

## Broadband USA Applications Database

**Applicant Name:** XW, LLC

**Project Title:** Broadband Ubiquity via Adaptive Filter Bank Modulation

**Project Type:** Sustainable Adoption

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### Executive Summary

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#### A. PROBLEM STATEMENT

20 million U.S. households and 4 million business/institutional locations cannot receive DSL or other land-based broadband service due to distance from a telephone company central office. Current options for providing broadband to a substantial percentage of unserved and underserved households all involve very significant expense, including digging trenches and other very expensive infrastructure build-outs. With this project, population density, and the economics thereof, will no longer limit access to broadband service, giving virtually every household in America economical high-speed Internet access.

**Lack of High-Speed Services:** Although providing broadband service to unserved and underserved, primarily rural, locations is clearly the priority of this project, the proposed innovation will also enable a 2× increase in area coverage at data rates in excess of 30Mbps, supporting a business-class service on existing copper networks and enabling telecom companies to compete with cable companies in offering triple-play type services.

**Limited Backhaul Capacity for Existing T1 Networks:** Xtendwave technology will increase capacity without upgrades or digging, increase capacity to key government-identified corridors, and upgrade key network points of congestion to accommodate capacity needed for new wireless technologies.

**Lagging Telecom Sector:** Xtendwave's technology would serve directly as an economic stimulus, helping to revive telecommunications equipment and semiconductor development and manufacture. In addition, Xtendwave believes that the project will result in many new jobs in sales, service, support, as well as in academia for research and development.

#### B. OVERALL APPROACH

Xtendwave, an established technology company located in Dallas, Texas, has created and patented a breakthrough technology that can address the rural broadband challenge and do so without the need for additional network builds.

Xtendwave's innovative, patented technology - "Adaptive Filter Bank Modulation," or "AFBM", allows DSL service providers to upgrade, replace, and add DSL line cards and modems that are equipped with Xtendwave's AFBM-XRTM chipset. Those DSL service providers will be able to deliver broadband data rates (i.e., 768kbps downstream, 200kbps upstream, per the BTOP definition) at up to 25,000 feet from a central office.

Xtendwave has identified an immediate need for AFBM in augmenting today's strained backbone networks. The company's technology will integrate into T1 copper networks that telephone carriers use for backhaul traffic from network endpoints, permitting more traffic through existing networks without costly upgrades. AFBM-XR will increase T1 network capacity by an order of magnitude, using existing infrastructure to meet the growing demand for high bandwidth cellular voice, data and video services.

Lastly, a significant opportunity exists in enabling DSL service providers and other telecommunications companies to better compete in urban markets and reach inner-city households with affordable broadband. AFBM chipsets will offer much higher speeds, so that DSL service providers can offer new services, specifically: "business class" over copper and the "triple play" services of high definition TV, internet access, and phone service. With AFBM, the bit rates needs for such services in urban, suburban, and exurban areas can be provided

Project description: Xtendwave, partnering with DSL equipment and service providers and telecommunications chip companies, will design and produce DSL chips employing Xtendwave's patented technology, and will supply initial production volumes of these chips at price parity with existing DSL chip solutions. Field-testing and qualification with DSL equipment providers will be carried out as part of the project. The delivery of these chips for production ramp-up will be completed within the prescribed 2-year period for BTOP/SBA funded projects.

### C. AREAS TO BE SERVED

Xtendwave's solution will reach essentially all of the 20 million primarily rural unserved/underserved households with broadband service, as well as enable the backhaul networks to access these markets, and allow the telcos to compete with cable by providing triple-play services.

#### D. XTENDWAVE'S QUALIFICATIONS

Xtendwave has four issued patents covering AFBM™ technology, and has received third-party validation of its hardware implementation. Xtendwave's management and technology team is in place, and has accrued sufficient private investment funding to carry out initial development and proof-of-concept. The team has over 80 years of relevant senior management experience. The company is partnering with service providers and equipment providers in the telecom industry to bring Xtendwave's solution to market and to unserved and underserved households.

#### E. JOBS TO BE CREATED OR SAVED

Xtendwave is a private-equity funded US company, with primary engineering operations in Dallas, Texas. In addition to Xtendwave's direct employment, thousands of jobs can be created in the DSL service and equipment provider industries, as well as in the semiconductor industry, related to engineering, operations, sales, service and support of AFBM™ enabled technologies.

#### F. OVERALL PROJECT COST

The estimated cost to deliver initial production quantities of AFBM-XR™ ASIC chips enabled with Xtendwave's technology to US telecom equipment providers is about \$19.7 million. This equates to roughly one dollar for each of the 20 million U.S. locations currently lacking broadband service. An additional \$10.5 million has been allocated to utilize the development platform of AFBM XR™, to develop both the AFBM XD™ and AFBM XB™ chipsets that will enable faster DSL to public computing centers and other critical need facilities, as well as increase copper network capacity on existing backbone networks that serve these new users. Total project cost is \$30.2M.