

**SUPPORTING STATEMENT
REQUEST FOR EXTENSION OF EXPERIMENTAL STA
WKAR-TV, East Lansing, MI (Facility ID 6104)**

The Board of Trustees of Michigan State University (“Licensee”), licensee of noncommercial educational television station WKAR-TV, East Lansing, MI (Facility ID 6014) (“WKAR-TV”), respectfully requests that the Commission grant a single, 74-day extension of its Experimental Special Temporary Authority (“Experimental STA”) to allow continued experimental operation of its testbed ATSC 3.0 facility on Channel 32.¹ The Experimental STA is nearing the expiration date, and Licensee requires a short extension of the Experimental STA (until December 31, 2019) so that it may complete tests on new ATSC 3.0 applications through continued operations on channel 32.

A Short Extension Will Service the Public Interest

With the Commission’s grant of the Initial STA, WKAR-TV became the first public television station in the U.S. to be authorized to conduct experimental ATSC 3.0 broadcasts. Licensee has built on the Michigan State University campus a NextGen Media Innovation Lab (“NMIL”), which is testing ways to maximize the potential of public television’s mission of service to the public. The NMIL has tested or developed interactive children’s programming, enhanced systems for communicating information during emergencies, methods to support new technologies in agriculture, and other critically important services to the community. Significant progress has been made in developing ATSC 3.0 applications, but a short continuance of broadcast operations is needed in order to prove out applications that can then be moved into a laboratory setting before being deployed in markets where actual ATSC 3.0 operations are being rolled out.

Licensee has thus far spent over \$400,000 on equipment modifications, a mask filter, property modifications, and other gear. NMIL operations began in August 2018, with the full facility becoming operational in January 2019. Through October 4, 2019, the ATSC 3.0 signal transmitted in connection with the NMIL’s ATSC 3.0 testbed has been in operation for a total of approximately 4,124 hours. Thus far, Licensee has focused on using the ATSC 3.0 technology to expand the capabilities of its current children’s educational programming so as to expand the accessibility of content. For the past several years, WKAR-TV has produced a children’s science and engineering program called *Curious Crew*. Along with the educational content of the show itself, WKAR-TV offers Curiosity Guides, comprised of supplemental content, tutorials, and other instructional material. Curiosity Guides have been available through the station’s website, but families lacking broadband connectivity at home are left out. Using ATSC 3.0 technology and a modified gateway device obtained from Triveni, the NMIL has circumvented this limitation by bundling supplemental content via the broadcast, enabling families that lack a broadband connection to receive and benefit from it. Licensee has

¹ WKAR-TV was initially granted an experimental STA to operate on Channel 36 on June 11, 2018 (the “Initial STA,” see FCC LMS File No. 0000053377). Those operations were shifted to Channel 32 earlier this year pursuant to the Commission’s grant of the Experimental STA, which Licensee now seeks to extend. See Letter to WKAR-TV from Kevin R. Harding of FCC, dated April 18, 2019 (FCC LMS File No. 0000069316).

successfully integrated the Curiosity Guide feature into the broadcast and has provided demonstrations at the PBS TechCon and NAB conferences in April 2019. Since then, Licensee has developed an additional experiment with supplemental content for the companion screen that offers learning reinforcement in the form of interactive games.

In addition, Licensee has established a partnership with the Lansing School District, under which 2,000 PBS Playtime Pads have been distributed to kindergarteners. Licensee is building on this partnership by developing an ATSC 3.0 app that will enable the Playtime Pads to serve as a platform to test companion screen applications. Through this project, Licensee has developed professional development for teachers and engagement initiatives for the parents, solidifying these partnerships to provide the groundwork for experimentation of companion screen testing. This project is allowing Licensee to test new models of intervention for elementary math and literacy, and early research data is showing improvements by students in these areas.

The tablet partnership is just one example of the type of project Licensee plans to pursue as a PBS station. Other ideas under consideration are telehealth and distance education to underserved and rural communities with limited broadband penetration. Using a combination of broadband and broadcasting, we will develop methods for delivering rich, interactive media using a thin back channel.

WKAR-TV's proximity to Detroit and the ongoing collaborations between MSU's engineering faculty and automakers offer potential avenues for research on potential application of ATSC 3.0 technology in the future of connected and autonomous automobiles. MSU's status as one of the original Land Grant Universities, its highly ranked College of Agriculture and Natural Resources, and its statewide Extension service allows the NMIL to test NextGen applications that support agriculture and the family farm. Automated remote control of irrigation systems depending on hyper-local weather conditions is an example of one possible application. With a community of students, faculty and staff that approaches 70,000 people, and an athletic stadium of 75,000 seats, emergency communications to MSU's staff and visitors is the highest priority. The NMIL enables MSU to test prototype systems that augment communications with first responders on campus and with the University community and that may be deployed at MSU, other universities, and public first responder departments in Michigan and elsewhere. The NMIL explores the potential of ATSC 3.0 to expand the availability and impact of local information, and it serves as a platform for developing and testing areas such as on-demand access to local content, interactivity, geographic targeting, potential applications for local government agencies and area NGOs. These efforts are enhanced by the deep experience and expertise both in research and in practice of the faculty at MSU's top-ranked School of Journalism and Communications Arts and Sciences Department.

The continued operation of the NMIL under the requested authority also will enable Licensee to continue exploration of the potential of ATSC 3.0 to serve content to mobile devices, such as smart phones, tablets or IoT devices. A key NMIL research effort is the optimal design of programming not just for mobile devices, but for other devices used as companion devices for educational outcomes. MSU has launched a major initiative on mobility, transforming its 5,200-

acre campus into a live, connected ecosystem to drive mobility research and development to advance smart-vehicle technology and better understand the human element. With much of the transformation already complete across its urban, suburban, industrial and rural zones, MSU's controlled infrastructure and active campus make it ideal to test emerging technologies for new mobility solutions. Those include ATSC 3.0 transmission, solutions for "first mile/last mile" transportation, and validation of technologies for automated and connected vehicle systems.

The NMIL also is testing ATSC 3.0 applications designed to make roadways smarter and safer through the use of ATSC 3.0 signals that carry real-time traffic information to road signs that can alert motorists to such things as speed limit changes in foggy conditions and upcoming slowdowns due to accidents. Licensee also has been collaborating with the University of North Carolina to replicate the UNCTV demo with first responders, utilizing our Advanced Warning and Response Network (AWARN). Instead of relying on mobile phones networks, which can be overburdened during an emergency, AWARN uses terrestrial broadcasting to deliver rich-media, geo-targeted content, such as emergency alerts, evacuation routes and additional information. We have the support of the Michigan State University Police to test this application using our ATSC 3.0 testbed operation in fall 2019 if the requested extension is granted.

Michigan State University has made the NMIL an institutional priority, with significant funding already provided for technology and personnel. A task force of researchers and experts from various fields – including engineering, education, health communication, game design, journalism, computer science and human computer interaction have provided leadership with proposed pilot projects for the testbed.

As the Commission knows, experimental ATSC 3.0 operations have been authorized in response to similar requests by other licensees. In the main, those requests were motivated by a desire to advance innovative new broadcast business models, such as micro-targeted advertising. As with Licensee's Initial STA and the Experimental STA we seek to extend, the instant request involves experiments that are intended to further the core values of noncommercial television licensees – education and the betterment of our communities – through ATSC 3.0 applications. For this reason alone, the public interest will be served by a grant of this request.

Continued Use of Channel 32 Is Necessary and Will Not Interfere with The TV Band Repack

Licensee has examined the possibility of finding a UHF channel other than channel 32 to complete the NMIL experiments, but as the broadcast incentive repack is continuing, channel availability has been reduced and no other UHF channels are available in the East Lansing area for testing. However, continued use of Channel 32 will do no harm to any other television station.

Consistent with the Engineering Statement attached to Licensee's application for the Experimental STA (*see* FCC LMS File No. 0000069316), which is incorporated herein by reference, allowing continued NMIL operations on Channel 32 will cause no new interference above the 0.5% limit until either WFQX-TV, Cadillac, MI (Channel 32, Facility ID 25396),

which is currently dark, implements a pending maximization application (*see* FCC LMS File No. 0000035809), or WDIV-TV, Detroit, MI (Channel 45, Facility ID 53114) begins testing on its post-auction repack channel (Channel 32) in Transition Phase 8. As discussed below, the continued operation of WKAR-TV's ATSC 3.0 facility on Channel 32 will not interfere with either of these stations:

- *Re WFOX-TV*: Licensee has discussed its proposed NMIL operation with the licensee of WFQX-TV and plans to coordinate with them to avoid any interference should the WFQX-TV reinstitute operations and implement its currently-pending maximization application (if granted).²
- *Re WDIV-TV*: Licensee has corresponded with Marcus Williams, Vice President for Engineering of Graham Media Group, Michigan, Inc., licensee of WDIV-TV. Mr. Williams indicated that WDIV-TV plans to request an STA to conduct field measurements in advance of the Phase 8 testing start date of January 18, 2020 in order to verify coverage for their side mounted auxiliary antenna, but that he is not opposed to an extension of the Experimental STA as long as (1) WKAR-TV coordinates its NMIL operations with WDIV-TV's field measurement operations so as to avoid any interference, and (2) WKAR-TV ceases NMIL operations as of January 1, 2020. Licensee agrees to comply with these two conditions.

In light of the foregoing, Licensee respectfully requests that the Commission promptly grant the Experimental STA to WKAR-TV.

² The Experimental STA currently includes a condition that WKAR-TV immediately cease ATSC 3.0 operations on channel 32 if and when the Commission grants WFQX-TV's application (LMS File No. 0000035809). Licensee requests that the Commission amend the current condition so as to provide that WKAR-TV must immediately cease operations on channel 32 if and when WFQX-TV provides notice that it intends to begin program test operations pursuant to a grant of its maximization application. Licensee understands that the licensee of WFQX-TV is not opposed to such an amendment.