

Parallel Thimble Shoal Tunnel

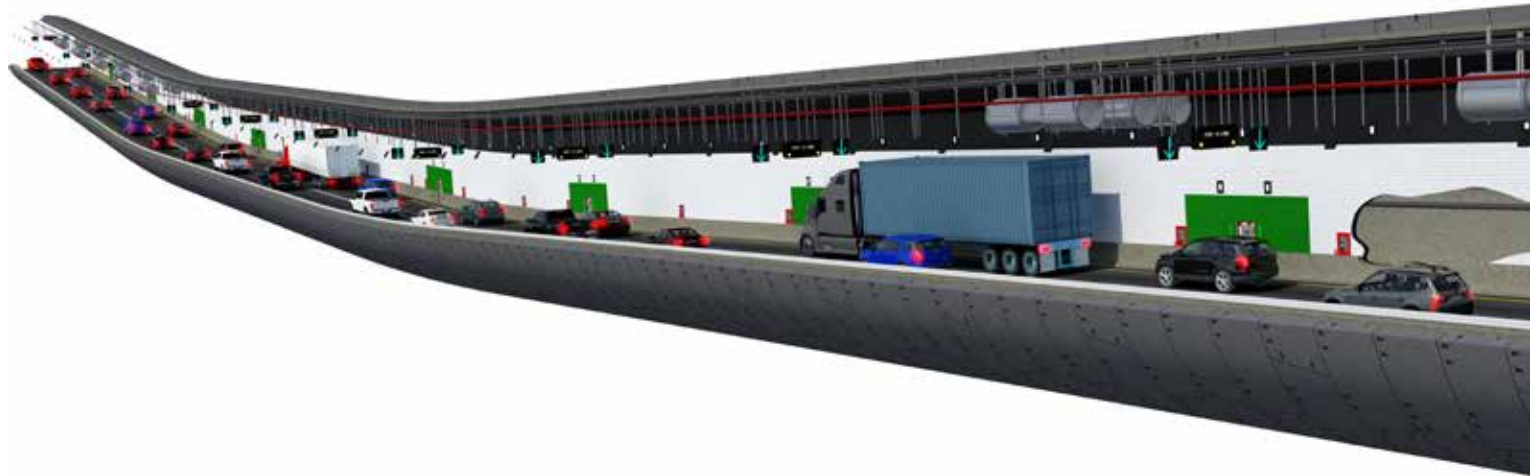
Modernizing the landmark
crossing of Chesapeake Bay



Opportunity

More than 115 million vehicles traveled over the Chesapeake Bay Bridge-Tunnel in its first 50 years. To meet future traffic demand and to improve safety, the existing trestles were twinned in the 1990s, increasing capacity from two lanes to four lanes. However, a bottleneck remains with traffic restricted to single southbound and northbound lanes through the existing immersed-tube tunnels.

The Chesapeake Bay Bridge and Tunnel District decided to augment capacity by creating a new tunnel under the Thimble Shoal Channel. The project was procured through a design-build mechanism, allowing teams to choose either the immersed-tube or the bored-tunnel methodology.



Solution

As part of a successful joint venture, we are engineering a one-mile subaqueous bored tunnel parallel to the existing immersed-tube tunnel. Thirty-nine feet (12 meters) in diameter, the two-lane tunnel will be constructed between two existing artificial islands.

The joint venture's innovative approach during the tender phase allowed \$250 million to be cut from the construction cost. Portal approach structures were located within the limits of the existing islands. The bored-tunnel approach was chosen to mitigate the impact of construction

on the navigation channel. New trestle construction was eliminated in favor of replacing and widening the superstructure. Precast concrete segments reinforced with steel fiber were selected for the tunnel lining.

Prior to construction, we facilitated a joint permit application with the US Army Corps of Engineers, allowing construction to proceed in the Federal Navigation Channel while limiting the impact on marine life and the environment.

Owner

Chesapeake Bay Bridge
and Tunnel District

Project

Parallel Thimble Shoal Tunnel

Client

Chesapeake Tunnel Joint
Venture (Dragados USA and
Schiavone Construction)

Location

Chesapeake Bay, Virginia

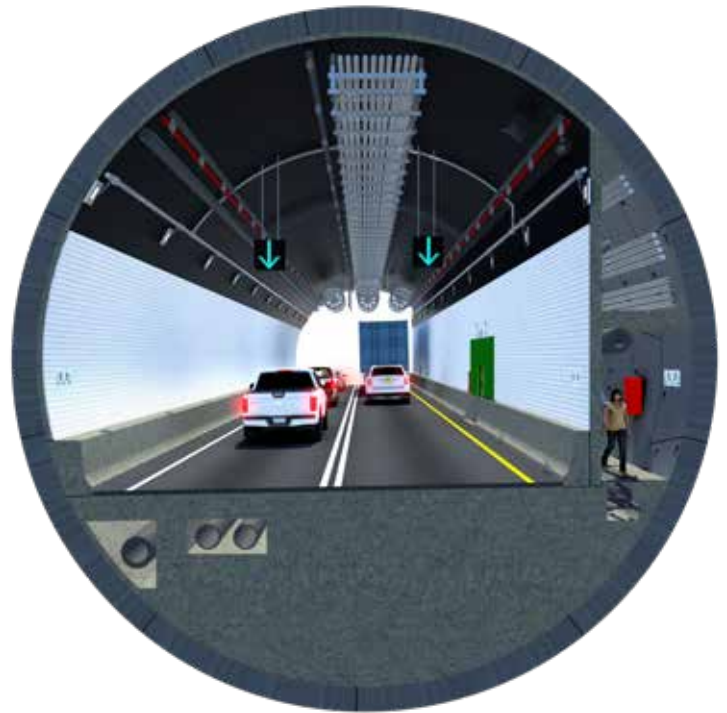
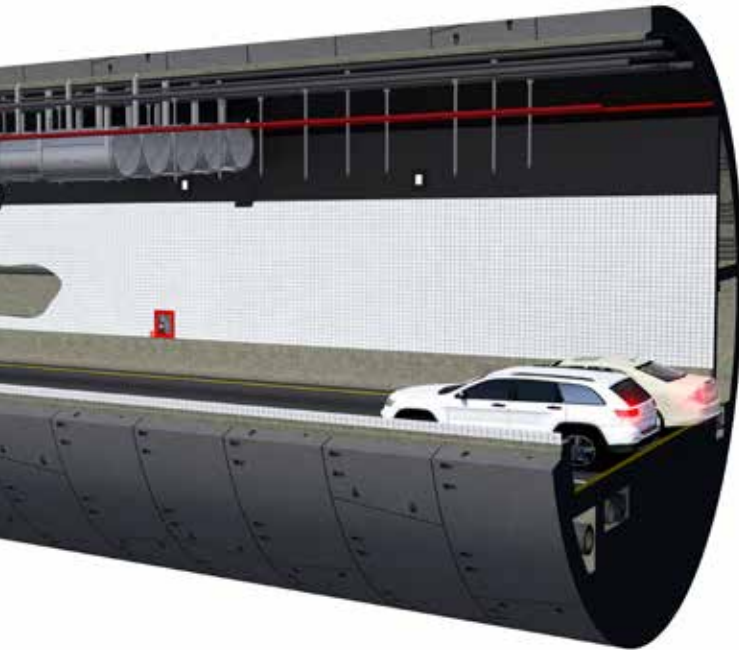
Expertise

Design-build: pre-bid and
final design, design services
during construction

Outcome

When complete, the Parallel Thimble Shoal Tunnel will reduce congestion during the peak travel season and improve the operational safety and redundancy of the Chesapeake Bay Bridge-Tunnel. The design, including ADA upgrades to the existing Fishing Pier on Portal Island No. 1, addresses long-term durability and maintenance, meeting the required design life of 100 years for structures.

Construction of the bored tunnel will begin in the summer of 2017. The tunnel is expected to open for operations in early 2022.



Four lanes wide and 20 miles long, the Chesapeake Bay-Bridge Tunnel consists of low-level trestles and two mile-long tunnels.

Opened on April 15, 1964, the Chesapeake Bay Bridge-Tunnel carries US 13, the main north-south highway on Virginia's Eastern Shore, across the Chesapeake Bay to Virginia Beach. At almost 23 miles (37 kilometers), it is considered the world's largest bridge-tunnel complex, with 12 miles (19 kilometers) of low-level trestle, two one-mile (1.6-kilometer) tunnels, four artificial islands, two bridges, and 5.5 miles (8.9 kilometers) of approach roads.

Shortly after opening, the Bridge-Tunnel was selected as one the Seven Engineering Wonders of the Modern World in a worldwide competition that included more than 100 major projects. A new design-build tunnel will increase the capacity of this historic crossing.

Opening opportunities with connected thinking.

**For more information, write to
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