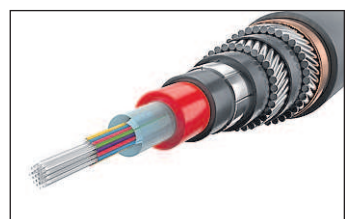
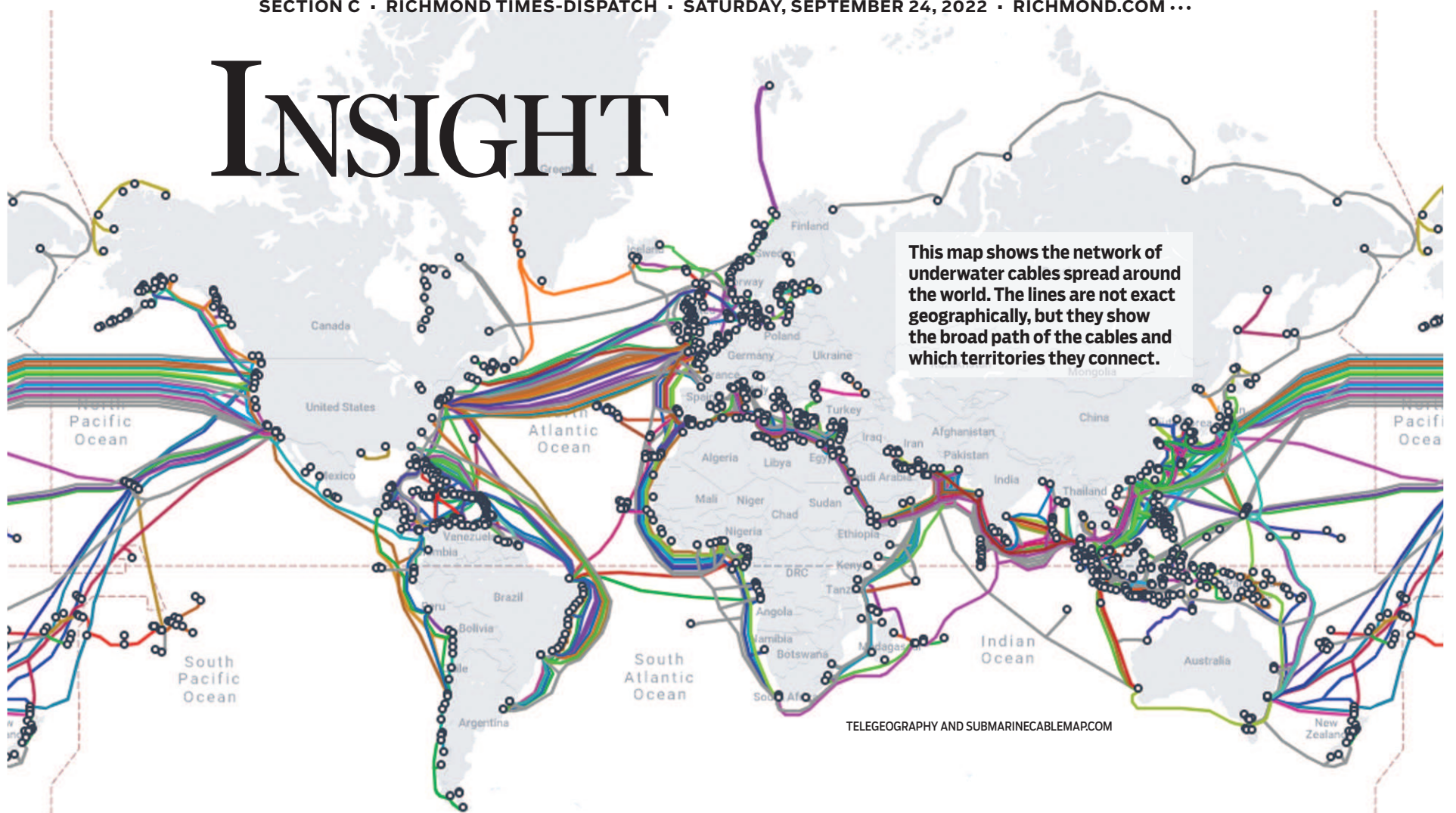


INSIGHT



Subsea cables

WHAT ARE THEY?

Though many may think global connectivity is made possible by satellites, there is actually a physical network connected on land and under the ocean.

Nearly all international connectivity — voice, data and internet — travels through underwater cables. These cables, known as submarine or subsea cables, lie along the sea floor. Closer to shore, they are buried for added protection.

The cables are laid along the safest path underwater, avoiding fault zones, fishing zones, anchoring areas and other dangers.

Some cables are short, like the 81-mile cable between Ireland and the United Kingdom, while others are incredibly long, like the 12,427-mile Asia America Gateway cable that runs across the Pacific Ocean.

Nearly all countries that have a coastline are connected to subsea cables, and anyone accessing the internet has the potential to use them.

99.7%

of all intercontinental data is carried via subsea cables



MAREA cable installation

HOW DO THEY WORK?

Modern subsea cables use fiber-optic technology. Lasers on one end fire at rapid rates down thin glass fibers to receptors at the other end.

The cables are typically as wide as a garden hose. The filaments that carry light signals are extremely thin — roughly the diameter of a human hair. These fibers are then wrapped in a few layers of insulation and protection.

530

Total number of active and planned subsea cables as of 2022

WHO OWNS THEM?

Cables were traditionally owned by telecom carriers that would form a consortium. In the late 1990s, private cables began being built. Both models still exist today.

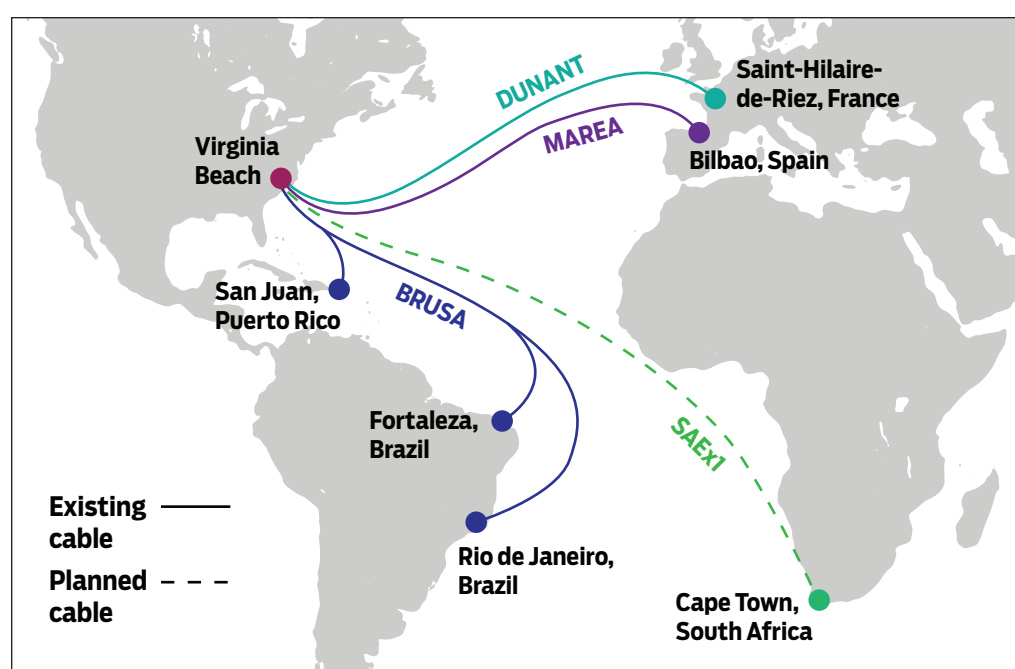
Content providers such as Google, Facebook, Microsoft and Amazon are major investors in new cables and own or lease more than half of the global undersea bandwidth.

VIRGINIA'S DIGITAL CONNECTION TO THE WORLD

Just five years ago, all of the subsea cables along the U.S. Eastern Seaboard landed in New Jersey-New York or Florida. But in 2012, Hurricane Sandy caused so much destruction to the New York coastline that it prompted the development of a third East Coast landing site in Virginia Beach. The area is now home to three international cables, and another one is in development. These cables come ashore in Virginia Beach and end in Henrico County at the Meta (Facebook parent company) data center and the QTS data center next door.

Virginia Beach's international cables

Three subsea cables come ashore in Virginia Beach and connect the U.S. to France, Spain, Puerto Rico and Brazil. These cables are among the most modern, highest-capacity routes in the world. A fourth cable, SAEXI, is currently under development, and construction is expected to begin in 2025. When completed, it will be the first and only cable to directly connect the U.S. with South Africa. As a result of the subsea cables, demand is increasing for locating data centers in Virginia Beach with nearly 1,000 acres available for data center and cable landing station facilities.



DUNANT

Ready for service: January 2021
Length: 3,977 miles
Owner: Google

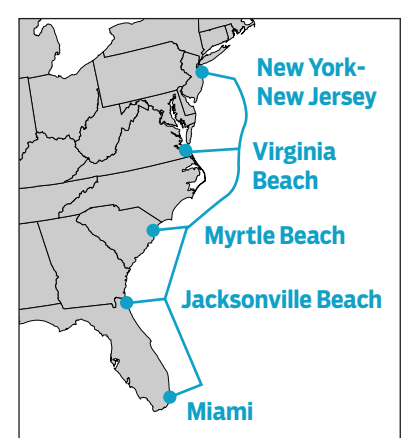
MAREA

Ready for service: May 2018
Length: 4,104 miles
Owners: Meta, Microsoft, Telxius

BRUSA

Ready for service: August 2018
Length: 6,835 miles
Owner: Telxius

Confluence cable

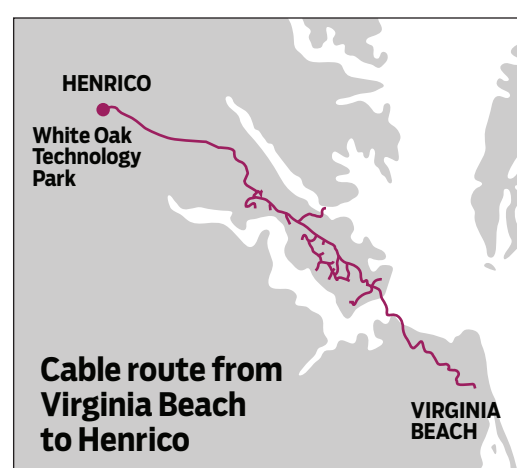


Virginia Beach also has full permits in place for four more subsea cable conduits that will accommodate further cables including the Confluence cable coming from New York-New Jersey and connecting to Virginia Beach; Myrtle Beach, S.C.; Jacksonville, Fla.; and Miami.

The Confluence-1 is the first subsea cable system dedicated to linking strategic global communications nodes on the U.S. East Coast. The infrastructure for the Sandbridge area of Virginia Beach is scheduled to start in November.

CONFLUENCE-1

Ready for service: 2023
Length: 1,598 miles
Owners: Confluence Networks



Henrico data centers

Virginia's subsea cables come ashore in Virginia Beach and end in Henrico County, connecting to two massive data centers: Meta (the parent company of Facebook) and QTS.

Meta is investing more than \$1 billion to build a 2.5 million-square-foot data center campus in the White Oak Technology Park. The first phase opened in 2020.

QTS, which acquired a former semiconductor plant in 2010 and turned it into a 1.5 million-square-foot mega data center, is expanding its operations. The facility — the world's fourth-largest data center — provides access to more than 20 network providers. QTS acquired an



Meta built this new data center at White Oak Technology Park in eastern Henrico.

additional 200 acres next to its existing center, and construction is underway to double the size of its campus.

Learn more about how the megaregion from Richmond to Hampton Roads is working to become a Global Internet Hub at www.globalinternethub.org

How fast data travels

In the blink of an eye, data can transmit back and forth from Henrico to Spain twice.

From Henrico to:	Latency (milliseconds)
Virginia Beach	2.74
Madrid, Spain	72.74
Marseille, France	79.27
Frankfurt, Germany	82.74
London, UK	85.49
Sao Paulo, Brazil	108.24

History

While fiber-optic data transmission has been a relatively recent invention, subsea cables have been around for more than 160 years. The first transatlantic telegraph cable was laid in 1858, between Ireland and the province of Newfoundland in Canada.

Prior to this cable, the only way to transmit a message across the Atlantic was by boat, which took 10 days. After the cable was laid, it took only a matter of minutes. Repeaters, which are used to amplify the signal along cables, were first introduced in 1956.

Satellites

Satellites can be used to reach areas that aren't yet wired with fiber optics, but the cables can carry much more data at a far less cost than satellites. According to the FCC, satellites account for just 0.37% of all U.S. international capacity.

WIRELESS SIGNALS

When you use your cellphone, the signal is carried wirelessly only from your phone to the nearest cell tower. From there, the data will be carried over land and subsea fiber-optic cables.