

# Example Network Design Report

TEX Head Office  
39 Collins Street  
Auckland CBD

## 1. Customer Requirements

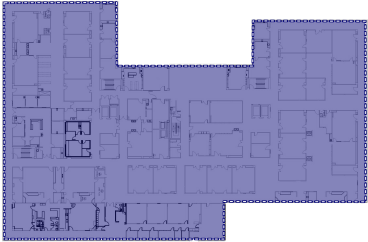
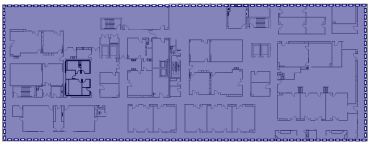
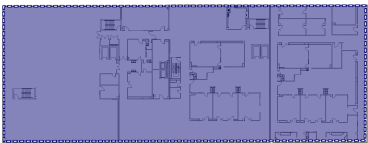
### 1.1. Coverage Requirements

|                                  |           |                                         |
|----------------------------------|-----------|-----------------------------------------|
| signal strength at least         | -70.0 dBm |                                         |
| signal-to-noise ratio at least   | 15.0 dB   |                                         |
| data rate at least               | 6 Mbps    |                                         |
| number of access points at least | 2         | when signal strength at least -80.0 dBm |
| ping round trip time at most     | 200.0 ms  |                                         |
| Packet loss at most              | 5.0 %     |                                         |

### 1.2. Capacity Requirements

| Amount | Device        |
|--------|---------------|
| 900    | Laptop        |
| 600    | AC Smartphone |
| 50     | Tablet        |

## 2. Coverage Areas

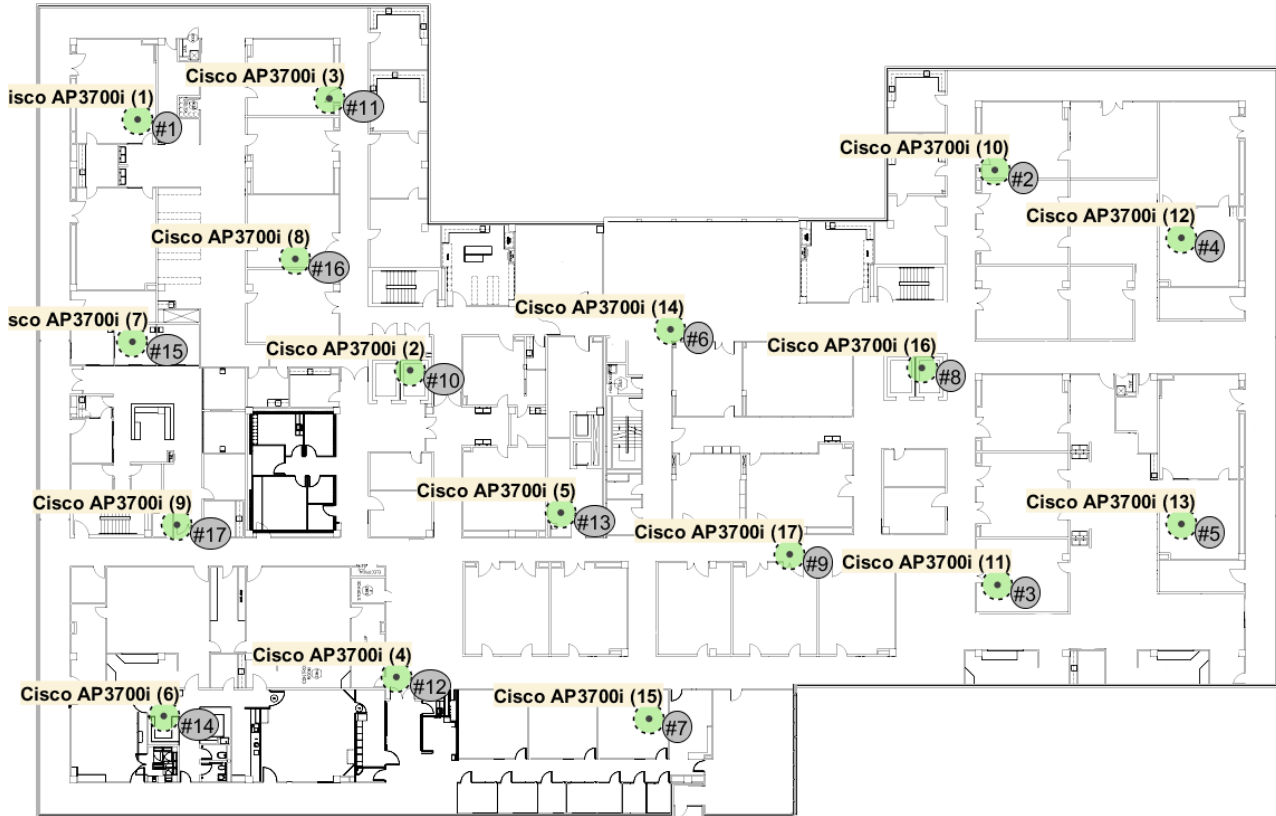
| Map                                                                               | Name    | Coverage Area          |
|-----------------------------------------------------------------------------------|---------|------------------------|
|  | Floor 1 | 3,458.1 m <sup>2</sup> |
|  | Floor 2 | 2,471.6 m <sup>2</sup> |
|  | Floor 3 | 2,433.9 m <sup>2</sup> |

Total coverage area: 8,363.6 m<sup>2</sup>

### 3. Map Floor 1

#### 3.1. Survey Routes and AP Locations

##### 3.1.1 Access Point Locations





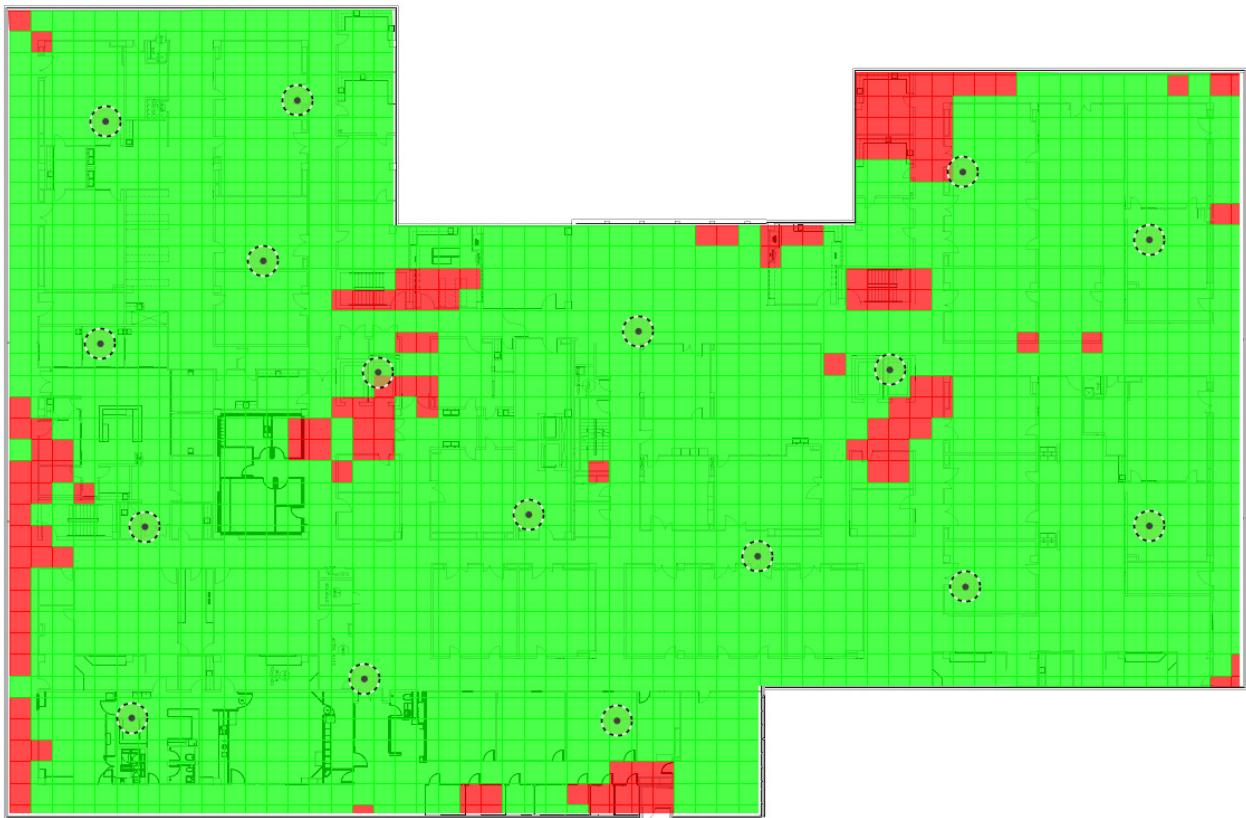
| Access Points                                                                         |        |
|---------------------------------------------------------------------------------------|--------|
| Name: <b>Cisco AP3700i (1) (#1)</b>                                                   | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>36</b><br>Networks:   |        |
| Name: <b>Cisco AP3700i (10) (#2)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>104</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (11) (#3)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>64</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (12) (#4)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>44</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (13) (#5)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>108</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (14) (#6)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>52</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (15) (#7)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>104</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (16) (#8)</b>                                                  | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>136</b><br>Networks:  |        |

|                                                                                       |        |
|---------------------------------------------------------------------------------------|--------|
| Name: <b>Cisco AP3700i (17) (#9)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>116</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (2) (#10)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>60</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (3) (#11)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>56</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (4) (#12)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>124</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (5) (#13)</b>                                                  | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>40</b><br>Networks:   |        |
| Name: <b>Cisco AP3700i (6) (#14)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>112</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (7) (#15)</b>                                                  | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>100</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (8) (#16)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>120</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (9) (#17)</b>                                                  | Notes: |
| Radio on channel: <b>6</b>                                                            |        |

Networks:  
Radio on channel: **48**  
Networks:

### 3.2. Network Health

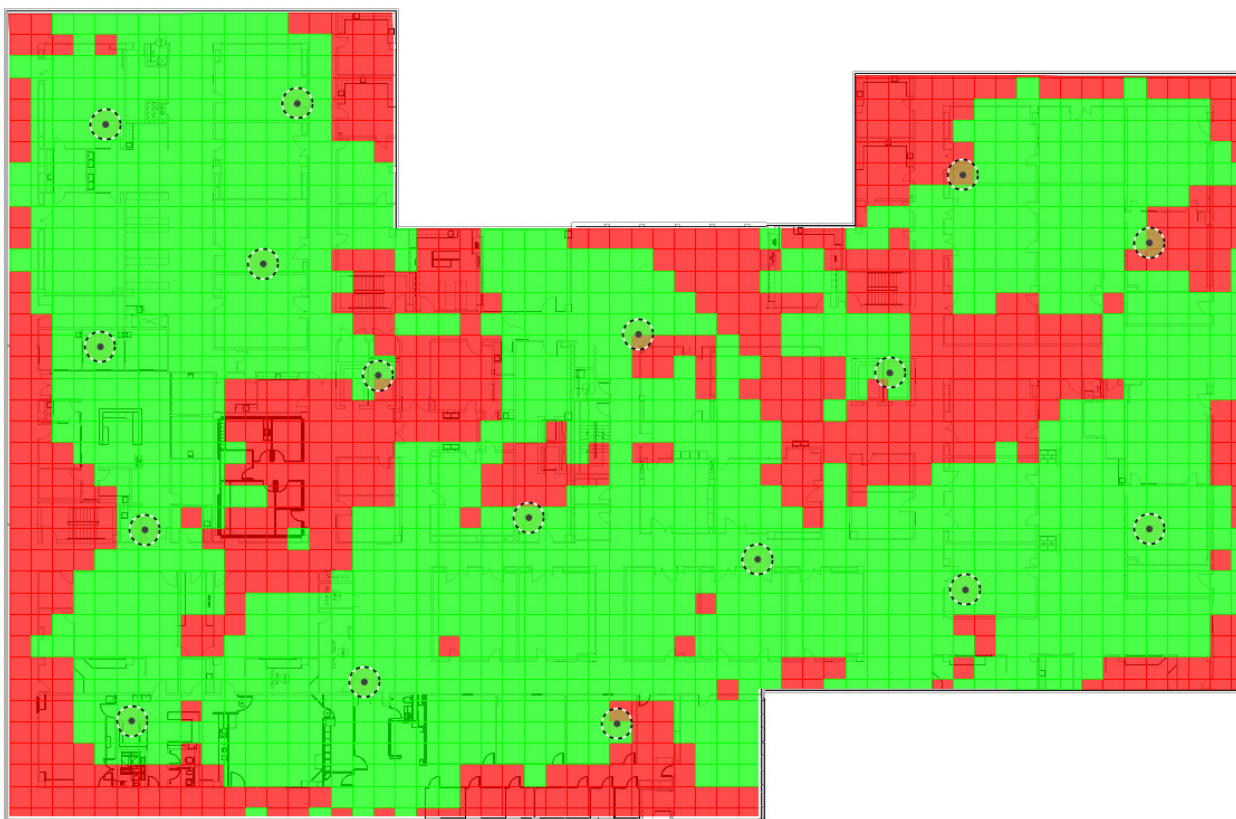
#### 3.2.1 2.4 GHz



Fail

Pass

3.2.2 5 GHz

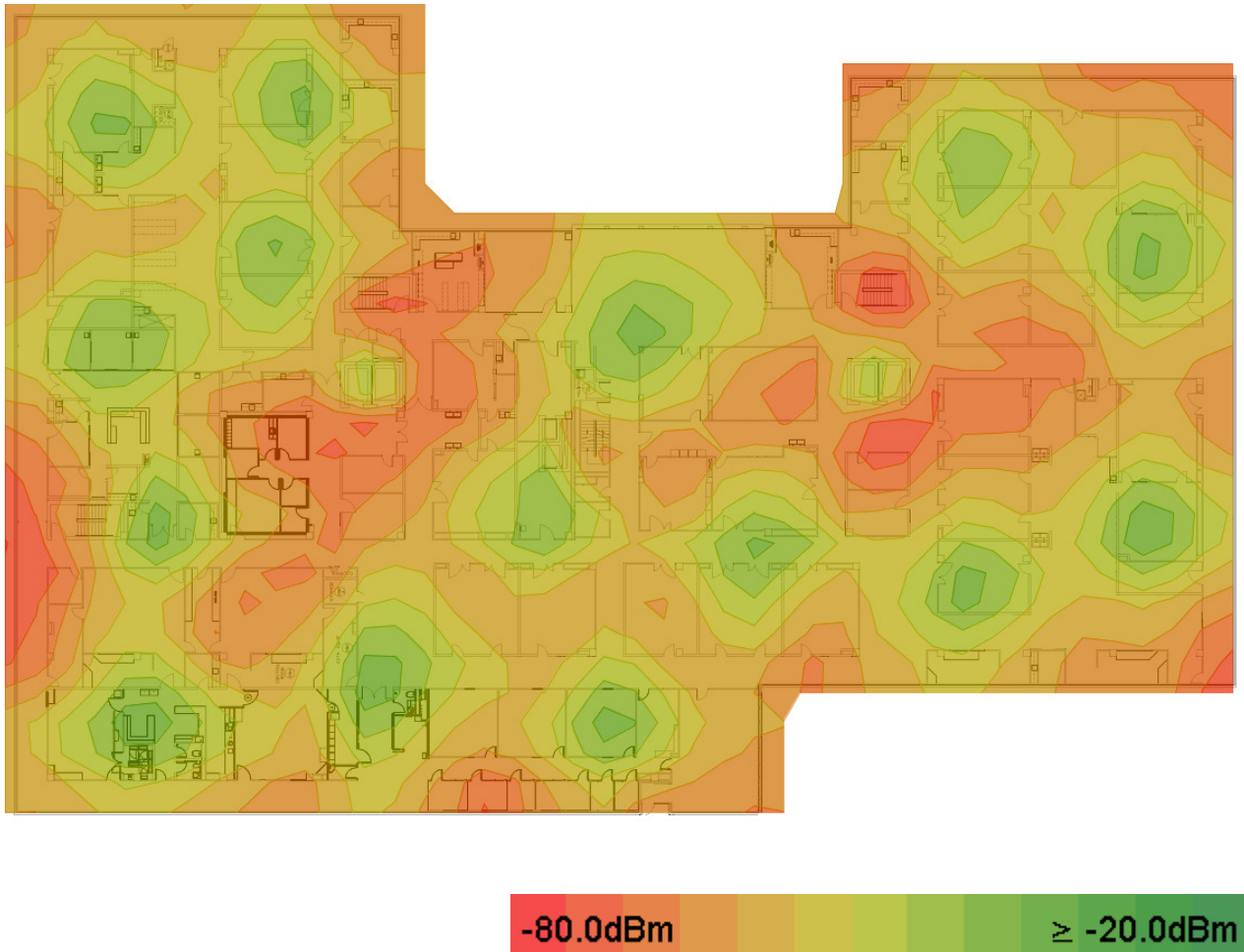


**Fail**

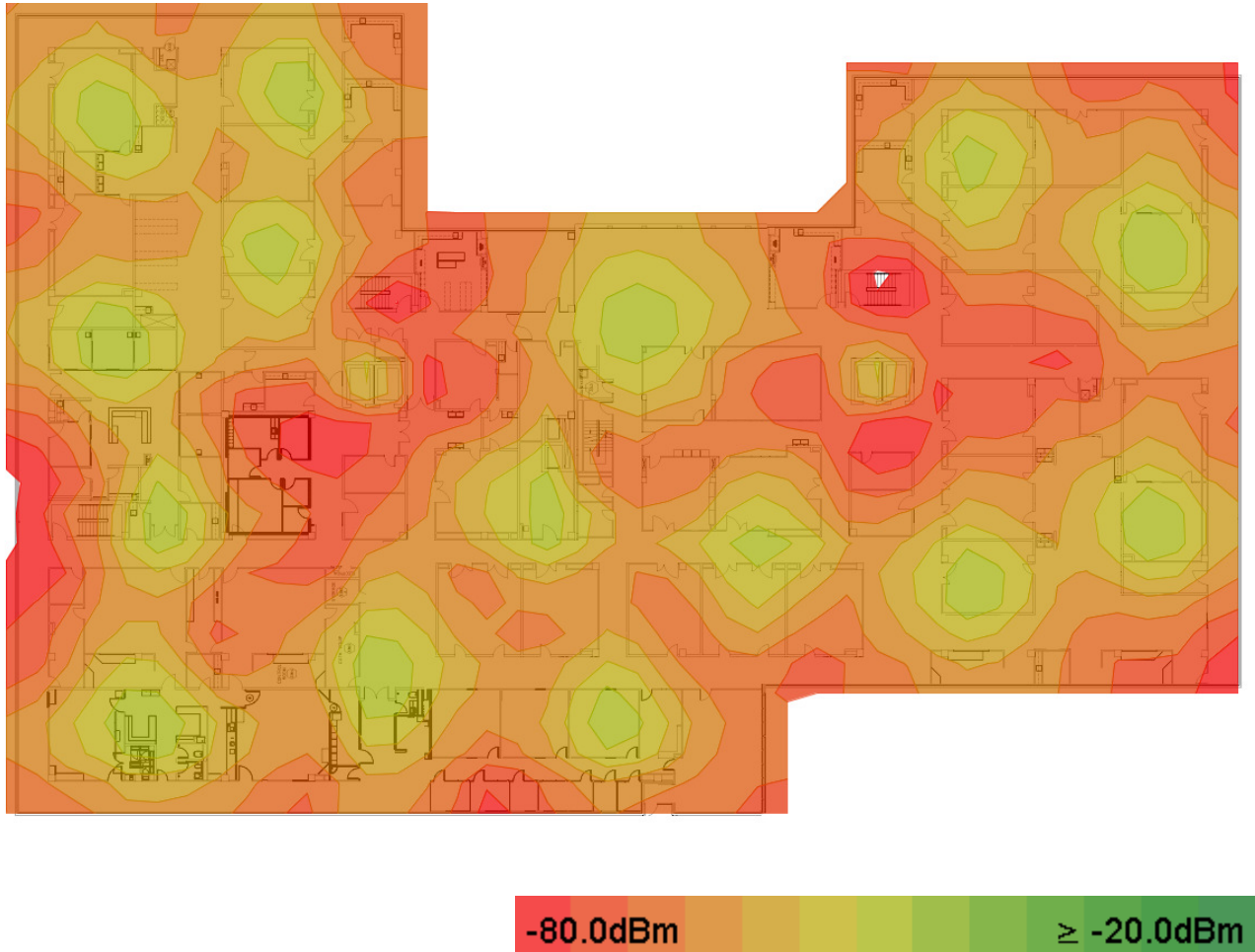
**Pass**

### 3.3 Coverage, Interference and SNR

#### 3.3.1 Signal Strength 2.4 GHz

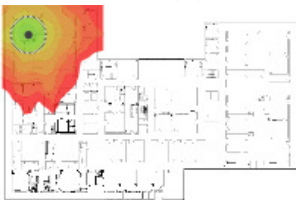


### 3.3.2 Signal Strength 5 GHz

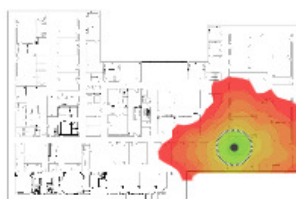


#### 3.3.2.1 Per-Access Point Coverage 2.4 GHz

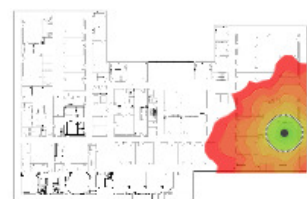
Cisco AP3700i (1) @ Channel 6



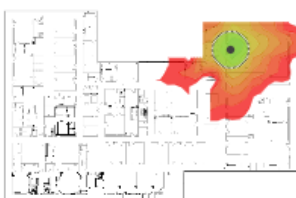
Cisco AP3700i (11) @ Channel 11



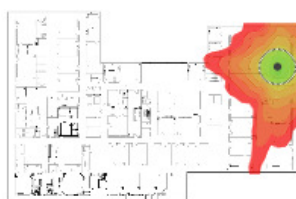
Cisco AP3700i (13) @ Channel 1



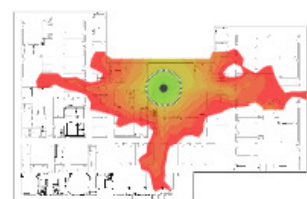
Cisco AP3700i (10) @ Channel 1



Cisco AP3700i (12) @ Channel 11

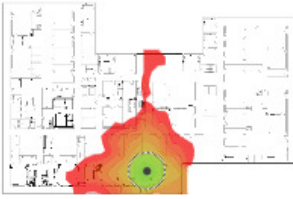


Cisco AP3700i (14) @ Channel 11





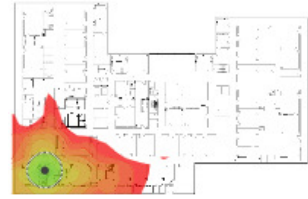
Cisco AP3700i (15) @ Channel 11



Cisco AP3700i (2) @ Channel 11



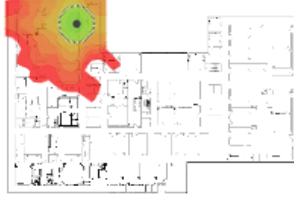
Cisco AP3700i (6) @ Channel 11



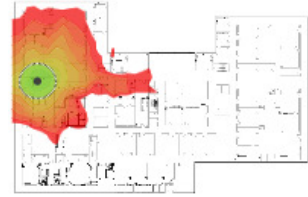
Cisco AP3700i (16) @ Channel 6



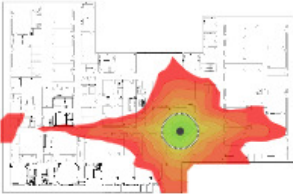
Cisco AP3700i (3) @ Channel 11



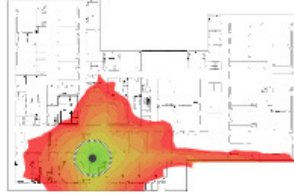
Cisco AP3700i (7) @ Channel 11



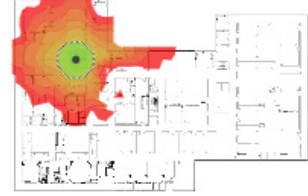
Cisco AP3700i (17) @ Channel 1



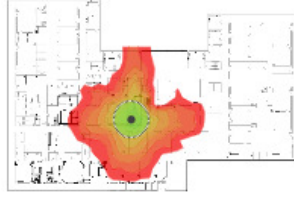
Cisco AP3700i (4) @ Channel 1



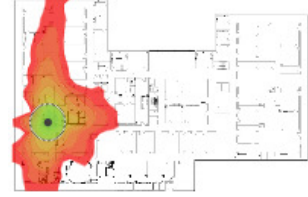
Cisco AP3700i (8) @ Channel 1



Cisco AP3700i (5) @ Channel 6



Cisco AP3700i (9) @ Channel 6

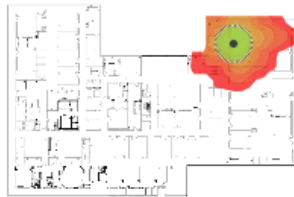


### 3.3.2.2 Per-Access Point Coverage 5 GHz

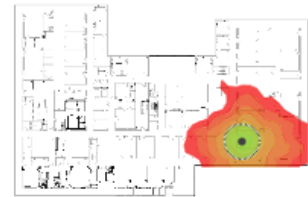
Cisco AP3700i (1) @ Channel 36



Cisco AP3700i (10) @ Channel 104



Cisco AP3700i (11) @ Channel 64

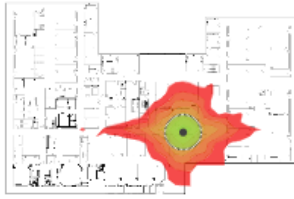




Cisco AP3700i (12) @ Channel 44



Cisco AP3700i (17) @ Channel 116



Cisco AP3700i (6) @ Channel 112



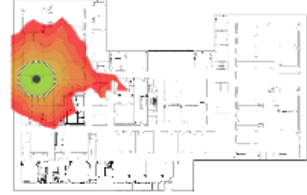
Cisco AP3700i (13) @ Channel 108



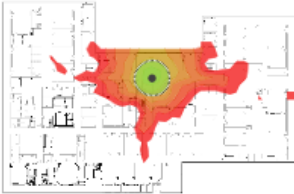
Cisco AP3700i (2) @ Channel 60



Cisco AP3700i (7) @ Channel 100



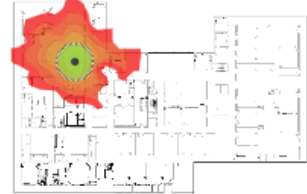
Cisco AP3700i (14) @ Channel 52



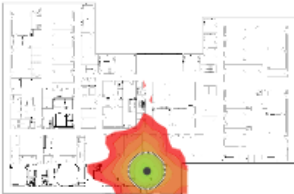
Cisco AP3700i (3) @ Channel 56



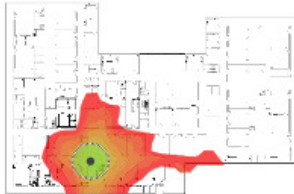
Cisco AP3700i (8) @ Channel 120



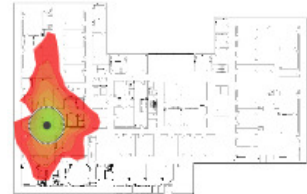
Cisco AP3700i (15) @ Channel 104



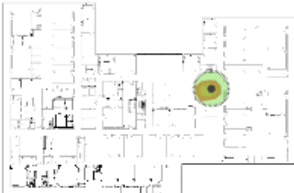
Cisco AP3700i (4) @ Channel 124



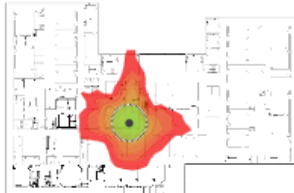
Cisco AP3700i (9) @ Channel 48



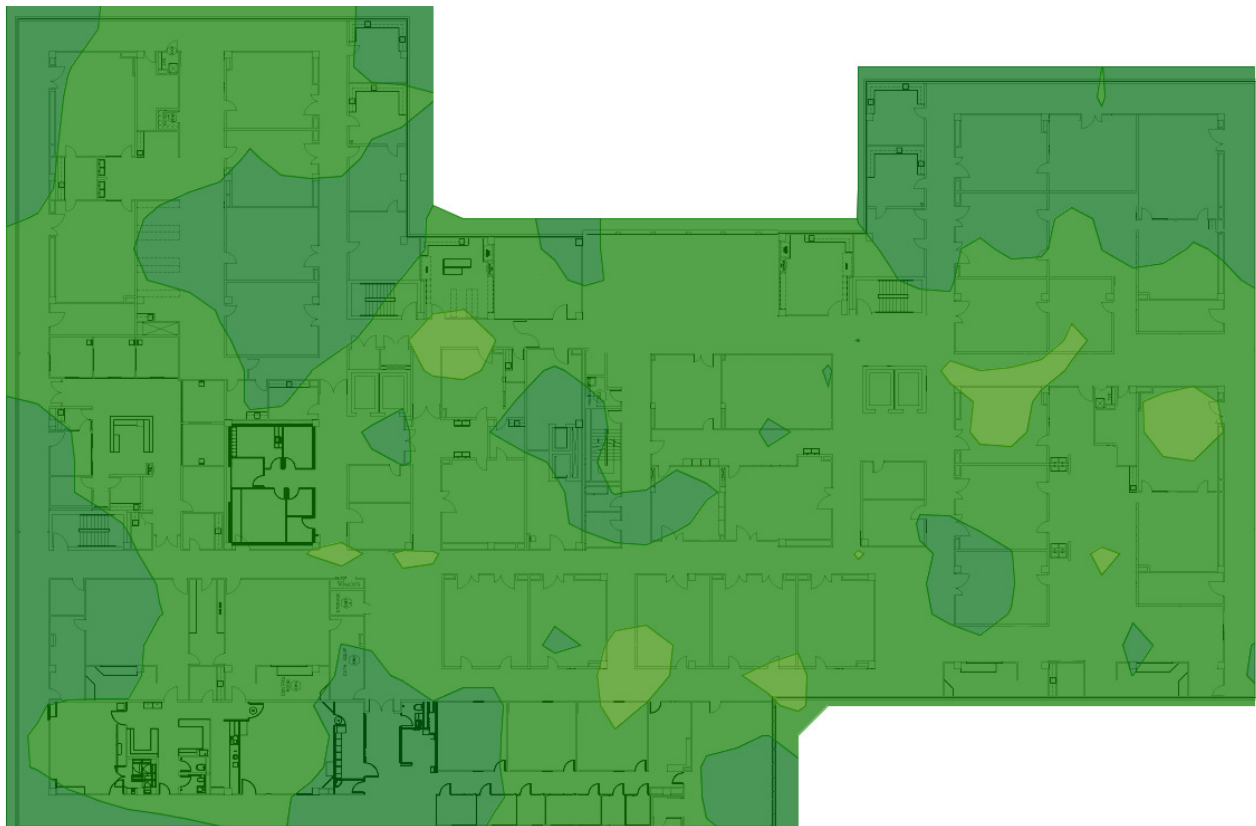
Cisco AP3700i (16) @ Channel 136



Cisco AP3700i (5) @ Channel 40



### 3.3.3 Interference 2.4 GHz



-100.0dBm

≈ -60.0dBm

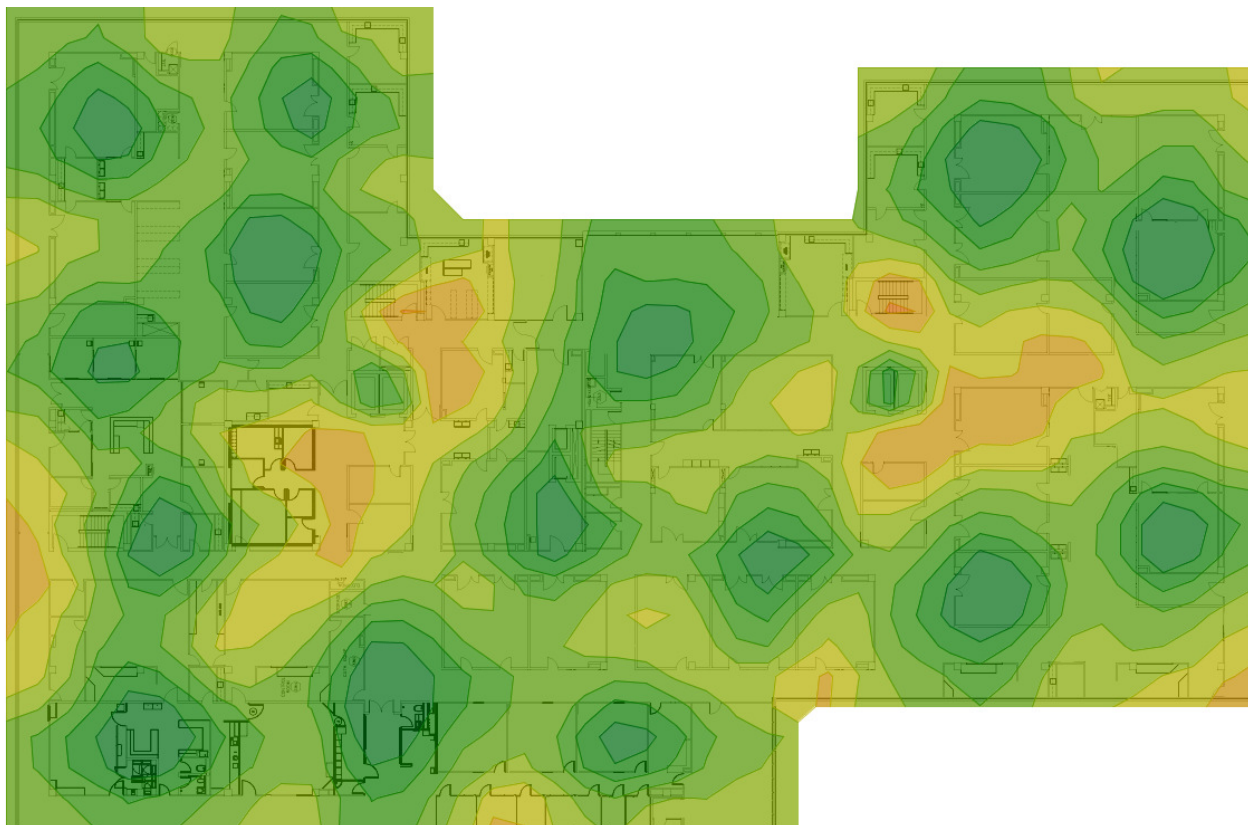
### 3.3.4 Interference 5 GHz



-100.0dBm

-60.0dBm

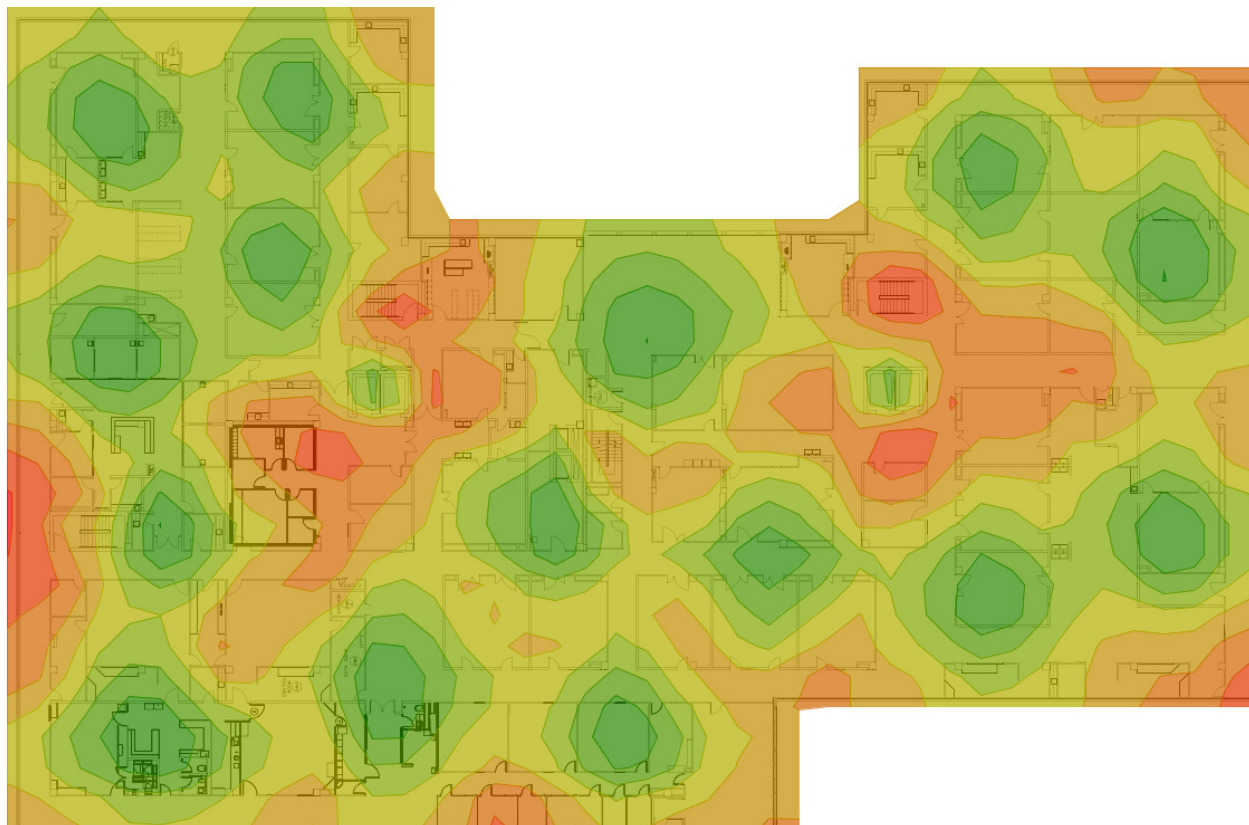
3.3.5 SNR 2.4 GHz



5.0dB

$\geq 50.0\text{dB}$

3.3.6 SNR 5 GHz



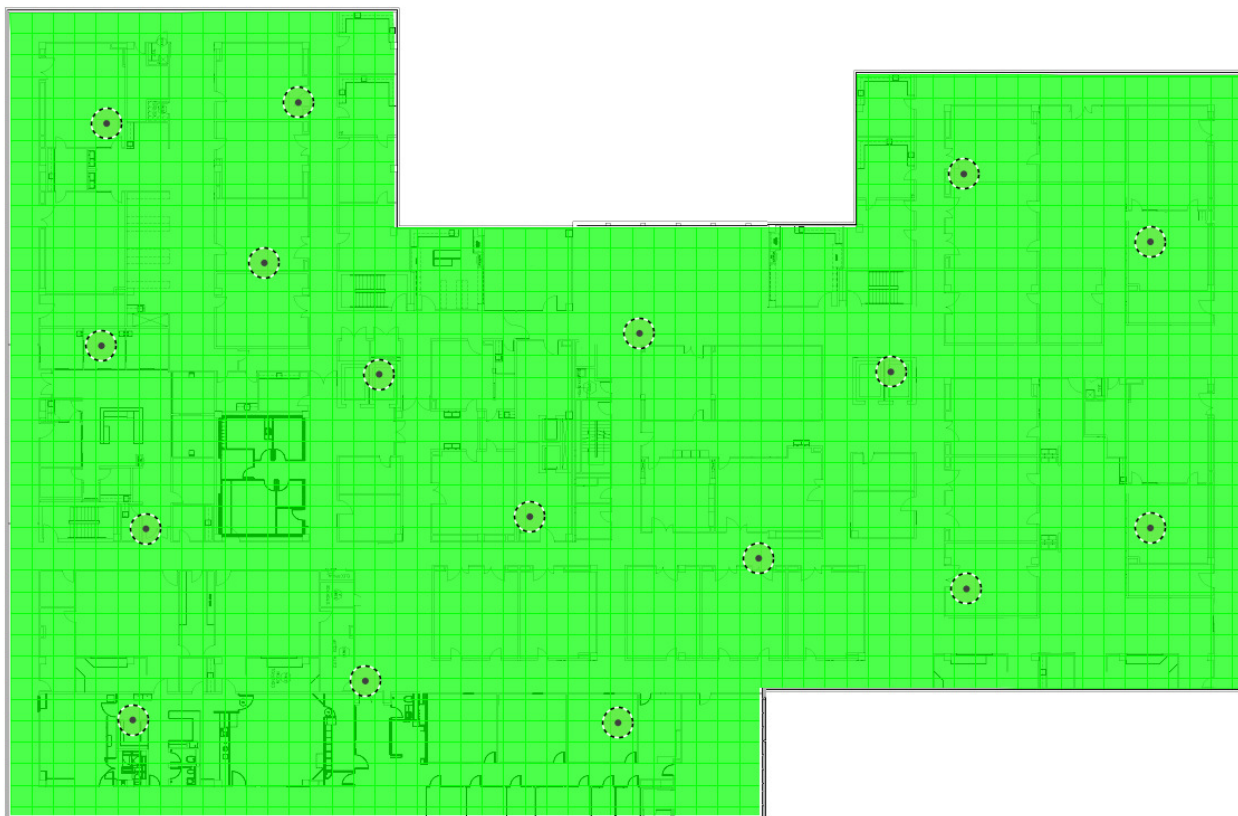
5.0dB

$\geq 50.0\text{dB}$

### 3.4 Capacity

| Number of devices on this floor | Device        |
|---------------------------------|---------------|
| 372 / 900                       | Laptop        |
| 248 / 600                       | AC Smartphone |
| 21 / 50                         | Tablet        |

#### 3.4.2 Capacity Health 2.4 GHz



**Pass**

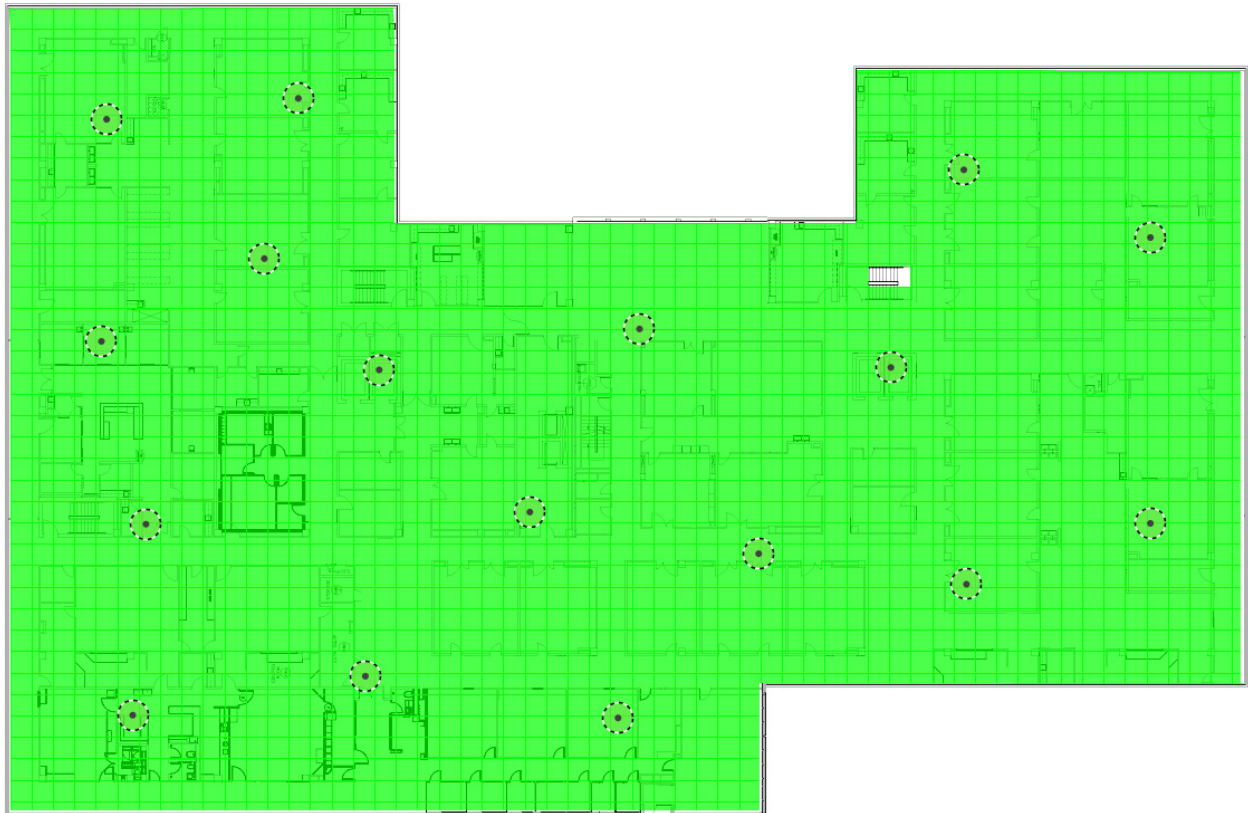
**Capacity**

**Assoc.**

**VoIP calls**



### 3.4.3 Capacity Health 5 GHz



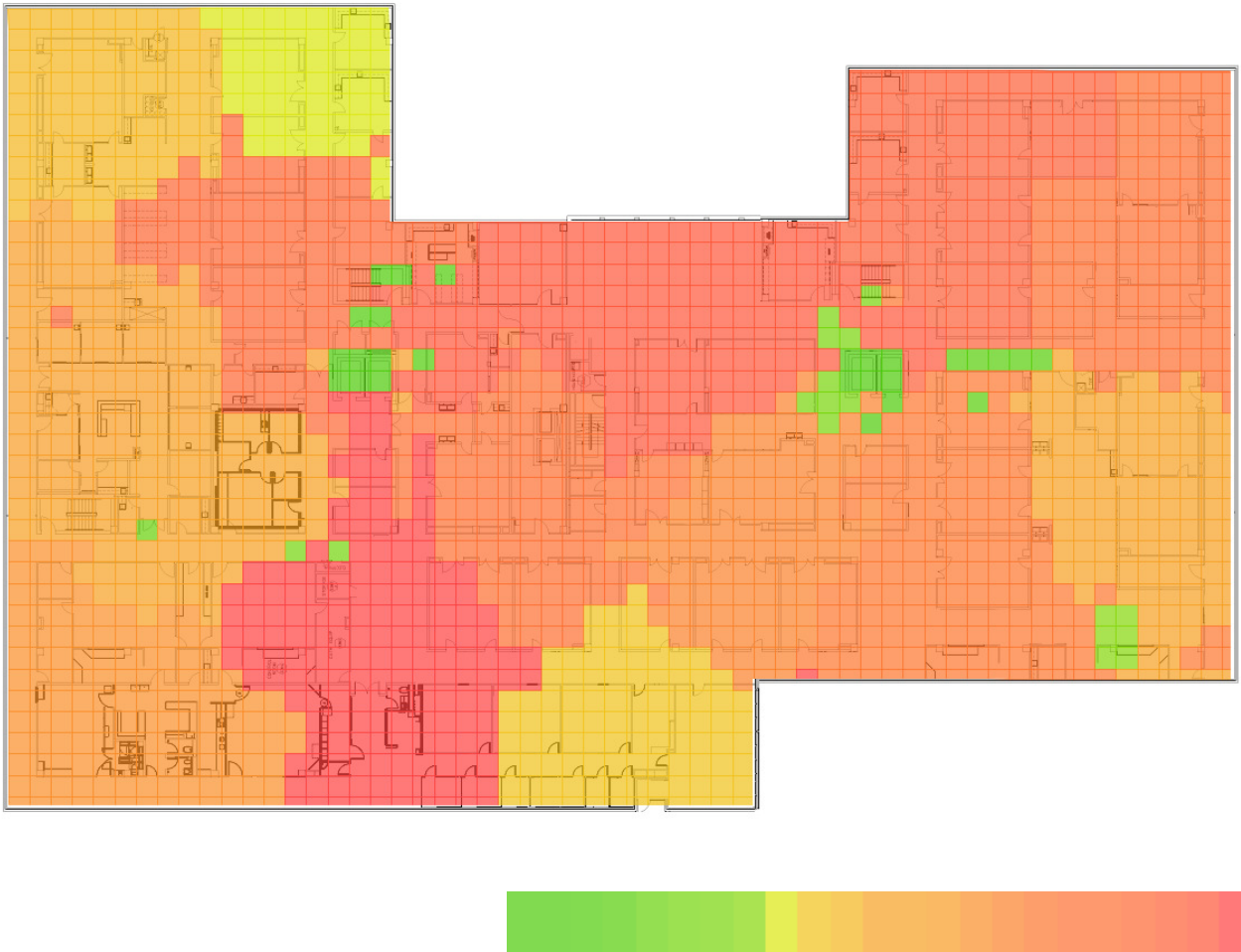
Pass

Capacity

Assoc.

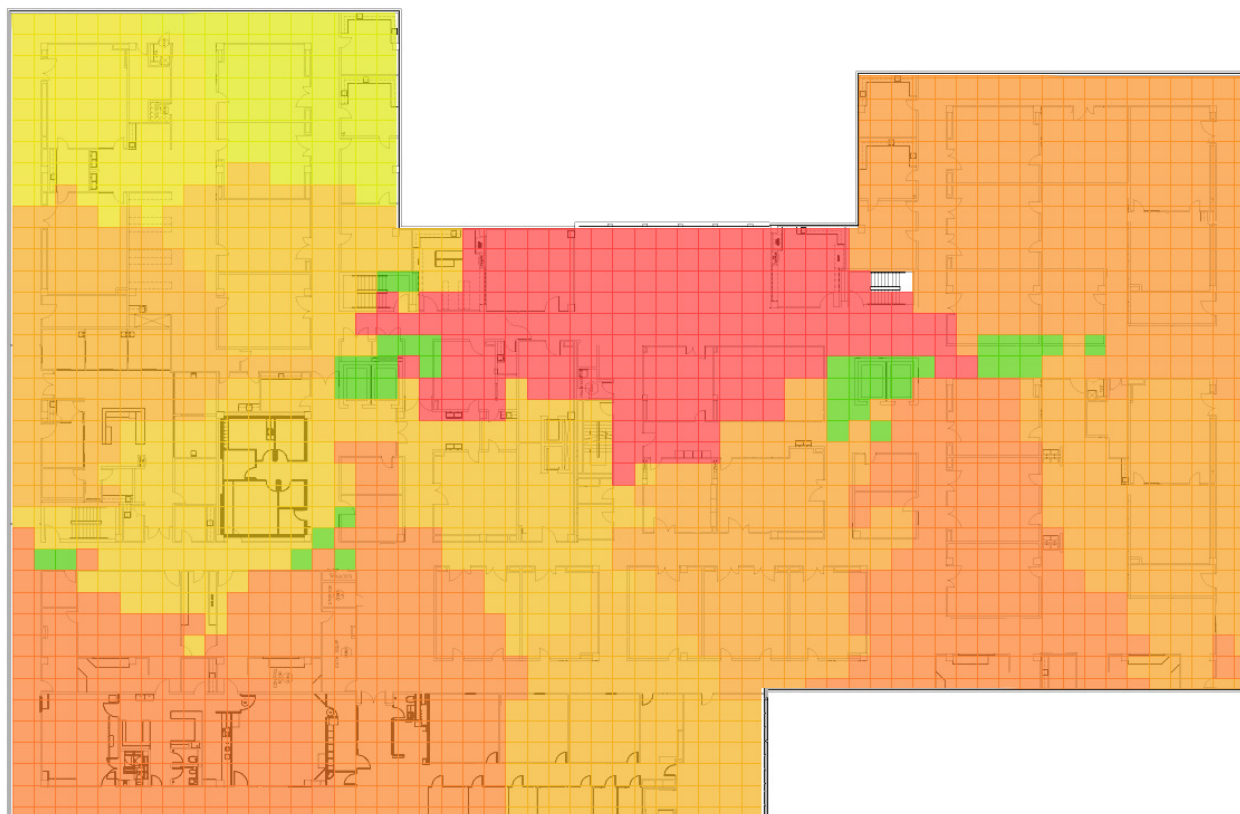
VoIP calls

### 3.4.4 Associated Clients 2.4 GHz

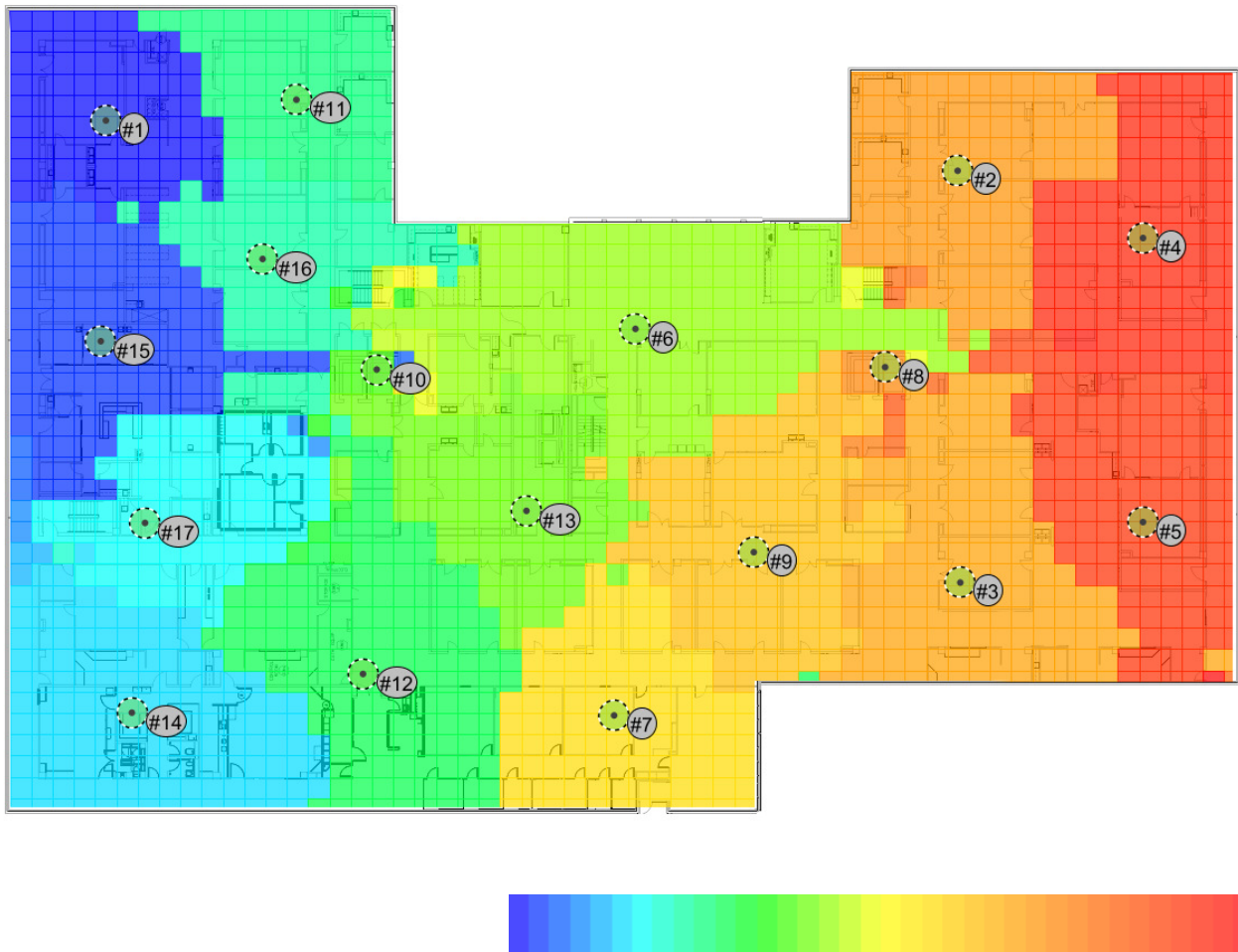




### 3.4.5 Associated Clients 5 GHz



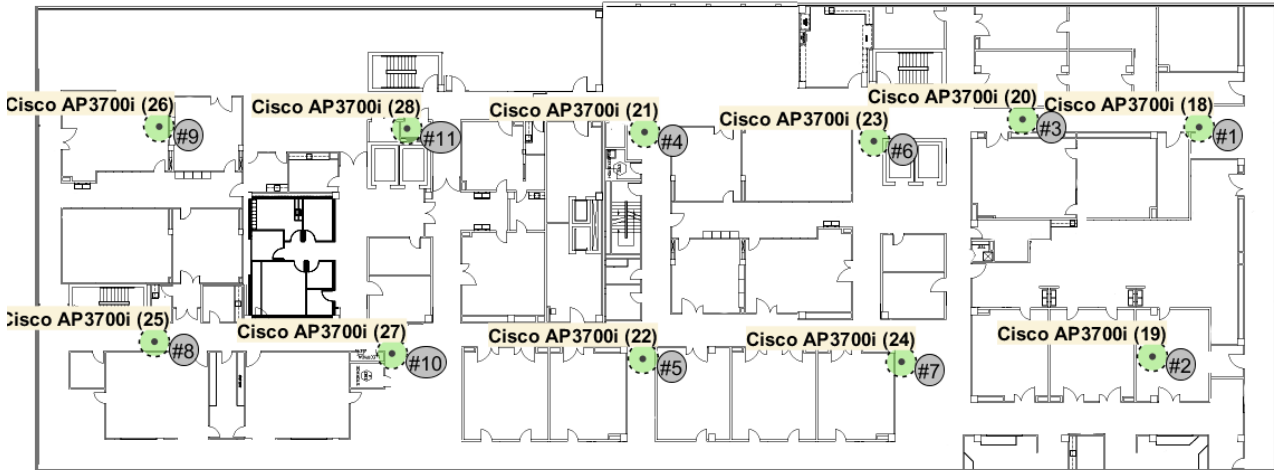
### 3.5 AP Serving Areas



#### 4. Map Floor 2

##### 4.1 Survey Routes and AP Locations

##### 4.1.1 Access Point Locations

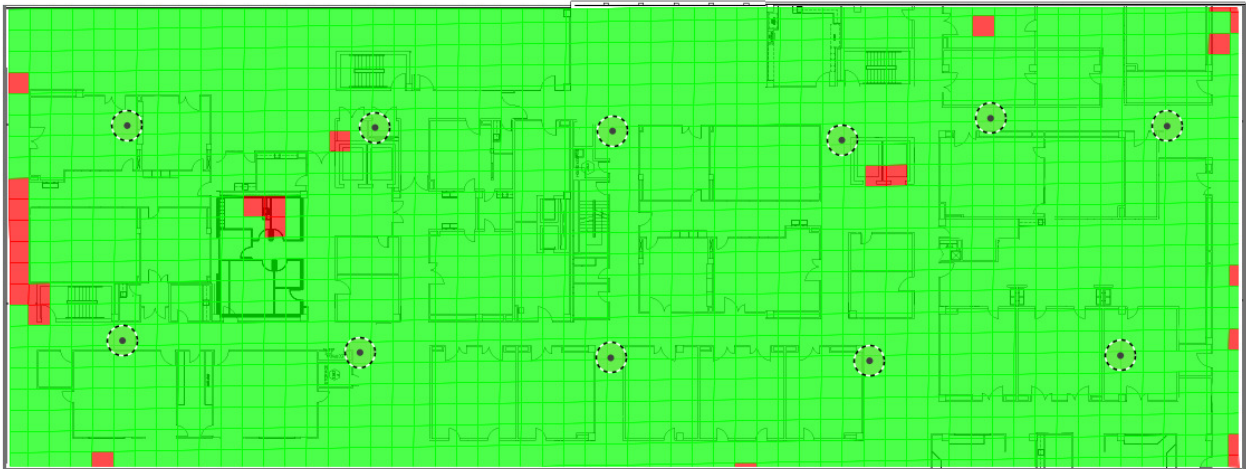


| Access Points                        |        |
|--------------------------------------|--------|
| Name: <b>Cisco AP3700i (18) (#1)</b> | Notes: |
| Radio on channel: <b>1</b>           |        |
| Networks:                            |        |
| Radio on channel: <b>64</b>          |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (19) (#2)</b> | Notes: |
| Radio on channel: <b>6</b>           |        |
| Networks:                            |        |
| Radio on channel: <b>116</b>         |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (20) (#3)</b> | Notes: |
| Radio on channel: <b>11</b>          |        |
| Networks:                            |        |
| Radio on channel: <b>136</b>         |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (21) (#4)</b> | Notes: |
| Radio on channel: <b>1</b>           |        |
| Networks:                            |        |
| Radio on channel: <b>40</b>          |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (22) (#5)</b> | Notes: |
| Radio on channel: <b>11</b>          |        |
| Networks:                            |        |
| Radio on channel: <b>124</b>         |        |
| Networks:                            |        |

|                                                                                       |        |
|---------------------------------------------------------------------------------------|--------|
|                                                                                       |        |
| Name: <b>Cisco AP3700i (23) (#6)</b>                                                  | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>104</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (24) (#7)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>52</b><br>Networks:   |        |
| Name: <b>Cisco AP3700i (25) (#8)</b>                                                  | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>132</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (26) (#9)</b>                                                  | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>48</b><br>Networks:   |        |
| Name: <b>Cisco AP3700i (27) (#10)</b>                                                 | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>60</b><br>Networks:   |        |
| Name: <b>Cisco AP3700i (28) (#11)</b>                                                 | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>112</b><br>Networks: |        |

## 4.2 Network Health

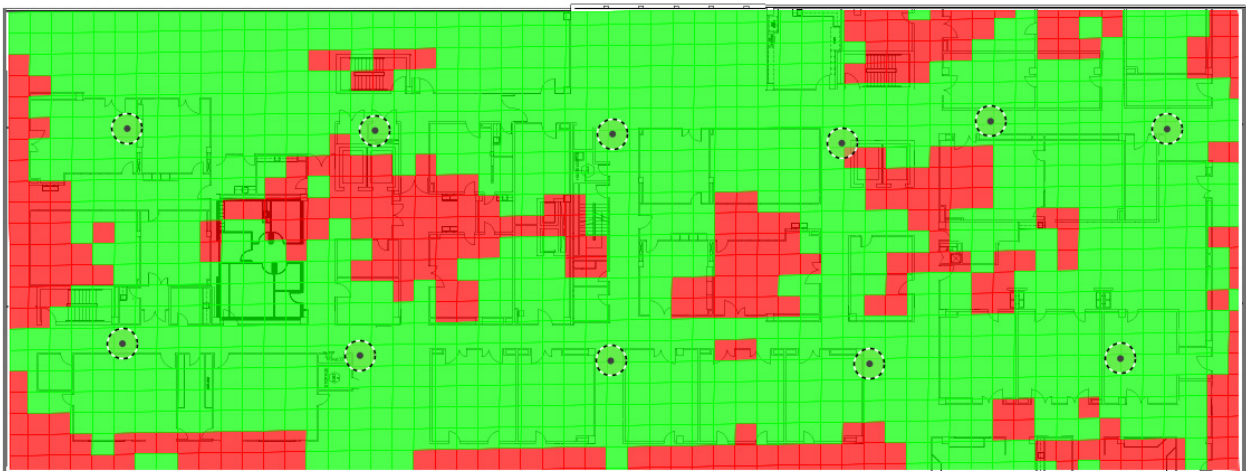
### 4.2.1 2.4 GHz



Fail

Pass

### 4.2.2 5 GHz

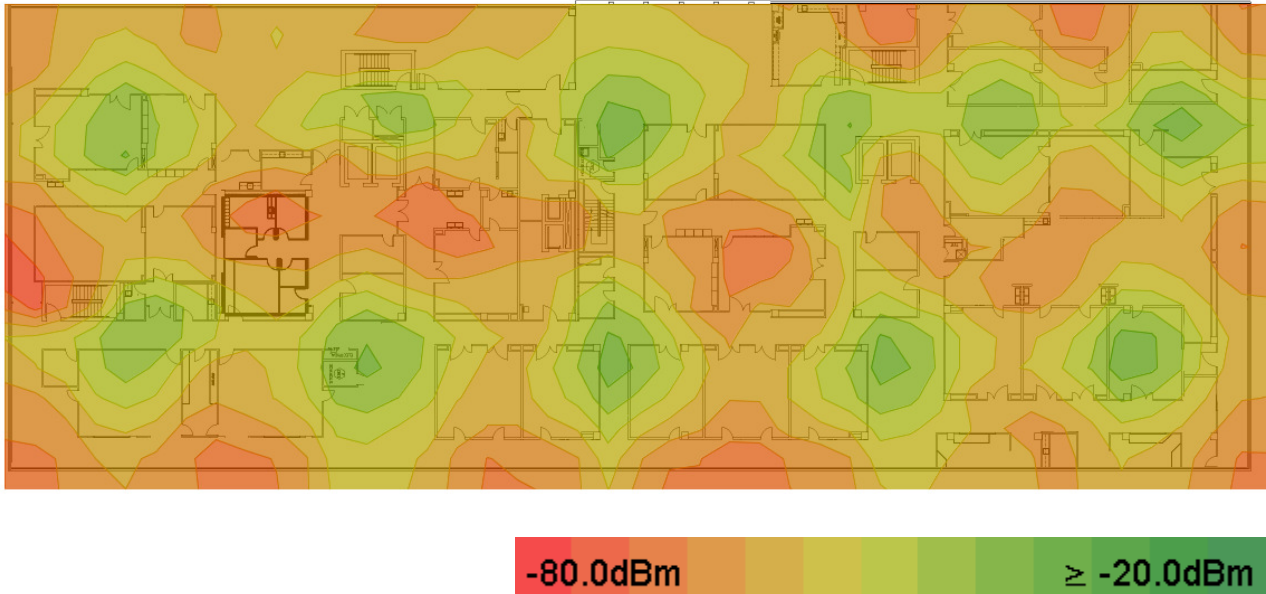


Fail

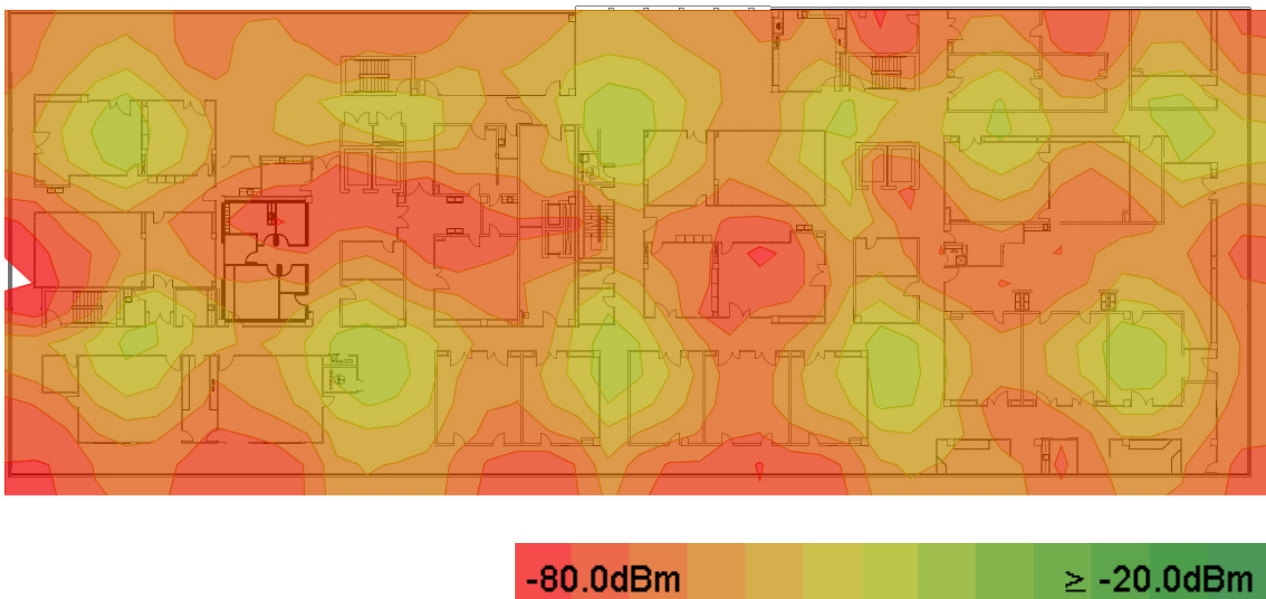
Pass

### 4.3 Coverage, Interference and SNR

#### 4.3.1 Signal Strength 2.4 GHz



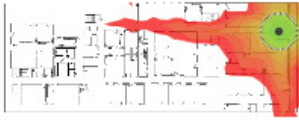
#### 4.3.2 Signal Strength 5 GHz



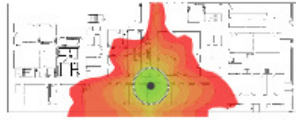


#### 4.3.2.1 Access Point Coverage 2.4 GHz

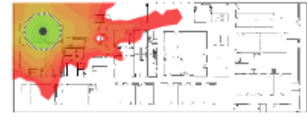
Cisco AP3700i (18) @ Channel 1



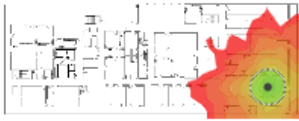
Cisco AP3700i (22) @ Channel 11



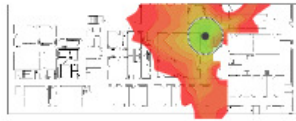
Cisco AP3700i (26) @ Channel 6



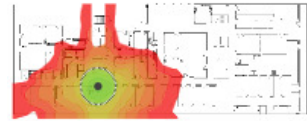
Cisco AP3700i (19) @ Channel 6



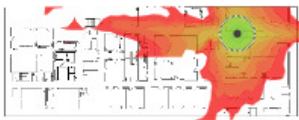
Cisco AP3700i (23) @ Channel 6



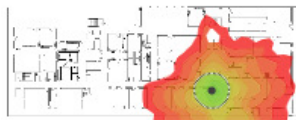
Cisco AP3700i (27) @ Channel 6



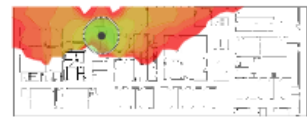
Cisco AP3700i (20) @ Channel 11



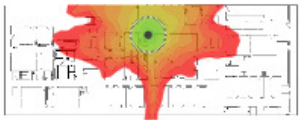
Cisco AP3700i (24) @ Channel 1



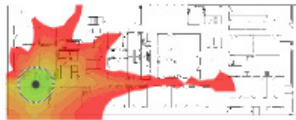
Cisco AP3700i (28) @ Channel 11



Cisco AP3700i (21) @ Channel 1



Cisco AP3700i (25) @ Channel 1

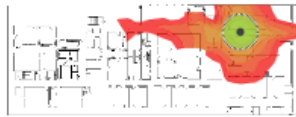


#### 4.3.2.2 Access Point Coverage 5 GHz

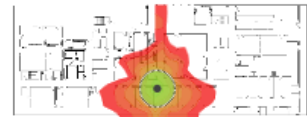
Cisco AP3700i (18) @ Channel 64



Cisco AP3700i (20) @ Channel 136



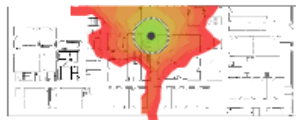
Cisco AP3700i (22) @ Channel 124



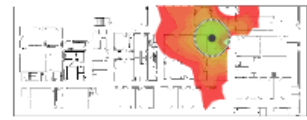
Cisco AP3700i (19) @ Channel 116



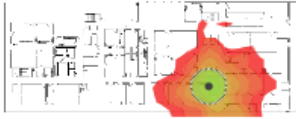
Cisco AP3700i (21) @ Channel 40



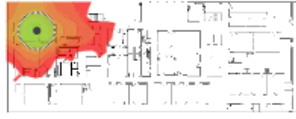
Cisco AP3700i (23) @ Channel 104



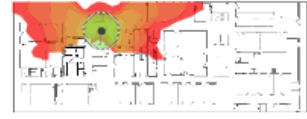
Cisco AP3700i (24) @ Channel 52



Cisco AP3700i (26) @ Channel 48



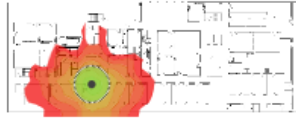
Cisco AP3700i (28) @ Channel 112



Cisco AP3700i (25) @ Channel 132



Cisco AP3700i (27) @ Channel 60

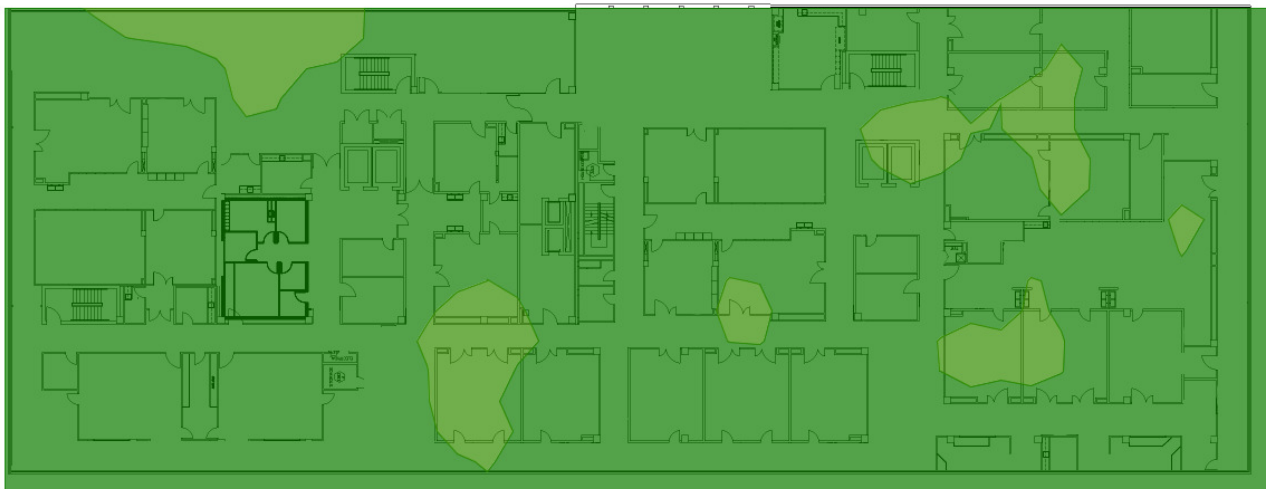




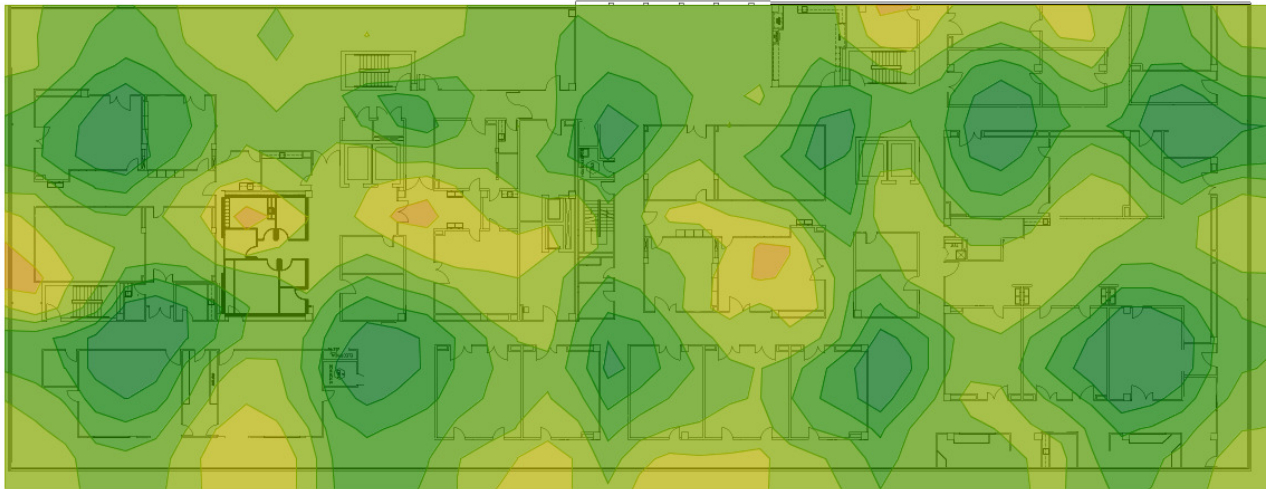
#### 4.3.3 Interference 2.4 GHz



#### 4.3.4 Interference 5 GHz

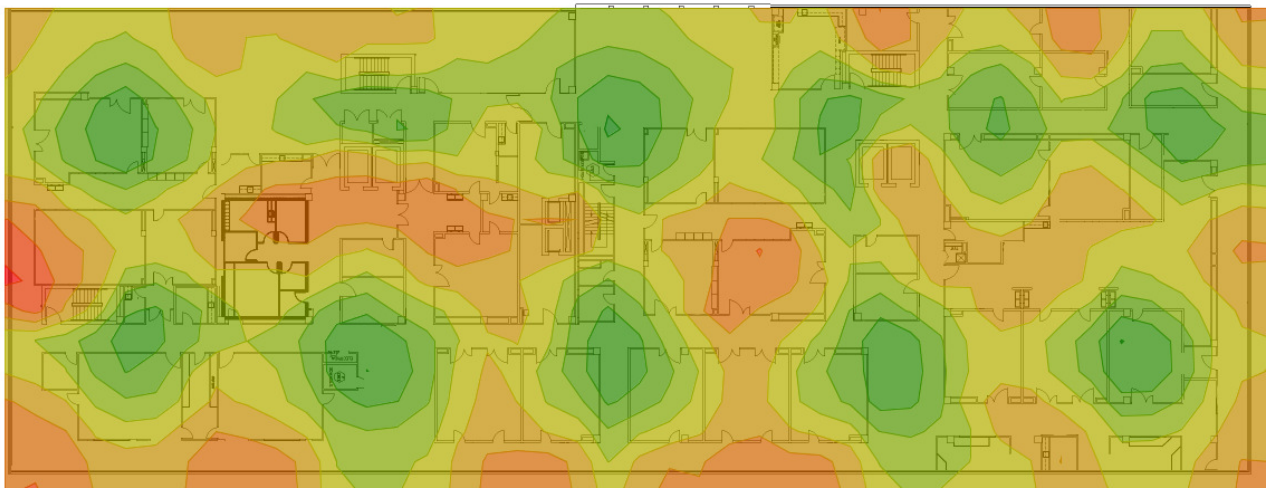


#### 4.3.5 SNR 2.4 GHz



5.0dB  $\geq 50.0\text{dB}$

#### 4.3.6 SNR 5 GHz

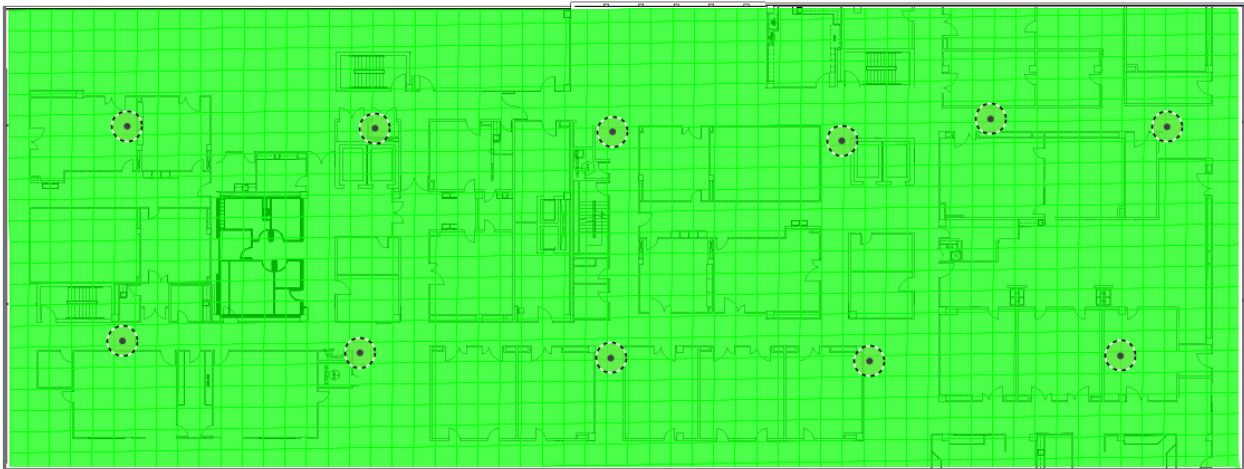


5.0dB  $\geq 50.0\text{dB}$

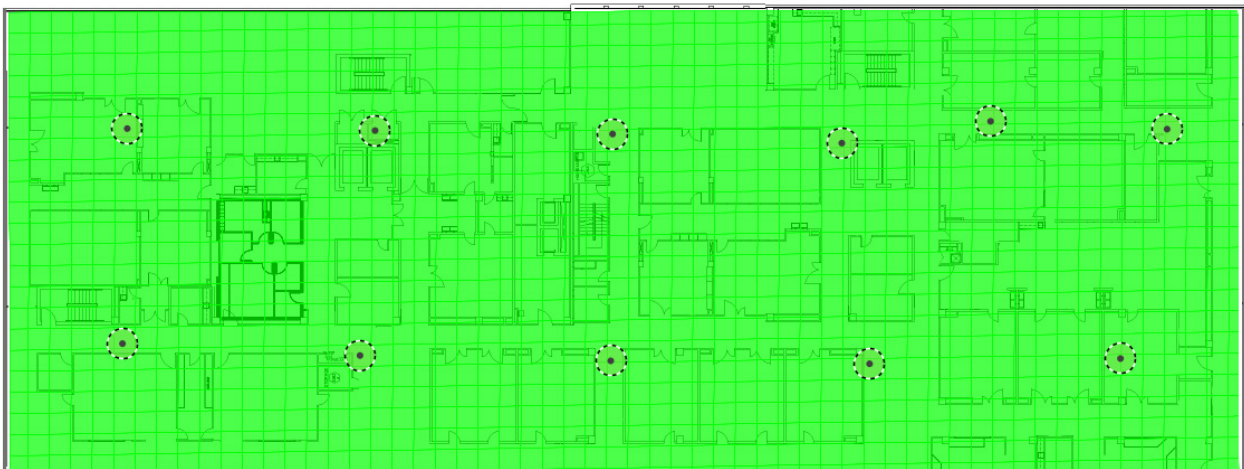
#### 4.4 Capacity

| Number of devices on this floor | Device        |
|---------------------------------|---------------|
| 266 / 900                       | Laptop        |
| 177 / 600                       | AC Smartphone |
| 15 / 50                         | Tablet        |

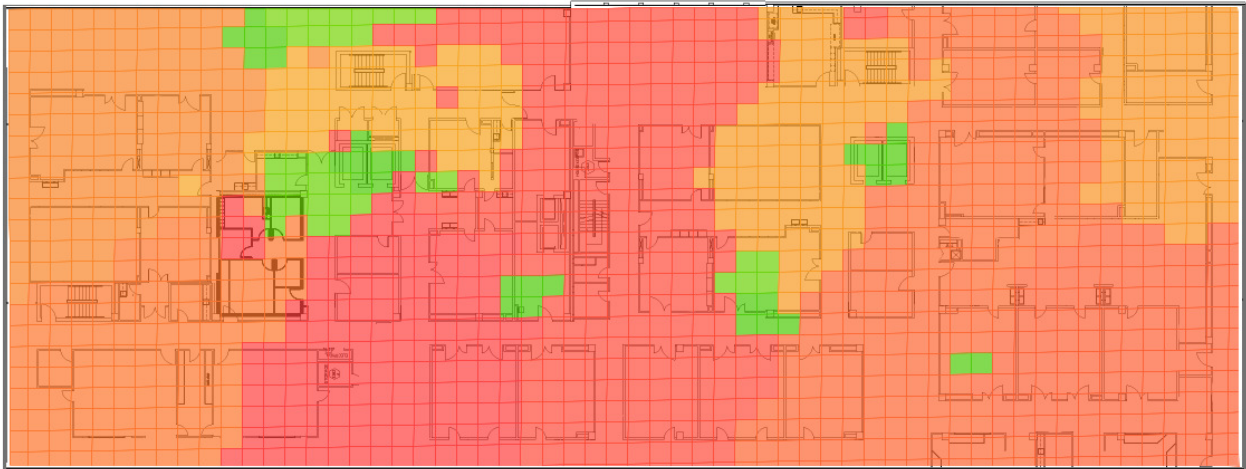
##### 4.4.2 Capacity Health 2.4 GHz


**Pass**
**Capacity**
**Assoc.**
**VoIP calls**

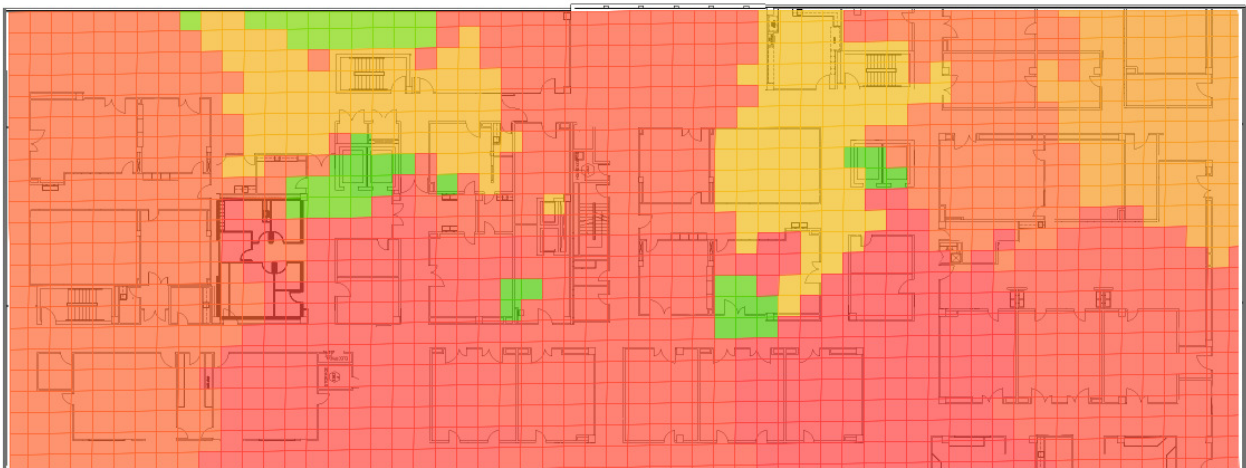
##### 4.4.3 Capacity Health 5 GHz


**Pass**
**Capacity**
**Assoc.**
**VoIP calls**

#### 4.4.4 Associated Clients 2.4 GHz

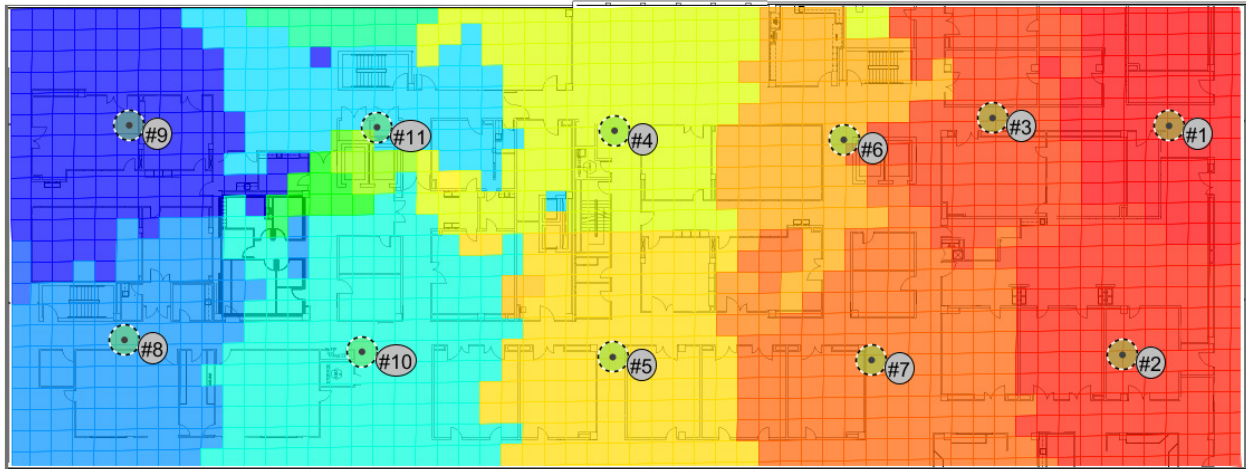


#### 4.4.5 Associated Clients 5 GHz





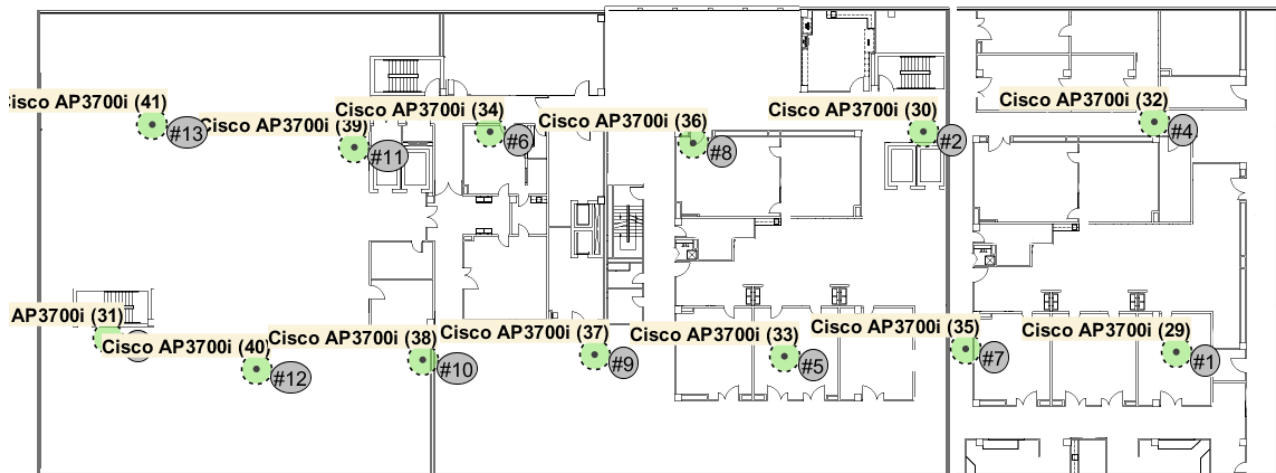
#### 4.5 AP Serving Areas



## 5 Map Floor 3

### 5.3 Survey Routes and AP Locations

#### 5.3.2 Access Point Locations



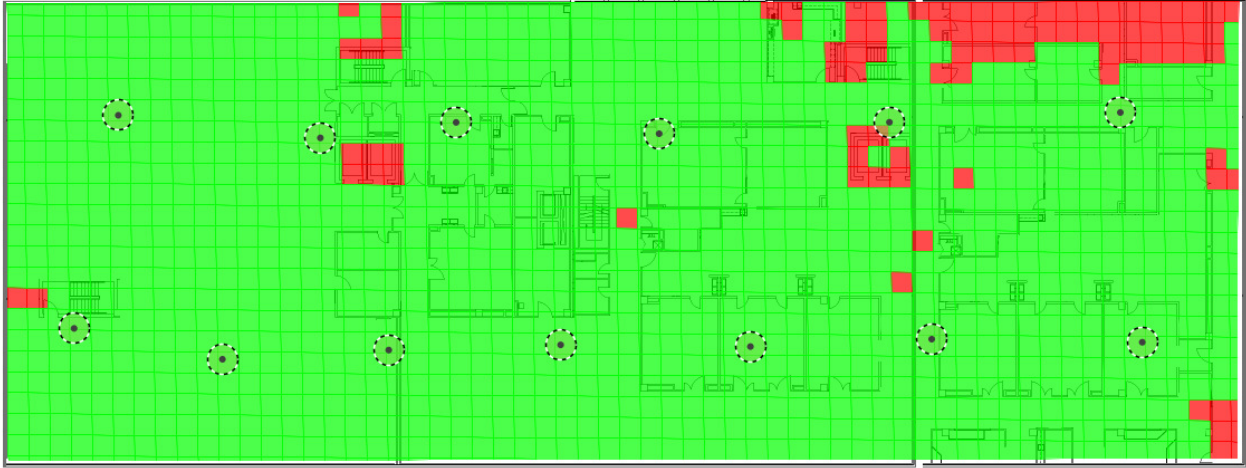
| Access Points                        |        |
|--------------------------------------|--------|
| Name: <b>Cisco AP3700i (29) (#1)</b> | Notes: |
| Radio on channel: <b>11</b>          |        |
| Networks:                            |        |
| Radio on channel: <b>64</b>          |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (30) (#2)</b> | Notes: |
| Radio on channel: <b>11</b>          |        |
| Networks:                            |        |
| Radio on channel: <b>52</b>          |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (31) (#3)</b> | Notes: |
| Radio on channel: <b>11</b>          |        |
| Networks:                            |        |
| Radio on channel: <b>64</b>          |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (32) (#4)</b> | Notes: |
| Radio on channel: <b>6</b>           |        |
| Networks:                            |        |
| Radio on channel: <b>136</b>         |        |
| Networks:                            |        |
| Name: <b>Cisco AP3700i (33) (#5)</b> | Notes: |
| Radio on channel: <b>6</b>           |        |
| Networks:                            |        |

|                                                                                      |        |
|--------------------------------------------------------------------------------------|--------|
| Radio on channel: <b>40</b><br>Networks:                                             |        |
| Name: <b>Cisco AP3700i (34) (#6)</b>                                                 | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>132</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (35) (#7)</b>                                                 | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>116</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (36) (#8)</b>                                                 | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>112</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (37) (#9)</b>                                                 | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>60</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (38) (#10)</b>                                                | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>120</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (39) (#11)</b>                                                | Notes: |
| Radio on channel: <b>11</b><br>Networks:<br>Radio on channel: <b>56</b><br>Networks: |        |
| Name: <b>Cisco AP3700i (40) (#12)</b>                                                | Notes: |
| Radio on channel: <b>6</b><br>Networks:<br>Radio on channel: <b>36</b><br>Networks:  |        |
| Name: <b>Cisco AP3700i (41) (#13)</b>                                                | Notes: |
| Radio on channel: <b>1</b><br>Networks:<br>Radio on channel: <b>108</b><br>Networks: |        |



## 5.4 Network Health

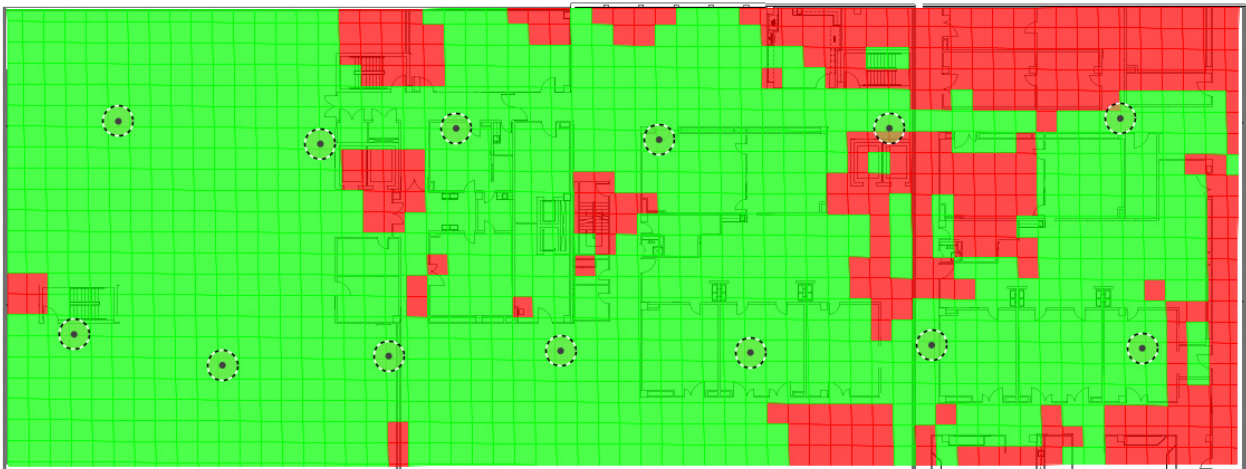
### 5.4.1 2.4 GHz



Fail

Pass

### 5.4.2 5 GHz

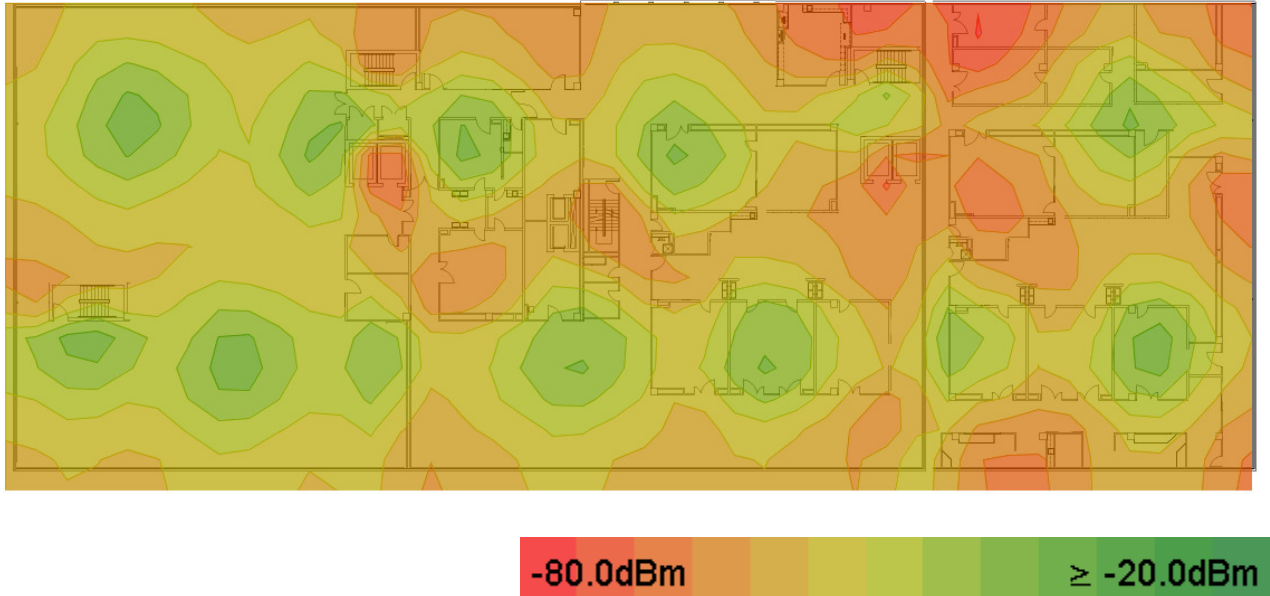


Fail

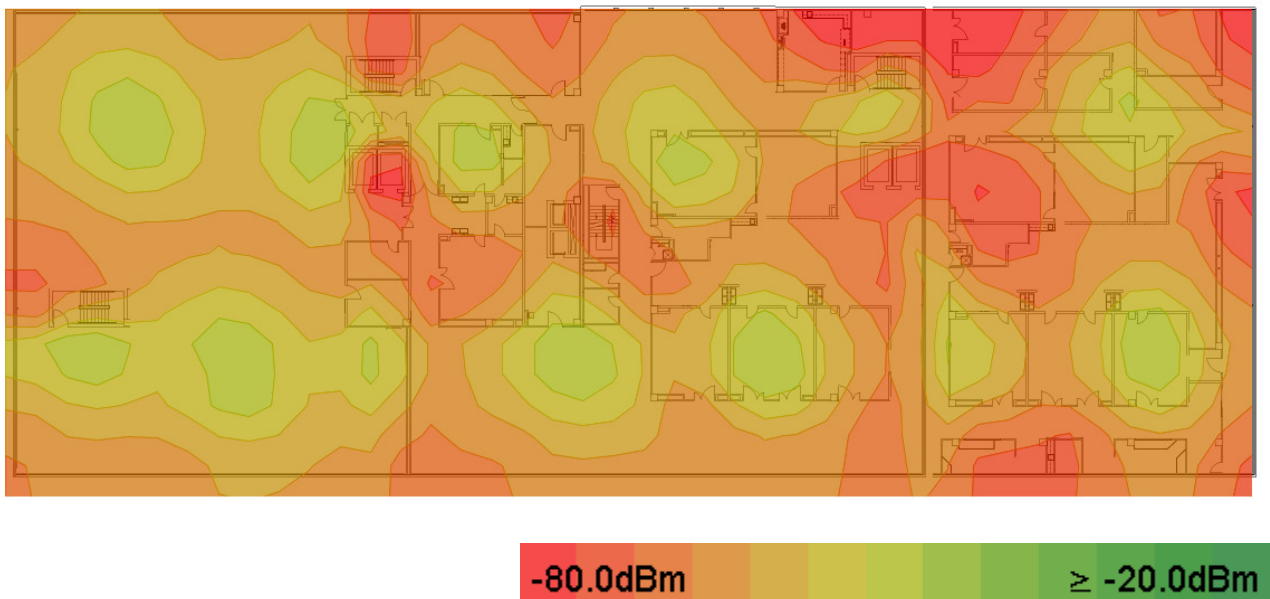
Pass

## 5.5 Coverage, Interference and SNR

### 5.5.1 Signal Strength 2.4 GHz



### 5.5.2 Signal Strength 5 GHz



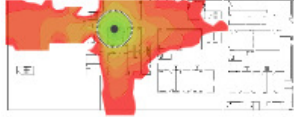
### 5.5.2.1

### Access Point Coverage 2.4 GHz

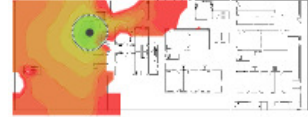
Cisco AP3700i (29) @ Channel 11



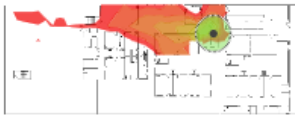
Cisco AP3700i (34) @ Channel 6



Cisco AP3700i (39) @ Channel 11



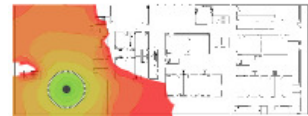
Cisco AP3700i (30) @ Channel 11



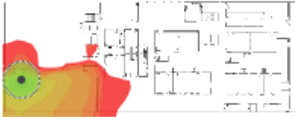
Cisco AP3700i (35) @ Channel 1



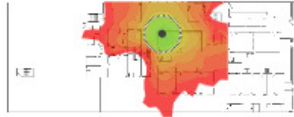
Cisco AP3700i (40) @ Channel 6



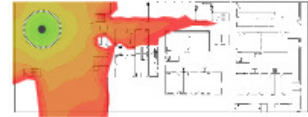
Cisco AP3700i (31) @ Channel 11



Cisco AP3700i (36) @ Channel 1



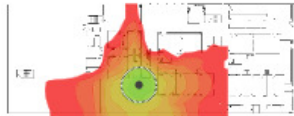
Cisco AP3700i (41) @ Channel 1



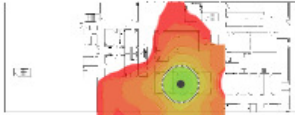
Cisco AP3700i (32) @ Channel 6



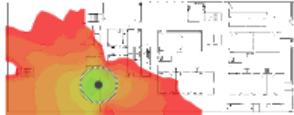
Cisco AP3700i (37) @ Channel 11



Cisco AP3700i (33) @ Channel 6



Cisco AP3700i (38) @ Channel 1



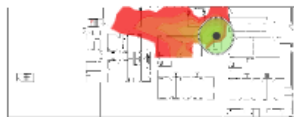
### 5.5.2.2

### Access Point Coverage 5 GHz

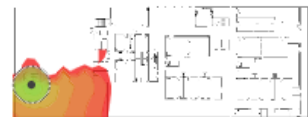
Cisco AP3700i (29) @ Channel 64



Cisco AP3700i (30) @ Channel 52



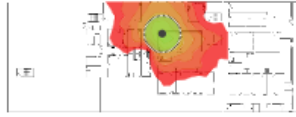
Cisco AP3700i (31) @ Channel 64



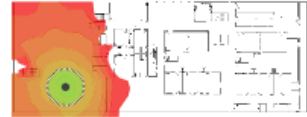
Cisco AP3700i (32) @ Channel 136



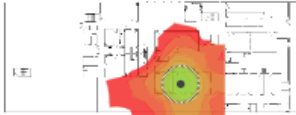
Cisco AP3700i (36) @ Channel 112



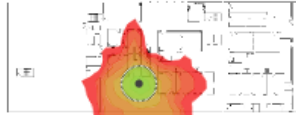
Cisco AP3700i (40) @ Channel 36



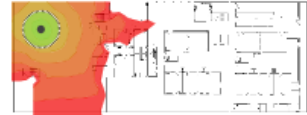
Cisco AP3700i (33) @ Channel 40



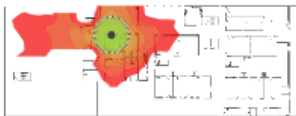
Cisco AP3700i (37) @ Channel 60



Cisco AP3700i (41) @ Channel 108



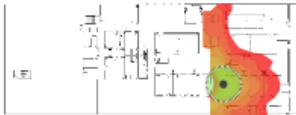
Cisco AP3700i (34) @ Channel 132



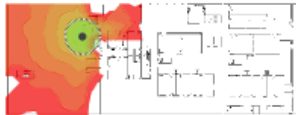
Cisco AP3700i (38) @ Channel 120



Cisco AP3700i (35) @ Channel 116



Cisco AP3700i (39) @ Channel 56



### 5.5.3 Interference 2.4 GHz

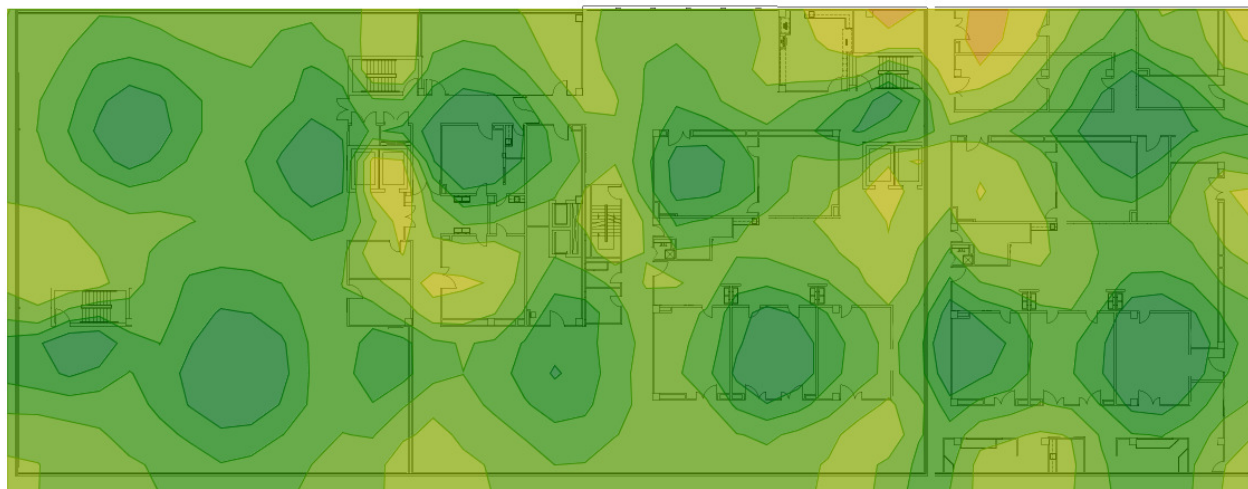


### 5.5.4 Interference 5 GHz





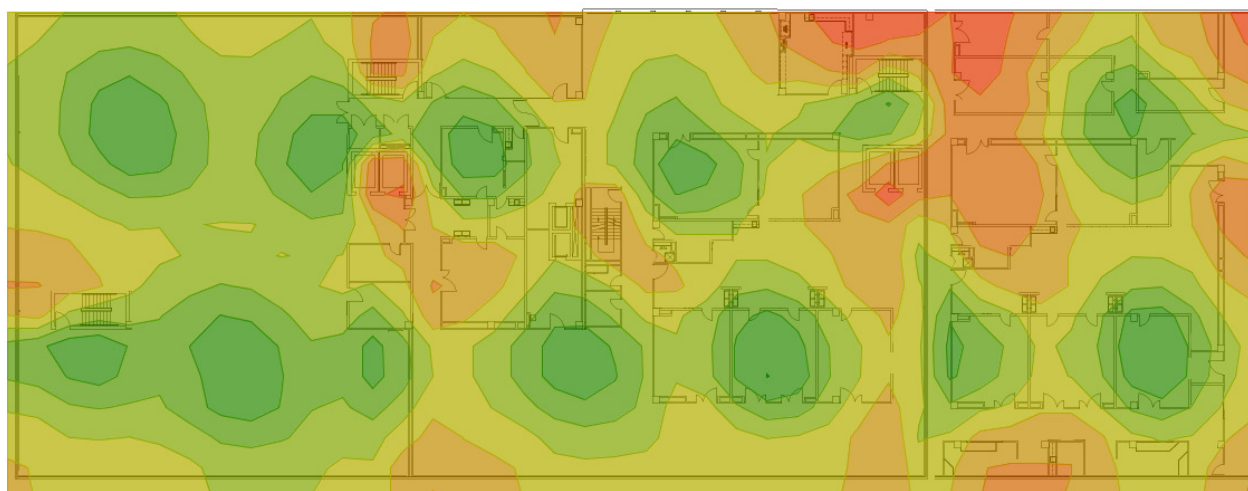
### 5.5.5 SNR 2.4 GHz



5.0dB

≥ 50.0dB

### 5.5.6 SNR 5 GHz



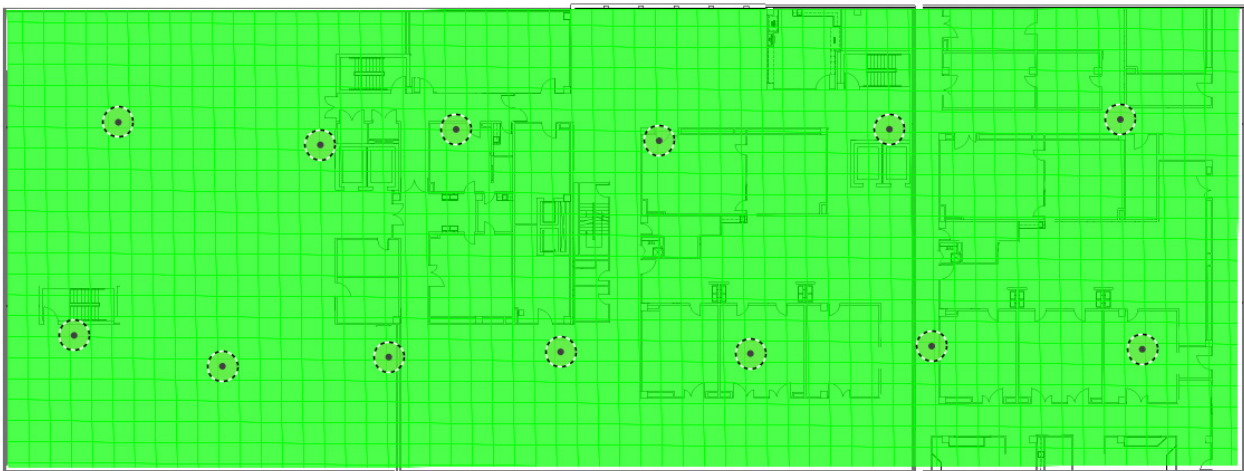
5.0dB

≥ 50.0dB

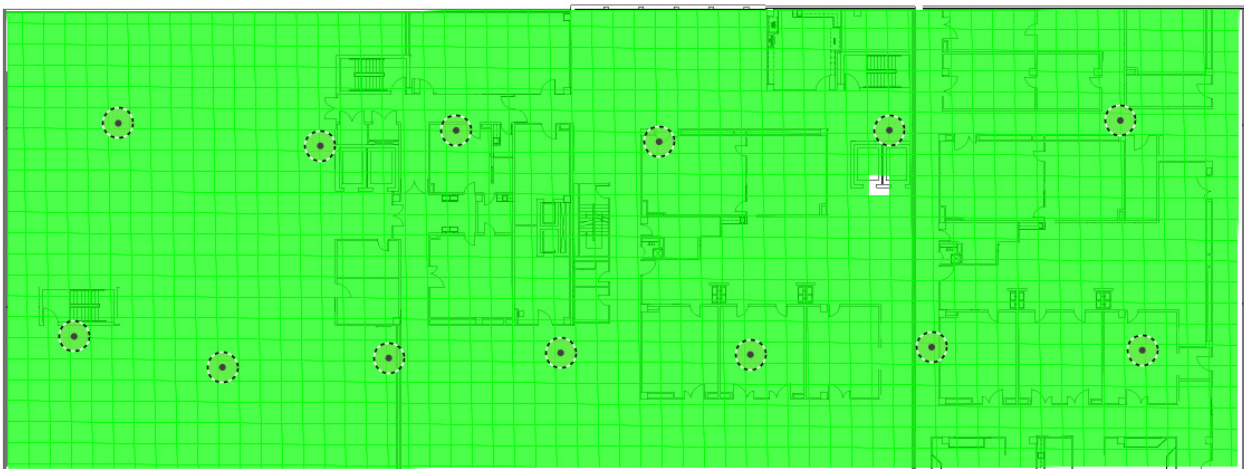
## 5.6 Capacity

| Number of devices on this floor | Device        |
|---------------------------------|---------------|
| 262 / 900                       | Laptop        |
| 175 / 600                       | AC Smartphone |
| 15 / 50                         | Tablet        |

### 5.6.1 Capacity Health 2.4 GHz

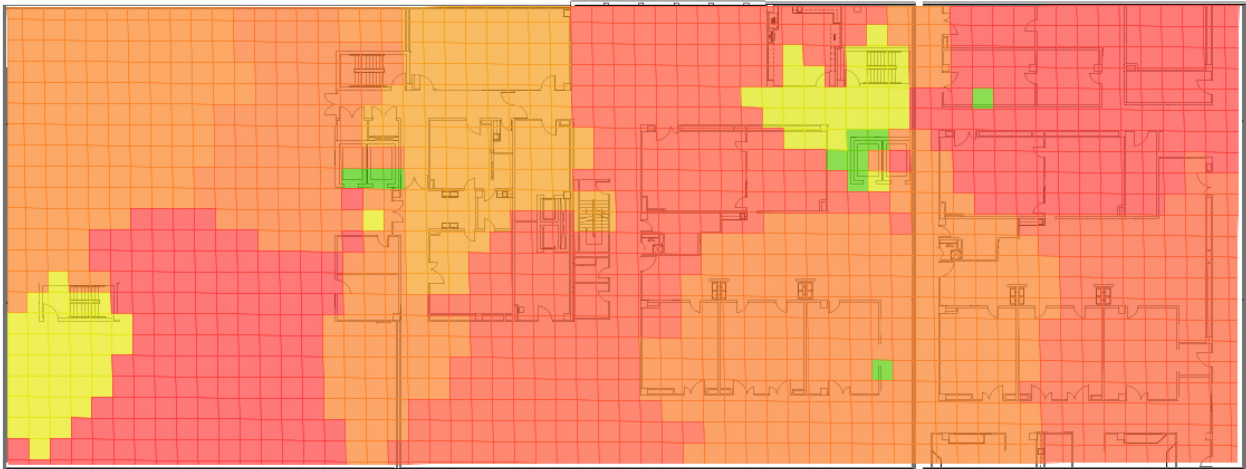

**Pass**
**Capacity**
**Assoc.**
**VoIP calls**

### 5.6.2 Capacity Health 5 GHz

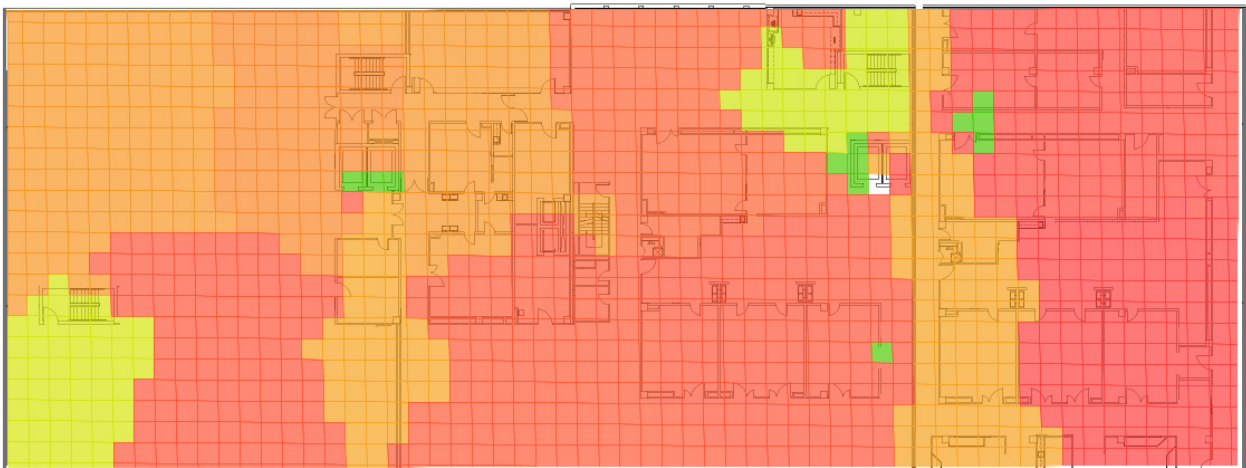

**Pass**
**Capacity**
**Assoc.**
**VoIP calls**



### 5.6.3 Associated Clients 2.4 GHz



### 5.6.4 Associated Clients 5 GHz



## 5.7 AP Serving Areas

