Voice Quality of Service

Report

Mahe, Praslin & La Digue, Seychelles

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List of Abbreviations

CD	Call Duration
CSFB	Circuit Switched Fall Back
CSSR	Call Setup Success Ratio
CST	Call Setup Time
DCR	Drop Call Ratio
GSM	Global System for Mobile Communications
HD	High Definition
SCRA	Seychelles Communications Regulatory Authority
KPI	Key Performance Indicator
LTE	Long-Term Evolution
LTE-A	Long-Term Evolution Advanced
MOC	Mobile Originating Call
MOS	Mean Opinion Score
MNO	Mobile Network Operators
POLQA	Perceptual Objective Listening Quality Analysis
WCDMA	Wideband Code Division Multiple Access
UMTS	Universal Mobile Telecommunications System

1. EXECUTIVE SUMMARY

As mandated under the Communications Act, 2023, the Seychelles Communications Regulatory Authority (hereinafter referred to as SCRA) has the responsibility to take measures to protect the rights of consumers and end users in relation to matters of customer service, including the quality of service. In addition, the Broadcasting and Telecommunications (Quality of Service) Regulations, promulgated in November 2022, prescribe specific targets for some indicators that service providers must meet to comply with the regulations.

SCRA engaged Metro Global Telecom Services (Pty) Ltd. (MetroTelworks) to conduct a comprehensive Quality of Service (QoS) assessment on the mobile networks of Airtel Seychelles and Cable & Wireless Seychelles (CWS). This evaluation, undertaken from October 3 to October 31, 2024, focused on assessing the performance of voice services provided by these operators in multiple regions on the islands of Mahé, Praslin & La Digue in Seychelles. During the assessment period, measurements were conducted across over 1300 kilometres.

The primary objective of this initiative is to evaluate end-user experience concerning voice service quality by simulating real-world usage scenarios. The findings aim to provide valuable insights into service performance and help ensure that both operators meet established regulatory targets and industry standards for voice clarity, network coverage, and overall service reliability. Measurement activities were conducted in key areas on Mahé Island where mobile voice services are widely utilized. The surveyed regions were categorized into Central, East, North, South, West, Praslin, & La Digue with each region covering multiple districts to provide a comprehensive assessment of mobile service performance.

To facilitate the QoS assessment, a vehicle was equipped with the advanced Keysight Nemo Backpack Pro measurement tool, incorporating eight devices dedicated to voice testing to simulate typical mobility conditions. The assessment focused on four Key Performance Indicators (KPIs) critical to evaluating Voice QoS: Call Accessibility, Call Retainability, Call Setup Time, and Speech Quality (Mean Opinion Score or MOS). Additionally, two specific metrics were measured: the Drop Call Ratio (DCR), which reflects the user's ability to successfully complete a call, and the Call Setup Success Ratio (CSSR), which assesses the ability to initiate a call.

According to the QoS standards set forth by SCRA, the targeted metrics required for operators include a maximum average Drop Call Ratio (DCR) of 2% and an average Call Setup Success Ratio (CSSR) of 97% or higher. The results of the assessment indicated that Airtel performed better in more KPIs than CWS as summarised below:

- Call Setup Success Ratio (CSSR): Airtel consistently achieved an average CSSR of 97% or higher, meeting the target and demonstrating strong network accessibility. In contrast, CWS fell short of the CSSR target, highlighting an area for improvement in call setup reliability.

- Drop Call Ratio (DCR): Both Airtel and CWS failed to meet the target of <2%, indicating challenges in call retention. Airtel showed a slightly lower DCR compared to CWS, but both operators need to focus on enhancing network stability to reduce dropped calls.

- Call Setup Time: Both operators maintained a Call Setup Time of less than 9 seconds, reflecting efficient network performance in establishing connections quickly. Airtel consistently outperformed CWS in this area, providing faster call setups across regions.

- Speech Quality (Mean Opinion Score): Both operators achieved speech quality scores of better than 3.0, with CWS achieving a higher MOS, reflecting superior perceived audio quality. This suggests that CWS may be leveraging advanced audio codecs or better optimization to deliver clearer and more natural voice transmission, though Airtel maintained a solid performance.

This QoS assessment highlights the strong performance of both Airtel Seychelles and Cable & Wireless Seychelles, with notable strengths in Call Setup Time and Speech Quality. However, areas such as Drop Call Ratio and Call Setup Success Ratio require attention, particularly for CWS. Both operators have demonstrated alignment with SCRA standards in key areas, ensuring reliable mobile service quality for residents and visitors.

2. INTRODUCTION

As mandated under the Communications Act, 2023, the Seychelles Communications Regulatory Authority (hereinafter referred to as SCRA) has the responsibility to take measures to protect the rights of consumers and end users in relation to matters of customer service, including the quality of service. In addition, the Broadcasting and Telecommunications (Quality of Service) Regulations, promulgated in November 2022, prescribe specific targets for some indicators that service providers must meet to comply with the regulations.

SCRA is committed to ensuring that all residents of Seychelles have access to high-quality, affordable communication services. To support this goal, SCRA contracted Metro Global Telecom Services (Pty) Ltd. (MetroTelworks) to perform drive testing of mobile voice services provided by Airtel Seychelles and Cable & Wireless Seychelles (CWS) on the island of Mahé.

The Quality of Service (QoS) monitoring was conducted in all the districts within the Central, Eastern, Northern, Southern, Western, La Digue, and Praslin regions of Seychelles. These regions included multiple districts, major road networks, and areas of previous user concerns regarding mobile service quality. The assessment involved testing within real-world usage areas to provide insights into voice telephony performance across different environments and ensure compliance with SCRA's service standards.
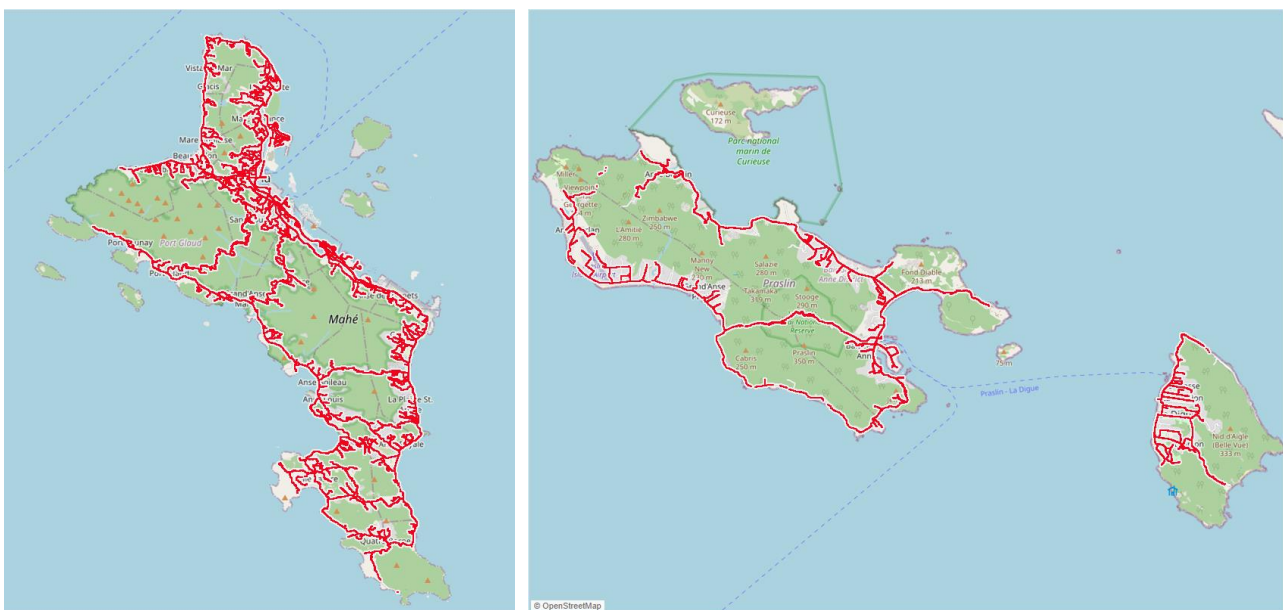
Figure 1. Mahe, La Digue & Praslin Islands Drive Routes

QoS is defined as the collective effect of service performance that determines the degree of satisfaction a user derives from a service. It provides an indication of what a customer experiences when using a mobile network and is evaluated in terms of Call Accessibility, Call Setup Time, and Call Retainability and Speech Quality parameters.

a) Call Accessibility is reported as a percentage and is a measure of the number of times a user can successfully establish a call as a ratio of the total calls attempted. It is measured using Call Setup Success Ratio (CSSR).

b) Call Setup Time is the time interval from the instant a user initiates a mobile call request until a complete message indicating call disposition is received by the calling terminal. It is measured from the time a user presses the dial button until the user gets connected to the dialled party.

c) Retainability is defined as the ability for a call to stay connected through to a normal call tear-down process, without abnormally disconnecting from the cell site that caries the call. It is measured using Drop Call Ratio (DCR).

d) Speech Quality is the condition of conversational speech without noise and echo interference. It is measured using the Mean Opinion Score (MOS).

3. METHODOLOGY

In each of the regions assessed for this Quality of Service (QoS) test, Metro Global Telecom Services (Pty) Ltd. (MetroTelworks) collected a minimum of 120 samples per mobile operator. Utilizing a drive-test sampling methodology, the approach provides a snapshot view of network performance from a real-world user perspective, assessing voice service quality at specific times and locations along selected routes. While not a comprehensive representation of overall network performance, the sampling method is considered statistically relevant for understanding operator voice service quality in the Central, Eastern, Northern, Southern, Western, La Digue & Praslin regions.

The voice testing setup included two distinct scenarios—short calls and long calls:

- **Short calls** measured Call Accessibility and Call Setup Time.
- **Long calls** assessed Call Retainability and Speech Quality.

One vehicle equipped with specialized drive-test equipment, facilitated the measurements.

- Four mobile devices for the long-call scenario, configured to call in the same vehicle. This setup created a realistic Mobile-to-Mobile testing environment, with one device in vehicle designated as the Call Originating (A-side) and the corresponding device in the same vehicle as the Call Terminating (B-side).
- Four mobile devices for the short-call scenario, configured to call in the same vehicle. This setup created a realistic Mobile-to-Mobile testing environment, with one device in vehicle designated as the Call Originating (A-side) and the corresponding device in the same vehicle as the Call Terminating (B-side).
- This setup enabled four devices per operator in the vehicle, totalling eight devices for voice testing.

Call Windows and Measurement Protocols: The testing protocol defined the Call Windows as follows:

- Long call window: 120 seconds of active call duration plus 30 seconds each for setup/release phases and post-call interval, totalling 180 seconds.
- Short call window: 10 seconds of active call duration plus 30 seconds setup/release and post-call intervals, resulting in a 70-second window.

The voice quality of samples was analysed using the HD-voice-capable ITU-standard POLQA wideband algorithm, with 6-7 samples recorded per call. Devices were set to select the best available network

technology, enabling Circuit Switched Fall Back (CSFB) calls in LTE-equipped areas where operators fall back to 3G/UMTS for voice services.

Voice testing was done in two phases with a measurement window gap of at least seven days in between both measurements to allow for any outages that may have been experienced in one phase to not negatively impact the overall results and give a view of network performance over different times.

3.1.   EQUIPMENT TEST SETUP AND CONFIGURATION

3.1.1. SYSTEM USED.

The testing equipment used was a Nemo Back Pro that was equipped with 12 Samsung Galaxy A52s (5G) devices supporting the following technologies: - GSM, UMTS, LTE, LTE-A & 5G. Figure 2 & 3 below shows the testing kit used for collection and full set of technologies supported by the devices:

The mobile devices were configured to automatically select a mobile network and radio access technology.

Figure 2. Keysight Nemo Backpack Pro

3.1.2. DEVICE DESCRIPTION

The Samsung Galaxy A52s 5G Smartphone was selected as the measurement User Equipment (UE) for Voice Services. It supports the following technologies: 2G GSM, 3G WCDMA, 4G LTE FDD, 4G LTE TDD, 5G Sub6 FDD, 5G Sub6 TDD.

Technology	GSM / HSPA / LTE / 5G
2G bands	GSM 850 / 900 / 1800 / 1900 - SIM 1 & SIM 2 (dual-SIM model only)
3G bands	HSDPA 850 / 900 / 1700(AWS) / 1900 / 2100
4G bands	1, 2, 3, 4, 5, 7, 8, 12, 17, 20, 26, 28, 32, 38, 40, 41, 66
5G bands	1, 3, 5, 7, 8, 20, 28, 38, 40, 41, 66, 78 SA/NSA/Sub6
Speed	HSPA 42.2/5.76 Mbps, LTE (CA) Cat18 1200/150 Mbps, 5G

Figure 3. Technology Bands supported by Samsung Galaxy A52s 5G

3.1.3. SHORT AND LONG CALL WINDOWS

Figure 4. shows the call windows for the long and short calls as highlighted in the methodology section.
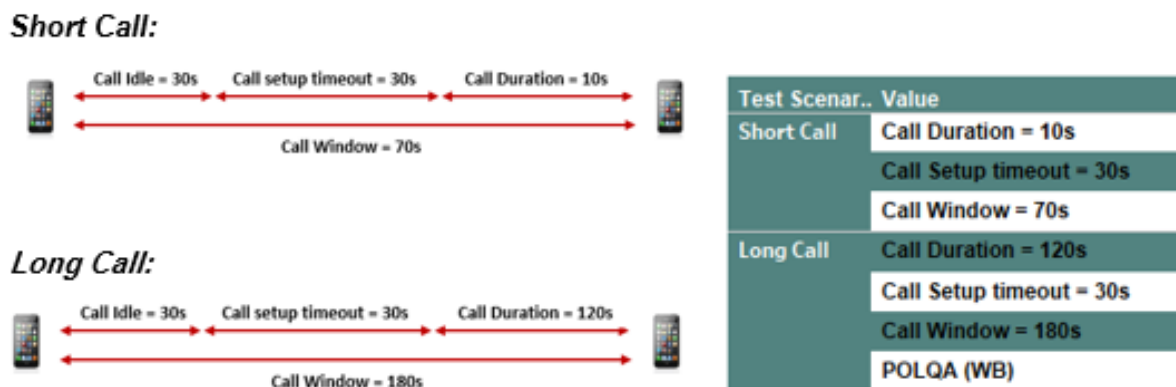

Figure 4. Call Window Duration

3.1.4. ROUTE SELECTION

Measurement routes were selected to reflect the end-user distribution at different geographical locations in districts where there is a likely usage of mobile phones – towns, districts, major roads, secondary roads and places where people gather. The regions in which the QoS measurements were conducted are as indicated in Table 1.

Table 1. Test timeline for regions covered.

Regions Testing Dates		
Regions	**Dates**	**Phases**
Central	04/10/2024 to 07/10/2024	Phase 1
	18/11/2024 to 21/10/2024	Phase 2
East	08/10/2024 to 16/10/2024	Phase 1
	21/10/2024 to 31/10/2024	Phase 2
La Digue & Praslin	23/10/2024 to 24/10/2024	Phase 1
	29/10/2024 to 30/10/2024	Phase 2
North	03/10/2024 to 04/10/2024	Phase 1
	18/10/2024	Phase 2
South	09/10/2024 to 14/10/2024	Phase 1
	22/10/2024 to 28/10/2024	Phase 2
West	10/10/2024 to 11/10/2024	Phase 1
	31/10/2024	Phase 2

MEASUREMENT PARAMETERS AND TARGETS

3.1.5. PARAMETERS

3.1.5.1. CALL SETUP SUCCESS RATIO [%]

The Call Setup Success Ratio (CSSR) is the percentage of calls that are successfully set up as a percentage of the total call attempts. The formula to calculate CSSR is shown below:

CSSR = Y/X *100

Where, Y represents successful setup calls, and X is the total number of call attempts.

3.1.5.2. UNSUCCESSFUL CALL SETUP RATIO [%]

The percentage of attempted calls not setup successfully.

3.1.5.3. DROP CALL RATIO [%]

Dropped Call Ratio (DCR) is the proportion of incoming and outgoing calls, which, once correctly established and having been assigned a traffic channel, is dropped, or interrupted prior to the deliberate completion by the user. The formula to calculate DCR is shown below:

DCR= D/S*100

Where D = number of dropped calls and S = number of successful calls established

3.1.5.4. CALL SETUP TIME [S]

Call Setup Time is the time interval from the instant a user initiates a network connection request until a complete message indicating call disposition is received by the calling terminal. It is measured from the time a user presses the dial button until the user gets connected to the dialled party. The mean time in seconds taken to answer customer calls.

3.1.5.5. SPEECH QUALITY (MOS)

Speech quality on call basis is an indicator representing the end-to-end speech transmission quality of the mobile telephony service. This parameter computes the speech quality on the basis of completed calls. Measurement made use of the POLQA Algorithm which compares the reference signal received from the transmitting side against an equivalent sample on the receiving side.

3.1.6. TARGETS

According to the QoS standards set forth by SCRA, the following voice parameters' targets are defined as follows:

1. Call Setup Success Ratio – Average Call Setup Success Ratio must be 97% or higher.
2. Call Setup Time Ratio – No specific target specified.
3. Drop Call Ratio – Average Drop Call Ratio must be less than or equal to 2%.
4. Speech Quality – No specific target specified.

4. RESULTS AND ANALYSIS

This section provides a summary of the mobile operators' performance results based on the drive test route in the following test regions: Central, Eastern, Northern, Southern, Western, La Digue & Praslin. The results are combined for all Regions tested in Seychelles.

4.1. KPI RESULTS OVERALL

Table 2. Summary of Overall Voice Results

	Airtel	CWS
Call Setup Success Ratio [%]	98.66	96.67
Call Setup Unsuccessful Ratio [%]	1.34	3.33
Drop Call Ratio [%]	2.66	3.44
Call Setup Time [s]	6.36	7.81
POLQA MOS	3.12	3.41

Summary:

Airtel met and exceeded the targets in the call setup success ratio, whereas CWS fell short of the call setup success target.

Both Airtel and CWS fell short of the target (underperformance) in the drop call ratio, with Airtel achieving a slightly better result.

Airtel performed better in terms of lower unsuccessful ratios and quicker setup times, while CWS showed an edge in voice call quality.

4.2. KPI RESULTS PER REGION

Table 3 shows a summary of the results per region. Detailed results are provided in the Appendix 1.

Table 3. Summary of KPI Results per Region

		Central	East	La Digue & Praslin	North	South	West
Call Setup Success Ratio [%]	**Airtel**	98.48	99.04	99.40	99.28	97.48	98.08
	CWS	96.56	97.64	95.95	98.41	95.76	95.91
Call Setup Unsuccessful Ratio [%]	**Airtel**	1.52	0.96	0.60	0.72	2.52	1.92
	CWS	3.44	2.36	4.05	1.59	4.24	4.09
Drop Call Ratio [%]	**Airtel**	2.88	1.44	1.76	1.56	4.03	4.90
	CWS	2.54	2.59	4.37	1.59	4.96	4.33
Call Setup Time [s]	**Airtel**	6.56	6.14	6.14	6.51	6.50	6.37
	CWS	7.84	7.48	7.88	7.71	7.91	8.11
POLQA MOS	**Airtel**	3.10	3.11	3.15	3.14	3.14	3.07
	CWS	3.37	3.35	3.52	3.34	3.42	3.40

Summary

Call Setup Success Ratio [%]: Airtel exceeded the target in all regions, while CWS only met the target in the Eastern and Northern Regions. Airtel performed better overall in this KPI.

Call Setup Unsuccessful Ratio [%]: Airtel consistently had a lower unsuccessful ratio than CWS in all regions.

Drop Call Ratio [%]: Airtel was able to achieve the target results in the Northern, Eastern and La Digue & Praslin regions. CWS was only able to achieve the target in the Northern Region.

Call Setup Time [s]: Airtel had faster call setup times than CWS across all regions, indicating better performance in connecting calls quickly.

POLQA MOS: CWS consistently scored higher in POLQA MOS across all regions, indicating a better perceived audio quality during calls.
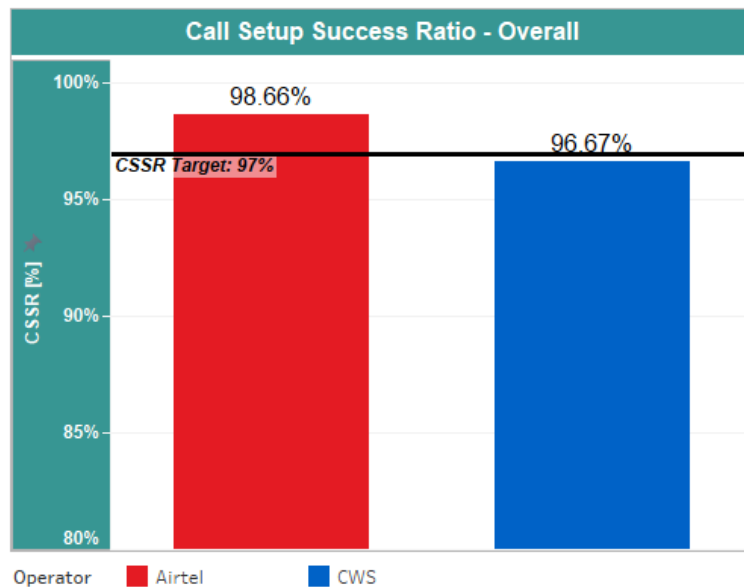
4.2.1. CALL ACCESSIBILITY (SHORT CALL)

Figure 5. CSSR KPI Overall Results – Short Call

Figure 5 shows the Overall Call Setup Success Ratio (CSSR) for all tested regions combined. Airtel demonstrated strong network efficiency by achieving the highest CSSR of 98.66%, exceeding the target of 97%. In contrast, CWS recorded a CSSR of 96.67%, falling just short of the target. Airtel's superior performance highlights its reliable and efficient network in enabling successful call setups, while CWS needs to improve to meet the CSSR benchmark in some regions.
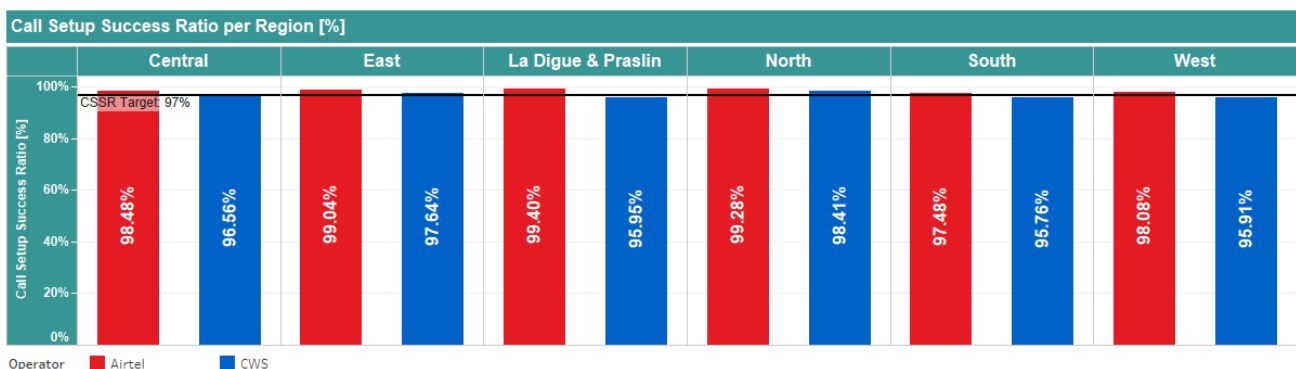

Figure 6. CSSR KPI per Region - Short Call

Figure 6 shows that Airtel consistently meets or exceeds the target in all regions, demonstrating strong network reliability. CWS met the target in the Eastern and Northern but fell short in Central, Southern, La Digue & Praslin and Western regions.
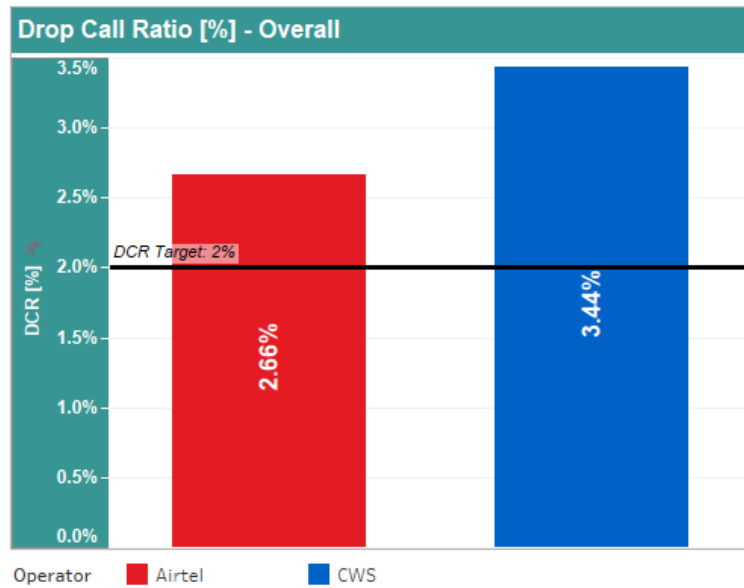
4.2.2. DROP CALL RATIO (LONG CALL)

Figure 7. DCR KPI Overall Results – Long Call

Figure 7. shows the overall Drop Call Ratio (DCR) results, revealing that neither Airtel nor CWS met the target of <2%. Airtel recorded a DCR of 2.66%, while CWS had a slightly higher DCR of 3.44%. Although both operators fell short of the target, Airtel demonstrated relatively better network efficiency by maintaining a lower drop call ratio compared to CWS. This indicates that Airtel's network provides a slightly more reliable call retention experience.
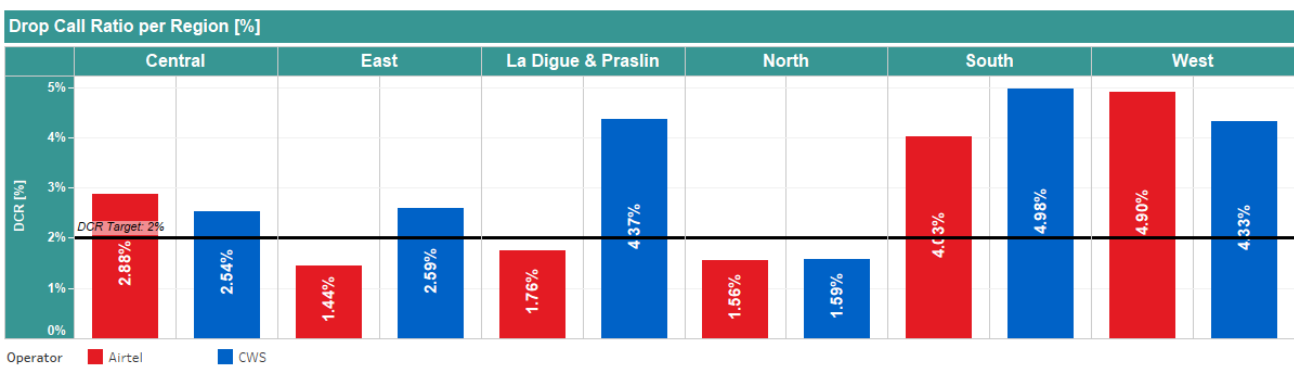

Figure 8. DCR KPI per Region - Long Call

Figure 8. shows the operator's Drop Call Ratio [%] results per region. Airtel met the target in Eastern, Northern, La Digue & Praslin regions but failed in Central, Southern, and Western regions. CWS also struggles, failing to meet the target in all regions except the Northern region. Airtel edges out slightly with better performance in most regions, but neither provider achieves satisfactory drop call performance overall.
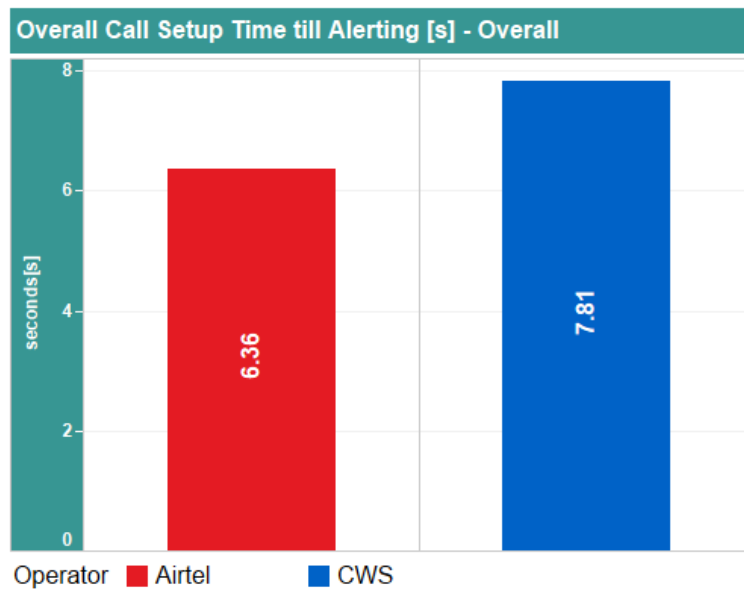
4.2.3. CALL SETUP TIME (SHORT CALL)

Figure 9. Call Setup Time[s] KPI Overall Results

Figure 9. shows the overall Call Setup Time (CST) results for all regions combined on Mahé Island, Seychelles. Airtel demonstrated superior network efficiency by achieving the lowest average Call Setup Time of 6.36 seconds, significantly outperforming CWS, which recorded an average CST of 7.81 seconds.
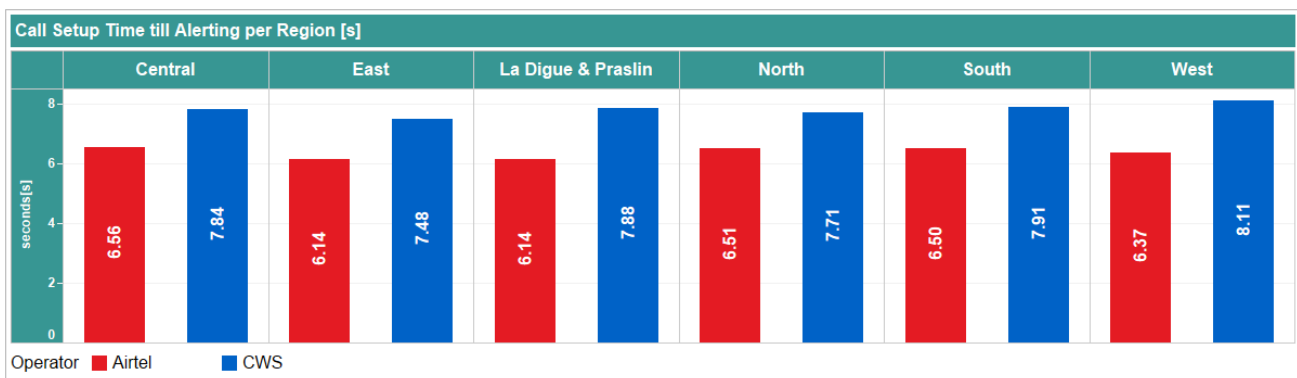

Figure 10. Call Setup Time[s] KPI per Region

Figure 10. shows Airtel has consistently lower setup times than CWS, indicating faster and more efficient call connections across all regions. CWS lags in every region, with the longest setup times recorded in the Western region.
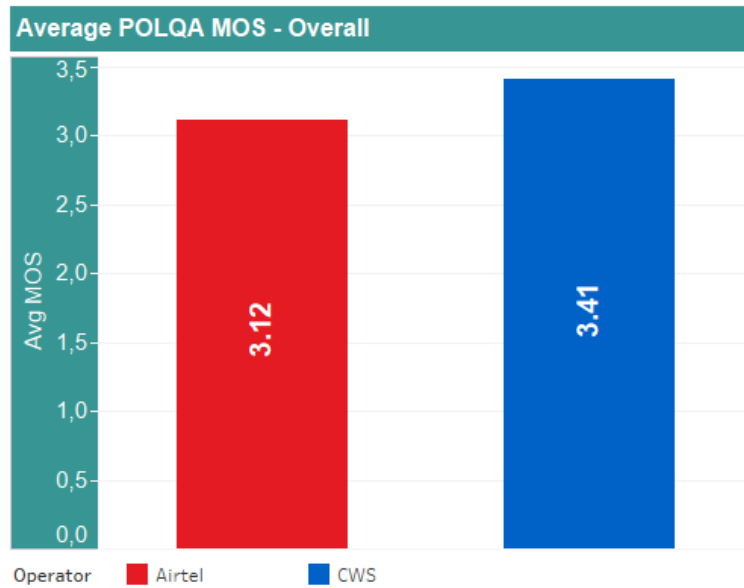
4.2.4. POLQA MOS (LONG CALL)

Figure 11. Speech Quality Overall Results

Figure 11 shows the overall Voice Speech Quality results for all regions. CWS achieved the highest score of 3.41, outperforming Airtel, which scored 3.12. This indicates that CWS offers better voice clarity and a better overall audio experience during calls due to use of higher codecs which can enhance the listening experience by improving audio quality, even under challenging network conditions, by optimizing bandwidth utilization and reducing distortion or noise.
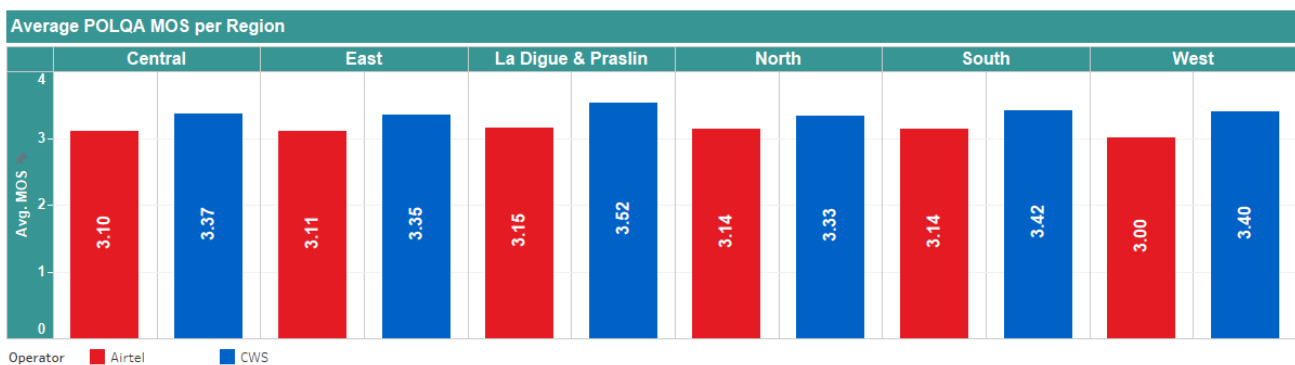
Figure 12. Speech Quality Results per Region

Figure 12. depicts speech quality results per tested region. Both Operators achieved an average POLQA MOS of at least three (3) in all the tested regions. CWS outperforms Airtel in all regions, with higher MOS scores indicating better voice clarity and user experience. Airtel, while maintaining decent scores, lags in voice quality. CWS, showed a clear advantage in voice clarity in all regions tested.

4.3.   RADIO TECHNOLOGY
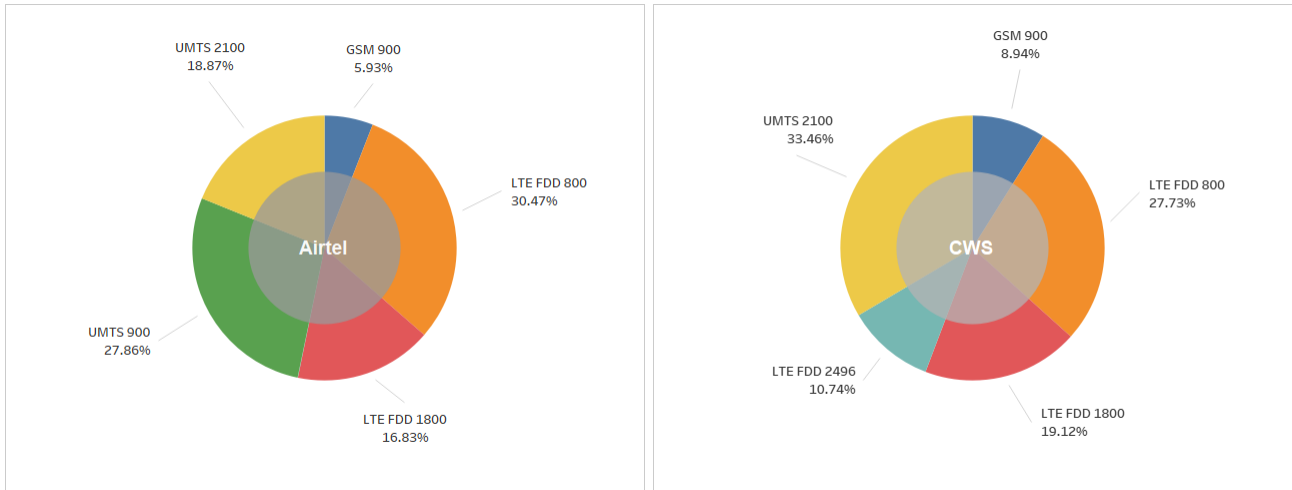
Figure 13. Serving Radio Technology Overall Results

Figure 13 shows the distribution of the overall serving technology during the drive test including the time the devices were in idle mode. All operators' serving technology during calls was mainly on UMTS technology, CWS showed presence of most samples on UMTS 2100 and no samples on U900. Airtel had higher samples on UMTS 900 as compared to UMTS2100.

Figure 14 shows the distribution of the serving radio technology per region. Airtel showed significant presence of UMTS 900 for all tested regions in Seychelles.

Figure 14. Serving Radio Technology per Region

5. CONCLUSION

This section provides a summary and key finding of all measurements. The results illustrate a snapshot of the mobile network performance and customer experience within the measured time and location context.
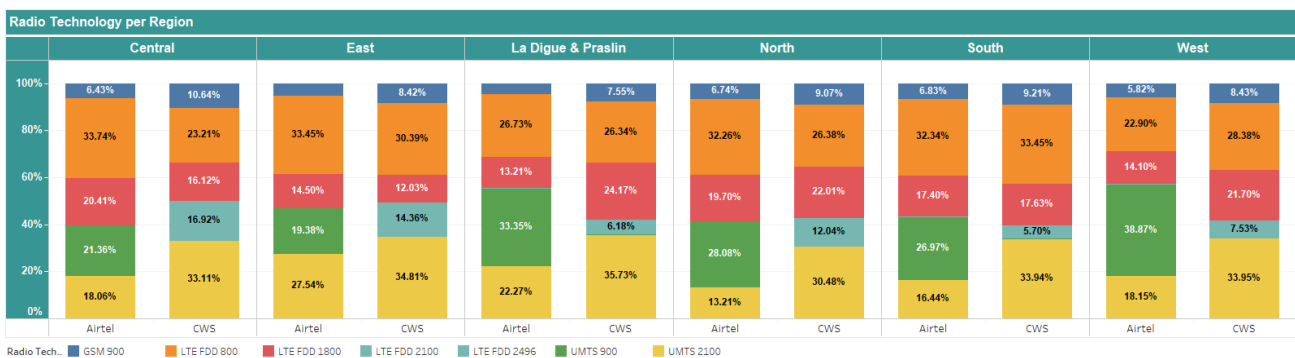
The results indicate the end-user's Quality of Service and operators' network performance per region in the areas assessed in Seychelles. Below are the highlights: -

5.1. CALL SETUP SUCCESS RATIO (TARGET: 97%)

- Airtel consistently met or exceeds the target in all regions, demonstrating strong network reliability.
- CWS met the target in the Eastern and Northern regions but fell short in Central, Southern, Western, La digue & Praslin regions.
- Airtel, with better performance in all regions except the North, where both performed well.

5.2. DROP CALL RATIO (TARGET: 2%)

- Airtel achieved the target in the La Digue & Praslin, Eastern and Northern regions but fell short in the Central, Southern, and Western regions, where drop call ratios are significantly higher.
- CWS also struggled, failing to achieve the target in most of the regions except the North.
- Airtel edges out slightly with better performance in most regions, but neither provider achieved satisfactory drop call performance overall.

5.3. CALL SETUP TIME

- Airtel had consistently lower setup times than CWS, indicating faster and more efficient call connections across all regions.
- CWS lagged in every region, with the longest setup times recorded in the West.

5.4. POLQA MOS (VOICE QUALITY)

- CWS outperformed Airtel in all regions, with higher MOS scores indicating superior voice clarity and user experience.
- Airtel, while maintaining decent scores, lagged in voice quality.

5.5. OVERALL PERFORMANCE

Airtel demonstrates stronger results in **call setup success ratio** and **setup time**, consistently meeting targets and outperforming CWS in most regions.

- CSSR: 98.66% (Meets the target; better performance in call setup success).
- DCR: 2.66% (Does not meet the target; needs improvement in reducing dropped calls).
- Call Setup Time: 6.36 seconds (lower than CWS, indicating quicker call setup).
- POLQA-MOS: 3.12 (lower audio quality compared to CWS).

CWS leads in **voice quality (POLQA MOS)** but falls behind in meeting the **call setup success** and **drop call ratio** targets.

- CSSR: 96.67% (Below the target; needs improvement in call setup success).
- DCR: 3.44% (Does not meet the target; higher dropped call rate than Airtel).
- Call Setup Time: 7.81 seconds (slower than Airtel, indicating delayed call setup).
- POLQA-MOS: 3.41 (higher audio quality compared to Airtel).

Conclusion: This QoS assessment highlights the strong performance of both Airtel Seychelles and Cable & Wireless Seychelles, with notable strengths in Call Setup Time and Speech Quality. Both operators have demonstrated alignment with SCRA standards in key areas, ensuring reliable mobile service quality for residents and visitors. Their commitment to enhancing network performance reflects ongoing efforts to support seamless connectivity and improve the overall user experience**.**

Airtel emerges as the overall leader in Voice KPI performance, but both providers need to address drop call ratio issues to meet target thresholds comprehensively. With targeted improvements in call retention and setup success, both providers can further enhance service quality.

5.6. AREAS OF IMPROVEMENT

To address the areas that failed to achieve the target, a breakdown of the main districts of concern for each operator are included below.

Airtel areas for improvement:

In order to improve the call setup success ratio as well as drop call ratio, Airtel needs to focus on the following districts:

- Central Region - Bel Air district

- Eastern region - Les Mamelles district

- Southern region - Takamaka district, Anse Royal, Baie Lazare districts.

- Western region -Port Glaud and Grand Anse districts.

CWS areas for improvement:

CWS improvements will come from focusing on the following districts:

- Central region - Bel Air, English River, Mont Buxton and Mont Fleuri districts.

- Eastern regions - Les Mamelles and Pointe Larue districts.

- Southern region – Baie Lazare, Takamaka and Anse Royale districts.

- Western region - Anse Boileau, Port Glaud, Grand Anse

- Praslin

From the performance of both operators, it is evident that the Western and Southern Regions are the ones where users are most impacted in terms of quality of services as both operators must address the performance in most of the districts in these regions.

6. APPENDICES

6.1.   APPENDIX 1: DETAILED TEST RESULTS PER PHASE

Table 4. CSSR and Call Setup Time - Phase 1 and Phase 2

		Central		East		La Digue & Praslin		North		South		West		Grand Total
		Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	
Call Attempt	**Airtel**	490	563	494	553	642	701	520	453	555	595	385	395	6,346
	CWS	474	544	478	540	614	671	506	436	520	566	386	396	6,131
Call Failed	**Airtel**	8	8	6	4	5	3	5	2	14	15	9	6	85
	CWS	19	16	10	14	28	24	7	8	20	26	11	21	204
Call Setup Success Ratio [%]	**Airtel**	98.37	98.58	98.79	99.28	99.22	99.57	99.04	99.56	97.48	97.48	97.66	98.48	98.66
	CWS	95.99	97.06	97.91	97.41	95.44	96.42	98.62	98.17	96.15	95.41	97.15	94.70	96.67
Call Setup Time [s]	**Airtel**	6.61	6.52	6.08	6.19	0.78	0.43	6.41	6.62	6.45	6.55	6.25	6.49	6.36
	CWS	7.80	7.87	7.35	7.60	4.56	3.58	7.40	8.07	8.05	7.77	8.20	8.02	7.81

Table 5. (DCR) and POLQA MOS - Phase 1 and Phase2

		Central		East		La Digue & Praslin		North		South		West		Grand Total
		Phase 1	Phase 2	Phase 1	Phase 2			Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	
Call Established	**Airtel**	128	150	131	146	165	176	137	119	146	152	99	105	1,654
	CWS	132	144	131	139	162	181	134	118	137	144	101	107	1,630
Call Dropped	**Airtel**	3	5	2	2	4	2	2	2	4	8	1	9	44
	CWS	4	3	2	5	7	8	2	2	7	7	4	5	56
Drop Call Ratio [%]	**Airtel**	2.34	3.33	1.53	1.37	2.42	1.14	1.46	1.68	2.74	5.26	1.01	8.57	2.66
	CWS	3.03	2.08	1.53	3.60	4.32	4.42	1.49	1.69	5.11	4.86	3.96	4.67	3.44
POLQA MOS	**Airtel**	3.09	3.12	3.12	3.11	3.11	3.18	3.15	3.13	3.12	3.16	3.09	2.92	3.12
	CWS	3.33	3.41	3.39	3.32	3.54	3.51	3.34	3.32	3.42	3.42	3.37	3.43	3.41

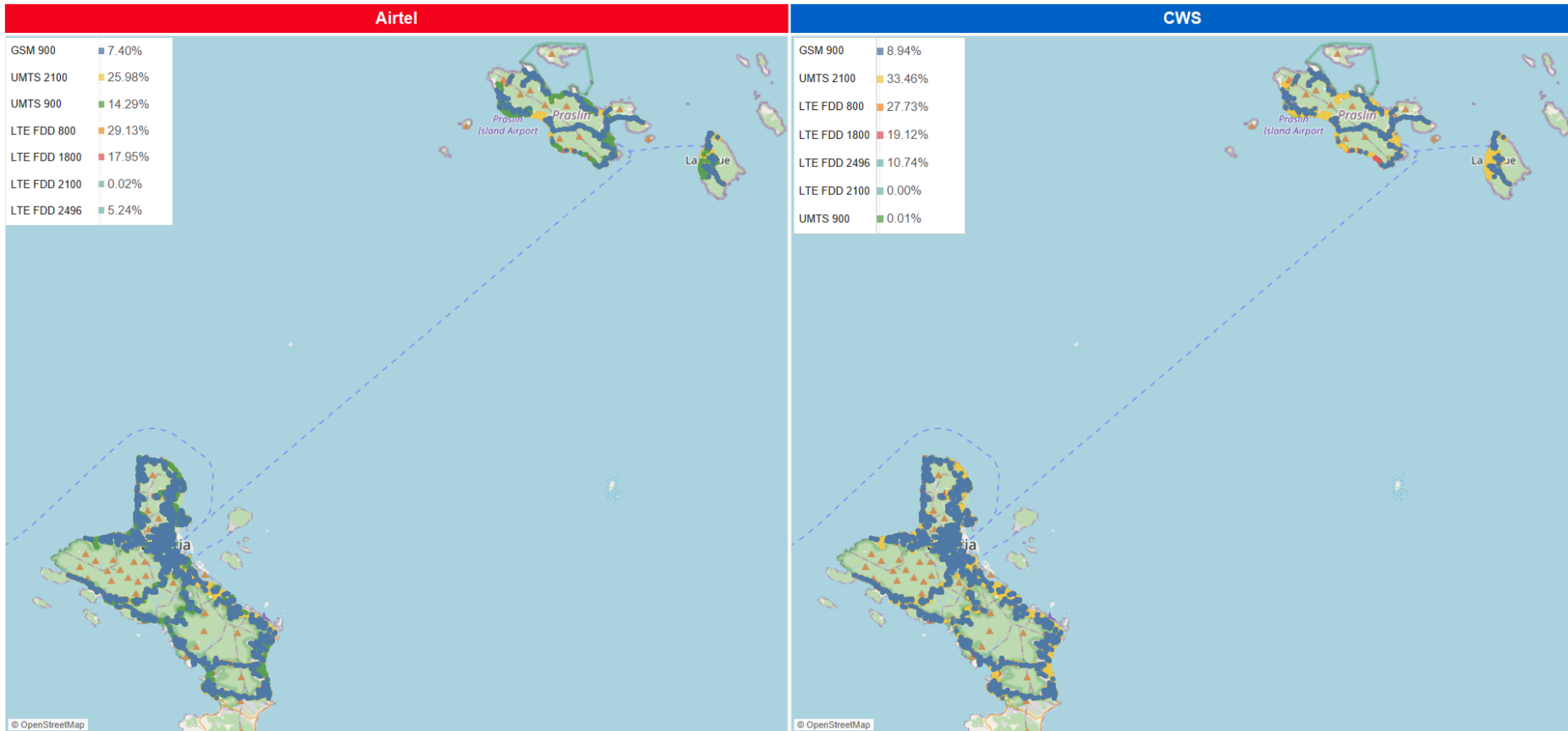## 6.2. APPENDIX 2 TECHNOLOGY MAPS

Figure 15. Radio Technology Maps

6.3. APPENDIX 3 CALL ATTEMPT FALIURE MAP
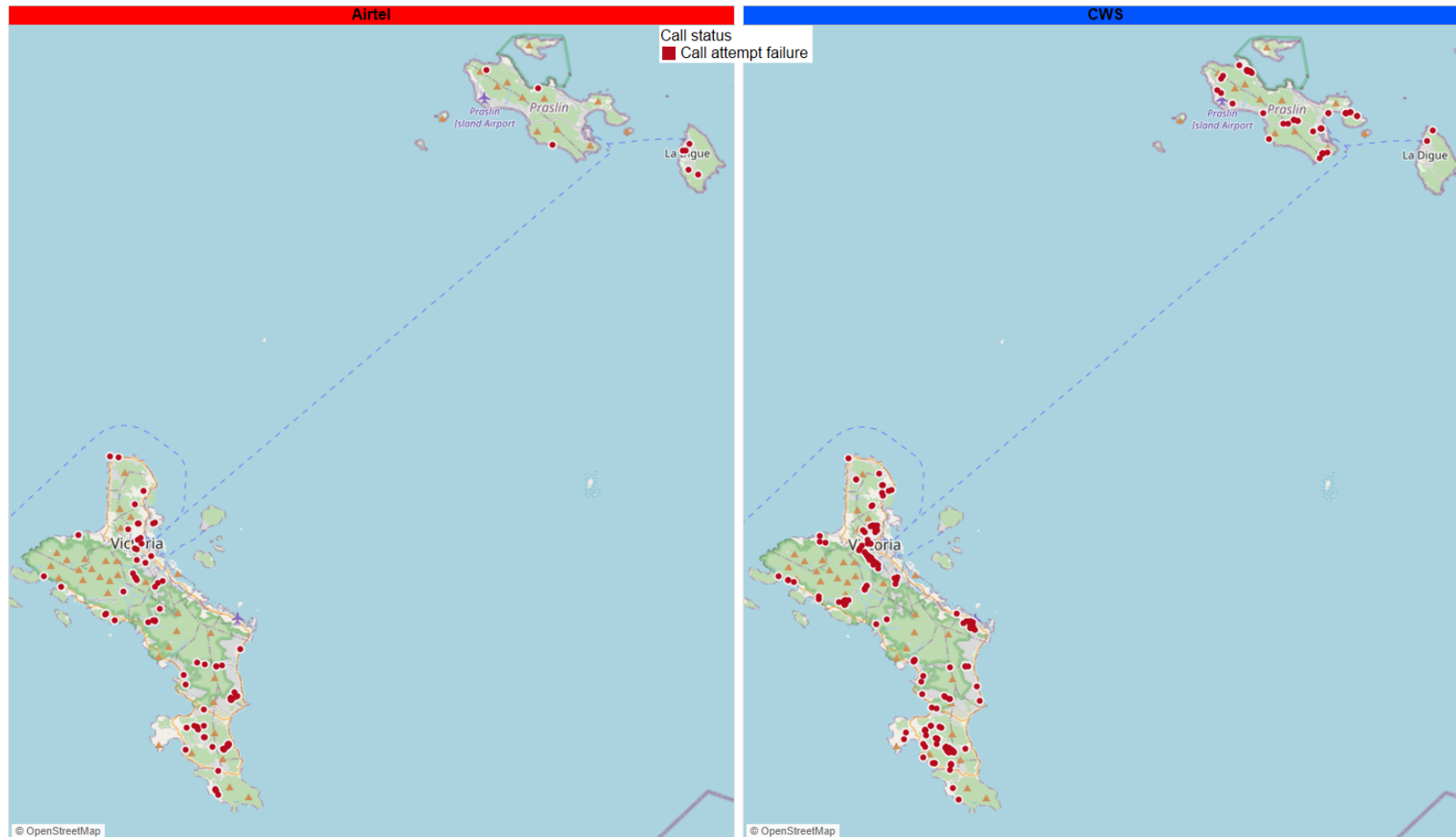

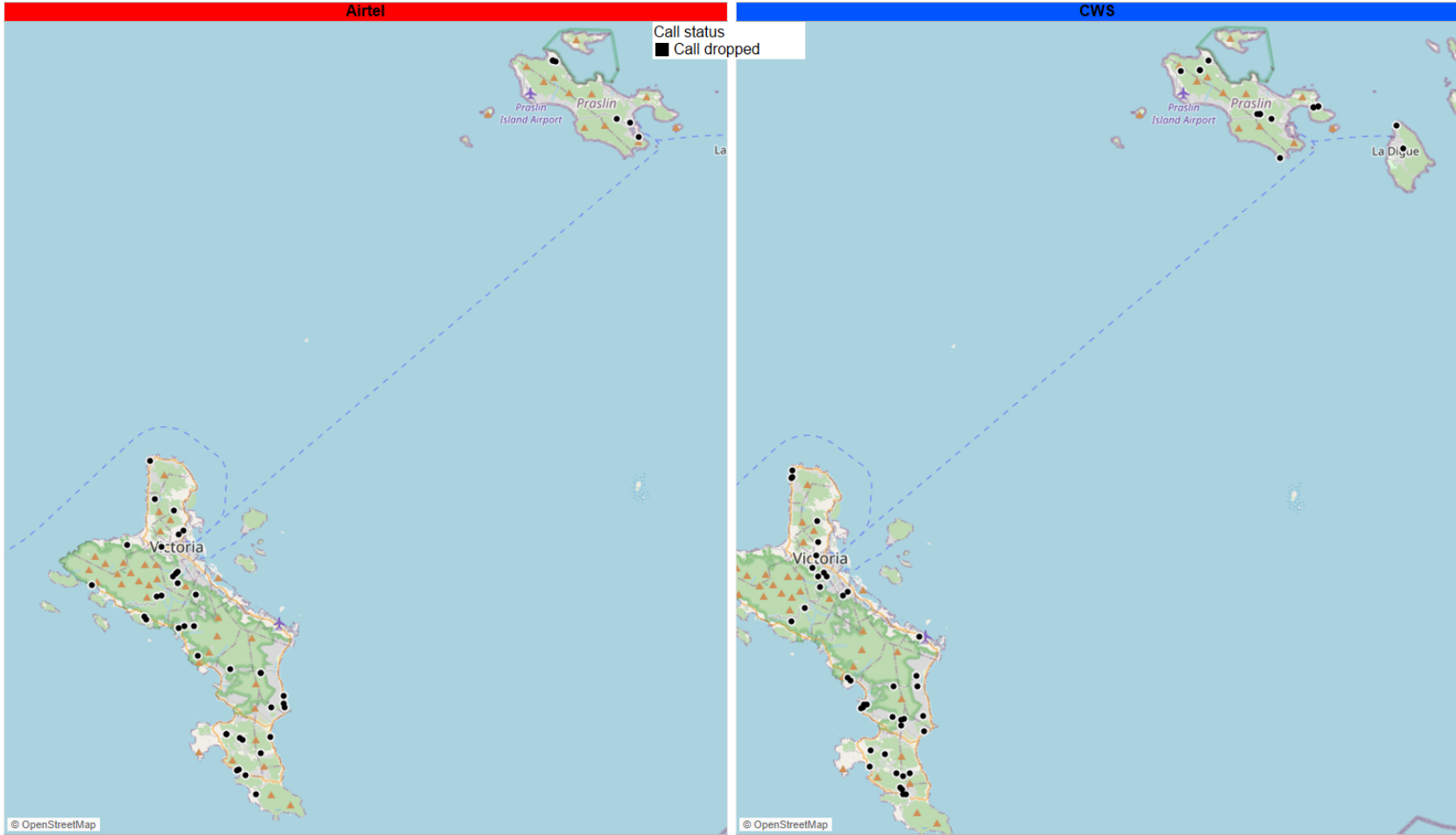*Figure 16: Call Attempt failure map*

6.4. APPENDIX 4 CALL DROP MAP

Figure 17: Call Drop map
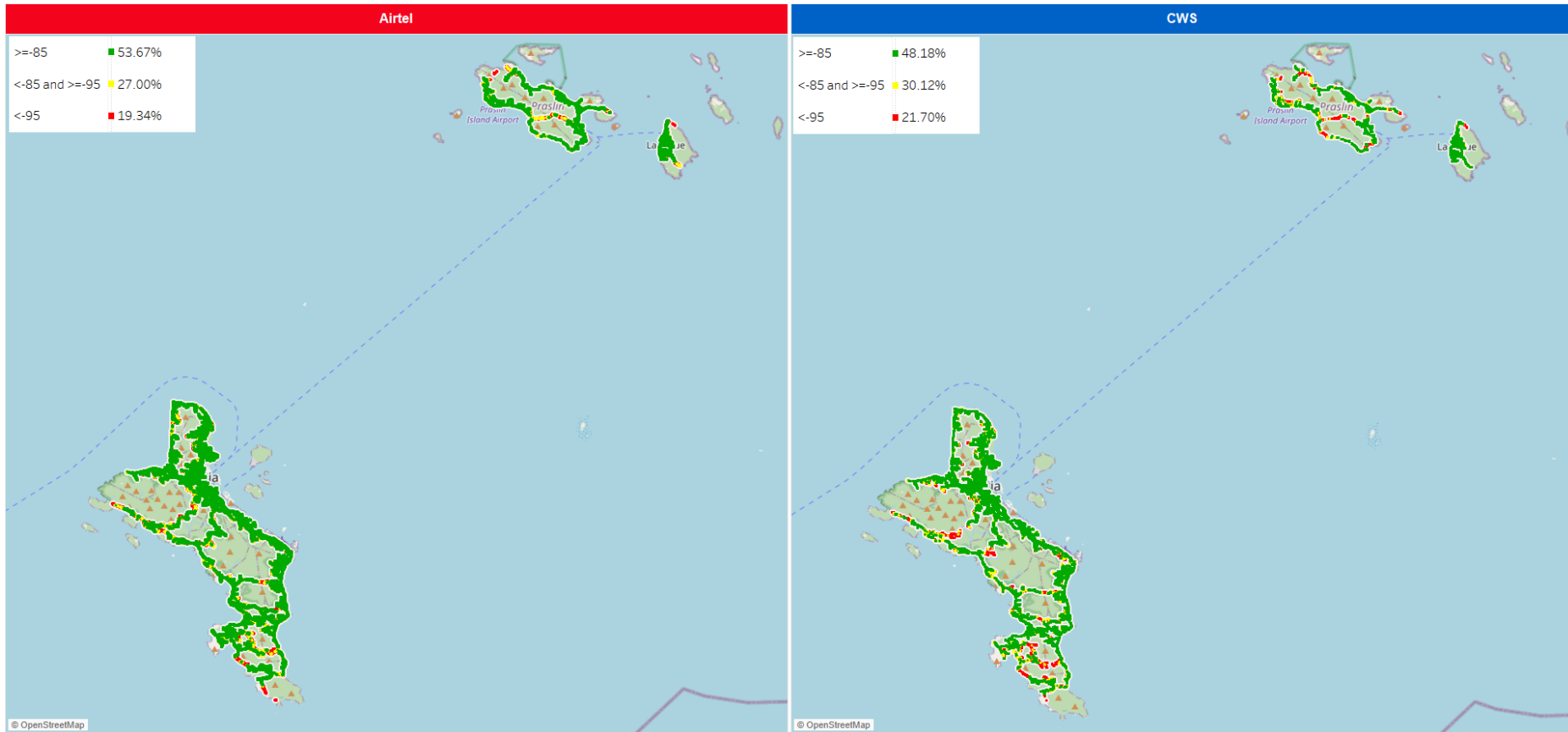
6.5.　APPENDIX 5: UMTS COVERAGE MAPS

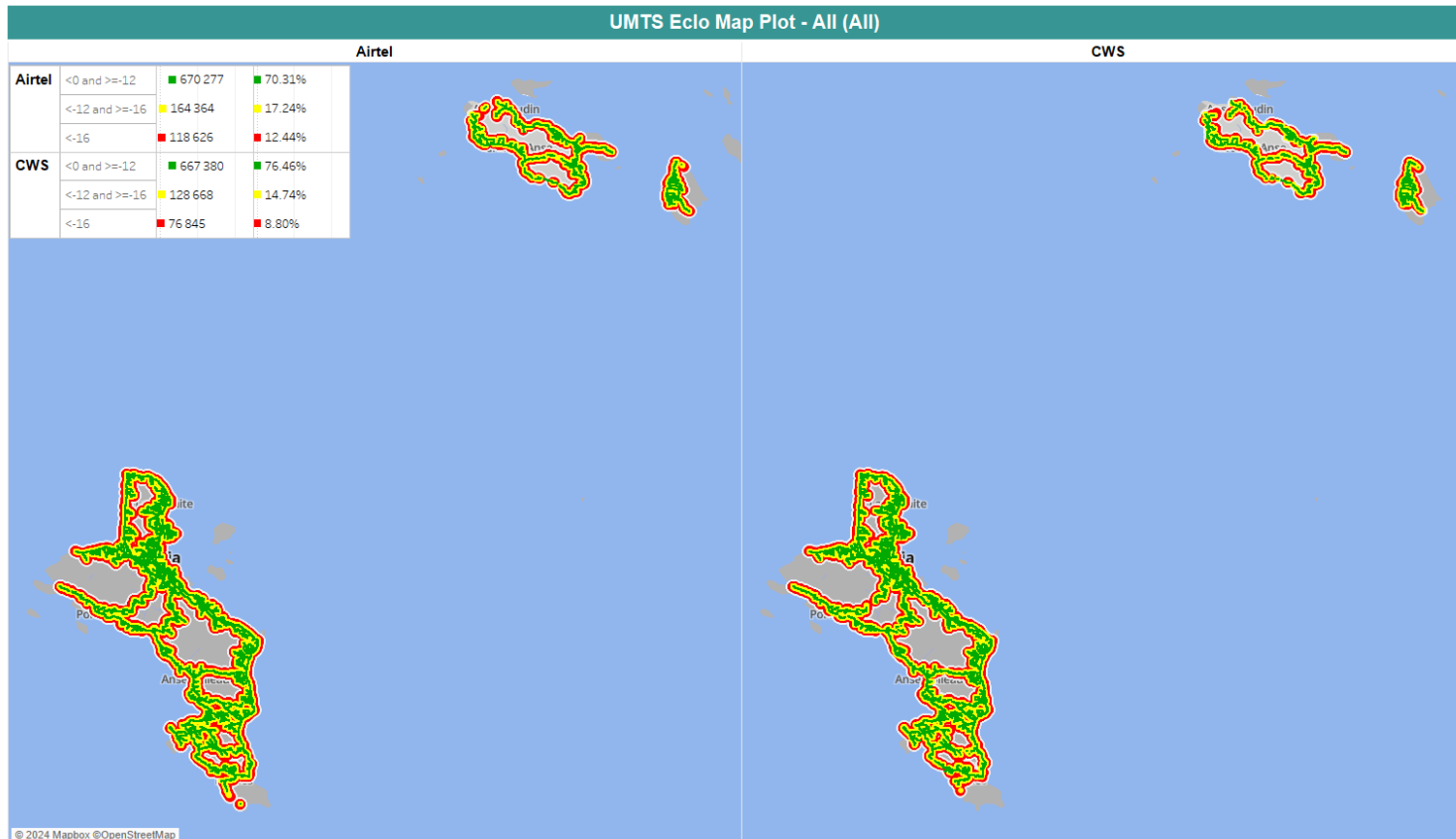*Figure 18. UMTS Coverage Map Plot*

6.6. APPENDIX 6: UMTS QUALITY MAPS

UMTS EcIo Map Plot - All (All)					
Airtel					
Airtel	<0 and >=-12	■	670 277	■	70.31%
	<-12 and >=-16	■	164 364	■	17.24%
	<-16	■	118 626	■	12.44%
CWS	<0 and >=-12	■	667 380	■	76.46%
	<-12 and >=-16	■	128 668	■	14.74%
	<-16	■	76 845	■	8.80%

Figure 19. UMTS EcNo Map Plot
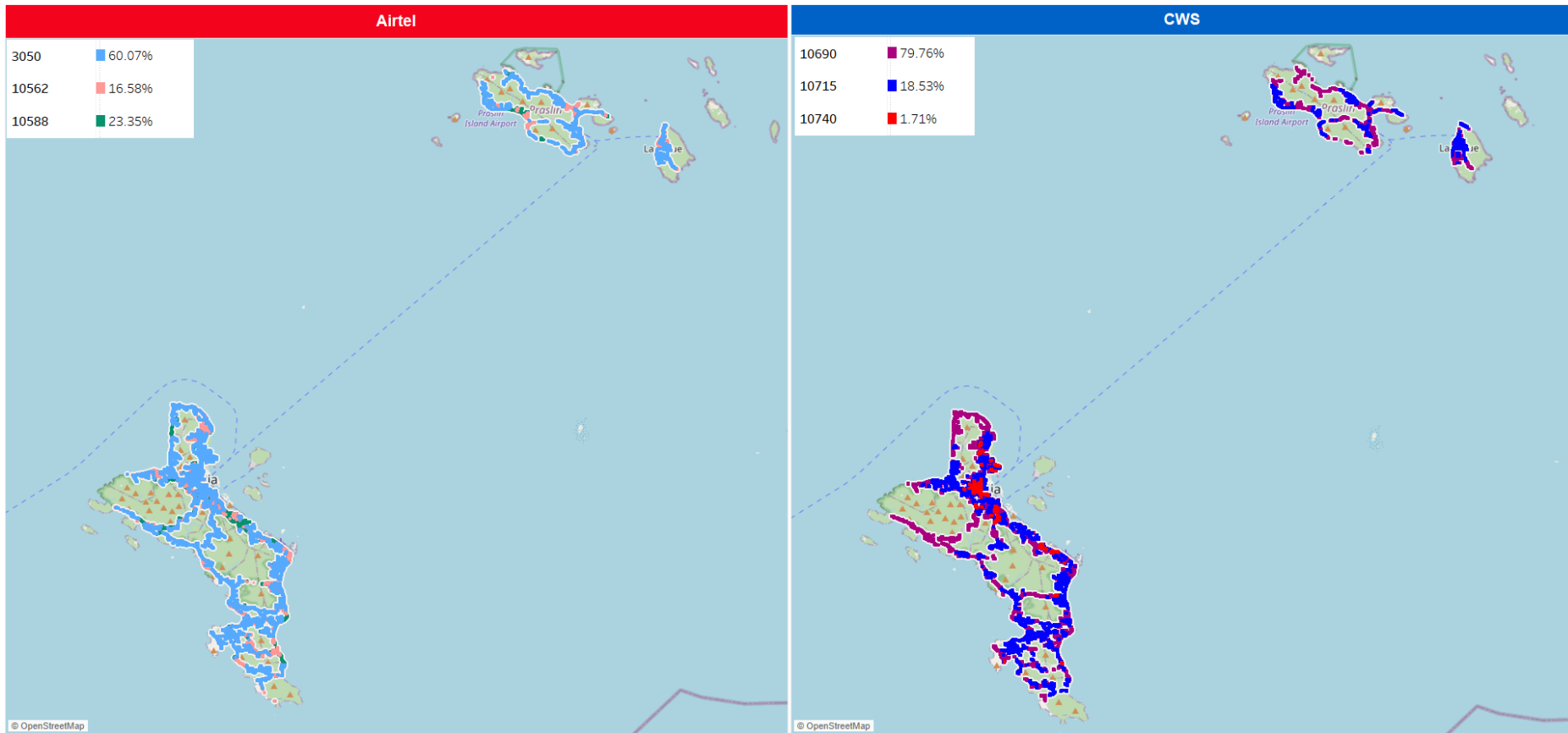
6.7. APPENDIX 7: UMTS UARFCN MAPS

Figure 20. UMTS URFCN Map Plot

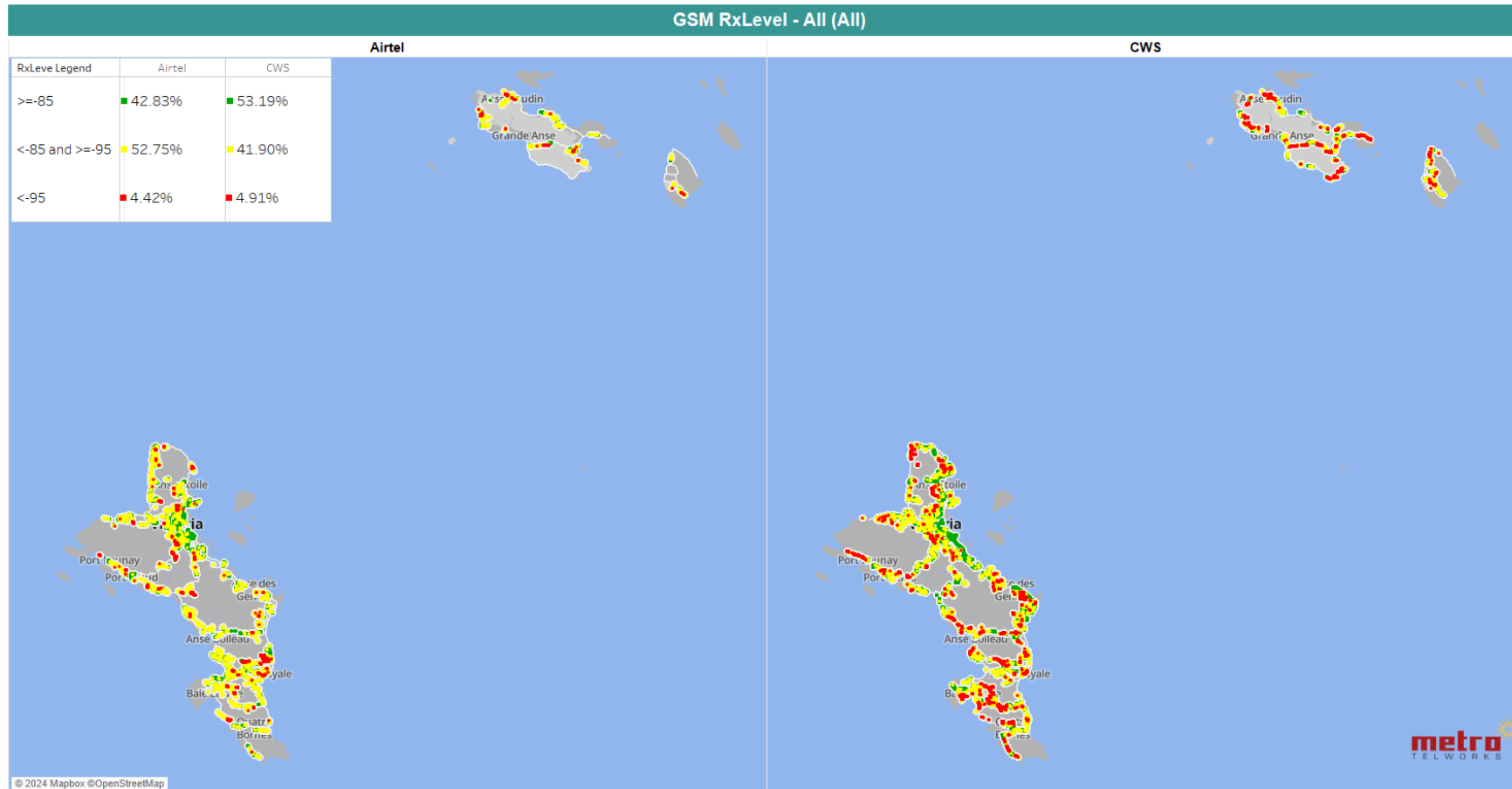## 6.8.   APPENDIX 8: GSM COVERAGE MAPS
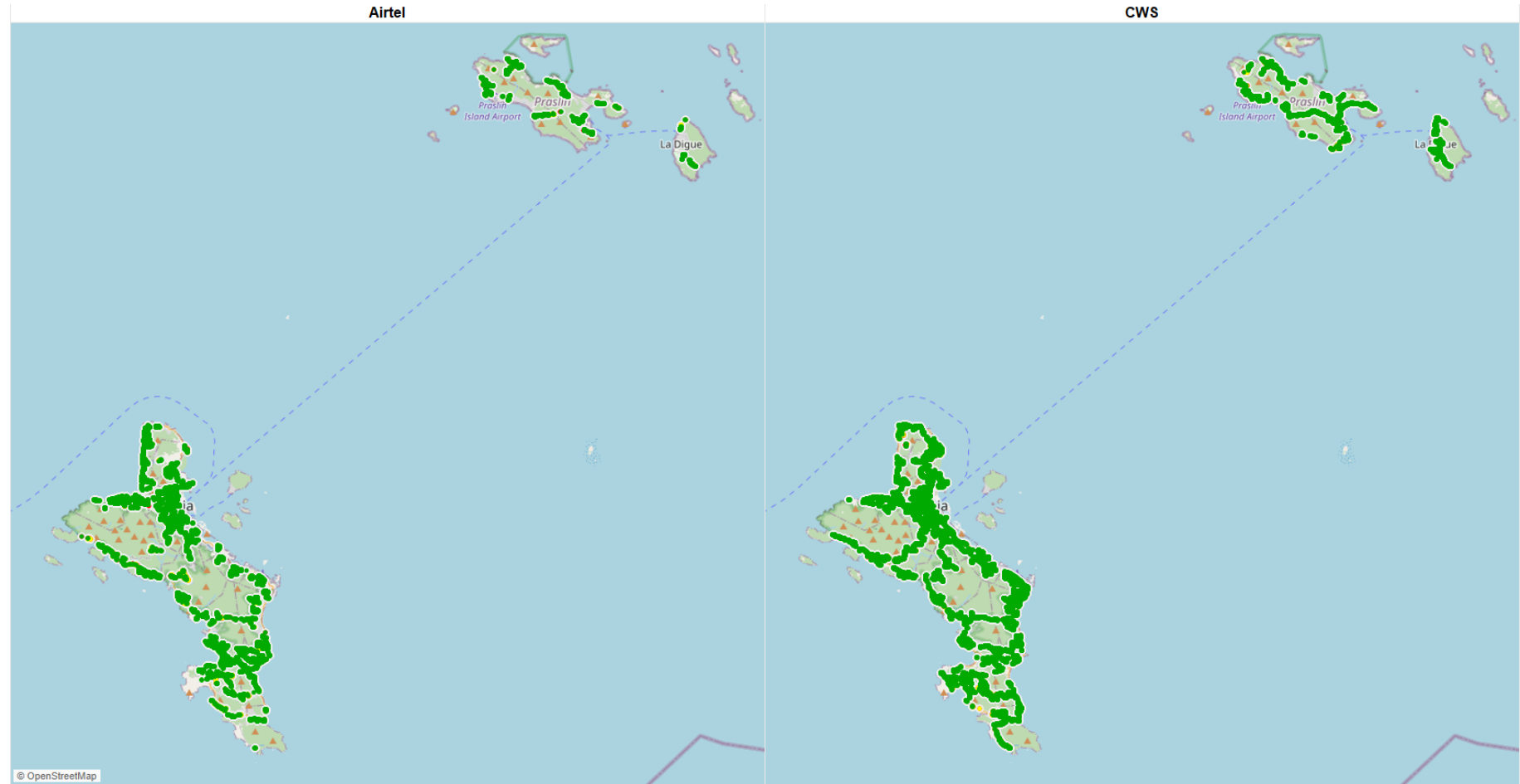

Figure 21. GSM RxLevel Map Plots

6.9. APPENDIX 9: GSM QUALITY MAPS

Figure 22. GSM Rx Quality Map Plot