

## It's the Law in Loma Linda:

# Mandatory Fiber and In-House Networks

An interview with Loma Linda's W. James Hettrick, Director of Information Systems

By Steven S. Ross ■ *Editor-in-Chief*

**T**he Loma Linda Connected Community Program is one of the few municipal Fiber-to-the-Home (FTTH) programs in the United States that is wholly run by a city rather than by a public utility district (PUD). In accordance with a 70-page set of detailed specifications, any new residential unit, or an old unit modifying more than 50 percent of its square footage, must contain wiring designed to bring broadband to all living spaces. Just as they must provide roads and utility infrastructure, developers of new subdivisions must now lay fiber to the units and provide space for the city to install its customer premise equipment. The average cost is \$3,500 per unit.

The visionary leaders behind the Loma Linda initiative are Dennis Halloway, City Manager, and W. James Hettrick, Information Systems Director.

According to Mr. Hettrick, "what's exciting about this is that the communication infrastructure of the U.S. is going to change in a revolutionary way in the next few years. Cities have an opportunity to do something about their role in this new environment. It's not generally seen as a necessity today, except for within certain communities, and cities have an opportunity to make a decision about how much they're going to be in control of that infrastructure.

"So they have a choice: They can decide to own their own infrastructure so they can wholesale or provide services over it, or they can continue to deal with the current situation where they must ask what they are allowed to do. I'd like those communities to have an opportunity to say what kind of infrastructure is put in,

so that they have some say over what kind of services they can provide later. It's pretty tough for cities to re-negotiate with the telcos after they put in their infrastructure and system. The telcos then see them as a revenue source rather than as a partner. After that, it becomes very difficult for cities to do the kinds of things that they may want to do."

### Q. Can you describe Loma Linda?

A. We're a city of 20,000 in a region of about 4 million people. There are about 8,000 residential units inside the city limits. With new developments, we'll be adding another 8,000 units within the next five or six years. In the next year we'll be adding 1,000 units and then it will kind of springboard from there. In 3 to 3 1/2 years we'll have 5,000 new units, and then the other 2 to 3,000 units will probably roll in within the next 2 years or so after that.

### Q. That's obviously fast growth. What kinds of people are moving in?

A. It's an interesting mix. We have the Loma Linda University Medical Center and Loma Linda University. We also have the Jerry L. Pettis Memorial VA Hospital, the Loma Linda Children's Hospital and the Loma Linda Community Hospital. So within about a two square mile area, we have four large hospitals and a large, prestigious university. We're drawing professional/technical people to the new housing. The new residents are also typically younger families with first time homebuyers. Ethnicity is all over the

place; there isn't any one group that's dominant.

### Q. Does this keep the population younger than it otherwise would be?

A. It's actually a pretty great mix. Loma Linda is also a retirement community, especially for the Seventh Day Adventists. The Adventist community is tied to the medical center and when they return from their missionary work they retire here. They're very educated and worldwide.

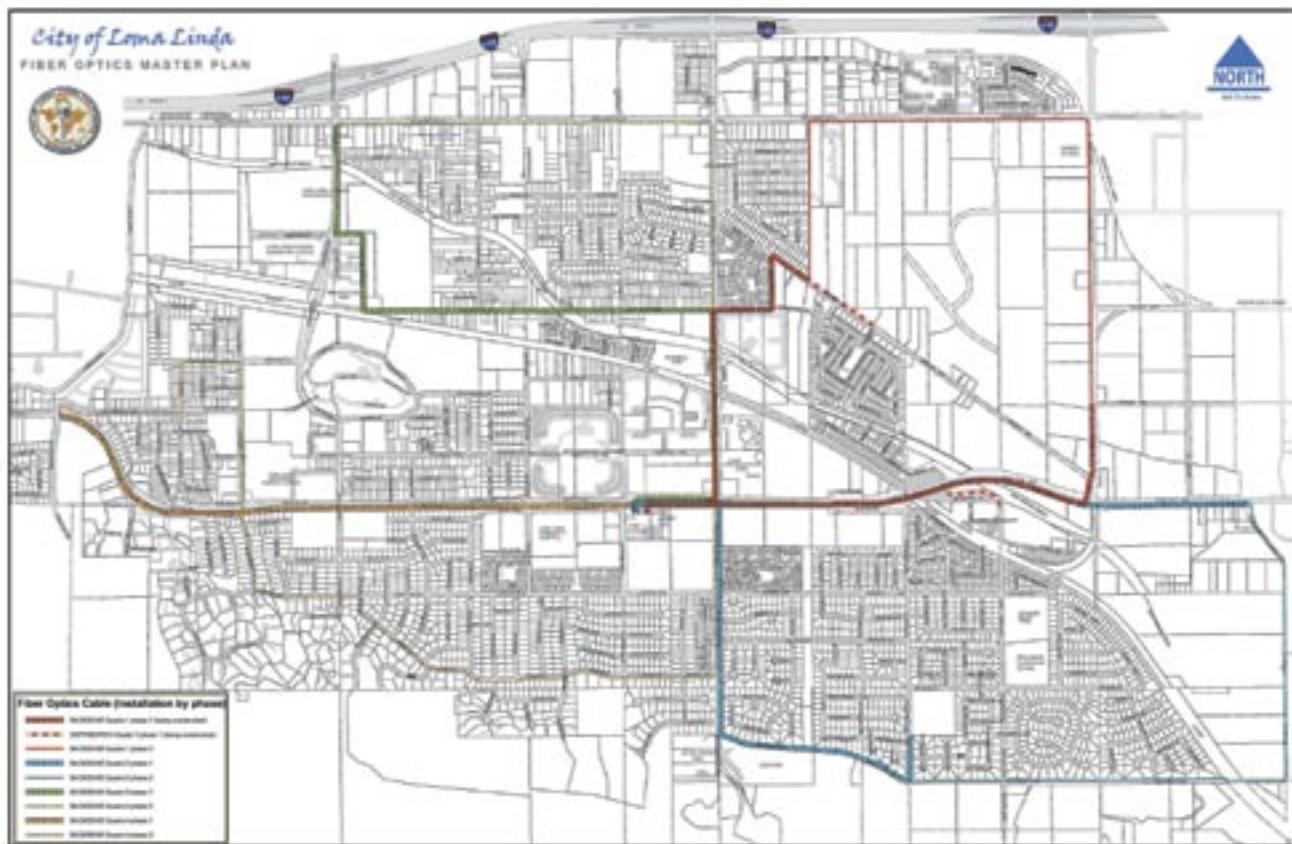
### Q. How big are the new homes?

A. The majority are three bedrooms and up. The low end now is \$300,000 for an 1,800 sq. ft. home on a 3,500 sq. ft. lot, all the way up to an 8,000 sq. ft. lot with homes ranging from \$700,000 to \$800,000.

### Q. Is there much MDU development or is it all freestanding singles?

A. There are quite a few MDUs. On the books right now we have between 1,200 and 2,000 apartments in the planned area. We also have normal lot size traditional housing tracts in the style of the 70s and 80s. And we have new smaller high-density tracts that are kind of on the verge of being town homes. So there's a good mix.

### Q. Is there any particular part of town that's going up more or less quickly?



*Loma Linda fiber master plan. Most new development is taking place inside the red fiber loop in the northeast. The area inside the blue loop is mostly developed.*

A. The map shows our fiber optic backbone. The quadrant with the red ring is where most of the new development is going to happen. The blue quadrant is mainly built out and there are some commercial sites that are off to the east side of town.

**Q. What are the developers like? Do you have relatively few developers doing all the work? Or is the market fractionalized?**

A. We have a wide variety of developers. We have some who are specifically doing the conceptual designs, and buying the land and selling it off to other builders. Ryland Homes was our first builder. The second was American Pacific and they have about 300 units planned. And there's Richman American, TriMark, AGS, The Spanos Companies and others.

**Q. Is there much in the way of rentals or is the housing mostly owner-occupied?**

A. Some people are buying new homes and renting them out for student housing; there is a shortage of student housing. Loma Linda is job-rich and housing poor.

**Q. How would you compare Loma Linda's density to that of the surrounding region?**

A. We are at the lower end of density in the region, although some people are concerned a little bit about all this development because they sense it coming. We understand that is natural. Change is difficult, but even with the forecasted development, our density should not exceed that of the region in general.

**Q. Let's turn to Loma Linda's new rules on broadband. The ordinance I downloaded is only one paragraph [see box].**

A. The ordinance references a construction specification. The spec is about 70 pages long. The spec is unique in that it calls out all the different types of regulatory standards that have to be met as well as the ways to meet them. We specify products they can use, as well as qualified vendors and implementers, thereby building a bill of materials and a scope of work to preclude deviance from the specifications. We did that to both promote adherence to the specifications and to provide needed cost relief to the builders by purchasing in quantities. Substitutions can be requested, but they must meet quality standards in order to be accepted.



*Distribution center mandated for the master bedroom closet.*

### Q. When did the ordinance pass?

A. We went through the process of doing a resolution first. The resolution passed as a building code revision, December 16, 2003. In October of 2004 we adopted it as an ordinance.

### Q. In California, do you have to coordinate with the state or county or can a community just do that on its own?

A. A community can add to the building code via ordinance, within its city boundaries, without other approval. We cannot add it to the official building code but it is an ordinance that becomes part of our conditions of approval for a development.

### Q. Was there any memorable event in the fight for passage?

A. Our first developer, Ryland, really questioned whether it was justified. They brought their consultants from GTE who had experience with Smart Park installations in the past [serving broadband-enabled office and industrial complexes]. We basically stepped up and answered

the questions that the council had about fiber, wireless and the future. The developers were concerned that we would not have connectivity when their units were available. Their biggest concern was “if we built this would we be able to use this right away, or is this just something that would sit vacant?” We made the commitment that we would have the network live for the first homeowners, and we met that obligation.

### Q. This developer, is it a group that builds a wide range of housing? Low-, middle-, or high-end?

A. Medium. It’s not low-end and I’ve seen a lot more expensive.

### Q. In terms of prices?

A. Between \$300,000 and \$650,000.

### Q. How big a development in terms of units did you start with?

A. We started small. We had a 50-unit development that was too far along in the process to fairly be required to adhere to the new building ordinance. That being said, they saw the value in the model to install conduit for future connectivity. Currently Ryland Homes (200 units) is under construction and shortly joining will be American Pacific (300 units), Richmond American (101 units), Tri-Mark (40 units), and AGS (a 300-unit MDU). We also have about 3,000 acres of open space.

### Q. That’s buildable open space?

A. We’re debating that issue. Our South Hills have open space because technically you could grade and build on some of the land. The question is do we want to sacrifice any of our trail systems. It is a classical debate between private landowners and public use. Also it is important to note that Loma Linda is a “walkable city.” This philosophy has been around for about many years. For example there are over 2,000 members

in the local walking club, many of whom use the trails located in the South Hills.

### Q. Was there any particular person in the community that you want to point out who pushed this?

A. The City Manager, Dennis Halloway. It started out as his idea to provide great Internet connectivity and enable smart home technology. At a council meeting a developer was presenting plans to build apartments and was focusing his presentation on smart home technology to be included. A city council member turned to the staff and said “I think we ought to *require* that for all new developments.”

### Q. Have you had any negative feedback in the year or so since?

A. No. Once developers recognized the perceptual monetary value of having a wired home, there have been no problems. In marketing and sales everyone seems happy. The only negative aspect is actually that we are having trouble keeping up with demand in terms of being able to satisfy public interest, mainly in the overbuild areas.

## What Homeowners Get

### Q. What does the 70-page specification cover?

A. It covers what pieces and parts to use, where they belong, a site plan, a fiber splice plan, a home data drop plan and everything else. We put together a bill of materials and are there to assist them.

### Q. Are there any changes pending in either the ordinance or the specifications? Is there anything that’s come up that you want to fix?

A. The specification declares itself to be a living document. Therefore we in theory have the ability to modify it midstream and impose the modifications on a developer. Of course, our relationship with a developer is based on faith and a win-

win strategy. So we usually don't enforce any changes that have occurred after they reach a certain threshold. But we'll find every so often, that we'll get feedback from a developer or service providers and we then integrate those changes.

We have a residential cabinet made by Ortronics that goes in between two studs in a wall in the master bedroom closet. In that box there's a 14½-inch rack mount system for all the patch panels. Every living space has two Cat 6 connections, data jacks, and a patch box, with two in the master bedroom and the primary living space (either living room or great room). All the connections go back to that cabinet.

The two data jacks mean everybody has two 16-port patch panels and one patch panel that lets them do their line appearances the way they want throughout their house. That's what's specified in the document. We have some other optional stuff they can put in there, for instance a high rig power strip that bolts in, a coax splitter, a 16-port switch, a SOHO fire-wall provided by WatchGuard.

**Q. What happens when the developer comes back to you and says your list is all well and good but what about this new development, this new technology her kid noticed?**

A. When it happens, we say "give us the literature on it and if we deem it of better quality we'll be happy to review it."

**Q. Or cheaper?**

A. Absolutely. As I said, if you can get something to meet the specs, of the same quality, cheaper and is easier to use, we would be fools not to consider it. It is important to note that the products and implementers we have specified provide a 25-year manufacturer warranty for the homeowners on the structured cabling system in the house, for the fiber in the right of way and throughout the development. These partnerships and the warranty mean that the cabling in-

***Studies have shown that homes wired with fiber usually sell for \$4000-\$14,000 over those without fiber.***

frastructure is covered from the house to the curb, providing the homeowner with peace of mind.

**Q. A lot of people talking about putting in fiber say it's in part to preempt the satellite dishes. They can't ban the dishes under federal law but they can reduce the demand.**

A. We believe that fiber will to win out in the minds of the people because it will be able to provide a greater array of services with more features. However, we didn't want to put users in a box, having to buy a service because it's the only one they can get or easily use in their home. So at the side of the house we required network connections for both copper and fiber. In fact, we include in the spec a conduit that runs from the wiring cabinet to the attic to allow users to more easily connect satellite feeds if desired.

**Other Communities May Join**

**Q. Were there reactions from nearby communities?**

A. In some, their administrative people have said that if we get close to their town with our network, they'll just tie into us. I said we would be happy to do that. At Loma Linda we're either leasing the network out or adding value with our own services. We'd love to be a wholesaler, but we're still in the process of negotiating a contract for the service providers, so we have to do it ourselves for now. And that's why we're providing strictly data services.

**Q. Isn't your cost lower because so much of the construction work is done by the developers?**

A. True. It's built by the developers to our

specifications just like the streets, water, sewer and storm drain system. After completion they deed the infrastructure over to us; we then must maintain it forever. Once it's available to us, we put in our active gear and serve their buyers. They, of course, market their homes in this region as unique. On a side note, studies have shown that homes wired with fiber usually sell for \$4000-\$14,000 over those without fiber.

**Q. You're Ethernet all the way I gather.**

A. Yes, we're active all the way, up to 100 Mbps to the house.

**The Beginning**

**Q. What happened to the first developer? You had trouble serving?**

A. We had a timeline issue. The developer suggested we wouldn't get our network in place by the time they built. We bought free space optic units from Corning and for the initial phases the first few people ran on those until we got our fiber backbone built. We had some really engaged first customers. We offered a free month of service and they became our beta users, telling us what was going on; they were very accommodating.

**Q. Are the FSO units still running?**

A. No. We pulled them down and stored them. We realized we're going to use them again. Sometimes development happens in spurts. The city can use them to fill a similar deployment timeline gap in the future.

**Q. Having an active network helps you there too.**

A. Oh yeah. We love the active model because there are so many services we believe we're going to be able to provide. But, the way we designed our ordinance and the way we built our network it can very easily support PON.

**The Cost Issue**

**Q. Any estimate as to how much the mandated equipment adds to cost of the unit?**

A. Yes, around \$3,500 is the number we use as our estimate.

**Q. How much of that is inside stuff and how much is outside plant?**

A. Inside, we figure it's between \$2,500 and \$2,700 for the structural cable, wire, and labor. The rest of that is the fiber on the outside. That doesn't include some things that would have to be done anyway, such as trenching costs.

*The developers who have been putting those projects together into suites for office buildings and medical buildings like broadband. And for residential, buyers are very excited about it because it offers them the opportunity to work from home.*

There are additional costs. Developers build a minimum 10 x 10 usable space with four 30-amp circuits and two 2-ton air conditioners with dedicated power. We require them to put two 8-foot racks inside that room, and we can probably serve close to 1000 units in a room that size very easily. There's enough room in there to add a third rack if necessary.

**Q. Where are they normally putting that room?**

A. The first developer built it into the community pool center. We met with them and raised the floor of their pool building six inches with concrete so it's above everything else and will never get wet.

**Q. Where else have people been putting these things; not everyone is going to be building a community center.**

A. In developments where a structure like a community center is not available, they're being placed in parks or larger right of ways where they blend in naturally with the cohesive nature of the development.

**Q. What about commercial development?**

A. The positive feedback from that is probably the greatest we've had. The developers who have been putting those projects together into suites for office buildings and medical buildings like broadband. And for residential, buyers are very excited about it because it offers them the opportunity to work from home.

**Q. Can you talk about what your plans are for the future in terms of service providers?**

A. Obviously the big question. As a small city we have had a hard time drawing a huge interest. Reality is that it will take someone with the FTTH vision to come in and displace the incumbent providers for phone, video and data services. On

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that note, there are several service providers that are interested. Some from Europe desire to create a foothold into the US market using a smartly designed, preexisting infrastructure.

**Q. Who are the existing providers in the area?**

A. Adelphia for cable, and Verizon for phone. Both provide Internet services.

**Q. Do you feel Verizon has been a positive force?**

A. They're curious about the ordinance. They brought their FTTP staff and attorneys to investigate. When they saw that we were not going to impede them and that actually we're going to enable them to provide better service inside the house with our structural cable plant, it satisfied them.

**Q. For the \$3,500 is there a feeling among the developers that they're recouping that from the customers?**

A. Yes. Developers are making more money than they projected. The market here is strong and the value is apparent. What Loma Linda has done is the logical next step, mandating infrastructure that others have not been willing to commit to.

We found that it's imperative that every city department is involved at some level. So unless you have the ability within your city to pull people together to do something like this it's going to be difficult. ♦

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## Loma Linda's Unique Broadband Ordinance

15.54.010 Connected community program – Participation in program.

In recognition of the need to provide local residents and businesses within the community with additional options to meet their telecommunications needs, as adopted by city council resolution, all new development projects within the city, regardless of whether such new development falls within the fiber-optic master plan area, and additions that exceed more than fifty percent of the original structure that fall within the fiber-optic master plan area, will be required to participate in, and will be bound by, the connected community program and all conditions and requirements contained therein. Further, any conditions or requirements of the connected community program may be required as a condition of approval of any such new development or addition exceeding fifty percent of the original structure. (Ord. 629 § 1, 2004)

## Major Suppliers

**Ortronics** – Cabinets, racks and components

**Berk-Tek** – Cat 6 components

**Corning** – Fiber and related equipment

**Allied Telesyn** – Residential gateways, network gear and NMS

**Alpha Technologies** – Power equipment

**Anixter** – Distribution

**John Griffin Construction** – Plant and underground construction

**WatchGuard** – Headend firewall, optional SOHO firewall.

## Services Offered

Loma Linda plans to provide not only high-speed Internet access, but voice and video services as well. Right now, it is providing only data services. The monthly prices for symmetrical broadband are:

5 Mbps, \$29.95 residential, \$99.95 commercial.

10 Mbps, \$49.95 residential, \$199.95 commercial.

15 Mbps, \$99.95 residential, \$299.95 commercial.

Loma Linda offers a static network address for an extra \$20 per month, so that residents can provide services such as hosting their own web site from their location. It also offers a block of addresses for an extra \$30 per month.

Loma Linda also offers a collocation facility for Internet-based businesses.