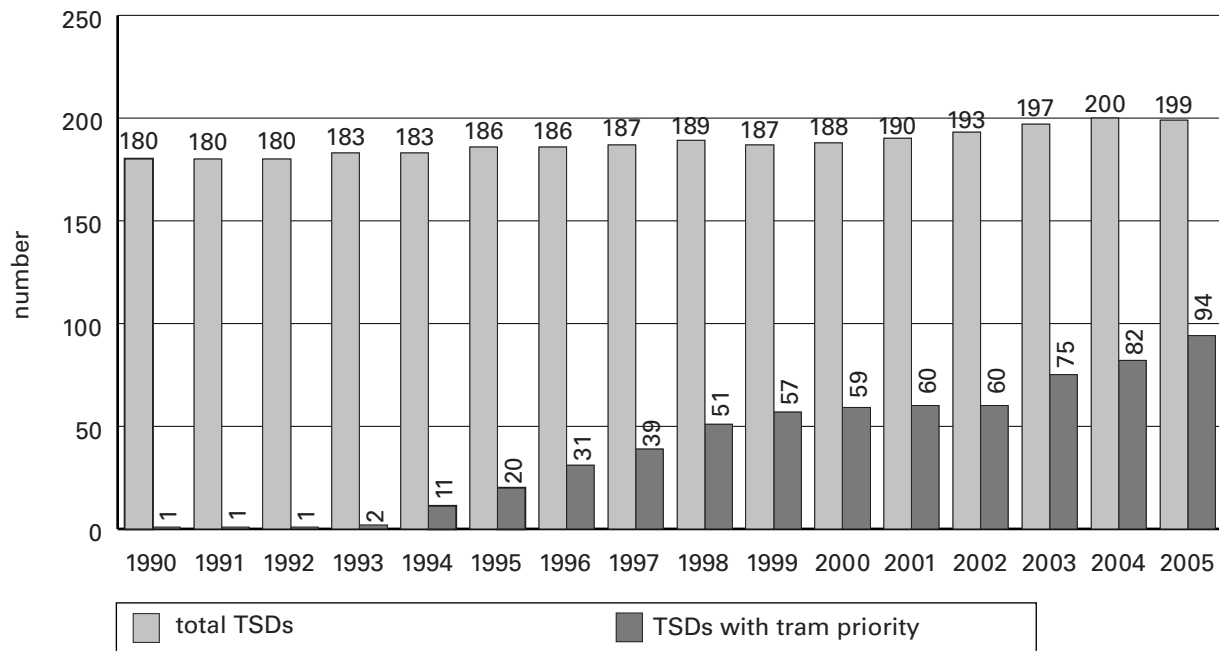


New and reconstructed TSDs are equipped with devices that, apart from dynamic actuation by vehicle and pedestrian demand, make possible to prefer public transport vehicles to car traffic. The **tram priority** in TSDs was tested in Prague already in early 1980s. Only from 1993, however, it started to be implemented on a larger scale. The number of public transport priority TSDs for trams increased by additional 12 locations during 2005.



As of 31.12.2005, the tram priority was introduced on 94 spots, achieving 47 per cent out of the total 199 TSDs in Prague tramway network. The absolute priority that makes the tram go through the crossroads with no stop is programmed on 41 crossroads with simpler traffic. A conditional priority that considers the demands of other means of traffic or trams approaching from more directions operates on other locations. It is always integrated with a dynamic TSD control that responds immediately to demands of all participants in traffic.

Traffic Signal Devices (TSD) on tram network, 1990 – 2005



The **bus priority TSD** was launched in 2003 on two light-controlled crossroads. In 2004, it was implemented on *Čimická* street in relation to putting in operation a new section of line C of Prague Metro between *Nádraží Holešovice* and *Ládví* stations. Another bus priority TSDs were prepared last year.

4.2 Traffic control centres

The expanding and updating of the "System of control and regulation of the urban road traffic" continued during 2005. It is the Prague Road Maintenance (*Technická správa komunikací hl. m. Prahy*) that is responsible for maintaining and developing the system in the capital. The principal traffic control centre (*HDRÚ*) is installed in the building of Public Transport Central Control (*Centrální dispečink MHD*) in *Na bojišti* street, district *Praha 2*. It is operated by the Police of the Czech Republic, specifically the Prague Constabulary (*Správa hl. m. Prahy*). As of 31.12.2005, the traffic control subsystem had 192 TSDs connected via the *VRS 2100*, *MIGRA* and *ADT* systems.

The server of the *VRS 2100* system connects TSDs in three out of the ten traffic areas Prague is divided into. The area 1 – *Holešovice, Letná* – has currently 26 TSDs linked to the *HDRÚ*. The control in the area 5 – Centre (Right Bank) – has 13 TSDs linked to it and the control for the area 8 can directly operate 24 TSDs.



The *VRS 2100* system enables an automated mobility management with temporal or dynamic program selection or, alternatively, a manual selection. Dynamic management programs are actuated by immediate needs of all the traffic participants (private cars, public transport, pedestrians, bikers). The crossroads may be controlled by setups created from structural signal programs. Different co-ordinated TSD groups can be made during the day. The operators are able to flexibly alter data, temporal and status management parameters. They can display a traffic load map or zoom to a single crossroads seeing on-line the current condition of the particular signal groups, the load and engagement of the detectors as well as the needs of pedestrians or possibly trams. The software makes possible for an operator to detect in time any inoperability of signal devices or individual detectors in the crossroads.

A subsystem under the *VRS 2100* is the *TRASSIS* system – a traffic responsive signal program selection on eight TSDs in the area 1, the co-ordinated route *Argentinská – Bubenské nábřeží – nábřeží Kpt. Jaroše*.

The *MIGRA* control system serves the area 3 – *Smíchov, Malá Strana, Střešovice* – with 59 TSDs linked to it. The basic features and operator options are analogous to the *VRS 2100* system. The *MIGRA* has an overlay system (*MOTION*) that applies the adaptive management principle on a larger scale (on 21 TSDs). The system, pooling the strategic, duration and demand detector data, finds the best values for the cycle duration, green-light offset at the follow-up crossroads and green-light limit values. The system does not select pre-set programs, rather it optimizes the traffic in keeping with the current traffic condition.

The *ADT* control server managed 52 TSDs in the area 10 – *Vinohrady, Nové Město*. This system processes additional 18 TSDs on the *Evropská* street. The *ADT* system is the oldest in Prague. The operator may monitor what is the software and hardware condition of the on-line controllers, whether the crossroads are in or out of operation or under repair, and also can switch to flashing amber.

The *ADT* management offers a selection in a controller of a particular crossroads according to the program time setting, either dynamic control programs (provided the crossroads are equipped with them) or pre-set programs created from the structural signal program by prolongation in stop points. The prolongation is pre-set for different times of day and week, based on traffic count results. An emergency operator intervention may alter the duration of a stop point prolongation or select any of the precompiled programs. These options of the central control make possible to manage both long planned and emergency conditions in traffic.

A vital portion of the *HDŘÚ* control in the *Na bojišti* street is a worksite for **Prague road tunnel management and traffic supervision**. The tunnels are *Strahovský, Mrázovka, Těšnov* and *Zlíchov – Radlická* underpass. The traffic management in *Letenský* tunnel depends on TSD control at its entries. The management of traffic in the tunnels is fully automatic. If the computer detects any problem, executes a pre-selected routine, e.g. closing a lane or the whole tunnel and it can also give an acoustic signal to the operator concerning the detected condition. Considering the greater need for safety in traffic constructions of that type, the supervision over the tunnel operation is allocated to yet another worksite. The Prague Tunnel Control at *Strahov* takes care for the technical matters of air-conditioning, lighting and breakdowns.

The *HDŘÚ* operates a large **TV monitoring system (TVD)** that supervises key spots at the Prague route network. There is 219 stationary and rotary TV monitoring cameras in Prague, the shots of which are used, apart from the *HDŘÚ* staff, also by dispatchers of Prague Public Transit Co. Inc. (*Dopravní podnik hl. m. Prahy*). In case an emergency traffic condition arises at a location unequipped with *TVD* cameras, the *HDŘÚ* operators can use additional 318 cameras of the Municipal Camera System (*Městský kamerový systém, MKS*).

The *HDŘÚ* integrates a **Park and Ride** system (*P+R*), so far, however, only in the west of the city, the *P+R* terminals *Zličín I, II* and *Nové Butovice*.

Variable information signs (PIT) that inform drivers by means of text messages concerning current important changes in the local traffic (congestions, accidents etc.) are implemented gradually. As of 31. 12. 2005, there was 20 *PIT* signs throughout Prague. A study was conducted to find out locations for additional ones. The bulk of the study's processing was done at *ÚDI Praha*, working jointly with the Traffic Information Centre (*DIC*) mentioned below. *ÚDI Praha* helps also prepare a study for a more comprehensive collection of data in traffic for the *HDŘÚ Praha*.

Taking care for enhancing road safety on the Inner Ring, a **vehicle average speed measurement** by means of Unicam Velocity video cameras has been installed in the section *Zličov – Radlická*, inside the *Mrázovka* tunnel and the *Strahovský* tunnel. Unicam Velocity calculates an average speed of the vehicles as a quotient of the distance between two profiles and the time it takes for the vehicle to cover that distance.

Permanent devices for **actual travelling speed measurement** and cameras detecting and documenting **traffic light violations** are also distributed along the Prague route network. At the close of 2005, the traffic light violation was documented at 13 TSDs and there was 15 locations where the vehicle speed was measured permanently.

4.3 Telematics in traffic and the Mobility Information Centre

Traffic telematics integrates IT and telecommunication technology with traffic engineering for the purpose of helping current infrastructure increase traffic volumes, safety and amenity of travel.

Principles for the development of telematics in traffic for the Capital of Prague define 11 development areas:

- Area 1: Road traffic control
- Area 2: Information for traffic and travel
- Area 3: Parking systems
- Area 4: Public transport
- Area 5: Systems of supervision and warning
- Area 6: Safety and rescue systems
- Area 7: Electronic payments
- Area 8: Vehicle systems
- Area 9: Haulage
- Area 10: Data collection and management
- Area 11: Traffic infrastructure administration

The individual function areas, considering the general architecture of the system, are in the process of building since 2002. The practical outworking of the Prague system of telematics is a long distance run and due to its large scale it must be implemented in stages. In 2005, the Road Traffic Control subsystem continued to be developed in line with the approved strategy. Still, the main achievement was launching the **Mobility Information Centre Prague (DIC)**.

What was already processed and provided concerning information in traffic and travel during the previous years confirmed that the general public is interested to have a wider range of traffic information. That is why preparations were made as early as 2004 with the purpose of launching the *DIC* Centre. The range of data that are collected in *HDŘÚ Praha* from various traffic detectors, TSDs and camera monitoring systems can be utilized, apart from traffic management, also to further improved information systems. The Mobility Information Centre provides currently a new information platform both in Prague and nationwide that collects, sorts and provides mobility information in various modalities. Its launching was helped by a number of public and private entities, with a significant assistance also by *ÚDI Praha* that continues to deal with the concept of its development and the issues that originate in its day-to-day operation.

The *DIC Praha* was launched on 1. 7. 2005 and since that time the drivers in Prague have available information broadcast by the RDS – TMC system (Radio Data System – Traffic Message Channel). The TMC system is fully standardized to provide mobility information to drivers that have installed a navigation system with TMC functionality in their cars. The test operation of the Centre was successful and converted to full-scale operation in the close of 2005.

The *DIC* is currently affiliated to *HDŘÚ Praha* and is contractually operated by the *ÚAMK* autoclub operators.

The Prague Road Maintenance uses the information processed by *DIC Praha* on its web pages www.doprava-praha.cz (only in Czech), entitled "*Dopravní informace on-line*". The user finds here information provided by WEB, WEB for PDA, WAP, SMS and MMS. There are mainly traffic load maps, tables of traffic densities, pictures from selected traffic cameras, information on closures of traffic, and data on Park and Ride vacancies.



5. NEW TRAFFIC ARRANGEMENTS

Trunk routes have been rearranged in the Inner and Outer Rings in the section between the crossroads *Jižní spojka – Chodovská* and *Kolbenova – Kbelská* with the purpose to reduce or alleviate the traffic demand on the route *U vršovického hřbitova – Bělocerkevská – U zdravotního ústavu – Soběslavská – Želivského – Pod Krejčárkem*.

The Inner Ring (City Ring, *MO*) has been relocated in the section between the crossroads *Jižní spojka – Chodovská* and *Jižní spojka – Průmyslová* to share its route with the Outer Ring along the Southern Connection (*Jižní spojka*). It leaves the Outer Ring route at the crossroads *Jižní spojka – Průmyslová* and takes a separate direction through the streets *Průmyslová – Kbelská* up to the crossroads with the *Kolbenova* street where the two routes join again sharing the *Kbelská* street to the crossroads with the *Liberecká* street.

The Outer Ring (Prague Ring, *PO*) continues provisionally from the crossroads *Jižní spojka – Průmyslová* along the *Štěrboholská* connection and a portion of the Eastern section of its definitive route up to the crossroads with the *Chlumecká* street, from where it follows through the streets *Chlumecká – Kolbenova* up to the crossroads with the *Kbelská* street where the two routes join again and follow on along the *Kbelská* street.



The traffic has been rearranged in the *Praha 6* quarter at the *Jiviny* neighbourhood for the purpose of reducing thoroughfare from the *Drnovská* street to the *Karlovarská* street.

Driving heavy vehicles on the Southern Connection (*Jižní spojka*) has been restricted to the right lane in order to enhance safety for private cars.

Permanent traffic rearrangements of local importance concerning traffic signs, residential areas and traffic direction on access roads have been effected in the centre of Prague in 2005.

6. TRAFFIC ACCIDENTS

6.1 Road accidents

In 2005, the number of accidents that occurred in Prague was 33,349 (13 % more than in 2004), 61 victims died (9 % more) and 2,996 victims were injured (20 % less). Pedestrians were involved in 742 accidents (10 % less) with 35 fatalities (35 % more) and 711 injured (15 % less). Pedestrians themselves were culpable in 352 accidents. The dominant share in accidents is of the drivers (97 %). The most frequent causes of driver's accidents were reckless driving, failure to give way and speeding. The number of accidents with intoxicated culprits was 748 (-9 %).

Accidents, impact on health and main causes of accidents

Year	2003	2004	2005	diff. 05/04 (%)
accidents	35 589	29 598	33 349	+13
fatal injuries	65	56	61	+9
serious injuries	466	428	393	-8
slight injuries	3 509	3 313	2 603	-21
accidents with injuries	3 269	3 086	2 506	-19
accidents without injuries	32 230	26 512	30 843	+16
Driver culpable due to	34 630	28 695	32 494	+13
speed	2 473	2 821	3 244	+15
overtaking	299	222	263	+18
failure to give way	9 588	8 463	9 658	+14
reckless driving	22 270	17 189	19 329	+12
Driver not culpable	959	903	855	-5
due to road defect	98	121	81	-33
due to pedestrian	454	384	352	-8

General trend in 2005 accidents: increase in the number of accidents comparing to the previous year, increase in death casualties, decrease in seriously and slightly injured victims, attenuation in accidents with injuries and increase in accidents with only damage.

Considering the long-term trends in traffic accidents, it may be concluded that the period from 1960s to 1980s used to have a relatively favourable trend in accident rate as the number of accidents followed approximately the VKT and grew slower than the VKT. In 1990s, however, traffic accidents started to increase more than VKT. Consequently, the accident risk rate indicated in relative accident rate, i.e. the number of accidents per one million VKT, also went up. Only since 2001, the number of registered accidents went down in spite of automobile traffic further increasing.

The decrease in registered traffic accidents since 2001, however, was affected by the regulation in force since January, 2001, that requires to report with the police only those traffic accidents that brought about injuries or material damage obviously exceeding the value of CZK 20,000.-- while by the end of 2000 the requirement was to report even the accidents with the material damage exceeding CZK 1,000.--.

In 2005 the all-Prague average was 5.1 registered traffic accidents in 1 million of vehicle-kilometres covered (by 32 % less than in 1990).

A favourable trend is a decrease in fatal, serious and slight injuries in traffic accidents during the last 5 years.

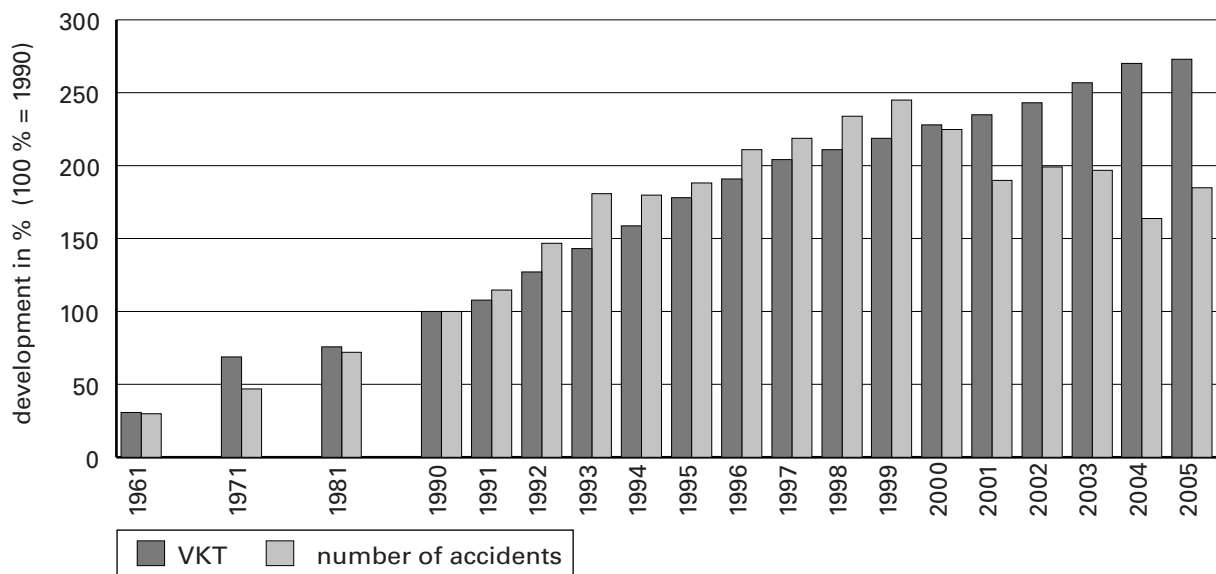
Traffic accidents, injuries and relative accident rate, 1961 – 2005

Year	Total accidents		Fatal injuries		Serious injuries		Slight injuries		Relative accident rate	% VKT
	number	%	number	%	number	%	number	%		
1961	5 495	30	63	69	580	157	2 361	84	7.3	31
1971	8 496	47	123	135	567	154	4 046	144	5.1	69
1981	13 064	72	81	89	401	109	2 572	92	7.1	76
1990	18 024	100	91	100	369	100	2 806	100	7.5	100
2000	40 560	225	80	88	521	141	3 260	116	7.4	228
2001	34 195	190	67	74	452	122	3 521	125	6.1	235
2002	35 888	199	82	90	477	129	3 679	131	6.1	243
2003	35 589	197	65	71	466	126	3 509	125	5.7	257
2004	29 598	164	56	61	428	116	3 313	118	4.6	270
2005	33 349	185	61	67	393	107	2 603	93	5,1	273

100 % = 1990

Relative accident rate = number of accidents per million VKT (average values, total road network)
 VKT = vehicle kilometres travelled, total road network

Accidents and VKT, 1961 – 2005
 Total road network, annual summaries



6.2 Traffic education

The Institute of Transportation Engineering of the City of Prague takes an active part in traffic education of adult, children and youth road traffic participants. Some of the events concerned with prevention of traffic accidents is held jointly with the Czech Ministry of Transportation. In 2005 the traffic education events were funded from the municipal budget with CZK 1,610,000 (including CZK 550,000 for the joint project of the Institute of Transportation Engineering of the City of Prague and the Prague Constabulary entitled "Road Safety for All") and approximately CZK 200,000 from the funds of the Ministry of Transportation.

The following programmes of children's traffic education were made in 2005:

- Cyclist Starter Action (Cyclists' Traffic Contest)
- Systematic Training Effort on children's traffic playgrounds
- Traffic education broadcasts for children and youth
- Interactive theatre performances on traffic-educational topics



- A traffic education event for children's home clients.
- A school starting event focused on the youngest pupils of all Prague schools
- A traffic-educational event "Children's Day" on *Letná* grounds (*Letenská pláň*).



A number of events was arranged for the adult traffic participants in 2005, e.g.:

- Spring and Autumn Driving Skill Contest for driving public,
- contests for handicapped motorists: the Prague Cup and the „No Accident Driving“ contest,
- lectures and safety events targeted for hearing-impaired drivers' special needs.

6.3 Measures to enhance road safety

The total of CZK 27.681 mill. from the *BESIP* program budget was invested in 2005 so as to implement safety measures in the road network, including:

- CZK 1.656 mill. for traffic safety devices – railings and guardrails on 51 places
- CZK 0.106 mill. to implement road mirrors – on 5 places
- CZK 1.412 mill. for surface chipping of roads too slippery when wet – on 5 places (*Jana Masaryka, Ke Klíčovu, Wolkerova, Svatovítská, Bubenská*)
- CZK 0.451 mill. to prepare roundabouts
- CZK 2.438 mill. for in-built speed humps – on 6 places
- CZK 1.898 mill. for assembled speed humps – on 39 places
- CZK 7.951 mill. to strengthen lighting on pedestrian crossings – on 4 places
- CZK 11.769 mill. for measures as demanded by the respective road administrations



7. TRAFFIC AT A STANDSTILL

7.1 Parking in the inner city

Inside Prague Conservation Area (8.7 km²), i.e. in *Praha 1* and portions of *Praha 2, 4* and *5* municipal areas, there are:

on the streets	16 150 places to stand,
inside yards	2 842 places to stand,
the total is	18 992 places to stand (excluding garages)

Parking in the city centre must be regulated seeing the vast demand and only moderate supply of parking places. Regulation is in the meantime thoroughly enforced in the territory on the right riverbank of Prague 1 (approx. 3 km²) by means of “Zones of paid standing” (ZPS). Rules for parking inside ZPS have been governed by Municipal Regulation No. 42/2000 Coll. since October 2000. and the Municipal Regulation No. 19/2005.

Street sections in ZPS **on the right riverbank of Praha 1** are divided into:

- standing with a time limit, i.e. “orange and green zone”, designated for vehicles of visitors,
- standing without a time limit, i.e. “blue zone”, designated for cars of the residents (individuals permanently living in ZPS) and subscribers (business or private individuals with a residency or a place of business in ZPS).

Number of parking places in ZPS:

- short-term and midterm (orange and green zone)	2 173 places
- long-term (blue zone)	5 951 places
- handicapped	235 places
- other (reserved for the Government and authorities)	337 places

Average occupancy of standing places in ZPS (2005)

- short-term and midterm standing	89.2 %
- long-term standing	88.0 %

The degree of ZPS rule compliancy in usage of places comparing to 2004 has slightly improved, but it is still low. The *Evropark, a. s.* company survey made in 2005 has shown that it was

- in short-term and midterm standing	49.0 %
- in long-term standing	61.5 %

Fees for the utilization of standing places in ZPS

- short-term standing (orange zone)	40 CZK/h
- midterm standing (green zone)	30 CZK/h
- midterm standing (green zone – border sectors)	15 CZK/h
- long term standing (blue zone)	
- 1st vehicle of an individual	700 CZK/veh./yr
- 1st vehicle of an individual over 65 years of age	350 CZK/veh./yr
- 2nd vehicle of an individual	7 000 CZK/veh./yr
- 3rd vehicle of an individual	14 000 CZK/veh./yr
- 1st business vehicle of an individual	12 000 CZK/veh./yr
- any vehicle of a business legal entity or 2nd or more business vehicles of an individual - basic price for the parking card	36 000 CZK/veh./yr
- vehicle of a corporate entity while providing a public service	250 CZK/veh./3 months

On the left riverbank of Prague 1 with the area of 2.4 km² and capacity of 1.5 thousand parking places, a zone is designated in which only vehicles of residents can be parked outside of reserved standing places and supervised parking places, marked with an approval from the Municipal Authority of Prague 1.

7.2 Car parks

Currently, the greater city centre has available car parks with the total capacity of approximately 16.5 thousand standing places, including 9,367 places at public facilities. The largest public car parks are the following:

<i>KOC Nový Smíchov</i>	2 000 standing places
<i>Kongresové centrum</i>	1 090 standing places
<i>Palác Flora</i>	550 standing places
<i>Helios (Wilsonova st.)</i>	520 standing places
<i>Zlatý Anděl</i>	500 standing places
<i>Milenium Plaza (hotel Marriott)</i>	480 standing places
<i>Palachovo náměstí – Rudolfinum</i>	453 standing places
<i>Anděl City</i>	400 standing places
<i>Wilsonovo nádraží (Wilsonova st.)</i>	371 standing places
<i>Kotva</i>	300 standing places

The total capacity of parking in Prague is not available. It is estimated at roughly 170 000 parking places.

Additionally, 365 off-street localities are registered on the city territory having capacity about 39 700 standing places, including 43 % supervised.

7.3 Park and Ride (P+R)

The combined mobility system Park and Ride (*P+R*) comprised by the end of October, 2005, altogether 14 parking facilities in the total capacity of 1,447 parking places. From the beginning of this year, the operation of the Park and Ride *Radlická* was discontinued as the site had to give way to the construction of a new administration building. Low demand was the reason for stopping the operation of the Park and Ride *Modřany* (rather out of reach by public transport).



The total parking places for the P+R users as of 31.12.2005 on 13 sites was 1,396 standing + 48 places for handicapped. The number of parking places for the public in individual localities is shown in the following table:

Park and Ride

Site	Number of standing places			
	P+R	handicapped	residents + other	Total
<i>Běchovice</i>	94	6		100
<i>Černý Most I</i>	294	6		300
<i>Černý most II</i>	131	7		138
<i>Holešovice</i>	74	2	1	77
<i>Ládví</i>	81	4		85
<i>Nové Butovice</i>	57	2		59
<i>Opatov</i>	182	4	26	212
<i>Palmovka</i>	119	3		122
<i>Radotín</i>	21	2	40	63
<i>Rajská Zahrada</i>	87	3		90
<i>Skalka</i>	107	5	65	177
<i>Zličín I</i>	85	2	1	88
<i>Zličín II</i>	64	2		66
Total	1 396	48	133	1 577

During 2005, two new Park and Rides were built, close to the Tesco hypermarket in the *Skalka* neighbourhood and close to the *Chodov* shopping centre where free test operations have started since November, 2005. The standard operation for both the Park and Rides is planned to start early in 2006.

The utilization of P+R is shown in the following table which compares the numbers of parking cars on P+R sites in Octobers of 2001 – 2005.

Vehicles parking at P+R in October 2001, October 2002, October 2003, October 2004 and October 2005

Site	Parked vehicles				
	10/2001	10/2002	10/2003	10/2004	10/2005
<i>Běchovice</i>	-	1 498	180	140	597
<i>Černý Most I</i>	10 716	3 481	9 818	9 714	9 226
<i>Černý Most II</i>	-	-	2 042	2 934	2 555
<i>Holešovice</i>	3 226	1 453	3 299	2 759	2 765
<i>Ládví</i>	-	-	-	2 184	2 117
<i>Modřany</i>	-	213	310	0 *	192
<i>Nové Butovice</i>	2 572	1 689	2 136	1 988	1 866
<i>Opatov</i>	5 073	5 389	5 732	5 890	5 168
<i>Palmovka</i>	4 446	3 779	4 183	3 521	3 874
<i>Radlická</i>	1 272	948	1 169	1 003	-
<i>Radotín</i>	463	878	918	768	805
<i>Rajská Zahrada</i>	2 837	409	2 697	2 626	2 701
<i>Skalka</i>	2 762	2 461	3 408	3 336	3 223
<i>Zličín I</i>	3 508	3 622	3 510	3 618	3 111
<i>Zličín II</i>	2 111	3 432	2 505	2 609	2 240
Total	38 986	29 252	41 907	43 090	40 440

* The P+R site *Modřany* not available due to road reconstruction





Low utilization of Park and Rides in 2002 was due to a special regime of public transport following the flood, especially the limited operation on sections of Metro. As soon as the condition in traffic got stable again in 2003, the occupancy of Park and Ride sites increased again and has kept approximately the same level ever since.

The highest usage (37 vehicles per 1 standing/month) had the Park and Rides *Holešovice* and *Zličín I* in October, 2005.

The effort to utilize unused standing places and meet the growing demand for parking places for residents led *ÚDI Praha* to work up a pilot project in order to open the *P+R Rajská Zahrada* for overnight and weekend parking. 30 parking places were recommended to reserve for that type of parking on workdays from 6 p.m. to 7 a.m. and around the clock on weekends. The overnight service at the *P+R Rajská Zahrada* has been available since 1.10.2005. The one month fee is CZK 300. The offer so far has been used by 10 clients.

A supplementary service on P+R sites is a bike storage. Bikers are offered this service free of charge, that is why they cannot use the public transport discount.

7.4 K+R stopping places

The combined mode of transit for which "K+R" (Kiss and Ride) has been coined uses the possibility for a companion in a private car to switch for a means of public transport while the driver immediately takes off, or alternatively a public transport passenger enters a waiting private car. This mode of transport was introduced to Prague in 2001, mostly at Metro stations. The duration allowed for the K+R short-time parking is 5 minutes.

Currently the following locations are marked out for this type of parking: next to the Metro *Radlická* station in both directions, *Černý Most* in the direction from the centre, *Kačerov*, *Vltavská*, *Opatov*, *Kobylisy*, *Ládví* and *I. P. Pavlova* in the direction to the centre.

In April, 2005, *ÚDI Praha* conducted a 12-hour survey at 6 selected K+R sites. There were recorded the duration of standing of each car, number of persons getting out or in, the locality of car registration and the type of car. Also the cars that did not stop at a place marked out for K+R use were included, providing the purpose for stopping was fulfilled (a passenger getting in/out and the car going on).

The survey proved a great demand for that type of parking among the general public, especially in the earlier part of morning and in the afternoon. Consequently, it seems desirable to provide for that mode of parking at other, especially all the newly constructed Metro stations.

8. BICYCLE TRAFFIC

The design of the development of the basic network of cycle routes from 2003 expects a stepwise implementation of the planned 450 km cycle routes on the territory of Prague. The routes of the basic system are selected in order to cover the whole area of the Capital. They are found, provided local conditions allow for it, in streets with low intensity car traffic, in roads which bikers share with pedestrians or on dedicated paths for bikers only. The basic system of bicycle routes throughout Prague are marked out in line with the Regulation of the Ministry of Transportation No. 30/2001 Coll. with the traffic signs for bikers.

By the end of 2005 the total of 190 km of the municipal bicycle route system was already demarcated and is operated. It includes roughly one third of them led on ways with no car traffic and jointly with pedestrians along available ways in parks and woods or along newly built separate ways for bikers and pedestrians.

A new segment of cycle route along the *Vltava* river from *Troja* to the city borders (1.6 km in length) was launched in 2005 as well as a new path on the gallery of the Hilton hotel including adjacent sections along the right bank of the *Vltava* between the *Hlávkův* bridge and the *Negrelli* viaduct (225 m long) with the follow-up on the *Karlín* counter-flood embankment in the direction to the *Libeň* neighbourhood. A new linking section of the cycle route *Černý Most – Dolní Počernice* from the border of the housing estate *Černý Most* in direction to *Dolní Počernice* (length 357 m) was also implemented, a cycle route outside the *Řepy* housing estate in the section from the *U boroviček* street toward the *Plzeňská* street (572 m long) was built, a cycle path in *Sedlec* along the *Vltava* from the *Roztocká* street up to the newly opened pedestrian and cycle ferry in *Sedlec* (length 910 m), a joint path for pedestrians and bikers along the *Evropská* street from the *Horoměřická* street to the *Libocká* street (2.6 km long) and a cycle route around Prague called "*Pražské kolo*" were demarcated. The crossroads *Ovenecká x Veletržní* in *Praha 7* was adjusted with supplying the horizontal traffic sign V 19 „Cycle route ahead“.

Most of the P+R sites already make possible to put off bikes (B+R system). The bicycles are supervised and the service is free. A pilot project of automatic lending of bicycles was launched in the *Karlín* neighbourhood in 2005. The project offers to lend bikes and turn them back to lockable stands that are set at strategic spots throughout *Karlín*. A user must register with the operator of the system prior to using this paid service.

Additional routes were projected in 2005, e.g.:

- *Troja – Ďáblice*, 8 km long
- *Staroměstské náměstí – Klárov – Pohořelec*
- *Modřany – Lhotka – Cholupice – Prague border*, 13 km long
- *Modřany – the Závodu míru bridge*, 3 km long
- *Malá Chuchle – Lahovice*, 4 km long
- *Freyova – the Kyjský pond*

ÚDI Praha conducted a survey in stages concerning the volumes of cycle traffic in both directions on 70 posts in April, May and June, 2005, on workdays (Monday through Thursday) from 7 a.m. to 8 p.m. The selected posts covered cycle routes, access routes to the greater city centre and all the bridges across the *Vltava* river.

The survey results show the peak hour of most profiles is reached afternoon to early evening, confirming a great share of leisure biking.



9. PEDESTRIAN TRAFFIC

Walking is the most natural and most frequent mode of human locomotion. Any trip by whatever traffic means starts and ends by walking. An estimated 23 % of all trips inside Prague is made only on foot.

The greatest number of intra-urban trips (almost one third) is made in the city centre on the area of the district *Praha 1*. Of all the intra-urban pedestrian trips, 23 % of the journeys have their origin or destination in *Praha 1*, while additional 9 % of pedestrian trips both starts and ends in this neighbourhood, which means the walkers do not cross the border of *Praha 1*. For this reason it is the city centre area that the most attention to pedestrian traffic adjustments is paid.

In 2005, e.g. sections on the *Karlova* street in the *Staré Město* neighbourhood were adjusted as well as in the *Petrská* street in the *Nové Město* neighbourhood in *Praha 1* quarter with the purpose to provide pedestrians with more protected and attractive space fit for relaxing.



More space was freed for pedestrians by means of reducing occupation of walking space by restaurant front yards and shopping booths, e.g. on the *Staroměstské* square and on the *náměstí Republiky* square next to the *V celnici* street in the space between the rear of the palace *U Hybernů* and the restored building of the Old Customs.



10. AIR TRANSPORT

Air passenger and freight transport is conducted mainly at the *Praha-Ruzyně* airport. The other three airports in and close to Prague (Točná, Kbely, Odolena Voda) are usually used for other, special purposes. The *Praha-Ruzyně* airport has three take-off and landing runways, two of them equipped for instrument traffic with the maximum capacity of 37 movements (take-offs and landings) of aircraft per hour. The airport overall annual transport capacity in 2005 was 7.2 mill. passengers (theoretical capacity), specifically 0.2 mill. passengers in terminal South and 7.0 mill. passengers in terminal North.

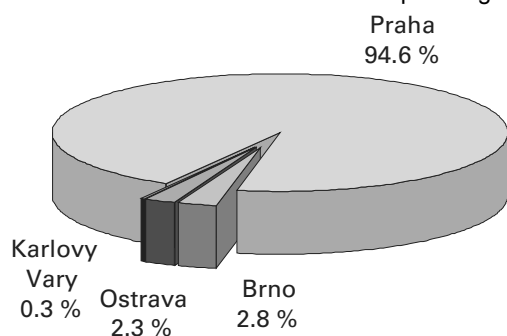
The operating capacity of the airport is 230,000 aircraft movements/year. Two terminals are available for clearing cargo, each with the capacity of 100,000 t/yr. In 2005 the *Praha-Ruzyně* airport was operated on by 56 companies with regular lines and 94 charter companies operating large aircraft. Regular connections to different parts of the world further expanded, reaching 113 as the total number of destinations in Europe and other continents this year. The biggest volumes of passengers were cleared to European destinations, viz. London, Paris, Frankfurt am M., Amsterdam, Copenhagen, Moscow, Manchester, Dublin and Zürich. The position of the *Praha-Ruzyně* airport in international comparison is seen from the following table.

Passenger volumes processed at selected airports (mill. passengers/year)

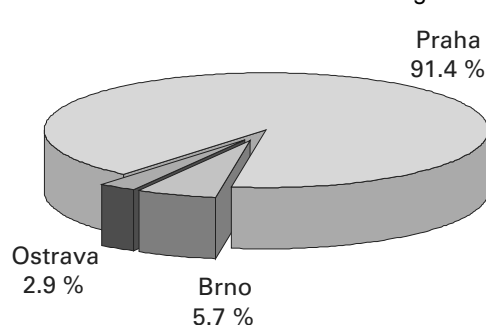
	1995	2000	2005	05/95 (%)
Chicago O'Hare	67,25	72,14	76,58	113,9
London Heathrow	54,13	64,28	67,92	125,5
Frankfurt Rhein-Main	37,4	48,96	52,22	139,6
Paris Charles de Gaulle	28,0	47,8	53,76	192,0
Amsterdam Schiphol	24,86	39,27	44,16	177,6
Madrid Barajas	19,57	32,57	41,93	214,3
Roma Fiumicino	20,71	25,88	28,62	138,2
Bruxelles National	12,50	21,52	16,12	129,0
Stockholm Arlanda	14,31	18,26	17,24	120,5
Kopenhagen Kastrup	12,71	18,16	19,75	155,4
Vienna Schwechat	8,37	11,79	15,86	189,5
Praha Ruzyně	3,21	5,79	10,78	335,8
Budapešť Ferihegy	2,94	4,67	8,06	274,1
Warsawa Okęcie	2,74	4,33	7,07	258,0
Bratislava M. R. Štefánika	0,19	0,28	1,33	700,0

The total volume of cleared passengers in 2005 at the four Czech airports that are international (*Praha, Brno, Ostrava, Karlovy Vary*) was 11.4 mill. passengers, i.e. by 12.6 % more than in 2004. This annual rise is markedly higher than increases in passenger volumes on 96 European airports, which was an average of 5.8 % in 2005. The volume of transported cargo (goods and mail), on the other hand, decreased by 3.9% to 56.6 thousand tons as compared with 2004.

**Share of Czech airports
in passenger transport performance**
% from the overall volume of cleared passengers

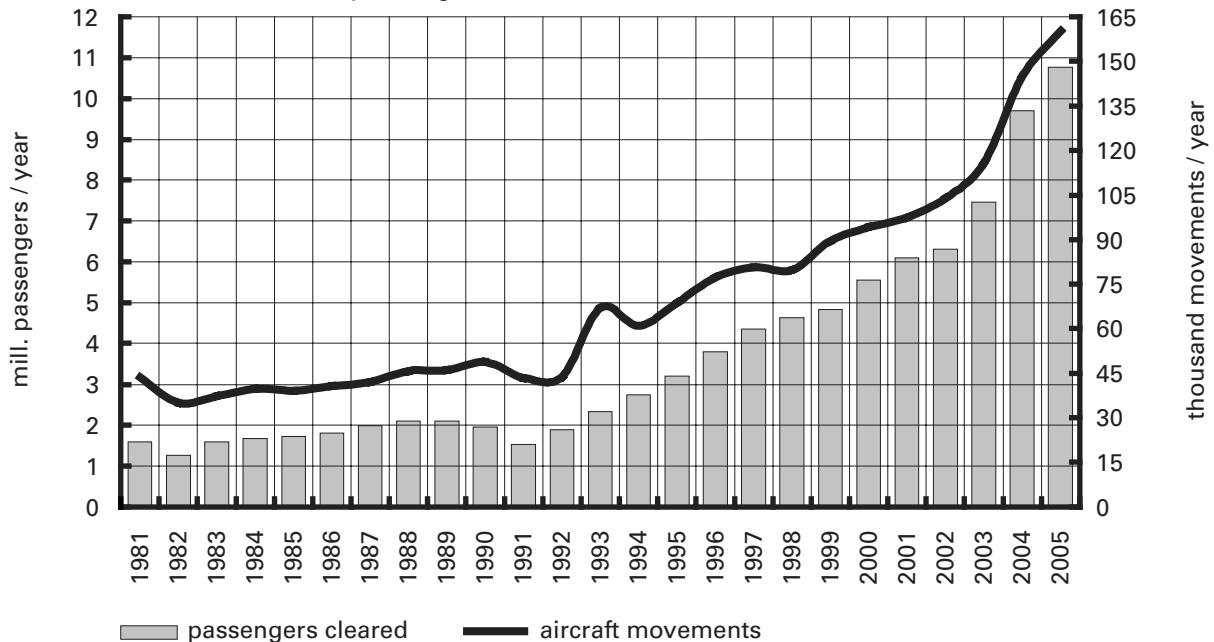


**Share of Czech airports
in cargo transport performance**
% from the overall volume of cleared cargo incl. mail



The total of 10,777,000 passengers were cleared through *Praha-Ruzyně* airport (capacity of which was exceeded) in 2005. Comparing with 2004, it is a record annual increase by 1.1 mill. passengers (11.1 %). The numbers consist of 84 % passengers transported by regular lines, the remaining 16 % by special lines. The most passengers were cleared in August (1,188,100 persons), the least in January (596,100 persons). Compared to 2004, the monthly high was by 11.2 % higher in 2005.

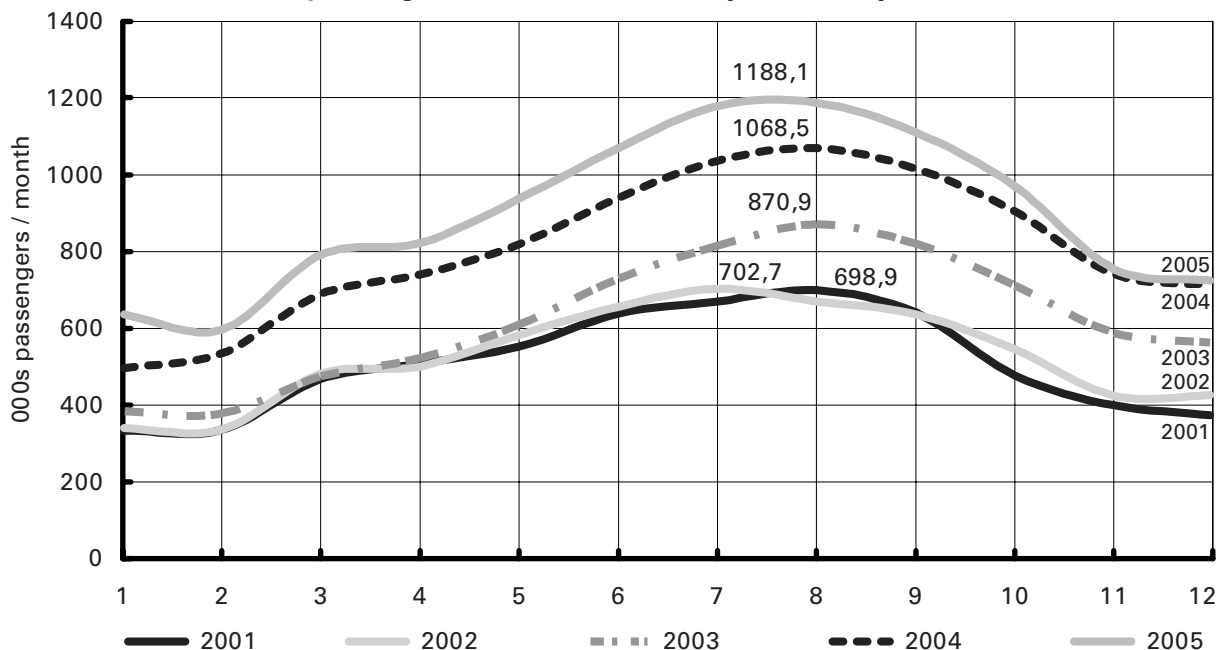
Development of the *Praha-Ruzyně* airport volumes
passengers cleared and aircraft movements



The number of aircraft movements in 2005 was 160,213 moves/year, which is by 15,251 moves more than in 2004 (by 10.5 %). The highest number of movements (15,283) was recorded in August, the lowest (10,113) in February. Compared to 2004, the maximum monthly number of movements in 2005 was higher by 8.7 %.

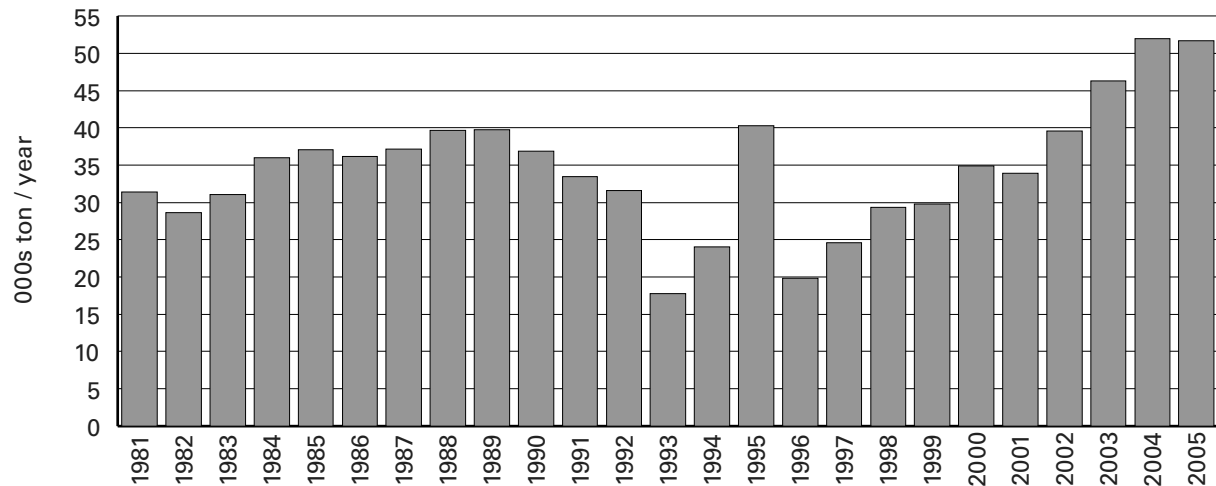
In 2005, cargo transport handled 46,002.5 t of goods and 5,727.9 t of mail. The total cargo transport reached 51,730.4 t, lower by 0.7 % against 2004. The most cargo was transported in December (4,856.7 t).

Number of passengers cleared at *Praha-Ruzyně*, monthly, 2001 – 2005



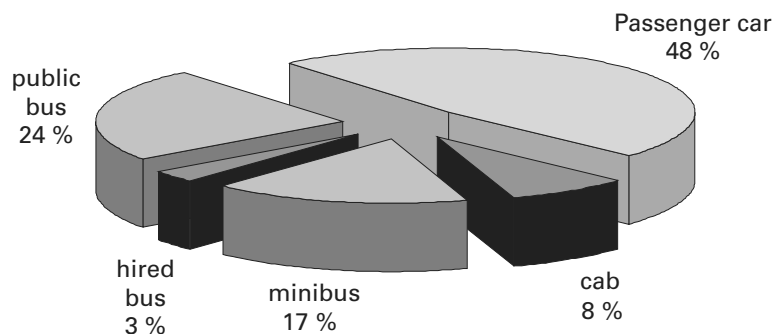
After 1991, which was the weakest year in passenger transport since 1982, the number of cleared passengers started to ascend sharply, beating the all-time high of the airport as early as 1993 (about 2.2 mill. passengers/year in 1978-79). Simultaneously, numbers of aircraft movements also rise. The cargo transport goes steadily up, too, so that in a long-time average it almost reaches the maximum average volumes achieved in the past.

Development of the *Praha-Ruzyně* airport volumes
freight handled (goods and mail)



The *Praha-Ruzyně* airport is found approximately 11 km away from the city centre where a downtown air terminal is located. Connection to the airport is provided for air travellers by a special commuter bus service which was extended, later last year, for a connection linking the airport and the *Praha-Holešovice* railway station by the line Airport Express to follow up the *Pendolino* train arrivals from *Ostrava* to *Praha*. Additionally, the airport is serviced by two municipal PT bus express lines linked to the Metro terminals at *Dejvice* (line A) and *Zličín* (line B). Other bus lines connect *Jihozápadní Město* housing estate. Cab service is also available, operated with passenger cars and minibuses (taxi lines) as well as many car rental companies. The majority share of airport-to-city passenger transport is provided by passenger cars.

Airport-to-city modal split, October 2003



The total number of lay-bys and parking places at the Air Terminal North (i.e. next to the main terminal building) serving the general public, airport employees and business companies that operate at the airport, is approximately 5,600 places. The parking facility in the building "C" provides over 2,700 places for the public, 332 more places are here reserved for car renting companies and 71 places is kept for immobile persons. The parking "C" services include coach lay-bys. The Air Terminal South provides 108 parking places for the public.

11. WATER TRANSPORT

Shipping on the *Vltava* river provides both passenger and cargo transport. The waterway capacity is limited by the capacity of the sluices *Podbaba* (5.2 mill. tons/year) and *Smíchov* (2.8 mill. tons/year).

Passenger shipping is mostly of holiday type. It is carried out by several companies all year round. The operators specialize in various sorts of cruises through Prague.

The largest passenger shipping operators are the Prague Steamship Company (*Pražská paroplavební společnost, a. s. – PPS*) and the European Water Transport (*Evropská vodní doprava s. r. o. – EVD*).

The oldest company is the Prague Steamship Company established in 1865. It is the owner of sightseeing and restaurant ships. Throughout the year, they offer regular sightseeing and tourist trips *Praha – Slapy*, *Praha – Troja* and *Praha – Mělník*. In 2004, the *PPS* transported 110,150 passengers. The data for 2005 were not provided.

Another large company offering passenger ship transport is the European Water Transport. They also operate ships throughout the whole year, either along regular timetables, or on special customer orders. The *EVD* transported 196,000 persons in 2005.

Apart from these, there is a number of smaller companies that offer cruises and social events on individual orders.

A new river ferry across the *Vltava* between *Sedlec* and *Zámky* is available to passengers and bikers since June, 2005. The tariff is included in Prague integrated transport.

Various carriers including foreign companies operate cargo ship traffic along the *Vltava* river. One of the largest carriers is European Water Transport (*Evropská vodní doprava s.r.o.*), which provides domestic and international transport of mass substrates, heavy pieces, containers, liquids etc.

The volume of the cargo shipping and numbers of ships flown in recent years are presented in the table below.

Sluice	Freight handled (t)				Ships used			
	2002	2003	2004	2005	2002	2003	2004	2005
<i>Modřany</i>	71 136	63 158	86 254	56 759	1 307	1 785	2 413	2 530
<i>Smíchov</i>	126 206	77 398	130 404	59 378	17 729	21 617	23 967	24 576
<i>Mánes</i>	7 251	6 523	4 018	690	2 604	2 878	2 998	2 329
<i>Štvanice</i>	117 296	83 289	126 295	106 749	3 603	4 118	5 330	7 740
<i>Podbaba</i>	214 173	241 000	293 027	302 726	1 203	1 415	1 690	1 799

Three harbours are found on the municipal territory: *Holešovice*, *Smíchov* and *Radotín*. They serve to reload various freight. The operator is Czech Harbours Company (*České přístavy a. s.*). The harbour users are carrier, warehousing, loading and producing companies and entities that use the land, buildings and infrastructure for river, railway and road transport. Commercial activity is often intertwined with leisure and water sport usage.



12. TRANSPORTATION INFRASTRUCTURE DEVELOPMENT

12.1 Engineering infrastructure

A number of traffic constructions were completed or started to operate in 2005. Many others were in progress in order to be completed in the years to come.

A split level junction to the *Chuchelská* radial road has been put to operation in the *Strakonická* street at the *Malá Chuchle* neighbourhood. It enables a collision-free access from the *Malá Chuchle* area to the *Strakonická* street. In the next stage the access is to make easier the so far complicated approach from the *Velká Chuchle* neighbourhood. It eliminates the last collision-prone level crossroads on the radial road, making simultaneously possible to expand the radial to six lanes.

An elevated road *Krejčárek – Palmovka* was launched early in December. It is expected to significantly improve the road link from *Žižkov* to *Libeň*. The 309 m long skyway (its cost was 140 million CZK) has been built under a larger railway project called „New Link”, shared by a group of four suppliers headed by *Skanska ŽS* company. The investor is Railway Infrastructure Administration (*Správa železniční dopravní cesty*), financial means are provided by the State Fund of Transport Infrastructure (*Státní fond dopravní infrastruktury*). Accesses in both directions from the *Novovysočanská* and *Pod Plynojemem* streets have been also built with the skyway. The shape of the bridge follows the earlier tram line between *Ohrada* and *Palmovka*. The *Pod Plynojemem* street originally level-crossed the busy *Vítkovská* railway, bringing about frequent congestions at the railway crossing. The bridge over the railway has substantially sped up the vehicle traffic at this location.



The *Chodov* shopping centre was launched at the end of the year. Included was a construction of new accesses to *Chodovská* radial road and redevelopment of those already in place. Further included in the shopping centre is a public car park with a Park and Ride facility for 700 users.

An access road to air terminal North 2 has been opened at the *Ruzyně* airport.

The *Karlín* neighbourhood continued to renew its infrastructure following the flood in August 2002. The first section of the *Křížikova* street has been repaired. The construction work goes on at the following segment of the street.

Several major repairs of the tram lines were also made in 2005:

- *Sokolovská* (section *Balabenka – nám. OSN*): the tram line reconstruction including adjacent road and utility network
- *Bělohorská* (section *Dlabačov loop – Bílá Hora*) including the replacement of traction mains
- a replacement of rail triangle at the crossroads of the *Zenklova*, *Klapkova* and *Trojská* streets

The following major repairs or road adjustments have been done in the network:

- *Přátelství* – a roundabout construction at the *K Netlukám* street
- *Kutnohorská* – a road and utilities reconstruction
- a repair of the *Bubenské nábřeží* embankment in front of the *Holešovická tržnice* market including the construction of flood counter-measures
- surface repairs of key roads made by milling of the road (e.g. *Cínovecká* and sections of the Southern Connection)
- a repair of the steel bridge across the railway *Praha – Benešov* at the *Vršovice* neighbourhood (*Moskevská – Bohdalecká*)
- a redevelopment of the *Záhřebská* street including a new roundabout at the crossroads of the *Záhřebská* and *Americká* streets.

Apart from the completed constructions, preparatory or construction work started or went on at other traffic construction sites in 2005. The largest ones include:

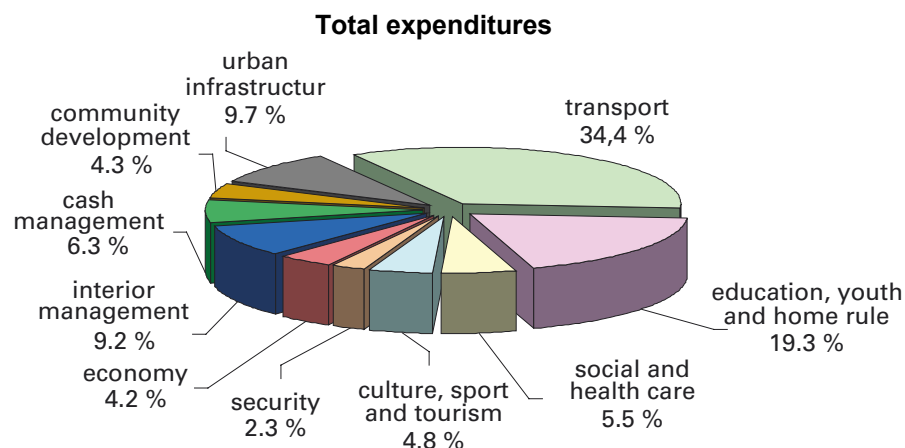
- the extending of Metro between *Ládví* and *Letňany*
- the New Link (i.e. connecting the railway stations *Praha-Hlavní nádraží* and *Praha-Masarykovo nádraží* with the stations *Praha-Libeň* and *Praha-Vysočany*)
- the *Depo Hostivař* Metro station
- the Outer Ring in the section *Slivenec – Lahovice*
- the split-level junction *Malovanka* (a follow-up of the *Strahovský* tunnel) at the northern portal of the *Strahovský* tunnel
- the continuation of the split-level junction *Malá Chuchle* making possible to link *Velká Chuchle* and *Radotín*
- the *Vysočanská* radial road construction – a split level access from the *Kbelská* street
- the terminal North 2 at the international airport *Praha-Ruzyně*

12.2 Funding the transport and traffic construction

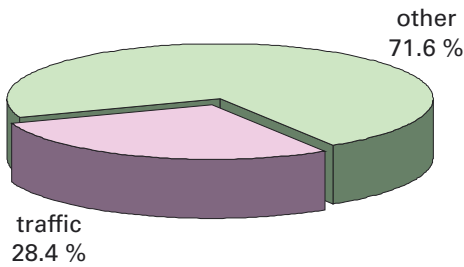
The urban transport operation and engineering infrastructure in 2005 were covered from the Prague's municipal budget, with further contributions from the national budget and corporate resources of the Prague Public Transit Co. Inc. (*DP hl. m. Prahy, a. s.*) and other municipal enterprises.

The Prague's municipal budget, adjusted on 30.9.2005, reached to expenditures of approximately CZK 57.2 bn., including CZK 19.8 bn. in the chapter 03 Transportation, which again in 2005 was the most substantial chapter of the municipal budget's expenditures. The traffic investments were 45 % of capital expenditures in all investments funded from the municipal budget.

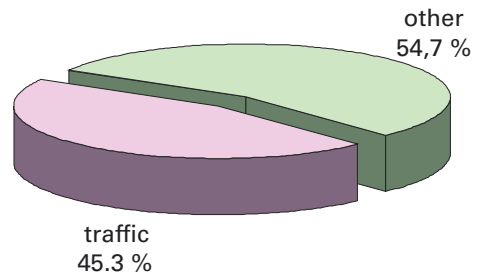
Breakdown of expenditures in municipal budget in 2005
budget adjusted as of 30.9.2005



Share of traffic in operational expenditures



Share of traffic in capital expenditures



The amount of CZK 19.8 bn. included also CZK 10.4 bn. earmarked to cover running operational expenditures and 9.4 bn. for capital expenditures.

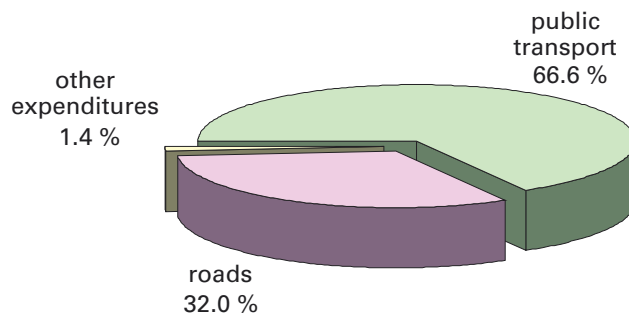
The **operational expenditures** in transportation cover, predominantly, subsidies for public passenger transport in and around the city. The total of CZK 8 bn. was allotted in the adjusted budget for this purpose. Almost CZK 2 bn. were set aside to cover repairs, maintenance and operation of the roads.

The **capital expenditures** covered mostly investment in development, i.e. construction of new roads, Metro lines and other transportation facilities (66 %) as well as larger repairs and redevelopment of traffic routes, equipment and renewal of technical devices (34 %). Expenditures allotted for improving the condition of public passenger transport prevailed also in the capital portion of the budget. Out of the total exceeding CZK 9 bn., CZK 5 bn. was earmarked for public transport renovation and development, CZK 4.3 bn. for investments in the road network.

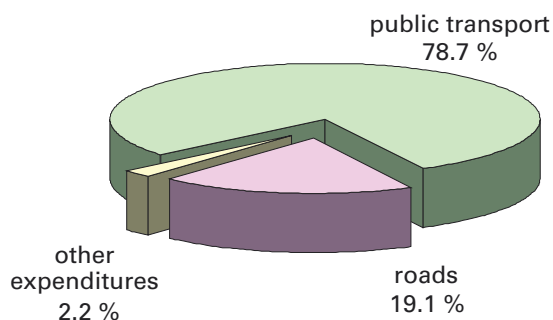
Expenditures for providing operation, modernization and development of public transport prevailed in the 2005 budget. Their share in the total expenditures in the chapter of transportation amounted to 67 %.

Structure of transportation expenditures in the 2005 municipal budget (budget adjusted as of 30.9.2005)

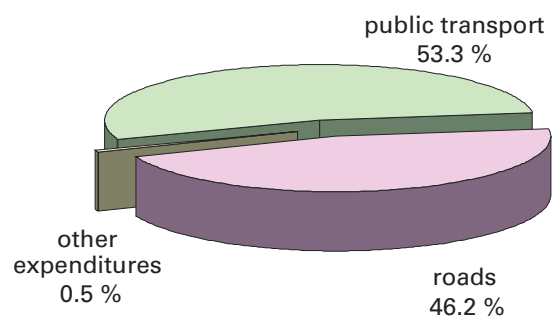
Total expenditures



Operational expenditures

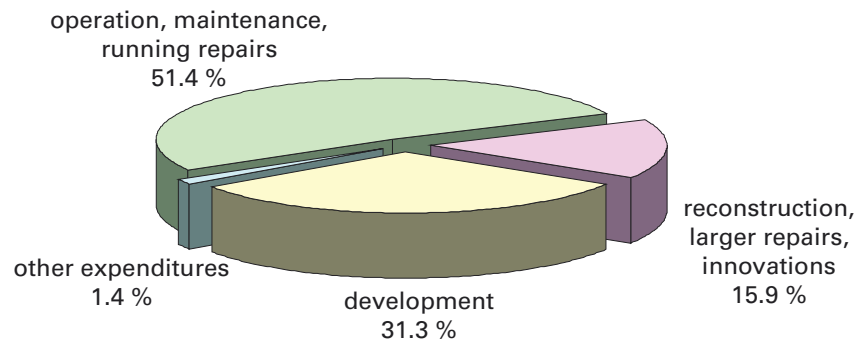


Capital expenditures

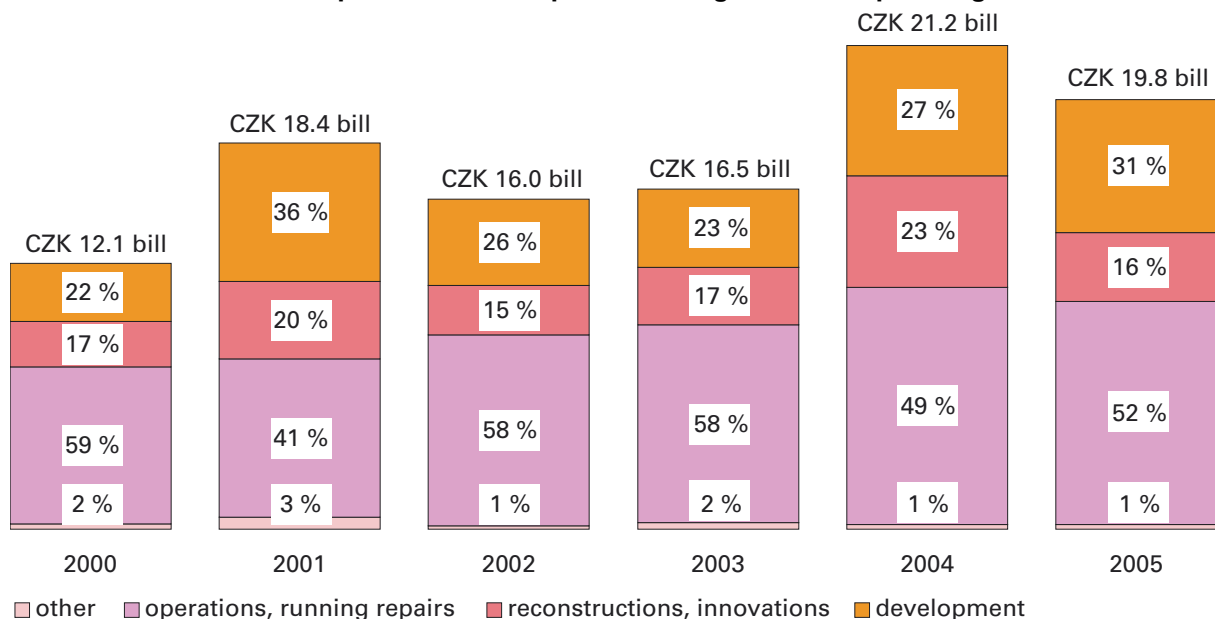


A more detailed analysis of the items listed in the breakdown of expenditures shows that CZK 10.2 bn. was directed toward operation, running repairs and maintenance of the urban transport system, CZK 3.1 bn. to provide for larger repairs, redevelopment and renewal of the technical equipment, CZK 6.2 bn. was earmarked for investments into development and almost CZK 300 mill. for other expenditures.

Total transportation expenditures in the 2005 budget
the budget adjusted as of 30.9.2005



Traffic expenditure development in Prague's municipal budget



The targeted contributions from the national budget and from the means of the National Fund for Traffic Infrastructure were provided to the Capital of Prague for repair and maintenance of roads (CZK 120 mill.), for the construction of Metro (CZK 420 mill.) and for the Metro system of protection (CZK 45 mill.). The Government also participates in the Prague Outer Ring construction, for the financing of which the Government had already assumed and guaranteed full responsibility. In 2005, the two galleries for future tunnels were completed on the sites 513 (Vestec – Lahovice) and 514 (Lahovice – Slivenec), a building permit was applied for and suppliers selected. An urban land permit was applied for the constructions 512 (D1 – Vestec), 518 Ruzyně – Suchdol) and 519 (Suchdol – Březiněves). The total of the resources spent during the year was CZK 720 mill., mostly to purchase land needed for the construction. The Prague Public Transit Co. Inc. contributed to investment constructions from its own resources and, apart from that, covered 44 % of the cost (CZK 955 mill.) spent in the year to renew the public transport fleet out of their own corporate resources. Funding of suburban transport was shared by communities around Prague whose population are users of the *PID* integrated transport. The Government also contributed to the Prague municipal budget to ensure the basic transportation service in the suburbs.

13. EUROPEAN UNION PROJECTS

The Capital of Prague and its organizations took part in solving two European Union mobility projects in 2005.

TRENDSSETTER (Setting Trends for Sustainable Urban Mobility)

The project was approved by the European Commission in 2001 as one of the eight projects of the CIVITAS program. The project aims at higher utilization of public transport, improvement of goods transport, cars and traffic infrastructure systems, and use of new services, making possible to preserve sustainable environment in cities. Under the supervision of Stockholm, bringing it to completion in 2005, partners from Stockholm, Lille, Graz, Prague and Pécs participate on the project.

The City of Prague with its bodies shared in dealing with three subtasks. The processing was provided by the Prague Public Transit (*Dopravní podnik hlavního města Prahy, a. s.*), our traffic engineering institution (*Ústav dopravního inženýrství hlavního města Prahy*), the City Council (*Magistrát hlavního města Prahy*) and the Prague Road Maintenance (*Technická správa komunikací hlavního města Prahy*).

The Prague Public Transit focused on launching CITYbus lines throughout the area with high concentration of healthcare facilities (the *Karlov* neighbourhood), which lacked a direct public transport service and showed rather long walking distances. The first citibus line started operation in April, 2003, and since then has been operating daily. The line is included in Prague integrated tariff system (*PID*) and is serviced with small buses (midibuses). The average occupancy is 20 passengers per vehicle.

The second subtask was adaptive bus priority in public transport. First it was launched on two crossroads (in 2003), presently it operates on 8 crossroads and TSD-controlled pedestrian crossings. It is under preparation related to the Metro development on additional 15 locations throughout *Praha 8* and *9* quarters. The priority system is based on radio communication from the vehicle to the TSD controller. The vehicle is localized with a stationary infra-beacon installed in front of the crossroads. The mobile technology is set in the vehicle. Currently, over 150 public buses are equipped with the device.

The third subtask "Widening of the Environmental Zone for Vehicles over 6 t" was processed by *ÚDI Praha*. Following the surveys and their analyses, two areas were recommended for possible extending the environmental zone. An area inside the *Praha 4* quarter was introduced in 2003. The follow-up probe verified the volume of heavy vehicle trips across the area did indeed went down by 11 per cent (while at the same time the annual increase of vehicle traffic was over 5 % in the area). The evaluation results according to model calculations show the restricted entry of lorries brings about a decrease in this area of particulate matter (PM) production by 5 %, a decrease in nitrogen oxides (NO_x) emissions by 9 %, a decrease in carbon dioxide (CO₂) emissions by 5 % and a reduction of energy consumption in heavy vehicle fuels (in GJ/year) by 2 %.

The available environmental zone of restricted access for heavy vehicles was extended in 2004 to an additional area in the *Praha 5* quarter. The expansion was made possible following the launch of the related Inner Ring (the *Mrázovka* tunnels). In comparison with 2002, the area experienced a decline in the goods vehicle traffic volumes by roughly 5 % while the volume of heavy haulage trips fell by almost 37 %. According to a model evaluation, it represents in heavy vehicle traffic an annual drop in PM production by 32 %, a drop in NO_x emissions by 37 % and a slump in CO₂ emissions by 12 %. The energy consumption in heavy vehicle fuels was reduced by more than 4 %.

CONNECT (Co-ordination and stimulation of innovative ITS activities in Central and East European countries)

It is a regional project shared, apart from the Czech Republic, by all the surrounding countries and smaller regional units, i.e. Slovakia, eastern lands of Germany (Berlin, Brandenburg, Saxony, Saxony-Anhalt), Austria (eastern regions of the country), Slovenia, Hungary and Poland.



The project's main task is to design a substantial mobility and safety adjustment in the CONNECT area. Measures for traffic management are designed on serious accident locations and the TERN network corridors and spotted main problems in the field of concern (e.g. mobility and safety management in tunnels, logistics and goods vehicle fleet turn-around control, emergency call management and unfavourable weather conditions).

CONNECT focuses mainly on "infomobility" services. It includes necessary studies and pilot projects to introduce systems providing quality information on traffic condition and passenger information. The services are upheld with improved quality of the data collected and improved telematic links between infocentres. It is exactly the Prague Mobility Information Centre (*DIC Praha*), jointly supported especially by Prague Road Maintenance (*TSK hl. m. Prahy*) and *ÚDI Praha* of all the municipal bodies, that fulfills the activity profile of CONNECT and was accepted in one of the subdivisions to be processed. The other subtask Prague participates in are information systems and stands for the blind. The chief co-ordinator for that is *ROPID*.

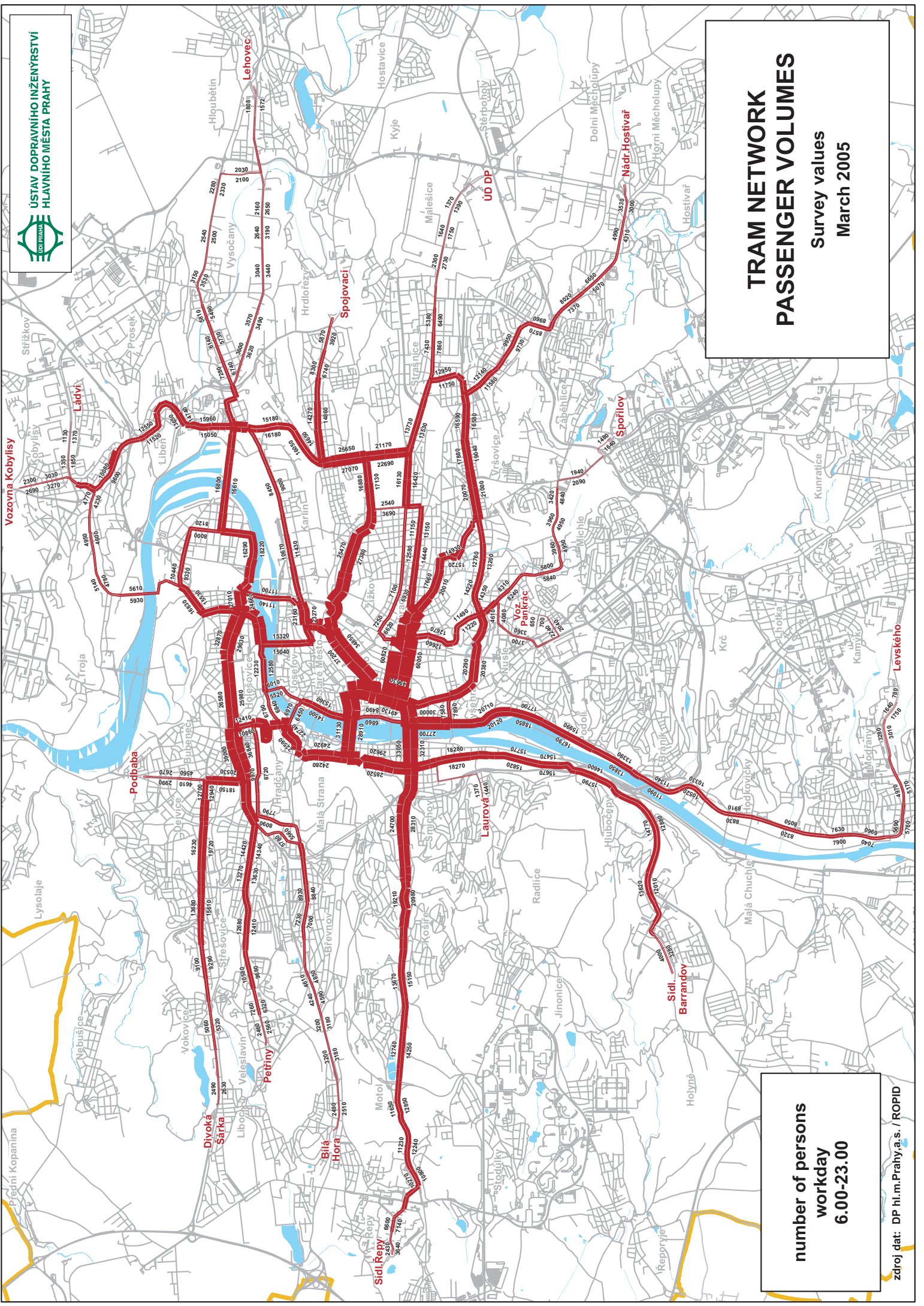
The Capital of Prague became a participant of the CONNECT project by signing the Letter of Commitment of 3.12.2003. This way, a number of studies and pilot projects made in preparation for the Prague Mobility Information Centre was able to be included in the project and makes possible to draw from the EU funds as much as 1/2 of the expenses that were already incurred due to it in the municipal budget during the previous period.

The CONNECT project is to continue during 2006 and 2007. In Prague, it is expected to contribute to a further development of the data collection systems and of providing mobility information. It concerns especially a continued development of the *DIC Praha* centre and increasing the information flow to the prospective users of the centre.



TRAM NETWORK PASSENGER VOLUMES

Survey values
March 2005



number of persons
workday
6.00-23.00

zdroj dat: DP hl.m.Prahy,a.s./ROPID

PRA HA
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1966  2006

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