

| January 24, 2014

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

Re: Notice of *Ex Parte* Communication, WC Docket No. 13-184

Dear Ms. Dortch:

On January 8, 2014, Curt Godwin, Network/System Administrator at the Forsyth County School System (Forsyth) in Georgia, spoke via telephone with Dania Ayoubi, Mark Walker, Soumitra Das, Chas Eberle, Mark Nadel, James Bachtell and Regina Brown of the Wireline Competition Bureau (Bureau). Then on January 22, 2014, Mr. Godwin and Mark Klingler, Director of Technology Services at Forsyth, spoke via telephone with Dania Ayoubi, Mark Walker, Soumitra Das, Chas Eberle, and Lisa Hone of the Bureau, and Nicholas Alexander of the Office of Strategic Planning (collectively, FCC staff). The following topics were discussed.

FCC staff expressed an interest in learning more about local area network (LAN) and Wi-Fi deployments in schools as well as getting data on the associated costs and pricing. Mr. Godwin explained Forsyth County's evolution to a bring-your-own-technology (BYOT) school system. Mr. Godwin estimated that Forsyth currently has 35 buildings/sites, and 46,000 total network users (41,000 students and 4,500 staff and teachers) with on average 20,000 devices connected to the network, concurrently. Mr. Godwin also estimated that Forsyth enrollment increases by roughly 1,500-1,700 students per year and that the number of devices on the network increases by 20-25% per year.

Mr. Godwin explained that Forsyth, which manages its LAN and Wi-Fi internally, has a fairly robust wired network with dark fiber out to all schools. Mr. Godwin described that there are two 1-Gbps connections to each building from the district office and three load-balanced internet connections from the district office.

Mr. Godwin also explained that vendors were hired to conduct a wireless technology evaluation, including predictive and actual site surveys, to assist with Forsyth's Wi-Fi deployment. Mr. Godwin explained that the evaluation made no distinction between instructional and common areas, and that user density was assumed to be uniform based on square footage. Mr. Godwin also explained that post-installation validation surveys were conducted, both by the vendor and Forsyth, to ensure a minimum Wi-Fi signal strength of -72 dBm throughout all instructional and common areas. As funding permits, Forsyth aims to upgrade the existing school networks to full coverage at -65 dBm, a signal strength that Mr.

Klinger considers to be more suitable to the smartphones and tablets that most students use as part of the BYOT initiative.

FCC staff inquired about wireless access points (WAP). Mr. Godwin explained that to avoid having one WAP per classroom, Forsyth purchased Xirrus wireless arrays with Power over Ethernet (PoE) injector that have the capacity to cover the same amount of square footage with far less hardware and infrastructure than a standard WAP. Mr. Godwin estimated a total of 648 arrays each with eight radios – three radios are assigned to 2.4 GHz channels, four to 5 GHz channels, and 1 to monitor. He also explained that he rarely observes a sustained load on the network of more than 20 Mbps per array. Mr. Godwin estimated that about five LAN switch ports are dedicated to each classroom.

Mr. Klingler explained that Forsyth purchased Xirrus arrays from the manufacturer in bulk at \$1,797 per array, along with annual premium hardware and software and support contracts at roughly \$207 per array. The annual maintenance and support contracts include software updates, hardware replacement, and technical support. Mr. Godwin also said Forsyth owns all of its network equipment.

Mr. Klingler also explained that each Xirrus array requires three Ethernet drops. He estimates that the cost of installing each drop is roughly \$250 for a total of \$750 per array. Mr. Klingler considers the array pricing to be very favorable and commented that Forsyth is often able to receive special pricing because of its reputation as a model for other school districts.

Mr. Klingler said that the Xirrus arrays are standalone and do not require separate wireless controllers, and that Forsyth purchased management software at an additional cost per array to allow for centralized configuration of all arrays. Forsyth does its installation “in-house.” Mr. Klingler estimated installation could be up to one hour per array (this is in addition to the installation of the required data lines). As BYOT devices continue to demand greater bandwidth, Mr. Klingler hopes to receive additional funding this year to add additional arrays and infill certain areas to get better coverage.

FCC staff also asked about general “rules of thumb” for equipment lifecycles in network planning. Mr. Klingler explained that while at one time Forsyth had most of its computers on a three-year lease cycle, for budgetary reasons, that is no longer the case. Forsyth aims to return to an annual refresh of one-third of its computer inventory. Mr. Klingler also explained that in his experience, the lifecycle of network equipment (i.e., switches and WAPs) is driven by changes and updates to technology and standards rather than by age or equipment wear. Mr. Klingler anticipates replacing Forsyth’s wireless arrays not because of equipment wear, but to accommodate the move to 802.11ac. Mr. Godwin also explained that to support a move to the 802.11ac standard, Forsyth will likely have to reengineer its array deployment to accommodate the 5 GHz frequencies, which are more readily attenuated or absorbed by obstructions between the WAP and client.

FCC staff expressed an interest in learning more about Forsyth's internal network deployment. Mr. Klingler provided a spreadsheet that details facilities inventory by building and site for all Forsyth County schools. That spreadsheet is included as an attachment. Mr. Godwin also provided a high-level network diagram to give FCC staff a better understanding of Forsyth's connectivity. That diagram is also included as an attachment.

Respectfully submitted,

 /s/

Dania Ayoubi

Attorney Advisor, Telecommunications Access Policy Division, Wireline Competition Bureau

Attachments