

### Experiment Description

Microsoft, in partnership with Allband Communications, a cooperative Internet service provider serving rural northeast Michigan, seeks to evaluate new ways of using TVWS technology to expand access to high-speed Internet access for America's students, especially in rural and underserved areas. Today, an estimated 70% of teachers assign homework that requires access to broadband,<sup>1</sup> even as 5 million American students go home at the end of each school day to a household that lacks a high-speed Internet connection.<sup>2</sup> The proposed deployment would help to address this unmet need in rural Hillman, MI by providing high-speed wireless Internet access on school buses as they complete their morning and afternoon routes. This will allow students without suitable connections at home to complete assignments that require broadband Internet access while they are on their way to and from school.

Each school bus would be equipped with a TVWS radio, which would communicate with fixed TVWS base stations for Internet backhaul and to verify that the device has not left the area where experimental operations have been authorized. Because of the significant coverage needs of this experimental deployment, however, Microsoft seeks to use an experimental fixed white-space device at a power level above that ordinarily permitted for personal/portable devices under the Commission's rules. Microsoft and Allband will prevent any harmful interference by adhering to the separation distances that ordinarily apply to fixed devices of the same transmit power and ensuring that bus-resident devices will not operate unless they are able to connect to one of a pre-programmed list of fixed base-station devices to be deployed in Hillman. A bus-resident device will cease operating if it has not been able to contact a base station in the last five seconds. This ensures that the bus-resident white-space devices are geofenced, and will not operate if a bus is driven outside of the intended area of

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<sup>1</sup> <http://www.freep.com/story/opinion/contributors/2015/03/16/internet-broadband-access/24849353/>

<sup>2</sup> <http://www.pewresearch.org/fact-tank/2017/03/22/digital-divide-persists-even-as-lower-income-americans-make-gains-in-tech-adoption/>

operation. A map depicting the bus route as well as location and coverage area of each fixed base station, outside of which the bus-resident devices will be unable to operate, is attached.

The experimental white-space devices have also not yet been configured for automatic database control. Because automatic database control is complex, the manufacturer intends to conduct experimental equipment trials to establish baseline device capabilities in a controlled environment before adding this additional functionality and seeking FCC equipment certification. To prevent harmful interference during the proposed experiment, each device would be limited to operations only on channels 31 through 33, and specific channels of operation would be selected manually each morning from within that restricted set based on channel-availability data in a white-spaces database. Microsoft will coordinate with local broadcasters to ensure interference protection for wireless microphones in the unlikely event that a broadcaster seeks to reserve a channel for wireless microphone operations within the experimental area on less than 24 hours' notice.