



## Case Study

# City of Beaumont, CA - Case Study

## Background

Located in the beautiful San Geronio Mountain Pass in Southern California, City of Beaumont provides the very best of rural beauty and charm, combined with planned growth and abundant recreational opportunities. City of Beaumont is three quarters of the way between Los Angeles and Palm Springs and has a current population of about 16,000.

Back in early 2005 Brian Modrak, the Information Systems manager at the City of Beaumont was facing a number of challenges. Their 2 main sites: City Hall and the Police department were connected using a leased T1 line and the limited bandwidth was not enough. "Users were constantly complaining about network timeout and latency" remembers Brian. "Dealing with the bandwidth limitation between the two sites was hampering everyone's work at the City".

The IT department was challenged to find the best and cost effective solution to upgrade the network speed between the two main sites.

## Challenges

### High Bandwidth

The City needed higher bandwidth, 4-10Mb at a minimum. They have 50 users at each location and with plans for overall rollout of VoIP and additional security cameras increasing bandwidth was critical.

### Security

Since this connection between the two sites was going to carry data traffic from the City and Police Department it was critical that it will be very secure.

### Cost

The solution needed to be cost effective

The IT department hoped to complete the project with minimum interruption to all the other departments at the City.

## Solution

Todd Macfarland the president of TMac Consulting suggested to the IT department to consider Free Space Optics (FSO) as a solution. Todd has been working with MRV as an integrator for a number of years and had successfully deployed FSO for other customers. Todd was well aware of the advantages of this technology and realized "it was a perfect fit for the City's requirements".

## What is FSO?

Free Space Optics (FSO) is a wireless technology used for point to point connections. It is using lasers to send information similar to fiber optics communications. However, instead of using fiber cables, FSO sends the information through the air.

[FSO provides a communication link without having to lease or deploy cable infrastructure. Furthermore, this technology does not require a license from the FCC. Additional benefits include quick deployment and high capacity of 1.5 Mbps to 1.25 Gbps. There are many applications to FSO including campus networks, backup support, last mile, and disaster recovery.]

After studying the MRV FSO solutions the City decided to deploy a pair of 100Mb units with an integrated RF backup. The distance between the two buildings was a short 200 feet and because the IT group wanted 99.999% (Five-Nines) availability they also installed an RF radio backup. The 100Mb FSO link acts as the main link and the 11Mb RF radio is the backup connection. This is extremely reliable because FSO is susceptible to interference from FOG but not to rain and the RF radio is susceptible to rain but not to fog.

Connecting City hall to the Police Department at high speed allowed the IT people to create one main data center at the PD. They were able to move the servers from City hall to the PD without hurting performance. Since the PD building provides the best possible physical security all servers were relocated to that building. Consolidating the two server rooms they had into one also made maintenance simpler.



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### Alternatives

The obvious alternative was to lease additional T1 circuit for data between our City hall and PD. This option turned out to be too expensive and with not enough bandwidth.

“The other alternative we considered was pulling fiber cables between the buildings but that meant closing the street for traffic while trenching” said Brian. That option was not favored by many at the City. “How can we expect to shut down the main road leading to the police department?” This street is also used by school buses driving kids to school and trenching would interfere.

That led them to focus on a wireless solution. FSO was one option but 802.11 radios seemed like a good alternative. But after carefully studying this option the IT staff concluded the bandwidth from 802.11 radios was not sufficient. It would probably be a good solution for just the voice portion but loading it with voice, video and data would be too much. And security was another big issue.

FSO was chosen because it offered the best alternative. “Since it’s a wireless technology we didn’t interrupt anybody’s work for even a single day. Additionally we can always relocate the link with little to no hassle.”

Towards the end of the year the city plans to relocate the Police Department to a different building. “If we had gone with fiber the cost of installing it would be lost. With FSO all I have to do is make sure I have power and fiber to the roof. Connecting the new building to the network is going to be very easy and will require only a minimal expense.”

### Success

“The FSO link helps us save about \$1000 a months. We used to pay \$300 for the T1 we had but because that wasn’t enough bandwidth we were going to lease another Data T1 that would have cost us \$700.”

“The FSO has given us much more bandwidth than we could have ever afford leasing T1s. having that expanded bandwidth opened up the door to many new services we never thought of”. The city is now adding security cameras so that they can monitor city hall

and having a big pipe is critical for real time video.

In the future they will use their FSO link to connect their VoIP phone system and also for their disaster recovery site and have two redundant networks.

“And the complaints we had to deal with regarding the slow network.. The day we turned the laser on those problems were gone. No one says to me anymore: the network is too slow”

“Other than the fact that it saved us costs and improved productivity we like it because we like to talk about it. It’s a cool device. We tell our vendors that we have a laser and all of them want to see it.”

City of Beaumont is located in a corridor crossed by the Santa Ana winds. The FSO units are being frequently hit by winds at speeds of 80-90 mile an hour. We have not seen any drop in performance even during the strongest winds.

The ample bandwidth provided by the FSO gives the city room for growth without any cost. Redundancy for VoIP, Server redundancy,

“Performance is at the highest rate out there” says Brian. It’s phenomenal and is close to perfect as possible” We are very happy with these units. It opened up doors to opportunities we never had as IT people.





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MRV has more than 50 offices throughout the world. Addresses, phone numbers, and fax numbers are listed at [www.mrv.com](http://www.mrv.com). Please e-mail us at [sales@mrv.com](mailto:sales@mrv.com) or call us for assistance.

**MRV (West Coast USA)**  
20415 Nordhoff St.  
Chatsworth, CA 91311  
800-338-5316  
818-773-0900

**MRV (East Coast USA)**  
295 Foster St.  
Littleton, MA 01460  
800-338-5316  
978-952-4700

**MRV (International)**  
Business Park Moerfelden  
Waldeckerstrasse 13  
64546 Moerfelden-Walldorf  
Germany  
Tel. (49) 6105/2070  
Fax. (49) 6105/207-100

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