

# CROATIA

## NATIONAL REPORT 2006

### I Network

The total length of motorway network, as completed by the end of 2006 in Croatia, amounts to 1068.5 km.

Thus in 2006 43 km of new motorways were built (as compared to 93.3 km that were built in 2005), and 10.5 km of existing roads were upgraded to the full motorway profile:

**On the Motorway A2: Zagreb - Macelj**

Jankomir - Zaprešić Section (7.4 km) - the existing two lane road was upgraded to the full motorway profile.

**On the Motorway A3: Bregana - Zagreb - Lipovac**

Županja - Lipovac section (30 km) - the construction work was completed on the entire Pan-European Corridor X route passing through Croatia

**On the Motorway A6: Zagreb - Rijeka**

Kupjak - Vrbovsko Section (3 km) - upgrade to the full motorway profile in the Čardak Tunnel zone.

**On the Semi-Motorway A9: Istrian Upsilon - Kaštel - Pula**

The semi-motorway section from Vodnjan to Pula (13 km) was opened to traffic in December.

In Croatia, motorways are operated by 4 companies, i.e. by *Hrvatske autoceste d.o.o.* (operates all toll motorways except for those in concession) and by three concession companies *BINA-ISTRA d.d. Pula* (operates the so called Istrian Upsilon - A8 and A9), *Autocesta Rijeka-Zagreb d.d.* (A6) and *Autocesta Zagreb-Macelj d.o.o.* (A2).

#### Number of motorway kilometres

	Company	2005 total	2005 not tolled	2006 total	2006 not tolled
1.	HAC d.o.o.	702,3	20,8	735,0	-
2.	ARZ d.d.	146,5	-	146,5	-
3.	BINA-ISTRA d.d.	130,1	-	145,0	-
4.	AZM d.d.	41,6	-	42,0	-
<b>TOTAL</b>		<b>1020,5</b>	<b>20,8</b>	<b>1068,5</b>	<b>0</b>

## II Sections under Construction

On December 31, 2006, the works were in progress on the total of 152.4 km of new motorways, and on the total of 53.1 km of the existing roads (upgrading to the full motorway profile):

Motorway A1: **Zagreb - Split - Dubrovnik**; Split-Ploče Sector (96 km in total length)  
Dugopolje - Bisko Section (11.8 km)  
Bisko - Šestanovac Section (25.1 km)  
Šestanovac - Zagvozd Section (13.4 km)  
Zagvozd - Ravča Section (26.9 km)

Motorway A2: **Zagreb - Macelj**  
Krapina - Macelj Section (17.2 km)

Motorway A3: **Bregana - Zagreb - Lipovac**  
rehabilitation of Ivanja Reka - Velika Kapanica Section (208.4 km)  
new interchange construction: Križ, Rugvica and Kosnica

Motorway A5: **Beli Manastir-Osijek-Border with Bosnia and Herzegovina** (88.9 km in total length)  
work in progress: Đakovo - Sredanci Section (23 km)  
work in progress: Osijek - Đakovo Section (32.5 km)

Motorway A6: **Zagreb - Rijeka** (upgrading of existing roads to full motorway profile 53.1 km)  
Vrbovsko-Bosiljevo Section from the Zečeve Drage Viaduct to the Severinske Drage Viaduct (8.8 km)  
Kikovica - Oštrovica Section (7.4 km)  
Oštrovica - Vrata Section (12.5 km)  
Vrata - Delnice Section (8.9 km)  
Delnice - Kupjak Section (7.9 km)  
Kupjak - Vrbovsko Section (from the start of the section to immediately after the Stara Sušica Viaduct) (7.6 km)

Motorway A11: **Zagreb - Sisak**; Jakuševac - Velika Gorica South Section (10 km in total length)  
work in progress: Velika Gorica South Interchange and a motorway segment (2.5 km)

In 2007, the total of 77.2 km of new motorways will be opened to traffic, as well as 16.2 km of existing roads upgraded to full motorway profile, i.e.:

- on the Zagreb - Split - Dubrovnik Motorway the total of 37 km,
- on the motorway Beli Manastir - Osijek - Border with Bosnia and Herzegovina the total of 23 km,
- on the Rijeka - Zagreb Motorway the total of 16.2 km of upgrade to full motorway profile a part of the Vrbovsko - Bosiljevo Section from Zečeve Drage Viaduct to Severinske Drage Viaduct (8.8 km), and the Kikovica - Oštrovica Section (7.4 km),
- on the Zagreb - Macelj Motorway the Krapina - Macelj Section (17.2 km).

In 2007, in addition to the continuation of the works started in previous year, the construction work will start on 45 km of new motorways and on 95 km of roads to be upgraded to motorway profile:

**Motorway A1: Zagreb - Split - Dubrovnik**

Ploče - Ploče Port Section (9 km)  
Ravča - Ploče 1 Section (27 km)

**Motorway A4: Zagreb - Goričan**

Goričan Section - Hungarian border (1.5 km)

**Semi-motorway A8 and A9: Istrian Upsilon**

A8 - Kanfanar - Rogovići - 18 km  
A9 - Umag - Pula - 77 km

**Motorway A11: Zagreb - Sisak**

Jakuševac - Velika Gorica South Section (7.5 km)

### III Financing and Investment

In 2006, the total of 4,172.14 millions of kunas (€ 556.28 million) were invested in new motorway construction, while 680.59 millions of kunas (€ 90.75 million) were invested in the upgrade of existing sections.

in millions of kn (millions of €) (1EUR=7,5 kunas)

Company	Investment in 2006		Planned investment in 2007	
	new sections	existing sections	new sections	existing sections
<b>HAC</b>	2.342,52 (312,34)	613,41 (81,79)	1.510,08 (201,34)	554,47 (73,93)
<b>ARZ</b>	651,02 (86,80)	44,38 (5,92)	1.541,06 (205,47)	134,55 (17,94)
<b>BINA ISTRA</b>	291,50 (38,86)	16,30 (2,17)	25,50 (3,40)	22,60 (3,01)
<b>AZM</b>	887,10 (118,28)	6,50 (0,87)	147,00 (19,60)	64,60 (8,61)
<b>TOTAL</b>	<b>4.172,14 (556,28)</b>	<b>680,59 (90,75)</b>	<b>3.223,64 (429,81)</b>	<b>776,22 (103,49)</b>

In 2006, the construction of motorways was mostly financed through loans and toll revenues, and the company Hrvatske autoceste d.o.o. also finances motorway construction through fuel tax revenues (0.60 kn per litre).

## IV Traffic

Number of vehicles in toll-collection zones

Company	2005		2006			
	Light vehicles (1st and 2nd category)	Heavy vehicles (3rd and 4th category)	Light vehicles (1st and 2nd category)	% (05/04)	Heavy vehicles (3rd and 4th category)	% (05/04)
HAC	25.235.660	3.817.003	26.132.792	0,36	4.001.357	0,48
ARZ	10.320.894	1.525.395	11.152.446	0,81	1.746.766	14,51
BINA ISTRRA	3.375.597	373.001	3.992.150	18,26	412.949	10,70
AZM	4.442.852	552.820	5.547.567	24,86	712.747	28,92
<b>TOTAL</b>	<b>43.375.003</b>	<b>6.268.219</b>	<b>46.824.955</b>	<b>+11,07</b>	<b>6.873.819</b>	<b>+13,65</b>

Note: The above data do not include vehicles free of toll charging.

The total motor vehicle traffic operated on motorways increased in 2006 by 13.65 percent, when compared to the previous year.

GDP increase in 2005	Traffic increase in 2005	GDP increase in 2005	Traffic increase in 2006
4,3	5,6	4,7	13,6

In 2005, the total motorway network increased by 93.3 km, i.e. by 9.9 percent when compared to the size of network in 2004. In 2006, the network increased by 43 km, i.e. by 4.7 percent when compared to the previous year.

## V Toll Rates

As the motorway network in the Republic of Croatia is still under construction, both open and closed toll collection systems are currently applied. However, once the network is complete, the closed toll collection system will be applied on motorways with several entrances and exits.

In the closed toll collection system the toll collected for light vehicles (1<sup>st</sup> vehicle category) amounts to 0.043 €/km (or 0.33 kn/km), not including the VAT. In the open toll collection system the toll is 0.038 €/km (0.29 kn/km). The toll rate ratio between the 1<sup>st</sup> and the 4<sup>th</sup> vehicle categories is 1:4.

**HAC** has not been increasing its toll rates since July 2004, and it grants a 10 percent discount throughout the year for toll payment by subscription, i.e. using the Smart Card. In winter season, from November 1 to March 31, a seasonal discount of 23.5 percent is granted. The toll payment by INA card became possible as of April 18, 2006. The ENC toll collection system has been in place since July 1, 2006 on all motorways operated by HAC.

**BINA ISTRRA** did not modify its toll rates for the Učka Tunnel and the Mirna Viaduct in 2006. The open toll collection system is applied.

**ARZ** did not modify its toll rates in 2006. It grants a 10 percent discount throughout the year for toll payment by Smart Card. In winter season, from November 1 to March 31, a

seasonal discount of 23.5 percent is granted. The toll payment possibilities were extended in 2006 by electronic toll collection system (ENC) and INA card.

AZM modified its toll rates on February 9, 2006 due to transfer from the open toll collection system to the closed toll collection system.

## VI Toll Revenues (not including VAT)

1 € = 7.5 kn

Company		2005		2006		% (06/05)
		kn	EUR	kn	EUR	
1.	HAC	974.835.682	129.978.091	1.113.192.788	148.425.705	+14,19
2.	ARZ	340.086.598	44.748.236	380.405.106	50.720.681	+11,85
3.	BINA-ISTRA	106.842.582	14.245.678	120.675.524	16.090.069	+12,94*
4.	AZM	68.887.470	9.184.996	87.754.303	11.700.573	+27,38
<b>TOTAL</b>		<b>1.490.652.332</b>	<b>198.157.001</b>	<b>1.702.027.721</b>	<b>226.937.028</b>	<b>+16,59</b>

\*The Mirna toll station opened in June 2006.

When compared to the previous year the toll revenues increased by 16.59 percent, which is principally due to traffic increase, opening of new toll motorway sections, introduction of new toll collection methods, and to some smaller price corrections on certain motorways in Croatia.

## VII Traffic Safety

Number of accidents:	2005					2006				
	HAC	BINA ISTRA	ARZ	AZM	TOTAL	HAC	BINA ISTRA	ARZ	AZM	TOTAL
- fatal accidents	26	9	7	2	44	21	5	15	2	43
- accidents with injuries	296	26	86	3	411	291	15	116	25	437
- accidents with material damage	1492	112	362	104	2070	1528	177	434	118	2257
<b>Total number of traffic accidents</b>	<b>1814</b>	<b>147</b>	<b>453</b>	<b>109</b>	<b>2525</b>	<b>1840</b>	<b>197</b>	<b>555</b>	<b>145</b>	<b>2737</b>
<b>Total number of fatalities</b>	<b>29</b>	<b>13</b>	<b>7</b>	<b>3</b>	<b>52</b>	<b>32</b>	<b>11</b>	<b>22</b>	<b>2</b>	<b>67</b>

The total of 2737 traffic accidents, with 67 fatalities, was registered in 2006. Out of this total, the number of accidents with injuries was 437.

The number of traffic accidents increased by 8.4 percent when compared to the previous year, and the number of motorway kilometres increased by 4.7 percent.

## **VIII Medium and Long Term Forecasts and Tendencies**

According to the Transport Development Strategy devised for the Republic of Croatia and adopted by Croatian Parliament, the Croatia is to have 1,365 km of motorways by the year 2013.

Technical properties of motorways and other toll facilities, and specific features of financial operations in this sector, made it necessary to put in place a specific organizational structure for the operation of these facilities. In addition to ensuring continuity of maintenance and further construction of sections and facilities on which work has already started, an intensive activity must be promoted in the next planning period in order to improve organization of routine maintenance, to further automatise toll collection, and to enhance quality of roadside service facilities on motorways.

## **IX Significant activities due for completion in 2006 and plans for 2007**

### **AZM**

In 2005, the AZM company started to implement the closed toll collection system on the Zaprešić - Krapina section. This process was completed on February 9, 2006. The system accepts Smart Cards, and it has been in commercial use (with a 10 percent discount granted to the 1<sup>st</sup> and 2<sup>nd</sup> category vehicles) since May 2, 2006. According to the decision made by the Government of the Republic of Croatia, the toll has been reduced by 56 percent for all vehicle categories on the road segment from Zabok to Krapina. Cash payments are not possible on automatic toll lanes. This feature is bound to accelerate vehicle passage through toll station considerably, once the users get used to this novelty. At the same time, the signalling has been modernized considerably, especially after opening of the Krapina Road Maintenance and Traffic Control Centre and introduction of some advanced traffic management and control features, such as an appropriate emergency system, weather system, and automatic changeable message signals. The Krapina - Macelj Section, scheduled for completion in 2007, will also feature state-of-the-art equipment fully compliant with stringent European standards.

### **BINA-ISTRA**

The Vodnjan to Pula section, 13 km in length, was opened to traffic in December 2006. Thus the total length of the Istria Upsilon was increased to 145 km. In addition, filling stations and appropriate roadside services were opened at the Bačva Roadside Facility, on both sides of the motorway. In the course of the year, pavement was renovated on the Matulji - Učka Section (12 km), and the earthing system for electrical installations was upgraded in the Učka Tunnel. The remote tunnel guidance system (SCADA) was modernized, the road marking was improved along the entire Istrian Upsilon route, and radar speed measuring devices were put in place in order to remind drivers not to exceed the speed limit. In addition, the radio system was introduced in Učka Tunnel in order to enable continuous communication among various emergency services (emergency medical services, fire fighting services, police, and National Protection & Rescue Service), communication among members of the maintenance crew and, for drivers, continuous reception of three radio stations while driving in the tunnel. The radio system also enables Bina-Istra operators to warn drivers - by directly tuning into the radio program - about accidental and hazardous situations in the tunnel.

The design work for realization of the second phase of the Istrian Upsilon, i.e. for its upgrade to the full motorway profile, was also initiated in 2006. The design work will continue in 2007 when construction work is to commence for the first 95 km of the future motorway.

## HAC

The year of 2006 was marked by modernization of the toll collection system. In fact, the toll collection system was fully integrated in that year into a logical whole, and it currently includes services such as financial control, traffic counting, and video surveillance. The operation and functioning of the system can now be monitored at any moment and at any toll station from the main centre situated at company headquarters. In order to reduce the time needed by vehicles to pass through toll stations, the company introduced an advanced no-contact tolling system which enables vehicles equipped with transponder to pass through toll station, with a minimum stopping time.

Based on market analysis focusing on both the current and prospective motorway users, HAC introduced privileged tariffs based on prepayment. Seasonal Smart Cards (cards similar in function and shape to credit cards, and used for toll payment), valid from November 1 to March 31, can be bought at a 23.5 percent discount. The toll prepayment model features a commercial 10 percent discount applicable throughout the year, and payment can be made in up to six instalments.

Motorway concessionaires are very much aware of the extent to which they contribute to the development of tourism in Croatia. Travelling comfort greatly influences an overall impression tourists get about a country. In this respect, development plans take into account changes in the emitting markets, i.e. a significant increase in tourist arrivals from Eastern European countries. Croatia is a major tourist destination, and most tourist (as many as 93 percent) come by roads. This is why a complex infrastructure based on the so called "intelligent transport systems" is continuously developed in order to inform drivers in the best and most accurate way about road condition. In addition to its role in improving road safety, the new equipment is increasingly being used to combat environmental pollution, to make time savings, and to increase mobility. Aware of the habits, needs, and requirements of modern road users, companies are taking steps to provide alternative information through some other media, among which the prominent place is taken by Internet.

The development of motorway network poses new challengers to maintenance crews particularly as many complex facilities and structures (long tunnels, big bridges and demanding environmental protection systems), requiring proper maintenance, are situated along sections opened in recent years. Among significant projects undertaken in the sphere of information technology applied in management and operation of motorways, an important place is taken by the Road Data Base and the Management System for Structures/Facilities. In brief, special program applications and tools - gathering information from a single data base - are used as a means enabling modern operation of motorways, while the GIS technology enables visualization of relevant data. Furthermore, the geo-information system provides a valuable support in analytical and decision making processes, and contributes to successful integration of data at the level of the global computer-operated road management system.

In the field of roadside facility management, the concessionaire's objective is to attain and comply with the highest European standards, particularly in the sphere of

construction requirements, aesthetic appearance of roadside facilities, and services offered to road users.

## **ARZ**

In 2006, the activities of the company Autocesta Rijeka-Zagreb d.d. (ARZ) concentrated on the continuation of motorway construction work, i.e. mostly on the upgrade of the existing semi-motorway to the full motorway profile. The financial closing was reached for construction work related to Phase II B, and so the related contracts were awarded and the work has already started. A motorway segment, 3 km in length, situated at the Vrbovsko - Bosiljevo Section (Čardak Tunnel with adjoining motorway segments) and forming part of the Phase II A, was opened to traffic in that year.

In addition to traditional toll collection methods, the company introduced in 2006 the electronic toll collection system (ENC) and payment by INA card.

In 2006, the ARZ company started with implementation of the environment management system according to the standard ISO 14001:2004 and, in March 2007, the company will go through certification process aimed at enhancing environmental protection by enforcing respect of regulations and by specifying significant environmental aspects and impacts as related to the company's main activity.

The activities scheduled for 2007 mainly focus on completion of the Phase II A and the Kikovica - Oštrovica Section, and also on roadside landscaping activities, design and construction of windbreaks (mostly on viaducts and next to viaducts) at the segment between Kikovica and Vrata, and on construction of five roadside service facilities.

The Donja Zdenčina Interchange is also to be built in 2007, while construction of the Novigrad Interchange is scheduled for 2008, i.e. for the year in which the total upgrade to full motorway profile is due for completion.

In early 2007, the ARZ company also started implementing the SAP business application system, and the implementation is expected to end in September this year.

The SAP business IT system (formed in 1972 as *Systemanalyse und Proqramentwicklung*) offers a comprehensive range of program applications for companies, as well as business solutions aimed at improving all aspects of business operations.

The ARZ company is convinced that it will reach a greater level of transparency in business operations once the SAP information and business application system is implemented. After SAP implementation, it will become much easier for the company to identify any flaws or deficiencies in operation, to find new possibilities, to increase its response or reaction time, and to optimize its activities and resources in order to implement best business practices in its overall and daily operations.



## KEY FIGURES 2006

<b>CROATIA</b>	<b>2006</b>
Total length of motorway network, km	<b>1068,50</b>
2 x 1 lane	<b>215,52</b>
2 x 2 lanes	<b>844,38</b>
2 x 3 lanes	<b>8,60</b>
2 x 4 lanes	<b>0,0</b>
Number of km under construction as on December 31, 2006	<b>152,4</b> <b>53,1</b> <small>(upgrade to full profile)</small>
Estimate of new sections to be completed and opened to traffic in 2007, km	<b>77,2</b> <b>16,2</b> <small>(upgrade to full profile)</small>
Annual toll revenues in 2006, EUR	<b>226.937.028</b>
Permanent staff	<b>3207</b>
AADT, LIGHT VEHICLES	<b>12.425</b>
AADT, HEAVY VEHICLES	<b>1.559</b>
AADT, LV + HV	<b>14.221</b>
Total number of accidents	<b>2.737</b>
Number of accidents with injuries	<b>437</b>
Number of fatalities	<b>67</b>
Number of kilometres travelled (10 <sup>6</sup> x km)	<b>4.502.527.735</b>
Number of toll stations	<b>84</b>
Number of traffic lanes	<b>432</b>
Number of lanes destined to electronic toll collection	<b>147</b>
Number of electronic tolling system subscribers	<b>5.324*</b>
Number of rest areas (with filling stations)	<b>66</b>
Number of rest areas	<b>112</b>
Number of restaurants	<b>22</b>
Number of hotels	<b>8</b>

\* HAC and ARZ companies have already introduced the electronic toll collection system, while this system is still not in place on motorways operated by BINA-ISTRA and AZM.