Demo Passive Survey

Prepared for:	Test Company
Prepared by:	Chris AirMagnet
Location:	Imaginery location
Time of Survey:	2046.02.29

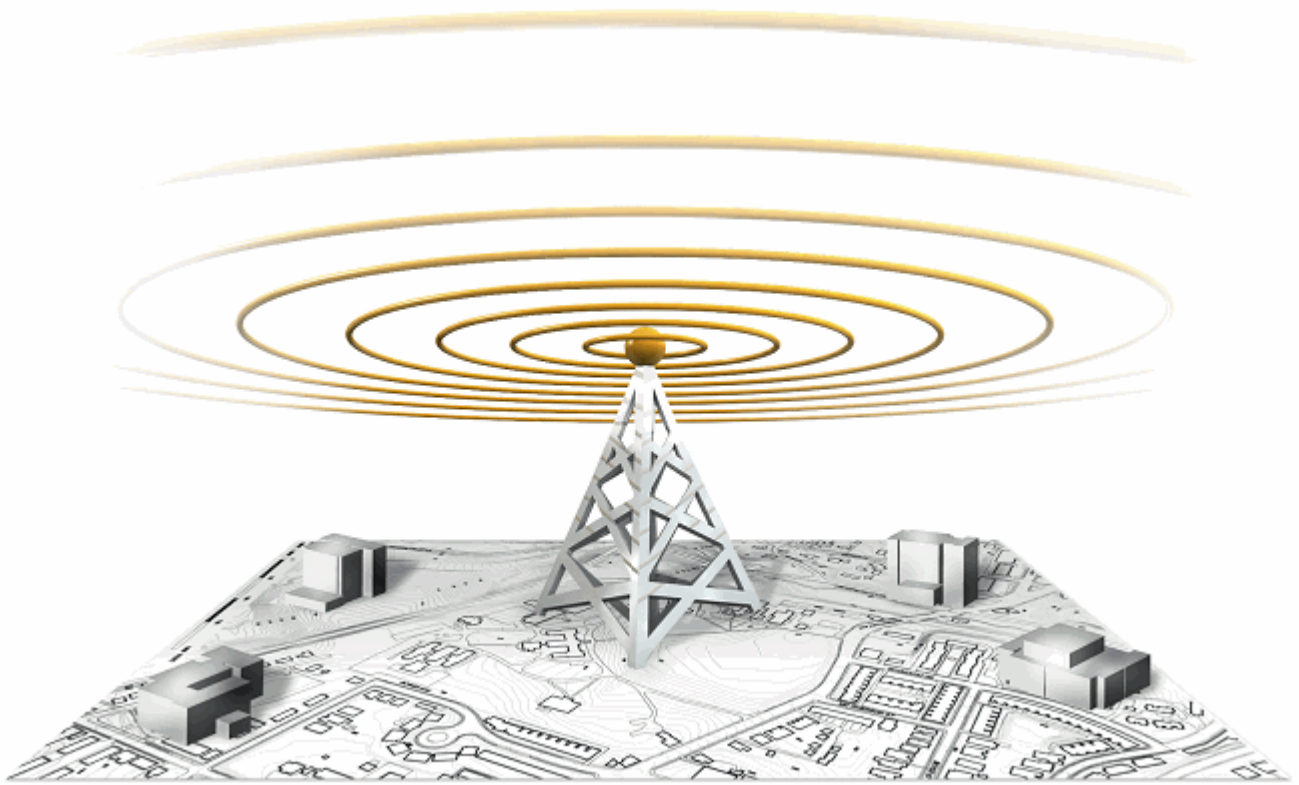


Table of Contents

1 Executive Summary

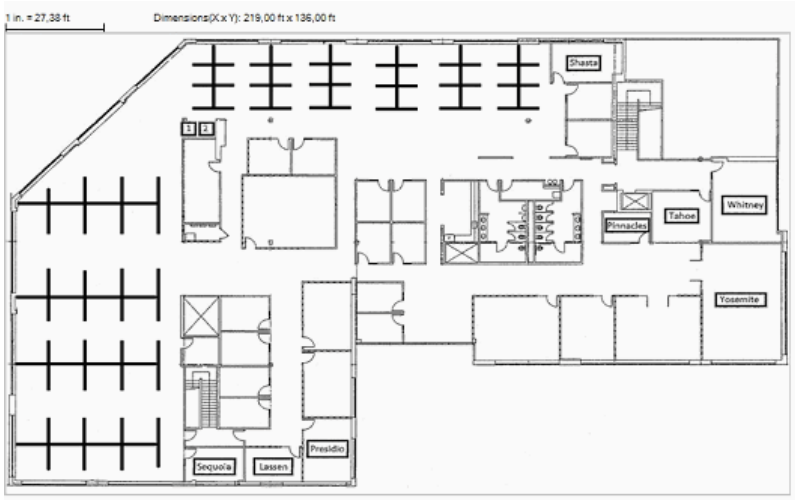
This wireless site survey and RF analysis were performed in order to gain an in-depth understanding of present RF interference sources and to meet overall wireless coverage requirements. The primary goal and subsequent objectives were designed with coverage, desired throughput and usability as primary driving requirements from the business group. This survey was created using an industry standard set of AirMagnet Survey PRO wireless tools and software, which are used for building and securing wireless networks. This survey encompasses site surveying, RF spectrum analysis surveying and real time active site surveying techniques. This document includes site survey specific information, Access Point configuration and installation data sheets, and RF coverage pattern maps. A wireless survey was performed at the customer site. The purpose of the survey is to determine the number and placement of wireless access points necessary to provide ubiquitous coverage for the entire building.

1.1 Survey Overview

1.1.1 Floor Plan Overview

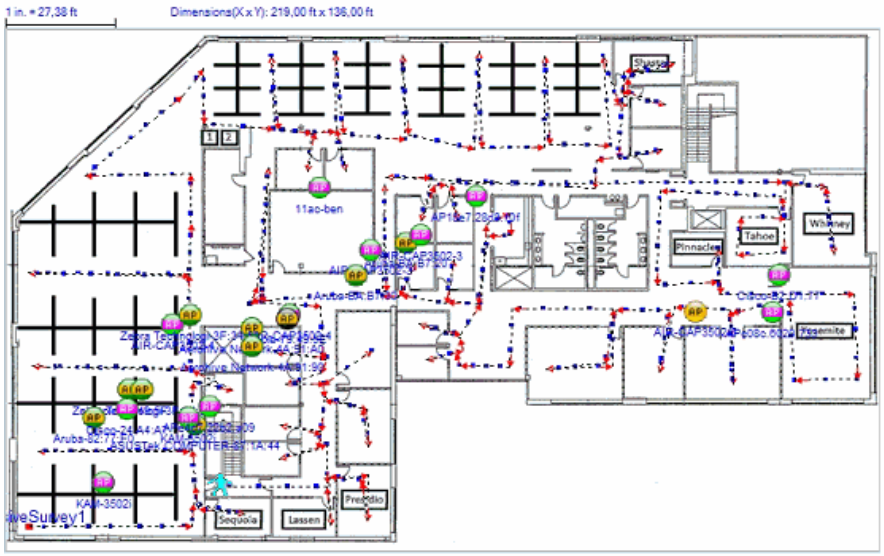
The image below details the area that was surveyed. It includes the floor plan and the dimensions of the building. It can be useful to refer back to this view from some of the other graphs to help orient yourself.

Dimensions	
X	219,00 ft
Y	136,00 ft



1.1.2 Survey Path

This image displays the path taken during the survey process. The red dots indicate points that were clicked during the survey, whereas the blue ones represent sampling points taken by the application automatically.



2 Introduction

2.1 Objective

2.1.1 Pre-Install/Post-Install Survey-Checkup

The stated objective of this survey is to perform a spot-check of the existing deployment in order to establish that the current wireless infrastructure meets the needs of the users present. The requirements against which these results will be compared are stated in the WLAN Deployment Requirements section detailed later in this report.

3 Methodology

Multiple surveys were performed to allow finer detail and comprehensive data gathering. The process used to determine the existing RF data coverage in the facility is outlined below:

- Passive surveys were conducted throughout the facility to gather RF data (signal strength, noise level, signal-to-noise ratio, SSID and MAC addresses)
- Active Surveys were conducted throughout the facility. This was done to test performance and the roaming and connectivity ability of the Wi-Fi Network.

4 WLAN Deployment Requirements

This section documents the user's stated requirements for satisfactory wireless service in the region being surveyed. Note that these values can differ from site to site.

4.1 Deployment Requirements

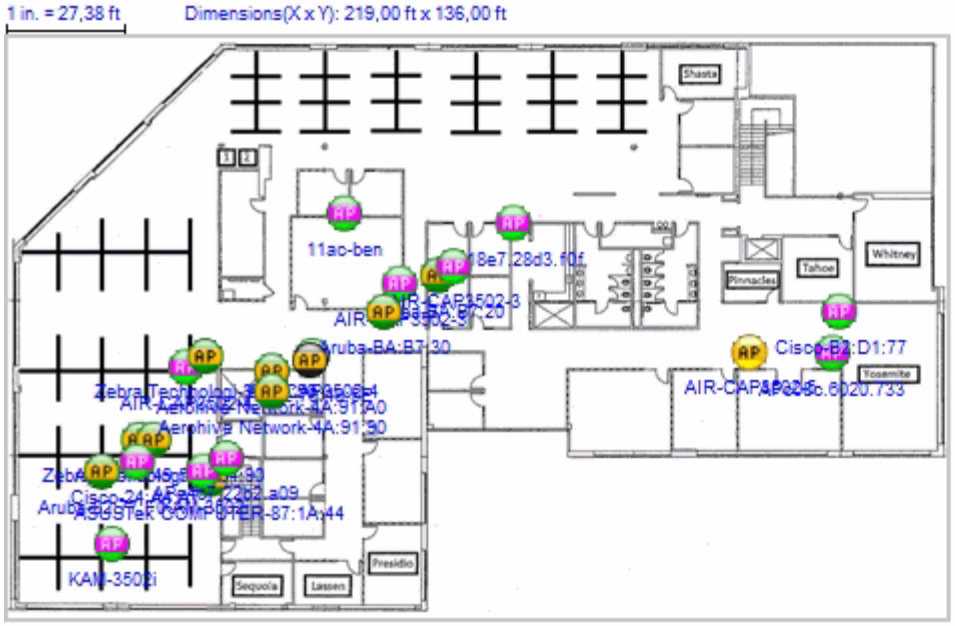
Description	Threshold
Desired Signal Coverage	
Minimum AP signal strength required	-67 dBm
Multiple AP Signal Coverage	
Number of APs required to provide coverage	2
Minimum AP signal strength required to provide coverage	-67 dBm
Channel Interference	
Interfered APs: Exclude APs if signal strength is weaker than	-75 dBm
Interfering APs: Exclude APs if signal strength is weaker than	-85 dBm
Measured PHY Data Rate Uplink Coverage	
Minimum AP PHY Data Rate required	5,50 Mbps
Measured PHY Data Rate Downlink Coverage	
Minimum AP PHY Data Rate required	54,00 Mbps
Predictive PHY Data Rate Downlink Coverage	
Minimum AP PHY Data Rate required	54,00 Mbps
Signal Noise Ratio Coverage	
Minimum Signal Noise Ratio required	25 dBm
Noise Level	
Maximum Noise Level Allowed	-90 dBm
User Capacity	
Maximum Users Supported per AP	15

With Load Balancing	True
Operating Mode	
Greenfield Operating Mode	Allowed
HT Mixed Operating Mode	Not Allowed
VHT Mixed Operating Mode	Allowed
Legacy Operating Mode	Not Allowed
Channel Width	
40 MHz Channel Width	Allowed
20HT MHz Channel Width	Not Allowed
20 MHz Legacy Channel Width	Not Allowed
80 MHz Channel Width	Allowed
160 MHz Channel Width	Allowed
802.11n Highest MCS Index	
Minimum Tx MCS index required	15
802.11ac Highest MCS Index	
Minimum Tx MCS index required	9

5 Current AP Placement and Configuration

The floor plan below shows the locations of the currently installed APs or desired if this is a new deployment . The specific details for each AP are described in the section labeled "AP Detail Breakdown".
Note: Only the AP's that were placed on the floor plan prior to running the report will be shown on the floor plan image.

5.1 AP Placement Overview


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
11ac-ben
Aruba-BA:B7:30
Cisco-B2:D1:77
Aerohive Network-4A:91:A0
Aerohive Network-4A:91:30
KAM-3503i

5.2 AP Detail Breakdown

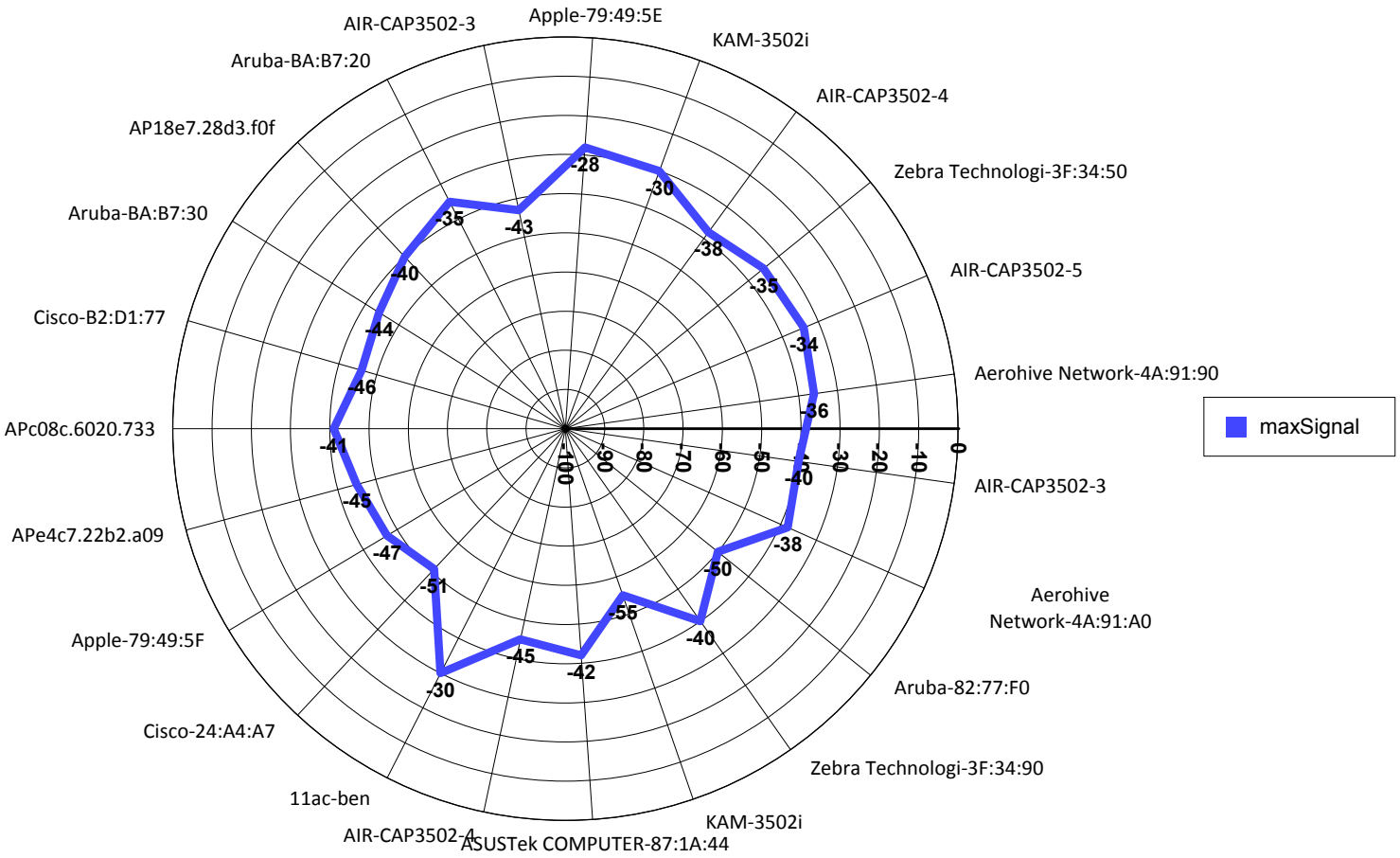
Access Points

AP Name	Media Type	MAC Address	Channel	SSID	Power,mW	Max Signal
---- Non ACL, Neighborings, Rogues----						
AIR-CAP3502-5	802.11g-2.4 GHz	58:BC:27:92:91:30	CH (1)	AMEpre	100	-34
Zebra Technologi-3F:34:50	802.11g-2.4 GHz	00:23:68:3F:34:50	CH (1)	AML	100	-35
Aerohive Network-4A:91:90	802.11gn-2.4 GHz	00:19:77:4A:91:90	CH (1)	AeroHive	100	-36
AIR-CAP3502-3	802.11gn-2.4 GHz	58:BC:27:92:8B:10	CH (11)	air-tek-01	100	-43
AIR-CAP3502-4	802.11gn-2.4 GHz	58:BC:27:92:A4:E0	CH (6)	air-tek-01	100	-38
Apple-79:49:5E	802.11gn-2.4 GHz	24:A0:74:79:49:5E	CH (7)	Mr B's WiFi Network	100	-28
Aruba-BA:B7:20	802.11gn-2.4 GHz	6C:F3:7F:BA:B7:20	CH (11)	aruba-ap	100	-35
KAM-3502i	802.11gn-2.4 GHz	E8:04:62:F7:EA:60	CH (6)	air-tek-01	100	-30
Zebra Technologi-3F:34:90	802.11a-5.0 GHz	00:23:68:3F:34:90	CH (157)	AML	100	-40
AP18e7.28d3.f0f	802.11ac-5.0 GHz	74:26:AC:14:21:AF	CH (36)	Cisco11ac	100	-40
APc08c.6020.733	802.11ac-5.0 GHz	50:17:FF:B2:D1:7F	CH (36 P, 40MHz, 36-40)	Cisco11ac	100	-41
APe4c7.22b2.a09	802.11ac-5.0 GHz	34:DB:FD:24:A4:AF	CH (36 P, 40MHz, 36-40)	Cisco11ac	100	-45
Apple-79:49:5F	802.11ac-5.0 GHz	24:A0:74:79:49:5F	CH (36 P, 80MHz, 36-48)	Mr B's WiFi Network	100	-47
Aruba-82:77:F0	802.11ac-5.0 GHz	9C:1C:12:82:77:F0	CH (161 P, 80MHz, 149-161)	Aruba-11ac	100	-50
ASUSTek COMPUTER-87:1A:44	802.11ac-5.0 GHz	74:D0:2B:87:1A:44	CH (149 P, 80MHz, 149-161)	ASUS_5G	100	-42
Cisco-24:A4:A7	802.11ac-5.0 GHz	34:DB:FD:24:A4:A0	CH (36 P, 80MHz, 36-48)	Cisco11ac	100	-51
Cisco-B2:D1:77	802.11ac-5.0 GHz	50:17:FF:B2:D1:70	CH (36)	Cisco11ac	100	-46
11ac-ben	802.11an-5.0 GHz	50:17:FF:EB:51:7F	CH (108,1)	Cisco11ac	100	-30
Aerohive Network-4A:91:A0	802.11an-5.0 GHz	00:19:77:4A:91:A0	CH (165)	AeroHive	100	-38
AIR-CAP3502-3	802.11an-5.0 GHz	58:BC:27:92:8B:1F	CH (165)	air-tek-01	100	-40
AIR-CAP3502-4	802.11an-5.0 GHz	58:BC:27:92:A4:EF	CH (116)	air-tek-01	100	-45
Aruba-BA:B7:30	802.11an-5.0 GHz	6C:F3:7F:BA:B7:30	CH (36)	aruba-ap	100	-44
KAM-3502i	802.11an-5.0 GHz	E8:04:62:F7:EA:6F	CH (153,-1)	air-tek-01	100	-55

Number of AP 23

Total APs 23

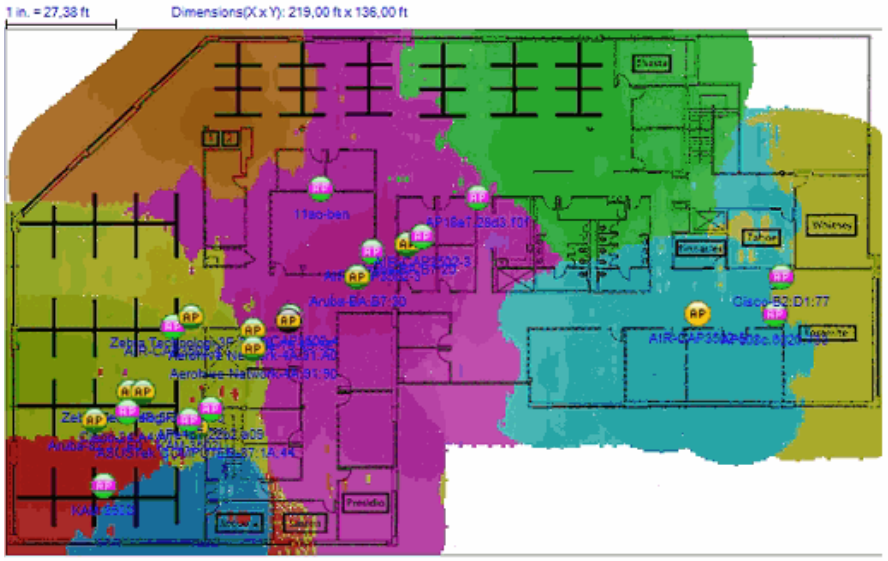
AP Signal Strength (dBm)



6 Current Deployment Site Survey

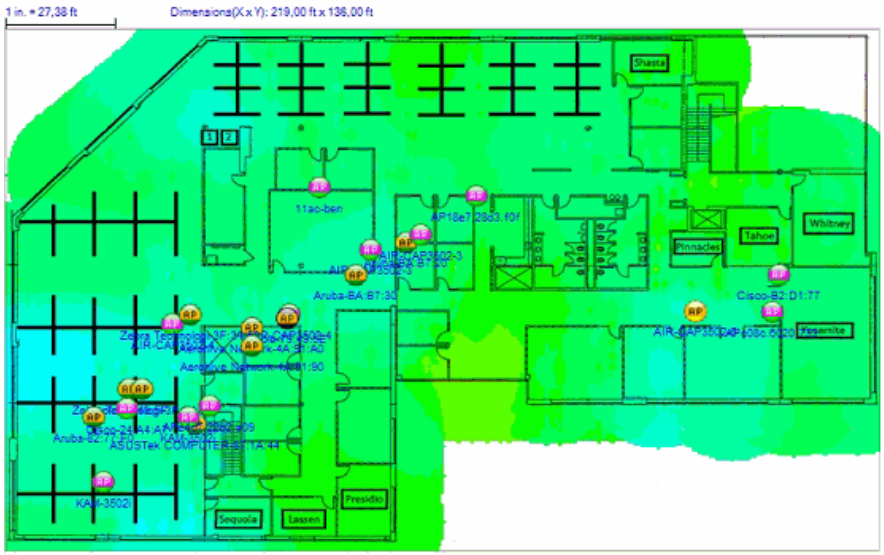
6.1 Access Point Coverage Regions

The image below shows the areas covered by the access points (in dBm). The color shown represents the AP with the strongest signal in any given area.This map will give you a visual representation of the Wi-Fi coverage area for the AP's.

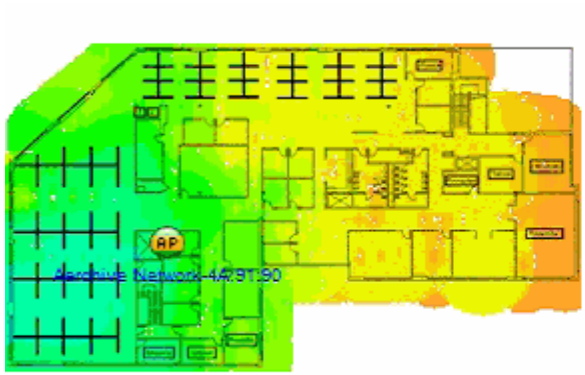


6.2 Overall Signal Coverage

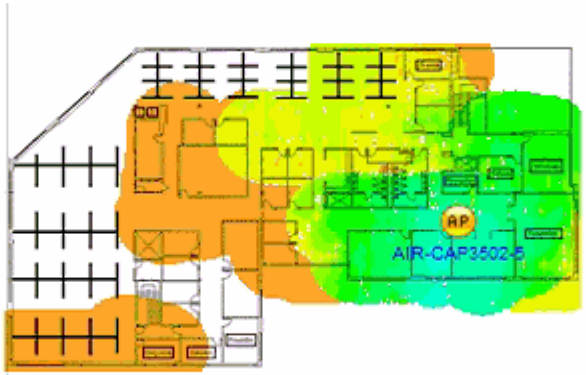
The image below displays the signal coverage (in dBm) at each point in the map layout. As a general rule, regions with signal levels below -67 dBm provide insufficient coverage for standard use (this value may vary depending on user requirements, service level agreements, applications used, number of users serviced, etc.).
APs are displayed in their detected locations (and reflect the existing power and antenna properties).
Note: An active Wi-Fi area can incorporate a variety of environmental factors that can vary throughout the day and may adversely affect RF coverage.
Note: Only the AP's that were placed on the floor plan prior to running the report will be shown on the floor plan image.


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
11ac-ben
Aruba-BA:B7:30
Cisco-B2:D1:77
KAM-3502
Signal (dBm)
0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

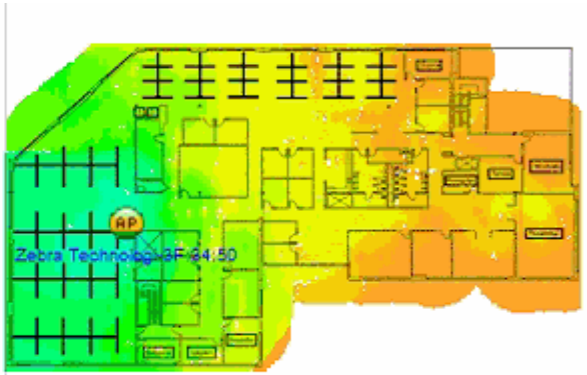
Individual Signal Distribution



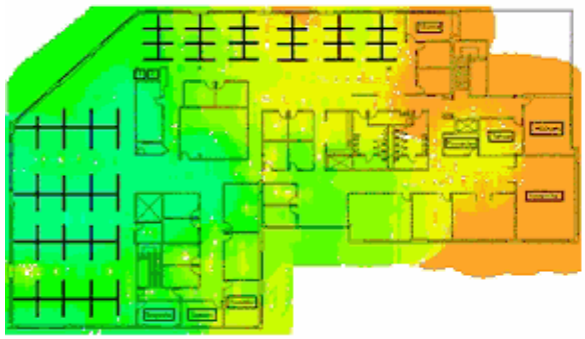
Aerohive Network-4A:91:90 [CH (1),AeroHive,-36]



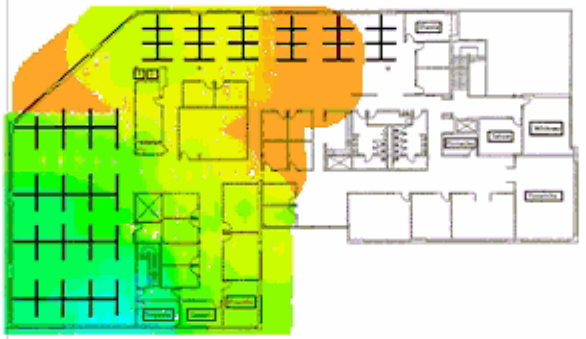
AIR-CAP3502-5 [CH (1),AMEpre,-34]



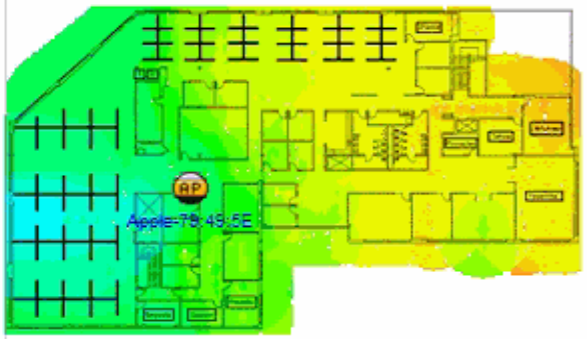
Zebra Technologi-3F:34:50 [CH (1),AML,-35]



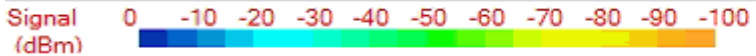
AIR-CAP3502-4 [CH (6),air-tek-01,-38]



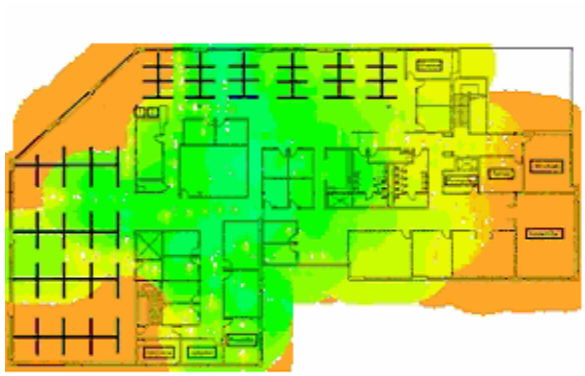
KAM-3502i [CH (6),air-tek-01,-30]



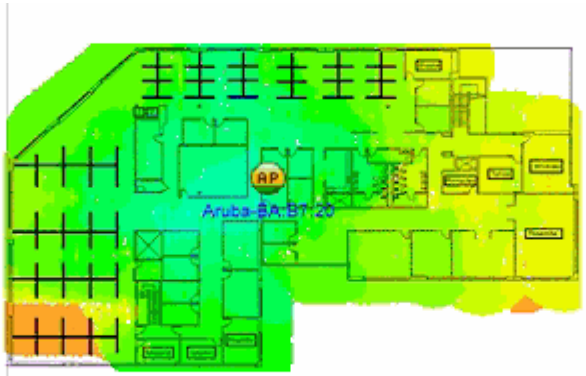
Apple-79:49:5E [CH (7),Mr B's WiFi Network,-28]



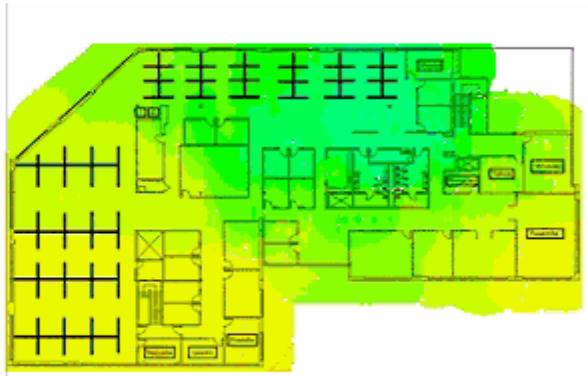
Individual Signal Distribution



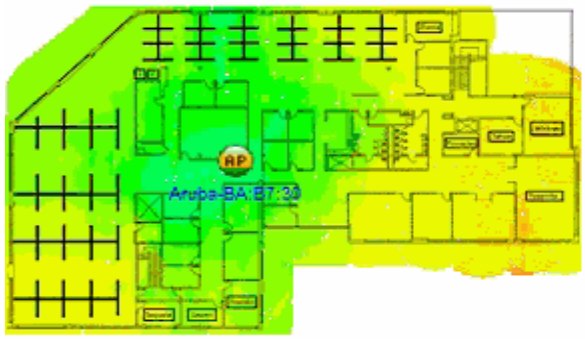
AIR-CAP3502-3 [CH (11),air-tek-01,-43]



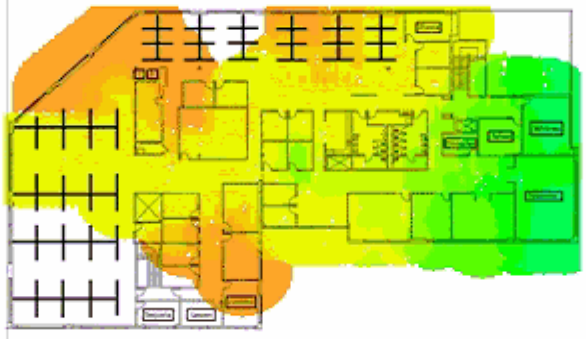
Aruba-BA:B7:20 [CH (11),aruba-ap,-35]



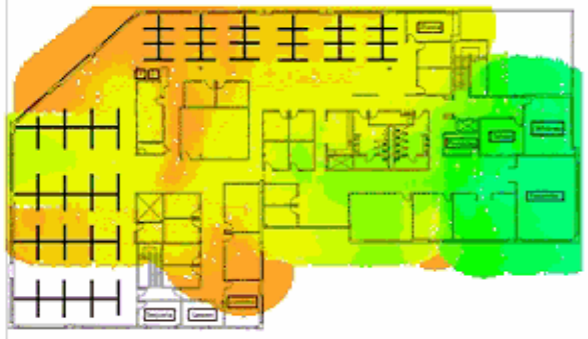
AP18e7.28d3.f0f [CH (36),Cisco11ac,-40]



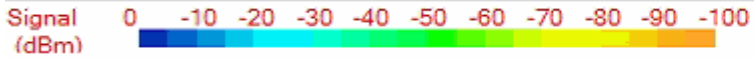
Aruba-BA:B7:30 [CH (36),aruba-ap,-44]



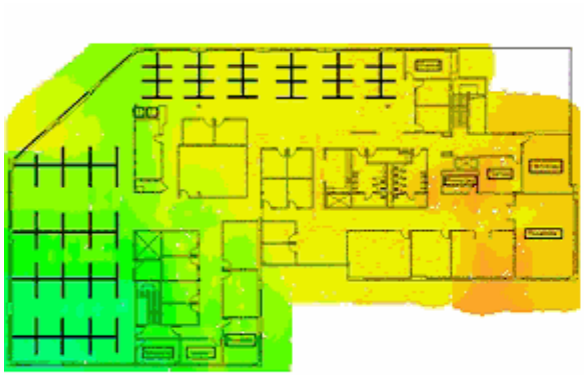
Cisco-B2:D1:77 [CH (36),Cisco11ac,-46]



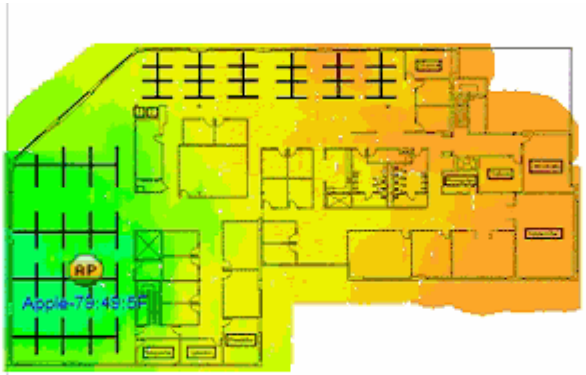
APc08c.6020.733 [CH (36 P, 40MHz, 36-40),Cisco11ac,-41]



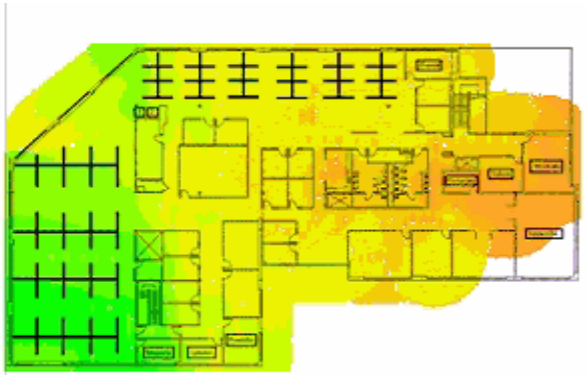
Individual Signal Distribution



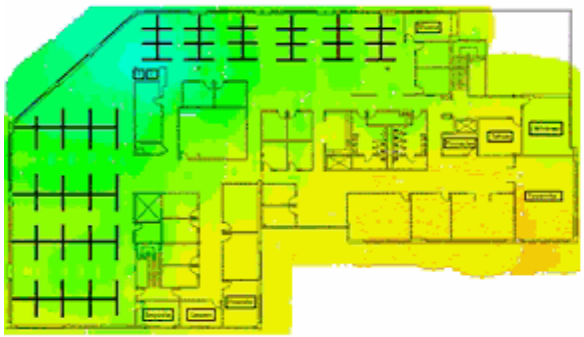
APe4c7.22b2.a09 [CH (36 P, 40MHz, 36-40),Cisco11ac,-45]



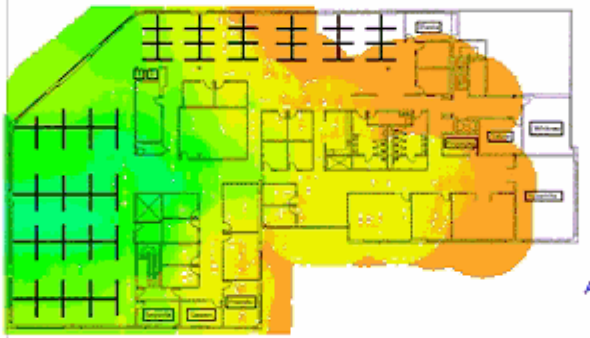
Apple-79:49:5F [CH (36 P, 80MHz, 36-48),Mr B's WiFi Network,-47]



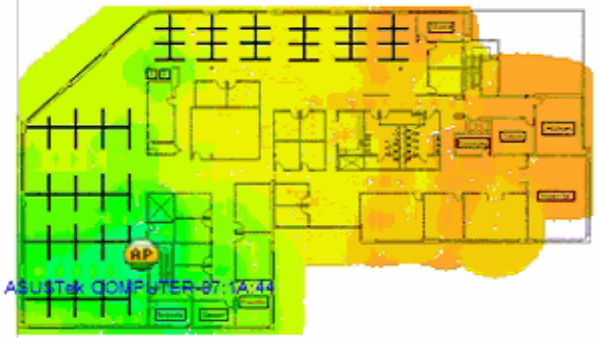
Cisco-24:A4:A7 [CH (36 P, 80MHz, 36-48),Cisco11ac,-51]



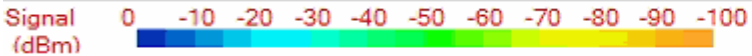
11ac-ben [CH (108),Cisco11ac,-30]



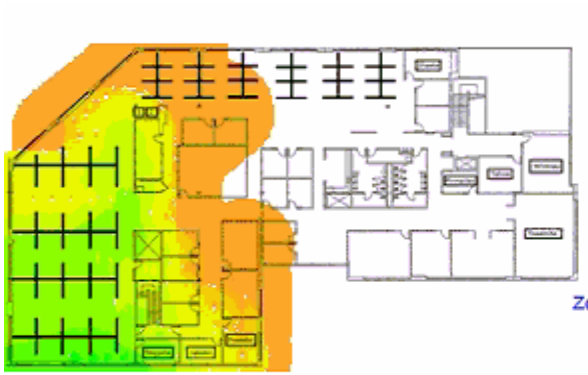
AIR-CAP3502-4 [CH (116),air-tek-01,-45]



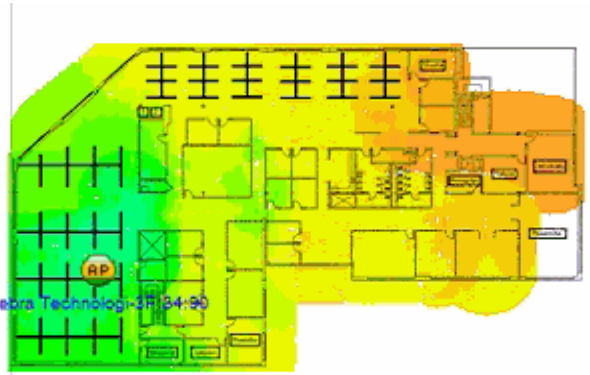
ASUSTek COMPUTER-87:1A:44 [CH (149 P, 80MHz, 149-161),ASUS_



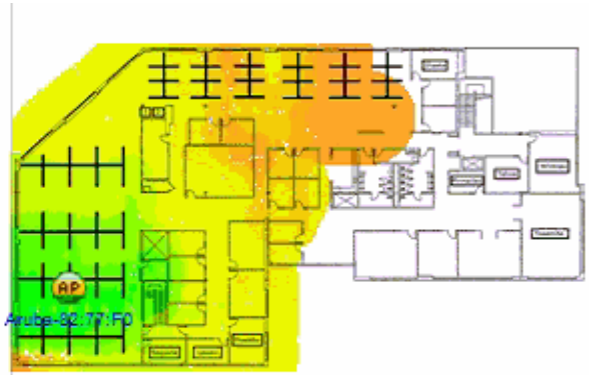
Individual Signal Distribution



KAM-3502i [CH (153),air-tek-01,-55]

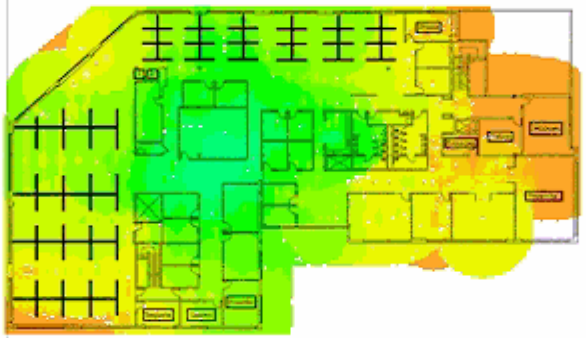


Zebra Technologi-3F:34:90 [CH (157),AML,-40]

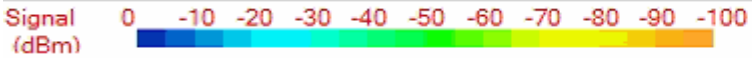


Aruba-82:77:F0 [CH (161 P, 80MHz, 149-161),Aruba-11ac,-50]

Aerohive Network-4A:91:A0 [CH (165),AeroHive,-38]

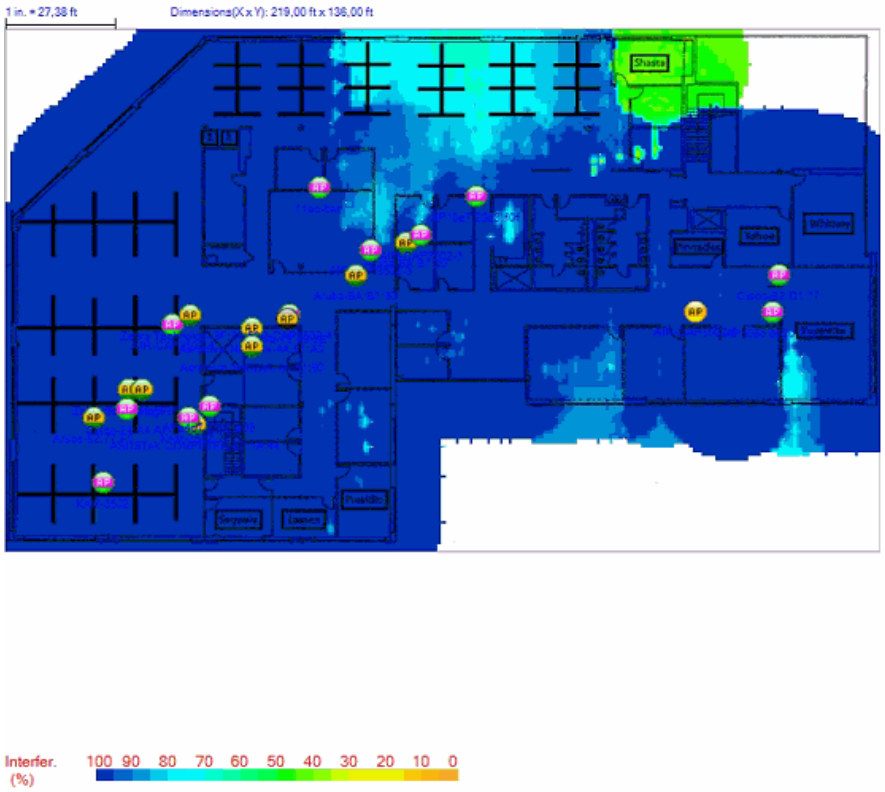


AIR-CAP3502-3 [CH (165),air-tek-01,-40]

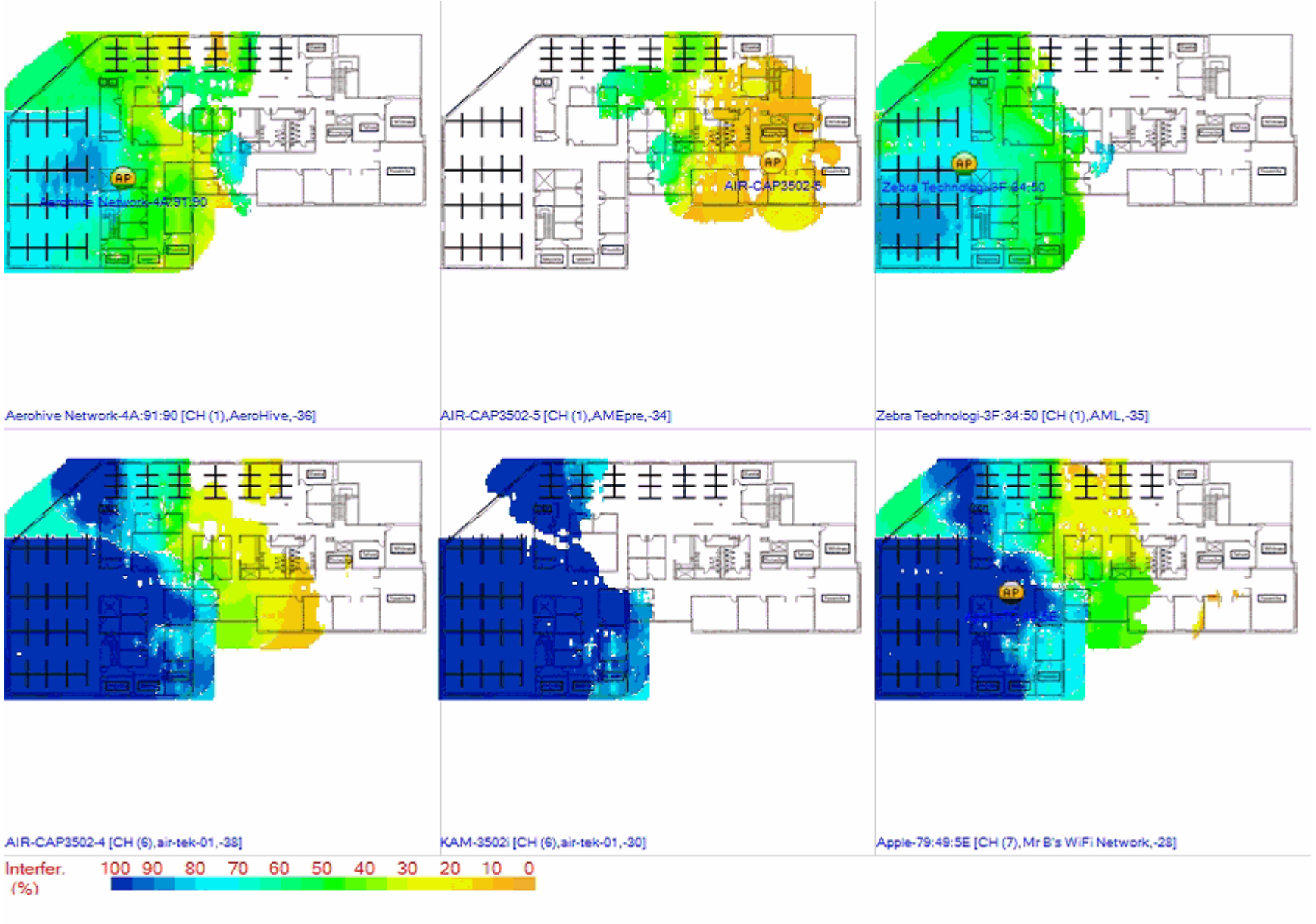


6.3 Channel Interference

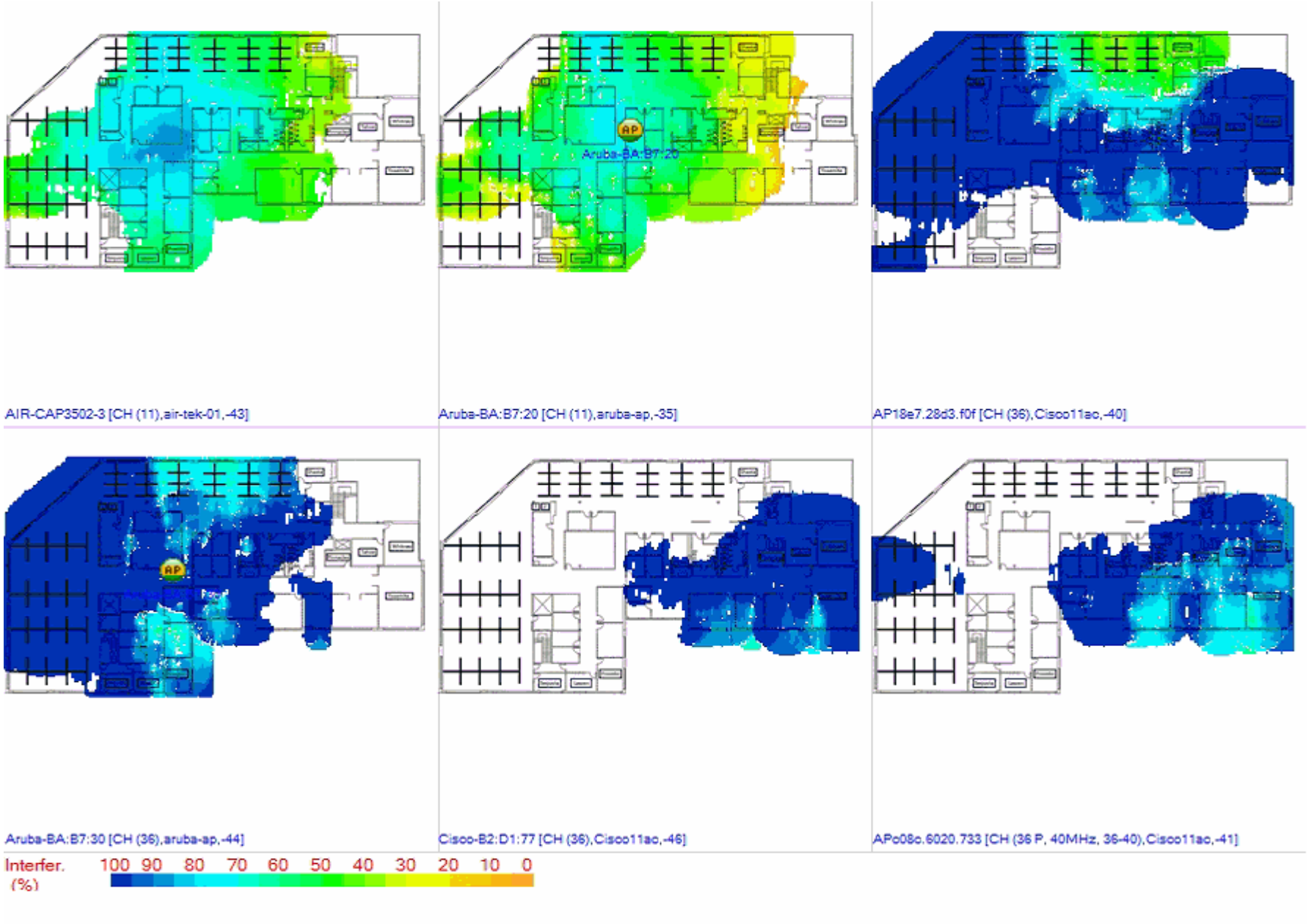
The image below displays the interference level (in percentage) at each point on the map layout.
APs are displayed in their detected locations and reflect the existing power and antenna properties. Note that the interference levels present in the environment can vary depending on several factors, such as the number of APs on a single channel, number of devices present, non-802.11 interferers, etc.
Note: Only the AP's that were placed on the floor plan prior to running the report will be shown on the floor plan image.



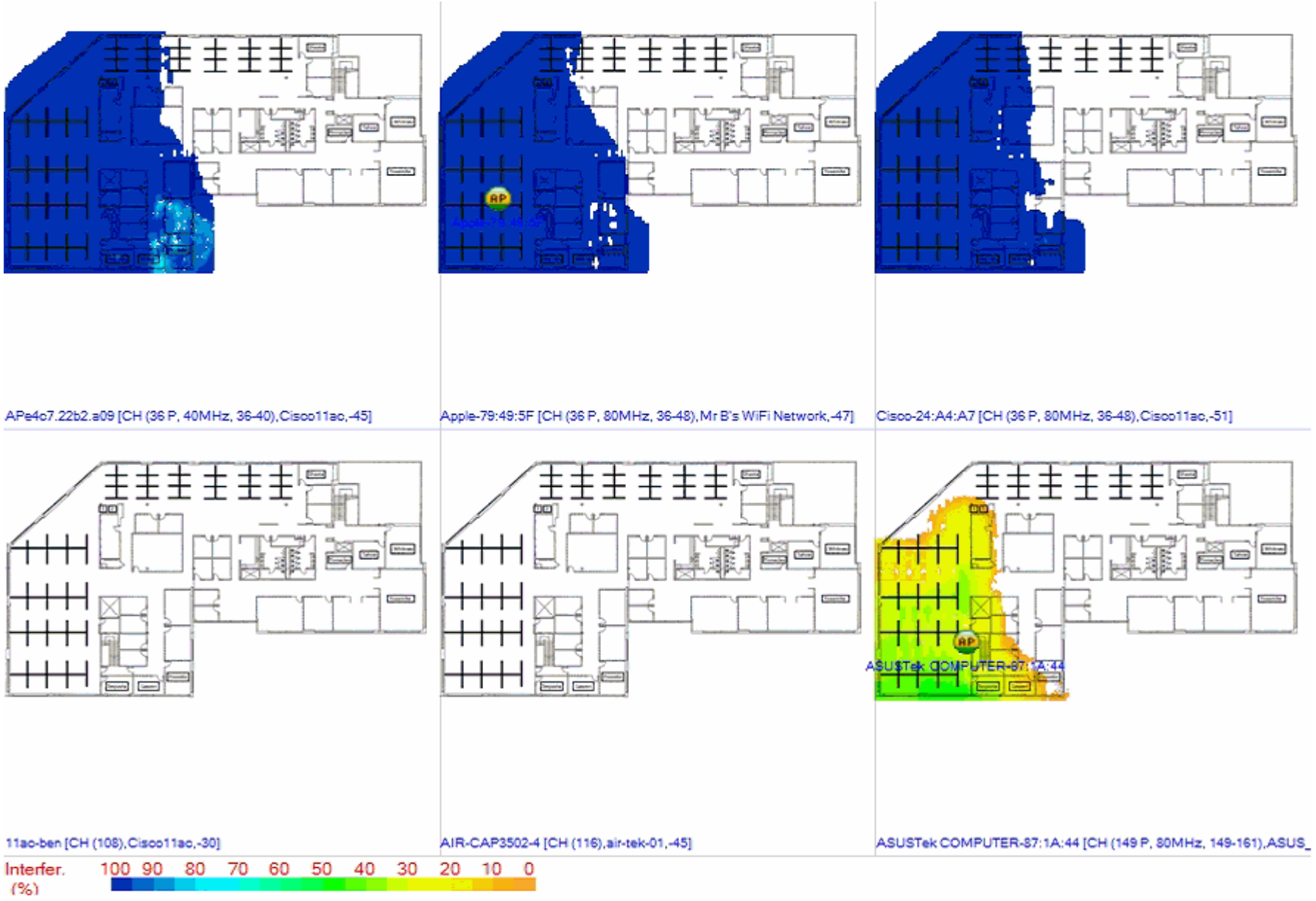
Individual Channel Interference Distribution



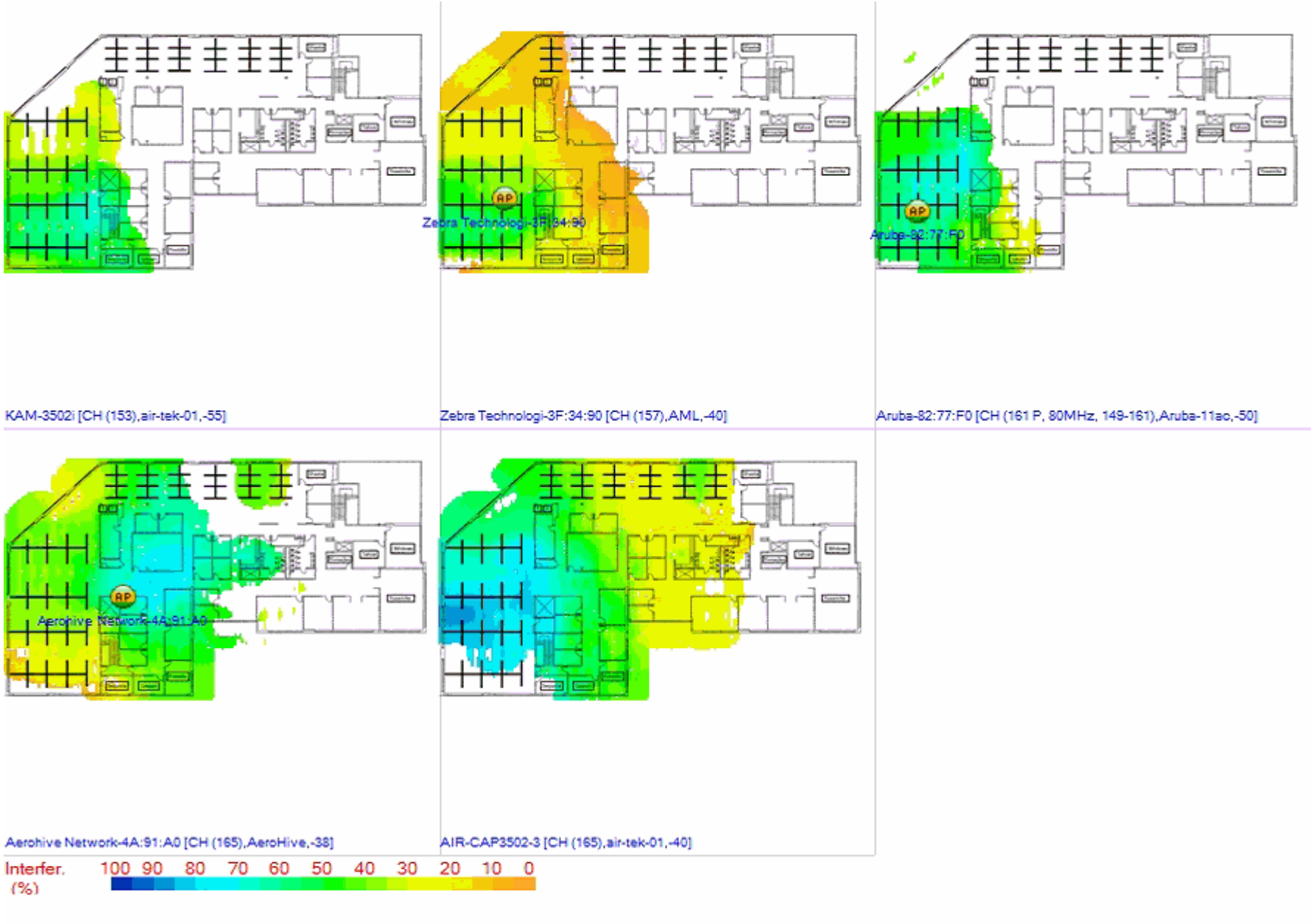
Individual Channel Interference Distribution



Individual Channel Interference Distribution

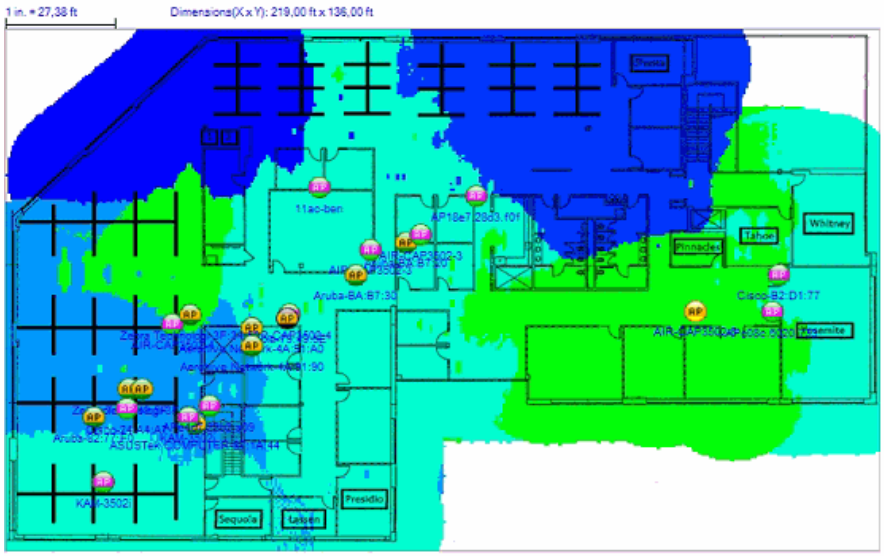


Individual Channel Interference Distribution

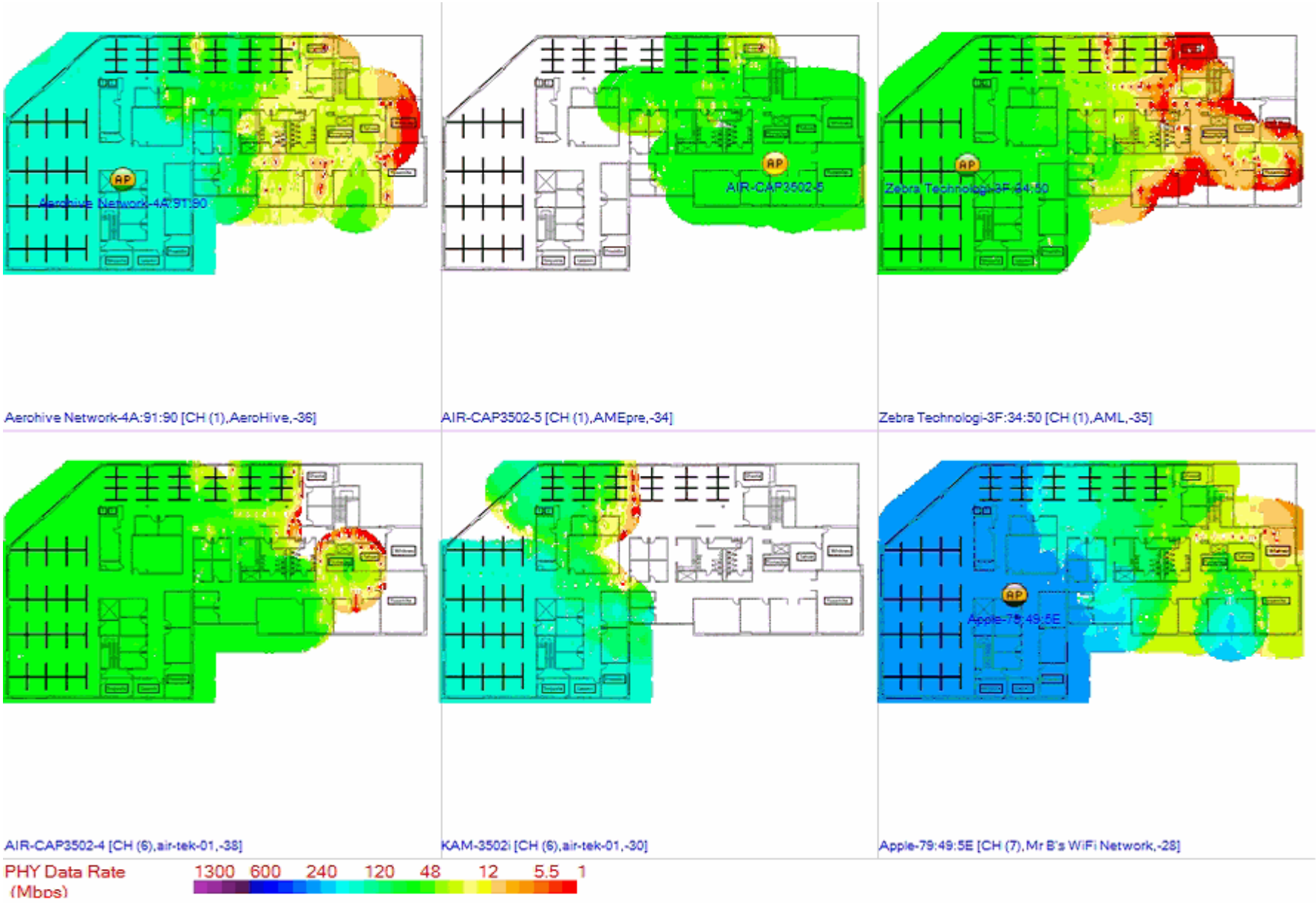


6.4 Predictive PHY Data Rate (Downlink)

The image below displays the predictive PHY data rate connection downlink at each point in the map layout. Connection Rates provides a direct insight into how well the network will support a real-world end-user client. When doing a Passive survey the ability to see the actual Data rate is not available. In order to provide Data Rates while doing a Passive survey we use Signal Strength to Data Rate mapping table. We take the detected signal strength and map it to a known Data Rate. A low Data Rate connection directly translates to lower throughput and performance for an end-user. Consistently low connection Rates are indicative of insufficient signal coverage, interference, noise, or miss-configured wireless devices.


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
11ac-ben
Aruba-BA:B7:30
Cisco-B2:D1:77
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Tahoe
PHY Data Rate (Mbps)
1300 600 240 120 48 12 5.5 1

Individual Predictive PHY Data Rate (Downlink) Distribution



Aerohive Network-4A:91:90 [CH (1),AeroHive,-36]

AIR-CAP3502-5 [CH (1),AMEpre,-34]

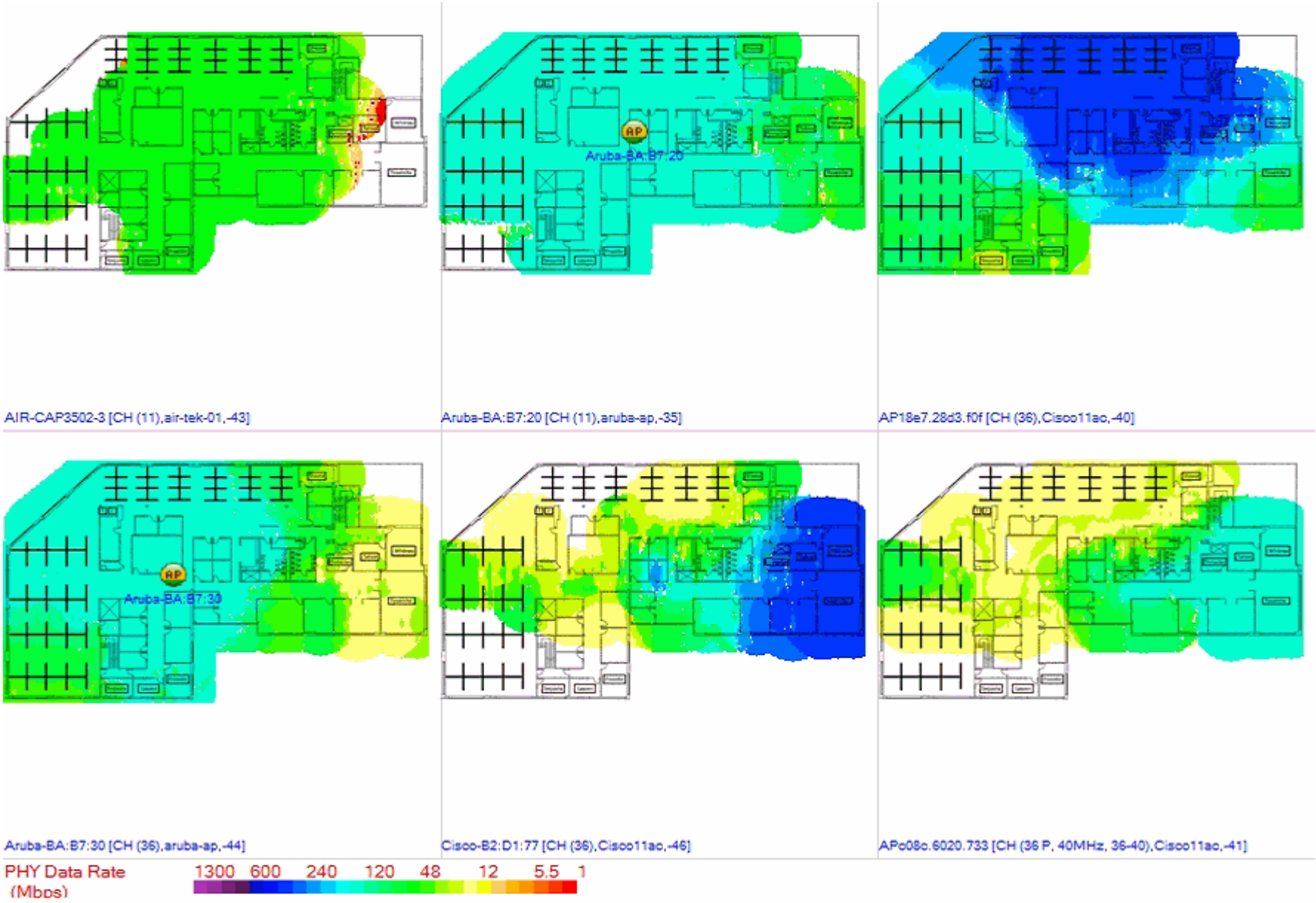
Zebra Technologi-3F:34:50 [CH (1),AML,-35]

AIR-CAP3502-4 [CH (6),air-tek-01,-38]

KAM-3502i [CH (6),air-tek-01,-30]

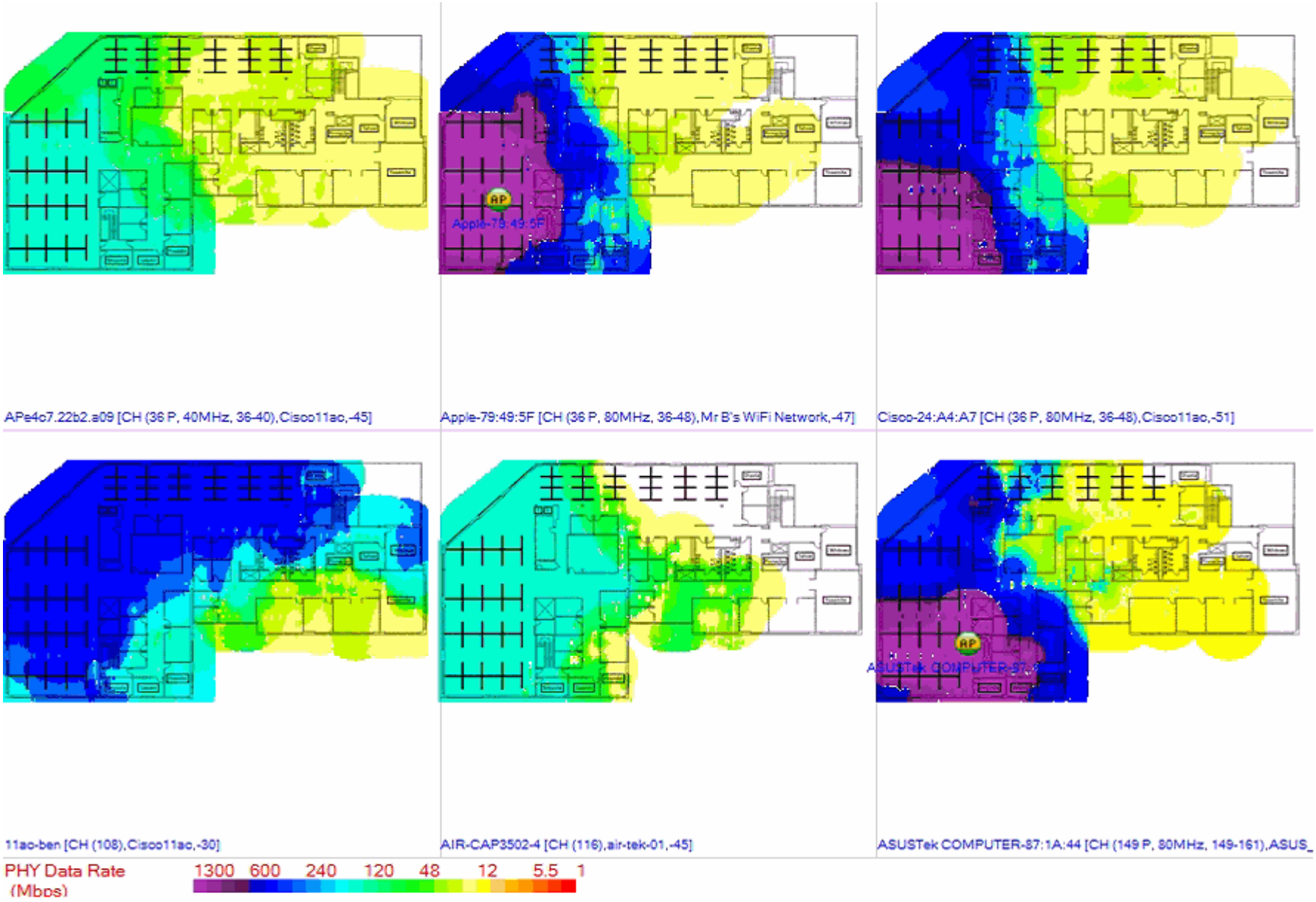
Apple-79:49:5E [CH (7),Mr B's WiFi Network,-28]

Individual Predictive PHY Data Rate (Downlink) Distribution

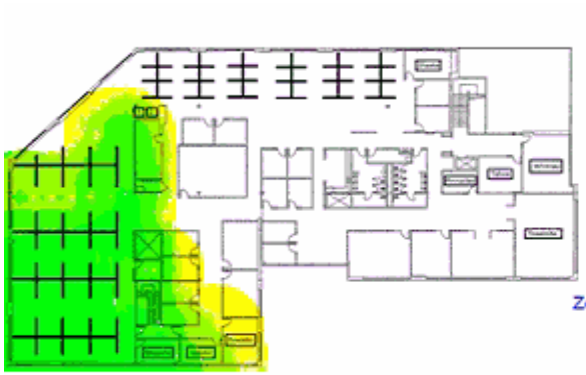


AIR-CAP3502-3 [CH (11),air-tek-01,-43]
Aruba-BA:B7:20 [CH (11),aruba-ap,-35]
AP18e7.28d3.f0f [CH (36),Cisco11ac,-40]
Aruba-BA:B7:30 [CH (36),aruba-ap,-44]
Cisco-B2:D1:77 [CH (36),Cisco11ac,-46]
APc08c.6020.733 [CH (36 P, 40MHz, 36-40),Cisco11ac,-41]

Individual Predictive PHY Data Rate (Downlink) Distribution

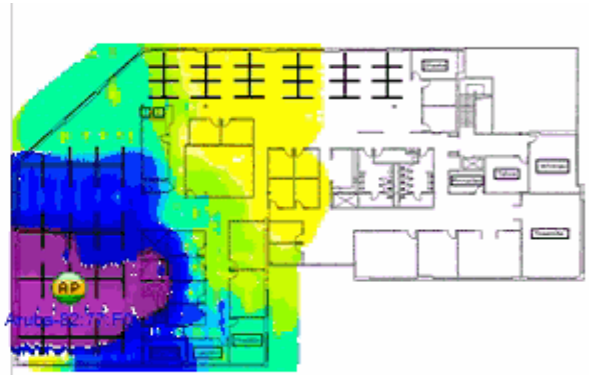


Individual Predictive PHY Data Rate (Downlink) Distribution

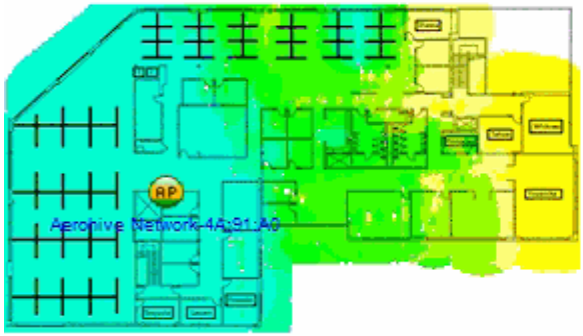


KAM-3502i [CH (153),air-tek-01,-55]

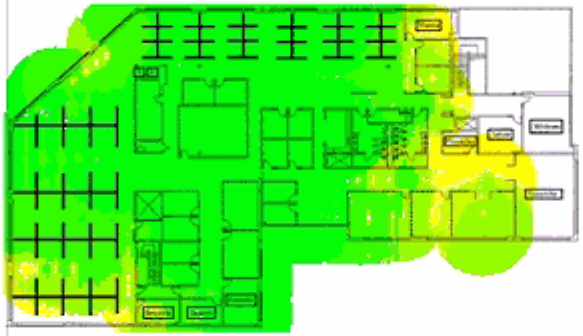
Zebra Technologi-3F:34:90 [CH (157),AML,-40]



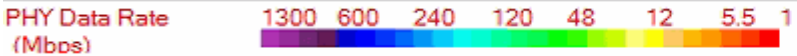
Aruba-82:77:F0 [CH (161 P, 80MHz, 149-161),Aruba-11ac,-50]



Aerohive Network-4A:91:A0 [CH (165),AeroHive,-38]

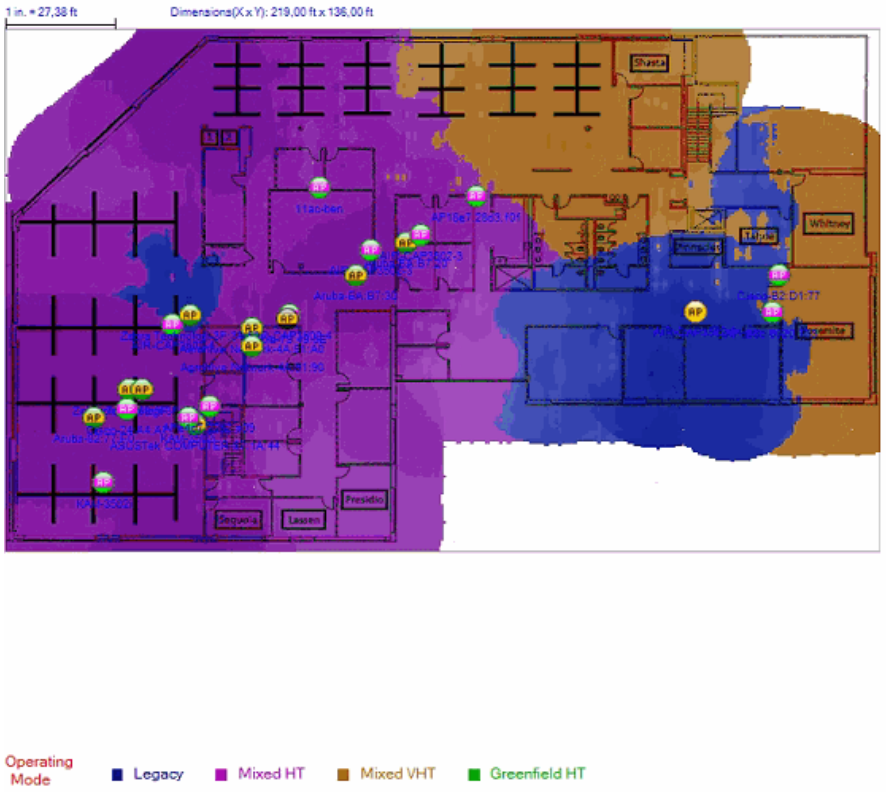


AIR-CAP3502-3 [CH (165),air-tek-01,-40]

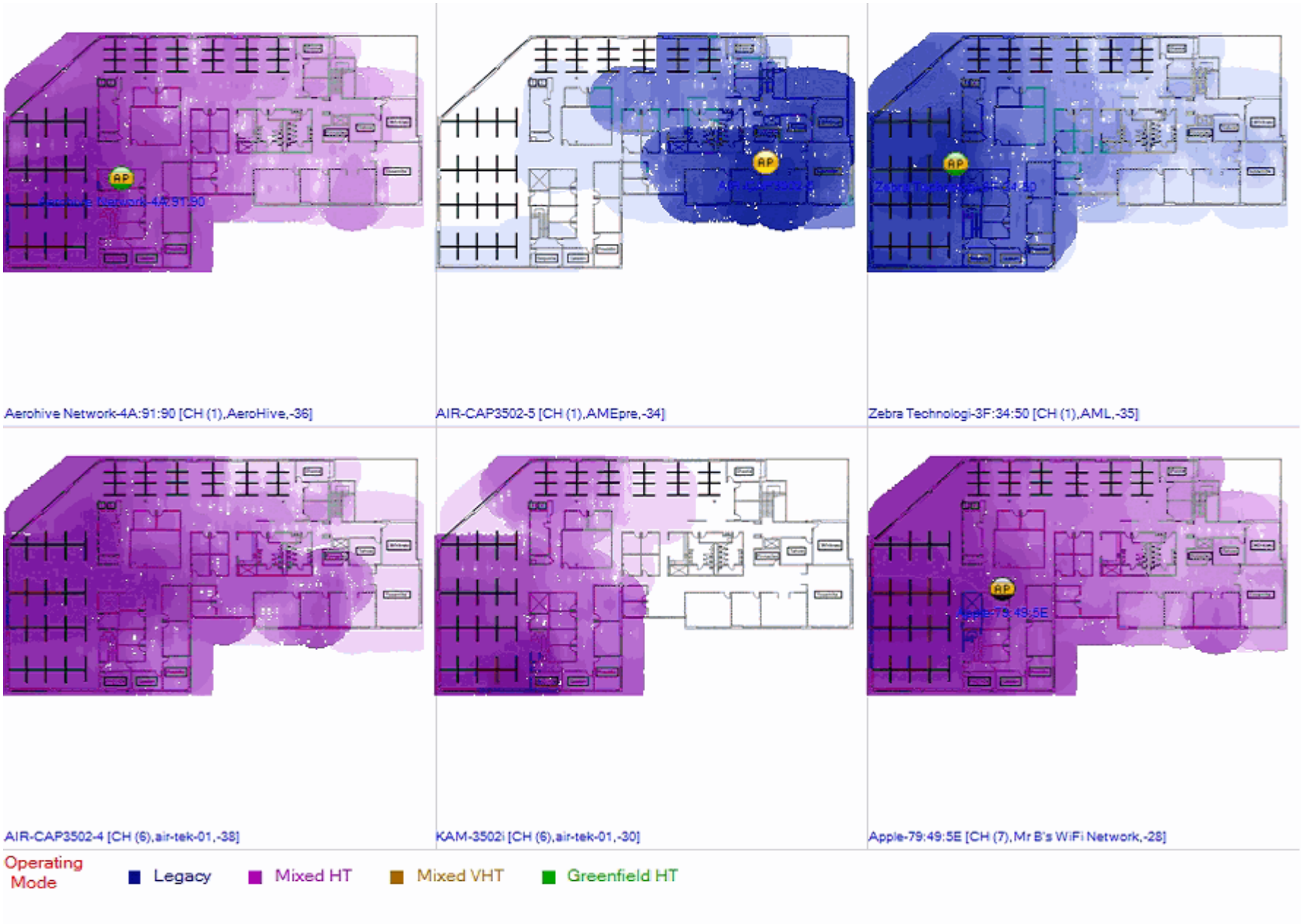


6.5 Operating Mode

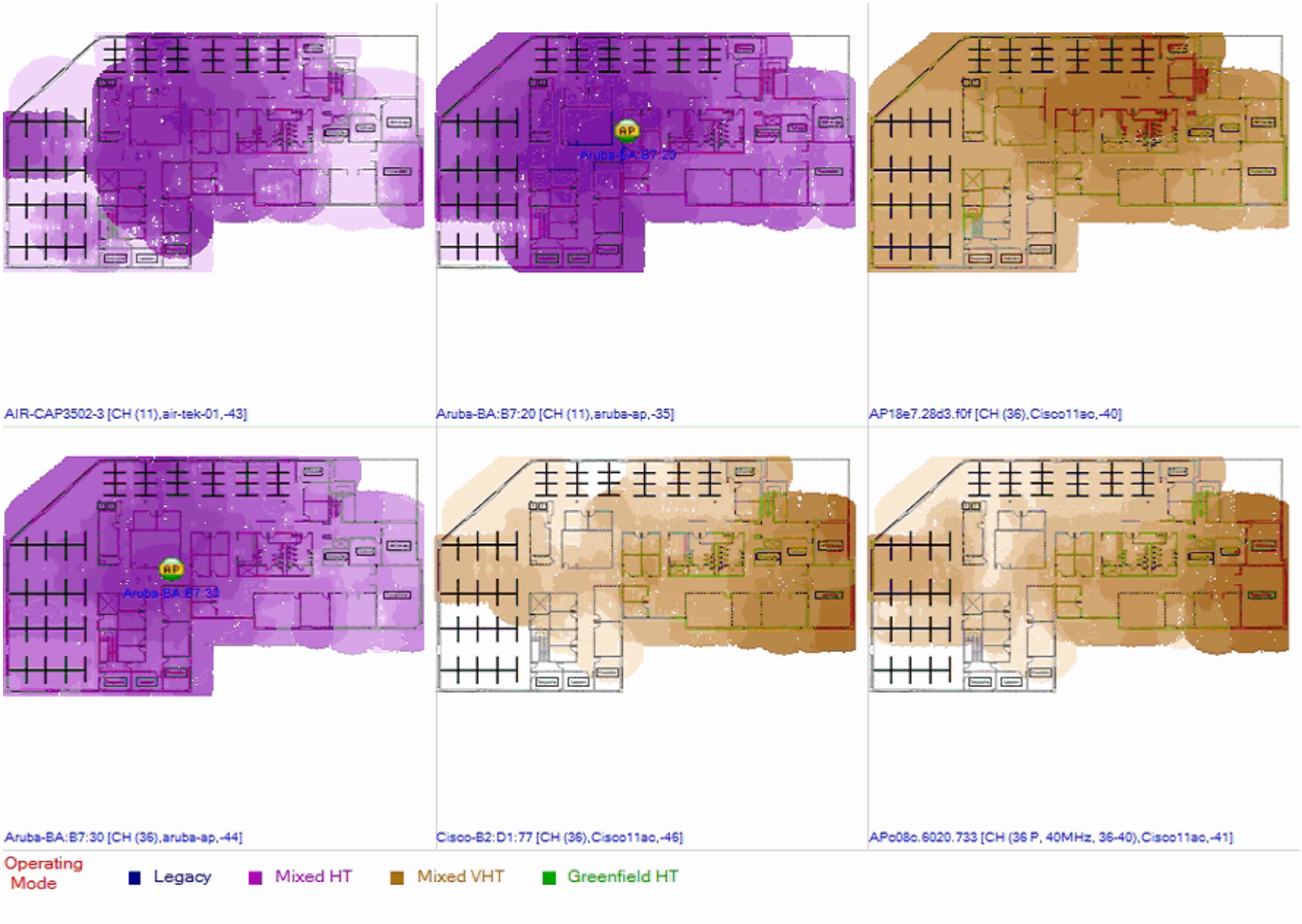
The image below displays the coverage of the 802.11 operating modes. Refer to the legend for the color that corresponds to each mode (Legacy, Mixed HT, Greenfield HT, or Mixed VHT). The heat map displays the color of the operating mode that corresponds to the AP with the strongest signal detected at any given point. For example, locations shown as Mixed HT may contain Mixed VHT signal coverage and vice versa, but the AP with the strongest signal in that area utilizes a Mixed HT implementation.



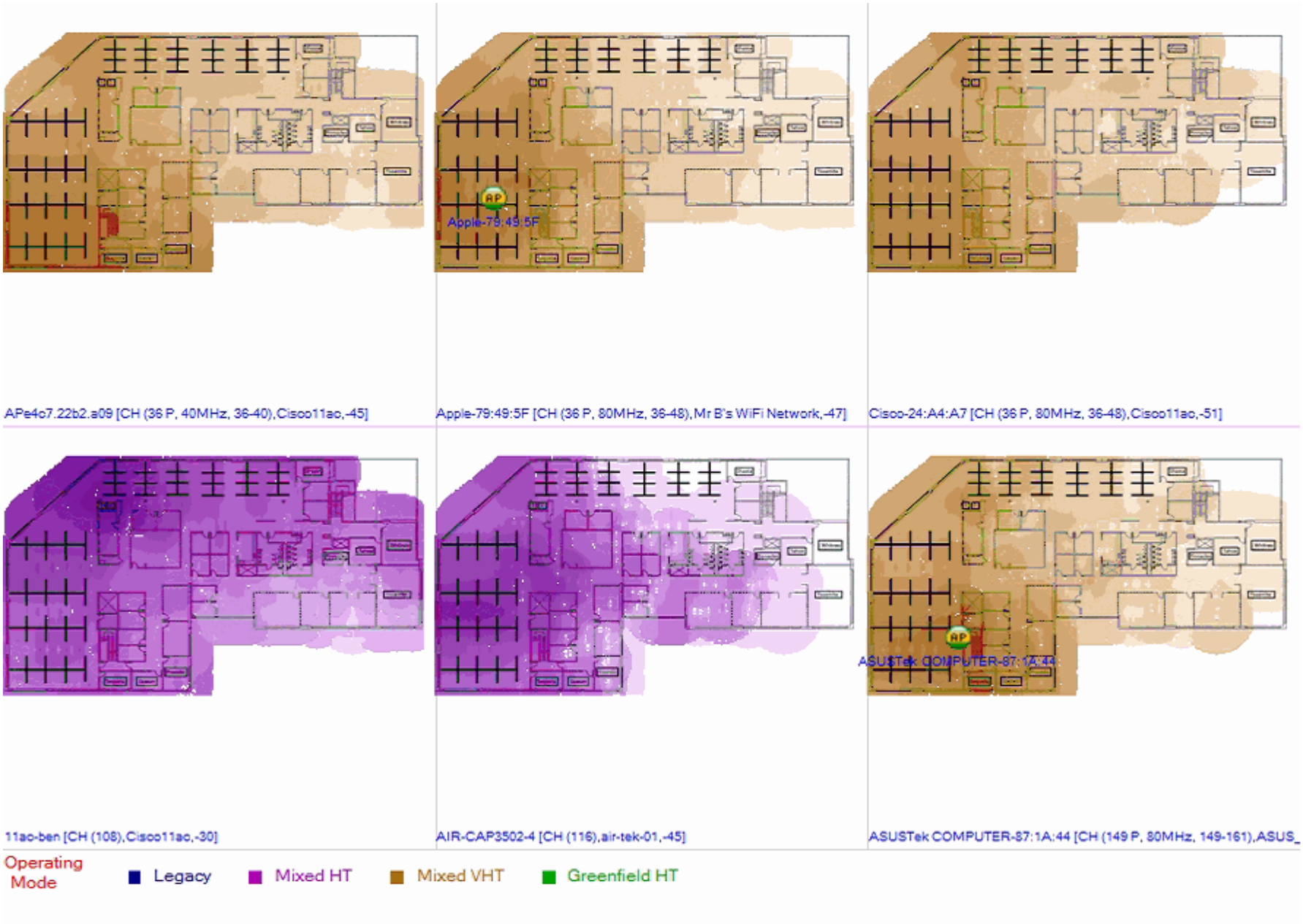
Individual Operating Mode Distribution



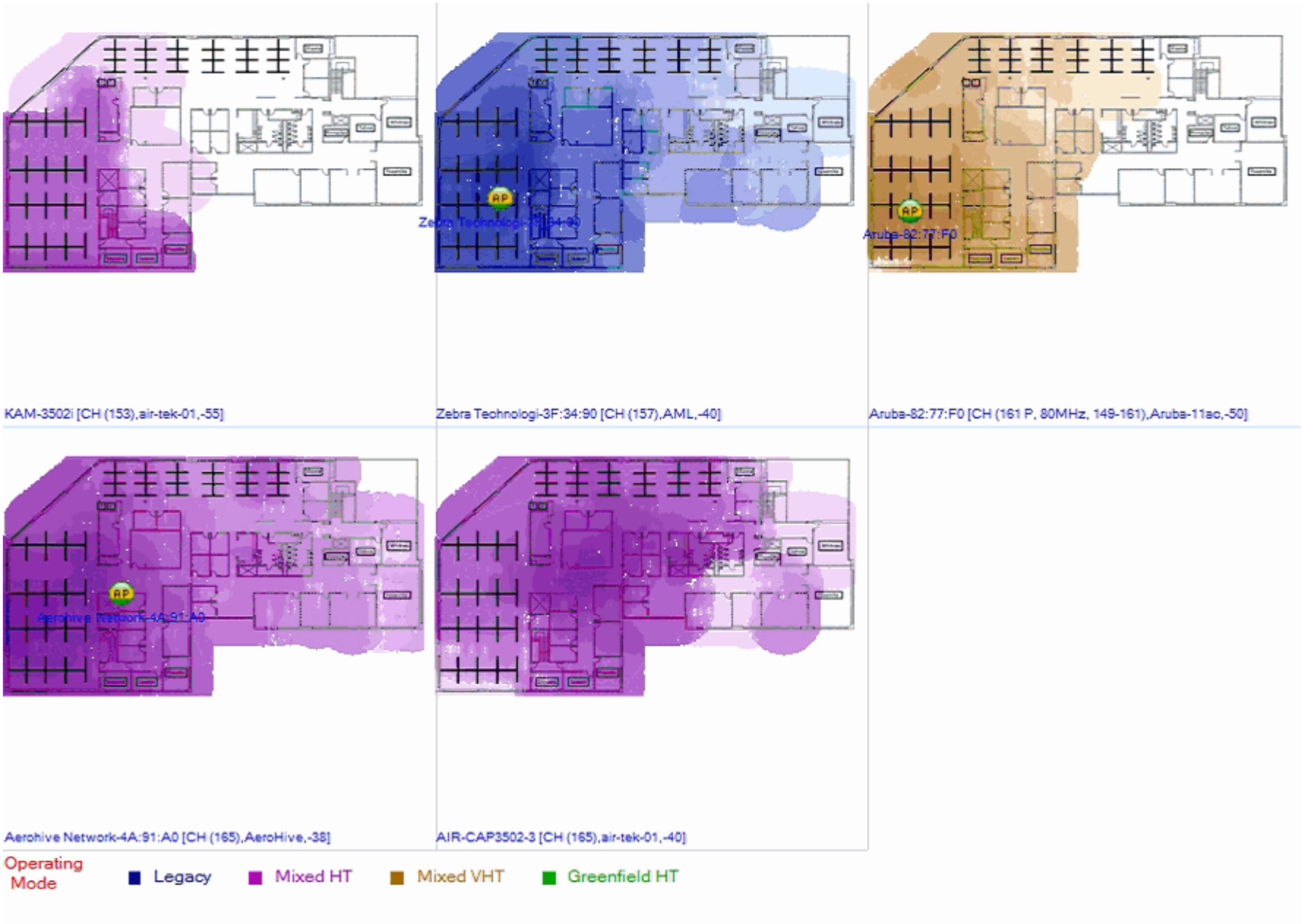
Individual Operating Mode Distribution



Individual Operating Mode Distribution

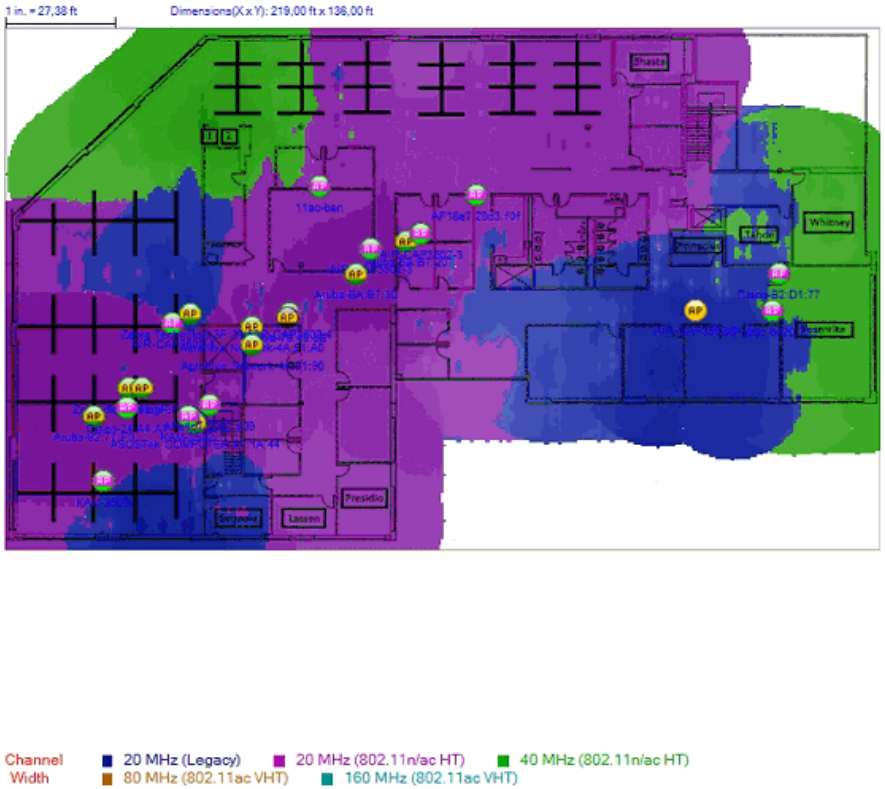


Individual Operating Mode Distribution

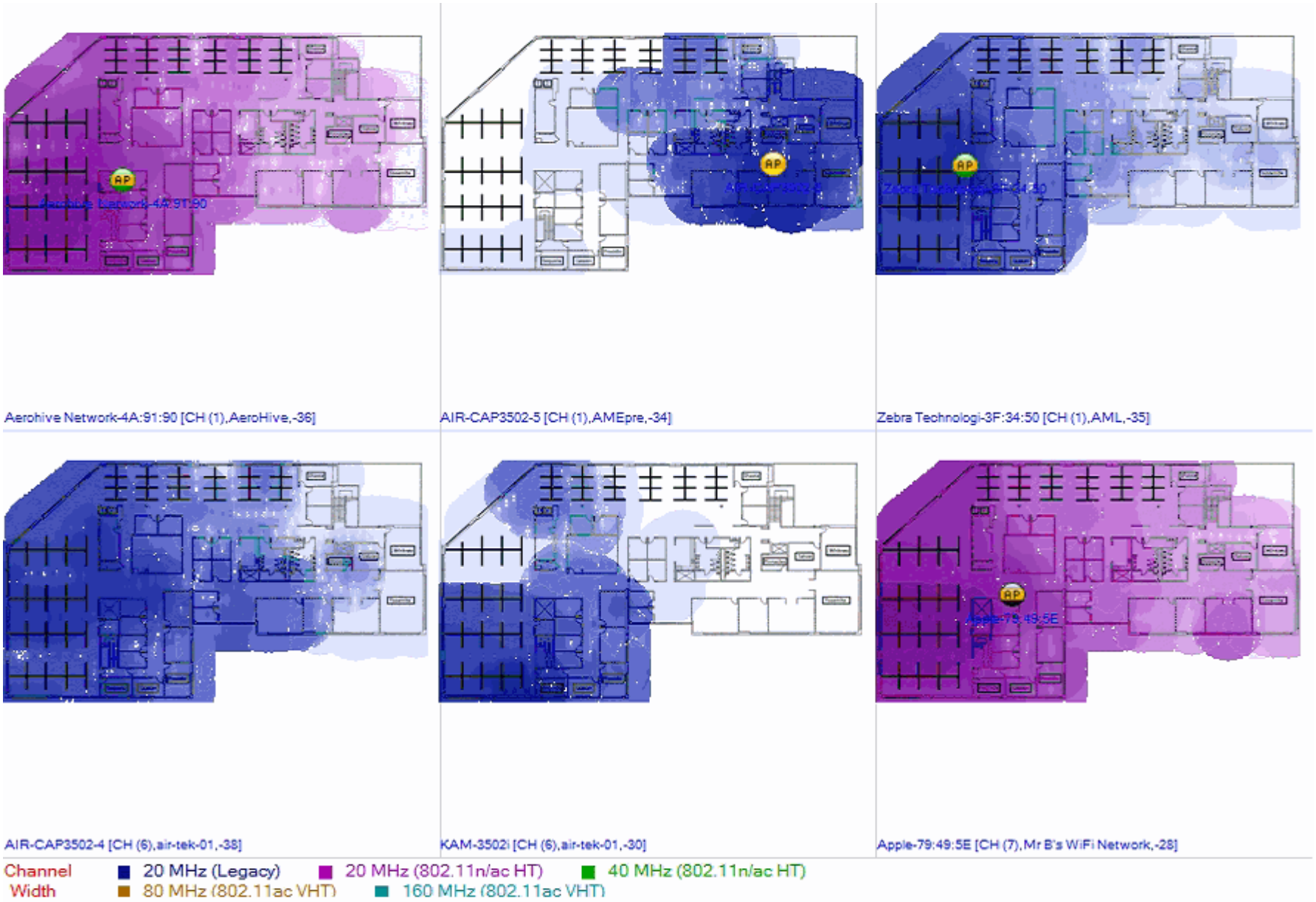


6.6 Channel Width

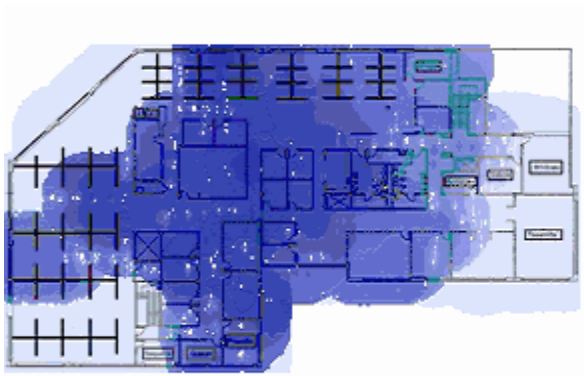
The image below displays the breakdown of the detected channel width.
The color shown represents the Channel Width of the AP with the strongest signal in any given area .



Individual Channel Width Distribution



Individual Channel Width Distribution

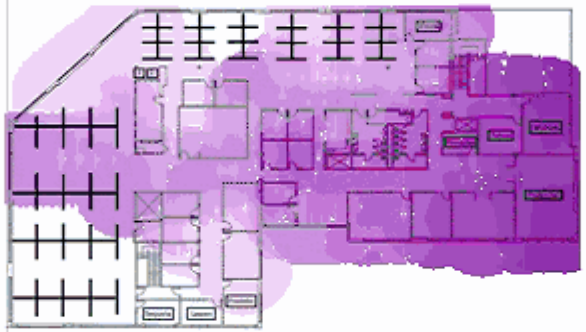


AIR-CAP3502-3 [CH (11),air-tek-01,-43]

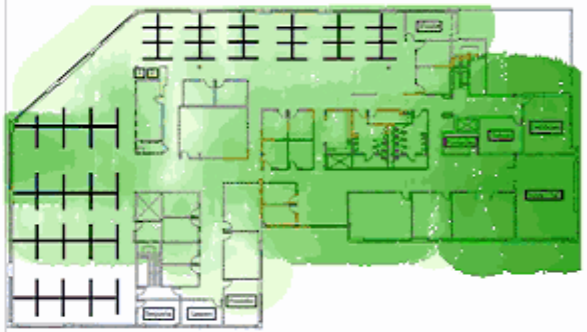
Aruba-BA:B7:20 [CH (11),aruba-ap,-35]

AP18e7.28d3.f0f [CH (36),Cisco11ac,-40]

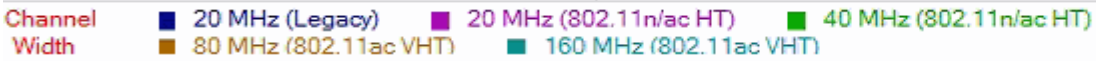
Aruba-BA:B7:30 [CH (36),aruba-ap,-44]



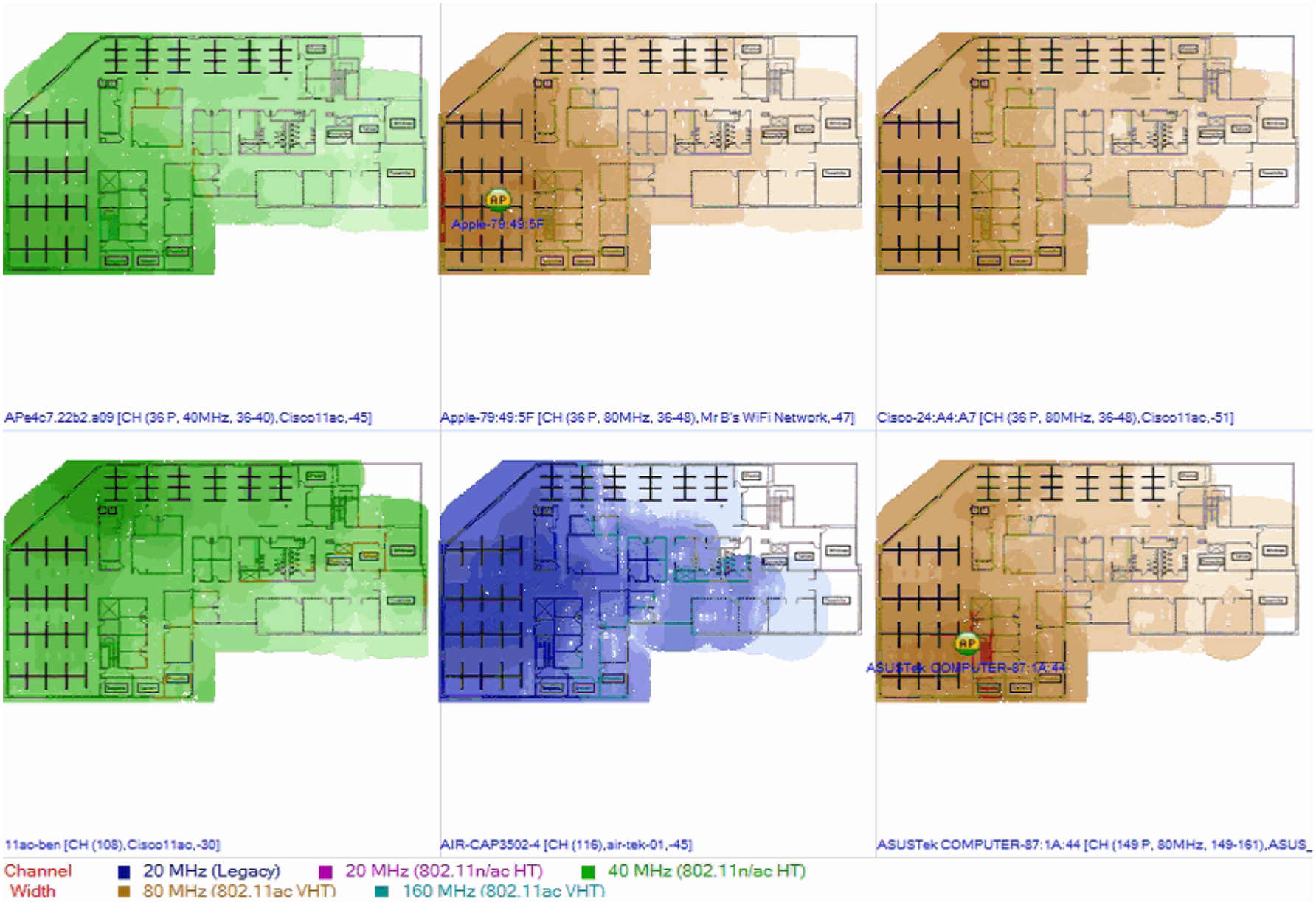
Cisco-B2:D1:77 [CH (36),Cisco11ac,-46]



APc08c.6020.733 [CH (36 P, 40MHz, 36-40),Cisco11ac,-41]

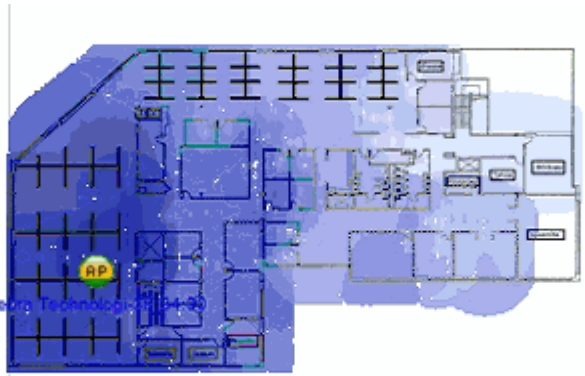


Individual Channel Width Distribution

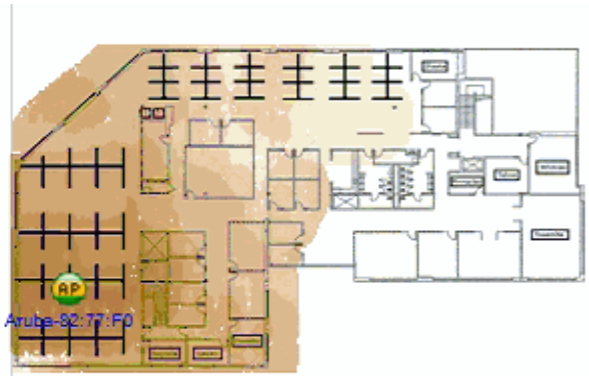


Individual Channel Width Distribution

KAM-3502i [CH (153),air-tek-01,-55]

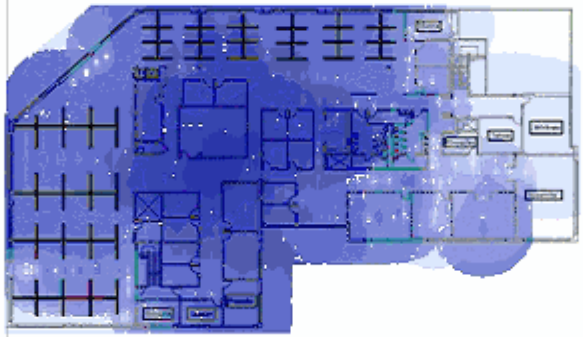


Zebra Technologi-3F:34:90 [CH (157),AML,-40]



Aruba-82:77:F0 [CH (161 P, 80MHz, 149-161),Aruba-11ac,-50]

Aerohive Network-4A:91:A0 [CH (165),AeroHive,-38]

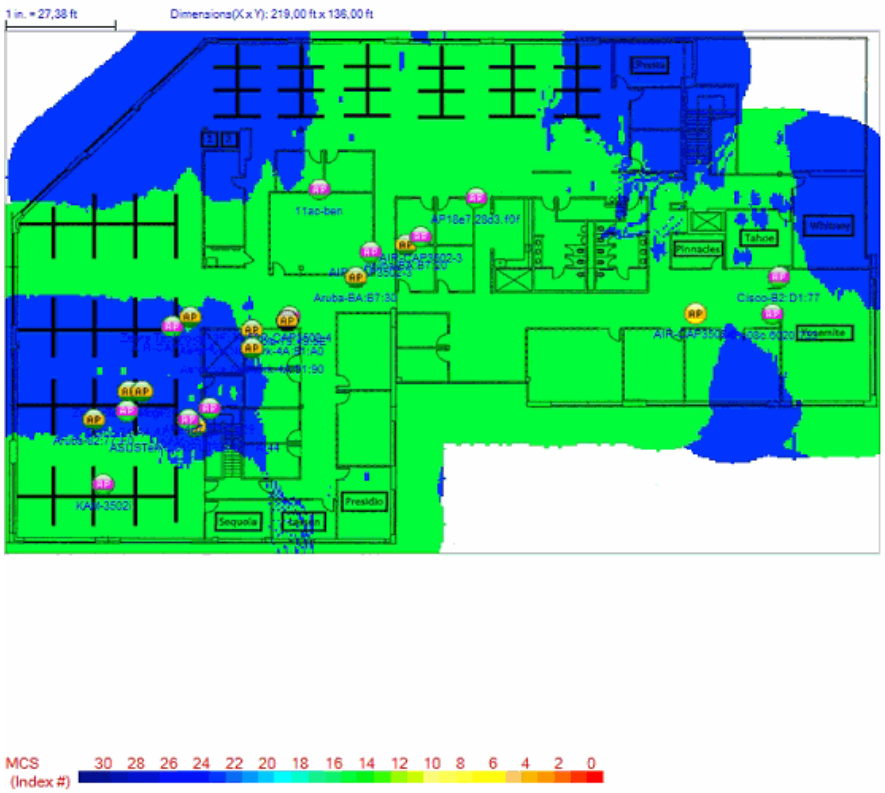


AIR-CAP3502-3 [CH (165),air-tek-01,-40]

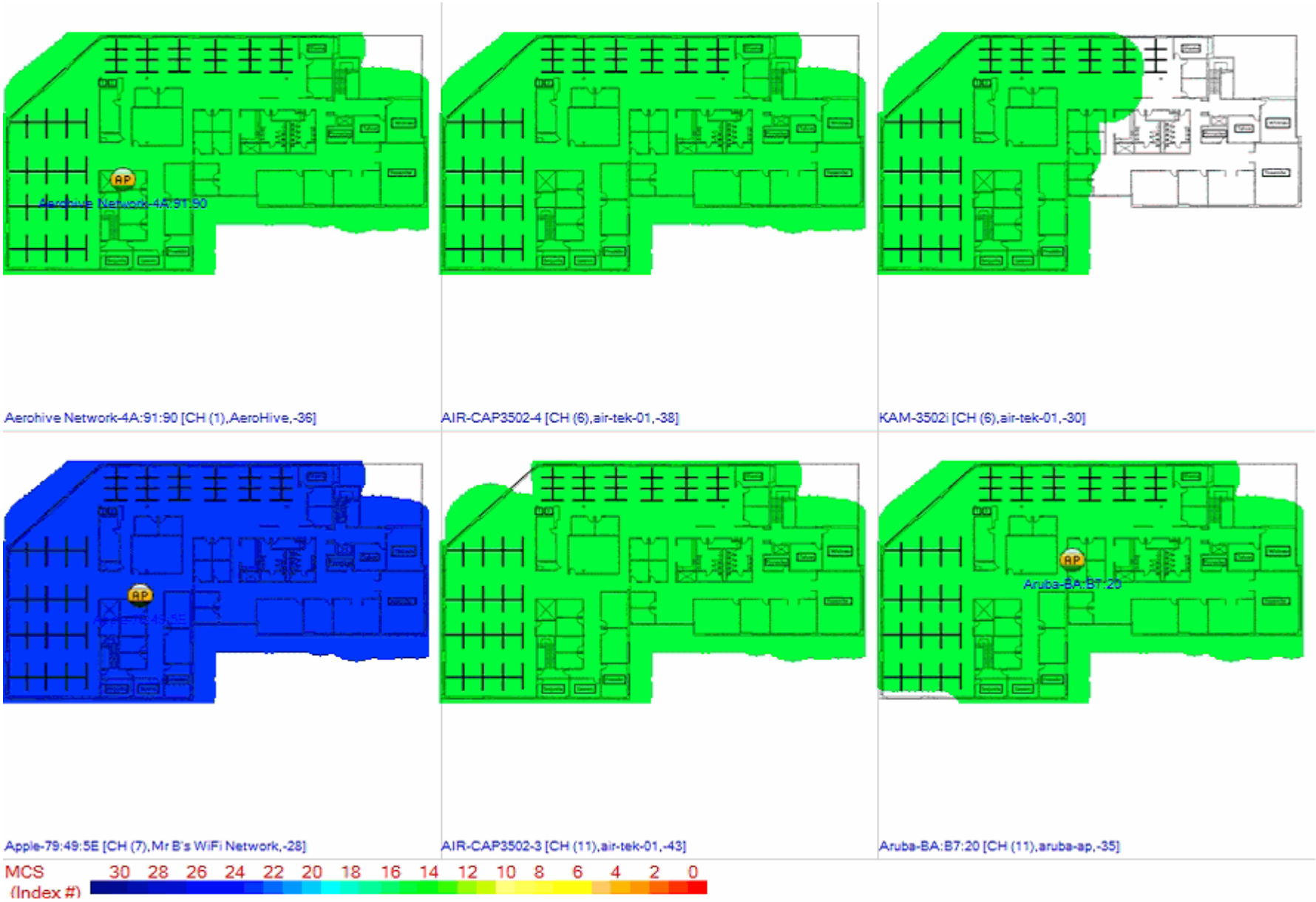
Channel Width
20 MHz (Legacy)
20 MHz (802.11n/ac HT)
40 MHz (802.11n/ac HT)
80 MHz (802.11ac VHT)
160 MHz (802.11ac VHT)

6.7 802.11n Max MCS (AP Tx)

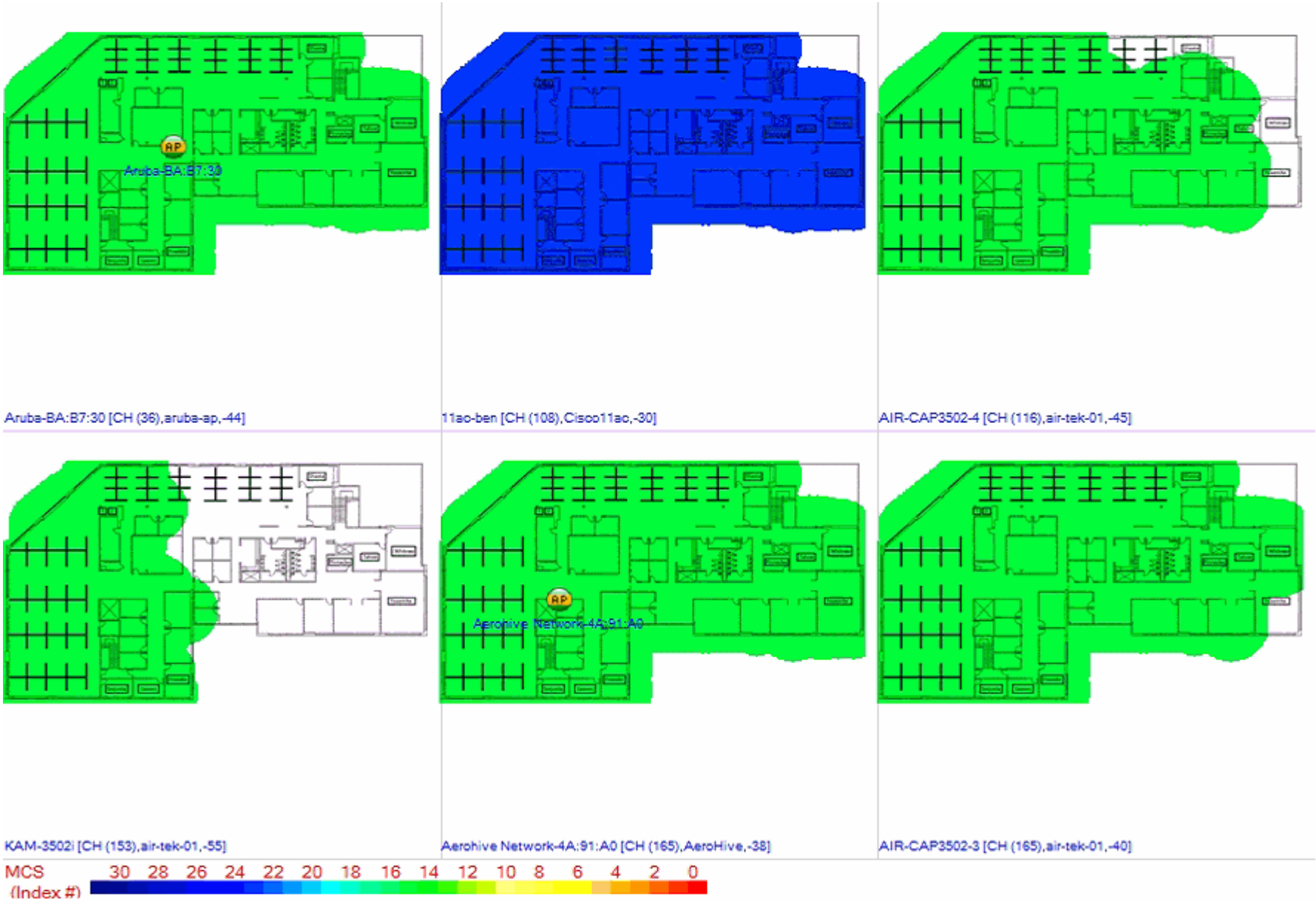
The image below displays the AP's detected 802.11n MCS Transmission Rates.
This heatmap reflects the 802.11n AP MCS Transmit mode that was detected.



Individual 802.11n Max MCS (AP Tx) Distribution

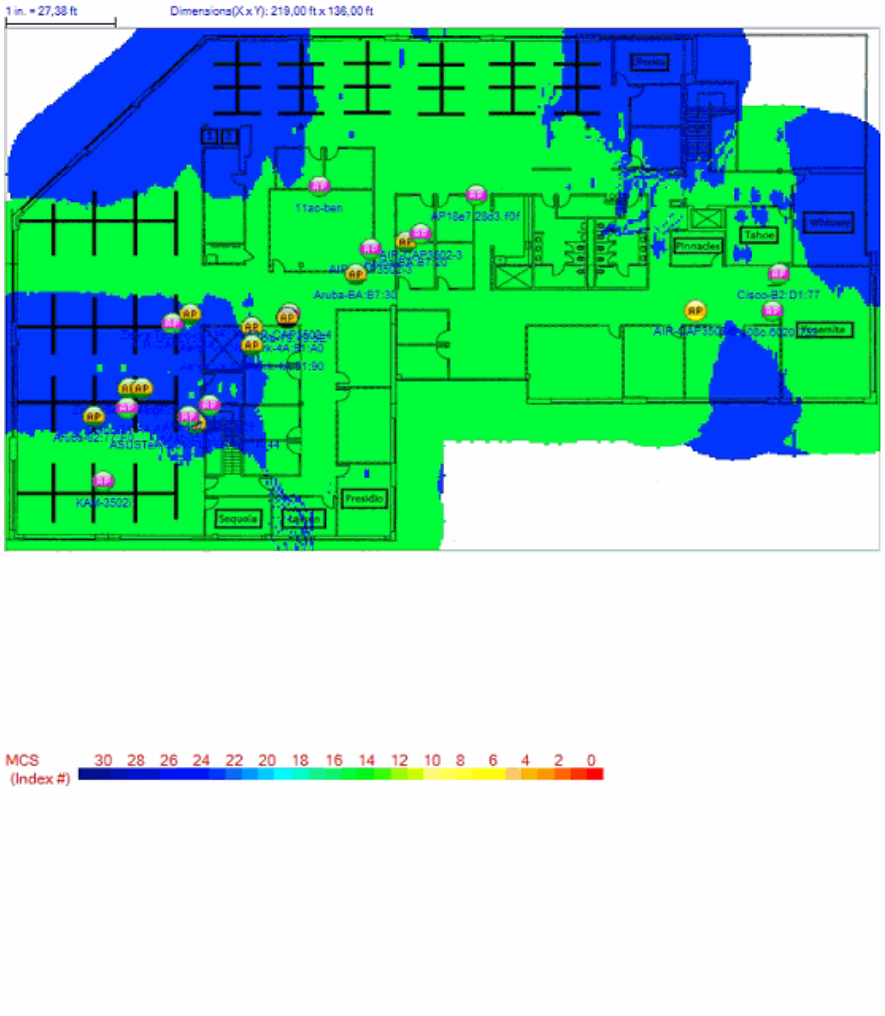


Individual 802.11n Max MCS (AP Tx) Distribution

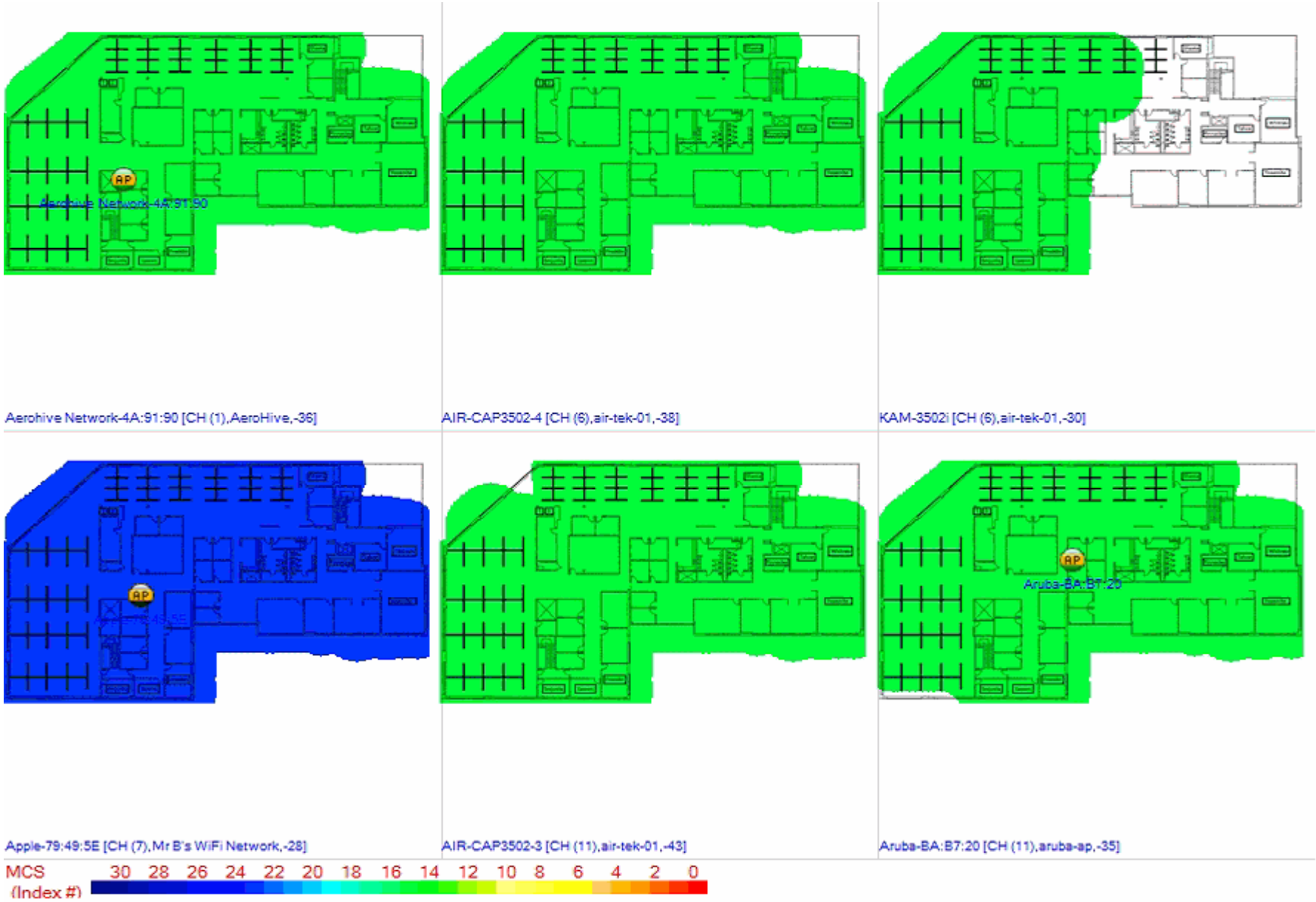


6.8 802.11n Max MCS (AP Rx)

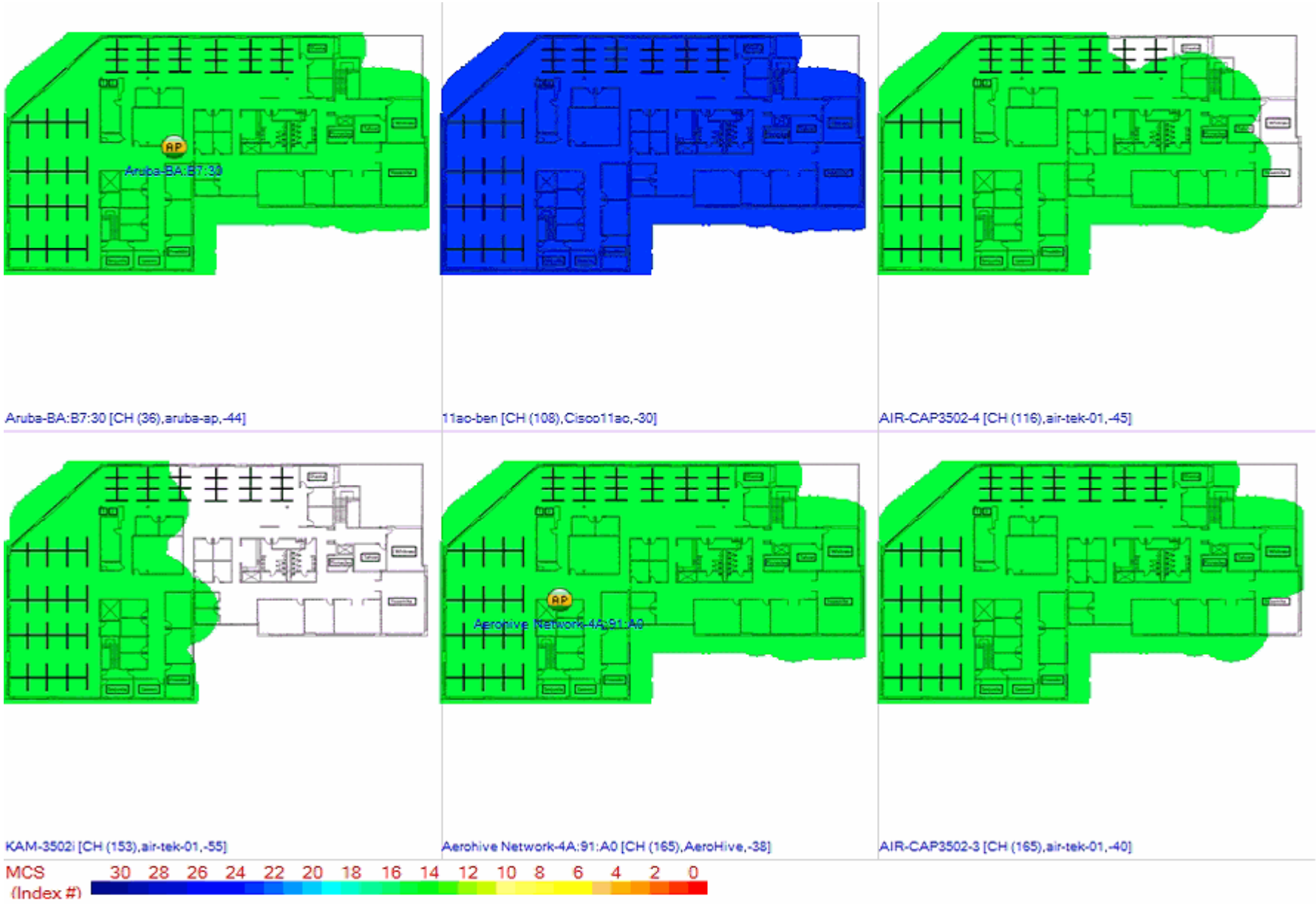
The image below displays the AP's detected 802.11n MCS Receive Rates.



Individual 802.11n Max MCS (AP Rx) Distribution

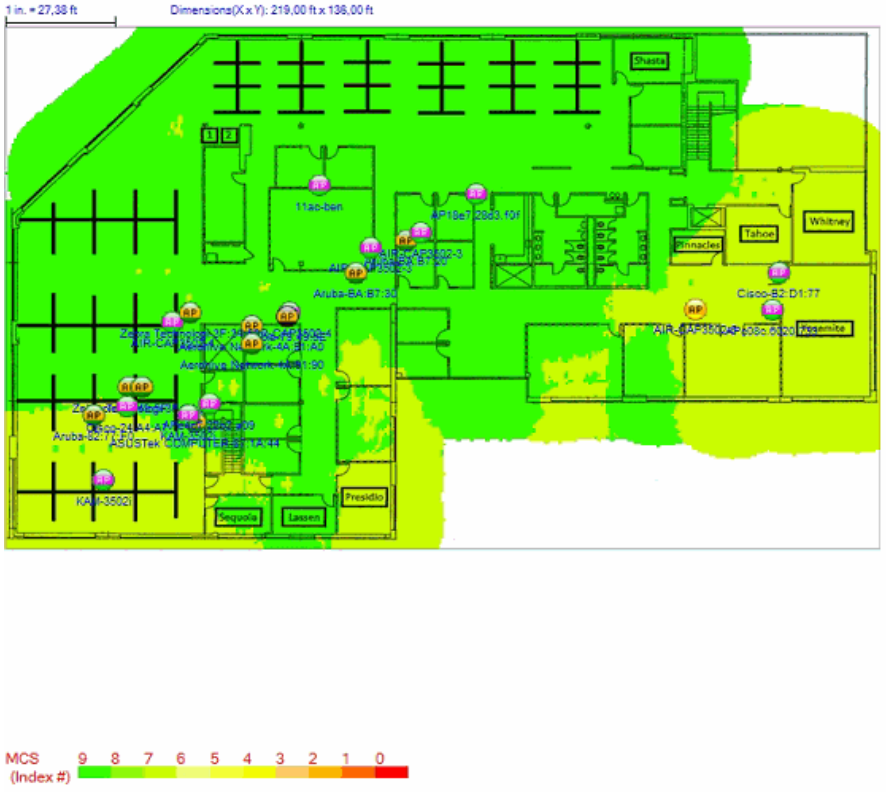


Individual 802.11n Max MCS (AP Rx) Distribution

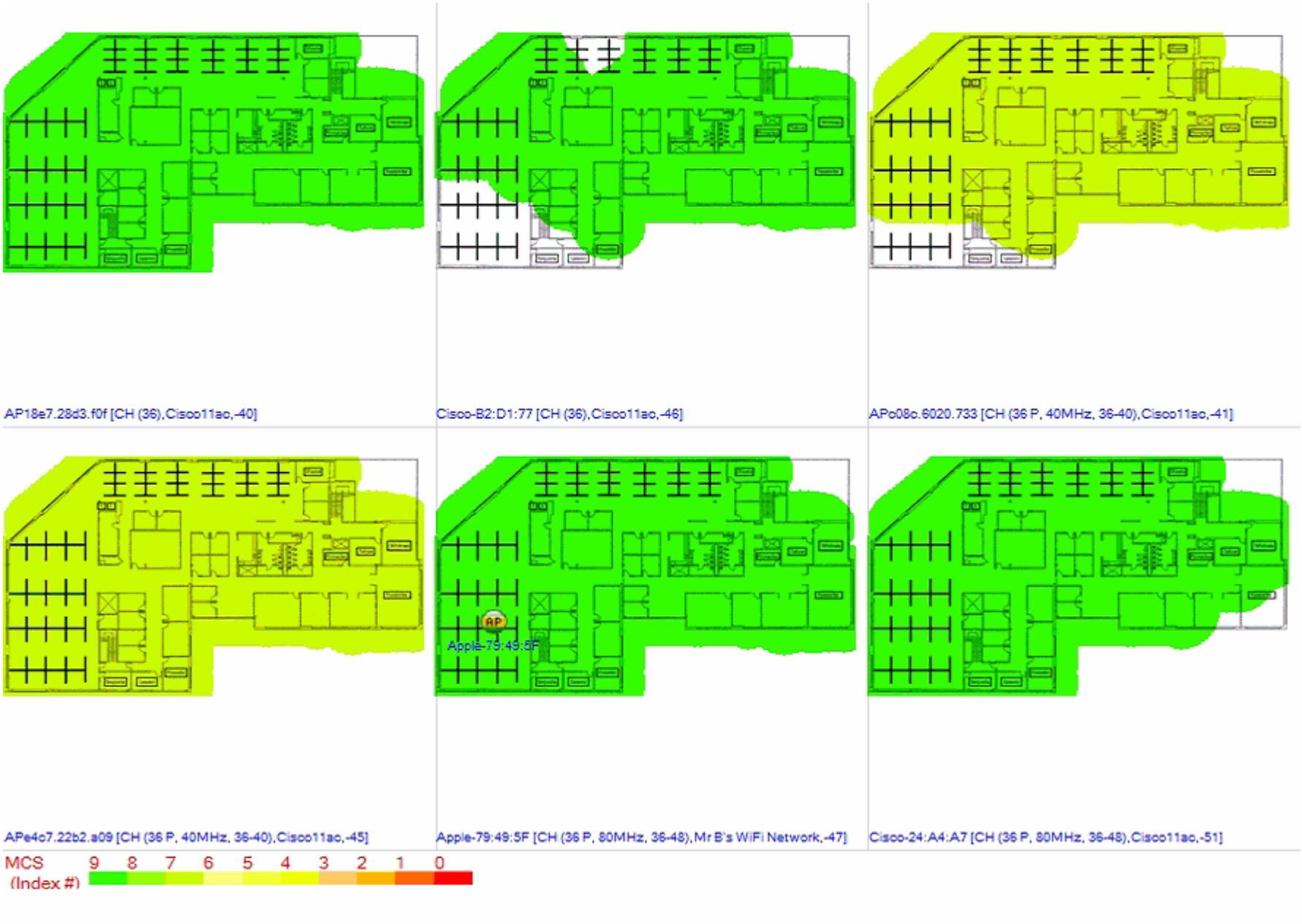


6.9 802.11ac Max MCS (AP Tx)

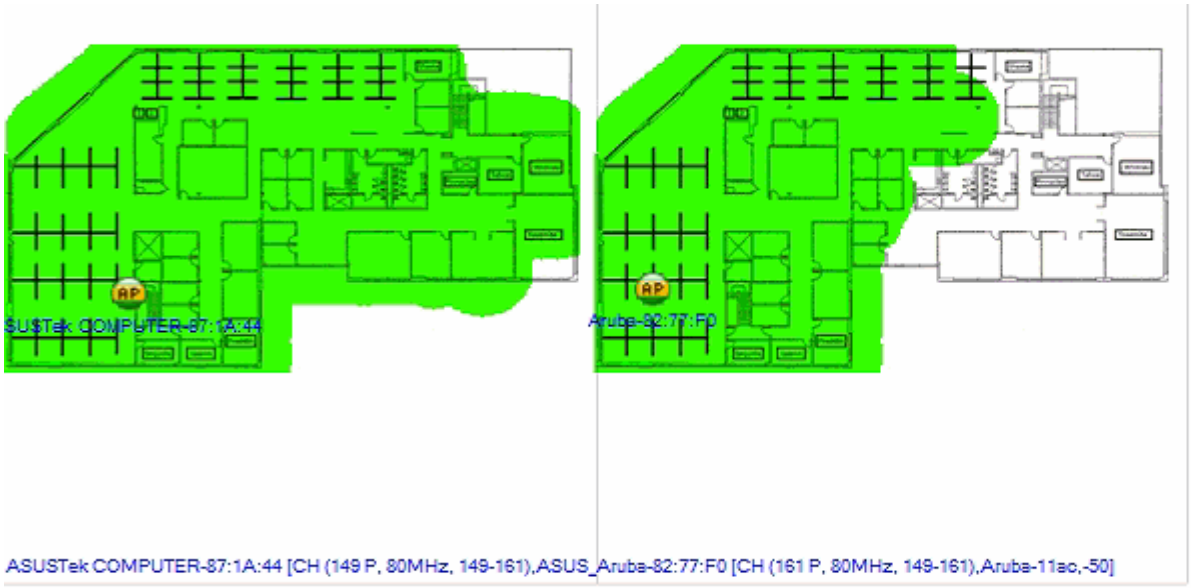
The image below displays the AP's detected 802.11ac MCS Transmission Rates.
This heatmap reflects the 802.11ac AP MCS Transmit mode that was detected.



Individual 802.11ac Max MCS (AP Tx) Distribution

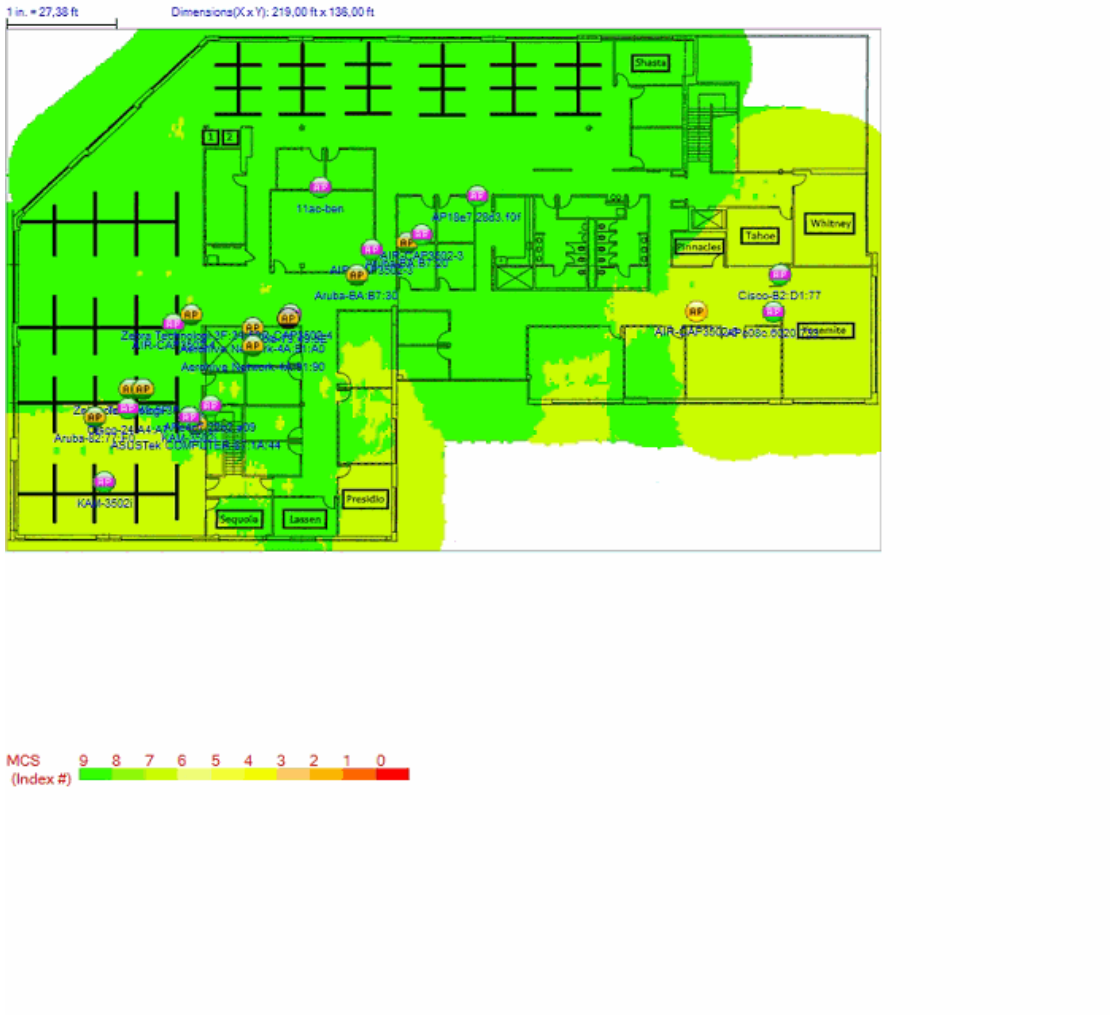


Individual 802.11ac Max MCS (AP Tx) Distribution

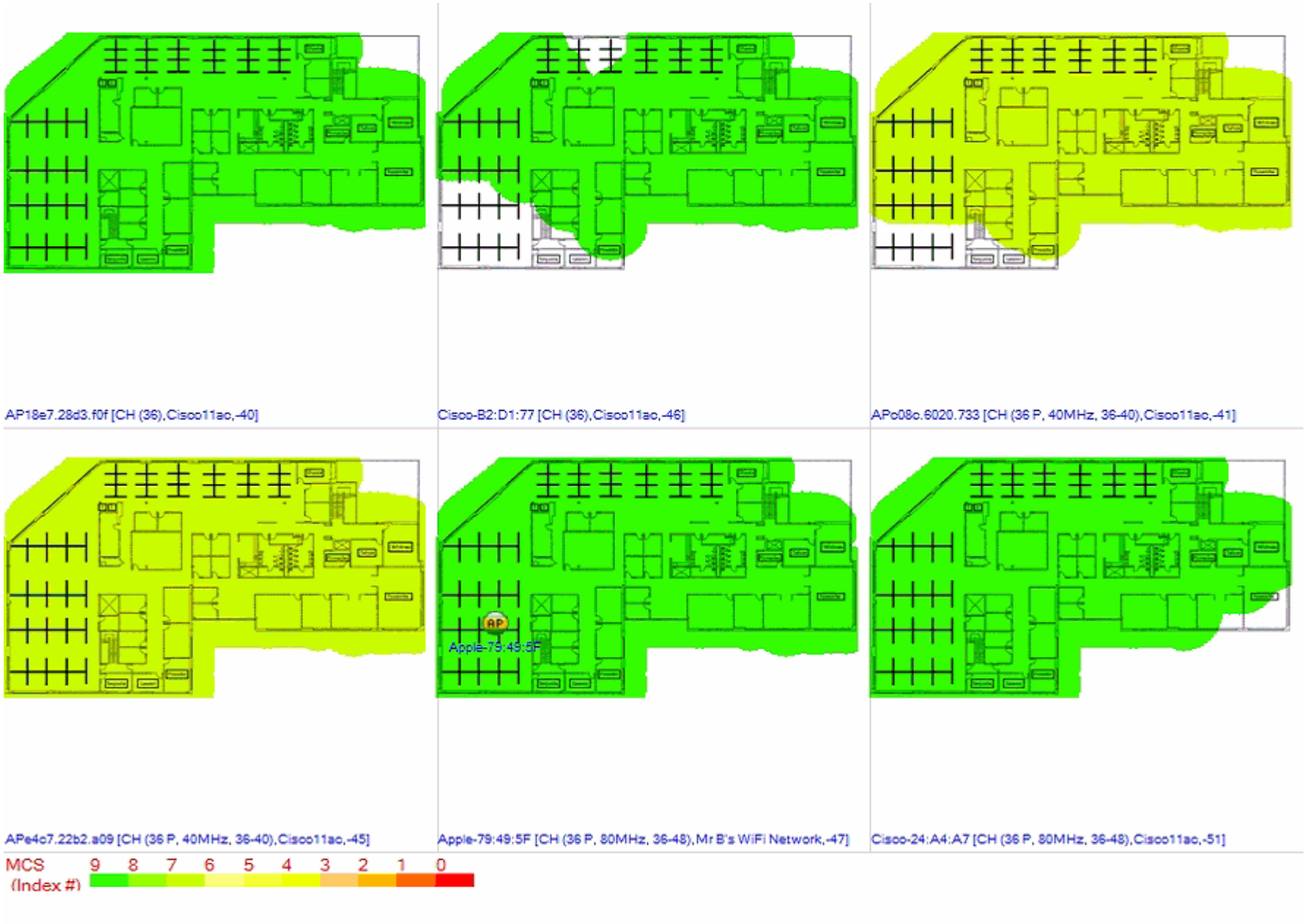


6.10 802.11ac Max MCS (AP Rx)

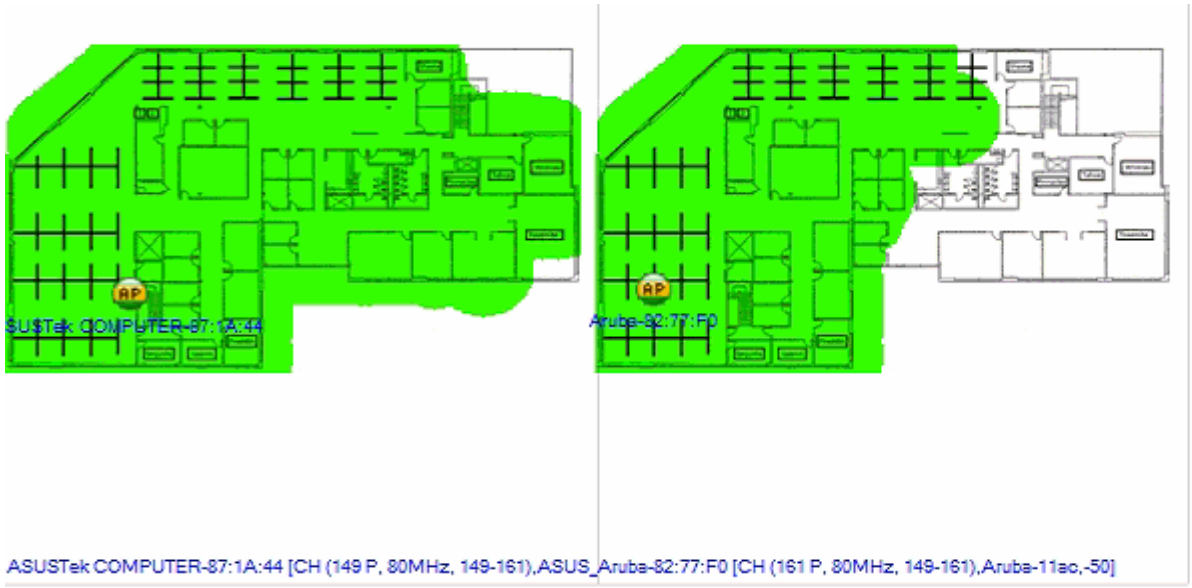
The image below displays the AP's detected 802.11ac MCS Receive Rates.



Individual 802.11ac Max MCS (AP Rx) Distribution



Individual 802.11ac Max MCS (AP Rx) Distribution



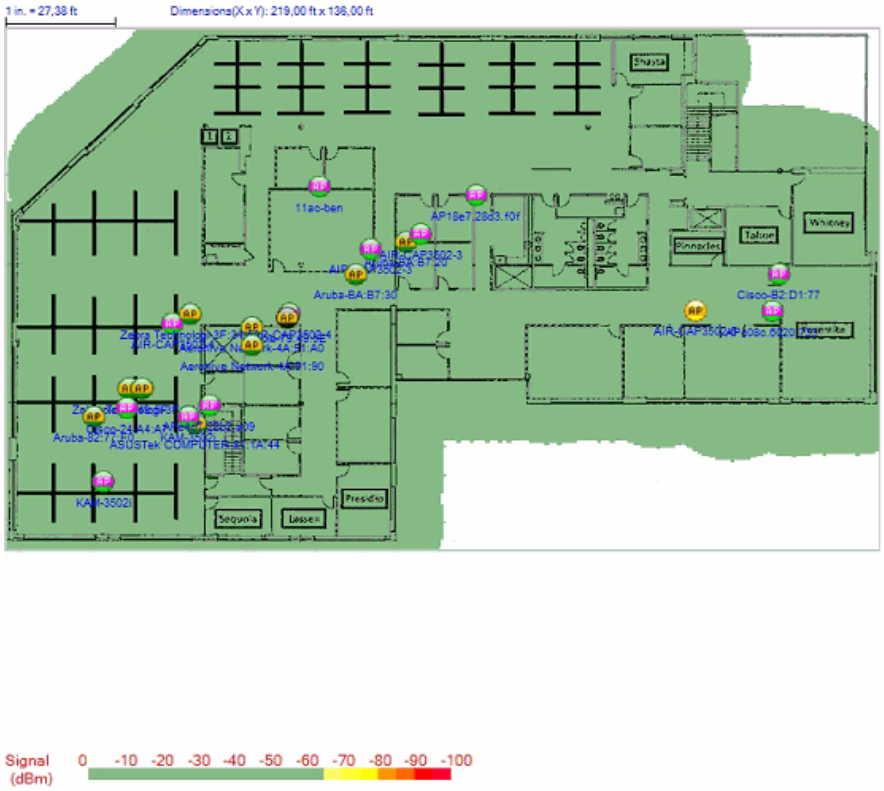
7 AirWISE Validation Against Requirements

This report section provides a comprehensive summary of all AirWISE data relating to the current survey project . AirMagnet's AirWISE engine allows users to specify minimum acceptable thresholds for various requirements within the network. It compares the data gathered during the survey process against the requirements. Requirements that are not met are highlighted in their respective sections. Several sections also contain signal heat maps that help demonstrate exactly where the threshold violations can be found. Each section provides a breakdown of each requirement and displays a pass/fail rating based on how well the collected results stand up against the objectives.

7.1 Signal Coverage

The Signal Coverage requirement allows the user to specify that certain regions of the deployment must have sufficient coverage to provide adequate service. Areas of the map that meet the current requirements for Signal coverage are labeled in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image.

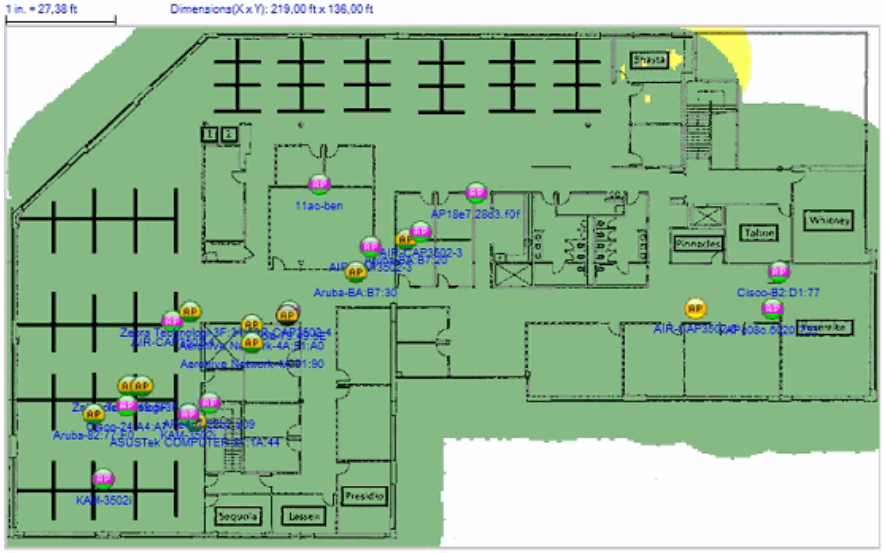
Desired Signal Coverage	
Pass/Fail Result	Pass: 100,00% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Minimum AP signal strength required	Minimum of -67 dBm



7.1.1 Redundant AP Coverage

The Redundant AP Coverage requirement allows the user to specify that certain regions of the deployment must have coverage from more than one AP in order to be considered adequate service. Areas of the map that meet the current requirements for AP coverage are labeled in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image.This requirement contains two configurable thresholds: the user must specify the minimum number of APs required for the site as well as the minimum signal level that is considered acceptable for the APs to warrant consideration. If either one of these two thresholds is not met, the area is considered non-compliant.

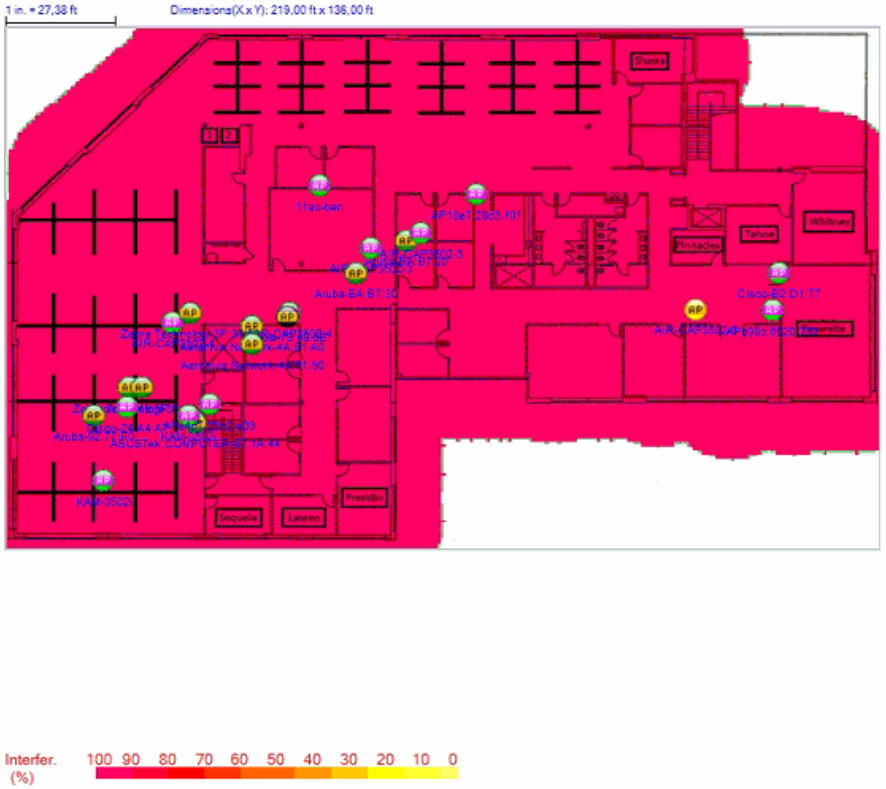
Multiple AP Signal Coverage	
Pass/Fail Result	Fail: 99,40% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Number of APs required to provide coverage	2
Minimum AP signal strength required to provide coverage	-67 dBm


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
11ac-ben
AP18e7.2883.f0f
Aruba-BA:B7:30
Tahoe
Whitney
Pinnacles
Cisco-B2:D1:77
Yosemite
Presidio
Sequoia
Lassen
KAM-3502i
AP Count (APs)
10 9 8 7 6 5 4 3 2 1 0

7.2 Channel Interference

Areas of the map that meet the current requirement for Supported Speed are labeled in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image. Let the mouse hover over any area of the map to show additional details.
Important Note: AirMagnet Survey measures interference from the point of view of a particular AP. Thus for a given AP, AirMagnet shows a cumulative view of all the various Wi-Fi sources that are interfering with that one AP. As a result, users should deselect all APs that are not the focus of investigation (using the device tree to the left on the Display page). The signals from de-selected devices are still considered when determining interference to other APs.

Channel Interference	
Pass/Fail Result	Fail: 0,30% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Interfered APs: Exclude APs if signal strength is weaker than	-75 dBm
Interfering APs: Exclude APs if signal strength is weaker than	-85 dBm

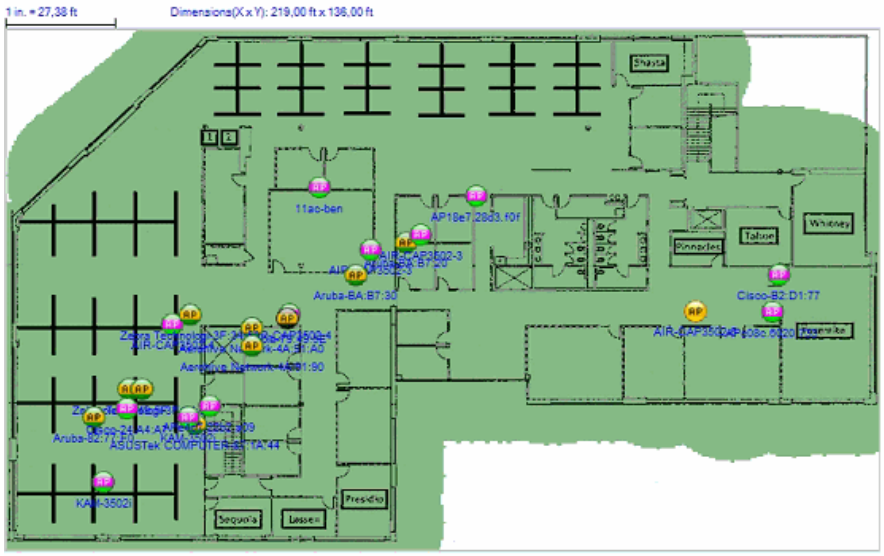

1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
Tahoe
Whitney
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
Interfer. (%)
100 90 80 70 60 50 40 30 20 10 0

7.3 PHY Data Rate

7.3.1 Predictive Downlink

Areas of the floor plan that meet the current requirement for Min Downlink Data Rate Supported are labeled in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image. This scale is shown in terms of Mbps.

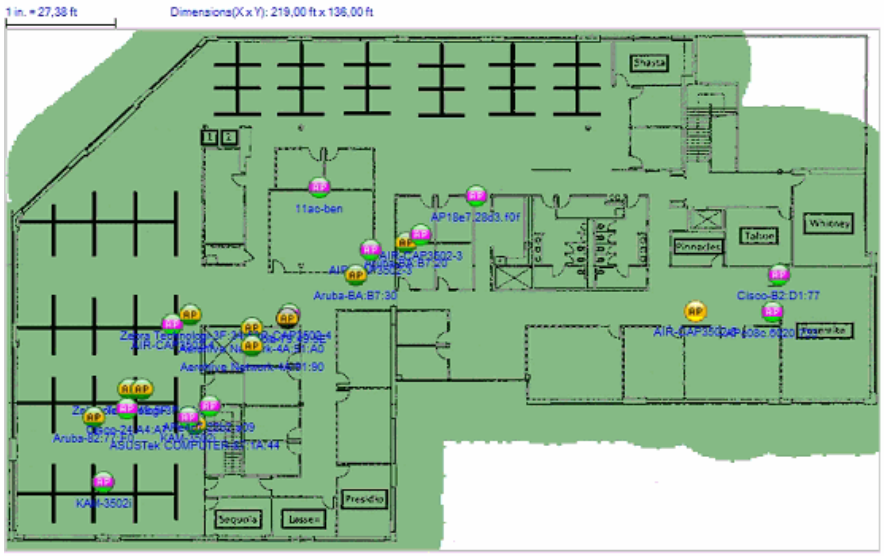
Predictive PHY Data Rate Downlink Coverage	
Pass/Fail Result	Pass: 100,00% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Minimum AP PHY Data Rate required	Minimum of 54,00 Mbps

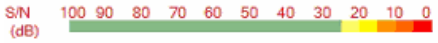

1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
11ac-ben
AP18e7.2883.f0f
Aruba-BA:B7:38
Cisco-B2:D1:77
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
KAM-3502i
PHY Data Rate (Mbps)
1300 600 240 120 48 12 5.5 1

7.4 Signal/Noise Ratio

Areas that meet the current RF coverage requirement are shown in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image. The weakest signals are shown in red.

Signal Noise Ratio Coverage	
Pass/Fail Result	Pass: 100,00% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Minimum Signal Noise Ratio required	25 dBm

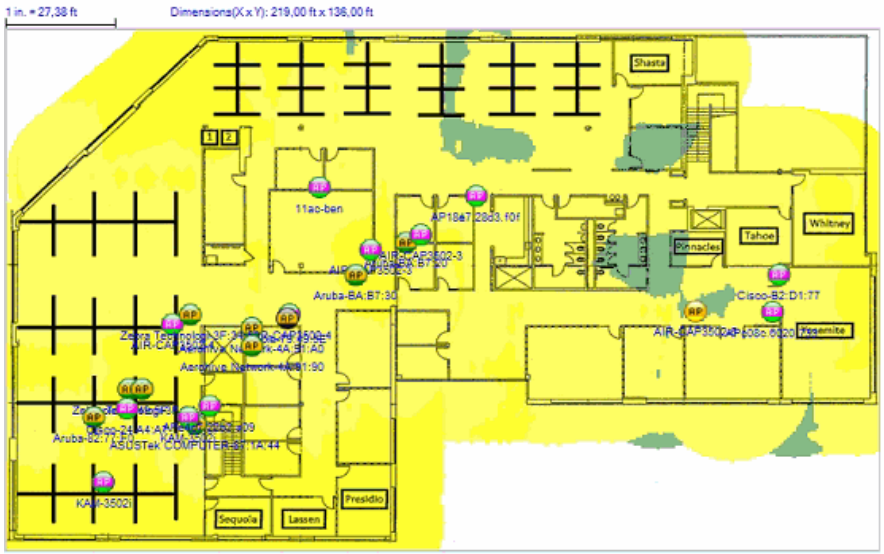

1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
11ac-ben
AP18e7.2883.f0f
Whitney
Tallac
Dinsmores
Aruba-BA:B7:30
Cisco-B2:D1:77
Presidio
Sequoia
Lassen
KAM-3502i


S/N (dB)
100 90 80 70 60 50 40 30 20 10 0

7.5 Noise Level

Areas of the map that meet the current requirement for noise are labeled in light green. Areas that do not meet the requirement are displayed according to the color code on the slider bar below the image. Noise levels are displayed in dBm with areas of highest noise shown in red.

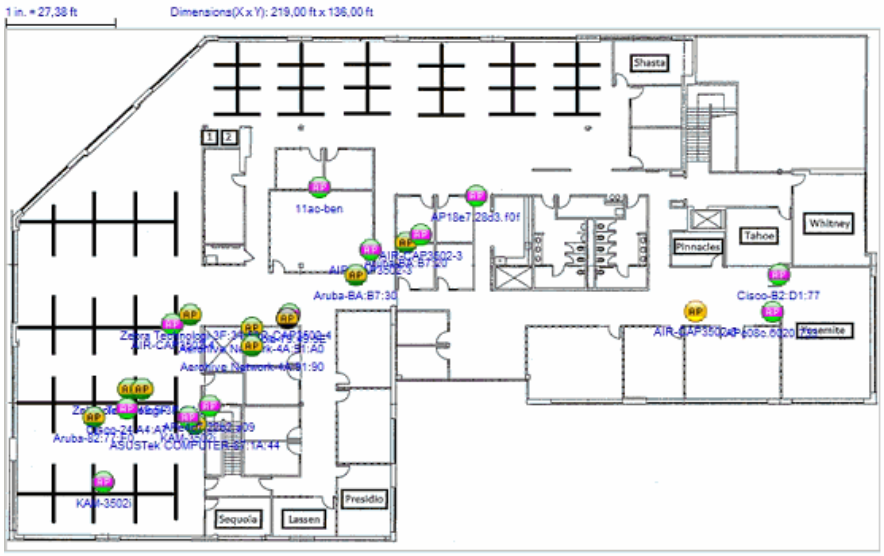
Noise Level	
Pass/Fail Result	Fail: 3,90% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Maximum Noise Level Allowed	-90 dBm


1 in. = 27.38 ft
Dimensions(X x Y): 219.00 ft x 136.00 ft
Shasta
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
11ac-ben
Aruba-BA:B7:30
Cisco-B2:D1:77
KAM-3502i
Noise (dBm)
0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100

7.6 User Capacity

The User Capacity requirement allows users to specify the number of users expected to be present in selected regions of the map. If the survey reveals that there are not enough APs present to service the users in the area , that region will be displayed in red on the heat map below.

User Capacity	
Pass/Fail Result	N/A
Maximum Users Supported per AP	15
With Load Balancing	True

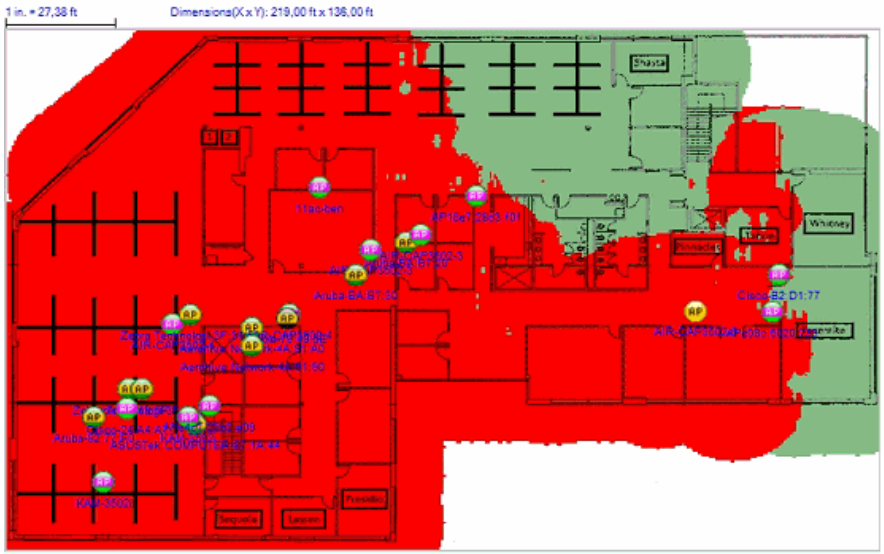

1 in. = 27.38 ft
Dimensions(X x Y): 219.00 ft x 136.00 ft
Shasta
11ac-ben
Whitney
Tahoe
Pinnacles
Cisco-B2:D1:77
Yosemite
Aruba-BA:B7:30
Presidio
Sequoia
Lassen
(User Count) 50 45 40 35 30 25 20 15 10 5 0

7.7 Operating Mode

This section shows if the network meets the Operating Mode requirements of the deployment policy. Four 802. 11n/ac operating modes are available, with each one being "allowed" or "not allowed". The table below provides a means of interpreting the heat map displayed immediately beneath it. The "Operating Mode" field displays the percentage of the network that complies with the Operating Mode policy as specified in the four Operating Mode fields below it and configured on the AirWISE page . This function allows users to view the areas of the network that do not provide appropriate Operating Mode coverage as defined by the specified policy. The regions that comply with the requirement are displayed in green, whereas regions that do not comply are displayed in red.

7.7.1 Overall

Operating Mode	
Pass/Fail Result	Fail: 21,90% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Greenfield Operating Mode	Allowed
HT Mixed Operating Mode	Not Allowed
VHT Mixed Operating Mode	Allowed
Legacy Operating Mode	Not Allowed


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
Whitney
Lassen
Sequoia
Presidio

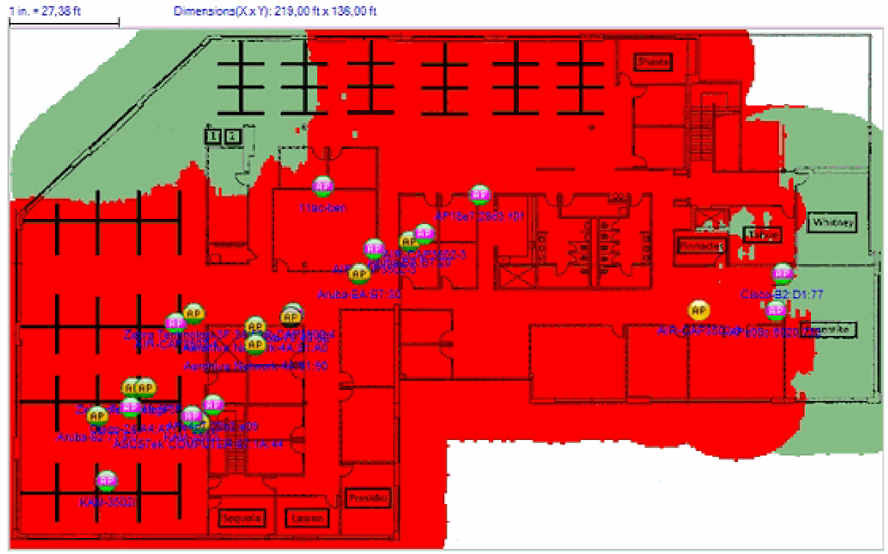

Operating Mode
Pass
Fail

7.8 Channel Width

This section of the channel width requirements will show the actual detected channel usages detected. The heat map will show the areas that will be the cause of the pass or failure of the requirements specified for the channel width.

7.8.1 Overall

Channel Width	
Pass/Fail Result	18,40% of the surveyed area meets the Minimum requirement.
40 MHz Channel Width	Allowed
20HT MHz Channel Width	Not Allowed
20 MHz Legacy Channel Width	Not Allowed
80 MHz Channel Width	Allowed
160 MHz Channel Width	Allowed



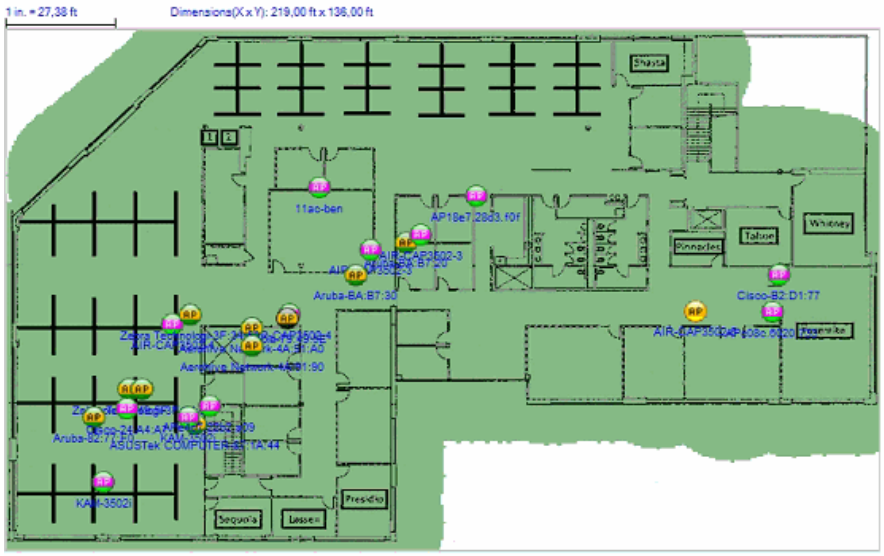
Channel Width
Pass
Fail

7.9 802.11n Highest MCS Index

This requirement show which areas of the current survey report meet the requirements specified by the 802. 11n Minimum Tx MCS Index required threshold. Areas that meet the requirement are displayed in light green, whereas regions that do not meet the required MCS are displayed in a color assigned by the color-codes on the legend.

7.9.1 Overall

802.11n Highest MCS Index	
Pass/Fail Result	Pass: 100,00% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Minimum Tx MCS index required	15


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
11ac-ben
AP18e7.2883.f0f
Whitney
Tallac
Dinsmore
Aruba-BA:B7:38
Cisco-B2:D1:77
Yosemite
Presidio
Sequoia
Lassen
KAM-3502i

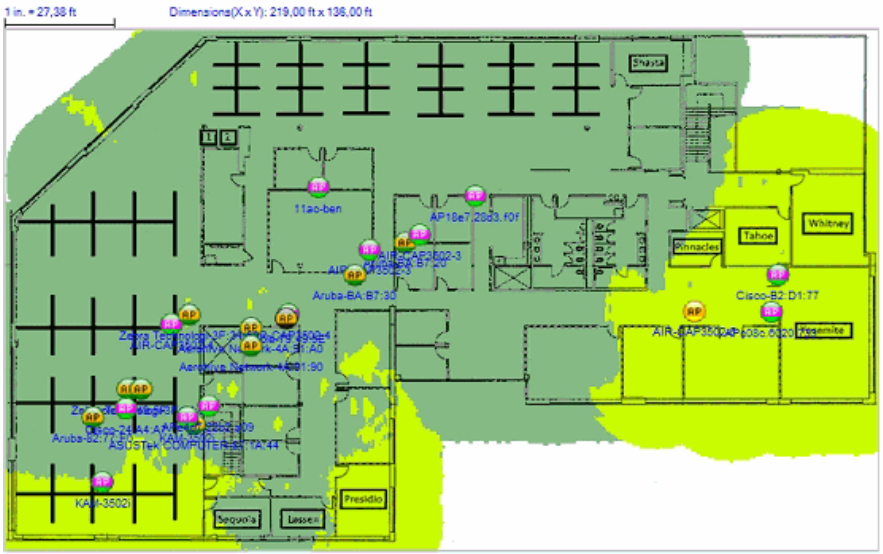

MCS
(Index #)
30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0

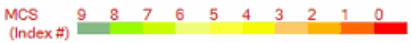
7.10 802.11ac Highest MCS Index

This requirement show which areas of the current survey report meet the requirements specified by the 802. 11ac Minimum Tx MCS Index required threshold. Areas that meet the requirement are displayed in light green, whereas regions that do not meet the required MCS are displayed in a color assigned by the color-codes on the legend.

7.10.1 Overall

802.11ac Highest MCS Index	
Pass/Fail Result	Fail: 71,70% of the surveyed area meets the Minimum requirement. (100,00% of Good Area. required to pass)
Minimum Tx MCS index required	9


1 in. = 27,38 ft
Dimensions(X x Y): 219,00 ft x 136,00 ft
Shasta
Whitney
Tahoe
Pinnacles
Yosemite
Presidio
Sequoia
Lassen
11ac-ben
AP18e7.28d3.f0f
Aruba-BA:B7:30
Cisco-B2:D1:77
KAM-3502i


MCS (Index #)
9 8 7 6 5 4 3 2 1 0

8 Conclusions

Overall, based on planned placement of the access points, more than % of the facility will meet the levels of RF signal strength (- dBm) and dB SNR as specified in the Statement of Work. Adjusting the scale to - dBm showed % of the entire survey area was covered at this signal strength.
In testing these areas it was noted that microwaves ovens and Bluetooth devices were in use.
The RF noise floor in this facility is remarkably low, showing less than - dBm.

Description	Value	Pass/Fail Result
Desired Signal Coverage	100,00% of Good Area.	Pass: 100,00% of Good Area. required to pass
Minimum AP signal strength required	-67 dBm	
Multiple AP Signal Coverage	99,40% of Good Area.	Fail: 100,00% of Good Area. required to pass
Number of APs required to provide coverage	2	
Minimum AP signal strength required to provide coverage	-67 dBm	
Channel Interference	0,30% of Good Area.	Fail: 100,00% of Good Area. required to pass
Interfered APs: Exclude APs if signal strength is weaker than	-75 dBm	
Interfering APs: Exclude APs if signal strength is weaker than	-85 dBm	
Measured PHY Data Rate Uplink Coverage	N/A	N/A
Minimum AP PHY Data Rate required	5,50 Mbps	
Measured PHY Data Rate Downlink Coverage	N/A	N/A

Minimum AP PHY Data Rate required	54,00 Mbps	
Predictive PHY Data Rate Downlink Coverage	100,00% of Good Area.	Pass: 100,00% of Good Area. required to pass
Minimum AP PHY Data Rate required	54,00 Mbps	
Signal Noise Ratio Coverage	100,00% of Good Area.	Pass: 100,00% of Good Area. required to pass
Minimum Signal Noise Ratio required	25 dBm	
Noise Level	3,90% of Good Area.	Fail: 100,00% of Good Area. required to pass
Maximum Noise Level Allowed	-90 dBm	
User Capacity	N/A	N/A
Maximum Users Supported per AP	15	
With Load Balancing	True	
Operating Mode	21,90% of Good Area.	Fail: 100,00% of Good Area. required to pass
Greenfield Operating Mode	Allowed	
HT Mixed Operating Mode	Not Allowed	
VHT Mixed Operating Mode	Allowed	
Legacy Operating Mode	Not Allowed	
Channel Width	18,40% of Good Area.	Fail: 100,00% of Good Area. required to pass
40 MHz Channel Width	Allowed	

20HT MHz Channel Width	Not Allowed	
20 MHz Legacy Channel Width	Not Allowed	
80 MHz Channel Width	Allowed	
160 MHz Channel Width	Allowed	
802.11n Highest MCS Index	100,00% of Good Area.	Pass: 100,00% of Good Area. required to pass
Minimum Tx MCS index required	15	
802.11ac Highest MCS Index	71,70% of Good Area.	Fail: 100,00% of Good Area. required to pass
Minimum Tx MCS index required	9