



## Into thin air — Why Silicon Valley Wi-Fi fizzled

*How community-based Wi-Fi faded away — and why Valley leaders won't let it go*

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**It seemed like such a good idea** — Internet for everyone, everywhere. So much so that cities across the United States announced plans for citywide Wi-Fi networks in an excited chorus starting in the early 2000s.

But in the last few years, most cities' plans to provide Internet access through a wireless network have fallen flat, deflated by shortcomings in technology and financial woes.

This spring, Silicon Valley became the latest casualty of the Wi-Fi flop.

In April, Internet-service provider Earthlink pulled out of Milpitas, part of a strategy to abandon the municipal-wireless business altogether. In May, MetroFi announced plans to pull the plug on Wi-Fi service to Cupertino, Sunnyvale, downtown San Jose, Santa Clara, Foster City and Concord. Those services went dark in June.

Throughout, Palo Alto has remained mostly on the sidelines, partially by intent and partially by chance.

The city's latest brush with Wi-Fi — a branded moniker for the short-distance wireless data transmission standard — came to an end this spring, when a business group working on establishing a Valley-wide wireless network, Silicon Valley Metro Connect, canceled plans to use Palo Alto as a test site in favor of San Carlos.

The city has historically looked at a different technology anyway, the super-fast cable service known as "fiber," of which it installed a roughly 40-mile network in 1996-98. The City Council will consider a proposal from Web firms to expand the fiber network at its July 7 and 14 meetings.

Yet Silicon Valley leaders insist wide-range wireless Internet continues to hold promise.

Bill Marion, Milpitas' information service director, believes Wi-Fi could help anyone who needs Internet "in the field" — from city inspectors to real-estate agencies. While Milpitas already has a smaller wireless system on main roads for its emergency vehicles, it is now considering using Earthlink's leftover equipment to restart a Wi-Fi network.

Wireless services could help machines communicate with each other — streamlining city and business functions, according to Seth Fearey, the vice president and chief operating officer of Joint Venture: Silicon Valley Network. Fearey's group is leading the Wireless Silicon Valley project under which Silicon Valley Metro Connect is conducting the San Carlos pilot.

And the ideal of the Internet as a great equalizer lives on in East Palo Alto, where a nonprofit coalition called WiFi101 launched a network of the same name in May. The WiFi101 network, they say, could once and for all bridge the "digital divide" separating residents from the benefits of Internet access.

While wireless initiatives nationwide and in Silicon Valley falter, local leaders are hesitant to let them fade. There is

hope here, and a search for better solutions, they say.

Citywide Wi-Fi access seemed brimming with potential a few years ago. Proponents said a free service, or at least one that offered both free and premium options, could help poorer communities reap Web-based benefits.

It would democratize the Internet, they said. Others dreamt of improved business or city services, or just offering residents another Internet provider. And simply put, the idea was downright nifty. While privacy concerns or doubts about practical implementation surfaced, many embraced the idea of ubiquitous Internet. In the evolution of the wired world, it seemed like the next step.

Yet citywide Wi-Fi ultimately fell prey to both technological and fiscal maladies, just like the adage that there's no such thing as a free lunch.

When governments from Philadelphia to San Francisco announced plans for municipal Wi-Fi systems circa 2004 they were hesitant to incur costs. So many brokered deals that saddled Internet firms with the task of building and running networks.

According to Rick Kitson, a spokesman for the City of Cupertino, the city's relationship to the firm was limited to one of "light-pole tenant." MetroFi rented poles on which to hang equipment, and the city paid nothing for the service, he said.

Sunnyvale had a similar set-up, with the business renting poles.

"It wasn't a partnership," city spokesperson John Pilger emphasized.

In such arrangements, it was up to the Internet firm to turn a profit.

Kitson said MetroFi tried several business models in Cupertino, including a home-subscriber service and selling advertisements to support its free service.

But this spring, MetroFi announced it was canceling Wi-Fi efforts throughout the Bay Area. News reports quoted Lucie Poulicakos, MetroFi's vice president of operations, as saying the company was considering bankruptcy.

Poulicakos declined to comment for this article, suggesting instead MetroFi CEO Chuck Haas, who did not return phone calls.

Behind the failure of subscriptions and advertising to sustain business lies a deeper flaw — the technology itself.

If Wi-Fi worked well over large metropolitan areas, perhaps it would attract more customers and advertisers. But it doesn't, according to residents and city officials.

One problem is the frequency on which Wi-Fi is broadcast, which — unlike old-fashioned analog television frequencies — is suited for short distances, Fearey said.

The architecture of a Wi-Fi network therefore relies on many transmitters relatively close to one another to blanket a given area, a structure called a mesh network. Some transmitters, known as nodes, aren't connected directly to the Internet server but rather relay the data to nodes that are.

The individual nodes, in turn, can be blocked from communicating with one another by tall buildings, hills or other obstructions.

This means Wi-Fi installed outdoors often remains outdoors, unable to penetrate thick walls.

Sunnyvale's brick library proved impermeable to MetroFi nodes despite two close-by installations, Pilger said. The city eventually installed its own Wi-Fi within the building, he said.

All these physical obstacles can make Wi-Fi service unpredictable — "a bit voo-doo," according to Solomon Hill, a partner in the East Palo Alto Wi-Fi effort.

In some cases, an amplifier can bring the Wi-Fi signal indoors — but that represented a surprise hurdle for Milpitas residents, according to Bill Marion, the city's information-service director.

People signing up for Earthlink's fee-based wireless service for about \$20 monthly hadn't expected the hidden cost of the \$100 amplifier, he said.

"A lot of people probably thought they could just open up their laptop in their house and everything would work. Well, not necessarily," he said. Many simply weren't familiar with Wi-Fi, accustomed to wire-based services such as DSL or cable, he said.

Earthlink arrived in Milpitas in 2006 and pulled out this spring, transferring its infrastructure to the city, which is considering what to do next, Marion said.

Finally, a basic practical concern lies at the heart of municipal Wi-Fi — does outdoor Internet service truly fill a need?

Web giant Google pays for a free Wi-Fi network in Mountain View as part of a five-year agreement with the city, set to run through 2011.

Resident Sam Sherman said he has trouble getting the Google Wi-Fi signal at home and hasn't tried it outside. Why?

"I prefer to be inside because there's air conditioning," he said.

Sherman is a barista at the popular Dana Street Roasting Company cafe, which already had a Wi-Fi network before Google's and doesn't rely on the Web firm's service to link patrons to the Internet, he said.

Daniel DeBolt, a reporter at The Mountain View Voice, the Weekly's sister paper, said he searched for people using the Wi-Fi network outdoors for articles on the Google service.

He couldn't find any.

Google representative Andrew Pederson cited a Google corporate-blog entry that said 15,000 different computers log on to the network monthly. The city has about 70,000 residents, according to a 2003 census.

Unlike MetroFi and Earthlink, however, Google doesn't need to profit from the arrangement. Pederson said the firm is driven by a desire to give back to the city — and the belief that more people online is better for Google, anyway.

In the wake of MetroFi and Earthlink's departures, city officials are wistful for what could have been.

"Any time a company like that fails to succeed, especially a local company, you know the people personally. It's very sad," Kitson said of MetroFi's departure.

Company leader Haas is a Cupertino resident and volunteers with the Boy Scouts, he added.

The city couldn't afford MetroFi's \$1,000-per-node or \$135,000 asking price to take over the technology and operate the network, so it will disappear for the time being, he said. But Silicon Valley being Silicon Valley, a new solution may not be far off.

"We're excited for the next technology and business model to come along because undoubtedly there will be [one]," Kitson said.

That model may have already arrived. Or such is the hope behind Fearey's Wireless Silicon Valley project.

A project task force of city officials, utility and sheriffs' departments and transportation authorities looked specifically for sustainability when it solicited for proposals in 2006, Fearey said.

"There's been a long history of wireless companies setting up all their equipment and then a year or two later they go out of business. So the criteria is a sustainable business model," he said.

Under that umbrella falls a variety of wireless — but not necessarily Wi-Fi — technologies, as well as the goal of serving businesses, rather than households, he said.

The nonprofit chose a proposal from a group of corporations calling itself Silicon Valley Metro Connect, whose members include Cisco, IBM, Azulstar, SeaKay and most recently Covad Communications.

The companies initially picked Palo Alto as a test site, but ducked out in March in favor of San Carlos because the city administration was already a Covad customer, Fearey said.

For the San Carlos trial, which is currently being set up, the companies are not solely relying on much-maligned Wi-Fi technology, according to Assistant City Manager Brian Moura. They will use WiMax, a longer-range technology, to connect Wi-Fi hotspots, he said.

But further technological details are murky, with Fearey and Moura saying they know little of the specifics and Covad declining numerous requests for comment.

Like Palo Alto's upcoming consideration of a fiber service, the San Carlos model will be commercial, Moura said.

"This is really about giving small businesses another choice. ... This is very much an economic development focus," he explained, adding it was a six-month trial.

The service will operate in an outdoor, square-mile business area, he said.

Fearey is confident the wireless will work out, someday. It is just too valuable an idea to go away, he said.

For example, wireless technologies that send only small bits of data in short bursts could streamline plenty of services, he predicted.

A soda machine could alert vendors when empty without an employee having to check it. Water or electrical meters could send the city their readings without a staff member having to visit.

"Once this initiative is in place, there's going to be an explosion of business and services that take advantage of it," he said.

Milpitas' Marion agreed.

City workers completing inspections would no longer need to fill out reports then upload them in separate steps if they could access the Internet in the field, he said.

Building inspectors, for example, spend about an hour at the end of the day putting their data online. If Milpitas' 12 inspectors could each save an hour a day, that would make 60 saved hours a week, he said. Put another way, that's one-and-a-half fewer employees for the city to bankroll.

When Earthlink vacated Milpitas, it left behind a \$1.8 million infrastructure — for free. The city put out a call for proposals on how to take advantage of it and got two offers, Marion said.

One is from Veraloft, which operates networks in Pacifica and Half Moon Bay and has partnered with WiFi101 in East Palo Alto.

The other is a joint proposal from Google and iNet solutions to form a nonprofit to operate the network, according to Marion. A review process involving the city attorney and council will take place next, he said.

Amid the pull-outs and uncertainty, one city is embracing Wi-Fi as a solution to social inequality.

In May, the WiFi101 network went live in East Palo Alto.

It's a city where only one in five families has a computer at home and even fewer have Internet access, according to a 2001 survey in the school district, Hill said.

On many days, the library is full of kids and an occasional adult jostling for space at computer terminals.

For students and city residents, the Internet-as-equalizer concept — now more idealistic than necessary in many communities — is a bare reality, according to Hill.

"We're in the middle of Silicon Valley [and] ... the economy is now online. If you don't have access you're going to be cut off," he said.

Hill knows other networks have fizzled. WiFi101 won't, he said.

The network is operated by a consortium of nonprofits, including the Ravenswood City School District, where Hill is technology director; One East Palo Alto, a longtime community-betterment group; and career-focused JobTrain, among others.

They are working to not merely run a Wi-Fi network — but create a self-perpetuating wireless culture, according to Hill.

The consortium, also called WiFi101, will operate a technician-training program for young people, primarily through JobTrain. Those trainees will then become the technical-support staff behind the fee-based service WiFi101 offers to residents and businesses. Without tech support, the network is free to all comers. With support, it costs \$15 monthly for individuals and \$50 for businesses.

The network is currently funded by a three-year grant from California Emerging Technology Fund, a matching grant Hill and others must fundraise to meet. They are hoping the training and support service will provide money in the long run, Hill said.

In addition to the sustainability plan, the technology powering WiFi101 will help it surmount hurdles other networks have stumbled over — literally, he said.

Rather than a node-based mesh network, Wifi101 is powered by high-performance antennas, he explained.

The antennas, made by Altai Technology and costing about \$10,000 each, are installed on school buildings, tall buildings — and even the Four Seasons Hotel, which lent a patch of roof for the cause, he said.

The city is relatively flat with only a few tall structures, so the antennas shouldn't have too much trouble, according to Hill. And if the signal has trouble penetrating walls, residents can purchase an amplifier for as little as \$60, he added.

The only area where the signal may have trouble reaching is near the Palo Alto border in the baylands, where the group has yet to find a suitable place to install an antenna.

Hill was in high spirits when talking about the network, perhaps the final key to bridging the so-called digital divide for his underserved community.

But as with so many other Wi-Fi schemes, this one isn't proceeding without a few clouds on the horizon.

The server had already been slowed by the number of users as of early June, Hill said. Even without advertising — the group wants to first finish installing the network over the next two months — 424 users had used it, in addition to the 50 or so private users, according to Stuart Jeffery, who is also working on the project.

"We're starting to sort of wonder how much bandwidth we're going to need. ... We're already maxing out the connection," Hill reflected. The consortium hopes to find a corporate partner to donate bandwidth, he said.

And a Weekly test of the network failed to find and sustain an Internet connection at several points within the city, including near antennas at City Hall and Costaño Elementary School.

Ultimately, the East Palo Alto network resembles other Wi-Fi networks in Silicon Valley — full of potential yet marked by uncertainty. It is unclear right now whether WiFi101 can bring Internet to the people.

Or whether the Covad-consortium can successfully woo small businesses in San Carlos.

Or whether the plan Milpitas picks will work out in the end.

But one thing is certain. The sun hasn't set on municipal Wi-Fi yet, at least not in Silicon Valley.

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