

# CASE STUDY

## CITY OF GARDEN GROVE

### CHALLENGE

The City of Garden Grove needed a secure high bandwidth point-to-point solution to connect its police and fire substations to a database at City Hall. Wired solutions were unavailable or involved high recurring costs. The city's initial wireless solution would not function as advertised in an urban non line-of-sight environment.

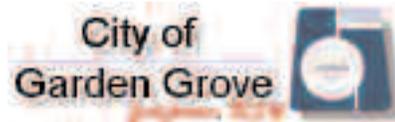
5G Wireless provided a complete solution with a Base Station mounted atop Garden Grove's City Hall along with 20 CPE units spread around the 18 square mile city. The city achieved non-LOS point-to-point shots of over 6 miles in an urban environment that featured significant RF noise. Cost savings were both immediate (replacement of a \$7,000 per month local tape drive backup with an automatic backup server located offsite), and long-term (operator-owned and re-deployable equipment that avoids a nearly \$50,000 annual T-1 rental cost). The solution is both expandable (up to 1,072 simultaneous users at the maximum data rate), and portable, should the connections need to be moved. Subsequently the City of Garden Grove has also begun alpha tests of a roaming Wi-Fi solution for real-time police vehicle communications.



Garden Grove City Hall



G-Force™ Base Station



Located in Orange County, California, the City of Garden Grove is home to over 169,000 residents. It is a thriving and diverse small city at 17 square miles. Garden Grove operates a coordinated network of police and fire stations

throughout the city, though in recent years it had been unable to provide affordable broadband communications between these stations. Frustrated with the cost of wireline proposals, and disillusioned by the inability of wireless providers to deliver the results they promised, the City of Garden Grove was desperately seeking a viable broadband point-to-point connectivity solution in the fall of 2002 when it first came across 5G Wireless.

The need for broadband was driven by a desire to transport volumes of police and court documents between City Hall's main servers and PCs at the police and fire stations. The city had also been using an expensive temporary tape backup system because City Hall was zoned as a flood plain. Broadband connectivity would allow data backup off-site on a continuous and lower cost basis.

The City of Garden Grove began seeking broadband solutions in 1999, looking at DSL and cable options. The city's cable company did not offer commercial service at that time and the DSL offering was more expensive on an annualized basis than a dedicated T-1 line installation. The T-1 line required a \$1,500 per site one-time charge plus a \$200 monthly recurring charge, resulting in a \$78,000 cost for year one and \$48,000 annually thereafter. Believing this recurring cost to be too high, the city's IT manager, Charles Kalil, turned to wireless solutions as the technology matured. In 2001, the city began testing a fixed wireless solution that promised a 5.8 GHz point-to-point link for all 8 bridges. This approach failed, making only two of the connections at sub 1 Mbps speeds.

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Mr. Kalil went back to the cable company. Knowing they did not have an available product of their own, the cable operator recommended 5G Wireless.

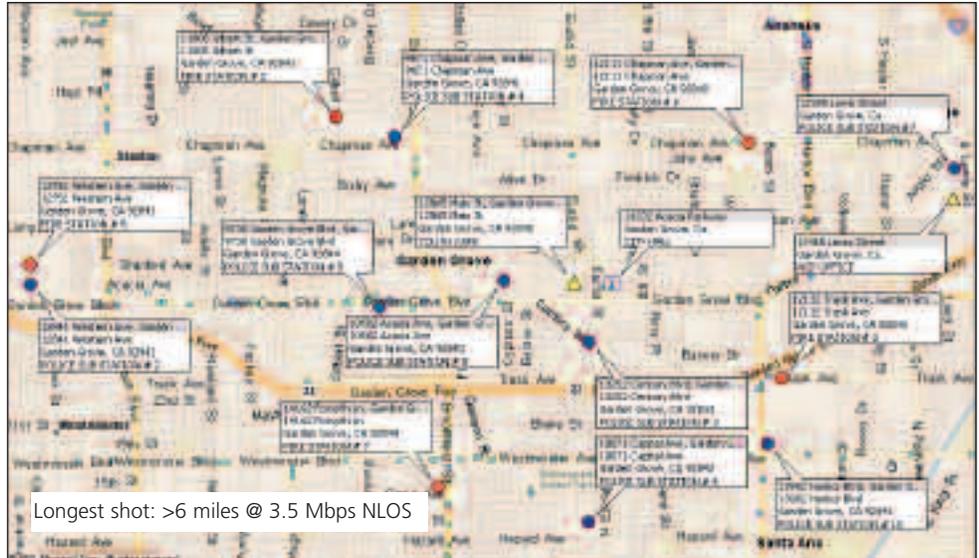
5G Wireless arrived in September, 2002, starting with an on-site survey of the locations Garden Grove wanted to connect. At this time the Garden Grove IT group was highly skeptical of wireless solutions, finding that datasheet specifications differed considerably from field performance among wireless solutions. The city instituted a new requirement for trial efforts with all new wireless suppliers under consideration.

All of the first six connections would have to be made at a minimum data rate of over 1 Mbps full duplex. Many of these connections were prohibitive for line-of-sight equipment, with average distances of 3 miles, and natural and man-made obstacles such as pine trees, buildings, and freeways in the path; hence the reason for the 5.8 GHz equipment failure. 5G Wireless made all six shots at rates between 3 and 4.5 Mbps full duplex.

Non line-of-sight connectivity at extraordinary broadband data rates was not enough to win over the City of Garden Grove however. Secure communication was another primary concern. The city was sending sensitive documents between city hall and the local police substations, and the data security plan had to be approved by the Department of Justice.

5G Wireless' compatibility with the city's 128 bit Open Source based encryption coupled with 5G Wireless' unique Media Access Control (MAC) authentication scheme complied with the Department of Justice requirements for network security. Once D.O.J. approval was gained, 5G Wireless won the contract to equip the remaining 14 sites that complete the city's municipal network. The network currently includes over 150 computers accessing the same Base Station at city hall, obtaining the maximum data rate simultaneously. Future plans call for additional simultaneous users to be supported via the same central access point.

The City of Garden Grove began its relationship with 5G Wireless with a healthy amount of skepticism having been disappointed by wired solutions, and misled by other wireless provider's solutions that fell far short of their spec sheets. Today, Garden Grove is delighted with the performance of its installed point-to-point network having achieved what no one thought possible. After a year of service, the city has had one downtime incident over the entire 5G Wireless network, amounting to 2 hours of total downtime for the year.



Garden Grove Site Map for first 11 PTP connections

Garden Grove IT Manager Charles Kalil is enthusiastic about 5G Wireless' solution. "We're getting three times the speed of T-1 at dialup prices. Frankly, I cannot see why anyone would make remote point-to-point connections any other way given 5G Wireless' advantages in speed and cost. We are replacing all our T-1 connections with 5G Wireless products now."

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