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

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

To: The Commission

COMMENTS OF ITRON, INC.

Itron, Inc. ("Itron"), by its attorneys, hereby submits these comments in response to the Commission's Notice of Proposed Rule Making in the above-captioned proceedings.[1]

Itron supports the Commission's effort to allow unlicensed broadband services to operate in unused portions of the television broadcast bands. Such an allocation would provide more suitable spectrum for unlicensed broadband uses; would reduce congestion in unlicensed bands; and would further the Commission's goal of making broadband services available to all Americans.

If the Commission makes this allocation, however, then it needs to ensure that licensed services are protected, and it should protect the public's investment in legacy broadband equipment by addressing backward compatibility issues. In addition, to avoid having incompatible services operating on the same frequencies, the Commission should segment the unused portions of the TV

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[1] *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band,* Notice of Proposed Rulemaking, FCC 04-113, 19 FCC Rcd 10018 (2004) ("TV Band NPRM").

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.

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."[2]

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.

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[2] *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).

In addition, the TV bands are better suited to WISP operations than certain unlicensed bands, such as the 2.4 and 5.7 GHz bands, that are presently used by WISPs in addition to the 902-928 MHz band. The TV bands are superior to these unlicensed bands for non-line-of-sight applications such as WISPs because the TV bands are lower in frequency.[3]

For all of these reasons, Itron agrees with the Commission that allowing unlicensed operation in the TV bands could benefit broadband operators such as WISPs by improving the service range of their existing operations, thereby enabling them to reach new customers.[4]

III. Allowing WISPs and Other Broadband Systems to Operate in 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 are relatively incompatible 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 6dB bandwidths of greater than 3 MHz.[5] This is the case even when no

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[3] Although the 902-928 MHz band is marginally better for line-of-sight transmissions than the 2.4 GHz and 5.7 GHz bands, there are other reasons, discussed in Section III of these comments, why the TV bands are preferable to the 902-928 MHz band for WISPs and other broadband networks.

[4] TV Band NPRM at ¶1.

[5] 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).

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.[6]

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.

Opening unused portions of the television bands to WISPs will help alleviate these incompatibilities. WISPs will be able to migrate to 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

[6] 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.

systems that are not used to provide broadband services.[7] 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.

IV. Licensed Operators Must Be Protected from Harmful Interference.

The Commission has proposed three methods for preventing unlicensed broadband operations from causing harmful interference to licensed operations in the TV bands:

(1) using geographic location information and frequency databases to determine whether unlicensed devices are located far enough outside of protected service contours to avoid causing harmful interference;

(2) allowing unlicensed devices to transmit only after receiving a "control" signal that positively identifies which TV channels are vacant and available for use; or

(3) requiring unlicensed devices to incorporate sensing capabilities to determine whether other transmitters are operating in an area.[8]

Itron supports the Commission's first proposal, so long as unlicensed devices are required to check the databases frequently (*e.g.*, daily or weekly). If this proposal is adopted, moreover, then to ensure reliability the FCC should

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[7] 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.

[8] TV Band NPRM at ¶20.

require that the unlicensed devices check frequency databases automatically through the Internet or similar means, rather than relying on manual checks.

Itron takes no position concerning the Commission's second proposal. As for the third proposal, although Itron has opposed relying on listen-before-transmit technology to detect transmissions by *unlicensed* devices,[9] this approach may be acceptable when it comes to listening for licensed television transmissions. There is a more stable and predictable listening environment in the television bands, because during the portions of the day when they are in operation, television stations generally transmit from a single location using power and other technical characteristics that do not vary.

Conclusion

The proposal to allocate unused portions of the TV bands for unlicensed broadband services will advance the Commission's strategic goal of extending broadband to all Americans.[10] The proposal also is rooted in sound spectrum management principles: 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.

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[9] *See, e.g., Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies,* Comments of Itron, Inc., ET Docket No. 03-108 (filed May 3, 2004).
[10] Federal Communications Commission, Strategic Plan FY 2003-FY 2008 at 6 (2002).

For these reasons, 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. In order to protect existing investment while encouraging the development of new products, moreover, the Commission should takes steps to protect licensed services in the television bands against harmful interference from unlicensed devices, and should address the issue of backward compatibility so that the needs of legacy equipment in existing unlicensed bands are taken into account.

Respectfully submitted,

ITRON, INC.

Henry Goldberg
Joseph A. Godles
Brita Dagmar Strandberg

GOLDBERG, GODLES, WIENER & WRIGHT
1229 Nineteenth Street, NW
Washington, DC 20036
(202) 429-4900
Its Attorneys

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