

Attachment A – Background Information, Response to Item 7 Questions & Requested for Extended License Term

This application has its roots in Experimental License WI2XPQ (expired) but goes beyond those experiments. That license allowed the Applicant, Carnegie Mellon University (“CMU”) to participate in the Naval Post-Graduate School’s Joint Interagency Field Experimentation (“JIFX”), sometimes referred to as “Naval Postgraduate School Field Experimentation (‘NPS-FX’).” Information about the experimentation is available online at <https://my.nps.edu/web/fx>. These events are generally held at Camp Roberts, Highway 101, Camp Roberts, CA 93451-5000. CMU has been, and will continue to be, an active participant in JFIX exercises, as well as certain experiments for the U.S. Department of Agriculture (“USDA”). Also, CMU is a participant in OPERA: Open Pittsburgh wirEless Research Accelerator, which is an open large-scale wireless communications and sensor testbed that will enable the next-generation of safe connected and automated vehicles and a host of smart city applications and services.

JFIX

JFIX enables a diverse group of academics, government labs, private industry, end users, and others to come together to develop and refine new technologies in a field environment. The results advance both the science of radio engineering and national defense. At times, emergency first responders also participate. Due to the sponsorship of the Army and Navy and the relationship of JFIX to military effectiveness and national defense, the exact nature of the experiments and exercises are generally treated as confidential and not disclosed beyond the sponsors and, as appropriate, the participants. As permitted by the Army and the Navy and upon reasonable request by the Commission, CMU would disclose information to the Commission on a confidential basis. This information would include: a) The complete program of research and experimentation proposed, including description of equipment and theory of operation; b) The specific objectives sought to be accomplished and c) How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion or utilization of the radio art, or is along a line not already investigated.

USDA

In addition, CMU has been approached by the USDA to participate in similar radio technology research throughout the state of California. CMU believes that this additional research, the results of which can generally be disseminated, can and will provide further benefits the public interest. Therefore, in this application, CMU is seeking permission to extend the license footprint throughout California, although CMU expects much of the experiments will be carried out in rural parts of the state.

OPERA

Many entities, including universities, state and local governments and businesses will participate with CMU in using the wireless OPERA platform in Allegheny County, Pennsylvania to:

- conduct advanced reproducible research on next-generation wireless technologies in real-world settings;
- obtain real-time sensing information to enable and optimize services and applications including, but not limited to, connected and automated vehicles (“CAVs”), traffic flows, traffic signal controls, fleet vehicle movements, streetlights, video analytics, bus transit, air/noise quality;
- leverage edge computing to reduce bandwidth requirements, minimize response times and address security and privacy concerns;
- build and study at-scale applications to improve safety and mobility, and monitor the environment; and
- utilize time-series and metadata repositories to serve as the foundation of long-term smart community data sciences research.

Research from the OPERA experiments will be shared as permitted.

CMU conducts many of its “on-location” experiments from its mobile RF laboratory (a retrofitted EMT rescue vehicle, length 7 meters, height 2.7 meters) with an extendable antenna mast (16 meters maximum from the top of the mast to the bottom of the tires) illustration filed perviously. This vehicle will be deployed at Camp Roberts and around the rest of the state. Accordingly, it is impossible to provide exact details requested in the questions about antenna height except at Camp Roberts.¹ Other experiments will be conducted with mobile transmitters outside the mobile lab.² When operating in locations within 805 meters of a covered airport, CMU will make any notifications to the Federal Aviation Administration (“FAA”) as explained in Section 17.7 of the Commission’s rules, 47 C.F.R. § 17.7.

Since the JFIX-, USDA- and OPERA-related experiments will be ongoing,³ CMU requests that it be granted an experimental license for the maximum period of five years. Section 5.71(a), 47 C.F.R. § 5.71(a). Such a grant would allow more CMU resources to be spent on research, rather than on license renewals. Further, CMU has a good compliance record with Commission rules, such that a longer license term does not increase the risk of harmful interference.

¹ CMU’s application includes antenna height location for Camp Roberts and is the same as that which was approved as part of WI2XPQ.

² CMU’s use of directional antennas will be in compliance with Part 15, Subpart C of the FCC’s rules.

³ For example, JFIX events are held quarterly.