

Southern Shores Wireless Committee Interim Report

INTRODUCTION

The Wireless Committee was formed in February 2008 to provide the data and analysis required for the Town Council and Planning Board to formulate an effective wireless policy that will:

“Provide Southern Shores property owners, residents and visitors with access to the full spectrum of wireless services and service providers.”

Specifically, the Wireless Committee was charged with the following tasks:

1. Define opportunities and issues
2. Determine vendor requirements
3. Identify municipal best practices
4. Conduct a “citizen forum”
5. Present wireless report / briefing

The following interim report summarizes findings to date and the choices that need to be made before the committee can proceed.

REVISED SCOPE OF WORK

After several discussions of the wireless topic, the Committee voted to narrow the scope and accelerate the timetable for their work to focus on the following two objectives:

- a. Provide better cellular access for the town
- b. Prepare for future needs of wireless Internet access.

OPPORTUNITIES AND ISSUES

Cellular signals

In order to determine the current coverage situation several phones representing most major providers were taken to multiple points throughout the town and readings taken. Keep in mind that this method of determining the signal strength and quality using only personal cell phones gave only a comparison and is by no means definitive. Since phones differ in design and signal strength also includes many other factors such as background noise, these data are presented for reference only.

Twenty-seven (27) data points were selected including four (4) in Martin’s Point. See attachments “A, B & C” The data points were determined by creating increasing concentric circles from the Dare County water tower near the Kitty Hawk Elementary School where several cell phone antenna arrays are located. The circles were drawn on a map of Southern Shores in 1/2 –mile increments radiating out to three (3) miles. Three to eight data points were selected along and within each radius. The map also included, as a reference, concentric circles drawn from the Dare County water tower in Duck. The readings were taken during clear weather on two separate occasions in order to include data from all the sources that were available. The data reported is the actual number of ‘bars’ that appeared on each phone at each location. The number should be scaled in order to account for the differing number of bars on phones of various manufacture. As expected the data shows decreased signal strength at locations more remote from the towers.

Why signal can be weak

a. Topology and vegetation.

Cell phone signals are in the microwave range and as such are basically line-of-sight. Topology and vegetation can and will interfere with signal strength. Southern Shores topology varies from the high dune area to low lying sheltered areas behind the dune in the maritime forest. The low lying areas are generally covered with the most vegetation and therefore signal strength appears to be weaker especially as the distance from a transmission tower increases.

b. Phone

The cell phone is a transmitter as well as a receiver and depending upon several factors such as age, manufacturer and features may provide good or bad service independent of the signal that it receives or sends. Individual evaluation of the various types and models of phones combined with the features offered by each wireless provider is the only way to determine whether they can provide the service level that is required.

c. Number of active phones

Another factor that can determine the signal reliability of a cell phone is the number of users accessing a particular tower at any one time. When cell towers first appeared most phones were analog and technology of the time allowed only 150 or so simultaneous calls. In recent times most phone have changed to digital and the technology has increased the number of simultaneous calls to more than 300 per tower. When a tower reaches its capacity it can no longer handle additional calls and regardless of signal strength calls cannot be made or received.

Remediation options

a. More towers

An obvious solution to increase individual cell performance is to add additional cell towers strategically located at the weakest signal points or in areas that would yield the greatest overall coverage. This solution would also entail solving several zoning and land use issues that was considered beyond the scope of this committee's charter.

b. Personal repeaters

Several personal repeaters made for in-home installation are commercially available. Research shows that they range in price from less than a hundred to several thousand dollars each claiming to increase signal strength or at least bring the strongest outside signal to be repeated on the inside of a structure. The committee has had no experience with these devices and mentions them here for reference only.

c. Better phones

As technology has improved so has the phones that wireless carriers are providing. Since all cell phones are transmitters as well as receivers and today's competitive wireless market changes almost daily, prudent choices when selecting a phone and/or carrier are a must. Side-by-side comparisons and trial evaluation periods using the phone and service in the environment in which it's going to be used is essential when making these choices.

d. Carriers

The choice of carriers serving Southern Shores and the Outer Banks cell market is not unlimited. The wireless committee does not endorse any carrier and recommend that decisions be made on an individual bases. It was our observation that some carriers had significantly stronger and/or weaker signals than others. When choosing a carrier all of the issues pertaining to each individual usage such as signal strength, intended areas of usage and available options should be discussed.

e. Emerging VOIP technology

Voice Over Internet Protocol or VOIP technology services are currently being offered by some wireless carriers and in the planning stages for several others. With broadband Internet service (either cable or DSL) a wireless phone call can be brought in through a connected computer without the need for any broadcast cell tower or other outside over-the-air signal what ever and relayed to a cell phone inside the home or immediate surroundings. This service and its attendant hardware are at an additional cost to the cell user.

INTERIM CONCLUSIONS AND NEXT STEPS

Cell service is weak in some areas of Southern Shores while other areas that are nearer the towers enjoy strong signals. To completely solve the weak signal issue would require the addition of strategically located cell tower(s) or in the alternative, individual solutions involving repeaters, better phones and/or service providers or VOIP technology.

Before the Wireless Committee or any other body proceeds to analyze implementation options, the following questions need to be addressed.

1. Is the Town Council willing to consider creating a new ordinance permitting wireless infrastructure in residential districts?
2. What is the goal of a wireless ordinance? Who will benefit and how? How will success be measured?
3. What services and providers are included in wireless infrastructure? Cellular service? Public Internet Access? Other wireless subscriber services?
4. Should physical wireless infrastructure be "shared" or "proprietary?" How many towers and transmitters can be constructed? How close together? How much proliferation is OK?
5. Is the Town Council willing to pay for professional signal analysis by an independent engineer to identify the best alternatives for improving services?

6. What guidance does the Town Council have regarding:
 - a. how much infrastructure?
 - b. in which zoning districts?
 - c. under what conditions?

7. How will Southern Shores inform property owners and residents of the engineering findings and engage them in reviewing alternatives and shaping final recommendations?

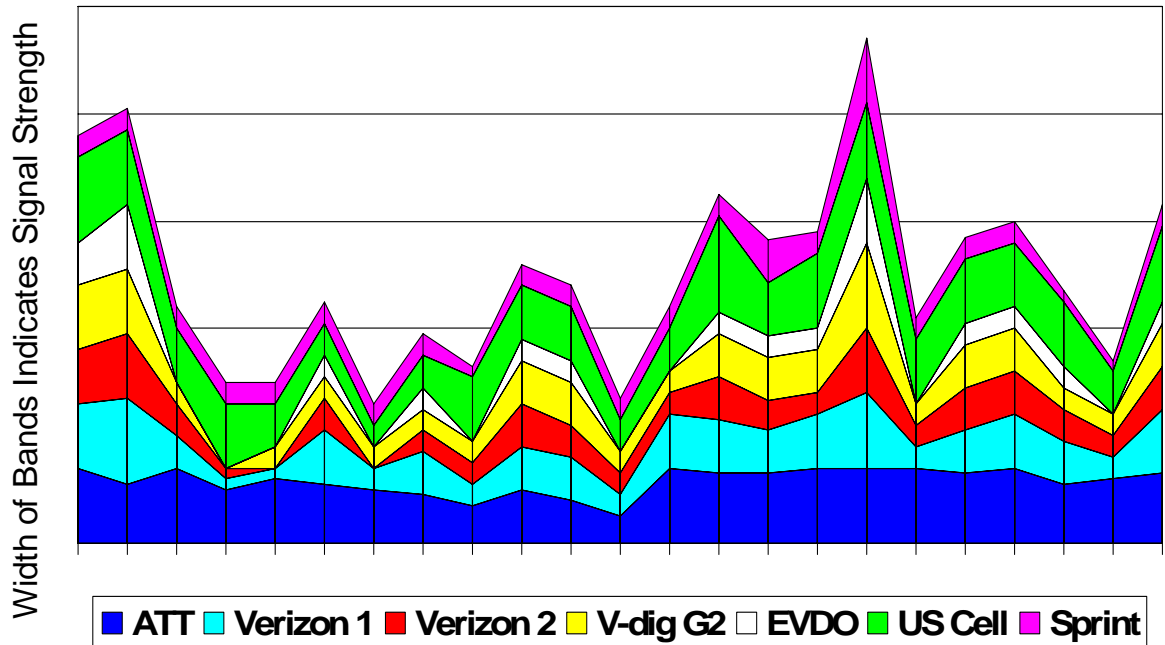
Attachment B

Signal Bars From Southern Shores Water and Cell Tower - N36 05.969 W075 43.984'

Measured By:	Carriers					
Phone Model:	AT&T	Verizon	Sprint	T-Mobile	AllTel	NEXTEL
Sweetgum La & Juniper Tr						
Dogwood Tr & Malard Cove Loop						
Creek Rd & Cato Dr						
Ocean View Loop						
Spindrift Tr & Landfall Loop						
Trinite Tr & Bear Track La						
Dogwood Tr & Osprey La						
Martin Point Rd & Gravely Dr						
Clam Shell Tr - N Extreme						
Dogwood Tr & Fairway Dr						
Poteskeet Loop N Extreme						
Currituck Rd						
Ocean Blvd & Dolphin Run						
Dogwood Tr & Hillcrest Dr						
Dogwood Tr & Sassafras La						
Mill Point						
Ocean Blvd & Sandpiper La						
Hillcrest Dr & Hickory Tr						
Dogwood Tr 1/2 mi N from Bridge						
5th Ave at beach						
Dogwood Tr at wading beach						
Hillcrest Dr & Sea Oats Tr						
Dogwood Tr - end						
Hillcrest beach parking lot						

13th Ave at beach						
Sea Oats Ct						
North Dune Loop						

Estimated Signal Strengths



Each Vertical Line is a Specific Location in Southern Shores