



THE ULTIMATE GUIDE TO

WilsonPro Commercial Cell Signal Boosters

*Selecting **the right amplifier** for your building.*

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Introduction

In our digital-savvy society, people are more connected than ever. In fact, [90% of American adults own a cell phone](#), and nearly one third of them describe their cell phone as “something they can’t imagine living without.”

This sentiment extends to the workplace, where professionals rely upon cellular devices more and more often to connect with customers, stay in touch with colleagues, and work remotely. In fact, one study confirms the importance of a reliable signal at work, reporting that 88% of small and medium companies use cell phones for business purposes. Yet another recent survey shows that more than two thirds of people believe [indoor wireless connectivity in the workplace is essential](#)—and the majority of those respondents said that a strong cellular signal would help increase workforce productivity.

In business environments and nonresidential settings, more and more people have come to rely on strong reception. And yet, [only 2% of commercial buildings have dedicated technology to offer reliable cellular coverage](#).

Clearly, the demand for strong reception in the commercial setting is already upon us, and chances are that it will only continue to grow.

For buildings without technology to support this growing demand, cell signal boosters offer a viable solution.

Why Might a Building Have Poor Cell Reception?

There are two primary reasons for cell phone reception problems: distance and obstruction. If your phone is too far from the cell tower, then the signal will be weak or even undetectable.

When it comes to obstructions, virtually any obstacle can be a hindrance to cell signal.

There are several common culprits:



TERRAIN —

Any terrain obstructions between the device and the cell tower (hills, mountains, ridges, bluffs, etc.) will block cell signals.



MAN-MADE OBJECTS —

In urban settings, buildings are the main obstructions to cell signals. Radio frequency (RF) signals can't easily pass through metal, brick, concrete or even glass. Almost any building can have reception problems indoors. Even if you are standing outside and surrounded by tall buildings, cell reception can be spotty.



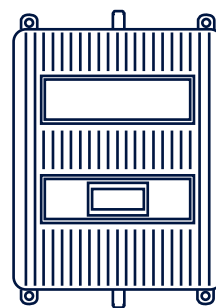
VEHICLES —

Vehicle materials like metal and safety glass do an excellent job of blocking RF signals. When you're inside a vehicle, it may be hard to get a good signal.



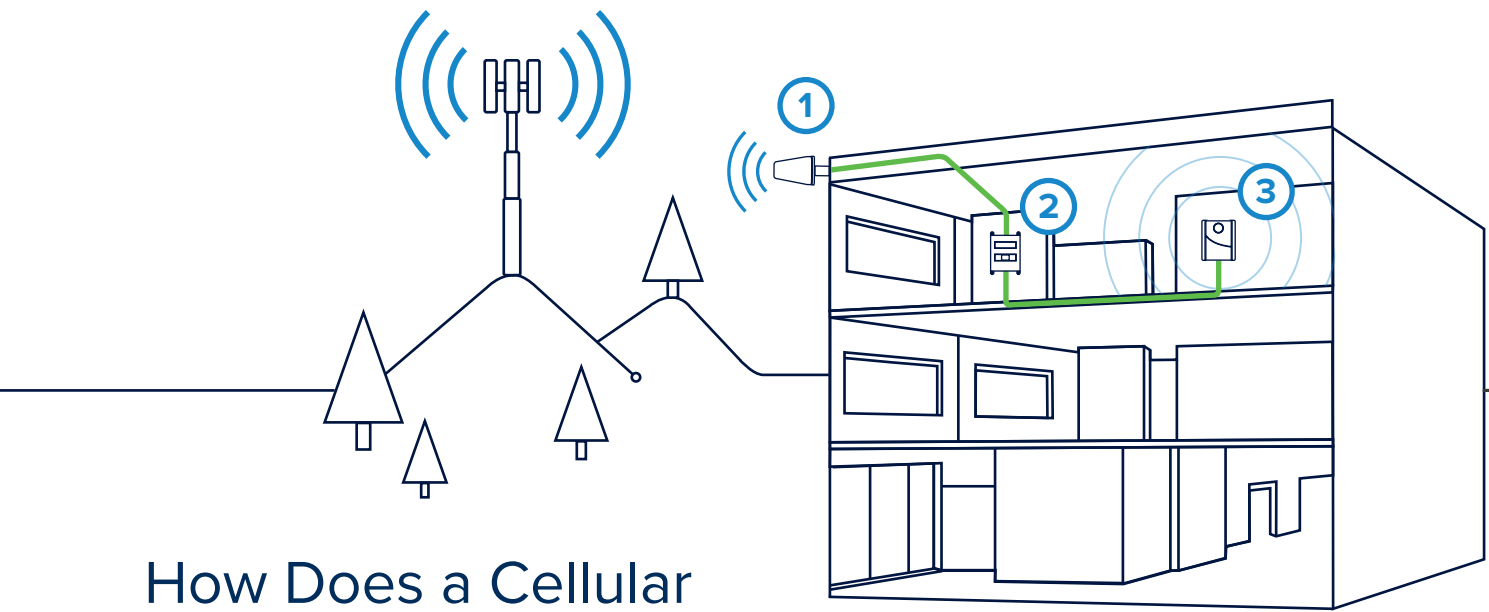
VEGETATION —

It may be hard to believe, but trees, shrubbery, and almost any kind of foliage can absorb and weaken cell signals.



What is a Cell Phone Signal Booster?

Often called an amplifier, **a cell signal booster amplifies voice and data signals to reduce dropped calls and lost connections.** The result is stronger, more reliable signal, clearer voice quality and faster data uploads and downloads. There are consumer cell phone boosters for vehicles and the home, and commercial-grade amplifiers for larger indoor spaces like office buildings, hospitals, schools, and warehouses.



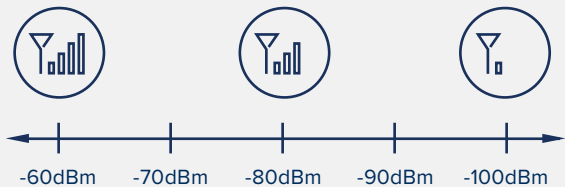
How Does a Cellular Amplifier Work?

A mobile phone is essentially a two-way radio with a modern user interface. Your mobile phone communicates with a cell tower by means of RF signals.

Cellular signal amplifiers work to intensify the signals from those cell towers and improve cellular and data reception in a commercial or residential space.

Here's how:

- 1 Bidirectional amplifiers (boosters) detect and collect very faint cell signals—much fainter than your phone can detect. They help those faint signals bypass various obstructions (like hills, trees, and buildings).
- 2 The boosters amplify faint signals to a usable level.
- 3 Then, the amplifiers broadcast the boosted signal inside a home, vehicle, office, or a commercial building, allowing them to be picked up by your phone or other cellular device.



DECIBELS AS A MEASURE OF SIGNAL STRENGTH

Decibel, abbreviated as dBm, is typically expressed as a negative number, -88 for example. **The closer to zero the reading is, the stronger the cell phone signal.** For example, -79 dBm is a stronger signal than -88 dBm. A reading of -50 is one of the strongest signals you will see, and a reading of -100 dBm indicates a fairly weak signal. If the signal gets much weaker than that, you may not have any service.

How Do I Know a Cellular Signal Amplifier Will Work in a Commercial Space?

The strength of the outside signal is critical. One way to determine if a cell signal amplifier will work for you is to go outside your office and make a call on your cell phone. If you can complete the call, there's a good chance that the outdoor signal is strong enough to create a better signal indoors, too.



Think of the booster system as a megaphone. A megaphone amplifies your voice, but if you whisper into the megaphone, then that amplified whisper won't be audible over much distance at all. However, if you yell into the megaphone, your amplified yell can be heard over a much further distance. And if you don't say anything into the megaphone, there is no sound produced at all.



Generally speaking, the best way to determine the signal strength both inside and outside the building is with a signal meter—a professional tool installation experts rely on for the most accurate signal readings.

The WilsonPro Signal Meter is a professional-grade handheld device that is designed to detect and display available signal frequency, bandwidth, and strength with absolute certainty. With an LCD display and rechargeable battery, the signal meter allows installers to make the most informed decisions when installing cellular signal boosting systems. It can detect signals indoors and outdoors, and works with 700, 800, 1900 and 2100 MHz spectrum bands. The meter can measure all major bands used for cellular signals in the US, including those utilizing 4G LTE networks.

In a commercial environment where multiple users on multiple carriers will need high-quality signal strength, a signal meter is the best way to assess cellular signal booster installation needs.

PROFESSIONAL INSTALLERS — [Contact WilsonPro](#) about purchasing your own signal meter.

The Advantage of Professional Installation

One of the advantages of using an amplifier for an in-building commercial space is the uncomplicated professional installation process. When it comes to commercial buildings, there's no time for dealing with poor reception. Staff and customers need strong cellular and data signals for all carriers and devices, and they depend on smart, lasting solutions to keep their businesses running.

Commercial-grade indoor cell signal boosters can typically improve the signal coverage area up to 35,000 square feet per amplifier and are often installed in zones, depending on the size of the building. However, all situations present new variables best handled by a certified installer.

Generally speaking, two factors impact the size of the indoor coverage area an amplifier is able to provide:



The strength of the unboosted signal available outside the building.



The system gain supplied by the amplifier. The stronger the available outside signal, the larger the indoor coverage area an amplifier can provide. Additionally, the higher system gain supplied by the amplifier, the larger the indoor coverage area.



Project Discovery
& Site Survey



System Design
& Budget Proposal



Schedule Date & Time to
Complete Scope of Work



Professional
Installation

Benefits of Professional Installation

Here are some of the most important benefits of using an installation expert:



CUSTOMIZED INSTALLATION PLAN —

Commercial buildings can range from 20,000 to 200,000 square feet, and no two buildings are exactly alike. Different layouts and building materials create unique cell signal amplification requirements. Professional installers can identify the requirements for jobs of this size, including how many amplifiers are needed, and any special conditions to account for. For example, there may be two cell towers nearby, but you only need to boost the signals from one of them. An installer can design a booster system to filter out one of the towers and only boost the signal you need.



EASE OF INSTALLATION —

With WilsonPro solutions, there is no need for laying fiber or connecting cables to a tower. Installers conduct site surveys and measure signal strength as part of the process.



FCC APPROVED —

WilsonPro amplifiers are all FCC approved under the consumer label, so commercial clients know that the products are legit.



SYSTEM DESIGN ASSISTANCE —

In large buildings, cell booster system design can get tricky. WilsonPro installers proactively help with design needs to make sure the right products are installed in the right way for the best result.



AFFORDABILITY —

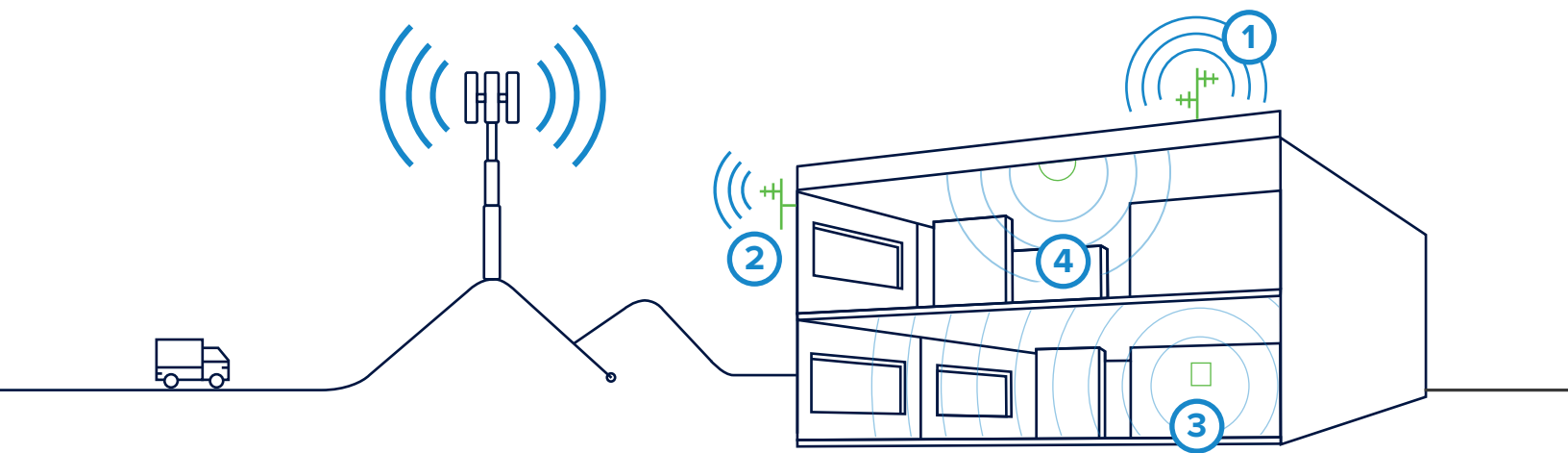
WilsonPro takes pride in the fact that its services and products are typically priced well below the competition. [Inquire with a certified WilsonPro installer](#) about a quote for your commercial space.



NO RECURRING FEES —

Unless an ongoing maintenance plan is specifically purchased, there are no recurring fees for installing a cell signal amplifier.

Read on to learn more about cell phone signal boosters, how they work in commercial buildings, and determine the best solution for your space.



Locating Cell Signals Using Antennas

Here, we discuss the differences between outside antennas and inside antennas, and installation options for each.

DONOR ANTENNA

Sometimes referred to as the “outside” antenna because it is typically located on the exterior of a commercial building, the donor antenna is the part of a cell signal booster that communicates with the cell tower (also called the signal source). Most signal boosters have a stand-alone donor antenna connected to the booster unit by coax cable.

There are two types of donor antennas: **directional** and **omnidirectional**. The more common type is the directional antenna. This type receives signals from a specific direction and must be pointed directly at the signal source for best performance. In contrast, the omni antenna receives signal in a 360-degree pattern and picks up signals from all directions.

- 1** WilsonPro uses **omnidirectional antennas** for most commercial building installations. In most cases, an omni antenna on the roof of a building reduces the need for the pointed accuracy of a directional antenna. An omni is ideal when the outside signal is sufficient (not too weak and not too strong). Since WilsonPro offers broadband solutions—that is, picking up signals from various towers and carriers and reproducing those signals inside so all personnel can experience improved coverage—omni antennas may be the best choice for commercial installations.
- 2** WilsonPro also offers **directional antennas**, which are designed to point directly at a cell tower—ideal for environments where the outside signal is especially weak (or very strong), and a finer level of signal strength control is needed. In situations where there is too strong or too weak of a signal (>-45dB or <-80dB), there may be a need to locate the tower for that particular band in order to strengthen or weaken the incoming signal. Directional antennas are best for that type of need.

BROADCAST ANTENNA

Sometimes called the “inside” antenna because it is located inside a building, the broadcast antenna is the part of a cell signal booster that transmits the amplified signal to phones and other cellular devices inside the building. As with donor antennas, most signal amplifiers have a stand-alone broadcast antenna connected to the amplifier unit by coax cable.


WilsonPro offers two main types of broadcast antennas: **panel antennas** and **dome antennas**.

- 3 Panel antennas** are directional antennas designed for transmitting a boosted signal inside a building. They broadcast a wide beam and should be placed near the area where you wish to increase the signal. A panel antenna often has a higher gain than a dome antenna—meaning it can transmit a stronger signal and receive a weaker one. Panel antennas are usually mounted to a wall.
- 4 Dome antennas** are a type of broadcast omnidirectional antenna designed to distribute a boosted signal inside a building. Dome antennas typically have a lower gain than panel antennas—meaning they are best for distributing incoming signals that are already fairly strong. They are designed to be installed on the ceiling.

LOCATING CELL TOWERS IN YOUR AREA

For resources on locating cell phone towers near your building’s location, visit the following websites:

 forums.wirelessadvisor.com/gallery

 antennasearch.com/

 cellreception.com/towers/

UNDERSTANDING POWER/GAIN

Gain is the measure of a booster or antenna’s signal output relative to its signal input. Gain is usually expressed in decibels (dB), a standard unit of measure for signal improvement.

If a booster provides a maximum 50 dB gain, then the boosted signal coming out of the unit is up to 50 dB stronger than the unboosted signal that went into the unit.



In practical terms, gain represents the relative level of signal boost that a booster and/or antenna is capable of providing. All other factors being equal, a booster with a higher gain value will provide a stronger signal and/or cover a larger area than one with a lower gain value.

An amplifier with specified system gain of 70 dBm will cover a larger indoor area than one spec'ed at 50 dBm gain. Ideally, a high gain booster and a strong outside signal would always provide the required indoor coverage area. Unfortunately, few situations are ideal. Variable incoming signals, obstacles, and building materials will affect how large an area a booster will cover.

One of the simplest and most helpful things you can do to improve cell reception is to find the location of your cell tower. A WilsonPro certified installation professional can help plot your nearest cell towers on a map to determine which direction your signal is coming from. Once you know that, an installer can effectively aim an antenna to pick up the best signal.

What Types of Commercial Cellular Amplifiers does WilsonPro Offer?

WilsonPro currently offers one primary amplifier for the commercial space: the Pro 70 model, with ascending improvements denoted as “plus” and “plus select.” This allows the installer or user to make a decision based on square footage or existing energy infrastructure. For example, the Pro 70 and Pro 70 Plus are available with both 50 Ohm and 75 Ohm. Ohm measures impedance, also known as the resistance to electrical energy flow. For a cellular signal boosting solution, it is best to use antennas, amplifiers, and cables of the same impedance—either 50 Ohm or 75 Ohm. Note that the Pro 70 Plus Select is only available in 50 Ohm.

50 vs. 75 Ohm

A 50 Ohm cable is intended for two-way data signal. Cables of this impedance are used in cellular towers as well as routers and Ethernet networks. This type of technology is preferred for a cellular signal boosting solution.

75 Ohm coaxial cables are used in the majority of households within the United States. This type of cable is designed for audio and video signals. As a result, cable and satellite receivers require a coaxial cable which has a 75 Ohm impedance. Since this type of cable is so commonly used in households, many customers prefer to utilize a 75 Ohm system.



Additional Accessories for Commercial Spaces

CABLES

Coaxial (coax) cable is used in all cell signal boosters to connect the antenna(s) to the booster unit. All signal boosters are certified by the FCC and Industry Canada with their specific lengths of coax cable. Substituting shorter cables than those that came with your booster may violate FCC and IC regulations.

FREQUENCY BANDS

As explained above, cell phones use the radio frequency spectrum to communicate. Specific frequency bands (or ranges) of the RF spectrum are assigned either to a specific cell carrier (Verizon, AT&T, etc), or to specific services (4G voice and data). When it comes to commercial cell signal booster installation, WilsonPro makes a point to improve signal quality for all users in a single space, no matter which carrier or device.



FCC-CERTIFIED — To be sold in the U.S., signal boosters must be certified by the Federal Communications Commission (FCC). In Canada, the certifying body is Industry Canada (IC). These government certifications provide assurance for consumers that (a) cell signal boosters work as they are supposed to, and (b) that they don't cause harmful interference on the cellular network. WilsonPro ensures that every amplifier purchased is FCC or IC certified, proof that it will work as promised.

What to Expect From a WilsonPro Partnership

WilsonPro cell signal boosters improve voice and data signals on [all North American cell carrier networks](#) and on all cellular-enabled devices, including phones, tablets and cell modems. WilsonPro offers wideband service, meaning it amplifies an entire frequency range, and individual carriers use specific frequencies within that range. The result? Devices across all carriers experience improved signal strength. When you're ready to call WilsonPro for commercial cell signal booster solutions, you can expect top-quality service, expert guidance, and reliable system design to keep your commercial operation running smoothly for years to come.

IN CONCLUSION

As you can see, boosting your in-building cell reception all begins with assessing the strength of the existing signal outside the building. From there, a certified solution-provider can help determine how many amplifiers and antennas are needed and the most effective installation design to implement. Timelines depends on the size of the building, the strength of the existing signal, and any custom modifications needed. Rest assured that commercial cell signal boosters can vastly improve the reception inside a building, making a big difference for communications on all carriers.

Ready for the next step? Learn more about commercial cell signal amplifiers, how they work, and how WilsonPro can provide cell signal coverage solutions by visiting the WilsonPro [blog](#) or by [contacting us](#) today.

Here's what to expect from WilsonPro:

WilsonPro installer conducts a site survey:

When looking for an in-building solution to poor cell reception, WilsonPro recommends starting with a site survey—that is, a professional service to assess the building and surrounding area to determine the existing signal strength. The installer will likely use a signal meter to determine the existing signal strength, and plot the location of nearby cell towers on a map. This step usually takes an hour or more, depending on the size of the building.

Installer determines the next steps: After the site survey, the installation professional will determine if a cell signal booster will work in the commercial space depending on the surrounding signal strength. The installer can determine how many boosters and antennas will be needed, and then assemble a bill of materials.

The WilsonPro solution-provider builds the quote: With WilsonPro's support, the installer or solution-provider will work up a quote for the customer depending on the materials and services required. From here, the customer can decide to move forward with the purchase and installation design.

Installation begins: Depending on the size of the building, products needed, and any special customizations, installation can be coordinated quickly. The solution-provider determines the timeline based on the number of amplifiers, antennas, and coax cable needed, as well as the ease of access to run the cable.



About **WilsonPro**

Wilson Electronics, LLC, home of WilsonPro, weBoost, and zBoost, is a leader in wireless communications infrastructure, dedicated to delivering connectivity to every corner of peoples' lives. The company has designed and manufactured cell phone signal boosters, antennas and related components for more than 20 years.

Each booster is designed to significantly improve cellular coverage in homes, workplaces or vehicles.

FC All Wilson Electronics products are designed, assembled and tested in the U.S.A., and certified by the U.S. Federal Communications Commission (FCC) and/or Industry Canada (IC).

For more information, please call **1-888-503-5329** or visit www.wilsonpro.com

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