
ÚDI PRAHA
INSTITUTE OF TRANSPORTATION
ENGINEERING OF THE CITY OF PRAGUE
THE 1999 YEARBOOK
OF PRAGUE'S TRANSPORTATION

Dear Reader,

this yearbook is provided for you to document the development of transport across the capital city of Prague in the year of 1999. The enormous increase of car traffic, which started after 1989 and lasted for eight years, slowed down in the past two years. The number of passenger cars registered within the municipal area grew "only" by eight and half thousand (that is by 1,4 %), and the car-per-head ratio stayed virtually the same. Still, with its 523 cars per 1000 people (that is 1,9 persons per 1 passenger car) Prague ranks among the most motorised cities throughout the world. The volume of vehicle-kilometers on Prague´s road network - the most precise parameter characterising the traffic development in the city streets - rose in 1999 by less than 4 %. In the last nine years, however, the vehicle-kilometers in Prague´s car traffic altogether have more than doubled (a rise of 219 %). Motor vehicles cover as many as 16 million km in Prague each day.

Admittedly, the overall increase of road traffic in Prague in the nineties is alarming especially when related to the environment, nevertheless we should bear in mind that traffic has a purpose. It is an essential part of the city´s organism and the way it is controlled helps to determine the quality with which the whole city operates as well as the satisfaction of its citizens. It is necessary to optimise transportation - create the best and safest routes, use the conveyances that are the best, most efficient and environmentally sensitive, provide for the preference of public transport and look for an optimal organisation of the whole system of traffic. Along with it, however, the other functions of the city must not be neglected. One of the purposes for optimising them should also be to help cut the traffic demand. The cut may, and must, be fostered substantially from the boom of information technology at the turn of the millenium. According to the estimation of experts presented at this year´s CeBIT exposition, by 2004 one in ten employees in the European Union is going to work at home, and as a result one can foresee a decrease in the volume of traffic thanks to the development of work "at home" by the computer.

Dear reader, I will be glad if information from this yearbook is of service gaining the necessary overview of the current transport situation in Prague as well as for professional decision making concerning the transport system of Prague. We will gladly provide more detailed and specifically targeted data directly at our institute or post them on our internet site **www.udi-praha.cz.**

Ladislav Pivec
Director

17th May, 2000

1 BASIC DATA

Selected data on the Capital of Prague as of 31. 12. 1999

City area	496	sq.km
Population	1 186 855	
Job opportunities	about 780 000	
Length of road network	3 398	km
specifically, motorways within the city	10	km
other urban motorways	71	km
All motor vehicles	744 125	
specifically, passenger cars	620 586	
Motor vehicles per head (in vehicles per 1 000 inhabitants)	627	
Personal cars per head (in cars per 1 000 inhabitants)	523	
Metro (underground) network (in operation)	49,8	km
Tram network	136,4	km
specifically, tramlines on its own trackbed	51	%
Municipal Public Transport bus network within the city	797,5	km
Traffic lights	395	
specifically, co-ordinated in „green waves"	272	
with traffic actuated control	149	
with tram priority	57	
separate pedestrian crossings	55	
Vehicle-kilometres in car traffic over the whole road network:		
for an average workday	16,0	million veh.-km
for a year	5,3	billion veh.-km
Modal split (based on the number of all trips within the municipal area in the course of a whole work day)		
public transport	58	%
car transport	42	%
Traffic accidents in 1999	44 192	
Injuries at traffic accidents:		
fatal injuries	74	
serious injuries	540	
slight injuries	3 558	
Relative accident rate (number of accidents per 1 million vehicle-kilometres travelled)	8,4	

2. CAR TRAFFIC

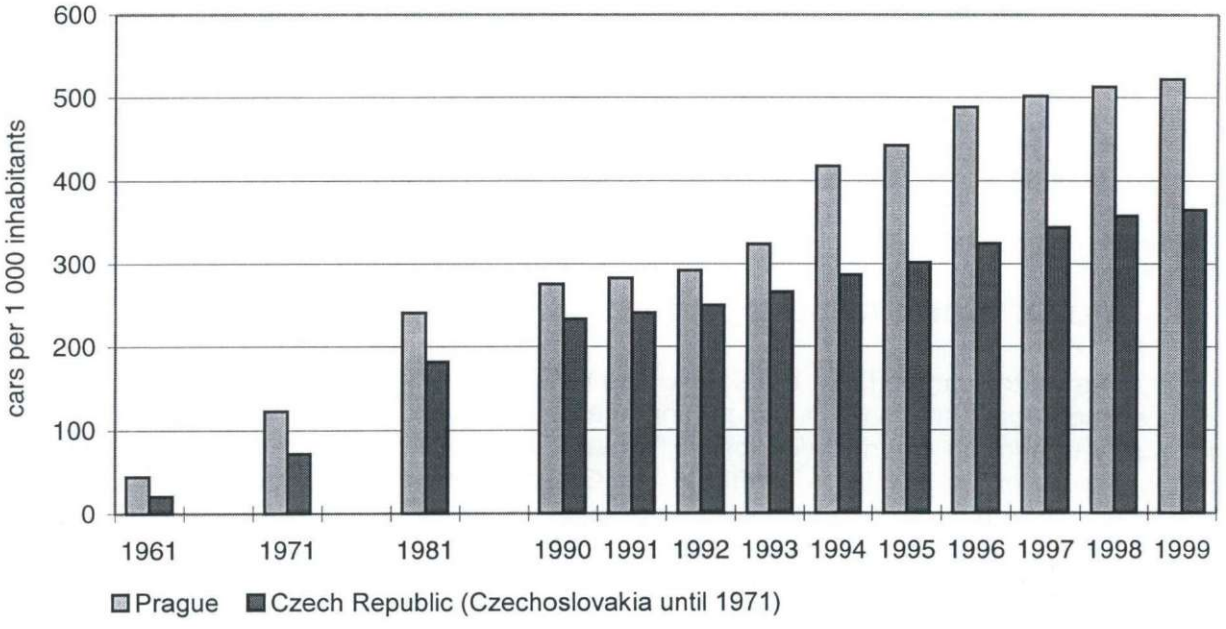
2.1 Development of Motorization and Personal Car Motorization

The total number of motor vehicles registered within the Prague city area grows steadily, boosting also the vehicles-per-head and cars-per-head figures. Rather fast growth rate in 1960s to 1970s slowed considerably down throughout the 1980s, the number of motor vehicles began to rise again notably following 1990. The essential share in the motor vehicle build-up is brought about by passenger cars.

While in 1980s the volume of passenger cars increased on average only by 6 000 cars each year, during (1991-1996) the average year-to-year increase reached 42 100. In the period from 1997-1998 this increase was lowered to 11 600 passenger cars per year and in 1999 the number of registered passenger cars increased by only 8 500.

The 1999 year end counted 1 car per 1,9 inhabitants in Prague. In this respect Prague got ahead of the most large motorised cities in Western Europe, where the value of cars-per-head parameter usually ranges between 2,1 to 2,3 inhabitants per 1 passenger car.

1961 to 1999 personal car motorization (cars per inhabitants)



Registered motor vehicles in 1961 – 1999

Year	PRAHA					Czech Republic (Czechoslovakia until 1971)				
	Popul.(in thous.)	All motor vehicles		Cars and vans		Popul.(in thous.)	All motor vehicles		Cars and vans	
		number	%	number	%		number	%	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
1996	1 205	702 966	164	588 968	175	10 309	4 991 607	124	3 349 008	139
1997	1 200	721 962	168	602 246	179	10 299	5 208 529	129	3 547 745	147
1998	1 193	735 504	172	612 128	182	10 290	5 383 765	133	3 687 451	153
1999	**1 187**	**744 125**	**174**	**620 586**	**185**	**10 278**	**5 238 776**	**130**	**3 695 792**	**153**

100 % = year 1990

Values of motor vehicles per head and cars per head in 1961 - 1999

Year	PRAHA				Czech Republic (Czechoslovakia until 1971)			
	Vehicles per head		Cars per head		Vehicles per head		Cars per head	
	veh. per 1 000 pers .	pers. per 1 veh.	cars per 1 000 pers.	pers. per 1 car	veh. per 1 000 pers	pers. per 1 veh.	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
1996	583	1,7	489	2,0	484	2,1	325	3,1
1997	601	1,7	502	2,0	506	2,0	344	2,9
1998	616	1,6	513	1,9	523	1,9	358	2,8
1999	**627**	**1,6**	**523**	**1,9**	**510**	**2,0**	**360**	**2,8**

2.2 Motor Car Traffic Volumes in 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 our larger 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 traffic performance in vehicle-kilometres (motor car kilometres travelled) throughout the whole of the road network. The vehicle-kilometres have been registered by the Institute of Transportation Engineering since 1978. Utilizing its own database software IDIS (Information traffic engineering system).

In addition to vehicle-kilometres, the Prague car traffic development trends are monitored by means of cordon surveys, i.e. periodic traffic counts taken on spots which make a rounded-off cordon over all the important in-roads entering a defined area. The downtown traffic development is monitored via the central cordon that reflects the two-way traffic

intensity at the entrances to the larger city centre as delimited roughly by the *Petřín* hill on the west, the *Letná* hill north, the *Rieger* park east and the *Vyšehrad* castle south. The extra-urban traffic development is monitored through the outskirts cordon reflecting the two-way car traffic intensity at the entry points of the main arterial roads and motorways into the densely built-up city area. The two cordons' time arrays have been registered and available in the Institute of Transportation Engineering since 1961.

The basic trends of development since the 1960s and their changes are documented with the following outline.

Average year-to-year growths in traffic volumes and vehicle-kilometres

	Year-to-year volume growth				Year-to-year veh.-km growth	
	central cordon		outskirts cordon		total road network	
	(veh./6-22 h)	%	(veh./6-22 h)	%	(veh.-km/0-24 h)	%
1960s	17 000	9	4 000	8	279 000	8
1970s	0	0	3 000	3	50 000	1
1980s	14 000	5	4 000	3	192 000	3
1991 - 1996	24 000	5	21 000	11	1 101 000	11
1997	5 000	1	45 000	17	998 000	7
1998	42 000	7	11 000	4	511 000	3
1999	**-9 000**	**- 1**	**16 000**	**5**	**574 000**	**3,7**

In the 1960s the growth in both intra-urban and extra-urban traffic as well as the total vehicle-kilometres (traffic performance) was rather high, yet considering the low starting values the total car traffic in comparison to the current condition was low.

In the 1970s the intra-urban traffic stagnated and the growth of the extra-urban traffic as well as the total traffic performance got markedly slowed down.

In the 1980s the growth in both the intra-urban and extra-urban traffic as well as the total traffic performance restored, but comparing with 1960s the rate was lower.

Since 1991 the number of cars as well as the car traffic volumes have had such an explosive boost that is unprecedented in Europe, apart from the former East German cities. The increase in volumes continued in 1999, though the growth rate decelerated relative to the early 1990s.

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

- In 1999 the car traffic over the total Capital of Prague area - measured by the traffic performance throughout the whole road network - went up by 3,7 % related to 1998. A faster increase than the average for all car traffic was in the traffic performance of passenger cars, which rose by 4,5 % as against the previous year, while the traffic performance of lorries and buses got down by 6 %.

- Comparing to the early 1990s when the average daily traffic performance had its annual increase of over 1 million vehicle-kilometres, the growth rate of the daily traffic performance subsided to about 0,5 million vehicle-kilometres in 1999. The abatement in the growth rate may have been influenced by a depression in the domestic economy in 1999 and the related reduction of corporate riding (travels by cars and

lorries of business and institutional establishments). This seems to be supported with the observed decrease of goods transport traffic performance.

- The daily traffic performance have had an overall increase in the last 9 years (1991-1999) by 8,7 million vehicle-kilometres a day. **It means that during the last 9 years the car traffic in Prague swelled more than in all the previous era the late 19th century until 1990.**

- The relative rate of traffic performance growth following 1990 is 2,3 times higher in Prague in comparison with all motorways and highways in Czech Republic:
  - in Prague (total road network) ..... by 119 %
  - on motorways and the highways in the Czech Republic (including the lengths within the Prague area) ..... by 51 %
  (by the courtesy of Road and Motorway Authority, Czech Republic.)

- All the rise in the car traffic in Prague following 1990 is due to passenger cars as the goods vehicle and bus traffic performances stagnate or drop slightly. From 1991 to 1999 the traffic performance per vehicle category in Prague went up as follows:
  - passenger cars ..... +148 %
  - lorries and buses ..... + 2 %
  - total vehicles ..... +119 %

- The car traffic growth rate differs in various city zones. During 1991 - 1999 the car traffic grew as follows:
  - average over the total network ..... +119 %
  - larger city centre ..... + 42 %
  - extra-urban traffic (municipal border) ..... +141 %
  - the intermediate zone of the city ..... +100 to + 240 %

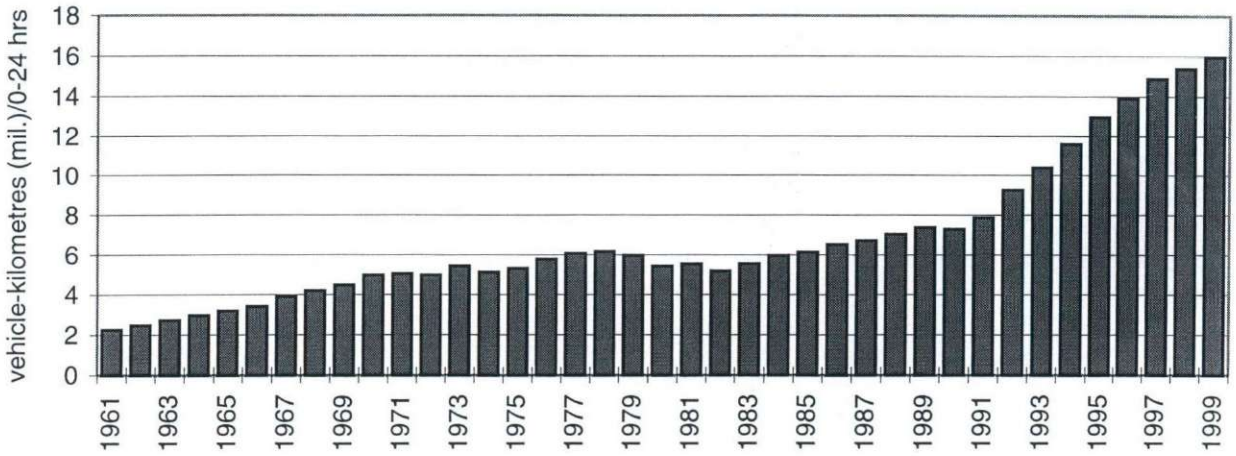
Motor car traffic vehicle-kilometres (traffic performance) in Prague in 1961 - 1999
The whole of the road network, an average workday, 0 - 24 hours

Year	All vehicles		Specifically, passenger cars		Passenger car share on traffic performance (%)
	veh.-km (in mill.)	%	veh.-km (in mill.)	%	
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
1996	13,896	191	12,426	212	89
1997	14,894	204	13,405	229	90
1998	15,405	211	14,001	239	91
1999	**15,979**	**219**	**14,503**	**248**	**91**

100 % = year 1990

Motor car traffic vehicle-kilometres (traffic performance) development in 1961 - 1999

The whole of the road network, an average workday, 0 –24 h



Average occupancy of cars in 1999 was:

- in the wider region of the city center ..... 1,41 persons per car
- in the outer region of the city ..... 1,51 persons per car
- on the average all over Prague..... 1,45 persons per car

The growth rate of traffic performance of passenger cars in Prague after the year 1990 when compared to the 80´s was more than 5 times higher in the first half of the 90´s, then in 1999 about 3 times higher, as is shown by the comparison of average annual growth of daily traffic performance on the whole city road network:

1981 - 1990	+	192 000 veh.- km/day per year
1991 - 1996	+	1 101 000 veh.- km/day per year
1997	+	998 000 veh.- km/day
1998	+	511 000 veh.- km/day
1999	+	574 000 veh.- km/day

3. MUNICIPAL PUBLIC TRANSPORT

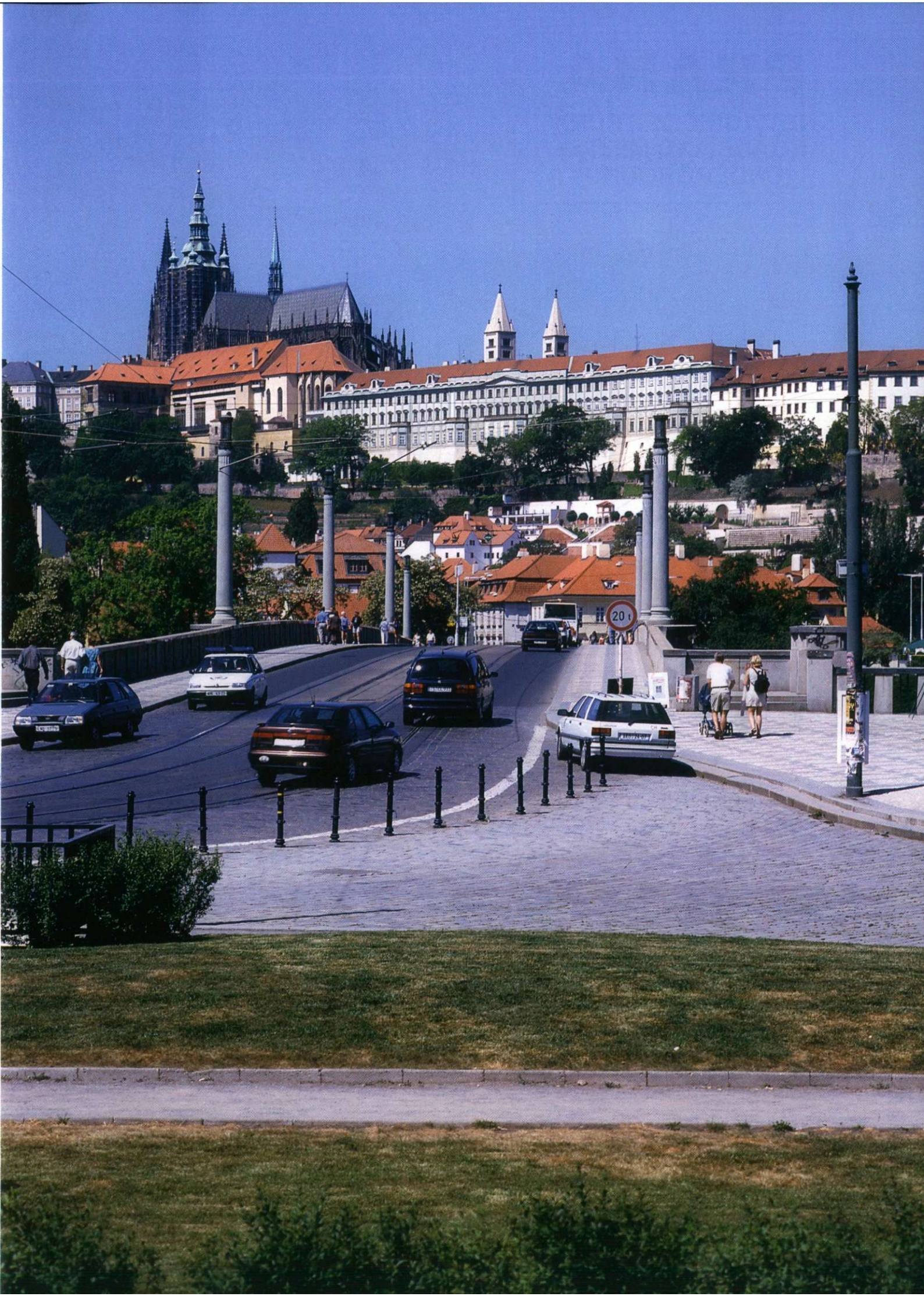
Prague Municipal Public Transport is a component of Prague Integrated Transport System which comprises the City of Prague, Czech Railways and several communities outside Prague that contribute to operation of regional coach lines beyond the limits of the City. The operators include Prague Public Transport Company (*Dopravní podnik hl. m. Prahy*) operating the metro (underground), tram lines, funicular railway and most of the bus lines, Czech Railways (*České dráhy*) operating the railways and additional ten smaller bus operators.

The **metro** (underground) makes up a backbone network of the municipal public transport. A new station *Hloubětín* on the line B was put in operation in November 1999. The metro network consists of three lines with a total operating length of 49,8 km and 50 stations (including three interchanges). The trains travel at an average commercial speed of 34,9 km/h, with the average distance between stations 1 038 m. First modernized metro train set was put in regular operation and by the end of 1999 a next stage of operational testing of new metro trains was completed. The metro share of the number of transported passengers reached 40,7 % of the total passengers using the municipal public transport.

The **tramway network** is 136,4 km long. 51 % of the lines run on a distinct trackbed (a raised embankment or, in places, separate track lanes led outside of road), 49 % of the tracks are in the roadway. The average stop distance is 499 m. The trams share 30 % of the total transported persons.

The **buses** make up a complementary network to the metro and trams; they provide spread coverage of the area, especially at the outskirts. The bus service was modified in accordance with the start of service of the metro station Hloubětín and at the same time optimised according to a detected demand. A service of joint-buses Ikarus was abolished on 1 July 1999. After buying 50 additional low-level buses, their number was almost doubled, so that it was possible to expand the use of low-level buses to three other bus lines. The bus share of the total transported persons is 29,3 %.

The **funicular** to the Petřín hill is a surface rail line 510 m long.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PRAHA

NETWORK OF TRUNK ROADS AND METRO (UNDERGROUND)

ÚDI PRAHA

D8

9

10

D 11

12

7

6

D5

D1

2

3 (varianta)

4

SILNIČNÍ OKRUH

MĚSTSKÝ OKRUH

PRŮSEČKA RADIÁLA

VYSOČANSKÁ RADIÁLA

ŠTĚRBOHOLSKÁ RADIÁLA

BŘEVNOVSKÁ RADIÁLA

RADLICKÁ RADIÁLA

CHODOVSKÁ RADIÁLA

SPOJOVACÍ RADIÁLA

A

B

C

D

P+R

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0 0,5 1 1,5 2 km

TRUNK ROADS

- 1/2000 reality
- stage
- plan (binding part)
- plan (non-binding part)

METRO

- 1/2000 reality
- stage

P&R TERMINALS

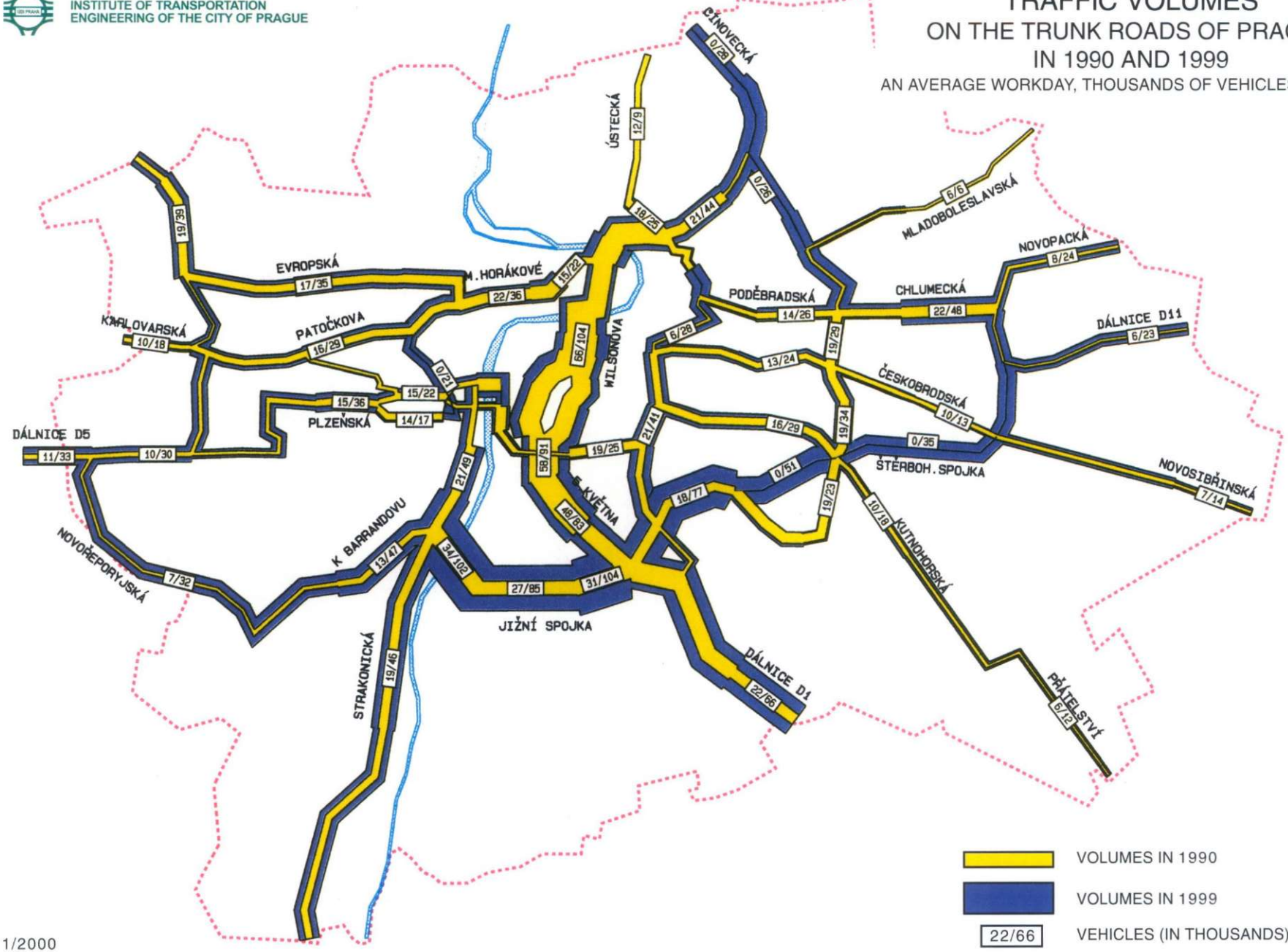
- 1/2000 reality
- stage

The networks are drawn in accordance with the Prague's Master City Plan in the state of 9. 9. 1999 and are subjected to possible changes.

INSTITUTE OF TRANSPORTATION
ENGINEERING OF THE CITY OF PRAGUE

TRAFFIC VOLUMES
ON THE TRUNK ROADS OF PRAGUE
IN 1990 AND 1999

AN AVERAGE WORKDAY, THOUSANDS OF VEHICLES IN 24 HRS



VOLUMES IN 1990

VOLUMES IN 1999

22/66 VEHICLES (IN THOUSANDS) 1990/1999

1/2000

Basic data on Municipal Public Transport – in 1999
(run by Prague Transport Company *DP hl. m. Prahy, a.s.*)

	Metro	Trams	Buses	Total
Operational network length (km)	49,8	136,4	797,5	983,7
specifically, on a distinct trackbed (%)	100	51	-	
Average distance between stations and stops (m)	1 038	499	693	
Average commercial speed (km/h)	34,9	17,8	24,3	
Vehicle-kilometres covered per year (thous.)	41 057	46 930	64 957	
Passengers transported per year (thous.)	428 075	316 585	308 321	1 052 981
Prague Public Transport Company employees	12 497			
Revenue from tickets (mil. CZK)	2 197			
Operational costs (mil. CZK)	9 219			
Revenue - costs ratio	23,83 %			

Development of selected characteristics of public transport

	Operational network length (km)				Average commercial speed (km/h)				Public Transport Performance on an average workday	
Year	metro	trams	buses	trolley-buses	metro	trams	buses	trolley-buses	place-km (mill.)	passengers transported (thous.)
1961	-	133	154	41	-	15,4	20,3	18,1	21	2 129
1971	-	138	332	9	-	15,6	20,2	18,1	30	1 745
1981	19,3	122,9	545	-	32,2	15,7	23,8	-	46,7	3 638
1990	38,5	130,5	607,3	-	34,6	17,4	23,7	-	57,6	4 186
1995	43,6	136,2	671,4	-	34,9	17,8	23,3	-	53,4	3 409
1996	43,6	136,2	724,6	-	34,9	17,9	23,8	-	54,5	3 423
1997	43,6	136,4	745,6	-	34,9	17,8	24,0	-	54,1	3 393
1998	49,8	136,4	759,7	-	34,9	17,7	24,3	-	54,4	3 349
1999	**49,8**	**136,4**	**797,5**	**-**	**34,9**	**17,8**	**24,3**	**-**	**56,1**	**3 343**

4. TRAFFIC SIGNAL CONTROL

The spread of traffic signal devices (TSD) on a larger scale began in Prague after 1967. The development of TSDs involved the following characteristic features:

- the number of TSDs skyrocketed until the early 1980s, then stood virtually still; the number of TSDs started to grow again only in the last few years due to the sharp increase in car traffic,
- the proportion of the TSDs co-ordinated in „green waves" is kept steadily high (70 %),
- traffic actuated control started to be applied as late as the latter 1980s, and still only a minor number of TSDs have this type of control (35 % of the total number),
- tram priority at traffic signals has been gradually introduced in Prague since 1993; bus priority at traffic lights remains non-existent, tram priority was by 31. 12. 1999 installed in 57 from the total number of 187 TSDs which exist in the tram network, the scheme of junctions with tram priority can be seen in a figure included in this publication.

The development of microelectronics and its penetration into the traffic signal devices industry has opened possibilities to reach a new quality level in traffic control on surface road junctions. While the preceding generations of TSD controllers, with few exceptions, made control possible only by means of preset fixed signal plans, at most enabling a call input only (on demand from vehicles or pedestrians inserting certain additional signal stage(s) into the signal plan at the expense of the other regular stages), present-day microcomputer controllers thanks to their in-built intelligence provide also dynamic traffic-actuated control.

Simultaneously, traffic-actuated control allows for another significant boost in quality - the public transport priority at traffic light signals, i.e. allocating green signal preferentially by coming public transport vehicles in order to let them through the junctions either with no stopping or only with a minimum delay.

As of 31. 12. 1999, Prague has had 395 sites controlled by traffic signals. Out of this number, 70 % TSDs have been interconnected in co-ordinated groups (with signal programs synchronised for the whole group so that the vehicles travelling in a synchronised direction may be provided with a smooth flow, free from stopping at traffic signals, so-called „green waves"). 55 sites out of all the TSDs (14 %) are separate pedestrian crossings, most of them equipped with push buttons for WALK green on demand only. 110 traffic light signals are equipped with acoustical signals for visually handicapped.

Basic data of traffic signal devices, 1961 - 1999

Year	1961	1971	1981	1990	1996	1997	1998	**1999**
All traffic signals	33	76	339	348	366	376	385	**395**
specifically, pedestrian crossings	-	9	37	45	49	51	54	**55**
in green waves	-	48	276	277	263	269	267	**272**
traffic-actuated	-	1	3	19	72	93	117	**149**
with tram priority	-	-	-	1	31	39	51	**57**

5. TRAFFIC ROAD ACCIDENTS

From evaluating long-term development trends of traffic accidents it can be concluded the long-term progression in accidents had a relatively favourable trend in 1960s through 1980s as the number of accidents more or less closely followed the progression in traffic performance (vehicle-kilometres) and grew slower than the traffic performances.

Since 1990 the basic trend of development has turned unfavourable as traffic accidents started to increase faster than traffic performance. The total accidents in 1999 rose by 145 % compared with 1991 while the traffic performance only by 119 %. Consequently, the accident risk rate also grew, which is expressed through a relative accident rate parameter (the number of accidents per one million vehicle-kilometres covered).

Comparing with 1980s (the average growth of 551 accidents/year), the average year-to-year growth in accidents is 5,3 times higher (2 908 accidents/year) in 1991-1999. The annual increases in accidents exhibited a steep upturning tendency until 1993. Only in 1994 at long last the accident growth stopped, in 1995 to 1999, however, the number of accidents turned again significantly upward.

Year-to-year accidents increase

Year		(accidents/year)
1961 – 1971 average		300
1971 – 1981 average		457
1981 – 1990 average		551
1991 – 1999 average		2 908
specifically,	1991	2 763
	1992	5 783
	1993	6 030
	1994	- 82
	1995	1 380
	1996	4 193
	1997	1 382
	1998	2 658
	1999	**2 061**

Accidents increased throughout the whole road network, at all places and road types: in straight sections, curves, both controlled and uncontrolled junctions, at trunk roads and minor service streets alike. One of the chief factors of this unfavourable development is a deterioration of traffic discipline with drivers as well as pedestrians, insufficient enforcement of the Highway Code observance and more of the easy-going, reckless and hazardous attitude. It is likely the deterioration of the drivers' discipline is affected by increasing impassability of the Prague road network.

What seems to be relatively favourable is - unlike the accident growth - that the number of accident injuries has a slower increase than both the total number of accidents and the traffic performance.

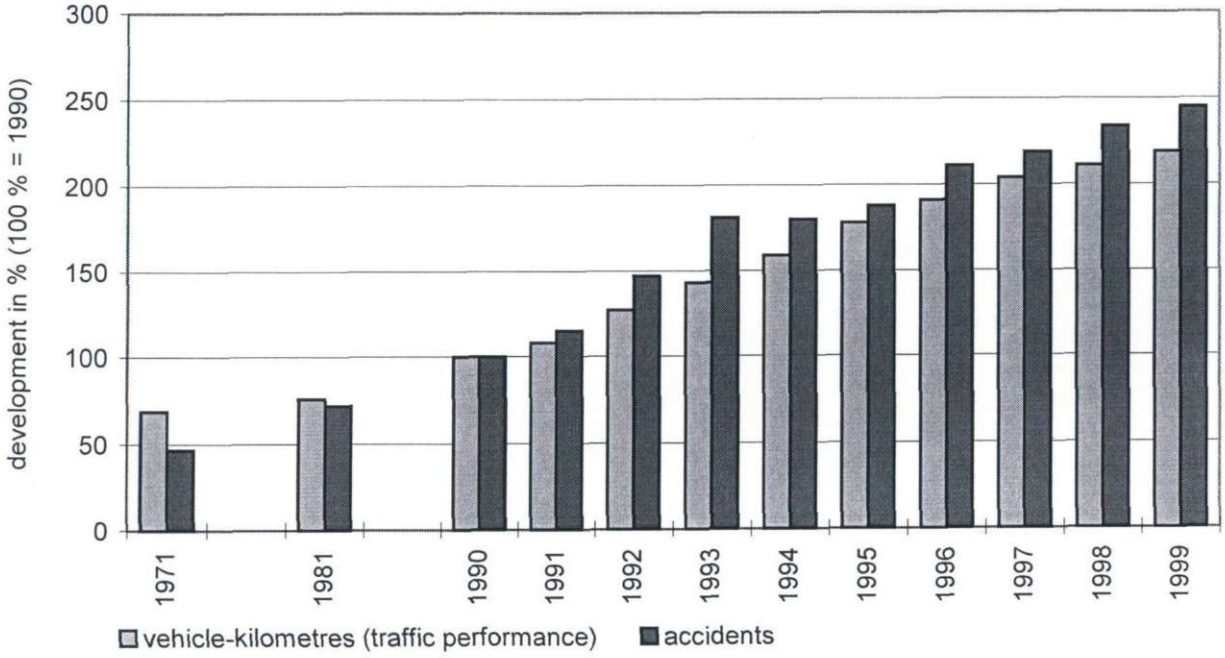
Traffic accidents, injuries and the relative accidents rate, 1961 - 1999

Year	Total accidents		Fatal injuries		Serious injuries		Slight injuries		Relative accident rate
	number	%	number	%	number	%	number	%	
1961	5 495	30	63	69	580	157	2 361	84	7,3
1971	8 496	47	123	135	567	154	4 046	144	5,1
1981	13 064	72	81	89	401	109	2 572	92	7,1
1990	18 024	100	91	100	369	100	2 806	100	7,5
1996	38 091	211	85	93	654	177	4 048	144	8,3
1997	39 473	219	90	99	539	146	3 720	133	8,0
1998	42 131	234	65	71	535	145	3 568	127	8,3
1999	**44 192**	**245**	**74**	**81**	**540**	**146**	**3 558**	**127**	**8,4**

100 % = year 1990

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

Accidents and vehicle-kilometres, 1961 - 1999



6. PARKING

6.1 Controlled Parking Zone in Prague 1

The controlled parking zone in Prague 1 east of the river (*Staré Město, Josefov, Nové město*) was launched on April, 1996. The establishing legal document for the controlled parking zone is currently the amended Prague Municipal Regulation No. 14/1997. It has determined those local roads in the area or their sections which may be used for parking of a motor vehicle for a limited time („orange and green zones," set for parking vehicles of both the public and visitors to Prague centre) for a price agreed in keeping with pricing regulations, and additionally those local roads where parking is permitted for permanent residents only or for the organisations that have their office within the area demarcated („blue zone," residential: R-standing, and admittance: A-standing) for a price agreed according to pricing regulations. The residential and admittance stalls along the local roads throughout all the area of Prague 1 east of the river are divided into three sectors, mainly for the reason of achieving better balance between the demand for parking and their supply in the controlled parking zone. The „blue zone" residential and admittance parking places are reserved for permanent users with no time limit.

The parking of public motor vehicles (i.e. visitors to the area), during the determined operation time displayed on the information plate below the road sign No. D 13 b „Car park with parking meters," have their standing time limited to a maximum of 2 hours (short-term standing - „orange zone") or maximum 6 hours (mid-term standing - „blue zone"). The vehicle standing during the displayed operation time is required to pay a fee. The fee is paid in advance via parking meters marked with either orange (max. 2 hrs) or green (max. 6 hrs) and shows the price and method of payment along with the park operating hours and the maximum permitted time for standing. Outside the operating hours displayed on the respective road sign and the related parking meter, the standing of vehicles within the „orange and green zones" is permitted with no time limit and is free of charge.

The operation time of the parks with temporary limited and paid parking is not uniform. The „orange zone" short-term paid parks usually operate Mondays to Saturdays from 8:00 a.m. to 18:00 (or possibly 20:00). The „green zone" mid-term standing usually operate Mondays to Fridays from 8:00 to 18:00. The basic price for one hour parking in the „orange zone" is CZK 40, and in the „green zone" CZK 30.

Parking and lay-by capacity development inside the Controlled Parking Zone, 1996 - 1998

	06/1996		1.1.1997		1.12.1998		1.12.1999	
	number	%	number	%	number	%	number	%
Orange zone (max. 2 hrs)	1 470	16	1 195	17	1 195	13	1 180	13
Green zone (max. 6 hrs)	1 185	13	1 064	14	1 064	12	1 043	12
Blue zone (park cards)	5 945	66	6 240	64	6 240	69	6 247	69
Reserved parking places	400	5	515	5	515	6	516	6
Total parking places	9 000	100	9 014	100	9 014	100	9 026	100
Parking meters installed	145		143		120		120	

The respecting coefficient the "orange and green zones" iscillated between 23 % to 30 %, in the "blue zone" 50 % to 56 %.

6.2 Park and Ride Parking Places

The Park and Ride system (P+R) which makes it possible to combine a car ride at the outskirts with a means of public transport into the central area is one of the ways to achieve the reduction of car traffic pressure exerted on the city centre. The necessary prerequisite for such a system to function satisfactorily is that there are Park and Ride parking places conveniently placed and of an adequate capacity to offer parking of vehicles near a stop of any rail transportation, particularly Metro.

From 1. 7. 1998 to 31. 12. 1999 nine park and ride parking places in Prague were launched into operation.

Number of parked vehicles at P+R parking places in October 1999

Parking place	Capacity	Number of parked vehicles	Average number of vehicles for 1 stand
Zličín I	94	3 970	42
Zličín II	70	2 006	29
Nové Butovice	60	2 313	39
Radlická	40	1 274	32
Skalka	175	1 702	10
Opatov	212	2 934	14
Rajská zahrada	80	1 976	25
Černý Most	300	7 785	26
Holešovice	77	2 835	37
Total	**1 108**	**26 795**	**24**

Note: Capacity of the parking places was updated in connection with the modifications of individual sites in 1999.

A vehicle guidance with the use of static or dynamic traffic signs is an integral part of a rationally functioning P+R system. The basis of static signs are four types of information boards. The individual types differ according to size and placement as a preliminary sign advice or confirmation of a correct direction of journey. Information boards are used for dynamic signs contaning traffic signs and service information with variable symbols. These boards inform about a distance and a number of vacant places at the closest parking places. Ways of formulation are specified in detail in principles of traffic signs for guidance to retaining parking places compiled by *ÚDI Praha* in 1999. By the end of November 1999 a test operation was started of the first actual dynamic guidance system at the P+R parking places in the Czech Republic, and that was at the parking place *Zličín, Nové Butovice* and *Radlická* at an approach to Prague. Information boards set a direction and a distance to the corresponding parking place and offer a survey of current number of vacant parking spaces at the specified parking places. The system enables a transfer of data even to Traffic Management Center *(HDŘÚ)* in Prague.

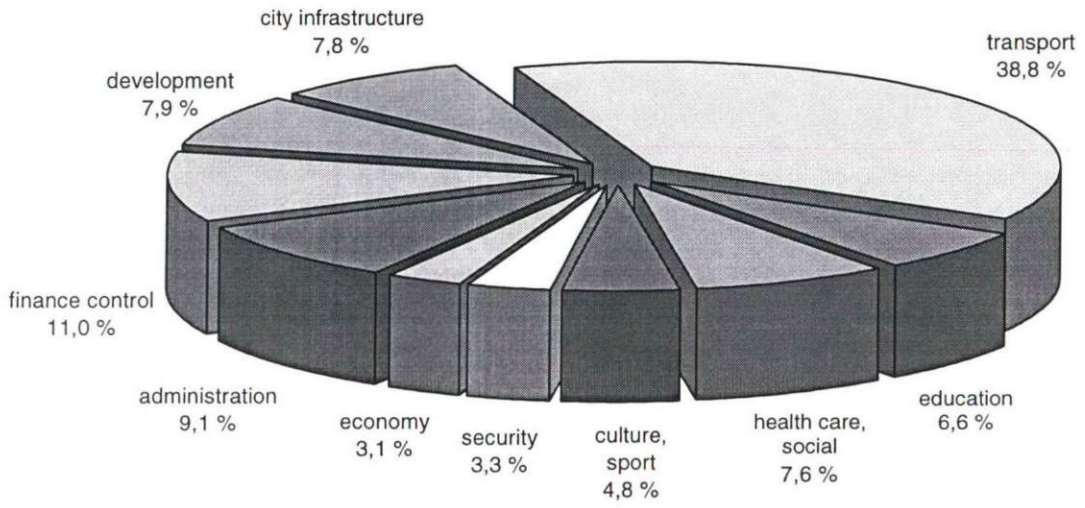
The P+R terminals are enclosed and guarded, and operate from 4 a.m. until about 1 a.m. of the following day (until the last Metro connection). The fee has been incorporated in the Prague Integrated Transport (*PID*) tariff system since 1. 5. 1998 by means of *PID* subscription tickets and special reduction day tickets for Municipal Public Transport.

The P+R parking price for any length of standing during the daytime operation is CZK 10. Prices of fares in connection with the parking at P+R parking places are 10 CZK for parking, 20 CZK for transfer round trip fare or 50 CZK for one day network fare. After the finish of metro service is over the parking places are closed. A driver pays the amount of 100 CZK/night for unpicked-up car.

7. FUNDING OF MUNICIPAL TRANSPORT AND THE TRAFFIC CONSTRUCTIONS

The 1999 traffic effort was financed from Prague's municipal budget, while only a minor share was contributed from the national budget and the corporate resources of the Prague Public Transport Company (*Dopravní podnik hl. m. Prahy, a.s.*). In 1999, the **adjusted Prague municipal budget** expected total expenditures of CZK 28,6 bill., with specific expenditures listed as CZK 11,1 bill. in the chapter Transportation. This almost 39 % share made transportation the most substantial portion of the spending part of the municipal budget in 1999.

The budget chapters sharing in the adjusted 1999 budget expenditures

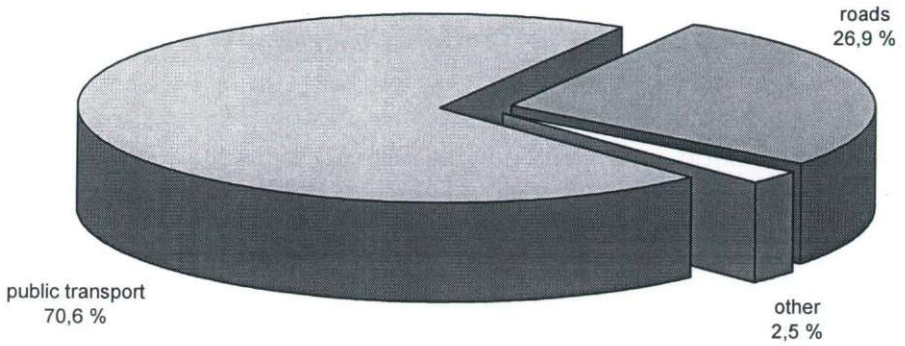


The amount of CZK 11,1 bill. earmarked for transportation in the adjusted budget was sub-divided into CZK 7,5 bill. to cover running operational expenditures, and CZK 3,6 bill. for capital expenditures.

The **operational expenditures** in transportation cover, predominantly, subsidies for public passenger transport in and around the city. A total budget of CZK 6,23 bill. was allotted for this purpose, including CZK 6,12 bill. for the Public Transport Company (*Dopravní podnik hl. m. Prahy, a.s.*) as a subsidy to municipal public transport operation. The remaining CZK 1,28 bill. was set aside to cover running road repairs and other expenditures needed to keep the system of traffic going.

The **investment spending (capital expenditures)** covered mostly investment in development, i.e. construction of new roads, tram and Metro lines, as well as other transportation facilities, plus also larger repairs and reconstruction of traffic routes and equipment and also renewal of the vehicle fleet. Expenditures allotted for improving the condition of public passenger transport prevailed also in this portion of the budget (out of the total CZK 3,6 bill., CZK 1,84 bill. was earmarked for public transport investments, CZK 1,56 bill. for reconstruction and development of the road network).

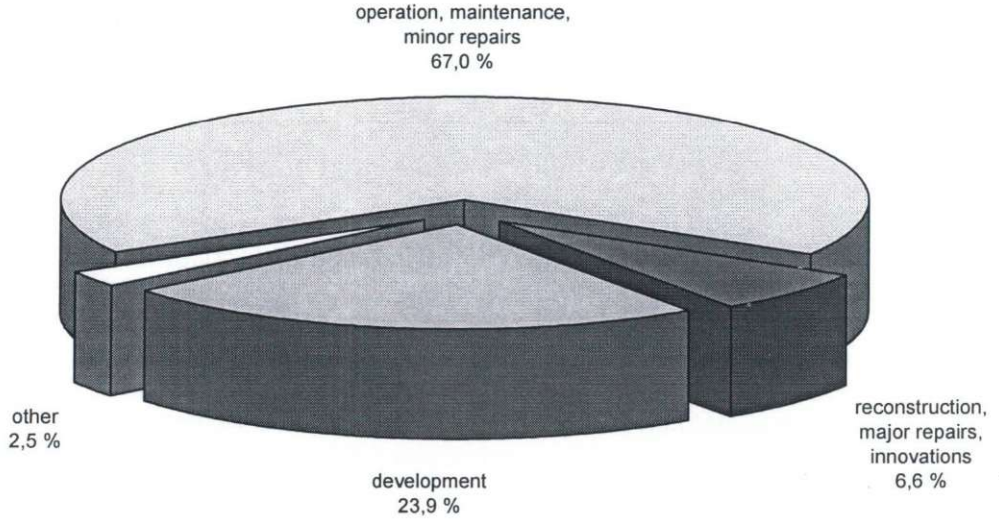
Total expenditures



The adjusted 1999 budget increased the expenditures for the safety as well as the restoration and development of public passenger transport whose share in the total expenditures of the Transportation chapter exceeded 70 %.

A more detailed analysis of the items listed in the breakdown of the Transportation chapter shows that about CZK 7,41 bill. was directed toward operation safety, running repairs and maintenance of the city transport system, CZK 0,72 bill. to provide for larger repairs, reconstruction and renewal of the technical equipment, CZK 2,65 bill. was earmarked for investments into development, and CZK 0,28 bill. for other expenditures needed to keep the traffic system going.

Structure of overall expenditures of chapter 3 of the adjusted 1999 Budget



The targeted means from the national budget was granted to the Capital City of Prague as contributions for repair and maintenance of the surface communications serving as roads and for construction of several specific communication segments. The government also granted to the capital city a contribution of 8,9 mill. CZK to cover the operational costs of the public transport, which, according to the road transport legislation, is supposed to be granted for the operation of basic transport service of the region. The feasible amount of this contribution is being estimated for Prague to be approximately 1 bill. CZK. The government via the Ministry of Transportation and Communication of the Czech Republic accepted the responsibility already in previous years for gradually building a ring road encircling Prague. Construction in progress were sections *Třebonice – Řepy* and *Řepy – Ruzyně*, for whose construction 780 mill. CZK was allocated in 1999.

Institute of Transportation Engineering of the City of Prague
Ústav dopravního inženýrství hlavního města Prahy

The Institute of Transportation Engineering of the City of Prague *(ÚDI Praha)* is a specialized organisation, the first of its kind in the Czech Republic, established in 1966. *ÚDI Praha* is concerned with engineering, design and consulting activities in the field of city transportation and traffic engineering, both for the City of Prague, and for other Prague and non-Prague customers.

Below are the main professional activities of *ÚDI Praha*:

- **processing of all kinds of transportation and traffic engineering documentation**
- **creating transport solutions and traffic city planning**
- **setting of transportation engineering conditions and materials for planning and project documentation of constructions works**
- **proposing co-ordinated developments of city transportation system and solution of integrated public transport system**
- **processing of traffic surveys, investigation and analyses**
- **creating, operating and up-to-dating of transportation engineering data bank system**
- **proposing traffic condition improvements**
- **designing traffic organisation on street network**
- **projecting traffic calm, designing of residential street and pedestrian zones**
- **regulating and restrictive measures for motor car traffic and proposals for parking policy**
- **designing of traffic signal devices, co-ordinated control, centralized control and public transport priority on traffic signals**
- **developing traffic conditions, transportation constructions and measures from the environmental point of view**

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