

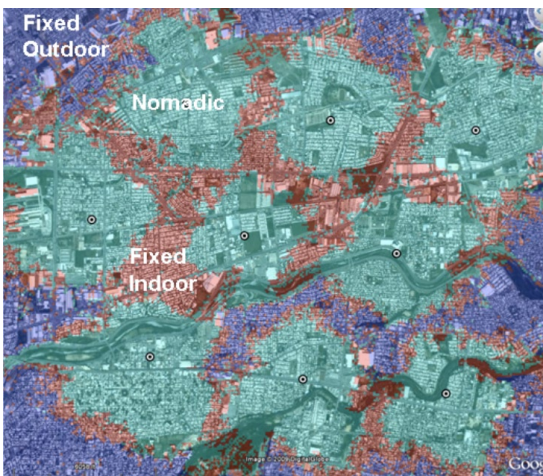
RF NETWORK PLANNING AND DESIGN SOLUTIONS FOR WiMAX

Motorola RF Planning Expertise Helps You Bring Your WiMAX Network to Market Faster and More Successfully

MEETING OPERATORS' BUSINESS OBJECTIVES

Motorola focuses on three key areas to meet an operator's network planning, design and optimization business objectives.

- Optimize CAPEX. Design that meets end user bandwidth requirements to maximize RF coverage, system capacity and user impact.
- Grow Revenue. Support for a broad application mix (fixed, nomadic, mobile) and ensure quality of service (voice and data).
- Minimize OPEX. A focus on optimization of subscriber experiences and network performance.



RF Design coverage plot matching a service provider's business objectives for delivering fixed outdoor, nomadic and fixed indoor service using a variety of devices.

The promise of your WiMAX license is virtually limitless. As the industry has foreseen, the demand for faster, more accessible communications continues to grow. Business, residential and government users continue to seek more reliable, more affordable fixed and mobile broadband connectivity. You'll be able to meet the needs of those customers as soon as your WiMAX network is up and running. The question is: Where do you find the depth of WiMAX technical expertise you need to go to market successfully?

Motorola offers you proven WiMAX experience in RF network planning and design. We can help you get to market faster and more profitably by optimizing CAPEX efficiency, making sure you don't overbuild and providing an elegant path for future growth. Once your network is operational, we will also make it easier for you to manage, fine tune and grow your system with our end-to-end WiMAX solutions portfolio. Motorola is committed to empowering you to fulfill the promise of your WiMAX license investment.

At Motorola, we understand that you have made a considerable investment in your WiMAX license and you want to start reaping a return as quickly as possible. We also know that the most crucial element in commercializing your network is rigorous upfront planning both in your business model and in your network design. Our strength is in enabling you to plan and place a robust WiMAX network on the air as quickly and cost-effectively as possible so you can focus on attracting customers with new wireless broadband solutions.

Business Planning

Motorola's RF network planning process starts with your business model and objectives. Our goal? To ensure a solid linkage between your business plan and your RF network plan. We will tailor your RF network design specifically to meet your business objectives in terms of coverage requirements, end user service expectations and projected capacity. Your business model is paramount, and with our years of experience and expertise we can help you deliver outstanding results.

By combining your specific market insights along with Motorola's in-depth radio propagation analysis, we can quickly create an RF network design that effectively meets your business objectives in terms of geographic area, population coverage, capacity and service offerings. Through Motorola's unique expertise, gained through decades of fixed and mobile wireless network design and implementation, we can more accurately predict your potential user base. We can also provide very precise network utilization predictions based on our market-tested user profiles and call models. With this information in hand, we work with you to determine the best technical and business launch strategies, including selecting target populations, geographical areas and application offerings that will lead to faster network commercialization and (ROI).

FREQUENCY PLANNING CONSULTATION

As your consultative partner, Motorola works closely with you to determine the most appropriate frequency plan, Time Division Duplex (TDD) ratio for downlink/uplink and other system parameters which best achieve your objectives. We'll help you answer critical questions.

Is it best to use a single frequency re-use pattern?

Should you choose a three-sector/three-frequency scheme?

Is a four-sector/four-frequency pattern more ideal?

Taking into consideration the amount of spectrum you have and your goals for throughput speeds and capacity, we will recommend the optimum configuration that enables you to utilize the most cost-effective mix of infrastructure, equipment and number of sites.

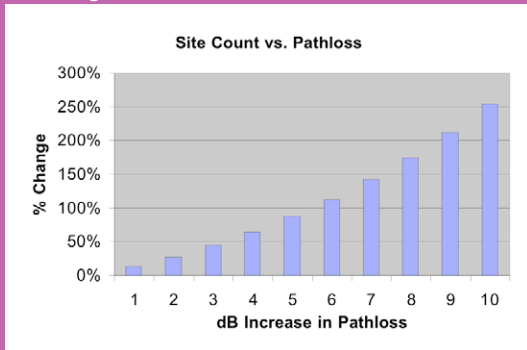
SOLUTIONS TO KEY DESIGN PROBLEMS

Motorola design capabilities provide solutions to key design problems. Detailed coverage plots indicate where services can be marketed and which devices can be used such as fixed indoor, fixed outdoor and USB devices.

DESIGN CHALLENGES

In building coverage is a key design challenge; building penetration can vary from 5dB to 40dB or more which can significantly change the number of sites.

RF Design



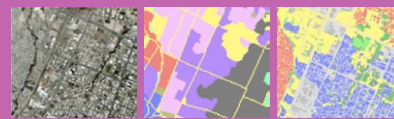
Hard to cover areas such as dense foliage, tall buildings and terrain affect end user experience.

DESIGN SOLUTIONS

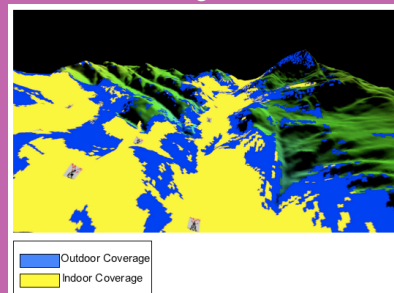
Motorola develops extraordinarily accurate RF designs which are critical for dependable in building coverage. Inaccuracies can lead to coverage holes and result in the need for additional sites.

Motorola delivers improved RF modeling with accurate high-resolution databases, tuned propagation models and 3-D building databases.

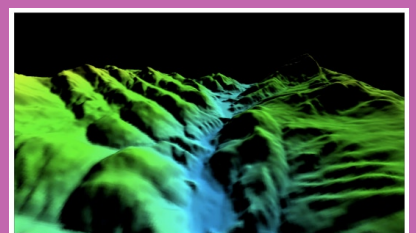
RF Modeling



WiMAX RF Coverage



Challenging Terrain



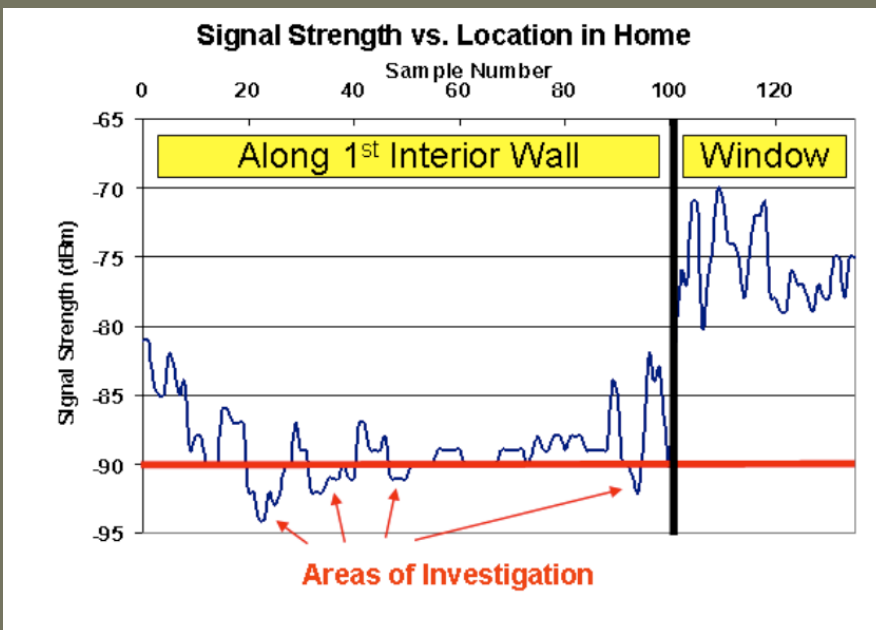
Network Planning

Equally important, Motorola's RF network planning services help you design the WiMAX network that best meets your business goals. Our network designs enable you to offer applications—from VoIP to video-on-demand to point-of-sale solutions and more—that will enhance your service differentiation. Motorola will assist you in determining which applications will build your revenues most quickly and cost-effectively. Should you concentrate on high-speed data and Internet access? Should you add VoIP to your offerings? Is it feasible to offer video? What kinds of growth rates are possible and what loads should you anticipate your system needing to handle?

By answering these and other critical questions quickly and realistically, Motorola teams with you to maximize your capital investment by going to market faster and more profitably. Most importantly, our network planning and design expertise ensures that your network is based on a sustainable technical strategy, providing an elegant evolution path as your business grows. We will also account for network growth with multiple-year capital plans and forecasts, sharing a preview of the equipment and sites that you will need to add in one year, three years, five years and even longer.

THE WORLDWIDE REACH OF MOTOROLA WiMAX SOLUTIONS

With trials and contracts for commercial WiMAX systems for customers in all regions around the world, Motorola is a global leader in 802.16e WiMAX. As of the third quarter of 2009 Motorola has shipped more than 1,000,000 CPEs and USB broadband modems and more than 10,000 access points. Motorola provides a total end-to-end WiMAX solution that extends beyond the infrastructure to the IP core, operations and maintenance, full services portfolio and customer premises equipment.



KEYS TO SUCCESSFUL DEVICE DEPLOYMENT

Motorola successfully translates RF design to device deployment with:

- Accurate RF coverage plots
- Multiple device types, such as indoor and outdoor devices and directional antennas, to account for various RF conditions
- Easy to use installation tools
- Trained installation teams
- Optimal CPE installation that maximizes end user performance and capacity

Coverage

Motorola offers unmatched expertise in optimizing wireless broadband coverage. Our sophisticated RF modeling tools, which utilize tuned propagation models, high-resolution terrain and clutter and 3-D building models, examine a range of different network scenarios, enabling you to select the optimum design for your business.

We make it easier for you to determine the optimal number of sites you'll need and our advanced site selection algorithms aid in determining the most cost effective site locations. Detailed RF propagation coverage maps assist you in visualizing the network and allow for interactive consultation to finalize the design, ensuring that the proper balance among number of sites, area and population covered. The maps also identify where you must fill in holes to maximize coverage and capacity. In addition, we are uniquely skilled at overcoming key RF coverage challenges such as mobile and in-building coverage and hard-to-cover areas with line-of-sight issues including high-rise buildings, dense foliage and hilly terrain.

Frequency Re-use Planning and Capacity. Taking into account your end user mix and applications offerings, we make recommendations for the best way to utilize the RF spectrum available to provide optimum performance from both an end user perspective as well as an overall capacity perspective. We provide pragmatic, cost-efficient short-term designs that make sure you don't overbuild your network by implementing expensive capital equipment before you need it. Keeping in mind your longer-term growth objectives, we make sure your network is designed for streamlined capacity expansion from day one.

Devices and Applications

Motorola's unique combination of modeling tools, mobility expertise and wireless broadband data experience can help you determine the specific devices and applications that will best serve your business goals. In turn, the types of devices and applications that your customers use will drive overall network design. Will they be using PDAs, laptops, handheld computers? Will your network have to cope with low-power devices? What kinds of applications will your customers want? High-speed Internet? VoIP? Streaming video? Online gaming? Social networking? What will their impact be on network performance? Motorola works with you to determine the network requirements for delivering high quality experiences to your customers, then designs the optimal WiMAX network solution to deliver envisioned results.



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