

Connected communities benefit from complete connection solutions

Belden is committed to sustainability and future-readiness, aiming to create a smarter and more efficient future for connected communities.

Case Study



Customer

Connected communities are all about fostering a sense of togetherness. These mixed-use campuses have emerged in recent years, combining residential, institutional, commercial and other spaces. They bring everything people need to live, work and play into one cohesive area.

Imagine a neighborhood spread across a standard city block (about 250 ft by 900 ft). It includes condos, green spaces, retail shops, offices, a hotel, entertainment venues and restaurants. Residents can find everything they need just steps from their door, whether attending a yoga class or running errands. Many of these communities are also part of transit lines for fast, efficient travel and include schools and childcare for safer, more convenient access.

Connected communities range from a few buildings to over 5 million square feet of development. They promote efficient use of utilities, building systems and land, reducing the demand for transportation infrastructure. By sharing resources, these communities conserve energy and reduce carbon emissions, minimizing environmental impact.

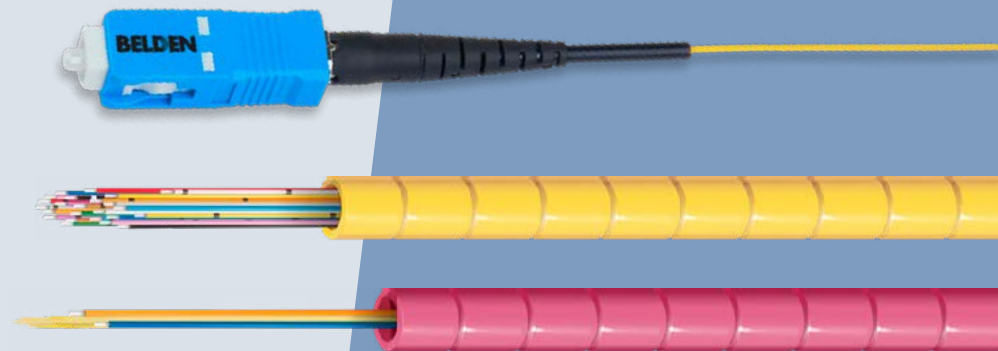
Connected communities bring services, systems, technology and people together to improve quality of life. They facilitate vital interaction and engagement, lessen environmental impact and ensure equitable access to services. These communities reduce commute times and provide everyone with access to the same utilities and services, from broadband to power.

This approach to living offers another significant benefit: it revitalizes old buildings. Across North America, connected communities are being established in vacant shopping malls, old factories and even empty school buildings.

Challenge

Data- and technology-driven innovations enhance services for people and businesses, improving tenant comfort and lowering utility bills. However, these environments pose unique infrastructure challenges. Unlike siloed communities, connected communities operate 24/7, requiring smart sensors and technologies for efficient automation.

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Legacy systems may need integration with new technology and network architectures, adding complexity. Historic building features can further restrict cabling and connectivity infrastructure.

Connected communities involve multiple architects, builders, contractors and investors. Harmonizing differing viewpoints is crucial to achieving project goals.

Solution

Building efficiency is crucial for simplifying life, work and play in a connected community. This relies on intelligent buildings powered by smart technologies and sensors. Traditional network designs often fall short in these environments, necessitating new approaches and concepts. Based on Belden's project experiences, here are four key recommendations for connected communities:

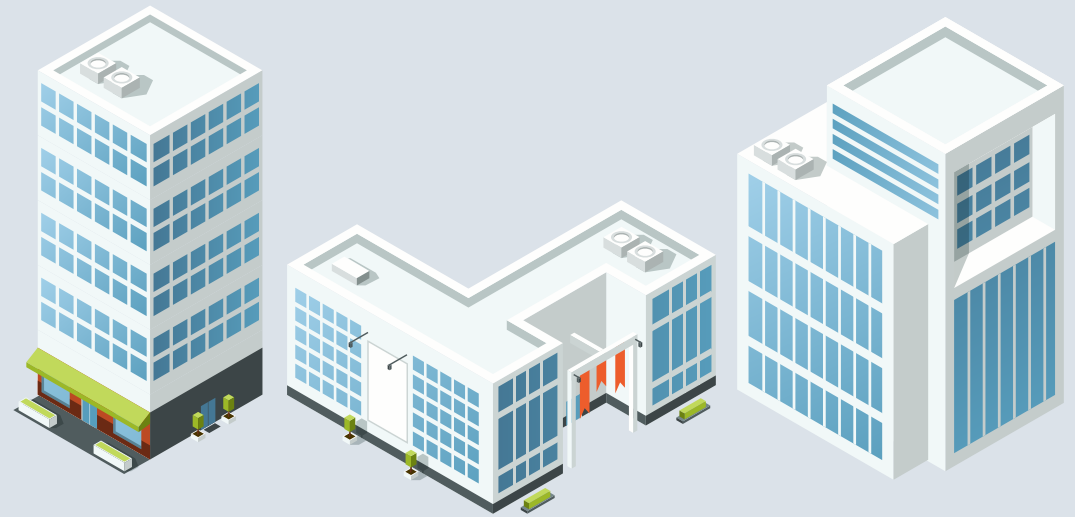
1. Establishing one common network infrastructure

Each space within a connected community requires different connectivity. ICT infrastructure must support voice, data and Wi-Fi for facilities management and operations like parking, security and safety systems. It also needs to handle commercial operations such as lighting, HVAC and unified communications, as well as

residential needs like broadband internet through fiber to the home.

Instead of designing separate fiber backbones for each segment (offices, retail, residential), a single infrastructure can be created. This allows traditionally siloed networks to share pathways, telecommunications rooms and backbone cabling. This reduces costs and saves space, which is vital in connected communities where every square foot counts. Shared spaces enable building managers to manage telecom infrastructure like utilities. For example, if a tenant in Building B needs fiber connectivity, management can quickly provide it.

A common and converged infrastructure creates a future-ready environment, allowing new technology to emerge with minimal disruption. When seventh-generation wireless or 12K streaming becomes standard, connected communities will have the foundation to support it.



In one North American connected community project, Belden reduced fiber count by over 20% and halved the number of pathways and spaces by adopting a common infrastructure approach. This ensures flexibility and scalability, meeting current and future connectivity needs.

A common and converged infrastructure creates a future-ready environment, allowing new technology to emerge with minimal disruption. When seventh-generation wireless or 12K streaming becomes standard, connected communities will have the foundation to support it. Existing cabling systems can be used to support new technology, enabling the entire community to benefit immediately.

2. Consider centralizing the FTTx approach

In typical multi-tenant housing with fiber to the home (FTTH), a carrier installs a passive optical network (PON) and places passive optical splitters on each floor (or every other floor). If a new system or provider is needed, devices can be moved, added or changed as necessary.

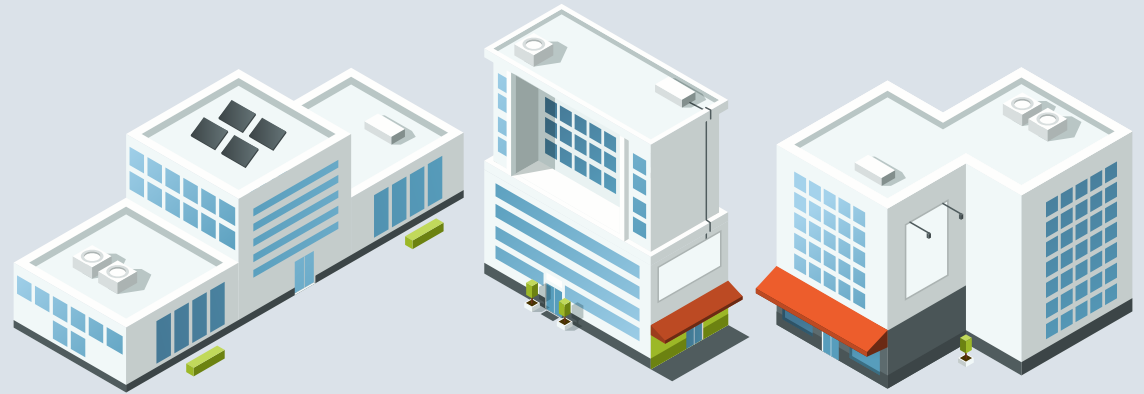
While this method works, it is optimized for one technology with one application for one service provider. When technology, business models, demands or architecture change, scaling becomes difficult. This approach also poses challenges for communities with multiple service providers.

In many connected communities, centralizing splitters is a better option. Instead of traditional edge distribution, splitters can be housed at a central location, such as the outside plant (OSP). This may require more fiber but fewer splitters and less networking gear, reducing operational resources and increasing flexibility. The result is cost savings and improved functionality.

3. Reducing points of administration

For campuses with multiple facilities, administration points can be centralized in the basement of each building. The campus should have main, primary and secondary telecommunications rooms, along with a main telecommunications room in every building.

Infrastructure that supports 5G cellular and other services from various providers is essential to ensure residents aren't locked into a specific carrier. To provide Wi-Fi and cellular services, a distributed antenna system (DAS) infrastructure that supports a carrier-neutral host system is necessary.



4. Supporting a carrier-neutral host network

Infrastructure that supports 5G cellular and other services from various providers is essential to ensure residents aren't locked into a specific carrier. To provide Wi-Fi and cellular services, a distributed antenna system (DAS) infrastructure that supports a carrier-neutral host system is necessary. This allows connected communities to handle multiple carriers and add more as needed.

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

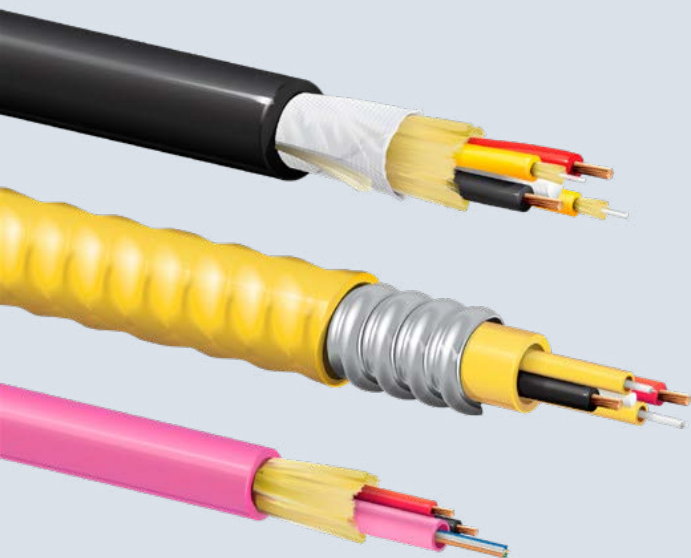
Depending on the size of your campus, this can reduce the number of common administration points from over 100 to just a few, making moves, adds and changes much more manageable.

Results

Belden's complete connection solutions provide connected communities with state-of-the-art infrastructure, all while ensuring environmental sustainability.

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

By rethinking connectivity, 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 complete connection solutions that unlock untold possibilities for our customers, their customers and the world. We advance ideas and technologies that enable a safer, smarter and more prosperous future. Throughout our 120+ year history we have evolved as a company, but our purpose remains – making connections. By connecting people, information and ideas, we make it possible. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia and Africa.

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