

= A6 (Croatia) =

The A6 motorway (Croatian : Autocesta A6) is a motorway in Croatia spanning 80 @.@ 2 kilometres (49 @.@ 8 mi) . It connects the nation 's capital , Zagreb , via the A1 , to the seaport of Rijeka . The motorway forms a major north ? south transportation corridor in Croatia and is a part of European route E65 Nagykanizsa ? Zagreb ? Rijeka ? Zadar ? Split ? Dubrovnik ? Podgorica . The A6 motorway route also follows Pan @-@ European corridor Vb .

The A6 motorway runs near a number of Croatian cities , provides access to Risnjak National Park and indirectly to numerous resorts , notably in the Istria and Kvarner Gulf regions . The motorway route was completed in 2008 . The motorway is nationally significant because of its positive economic impact on the cities and towns it connects , and because of its contribution to tourism in Croatia . The importance of the motorway as a transit route will be further increased upon completion of a proposed expansion of the Port of Rijeka and Rijeka transport node .

The motorway consists of two traffic lanes and an emergency lane in each driving direction separated by a central reservation . Sections of the motorway that have a gradient greater than 4 % are divided into three lanes to prevent traffic problems caused by slower vehicles . These sections have no emergency lanes . Similarly , there are no emergency lanes in the tunnels . All intersections of the A6 motorway are grade separated . As the route traverses rugged mountains it requires numerous long bridges , viaducts , tunnels , and other structures . As of 2010 there are nine exits and three rest areas situated along the route . The majority of the motorway is a ticket system toll road with pricing tied to vehicle classification . Each exit between Grobnik mainline toll plaza and Bosiljevo 2 interchange has a toll plaza . No toll is charged at Bosiljevo 2 where the traffic switches to the A1 motorway ; traffic is tolled upon leaving the A1 motorway . Exits between the mainline toll plaza and Orehovica interchange have no toll plazas , as that part of the A6 route is not tolled .

A motorway connecting Zagreb and Rijeka was originally designed in the early 1970s , and construction started north of Rijeka and south of Zagreb . The first section , between Rijeka and Kikovica , opened on September 9 , 1972 , and a Zagreb ? Karlovac section followed on December 29 , 1972 . Those sections were the first modern motorways to be built in Croatia and Yugoslavia . Due to political upheavals in Croatia and Yugoslavia , construction of the motorway was labeled a " nationalist project " and , along with the proposed Zagreb ? Split motorway , was cancelled in 1971 . After the Croatian War of Independence , efforts to build the motorway were renewed and construction resumed in 1996 . In 2004 , a two @-@ lane , single carriageway expressway was completed between the sections completed 25 years previously , and the second carriageway was built ; the motorway was completed on October 22 , 2008 . Construction costs are estimated at 661 @.@ 5 million euro . Although Hrvatske autoceste normally designs , builds , and operates motorways in Croatia , the A6 motorway is operated and maintained by Autocesta Rijeka ? Zagreb .

= = Route description = =

The A6 motorway is a significant north ? south motorway in Croatia connecting the largest seaport of the country , Rijeka , to its hinterland and to the rest of the Croatian motorway network via the A1 motorway Bosiljevo 2 interchange . The motorway follows a route through the Gorski Kotar region . Part of the road network of Croatia , the motorway is also part of European route E65 Nagykanizsa ? Zagreb ? Rijeka ? Zadar ? Split ? Dubrovnik ? Podgorica . The motorway is of major importance to Croatia in terms of development of the economy ; it is especially important for tourism and as a transit transport route . The road serves tourist resorts in Istria and the Kvarner Gulf islands . Because of the link formed between Zagreb and Rijeka , tourism @-@ related traffic originating from the countries neighbouring Croatia to the north flows via this road to the Adriatic coast on the south . The road also serves tourists originating in the northern inland areas of Croatia . The A6 route predominantly follows an east ? west orientation , but the motorway is locally regarded as a north ? south communication . The ultimate importance of the motorway as a transit route shall be achieved upon completion of the proposed expansion of Port of Rijeka and the Rijeka transport node . The expansion is planned to encompass an enhancement of the cargo handling capacity of the Port of

Rijeka ; improved railroad links ; and a new Rijeka bypass motorway linking the A6 , via a new interchange , with the present routes of the A7 and A8 motorways . One of the aims of the project is to increase traffic along the A6 route . As of the June 1997 Pan @-@ European Transport Conference in Helsinki , the motorway is a part of the Pan @-@ European corridor Vb .

The motorway spans 80 @.@ 2 kilometres (49 @.@ 8 mi) between Bosiljevo 2 interchange and Rijeka ? Orehovica interchange on the A7 motorway . The route serves Vrbovsko via the D42 , Delnice via the D3 , Crikvenica and Krk via the D501 , and Bakar via the D40 state road . The route is complete and further development of the motorway includes only the construction of additional rest areas . The A6 motorway consists of at least two traffic lanes and an emergency lane in each driving direction along its entire length , except in tunnels , where there are emergency bays instead . Sections of the A6 motorway steeper than 4 % grade have three traffic lanes , and slow vehicles are restricted to driving in the rightmost lane . All of the interchanges are trumpet interchanges . There are a number of rest areas along the motorway providing various types of services ranging from simple parking spaces and restrooms to filling stations , restaurants , and hotels . As of October 2010 , the motorway has nine interchanges providing access to numerous towns and cities and the Croatian state road network . The motorway is operated by Autocesta Rijeka ? Zagreb .

An automatic traffic monitoring and guidance system is in place along the motorway . It consists of measuring , control , and signalling devices , located in zones where driving conditions may vary ? at interchanges , near viaducts , bridges , tunnels , and in zones where fog and strong wind are known to occur . The system comprises variable traffic signs used to communicate changing driving conditions , possible restrictions , and other information to motorway users .

The A6 motorway mainly runs through the mountainous Gorski Kotar region , requiring not only large bridges and viaducts and long tunnels along the route , but also special care must be paid to protection of the environment , as the route is located in karst terrain , with numerous water supply protection zones and significant natural heritage . Risnjak National Park is located near the A6 route , and is accessed via the Delnice interchange . Due to the motorway access and its proximity to a number of seaside resorts , Risnjak is the most visited national park in Croatia . Karst terrain is especially susceptible to water pollution , so the A6 motorway is equipped with a closed water drainage system designed to channel rainwater , meltwater , and any spillages to purpose @-@ built processing facilities . Approximately 200 karst features ? caves and other types of karst features ? were observed and protected during construction of the motorway . An extraordinary example of this was a cavern 83 m (272 ft) long by 63 m (207 ft) wide and 45 m (148 ft) tall , found during execution of the 260 m (850 ft) long Vrata Tunnel . The cavern was bridged by one of the tunnel tubes , which was sealed to protect the cavern and the water flowing through it .

= = Toll = =

The A6 is a tolled motorway based on the vehicle classification in Croatia using a closed toll system integrated with the A1 motorway . The two roads connect at the Bosiljevo 2 interchange , forming a unified toll system . Since the A1 motorway is operated jointly by Autocesta Rijeka ? Zagreb and Hrvatske autoceste , the toll collection system is operated jointly by the two operators . As of October 2010 , the toll charged along the A6 route between Bosiljevo 2 interchange (A1 Bosiljevo exit) and the Kikovica mainline toll plaza varies depending on the length of route travelled and ranges from 6 @.@ 00 kuna (0 @.@ 82 euros) to 33 @.@ 00 kuna (4 @.@ 52 euros) for passenger cars and 25 @.@ 00 kuna (3 @.@ 42 euro) to 139 @.@ 00 kuna (19 @.@ 04 euro) for semi @-@ trailer trucks . The toll is payable in either Croatian kuna or euros and by major credit cards and debit cards . A number of prepaid toll collection systems are also used , including various types of smart cards issued by the motorway operator and ENC ? an electronic toll collection (ETC) system which is shared by most motorways in Croatia and provides drivers with discounted toll rates for dedicated lanes at toll plazas .

The toll collected by Autocesta Rijeka ? Zagreb for use of the A6 motorway is not reported separately . Autocesta Rijeka ? Zagreb only reports its total toll revenue , including toll revenue collected on the A7 motorway (Rupa ? Jurdani section) and the A1 motorway (Lu?ko ? Bosiljevo 2

section) as well as on the Krk Bridge . In the first half of the 2010 their toll revenue was 188 @. @ 2 million Croatian kuna (25 @. @ 3 million euros) .

= = Notable structures = =

As the A6 motorway route runs through mountainous terrain of Gorski Kotar , it comprises a substantial number of major structures ? bridges , viaducts , tunnels , underpasses , flyovers , and culverts . Out of the total length of the Rijeka ? Zagreb motorway of 146 @. @ 5 kilometres (91 @. @ 0 mi) , 22 @. @ 1 kilometres (13 @. @ 7 mi) are situated within such structures . The northern part of the Rijeka ? Zagreb motorway , designated as the A1 motorway , comprising 38 @. @ 6 kilometres (24 @. @ 0 mi) between Zagreb and Karlovac , contains only 572 metres (1 @. @ 877 ft) of such structures as the section is situated in a plain . The 11 @. @ 4 kilometres (7 @. @ 1 mi) between Karlovac and Bosiljevo 2 interchanges , contains as much as 4 @. @ 036 metres (13 @. @ 241 ft) of the structures . Thus the A6 motorway has 17 @. @ 5 kilometres (10 @. @ 9 mi) , or 21 % of the route , located within such structures . The Rijeka ? Zagreb motorway has a total of 24 viaducts , 13 tunnels , 5 bridges , 45 underpasses , and 26 flyovers . All of the bridges , viaducts , and tunnels on the A6 motorway have at least two driving lanes in each direction .

The longest tunnel on the A6 motorway route is the 2 @. @ 143 @-@ metre (7 @. @ 031 ft) Tuhobi? Tunnel , located on the O?trovica ? Vrata section . The tunnel was initially opened as a single @-@ tube tunnel in 1996 . The second tunnel tube was excavated in August 2007 and opened to traffic in 2008 . The European Tunnel Assessment Programme (EuroTAP) , a tunnel safety assessment programme supported by the European Commission , coordinated by FIA and led by the German motoring club ADAC , tested Tuhobi? Tunnel twice ? once in 2004 , when it achieved poor results , and again in 2009 after implementation of EuroTAP safety recommendations . The 2009 test ranked the tunnel as the second safest in Europe . An unusual feature associated with the A6 tunnels is the close proximity of the 1 @. @ 490 @-@ metre (4 @. @ 890 ft) Javorova Kosa and the 610 @-@ metre (2 @. @ 000 ft) Podvugle? tunnels ? they are separated by less than 60 metres (200 ft) of road . In order to prevent abrupt changes in road conditions caused by the weather , the distance between the tunnels is covered by translucent roofing . The tunnels are located on the Vrbovsko ? Ravna Gora section . Other significant tunnels on the A6 motorway are the 1 @. @ 130 @-@ metre (3 @. @ 710 ft) Veliki Glo?ac and Vrata tunnels . While the former , as with all the other tunnels mentioned , is significant due to its length , the latter is notable for the large cavern encountered during its excavation .

The most significant bridges and viaducts on the A6 motorway route are the 485 @-@ metre (1 @. @ 591 ft) Bajer Bridge spanning Lake Bajer near Fu?ine , on the Vrata ? O?trovica section , and the Ze?eve Drage and Severinske Drage viaducts . The two viaducts are 924 metres (3 @. @ 031 ft) and 725 metres (2 @. @ 379 ft) long respectively . The remaining viaducts on the motorway that are longer than 500 metres (1 @. @ 600 ft) are Hreljin and Golubinjak viaducts .

= = History = =

Transport links between Rijeka and Zagreb have always been of substantial importance because of the transport requirements of the Port of Rijeka . This was first recognised by the Habsburg Empire in 1728 , when the Carolina road was completed , and again in 1780 when the road was modernized . The original Rijeka ? Zagreb road was replaced in 1811 by a new route , the Louisiana road , in order to avoid the steep sections of its predecessor . The new road remained the primary transport link to Rijeka until 1873 , when the first railroad to the city was built . Further development of the port and industry in Rijeka and Zagreb required a more efficient road , which was built in 1954 . That road was to remain the principal road transport link between the two cities for decades .

Zagreb ? Rijeka motorway , of which the A6 motorway is a part , was one of three routes defined in 1971 as priority transport routes of Yugoslavia that were to be developed as motorways . The first section of the A6 motorway , between Orehovica and Kikovica , was 10 @. @ 5 km (6 @. @ 5 mi)

long and opened on September 9 , 1972 . The section was also the first six @-@ lane motorway built in Yugoslavia . The 39 @.@ 3 @-@ kilometre (24 @.@ 4 mi) long Zagreb ? Karlovac section , now designated the A1 motorway , was completed on December 29 , 1972 . Further construction was suspended for the following 25 years , as a political decision had been made by the Yugoslav leadership to withdraw funding for the construction . The funds were instead allocated to the construction of a motorway that would travel between Ljubljana , Zagreb , Belgrade , and Skopje , then known as the Brotherhood and Unity Highway . The Croatian section of the highway later became the A3 motorway . After the breakup of Yugoslavia , construction of the Rijeka ? Zagreb motorway was still on hold due to the Croatian War of Independence , and no further construction took place until 1996 . The sole exception to the 25 @-@ year @-@ long hiatus was the 7 @.@ 25 @-@ kilometre (4 @.@ 50 mi) long Kikovica ? O?trovica section , which was originally executed as an expressway and opened in 1982 .

In 1996 , construction of the A6 motorway resumed , and in 1997 , a further 30 km (19 mi) of expressway between O?trovica and Kupjak was completed . In December 1997 , the government of the Republic of Croatia founded the Autocesta Rijeka ? Zagreb company and tasked it with operating the completed sections of motorway and the construction of the remainder of the route . The new motorway operator resumed construction in three stages . During the first stage , 60 @.@ 18 km (37 @.@ 39 mi) of expressway between Kupjak and Karlovac were completed by the end of June 2004 , comprising 60 @.@ 18 kilometres (37 @.@ 39 mi) of motorway and semi @-@ motorway . In the second stage , the expressway was upgraded to a full motorway by the end of October 2008 . This stage required additional construction along 55 @.@ 57 kilometres (34 @.@ 53 mi) of the route . The upgraded motorway was officially opened on October 22 , 2008 , by Prime Minister Ivo Sanader at a ceremony held at the southern portal of Tuhobi? Tunnel . The opening ceremony coincided with opening of a new bridge over the river Mura on the border between Croatia and Hungary , connecting the A4 to the Hungarian M7 motorway . Thus the route spanning Budapest ? Zagreb ? Rijeka was completed as a modern motorway . Construction costs incurred are estimated at 661 @.@ 5 million euros . Even though Hrvatske autoceste normally develops motorways in Croatia , the A6 motorway is operated and maintained by Autocesta Rijeka ? Zagreb .

= = Traffic volume = =

Traffic is regularly counted by means of a traffic census at toll stations and reported by Autocesta Rijeka ? Zagreb , the operator of the motorway , and published by Hrvatske ceste . The reported traffic volume exhibits no significant variations as the motorway chainage increases , and as it passes by various major destinations and the interchanges that serve them , except at the Vrata interchange , where traffic to and from Krk Island , Crikvenica , and Novi Vinodolski flows . The greatest volume of traffic is registered between Delnice and Vrata interchanges ? with a 12 @,@ 600 @-@ vehicle annual average daily traffic (AADT) , and a 21 @,@ 150 @-@ vehicle average summer daily traffic (ASDT) figure . Sections south of Kikovica interchange likely carry substantial traffic volume as they serve Rijeka commuter traffic as well as the volume registered between the O?trovica and Kikovica interchanges . However , no traffic volume figures are published for those sections , since motorway traffic is counted by means of toll ticket sales analyses , and the sections south of Kikovica interchange are not tolled .

Substantial variations observed between AADT and ASDT are normally attributed to the fact that the motorway carries significant tourist traffic to Istria and Kvarner Gulf . The seasonal increase in traffic volume ranges from 41 % on the O?trovica ? Kikovica section to 69 % as measured on the Bosiljevo 2 ? Vrbovsko section . The average summer @-@ season traffic volume increase on the motorway is 65 % .

= = Rest areas = =

As of October 2010 , there are four rest areas operating along the A6 motorway , as a new rest area opened on October 9 , 2010 next to the western portal of Tuhobi? Tunnel on the Vrata ?

O?trovica section of the route . Applicable legislation provides for four types of rest areas designated as types A through D : A @-@ type rest areas comprise a full range of amenities including a filling station , a restaurant and a hotel or a motel ; B @-@ type rest areas have no lodging ; C @-@ type rest areas are very common and include a filling station and a café , but no restaurants or accommodations ; and D @-@ type rest areas offer parking spaces only , with possibly some picnic tables , benches , and restrooms . Even though the rest areas found along the A6 motorway generally follow this ranking system , there are considerable variations , as some of them offer extra services . The most notable example is Lepenica rest area ? even though it has no restaurant and therefore falls below B @-@ type rest area standard , there is , for instance , an RV park available . The filling stations typically have small convenience stores and some of them offer LPG fuel . As of October 2010 , all of the rest areas found along the A6 motorway comply with C @-@ type rest area standards or above .

The primary motorway operator , Autocesta Rijeka ? Zagreb , leases the rest areas to various operators through public tenders . As of October 2010 , there are three such rest area operators on the A1 motorway : INA , OMV and Tifon . The rest area operators are not permitted to sub @-@ lease the fuel operations ; the Tifon @-@ operated rest area has a restaurant and a hotel operated by Marché , a Mövenpick Hotels & Resorts subsidiary , but they are also penalized if some facilities required by the lease contract are not operating . All of the A6 motorway rest areas , except Ravna Gora , are accessible from one of the directions of the motorway traffic only . The rest areas normally operate 24 hours a day , seven days a week .

= = Exit list = =