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May 31, 2017

Ex Parte

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268; Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49; Amendment of Part 15 of the Commission's Rules for Unlicensed Operations in the Television Bands, Repurposed 600 MHz Band, 600 MHz Guard Bands and Duplex Gap, and Channel 37, ET Docket No. 14-165; Amendment of Parts 15, 73 and 74 of the Commission's Rules to Provide for the Preservation of One Vacant Channel in the UHF Television Band for Use by White Space Devices and Wireless Microphones, MB Docket No. 15-146

Dear Chairman Pai, Commissioner Clyburn, and Commissioner O'Rielly:

On May 23, the Mid-Atlantic Broadband Communities Corp. ("MBC") and Microsoft Corp. announced a new *Homework Network* for K-12 students in Charlotte and Halifax counties in Southern Virginia, powered by TV White Spaces technologies. This network will bring broadband internet access to the homes of thousands of students. In Charlotte and Halifax counties, approximately 50 percent of students lack broadband access at home. And an estimated 5 million households with school-age children across the U.S. are disadvantaged because of nonexistent broadband connectivity.[1] Yet nearly seven in ten teachers across the country assign homework and research that requires broadband.[2]

In response, Microsoft and MBC, with the support of the Virginia Tobacco Region Revitalization Commission, have activated the *Homework Network*, starting in Southern Virginia. The network has successfully begun connecting homes across Charlotte and Halifax counties and will reach more than 3,000 students in 1,000 homes this year. Students will have access to their schools' online networks, extending their learning opportunities beyond the school day, and leveraging local community investment in their school's existing digital resources. We believe this network will be a model that schools across the nation can implement to benefit their students. More broadly, today there are 25 Affordable Access Projects globally leveraging TV white spaces, addressing a variety of challenges, and providing broadband internet access to 665,760 people.

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[1] *See* Consortium for School Networking, *Digital Equity: Supporting Students & Families in Out-of-School Learning* 4 (Feb. 2016), http://www.cosn.org/sites/default/files/pdf/CoSN-EQUITY-toolkit-16FEBvr-with.pdf.

[2] *Id.* at 3.

All of this is possible because of the FCC's forward-looking, bipartisan decision to make TV White Spaces spectrum available to innovators. The uniquely advantageous physical characteristics of this low-band spectrum allow the network to extend existing broadband networks to households where it would have been technically and economically impractical in the past. Higher-frequency unlicensed radios simply would not have allowed this innovative partnership of local leaders and Microsoft to serve these important communities.

This is only the beginning. Now that the Incentive Action is complete, the FCC has the power to provide innovators and investors the certainty and predictability required to harness the enormous potential of the TV White Spaces across the country—for more efforts like the *Homework Network*; to expand network operators' reach in rural America; for precision agriculture advances including a cloud-based irrigation-targeting technology Microsoft began testing through its 2016 STA and has advanced using the experimental license granted by the FCC in March;[3] for Internet of Things connectivity in dense urban areas, ports, and factories; and much more. The Commission is poised to take the next step in promoting further innovation by resolving its outstanding TV White Spaces proceedings so as to preserve at least three usable 6 MHz channels in every market across the 600 MHz and TV bands for unlicensed uses like these. Without access to at least three usable channels in every market across the country, however, integrated circuit manufacturers simply will not produce standardized White Spaces chips—this tremendous opportunity will be lost and the spectrum will lay fallow.

I have attached a selection of media accounts of the launch of the *Homework Network* for your review, and for inclusion in the FCC record. Thank you again for your leadership on TV White Spaces, and please do not hesitate to contact me if you'd like more information about how this technology is empowering students, consumers, and businesses.

Sincerely,

Paul Garnett
Senior Director
Affordable Access Initiatives
Microsoft Corporation

Encs.

cc: Chairman Ajit Pai
Commissioner Mignon Clyburn
Commissioner Michael O'Rielly
Julius Knapp

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[3] *See* Microsoft Corporation, Application for New or Modified Radio Station Under Part 5 of FCC Rules, File No. 0136-EX-CN-2017 (submitted March 3, 2017).

THE GAZETTE-VIRGINIAN

Homework Network launches: Free internet will reach more than 3,000 students by end of year

From staff reports May 23, 2017

The Mid-Atlantic Broadband Communities Corporation and Microsoft Corporation on Tuesday announced the launch of an innovative Homework Network to deliver broadband internet access at home to thousands of students in Southern Virginia at no cost to the families.

MBC President and CEO Tad Deriso, state Sen. Frank Ruff, tobacco commission vice-chairman, Paul Garnett, Microsoft's senior director of affordable access initiatives, Del. James Edmunds and others announced the news at a ribbon cutting at South Boston/Halifax Early Learning Center in South Boston.

Ashley Hodge/Gazette-Virginian

"Closing the homework gap is critical for improving the odds of student success," said Deriso. "We are delighted to partner with Microsoft and others on such a groundbreaking initiative that, at the end of the day, connects young people to required educational resources and strengthens our local communities. Ultimately we believe such initiatives enhance competitiveness for economic development in Southern Virginia."

In Charlotte and Halifax counties, nearly 50 percent of students currently lack broadband access at home. Yet today, nearly seven in 10 teachers across the U.S. assign homework and research requiring broadband access creating the homework gap.

This local and national problem puts an estimated 5 million households with school-age children in the U.S. at a disadvantage creating an uneven playing field for future educational and economic prospects.

In response, Microsoft and MBC, with the support of the Virginia Tobacco Region Revitalization Commission, are activating the Homework Network, first in Halifax and Charlotte counties.

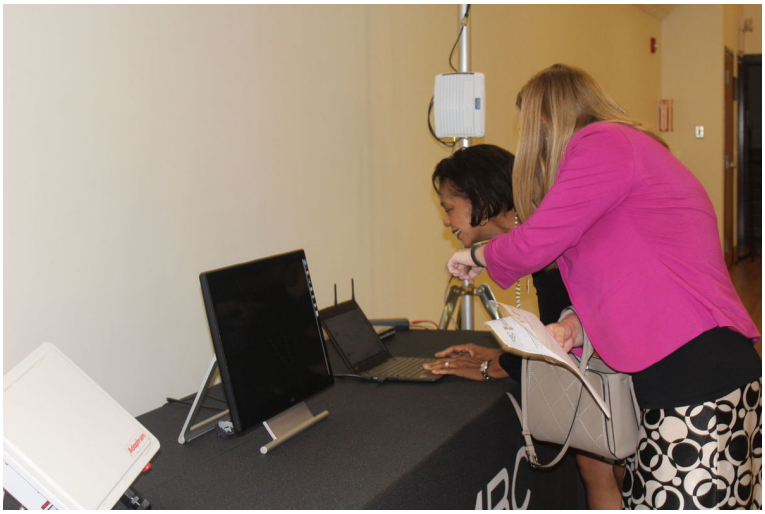
It has been piloted in 100 households across both counties, and by the end of 2017, it will reach more than 3,000 students in 1,000 homes.

Students will have free access to their schools' online networks where assignments and education resources are posted, extending their learning time beyond the school day.

This Homework Network is made possible by an innovative broadband technology, which Microsoft helped pioneer, that makes use of unused low-band spectrum often referred to as TV white space. Leveraging this technology, the network wirelessly extends existing broadband from local schools to students' homes.

Using TV white space equipment from U.S.-based Adaptrum, internet access is delivered via base stations installed on towers at or near fiber-connected schools and client ratios installed at students' homes.

T V white space technology is ideal for delivering broadband service to areas such as rural Southern Virginia, as it can cover large geographical ranges even in hilly terrain and dense tree cover of the region.



Ashley Hodge/Gazette-Virginian

The network is being installed by local internet provider B2X Online.

Microsoft has driven the development and adoption of TV white space technology as part of its Affordable Access Initiative that aims to support, grow and scale innovative businesses that are developing technologies that have the potential to help billions of people around the world gain reliable connectivity.

"Too many students in the U.S. are falling behind their peers because they lack reliable high-speed internet access at home," said Garnett. "Falling behind today means entering the job market at a disadvantage tomorrow. This innovative public-private partnership can help close that gap and is one step toward what we hope is an initiative replicated in other parts of the county. Given the benefits, it is important that the Federal Communications Commission ensure there is sufficient low-band spectrum available in every U.S. market."

"Rural Southern Virginia is now home to a highly innovative solution, which can serve as a model for other parts of the state and the U.S. and even around the world, to help young people succeed in school," said Ruff. "We are proud to help support and fund such an important project starting here in Charlotte and Halifax counties."

Following the ribbon cutting, guests were invited to test out a live network that was connected to the tower.

Article available at: http://www.yourgv.com/business/local_business/homework-network-launches-free-internet-will-reach-more-than-students/article_eb6aef38-3fef-11e7-b23c-3f02338a94d5.html

THE CHARLOTTE GAZETTE

Students to get free broadband

Using TV white space equipment from U.S.-based Adaptrum, internet access is delivered via base stations installed on towers, evidenced at this tower at Bacon District Elementary School.

By Morgan White | Published 11:36 am Wednesday, May 24, 2017

The Mid-Atlantic Broadband Communities Corp. (MBC) and Microsoft Corp. announced Tuesday the launch of an innovative Homework Network to deliver broadband wi-fi internet access at homes to thousands of students in Charlotte and Halifax at no cost to their families.

According to a press release regarding the project, in the two counties, about 50 percent of students currently lack broadband access at home.

"Yet today, nearly seven in 10 teachers across the United States assign homework and research requiring broadband access," officials said in the release. "The 'homework gap' is an urgent local and national problem."

"We're obviously excited to have that available for our students," said Charlotte County Public Schools Technology Director Rodney Hudson regarding the announcement.

The release cited an estimated five million households with school-age children in the U.S. are at a significant disadvantage due to limited or nonexistent broadband connectivity.

"These students are often unable to access the tools they need to succeed in school and to develop the skills they need to enter today's workforce," officials said in the release. "This creates an uneven playing field for future educational and economic prospects."

According to the release, Microsoft and MBC are activating the largest Homework Network in the U.S. starting in Charlotte and Halifax counties with support from the Virginia Tobacco Region Revitalization Commission.

"The network has been successfully piloted in 100 households across both counties, and will reach more than 3,000 students in 1,000 homes by the end of 2017," officials said in the release. "Students will have free access to their schools' online networks where assignments and education resources are posted, extending their learning time beyond the school day."

MBC President and CEO Tad Deriso, Tobacco Commission Vice-Chairman and State Sen. Frank Ruff, and Microsoft's Senior Director of Affordable Access Initiatives Paul Garnett, among others, made the announcement Tuesday in South Boston.

"Rural Southern Virginia is now home to a highly innovative solution, which can serve as a model for other parts of the state and the U.S. and even around the world, to help young people succeed in school," Ruff said. "We are proud to help support and fund such an important project starting here in Charlotte and Halifax counties."

"Closing the homework gap is critical for improving the odds of student success," Deriso said. "We are delighted to partner with Microsoft and others on such a groundbreaking initiative that, at the end of the day, connects young people to required educational resources and strengthens our local communities. Ultimately we believe such initiatives enhance competitiveness for economic development in Southern Virginia."

The release cited that the Homework Network in Virginia is made possible by an innovative broadband technology, which Microsoft helped pioneer, that makes use of unused low-band spectrum often referred to as TV white space.

“Leveraging this technology, the network wirelessly extends existing broadband from local schools to students’ homes,” officials said in the release. “Using TV white space equipment from U.S.-based Adaptrum, internet access is delivered via base stations installed on towers at or near fiber-connected schools and client radios installed at students’ homes.”

According to the release, TV white space technology is ideal for delivering broadband service to areas such as rural Southern Virginia, as it can cover large geographical range seven in the hilly terrain and dense tree cover of the region.

“The network is being installed by local internet service provider B2X Online. Microsoft has driven the development and adoption of TV white space technology as part of its Affordable Access Initiative,” officials said in the release.

Article available at: http://www.thecharlottegazette.com/2017/05/24/students-to-get-free-broadband/

RCR WIRELESS NEWS

Microsoft supports white space Wi-Fi network: Pilot white space Wi-Fi network to expand in southern Virginia

By Kelly Hill on MAY 23, 2017

Microsoft is supporting the launch of a Wi-Fi network that utilizes television white spaces, to provide connectivity in rural southern Virginia.

The "Homework Network" is being constructed by wireless internet service provider B2X Online using white space equipment from Adaptrum that consists of base stations on towers or near schools equipped with fiber connections, and radios installed in students' homes; the technology has a reach of home up to four miles away from the base station, according to a spokesperson.

The initial white space Wi-Fi network network has been successfully tested in 100 homes in Charlotte County, Va., and now that number is set to expand to 1,000 homes with 3,000 students in Charlotte County and neighboring Halifax County by the end of the year. Microsoft said that about half of the students in those counties don't have broadband access at home.

The Wi-Fi network provides free access to educational content by giving students access to their schools' online networks, so that they can complete homework and access learning tools.

Fiber provider Mid-Atlantic Broadband Communities Corp. is paying for the equipment and installation and plans to offer commercial services in the second phase of the project in partnership with B2X Online. The program also has support from the Virginia Tobacco Region Revitalization Commission.

Microsoft's support is part of its Affordable Access Initiative, through which it has been supporting projects to extend internet access in underserved areas in the U.S. and globally. Paul Garnett, Microsoft's senior director of Affordable Access Initiatives, discusses the program in the videos below:

https://www.youtube.com/watch?v=qTOJ8vX2QfQ

https://www.youtube.com/watch?v=cfrvTy-qxlc

Article available at: http://www.rcrwireless.com/20170523/network-infrastructure/microsoft-supports-white-spaces-wi-fi-network-tag6

WORK IT, SOVA: CONNECTING SOUTHERN VA'S BUSINESS COMMUNITIES

Homework Network to bring Wi-Fi access to students in Charlotte, Halifax

Special to Work It, SoVa | May 23, 2017

The Mid-Atlantic Broadband Communities, along with Microsoft, on Tuesday announced the largest "TV White Space" project in North America.

This Homework Network will allow thousands of students in Charlotte and Halifax to access high speed Wi-Fi at no cost.

This project aims to close the gap between students with high speed access and those in rural areas where access may not be available. With this technology, and the access it provides, students in rural Virginia will be prepared to enter an increasingly connected world.

The network, which has already been successfully piloted in Charlotte and Halifax counties, is being launched with the help of $500,000 in grant funds from the Tobacco Region Revitalization Commission. By the end of the year, 3,000 students in 1,000 homes will have access to their schools' online networks as a result of the project.

State Sen. Frank Ruff, tobacco commission vice chairman, said, "Rural Southern Virginia is now home to a highly innovative solution to help young people succeed in school, which can serve as a model for other parts of the state, the U.S. and even around the world. We are proud to help support and fund such an important project starting here in Charlotte and Halifax counties."

Paul Garnett, Microsoft's senior director of Affordable Access Initiatives added, "Too many students in the U.S. are falling behind their peers because they lack reliable high-speed internet access at home. Falling behind today means entering the job market at a serious disadvantage tomorrow. This innovative public-private partnership can help close that gap. Our partnership with MBC and others is one step in what we hope is replicated in other parts of the country and around the world."

The technology behind the network utilizes "TV white space," which is the unused spectrum between TV channels, by redirecting broadband from schools to receivers located at each home. The network utilizes hardware manufactured by Adaptrum and installed by B2X Online.

Tad Deriso, MBC president and CEO said, "Closing the homework gap is critical for improving the odds of student success. We are delighted to partner with Microsoft and others on such a groundbreaking initiative that, at the end of the day, connects young people to required educational resources and strengthens our local communities. Ultimately we believe such initiatives enhance competitiveness for economic development in Southern Virginia."

Article available at: http://www.godanriver.com/work_it_sova/news/homework-network-to-bring-wi-fi-access-to-students-in/article_198f37a8-400d-11e7-9236-fb8723d39348.html

THE SOUTHSIDE MESSENGER

New Homework Network Brings Thousands of Students Online in Rural Virginia

United States' Largest TV White Space Project Will Deliver Critical, At-Home Wi-Fi Access and Educational Content To K–12 Students in Charlotte and Halifax Counties

Written by Staff on May 25, 2017 at 9:46 am

SOUTH BOSTON Mid-Atlantic Broadband Communities Corp. and Microsoft Corp. on Tuesday announced the launch of an innovative Homework Network to deliver broadband internet access at home to thousands of students in Southern Virginia, at no cost to their families. In Charlotte and Halifax counties, about 50 percent of students currently lack broadband access at home. Yet today, nearly seven in 10 teachers across the United States assign homework and research requiring broadband access.

The "homework gap" is an urgent local and national problem. An estimated 5 million households with school-age children in the U.S. are at a significant disadvantage due to limited or nonexistent broadband connectivity. These students are often unable to access the tools they need to succeed in school and to develop the skills they need to enter today's workforce. This creates an uneven playing field for future educational and economic prospects.

In response, Microsoft and MBC are activating the largest Homework Network in the U.S. starting in Charlotte and Halifax counties with support from the Virginia Tobacco Region Revitalization Commission. The network has been successfully piloted in 100 households across both counties, and will reach more than 3,000 students in 1,000 homes by the end of 2017. Students will have free access to their schools' online networks where assignments and education resources are posted, extending their learning time beyond the school day.

MBC President and CEO Tad Deriso, Tobacco Commission Vice-Chairman Senator Frank Ruff, R-Va., and Microsoft's Senior Director of Affordable Access Initiatives Paul Garnett, among others, announced the news at an event Tuesday in South Boston, Virginia.

"Closing the homework gap is critical for improving the odds of student success," said MBC's Deriso. "We are delighted to partner with Microsoft and others on such a groundbreaking initiative that, at the end of the day, connects young people to required educational resources and strengthens our local communities. Ultimately we believe such initiatives enhance competitiveness for economic development in Southern Virginia."

The Homework Network in Virginia is made possible by an innovative broadband technology, which Microsoft helped pioneer, that makes use of unused low-band spectrum often referred to as TV white space. Leveraging this technology, the network wirelessly extends existing broadband from local schools to students' homes. Using TV white space equipment from U.S.-based Adaptrum, internet access is delivered via base stations installed on towers at or near fiber-connected schools and client radios installed at students' homes. TV white space technology is ideal for delivering

broadband service to areas such as rural Southern Virginia, as it can cover large geographical ranges even in the hilly terrain and dense tree cover of the region. The network is being installed by local internet service provider B2X Online.

Microsoft has driven the development and adoption of TV white space technology as part of its Affordable Access Initiative. The initiative aims to support, grow and scale innovative businesses that are developing technologies that have the potential to help billions of people around the world gain reliable connectivity.

"Too many students in the U.S. are falling behind their peers because they lack reliable high-speed internet access at home," said Microsoft's Garnett. "Falling behind today means entering the job market at a disadvantage tomorrow. This innovative public-private partnership can help close that gap, and is one step toward what we hope is an initiative replicated in other parts of the county. Given the benefits, it is important that the Federal Communications Commission ensure there is sufficient low-band spectrum available in every U.S. market."

"Rural Southern Virginia is now home to a highly innovative solution, which can serve as a model for other parts of the state and the U.S. and even around the world, to help young people succeed in school," said Senator Ruff. "We are proud to help support and fund such an important project starting here in Charlotte and Halifax counties."

Mid-Atlantic Broadband Communities Corporation (MBC) is committed to providing economic development leadership to Southern Virginia. MBC promotes economic development in Southern Virginia through the operation of a successful advanced open access fiber optic network, providing wholesale telecommunications transport services, colocation and tower leasing. MBC offers a state-of-the-art fiber optic network and supports the recruitment of major investments, including data centers, call center/operations centers, advanced manufacturing, research and development, and bio-tech industries.

The Tobacco Region Revitalization Commission is a 28-member body created by the 1999 General Assembly. Its mission is the promotion of economic growth and development in tobacco-dependent communities, using proceeds of the national tobacco settlement. To date, the Commission has awarded 2,036 grants totaling more than $1.1 billion across the tobacco region of the Commonwealth, and has provided $309 million in indemnification payments to tobacco growers and quota holders.

Microsoft (Nasdaq "MSFT" @microsoft) is the leading platform and productivity company for the mobile-first, cloud-first world, and its mission is to empower every person and every organization on the planet to achieve more.

Article available at: http://southsidemessenger.com/new-homework-network-brings-thousands-of-students-online-in-rural-virginia/