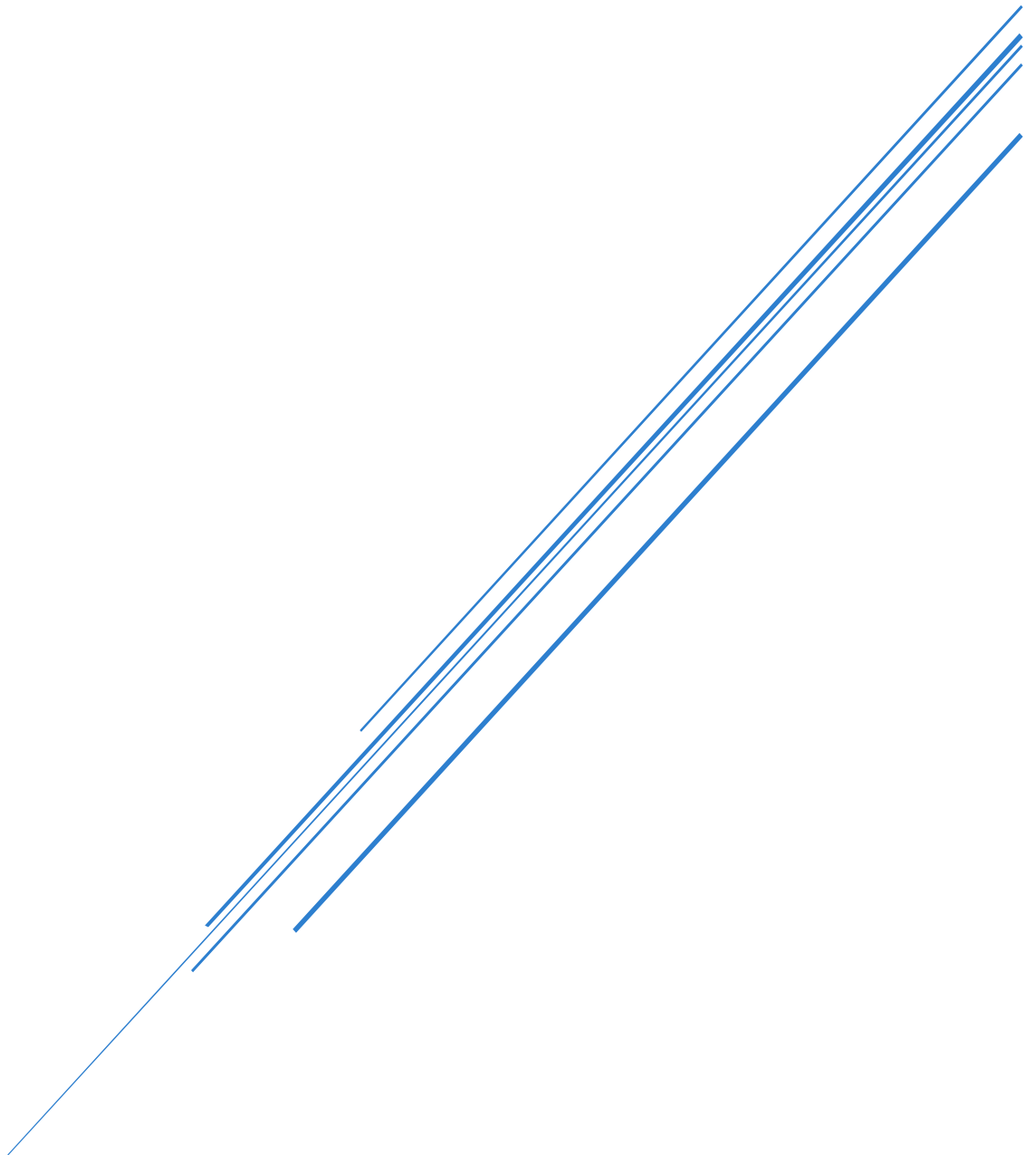




WAVETHRU

AUDIT REPORT



Customer X

Project Summary

- **The customer** is X.
- **Perimeter of the problem:** building Y, all floors from 0 to 1, located at
- **Interest of the customer:** improve data and call performances indoor for all 3 operators: operator A, operator B and operator C.

Description of the measurements

The measurements should allow the evaluation of two types of mobile services for the user:

- Voice Service : Ability to have telephone conversations.
- Data Service : Ability to be connected to the Internet and exchange data.

<i>Type of service</i>	<i>Technology</i>	<i>Measures</i>
<i>Voice</i>	2G / 3G / 4G Coverage	Call Test
<i>Data</i>	4G LTE / 5G Coverage	Download speed Upload speed

Quality of service and examples of use :



Type of service	Perfect	Good	Acceptable	Bad
Voice	100% call success Very good quality	100% call success Good quality	100% call success Average quality	frequent call failure
Data	Watching HD videos	Watching videos	Basic internet use	Low-speed or no connection
	Online gaming	Video conferencing	WhatsApp	Receiving emails without attachments
	Sending 'large' documents	Internet use	Email	Receiving messages without replying capacities
		WhatsApp	Messaging	

Results and projection*

Floor 0



* Simplified version for better understanding by the customer – based on an average of 90% of measured points (data available in Annexes)

Floor 1

		Outdoor	Before WAVETHRU	After WAVETHRU
Operator A	Voice			
	Data			
Operator B ***	Voice			
	Data			
Operator C	Voice			
	Data			

Measurements summary

- OUTDOOR
 - Signal coverage in free mode shows from limited to good 5G Non-Stand-Alone (NSA) and 4G signals for all operators, depending on the facade orientation.
 - Operator B has the best outdoor signal coverage.
 - Since the outdoor signal strength is limited — as observed on certain facades — the potential gain from WaveTHRU treatment is also limited.
 - Call coverage is from limited to good for Operator C, but good overall for operator B and operator 1. Almost all calls are over LTE low band.
 - Great Throughput performances available for all operators.
 - On average, the facade attenuation envelope reaches values of up to **-20 dB**.
- INDOOR
 - Signal coverage in free-mode: 4G and 5G NSA signal strength has been improved on both floors.
 - Call coverage has been improved. With all calls now running over LTE, users experience better call quality and enhanced stability.
 - Throughput performance has improved for both upload and download, making data services more efficient.

Annexes

The measurement setup

Radio signal measurements performed:

- Outside / Inside on the ground floor
- Inside on each floor (from 0 to 5)

Tools: WAVETHRU Audit tools (close to user experience)

- Quick overview of connectivity inside the building
- Assess signal strength and speed tests



A/ Measure radio KPIs

- 1 phone per MNO
- 2G/3G/4G/5G
- Strength/Quality/PCI/ Frequency
- Call and speed test
- Direct result visualization

Legend

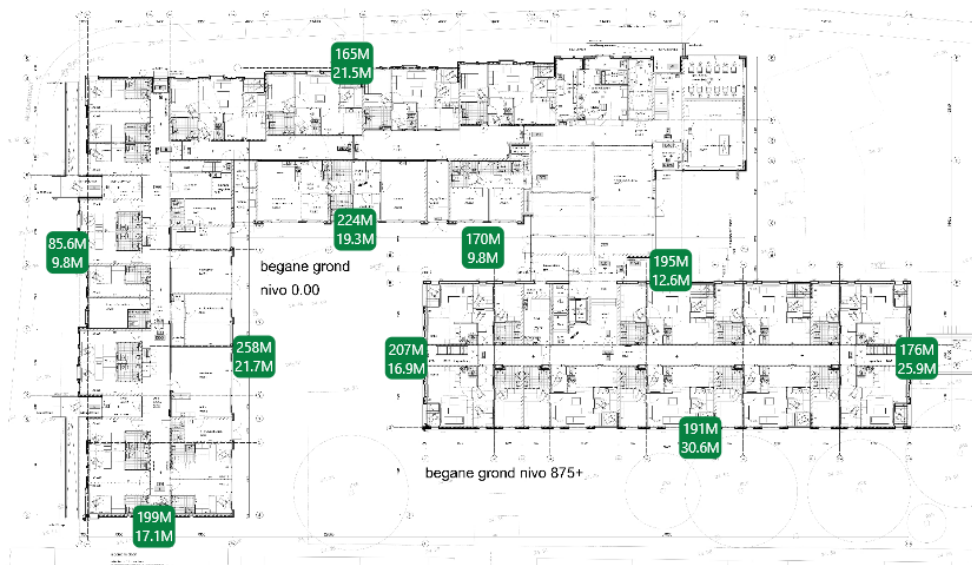


After WAVETHRU - Outdoor - Floor 0 - Operator A

VOICE



DATA



After WAVETHRU - Outdoor - Floor 0 - Operator B

VOICE



DATA

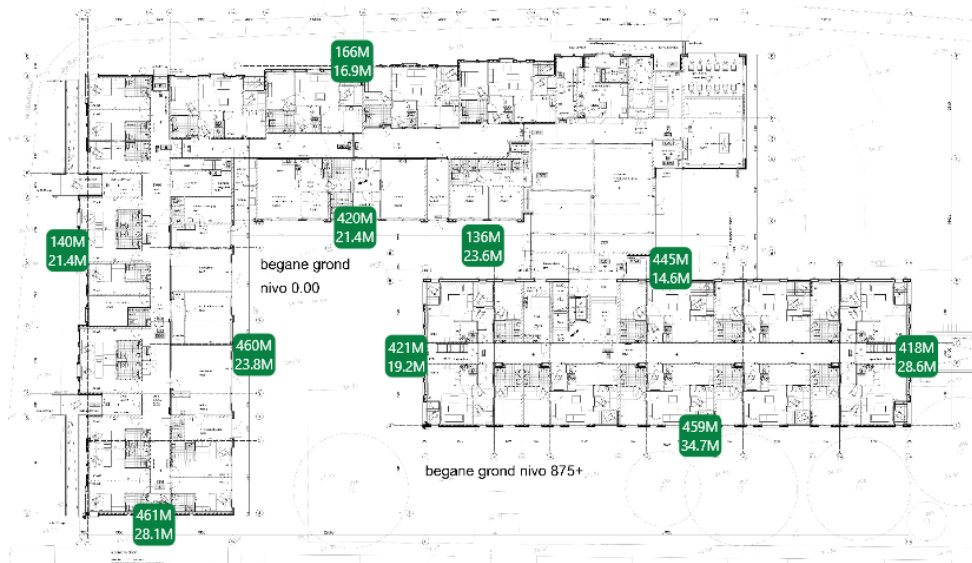


After WAVETHRU - Outdoor - Floor 0 - Operator C

VOICE

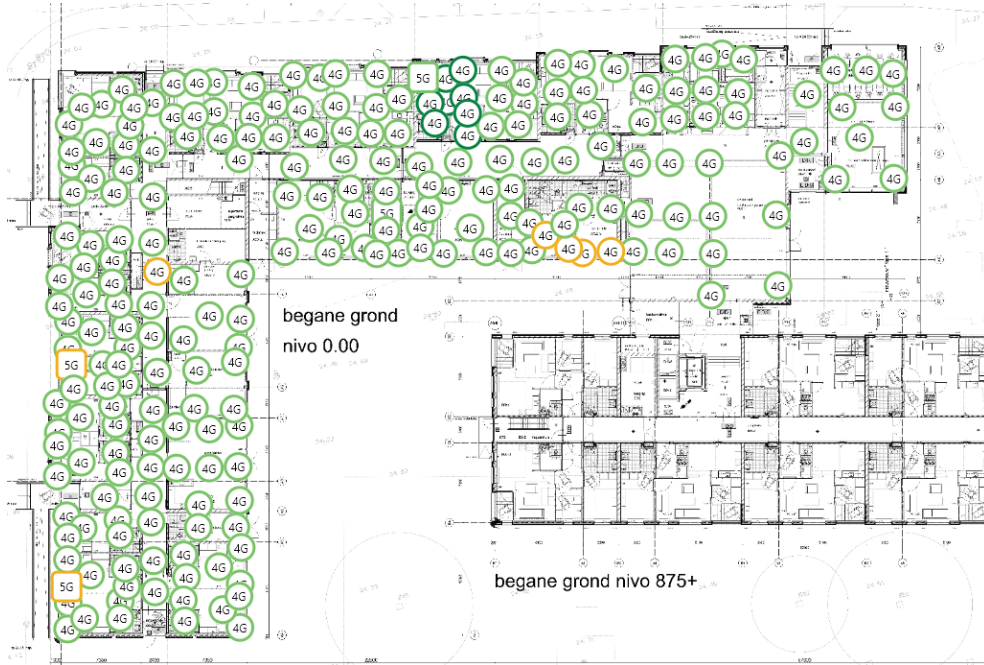


DATA

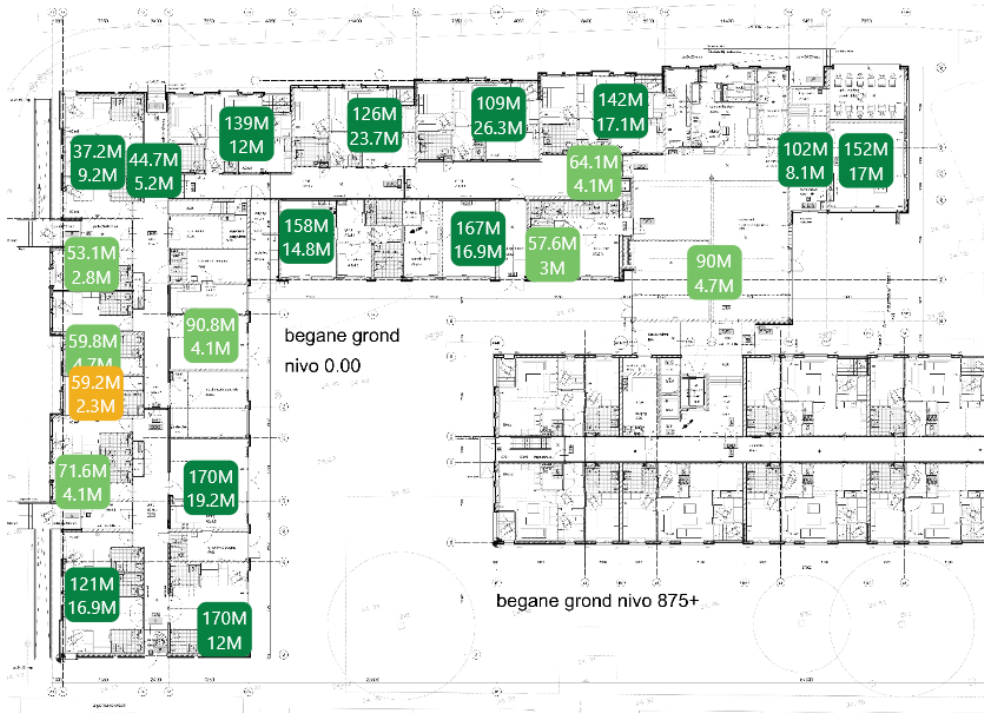


After WAVETHRU - Indoor - Floor 0 - Operator A

VOICE

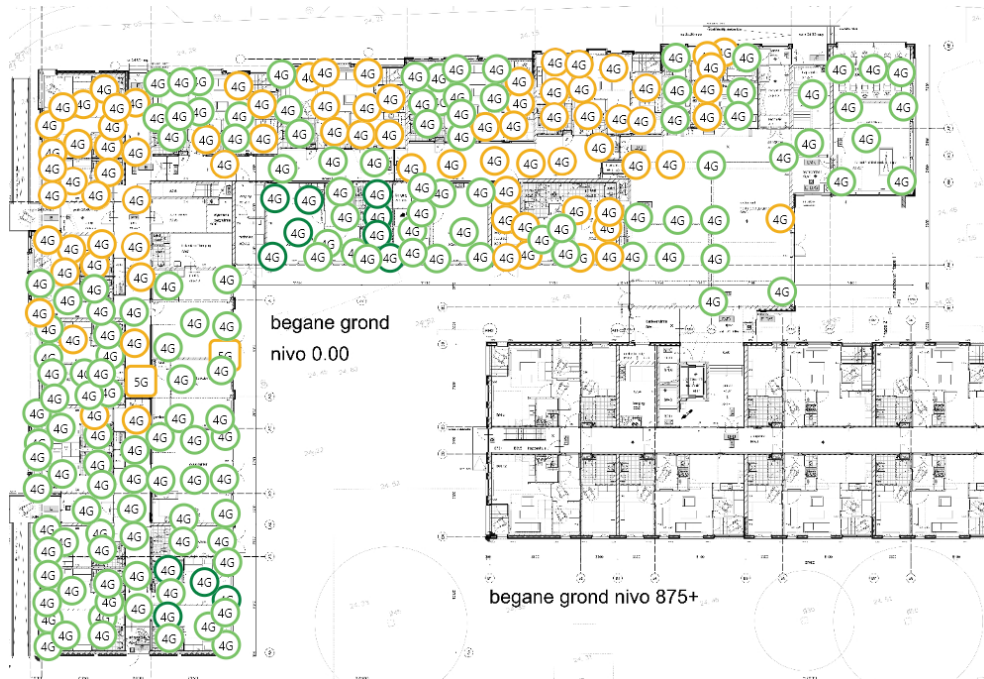


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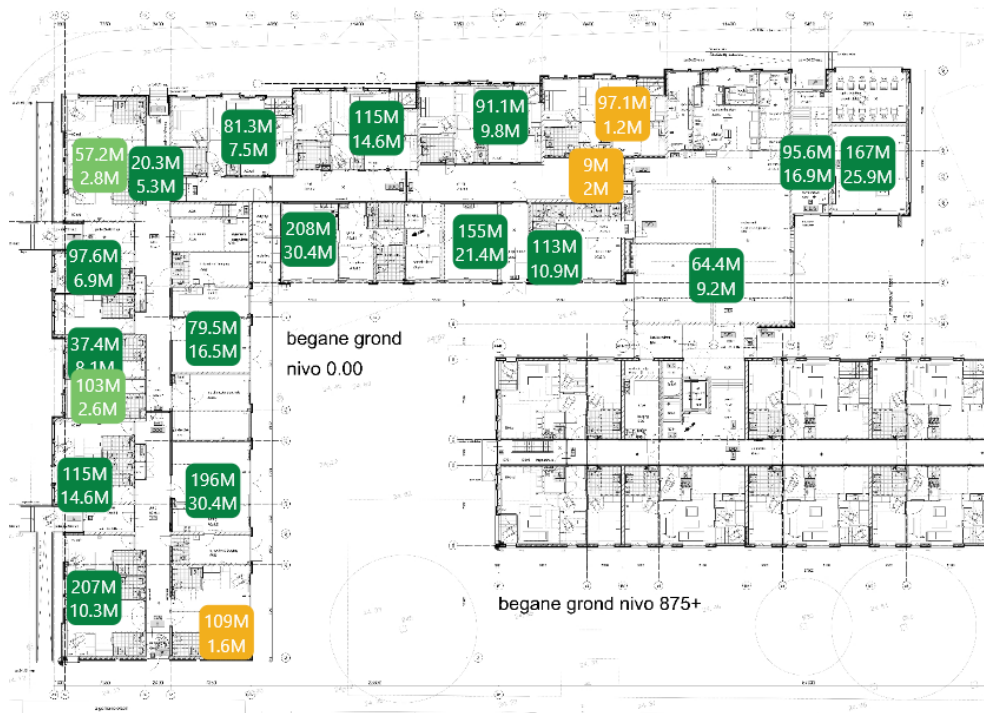


After WAVETHRU - Indoor - Floor 0 - Operator B

VOICE

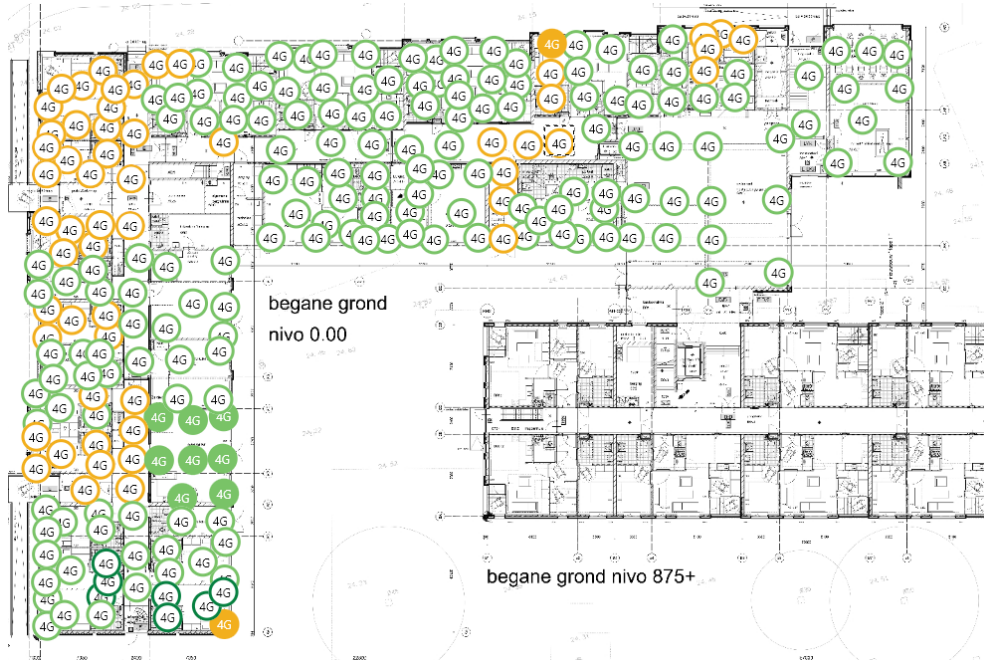


DATA

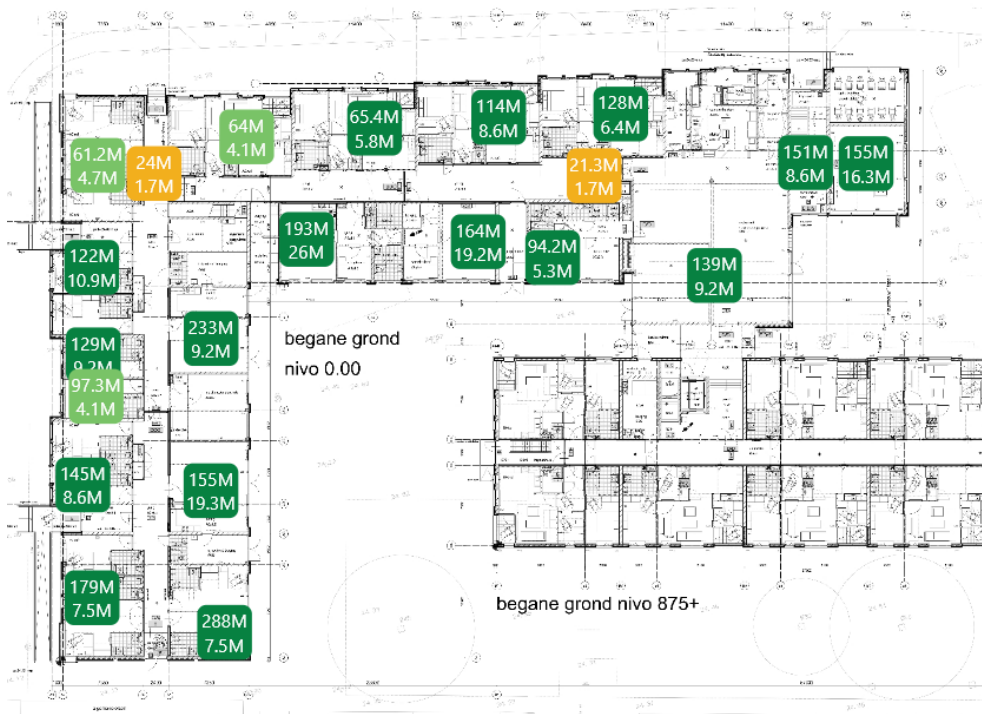


After WAVETHRU - Indoor - Floor 0 - Operator C

VOICE



DATA



After WAVETHRU - Indoor - Floor 1 - Operator A

VOICE



DATA



After WAVETHRU - Indoor - Floor 1 - Operator B

VOICE

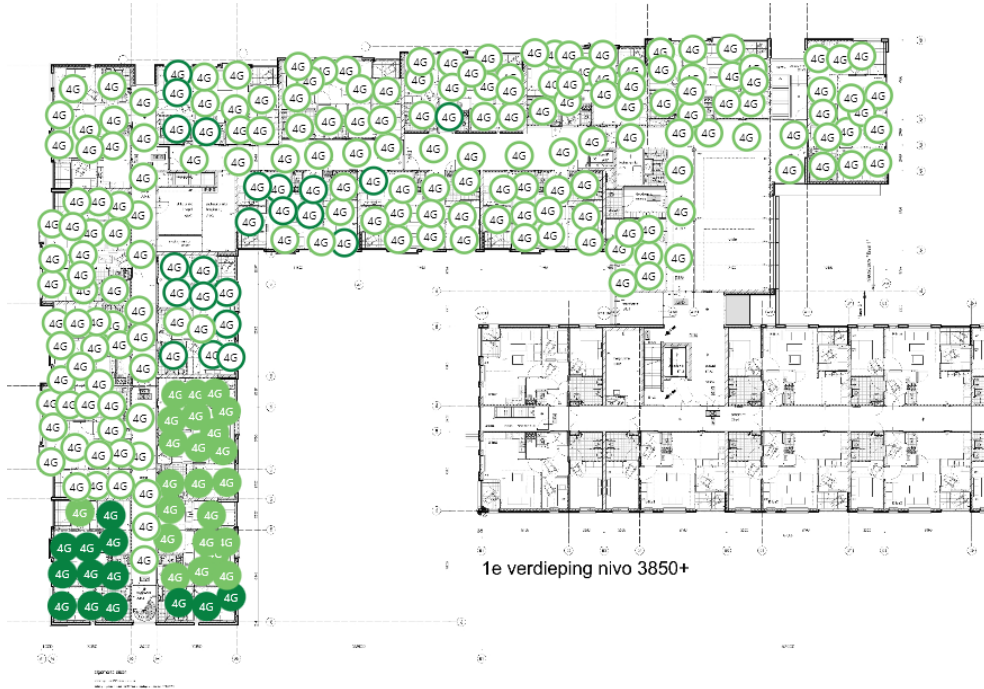


DATA



After WAVETHRU - Indoor - Floor 1 - Operator C

VOICE



DATA

