BELDEN

Connected Communities North America

Customer

Creating a sense of togetherness: that's what a connected community is all about.

Emerging over the past few years as mixed-use campuses, connected communities combine and consolidate multi-tenant residential, institutional, commercial and other spaces. They bring together everything people need to live, work and play.

Picture a closely knit neighborhood spread out across the size of a standard city block (about 250 ft by 900 ft). It's made up of condos, green space, retail shops, offices, a hotel, entertainment venues and restaurants. People can find everything they need just a few steps from their door, whether they want to attend a yoga class or run a few errands. In many cases, communities are also part of transit lines for fast, efficient travel—and they can include schools and childcare for safer, easier and more convenient access.

These connected communities range in size from a few buildings to more than 5 million square feet of development (and larger). They promote efficient access to and use of utilities, building systems and land; they also reduce transportation infrastructure demand. Because connected communities share resources, they also promote energy and carbon conservation by reducing power requirements during peak demand periods to minimize environmental impact.

Connected communities bring services, systems, technology and people together to improve quality of life, facilitate vital interaction and engagement, lessen environmental impact and ensure equitable access to services.

Connected communities aren't only about bringing services, systems and technology together: They bring people together to improve quality of life by reducing commute times, facilitating vital interaction and engagement, and ensuring equitable access to services. Everyone who lives, works and plays in these districts has access to the same utilities and services, from broadband to power.

This approach to living brings about another benefit, too: It breathes new life into old buildings. Across North America, connected communities are being established in vacant shopping malls, old factories and even empty school buildings.

Challenge

Behind many of these connected communities are data- and technology-driven innovations that offer new and improved services to people and businesses. Advanced analytics improve tenant comfort and serve their requirements while lowering utility bills and reducing stress on the electrical grid.

But these flexible environments also pose one-of-a-kind infrastructure challenges. As opposed to traditionally siloed communities, where some buildings operate 24/7 (such as residential spaces and hotels) while others operate during set hours of the day (businesses and retail shops, for example), connected communities are constantly in use. For this reason, they must prioritize efficiency and rely on smart sensors and technologies to automate and control building systems when and where possible.

Businesses and residences share access to the same utility infrastructure for water, gas, electricity and even telecom services. A robust foundation that can handle constant demand from all types of users and facilities—from libraries and senior living to theaters and coffee shops—is essential.

Because many of these communities involve adaptive reuse, they're often located in buildings with existing restrictions. These limitations can include anything from legacy platforms and systems to facility layouts that can't be significantly changed.

From an ICT perspective, some legacy systems may need to be integrated with new systems, technology and network architectures, creating additional complexities. Preservation of historic building features may also be a factor as well, which can further restrict cabling and connectivity infrastructure.
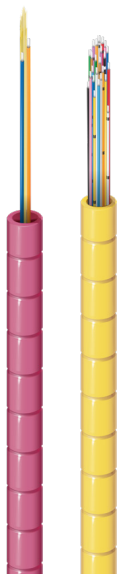
Lastly, connected communities often involve multiple architects, builders, contractors and investors. Even though each group has its own way of working, they bring their individual perspectives to the table. These differing viewpoints need to work in harmony to achieve project goals.

Solution

Building efficiency is key to making it simple to live, work and play in a connected community. This means relying on intelligent buildings that are powered by smart technologies and sensors.

Traditional network design isn't always the right fit for these environments. Connected communities call for new approaches, ideas and concepts. Based on our experiences with these types of projects, we pulled together just four of the many recommendations we've proposed for connected communities to address requirements across the multitude of vertical markets and horizontal technologies they represent.

1. Establishing One Common Network Infrastructure

Every live, work and play space requires different connectivity. ICT infrastructure needs to support voice, data and Wi-Fi for facilities management and operations (such as parking, security and life safety systems), as well as commercial tenant operations (lighting, HVAC, business-specific technology like unified communications, etc.) and residents living in the area need to be supported by fiber to the home (FTTH) to receive broadband internet connectivity.

Instead of designing one fiber backbone for each segment of the community—offices, retail, residential, etc.—a single infrastructure can be created.

Establishing a common infrastructure allows traditionally siloed networks to share pathways and spaces, telecommunications rooms and backbone

cabling, and similar materials and methods. This reduces costs and saves space from capital and operational perspectives—which is especially important in connected communities where every square foot counts.

Shared spaces also allow the building manager to take a utilities approach to managing telecom infrastructure. If a tenant in Building B needs fiber connectivity, for example, then management can quickly connect them to support those demands.

In one North American connected community project, Belden helped reduce fiber count by more than 20% and cut the number of pathways and spaces in half by taking a common approach to infrastructure—all while increasing and ensuring flexibility and scalability. This makes sure tenants get the connectivity they need now—and in the future.

A common and converged infrastructure creates a future-ready environment that allows new technology to emerge with minimal disruption. When seventh-generation wireless rolls out, or 12K streaming becomes the norm, connected communities will have a foundation in place to support it. Instead of being abandoned, existing cabling systems can be used to support new technology so the entire connected community can take advantage of it right away.

## 2. Consider Centralizing the FTTx Approach

In a typical multi-tenant housing situation that relies on FTTH, a carrier installs a passive optical network (PON) and distributes passive optical splitters by placing one on each floor (or every other floor). If a new system or provider needs to be accommodated, then devices can be moved, added or changed as necessary.

While this works, it's optimized to support one technology with one application for one service provider. When technology, business models, demands or architecture change, then it becomes difficult to scale accordingly. And what about a community that has or wants multiple service providers?

In many connected communities, centralizing splitters can be done instead. Instead of traditional edge distribution, splitters can be housed at a central location, such as the outside plant (OSP). While this may require more fiber, it also requires fewer splitters and less networking gear while simultaneously reducing operational resources and increasing operational flexibility. This leads to cost savings and improved functionality.

3. Reducing Points of Administration

For campuses with multiple facilities, a point of administration can be taken to the basement of each building. The campus has main, primary and secondary telecommunications rooms, as well as one main telecommunications room in every building as well.

Hotel

Condos

Community College

Office Space

Public Retail

Centralized

Decentralized
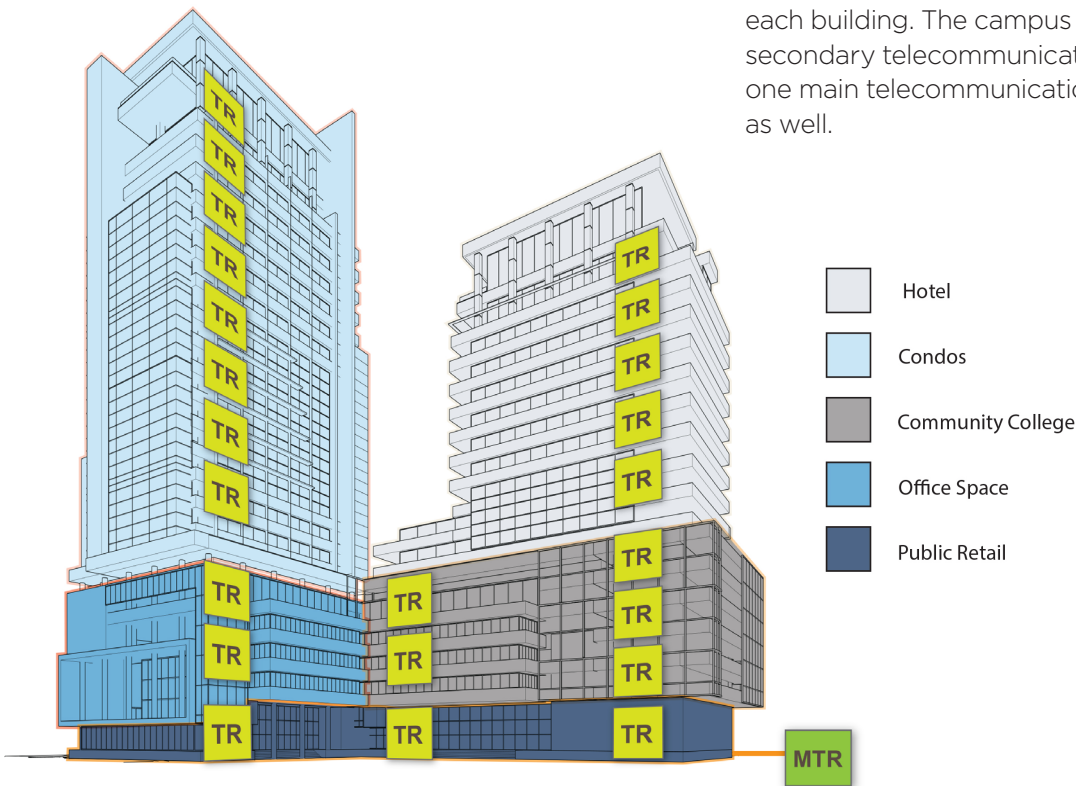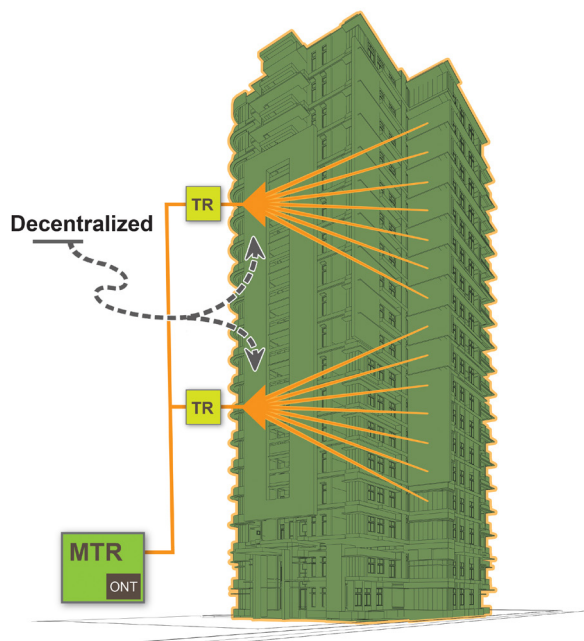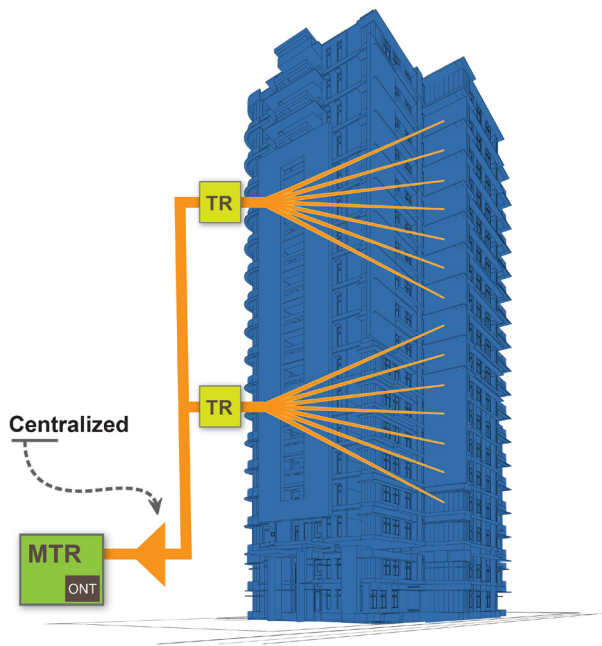
Depending on the size of your campus, this can decrease the number of common administration points from 100+ to a handful, making moves, adds and changes much more manageable.

4. Supporting a Carrier-Neutral Host Network

Infrastructure to support 5G cellular and other services from a variety of service providers is critical so residents aren't locked into a specific carrier.

To provide Wi-Fi and cellular services, distributed antenna system (DAS) infrastructure that supports a carrier-neutral host system allows connected communities to handle multiple carriers and add more as needed.

A carrier-neutral host network can also boost coverage, increase network capacity, enhance connection quality and give tenants more options: They can access whichever carrier they choose. It also allows for segmentation and prioritization of traffic to enhance services and security.

Results

By helping connected communities establish telecom as a true utility, these environments are able to harness efficiency. Bringing bandwidth to the building allows tenants to deploy whatever technology they need. The network can support technologies that operate in silos, as well as fully integrated smart systems—or anything in between.

By thinking about connectivity in new ways, connected communities can be more responsive to tenant demands while aligning telecommunications with operational efficiency goals and reducing environmental impact.

About Belden

Belden Inc. delivers the infrastructure that makes the digital journey simpler, smarter and more secure. We're moving beyond connectivity—from what we make to what we make possible through a performance-driven portfolio, forward-thinking expertise and purpose-built solutions. With a legacy of quality and reliability spanning 120-plus years, we have a strong foundation to continue building the future. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia and Africa. For more information, visit us at www.belden.com; follow us on Facebook, LinkedIn and Twitter.

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