

## CellGain Services

Consulting • Engineering • Integration • Turnkey Solutions

Complicated agency codes, complex multi-band cost-effective solutions, and risks of delay and interruptions from multi-party coordination are just some of the common challenges faced in providing in-building wireless coverage.

From design and engineering to testing and commissioning, CellGain offers any and all phases of integration services and delivers the best-fit Distributed Antenna System (DAS) solution unique to the client environment. CellGain delivers turnkey solutions complete with all required agency approvals with simplicity, speed, and confidence, leveraging CellGain's innovative tools and products where applicable.

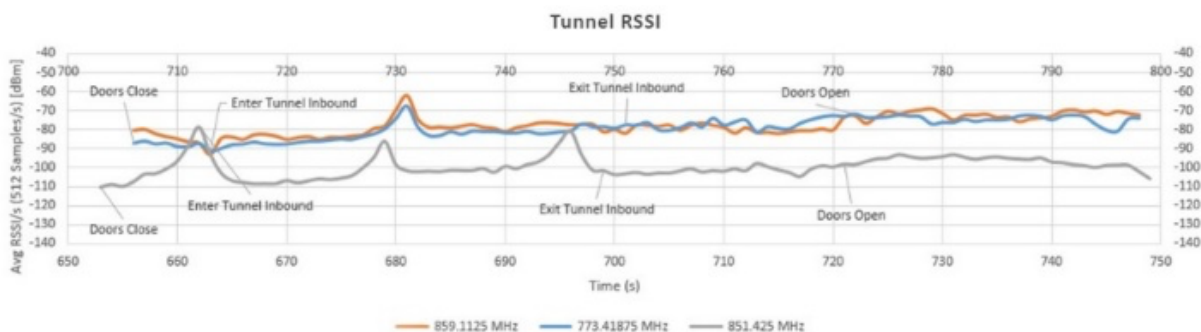
A trusted expert specializing in public safety with over 30 years of experience and success, CellGain provides seamless wireless coverage for critical public infrastructures, such as public transits, airports, tunnels, high-occupancy buildings and campuses. Sample projects include Port Authority of NY&NJ, San Francisco Municipal Transportation Agency, World Trade Center, LaGuardia Airport, and more.

CellGain is MBE-certified by New York State, New York City, and the Port Authority of New York and New Jersey.

### CONSULTING

- Site Survey
- Topology Review
- Public Safety Agency Requirements
- Solution Requirements

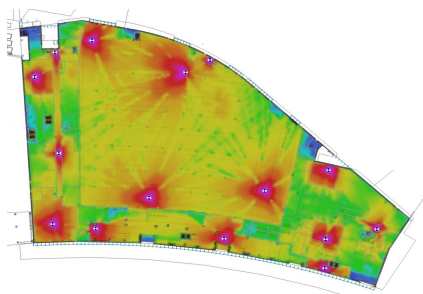
CellGain provides consulting services to assess customer requirements for the best-fit wireless communications solutions. Depending on client needs, the services can include gap analysis on current operations (e.g., RSSI for Received Signal Strength Indicator), topology review of covered infrastructure, assessment of requirements across involved public safety agencies, assessment of current planned design and equipment lists, and more.



### DESIGN & ENGINEERING

- Solution Design & Modeling
- Coverage / iBWave Analysis
- Vendor Agnostic Product Selection and Integration
- Link Budget Analysis
- Design Drawings & Parts List
- Solution Approval

CellGain designs and engineers the best-fit solutions based on client and public safety agencies requirements with the right products available. The solutions are optimized with high resiliency via redundancy and verified such as with iBWave and Link Budget analyses. Detailed design drawings, including building details for interoperability with other contracts, are provided with the parts list.



#### Link Budget Report

Project name: Design company: CellGain Wireless  
 Project creation date: Designer:

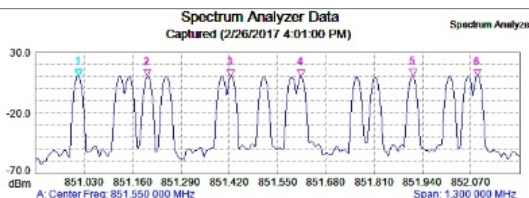
Antenna ID	Operator	System ID	Summary			
			Sys Out: Per	Total DAS Gain/Loss	Antenna Gain	Antenna ERP
			Total	(dBm)	(dBi)	(dBm)
HH1D1-FT4201		800 MHz - SMB - Analog - Sector 1	-8.89	-4.50	4.39	0.00
HH1D1-FT4202		800 MHz - SMB - Analog - Sector 1	-8.89	-4.50	4.39	0.00
HH1D1-FT4203		800 MHz - SMB - Analog - Sector 1	-8.89	-4.50	4.39	0.00
HH1D1-FT4204		800 MHz - SMB - Analog - Sector 1	-8.89	-4.50	4.39	0.00
HH1D1-FT4205		800 MHz - SMB - Analog - Sector 1	-8.89	-4.50	4.39	0.00

### IMPLEMENTATION & ACCEPTANCE

- Solution Staging and Testing
- Field Installation
- Performance Testing
- Site Acceptance Testing
- Stakeholder Acceptance Signoff and documentation

CellGain delivers integrated solutions onsite with validation through field testing and user acceptance testing. Leveraging CellGain's innovative tools and processes developed from decades of expertise and experience, CellGain accelerates project delivery while minimizing unforeseen pitfalls. For example, CellGain's MultiTone Signal Generator achieves a saving of up to 85% in acceptance testing time with minimal interruption on live operations ("simulate without interference").

CellGain manages across agencies and obtains all necessary approvals from multiple stakeholders, simplifying this complex task.



Mhz	Ref	Delta	Ref Freq	Ref Amp	Delta Freq	Delta Amp
1			851.013 455 MHz	10.47 dBm		
2			851.200 182 MHz	10.31 dBm		
3			851.424 727 MHz	10.03 dBm		
4			851.613 810 MHz	9.86 dBm		
5			851.814 000 MHz	10.46 dBm		
6			852.088 909 MHz	10.16 dBm		

#### Measurement Parameters

Trace Mode	Normal	Stop Frequency	852.200 000 MHz
Preamp	OFF	Frequency Span	1.300 000 MHz
Min Sweep Time	0.001 S	Reference Level	15.000 dBm
Reference Level Offset	-15 dB	Scale	10.0 dB/div
Input Attenuation	35.0 dB	Serial Number	1522087
RBW	10.0 kHz	Base Ver.	V5.70
VBW	3.0 kHz	App Ver.	V6.95
Detection	Peak	Model	S382E
		Options	21, 27, 28, 31, 411, 431
Center Frequency	851.550 000 MHz	Date	2/26/2017 4:01:00 PM
Start Frequency	850.900 000 MHz	Device Name	

**TRAINING AND OPERATIONS**

- User & Technician Training
- Network Monitoring and Management
- NOC Integration
- Ongoing Maintenance

CellGain provides training for testing (e.g., OTDR for optical transmission), field integration, maintenance and trouble shooting. Ongoing monitoring and maintenance is available.

Network management is made simple with CellGain's FTAS Network Management System (NMS), which provides visibility and control across the full network as well as individual components. The FTAS NMS is ready to integrate with Network Operations Center (NOC) has proven to achieve a 50% time saving on diagnostic and maintenance.



**PROGRAM MANAGEMENT**

- Single Point of Contact
- Milestone Reporting
- Stakeholder Approval
- Contractor & Vendor Management
- End to End Turnkey Delivery

CellGain simplifies the delivery of turnkey solutions and any phases of the integration services through end-to-end program management with a single point of contact. CellGain manages all stakeholders as well as vendors and contracts to streamline coordination, reduce risks and errors, and accelerate time to operations. With a proven track record of on-time, on budget delivery, CellGain is a trusted partner to provide wireless coverage to critical public infrastructures.