# Renovating Existing Structures for Wireless Networks is Easier with Snake Tray®

EXECUTIVE SUMMARY

Our growing appetite for wireless communications and mobility is driving the need to install wireless network infrastructure in places it had never been before. While constructing a building from the ground up incorporating modern networking technology presents its own set of challenges, retrofitting a structure built one hundred years ago or even just twenty years ago to enable effective wireless coverage can be a labor intensive and expensive proposition.

It's no one's fault. Who would have conceived of the need to build cable pathways for technologies that did not yet exist? Yet here we are, drilling holes in the walls of schools, hospitals, churches and office buildings to hang exposed cables in places that would make architects cry. There is a better way.

This white paper examines how Snake Tray's 454 Series Universal Cable Tray system reduces costs, speeds timeframes and improves building aesthetics when renovating existing structures to accommodate today's wireless networking technologies.
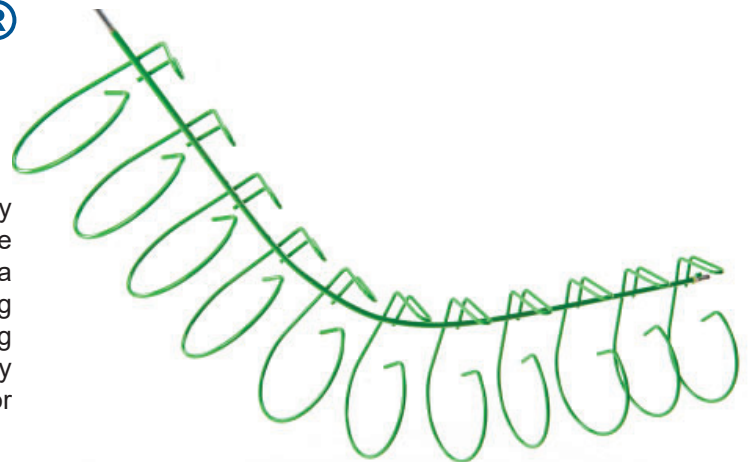
Bringing Yesterday's Buildings Up to Speed

The world is going wireless. The paradox here is that implementing new technologies to improve wireless network performance actually increases the need for cables and cable conveyance systems. Because at some point, every wireless access point deployed in a network environment requires a hard-wired connection to a router, server or service provider. Only the final connection to the mobile device is wireless. The proliferation of access points needed to handle increasing volumes of wireless data traffic only compounds the situation. The coming wave of 5G networks, with their smaller cell ranges and frequencies that cannot penetrate dense walls and barriers, will require even more access points, and hence more cabling.

Constructing a new building integrating wireless technology presents its own challenges. But architects and engineers designing new structures have developed cutting-edge methods to incorporate technology into the skeleton of a building like raised flooring, and they have the luxury of anticipating obstacles. Existing structures, on the other hand – whether a school, hospital, retail store, church, airport terminal or office building – can be difficult to update internally.

Cosmetic upgrades aside, renovating a commercial structure built decades ago to enable the networking/communication/power distribution technologies of today can be a labor intensive and expensive undertaking. Most are of brick or cinder block construction designed without accessible interstitial spaces or raised floors. The overwhelming majority use dropped ceilings to create a concealed space for the water, sewage and sprinkler system pipes, HVAC ductwork and ventilation, lighting fixtures and connections, plus the miles of electrical wires and telecommunication cables that run overhead. Some have ornamental crown moldings, plaster ceilings or historic elements that must be preserved. Others that have been built more recently may feature architectural trends that sometimes restrict – but other times enhance – renovation, such as exposed joists and lighting fixtures, partial dropped/suspended ceilings, and even completely open ceilings. Look upwards in many large retail outlets and dining establishments and you'll see visible plumbing, electrical lines and ventilation (and possibly skylights to allow natural light to enter). These elements, as well as any cable conveyances, are

A Case In (Access) Point

A major New York City hospital campus consists mostly of buildings constructed in the early 1900s, well before architects would ever conceive of the need to run network cables through interstitial spaces. With demand for wireless connectivity skyrocketing across the complex, plus the growing number of low voltage cables carrying voice, data and now even powering LED lighting systems, management realized installing an updated wireless network and low voltage power distribution pathway could not be put off any longer. Earlier efforts to bring wireless connectivity to the hospital consisted of discontinuous segments of cable trays and J-hooks installed above dropped ceilings. There were also areas of plaster ceilings where the cables were exposed, sagging from lack of support, or "anchored" using Velcro straps. Turns were made with tight bend radii that could damage the copper or fiber inside, and the bundles were zip-tied together, making repairs and expansion difficult if not impossible.

Snake Tray recommended its 454 Series Universal Cable Tray to meet the challenge. It would offer a continuous yet flexible cable conveyance solution, providing protection and segregation of cables while building in capacity for future expansion. Perfect for installation above dropped ceilings, turns were made with the proper bend radius to minimize cable stress. To solve the problem of cable exposure, a series of 18" square holes were cut into the sections of plaster ceiling. The installers would then bend the flexible 454 Series tray segments though the access holes for anchoring to a convenient vertical or horizontal surface, quickly run the cables, patch the holes and move on for a continuous and completely concealed low voltage/wireless network cable pathway.

The 454 Series Universal Cable Tray has performed so well that it is now the official cable conveyance system approved for use throughout the hospital campus for any future cabling projects or network expansion.

A Gateway to Expanded Wireless

Perhaps nowhere else are the cable run lengths longer and the wireless user populations greater than at a large metropolitan airport.

With literally tens of thousands of passengers using smartphones as they move through its concourses every day, a major southern US airport needed to update its wireless network to handle the increased data traffic and resulting device contention from both employees and travelers. The network had already undergone major upgrades due to the flood of TSA regulations and security equipment installed post 9/11, and was strained to capacity. The solution was clear: an updated, faster Wi-Fi network with more multi-frequency access points. But in this case the issue was about designing a continuous cable conveyance system that would span the length of entire passenger terminals – some more than a quarter-mile long – carrying dozens of cables running the distance from server closets to access points installed at and in between every gate. The airport was designed with dropped ceilings, so access to a continuous interstitial space wasn't an issue. It was more about the need to keep cables organized, protected and grounded over long runs, and being able to install an end-to-end cable conveyance system with minimal disruption to airport operations and passengers.

Specifically designed for the continuous conveyance of low voltage telecommunication and wireless network cables, Snake Tray's 454 Series Universal Cable Tray proved to be the best solution. The trays arrived nested together for easy handling by installers at the job site. With horizontal and vertical mounting rings built-in, there were no special brackets or extra hardware needed. A simple wall anchor positioned about every four feet provided the necessary support while speeding installation and reducing costs. A single inline bolt joins tray segments together for a continuously grounded linear solution. The flexibility of the 454 Series allowed installers to work quickly around pre-existing obstacles on the walls as they moved down the concourses. Then it was a simple matter of pulling cables. As a result, the airport was able to install the miles of cable needed to modernize its wireless network quickly at minimal cost, improving service to all wireless users while building in an upgrade path for future expansion.

made, finished and purposely left exposed as part of the architectural statement of the building.

Whether built one hundred years ago or only recently, with ceilings that are open or closed, updating an existing structure to enable (or expand) wireless and/or other 21st century networking technologies can be accomplished quickly and cost-effectively – if you have the right tools.

Bringing Predictability to Unpredictable Environments

You never know what you're going to find when you first peek above a dropped ceiling panel. A workable space, or a mess of wires weaving over and under ductwork, utility pipes or other obstacles? At Snake Tray, we have a way to teach old buildings some new tricks with a simple yet cost effective method for integrating today's technology into yesterday's architecture.

Snake Tray's 454 Series Universal Cable Tray enables speedy ad-hoc installation without a defined plan set. The conveyance tray is not restricted to straight line runs; it can be easily bent and curved at the will of the installer to work around any obstacle. Built-in vertical and horizontal mounting rings offer flexible anchoring options to the most convenient surface, or suspend it from threaded rods to span open spaces. This returns predictability – and accurate budgeting of time and materials – to every project because entire runs can be installed without surprises; no special parts or on-site fabrication is required.

The 454 Series Universal Cable Tray is manufactured in eight-foot segments that nest together for cost effective shipping and easier handling at the job site. It is modular and infinitely expandable to handle long runs. Available in three loading diameters of 2", 4" and 6", the 454 Series can reliably hold bundles of up to 30, 120, or 260 Category 6 cables (.25 in^2) respectively. Designed for easy cable pulling or loading from the side, 454 Series cable tray sections are joined together using universal inline connector bolts that provide both mechanical and electrical bonding in one piece.

When renovating structures with fully or partially open ceilings, the pipes, ducts and cables are often painted a specific color. The 454 Series Universal Cable Tray can be powder coated to match. Further, the tray employs a patented lobster trap design that keeps cables lying securely in place as the conveyance navigates upsweeps, downsweeps and even 90° turns. The shortest distance between two points is a straight line. Sometimes when changing direction or plane, a cable bundle will take the path of least resistance and begin to lift itself out of the tray, placing strain on the cables and impacting the tray's ability to support, organize and segregate them. The 454 Series Universal Cable Tray system prevents this phenomenon.

Bringing In Snake Tray® Speeds Renovations, Reduces Costs

Twenty-plus years ago, the only wire-related items builders had to consider prior to construction were electrical power lines, analog telephone lines and coax cable. Up until recently, engineers and architects did not take into account the cabling aspects and pathways for low voltage lighting, voice and data communication lines during the early stages of building design; much less outfitting buildings for effective wireless coverage. These were more afterthoughts, and it was assumed those elements would be installed above the dropped ceilings during interior finishing.

The 454 Series Universal Cable Tray is the perfect solution for older buildings designed without dedicated telecommunications and/or network cable pathways. It offers the ability to securely traverse long distances, the flexibility to reroute around obstacles and easily change vertical and horizontal planes without customization, and the capacity to load and convey hundreds of cables where none had been before. It does all this while improving building aesthetics, keeping the underbelly of wireless networking out of sight.

Let us show you how easy it is to speed renovation while controlling costs when updating your next building for today's networking technologies with Snake Tray's 454 Series Universal Cable Tray.