= Eisenhower Tunnel =

The Eisenhower Tunnel , officially the Eisenhower ? Edwin C. Johnson Memorial Tunnel , is a dual @-@ bore , four @-@ lane vehicular tunnel approximately 60 mi (97 km) west of Denver , Colorado , United States . The tunnel carries Interstate 70 under the Continental Divide in the Rocky Mountains . With a maximum elevation of 11 @,@ 158 ft (3 @,@ 401 m) AMSL , it is one of the highest vehicular tunnels in the world . The tunnel is the longest mountain tunnel and highest point on the Interstate Highway System . Completed in 1979 , it was one of the last major pieces of the Interstate Highway system to be completed . The westbound bore is named after Dwight D. Eisenhower , the U.S. President for whom the Interstate system is also named . The eastbound bore is named for Edwin C. Johnson , a governor and U.S. Senator who lobbied for an Interstate Highway to be built across Colorado .

= = Description = =

The Eisenhower bore (westbound tunnel) is 1 @.@ 693 mi (2 @.@ 72 km) long while the Johnson bore (eastbound tunnel) is 1 @.@ 697 mi (2 @.@ 73 km) long . The tunnels are sloped with a 1 @.@ 64 % grade , with an elevation of 11 @,@ 013 feet (3 @,@ 357 m) at the east portal and 11 @,@ 158 ft (3 @,@ 401 m) at the west portal . At the time of dedication , they were the highest vehicular tunnels in the world . While the Eisenhower Tunnel remains the highest vehicular tunnel in the United States , higher tunnels have since been constructed elsewhere , such as the Fenghuoshan Tunnel , a rail tunnel in China . The Eisenhower tunnel is noted as the longest mountain tunnel and highest point on the Interstate Highway System . The tunnel bores measure 48 feet (15 m) by 40 feet (12 m) ; however , the portion accessible to the public is a square shape measuring just over 16 feet (4 @.@ 9 m) tall . The rest of the bore is used for forced air ventilation and water drainage systems .

= = = Height restriction = = =

Due to additional height restrictions from variable @-@ message signs and lighting systems , the original posted clearance of the tunnels was 13 @.@ 5 feet (4 @.@ 1 m) . The trucking industry lobbied the Colorado Department of Transportation (CDOT) to increase the vertical clearance of the tunnel . With a 2007 retrofit that used lower profile lighting and signs , it is now possible for trucks 13 @.@ 92 feet (4 @.@ 24 m) to navigate the tunnel , an increase of 5 inches (13 cm) over the original limit . Sensors activate audible sirens near each entrance of the tunnel if a vehicle above the posted height attempts to enter the tunnel . Traffic signals at that entrance will turn red , stopping all traffic . The entrance will remain closed until the over @-@ height vehicle is removed from the freeway , sometimes causing severe delays for all traffic . CDOT noted that prior to the retrofit , about 20 @,@ 000 vehicles per year tripped the alarm . The trucking industry argued that many of these trucks were under the height requirement but tripped the alarm due to their air suspensions (which can be manually lowered for the duration of the journey through the tunnel) or due to snow and ice atop the trailer . During this time , the trucking industry estimated the number of alarms would drop by as much as 80 % if the clearance could be raised even a few inches . Another feature of the retrofit monitors truck weight ? a safe speed for each truck on the 7 % grades and curves just outside the tunnel is calculated and displayed for each driver .

= = = Alternate route = = =

To mitigate the dangers posed by a fire inside the tunnel , trucks hauling hazardous materials are also prohibited from using the tunnel . Prohibited trucks , bicycles , pedestrians and those who wish to stop and view the scenery must take the longer and steeper climb and descent of the older U.S. Highway 6 across Loveland Pass , 834 ft (254 m) higher at 11 @,@ 992 ft (3 @,@ 655 m) above sea level . Other than the above exceptions , the tunnel has replaced the pass for general vehicular

traffic . While less formidable than the older route , the approach to the tunnel on both sides is steep , and runaway truck ramps are available for truckers who lose control .

During construction or winter storms that require closing Loveland Pass , there is a procedure in place to allow hazardous material trucks to use the tunnel . Once per hour , the tunnel bores will be closed to regular traffic , and the trucks will be guided through the tunnel in a convoy with escorts .

As of December 2009 , almost 276 million vehicles have passed through the tunnel . This figure includes a significant number of visitors to Colorado 's ski resorts .

= = History = =

The idea for a tunnel under Loveland Pass existed at least since the 1940s . Serious discussion began when the state of Colorado lobbied for the Interstate Highway System to route a transcontinental highway across Colorado . After a round of negotiations with Utah officials , it was decided the best option was to follow the U.S. Route 6 corridor . Engineers recommended to tunnel under the pass , rather than attempt to build a route across it that conformed to Interstate Highway standards .

The Eisenhower ? Johnson Memorial Tunnel was known as the Straight Creek Tunnel during construction , named for the waterway that runs along the western approach to the tunnel . Before the tunnel was dedicated , it was renamed to honor Dwight D. Eisenhower and Edwin C. Johnson . Construction on the first bore of the tunnel was started on March 15 , 1968 . Construction efforts suffered many setbacks and the project went well over time and budget . One of the biggest setbacks was the discovery of fault lines in the path of the tunnel that were not discovered during the pilot bores . These faults began to slip during construction and emergency measures had to be taken to protect the tunnels and workers from cave @-@ ins and collapses . Despite the best efforts of engineers , three workers were killed boring the first tube , and four in boring the second .

Further complicating construction , the boring machines could not work as fast as expected at such high elevations ; the productivity was significantly less than planned . The frustration prompted one engineer to comment , " We were going by the book , but the damned mountain couldn 't read " . Though the project was supposed to take three years , the tunnel was not opened to traffic until March 8 , 1973 . Initially , the northern Eisenhower bore was used for two @-@ way traffic , with one lane for each direction . The amount of traffic through the tunnel exceeded predictions , and efforts soon began to expedite construction on the southern bore . Construction began on the eastbound Edwin C. Johnson tunnel on August 18 , 1975 and finished on December 21 , 1979 . The initial engineering cost estimate for the Eisenhower bore was $ 42 million ; the actual cost was $ 108 million (equivalent to $ 576 million in 2016) . Approximately 90 % of the funds were paid by the federal government , with the state of Colorado paying the rest . At the time , this figure set a record for the most expensive federally aided project . The excavation cost for the Johnson bore was $ 102 @.@ 8 million (equivalent to $ 335 million in 2016) . Not included in these figures is about $ 50 million in non @-@ boring expenses in the construction of both tunnels .

The tunnel construction became unintentionally involved in the women 's rights movement when Janet Bonnema applied for work with the Colorado Department of Transportation . She was given an assignment on the Straight Creek Tunnels project , but her supervisor misread her resume and thought he was hiring " James " . When the supervisor discovered the department had hired a woman , she was instead tasked with doing support work from the office . There was opposition to a woman entering the construction site : One supervisor stated that if she entered , " Those workers would flat walk out of that there tunnel and they 'd never come back " . The workers , most of whom had a mining background , expressed a common superstition that a woman brought bad luck to a mine . One worker insisted , " It 's a jinx . I 've seen too many die after a woman was in the tunnel . " Bonnema sued the department for the right to work inside the tunnel . She countered that she was in better shape and more agile than most of the men working on the tunnel . Emboldened by the passage of an equal rights law in Colorado , she finally entered the tunnel , with an entourage of reporters , on November 9 , 1972 . Some workers did walk off the job ; at least one yelled , " Get those women out of here " . She remained determined and re @-@ entered the tunnel a few days

later . The next time she dressed in coveralls , and was even assigned tasks on the roof of the tunnel overlooking the men below . Surprised that nobody apparently noticed she was a woman , she stated , " I had a good disguise " .

= = = Plane crash = = =

During construction in 1970 , a plane crash occurred less than two miles (3 km) northeast of the east portal on Friday , October 2 . A Martin 4 @-@ 0 @-@ 4 charter aircraft , one of two carrying the college football team of Wichita State University , crashed just north of the highway (39 @.@ 6935 ° N 105 @.@ 8825 ° W ? / 39 @.@ 6935 ; -105.8825) . Of the 40 passengers and crew on board , only nine survived . The team was on its way to a game with Utah State University in Logan , and had recently refueled at Denver 's Stapleton International Airport . The other plane took a different route and landed safely in Logan . Workers constructing the tunnel were among the first on scene at the crash site .

= = Water Diversion = =

As with the Moffat Tunnel , while the Eisenhower Tunnel was primarily intended as a transportation tunnel , it also serves as a water tunnel for water diversion from the western side of the Continental Divide to the eastern side . Water from the Straight Creek watershed (a tributary of the Blue River) , along with all seepage entering the tunnel is discharged into Clear Creek for delivery to the Coors Brewing Company . Typically , the tunnel delivers over 300 acre @-@ feet (370 @,@ 000 m3) of water per year .