

QUALITY OF MOBILE NETWORK EXPERIENCE

KINGDOM OF BAHRAIN – 2023



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EXECUTIVE SUMMARY

We all expect excellent mobile services from our network service providers, and for that reason we have shifted our focus from measuring technical Quality of Service metrics towards measuring the mobile networks Quality of Experience “QoE”, i.e measurements that reflect how users perceive their connectivity while using mobile networks. This more user-centric approach has become increasingly important in the digital age where users are more concerned with how they experience mobile services. Measuring technical perimeters remains necessary, as the technical aspects and network capabilities of mobile networks are equally as important to observe the optimum performance of a network. Where as QoE focuses on the end-user's perception of that performance.

This new Mobile Network Quality of Experience report will help us develop an understanding into the consumer's perceived network quality in relation to the various mobile services that are used. Furthermore this insight will allow operators to factor it into its decision-making processes as it will help achieve a deep understanding of what consumers are experiencing, allowing operators to prioritize investments and optimisations which directly impact customer satisfaction. The chosen metrics (4G & 5G data and voice Coverage, Voice Quality, SMS service, Social Media platforms experience, Web surfing and file transfers) align with end-customer relevance and international comparability in accordance to international studies, standards and best practices.

The Kingdom of Bahrain prides itself in having 100% population coverage in 4G across all mobile operators and 100% coverage in 5G in 2 out of 3 mobile networks, with 97% coverage in the 3rd mobile network. This gives consumers excellent outdoor coverage for data and voice services, and we can observe the same level of excellence across voice calls, SMS services, web surfing, and HTTP file transfers.

In regards to the social media, all three network operators achieved excellent results. This shows that collectively the mobile networks performance in Bahrain is of high quality and do deliver an excellent level of service to consumers. Nonetheless there are room for improvements and we will continue to raise the metrics and KPI's higher as the expectation of consumers is always for better services and experiences.

The world of telecommunications is constantly evolving, where consumers always expect a consistent and hassle free experience when using Mobile services. This report shows how the coverage is being experienced by mobile users on their phones and other devices, which makes Quality of Experience paramount, and by shifting our attention from QoS to QoE, we can better address user needs better and further enhance consumer overall satisfaction.

INTRODUCTION

Quality of Experience (QoE) is defined by the ITU-T as “the overall acceptability of an application or service, as perceived subjectively by the end-user” (ITU-T, n.d.).

Quality of Experience is subjective due to its nature of being a personal user’s viewpoint, and what an individual deems as a “Excellent, good or fair”.

The QoE report shall provide network operators with some sense on the active role that perception of network performance has on the overall customer satisfaction inclusive of reliability, availability, throughput and efficiency

Through studies carried out by regulators and consumer associations around the world, it appears important today to integrate QoE into decisions with operators in order to guarantee a high level of customer satisfaction with a minimum of resources and a maximum return on investment.

It is also important to note that QoS influences the user’s QoE.

The Authority selected Directique, an international consulting firm to conduct the assessment using testing methodology designed to gather a faithful qualitative record from an end users’ point of view, avoiding assessing quality through a pure technical angle as this is performed by Mobile Operators themselves on a regular basis.

QUALITY OF EXPERIENCE

As QoE is crucial for ensuring that users have a satisfactory interaction with telecom services, it is important to identify indicators to assess the customer experience, which can help operators to improve their services.

2.1. QOE INDICATORS AND THRESHOLDS

The following table shows the QoE KPI Thresholds:

<i>QOE KPIS</i>	<i>EXCELLENT</i>	<i>GOOD</i>	<i>FAIR</i>
4G Data Population Coverage ¹	Greater or equal to 99.9%	BETWEEN 95% AND 99.9%	BELOW 95%
5G Data Population Coverage	Greater or equal to 99.9%	BETWEEN 95% AND 99.9%	BELOW 95%
Voice Population Coverage	Greater or equal to 99.9%	BETWEEN 95% AND 99.9%	BELOW 95%
Voice Quality - Excellent Quality Rate MOS>3.1 for Mobile to Mobile calls	GREATER OR EQUAL TO 98%	BETWEEN 95% AND 98%	BELOW 95%
SMS RS10 - Rate of SMS Sent & received within 10s	GREATER OR EQUAL TO 99%	BETWEEN 99% AND 98%	LOWER THAN 98%
SMS RS5 - Rate of SMS Sent & received within 5s	GREATER OR EQUAL TO 99%	BETWEEN 99% AND 98%	LOWER THAN 98%
WhatsApp- Average delay to publish a message	LESS OR EQUAL TO 2s	BETWEEN 2S AND 4S	GREATER THAN 4s
WhatsApp - Rate of Successful Publication <5s	Greater or equal to 99%	Between 99% and 95%	LOWER THAN 95%
Instagram - Average delay to publish a post	Less or equal to 0.5s	Between 0.5s and 1s	Greater than 1s
Instagram - Rate of Successful Publication <5s	Greater or equal to 99%	Between 99% and 95%	LOWER THAN 95%
Facebook - Average delay to publish a post	Less or equal to 5s	Between 5s and 10s	Greater than 10S
Facebook - Rate of Successful Publication <5s	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
YouTube - Average time to stream a 60 second video without advertisements	Less or equal to 62s	BETWEEN 62s AND 65s	GREATER THAN 65s

¹ Coverage: "means the portion of the population to which mobile telecommunications services (voice and data) are accessible" as defined in the Individual Mobile Licences of Mobile Network Operators

<i>QOE KPIS</i>	<i>EXCELLENT</i>	<i>GOOD</i>	<i>FAIR</i>
YouTube - Rate of Successful streaming <62s	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
HTTP DL 4G - Rate of Successful HTTP DL 4G with a throughput greater than 30Mbps	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
HTTP UL 4G - Rate of Successful HTTP UL 4G with a throughput greater than 10Mbps	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
Web browsing 4G - Rate of Successful Webpage Downloaded within 10s	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
HTTP DL 5G - Rate of Successful HTTP DL 5G with a throughput greater than 100Mbps	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
HTTP UL 5G - Rate of Successful HTTP UL 5G with a throughput greater than 30Mbps	Greater or equal to 99%	Between 99% and 95%	Lower than 95%
Web browsing 5G - Rate of Successful Webpage Downloaded within 5s	Greater or equal to 99%	Between 99% and 95%	Lower than 95%

2.1. OPERATORS' COVERAGE MAPS

QoE tests are based on operators' 4G and 5G coverage measured as follows.



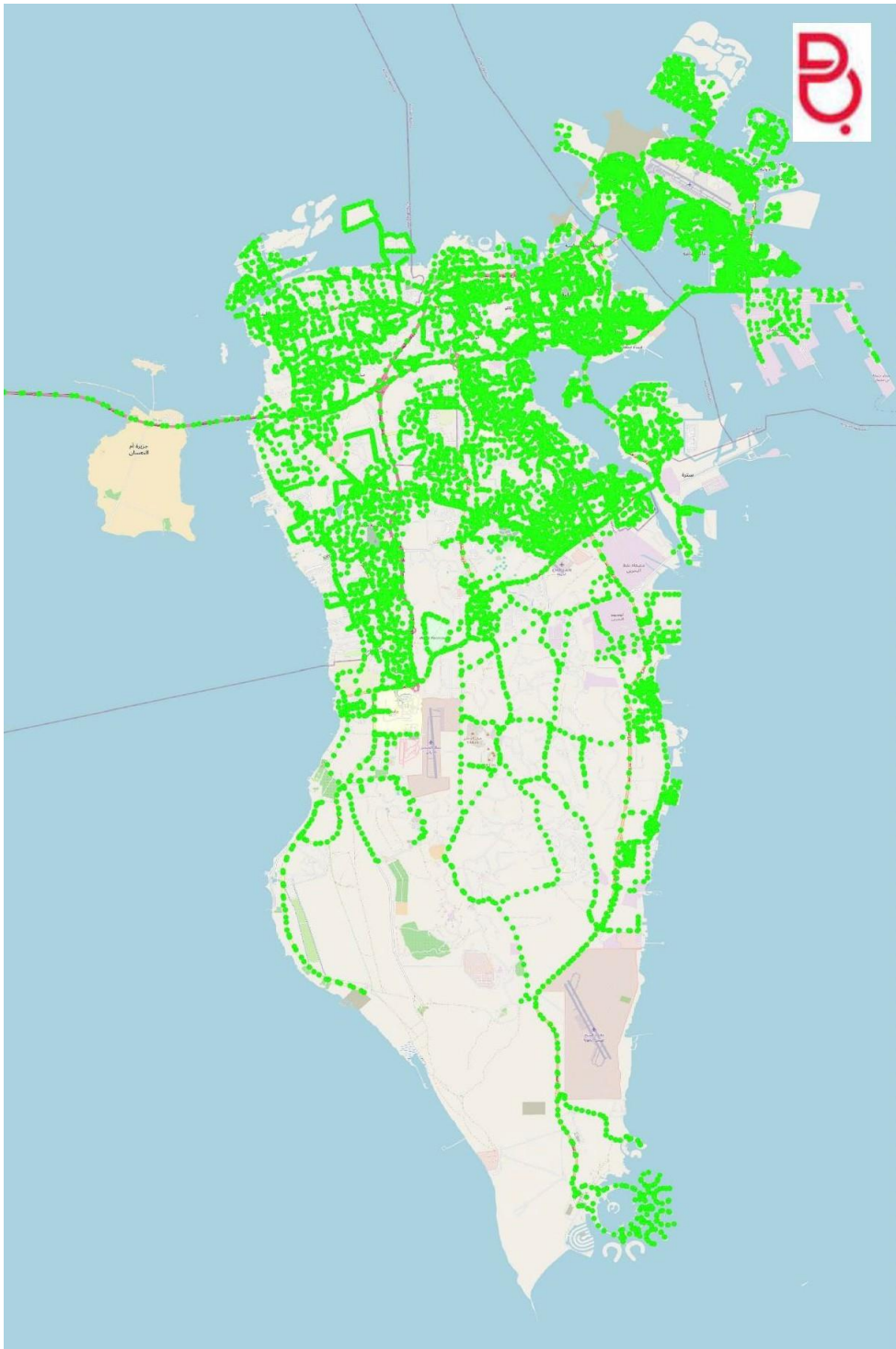
If the spot is green, the test was inside the coverage zone of the operator and accessibility to network was effective on the handset.



If the spot is red, the test was inside the coverage zone of the operator and accessibility to network was not effective on the

In 4G the coverage is presented for Voice and Data service.

2.1.1. BATELCO – VOICE COVERAGE



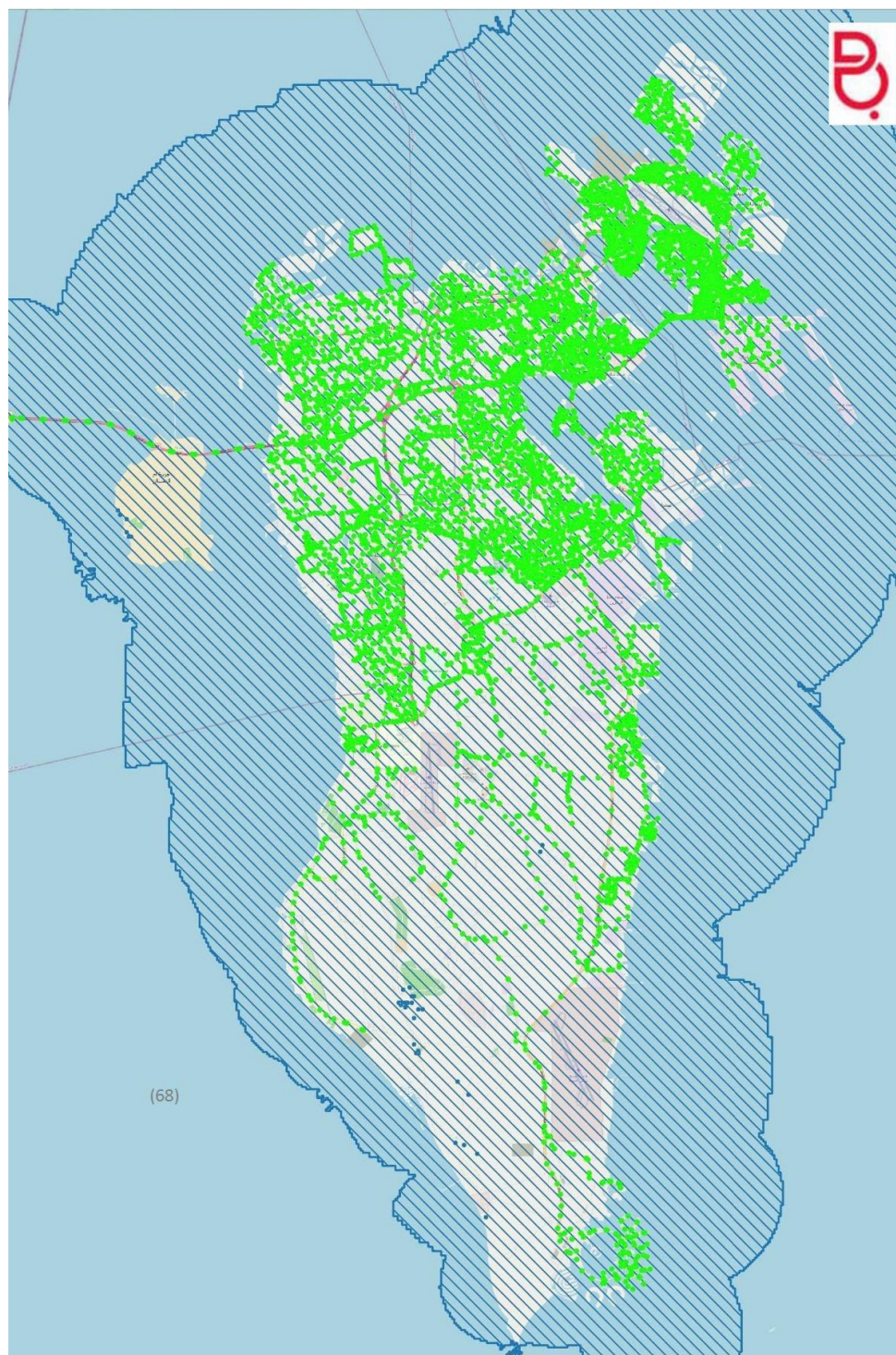
VOICE COVERAGE

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage – 2023

2.1.2. BATELCO 5G – DATA COVERAGE FOR A 5G USER



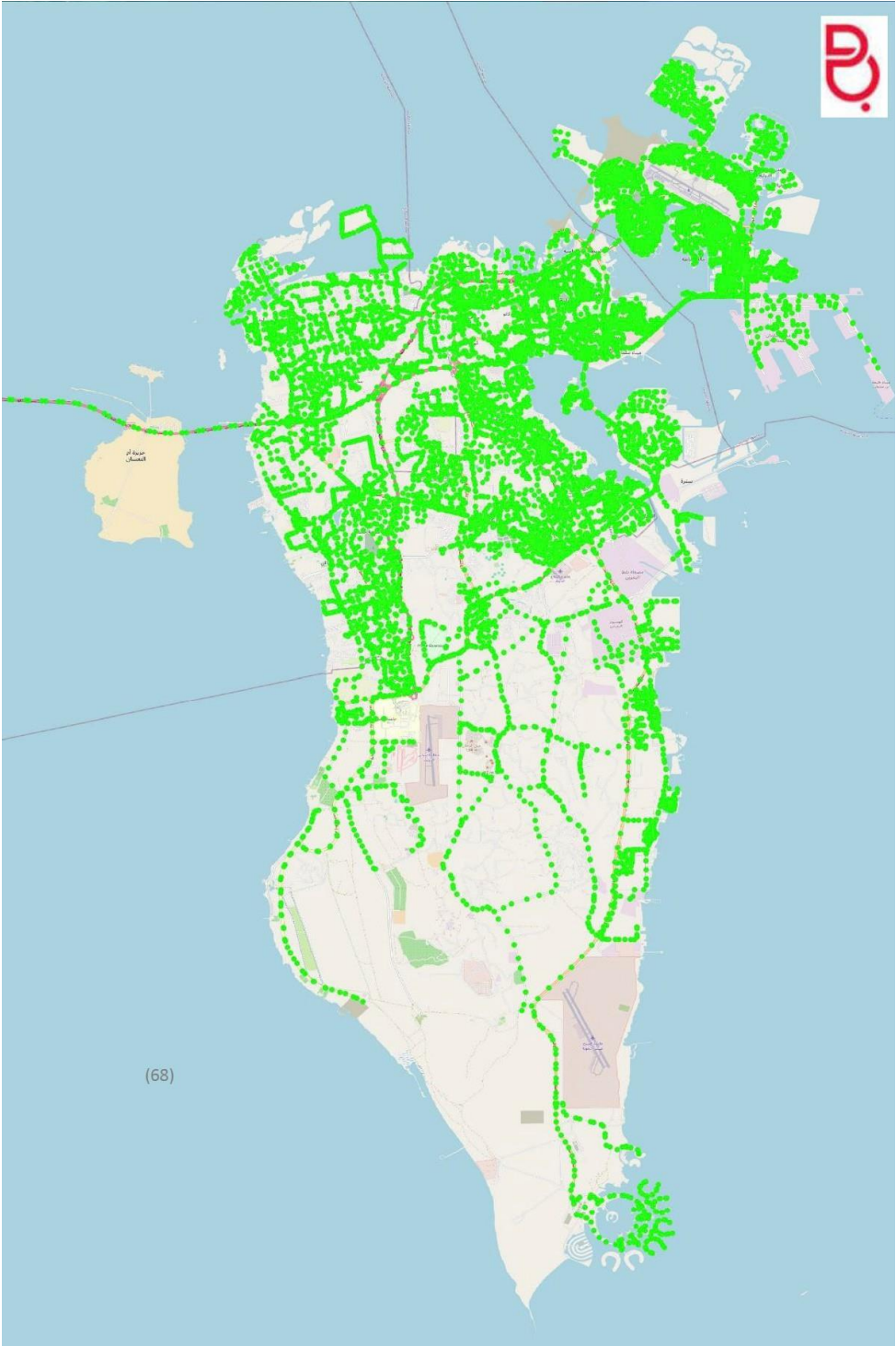
DATA COVERAGE - 5G

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

2.1.3. BATELCO 4G – DATA COVERAGE FOR An LTE USER



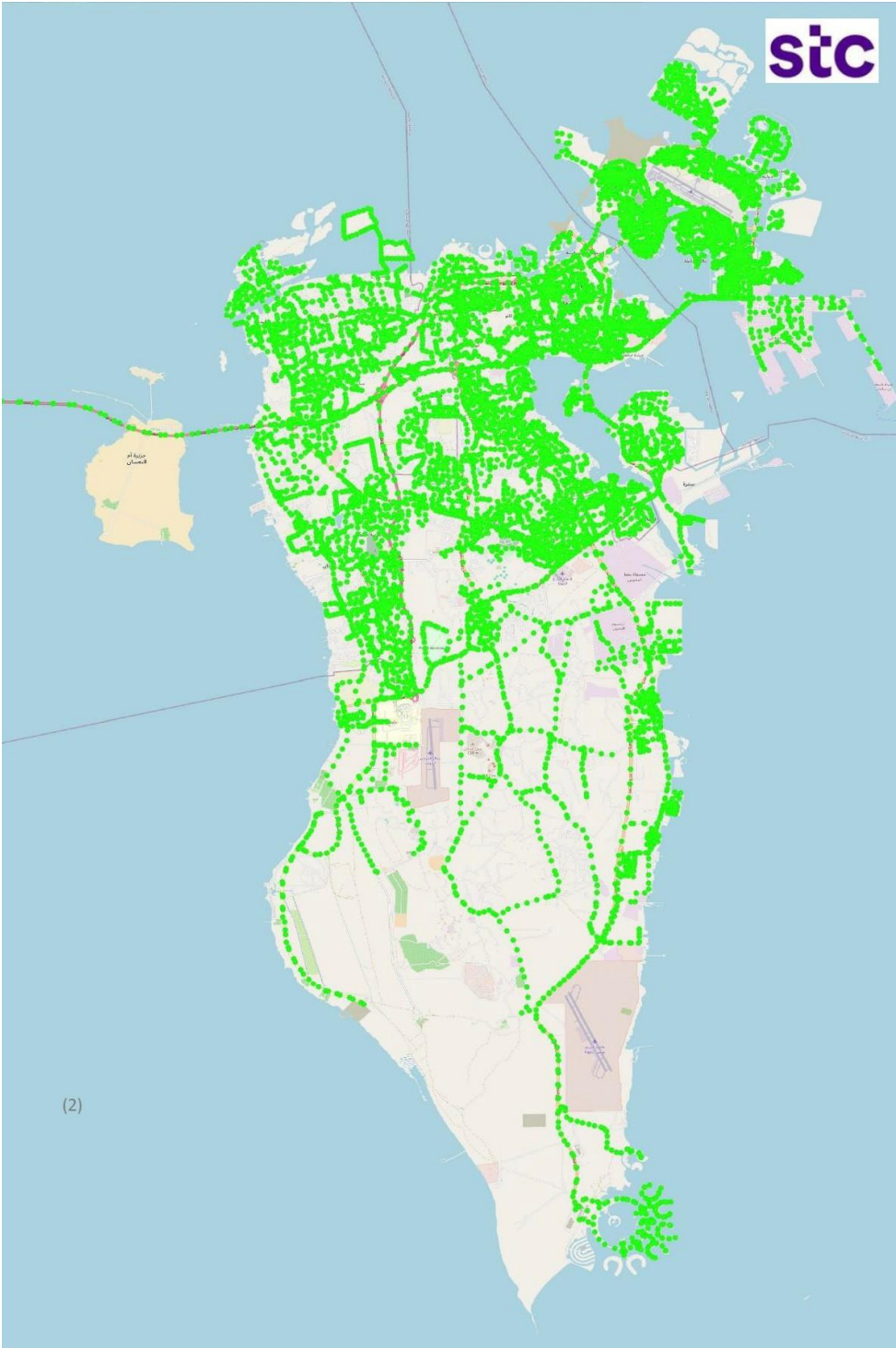
DATA COVERAGE - 4G

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage – 2023

2.1.4. STC BAHRAIN – VOICE COVERAGE



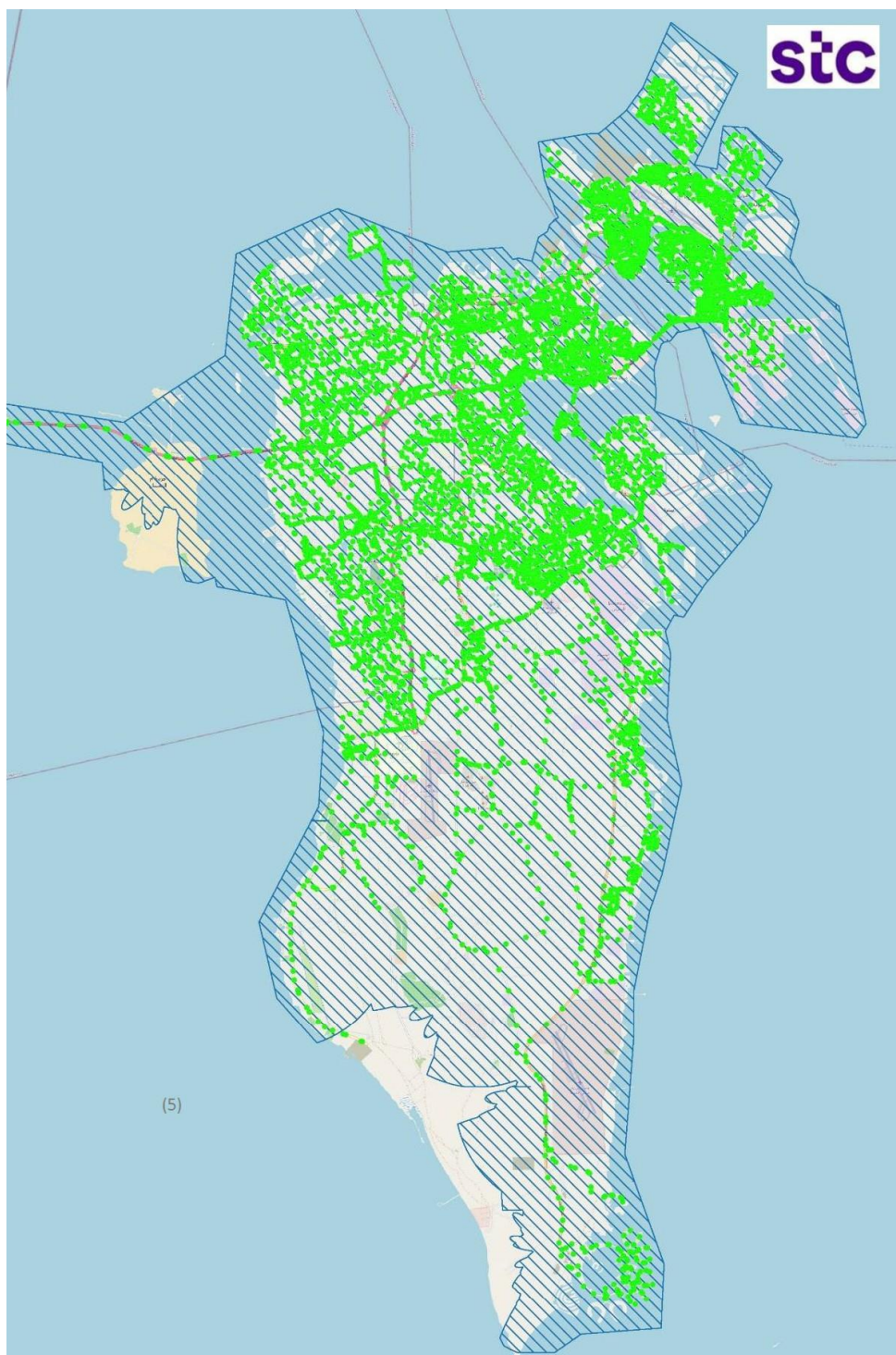
Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

VOICE COVERAGE

2.1.5. STC BAHRAIN 5G – DATA COVERAGE FOR A 5G USER



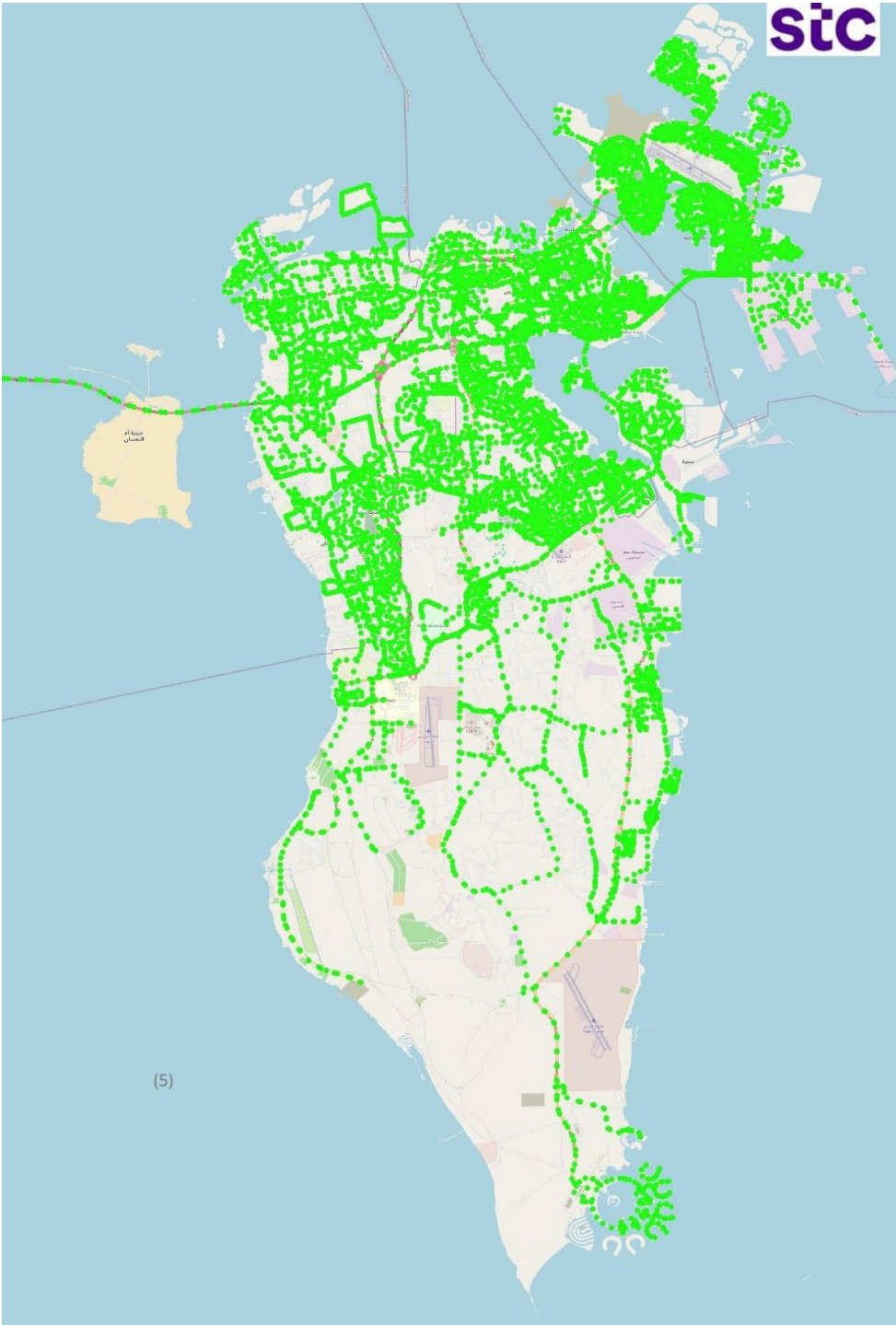
DATA COVERAGE - 5G

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage – 2023

2.1.6. STC BAHRAIN 4G – DATA COVERAGE FOR An LTE USER



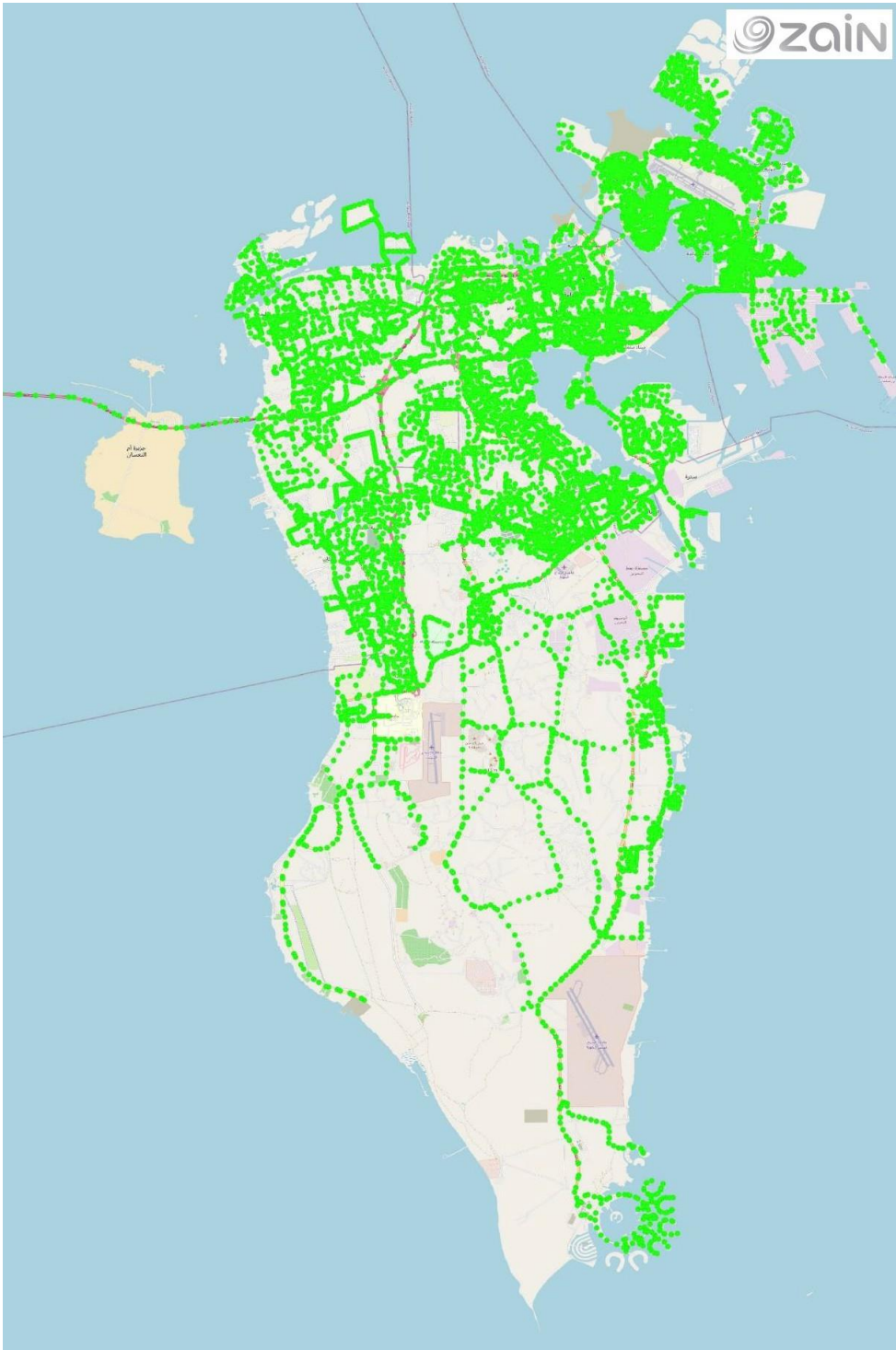
Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

DATA COVERAGE - 4G

2.1.7. ZAIN – VOICE COVERAGE



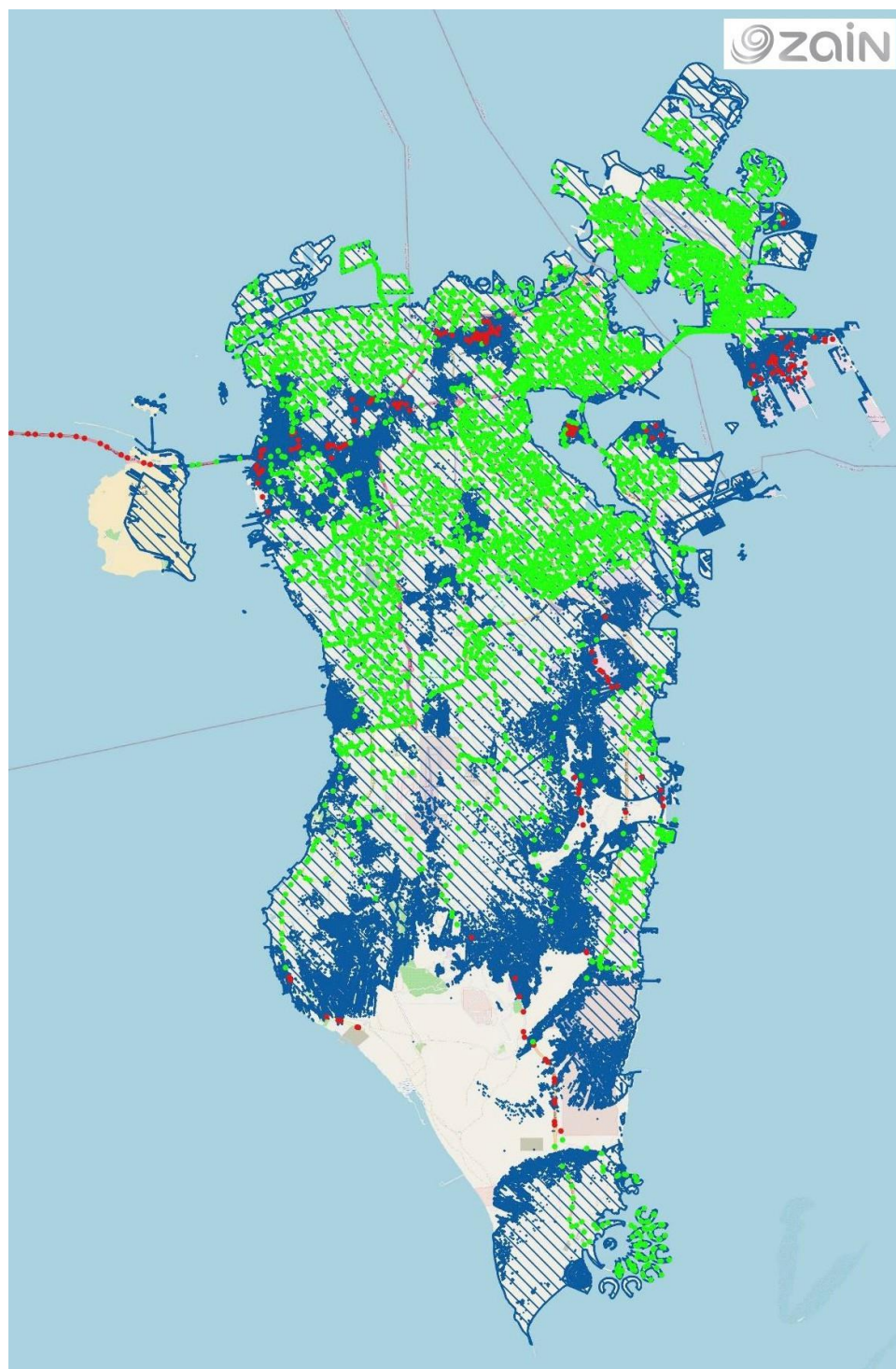
VOICE COVERAGE

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

2.1.8. ZAIN 5G – DATA COVERAGE FOR A 5G USER



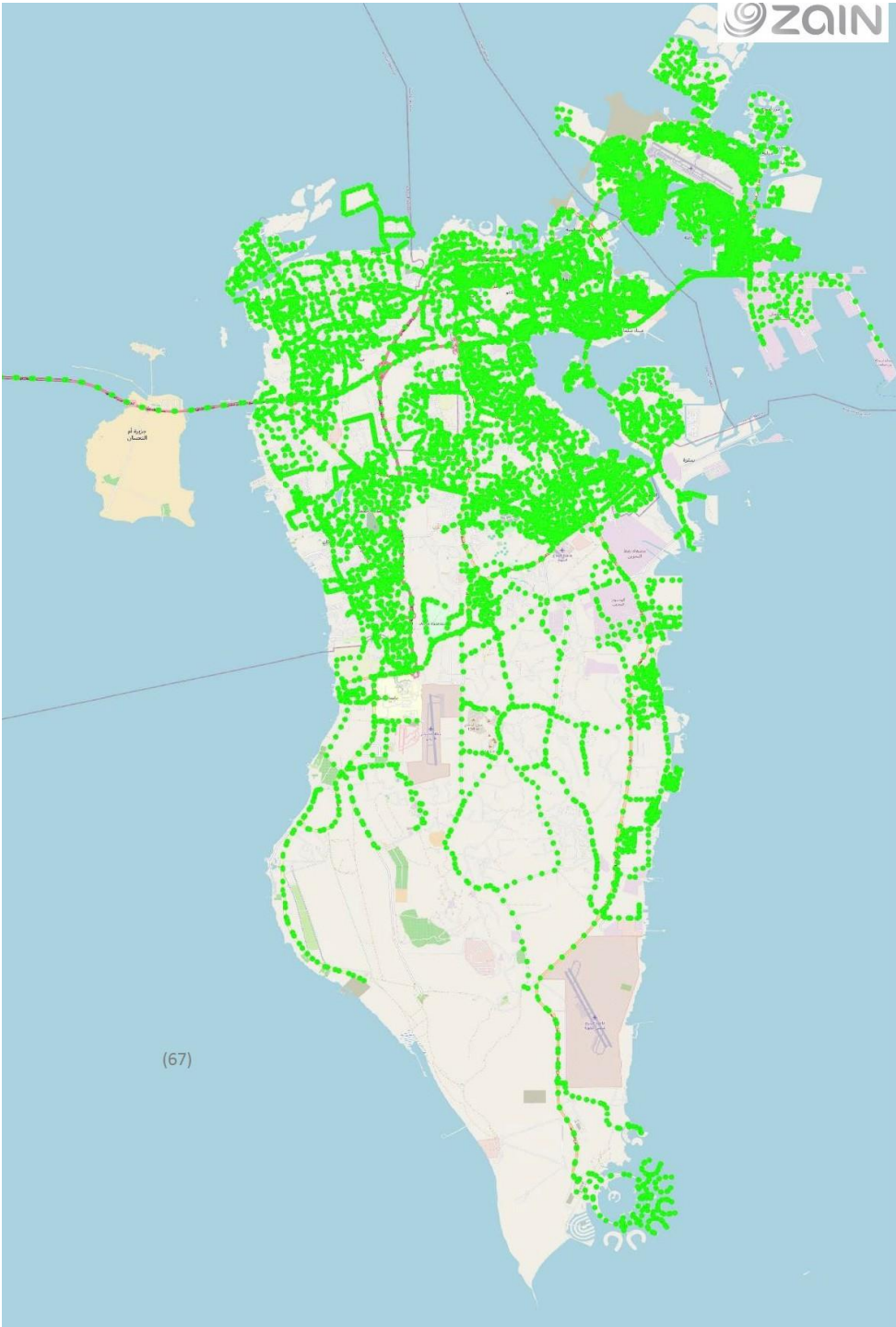
Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

DATA COVERAGE - 5G

2.1.9. ZAIN 4G – DATA COVERAGE FOR An LTE USER



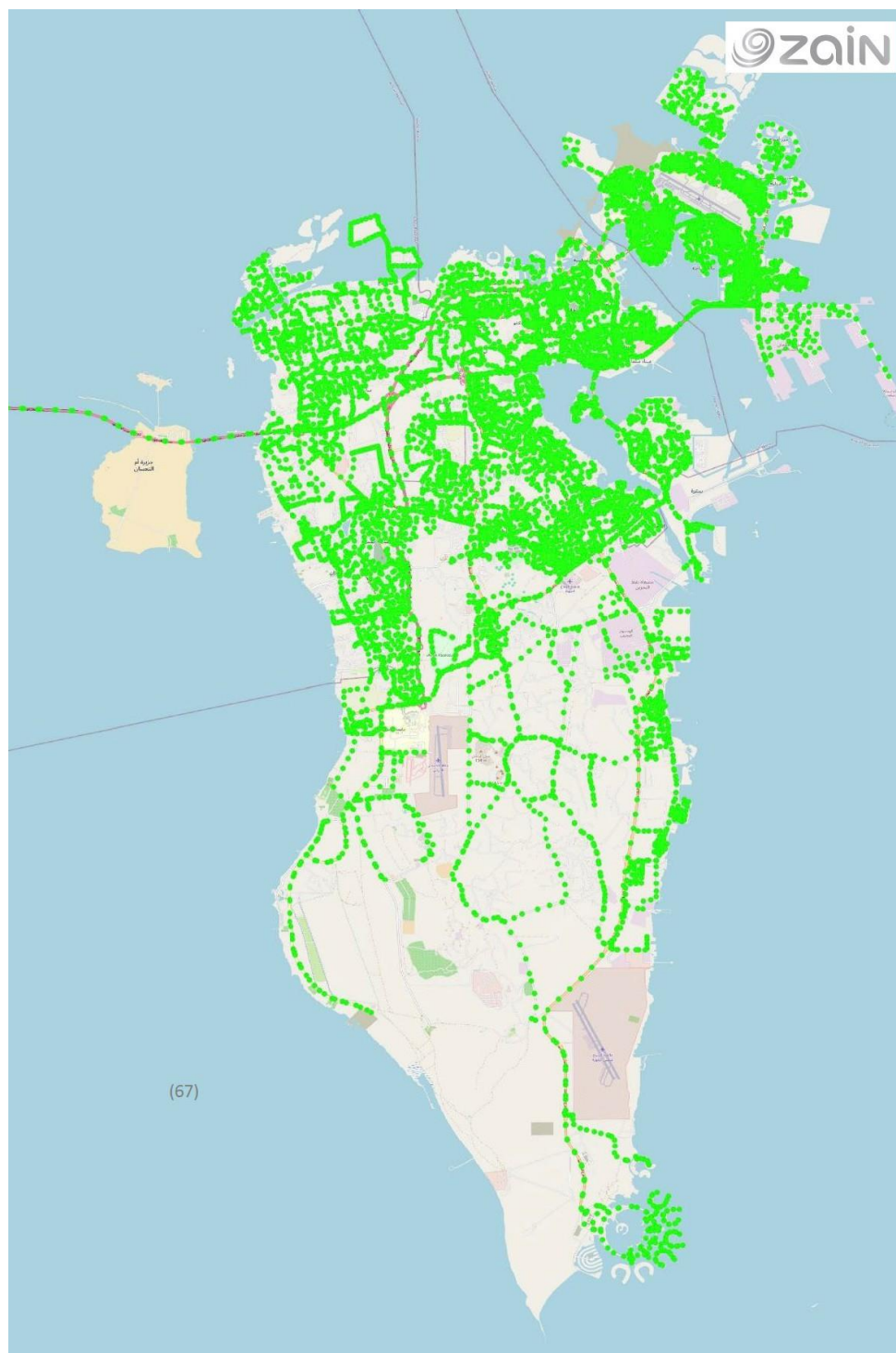
DATA COVERAGE - 4G

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage – 2023

2.1.9. ZAIN 4G – DATA COVERAGE FOR An LTE USER



DATA COVERAGE - 4G

Surveyed period:

From 22nd of November
to 11th of December 2023

Mobile Coverage –
2023

2.2. QOE RESULTS

2.2.1. DATA COVERAGE AND VOICE COVERAGE

	BATELCO	STC	ZAIN
4G Data Population Coverage	EXCELLENT	EXCELLENT	EXCELLENT
5G Data Population Coverage	EXCELLENT	EXCELLENT	GOOD
Voice Population Coverage	EXCELLENT	EXCELLENT	EXCELLENT

2.2.2. VOICE AND SMS

	BATELCO	STC	ZAIN
Voice Quality - Excellent Quality Rate MOS>3.1 for Mobile-to-Mobile calls	EXCELLENT	EXCELLENT	EXCELLENT
SMS RS10 - Rate of SMS Sent & received within 10s	EXCELLENT	EXCELLENT	EXCELLENT
SMS RS5 - Rate of SMS Sent & received within 5s	EXCELLENT	EXCELLENT	EXCELLENT

2.2.3. WEB SURFING, HTTP FILE TRANSFERS

	BATELCO	STC	ZAIN
HTTP DL 5G - Rate of Successful HTTP DL 5G with a throughput greater than 100Mbps	EXCELLENT	EXCELLENT	EXCELLENT
HTTP UL 5G - Rate of Successful HTTP UL 5G with a throughput greater than 30Mbps	EXCELLENT	EXCELLENT	EXCELLENT

	<i>BATELCO</i>	<i>STC</i>	<i>ZAIN</i>
HTTP DL 4G - Rate of Successful HTTP DL 4G with a throughput greater than 30Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>GOOD</i>
HTTP UL 4G - Rate of Successful HTTP UL 4G with a throughput greater than 10Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>

	<i>BATELCO</i>	<i>STC</i>	<i>ZAIN</i>
Web browsing 5G - Rate of Successful Webpage Downloaded within 5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Web browsing 4G - Rate of Successful Webpage Downloaded within 10s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>

2.2.4. SOCIAL MEDIA

	<i>BATELCO</i>	<i>STC</i>	<i>ZAIN</i>
Instagram - Average delay to publish a post	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Instagram - Rate of Successful Publication <5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
WhatsApp- Average delay to publish a message	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
WhatsApp - Rate of Successful Publication <5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Facebook - Average delay to publish a post	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Facebook - Rate of Successful Publication <5s	<i>FAIR</i>	<i>FAIR</i>	<i>FAIR</i>
YouTube - Average time to stream a 60 second video without advertisements	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
YouTube - Rate of Successful streaming <62s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>

2.3. SUMMARY

<i>QOE KPI</i>	<i>BATELCO</i>	<i>STC</i>	<i>ZAIN</i>
4G Data Population Coverage	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
5G Data Population Coverage	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>GOOD</i>
Voice Population Coverage	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Voice Quality - Excellent Quality Rate MOS>3.1 for Mobile-to-Mobile calls	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
SMS RS10 - Rate of SMS Sent & received within 10s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
SMS RS5 - Rate of SMS Sent & received within 5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
WhatsApp- Average delay to publish a message	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
WhatsApp - Rate of Successful Publication <5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Instagram - Average delay to publish a post	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Instagram - Rate of Successful Publication <5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Facebook - Average delay to publish a post	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Facebook - Rate of Successful Publication <5s	<i>FAIR</i>	<i>FAIR</i>	<i>FAIR</i>
YouTube - Average time to stream a 60 second video without advertisements	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
YouTube - Rate of Successful streaming <62s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>

<i>QOE KPI</i>	<i>BATELCO</i>	<i>STC</i>	<i>ZAIN</i>
HTTP DL 4G - Rate of Successful HTTP DL 4G with a throughput greater than 30Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>GOOD</i>
HTTP UL 4G - Rate of Successful HTTP UL 4G with a throughput greater than 10Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Web browsing 4G - Rate of Successful Webpage Downloaded within 10s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
HTTP DL 5G - Rate of Successful HTTP DL 5G with a throughput greater than 100Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
HTTP UL 5G - Rate of Successful HTTP DL 5G with a throughput greater than 30Mbps	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>
Web browsing 5G - Rate of Successful Webpage Downloaded within 5s	<i>EXCELLENT</i>	<i>EXCELLENT</i>	<i>EXCELLENT</i>

A series of white, wavy, horizontal lines of varying amplitudes and frequencies, creating a sense of movement and depth against the dark blue background.

QUALITY OF EXPERIENCE

KINGDOM OF BAHRAIN – 2023

About the study

This study is published in accordance with Articles 3(b)(1), 3(c)(2), 3(c)(4) and Article 54 of the Telecommunications Law promulgated by Legislative Decree No. (48) of 2002.

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