



MARAVEDIS

Telecom Market Research & Analysis

India Broadband Wireless and WiMAX Market Analysis and Forecasts: 2006-2012 1st Edition



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and

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About the Team

This report is the result of a special collaboration between two leaders in market research: Maravedis Inc and Tonse Telecom. Tonse Telecom provided an invaluable contribution as a consultancy based in India, its home-base market.

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Tonse Telecom Pvt. Ltd. (www.tonsetelecom.com) delivers research, analysis and consulting services exclusively for the Indian telecom sector, particularly vertical services. Tonse believes that delivering significant value to clients requires bringing unprecedented depth to research and unique insights that can only come from personal relationships, feet-on-the-street presence and local partnership with every segment of the value chain: device makers, software developers, value-added service companies, service providers, infrastructure vendors and regulatory and policy builders.

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About Maravedis

Maravedis is a leading objective, third party research and analysis firm focusing on Broadband Wireless technologies including WiMAX, 802.20, TD-CDMA and Wireless Local Loop Systems. Maravedis' mission is to be the most trusted bridge between the world of fixed-mobile convergence and the world of real deployments and sound business models.

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Executive Summary

Background

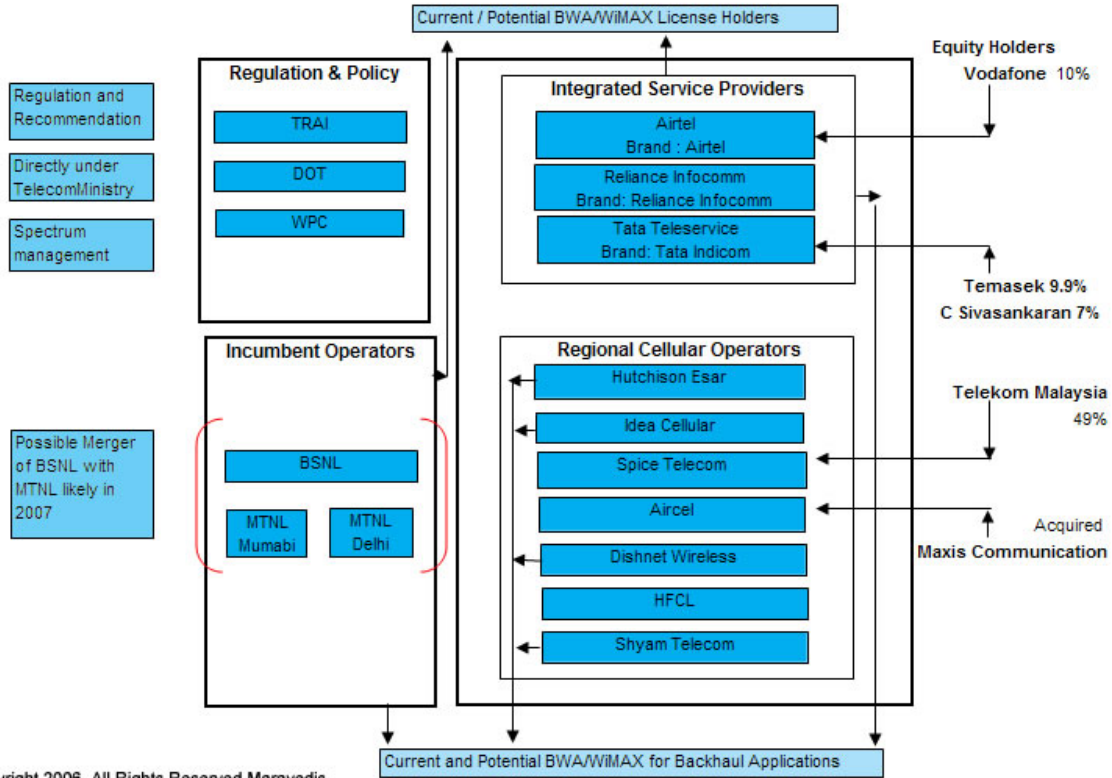
India started its economic liberalization program in 1991. In 1994, the first step to opening the telecom market to privatization was taken. The first private sector wireline and cellular licenses were issued in 1995. From then on, Indian telecom has seen several milestones crossed and many missteps that provided valuable lessons. The effective telecom tariff for domestic voice service has dropped from Rs 14 per minute (US\$0.3 at US\$1 = Rs 44.5) to about Rs 1 (US\$0.02) per minute in the last 10 years. The result is that the number of telephone connections (wireline and wireless lines) has doubled in the past two years, to about 150 million. The Ministry of Telecom has set a target for 2007 of about 250 million connections and mobile coverage for 85% of the country's geographical area, from about 30% today.

India now has 49.75 million fixed subscribers and 100 million mobile users, for a total of about 150 million. That may seem like a large figure, but with a population of 1.08 billion, it translates to just 14 phones for every 100 people. And that number is skewed by the relative wealth of the cities – while urban teledensity is around 31 percent, just 2 percent of the rural population has phone lines. With India's expanding middle class, demand for telephone services is growing beyond carriers' ability to keep up.

The telecom ministry is initiating an ambitious project to release a total of about 45 MHz of spectrum from the Department of Defense to augment necessary spectrum for 3G services. Although details are not yet available, the cost has been estimated at about US\$200 million, and the time frame is expected to be early 2007.

With respect to rural connectivity, the government's objective is to reach about 50 million rural connections, or one phone per three rural households, by 2007 and about 80 million rural connections, or one phone per two rural households, by 2010.

Current Market Structure: India



Broadband Market

Broadband services were launched in India in 2005. ADSL services now cover 300 towns with a combined 1.5 million connections, while broadband wireless subscriber figures are still negligible.

While low broadband penetration is a clear opportunity for BWA/WiMAX, the market take off will require sufficient spectrum, very low cost CPE and affordable end-to-end connectivity, including the computing platform. A country where broadband's average revenue per user (ARPU) is estimated at US\$8-10 requires very low equipment cost. In fact, Huawei is already delivering DSL modems at US\$13 to Indian operators.

The Indian telecom sector operates in a volume-driven market. If the broadband market in India grows to meet the government's revised targets, it might spur one of the world's largest broadband wireless markets. For example, target broadband connections have been currently revised to 9 million subscribers by 2007 and 20 million by 2010. Quite likely the majority of these will be wireless broadband connections because of the poor wireline infrastructure in place.

BWA/WiMAX Regulation

Enough operators are complaining about lack of adequate radio spectrum, that the government is considering the release of some of the spectrum held by the departments of Space and Defense. Currently, license holders in the 3.3-3.4 GHz band have on average, a spectrum of 2x6 MHz to deploy broadband services, even though an analysis shows that 20 MHz is the minimum to support wide scale deployments and hence a profitable business case.

At the end of June 2006, the Telecom Regulatory Authority of India (TRAI) initiated a public consultation on "Allocation and pricing of spectrum for 3G services and broadband wireless access" including WiMAX. This consultation, in which the WiMAX Forum is keen to participate, will probably take until the end of 2006 to produce recommendations.

Further pressure on available bandwidth is coming from operators who require allocations of the 3G/UMTS spectrum. BWA/WiMAX technologies require specific frequency bands to be opened up in the 3.5 GHz band (an internationally approved standard), which is currently allocated to the Department of Space for INSAT downlink. Regulators and policy makers are deciding the best way to manage the spectrum.

BWA/WiMAX Activity

Bharti TeleVentures, Reliance, SIFY, BSNL and VSNL (Tata Group) have all acquired licenses in 3.3 GHz range and are in various stages of trials. VSNL has announced Phase 1 pre-WiMAX deployment of Aperto gear in 60 locations, extending to 200 locations within the year. Although there is clearly insufficient spectrum to offer DSL-like service, several operators have indicated that there is still a huge market for 64 and 128 kb/s connections, which should alleviate the lack of spectrum.

Other active players include utilities and several branches of the Indian government.

Intel is making significant progress in working closely with the Indian Government in bringing the latter's rural broadband goals to reality. The innovative "village entrepreneur" model, together with a net-enabled community info-kiosk, is an ideal way to reach the many who are not yet connected. While Motorola is strengthening its presence in the hinterlands through its extensive BWA projects for state governments, Alcatel has set up a joint venture with the C-Dot (the R&D arm of the DoT) to focus on exclusive BWA/WiMAX solutions that are tailor made for India at price points the Indian consumer is comfortable paying.

Anticipated Developments

Several key events should influence the Indian BWA/WiMAX environment in the months ahead. While most operators have only conducted limited trials of vendor products, we

expect larger deployments to begin in January 2007, provided that the needed additional spectrum is made available as envisioned.

The mobile industry, already faced with a steep decrease in voice ARPU, is expanding its reach by offering voice services in rural areas and high-margin data services in urban areas in order to try to increase revenues. Mobile TV, IPTV and other broadband applications are under trial at Reliance, Bharti and MTNL. The increased level of eCommerce activity – mainly through travel bookings, discount airfares, holiday destination packages, job hunting and matrimonial services – is creating a huge demand for always-on broadband services that is expected to take the current Internet user population to 100 million before 2007.

Government-led initiatives with strong technology partners such as Intel, Motorola and Alcatel will trigger successful applications such as the Railtel cyber-cafe network along the entire rail route of the nation. Local technology-product companies with differentiated products engineered in India will have an opportunity to deploy in large domestic networks, learn from the experience and go global. Thus, they could form the first-generation Indian telecom product companies to address global markets.

The mobile-content industry in India is on the threshold of great change, as television, production houses and content aggregators are working frantically to define the new frontier in the Indian content business. Mobile operators and ISPs that have strong alliances with content developers will be able to define the content-licensing model, which is at the heart of the broadband business. This will pose a new challenge for Indian service providers.

Although the Indian broadband arena is emerging, it clearly offers huge potential for those that can demonstrate perseverance, patience and commitment.

Market Forecasts

In 2005, the BWA equipment market opportunity was a mere US\$6 million, dominated by small deployments for backhaul applications to enterprises with outdoor equipment. However, Maravedis and Tonse believe that with the upcoming spectrum opening, the certification of new equipment and lower-cost CPEs, the annual 3.3 and 3.5 GHz equipment opportunity will increase from US\$4 million in 2005 to US\$256 million in 2012.

Maravedis and Tonse project an accumulated 18 million BWA subscribers by 2012, counting both residential and business segments. WiMAX subscribers should represent two-thirds of this figure. Approximately 60% of the WiMAX subscribers will be mobile customers who are predominately residential, while fixed WiMAX will continue to be driven by large corporations and, to a lesser extent, by SME customers.

Methodology & Assumptions

The research was conducted through two main channels:

Secondary Sources

Maravedis always strives to provide its clients with a new and unique perspective of the industry based on its own research. To ensure that we add value to the information already available to stakeholders in the industry, we reviewed most of the market research available on broadband wireless access in India, including

- ITU Statistical Yearbook, 2005
- The World Bank Development Indicators, 2005
- Numerous articles
- Indian ISP Association

Primary Sources

Primary research is a lengthy but indispensable process for market research because it yields data neither biased nor distorted by intermediaries. As part of this research, Maravedis conducted interviews with the following:

- All service providers listed in the report
- The regulatory authorities
- National account managers and other key representatives of equipment vendors active in the Indian market

The survey took place from January to June 2006 and involved discussions with product managers, marketing executives, regulators, technologists and sales people at all organizational levels. We would like to thank all the participants in our survey for their time and contributions.