

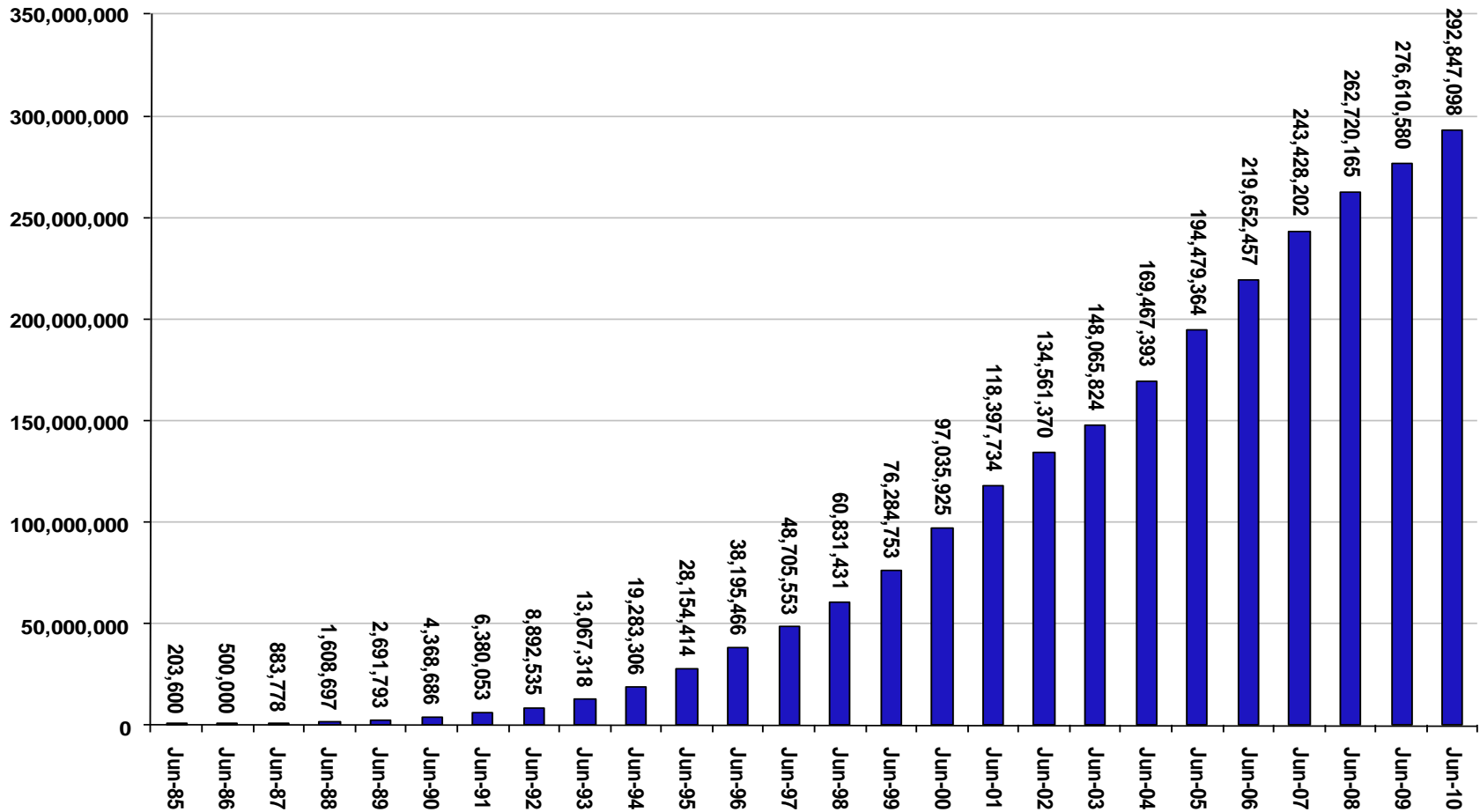


AT&T Wireless Briefing Oakland Planning Commission December 7, 2011

- Overview of the current wireless environment
- Methodology of site selection
- Presentation of deployment alternatives

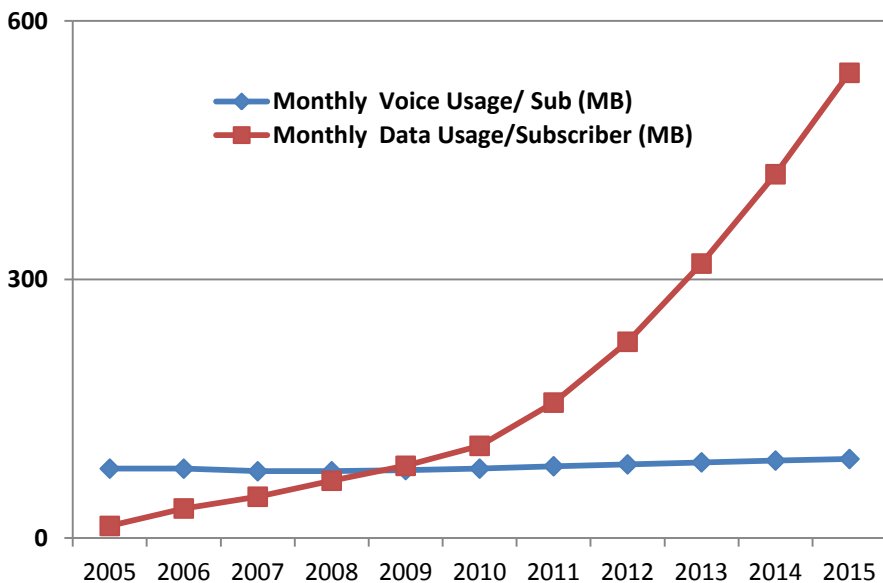
A picture is worth 1,000 words!

Midyear 2010 Wireless Subscriber Connections

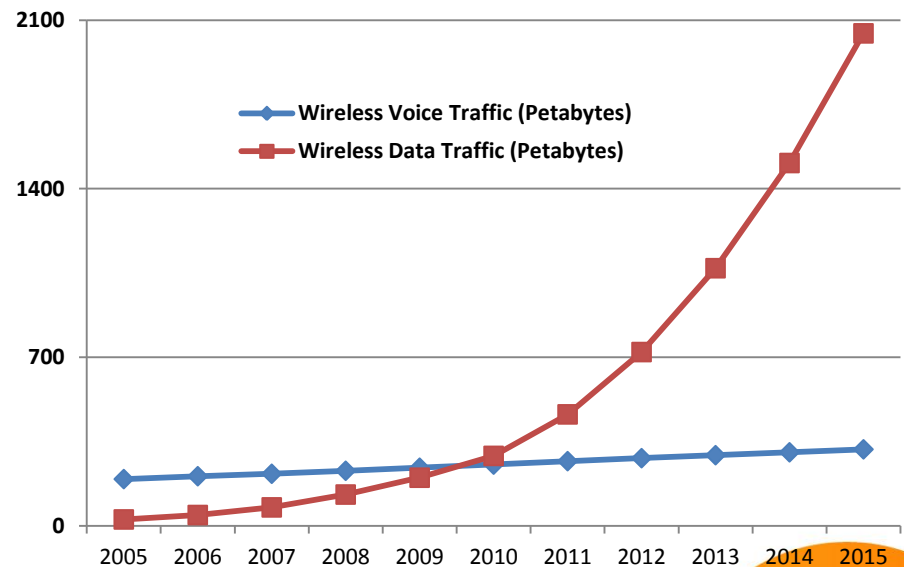


Consumer experience is changing - Industry forecasts show exponential growth in data usage, while voice stabilizes.

- Consumers are increasingly switching to smartphones and emerging devices that require ubiquitous access to high speed wireless networks



Source: Frost & Sullivan Industry Forecast



The Wireless Revolution - At Home

- Consumers want broadband **to the person** and **to the home**, wherever & whenever they are.
- 24.7% of American homes are **wireless only**.
- Among all wireless-only adults, the proportion over age 30 has steadily increased.
- Parents want to stay in touch with their children, whether by text or voice communication.
- Wireless service isn't magic – it requires infrastructure placed in proximity to wireless customers.



The Wireless Revolution - At Work

*Businesses are increasingly **dependent** on strong **wireless services***

- Mayor Quan has identified Economic Development and Job creation as key issues for moving Oakland in the right direction.
- Oakland is home to a few big businesses, but the majority of our business sector is comprised of small businesses that need to be supported. (Approximately 85% per OMCC)
- 65% of small businesses said they could not survive – or it would be a major challenge to survive – without wireless technology. * AT&T Small Business Technology Pole (March 2010)
- Smartphone's comprised 45-50% of all handsets sold in the U.S. during the 3Q 2010, a 90% increase from the previous year.
- Lines have blurred between where people live and work.



Consumers rely on wireless *especially* during an emergency

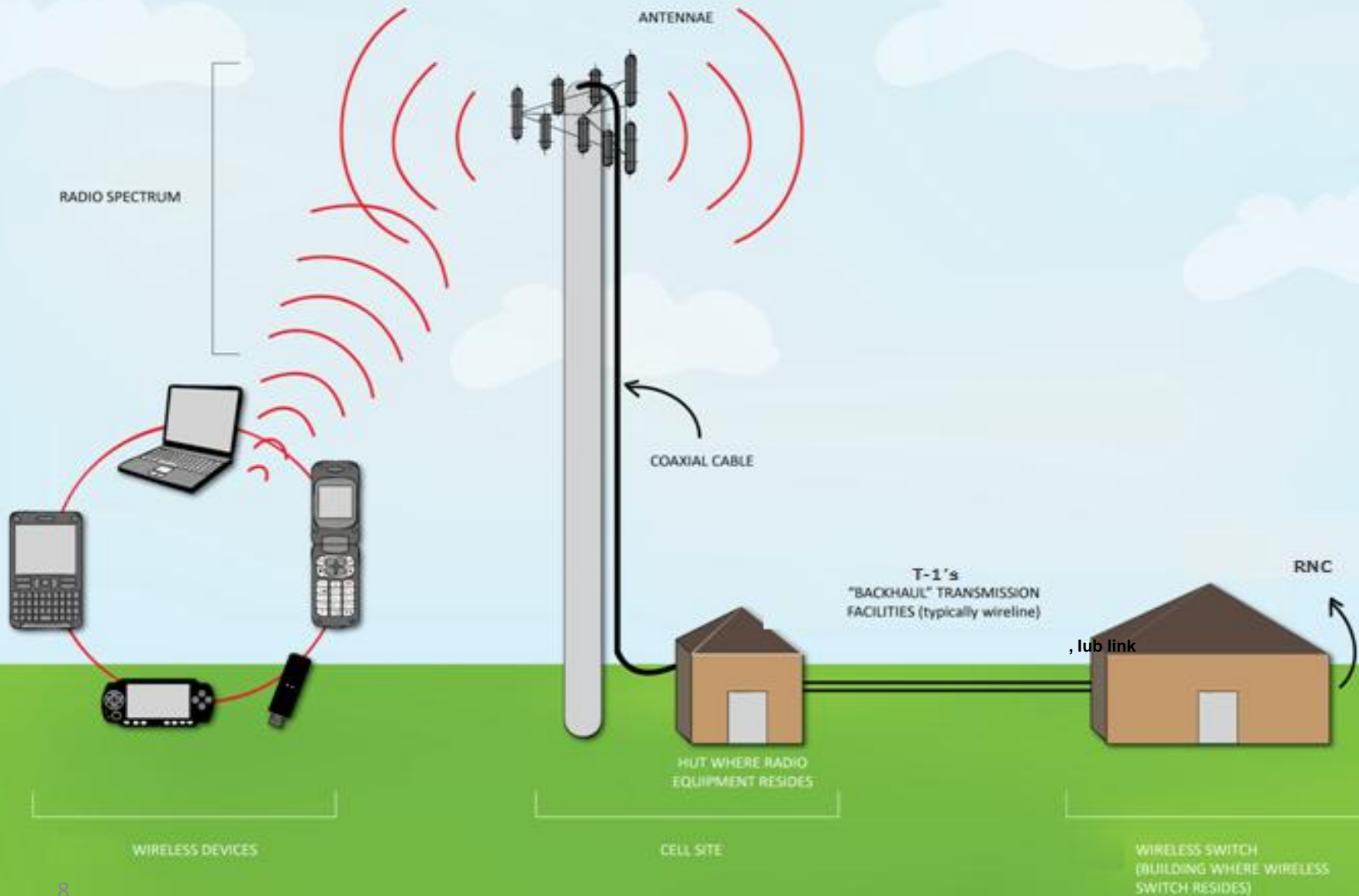
- Reliable widespread wireless service is a public safety issue. More 9-1-1 calls are made from wireless phones than from a land line.
- **74 percent of Americans who own mobile phones** say they have used their hand-held device in an emergency and gained valuable help (Pew Research Center).
- **Nearly 90 percent of cell phone users** believe mobile technology is important for communicating during an emergency or a crisis (Amplitude Research).

Oakland: The Need for Wireless Network Expansion

- We continually identify areas in Oakland that could benefit from capacity improvements.
- Each site is chosen scientifically by engineers, and consideration is given to issues like aesthetics, existing network capacity and resident/user demand.
- Areas that demonstrate a clear demand for improved service are chosen for upgrades.
- A better wireless experience - one with fewer dropped calls, faster data speed, and more reliability requires increased wireless infrastructure.

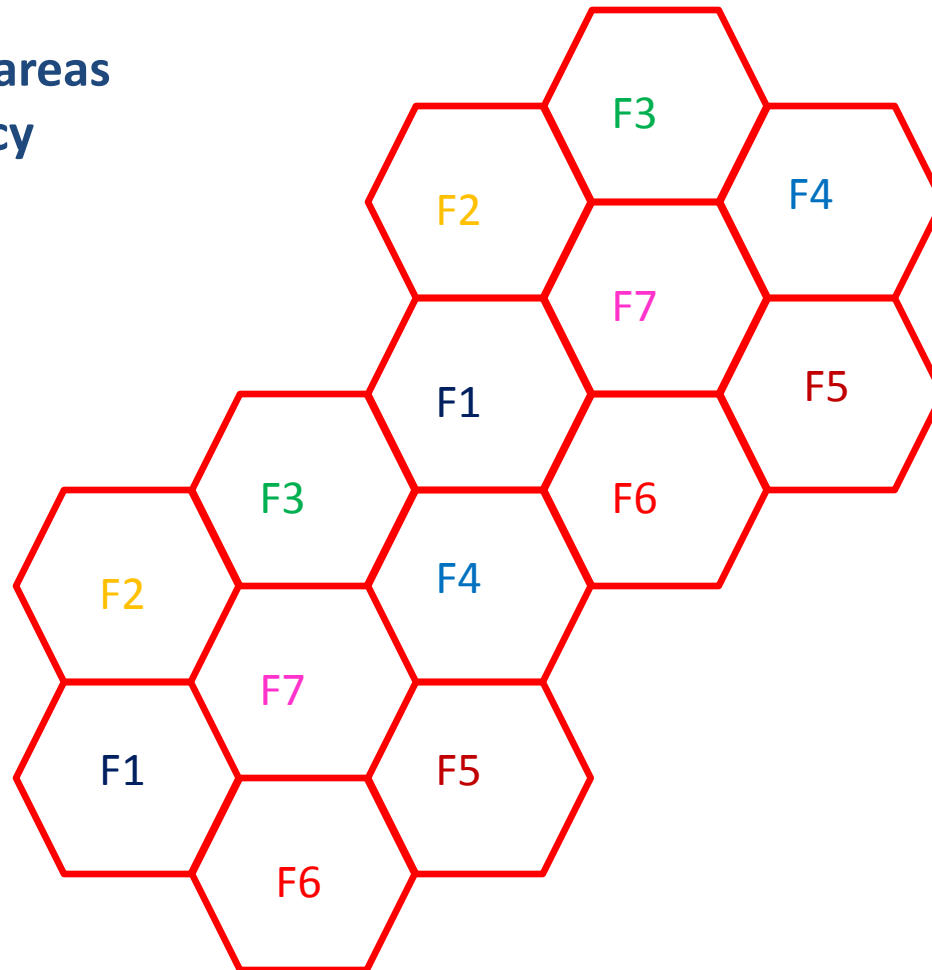


How Wireless Technology Works!



The Cellular Concept - Design Planning Grid

Small, uniform,
cell site coverage areas
allow for frequency
reuse, more
capacity, less
Interference.



When a cell site is needed

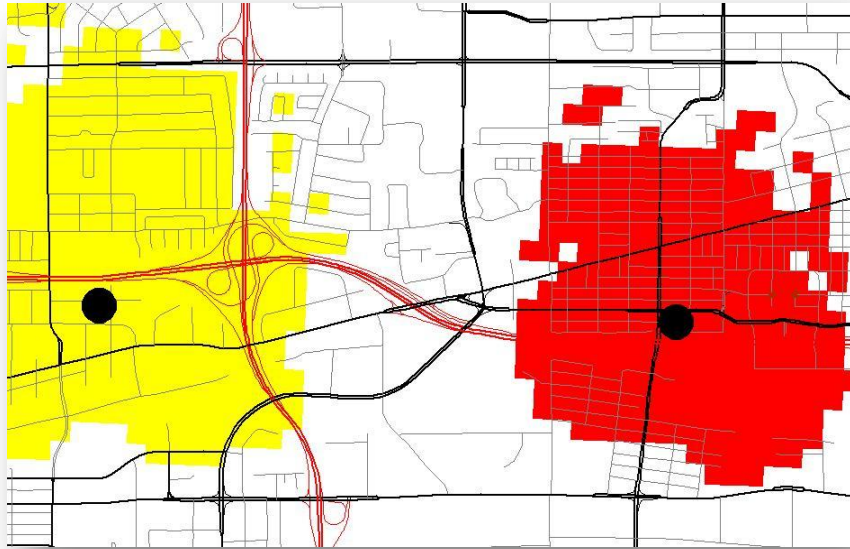


- **Since every year more Americans are becoming wireless users**, and the way they use smart wireless devices is changing dramatically, our work upgrading and maintaining AT&T's network is never done.

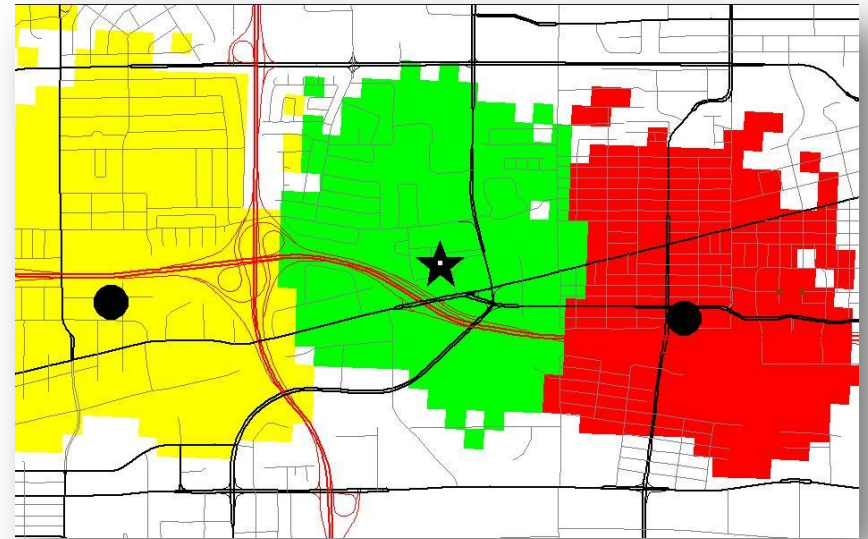
We're always scrutinizing our network to prevent coverage gaps. Here are some of the key factors we take into account as we upgrade and expand our network:

- **Network data** – Our internal data may show where gaps in coverage may occur
- **Customer churn** – We may discover coverage gaps when customers leave AT&T for other wireless carriers
- **Review of existing facilities** – We investigate where existing wireless facilities can help fill gaps in coverage
- **New cell sites** – We invest time, capital and other resources to resolve coverage gaps
- **Various criteria** used to locate a site.

Cell Site to Provide Coverage In-fill

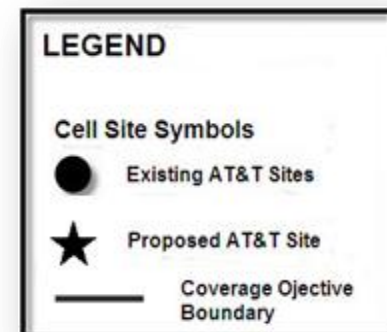


Coverage Gap
(without cell site)

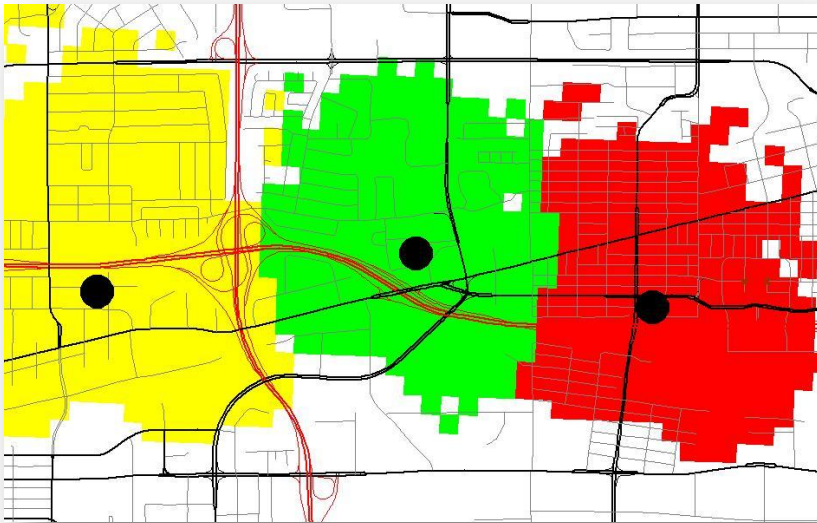


Coverage Gap
(with cell site in green)

In this example a coverage hole is filled with a new cell site (Green) in order to provide contiguous coverage on the highway

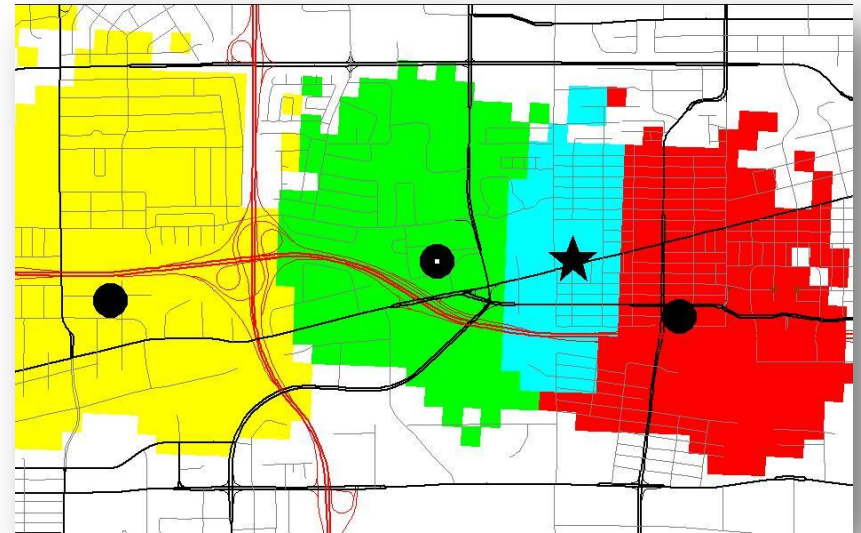


Cell site to provide traffic offloading, termed “Cell Splitting”

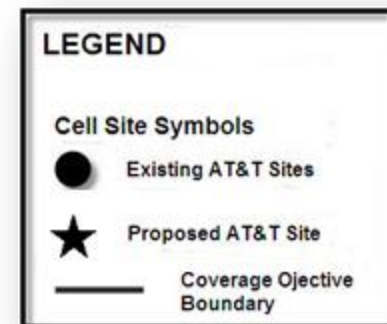


Before Traffic Offloading / Cell Splitting

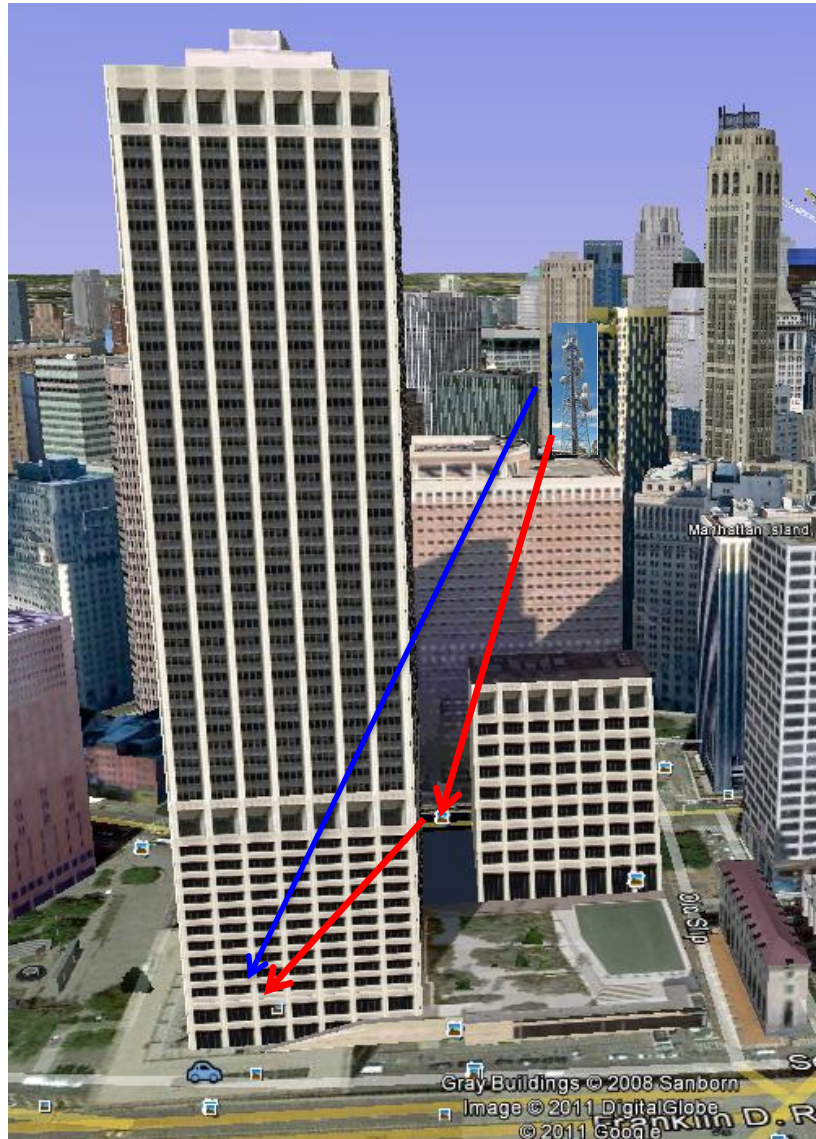
In this example, a cell site (Blue) is deployed to offload traffic from adjacent cell sites, Green and Red.



After Offloading of Traffic / Cell Splitting



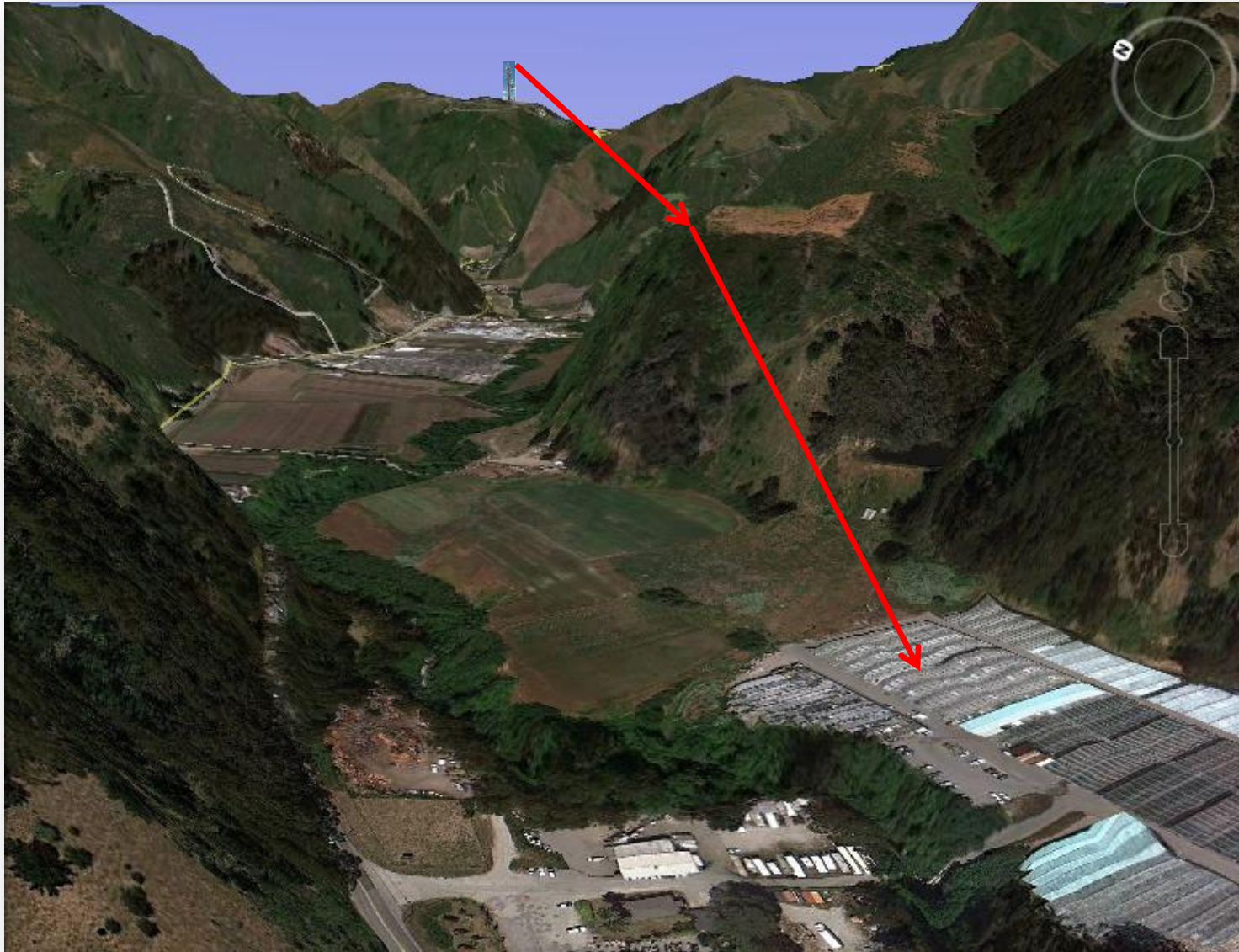
Line of Sight obstructed by Building



This example shows the direct path of the signal from cell site is blocked by building.

Obstructions from buildings and other structures attenuate signal power received by user.

Line-Of-Sight Blocked by Terrain



Network Quality Initiatives – Coverage, Quality, Capacity

- **New Cell Sites.**
- **Modifications.**
- **Distributed Antenna Systems (DAS).**
- **UMTS carriers.**
- **LTE deployments.**
- **Upgrades to existing sites**
- **WiFi.**



What do these wireless
cell sites look like?



Church Roof Antenna Screen



- Antennas screened by new stealth steeple on Church
- Blends in with Buildings Architectural Design



School Collocation Site – Antennas behind corner mount screening

Holy Names High School
4660 Harbord Dr. Oakland

Tree Pole Design



“Monopine” Tree
Pole Design

Nestled in amongst
other similar trees
blends in natural
surroundings

Antennas located in
top of trees foliage

Existing site located 900 1st Gilroy, CA

Different Varietal Stealth
Pine Tree amongst
watertank and other
foliage



Existing Multicarrier Site located 1200 Thompson Avenue, Napa, CA

Antenna on Building Roof



Antennas mounted to side of existing building site at AT&T Central Office Building at 2116 Brancroft Way, Berkeley - **ABOVE**

Antenna mounted inside stealth roof top enclosure - **BELOW**



Existing Apartment at 1001 Warfield, Oakland

Stadium Light Pole Application



Antennas on
Stadium
Light Pole

Multiple
Carriers at
this location

Proposed Antenna Site on Neighborhood Retail

(Proposed Site at 1495 Solano Ave, Albany)



Before



After

Proposed antenna stealth cupolas and equipment roof top screen. See red arrows



Thank you for your time

Questions?