EXCLUSIVE!

Wireless Protects Historic Shops From Flames

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CASE STUDY IN BRIEF

- **Subject:** Gilman Village specialty shopping center in Issaquah, Wash.
- **System:** Wireless fire detection system using more than 350 detectors to protect 52 buildings dating back to the early 1900s
- **Installing Company:** Eagle Systems & Security Inc.
- **Location:** Kirkland, Wash.
- **Years in Business:** 16 years

A shopping district of historic wooden structures near Seattle turned to a modern solution to detect flames that might turn it to dust. Where a wired fire detection system seemed too costly and could damage the century-old buildings, wireless became a viable solution that has proved itself under fire.

A quaint shopping area with buildings more than 100 years old turned to a 21st-century solution to prevent fires from wiping away history.

A few small fires at the Gilman Village specialty shopping complex in Issaquah, Wash., were a reminder of the disaster just waiting to happen. The shopping area was a collection of 29 wood-frame structures dating as far back as 1900, connected by equally flammable wooden boardwalks. All of them were built before fire codes, and a kitchen fire in one of the restaurants had the potential to burn the entire village to the ground.

Gilman Village had two fires in 2000, its first in 25 years. Without a fire alarm system, it was sheer luck that the fires were seen in time to keep them from taking out the entire complex. "It isn't that there were a lot of fires," says Aaron Barouh, general manager for Gilman Village. "It was the potential for any fire to be a real disaster."

Barouh went to several alarm companies looking for someone to install a monitored fire system. Companies told him it would cost a fortune to hard-wire 51 shops and restaurants to a fire detection system. On top of that, the historic nature of the buildings didn't gel with the ripping out of walls to insert and connect wiring.

After calling several large and medium-sized contractors and integrators, Barouh turned to a small one — Eagle Systems & Security Inc. of Kirkland, Wash., with just two employees. The small company had a big idea: A wireless smoke and fire detection system that would cost tens of thousands less than a wired system while preserving the history of the shopping village.

Gilman Village Wireless Fire System Equipment Overview

Quantity	Description
235	5808LST wireless smoke/heat detectors
50	5809 wireless heat detectors
4	V128FB Ademco Vista Series wireless commercial UL burglary and fire combination control panels
5	5881ENHC RF receivers
2	6139 keypads
2	6150 keypads

All equipment by Honeywell Security

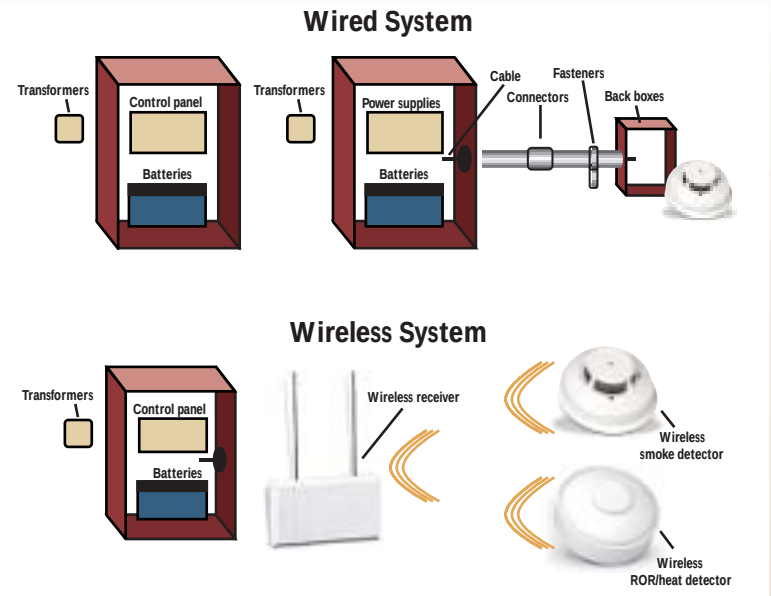
Honeywell

Wireless systems have surged in effectiveness during the past decade, as wireless transmitters have become more powerful and reliable. However, skepticism by both contractors and end users concerning wireless hasn't changed much in the past 10 years. That has added additional challenges to the process of getting approval from an authority having jurisdiction (AHJ).

The doubts concerning wireless may dim as organizations like the National Fire Protection Association (NFPA) have started to express approval of wireless solutions for fire prevention. That doesn't make the leap for a contractor to wireless any easier. While there isn't the grunt work of laying out yards of cable and figuring out the paths to take it, a wireless installation involves more problem solving and testing.

After a three-year, three-phase project involving a great deal of trial and error, the largest commercial wireless alarm installation in the United States is in full operation and has already proved itself in protecting the popular destination 17 miles east of Seattle.

Comparing Wired and Wirelss Solutions



The clear difference between a wired and wireless fire detection installation is in the hardware. However, it takes more trial and error for installers to find the right positions for wireless equipment.

Source: Honeywell Security

Collection of Old Buildings Needed a New Kind of Solution

A walk through Gilman Village is a trip back to a time when stores were mom-and-pop operations and shopping centers didn't have a Gap, Banana Republic or food court.

The retail center opened in 1972 after developers sought to save turn-of-the-century buildings in the once-thriving mining town of Issaquah. The old buildings were transported to the Gilman Village site and renovated into a retail complex meant to cultivate independent shops and restaurants.

More than 30 years later, Gilman Village hasn't been lacking in visitors, though until recently it has lacked a fire detection system. After getting cost estimates from other contractors that rivaled the height of nearby Mount Rainier, Barouh called Eagle Systems. At first, Eagle owner Dave Holmes and his technician partner Jim Schroder didn't see a low-cost solution for

Gilman Village. "We would have needed a million miles of conduit," Holmes exaggerated. "These are small buildings separated by 25 to 309 feet." Then they remembered reading wireless fire detection product literature from Honeywell Security, formerly the Ademco Group. "Jim and I both looked at each other and said, 'That might work.'"

While hard-wire systems use cable and conduit to transmit alarms, the wireless system uses transmitters and receivers to communicate with the control panel without cables. Not only can this reduce the intrusiveness of the cabling, but also cut the cost of the installation.

Schroder says that while hooking up a wired fire detection system at Gilman would have cost the end user $210,000, wireless reduced the cost to $80,000.

Photo courtesy Jim Schroder, Eagle Systems & Security

Visitors to Gilman Village might miss the wireless receivers attached to the side of the historic buildings.

Skepticism Stands in Way of Wireless Acceptance

Getting approval to start the largest commercial wireless fire detection system in history would prove to be as hard as installing it. Holmes and Schroder had to get past skepticism before they ever put in their first screw.

A lot of the skepticism around wireless surrounds the unreliability of the first wireless fire systems introduced in the late 1980s. A bad first impression left some installers pledging they would never go wireless and AHJs vowing never to give installer requests for wireless the time of day.

"I was there when it first came out and it left a very bad taste in my mouth," says Al Colombo, writer of *SSI*'s "Fire Side Chat" column (*see page 30*). "I took a long time to try it again. Early transmitters were not uniquely addressed."

However, today's wireless systems would seem unrecognizable to one who dealt with the earlier systems. Transmitters, once the size of a deck of cards, are now measured in millimeters. Power is less of an issue, with 1.5V lithium batteries having an operating life of three to seven years. "These devices are highly supervised now. They know when there is a problem and when a battery is about to die. In the world I see ahead, everything will be wireless."

There remains a presumption that a wireless fire installation is an illegal one and violates standards like those set forth by NFPA. However, NFPA revisions to its codes during the last decade have included guidelines for installing safe and legal wireless fire alarm systems, including NFPA 72 — the National Fire Alarm Code.

"I would expect more traditional fire alarm systems would be predominant, but wireless systems can be used to fit a specific need like where you don't want to disturb historical integrity and don't want to be too invasive," says Lee Richardson, a senior electrical engineer with NFPA, who adds he hasn't seen any anecdotal information to suggest there is anything wrong with going wireless. "There is no reason to tell you they shouldn't be installed at all."

AHJ Approval Last Barrier to Getting Installation Under Way

Whether it's wireless or not, one of the highest hurdles fire alarm system installers face is getting the approval of the AHJ. That is especially true with systems using newer technologies. Wireless has the additional burden of being a newer technology that made a bad first impression.

"From my vantage point and that of other fire marshals, technology is changing so quickly and we're having a tough time keeping up with it," says Issaquah Fire Marshal Tim Pilling. "It's just human nature."

Holmes says it took some time to convince Pilling that the system would work. "The fire marshal wasn't going to do it," Holmes says. "The AHJ said, 'No way.'"

However, Pilling says that he and other fire marshals keep an open mind about new technology and he never discounted Holmes' proposal completely. He says contractors shouldn't go to an AHJ with a defeatist attitude. AHJs may be more open-minded than installers may think.

"I never think 'I shouldn't approve it.' The first thing I ask is to give me the manufacturer's specs and make calls to other fire marshals," Pilling says.

Pilling's main advice for contractors looking to win AHJ approval is for them to do their homework and gather up evidence to back themselves up. Words won't convince a fire marshal as much as hard proof will. He says to go into the meeting with the AHJ with documentation from the manufacturer as well as accounts from other fire marshals that approved similar systems. "That's a saving grace," Pilling says. "That saves me a lot of heartache to see it has worked in other jurisdictions."

Finding Right Solution for Wireless Installation Took Trial and Error

With approval out of the way, Holmes and Schroder began the installation of the system in 2001. It was a job that would take three phases and three years to complete.

"We didn't want to do them all at once. We made sure each one worked and got the fire marshal to give final approval," Holmes says. "There was a fair amount of fine tuning that was required and that fine tuning is still going on." →

For equipment, Eagle relied exclusively on products from what was then Ademco and is now Honeywell Security. "Those Ademco panels are top-notch. We don't use any other," Holmes says. "We know the panels so there wasn't a learning curve."

At the heart of the Gilman Village installation were the Vista Series wireless commercial UL burglary and fire combination control panels that were new to the market in 2001. The panels communicated with 5808LST wireless smoke/heat detectors, 5809 series wireless heat detectors and 5881ENHC RF receivers. In total, the system would consist of more than 285 detectors and four panels (*see equipment list on page 56*).

It took several tries for Holmes and Schroder to establish a constant communication between the detectors and the panels. The detectors had to transmit a signal every few minutes to the main panel or the panel would register a trouble signal.

First, the two tried using repeaters, which amplify or rebuild a signal so it could be better received at the panel. After installing the repeaters, however, the signals still weren't being received. The two installers removed the repeaters and went back to the drawing board. "Let me tell you … repeaters don't work. They caused us so much trouble," Holmes says. "They aren't conducive to fire alarm systems."

That was when the two had an idea involving the receivers that gather the transmissions from the wireless devices. Usually, receivers are placed in the wall right behind the wireless device, but Eagle's installers decided to place those receivers on the outside of the building. When Holmes called the manufacturer with his solution, they expressed surprise.

"We were pushing the envelope. We knew it. The factory said it had never been done before," Holmes says. The novel solution proved to be the right one — There were no longer problems with lost signals when the receivers were placed outside. The receiver solution helped the two push the envelope even further in terms of the distance between detector and panel. While factory specs say the maximum distance is 150 feet, Holmes and Schroder were able to double that distance. "The factory calls us now!" Holmes exclaims.

Photo courtesy Jim Schroder, Eagle Systems & Security

A May fire damaged one of the buildings in Gilman Village, but the wireless fire detection system did its job and prevented much more extensive damage.

Holmes' advice to others looking to conduct a large installation of a wireless commercial fire system is to be sure to not only mount the receivers outside, but mount them high — not because of the fear of vandals, but because that increases the line of sight between detector and panel.

System Comes Through When Flames Threaten to Grill Village

The question of whether the wireless fire alarm system at Gilman Village works was answered this year while most of the village's patrons were asleep in the early hours of May 1.

The Iris Grill occupied one of the oldest buildings in the complex. New owners had bought the upscale eatery in March as their first business. Less than two months later, a single cigarette nearly burned their dreams away.

While fire officials don't know for sure the cause of the fire that damaged the Iris Grill, they think it started when a patron smoking outside threw their cigarette next to a bucket of flammable fat near closing time. Around 2:30 a.m., the combustible combination of cigarette and food waste ignited. The flames immediately went up the side of the building and sucked into a window on the top floor.

Before the system was installed, the fire would have gone on unnoticed in the middle of the night and would have had the potential to race across the property. Now, with the system in place, the Issaquah fire department was immediately alerted to the presence of flame and smoke at one of the Gilman Village buildings.

There was still a $500,000 price tag for damage, but that damage was confined to the side of the building and a part of the upper floor. Instead of the Iris Grill being out of business, repairs will allow it to reopen by the end of the year and Gilman Village itself didn't so much as close for a day. "All the money spent on the system was made up right there," Pilling says. "We have a much more secure feeling of safety than we did before."

The system still has its occasional problems, mainly from spent batteries. Holmes says the Gilman Village project will be a lifetime endeavor. He makes a point to get out his case once a year to replace each and every battery on the property and to keep up maintenance of the system. "I'm married to this rest of my life," says Holmes. "I don't think any other companies out there, especially big companies, hold peoples' hands like we did." ■