Chesapeake Bay Bridge-Tunnel

An evolving engineering marvel

Supply Chain Digital Corporate Profile
The engineering masterpiece known as the Chesapeake Bay Bridge-Tunnel has certainly rendered both architects and engineers speechless through the years. Crossing over and under open waters where the Chesapeake Bay meets the Atlantic Ocean, the Bridge-Tunnel offers a direct link between southeastern Virginia and the Delmarva Peninsula (Delaware plus the Eastern Shore counties in Maryland and Virginia), and provides a scenic shortcut between Virginia Beach and Wilmington, Delaware.

The Chesapeake Bay Bridge-Tunnel is the largest bridge and tunnel complex in the world. Recognized as one of the engineering wonders of the world, this facility stretches 17.6 miles from shore to shore and opened to traffic in April of 1964 after 3½ years of construction.

“The District used to be operated as a ferry service and, including wait times, the total crossing could take up to two hours,” says Jeff Holland, Executive Director of the Chesapeake Bay Bridge-Tunnel. “Today, with a four-lane facility, a crossing takes just 25 minutes.”
“We are always evaluating avenues to become more green and save money”
- Jeff Holland, Executive Director

The facility is comprised of a series of low-level trestles, two one-mile-long tunnels, two bridges, two miles of causeway, four man-made islands and 5½ miles of approach roads. The District, a political subdivision of the Commonwealth of Virginia, has the sole responsibility for operating and maintaining the Chesapeake Bay Bridge-Tunnel complex which, because of its unique exposure to wind, waves and currents, must be carefully inspected and maintained both above and below the surface of the water.

**Ongoing projects**

Work is currently under way on a tunnel retrofit project that consists of the removal and replacement of deteriorated areas of wall tile on the main tunnel walls of the interior tube. “We will take out areas where steel is exposed to rust and remove the corroded steel and replace concrete where needed,” Holland says. “That project should be complete in December of this year.”

Another capital project includes substructure repair, which involves both maintenance and structural repairs to more than 600 concrete cylinder piles across the facility. “We recently won an award from the International Concrete Repair Institute for our substructure repair project to strengthen the piles and maximize longevity.”

“Because of the harsh marine environment, we conduct hydrographic surveys to examine and monitor the movement of the bay bottom. If there are areas that fall below the minimum threshold, we add stability to the bay bottom, which offers a solid foundation over time.” To that end, a tunnel scour remediation project for the two tunnels as well as other areas along the facility is in progress and will continue for another two years.

Other continuing capital projects include the expansion of the existing North Plaza Rest Area to include the Southern Gateway Welcome Center, upgrades to the sewer lift station, and the installation of pumps and equipment within the portal islands and mid-channel pump rooms of both Thimble Shoals Channel Tunnel and Chesapeake Channel Tunnel. “We are also evaluating the potential to construct avian-friendly wind turbines on the District premises,” notes Holland. “Our main concern is that we do not cause any negative impacts to our surrounding environment.”

**Economic impact**
The District has endeavored to become lean in recent years. “We try to maximize our net revenues for infrastructure preservation. We want to be sure we maintain the facility with a high...”
degree of competency. That's an important component of what we are all about. Four years ago, we had 170 full-time employees but we now have 150 and we remain focused on improving our efficiency," Holland says.

“O u r  s o l e  i n t e n t  i s  t o  p r o v i d e  a  v i t a l
crossing. Our resources are the bridge infrastructure and our travelers, so we want to provide excellent customer service while at the same time maximizing our net revenue while minimizing our payroll to preserve that infrastructure. The current economic environment has been a challenge but our business model is solid,” he continues.

Minimizing traffic impact to its customers is paramount to the Chesapeake Bay Bridge-Tunnel’s success. "We are tied into the state’s traffic advisory system so that travelers can become aware of hazardous road conditions by email, text, and an automated phone system," Holland explains.

An eye to the future

Being environmentally friendly is of utmost concern to the Chesapeake Bay Bridge-Tunnel. "We are always evaluating avenues to become more green and save money," Holland says. “We are in the process of working on a pilot project with LED lighting for our roadways and we have been testing them to see the durability, reliability and cost savings. All navigational aids for boaters have already been switched to LED."

Forty-five years later, the Chesapeake Bay Bridge-Tunnel continues to play an important role as an integrated transportation system that serves both a local and a national population. To date, more than 100 million commercial and passenger vehicles have crossed the Bridge-Tunnel. “We envision continuing to have increased traffic that produces adequate revenue for improvement projects and that keeps tolls at reasonable rates.”