



LONGMONT **CASE STUDY**

Building **smart cities** in communities where digital participation and integration are the primary drivers of economic growth



Introduction

Smart cities are a growing movement in communities where digital participation and integration are the primary drivers of economic growth and safety for residents and businesses. The City of Longmont has a rich history of cultivating new ideas to support its development as it competes with nearby Denver and Boulder, and the smart city applications are providing Longmont with an edge in this competition.

In the 90s, Longmont achieved a downtown revitalization, attributed mainly to the adoption of civil engineering that focused on creating walkable environments to encourage economic growth and community spaces. This growth spiked Longmont's population, and in the 2000s, as internet connectivity became a primary concern for Longmont's residents, the city began to experiment with public Wi-Fi networks. The experiment culminated in the birth of NextLight, one of the first municipal fiber networks in the country. NextLight provides internet for most homes within Longmont, gives residents with access to 1-gig of internet service for only \$69.95 a month, and was rated one of the fastest internet providers in the country by PC Magazine in 2022. As we turn the corner in 2023 and begin looking to the future of community connectivity, Longmont is far ahead of the competition and is building the infrastructure to support smart city applications that will impact the city's future development. This smart city technology will help Longmont optimize its resources, reduce costs, and improve its services in transportation, public safety, and environmental monitoring. One key aspect of building this smart city is deploying a robust wireless network that can support these various applications.



THE CHALLENGES

2020 marked the beginning of the COVID-19 pandemic, and the world quickly realized the internet would be the only way to continue work or education. The nation rushed to acquire reliable internet connectivity, but many were left unconnected and didn't have the opportunities to get online. Longmont's St. Vrain School District, the seventh largest school district in Colorado, found itself in this predicament after discovering that many of its students and faculty could not receive adequate internet access to continue online classes. These students and staff needed a solution to bridge this digital divide, and it had to be done quickly and within a budget. Fortunately, the school had been experimenting with remote access options before the pandemic and had recently partnered with Vall Technologies, a local systems integrator. The school and Vall Technologies began to deploy a private network to provide internet connectivity to students needing internet access.

Fast forward to 2022, the city and the school had developed a plan and were actively coordinating tactics to tackle the digital divide within the community. However, as the digital divide shrunk, another problem grew within Longmont - violence in the community was on the rise. Criminal elements began to plague Longmont's walkable downtown area, and residents' concerns began to mount. On August 24, 2022, thirteen-year-old Isahis "Zay" Rosales was killed in a drive-by shooting in Kensington Park in Longmont. The park is a half-mile from Main Street. The city needed to take action to improve the public safety and security of the downtown area. Longmont needed a scalable solution that could cover vast distances, be deployed quickly, and provide great security.

THE SOLUTION

To give students the ability to connect to the school's private network and access the internet, St. Vrain leveraged Baicells LTE eNodeBs (eNBs) and CBRS spectrum to provide internet access to students. These eNBs were installed on various school properties and are transmitting to residential locations.

Vall Technologies worked closely with the school district to build a network that could provide the most significant impact and get internet access to the students with the greatest need. LTE technology allows the wireless signal to travel further in outdoor environments and overcome many non-line-of-sight (NLOS) challenges typically found in Wi-Fi networks. The school took further advantage of the Baicells platform by leveraging the built-in network management tools found within the system. This enabled the school to ensure the network was used for educational-approved purposes by students. To date, the school has connected 4,000 students to the network.

St. Vrain has expanded this network beyond its initial purpose to bridge the digital divide. The school has launched the Advanced Global Innovative Learning Environments (AGILE) program, which allows high school students to attend classes from schools they might not typically be able to attend. This private network, in combination with AGILE, is helping to remove the barrier for students to participate in specific courses they might not have access to and further customize their education based on their interests.

The Solution - Continued

As the school began this network buildout, the city took note and began assisting by providing property access to critical locations and by tapping its fiber provider, NextLight. NextLight's fiber service has provided a robust backhaul connection to hardware sites, speeding up the deployment process. The city began to discuss other use cases for the wireless network and quickly realized the near-limitless potential the LTE infrastructure would start to provide.

"The use cases are nearly endless,"
said Longmont's city manager Harold Dominguez.

Currently, the city has 64 sites that blanket most of downtown Longmont with private LTE network connectivity. The first step has been to build a robust security camera system that can be accessed by public safety officials to assist in ongoing investigations and to dissuade criminal activity. The first camera site was erected in Kensington Park following the shooting. Most of the downtown area now has cameras attached to the network, allowing public safety officials to monitor the area effectively. Due to the secure nature of private LTE networks, citizens can rest easy in knowing that it is virtually impossible to hack into the security camera network.



Harold Dominguez.

The city is now further developing the private LTE network to support different uses, including criminal element detection in public housing projects, real-time monitoring and reading of various maintenance sensors, personal communications, traffic monitoring, and metadata collection of public transportation systems.

THE CONCLUSION

In conclusion, Longmont, a small community in Colorado, is building a smart city with the help of Baicells LTE hardware. Using CBRS, Longmont and the St. Vrain School District have leveraged Baicells LTE eNodeBs to provide internet access to students in need and improve security for the public. The project started with connecting students at St. Vrain and has become a complete infrastructure innovation driving the next-generational connectivity. This private LTE network infrastructure will support smart-city applications and impact the city's future economic and public services development. Leveraging private LTE, Longmont has a scalable solution to overcome NLOS challenges and provide a robust wireless network to support various applications and optimize its resources, reduce costs, and improve its services in transportation, public safety, and environmental monitoring.

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