

Great Lakes Tunnel

# Upgrading vital energy infrastructure



**Energy delivery is important.  
Safe energy delivery is paramount.**

Enbridge is making a safe pipeline safer. As part of our agreement with the State of Michigan, we plan to replace our existing Line 5 dual pipelines at the Straits of Mackinac with a pipeline secured in a larger underground tunnel, deep under the Straits.

Once this tunnel is complete, we would permanently deactivate our existing dual pipelines at the Straits, which have operated safely since 1953.

**What does Line 5 transport?**

Line 5 is a light oil and natural gas liquids (NGL) pipeline. By delivering these products, Line 5 helps generate more than half the propane used in Michigan, and feeds regional refineries producing the gas, diesel and jet fuel used by Michigan consumers and industry.

**What are the safety benefits?**

We'd be enhancing safety where it matters most. Lined with thick, reinforced concrete, a tunnel would protect the aquatic environment – and reduce the likelihood of environmental impact to near zero.

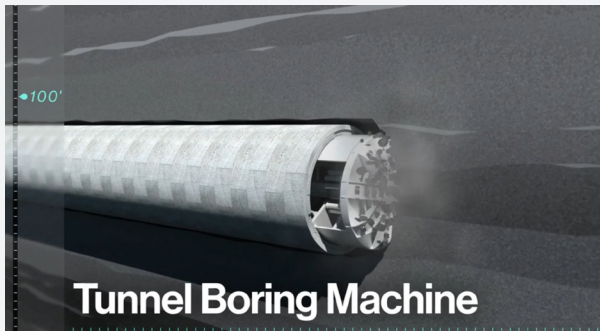
The tunnel would eliminate the possibility of an anchor strike, and it may also provide access for ongoing inspection and maintenance work.

**How would this be significant to Michigan?**

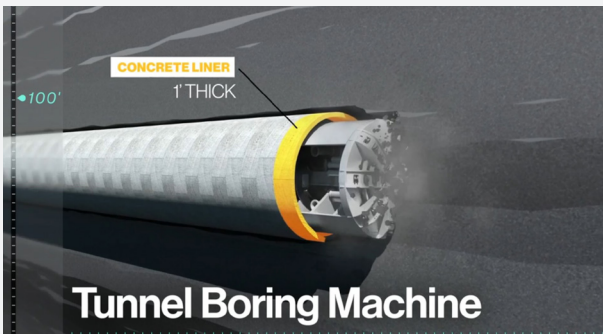
Enbridge would be replacing energy infrastructure, and providing significant utility infrastructure, while investing in Michigan.

Enbridge has invested more than \$100 million on the project. Enbridge will continue to advance the project, which Enbridge will pay for, and which nearly 70 percent of Michiganders support. Once we receive all permits, we are committed to starting construction within the timeframe stated in the Tunnel Agreement with the State of Michigan.

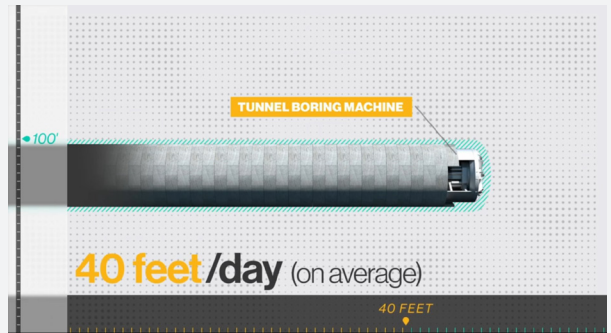
# Great Lakes Tunnel: The construction process



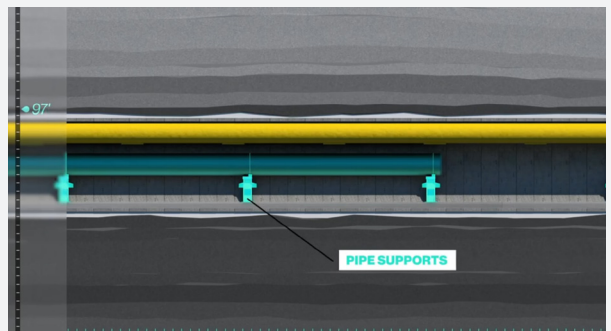
**1** The tunnel would be bored through rock anywhere from 60 to 250 feet below the lake bed, using an apparatus called a tunnel boring machine.



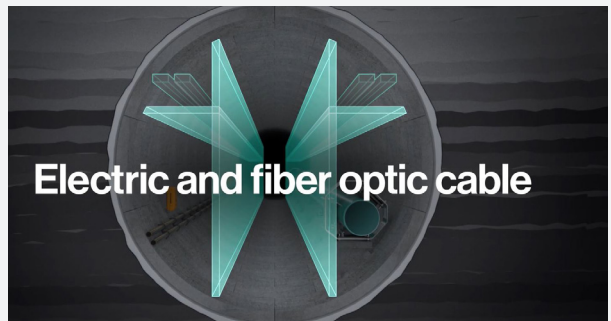
**2** While the boring machine moves forward, it lifts segments of a 1-foot-thick reinforced concrete liner into place. Grout completes the seal.



**3** Like a giant mechanical earthworm, the tunnel boring machine would move an average of 40 feet a day, five days a week. At that rate, it's expected to take about two years to make its way across the full 4 miles under the Straits.



**4** Pipe segments would be coated and welded in an onshore staging area. Supports with rollers will be bolted along the tunnel wall, and the pipe pushed along that roller system – one long segment at a time.



**5** The tunnel will be equipped with drainage, leak detection equipment and electronic communications, and could accommodate third-party utilities, including electric and fiber optic cable.

## Engaging with experts

We've worked closely with engineering, construction and environmental consultants, as well as subject-matter experts engaged by the State. Whether the tunnel is sized for a single pipeline, or designed for multiple utilities within this publicly owned infrastructure, these experts have determined that tunneling would be a safe and viable path forward.

## State of the art

As we move toward a long-term solution for the future of Line 5, Enbridge is investing in the future of energy infrastructure – and the future of Michigan. The Great Lakes Tunnel will be state of the art, with enhanced safety features, further demonstrating Enbridge's commitment to protecting Michigan's natural resources.

We're making a safe pipeline safer. We're upholding our promise to protect the Great Lakes. And we're continuing to safely meet Michigan's energy needs. Today – and well into the future.

For more information, please visit [enbridge.com/line5tunnel](http://enbridge.com/line5tunnel)