CLIENT:

AS CANCELAS

PROJECT:

DEMO PROJECT 1

DATE:

5/4/2016

HEAT MAPS ACRYLIC WiFi

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1. Site Survey Summary

1.1. Wireless network survey information

This section contains general information regarding the wireless environment analysis using Acrylic WiFi Heatmaps.

Project Name	**Demo Project 1**
Client	**As Cancelas**
Description	**Shopping center site survey**
Data	**11/06/2015**
Selected Locations	**3**
Selected Scans	**7**
Selected Stations	**29**

1.2. SUMMARY OF DETECTED NETWORKS

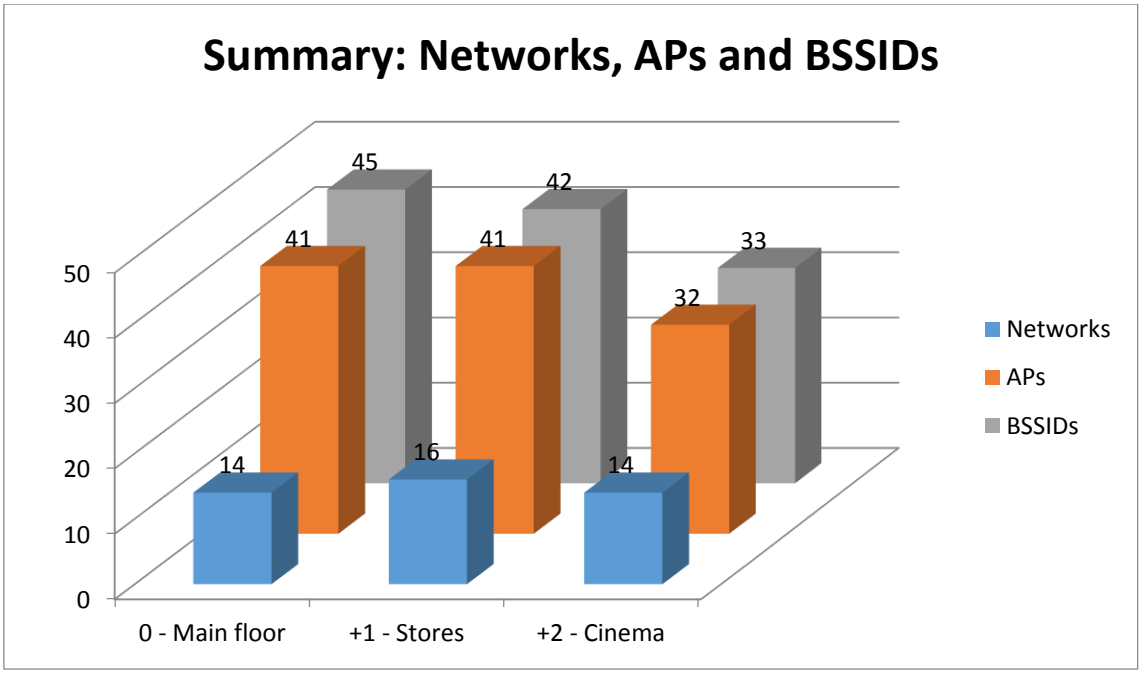
The following table summarizes Networks, MAC addresses and physical APs grating network accesses at different locations:

- Location: Physical area where monitoring takes place.
- Networks: Number of Networks detected.
- Access Points (APs): Number of physical access points.
- BSSIDs: Access points (MAC addresses) granting network access.

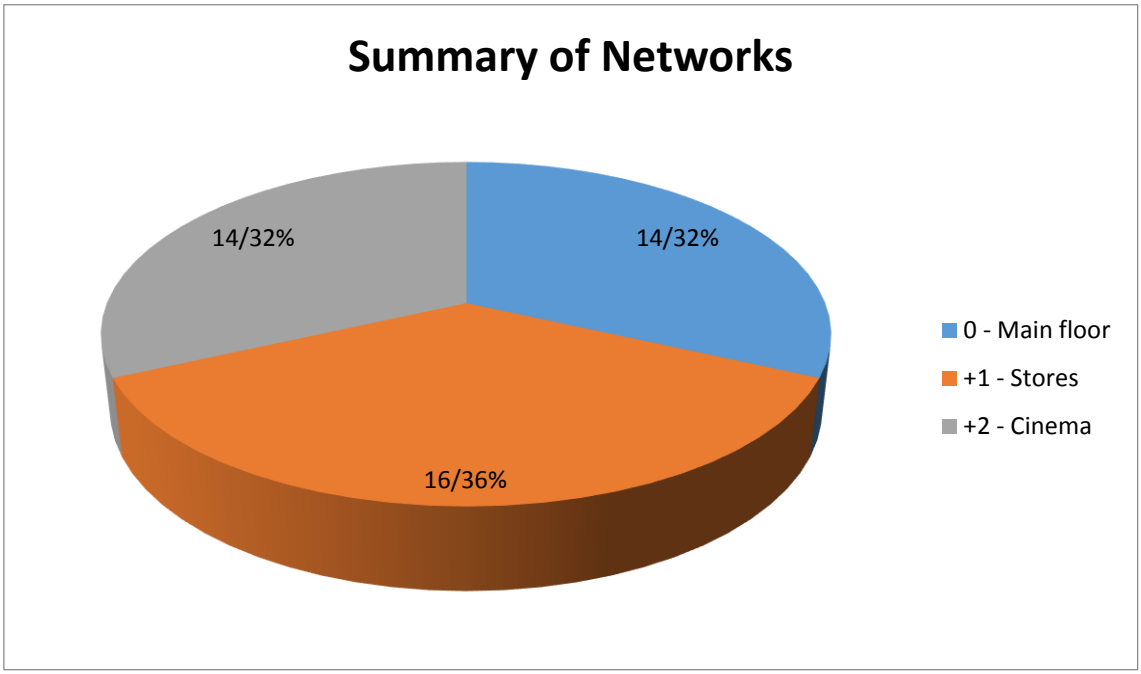
The number of BSSIDs can exceed the number of physical APs because a single AP can propagate more than one network by using different MAC addresses.

LOCATION	NETWORKS	APS	BSSIDS
0 - Main floor	14	41	45
+1 - Stores	16	41	42
+2 - Cinema	14	32	33
Total	*17*	*45*	*49*

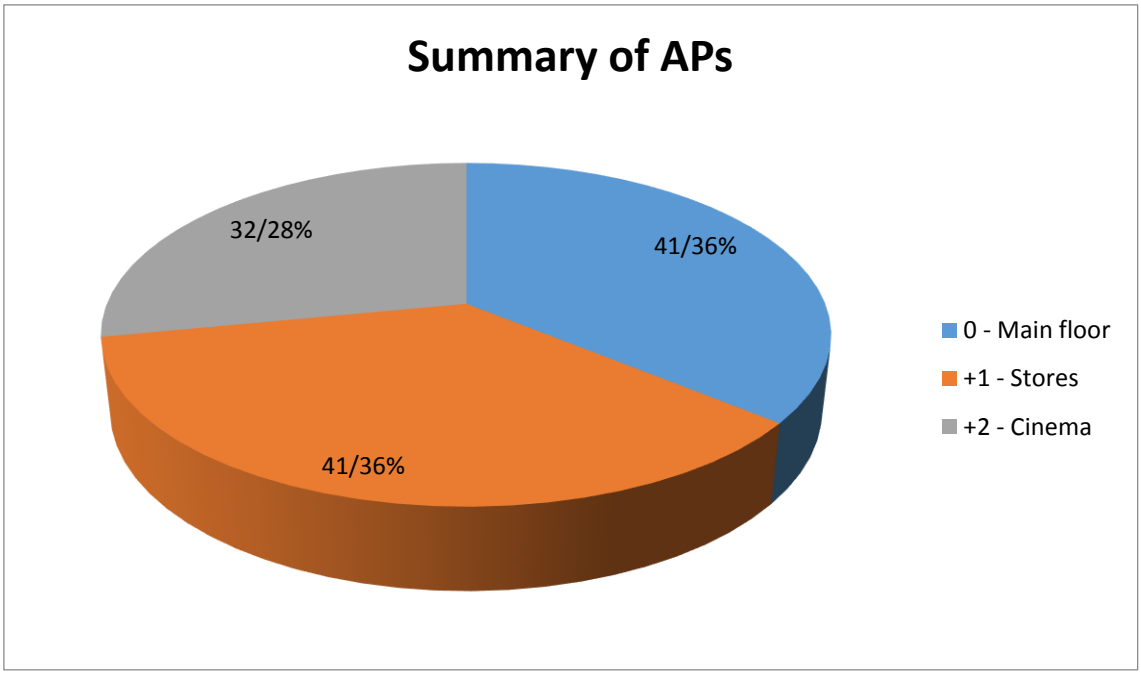
The following graph shows a comparison between the number of networks, physical APs and BSSIDs at each location.



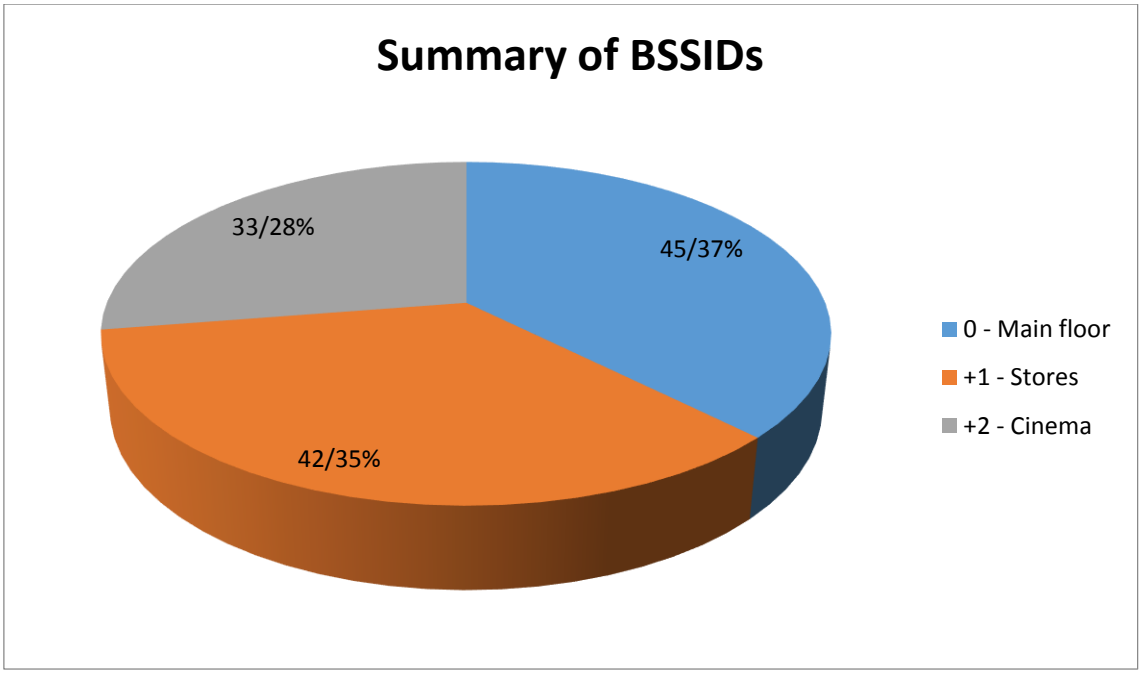
The following graph shows the total number and the percentage of networks detected at each location.



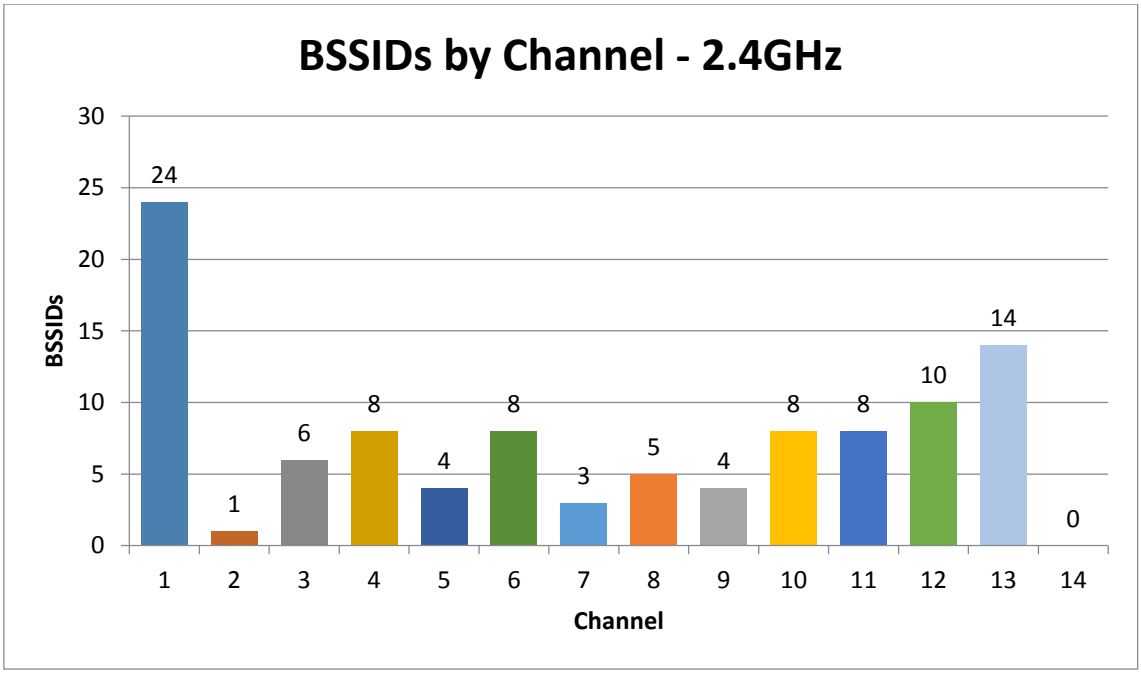
The following graph shows the total number and the percentage of physical APs detected at each location.

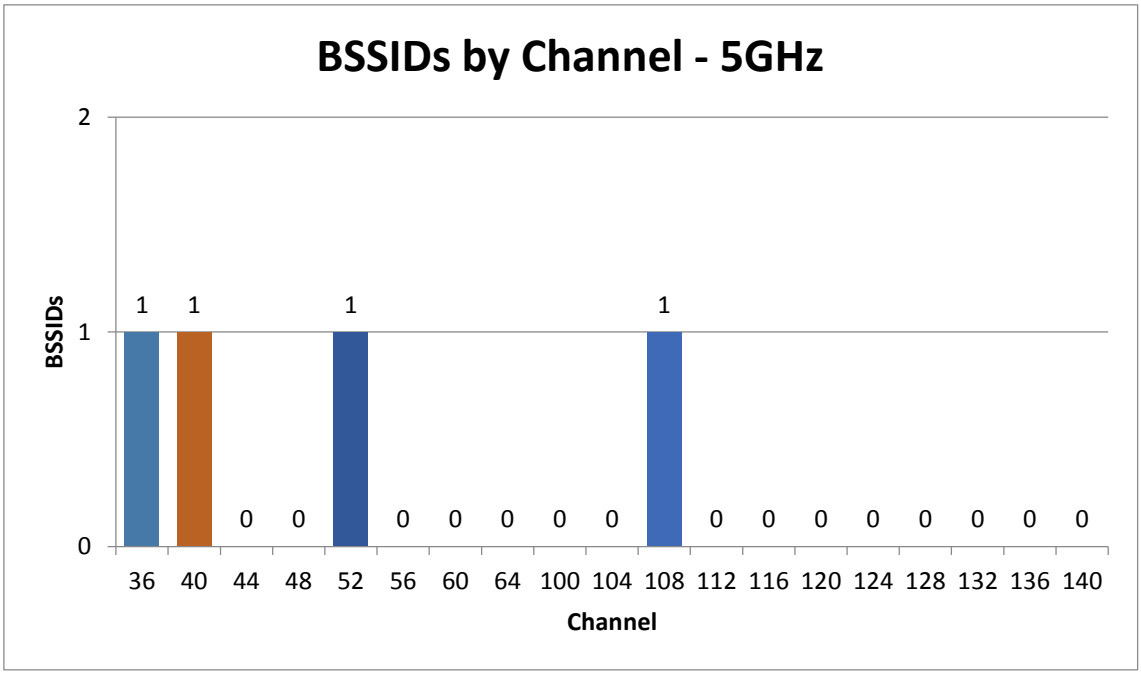


The following graph shows the total number and the percentage of BSSIDs detected at each location.

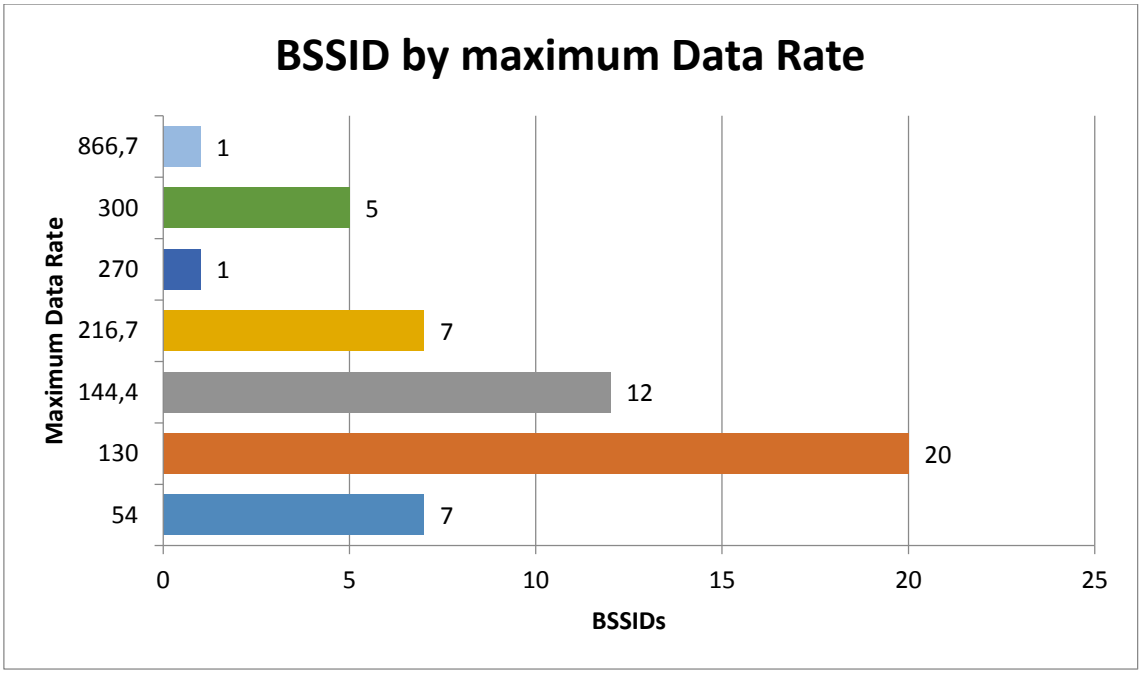


The following two graphs show the number of BSSIDs detected at each Channel, in the 2.4GHz bandwidth and in the 5GHz bandwith respectively.





The following graph shows the number of BSSIDs detected, ordered by maximum Data Rate registered value.



2. NETWORKS

The following table contains relevant information about all the networks detected during the survey:

- SSID: Network identifier offered by the BSSID.
- BSSID: Unique device identifier (Basic Service Set Identifier)
- Channel: Identifier of the frequency on which the network is operating.
- Frequency: Value of frequency in which the network channel is operating, expressed in Mhz.
- Average RSSI: Average Signal Strength detected on each device during the survey.
- Maximum RSSI: Maximum Signal Strength detected on each device during the survey.
- Minimum RSSI: Minimum Signal Strength detected on each device during the survey.
- Security: Types of authentication and encryption supported by the network.
- WPS: Wi-Fi Protected Setup version supported by the network.

	SSID	BSSID	CHAN	FREQ	RSSI AVG	RSSI MAX	RSSI MIN	SECURITY	WPS
1	*AsCancelas*	04:BD:88:F0:7E:A0	6	2437	-71	-69	-74	Open	
		04:BD:88:F0:A1:E0	1	2412	-60	-32	-95	Open	
		04:BD:88:F0:D2:C0	1	2412	-66	-47	-82	Open	
		04:BD:88:F0:E1:00	1	2412	-66	-47	-84	Open	
		04:BD:88:F0:E1:80	6	2437	-59	-35	-95	Open	
		04:BD:88:F1:02:80	1	2412	-74	-67	-80	Open	
		04:BD:88:F1:03:A0	1	2412	-62	-30	-81	Open	
		24:DE:C6:81:0B:B2	8	2447	-74	-36	-95	Open	
		24:DE:C6:81:0B:E2	5	2432	-68	-36	-95	Open	
		24:DE:C6:81:0B:F2	1	2412	-68	-35	-95	Open	
		24:DE:C6:81:0C:32	12	2467	-67	-39	-95	Open	
		24:DE:C6:81:0C:72	4	2427	-69	-29	-95	Open	
		24:DE:C6:81:0C:82	13	2472	-69	-27	-95	Open	
		24:DE:C6:81:0E:02	9	2452	-62	-28	-95	Open	
		24:DE:C6:81:0E:52	1	2412	-70	-32	-95	Open	
		24:DE:C6:81:0E:B2	12	2467	-70	-27	-95	Open	
		24:DE:C6:81:0F:02	13	2472	-70	-20	-95	Open	
		24:DE:C6:81:0F:A2	10	2457	-69	-33	-95	Open	
		24:DE:C6:81:11:62	10	2457	-68	-29	-95	Open	
		24:DE:C6:81:12:12	13	2472	-69	-39	-95	Open	
		24:DE:C6:81:15:02	13	2472	-69	-32	-95	Open	
		24:DE:C6:81:1C:32	12	2467	-67	-36	-95	Open	
		24:DE:C6:81:58:12	10	2457	-76	-56	-95	Open	
		24:DE:C6:91:AE:52	11	2462	-80	-67	-95	Open	

3. Access Points

This section shows information about the physical access points detected during a survey, grouping all BSSIDs that are managed by the same physical device, as well as the number of clients connected to each one of them during the survey.

For each physical access point, its manufacturer is shown, as well as all its managed networks.

For each physical access point:
- BSSID: Associated MAC addresses granting network access.
- SSID: Network identifier offered by the BSSID.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- Clients: Number of connected clients (if monitoring is performed on Monitor Mode or Airpcap)

04:BD:88:F0:7E:A- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F0:7E:A0	AsCancelas	6	2437

04:BD:88:F0:A1:E- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F0:A1:E0	AsCancelas	1	2412

04:BD:88:F0:D2:C- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F0:D2:C0	AsCancelas	1	2412

04:BD:88:F0:E1:0- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F0:E1:00	AsCancelas	1	2412

04:BD:88:F0:E1:8- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F0:E1:80	AsCancelas	6	2437

04:BD:88:F1:02:8- / Aruba Networks

BSSID	SSID	Channel	Freq
04:BD:88:F1:02:80	AsCancelas	1	2412

04:BD:88:F1:03:A- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
04:BD:88:F1:03:A0	AsCancelas	1	2412

24:DE:C6:81:0B:B- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0B:B2	AsCancelas	8	2447

24:DE:C6:81:0B:E- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0B:E2	AsCancelas	5	2432

24:DE:C6:81:0B:F- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0B:F2	AsCancelas	1	2412

24:DE:C6:81:0C:3- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0C:32	AsCancelas	12	2467

24:DE:C6:81:0C:7- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0C:72	AsCancelas	4	2427

24:DE:C6:81:0C:8- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0C:82	AsCancelas	13	2472

24:DE:C6:81:0E:0- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0E:02	AsCancelas	9	2452

24:DE:C6:81:0E:5- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0E:52	AsCancelas	1	2412

24:DE:C6:81:0E:B- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0E:B2	AsCancelas	12	2467

24:DE:C6:81:0F:0- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0F:02	AsCancelas	13	2472

24:DE:C6:81:0F:A- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:0F:A2	AsCancelas	10	2457

24:DE:C6:81:11:6- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:11:62	AsCancelas	10	2457

24:DE:C6:81:12:1- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:12:12	AsCancelas	13	2472

24:DE:C6:81:15:0- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:15:02	AsCancelas	13	2472

24:DE:C6:81:1C:3- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:1C:32	AsCancelas	12	2467

24:DE:C6:81:58:1- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:81:58:12	AsCancelas	10	2457

24:DE:C6:91:AE:5- / ARUBA NETWORKS

BSSID	SSID	CHANNEL	FREQ
24:DE:C6:91:AE:52	AsCancelas	11	2462

4. Location Survey: 0 - Main floor

4.1. Location details

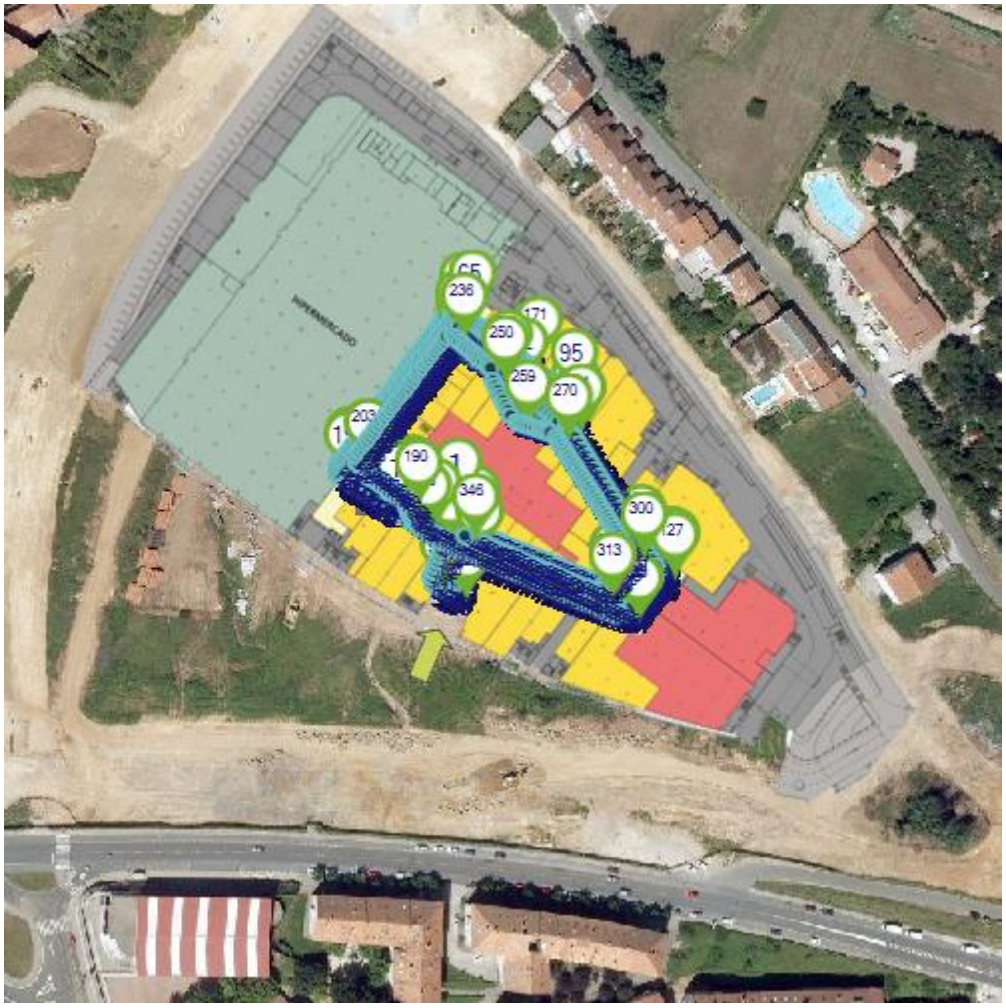
Short data related to the **0 - Main floor** Location

Location Name	**0 - Main floor**
Description	**Supermarket and Mall**
Selected Scans at this Location	**First scan at main floor**
	Scan passive + active survey
	Scan passive + active survey 2

Blueprint for the location 0 - Main floor

4.1.1. SURVEY ROUTE

The following image shows the path followed at the **0 - Main floor** location during the site survey, which indicates all locations where data was collected to be later analyzed.



4.1.1.1. FIRST SCAN AT MAIN FLOOR

Survey Route for 0 - Main floor Location - First scan at main floor

4.1.1.2. SCAN PASSIVE + ACTIVE SURVEY

Survey Route for 0 - Main floor Location - Scan passive + active survey

4.1.1.3. SCAN PASSIVE + ACTIVE SURVEY 2

Survey Route for 0 - Main floor Location - Scan passive + active survey 2

4.1.2. "0 - MAIN FLOOR" ACCESS POINT POSITION

The following image shows the approximate positions within the **0 - Main floor** location of all access points identified during the site survey. These positions are manually configured, or otherwise are automatically estimated based on the measured data.

Physical APs Position for 0 - Main floor Location

	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0E:02	AsCancelas	Aruba Networks	9
2	24:DE:C6:81:0E:52	AsCancelas	Aruba Networks	1
3	24:DE:C6:81:0E:B2	AsCancelas	Aruba Networks	12
4	24:DE:C6:81:0F:A2	AsCancelas	Aruba Networks	10
5	04:BD:88:F1:03:A0	AsCancelas	Aruba Networks	1
6	04:BD:88:F1:02:80	AsCancelas	Aruba Networks	1
7	04:BD:88:F0:E1:80	AsCancelas	Aruba Networks	6
8	04:BD:88:F0:7E:A0	AsCancelas	Aruba Networks	6

4.2. Network Survey: AsCancelas

4.2.1. Network Details

4.2.1.1. AP-based Information

The following table contains information related to the **AsCancelas** network, which is organized based on its APs:

- SSID: Network identifier offered by the BSSID.
- BSSID: Associated MAC addresses granting network access.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- Security: Types of authentication and encryption supported by the network.
- Vendor: Device manufacturer.

	SSID	AsCancelas			
	BSSID	Channel	Freq	Security	Vendor
1	04:BD:88:F0:7E:A0	6	2437	Open	Aruba Networks
2	04:BD:88:F0:D2:C0	1	2412	Open	Aruba Networks
3	04:BD:88:F0:E1:00	1	2412	Open	Aruba Networks
4	04:BD:88:F0:E1:80	6	2437	Open	Aruba Networks
5	04:BD:88:F1:02:80	1	2412	Open	Aruba Networks
6	04:BD:88:F1:03:A0	1	2412	Open	Aruba Networks
7	24:DE:C6:81:0B:B2	8	2447	Open	Aruba Networks
8	24:DE:C6:81:0B:E2	5	2432	Open	Aruba Networks
9	24:DE:C6:81:0B:F2	1	2412	Open	Aruba Networks
10	24:DE:C6:81:0C:32	12	2467	Open	Aruba Networks
11	24:DE:C6:81:0C:72	4	2427	Open	Aruba Networks
12	24:DE:C6:81:0C:82	13	2472	Open	Aruba Networks
13	24:DE:C6:81:0E:02	9	2452	Open	Aruba Networks
14	24:DE:C6:81:0E:52	1	2412	Open	Aruba Networks
15	24:DE:C6:81:0E:B2	12	2467	Open	Aruba Networks
16	24:DE:C6:81:0F:02	13	2472	Open	Aruba Networks
17	24:DE:C6:81:0F:A2	10	2457	Open	Aruba Networks
18	24:DE:C6:81:11:62	10	2457	Open	Aruba Networks
19	24:DE:C6:81:12:12	13	2472	Open	Aruba Networks
20	24:DE:C6:81:15:02	13	2472	Open	Aruba Networks
21	24:DE:C6:81:1C:32	12	2467	Open	Aruba Networks
22	24:DE:C6:81:58:12	10	2457	Open	Aruba Networks
23	24:DE:C6:91:AE:52	11	2462	Open	Aruba Networks

4.2.1.2. CHANNEL-BASED INFORMATION

The following table contains **AsCancelas** network related information, which is organized based on the transmitting channels/frequencies:

- SSID: Network identifier offered by the BSSID.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- BSSID: Associated MAC addresses granting network access.
- Vendor: Device manufacturer.

SSID	ASCANCELAS		
CHANNEL	FREQUENCY	BSSID	VENDOR
1	2412	24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0E:52	Aruba Networks
		04:BD:88:F0:D2:C0	Aruba Networks
		04:BD:88:F0:E1:00	Aruba Networks
		04:BD:88:F1:02:80	Aruba Networks
		04:BD:88:F1:03:A0	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:0C:82	Aruba Networks
3	2422	24:DE:C6:81:0C:32	Aruba Networks
		24:DE:C6:81:0C:82	Aruba Networks
		24:DE:C6:81:0E:52	Aruba Networks
		24:DE:C6:81:0F:A2	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
4	2427	24:DE:C6:81:0C:72	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
5	2432	24:DE:C6:81:0B:E2	Aruba Networks
6	2437	04:BD:88:F0:E1:80	Aruba Networks
		24:DE:C6:91:AE:52	Aruba Networks
		04:BD:88:F0:7E:A0	Aruba Networks
8	2447	24:DE:C6:81:0B:B2	Aruba Networks
9	2452	24:DE:C6:81:0E:02	Aruba Networks
		24:DE:C6:81:0B:B2	Aruba Networks
		24:DE:C6:81:0C:72	Aruba Networks
10	2457	24:DE:C6:81:0F:A2	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks

SSID	AsCancelas		
Channel	Frequency	BSSID	Vendor
		24:DE:C6:81:0B:B2	Aruba Networks
11	2462	24:DE:C6:91:AE:52	Aruba Networks
12	2467	24:DE:C6:81:0C:32	Aruba Networks
		24:DE:C6:81:0E:B2	Aruba Networks
		24:DE:C6:81:1C:32	Aruba Networks
		24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0E:02	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks
13	2472	24:DE:C6:81:0C:82	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:0B:E2	Aruba Networks
		24:DE:C6:81:0C:72	Aruba Networks
		24:DE:C6:81:0E:B2	Aruba Networks
		24:DE:C6:81:0E:02	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks
		24:DE:C6:91:AE:52	Aruba Networks

4.2.1.3. "AsCancelas" Access Point Position

The following image shows the approximate positions of all access points identified during the site survey which are publishing the network **AsCancelas.** These positions are manually configured, or otherwise are automatically estimated based on the measured data.

Physical APs Position for AsCancelas Network

	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0E:02	AsCancelas	Aruba Networks	9
2	24:DE:C6:81:0E:52	AsCancelas	Aruba Networks	1
3	24:DE:C6:81:0E:B2	AsCancelas	Aruba Networks	12
4	24:DE:C6:81:0F:A2	AsCancelas	Aruba Networks	10
5	04:BD:88:F1:03:A0	AsCancelas	Aruba Networks	1
6	04:BD:88:F1:02:80	AsCancelas	Aruba Networks	1
7	04:BD:88:F0:E1:80	AsCancelas	Aruba Networks	6
8	04:BD:88:F0:7E:A0	AsCancelas	Aruba Networks	6

4.2.2. WiFi Quality

4.2.2.1. Web Browsing WiFi requirements

4.2.2.1.1. RSSI Coverage

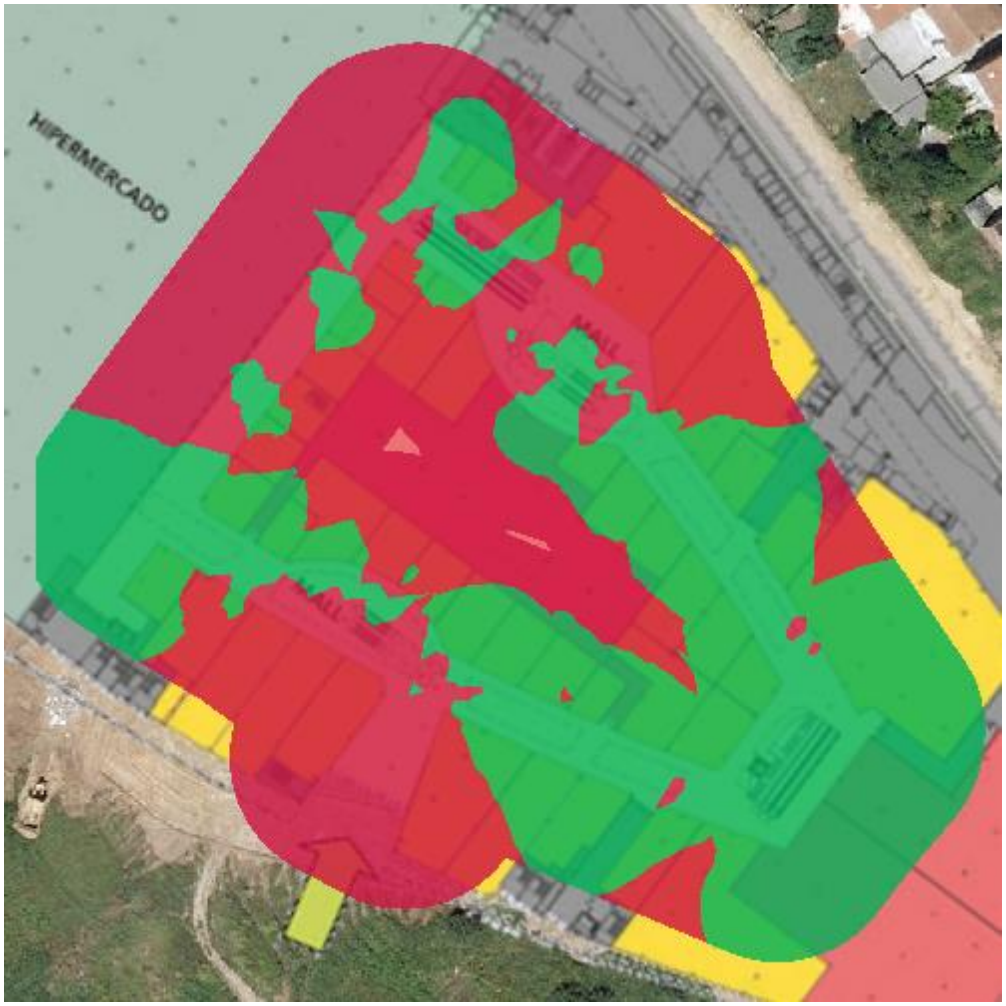
The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.

RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
Fail	

4.2.2.1.2. SIMULTANEOUS RSSI COVERAGE

The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.



Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
	Simultaneous APs Required greater than or equal 2 APs
Fail	

4.2.2.1.3. CHANNEL OVERLAP

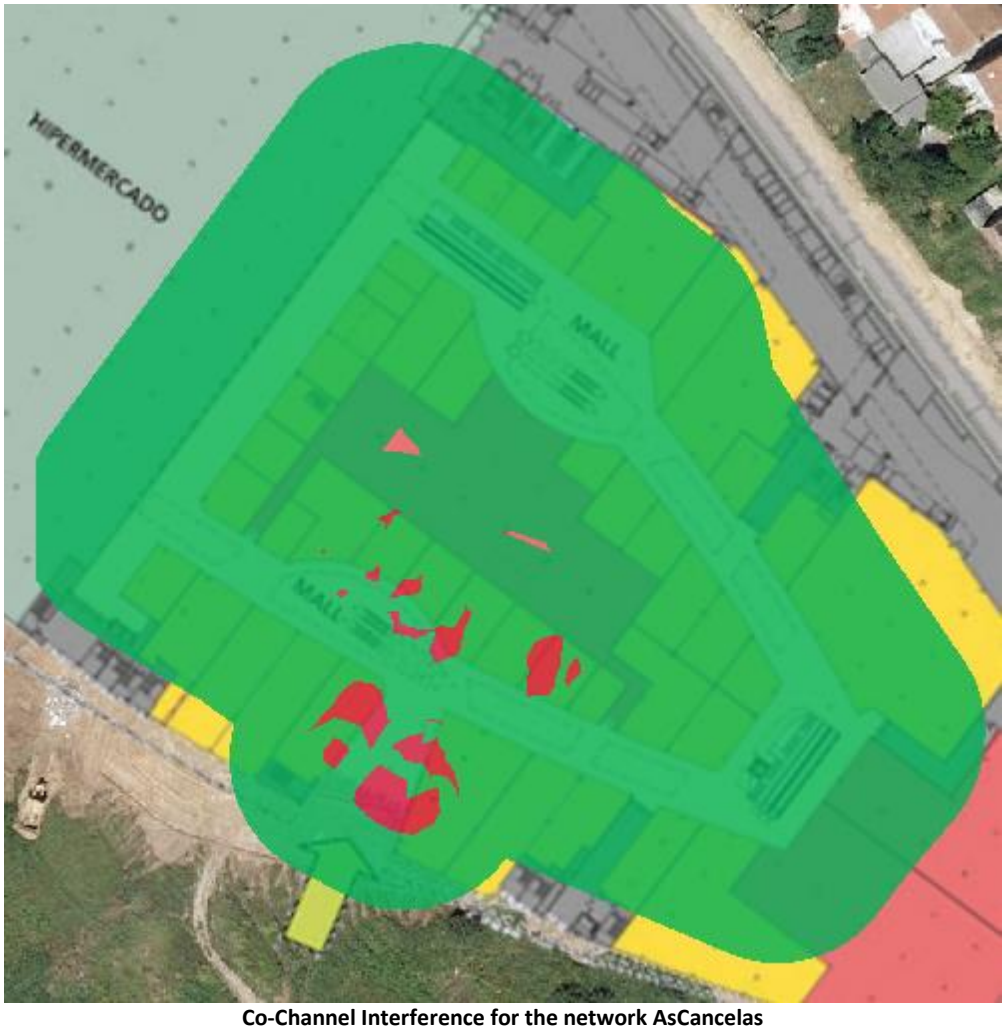
The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

4.2.2.1.4. CO-CHANNEL INTERFERENCE

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.



Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

4.2.2.1.5. LATENCY

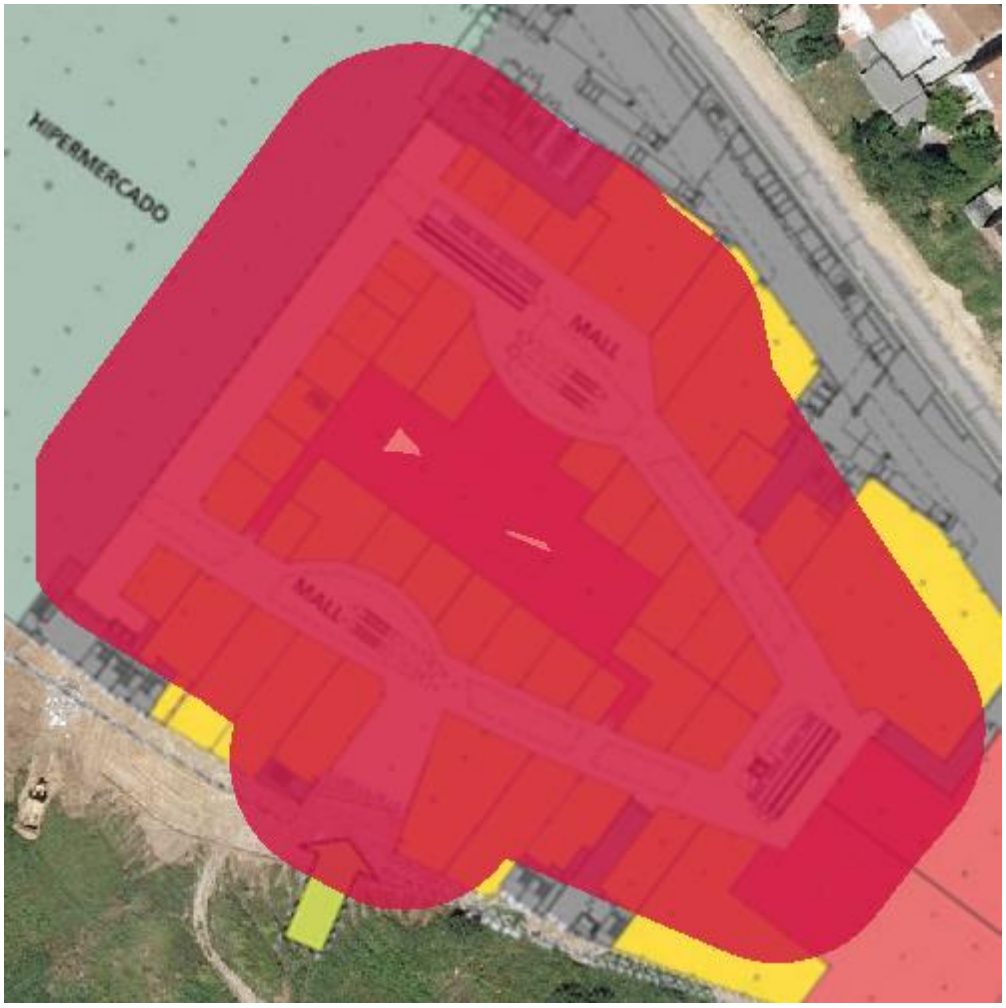
Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

Latency for the network AsCancelas

Pass	Network Latency less than or equal 100ms
Fail	

4.2.2.1.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.



Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 320 kbps
Fail	

4.2.2.1.7. PACKET LOST

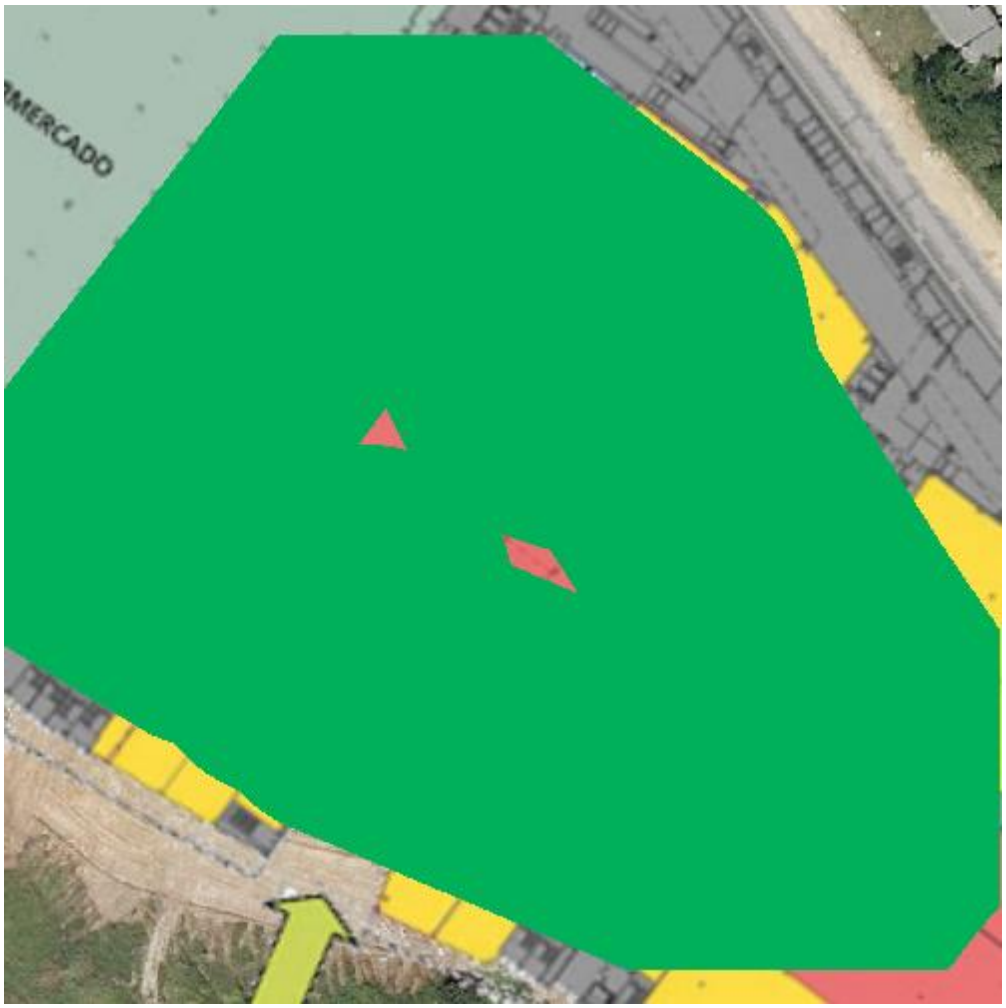
The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.

Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

4.2.2.1.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming



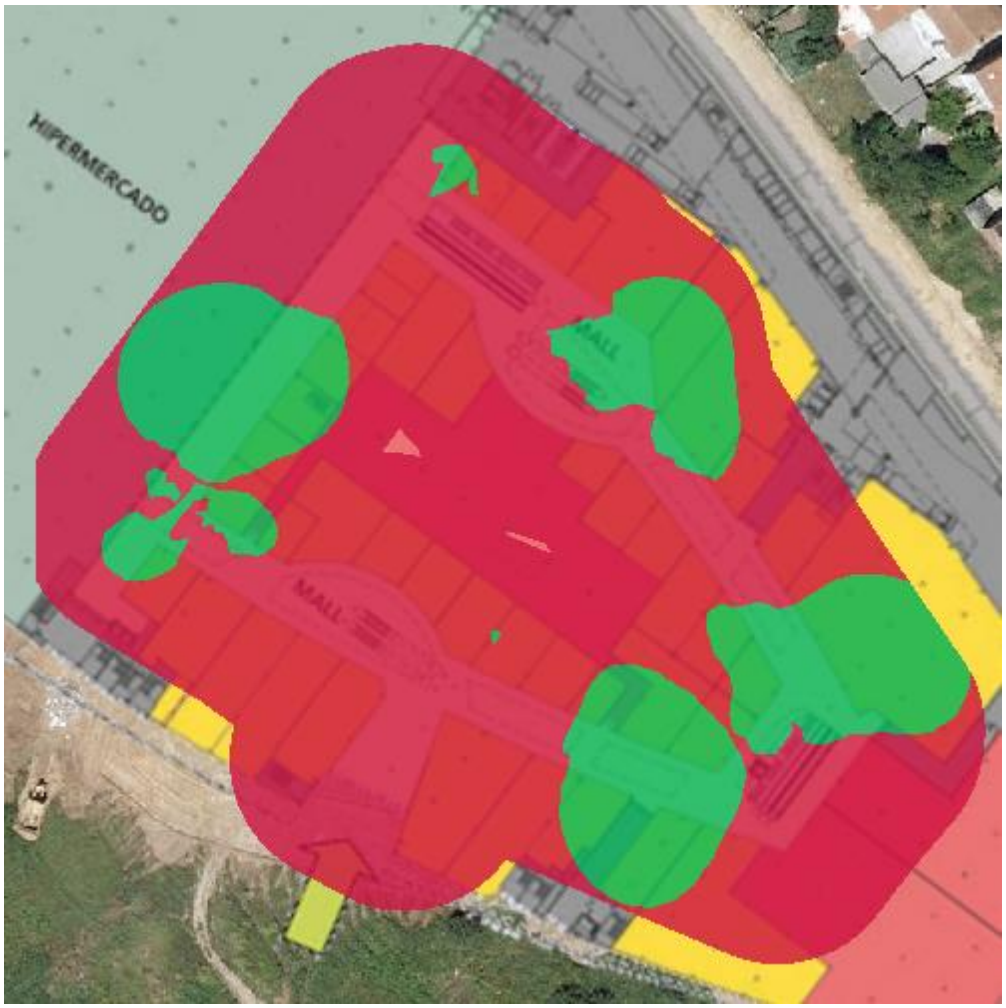
Access Point Roaming for the network AsCancelas

Pass
Fail

4.2.2.2. VoIP over WiFi requirements

4.2.2.2.1. RSSI Coverage

The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.

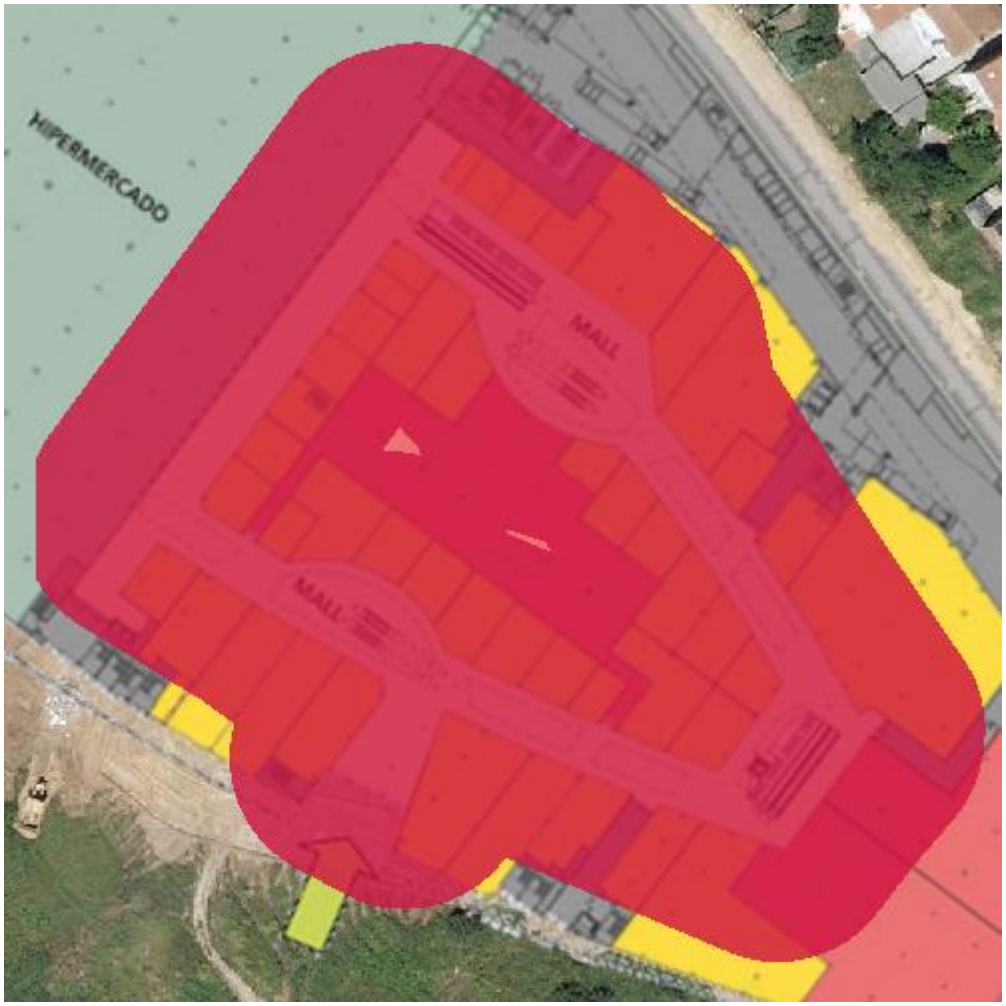


RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -50 dBm
Fail	

4.2.2.2.2. SIMULTANEOUS RSSI COVERAGE

The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.



Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -45 dBm
	Simultaneous APs Required greater than or equal 5 APs
Fail	

4.2.2.2.3. CHANNEL OVERLAP

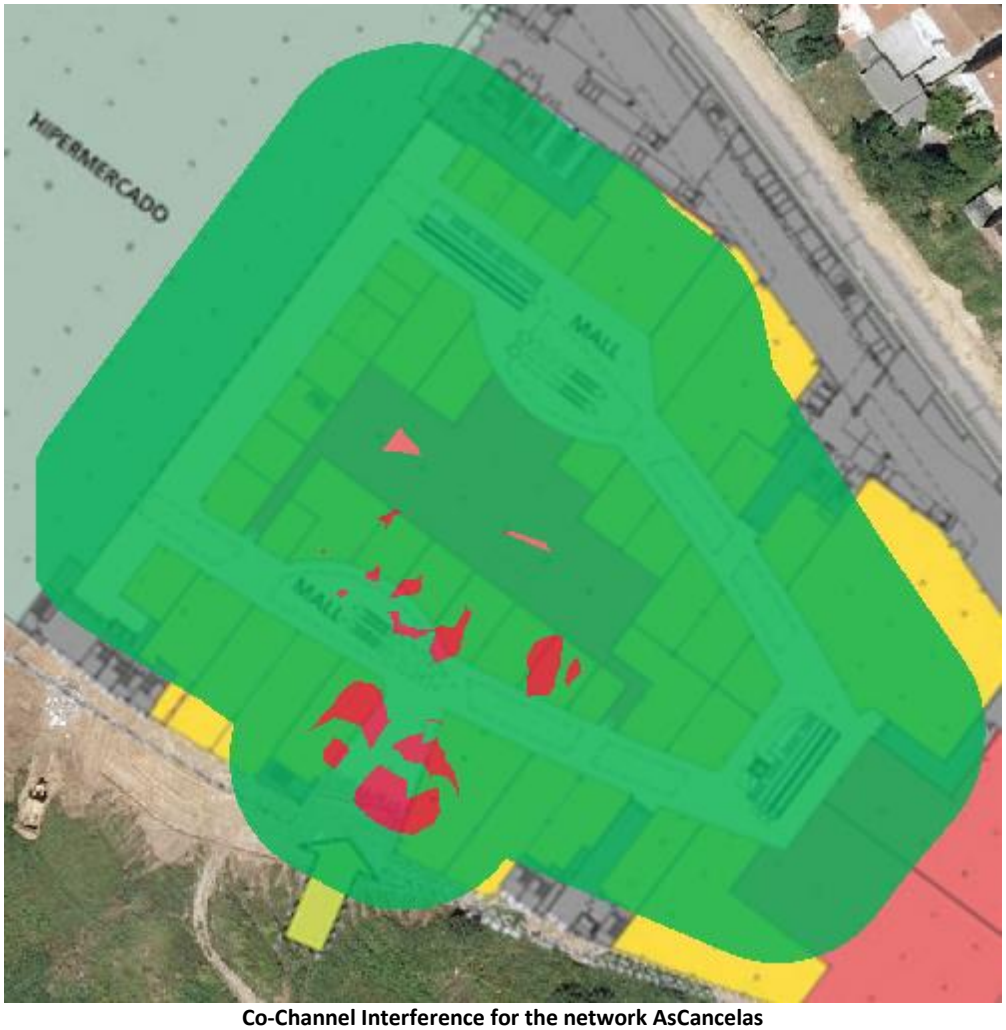
The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

4.2.2.2.4. CO-CHANNEL INTERFERENCE

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.



Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

4.2.2.2.5. LATENCY

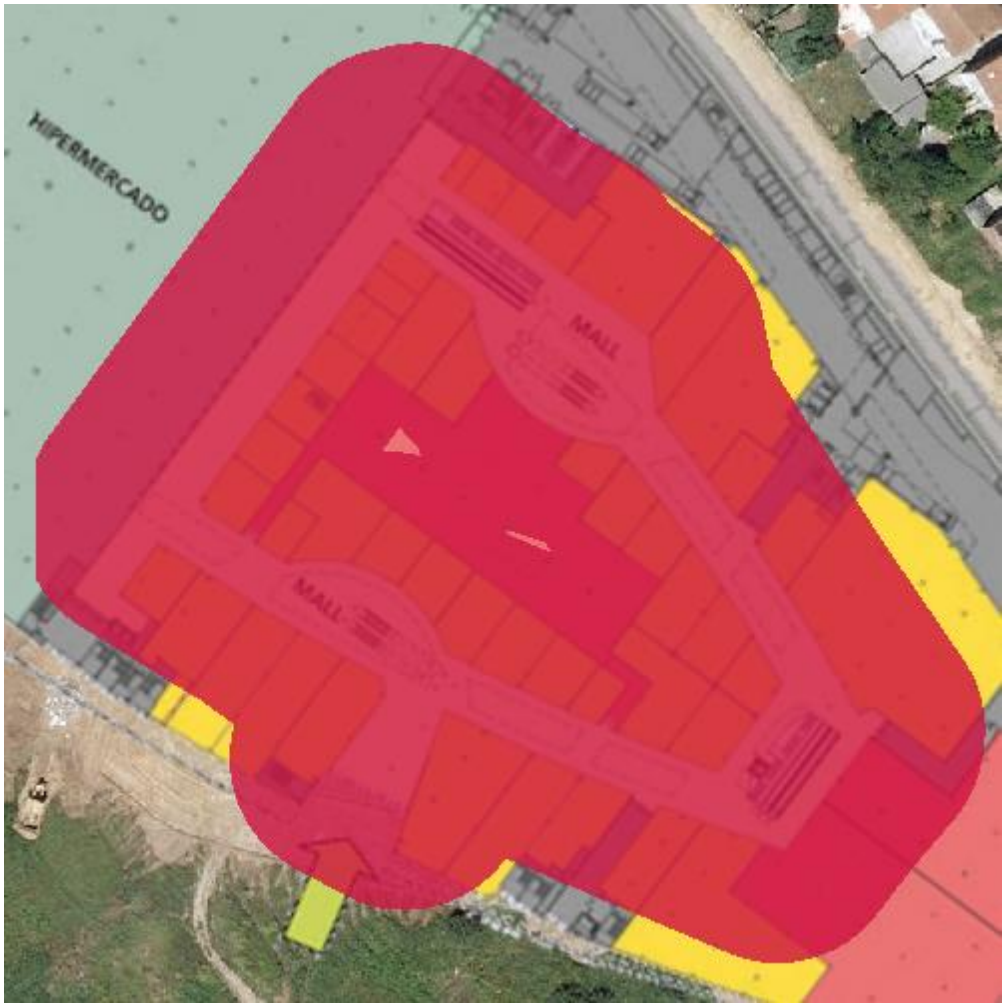
Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

Latency for the network AsCancelas

Pass	Network Latency less than or equal 256ms
Fail	

4.2.2.2.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.



Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 5000 kbps
Fail	

4.2.2.2.7. PACKET LOST

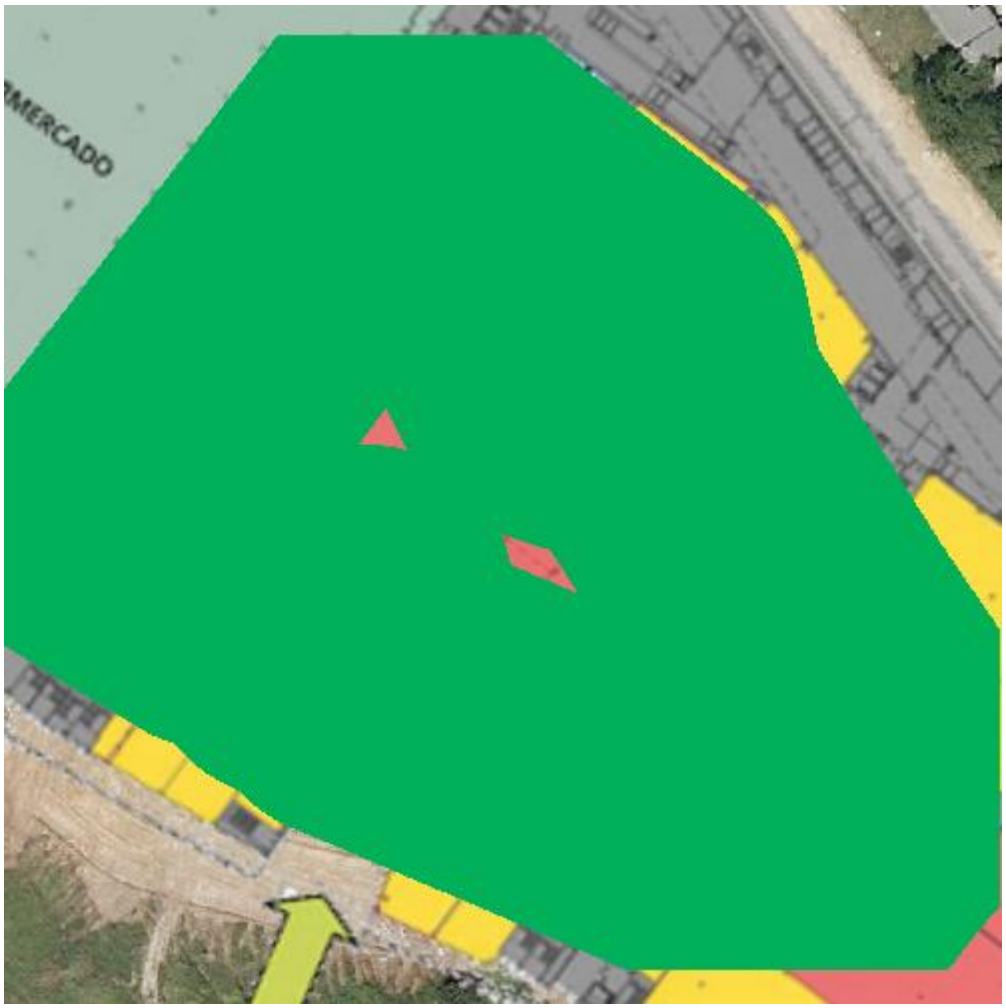
The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.

Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

4.2.2.2.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming



Access Point Roaming for the network AsCancelas

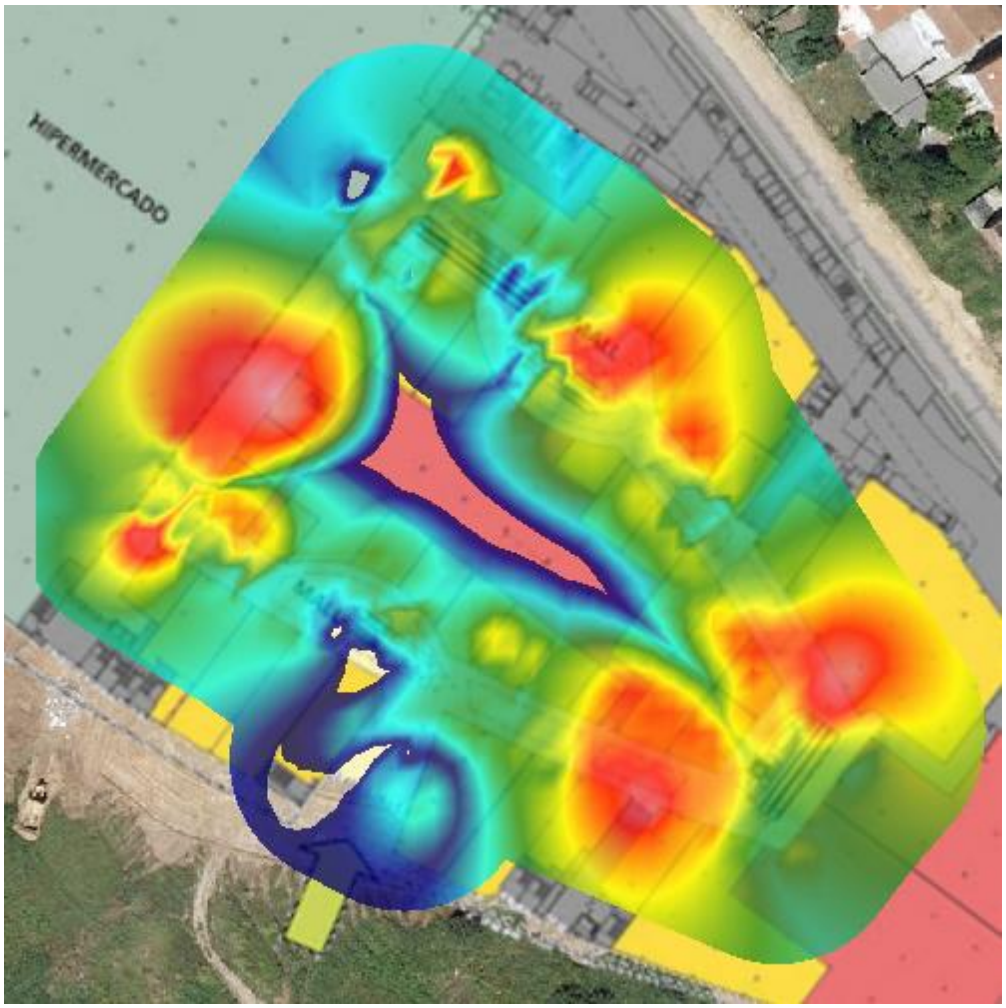
Pass
Fail

4.2.3. SURVEY

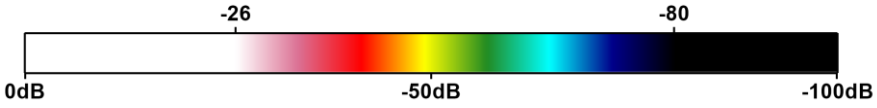
4.2.3.1. RSSI HEATMAP

Signal Strength translates as how efficiently the network is reaching the surveyed area, indicating how the **AsCancelas** network is received at each location.

Signal strength values range from 0 db to -100db, being -100db the worse performance. The color scheme is shown below the image.



Signal Strength Heatmap for AsCancelas Network

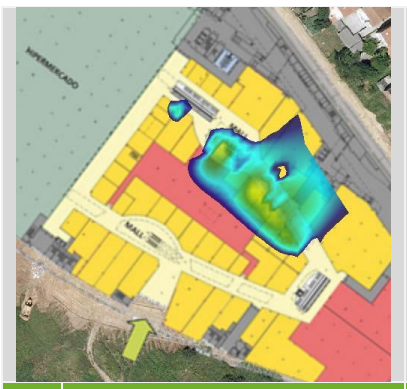


Network coverage area*	8077 m2

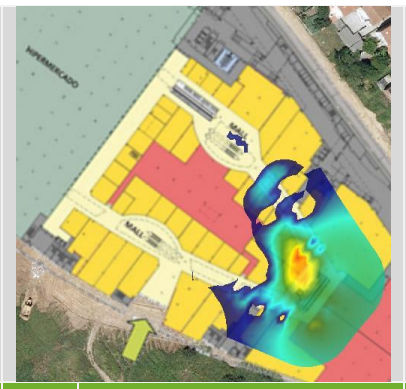
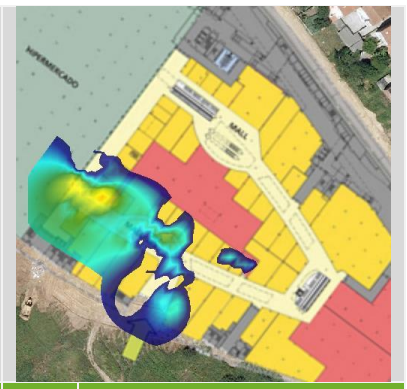
*This information indicates the network coverage area at a signal strength of at least:-75

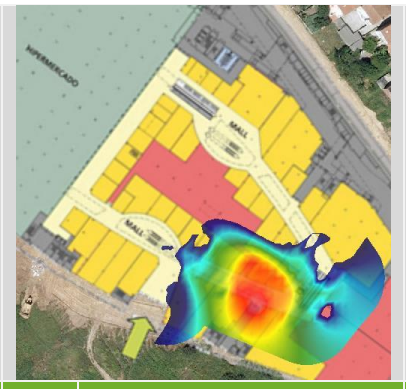
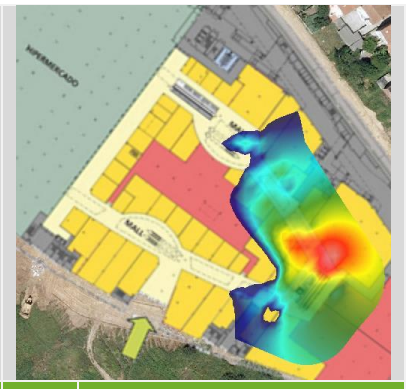
4.2.3.2. RSSI DETAILED BY AP

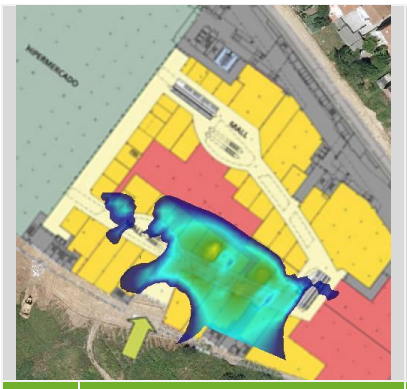
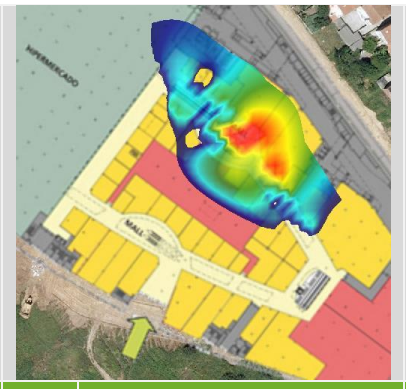
The following table contains a tile view of all BSSIDs associated to the **AsCancelas** network, along with its signal strength heatmap, associated covered area, and device manufacturer.

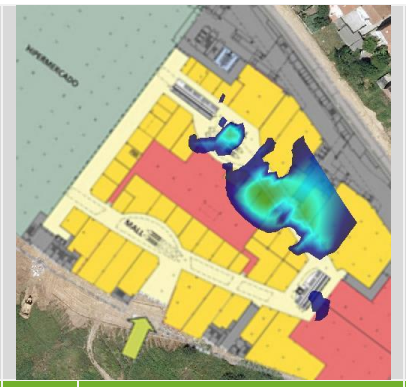
No Signal Strength data over RSSI = -75	No Signal Strength data over RSSI = -75	
1 **04:BD:88:F0:7E:A0**	2 **04:BD:88:F0:D2:C0**	3 **04:BD:88:F0:E1:00**
Coverage area: 0 m2	Coverage area: 0 m2	Coverage area: 32 m2
Aruba Networks	Aruba Networks	Aruba Networks
	No Signal Strength data over RSSI = -75	
4 **04:BD:88:F0:E1:80**	5 **04:BD:88:F1:02:80**	6 **04:BD:88:F1:03:A0**
Coverage area: 1837 m2	Coverage area: 0 m2	Coverage area: 1293 m2
Aruba Networks	Aruba Networks	Aruba Networks
	No Signal Strength data over RSSI = -75	
7 **24:DE:C6:81:0B:B2**	8 **24:DE:C6:81:0B:E2**	9 **24:DE:C6:81:0B:F2**

Coverage area: 1751 m2	Coverage area: 0 m2	Coverage area: 2267 m2
Aruba Networks	Aruba Networks	Aruba Networks

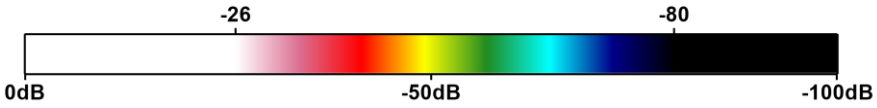
No Signal Strength data over RSSI = -75		
10 **24:DE:C6:81:0C:32**	11 **24:DE:C6:81:0C:72**	12 **24:DE:C6:81:0C:82**
Coverage area: 0 m2	Coverage area: 2165 m2	Coverage area: 2768 m2
Aruba Networks	Aruba Networks	Aruba Networks

		
13 **24:DE:C6:81:0E:02**	14 **24:DE:C6:81:0E:52**	15 **24:DE:C6:81:0E:B2**
Coverage area: 1837 m2	Coverage area: 2704 m2	Coverage area: 3644 m2
Aruba Networks	Aruba Networks	Aruba Networks

		
16 **24:DE:C6:81:0F:02**	17 **24:DE:C6:81:0F:A2**	18 **24:DE:C6:81:11:62**
Coverage area: 2279 m2	Coverage area: 2156 m2	Coverage area: 1782 m2

Aruba Networks	Aruba Networks	Aruba Networks
		No Signal Strength data over RSSI = -75
19 **24:DE:C6:81:12:12**	20 **24:DE:C6:81:15:02**	21 **24:DE:C6:81:1C:32**
Coverage area: 1959 m2	Coverage area: 1440 m2	Coverage area: 0 m2
Aruba Networks	Aruba Networks	Aruba Networks

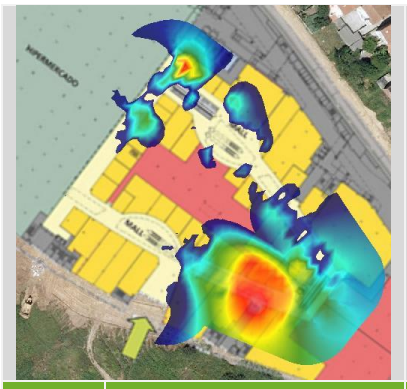
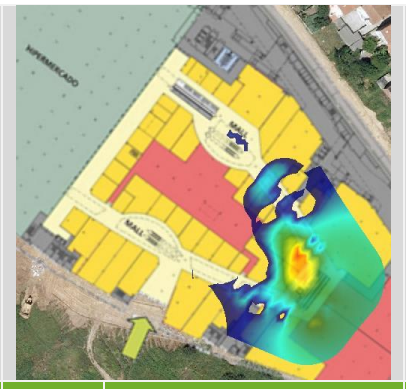
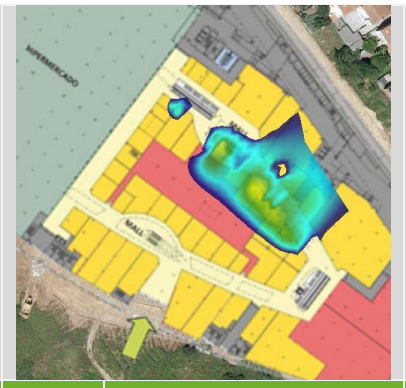
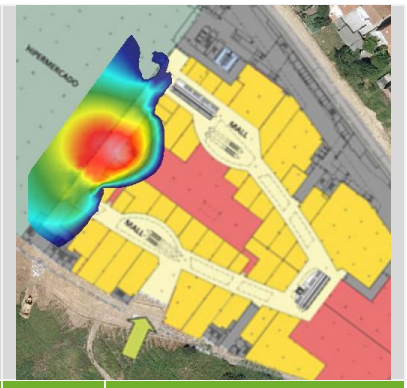
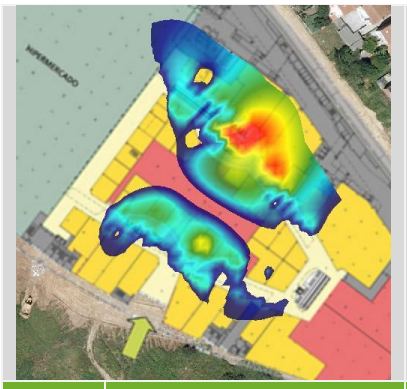
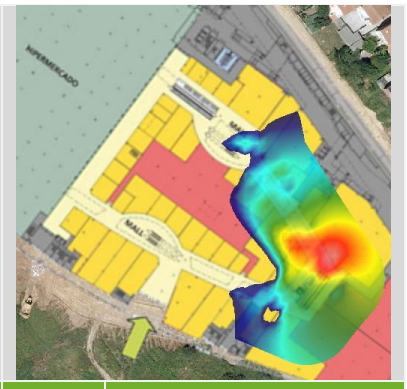
22 **24:DE:C6:81:58:12**	23 **24:DE:C6:91:AE:52**
Coverage area: 287 m2	Coverage area: 2 m2
Aruba Networks	Aruba Networks



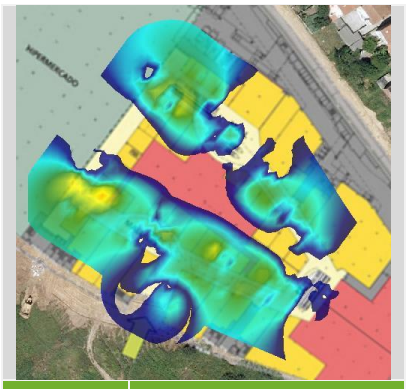
4.2.3.3. RSSI DETAILED BY CHANNEL

The following table contains a tile view of all operative channels on the **AsCancelas** network.

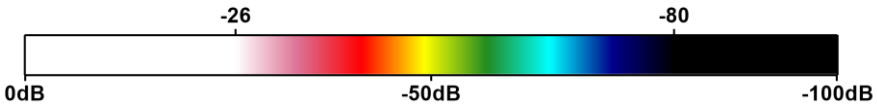
The graph shows the signal strength heatmap, and the coverage area associated with this network on that channel.

				No Signal Strength data over RSSI = -75	
1	**Channel 1**	2	**Channel 4**	3	**Channel 5**
Coverage area: 4632 m2		Coverage area: 3024 m2		Coverage area: 0 m2	
					
4	**Channel 6**	5	**Channel 8**	6	**Channel 9**
Coverage area: 1762 m2		Coverage area: 1512 m2		Coverage area: 2020 m2	
					
7	**Channel 10**	8	**Channel 11**	9	**Channel 12**

Coverage area: 3882 m2	Coverage area: 2 m2	Coverage area: 2804 m2



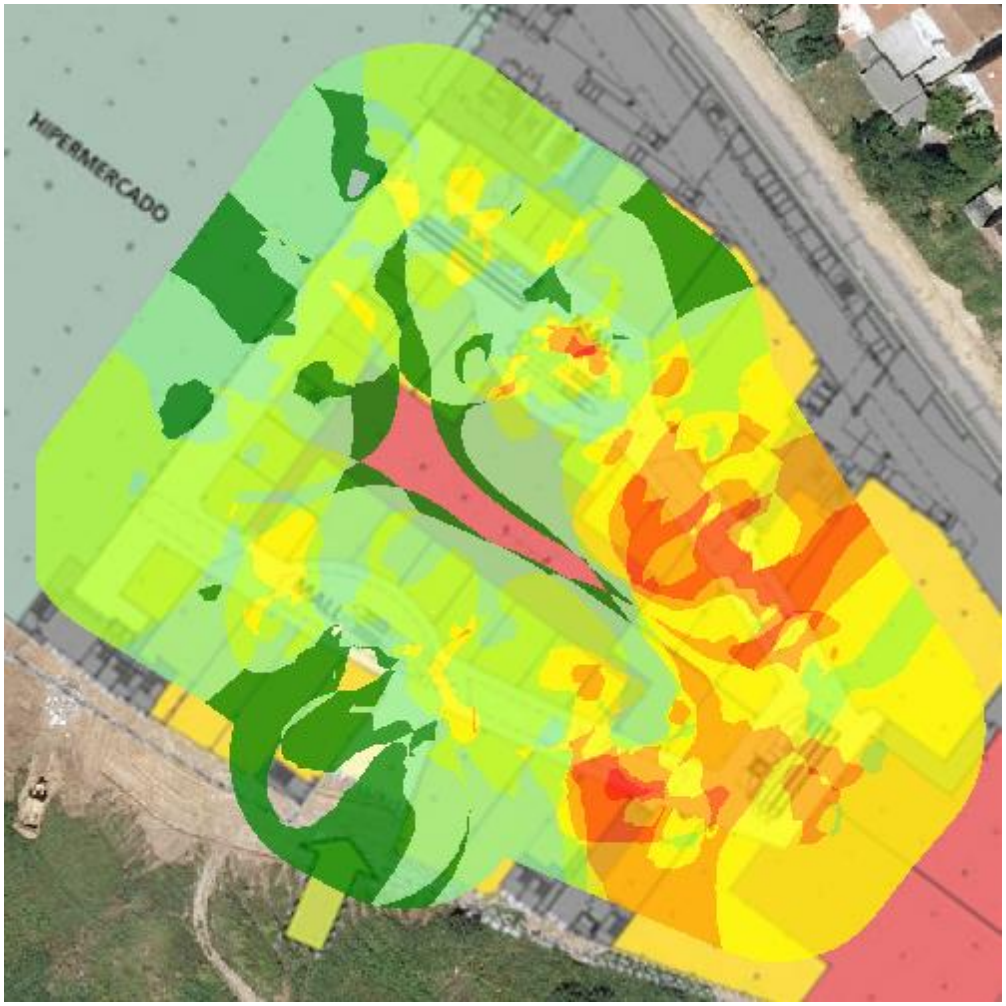
10	**Channel 13**
Coverage area: 7312 m2	



4.2.3.4. NUMBER OF APS

The following image shows the number of access points granting access to the **AsCancelas** network that were detected within the surveyed area.

The graph reveals the existing signal overlapping from the different access points granting access to the same network.



Number of APs for AsCancelas Network

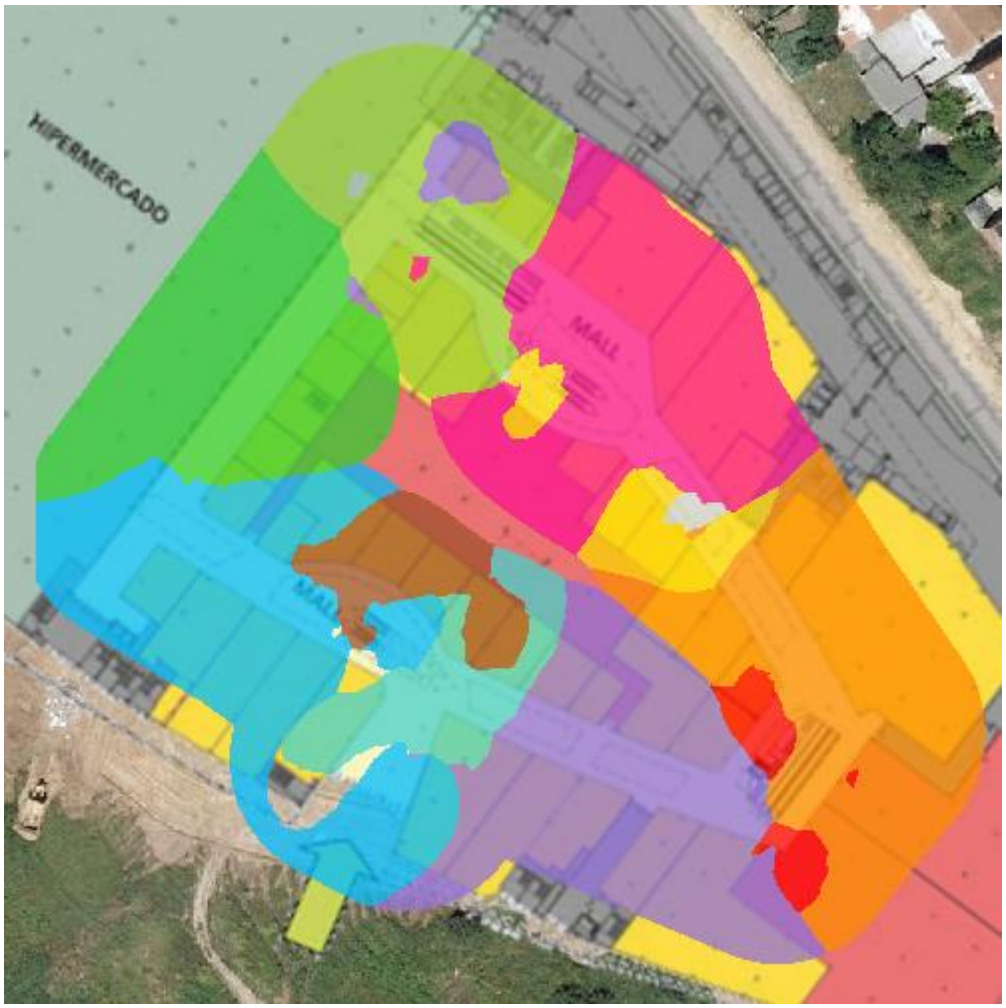
Number of APs	1	2	3	4	5	6	7	8	9	10

4.2.3.5. AP COVERAGE

The following image shows the color coded coverage of every AP propagating the **AsCancelas** network.

If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

Using this graph, you will be able to analyze the appropriate coverage distribution.



AP Coverage for AsCancelas Network

Access Point
04:BD:88:F0:7E:A0
04:BD:88:F0:E1:80
24:DE:C6:81:0B:B2
24:DE:C6:81:0C:32
24:DE:C6:81:0E:02
24:DE:C6:81:0F:02
24:DE:C6:81:12:12
24:DE:C6:81:58:12

Access Point
04:BD:88:F0:D2:C0
04:BD:88:F1:02:80
24:DE:C6:81:0B:E2
24:DE:C6:81:0C:72
24:DE:C6:81:0E:52
24:DE:C6:81:0F:A2
24:DE:C6:81:15:02
24:DE:C6:91:AE:52

Access Point
04:BD:88:F0:E1:00
04:BD:88:F1:03:A0
24:DE:C6:81:0B:F2
24:DE:C6:81:0C:82
24:DE:C6:81:0E:B2
24:DE:C6:81:11:62
24:DE:C6:81:1C:32

4.2.3.6. CHANNEL COVERAGE

The following image shows the coverage range for every channel in the **AsCancelas** network.

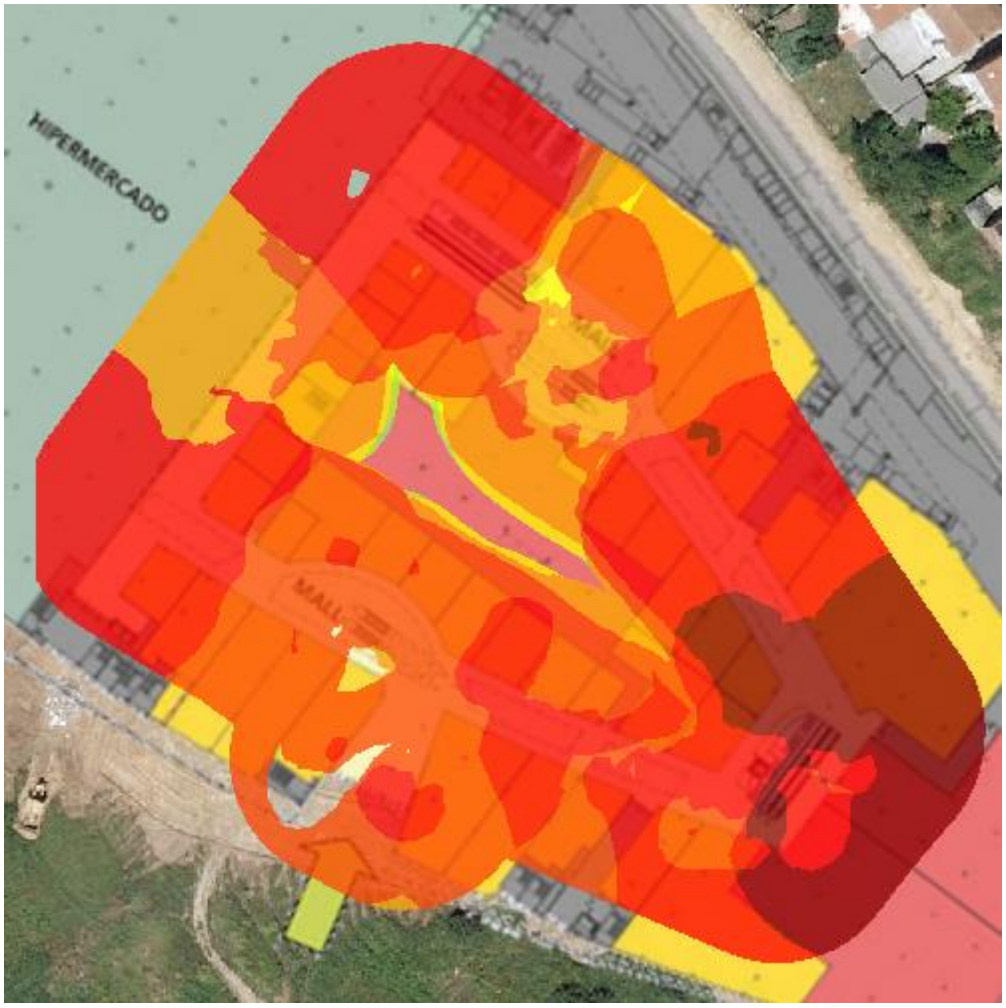
If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

Channel Coverage for AsCancelas Network.

Channel	1	4	5	6	8	9	10	11	12	13

4.2.3.7. CHANNEL OVERLAP

The following image shows the coverage area for each operative channel on the **AsCancelas** network, and the signal overlapping between two or more channels throughout the surveyed area.

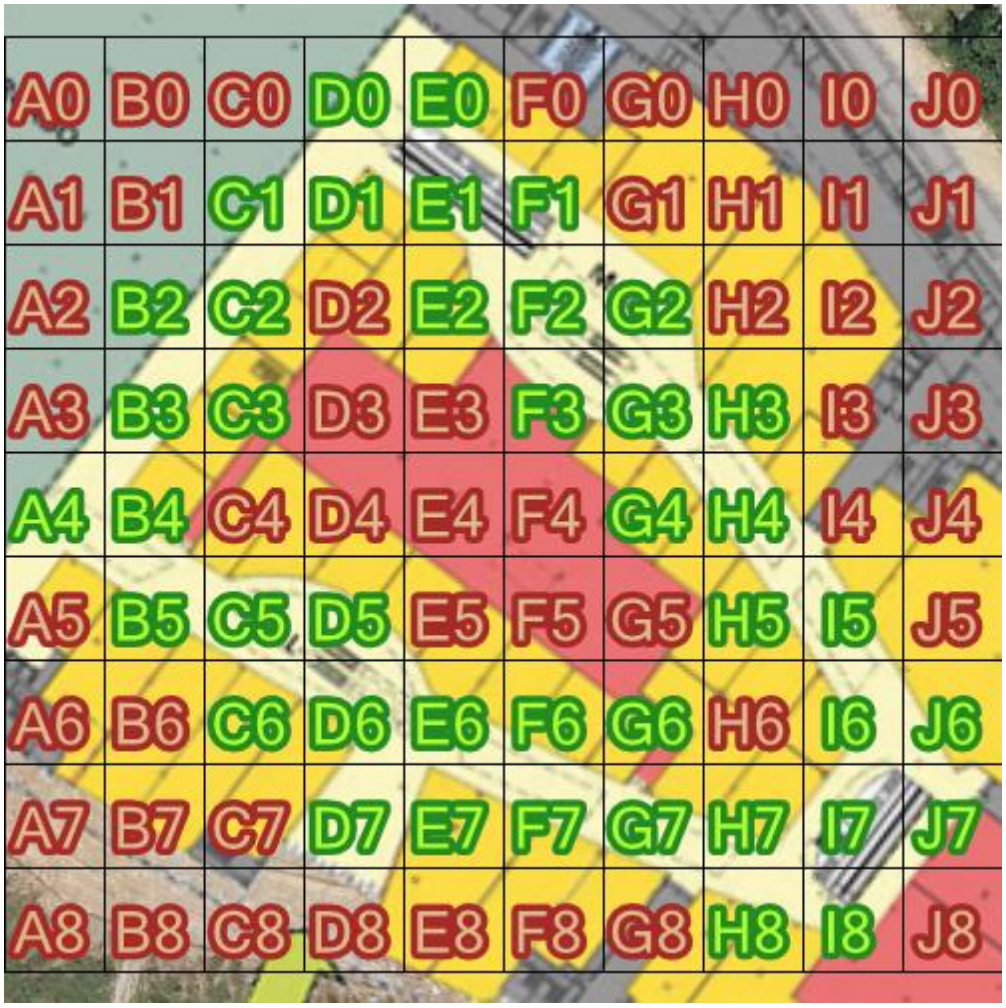


Channel Overlap for AsCancelas Network

Channel	1	2	3	4	5	6	7	8	9	10

4.2.3.8. DETAILED GRID

In the following image, the blueprint associated to the surveyed area is divided into quadrants. Each quadrant shows the collected information in that grid.



Detailed Grid for AsCancelas Location

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
D0	13	-49	-73	AsCancelas	8	216,7
E0	13	-30	-68	AsCancelas	10	216,7
C1	12	-50	-68	AsCancelas	7	216,7
D1	30	-45	-69	AsCancelas	10	216,7
E1	22	-50	-71	AsCancelas	10	216,7
F1	20	-50	-73	AsCancelas	11	216,7
B2	5	-40	-54	AsCancelas	4	216,7
C2	32	-28	-63	AsCancelas	6	216,7
E2	5	-58	-69	AsCancelas	6	216,7
F2	25	-38	-70	AsCancelas	11	216,7
G2	19	-33	-69	AsCancelas	14	216,7
B3	39	-34	-60	AsCancelas	5	216,7
C3	2	-28	-53	AsCancelas	4	216,7
F3	11	-43	-65	AsCancelas	9	216,7
G3	30	-42	-68	AsCancelas	12	216,7
H3	10	-38	-70	AsCancelas	10	216,7
A4	23	-35	-62	AsCancelas	10	216,7
B4	29	-39	-61	AsCancelas	8	216,7
G4	5	-49	-65	AsCancelas	8	216,7
H4	38	-41	-69	AsCancelas	13	216,7
B5	24	-41	-67	AsCancelas	11	216,7
C5	33	-49	-70	AsCancelas	12	216,7
D5	9	-51	-68	AsCancelas	7	216,7
H5	17	-45	-68	AsCancelas	11	216,7
I5	27	-45	-70	AsCancelas	13	216,7
C6	7	-56	-72	AsCancelas	7	216,7
D6	25	-53	-76	AsCancelas	11	216,7
E6	28	-43	-71	AsCancelas	9	216,7
F6	12	-47	-68	AsCancelas	8	130
G6	1	-52	-59	AsCancelas	5	130
I6	34	-37	-67	AsCancelas	11	130
J6	10	-27	-67	AsCancelas	10	130
D7	15	-57	-74	AsCancelas	5	130
E7	9	-55	-70	AsCancelas	9	216,7
F7	24	-45	-68	AsCancelas	11	216,7
G7	36	-32	-66	AsCancelas	9	216,7
H7	22	-39	-66	AsCancelas	11	216,7
I7	15	-41	-63	AsCancelas	11	216,7

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
J7	21	-37	-68	AsCancelas	12	130
H8	16	-38	-65	AsCancelas	11	216,7
I8	19	-52	-68	AsCancelas	12	216,7

4.2.3.9. SNR HEATMAP

The following image shows the **AsCancelas** network's signal-to-noise ratio throughout the surveyed area.

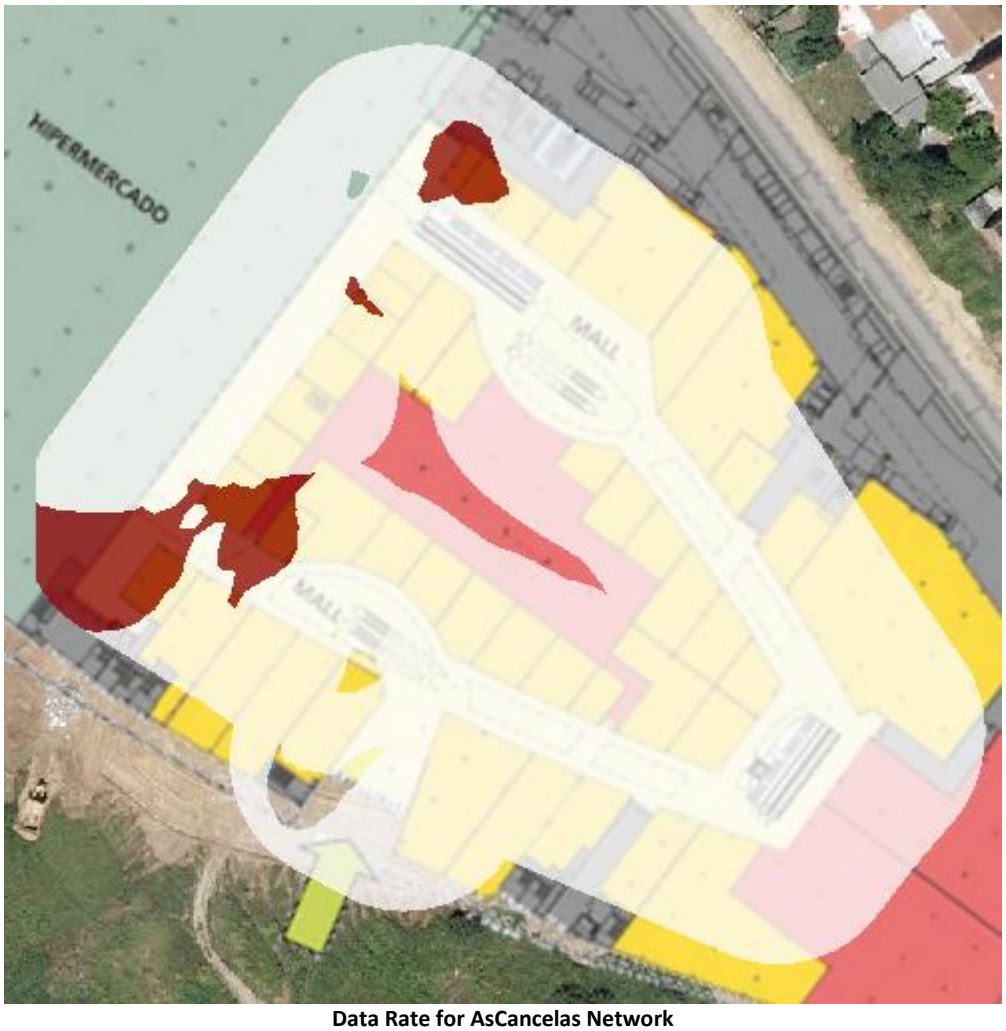
Signal-to-noise ratio measures the ratio between the Wi-Fi network signal strength and the background noise. Higher noise levels will result in a larger negative impact on communications. This parameter offers valuable information on the effectiveness of communications.
These values range from 0 to 100, being 100 the best possible communication quality.

The graph can't be generated due to the absence of the required data.

4.2.3.10. DATA RATE HEATMAP

The following image shows the area covered by the APs based on their data transfer rates for the **AsCancelas** network throughout the surveyed area.

Data rate helps determine the maximum data transmission speed among the wireless devices connected to a Wi-Fi network.
This value allows you to establish how consistent a network is when transmitting data across the coverage area, and helps you find those areas where these values greatly differ or the network performance significantly decreases.



Data Rate for AsCancelas Network

Data Rate
54

Data Rate
130

Data Rate
216,7

4.2.3.11. DATA RATE DETAILED

The following table shows a tile view of all BSSIDs associated with the **AsCancelas** network, together with the graph indicating the covered area and the maximum supported data transfer rate speed.

Data rate helps determine the maximum data transmission speed between the wireless devices connected to a Wi-Fi network.
It allows you to determine how efficiently a network transmits data throughout a certain area, and if there are blind zones where reduced network performance is observed.

1	**04:BD:88:F0:7E:A0**	2	**04:BD:88:F0:D2:C0**	3	**04:BD:88:F0:E1:00**
Aruba Networks		Aruba Networks		Aruba Networks	
4	**04:BD:88:F0:E1:80**	5	**04:BD:88:F1:02:80**	6	**04:BD:88:F1:03:A0**
Aruba Networks		Aruba Networks		Aruba Networks	

7	24:DE:C6:81:0B:B2
Aruba Networks	

8	24:DE:C6:81:0B:E2
Aruba Networks	

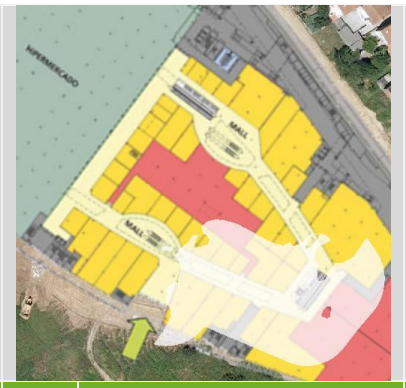
9	24:DE:C6:81:0B:F2
Aruba Networks	

10	24:DE:C6:81:0C:32
Aruba Networks	

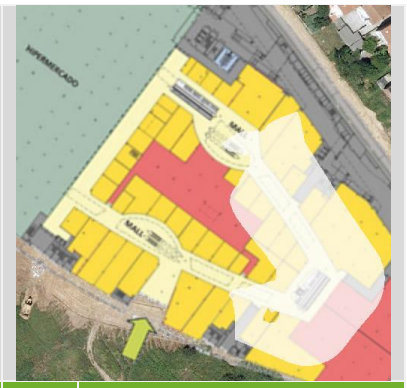
11	24:DE:C6:81:0C:72
Aruba Networks	

12	24:DE:C6:81:0C:82
Aruba Networks	

13	24:DE:C6:81:0E:02
Aruba Networks	



14	24:DE:C6:81:0E:52
Aruba Networks	



15	24:DE:C6:81:0E:B2
Aruba Networks	

16	24:DE:C6:81:0F:02
Aruba Networks	

17	24:DE:C6:81:0F:A2
Aruba Networks	

18	24:DE:C6:81:11:62
Aruba Networks	

19	24:DE:C6:81:12:12
Aruba Networks	

20	24:DE:C6:81:15:02
Aruba Networks	

21	24:DE:C6:81:1C:32
Aruba Networks	

22	24:DE:C6:81:58:12
Aruba Networks	

23	24:DE:C6:91:AE:52
Aruba Networks	

Data Rate	**54**	**130**	**216,7**

4.2.3.12. CELL DENSITY HEATMAP

The following image shows a heatmap revealing the distribution of all client devices connected to the APs propagating the **AsCancelas** network.

Cell density allows you to spot which zones have the higher number of client devices connected to the network by showing its saturation.
It provides useful information to allow for an even AP distribution according to actual usage.

The graph can't be generated due to the absence of the required data.

4.2.3.13. RETRIES RATE HEATMAP

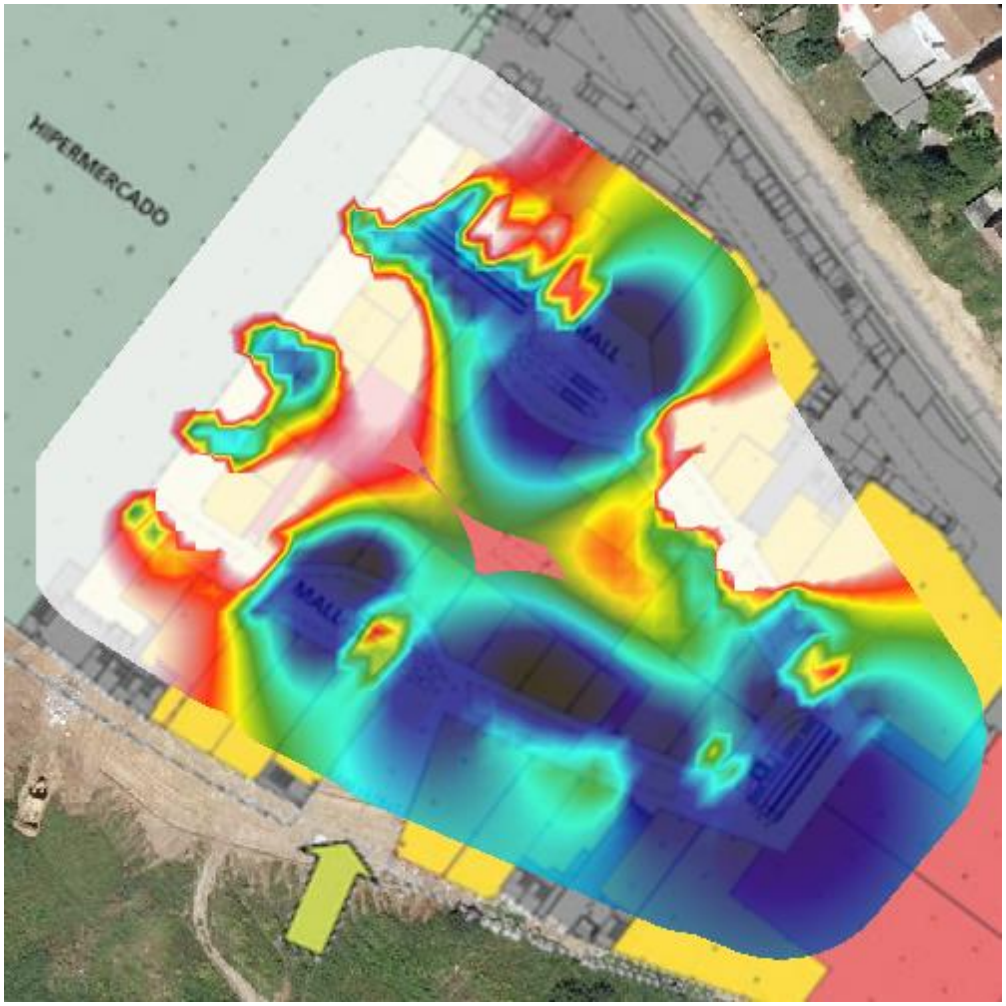
In an ideal Wi-Fi communication, all sent data packets reach their destination. Otherwise, poor transmission, interferences or any other communication problems can cause the dropped packets to be retransmitted for a correct data transmission. The larger the number of retransmitted or forwarded packets, the larger the communication latency will be, resulting in a lower communication quality.

The graph can't be generated due to the absence of the required data.

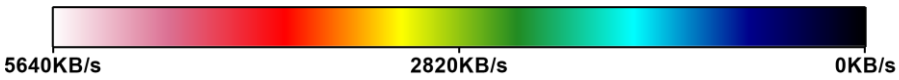
BANDWIDTH

Bandwidth indicates the amount of data being transmitted through **AsCancelas** network for each area within the network site range.

Bandwidth is measured in kilobytes per seconds, KB/s (1MB/s=1000KB/s), where a higher value translates as a better network performance.



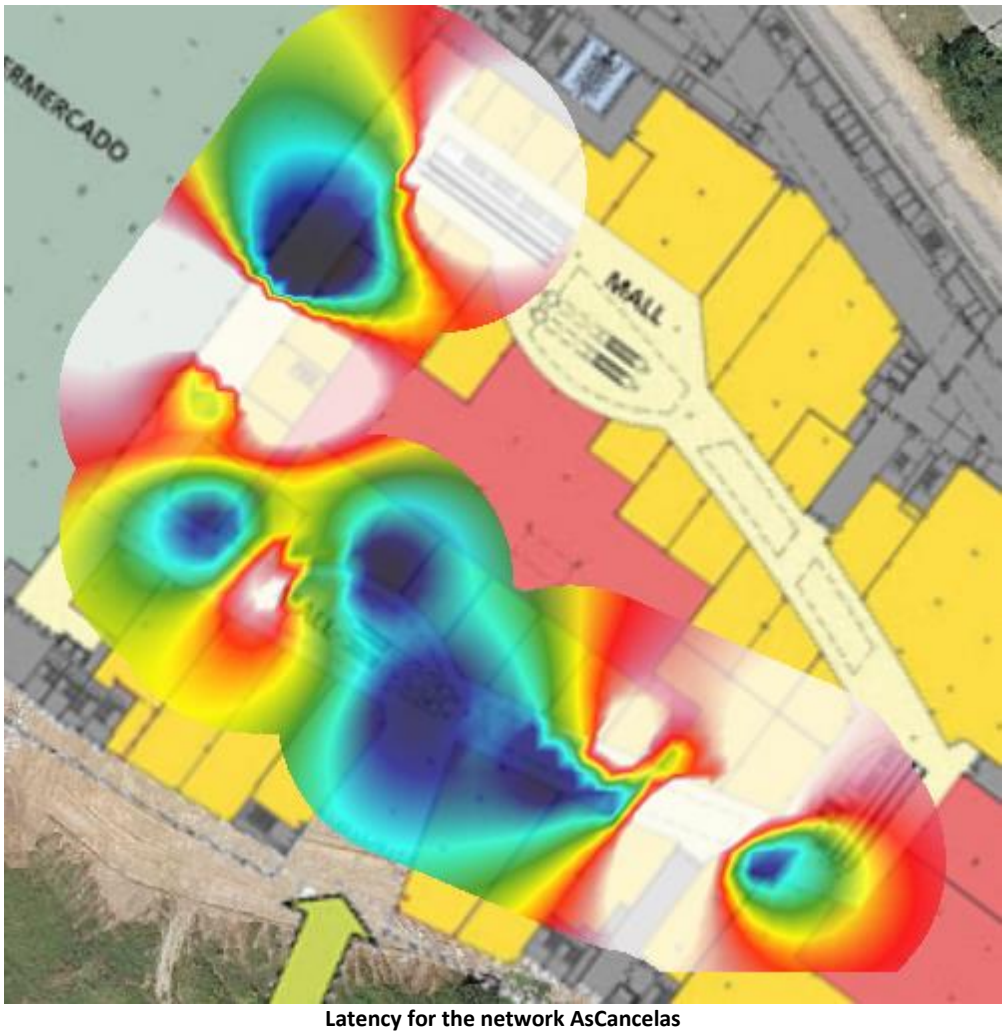
Bandwidth for the network AsCancelas



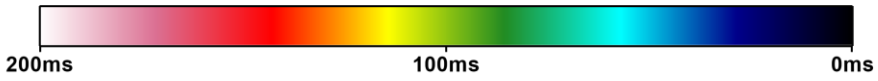
4.2.3.14. LATENCY

Latency indicates the time delay experienced in the data transfer through **AsCancelas** network for each area within the network site range.

When a data packet is sent, it is received by a receiving device that notifies the transmitting device that the packet has been successfully received. Latency is the period from the time a data packet is sent to the time the packet reception confirmation is received. Latency is measured in milliseconds (ms).
The higher the latency, the lowest the network performance will be. High latency values negatively impact real-time application performance, such as video-conferencing and VoIP communications.



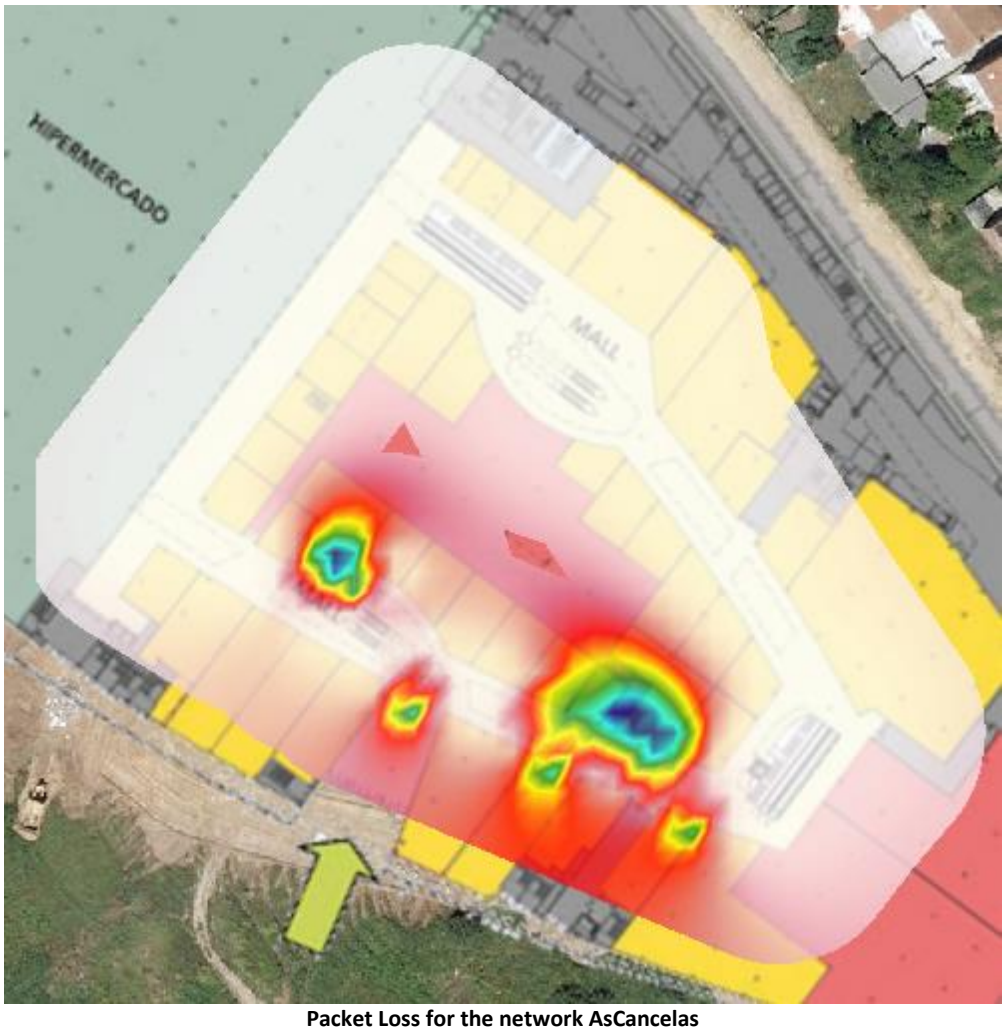
Latency for the network AsCancelas



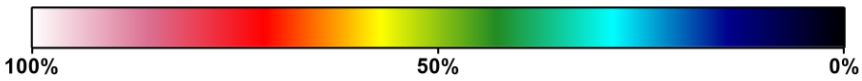
4.2.3.15. PACKET LOSS

In an ideal data communication, all sent data packets reach their destination; otherwise there is a packet loss that negatively impacts the data transmission performance, hence the overall network performance.
When a data packet is lost, if required by the protocol, it should be re-transmitted until a successful reception notification is received. This increases the amount of time necessary for a data unit to be transmitted, reducing the amount of data that can be transmitted per unit of time. The higher this value is, the lower the network performance will be.

The following image shows the areas where data packet loss is experienced within **AsCancelas** network site range.



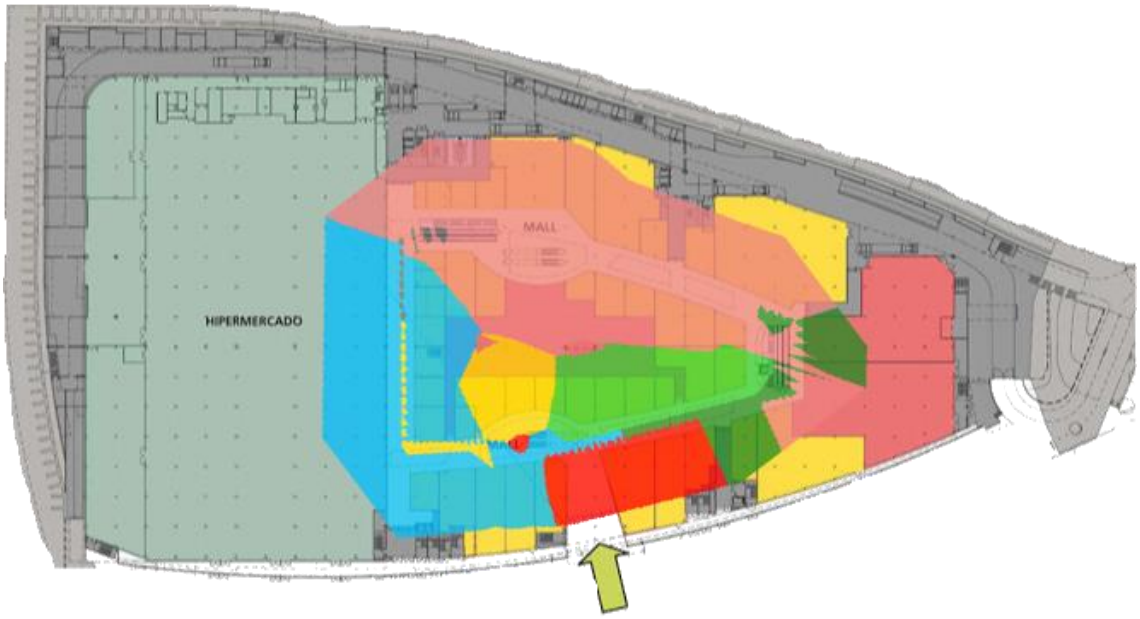
Packet Loss for the network AsCancelas



4.2.3.16. ROAMING

Data roaming in a Wi-Fi network infrastructure is the ability of a client device to move around within a multiple access point network's coverage area without disconnections.
To ensure roaming in a multiple access point Wi-Fi network, access points' coverage ranges should overlap.
Accordingly, a moving client device will have continuous network coverage, and based on the device's internal settings and access point configuration, network access will be granted through the different access points across the coverage area.

The following image shows all **AsCancelas** network access points to which the device has been connected to while itinerating.



Roaming for the network AsCancelas

Access Point
04:BD:88:F0:E1:90
24:DE:C6:81:0C:82
24:DE:C6:81:0E:B2

Access Point
04:BD:88:F1:03:B0
24:DE:C6:81:0E:02

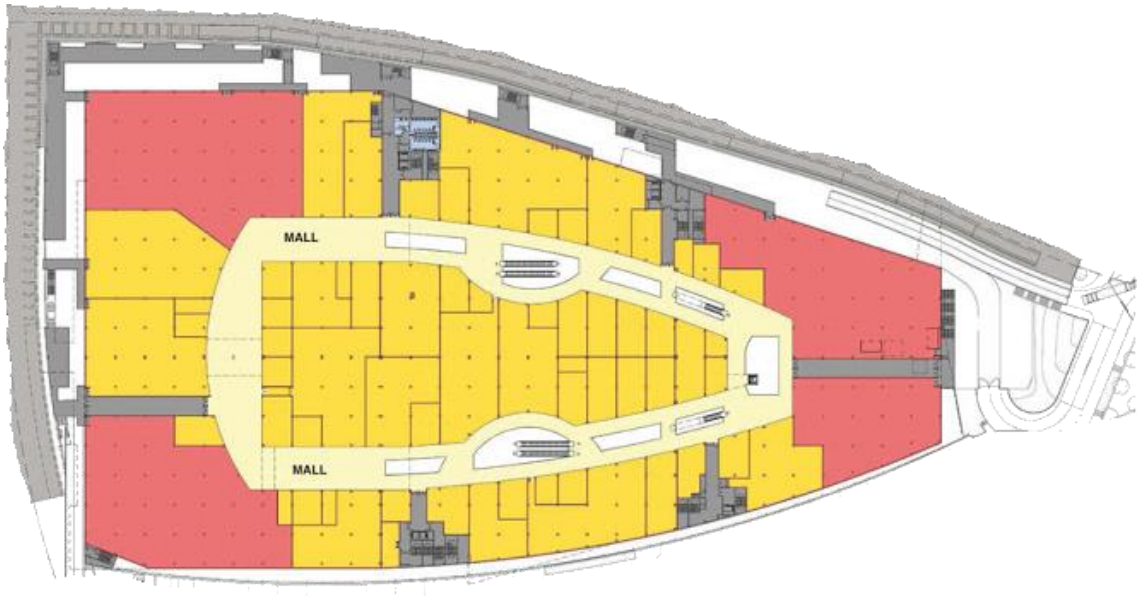
Access Point
24:DE:C6:81:0C:72
24:DE:C6:81:0E:52

5. Location Survey: +1 - Stores

5.1. Location details

Short data related to the **+1 - Stores** Location

Location Name	**+1 - Stores**
Description	
Selected Scans at this Location	**Scan between stores**
	Scan passive + active survey



Blueprint for the location +1 - Stores

5.1.1. SURVEY ROUTE

The following image shows the path followed at the **+1 - Stores** location during the site survey, which indicates all locations where data was collected to be later analyzed.

5.1.1.1. SCAN BETWEEN STORES

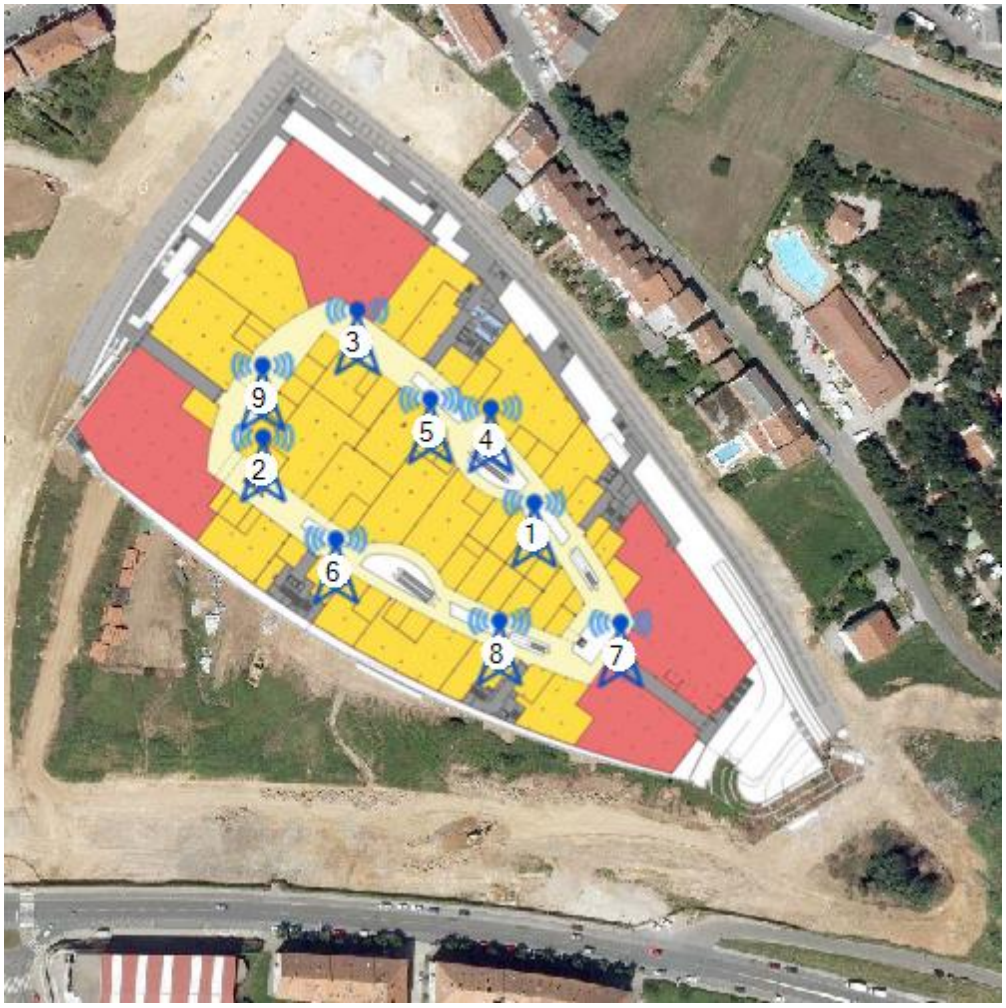
Survey Route for +1 - Stores Location - Scan between stores

5.1.1.2. SCAN PASSIVE + ACTIVE SURVEY

Survey Route for +1 - Stores Location - Scan passive + active survey

5.1.2. "+1 - STORES" ACCESS POINT POSITION

The following image shows the approximate positions within the **+1 - Stores** location of all access points identified during the site survey. These positions are manually configured, or otherwise are automatically estimated based on the measured data.



Physical APs Position for +1 - Stores Location

	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0B:B2	AsCancelas	Aruba Networks	8
2	24:DE:C6:81:0B:E2	AsCancelas	Aruba Networks	5
3	24:DE:C6:81:1C:32	AsCancelas	Aruba Networks	12
4	24:DE:C6:81:58:12	AsCancelas	Aruba Networks	10
5	24:DE:C6:81:12:12	AsCancelas	Aruba Networks	13
6	24:DE:C6:81:0C:82	AsCancelas	Aruba Networks	13
7	24:DE:C6:81:0C:72	AsCancelas	Aruba Networks	4
8	24:DE:C6:81:0F:02	AsCancelas	Aruba Networks	13
9	04:BD:88:F0:A1:E0	AsCancelas	Aruba Networks	1

5.2. Network Survey: AsCancelas

5.2.1. Network Details

5.2.1.1. AP-based Information

The following table contains information related to the **AsCancelas** network, which is organized based on its APs:

- SSID: Network identifier offered by the BSSID.
- BSSID: Associated MAC addresses granting network access.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- Security: Types of authentication and encryption supported by the network.
- Vendor: Device manufacturer.

	SSID	AsCancelas			
	BSSID	Channel	Freq	Security	Vendor
1	04:BD:88:F0:7E:A0	6	2437	Open	Aruba Networks
2	04:BD:88:F0:A1:E0	1	2412	Open	Aruba Networks
3	04:BD:88:F0:D2:C0	1	2412	Open	Aruba Networks
4	04:BD:88:F0:E1:00	1	2412	Open	Aruba Networks
5	04:BD:88:F0:E1:80	6	2437	Open	Aruba Networks
6	04:BD:88:F1:02:80	11	2462	Open	Aruba Networks
7	04:BD:88:F1:03:A0	1	2412	Open	Aruba Networks
8	24:DE:C6:81:0B:B2	6	2437	Open	Aruba Networks
9	24:DE:C6:81:0B:E2	1	2412	Open	Aruba Networks
10	24:DE:C6:81:0B:F2	1	2412	Open	Aruba Networks
11	24:DE:C6:81:0C:32	12	2467	Open	Aruba Networks
12	24:DE:C6:81:0C:72	5	2432	Open	Aruba Networks
13	24:DE:C6:81:0C:82	4	2427	Open	Aruba Networks
14	24:DE:C6:81:0E:02	13	2472	Open	Aruba Networks
15	24:DE:C6:81:0E:52	1	2412	Open	Aruba Networks
16	24:DE:C6:81:0E:B2	13	2472	Open	Aruba Networks
17	24:DE:C6:81:0F:02	3	2422	Open	Aruba Networks
18	24:DE:C6:81:0F:A2	12	2467	Open	Aruba Networks
19	24:DE:C6:81:11:62	1	2412	Open	Aruba Networks
20	24:DE:C6:81:12:12	3	2422	Open	Aruba Networks
21	24:DE:C6:81:15:02	13	2472	Open	Aruba Networks
22	24:DE:C6:81:1C:32	5	2432	Open	Aruba Networks
23	24:DE:C6:81:58:12	13	2472	Open	Aruba Networks
24	24:DE:C6:91:AE:52	10	2457	Open	Aruba Networks

5.2.1.2. CHANNEL-BASED INFORMATION

The following table contains **AsCancelas** network related information, which is organized based on the transmitting channels/frequencies:

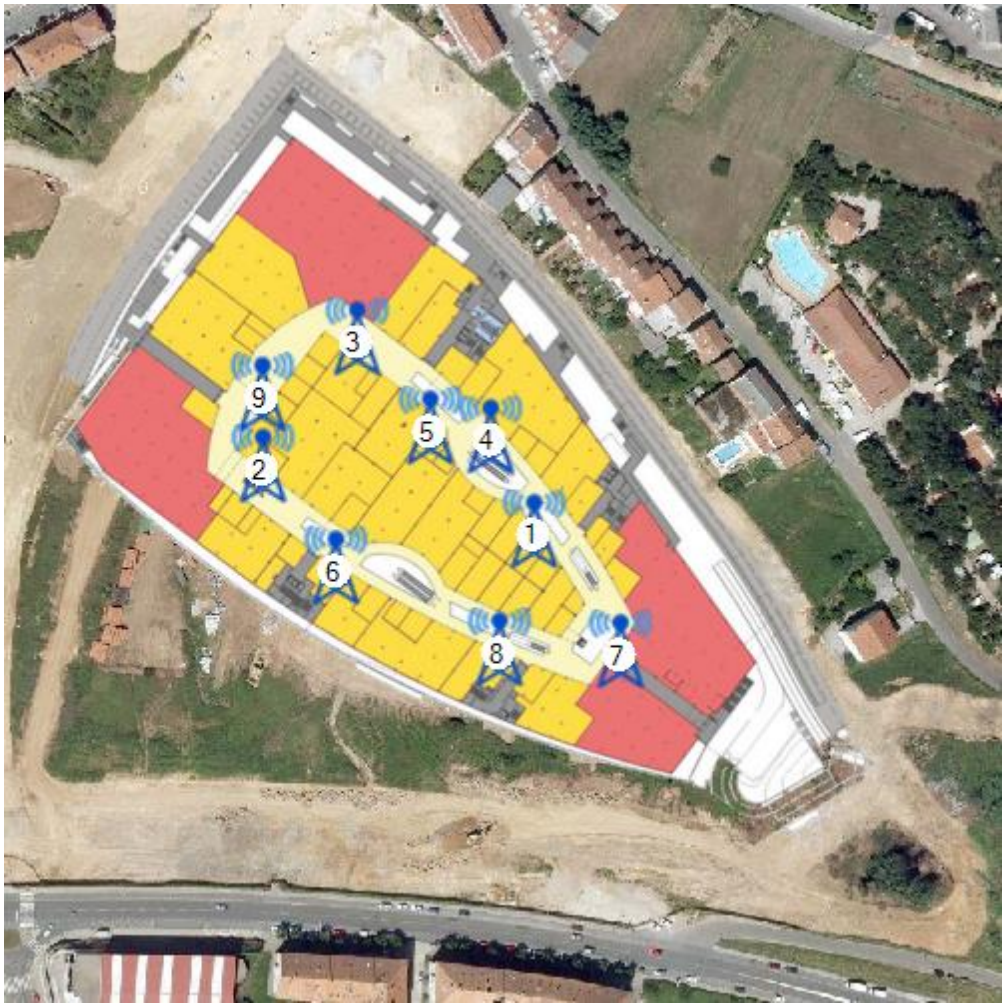
- SSID: Network identifier offered by the BSSID.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- BSSID: Associated MAC addresses granting network access.
- Vendor: Device manufacturer.

SSID	ASCANCELAS		
CHANNEL	FREQUENCY	BSSID	VENDOR
1	2412	24:DE:C6:81:0B:E2	Aruba Networks
		24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0E:52	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		04:BD:88:F0:A1:E0	Aruba Networks
		04:BD:88:F0:D2:C0	Aruba Networks
		04:BD:88:F0:E1:00	Aruba Networks
		04:BD:88:F1:03:A0	Aruba Networks
		24:DE:C6:81:0C:32	Aruba Networks
		24:DE:C6:81:0C:72	Aruba Networks
		24:DE:C6:81:0E:B2	Aruba Networks
3	2422	24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
4	2427	24:DE:C6:81:0C:82	Aruba Networks
5	2432	24:DE:C6:81:0C:72	Aruba Networks
		24:DE:C6:81:1C:32	Aruba Networks
6	2437	24:DE:C6:81:0B:B2	Aruba Networks
		04:BD:88:F0:7E:A0	Aruba Networks
		04:BD:88:F0:E1:80	Aruba Networks
7	2442	24:DE:C6:91:AE:52	Aruba Networks
10	2457	24:DE:C6:91:AE:52	Aruba Networks
		24:DE:C6:81:0B:B2	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
11	2462	04:BD:88:F1:02:80	Aruba Networks
12	2467	24:DE:C6:81:0C:32	Aruba Networks
		24:DE:C6:81:0F:A2	Aruba Networks
		24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0C:82	Aruba Networks

SSID	AsCancelas		
Channel	Frequency	BSSID	Vendor
		24:DE:C6:81:0E:52	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:1C:32	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks
13	2472	24:DE:C6:81:0E:02	Aruba Networks
		24:DE:C6:81:0E:B2	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks
		24:DE:C6:81:0B:E2	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:0F:A2	Aruba Networks

5.2.1.3. "AsCancelas" Access Point Position

The following image shows the approximate positions of all access points identified during the site survey which are publishing the network **AsCancelas.** These positions are manually configured, or otherwise are automatically estimated based on the measured data.



Physical APs Position for AsCancelas Network

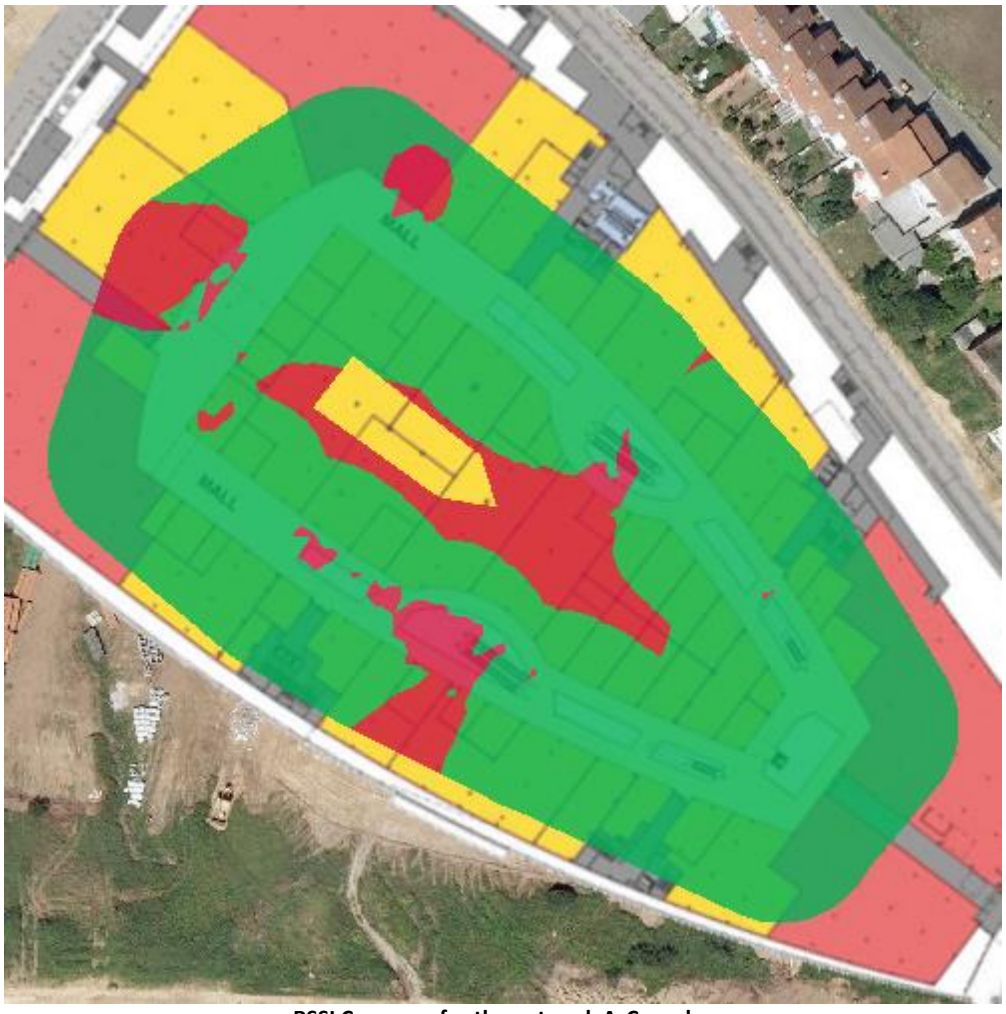
	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0B:B2	AsCancelas	Aruba Networks	8
2	24:DE:C6:81:0B:E2	AsCancelas	Aruba Networks	5
3	24:DE:C6:81:1C:32	AsCancelas	Aruba Networks	12
4	24:DE:C6:81:58:12	AsCancelas	Aruba Networks	10
5	24:DE:C6:81:12:12	AsCancelas	Aruba Networks	13
6	24:DE:C6:81:0C:82	AsCancelas	Aruba Networks	13
7	24:DE:C6:81:0C:72	AsCancelas	Aruba Networks	4
8	24:DE:C6:81:0F:02	AsCancelas	Aruba Networks	13
9	04:BD:88:F0:A1:E0	AsCancelas	Aruba Networks	1

5.2.2. WiFi Quality

5.2.2.1. Web Browsing WiFi requirements

5.2.2.1.1. RSSI Coverage

The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.



RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
Fail	

5.2.2.1.2. SIMULTANEOUS RSSI COVERAGE

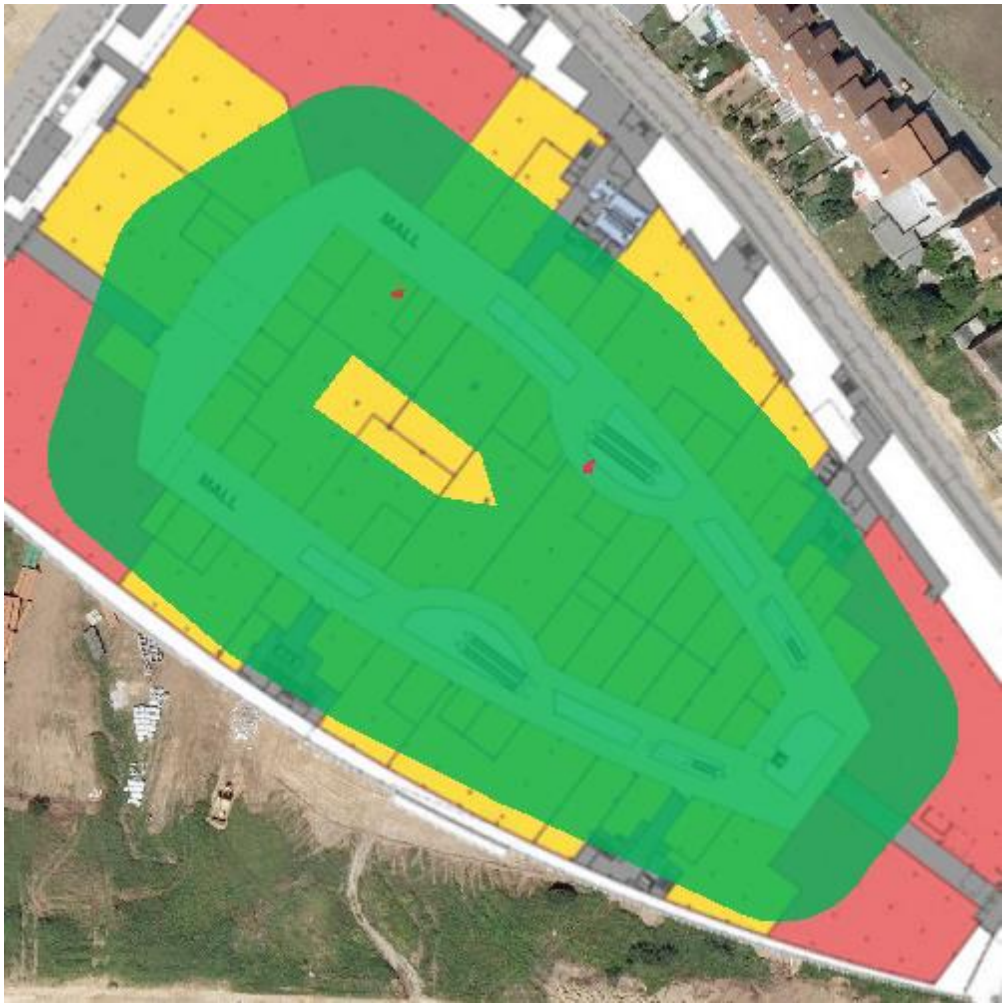
The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.

Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
	Simultaneous APs Required greater than or equal 2 APs
Fail	

5.2.2.1.3. CHANNEL OVERLAP

The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

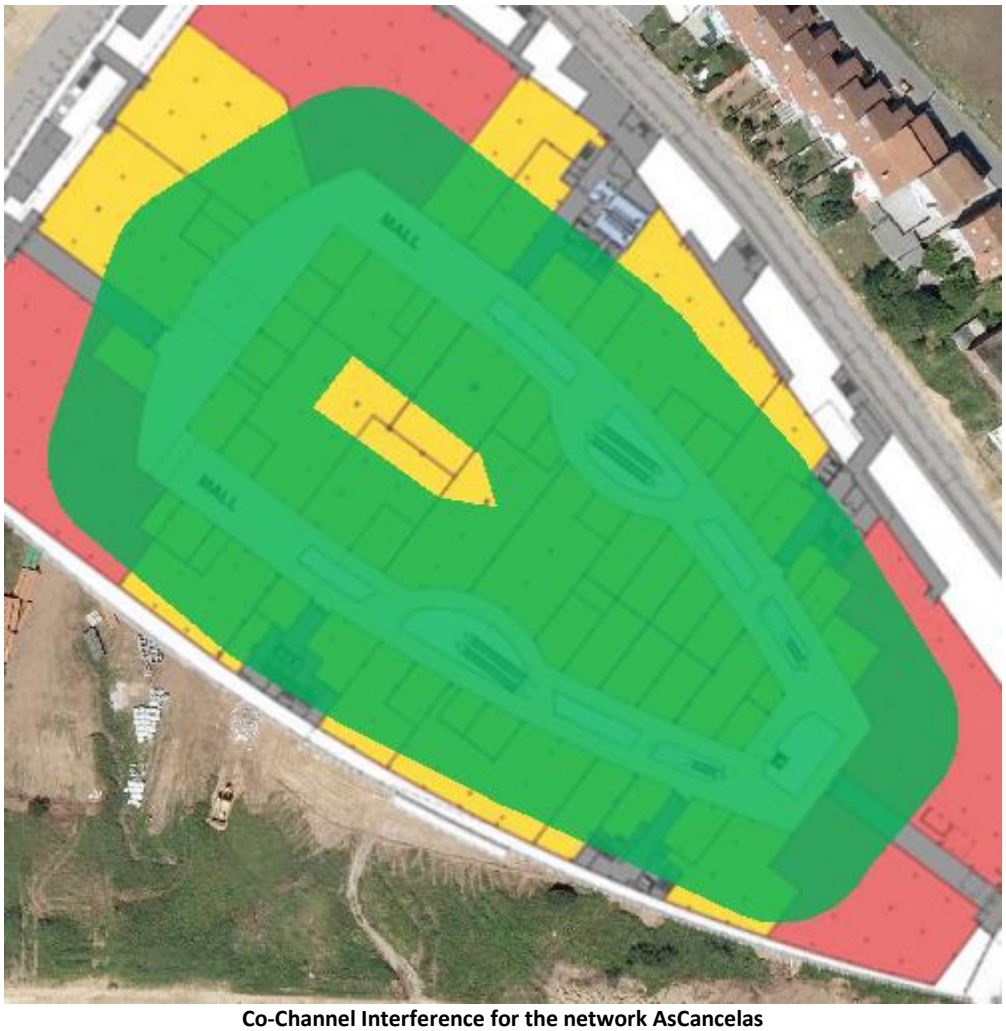


Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

5.2.2.1.4. Co-Channel Interference

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.

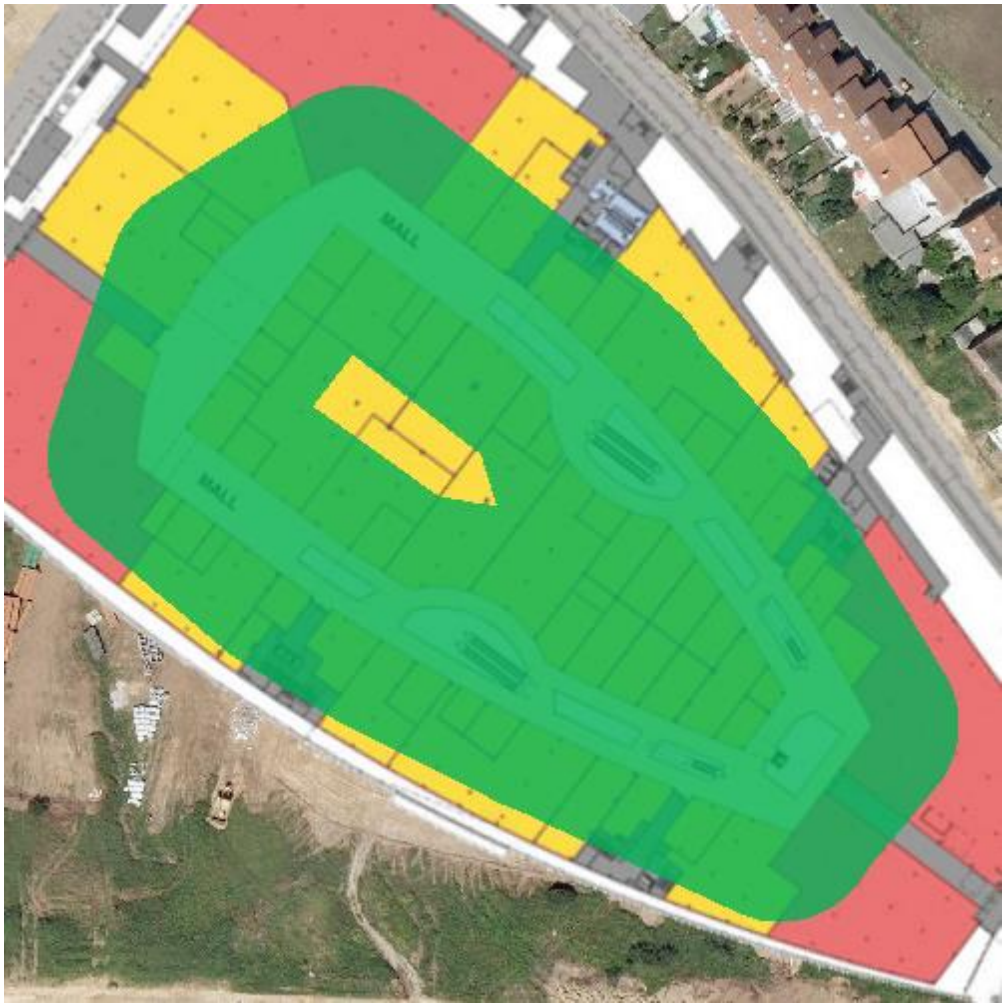


Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

5.2.2.1.5. LATENCY

Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

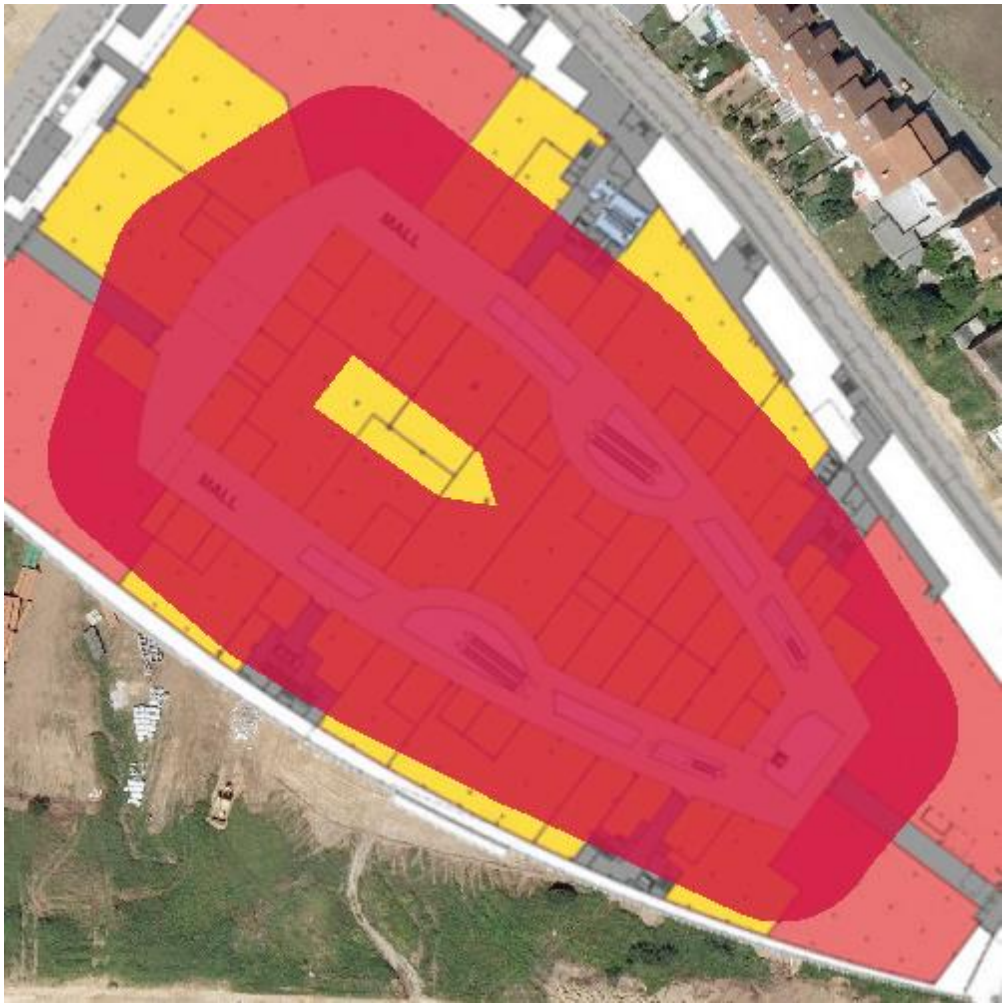


Latency for the network AsCancelas

Pass	Network Latency less than or equal 100ms
Fail	

5.2.2.1.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.

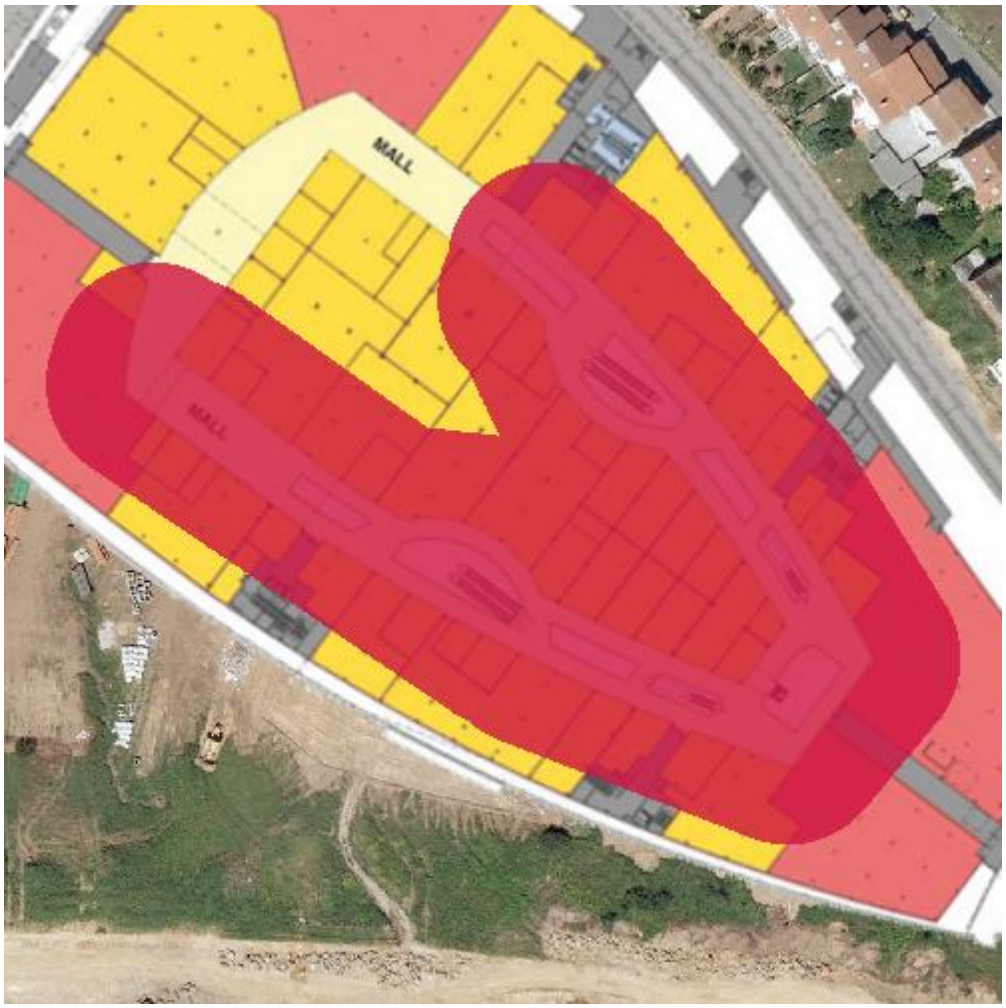


Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 320 kbps
Fail	

5.2.2.1.7. PACKET LOST

The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.



Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

5.2.2.1.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming

Access Point Roaming for the network AsCancelas

Pass
Fail

5.2.2.2. VoIP over WiFi requirements

5.2.2.2.1. RSSI Coverage

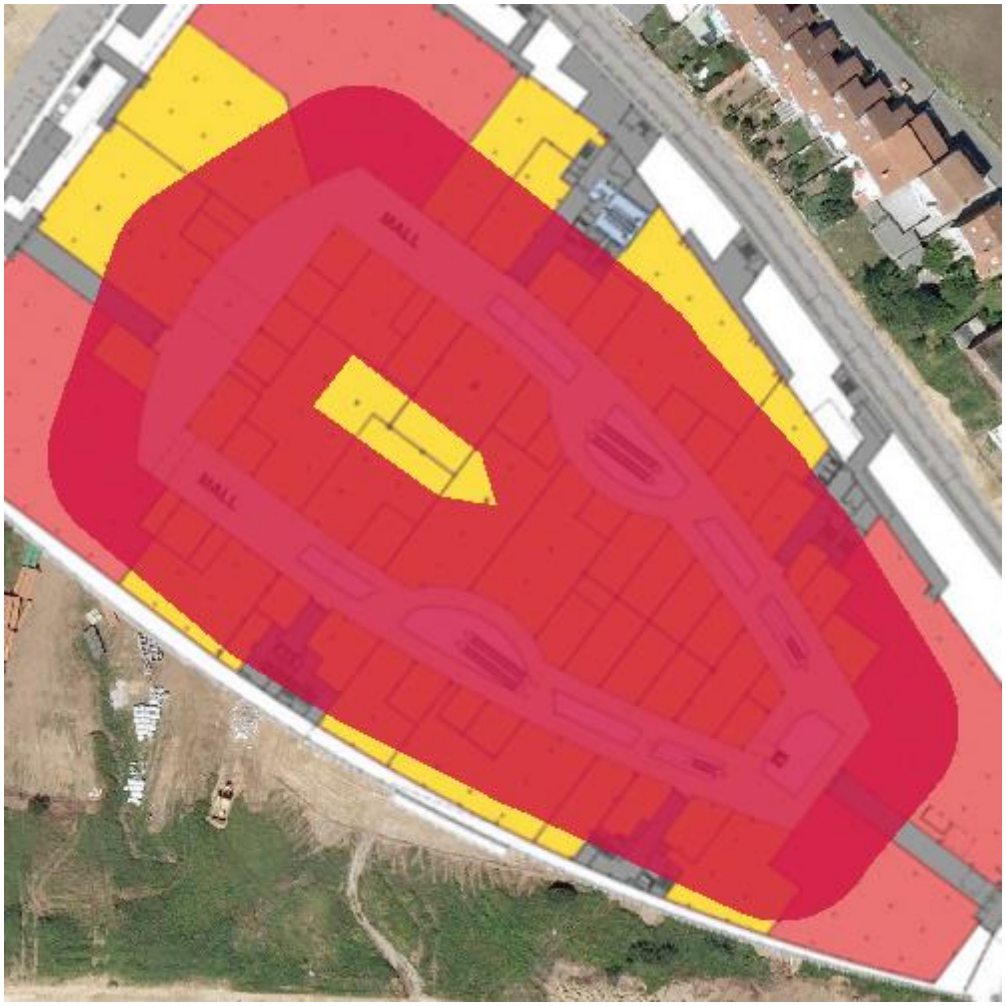
The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.

RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -50 dBm
Fail	

5.2.2.2.2. SIMULTANEOUS RSSI COVERAGE

The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.

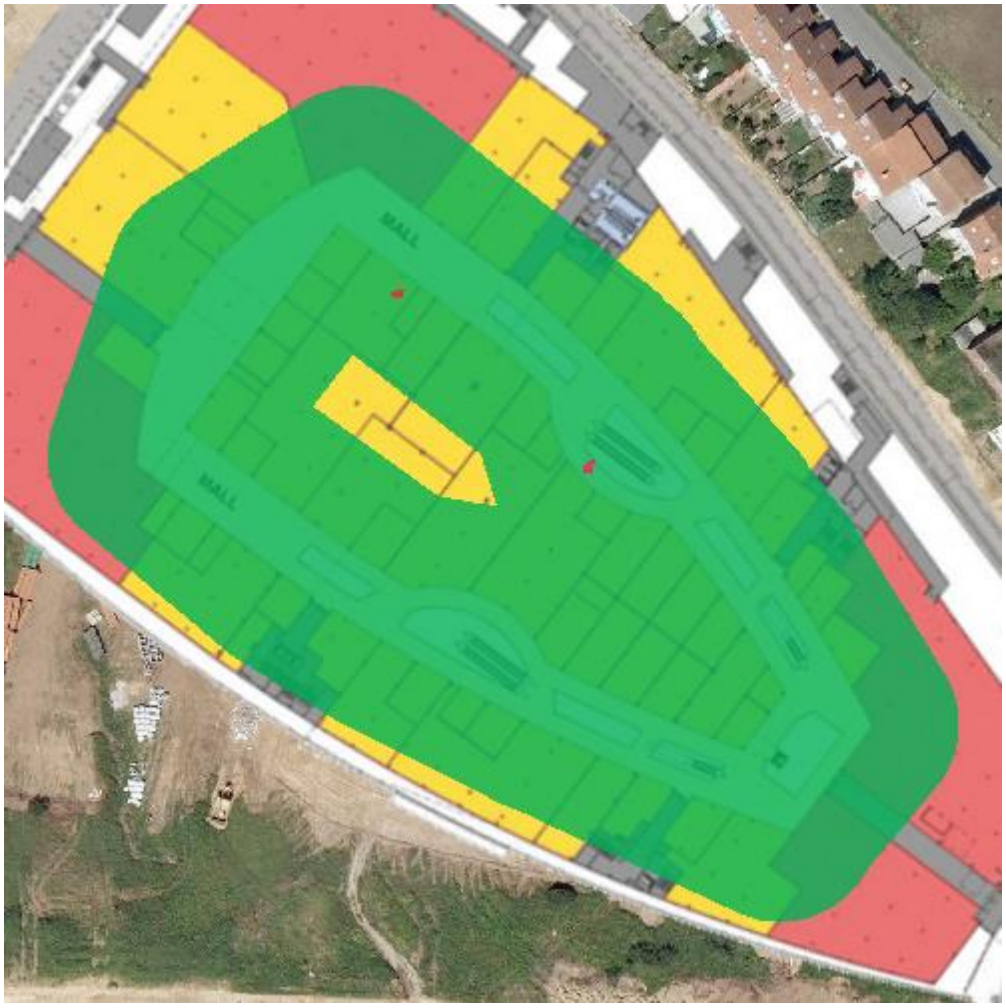


Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -45 dBm
	Simultaneous APs Required greater than or equal 5 APs
Fail	

5.2.2.2.3. CHANNEL OVERLAP

The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

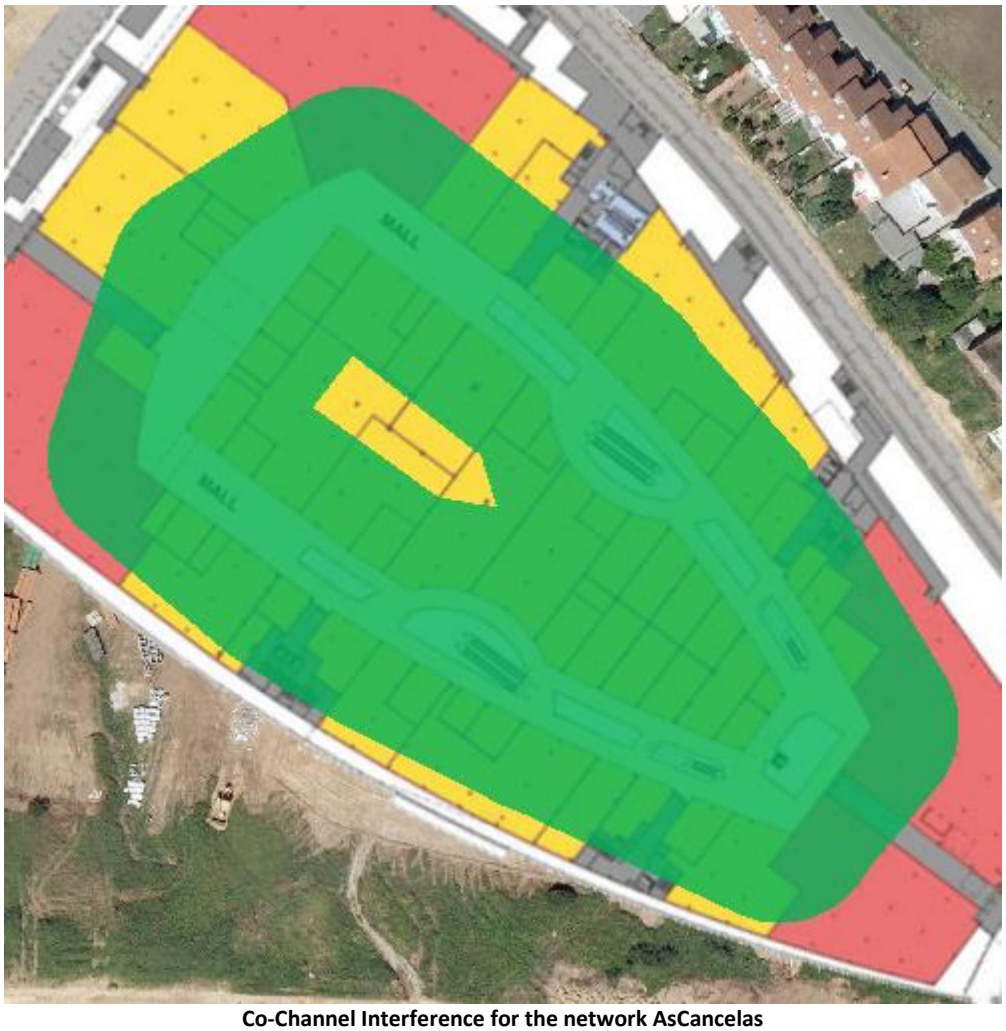


Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

5.2.2.2.4. Co-Channel Interference

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.

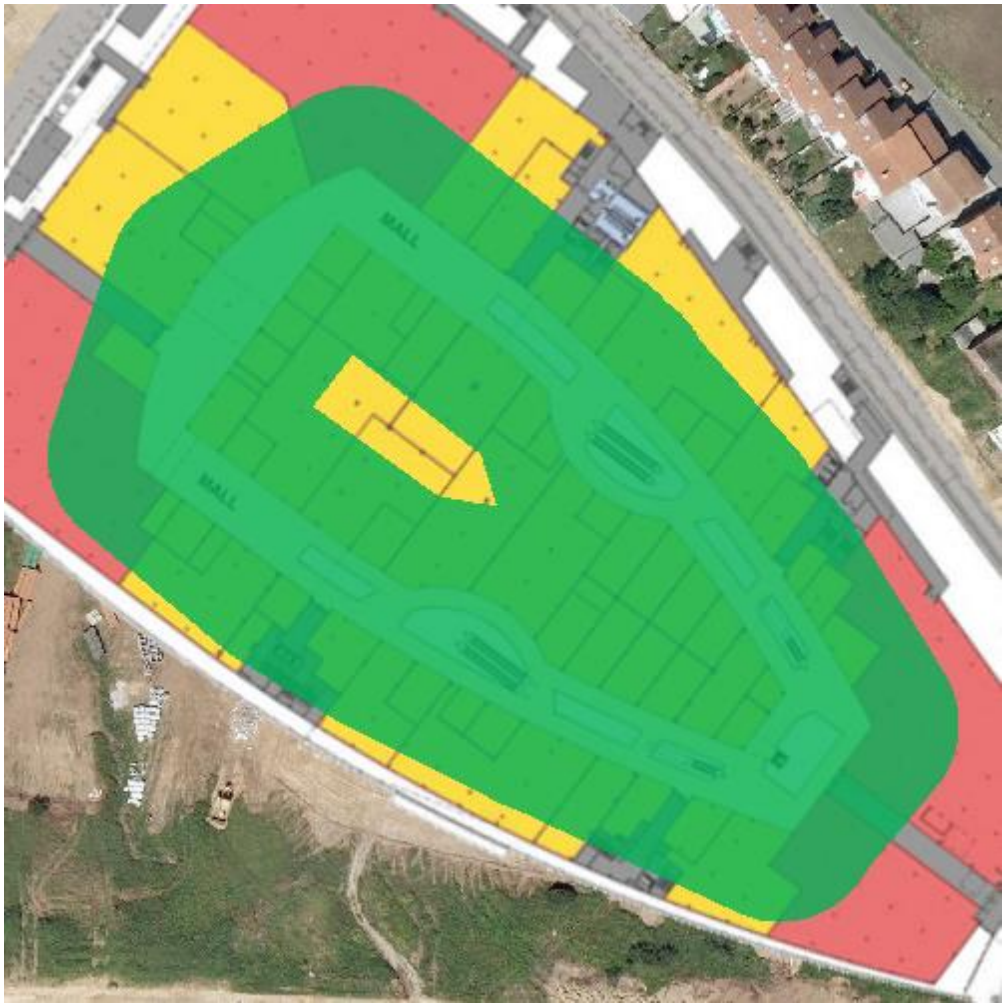


Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

5.2.2.2.5. LATENCY

Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

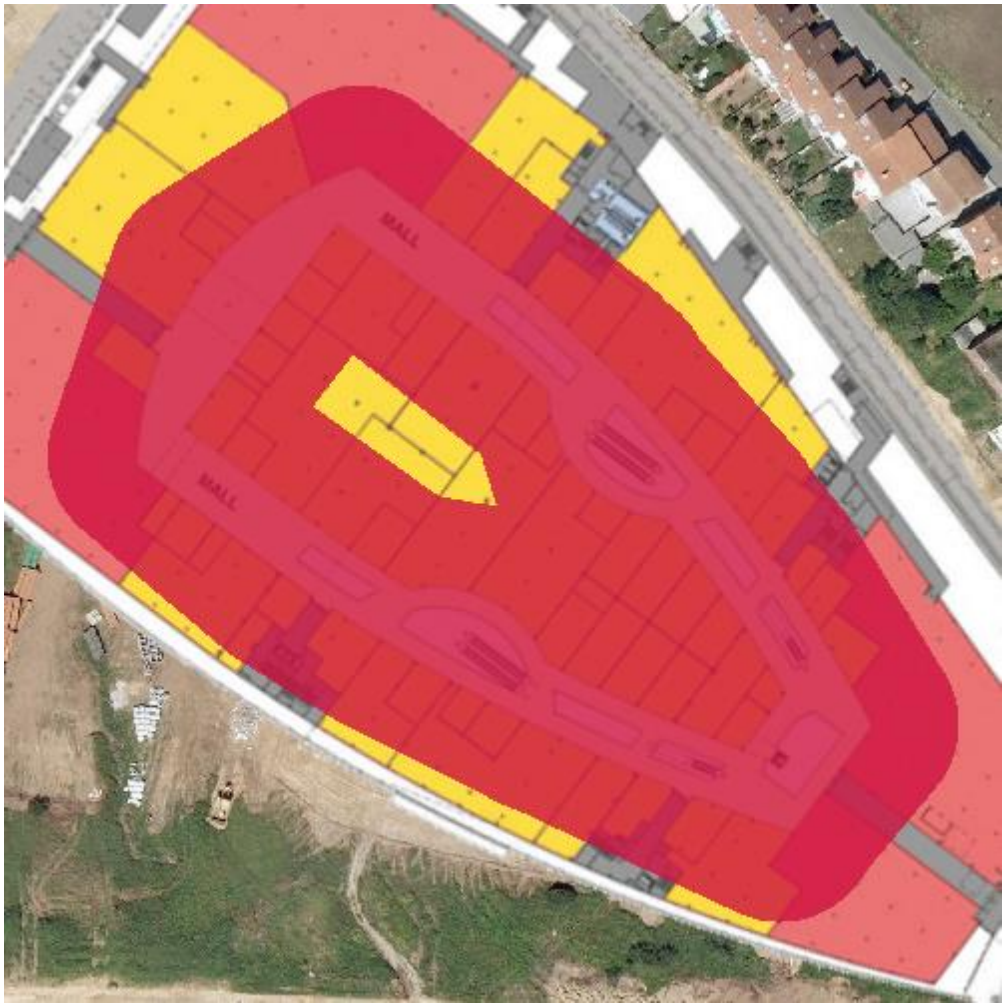


Latency for the network AsCancelas

Pass	Network Latency less than or equal 256ms
Fail	

5.2.2.2.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.

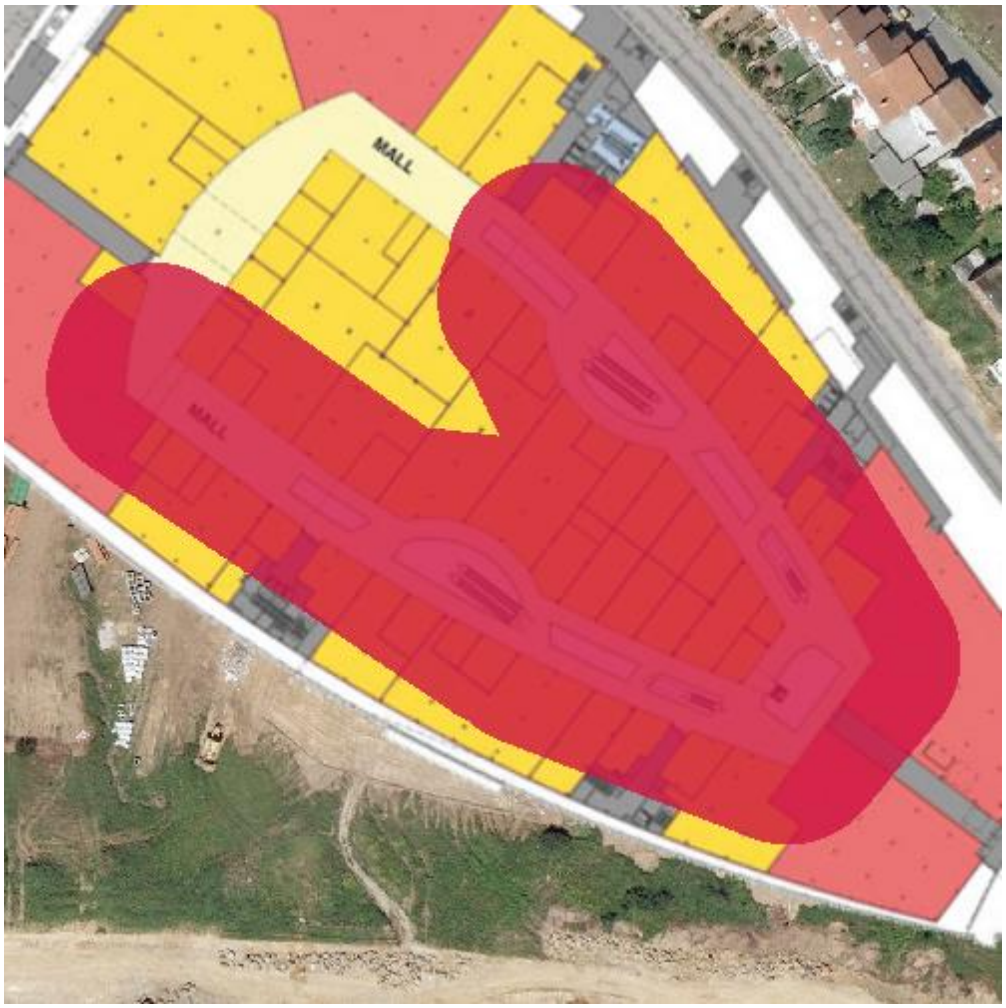


Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 5000 kbps
Fail	

5.2.2.2.7. PACKET LOST

The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.



Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

5.2.2.2.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming

Access Point Roaming for the network AsCancelas

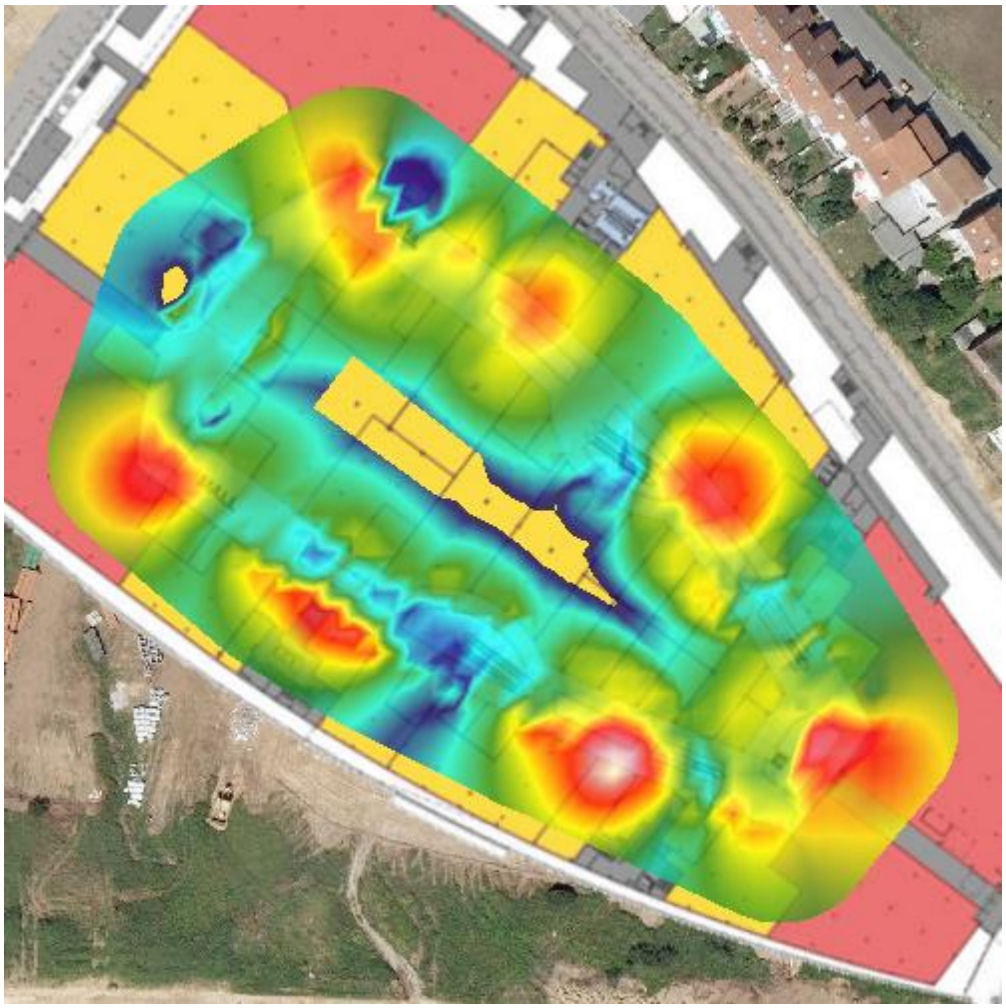
Pass
Fail

5.2.3. SURVEY

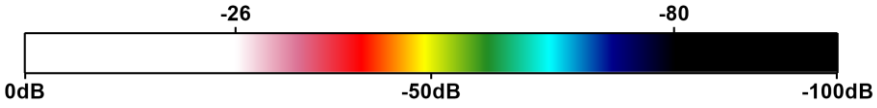
5.2.3.1. RSSI HEATMAP

Signal Strength translates as how efficiently the network is reaching the surveyed area, indicating how the **AsCancelas** network is received at each location.

Signal strength values range from 0 db to -100db, being -100db the worse performance. The color scheme is shown below the image.



Signal Strength Heatmap for AsCancelas Network

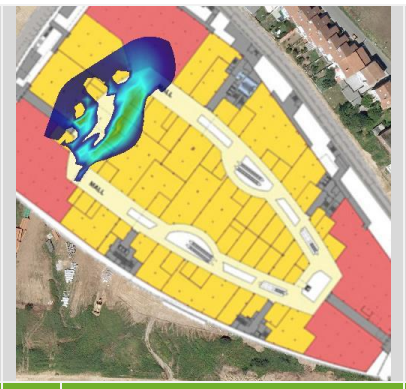
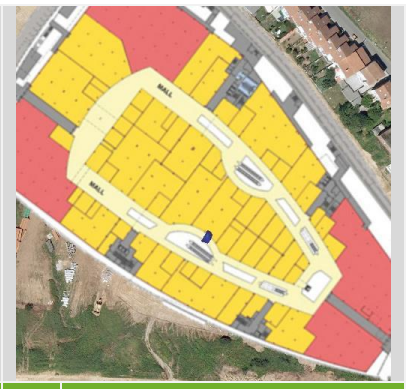
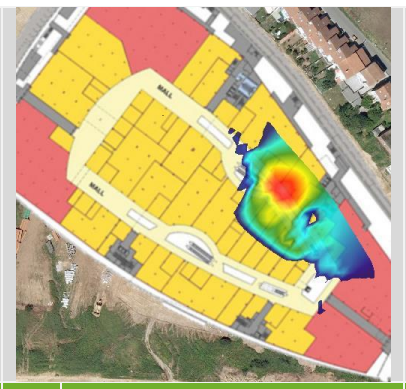
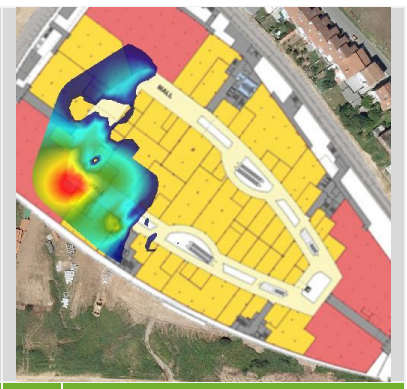


Network coverage area*	9162 m2

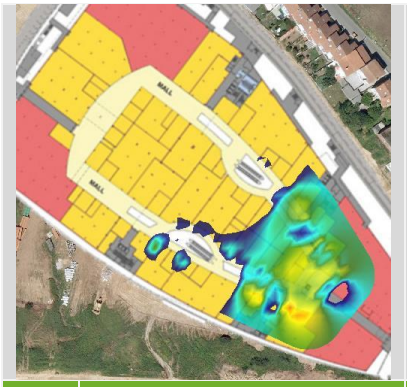
*This information indicates the network coverage area at a signal strength of at least:-75

5.2.3.2. RSSI DETAILED BY AP

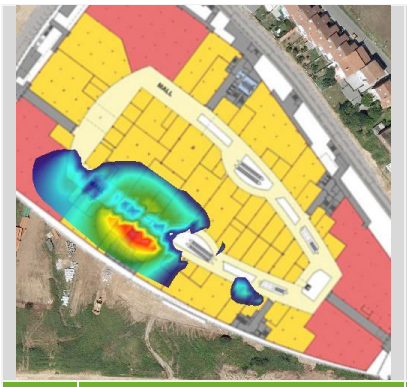
The following table contains a tile view of all BSSIDs associated to the **AsCancelas** network, along with its signal strength heatmap, associated covered area, and device manufacturer.

No Signal Strength data over RSSI = -75		
1 **04:BD:88:F0:7E:A0**	2 **04:BD:88:F0:A1:E0**	3 **04:BD:88:F0:D2:C0**
Coverage area: 0 m2	Coverage area: 2084 m2	Coverage area: 25 m2
Aruba Networks	Aruba Networks	Aruba Networks
		No Signal Strength data over RSSI = -75
4 **04:BD:88:F0:E1:00**	5 **04:BD:88:F0:E1:80**	6 **04:BD:88:F1:02:80**
Coverage area: 198 m2	Coverage area: 62 m2	Coverage area: 0 m2
Aruba Networks	Aruba Networks	Aruba Networks
		
7 **04:BD:88:F1:03:A0**	8 **24:DE:C6:81:0B:B2**	9 **24:DE:C6:81:0B:E2**

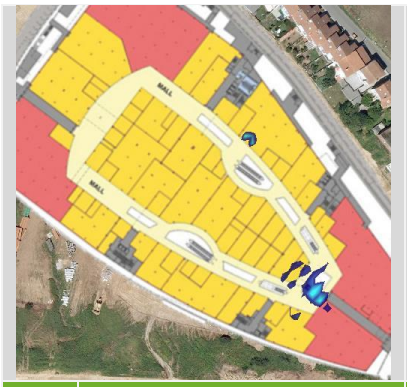
Coverage area: 282 m2	Coverage area: 2683 m2	Coverage area: 3215 m2
Aruba Networks	Aruba Networks	Aruba Networks



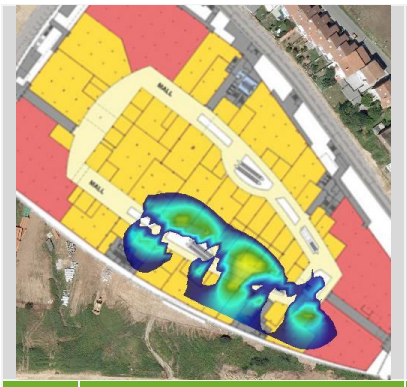
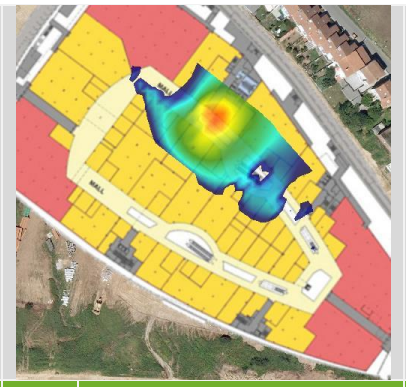
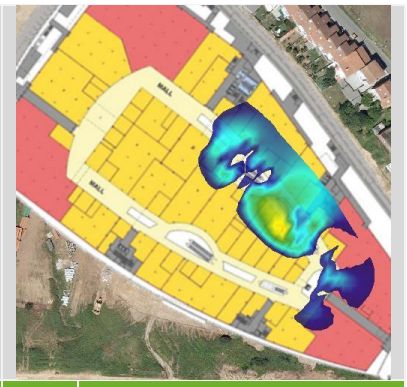
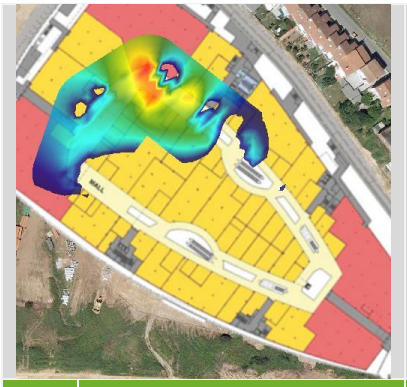
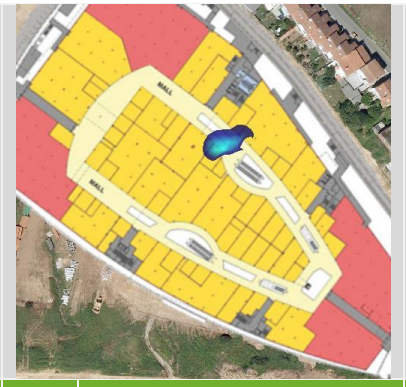
10	**24:DE:C6:81:0B:F2**	11	**24:DE:C6:81:0C:32**	12	**24:DE:C6:81:0C:72**
Coverage area: 4552 m2		Coverage area: 0 m2		Coverage area: 3889 m2	
Aruba Networks		Aruba Networks		Aruba Networks	

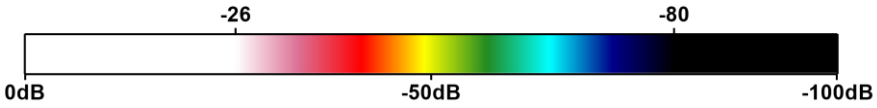


13	**24:DE:C6:81:0C:82**	14	**24:DE:C6:81:0E:02**	15	**24:DE:C6:81:0E:52**
Coverage area: 3520 m2		Coverage area: 2 m2		Coverage area: 868 m2	
Aruba Networks		Aruba Networks		Aruba Networks	



16	**24:DE:C6:81:0E:B2**	17	**24:DE:C6:81:0F:02**	18	**24:DE:C6:81:0F:A2**
Coverage area: 314 m2		Coverage area: 3596 m2		Coverage area: 963 m2	

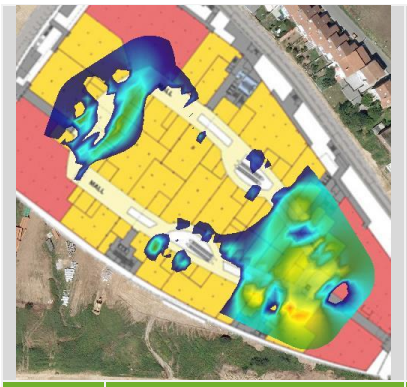
Aruba Networks	Aruba Networks	Aruba Networks
		
19 **24:DE:C6:81:11:62**	20 **24:DE:C6:81:12:12**	21 **24:DE:C6:81:15:02**
Coverage area: 3230 m2	Coverage area: 2897 m2	Coverage area: 3304 m2
Aruba Networks	Aruba Networks	Aruba Networks
		
22 **24:DE:C6:81:1C:32**	23 **24:DE:C6:81:58:12**	24 **24:DE:C6:91:AE:52**
Coverage area: 3877 m2	Coverage area: 319 m2	Coverage area: 0 m2
Aruba Networks	Aruba Networks	Aruba Networks



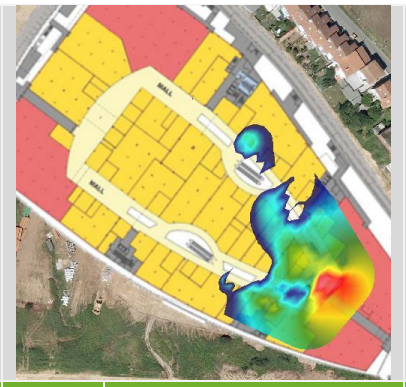
5.2.3.3. RSSI DETAILED BY CHANNEL

The following table contains a tile view of all operative channels on the **AsCancelas** network.

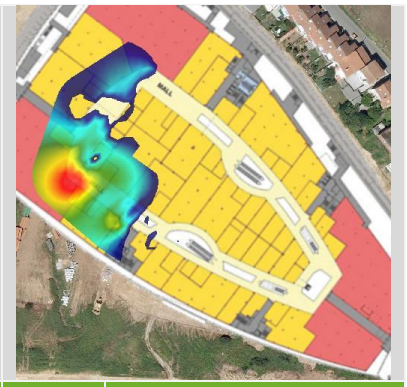
The graph shows the signal strength heatmap, and the coverage area associated with this network on that channel.



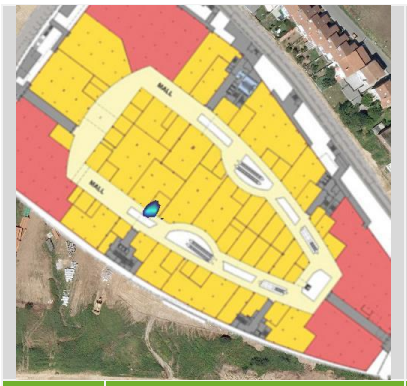
1	**Channel 1**
Coverage area: 6492 m2	



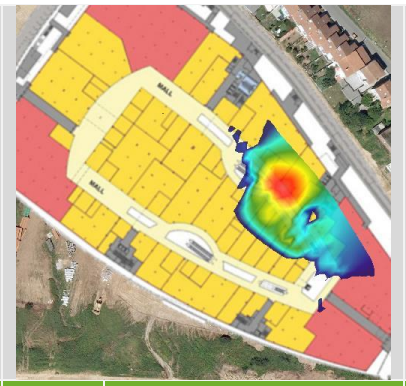
2	**Channel 4**
Coverage area: 4372 m2	



3	**Channel 5**
Coverage area: 3034 m2	

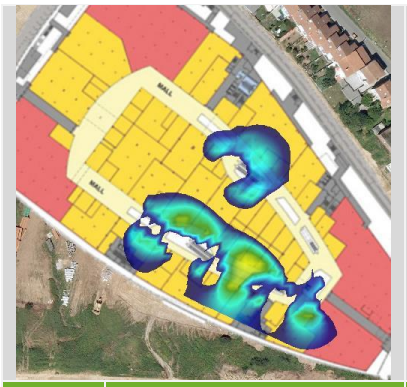


4	**Channel 6**
Coverage area: 62 m2	

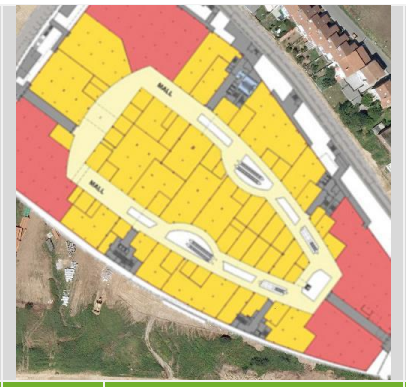


5	**Channel 8**
Coverage area: 2460 m2	

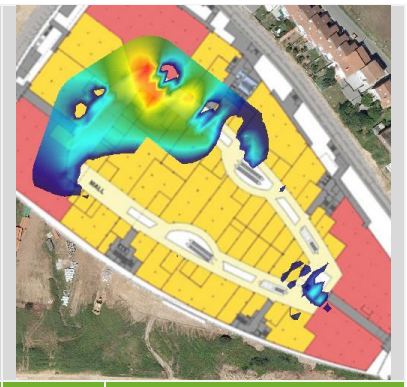
6	**Channel 9**
Coverage area: 2 m2	



7	**Channel 10**

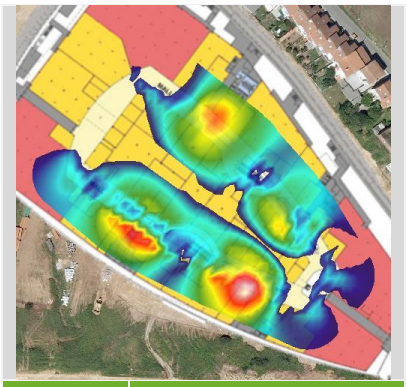


8	**Channel 11**

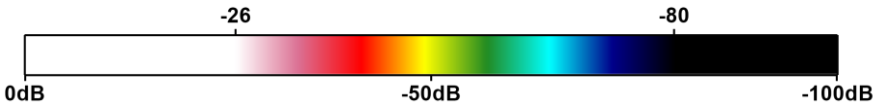


9	**Channel 12**

Coverage area: 4266 m2	Coverage area: 0 m2	Coverage area: 4065 m2



10	**Channel 13**
Coverage area: 8056 m2	



5.2.3.4. NUMBER OF APS

The following image shows the number of access points granting access to the **AsCancelas** network that were detected within the surveyed area.

The graph reveals the existing signal overlapping from the different access points granting access to the same network.

Number of APs for AsCancelas Network

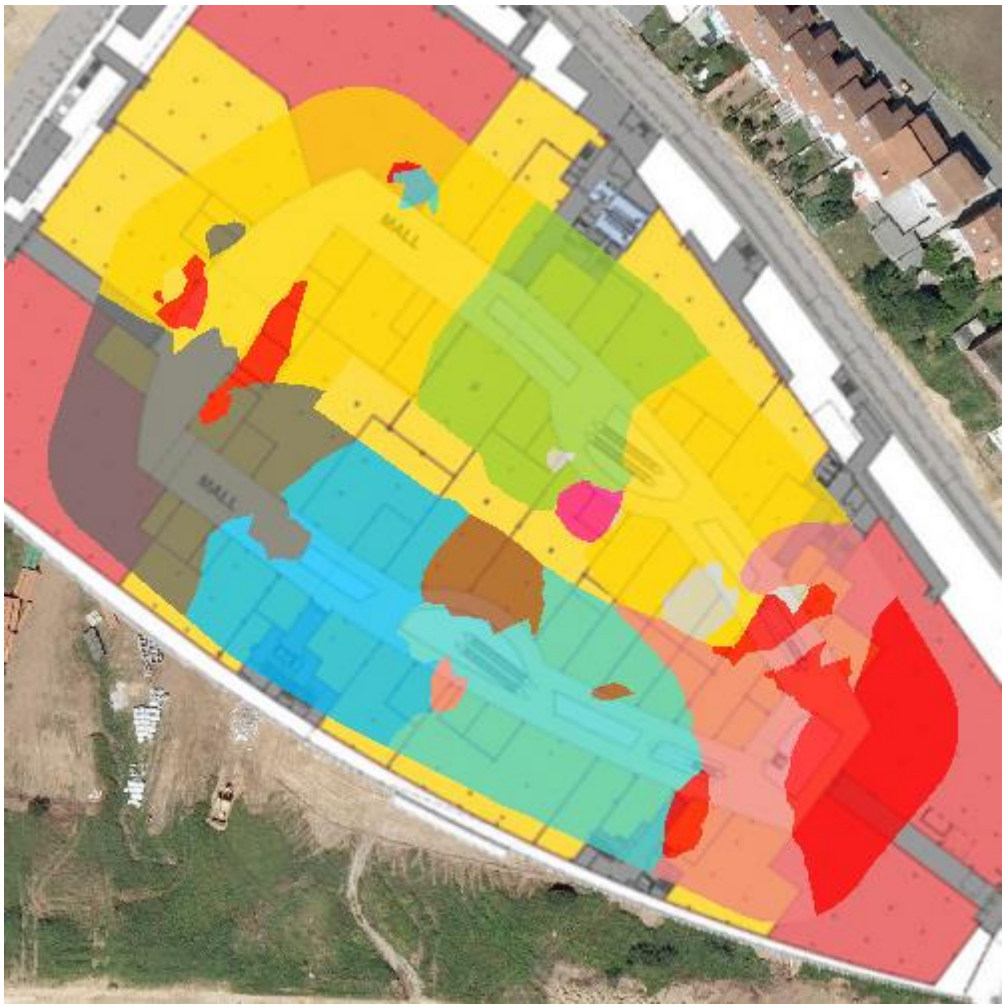
Number of APs	1	2	3	4	5	6	7	8	9	10

5.2.3.5. AP COVERAGE

The following image shows the color coded coverage of every AP propagating the **AsCancelas** network.

If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

Using this graph, you will be able to analyze the appropriate coverage distribution.



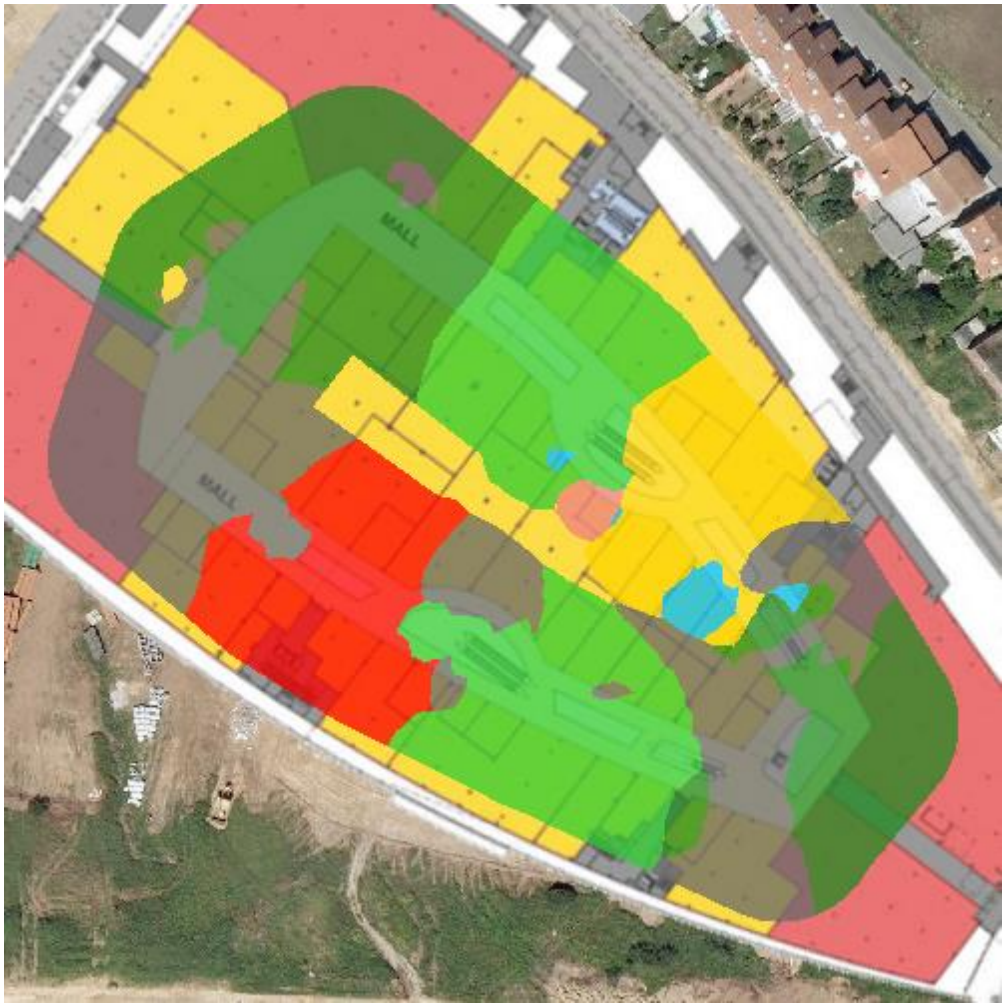
AP Coverage for AsCancelas Network

Access Point	Access Point	Access Point
04:BD:88:F0:7E:A0	04:BD:88:F0:A1:E0	04:BD:88:F0:D2:C0
04:BD:88:F0:E1:00	04:BD:88:F0:E1:80	04:BD:88:F1:02:80
04:BD:88:F1:03:A0	24:DE:C6:81:0B:B2	24:DE:C6:81:0B:E2
24:DE:C6:81:0B:F2	24:DE:C6:81:0C:32	24:DE:C6:81:0C:72
24:DE:C6:81:0C:82	24:DE:C6:81:0E:02	24:DE:C6:81:0E:52
24:DE:C6:81:0E:B2	24:DE:C6:81:0F:02	24:DE:C6:81:0F:A2
24:DE:C6:81:11:62	24:DE:C6:81:12:12	24:DE:C6:81:15:02
24:DE:C6:81:1C:32	24:DE:C6:81:58:12	24:DE:C6:91:AE:52

5.2.3.6. CHANNEL COVERAGE

The following image shows the coverage range for every channel in the **AsCancelas** network.

If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

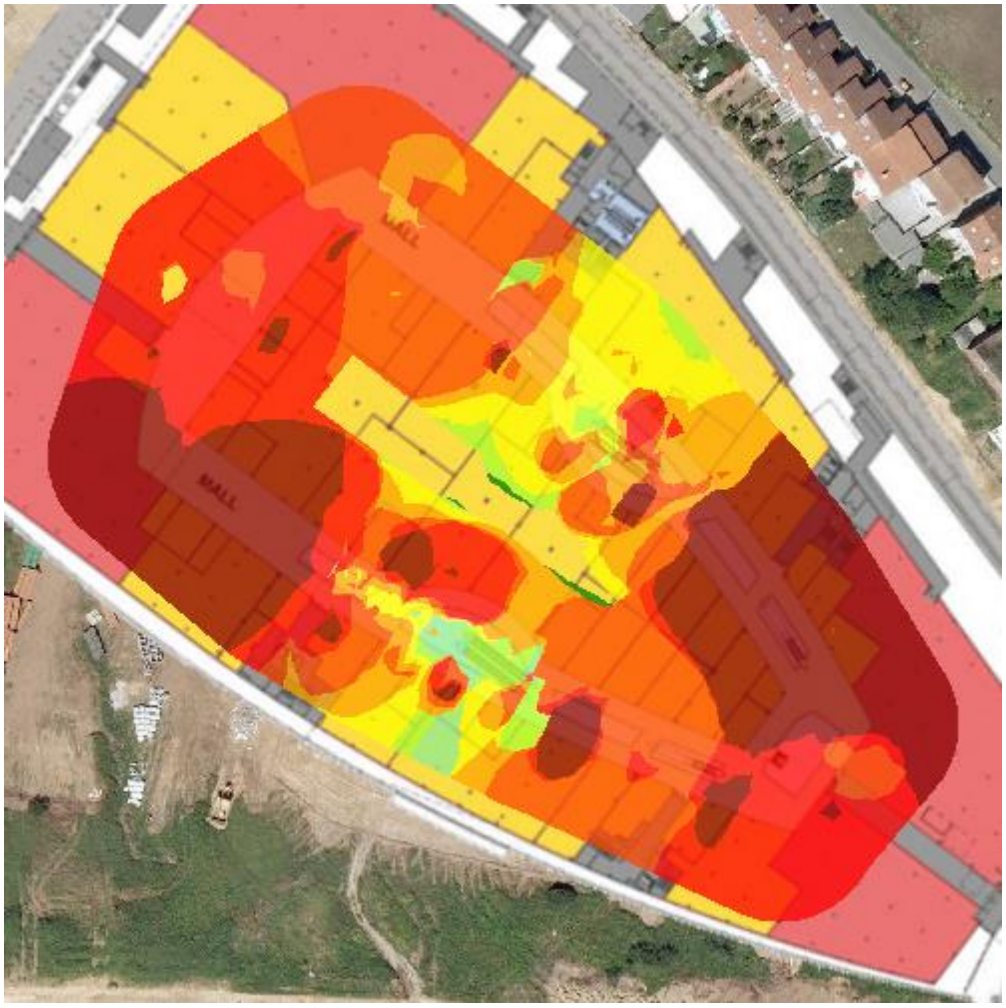


Channel Coverage for AsCancelas Network.

Channel	1	3	4	5	6	10	11	12	13

5.2.3.7. CHANNEL OVERLAP

The following image shows the coverage area for each operative channel on the **AsCancelas** network, and the signal overlapping between two or more channels throughout the surveyed area.

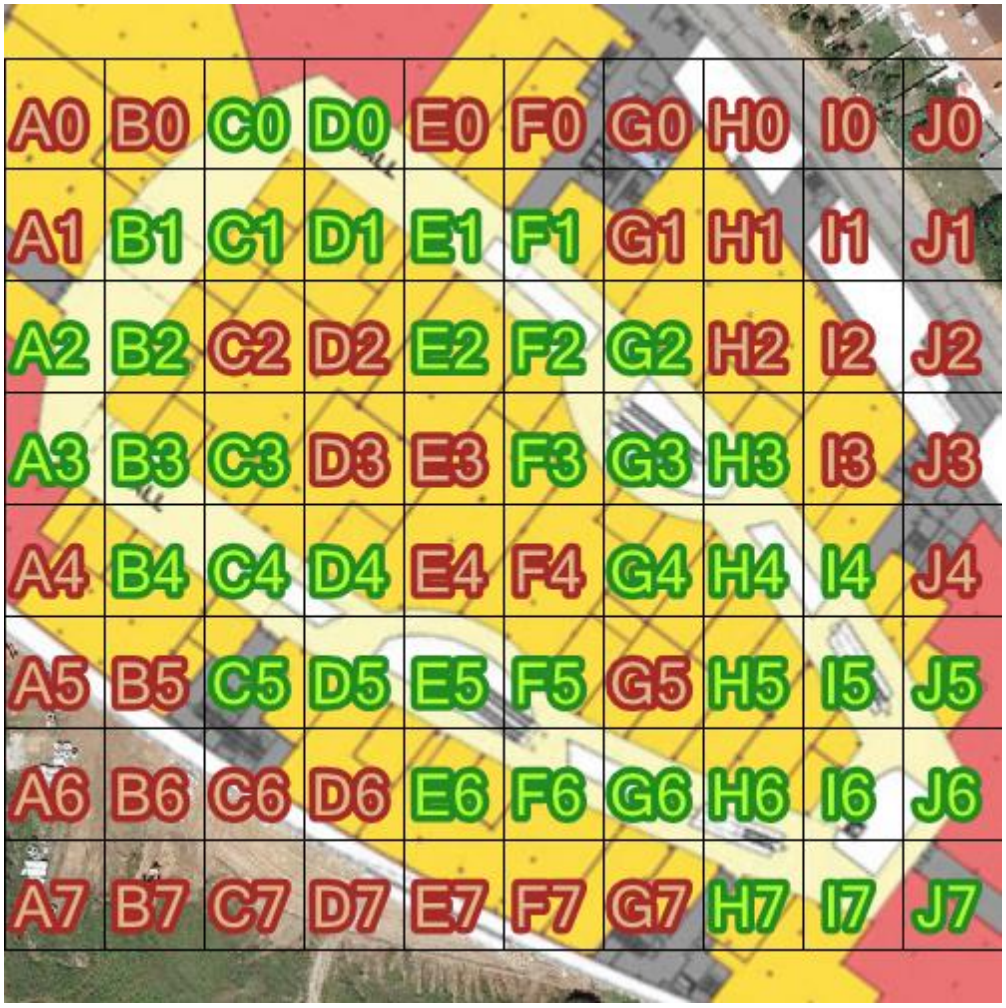


Channel Overlap for AsCancelas Network

Channel	1	2	3	4	5	6	7	8	9	10

5.2.3.8. DETAILED GRID

In the following image, the blueprint associated to the surveyed area is divided into quadrants. Each quadrant shows the collected information in that grid.



Detailed Grid for AsCancelas Location

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
C0	28	-42	-67	AsCancelas	9	216,7
D0	23	-36	-68	AsCancelas	9	216,7
A1	1	-61	-62	AsCancelas	2	130
B1	37	-32	-65	AsCancelas	6	216,7
C1	13	-46	-69	AsCancelas	5	216,7
D1	15	-38	-68	AsCancelas	11	216,7
E1	34	-42	-69	AsCancelas	13	216,7
F1	8	-39	-73	AsCancelas	8	216,7
A2	26	-48	-67	AsCancelas	8	216,7
B2	19	-44	-73	AsCancelas	8	216,7
E2	5	-48	-67	AsCancelas	9	216,7
F2	31	-50	-71	AsCancelas	11	216,7
G2	21	-51	-73	AsCancelas	12	216,7
A3	28	-36	-68	AsCancelas	11	216,7
B3	26	-47	-67	AsCancelas	8	216,7
C3	1	-58	-61	AsCancelas	2	130
F3	6	-56	-73	AsCancelas	9	216,7
G3	32	-44	-72	AsCancelas	14	216,7
H3	15	-36	-74	AsCancelas	10	130
B4	11	-43	-67	AsCancelas	8	216,7
C4	33	-33	-68	AsCancelas	10	216,7
D4	15	-50	-72	AsCancelas	9	216,7
G4	2	-56	-73	AsCancelas	7	216,7
H4	36	-37	-69	AsCancelas	11	216,7
I4	14	-44	-70	AsCancelas	10	130
C5	4	-27	-63	AsCancelas	5	130
D5	21	-27	-73	AsCancelas	11	216,7
E5	30	-44	-71	AsCancelas	10	216,7
F5	15	-51	-68	AsCancelas	9	216,7
H5	6	-44	-61	AsCancelas	6	130
I5	39	-42	-71	AsCancelas	14	130
J5	4	-57	-83	AsCancelas	8	130
E6	4	-44	-72	AsCancelas	8	216,7
F6	24	-37	-68	AsCancelas	10	216,7
G6	40	-20	-64	AsCancelas	12	216,7
H6	22	-46	-69	AsCancelas	11	216,7
I6	22	-47	-73	AsCancelas	10	130
J6	26	-29	-67	AsCancelas	12	130

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
H7	17	-36	-71	AsCancelas	10	130
I7	24	-35	-71	AsCancelas	8	130
J7	1	-60	-71	AsCancelas	3	216,7

5.2.3.9. SNR HEATMAP

The following image shows the **AsCancelas** network's signal-to-noise ratio throughout the surveyed area.

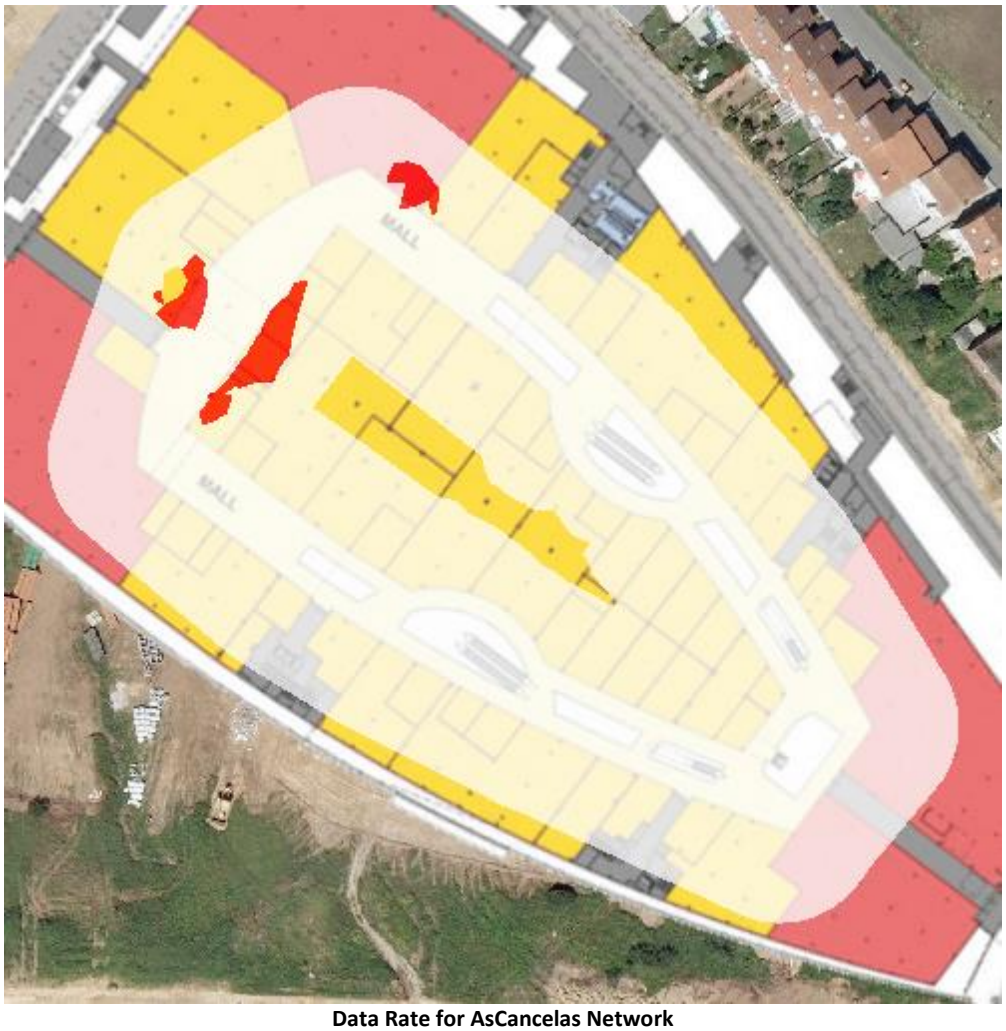
Signal-to-noise ratio measures the ratio between the Wi-Fi network signal strength and the background noise. Higher noise levels will result in a larger negative impact on communications. This parameter offers valuable information on the effectiveness of communications.
These values range from 0 to 100, being 100 the best possible communication quality.

The graph can't be generated due to the absence of the required data.

5.2.3.10. DATA RATE HEATMAP

The following image shows the area covered by the APs based on their data transfer rates for the **AsCancelas** network throughout the surveyed area.

Data rate helps determine the maximum data transmission speed among the wireless devices connected to a Wi-Fi network.
This value allows you to establish how consistent a network is when transmitting data across the coverage area, and helps you find those areas where these values greatly differ or the network performance significantly decreases.



Data Rate for AsCancelas Network

Data Rate
54

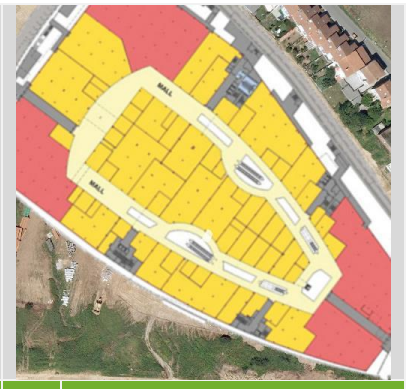
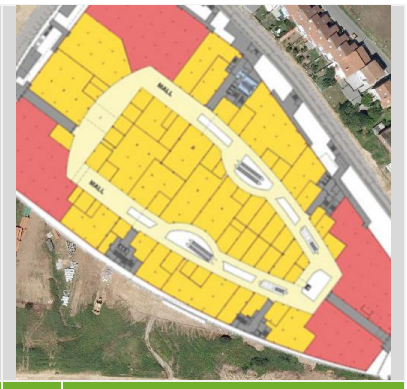
Data Rate
130

Data Rate
216,7

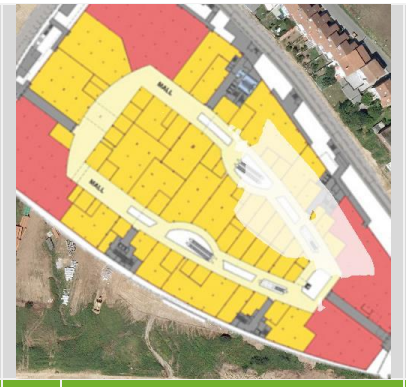
5.2.3.11. DATA RATE DETAILED

The following table shows a tile view of all BSSIDs associated with the **AsCancelas** network, together with the graph indicating the covered area and the maximum supported data transfer rate speed.

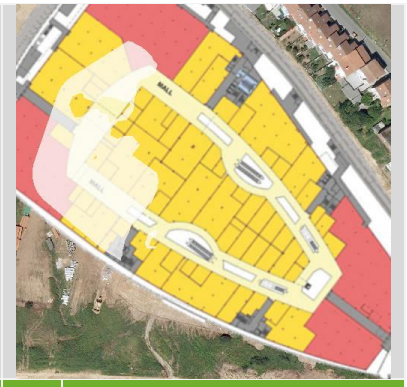
Data rate helps determine the maximum data transmission speed between the wireless devices connected to a Wi-Fi network.
It allows you to determine how efficiently a network transmits data throughout a certain area, and if there are blind zones where reduced network performance is observed.

					
1	**04:BD:88:F0:7E:A0**	2	**04:BD:88:F0:A1:E0**	3	**04:BD:88:F0:D2:C0**
Aruba Networks		Aruba Networks		Aruba Networks	
					
4	**04:BD:88:F0:E1:00**	5	**04:BD:88:F0:E1:80**	6	**04:BD:88:F1:02:80**
Aruba Networks		Aruba Networks		Aruba Networks	

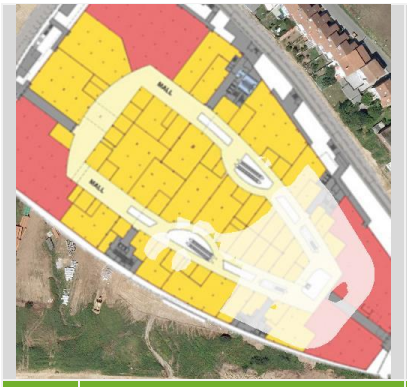
7	04:BD:88:F1:03:A0
Aruba Networks	



8	24:DE:C6:81:0B:B2
Aruba Networks	

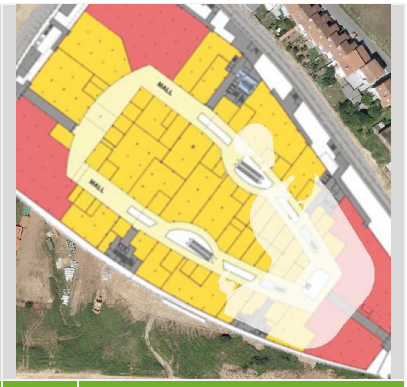


9	24:DE:C6:81:0B:E2
Aruba Networks	

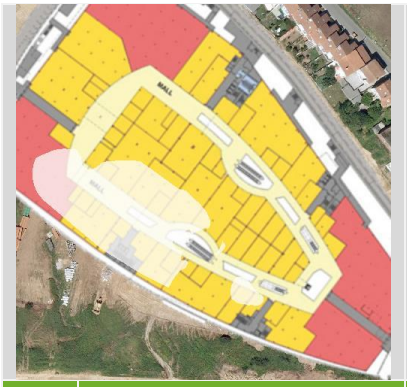


10	24:DE:C6:81:0B:F2
Aruba Networks	

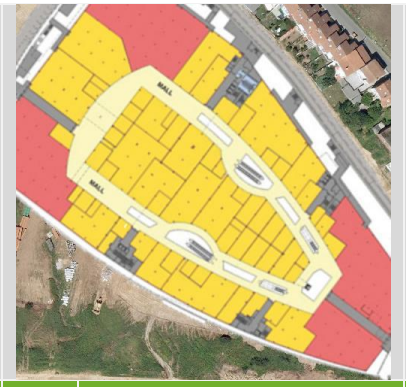
11	24:DE:C6:81:0C:32
Aruba Networks	



12	24:DE:C6:81:0C:72
Aruba Networks	



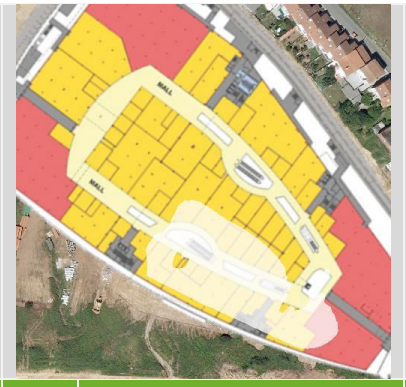
13	24:DE:C6:81:0C:82
Aruba Networks	



14	24:DE:C6:81:0E:02
Aruba Networks	

15	24:DE:C6:81:0E:52
Aruba Networks	

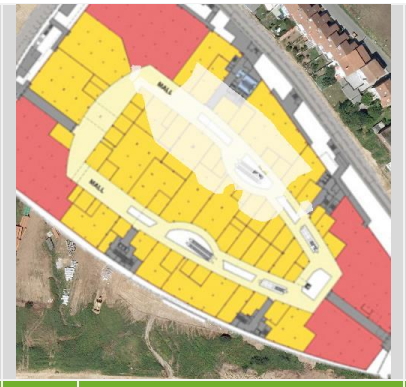
16	24:DE:C6:81:0E:B2
Aruba Networks	



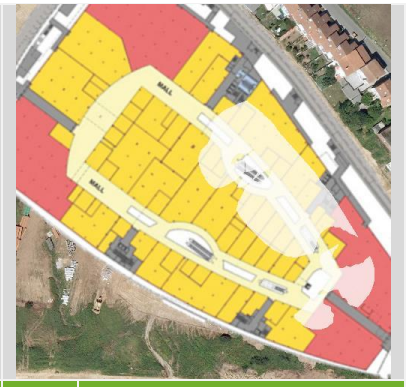
17	24:DE:C6:81:0F:02
Aruba Networks	

18	24:DE:C6:81:0F:A2
Aruba Networks	

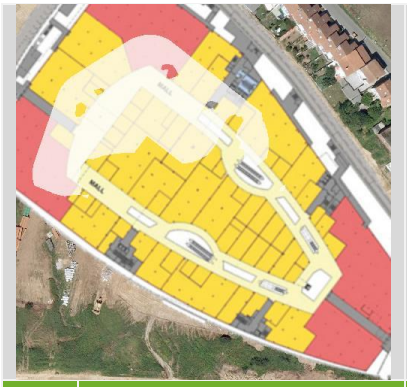
19	24:DE:C6:81:11:62
Aruba Networks	



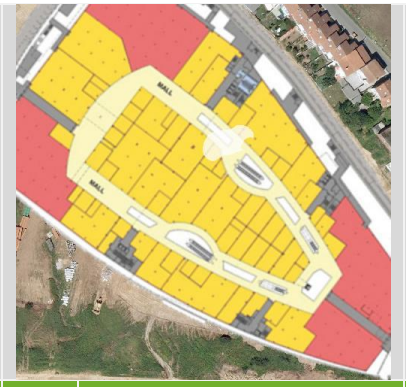
20	24:DE:C6:81:12:12
Aruba Networks	



21	24:DE:C6:81:15:02
Aruba Networks	



22	24:DE:C6:81:1C:32
Aruba Networks	



23	24:DE:C6:81:58:12
Aruba Networks	

24	24:DE:C6:91:AE:52
Aruba Networks	

Data Rate	54	130	216,7

5.2.3.12. CELL DENSITY HEATMAP

The following image shows a heatmap revealing the distribution of all client devices connected to the APs propagating the **AsCancelas** network.

Cell density allows you to spot which zones have the higher number of client devices connected to the network by showing its saturation.
It provides useful information to allow for an even AP distribution according to actual usage.

The graph can't be generated due to the absence of the required data.

5.2.3.13. RETRIES RATE HEATMAP

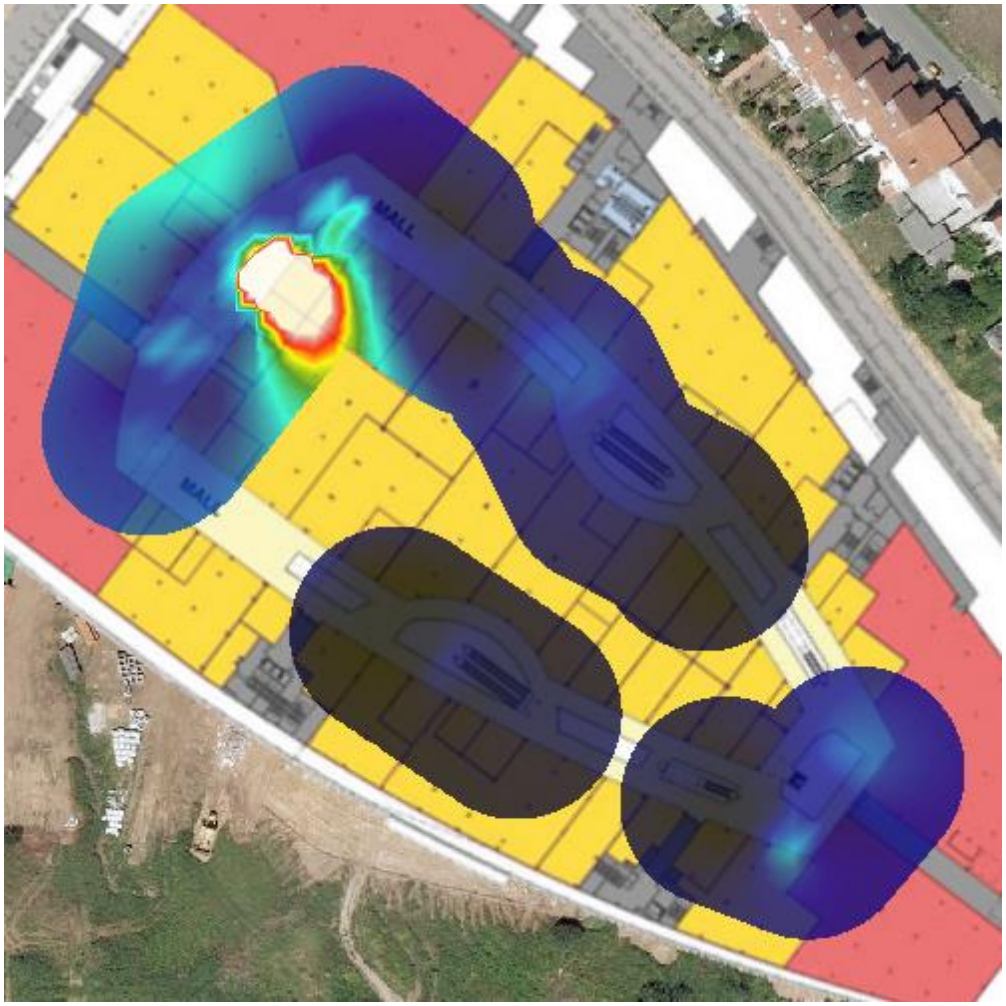
In an ideal Wi-Fi communication, all sent data packets reach their destination. Otherwise, poor transmission, interferences or any other communication problems can cause the dropped packets to be retransmitted for a correct data transmission. The larger the number of retransmitted or forwarded packets, the larger the communication latency will be, resulting in a lower communication quality.

The graph can't be generated due to the absence of the required data.

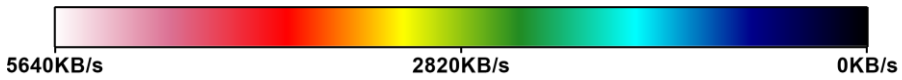
5.2.3.14. BANDWIDTH

Bandwidth indicates the amount of data being transmitted through **AsCancelas** network for each area within the network site range.

Bandwidth is measured in kilobytes per seconds, KB/s (1MB/s=1000KB/s), where a higher value translates as a better network performance.



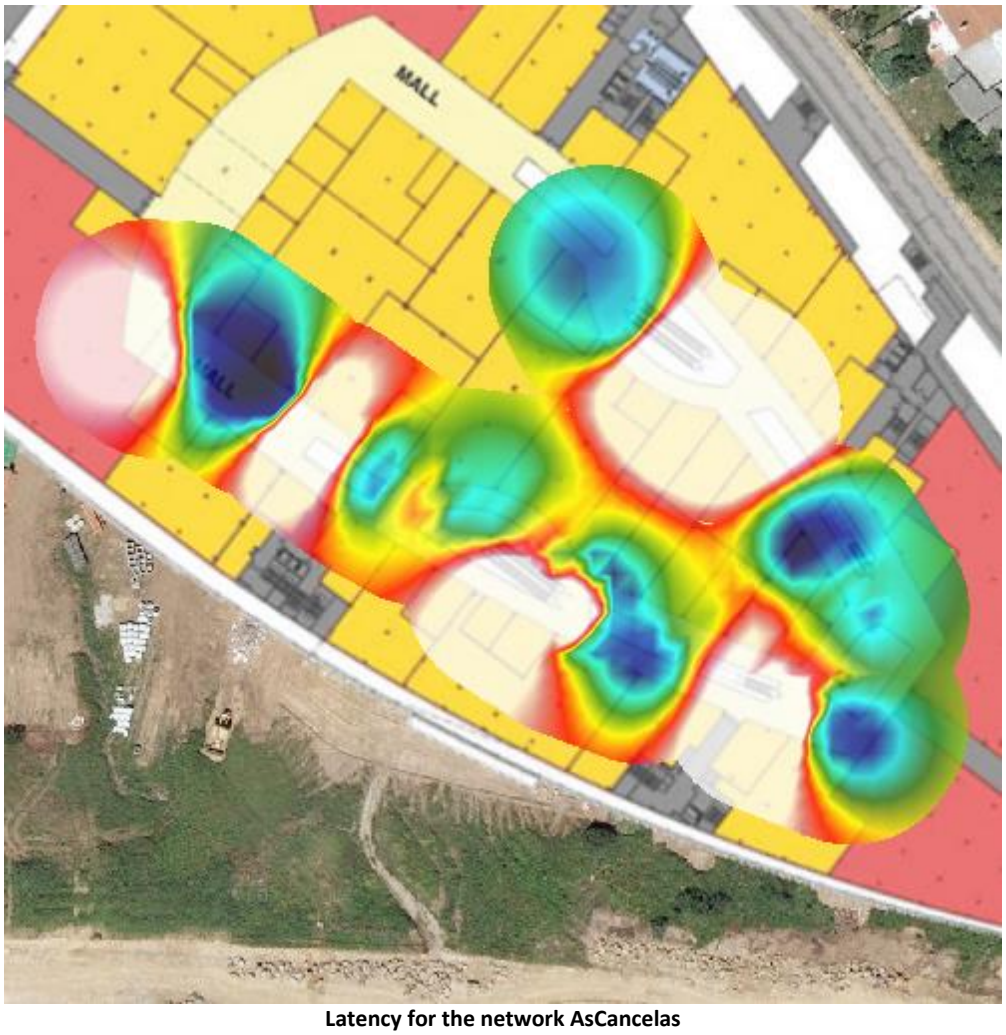
Bandwidth for the network AsCancelas



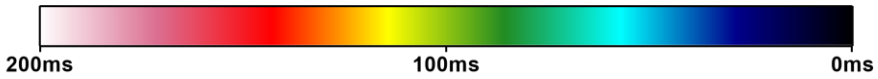
5.2.3.15. LATENCY

Latency indicates the time delay experienced in the data transfer through **AsCancelas** network for each area within the network site range.

When a data packet is sent, it is received by a receiving device that notifies the transmitting device that the packet has been successfully received. Latency is the period from the time a data packet is sent to the time the packet reception confirmation is received. Latency is measured in milliseconds (ms).
The higher the latency, the lowest the network performance will be. High latency values negatively impact real-time application performance, such as video-conferencing and VoIP communications.



Latency for the network AsCancelas



5.2.3.16. PACKET LOSS

In an ideal data communication, all sent data packets reach their destination; otherwise there is a packet loss that negatively impacts the data transmission performance, hence the overall network performance.
When a data packet is lost, if required by the protocol, it should be re-transmitted until a successful reception notification is received. This increases the amount of time necessary for a data unit to be transmitted, reducing the amount of data that can be transmitted per unit of time. The higher this value is, the lower the network performance will be.

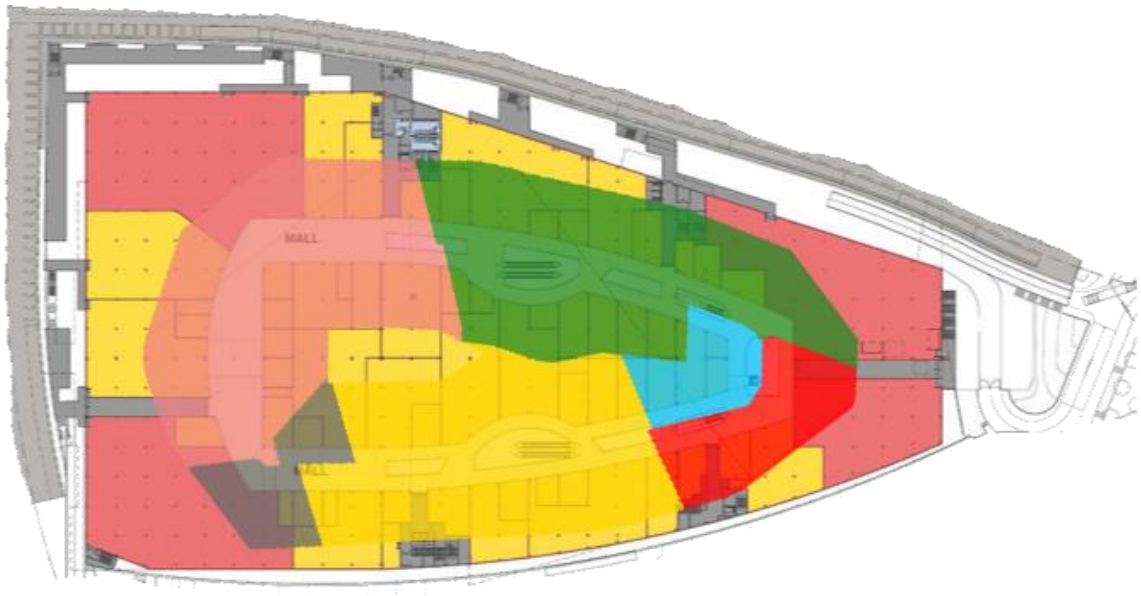
The following image shows the areas where data packet loss is experienced within **AsCancelas** network site range.

The graph can't be generated due to the absence of the required data.

5.2.3.17. ROAMING

Data roaming in a Wi-Fi network infrastructure is the ability of a client device to move around within a multiple access point network's coverage area without disconnections.
To ensure roaming in a multiple access point Wi-Fi network, access points' coverage ranges should overlap.
Accordingly, a moving client device will have continuous network coverage, and based on the device's internal settings and access point configuration, network access will be granted through the different access points across the coverage area.

The following image shows all **AsCancelas** network access points to which the device has been connected to while itinerating.



Roaming for the network AsCancelas

Access Point
04:BD:88:F0:A1:F0
24:DE:C6:81:0F:02

Access Point
24:DE:C6:81:0C:72
24:DE:C6:81:12:12

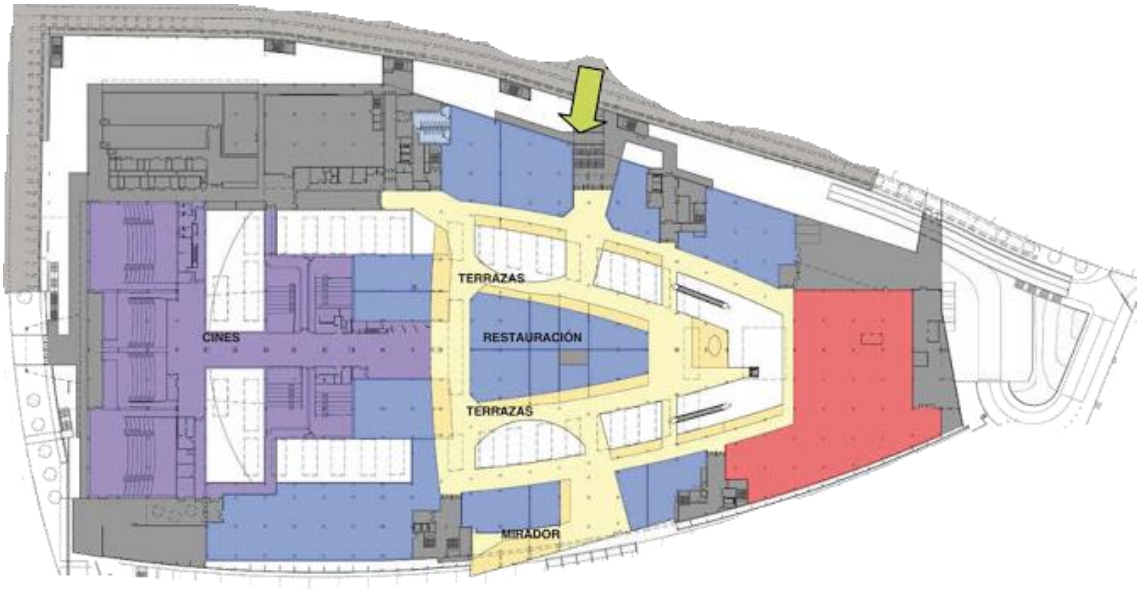
Access Point
24:DE:C6:81:0C:82
24:DE:C6:81:15:02

6. Location Survey: +2 - Cinema

6.1. Location details

Short data related to the **+2 - Cinema** Location

Location Name	**+2 - Cinema**
Description	**Cinema and restaurants**
Selected Scans at this Location	**Scan through restaurants**
	Scan passive + active survey



Blueprint for the location +2 - Cinema

6.1.1. SURVEY ROUTE

The following image shows the path followed at the **+2 - Cinema** location during the site survey, which indicates all locations where data was collected to be later analyzed.

RESTAURACIÓN

6.1.1.1. SCAN THROUGH RESTAURANTS

Survey Route for +2 - Cinema Location - Scan through restaurants

6.1.1.2. SCAN PASSIVE + ACTIVE SURVEY

Survey Route for +2 - Cinema Location - Scan passive + active survey

6.1.2. "+2 - CINEMA" ACCESS POINT POSITION

The following image shows the approximate positions within the **+2 - Cinema** location of all access points identified during the site survey. These positions are manually configured, or otherwise are automatically estimated based on the measured data.

Physical APs Position for +2 - Cinema Location

	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0C:32	AsCancelas	Aruba Networks	12
2	24:DE:C6:81:0B:F2	AsCancelas	Aruba Networks	1
3	24:DE:C6:91:AE:52	AsCancelas	Aruba Networks	11
4	24:DE:C6:81:11:62	AsCancelas	Aruba Networks	10
5	24:DE:C6:81:15:02	AsCancelas	Aruba Networks	13
6	04:BD:88:F0:E1:00	AsCancelas	Aruba Networks	1
7	04:BD:88:F0:D2:C0	AsCancelas	Aruba Networks	1

6.2. Network Survey: AsCancelas

6.2.1. Network Details

6.2.1.1. AP-based Information

The following table contains information related to the **AsCancelas** network, which is organized based on its APs:

- SSID: Network identifier offered by the BSSID.
- BSSID: Associated MAC addresses granting network access.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- Security: Types of authentication and encryption supported by the network.
- Vendor: Device manufacturer.

	SSID	AsCancelas			
	BSSID	Channel	Freq	Security	Vendor
1	04:BD:88:F0:D2:C0	1	2412	Open	Aruba Networks
2	04:BD:88:F0:E1:00	1	2412	Open	Aruba Networks
3	04:BD:88:F0:E1:80	6	2437	Open	Aruba Networks
4	04:BD:88:F1:03:A0	1	2412	Open	Aruba Networks
5	24:DE:C6:81:0B:B2	10	2457	Open	Aruba Networks
6	24:DE:C6:81:0B:F2	10	2457	Open	Aruba Networks
7	24:DE:C6:81:0C:32	1	2412	Open	Aruba Networks
8	24:DE:C6:81:0C:72	5	2432	Open	Aruba Networks
9	24:DE:C6:81:0C:82	4	2427	Open	Aruba Networks
10	24:DE:C6:81:0E:52	4	2427	Open	Aruba Networks
11	24:DE:C6:81:0E:B2	13	2472	Open	Aruba Networks
12	24:DE:C6:81:0F:02	1	2412	Open	Aruba Networks
13	24:DE:C6:81:0F:A2	12	2467	Open	Aruba Networks
14	24:DE:C6:81:11:62	1	2412	Open	Aruba Networks
15	24:DE:C6:81:12:12	5	2432	Open	Aruba Networks
16	24:DE:C6:81:15:02	13	2472	Open	Aruba Networks
17	24:DE:C6:81:1C:32	12	2467	Open	Aruba Networks
18	24:DE:C6:81:58:12	13	2472	Open	Aruba Networks
19	24:DE:C6:91:AE:52	1	2412	Open	Aruba Networks

6.2.1.2. CHANNEL-BASED INFORMATION

The following table contains **AsCancelas** network related information, which is organized based on the transmitting channels/frequencies:

- SSID: Network identifier offered by the BSSID.
- Channel: Identifier of the frequency associated to the network.
- Frequency: Value of the frequency associated to the network.
- BSSID: Associated MAC addresses granting network access.
- Vendor: Device manufacturer.

SSID	ASCANCELAS		
CHANNEL	FREQUENCY	BSSID	VENDOR
1	2412	24:DE:C6:81:0C:32	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:11:62	Aruba Networks
		24:DE:C6:91:AE:52	Aruba Networks
		04:BD:88:F0:D2:C0	Aruba Networks
		04:BD:88:F0:E1:00	Aruba Networks
		04:BD:88:F1:03:A0	Aruba Networks
		24:DE:C6:81:0E:52	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
4	2427	24:DE:C6:81:0C:82	Aruba Networks
		24:DE:C6:81:0E:52	Aruba Networks
		24:DE:C6:81:0C:32	Aruba Networks
5	2432	24:DE:C6:81:0C:72	Aruba Networks
		24:DE:C6:81:12:12	Aruba Networks
6	2437	04:BD:88:F0:E1:80	Aruba Networks
7	2442	24:DE:C6:91:AE:52	Aruba Networks
10	2457	24:DE:C6:81:0B:B2	Aruba Networks
		24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0C:72	Aruba Networks
12	2467	24:DE:C6:81:0F:A2	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:1C:32	Aruba Networks
13	2472	24:DE:C6:81:0E:B2	Aruba Networks
		24:DE:C6:81:15:02	Aruba Networks
		24:DE:C6:81:58:12	Aruba Networks
		24:DE:C6:81:0B:B2	Aruba Networks
		24:DE:C6:81:0B:F2	Aruba Networks
		24:DE:C6:81:0F:02	Aruba Networks
		24:DE:C6:81:0F:A2	Aruba Networks

SSID	AsCancelas		
Channel	Frequency	BSSID	Vendor
		24:DE:C6:81:11:62	Aruba Networks

6.2.1.3. "AsCancelas" Access Point Position

The following image shows the approximate positions of all access points identified during the site survey which are publishing the network **AsCancelas.** These positions are manually configured, or otherwise are automatically estimated based on the measured data.

Physical APs Position for AsCancelas Network

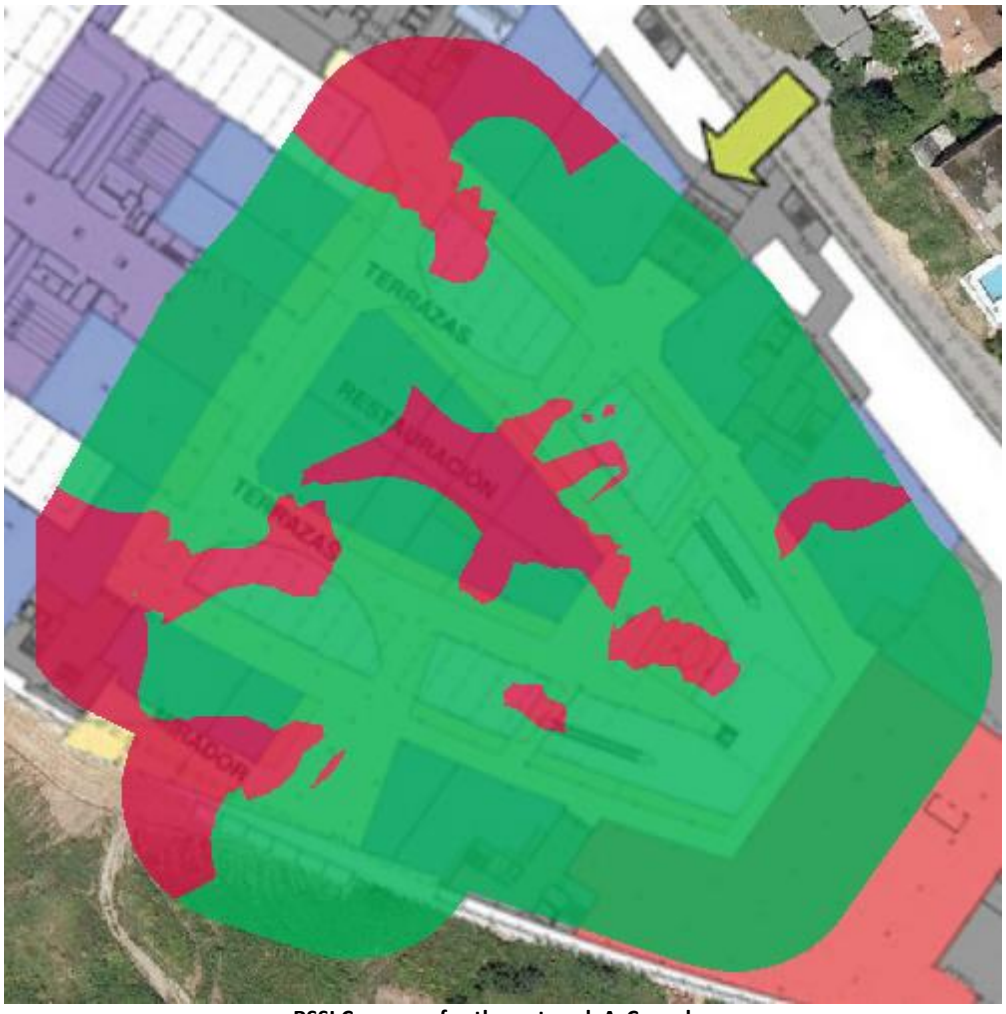
	BSSID	SSID	VENDOR	CHAN
1	24:DE:C6:81:0C:32	AsCancelas	Aruba Networks	12
2	24:DE:C6:81:0B:F2	AsCancelas	Aruba Networks	1
3	24:DE:C6:91:AE:52	AsCancelas	Aruba Networks	11
4	24:DE:C6:81:11:62	AsCancelas	Aruba Networks	10
5	24:DE:C6:81:15:02	AsCancelas	Aruba Networks	13
6	04:BD:88:F0:E1:00	AsCancelas	Aruba Networks	1
7	04:BD:88:F0:D2:C0	AsCancelas	Aruba Networks	1

6.2.2. WiFi Quality

6.2.2.1. Web Browsing WiFi requirements

6.2.2.1.1. RSSI Coverage

The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.

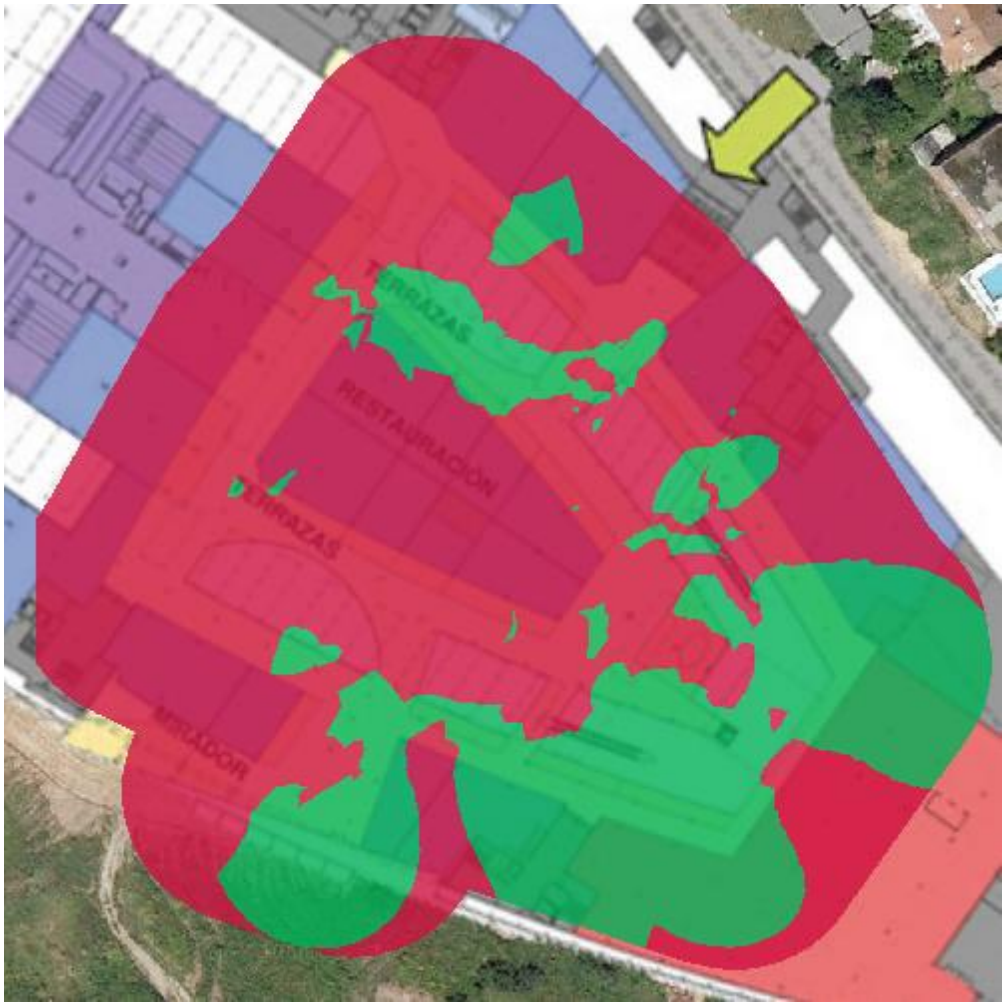


RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
Fail	

6.2.2.1.2. SIMULTANEOUS RSSI COVERAGE

The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.



Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -65 dBm
	Simultaneous APs Required greater than or equal 2 APs
Fail	

6.2.2.1.3. CHANNEL OVERLAP

The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

6.2.2.1.4. Co-Channel Interference

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.

Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

6.2.2.1.5. LATENCY

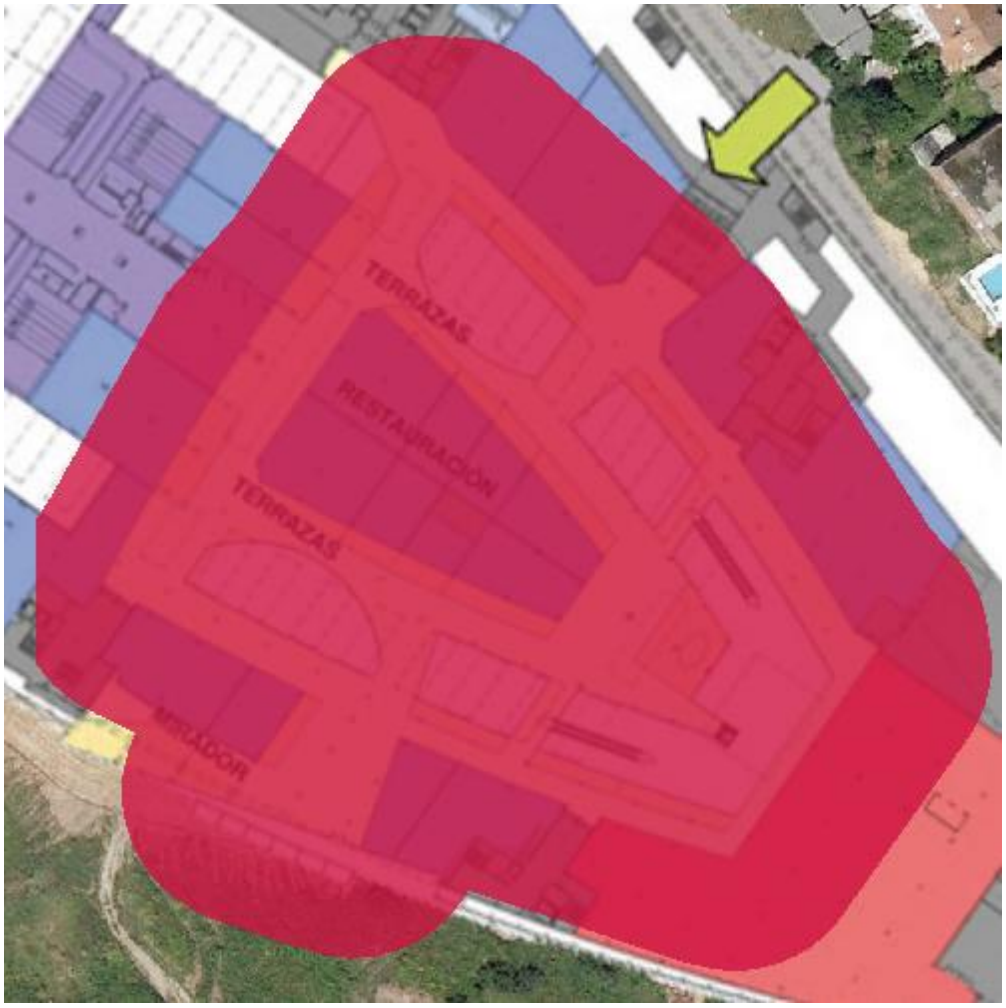
Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

Latency for the network AsCancelas

Pass	Network Latency less than or equal 100ms
Fail	

6.2.2.1.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.



Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 320 kbps
Fail	

6.2.2.1.7. PACKET LOST

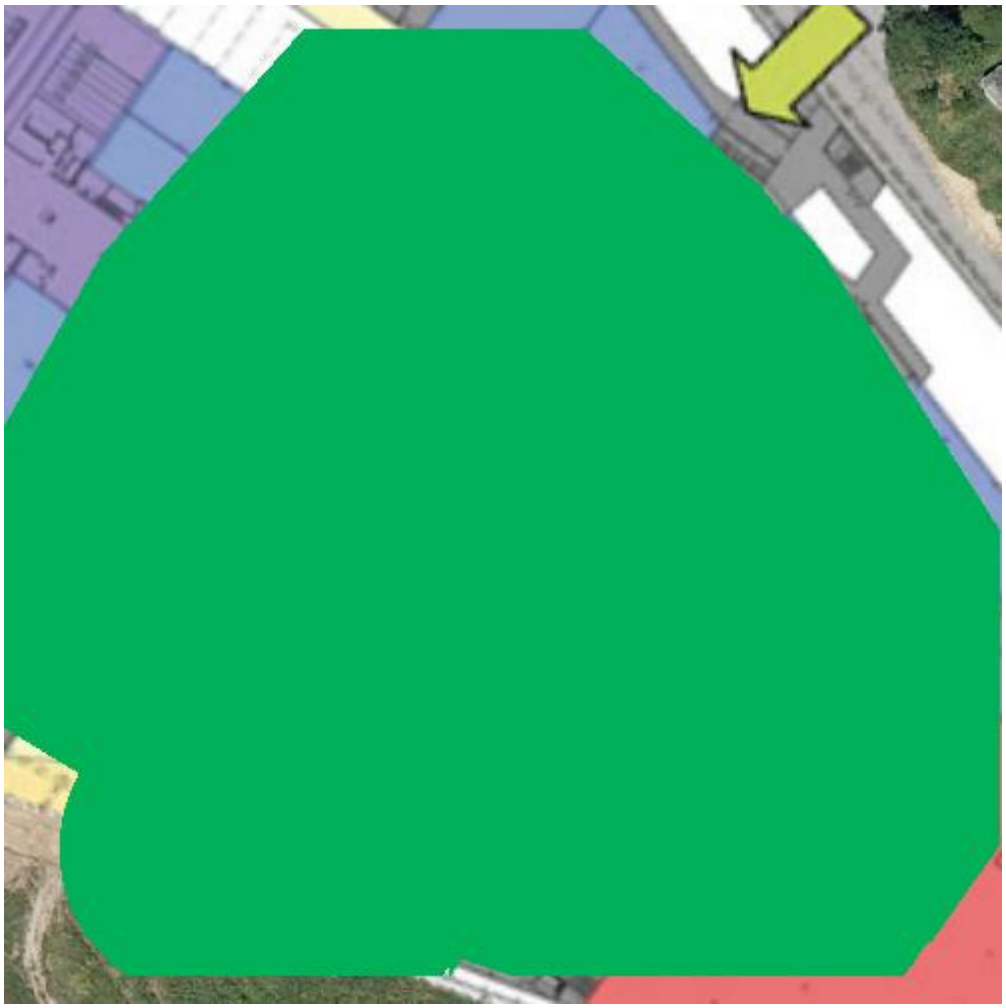
The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.

Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

6.2.2.1.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming



Access Point Roaming for the network AsCancelas

Pass
Fail

6.2.2.2. VoIP over WiFi requirements

6.2.2.2.1. RSSI Coverage

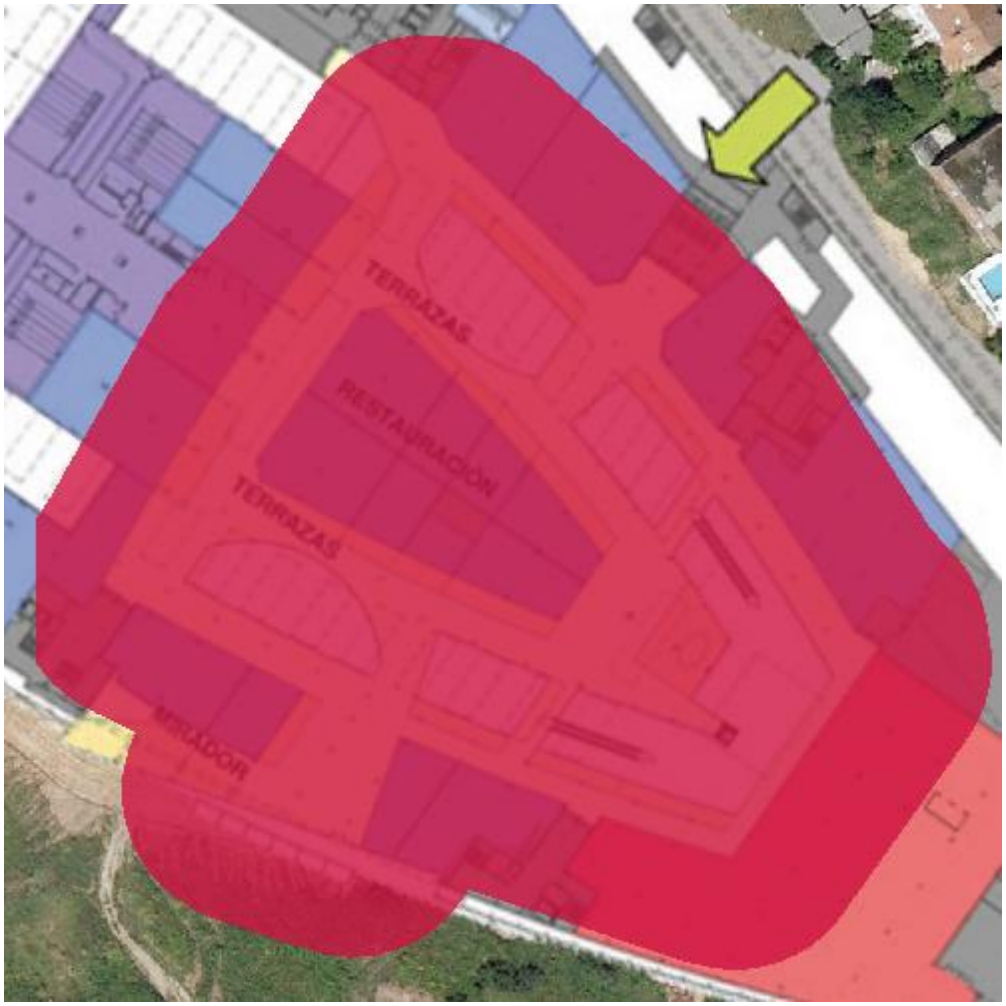
The Rssi Coverage control displays those areas where the signal strength received from any of the selected access points falls below the selected threshold value. Signal strength has a significant impact on the quality of communications. Signal strength is measured in dBm, and ranges from 0 dBm (stronger) to -100 dBm (weaker).
Acceptable values range from 0 to -75 dBm. Proper communication cannot be guaranteed with lower signal strength values.

RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -50 dBm
Fail	

6.2.2.2.2. SIMULTANEOUS RSSI COVERAGE

The Simultaneous AP Coverage control displays those areas where signal strength received by any of the network access points is equal or lower than the predetermined threshold value.
To ensure dependable wireless communications, it is necessary, under certain circumstances, that all the points in the coverage area can access a certain number of access points within the network infrastructure, preventing channel overlapping, with at least a minimum signal strength.



Simultaneous RSSI Coverage for the network AsCancelas

Pass	RSSI Required greater than or equal -45 dBm
	Simultaneous APs Required greater than or equal 5 APs
Fail	

6.2.2.2.3. CHANNEL OVERLAP

The Channel Overlapping control shows those areas where adjacent interference requirements are met.
An AP is considered to have an adjacent interference when some of its transmitted frequencies overlap with another AP transmitting on a different channel over the same band.

Channel Overlap for the network AsCancelas

Pass	AP Overlap less than or equal 0 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

6.2.2.2.4. Co-Channel Interference

This control displays those areas where co-channel interference parameters are met.
An AP is considered to have a co-channel interference when there is another AP transmitting on the same channel.
As a consequence of channel overlap, access points occupy the same radio spectrum, sharing it and using it alternately, so only one AP will be transmitting at a time.
This kind of interferences worsen communications performance because it is necessary to analyse wireless space before transmitting. If one AP is transmitting, others must wait for this to stop before they can transmit. This makes total transmission time to be divided into the number of APs that transmit in the same frequency.

Co-Channel Interference for the network AsCancelas

Pass	Overlapping APs less than or equal 1 APs
	Gap RSSI greater than or equal 20 dBm
Fail	

6.2.2.2.5. LATENCY

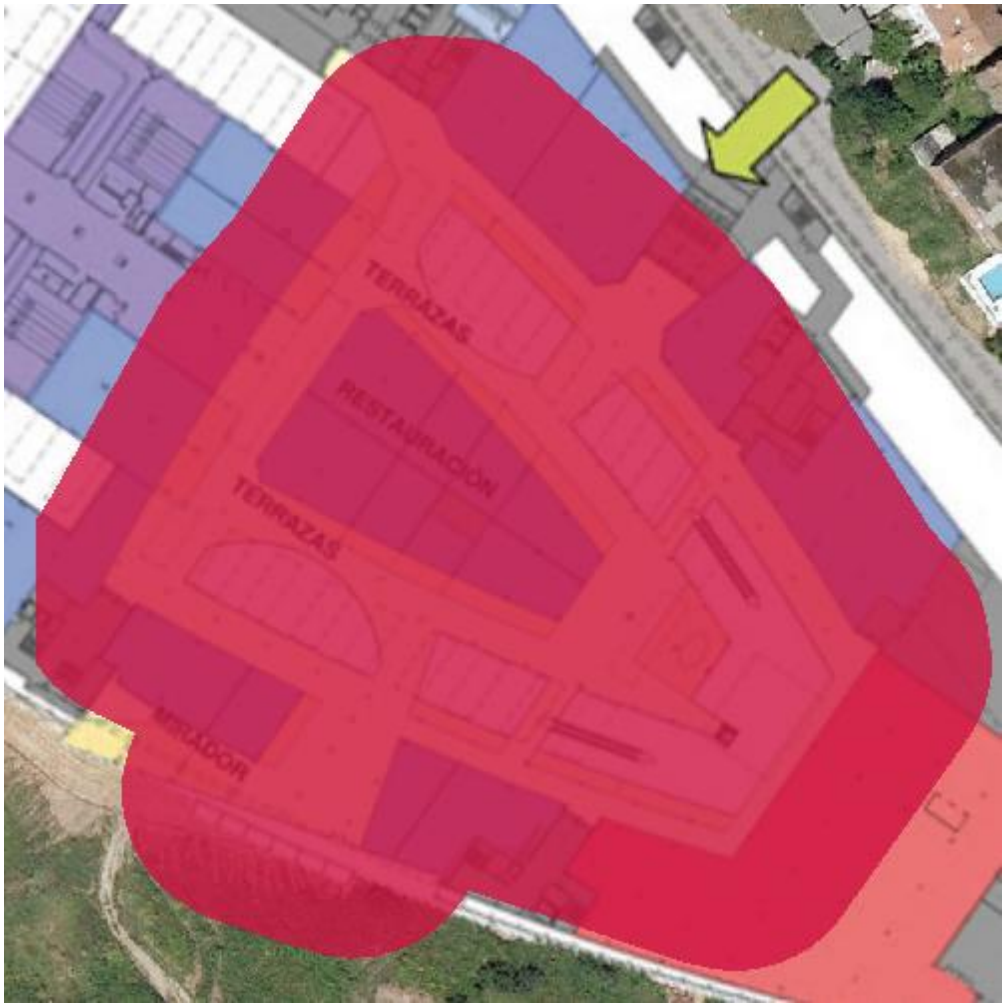
Latency is the time interval between sending a data packet and receiving it back, in this case, latency is the amount of time a packet takes to be transmitted and received back in the wireless space.
Acceptable latency values range from 1-10ms.

Latency for the network AsCancelas

Pass	Network Latency less than or equal 256ms
Fail	

6.2.2.2.6. BANDWIDTH

The Bandwidth control ensures that minimum bandwidth quality requirements for the connection established by the active survey are met throughout the coverage area.



Bandwidth for the network AsCancelas

Pass	Bandwidth greater than or equal 5000 kbps
Fail	

6.2.2.2.7. PACKET LOST

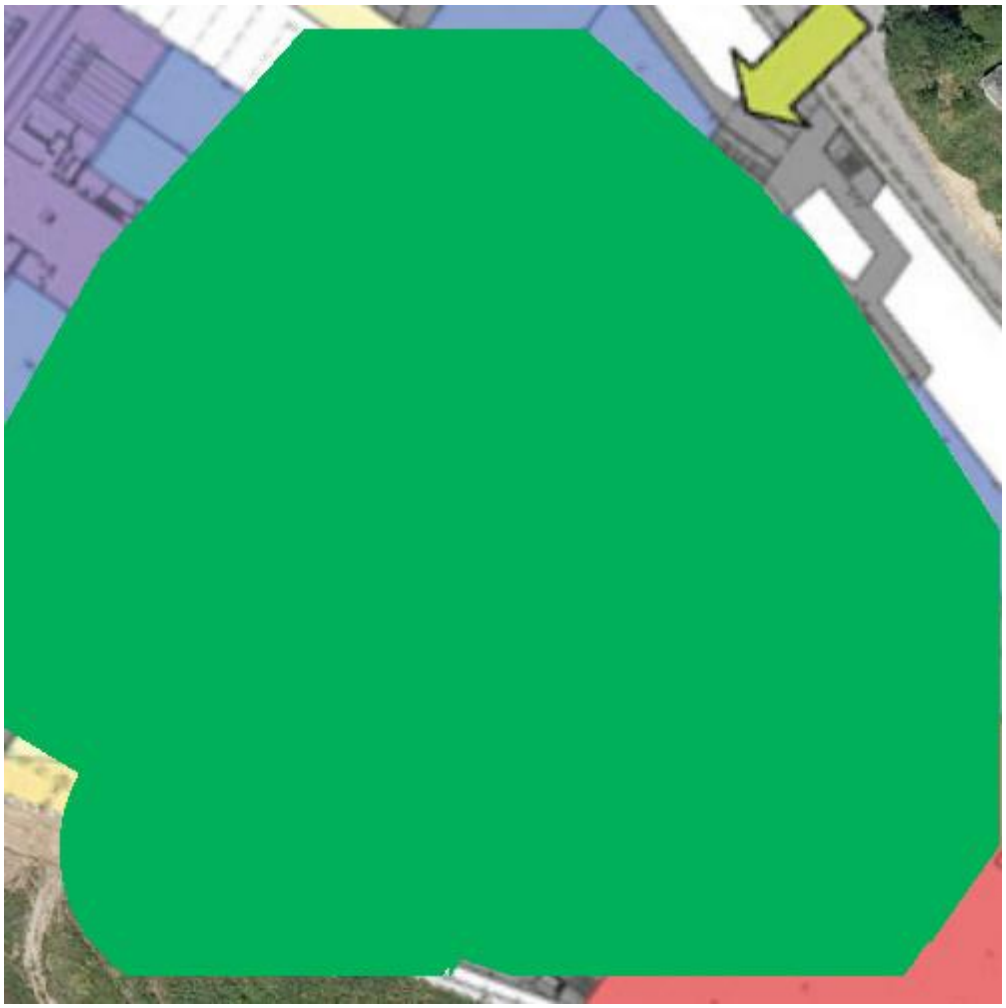
The packet loss rate is the percentage of packets that are lost, in other words, that do not reach their destination at the time of establishing communication, and that are (usually) retransmitted.
Packet loss has a negative impact on network performance. When a packet does not reach its destination, packet retransmission is usually requested by the recipient to keep communication flowing normally.
Packet loss rates of under 10% are acceptable and will have a negligible impact on network performance in most cases.

Packet Lost for the network AsCancelas

Pass	Ratio Lost less than or equal 25%
Fail	

6.2.2.2.8. ACCESS POINT ROAMING

The Roaming control shows those areas where Roaming is required by extending network coverage through many different access points. In a wireless infrastructure, multiple access points are deployed to provide coverage throughout the desired area.
Roaming allows moving devices to maintain wireless communication by connecting to new access points within the same network to maintain the quality of communication and prevent degradation of signal strength. This service is called Roaming



Access Point Roaming for the network AsCancelas

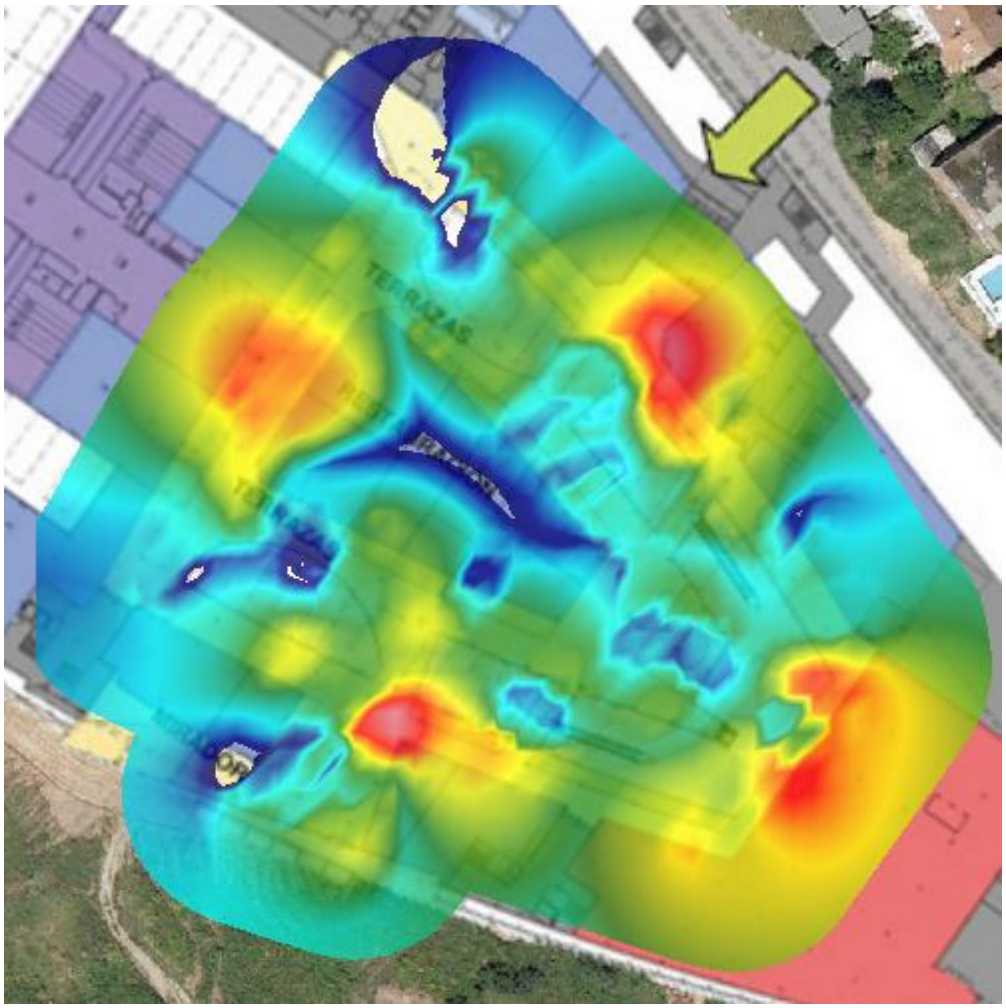
Pass
Fail

6.2.3. SURVEY

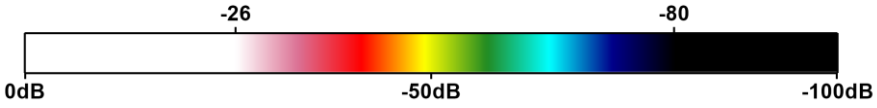
6.2.3.1. RSSI HEATMAP

Signal Strength translates as how efficiently the network is reaching the surveyed area, indicating how the **AsCancelas** network is received at each location.

Signal strength values range from 0 db to -100db, being -100db the worse performance. The color scheme is shown below the image.



Signal Strength Heatmap for AsCancelas Network

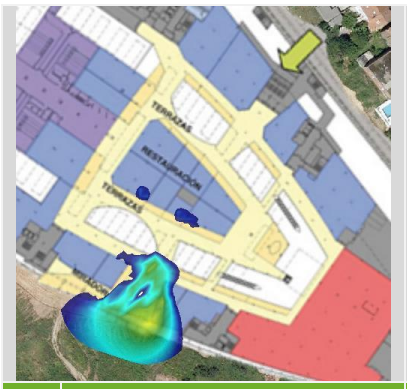
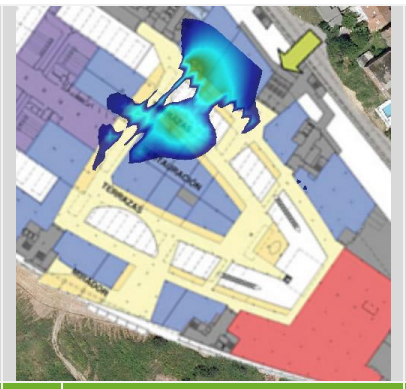
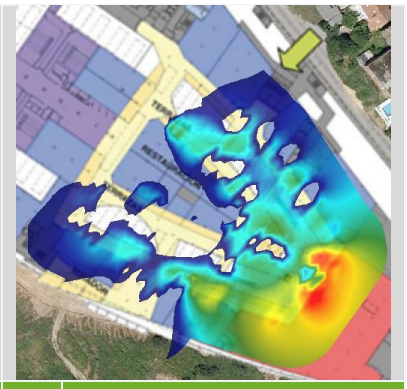
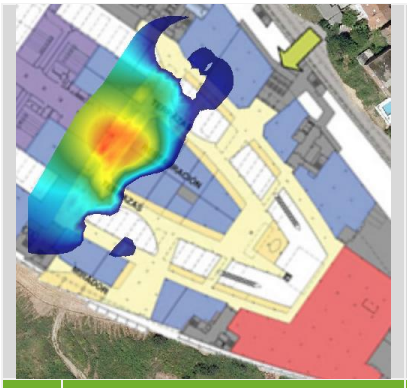
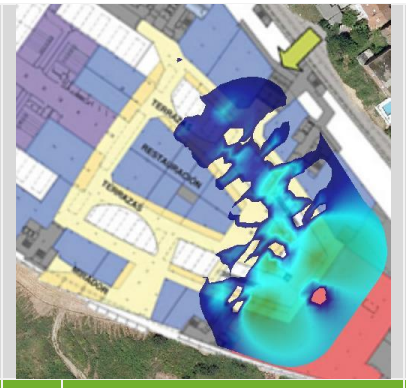


Network coverage area*	7730 m2

*This information indicates the network coverage area at a signal strength of at least:-75

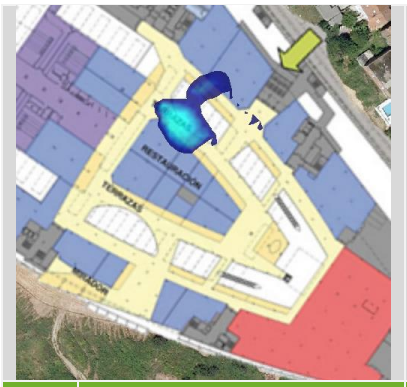
6.2.3.2. RSSI DETAILED BY AP

The following table contains a tile view of all BSSIDs associated to the **AsCancelas** network, along with its signal strength heatmap, associated covered area, and device manufacturer.

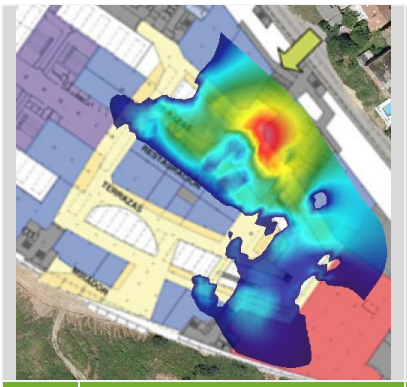
		No Signal Strength data over RSSI = -75
1 **04:BD:88:F0:D2:C0**	2 **04:BD:88:F0:E1:00**	3 **04:BD:88:F0:E1:80**
Coverage area: 1295 m2	Coverage area: 1461 m2	Coverage area: 0 m2
Aruba Networks	Aruba Networks	Aruba Networks
No Signal Strength data over RSSI = -75		
4 **04:BD:88:F1:03:A0**	5 **24:DE:C6:81:0B:B2**	6 **24:DE:C6:81:0B:F2**
Coverage area: 0 m2	Coverage area: 1625 m2	Coverage area: 6008 m2
Aruba Networks	Aruba Networks	Aruba Networks
		
7 **24:DE:C6:81:0C:32**	8 **24:DE:C6:81:0C:72**	9 **24:DE:C6:81:0C:82**

Coverage area: 2382 m2	Coverage area: 4225 m2	Coverage area: 49 m2
Aruba Networks	Aruba Networks	Aruba Networks

10	24:DE:C6:81:0E:52	11	24:DE:C6:81:0E:B2	12	24:DE:C6:81:0F:02
Coverage area: 1183 m2		Coverage area: 713 m2		Coverage area: 1657 m2	
Aruba Networks		Aruba Networks		Aruba Networks	



13	24:DE:C6:81:0F:A2	14	24:DE:C6:81:11:62	15	24:DE:C6:81:12:12
Coverage area: 464 m2		Coverage area: 5079 m2		Coverage area: 28 m2	
Aruba Networks		Aruba Networks		Aruba Networks	



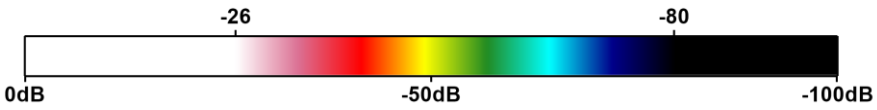
No Signal Strength data over RSSI = -75

No Signal Strength data over RSSI = -75

16	24:DE:C6:81:15:02	17	24:DE:C6:81:1C:32	18	24:DE:C6:81:58:12
Coverage area: 5026 m2		Coverage area: 0 m2		Coverage area: 0 m2	

Aruba Networks	Aruba Networks	Aruba Networks

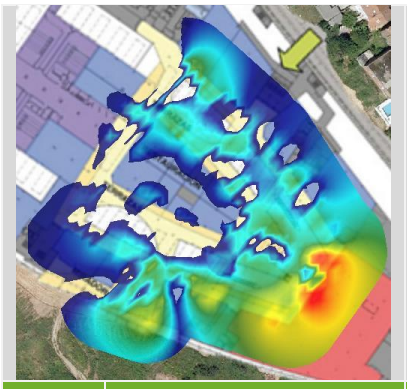
19	**24:DE:C6:91:AE:52**
Coverage area: 16 m2	
Aruba Networks	



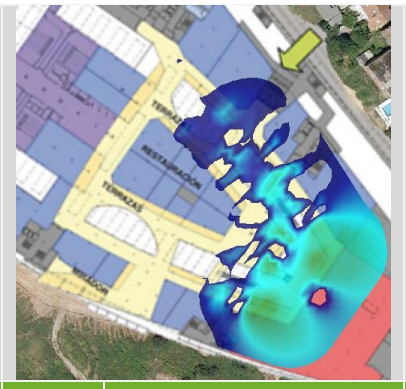
6.2.3.3. RSSI DETAILED BY CHANNEL

The following table contains a tile view of all operative channels on the **AsCancelas** network.

The graph shows the signal strength heatmap, and the coverage area associated with this network on that channel.



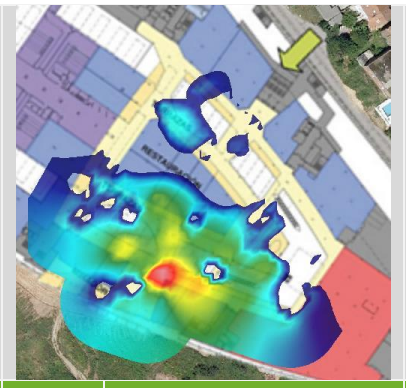
1	**Channel 1**
Coverage area: 7860 m2	



2	**Channel 4**
Coverage area: 4028 m2	

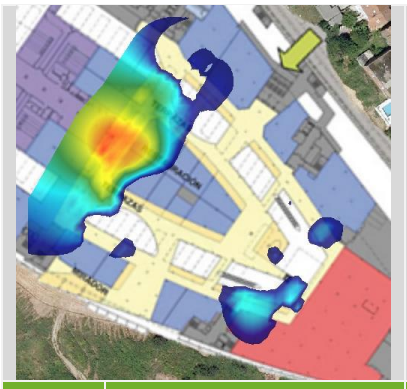
3	**Channel 6**
Coverage area: 0 m2	

4	**Channel 8**
Coverage area: 1692 m2	

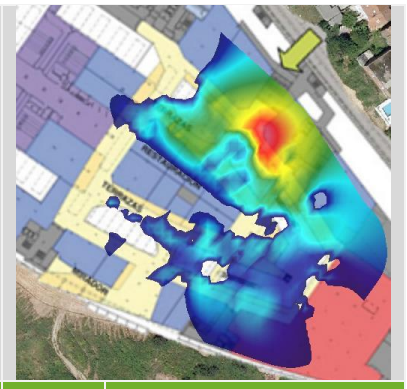


5	**Channel 10**
Coverage area: 4988 m2	

6	**Channel 11**
Coverage area: 16 m2	

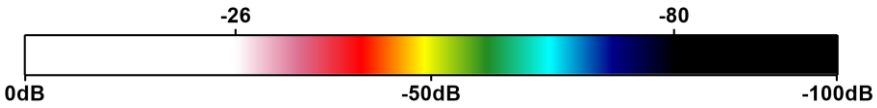


7	**Channel 12**



8	**Channel 13**

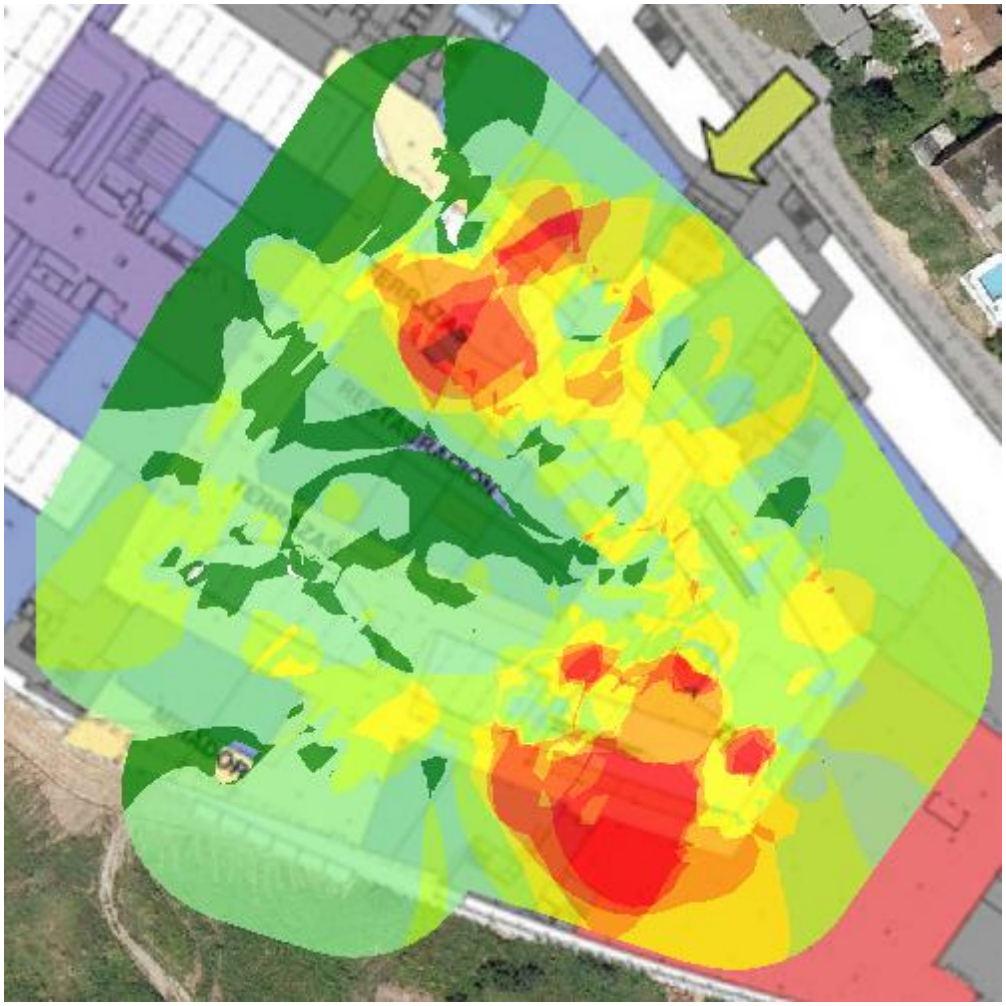
Coverage area: 2968 m2	Coverage area: 5277 m2



6.2.3.4. NUMBER OF APS

The following image shows the number of access points granting access to the **AsCancelas** network that were detected within the surveyed area.

The graph reveals the existing signal overlapping from the different access points granting access to the same network.



Number of APs for AsCancelas Network

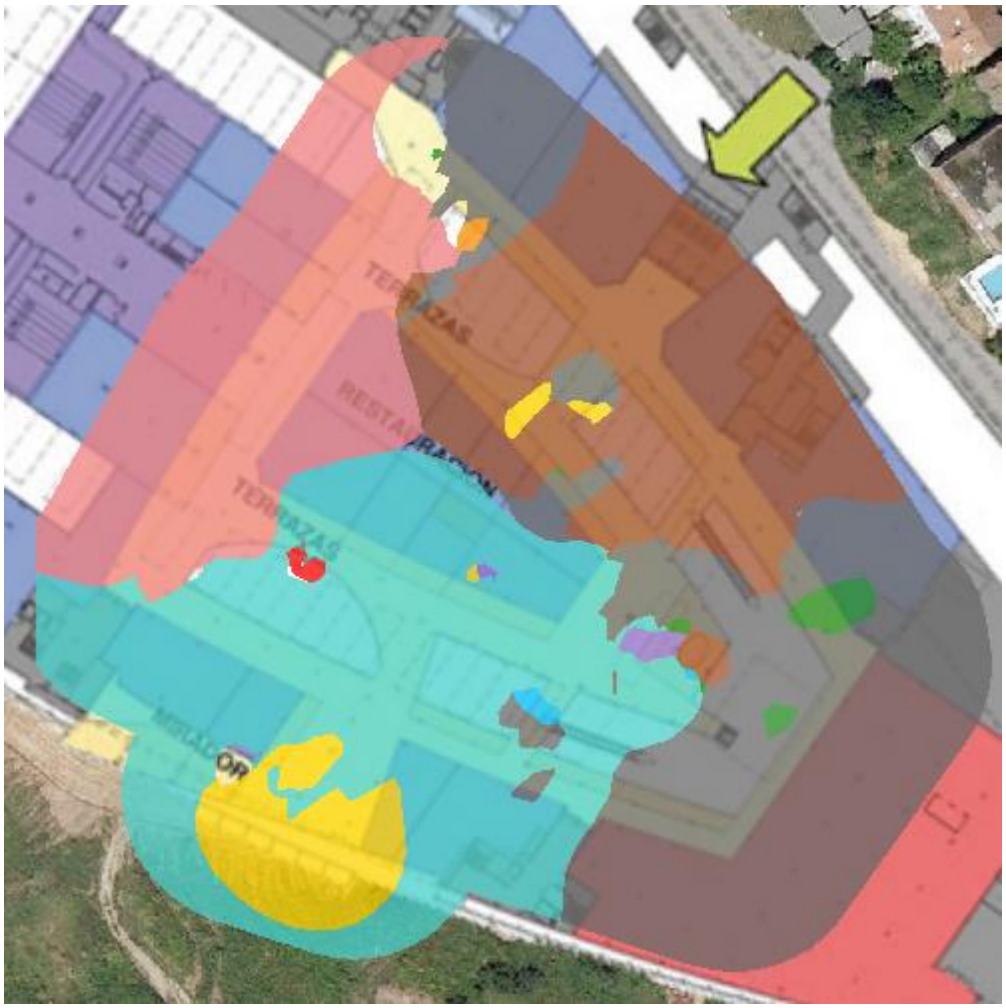
Number of APs	1	2	3	4	5	6	7	8	9	10

6.2.3.5. AP COVERAGE

The following image shows the color coded coverage of every AP propagating the **AsCancelas** network.

If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

Using this graph, you will be able to analyze the appropriate coverage distribution.



AP Coverage for AsCancelas Network

Access Point
04:BD:88:F0:D2:C0
04:BD:88:F1:03:A0
24:DE:C6:81:0C:32
24:DE:C6:81:0E:52
24:DE:C6:81:0F:A2
24:DE:C6:81:15:02
24:DE:C6:91:AE:52

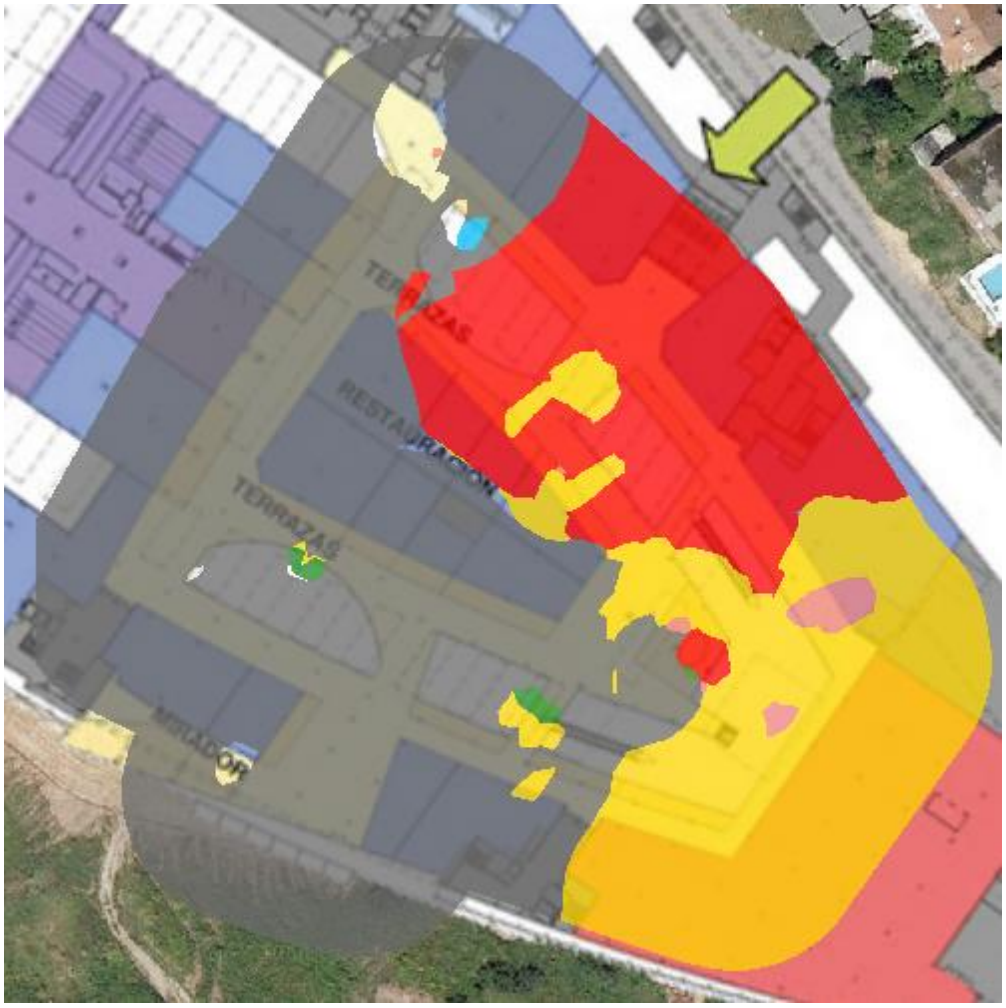
Access Point
04:BD:88:F0:E1:00
24:DE:C6:81:0B:B2
24:DE:C6:81:0C:72
24:DE:C6:81:0E:B2
24:DE:C6:81:11:62
24:DE:C6:81:1C:32

Access Point
04:BD:88:F0:E1:80
24:DE:C6:81:0B:F2
24:DE:C6:81:0C:82
24:DE:C6:81:0F:02
24:DE:C6:81:12:12
24:DE:C6:81:58:12

6.2.3.6. CHANNEL COVERAGE

The following image shows the coverage range for every channel in the **AsCancelas** network.

If coverage from two or more channels overlap throughout the surveyed area, then the stronger signal channel is display.

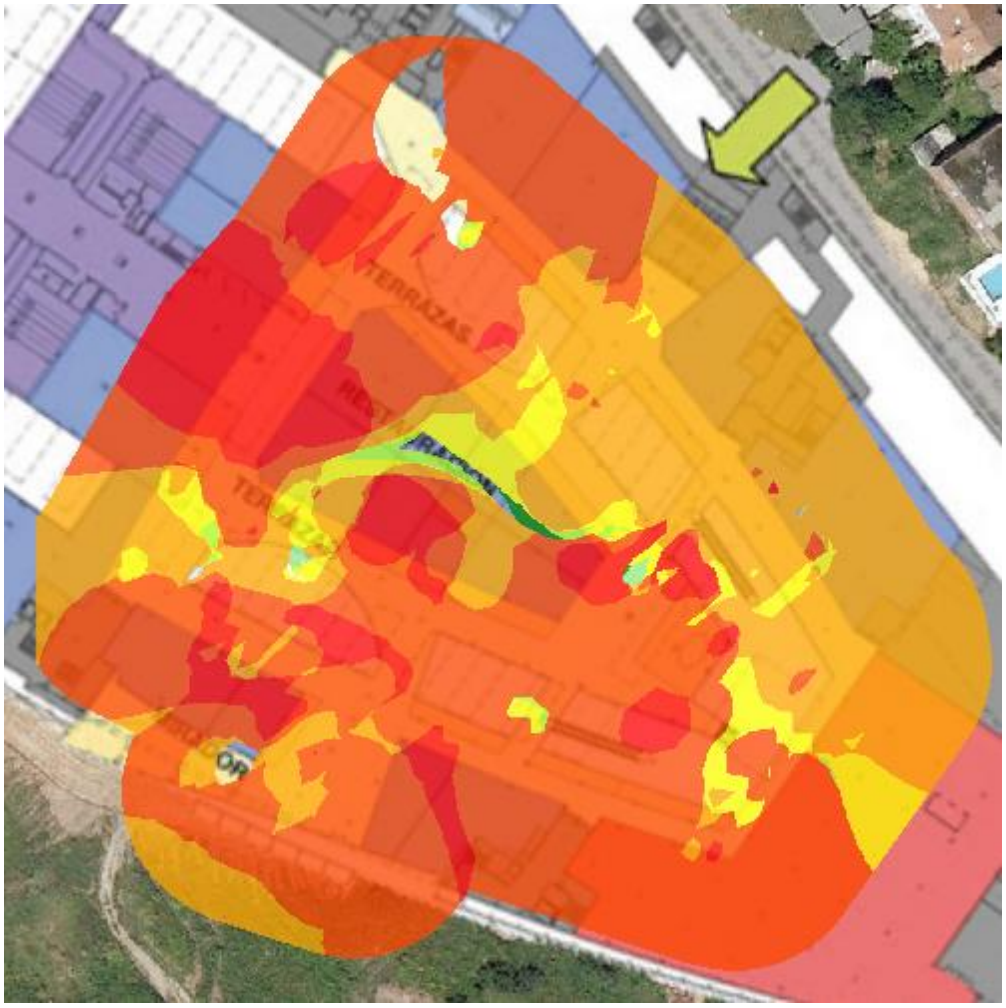


Channel Coverage for AsCancelas Network.

Channel	1	4	5	6	10	12	13

6.2.3.7. CHANNEL OVERLAP

The following image shows the coverage area for each operative channel on the **AsCancelas** network, and the signal overlapping between two or more channels throughout the surveyed area.

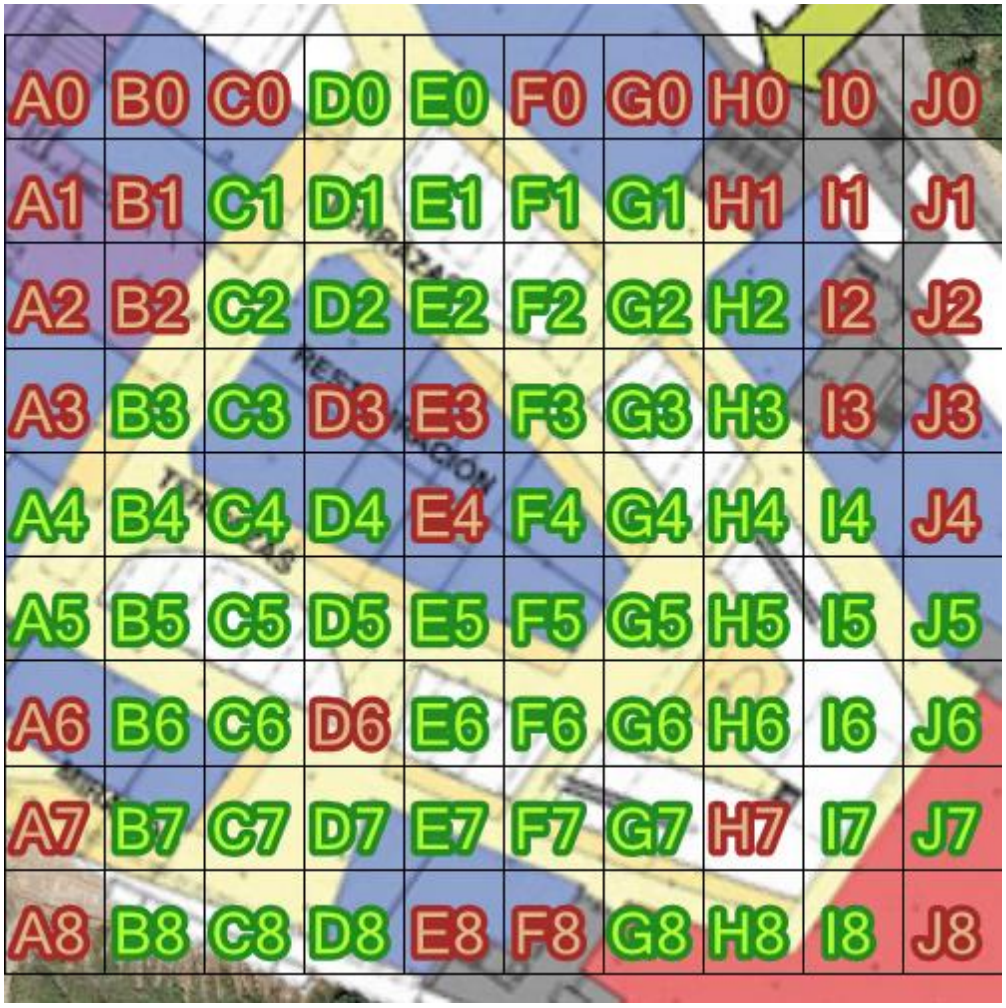


Channel Overlap for AsCancelas Network

Channel	1	2	3	4	5	6	7	8	9	10

6.2.3.8. DETAILED GRID

In the following image, the blueprint associated to the surveyed area is divided into quadrants. Each quadrant shows the collected information in that grid.



Detailed Grid for AsCancelas Location

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
D0	6	-49	-73	AsCancelas	9	216,7
E0	16	-47	-72	AsCancelas	10	216,7
F0	1	-65	-70	AsCancelas	5	216,7
C1	3	-56	-65	AsCancelas	4	216,7
D1	24	-49	-72	AsCancelas	13	216,7
E1	1	-68	-86	AsCancelas	3	130
F1	14	-52	-72	AsCancelas	12	216,7
G1	4	-48	-75	AsCancelas	10	216,7
C2	27	-41	-69	AsCancelas	11	216,7
D2	12	-52	-71	AsCancelas	10	216,7
E2	23	-52	-71	AsCancelas	11	216,7
F2	4	-53	-72	AsCancelas	9	216,7
G2	32	-32	-73	AsCancelas	14	216,7
H2	4	-32	-64	AsCancelas	7	130
B3	18	-39	-72	AsCancelas	12	216,7
C3	14	-44	-69	AsCancelas	8	216,7
F3	19	-55	-72	AsCancelas	11	216,7
G3	2	-62	-72	AsCancelas	6	130
H3	13	-39	-67	AsCancelas	11	216,7
A4	5	-62	-74	AsCancelas	8	216,7
B4	20	-45	-73	AsCancelas	9	216,7
C4	14	-57	-75	AsCancelas	11	216,7
D4	3	-51	-69	AsCancelas	6	216,7
G4	8	-55	-73	AsCancelas	10	130
H4	12	-46	-72	AsCancelas	11	130
I4	9	-54	-69	AsCancelas	8	216,7
A5	14	-63	-73	AsCancelas	7	216,7
B5	5	-62	-74	AsCancelas	7	216,7
C5	2	-57	-73	AsCancelas	5	130
D5	13	-49	-70	AsCancelas	7	216,7
E5	12	-48	-71	AsCancelas	10	216,7
F5	3	-58	-70	AsCancelas	8	216,7
G5	10	-58	-73	AsCancelas	10	216,7
H5	7	-53	-73	AsCancelas	8	130
I5	8	-56	-71	AsCancelas	11	216,7
J5	6	-57	-72	AsCancelas	9	130
B6	8	-58	-75	AsCancelas	8	216,7
C6	15	-48	-69	AsCancelas	9	216,7

	Survey Points	Best RSSI	Avg RSSI	Networks (SSIDs)	APs	Data Rate (Max)
E6	2	-54	-69	AsCancelas	5	130
F6	22	-53	-72	AsCancelas	11	216,7
G6	18	-54	-70	AsCancelas	9	130
H6	5	-55	-70	AsCancelas	8	130
I6	1	-49	-74	AsCancelas	8	130
J6	14	-38	-69	AsCancelas	10	216,7
B7	2	-76	-86	AsCancelas	2	130
C7	14	-47	-69	AsCancelas	7	216,7
D7	22	-29	-68	AsCancelas	9	216,7
E7	11	-45	-72	AsCancelas	10	216,7
F7	14	-45	-70	AsCancelas	10	130
G7	3	-56	-74	AsCancelas	9	130
I7	15	-35	-69	AsCancelas	11	216,7
J7	1	-46	-68	AsCancelas	7	216,7
B8	2	-54	-72	AsCancelas	3	216,7
C8	16	-52	-73	AsCancelas	7	216,7
D8	5	-48	-71	AsCancelas	7	216,7
G8	11	-53	-68	AsCancelas	10	130
H8	14	-46	-71	AsCancelas	11	216,7
I8	4	-47	-67	AsCancelas	9	130

6.2.3.9. SNR HEATMAP

The following image shows the **AsCancelas** network's signal-to-noise ratio throughout the surveyed area.

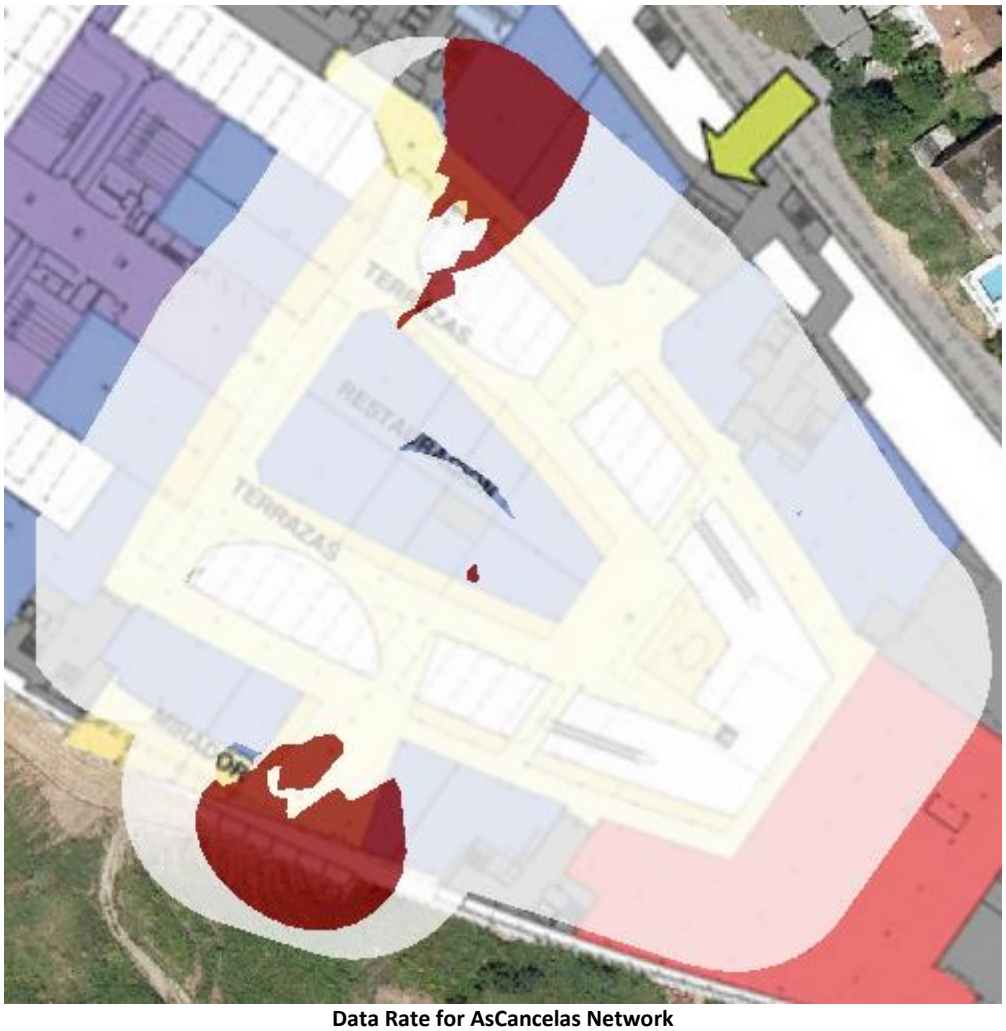
Signal-to-noise ratio measures the ratio between the Wi-Fi network signal strength and the background noise. Higher noise levels will result in a larger negative impact on communications. This parameter offers valuable information on the effectiveness of communications.
These values range from 0 to 100, being 100 the best possible communication quality.

The graph can't be generated due to the absence of the required data.

6.2.3.10. DATA RATE HEATMAP

The following image shows the area covered by the APs based on their data transfer rates for the **AsCancelas** network throughout the surveyed area.

Data rate helps determine the maximum data transmission speed among the wireless devices connected to a Wi-Fi network.
This value allows you to establish how consistent a network is when transmitting data across the coverage area, and helps you find those areas where these values greatly differ or the network performance significantly decreases.



Data Rate for AsCancelas Network

	Data Rate
	130

	Data Rate
	216,7

6.2.3.11. DATA RATE DETAILED

The following table shows a tile view of all BSSIDs associated with the **AsCancelas** network, together with the graph indicating the covered area and the maximum supported data transfer rate speed.

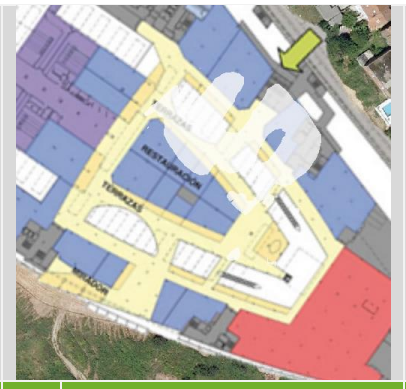
Data rate helps determine the maximum data transmission speed between the wireless devices connected to a Wi-Fi network.
It allows you to determine how efficiently a network transmits data throughout a certain area, and if there are blind zones where reduced network performance is observed.

1	04:BD:88:F0:D2:C0
Aruba Networks	

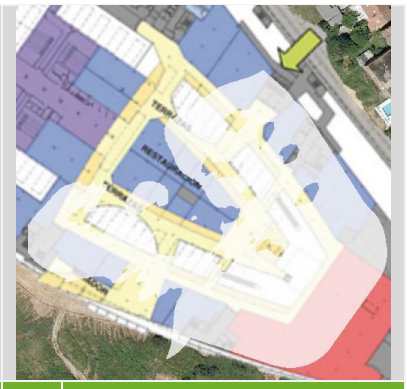
2	04:BD:88:F0:E1:00
Aruba Networks	

3	04:BD:88:F0:E1:80
Aruba Networks	

4	04:BD:88:F1:03:A0
Aruba Networks	

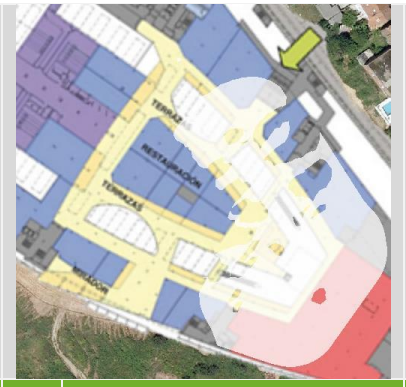


5	24:DE:C6:81:0B:B2
Aruba Networks	



6	24:DE:C6:81:0B:F2
Aruba Networks	

7	24:DE:C6:81:0C:32
Aruba Networks	



8	24:DE:C6:81:0C:72
Aruba Networks	

9	24:DE:C6:81:0C:82
Aruba Networks	

10	24:DE:C6:81:0E:52
Aruba Networks	

11	24:DE:C6:81:0E:B2
Aruba Networks	

12	24:DE:C6:81:0F:02
Aruba Networks	

13	24:DE:C6:81:0F:A2
Aruba Networks	

14	24:DE:C6:81:11:62
Aruba Networks	

15	24:DE:C6:81:12:12
Aruba Networks	

16	24:DE:C6:81:15:02
Aruba Networks	

17	24:DE:C6:81:1C:32
Aruba Networks	

18	24:DE:C6:81:58:12
Aruba Networks	

19	24:DE:C6:91:AE:52
Aruba Networks	

Data Rate	130	216,7

6.2.3.12. CELL DENSITY HEATMAP

The following image shows a heatmap revealing the distribution of all client devices connected to the APs propagating the **AsCancelas** network.

Cell density allows you to spot which zones have the higher number of client devices connected to the network by showing its saturation.
It provides useful information to allow for an even AP distribution according to actual usage.

The graph can't be generated due to the absence of the required data.

6.2.3.13. RETRIES RATE HEATMAP

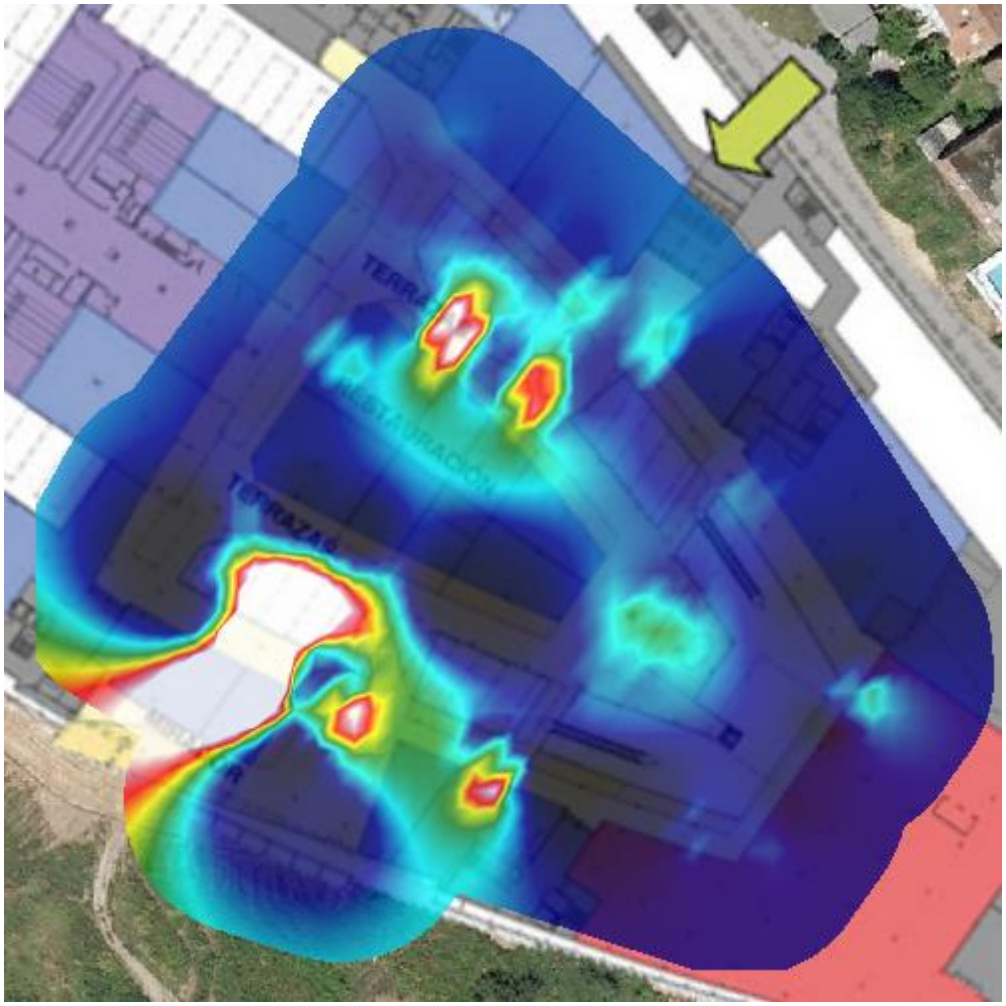
In an ideal Wi-Fi communication, all sent data packets reach their destination. Otherwise, poor transmission, interferences or any other communication problems can cause the dropped packets to be retransmitted for a correct data transmission. The larger the number of retransmitted or forwarded packets, the larger the communication latency will be, resulting in a lower communication quality.

The graph can't be generated due to the absence of the required data.

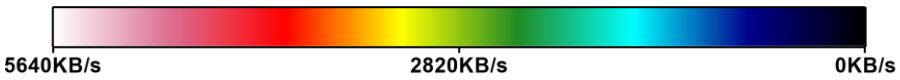
6.2.3.14. BANDWIDTH

Bandwidth indicates the amount of data being transmitted through **AsCancelas** network for each area within the network site range.

Bandwidth is measured in kilobytes per seconds, KB/s (1MB/s=1000KB/s), where a higher value translates as a better network performance.



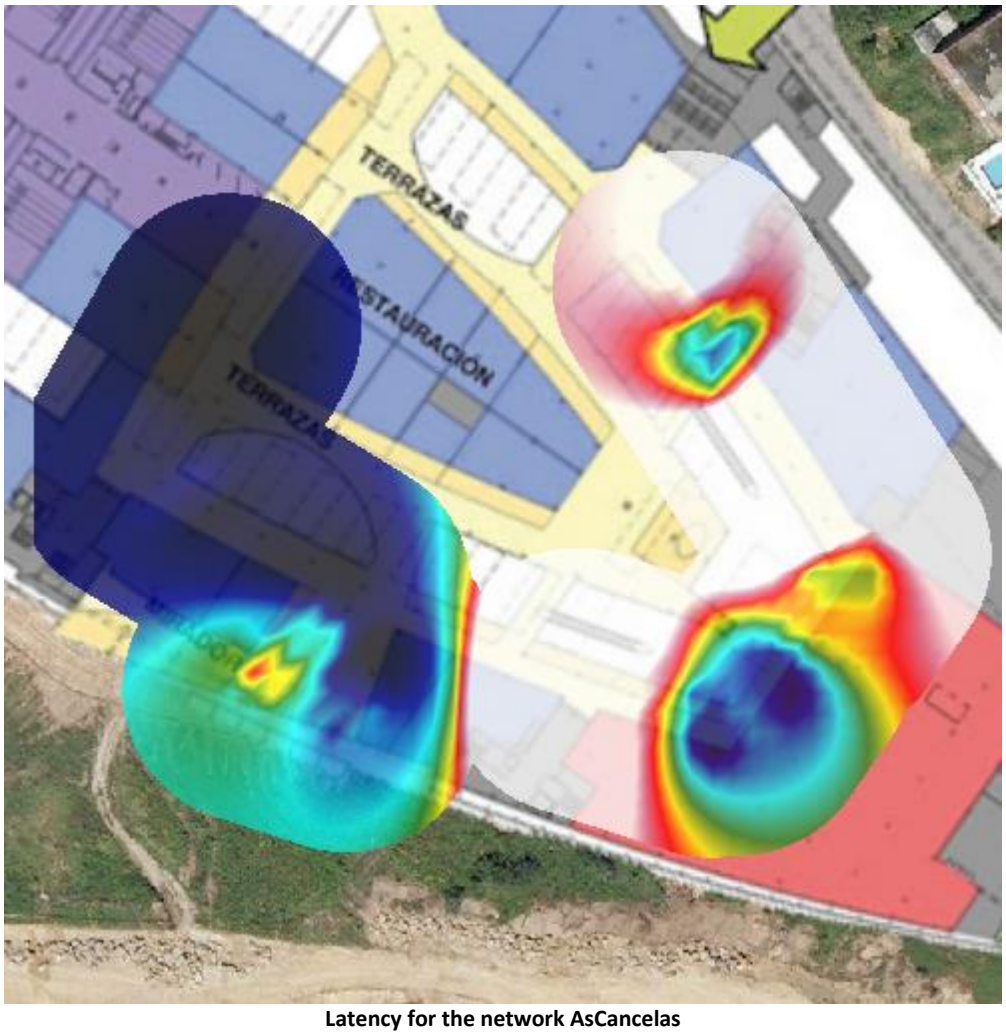
Bandwidth for the network AsCancelas



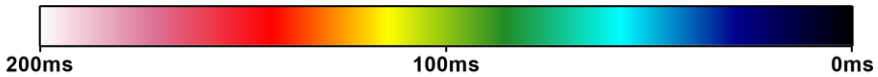
6.2.3.15. LATENCY

Latency indicates the time delay experienced in the data transfer through **AsCancelas** network for each area within the network site range.

When a data packet is sent, it is received by a receiving device that notifies the transmitting device that the packet has been successfully received. Latency is the period from the time a data packet is sent to the time the packet reception confirmation is received. Latency is measured in milliseconds (ms).
The higher the latency, the lowest the network performance will be. High latency values negatively impact real-time application performance, such as video-conferencing and VoIP communications.



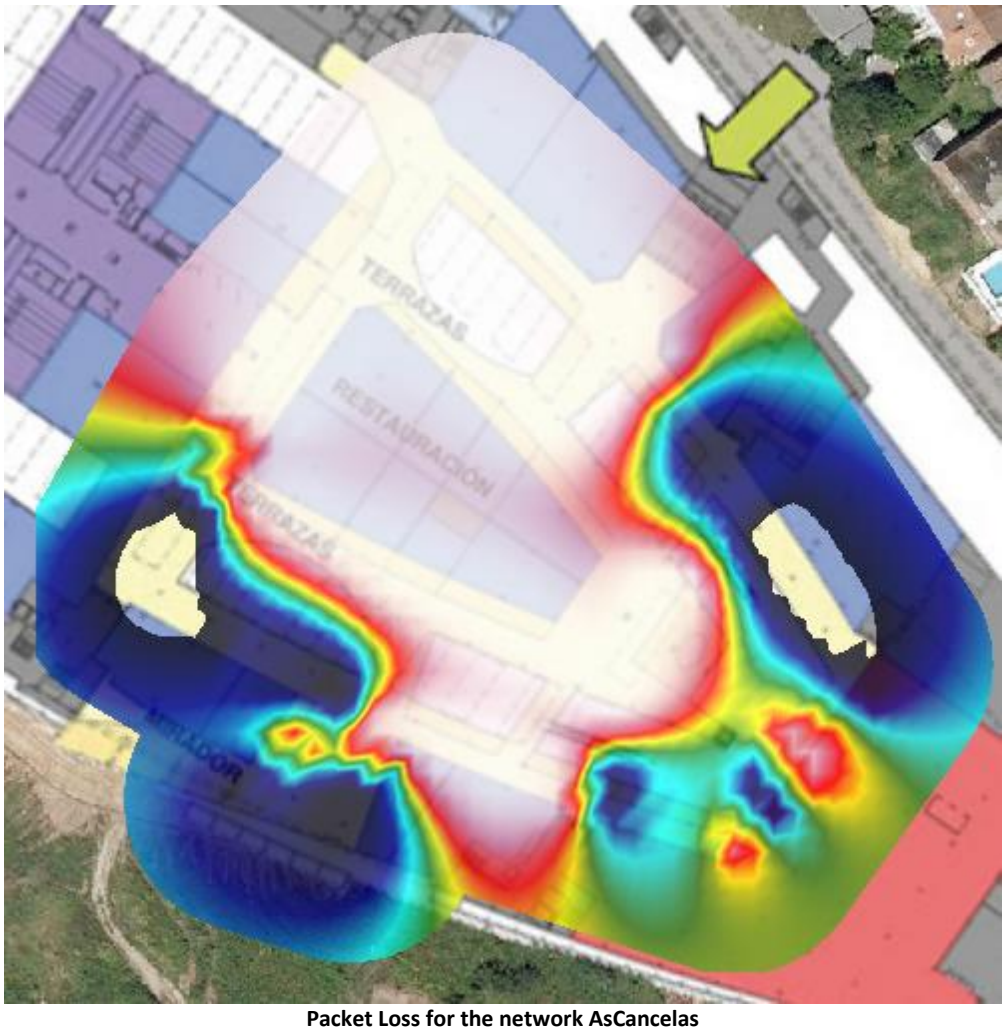
Latency for the network AsCancelas



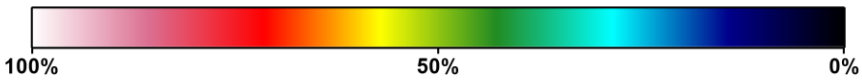
6.2.3.16. PACKET LOSS

In an ideal data communication, all sent data packets reach their destination; otherwise there is a packet loss that negatively impacts the data transmission performance, hence the overall network performance.
When a data packet is lost, if required by the protocol, it should be re-transmitted until a successful reception notification is received. This increases the amount of time necessary for a data unit to be transmitted, reducing the amount of data that can be transmitted per unit of time. The higher this value is, the lower the network performance will be.

The following image shows the areas where data packet loss is experienced within **AsCancelas** network site range.



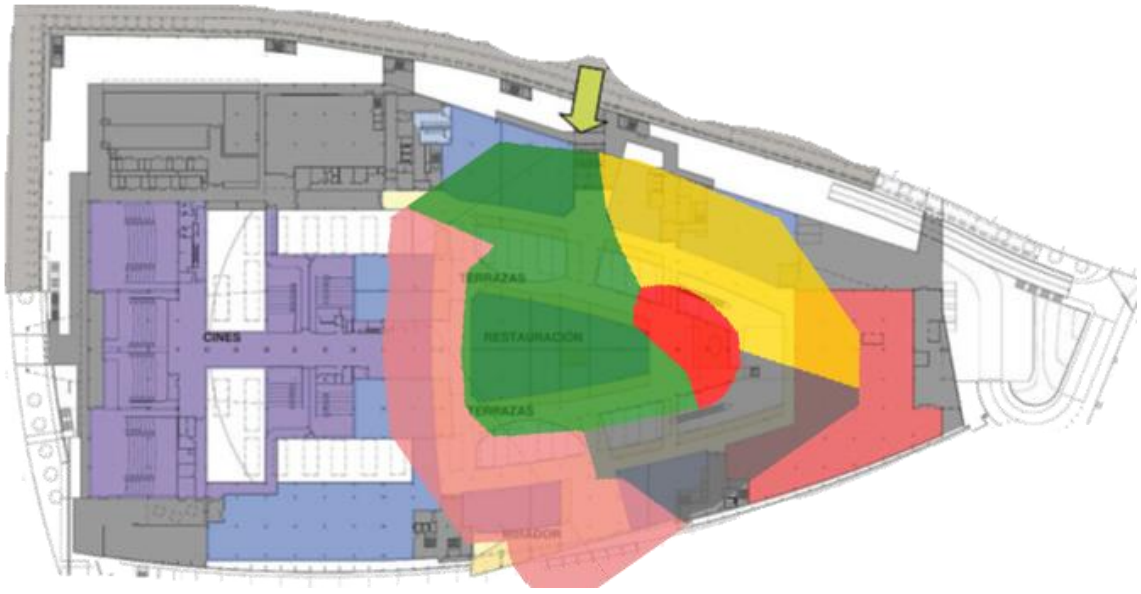
Packet Loss for the network AsCancelas



6.2.3.17. ROAMING

Data roaming in a Wi-Fi network infrastructure is the ability of a client device to move around within a multiple access point network's coverage area without disconnections.
To ensure roaming in a multiple access point Wi-Fi network, access points' coverage ranges should overlap.
Accordingly, a moving client device will have continuous network coverage, and based on the device's internal settings and access point configuration, network access will be granted through the different access points across the coverage area.

The following image shows all **AsCancelas** network access points to which the device has been connected to while itinerating.



Roaming for the network AsCancelas

Access Point
04:BD:88:F0:D2:D0
24:DE:C6:81:11:62

Access Point
04:BD:88:F0:E1:10
24:DE:C6:81:15:02

Access Point
24:DE:C6:81:0B:F2