

# **BDA Procurement**

(Bi-Directional Amplifier)



*Things You Should  
Know About  
Your Vendor*

# Estimate VS Quote



## Guess-T-Mate



- Helpful when developing a project Budget
- Only thing you can do without a survey

# Fixed Pricing

- Can only be achieved after a survey is done
- Building code requirements will change the price
- Building Blueprints are necessary to do survey
- Radio coverage enhancement must be defined





# Acquire Site Data

- Involves measuring RF signals throughout the entire area to be covered.
- It must exist, can't be done on new construction until the windows and walls are up. RF system must be up and running for measurements.
- Using the building schematic you produce a heat map of the entire space based on signal readings and inertial navigation.





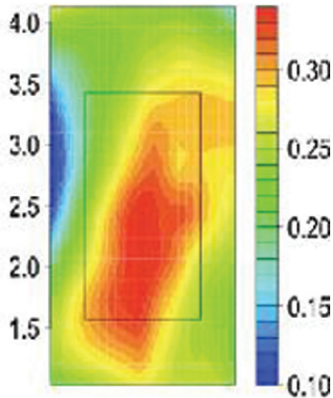


# The Survey Process

- Define the system which needs indoor coverage
- Know and account for Building codes
- Cellular
  - Carrier agreements may or may not be possible
  - Get Carrier agreement before you start
  - Carrier must supply BTS equipment or allow Donor access
- Public Safety
  - Must have adequate donor signal at the headend
  - Channelized usually best solution
  - Broad band (class B) must be registered with FCC
  - [www.fcc.gov/signal-boosters/registration](http://www.fcc.gov/signal-boosters/registration)



# Heat Maps and Donor Signals



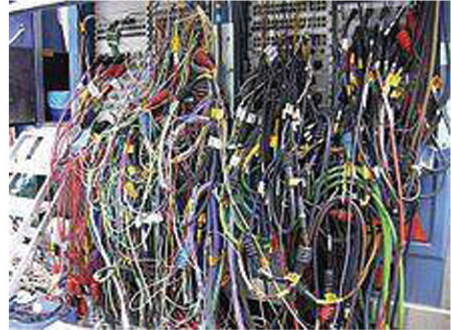
- Donor signal is the signal strength at the point the RF systems enters and leaves the premises
- Maps are color coded signal strengths superimposed over the building schematics floor by floor
- Acquiring this data may take a day or a week or a month depending on the coverage area
- This process usually involves a cost depending on the effort needed to gather the data



# **Engineering a Solution**

- Once the data is collected engineering a solution is a complex matter of adding Db's
- 6Db capture rule / 20Db Gain Cap rule
- In spaces where there is significant signal from the donor site the BDA signal must be 6 Db stronger to talk over direct signal
- Once all the losses and gains are added up and only then can you produce a design layout and produce a fixed firm price

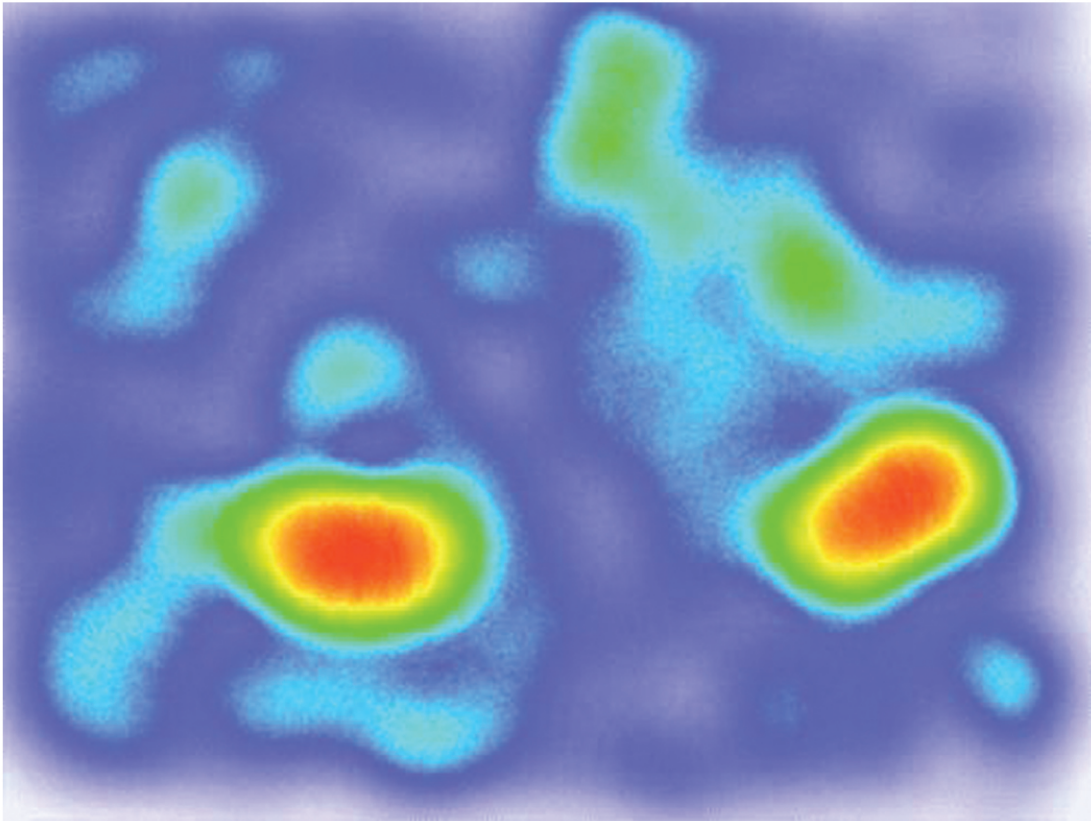
# Installation



- Pulling Coax
- Proper hangers and installation to secure cable
- Laying cable on drop ceiling is Wrong Run away!
- Plenum spaces / Riser spaces
- Fire stop, building codes
- Cable termination and Splitter installation
- PIM testing distributed antenna system
- Document any changes or pertinent information during install



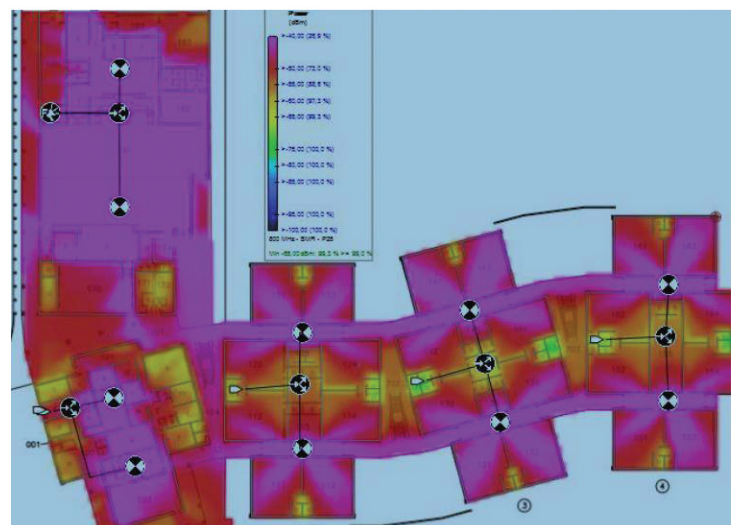
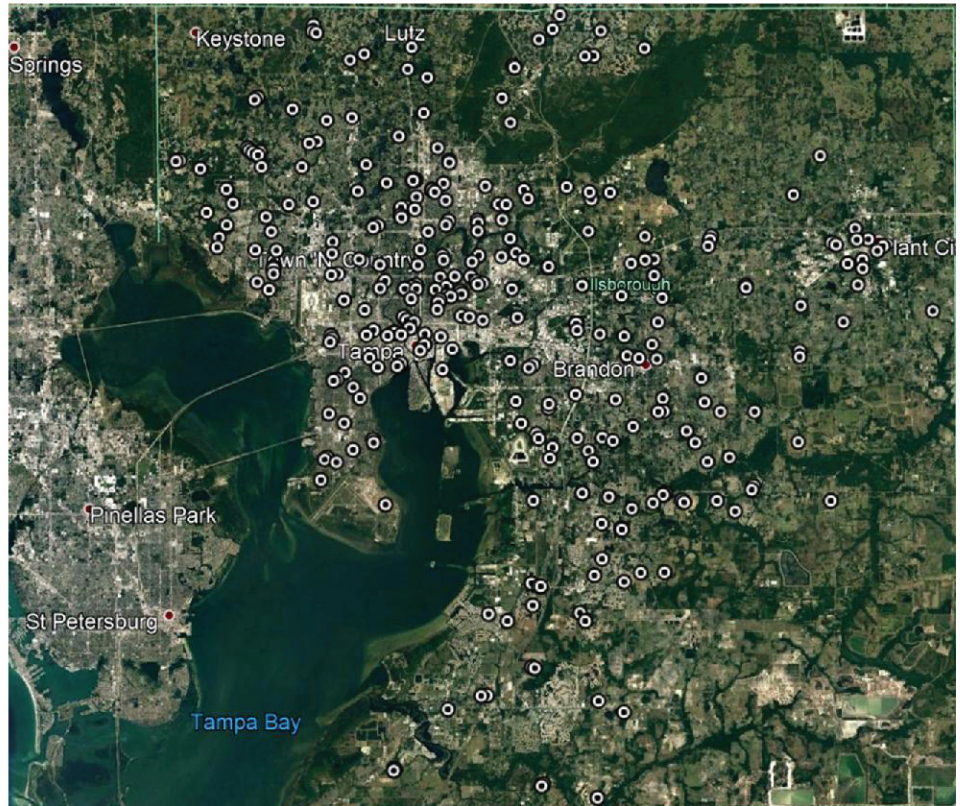
# Optimization



- Basically repeats the survey producing a new heat map with the Amplifier active
- Tests with live system to insure all areas of building have coverage sometimes with Fire Marshall
- Post install survey and “as built” documentation become the benchmark for the system
- System Benchmark will be used for yearly certification process now becoming part of fire inspection code

# Tools

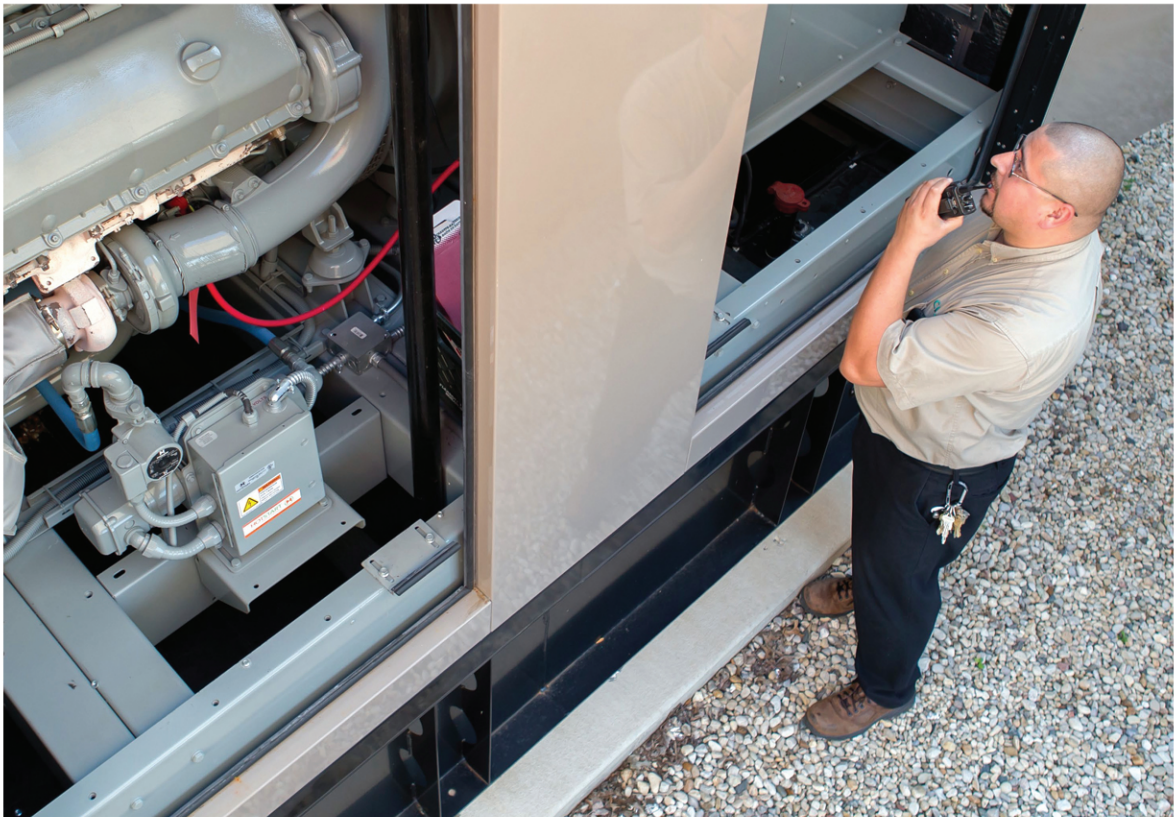
- Hardware
- Software
- Knowing the rules





# Service and Maintenance

- Invest in the hardware (Test and Verify)
- Invest in coverage software (maybe??)
- Choose products that support **UPLINK Squelch (transmitter gating)**
- Having the right partner
- Know the rules
- Train



# Partners and Products

- Cable Pullers
- Who owns the donor system?  
(City, County, State)

## Summary

- There are many different types of BDA systems
- Make sure you have or have access to the right tools to design AND maintain a BDA system
- The right partners and products are critical to your success
- Testing and Verification is equal in importance as the performance guidelines