

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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| In the Matter of |) | |
| |) | |
| Unlicensed Operation in the |) | ET Docket No. 04-186 |
| TV Broadcast Bands |) | |
| |) | |
| Additional Spectrum for Unlicensed Devices |) | ET Docket No. 02-380 |
| Below 900 MHz and in the 3 GHz Band |) | |

To: The Commission

COMMENTS OF ITRON, INC.

Itron, Inc. (“Itron”), by its attorneys, hereby submits these comments in response to the Commission’s First Report and Order and Further Notice of Proposed Rulemaking in the above-captioned proceedings.¹

In its First Report and Order, the Commission concluded that “low power devices can generally be allowed to operate on TV channels in areas where those frequencies are not being used for TV or other incumbent licensed services,” so long as “such devices comply with appropriate protective measures for ensuring that they do not cause interference to already authorized services.”² Based on this conclusion, it adopted “initial decisions to permit fixed low power devices to operate on any permissible TV channel, but only at times and locations where the spectrum is not already being used by other authorized services.”³ Itron applauds the Commission’s action, which will provide more suitable spectrum for unlicensed broadband uses; reduce congestion in unlicensed bands; and

¹ *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, First Report and Order and Further Notice of Proposed Rulemaking, FCC 06-156 (Oct. 18, 2006).

² *Id.* ¶ 2.

³ *Id.*

further the Commission's goal of making broadband services available to all Americans.

In its Further Notice of Proposed Rulemaking, the Commission requested comment, among other things, concerning "the types and applications of unlicensed devices that parties expect to be developed to operate in the TV bands."⁴ The Commission recognized that "fixed unlicensed devices would be used by WISPs and others as base stations to provide Internet access and other broadband data services to homes and businesses," and that "fixed operations would be outdoors, might cover a substantial geographic area, and might be part of a commercial infrastructure."⁵

Itron agrees that WISPs and other broadband systems are likely candidates for using unoccupied TV channels. For reasons that are discussed in additional detail below, the Commission should segment the unused portions of the TV bands, limiting unlicensed operations to broadband services in one portion of the band and to non-broadband services in the other portion of the band. Segmenting the band in this fashion will enhance spectrum efficiency by avoiding having incompatible services operating on the same TV band frequencies. Segmenting the TV band also will serve as an inducement for WISPs to migrate from other bands in which, at present, they operate side-by-side with unlicensed devices with which they have technical compatibility issues.

⁴ *Id.* ¶ 58.

⁵ *Id.*

I. Introduction

Itron is the nation's leading manufacturer and supplier of automatic meter reading ("AMR") technologies. Itron supplies its RF-based AMR systems to electric, gas, and water utility companies nationwide. Itron's AMR systems enable a utility to monitor business and residential meters from a remote location using a hybrid architecture that employs both licensed and unlicensed frequencies. Itron has provided nearly 40 million meter modules to more than 1200 utility companies nationwide, and Itron customers have invested over \$2 billion in their AMR networks. Tens of millions of AMR devices already are deployed and operating in the unlicensed 902-928 MHz band. Itron's customers use their AMR networks to provide the public at large with services that the Commission has described as "essential."⁶

II. Operating in TV Bands Would Benefit WISPs.

The unoccupied portions of the TV bands are an ideal location for broadband, WISP-type services. WISPs are particularly vulnerable to interference, because Internet service requires high data rates, and when WISPs have to share spectrum with disparate users, the WISPs may have to repeat transmissions, thereby reducing their data rates. Relocating WISPs from the unlicensed bands that they currently use, which are also used extensively by non-WISP unlicensed services, to unoccupied portions of the TV band, which are not otherwise in use, will decrease dramatically the interference to which WISPs are subject without causing interference to TV stations operations.⁷

⁶ See *Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended; Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies; Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz; Petition for Rule Making of the American Mobile Telecommunications Association, Report and Order and Further Notice of Proposed Rule Making*, WT Docket No. 99-87, 15 FCC Rcd 22709, 22711-12 (2000).

⁷ WISPs can easily be coordinated and located to avoid interference to TV users. The cost of WISP subscriber devices allows for frequency agility and a central control mechanism from the WISP central tower to adapt frequency sets as necessary.

The propagation characteristics of the TV bands are well suited to WISP operations. These propagation characteristics make the TV bands a more natural home for the WISPs than the 902-928 MHz, 2.4 GHz, and 5.7 GHz unlicensed bands that are presently used by WISPs.

III. Encouraging WISPs and Other Broadband Systems to Migrate to Unused Portions of the TV Bands Would Benefit Other Unlicensed Users.

In general, unlicensed devices with similar technical characteristics share spectrum better than unlicensed devices with different technical characteristics. For this reason, WISPs have technical compatibility issues with many devices operating in the 902-928 MHz band.

The 902-928 MHz unlicensed band is populated with numerous low power devices that have short duty cycles. Most of these devices pre-date the Commission's adoption of Section 15.247 (b)(3) of the rules, which permits the use of digital modulation schemes with devices employing high gain antennas and using output power of up to one watt. WISPs, on the other hand, operate at the upper end of the power limits for unlicensed devices and have extended duty cycles. For example, existing WISP devices operating in the 902-928 MHz band have 6 dB bandwidths of greater than 3 MHz.⁸ This is the case even when no data is being sent and the system is only polling for users. These differences make coordination difficult for both co-channel and adjacent channel operations.⁹

⁸ 6 dB bandwidth is a common measure of bandwidth for systems employing digital modulation techniques. *See, e.g.*, 47 C.F.R. § 15.247(a)(2).

⁹ Incompatibilities with WISPs are not as pronounced in the 2.4 and 5.7 GHz ISM bands, which are used by a variety of devices with higher data rates, higher power and longer duty cycles. WISPs cannot rely exclusively on 2.4 GHz and 5.7 GHz spectrum, however, because they have a need for long-range and in-building operations for which lower frequency bands are better suited.

The incompatibilities between WISPs and other unlicensed devices operating in the 902-928 MHz bands are growing. Data rate requirements for Internet services are on the rise in order to accommodate streaming video, VoIP, and other broadband services, and to satisfy these needs WISPs will need longer duty cycles and wider bandwidth. Early modems operated with data rates on the order of 300bps; today's modems use data rates that are many times that figure.

Encouraging WISPs to migrate to the television bands will help alleviate these incompatibilities. WISPs will be able to use uncongested spectrum that is not populated with low power, short duty cycle devices, leaving the 902-928 MHz band as a haven for more traditional Part 15 uses.

If the unused portions of the TV bands are made available both to high power/extended duty cycle devices and to low power/short duty cycle devices, however, there is a danger that the incompatibilities and coordination issues that already exist in the 902-928 MHz band will be replicated in the TV bands. To avoid these problems, the Commission should segment the TV bands, limiting operations in one portion of the bands to WISPs and other unlicensed broadband systems, and limiting operations in the other portion of the bands to unlicensed systems that are not used to provide broadband services.¹⁰ This separation will give WISPs the operational flexibility and access to uncongested spectrum that they need, and will relieve congestion and alleviate coordination issues in the non-broadband portion of the TV bands and in the 902-928 MHz band as WISPs migrate to the unused TV channels that are dedicated to broadband operations.

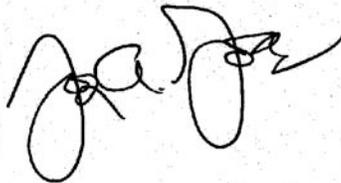
Conclusion

¹⁰ There is ample spectrum in the TV bands for both broadband and non-broadband unlicensed operations: Following the transition to digital channels, the TV bands will consist of "core" channels 2-51, which comprise 300 MHz. There is also ample demand for additional spectrum for broadband and non-broadband unlicensed operations. The ISM bands are heavily used for both types of transmission, and the public's appetite for wireless devices, and industry's ability to create new ones, are exploding.

Broadband services such as WISPs, because they require higher power levels, longer duty cycles, and larger blocks of spectrum than traditional unlicensed services, will share better with one another in new spectrum that is used exclusively by unlicensed broadband systems than they can share with undifferentiated unlicensed services in the heavily used 902-928 MHz band. Accordingly, the Commission should permit unlicensed radio transmitters to operate in the broadcast television spectrum, on a segmented broadband/non-broadband basis, at locations where that spectrum is not being used.

Respectfully submitted,

ITRON, INC.

A handwritten signature in black ink, appearing to read "J. Godles", with a stylized flourish at the end.

Joseph A. Godles

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