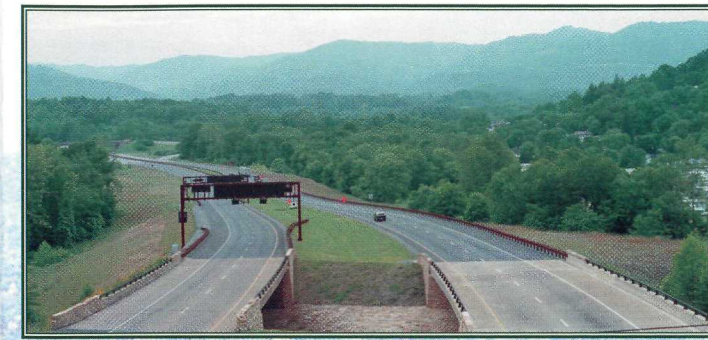


CUMBERLAND GAP TUNNEL

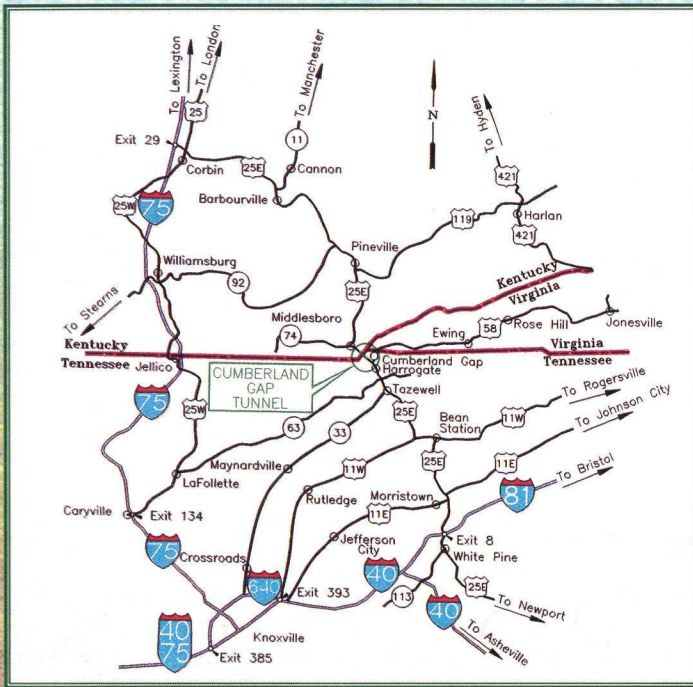
CUMBERLAND GAP TUNNEL



Nestled in the rugged Cumberland Mountains of the Appalachian Range, where the states of Kentucky, Tennessee and Virginia come together, the Cumberland Gap Tunnel, through the use of modern technology, has paved the way for the historical preservation of the area. The Cumberland Gap Tunnel opened to the public on October 18, 1996.



Cumberland Gap is often referred to as the "Gateway to the West". Pioneers such as Dr. Thomas Walker and Daniel Boone were some of the first to use the "Wilderness Trail", which opened the western territory to settlers and pioneers. With the opening of the tunnel, the Cumberland Gap and the Wilderness Trail will be restored and visitors will be able to gain a greater perspective of our country's earliest travelers.



Designed by
The Cumberland Gap Tunnel Authority
In Cooperation with
Kentucky Transportation Cabinet
Tennessee Department of Transportation
and
The Cumberland Gap National Historical Park



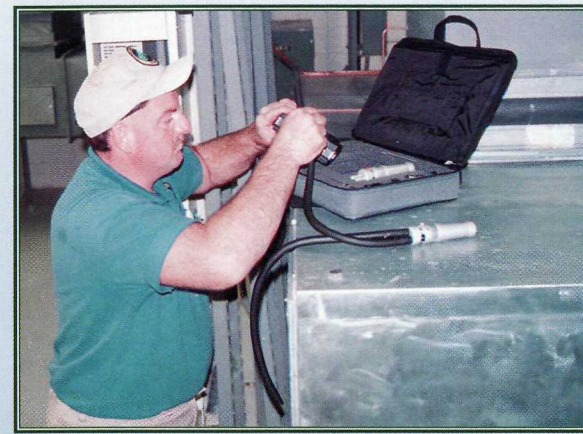
On June 21, 1991, the first rock of what is now the north-bound tunnel was blasted. This construction effort was a multi-national effort. Workers from Germany, Austria, Italy, China, France, Canada, as well as Native Americans and Appalachian coal miners and construction workers labored side by side to bring this magnificent structure from the designer's plan sheets to reality.

A pilot tunnel, 10 feet high, 10 feet wide, and 4100 feet long, revealed several characteristics of the mountain that would prove to be challenging. It was discovered that the mountain would produce 450 gallons of water every minute, regardless of outside weather conditions. The tunnels would course through occasional rock voids with thick clay infillings. Within limestone formations, caves as high as 85 feet and a "lake" of water 30 feet deep were encountered. The crushing movement of the rock layers, a result of the overthrust that formed the mountain, confronted the tunnelers with a formidable safety hazard; so much so that insurance companies based their construction premiums on a predicted 4 to 6 deaths. Excavation took place simultaneously from each side of the mountain and met in precise alignment on July 9, 1992. The project was opened to traffic 1,947 days after the first blast. There were no deaths and all geological problems were successfully handled.

The Cumberland Gap Tunnel is actually a set of twin tunnels. The tunnels are 4,600 feet in length. Each has two driving lanes and at the tallest point the tunnels are 30 feet in height. Cross passages located every 300 feet, connect the two tunnels and are equipped with fire extinguishers and phones for emergency use. Each tunnel is lined with a thick PVC liner to ensure that the tunnels remain dry. High pressure sodium lights illuminate the tunnels in such a manner that automatically adjust the motorists' eyes to the underground conditions. Thirty two large jet-powered fans keep air moving through the tunnels. Loop detectors, spaced strategically throughout the tunnels' roadways, allow the operational staff to obtain traffic volume, speed and incident data through the system's central computers. Overhead variable message signs inform motorists of current roadway conditions. Additionally, a control room operator has constant visual contact with the vehicles traveling through the tunnel by means of cameras mounted atop the internal variable message signs.

The Kentucky portal building houses the control center for the tunnel's operation. This two story building's lower floor is an emergency vehicle garage, which contains a fully equipped ambulance and fire truck, as well as two wreckers. The second floor is comprised of offices and the central control room. The Tennessee portal building has the same arrangement as the Kentucky building, but has no control room. All systems in the tunnels and buildings are equipped with backup systems. The tunnels are also provided with an emergency power source in the event of a main power failure.

The Cumberland Gap Tunnel is an engineering marvel. It stands as an example of what can be accomplished through cooperation between federal and state agencies.



Operators are on duty 24 hours a day, seven days a week. Ambulances, fire-rescue trucks and wreckers are located at each portal building. In order to respond to any emergency, all operators at the Cumberland Gap Tunnel are cross trained as Emergency Medical Technicians and Fire Fighters.



The Cumberland Gap Tunnel, the most modern in the world, uses various technologies to monitor, direct and respond to traffic. A control room operator uses several television monitors to identify any difficulty which may arise outside or within the tunnels. This operator has direct contact with all employees and is able to control all of the variable message signs through the Traffic Surveillance Control System.



The tunnel is equipped with the a Supervisory Control and Data Acquisition System (SCADA). Ventilation fans, carbon monoxide gas monitors and heat detectors, located within the tunnels, are controlled by SCADA. SCADA can also alert the control room operator of mechanical malfunctions within the buildings as well.

