



**NEW AMERICA**  
FOUNDATION

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*Issue Memo:*

***Unlicensed Spectrum Economic Trends***  
**How Licensed-Exempt Spectrum is Enabling Economic Growth**

***1) Astronomical Growth in Unlicensed Wireless Equipment Sales***

Data Points from:

In-Stat/MDR, "Joe Schmo Has Wi-Fi: The Wireless Home Becomes a Reality," [report] December 2003.

- In 2003, an estimated 22.7 million access points and networking cards were shipped, compared to 7.2 million units shipped in 2002.
- In 2003, shipments of wireless networking cards and access points increased by 300% from the previous year.
- The report estimates that 29 million units will be shipped in 2004. By 2007, they estimate that 43 million units will be shipped.
- In 2003, Wi-Fi hardware revenue grew to \$1.7 Billion, an increase of 140% from 2002, when hardware revenues reached \$700 million.

Data Points from:

Synergy Research Group, Press Release from February 11, 2004: ***WLAN Market Eclipses \$2.5 Billion Mark***, Available at <http://srgresearch.com/store/press/2-11-04.html>.

- Sales in the final quarter of 2003 totaled \$751.9 million. Revenue growth was up by 40 percent from the previous year.  
<http://www.wi-fiplanet.com/news/article.php/3311551>
- Enterprise WLAN equipment sales were up nine percent, while SOHO/Home WLAN Equipment sales grew 66 percent.
- Additionally, the SOHO/Home segment represented 65 percent of the total WLAN market.

***2) Unlicensed Last-Mile Connections Outdistance MDS/ITFS Connections by More Than 3:1***

Data Points from:

Parks Associates, "Unlicensed Broadband Wireless: Solutions and Applications," [report] December 2003.

- **Parks Associates estimates that there are currently more than 200,000 U.S. households who receive broadband access via unlicensed fixed wireless,**

**compared to an estimated 40,000 – 70,000 households with licensed, fixed wireless access.**

- The report estimates that in 2003 WISPs generated \$250 million dollars in recurring revenue for providing Unlicensed Broadband Wireless (UBW) access.
- The report estimates that recurring revenues will approach \$2 Billion dollars by 2008.

The report author, Yuanzhe (Michael) Cai says:

- *The market for unlicensed broadband wireless (UBW) technologies is still at a very early stage, with a highly fragmented service market and a plethora of proprietary technologies using different bands and protocols.*
- *In the past two years, the proliferation of wireless ISPs and the declining cost and improved quality of equipment have generated momentum for this industry.*
- *Looking forward, service providers will focus not only on expanding their footprint but also increasing the take rate within existing coverage areas. In the meantime, further declines in equipment costs will help more WISPs justify their residential business plans. Also, the industry will get a further boost around 2006 when real benefits from WiMAX standardization start to materialize.*
- *Underserved market has great growth potentials. It should not be confused with unserved market—areas with monopolistic and even duopolistic market structures can be considered underserved markets as well. Neither does underserved market necessarily indicate a rural market; newly developed communities and urban edge markets are good candidates for UBW services.*

### ***3) Unlicensed Spectrum Provides Growth Opportunity for Local ISPs and Entrepreneurs; Licensed Spectrum Inhibits Broadband Investment***

Data Points from:

ISP-Market LLC, *Broadband Wireless Access 2002: Service Provider Profiles, Market Drivers and Spending Projections*, [report] 2002.

- **In 2002, 40% of the ISPs who deployed fixed wireless systems did so because they had no other option for providing broadband services to their customers.** (Without unlicensed spectrum, those ISPs would have no other mechanism for increasing their service offerings and a significant source of small business investment would be lost.)
- **The report estimates that there are 2,400 WISPs in operation serving 6,000 markets in the U.S.** (This figure was referenced by Intel executives Margaret LaBrecque and D.J. Johnston, “IEEE 802.16 WirelessMAN Specification Accelerates Wireless Broadband Access,” Available at <http://www.intel.com/update/contents/st08031.htm>.)
- The largest Licensed Fixed Wireless Broadband provider, Sprint, stopped adding customers to their Sprint Broadband Direct service in Spring of 2001 (almost 3 years ago), when they had an estimated 52,000 subscribers. Parks Associates estimates

that the bulk of the 40,000 – 70,000 licensed fixed wireless broadband households are leftover Sprint and WorldCom customers, with very little growth recorded in the licensed segment of the fixed wireless market in the past three years.

- *For more info See Sue Marek, “Broadband Wireless Still In Limbo: Major U.S. Deployments Evade Fixed Wireless as Players Walk the Tightrope until the Tide Turns,” Wireless Week, January 01, 2003.*

Data Points from:

In-Stat/MDR, *The Momentum of 802.11 Accelerates the Fixed Wireless Market*, [report] May 2002.

- **Residential subscriptions to unlicensed fixed wireless broadband are expected to grow from an estimate 123,000 in 2001 to almost 2.5 million by 2006.**
- From the press release of this In-Stat/MDR report: *“Wireless Local Area Networks (WLANs) setup to operate over license-exempt (spectrum) have enabled service providers to deliver reliable broadband connectivity that can be deployed quickly and be priced competitively with DSL and cable, without having to buy expensive licenses.”* Available at [http://www.isp-planet.com/research/2002/instat\\_wlan\\_020523.html](http://www.isp-planet.com/research/2002/instat_wlan_020523.html).

***4) This Tremendous Growth in Unlicensed Wireless Has Occurred Despite Crowded Unlicensed Bands: What Could Happen if UWB Had Room to Grow (on 2.5)?***

Data Points from:

Kenneth R. Carter, Ahmed Lahjouji, Neal McNeil, *Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues*, Federal Communications Commission, OSP Working Paper Series No. 39, May 2003.  
[http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/DOC-234741A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-234741A1.pdf)

The Consumer Electronics Association estimates that there is an installed base of more than 348.23 million Part 15 consumer electronics devices; that is, more than one for every US citizen. (Page 22)

Table 1. Current Installed Base of Part 15 Devices

<b>Product</b>	<b>Penetration</b>	<b>Number per Households Using</b>	<b>Total Installed Base (in millions)</b>
Cordless Phones	81.00%	1.5	130.01
Garage Door Openers	40.80%	1.29	56.26
Keyless entry systems for cars	26.50%	1.4	39.71
Remote control toys	19.50%	2.61	54.57
Home security systems	18.00%	1.1	21.21
Toy walkie-talkies (not FRS)	15.10%	1.85	29.81
Baby monitors	10.50%	1.38	15.52
Wireless Routers	N/A	N/A	1.14
Number of US Households: 107 million			

**Data Points from: Intel**

Paul Otellini, President, Chief Operating Officer, Intel Corporation, San Jose, Calif., Sept. 16, 2003, INTEL DEVELOPER FORUM, FALL 2003, Available:  
<http://www.intel.com/pressroom/archive/speeches/otellini20030916.htm>

*“There are 12.7 million wireless access points installed in the install base. They're deploying at (a rate of) one every four seconds.”*

**Data Point from:**

Pyramid Research, *Worldwide Wi-Fi: A Global Survey of Wi-Fi and the Telecoms Industry*, [report] August 2003. Available at [http://www.pyramidresearch.com/info/rpts/july03\\_wifi.asp](http://www.pyramidresearch.com/info/rpts/july03_wifi.asp)

- Pyramid Predicts 700 Million Wi-Fi Users By 2008

This growth is explained by Sean Maloney, Intel Executive Vice President, General Manager, Intel Communications Group, at the 2004 Wireless Communications Association's Technical Symposium and Business Expo, Jan. 21, 2004 in the following way:

<http://www.intel.com/pressroom/archive/speeches/maloney20040121.htm>

*Obviously, with the growth in attachment rates, the number of Wi-Fi users is rocketing. So this is a number from Pyramid Research that just came out. I don't know how you say there's going to be 700 million users, right? But it sounds like a big number, so I thought I'd show it to you.*

*In reality, what's happening is that Wi-Fi is arriving for free in homes. It's being built into the DSL router, or it's being built into the cable modem. In consequence, I guess anybody in that home is going to be a Wi-Fi user, because as you see from the consumer electronic shows, the plasma screens are going to have Wi-Fi interfaces and the TVs and so on will have Wi-Fi interfaces, and of course all the PCs will have them. Desktop PCs will start getting it towards the end of this year, and it will be standard in any PC certainly by the middle of 2005.*

*So anybody who goes out and buys a PC and increasingly goes out from about 2005 onwards and buys a high-end cell phone is going to be a Wi-Fi user. And I guess that's kind of how you get to this number, of that number 700 million.*

**5) Looking Beyond Wi-Fi: Fixed Wireless Equipment Sales Expected to Double in Two Years**

Data Points from:

In-Stat/MDR, *WiMAX: 802.16 Brings Standards to Fixed Wireless*, [report] December 2003. Available at <http://www.instat.com/press.asp?Sku=IN030845WN&ID=849>

- **Fixed Wireless Broadband Equipment sales for last-mile connectivity, network backhaul and broadband networks were \$558.7 Million in 2003.**
- This figure is before the introduction of the 802.16 and 802.20 standards and the economies of scale these two breakthrough technologies are anticipated to provide to the unlicensed market.

- **Fixed Wireless Broadband Equipment sales are expected to surpass \$1 Billion in 2005**, as a number of manufacturers are expected to release Wi-MAX products in 2004 & 2005.