

# Virginia's Historic Jamestowne Gets a Broadband Makeover

Cox Business enables the U.S. historic site to connect with remote students and history buffs around the world.

By Sean Buckley / *Broadband Communities*

**A**s the first English settlement in North America, Jamestown Island plays a central role in the U.S.'s history and is the backdrop for the story of John Smith, Pocahontas and other key historical figures. As the 1607 settlement evolved into a prosperous colony, the Virginia Powhatan Indians were pushed out of their homeland.

Today, the site is overseen by the Jamestown Rediscovery Foundation (JRF), which is affiliated with Preservation Virginia, a private, nonprofit organization that provides statewide historic preservation. The JRF and Preservation Virginia jointly administer Historic Jamestowne through a public/private partnership with the National Park Service.

Preservation Virginia acquired 22.5 acres of Jamestown Island in 1893. In 1994, the Jamestown Rediscovery archaeological project launched to find the remains of the original James Fort. The project established the location of the fort and its main buildings, recovered more than 3 million artifacts, and provided an understanding of early settlers' lives and relationships with the area's native peoples.

Despite the allure of the site, until recently, Jamestown Island lacked one key amenity: broadband connectivity for its researchers, educators and visitors.

A big reason for the lack of a stable broadband connection is Jamestown Island's location. Separated from the large service providers on the other side of the James

River, the island's 13 main tourism locations, including the Visitors Center and museum, were restricted by the limitations of the aging telecom infrastructure.

Enter Cox Business, which has given Jamestown Island a technology makeover.

Before Cox Business, Jamestown had a copper-based DSL connection and one T-1 (1.5 Mbps) connection from another provider. The T-1 line was broken down into channels: 10 to 11 were used for telephone lines, and the other 13 were for data.

"If you get 56 Kbps times 13, that's not a lot of bandwidth to download things," says Rick Starsher, sales engineer for Cox. Thanks to Cox, the 411-year-old island community now has high-speed internet, enhancing the visitor experience – from both an on-site and virtual perspective.

After the COVID-19 pandemic hit, community leaders recognized the need to improve connectivity to enable better virtual access to the site. But this request presented a unique challenge: modernizing the visitor experience while preserving historical richness.

"One problem with being a historic site on the original island is that we're a bit in the middle of nowhere, even though we're in a region with 3 to 4 million Virginians," says Mark Summers, director of youth and public programs for Jamestown Rediscovery. "Although we have a lot of visitors every year and a lot of good ideas, up until a few years ago, we were behind the times in terms of technology."

## BROADBAND'S MODERNIZING ROLE

Cox Business provides Jamestown with cable broadband internet, Wi-Fi and business services. With the Wi-Fi capability, Summers can sign on via his mobile phone and speak to students in another part of the world about the Jamestown Island site. For example, Jamestown Rediscovery has been able to conduct live sessions with students from France, Los Angeles, Chicago and New York.

“Without using my mobile data, I can use the Wi-Fi network to give a live tour to students in their classroom with a picture that’s very clear and calls that don’t get dropped,” Summers says.

This capability has been especially important for students unable to travel to the site because of the COVID-19 pandemic. The last in-person field trip Jamestown Discovery hosted was in March 2020.

Just how successful has the virtual program been? Very, considering that students from 203 schools in 28 states participated in virtual learning tours. About 50 percent were Virginia schools and the other 50 percent were from other states.

“We get letters from kids who said they felt like they were there live,” Summers says. “We’re talking about states where things are shut down, and kids can’t go on field trips. I would not be able to do my job as an educator during the pandemic without this connectivity.”

The new capabilities enabled by improved connectivity also help members of Jamestown Discovery’s staff provide webinars and post videos on social media. For example, people around the world can watch a stream of a real-time dig from Jamestown Church, a brick church built in 1639 that’s one of the oldest surviving remnants Europeans built in the original 13 colonies and in the U.S. overall.

“There’s talk of all of us doing more online programming, even as we reopen and more people come in person,” Summers says. “We’re going to continue hosting virtual field trips.”



Cox Business provides Jamestown Island with cable broadband internet, Wi-Fi and business services. Now, people around the world can virtually visit the historic site.

In addition, he says that people in the archeological lab are planning to showcase artifacts remotely and host discussions live as a way of raising awareness of the site. “Sometimes there’s an old-fashioned way of thinking that if you give away these programs for free, people won’t come to the site, but that’s the argument we saw about putting baseball on the radio 80 years ago.”

Summers notes that the virtual program has had the opposite effect. “It brought more people to come in person,” he says. “That’s what we’re using it for: raising awareness and making people come to the original place, but if they can’t make it, they can still be educated. We’re reaching millions more people than we could have reached before.”

With high-speed internet connectivity at its 13 locations, Jamestown Rediscovery and the National Park Service teams plan to introduce new digital experiences to the public, including live cameras on archeological excavations, virtual tours of long-lost landscapes, and 360-degree videos.

Jamestown Rediscovery has a lot of followers who likely would tune in to watch archeological digs on video, similar to the way people from all over the world tune into popular “panda cams.” Although Jamestown Discovery has not formally launched such a service yet, it is considering doing so.

## FOCUS ON VIRTUAL LEARNING

The previous lack of network bandwidth also inhibited Jamestown Rediscovery from offering virtual classes. Before Cox installed the new network, the organization could not complete a video session without being interrupted.

By making the upgrade to broadband, Jamestown has taught in 27 of the 100 largest school districts in the U.S. Students can now virtually visit James Fort and Historic Jamestowne’s archaeology museum, the Archaearium. Since September 2020, 30,000 students from 175 schools in 27 states have experienced Historic Jamestowne.

Virtual education programs now reach urban centers with public schools that could not afford the high cost of plane tickets, hotels and insurance. These districts represent the most diverse areas of the U.S., including immigrant and underserved communities. Keeping costs down has allowed Jamestown Rediscovery to reach schools that would never visit Virginia.

In April, Kings Grant Elementary students, Jamestown Rediscovery and Cox hosted a virtual kickoff event to celebrate the new network.

The Cox Business enhanced connectivity allows Jamestown Rediscovery to populate a virtual tour portal for exploring Jamestown Island’s history and archaeology. Virtual tours of the archaeological site of James Fort



Since 2019, Cox has installed 13,000 linear feet of directional boring, pedestals, ground vaults and fiber runs on Jamestown Island.

and the Archaearium are “hosted” through a series of videos connected in an interactive, online map.

One tour weaves the history of the settlement with how archaeological research has informed modern understanding of the site. Another tour is presented from the perspective of Anas Todkill, an important early settler who was a comrade of Captain John Smith. Relevant historical information, images, artifacts and other videos are linked to each tour topic, enabling students and other visitors to explore further.

Virtual field trip tours allow students from across the world to conduct an immersive, in-depth experience with the settlement and archaeology, all through a broadband connection.

Summers says that without Cox’s services, it would not be able to deliver educational programs across the country. It used to be able to host only a handful of well-funded schools from the West Coast that could afford to make the trip to Jamestown Island. Now, any students, regardless of their socioeconomic status, can experience Historic Jamestowne from their classrooms.

“Before last year, I tried to do virtual programs for schools that could not afford to come here, and calls would be dropped,” Summers says. “We could not do what we wanted to do even though we had the ideas.”

In addition, a solid broadband connection now enables staff to research by looking at archives from any location and to collaborate better across departments.

Researchers, history buffs and students can now look at the work Jamestown Discovery conducted at a site regardless of weather conditions. “When we have rain or if the site is covered up because it’s wintertime, people can still see the work and research that has been done,” Summers says.

“We’re seeing the first 1 to 2 percent of potential,” Summers says of broadband’s impact. “That does not mean we don’t keep doing our traditional jobs – I still have to teach, and archeologists have to analyze artifacts – but now we have another platform.”

## FEDERAL, PRIVATE LAND CHALLENGES

Cox Business began the Jamestown Island project in summer 2019 and has installed more than 13,000 linear feet of directional boring, pedestals, ground vaults and fiber runs. When Cox started network construction, it had to use special ground scanning equipment to preserve the artifacts underground when it was boring the ground to install the fiber. Cox used a directional boring

machine to install the underground lines. A ground penetration radar was used to see into the ground.

“The reason this machine was being used is that our contractors were crossing areas that have artifacts and they wanted to make sure we were not disturbing the area if we ran into an artifact,” says Charlie Hardy, outside construction planner at Cox Communications.

But because Jamestown Island is a historic site overseen by local and federal government agencies – including the National Park Service and Virginia Preservation – starting the build came with various challenges.

For one, the site is on an island. Cox had to find a way to extend its network to the area. Second, it is a historical site, so Cox had to be careful not to disturb any existing sensitive areas.

Summers says navigating federal and private land rules was difficult. “We have a unique partnership with the National Park Service, which is sensitive to historic sites,” Summers says. “Being sensitive to the historic nature of the place and all of the overlapping government regions was a huge layer of complications we had to work through.”

In all, it took about a year to get the necessary permits for Cox to begin building out network facilities on the site.

Thom Watkins, vice president of sales for Cox Virginia, says that getting the build started was not easy and “there were challenges beyond the norm that had to be overcome, but all of the agencies, including the Jamestown Virginia Preservation service and the National Park Service, worked together with us to make it happen.”

## RFOG FITS THE BILL

Jamestown Island is so remote that it could get only copper-based services. Getting the island’s facilities onto the network meant potentially high costs for Cox.

However, Cox Business found a viable solution. “To build hybrid fiber coax (HFC) and fiber together would be costly,” Hardy says. “I thought that if we needed to build fiber anyway, we could build the HFC like a fiber-

to-the-home (FTTH) project that would not involve any coax. By doing this, we will be able to provide a more reliable network.” By installing the circuit breaker and FTTH rack in one of Jamestown Rediscovery’s buildings, Cox reduced costs because it did not have to install a power supply and outdoor cabinets.

After several meetings about what would be the least expensive option, Cox settled on building a radio frequency over glass (RFoG) network.

RFoG is a deep-fiber network design in which the coax portion of the HFC network is replaced by a single-fiber PON.

What’s compelling about RFoG is that it delivers the same services as an HFC-based DOCSIS network with the added benefit of improved noise performance and increased usable RF spectrum both downstream and upstream.

“The RFoG network brought fiber service down to a central hub to bring a healthy-sized circuit into the Visitors Center for the National Park Service,” says Dan Eagle, manager of government and federal accounts at Cox Business. “We were able to bring fiber and convert it to HFC to the smaller locations.”

He adds that though the costs were high, Cox “pitched in a considerable amount of capex to make the project happen.”

#### **A COMMUNITY EFFORT**

The network build presented various challenges, but Cox Business sees it as an opportunity to serve as a community partner. “We want to be part of the community and to give back where we can,” says Watkins.

Besides Jamestown, Cox Business is working on a similar project with the National Park Service in Yorktown, Virginia, to equip five sites.

Yorktown is famous for being the site of the siege and subsequent surrender of General Charles Cornwallis to General George Washington and the French Fleet on October 19, 1781. Although the Revolutionary War lasted another year, the British defeat at Yorktown effectively ended it.

“Yorktown is a very similar project,” says Eagle. “We don’t know how they will use the connectivity, but we hope they will be creative.” ❖



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