

Figure 9: Quality vs MOS

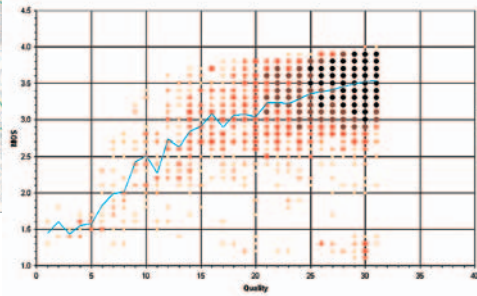
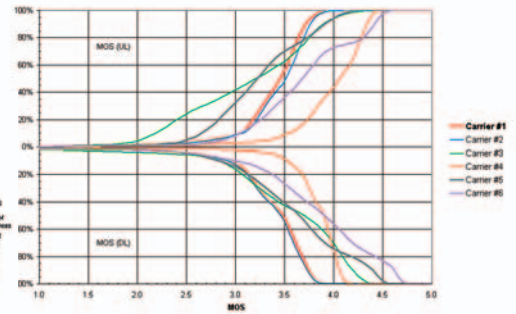


Figure 10: Composite MOS (DL) and MOS (UL) CDF



Benchmarking Reports present data in a wide variety of easy-to-use formats.

# Know Your Competitive Position through Benchmarking

*WHAT ARE YOUR NETWORK'S STRENGTHS? DO YOU KNOW YOUR COMPETITORS' WEAKNESSES? WHERE ARE YOUR OWN WEAK SPOTS, AND WHAT MUST YOU DO TO REMAIN COMPETITIVE? YOU NEED TO KNOW IF PROSPECTIVE CUSTOMERS ARE REALLY FINDING BETTER SERVICE ELSEWHERE, SO YOU CAN MAKE CHANGES BEFORE IT IS TOO LATE.*

## COMPETITIVE COMPARISONS

Accurate benchmarking lets you know exactly where you stand among your competition. Benchmarking is not the same thing as field testing; it is a comparison of multiple networks with the intention of finding out how your network compares. It measures what customers perceive, presented as a single metric. It also provides the information needed to identify and resolve problems that can degrade network quality.

Ideally, benchmarking reports reflect the typical subscriber's network experience. It can be performed for either voice or data services. This allows you to see competitive advantages you can build on as well as weaknesses you can improve.

## THE BASICS OF BENCHMARKING

Benchmarking has been defined as a continuous, systematic process of evaluating your outputs or work processes against the toughest competitors, or those companies recognized as industry best. It is one of the best ways to improve quality, but it can only succeed if strict methodology is applied. Intelligent, comprehensive data collection is

crucial. It is also critical to make sure that data collection equipment is set up and configured properly. In addition, you have to carefully select the criteria on which you wish to judge network quality.

There are hundreds of formulas and methodologies used to determine which carrier is "best." Unfortunately, these diverse combinations often arrive at contradictory conclusions. In addition, different parameters such as network performance, network footprint, service pricing, customer support, and even handset selection can affect, to varying degrees, a customer's overall opinion of a wireless carrier. These statistical unknowns are complicated even more by the logistical and hardware complexities involved in benchmarking competing carriers in a mobile environment.

## OUR SOLUTION – BENCHMARKING REPORTS

In conjunction with Global Wireless Solutions, Inc. (GWS), Ericsson TEMS is now offering Benchmarking Reports that pinpoint your position among the operators in your area. Our combined experience with drive testing methodology and equipment, as well as our pooled understanding of network quality, gives us the

ability to together produce unique, comprehensive reports that accurately represent competitive comparisons. We understand the challenges involved in benchmarking and know how to deal with them to give operators information they can rely on.

According to a 2002 Yankee Group study, the single most important factor affecting subscriber attitude is network reliability. To find out what influences a subscriber's opinion of reliability, an independent study was commissioned. As a result of this study, Key Performance Indicators (KPIs) have been identified. These gauge how the subscriber perceives the network. Weighting these performance indicators to reflect the importance subscribers place on each of them, the Composite Score is calculated.

For Voice Benchmarking Reports, the KPIs are defined as follows:

**Service Coverage:** Is service even available? If a carrier does not even attempt to provide service where customers travel on a daily basis, those customers will become frustrated very quickly. Service Coverage is de-

terminated by calculating the percentage of call attempts that fail due to no service.

**Access Failure Rate:** Are calls getting blocked where customers know there is normally service? Access Failures provide a minor annoyance compared to the daily frustration experienced by service coverage limitations. After all, in most access failure cases, pressing the SEND button a second time will resolve the issue from the customer's perspective. The Access Failure Rate is defined as the percentage of call attempts that fail in areas where there is service.

**Retainability:** How often are customers rudely interrupted by dropped calls? Retainability reflects the percentage of *good* terminations. Carriers want to see a retainability rate above 98%. Retainability is defined as the percentage of calls that were terminated by the customer rather than by the network.

**Voice Quality:** Even if the call did not drop, how often did the caller strain to understand the conversation (bad downlink quality)? How many times did the call recipient ask the caller to repeat himself (bad uplink quality)? Either situation can negatively shift the focus of the customer's conversation to the wireless service. Voice Quality is the percentage of voice scores that occurred that would be classified as acceptable to a vast majority of users.

**Access Time:** Do customers notice a delay before their calls start ringing? Access Time is the average amount of time elapsed between pressing the SEND button on the phone and hearing the first ringback tone. Sometimes this delay is considerable enough that the customer consciously notices it. This is by far the least important factor, but can be a determinant between two otherwise equal competitors.

As more and more customers demand sophisticated new 2.5G and 3G services, testing a network's ability to handle data transmissions is becoming vital. For this reason, Data Benchmarking Reports are also available. In addition to the KPIs already discussed, the Composite Score calculated in the Data Benchmarking Report also takes into account throughput rate.

**Throughput:** How much time does it take to download or upload a file? Throughput is the average rate at which a network transfers the data contained within a file. The faster the average throughput, the quicker a customer can transfer that file.

With these key performance definitions in hand, an accurate composite score can be calculated, rating each carrier's performance throughout the market. Then you can see how

your network truly performs among the competition.

#### **FROM AN OVERVIEW TO THE DETAILS**

The composite score and key performance indicators listed above are presented in the Executive Summary portion of the Benchmarking Report to give you an overview of network performance at a glance. However, they only provide a small subset of the competitive information we provide. With the large amount of data gathered while benchmarking carrier performance, you also get a host of information to guide you in alleviating problem areas in your networks. A sampling of these reporting features includes:

- Detailed Throughput analysis showing the effect of signal strength, error rates, and other technology-specific parameters on the application throughput.
- Categorically identified failed initiations and drops, which provide a means of understanding what is happening within the network.
- Detailed analysis of the quality of coverage, detailing points of poor coverage and interference.
- Detailed analysis of handover quality, detailing poor and questionable handovers.
- Detailed geographical plots of each carrier's performance to see exactly where each has strengths and weaknesses.

#### **COLLECTION OF BENCHMARKING DATA**

Testing mobile, in-vehicle network performance provides a total snapshot of each carrier's voice and data network performance, and the effect of handoffs and reselections on per-

formance. Using the industry-leading tools from the TEMS portfolio to collect the data ensures the integrity of the collected data. The proven methodology ensures accurate reporting for pedestrian and indoor areas as well as traditional drive-test routes.

#### **COLLABORATION FOR OUR CUSTOMERS**

Both Ericsson TEMS and GWS have the expertise to be ideal providers of Benchmarking Reports. For example, Ericsson's involvement with the Telecommunication Standardization Sector of the International Telecommunication Union (ITU T) provides unique insight into the future issues of voice quality standards. GWS features the largest active benchmarking fleet in the world. Both companies have analysis and presentation competence born of years of experience in the market and demonstrate a commitment to network quality in all areas, particularly from a subscriber's perspective.

#### **CONCLUSION**

Using reliable network data and a unique, research-driven formula for calculating the composite score, these Benchmarking Reports give a completely reliable indication of how your network stacks up to the competition. The wealth of additional information is an indispensable aid in making network decisions to keep you ahead. A cost-effective method of ensuring Quality of Service for voice and data traffic, benchmarking is an important task for all network operators, and operators can now get top-quality Benchmarking Reports from those who know them best. ☼

*By Lisa Sigler, Ericsson TEMS, and  
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*Global Wireless Solutions, Inc. ([www.gwsolutions.com](http://www.gwsolutions.com)), headquartered in Chantilly, VA.,  
is the industry-leading wireless benchmarking solutions company.*

#### **BENCHMARKING REPORTS FOR MAJOR MARKETS IN THE U.S.**

*Ericsson TEMS and GWS are currently offering comprehensive Benchmarking Reports for major markets across the United States. These reports provide operators a detailed look at non-proprietary data without the cost or hassle of conducting their own collection or analysis. Customized reports, or reports on proprietary data, can also be provided. These Benchmarking Reports are the next step toward beating the competition.*

#### **Markets include:**

<i>Atlanta</i>	<i>Denver</i>	<i>Miami</i>	<i>Sacramento</i>	<i>Washington DC</i>
<i>Austin</i>	<i>Detroit</i>	<i>Minneapolis</i>	<i>Salt Lake City</i>	<i>West Palm Beach</i>
<i>Baltimore</i>	<i>Ft. Lauderdale</i>	<i>Nashville</i>	<i>San Diego</i>	
<i>Boston</i>	<i>Houston</i>	<i>Phoenix</i>	<i>SF/Bay Area</i>	
<i>Chicago</i>	<i>LA</i>	<i>Pittsburgh</i>	<i>Seattle</i>	
<i>Dallas</i>	<i>Las Vegas</i>	<i>Portland</i>	<i>Tampa Bay</i>	