

# تقرير مختصر عن نتائج قياس جودة خدمات شبكات المحمول عن شهر ابريل 2020

إصدار 1 يونيو 2020



تم إجراء اختبارات قياسات جودة خدمات التليفون المحمول لعدد 80 منطقة (مدينة وحي)، عن طريق إجراء الاختبارات القياسية لخدمات الصوت والبيانات باستخدام سيارات القياس لمسافات تصل إلى 24 ألف كم.

**80**  
منطقة قياس

بلغ مجموع المناطق التي تم فيها تحسن الخدمة 15 منطقة من إجمالي 58 منطقة كانت تعاني من سوء الخدمة في شهر مارس، موزعة نسبتها وفقاً للمشغلين كالتالي، 32% وى، 31% فودافون، 26% اتصالات، 11% أورنج.

**15**  
منطقة تحسنت



بلغ مجموع المناطق التي تم فيها رصد تأثير في جودة خدمات الاتصالات 57 منطقة، متأثرة بزيادة كبيرة في معدلات الاستخدام لشبكات المحمول خلال شهر رمضان، بالإضافة للإجراءات الاحترازية أثناء فترات حظر التجوال والتي أثرت على سرعة الاستجابة لأعطال التقنية المفاجئة.

**57**  
منطقة متأثرة

المناطق الجغرافية التي تم فيها رصد تأثير جودة الخدمات الصوتية لشبكات المحمول

وي فودافون اتصالات أورنج

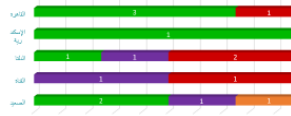
عدم بدء المكالمات

عدد المناطق



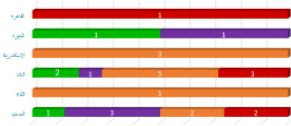
انقطاع المكالمات

عدد المناطق



جودة صوت المكالمات

عدد المناطق



مؤشرات جودة خدمات البيانات لشبكات المحمول

معايير خدمات البيانات لشبكات المحمول كانت في الحدود المقبولة لجميع الشركات وفقاً للتخصيص مع تميز شركتي أورنج واتصالات في سرعة تنزيل البيانات.

تم رصد عدد محدود من المناطق التي تأثرت فيها مؤشرات جودة البيانات خاصة أوقات الذروة كما هو مبين بالتقرير التفصيلي.

# رسم توضيحي "انفوجراف" لمؤشرات جودة خدمات المحمول في شهر أبريل 2020

• في إطار حرص الجهاز القومي لتنظيم الاتصالات علي تحسين جودة خدمات الاتصالات المقدمة للمواطنين؛ أصدر اليوم المركز القومي لمراقبة جودة خدمات الاتصالات التابع للجهاز القومي تقريره لنتائج قياسات شهر أبريل لجودة خدمات الصوت والانتزنت المقدمة من شركات الاتصالات العاملة في مصر؛ حيث تم اجراء اختبارات جودة الخدمة خلال الشهر لما يقرب من 24 الف كيلو متر من المناطق المأهولة بالسكان في جمهورية مصر العربية، والمقسمة إلى ما يقرب من 80 مدينة وحي؛ حيث تمت القياسات لخدمات الصوت والبيانات بإجراء مئات الآلاف من المكالمات الاختبارية بالإضافة إلى اختبارات خدمات البيانات للمحمول.

• يتم تقييم جودة الخدمات الصوتية وفقا للمعايير الدولية والتي من أهمها:

○ مؤشر عدم بدء المكالمة (Call block) وهو يعبر عن عدم قدرة العميل على بدء المكالمة الصوتية.

○ مؤشر انقطاع المكالمة (Call drop) وهو يعبر عن انقطاع الخط اثناء المكالمة الصوتية.

○ مؤشر جودة صوت المكالمة (Voice quality) وهو يعبر عن متوسط مستوى جودة الصوت اثناء المكالمة الصوتية.

• فيما يتم تقييم جودة اختبارات خدمات البيانات للمحمول وفقا لمعايير أهمها :

○ سرعة تنزيل البيانات (Download Throughput) وهي سرعة تنزيل المحتوى من الشبكة للعميل.

○ سرعة تحميل البيانات (Upload Throughput) وهي سرعة تحميل المحتوى من العميل الى الشبكة.

فيما يلي اعداد المناطق (مدن وأحياء) التي تم رصد انها تعاني من مشاكل في جودة الخدمات الصوتية في شهر ابريل :

- **لشركة فودافون:** من أصل (80) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (18) مدينة وحي تعاني من تأثر في مؤشر عدم بدء المكالمات، من أهمها مدينتي والعبور ومصر الجديدة ومدينة نصر والمرج والسلام وحدائق القبة والعباسية وشبرا والمقطم في القاهرة، ومن حيث عدم أكتمال أو انقطاع المكالمات عدد (4) مدينه وحي وأهمها في القاهرة المعادي، ومن حيث جوده صوت المكالمات عدد (6) مدينه وحي أهمها في القاهرة مدينتي.
- **ولشركة اورانج:** من أصل (80) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (23) مدينة وحي تعاني من تأثر في مؤشر عدم بدء المكالمات، من أهمها العبور والتجمع ومدينة نصر والعباسية وحلوان في القاهرة والسادس من أكتوبر والشيخ زايد والهرم وفي الجزيرة، وفي الإسكندرية، مناطق في غرب الاسكندرية ومرسى مطروح، ومن حيث جوده صوت المكالمات عدد (11) مدينه وحي أهمها مناطق في شرق وغرب الاسكندرية.
- **ولشركة اتصالات:** من أصل (80) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (17) مدينة وحي تعاني من تأثر في مؤشر عدم بدء المكالمات، من أهمها مدينتي والعبور وشبرا والزمالك والمعادي والمقطم في القاهرة، ومن حيث عدم أكتمال أو انقطاع المكالمات عدد (7) مدينه وحي وأهمها مدينتي والعبور وحلوان في القاهرة ومناطق في شرق الإسكندرية، ومن حيث جودة صوت المكالمات عدد (4) أهمها السادس من أكتوبر في الجزيرة.
- **ولشركة وى:** من أصل (80) مدينة وحي تم اجراء اختبارات القياس عليهم تم رصد عدد (24) مدينة وحي تعاني من تأثر في مؤشر عدم بدء المكالمات، من أهمها العبور والرحاب ومصر الجديدة ومدينة نصر وحدائق القبة والعباسية والمنيل وشبرا والزمالك وحلوان والمعادي والمقطم في القاهرة، وفي الجزيرة الشيخ زايد وفي الإسكندرية شرق الإسكندرية، ومن حيث جوده صوت المكالمات عدد (5) مدينه وحي أهمها السادس من أكتوبر في الجزيرة .

- ويتضح من التقرير التفصيلي أن معايير خدمات البيانات في الحدود المقبولة لجميع الشركات وفقاً للترخيص مع تميز شركات أورانج واتصالات في سرعة تنزيل البيانات فيما عدا بعض المناطق أوقات الذروة (وفقاً للتقرير التفصيلي لكل منطقة).
- ويأتي هذا التقرير في إطار متابعة الجهاز القومي لتنظيم الاتصالات لجودة الخدمات المقدمة من مشغلي شبكات الاتصالات في السوق المصري للمستخدمين ورفع وعي المستخدمين بمؤشرات جودة هذه الخدمات.
- وفيما يلي قائمة بالمناطق التي تم رصد بها تحسن أو سوء للخدمة حسب كل مشغل ومنطقة جغرافية:

**جودة صوت المكالمات**



**انقطاع المكالمات**



**عدم بدء المكالمات**



**أماكن تعاني من خدمة سيئة**

**أماكن تم رصد فيها تحسن**

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القاهرة	القاهرة
مدينتي	العبور
الدلتا	الرحاب
دمهور	التجمع
دسوق	الدلتا
دمياط	كفر الشيخ
الصحيد	المنصورة
ابو قرقاص	شبين الكوم
إسنا	الصحيد
	الفيوم
	أسيوط
	نجع حمادي - فرشوط

**أماكن تعاني من خدمة سيئة**

**أماكن تم رصد فيها تحسن**

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٣

القاهرة	القاهرة
المعادي	المقطم
القناة	الدلتا
العين السخنة	الإقازيق
الدلتا	كفر الزيات
بنها	
القنطرة	

**أماكن تعاني من خدمة سيئة**

**أماكن تم رصد فيها تحسن**

١٨

٢١

الدلتا	القاهرة	الدلتا	الاسكندرية
القناطر	مدينتي	قليوب	شرق ٤
شبين الكوم	دمياط	فقوس	القاهرة
الصحيد	هليوبوليس ٢	الإقازيق	الرحاب
الفيوم	مدينة نصر ٢	دمهور	التجمع
ابو قرقاص	المرج	كفر الزيات	مدينة نصر ١
الخارجة - الفراخه	السلام	طنطا - المحله	العباسيه
كوم أمبو	حدائق القبه	دسوق	شبرا الخيمه
	العباسيه	كفر الشيخ	الزمالك
	شبرا	المنصوره	الصحيد
	المقطم	منوف الباجور	سينيورس ترسا
	القناة		المنيا
	الاسماعيلية		أسيوط
			الجيزة
			فيصل

**\*\* المدن والاحياء التي تم رصد أنها لا تزال تعاني من مشاكل معايير جودة الخدمات الصوتية وكذلك المناطق التي ظهر فيها تحسن**



## تقرير جودة خدمة شركة أورانج

شهر ابريل ٢٠٢٠

جودة صوت المكالمات



انقطاع المكالمات



عدم بدء المكالمات



أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الاسكندرية

شرق ١

شرق ٥

غرب ٢

القناة

بورسعيد

الدلتا

كفر الدوار

طنطا - المحله

كفر الشيخ

السينبلاوين

دمياط

الصحيد

الواسطه

ابو قرقاص

القاهرة

العبور

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الصحيد

ابو قرقاص

الدلتا

بنها

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الجيزة

٦ اكتوبر ١

الشيخ زايد ١

الهرم

الصحيد

بني سويف

الواسطه

ابو قرقاص

طهطا أخميم

الخارجه - القرافره

نجع حمادي - فرشوط

الأقصر

الاسكندرية

غرب ١

غرب ٢

مرسي مطروح

القاهرة

العبور

التجمع

مدينه نصر ٢

العباسيه

حلوان ٢

القناة

الاسماعيلية

الدلتا

كفر الدوار

طنطا- المحله

دمياط

شبين الكوم

الاسكندرية

شرق ٥

الساحل الشمالي

القاهرة

الشروق

المقطم

دلتا

بنها

المنصوره

السينبلاوين

منوف الباجور

الصحيد

سينيوس ترسا

\*\* المدن والادعاء التي تم رصد أنها لا تزال تعاني من مشاكل معايير جودة الخدمات الصوتية وكذلك المناطق التي ظهر فيها تحسن

## تقرير جودة خدمة شركة اتصالات

شهر ابريل ٢٠٢٠

جودة صوت المكالمات

انقطاع المكالمات

عدم بدء المكالمات

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الدلتا	الاسكندرية
قليوب	شرق ٢
شبين الكوم	القاهرة
الجيزة	العبور
السادس من أكتوبر ٢	القناة
الصعيد	السويس
الواسطه	الصعيد
	ابو قرقااص

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الاسكندرية	القاهرة
شرق ٣	مدينه نصر ١
القاهرة	كفر الزيات
مدينتي	الصعيد
العبور	الفيوم
حلوان ٢	
الدلتا	
الزقازيق	
الصعيد	
الواسطه	
إسنا	

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الصعيد	القاهرة	الدلتا	القاهرة
سينيورس ترسا	مدينتي	رأس البر	الرحاب
الواسطه	العبور	الجيزة	مدينه نصر ٢
ابو قرقااص	شبرا	إمبابة	عين شمس
الخارجه - الفرافره	الزمالك	الصعيد	المرج
إسنا	المعادي	الفيوم	العباسيه
	المقطم	المنيا	المنيل
	الدلتا	طهطا أخميم	القناة
	قليوب		الاسماعيلية
	فقوس		
	المنصوره		
	السينبلاوين		
	منوف الباجور		
	شبين الكوم		

\*\* المدن والادعاء التي تم رصد أنها لا تزال تعاني من مشاكل معايير جودة الخدمات الصوتية وكذلك المناطق التي ظهر فيها تحسن



جودة صوت المكالمات



انقطاع المكالمات



عدم بدء المكالمات



أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



دلتا	القاهرة
قليوب	العبور
الجيزة	القناة
السادس من أكتوبر ٢	الإسماعيلية
الصحيد	ابو قرقاص
سينيورس ترسا	المنيا
الواسطه	الخارجة- الفرافره
إسنا	

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



القناة	القاهرة
العين السخنة	مدينتي
الدلتا	العبور
بنها	مدينه نصر ٢
الصحيد	المقطم
الواسطه	الدلتا
	كفر الزيات

أماكن تعاني من خدمة سيئة

أماكن تم رصد فيها تحسن



الدلتا	الاسكندرية	الدلتا	الاسكندرية
قليوب	شرق ٣	بنها	شرق ١
طنطا- المحله	القاهرة	القناطر	شرق ٤
السينبلاوين	العبور	فقوس	شرق ٥
منوف الباجور	الرحاب	دسوق	غرب ٢
الصحيد	هليوبوليس ٢	دمياط	القاهرة
الفيوم	مدينه نصر ٢	رأس البر	مدينه نصر ١
الواسطه	حدائق القبه	الصحيد	عين شمس
ابو قرقاص	العباسيه	سينيورس ترسا	المرج
المنيا	المنيل	المنيا	حلوان ١
الخارجة - الفرافره	شبرا	أسيوط	القناة
إسنا	الزمالك	سوهاج	الاسماعيلية
	حلوان ٢		النويس
	المعادي		الجيزة
	المقطم		٦ اكتوبر ١
	الجيزة		
	الشيخ زايد ٢		

\*\* المدن والادعاء التي تم رصد أنها لا تزال تعاني من مشاكل معايير جودة الخدمات الصوتية وكذلك المناطق التي ظهر فيها تحسن

# Benchmarking Report No. 10

APRIL 2020



# Executive Summary

# AGENDA

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## 1. Executive Summary

2. Voice Service Quality & Performance - Cairo

3. Data Service Quality & Performance – Cairo

4. Voice Service Quality & Performance - Giza

5. Data Service Quality & Performance – Giza

6. Voice Service Quality & Performance - Alexandria

7. Data Service Quality & Performance - Alexandria

8. Voice Service Quality & Performance - Delta

9. Data Service Quality & Performance – Delta

10. Voice Service Quality & Performance - Canal

11. Data Service Quality & Performance – Canal

12. Voice Service Quality & Performance – Upper Egypt

13. Data Service Quality & Performance – Upper Egypt

14. Annexes

# Executive Summary

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Due to the fact that **NTRA** in **Egypt** is concerned about maintaining the highest standards of the quality of the network and getting the market insight about how operators are performing in the market from a **QoS/QoE** perspective. **NTRA** along with Rohde and Schwarz carried out an extensive benchmarking survey of the Mobile networks in **Egypt** with focus on the performance of the four operator's network.

The full scope of measurements performed covers **Egypt** on monthly basis. Measurement is divided over seven main regions, Cairo, Giza, Alexandria, Delta, Canal, Red Sea and Upper Egypt. Each area is consisting of some clusters that will be measured during each month. And the results of each month will be discussed on this presentation.

This presentation gives a summary view of **April-20** measurements that took place in April 2020 for **Egypt** as defined in later slides of this presentation, during this survey, a distance of ~ **24,000 KM's** were driven. All measurements were done in Window time from 8AM to 8PM.

This presentation addressed 2nd, 3rd and 4th generation mobile networks (2G,3G,4G) for the Four licensees **Etisalat, Orange, Vodafone** and **WE** (sorted alphabetically) in outdoors measurements. Key performance indicators used in the survey are included in Annexes slides at the end of this presentation. For this campaign, Mobile to Mobile voice scenario approach was followed to better represent customer experience in a modernized manner.

# Quantitative Information

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Voice Measurements	Number of Tests
Total Number of Voice Calls	56,361

Data Measurements	Number of Tests
HTTP Download	58,378
HTTP Upload	58,304
HTTP Browsing - Facebook	58,043
HTTP Browsing – Twitter	57,918
HTTP Browsing – Google	58,179
HTTP Browsing – YouTube	58,134
HTTP Browsing – Yahoo	57,955
YouTube - Video Stream	58,231
Total Ping Attempts	2,937,517

# Methodology

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**NTRA** has preformed drive test that cover all governorates and major highways across the country. The tests were in same time and condition for the four operators to ensure fair comparison.

**NTRA** measures the major “key performance indicators” (**KPI**) that directly relate to the public’s experience through Outdoor (in-car user experience). These include block, dropped calls, voice quality, data throughput. (all details will be found on annexes slides)

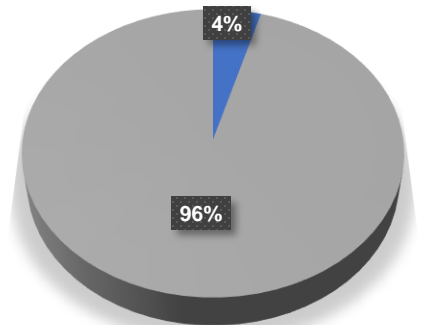
The drive test results represent a snapshot of the mobile service provider’s network in-car user experience and using a particular type of smartphones to simulate end user. The reported level of service quality may therefore not be exactly comparable with the consumer’s own experience;

The threshold for each **KPI** in license is mentioned in the legend of each graph. (and it is included in the annexes slides) For better understand the results in reference to the threshold value:

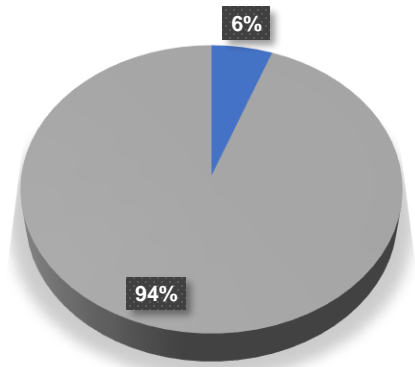
- Every result exceeds the threshold value is considered as a violation to the license terms for **Voice KPI’s**.
- Every result exceeds the threshold value is considered as a violation to the license terms for **Data KPI’s** except for **Download Throughput** and **Upload throughput**.
- **Download Throughput** and **Upload throughput** violation counted when the result is lower than the threshold value.
- We Denotes the violations where penalties are applied as dashed **Dark RED** Line
- We Denotes the violations where penalties are not applied as **Solid Black** Line



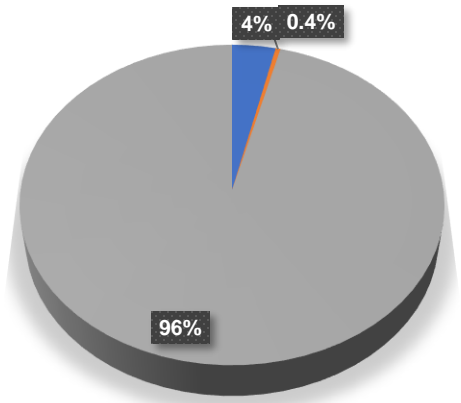
# Licensed-KPI's Violation Percentage over Egypt (31 zones \* 8 KPIs in license = 248 possible violations)



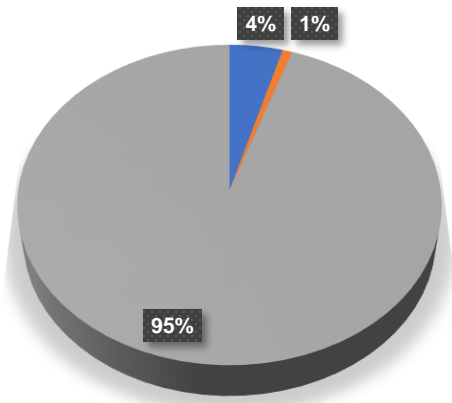
■ Violated KPI's - Voice ■ Violated KPI's - Data ■ Non-violated KPIs



■ Violated KPI's - Voice ■ Violated KPI's - Data ■ Non-violated KPIs



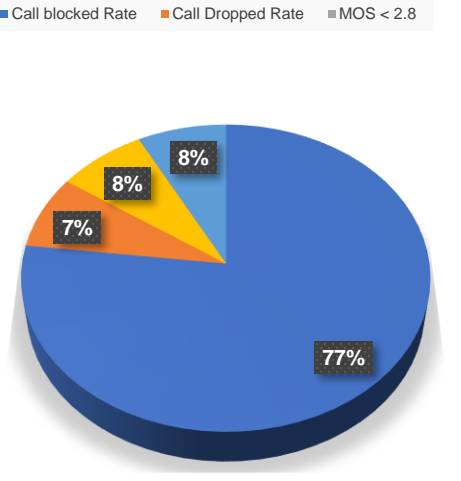
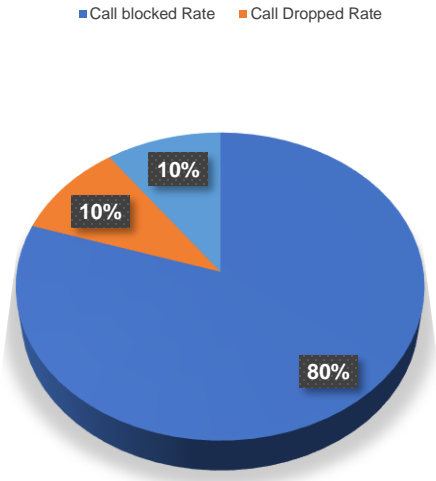
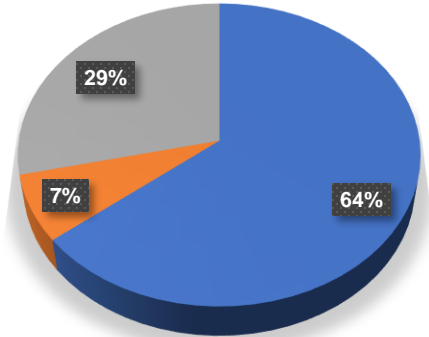
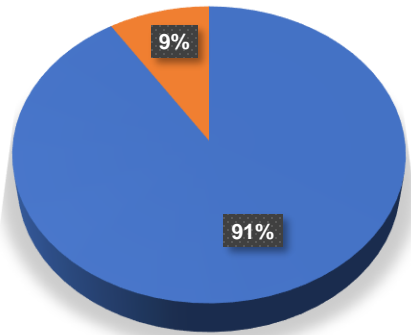
■ Violated KPI's - Voice ■ Violated KPI's - Data ■ Non-violated KPIs



■ Violated KPI's - Voice ■ Violated KPI's - Data ■ Non-violated KPIs

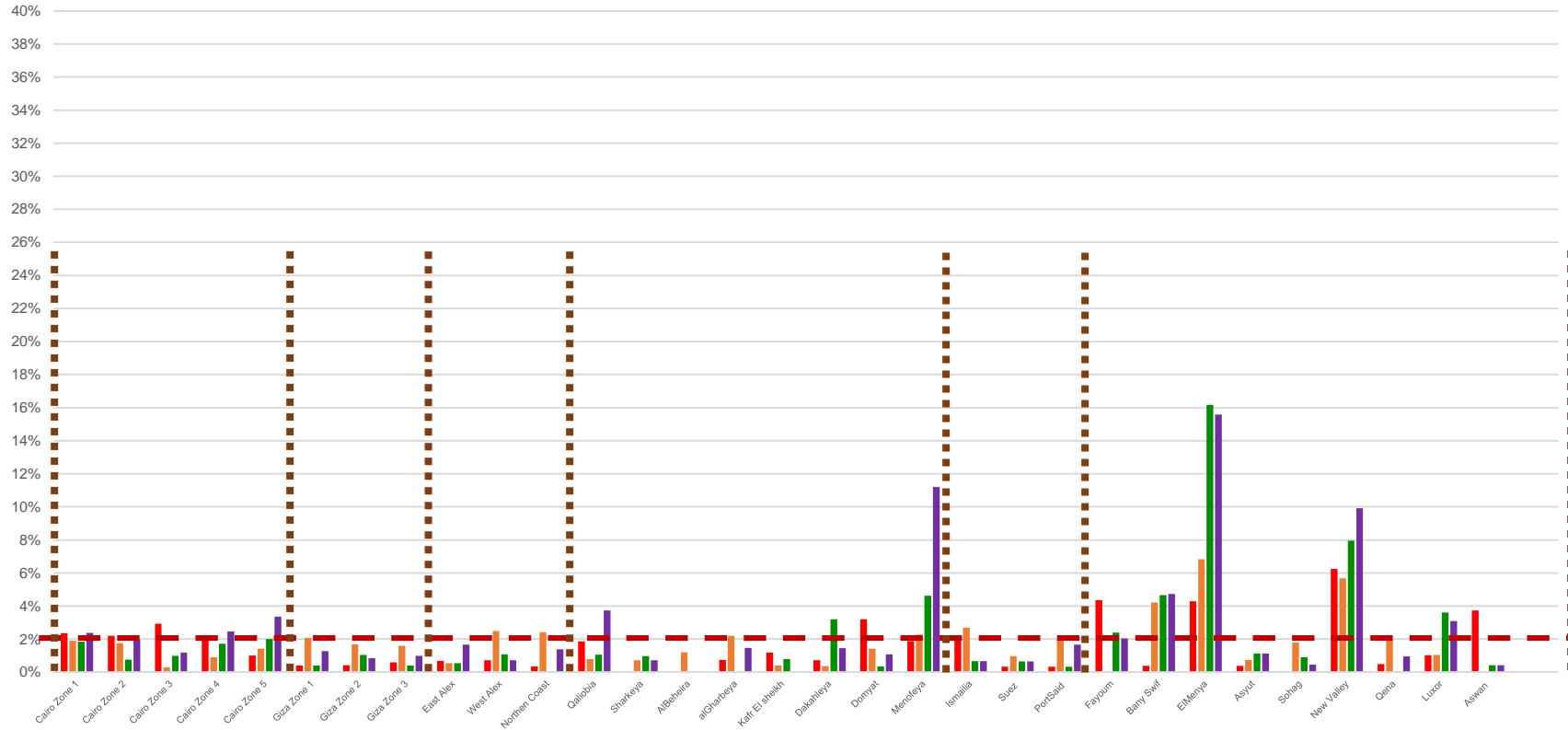


# Licensed-KPI's Violation Percentage over Egypt



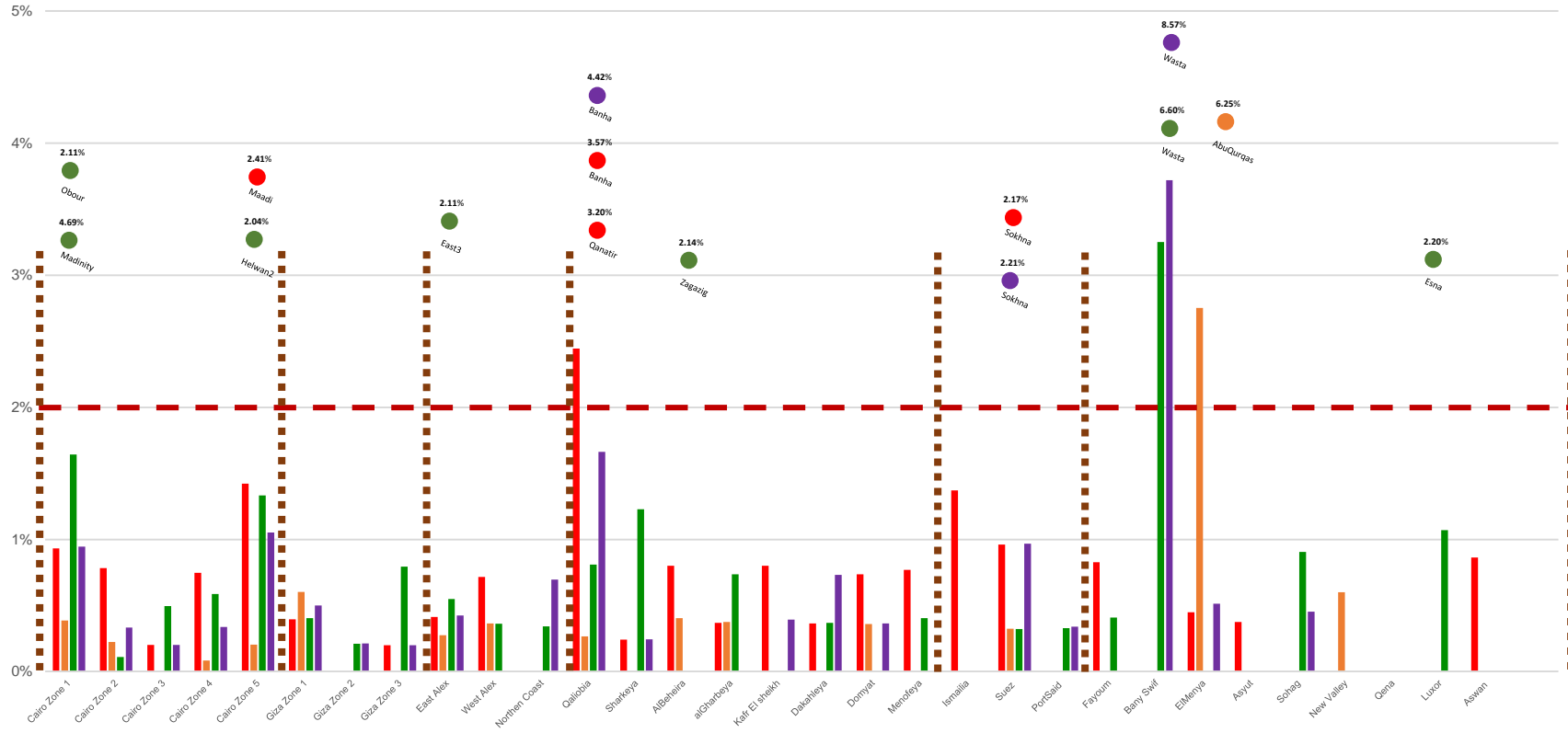
# Call Blocked Rate - Zones

Call Blocked Rate



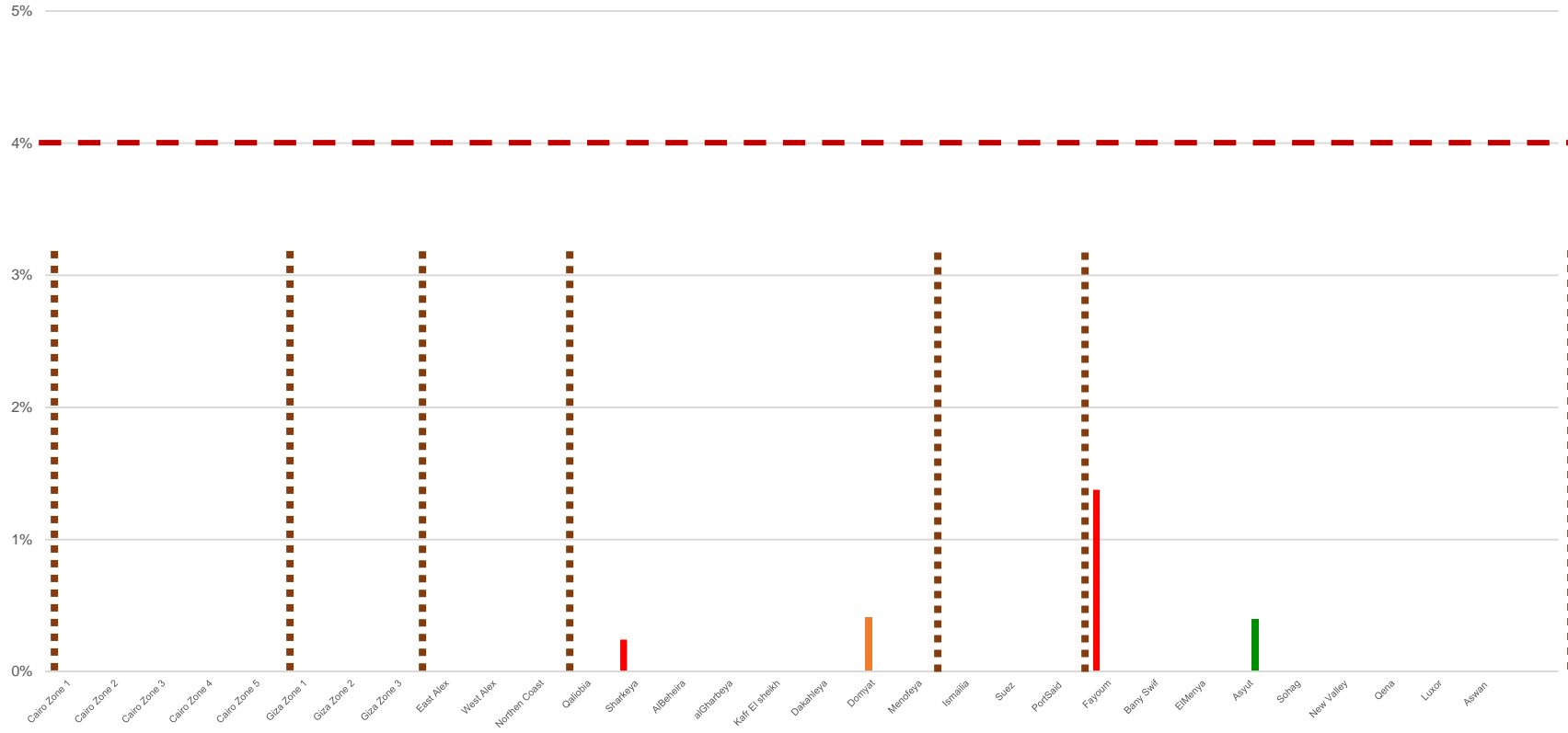
# Call Dropped Rate - Zones

Call Dropped Rate



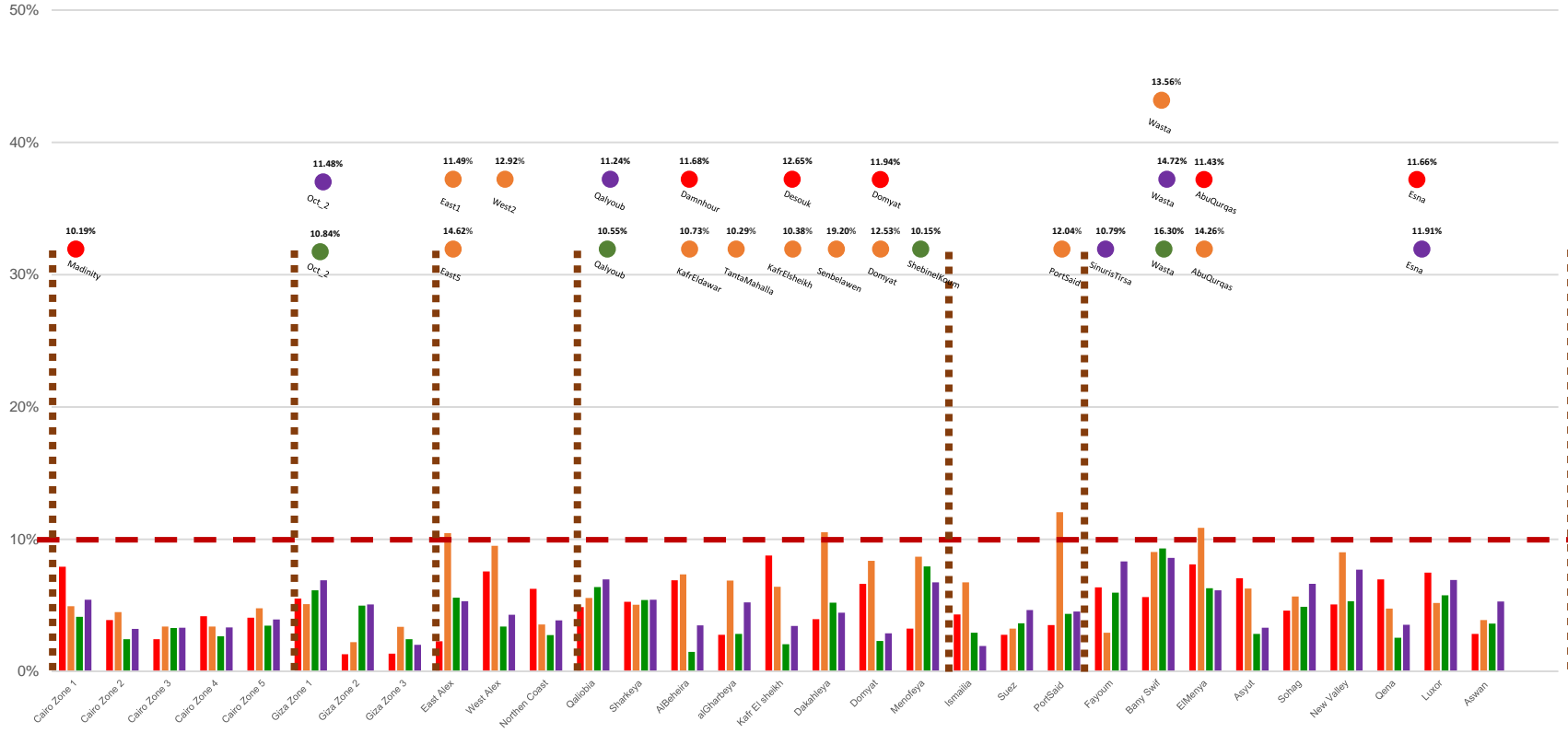
# CSFB Failure Rate - Zones

CSFB Failure Rate

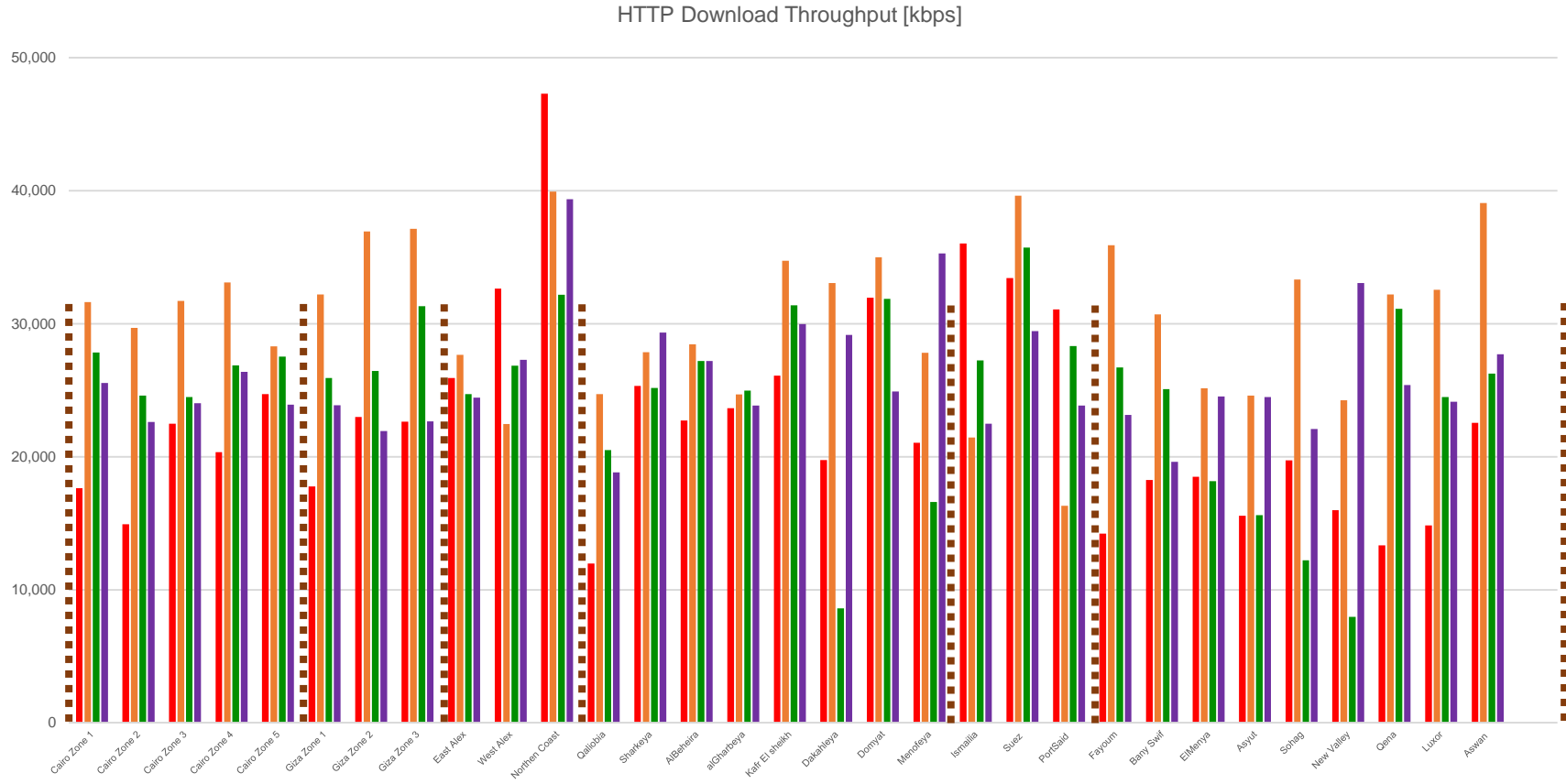


# Voice Speech Quality - Zones

Voice Speech Quality on Sample < 2.8

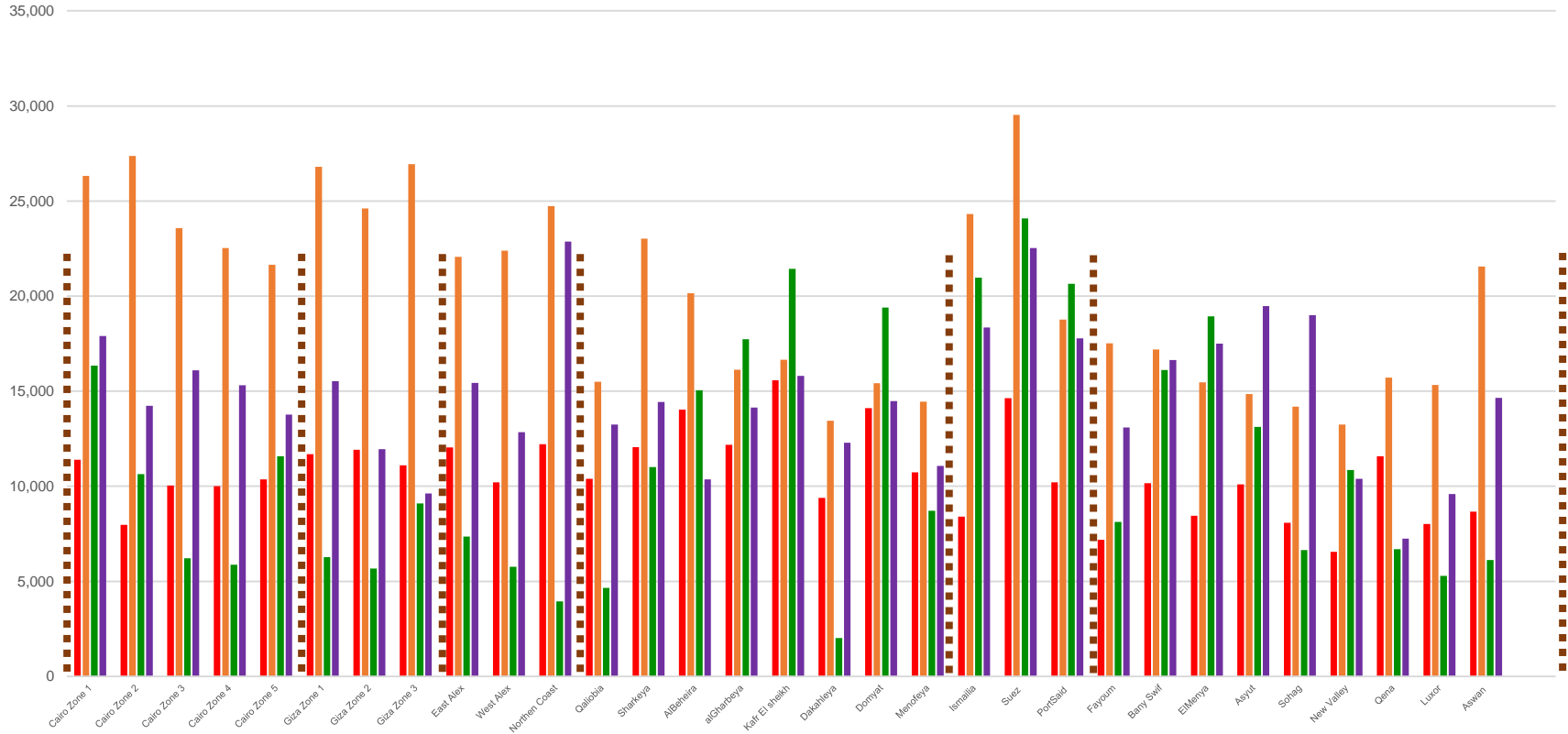


# Download Throughput [kbps] - Zones



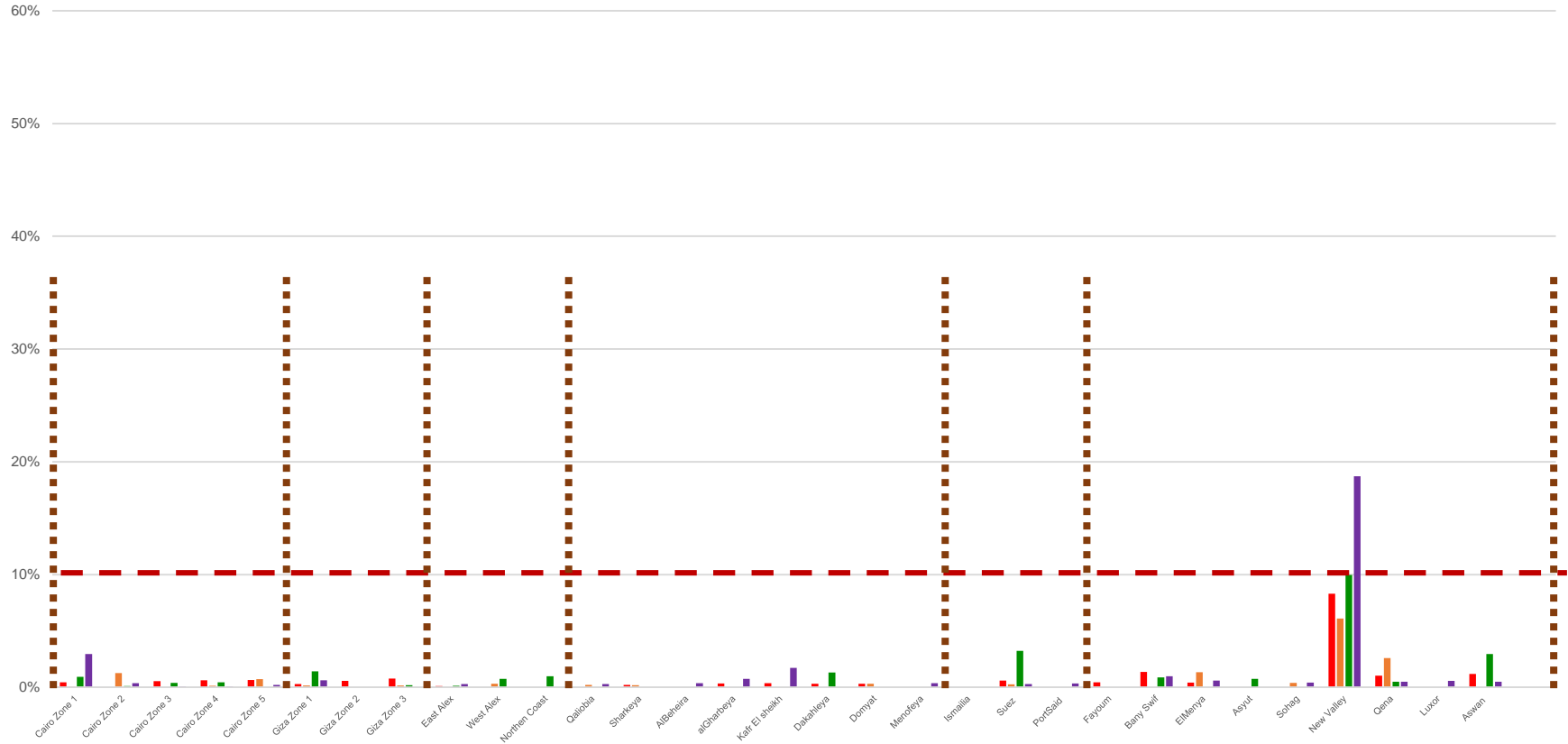
# Upload Throughput [kbps] - Zones

HTTP Upload Throughput [kbps]



# Download Session Blocked Ratio - Zones

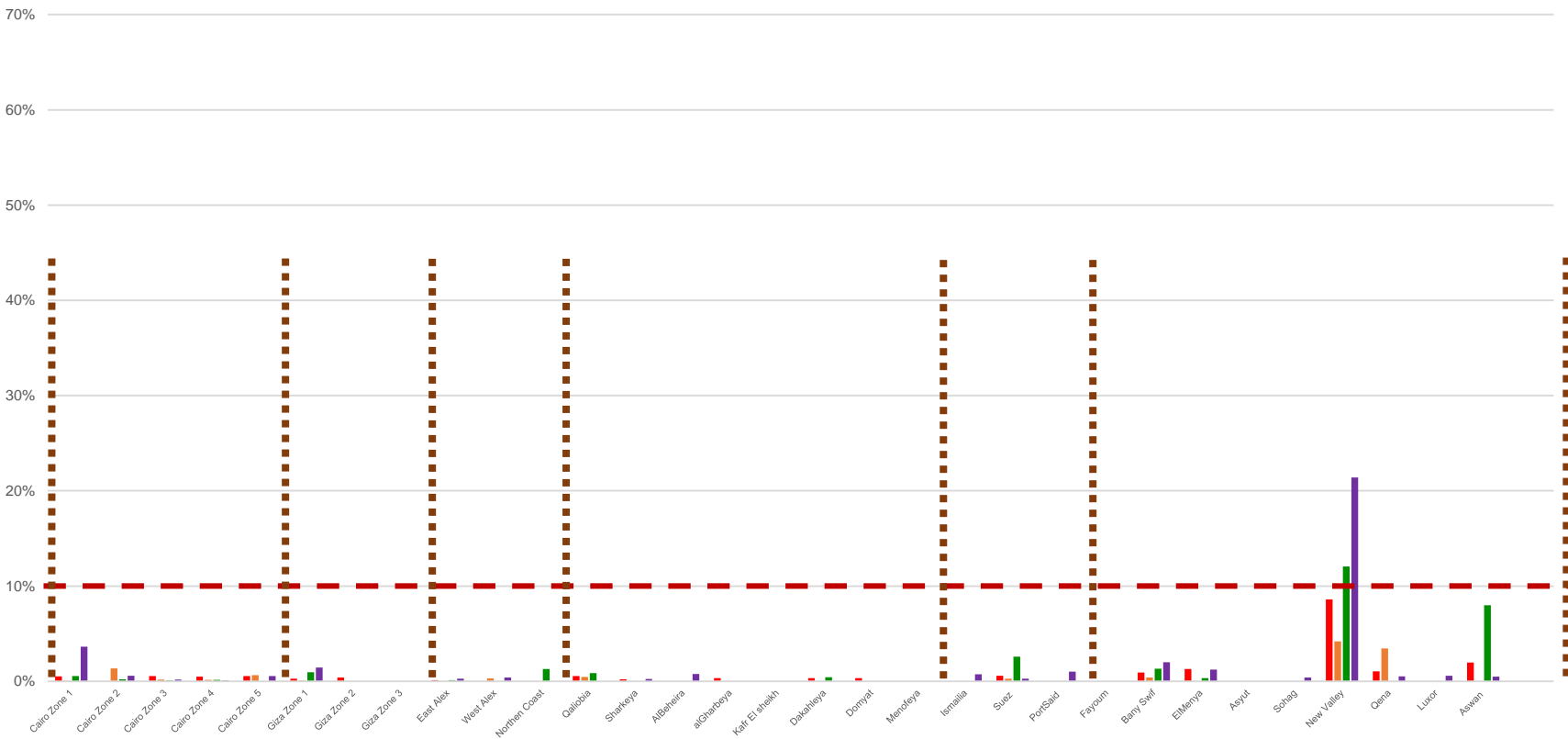
Download Session Block Ratio





# Upload Session Blocked Ratio - Zones

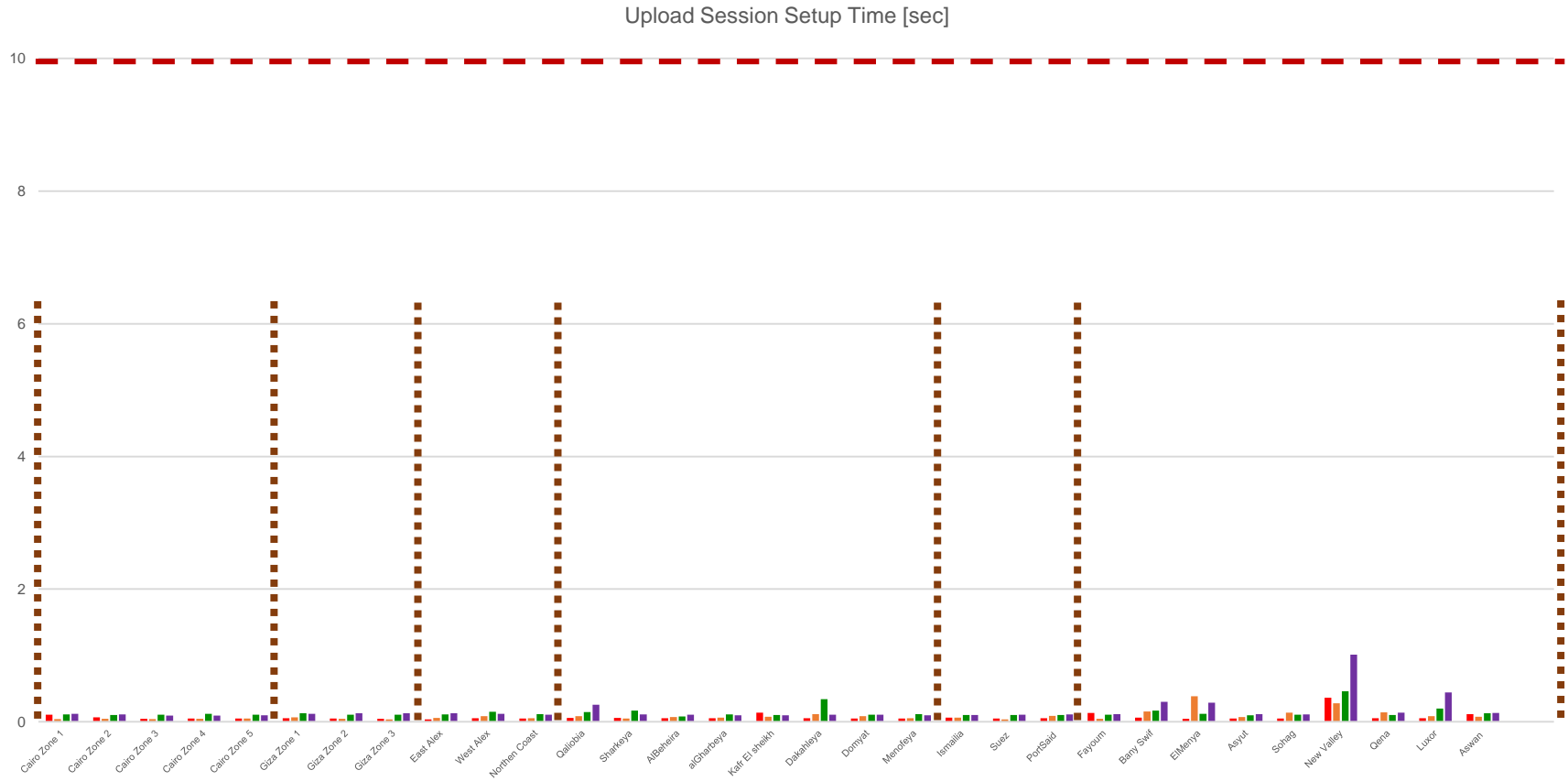
Upload Session Failure Ratio



# Download Session Setup Time - Zones



# Upload Session Setup Time - Zones





# Cairo Region KPIs

# AGENDA

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1. Executive Summary

## 2. Voice Service Quality & Performance - Cairo

3. Data Service Quality & Performance – Cairo

4. Voice Service Quality & Performance - Giza

5. Data Service Quality & Performance – Giza

6. Voice Service Quality & Performance - Alexandria

7. Data Service Quality & Performance - Alexandria

8. Voice Service Quality & Performance - Delta

9. Data Service Quality & Performance – Delta

10. Voice Service Quality & Performance - Canal

11. Data Service Quality & Performance – Canal

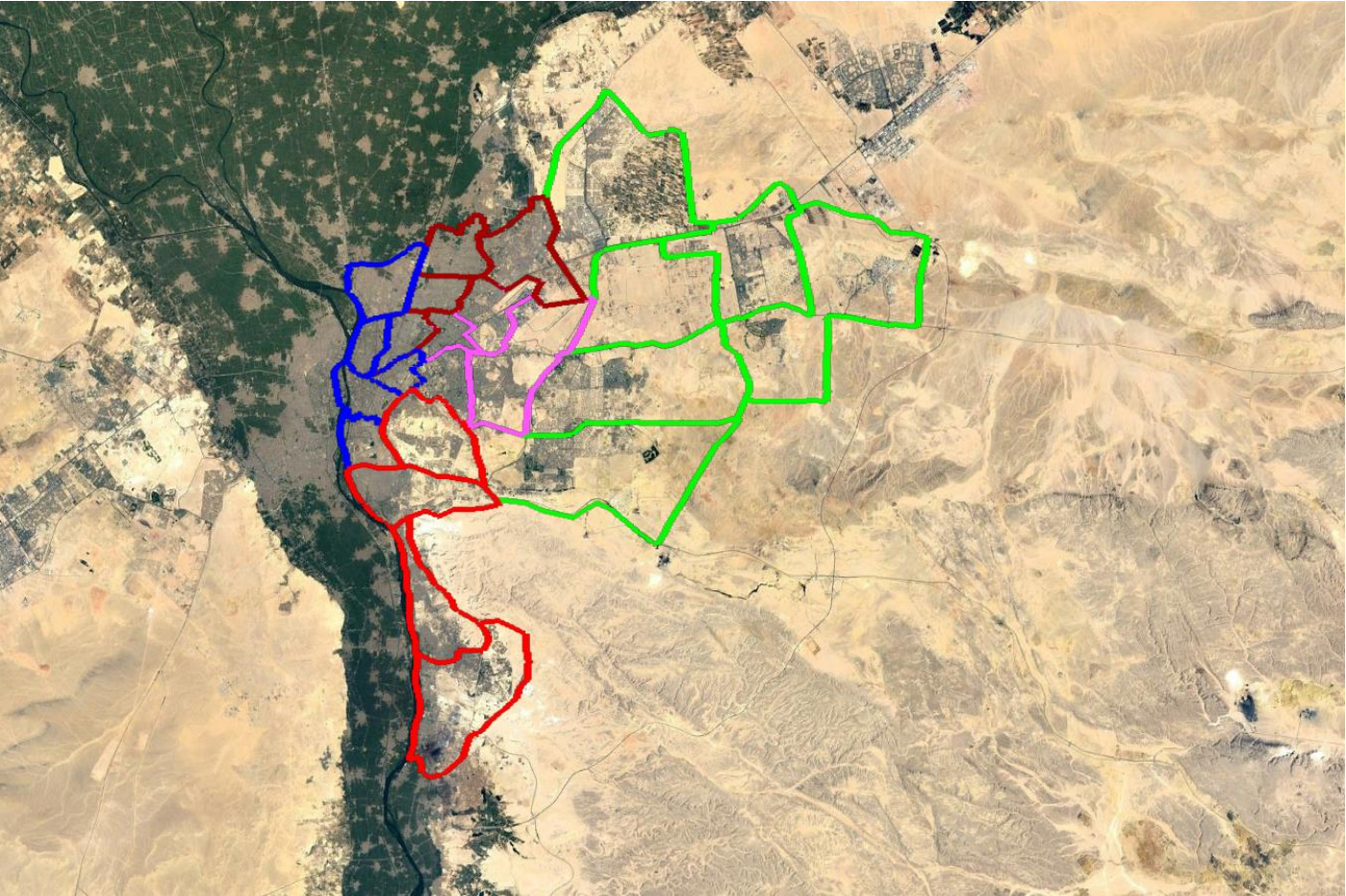
12. Voice Service Quality & Performance – Upper Egypt

13. Data Service Quality & Performance – Upper Egypt

14. Annexes

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# Zones Definition



## Cairo

<b>Cairo Z1</b>	Madinity Obour Rehab Sherouk Tagamoaa
<b>Cairo Z2</b>	Heliopolis 1 Heliopolis 2 Nasr City 1 Nasr City 2
<b>Cairo Z3</b>	Ain Shams ElMarg ElSalam Qobba Gardens
<b>Cairo Z4</b>	Abbasia AlManyal Shobra Shobra ElKhamia Zamalek
<b>Cairo Z5</b>	Helwan 1 Helwan 2 Maadi Mokattam

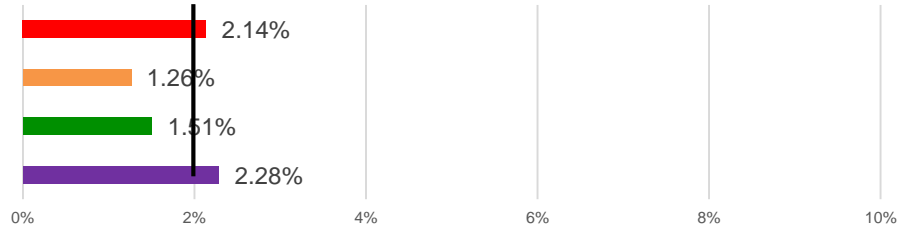
# Accessibility: Call Blocked Rate



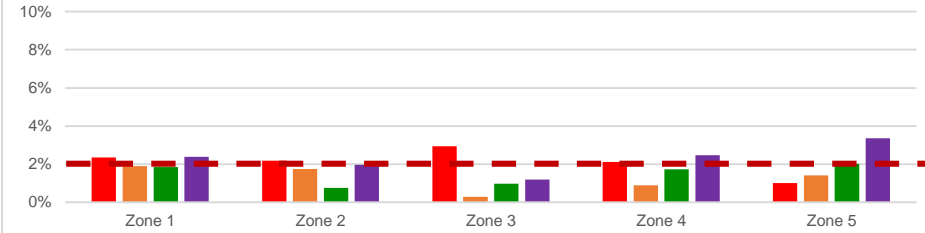
2/3/4G: Short Call



Call Blocked Rate - Overall

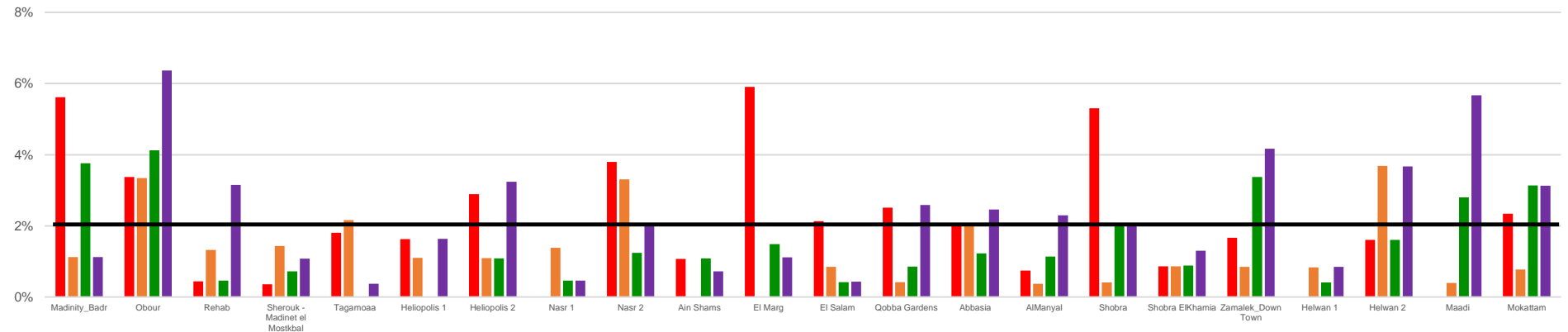


Call Blocked Rate - Zones

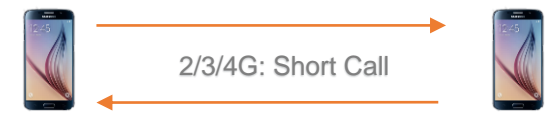


**Call Blocked Rate** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

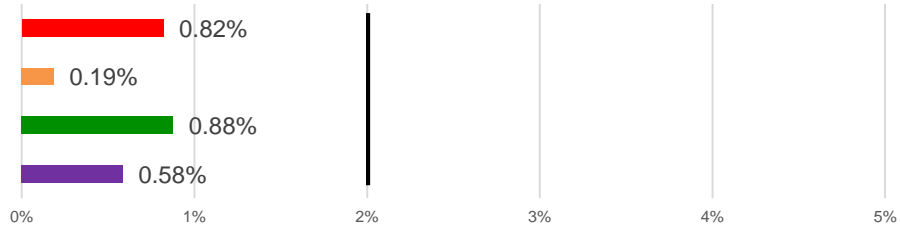
Call Blocked Rate



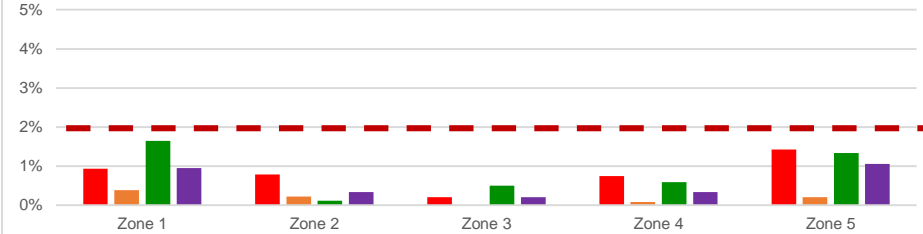
# Retainability: Call Dropped Rate



Voice Call Dropped Rate - Overall

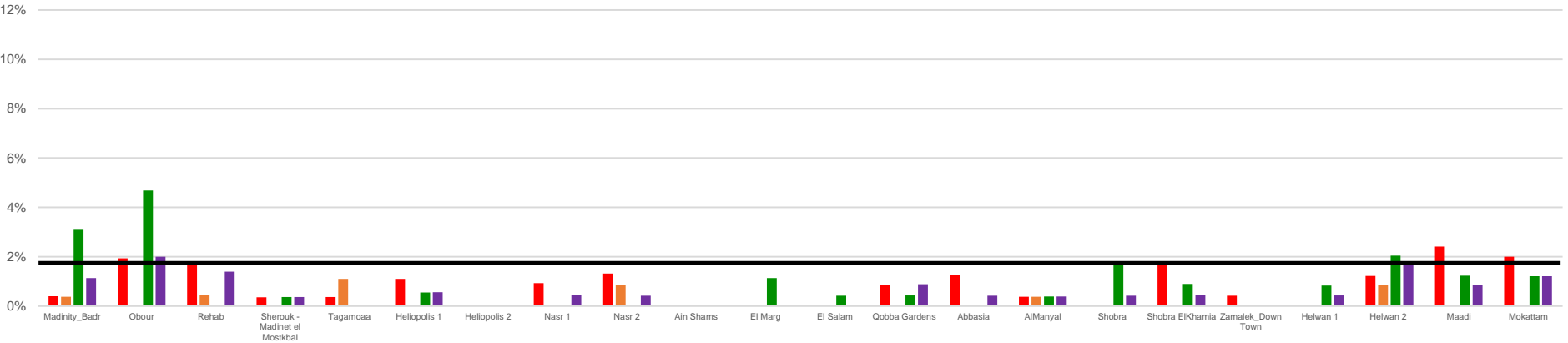


Voice Call Dropped Rate - Zones



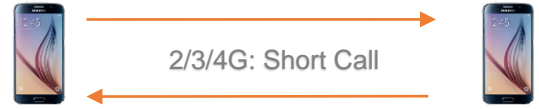
Voice Call Retainability is represented by call drop rates.

Voice Call Dropped Rate

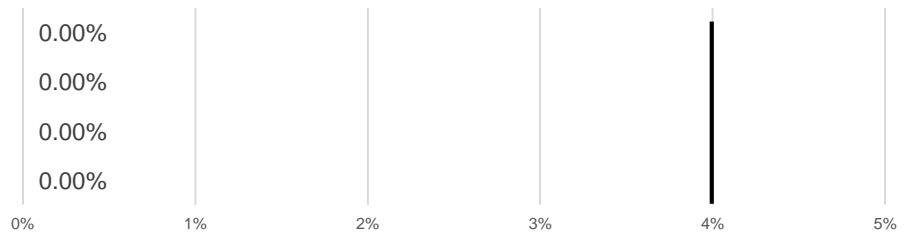




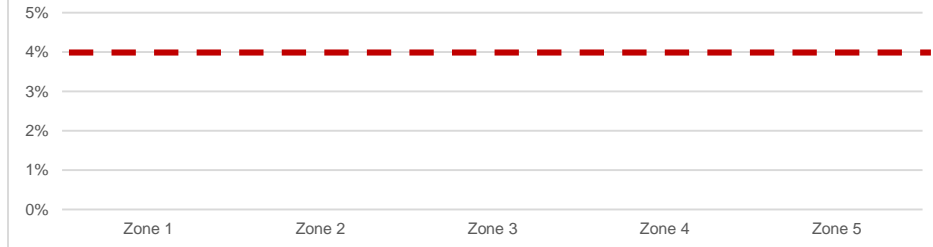
# Accessibility: CSFB Failure Rate [%]



CSFB Failure Rate - Overall



CSFB Failure Rate - Zones

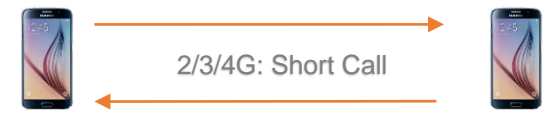


**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.

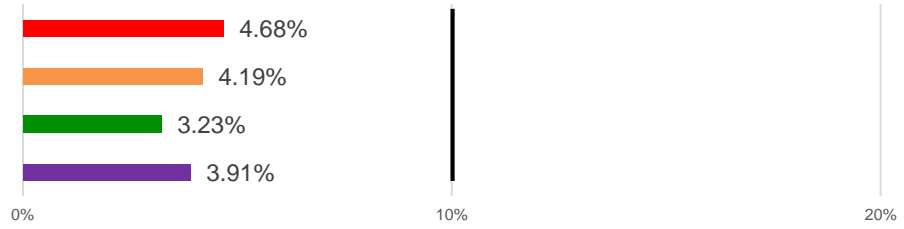
CSFB Failure Rate



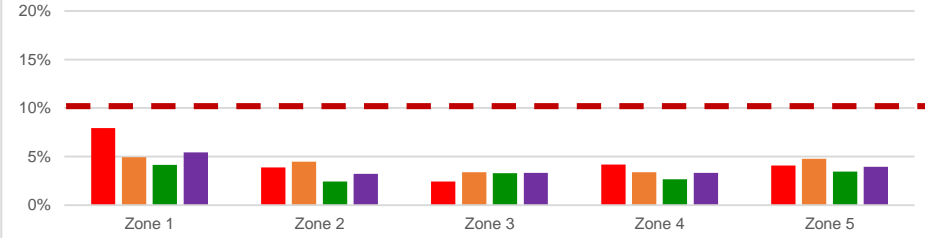
# Speech Quality: MOS Voice Speech Quality < 2.8



Voice Speech Quality on Sample < 2.8 - Overall

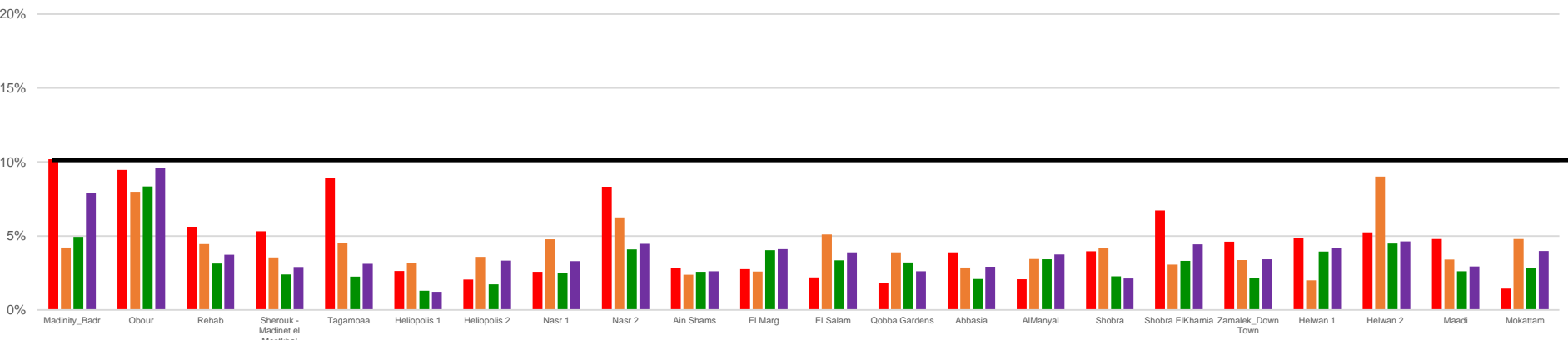


Voice Speech Quality on Sample < 2.8 - Zones

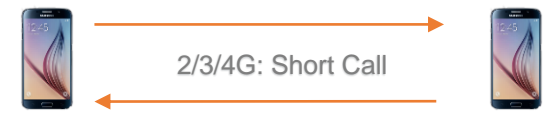


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

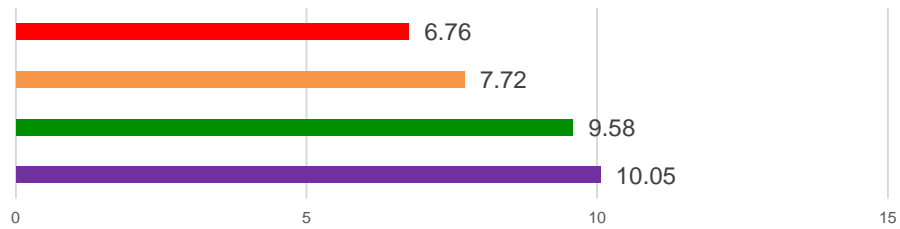
Voice Speech Quality on Sample < 2.8



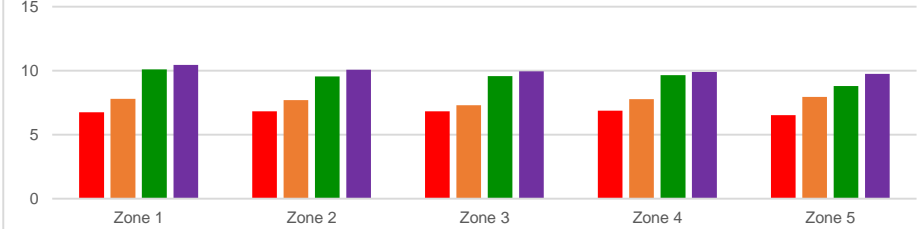
# Accessibility: Call Access Time [sec.]



Call Access Time - Overall

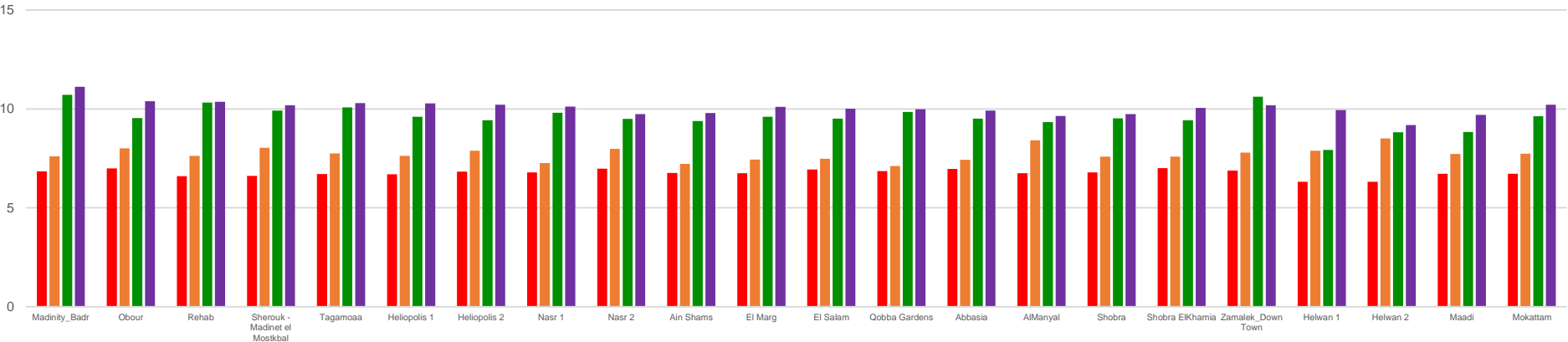


Call Access Time - Zones

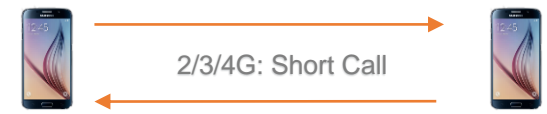


**Call Access Time** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

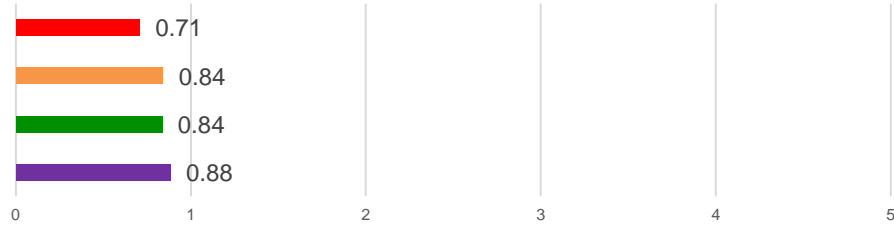
Call Access Time



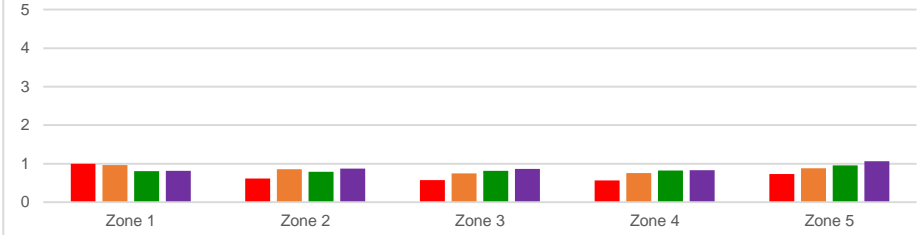
# Accessibility: CSFB Delay [sec.]



Circuit Switch Fall Back Delay - Overall

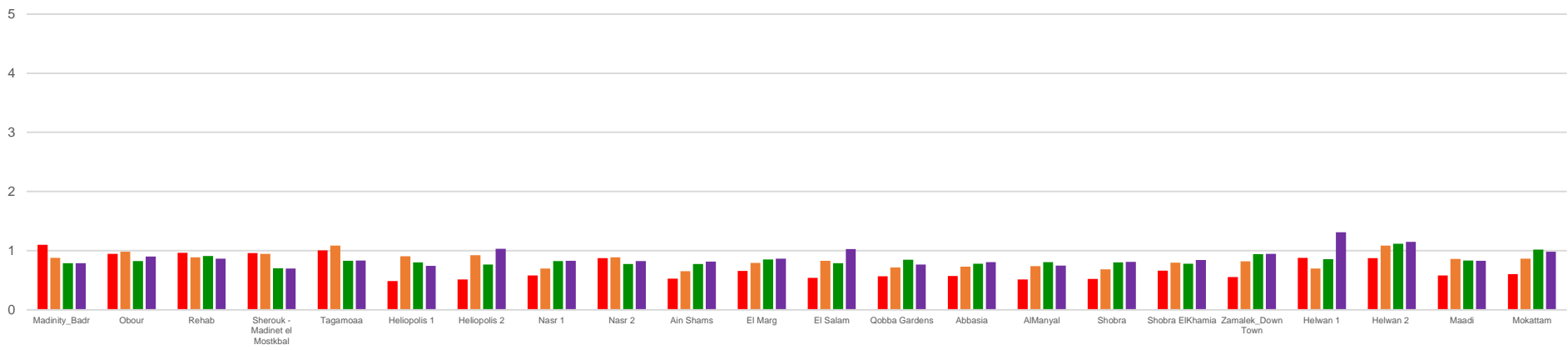


Circuit Switch Fall Back Delay - Zones

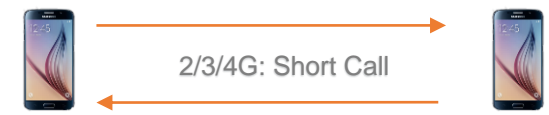


**CSFB Delay** represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

Circuit Switch Fall Back Delay



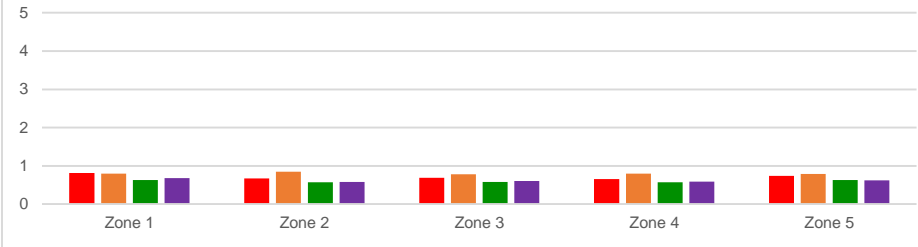
# Accessibility: Telephony Return Delay [sec.]



Telephony Return Delay - Overall

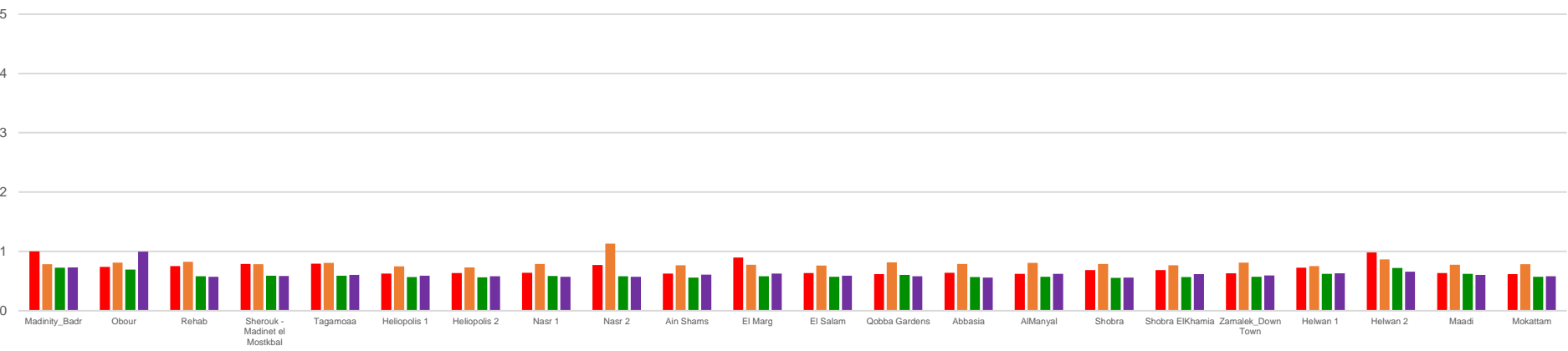


Telephony Return Delay - Zones



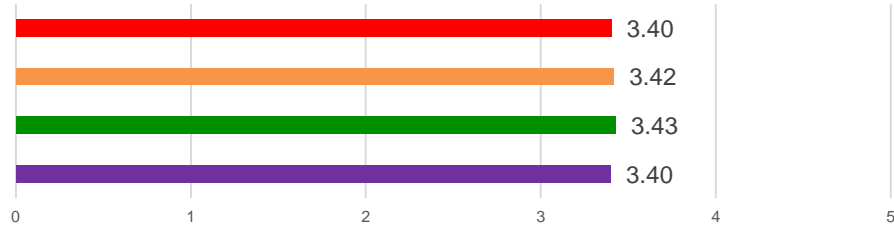
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end

Telephony Return Delay

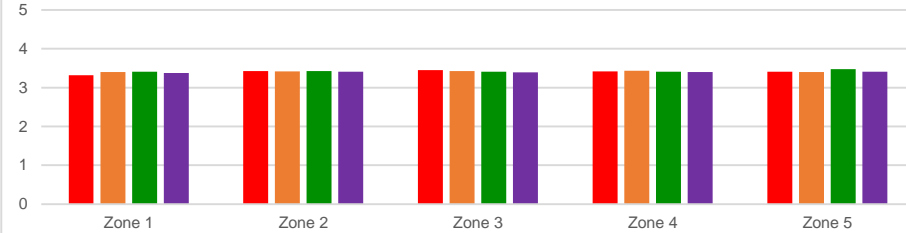


# Speech Quality: MOS Scores

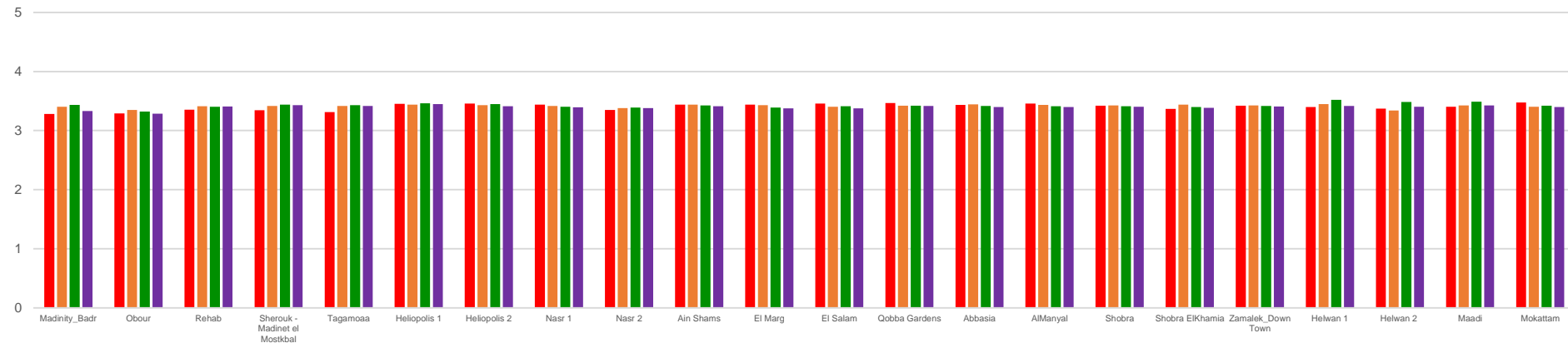
Voice Speech Quality - Overall



Voice Speech Quality - Zones



Voice Speech Quality



# Speech Quality: Call technology Usage & Codec Base Usage

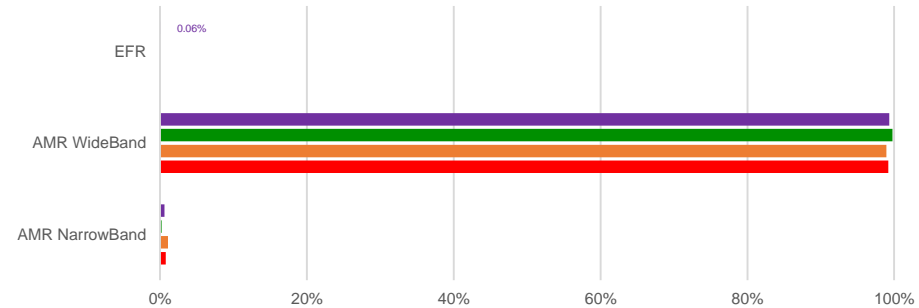
Call Technology Usage Overall



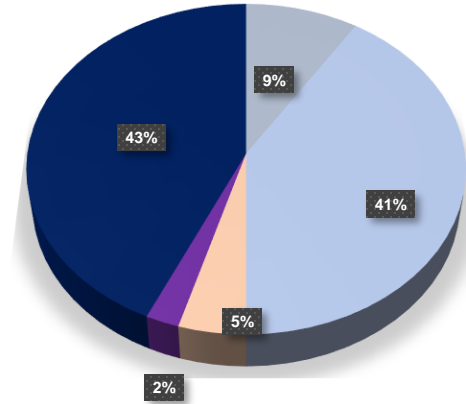
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

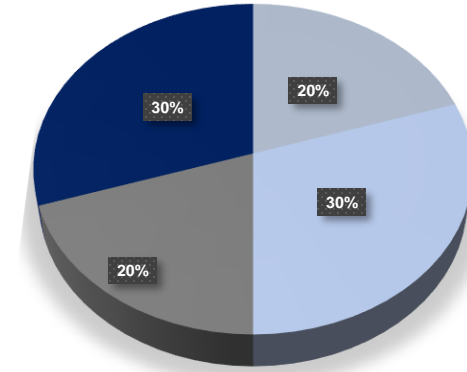
Codec Base Usage



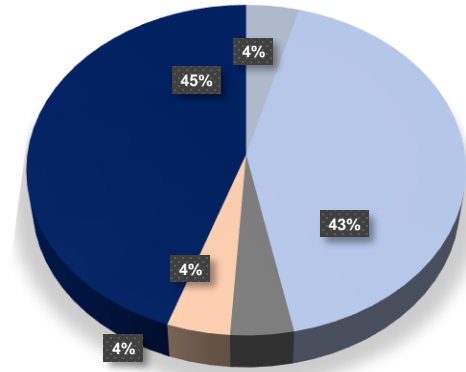
# Analysis: Dropped Calls Causes



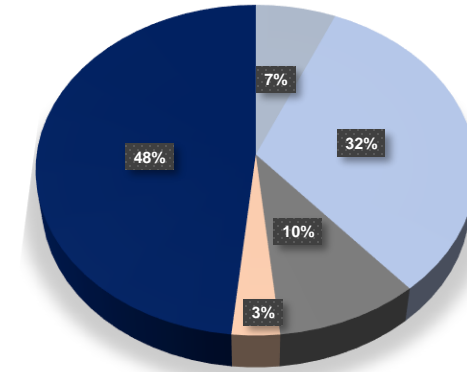
- 2G Quality
- 3G Quality
- Mobility Issue
- Other
- RAN Issue



- 2G Quality
- 3G Quality
- Core Network
- RAN Issue



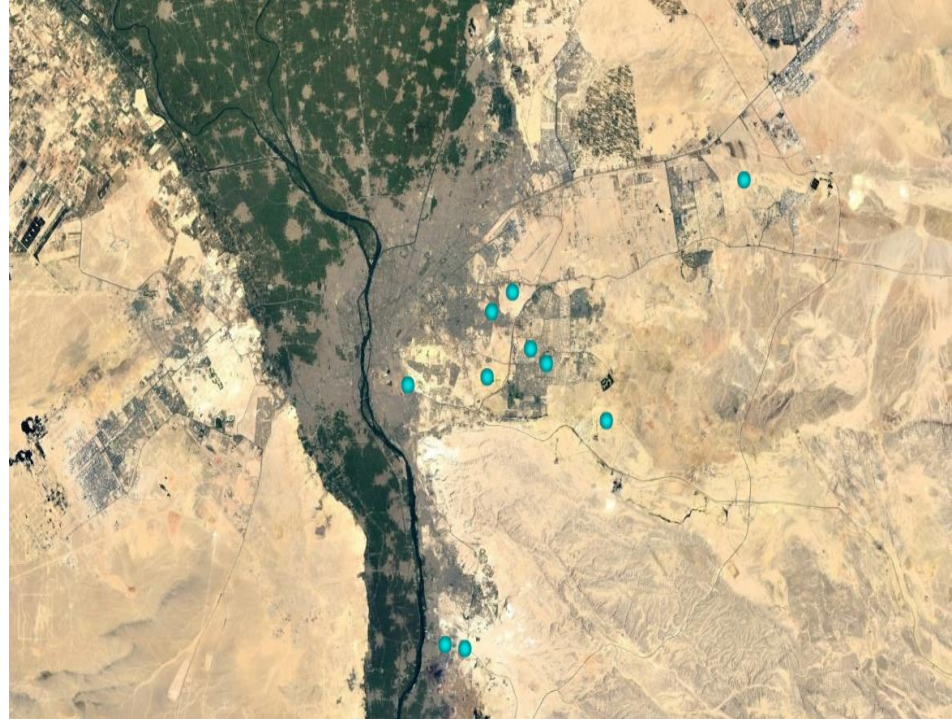
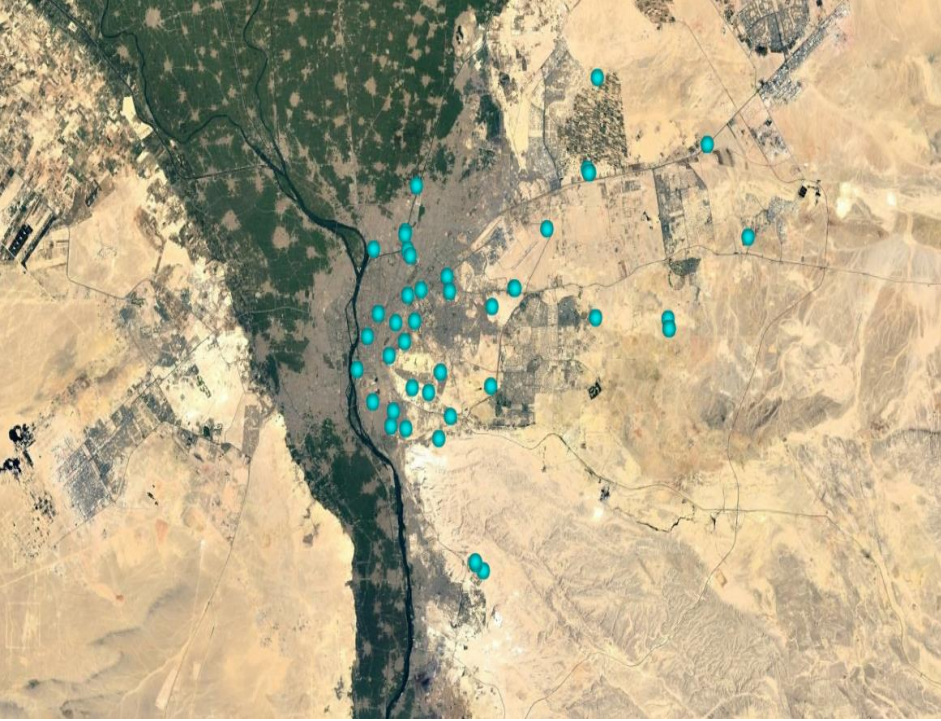
- 2G Quality
- 3G Quality
- Core Network
- Mobility Issue
- RAN Issue



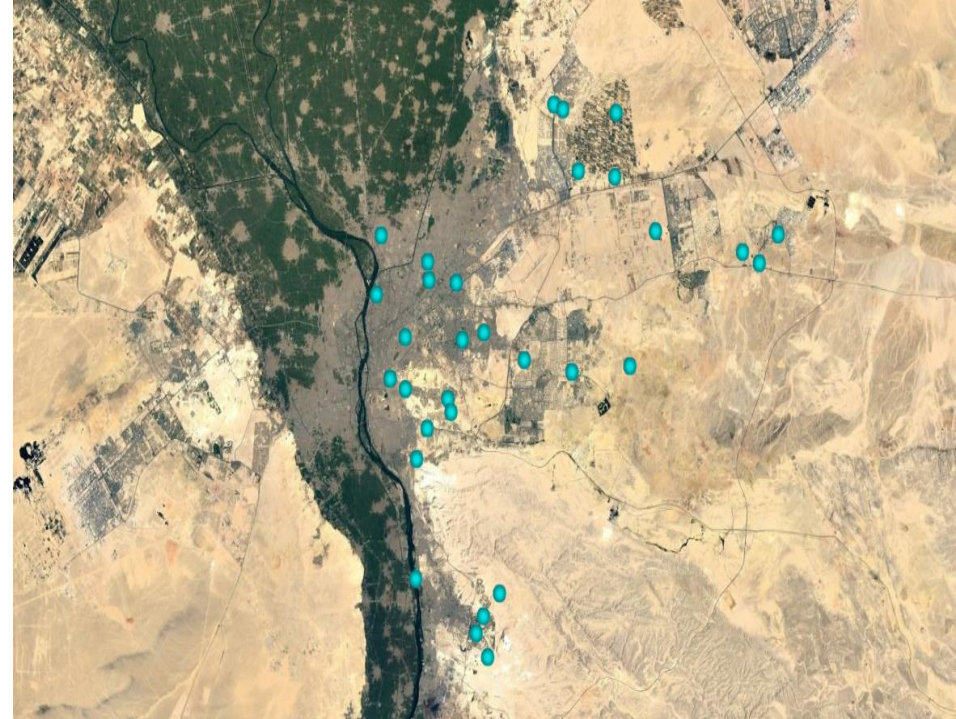
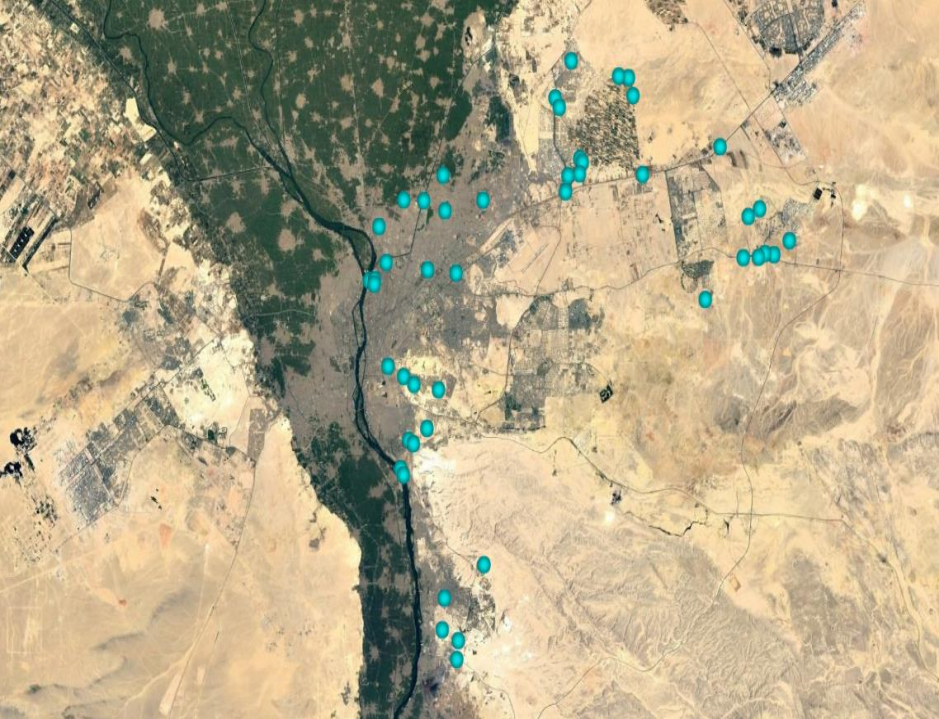
- 2G Quality
- 3G Quality
- Core Network
- Mobility Issue
- RAN Issue



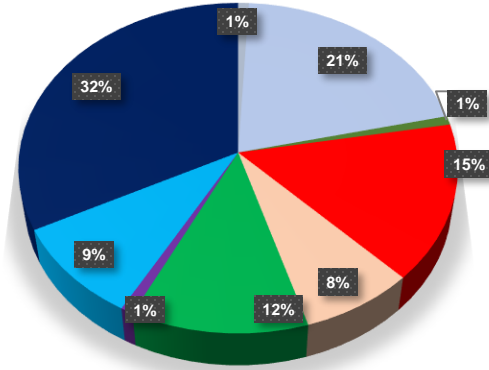
# All Operators: Dropped Calls Locations 1/2



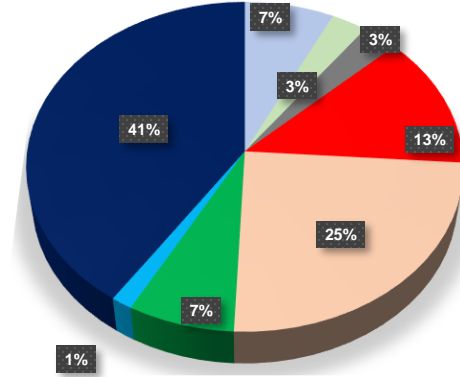
# All Operators: Dropped Calls Locations 2/2



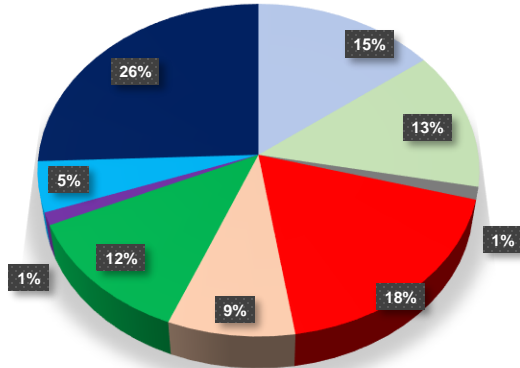
# Analysis: Failed Calls Causes



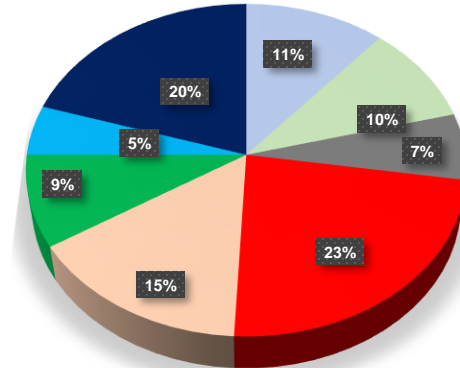
- 2G Quality
- 3G Quality
- 4G Coverage
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue



- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Paging Issue
- RAN Issue

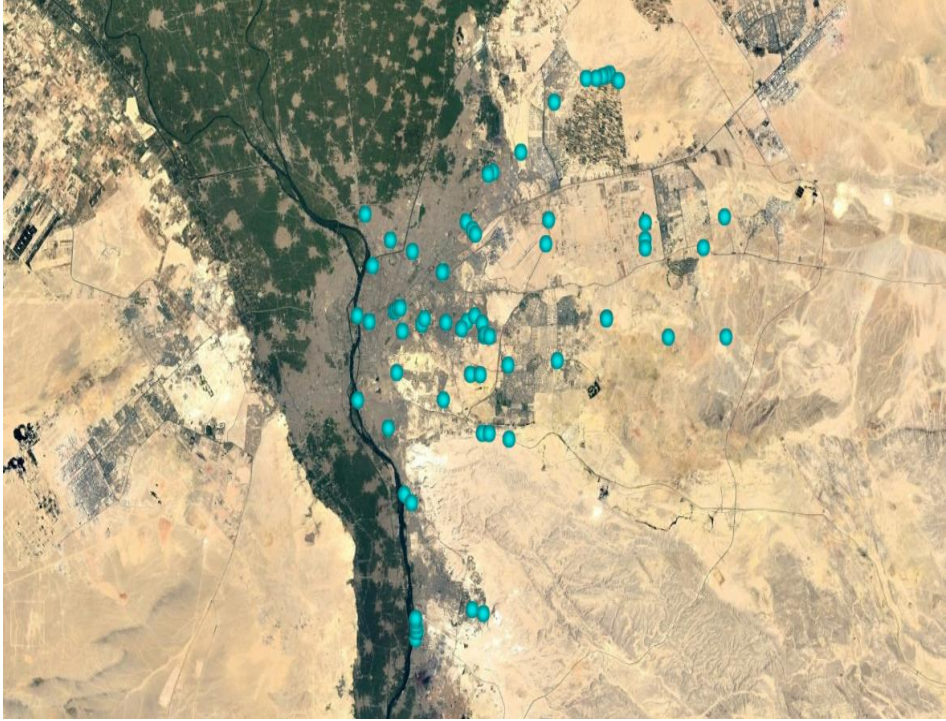
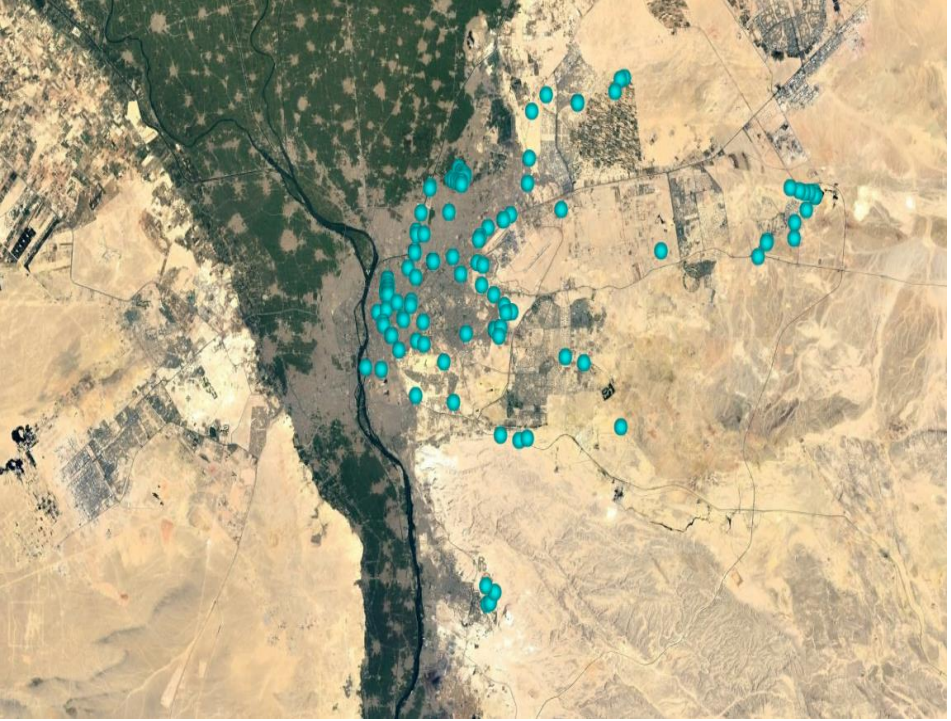


- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

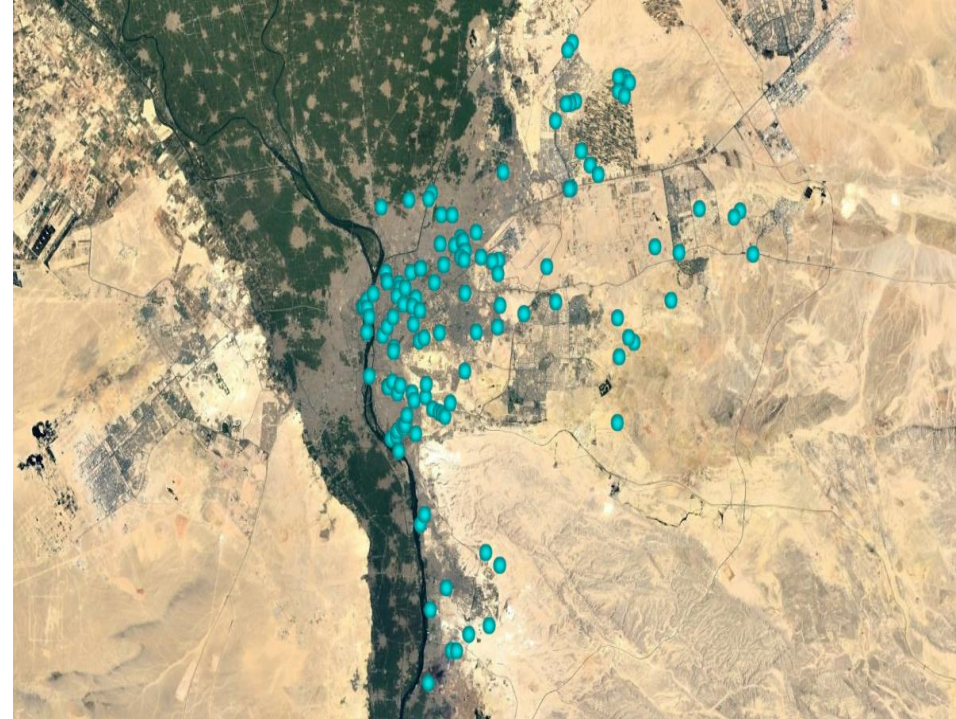
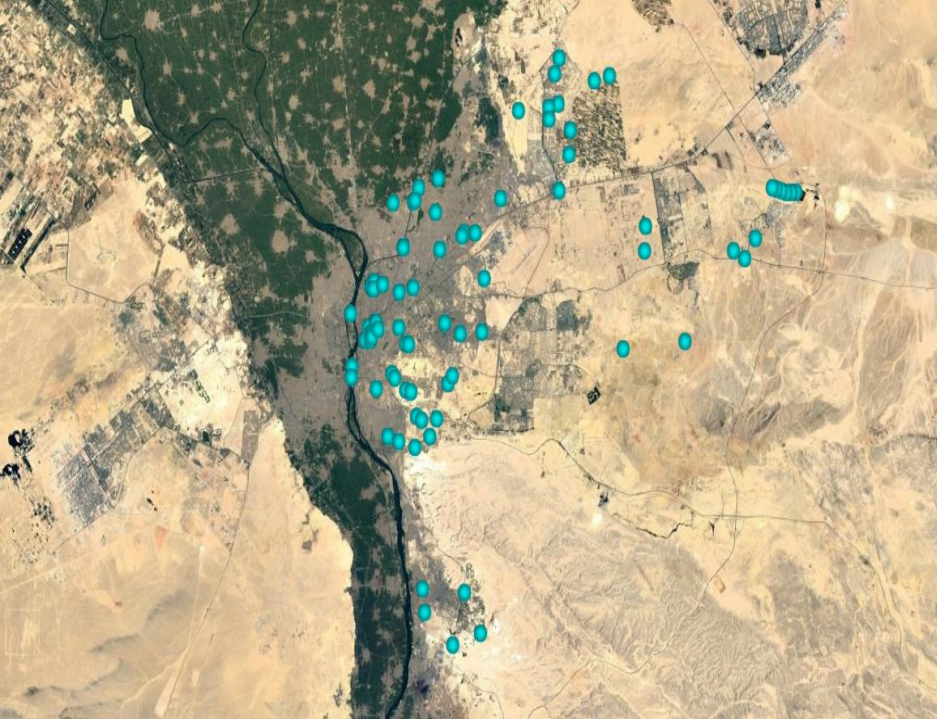


- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Paging Issue
- RAN Issue

# All Operators: Blocked Calls Locations 1/2



# All Operators: Blocked Calls Locations 2/2



# AGENDA

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1. Executive Summary

2. Voice Service Quality & Performance - Cairo

**3. Data Service Quality & Performance – Cairo**

4. Voice Service Quality & Performance - Giza

5. Data Service Quality & Performance – Giza

6. Voice Service Quality & Performance - Alexandria

7. Data Service Quality & Performance - Alexandria

8. Voice Service Quality & Performance - Delta

9. Data Service Quality & Performance – Delta

10. Voice Service Quality & Performance - Canal

11. Data Service Quality & Performance – Canal

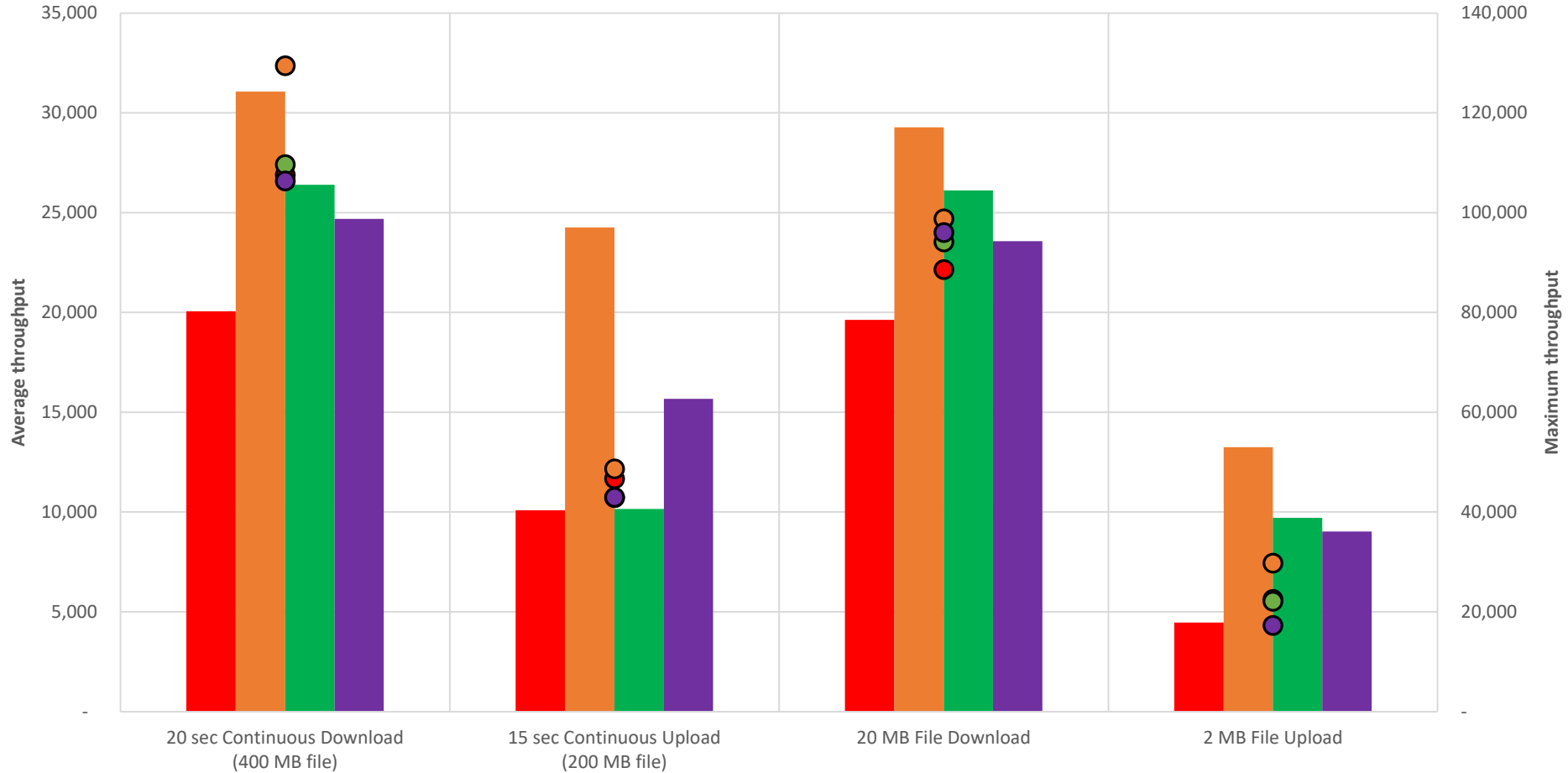
12. Voice Service Quality & Performance – Upper Egypt

13. Data Service Quality & Performance – Upper Egypt

14. Annexes

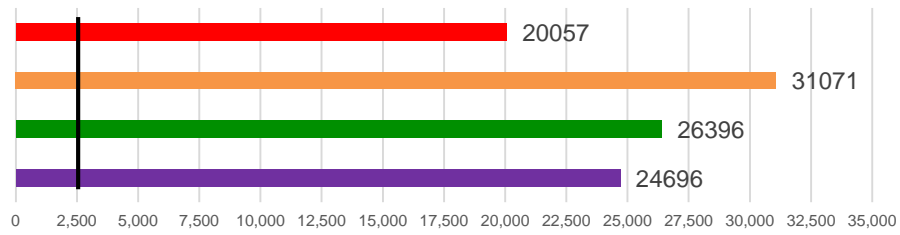
## NETWORK PERFORMANCE TEST

## USER EXPERIENCE TEST

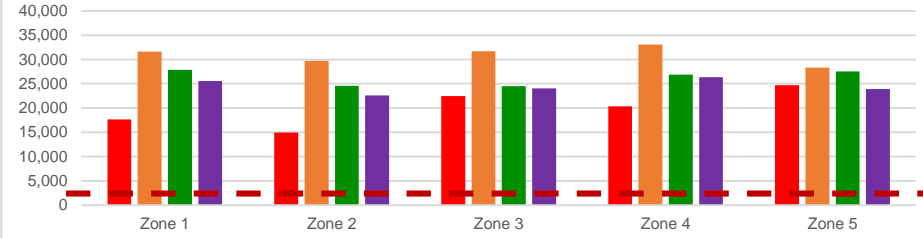


# FDTT HTTP Download Transfer Throughput – Network Performance

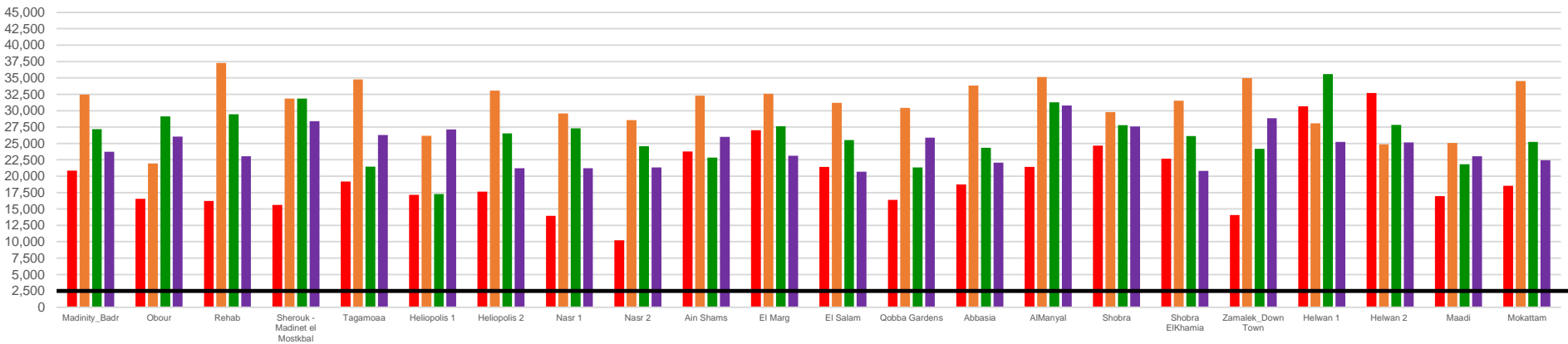
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones



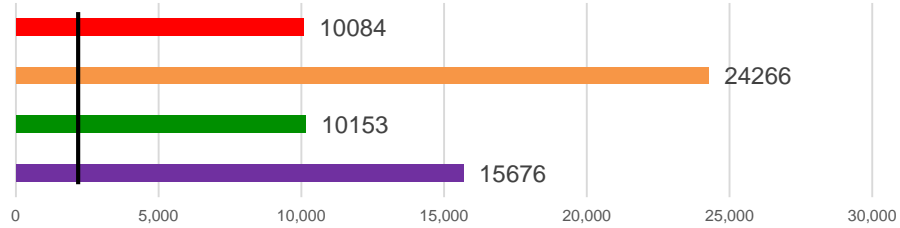
400 MB File FDTT HTTP Download Throughput [kbps]



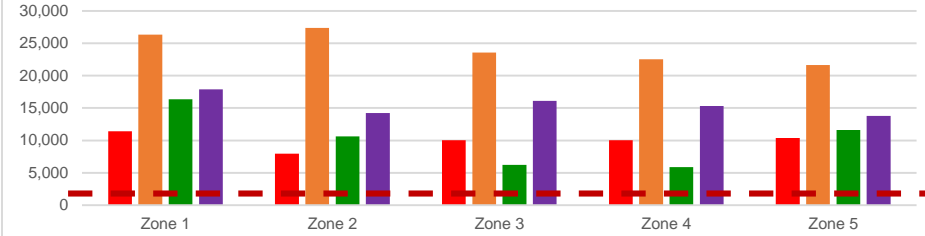


# FDTT HTTP Upload Transfer Throughput – Network Performance

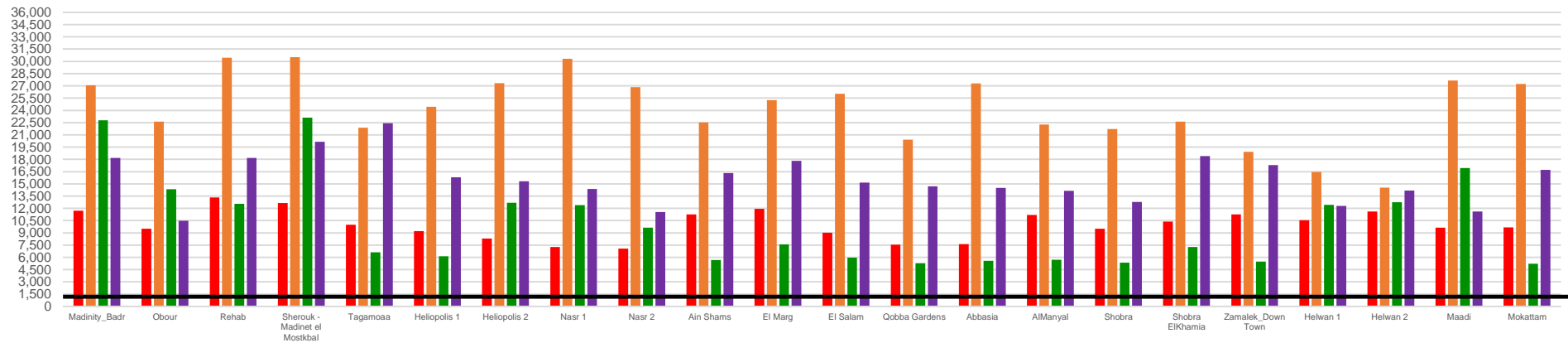
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones

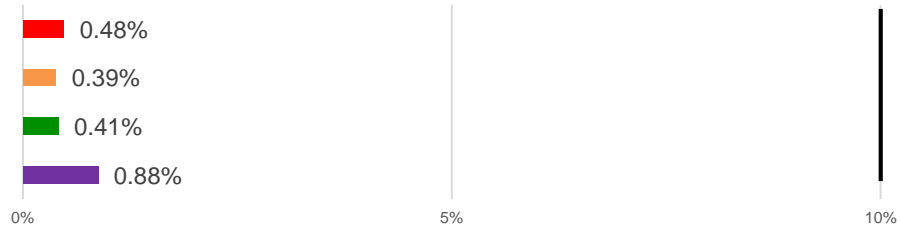


200 MB FDTT HTTP Upload Throughput [kbps]

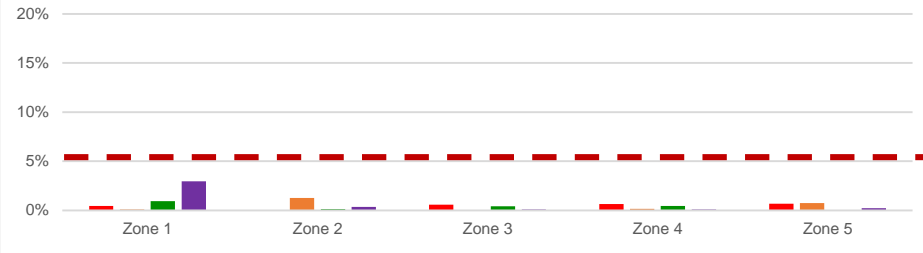


# HTTP Download Session Blocked Rates

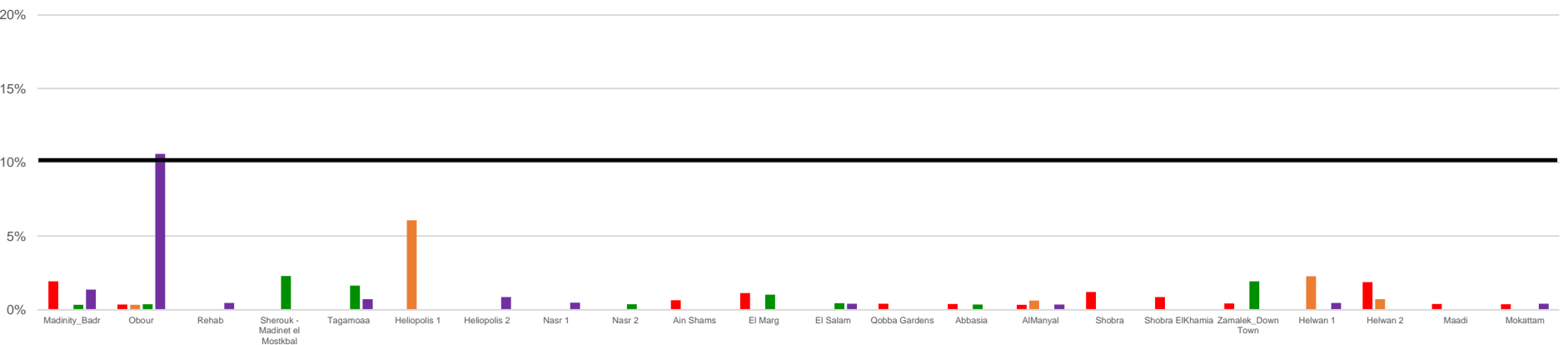
Download Session Blocked Ratio - Overall



Download Session Blocked Ratio - Zones

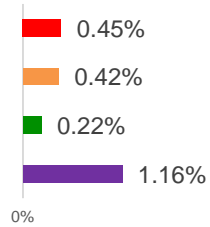


Download Session Blocked Ratio

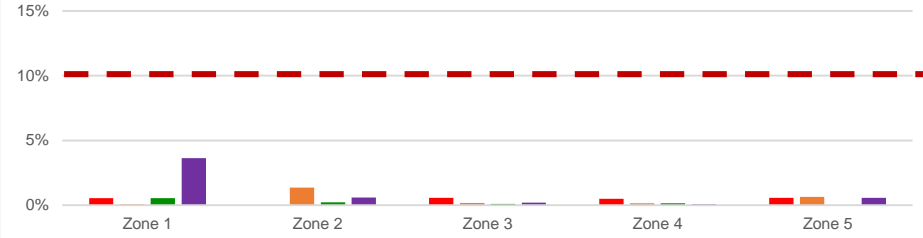


# HTTP Upload Session Blocked Rates

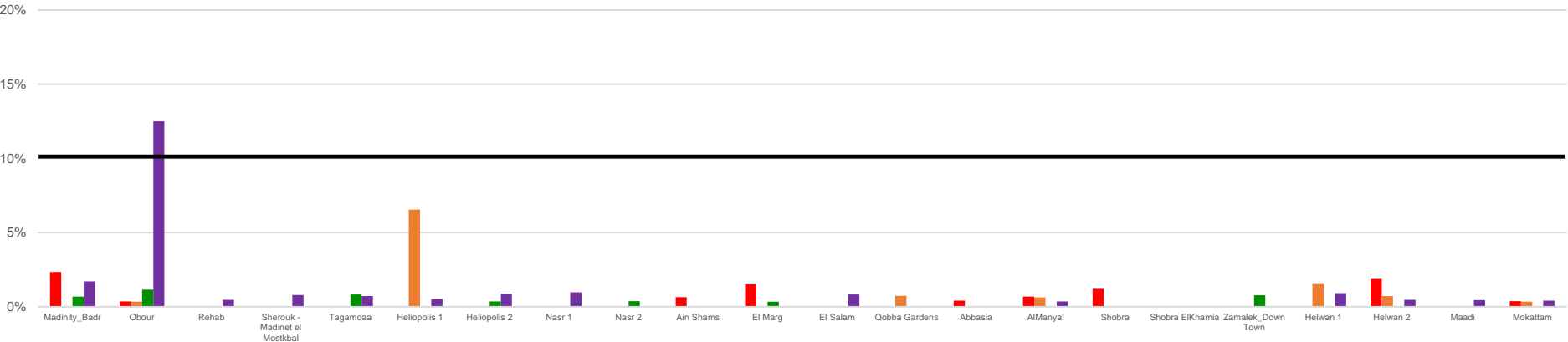
Upload Session Blocked Ratio - Overall



Upload Session Blocked Ratio - Zones

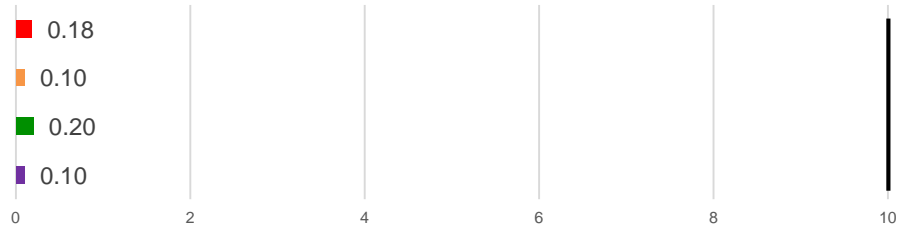


Upload Session Blocked Ratio

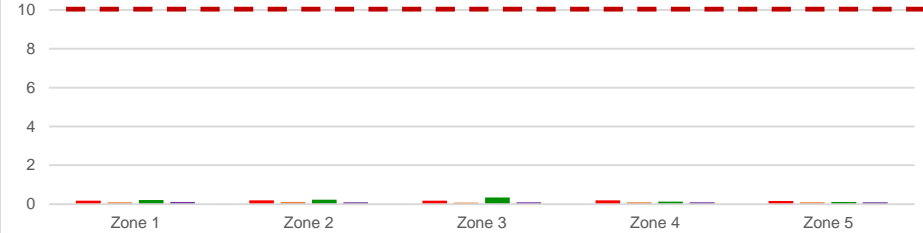


# HTTP Download Average Session Setup Time

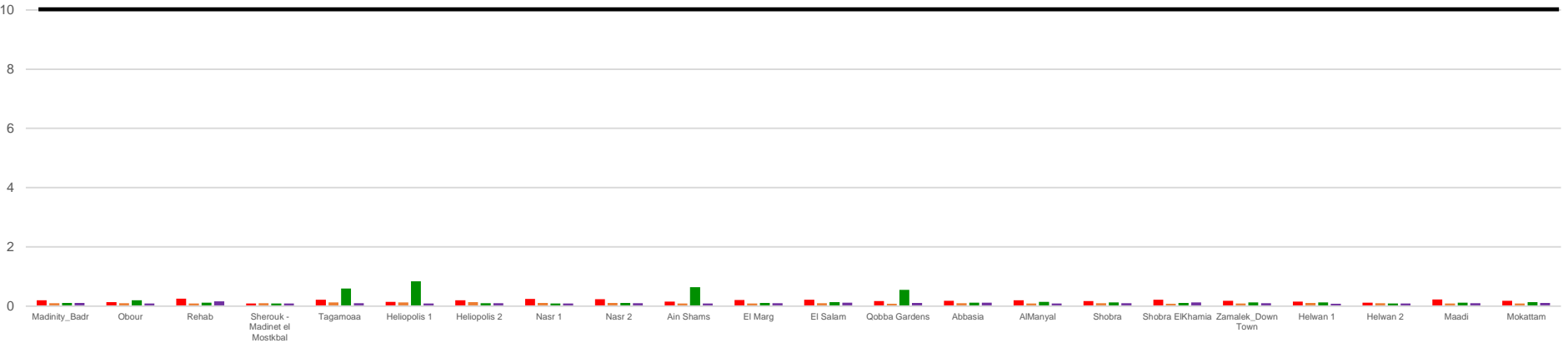
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

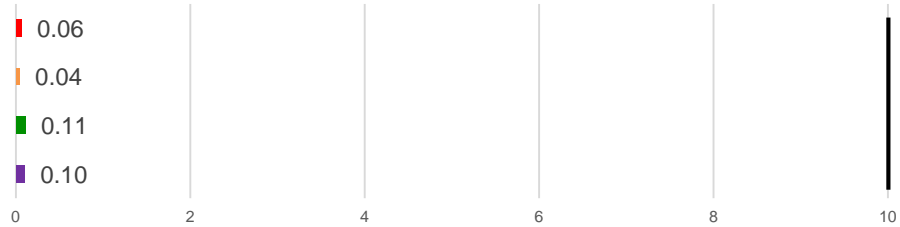


Average Session Setup Time [sec]

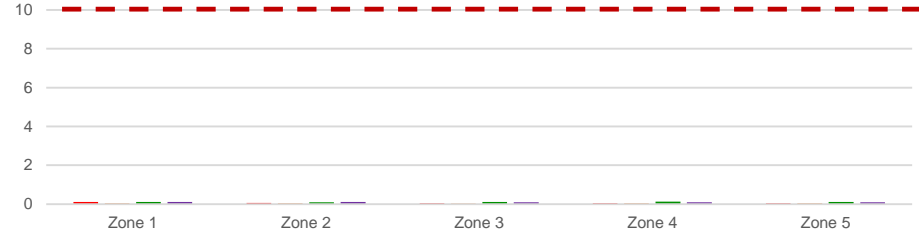


# HTTP Upload Average Session Setup Time

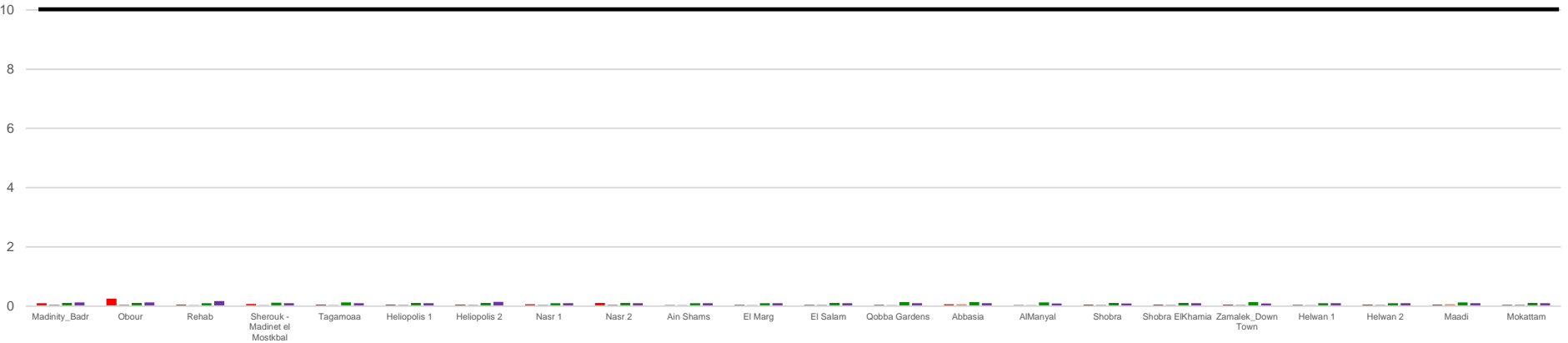
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

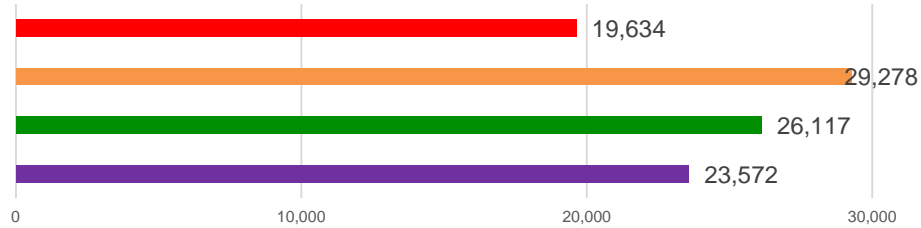


Average Session Setup Time [sec]

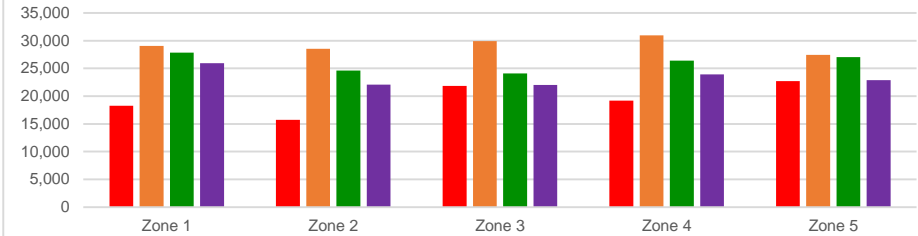


# HTTP Download Throughput – Customer Experience

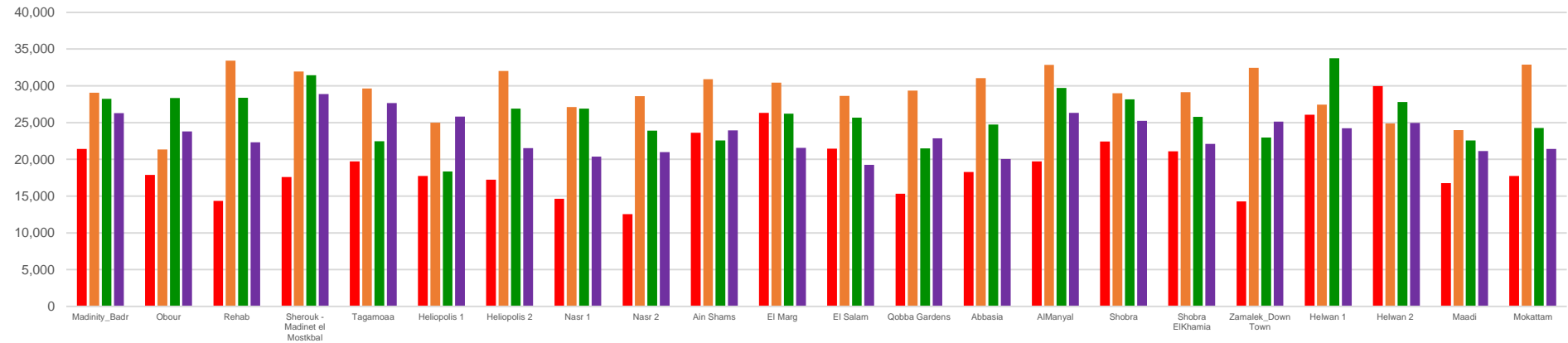
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones

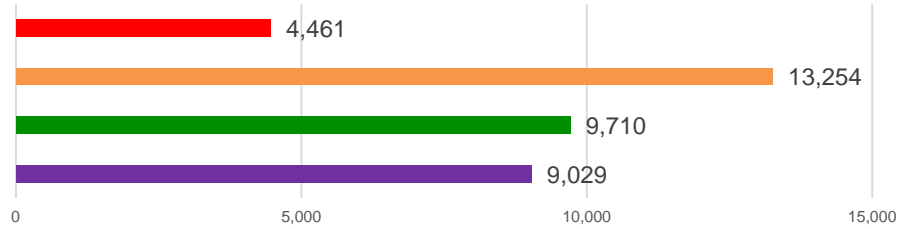


20MB Download Throughput [kbps]

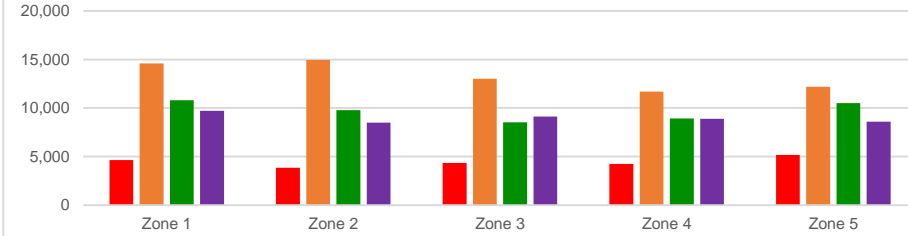


# HTTP Upload Throughput – Customer Experience

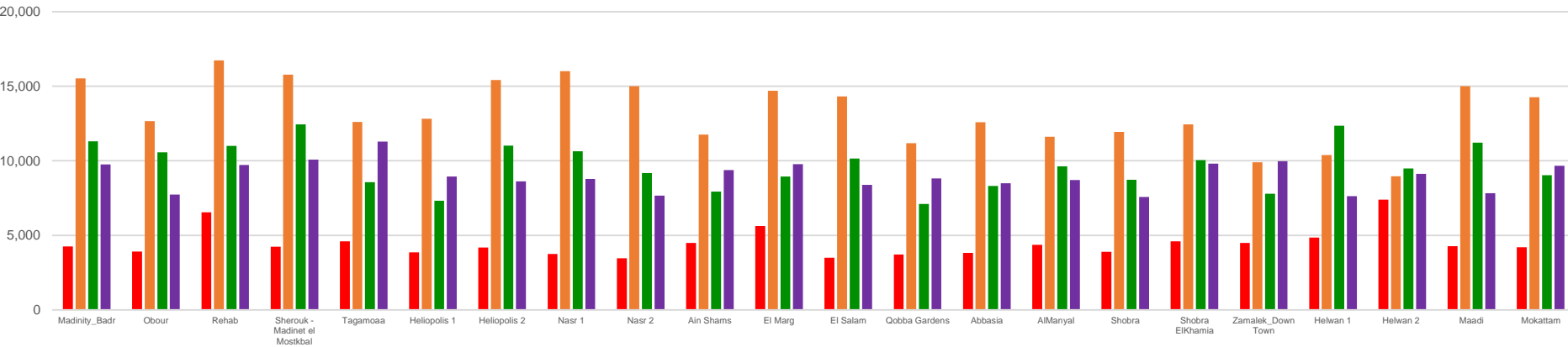
2MB Upload Throughput [kbps] - Overall



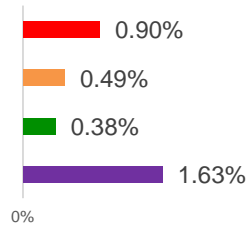
2MB Upload Throughput [kbps] - Zones



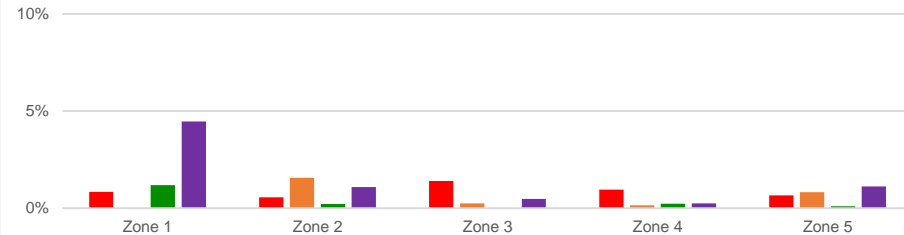
2MB Upload Throughput [kbps]



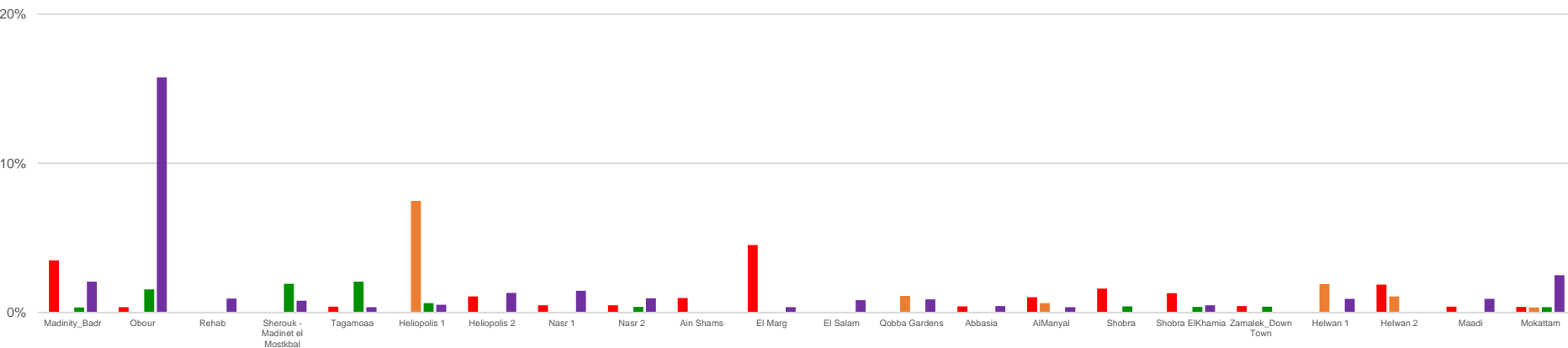
Session Failure Ratio - Overall



Session Failure Ratio - Zones

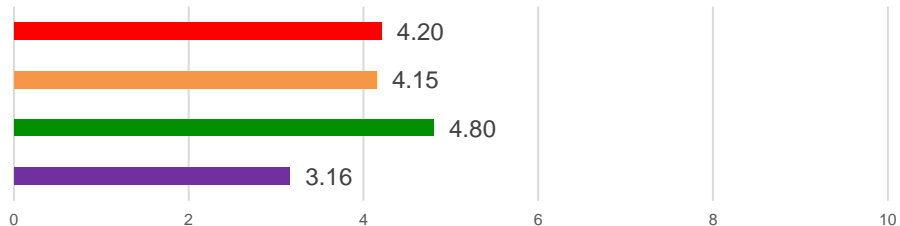


Session Failure Ratio

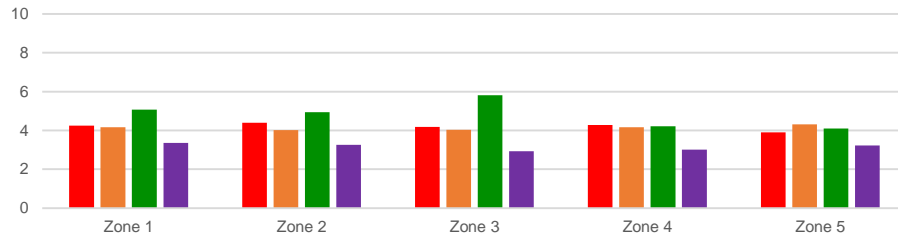




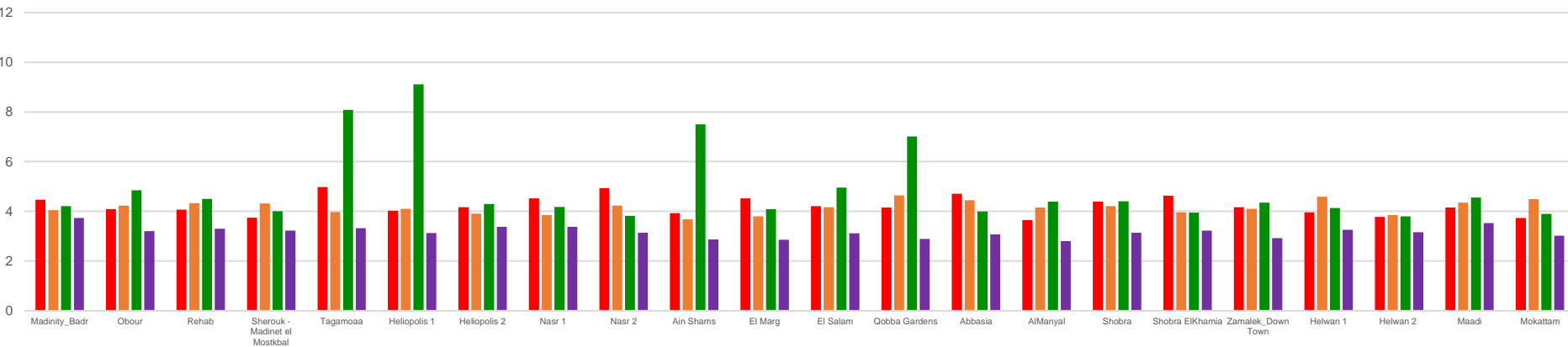
Average Session Time - Overall



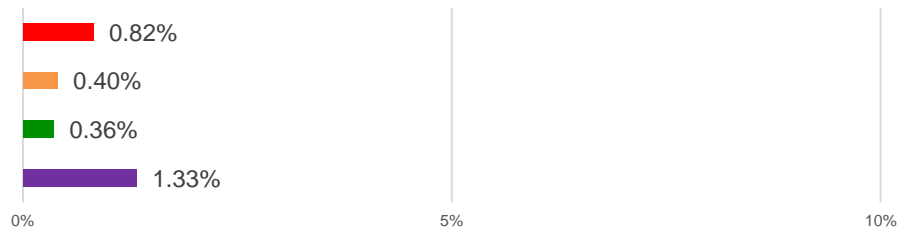
Average Session Time - Zones



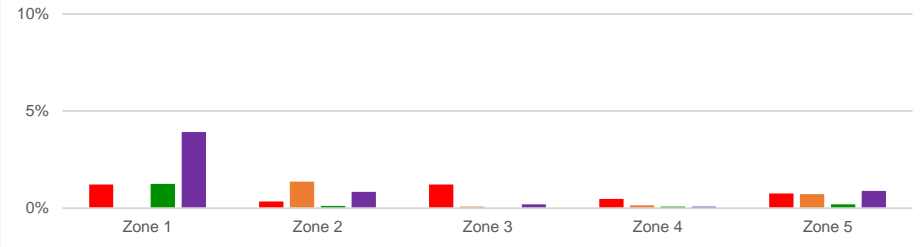
Average Session Time



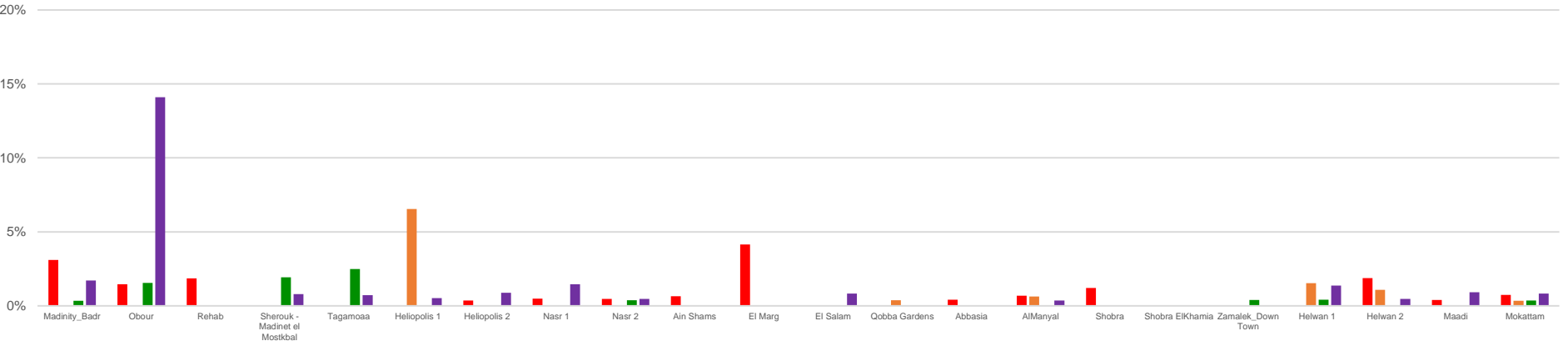
Session Failure Ratio - Overall



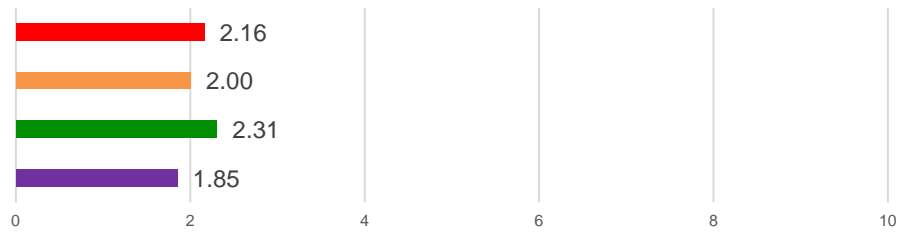
Session Failure Ratio - Zones



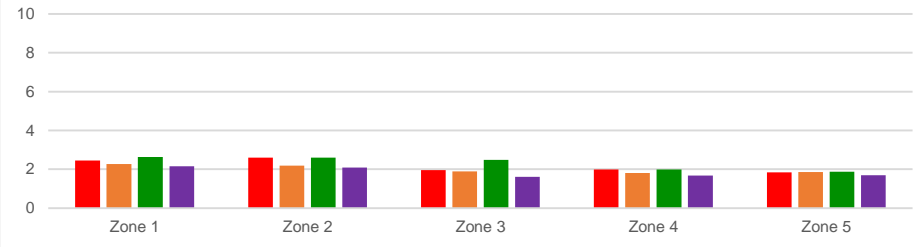
Session Failure Ratio



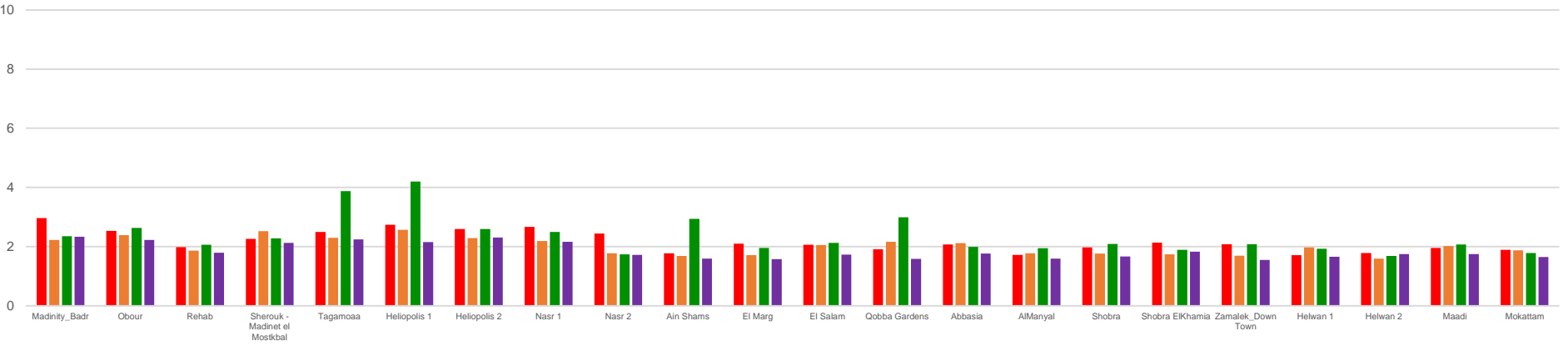
Average Session Time - Overall



Average Session Time - Zones

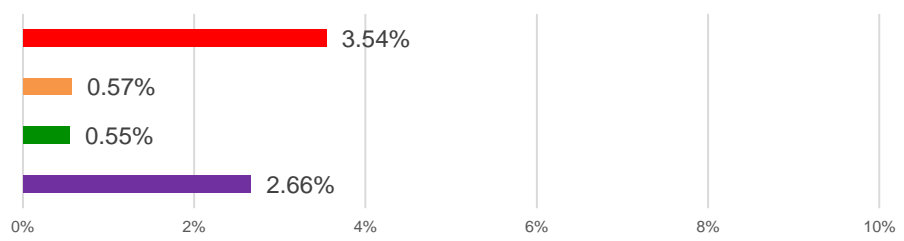


Average Session Time

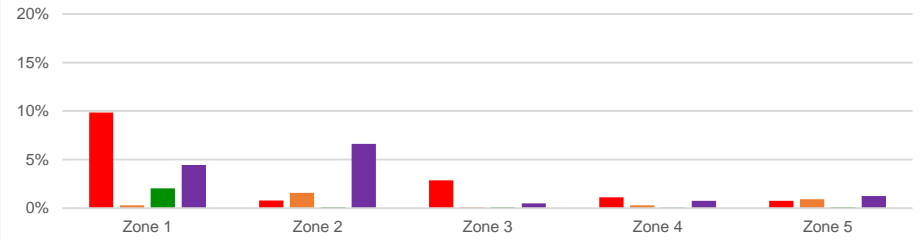


# YouTube Session Failure Ratio

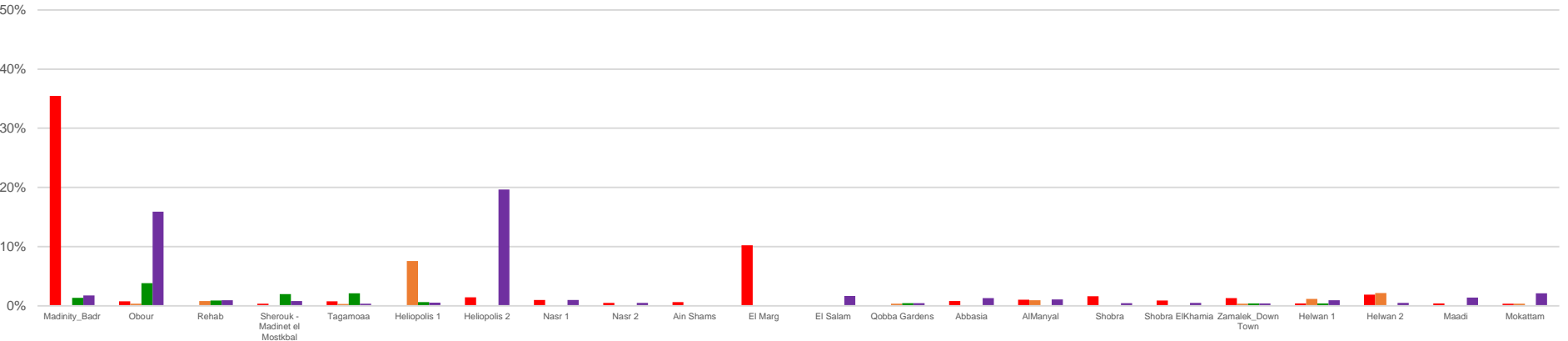
YouTube Session Failure Ratio - Overall



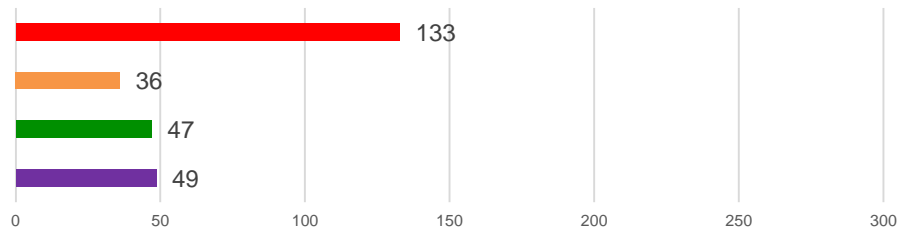
YouTube Session Failure Ratio - Zones



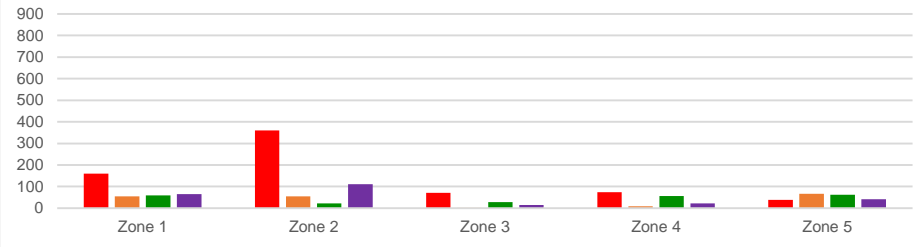
YouTube Session Failure Ratio



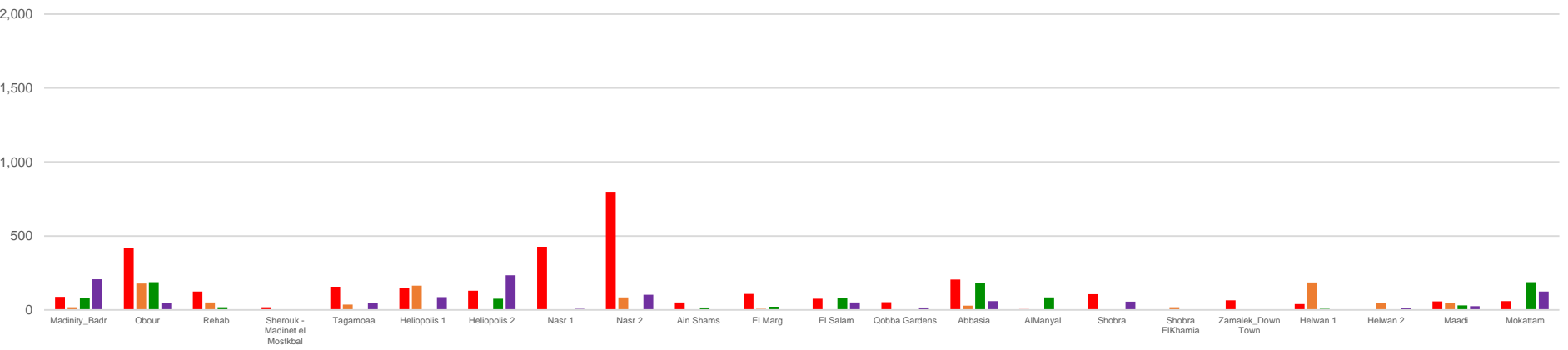
Freezing Time - Overall



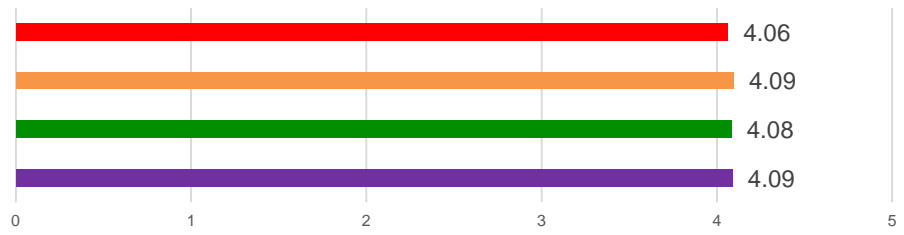
Freezing Time - Zones



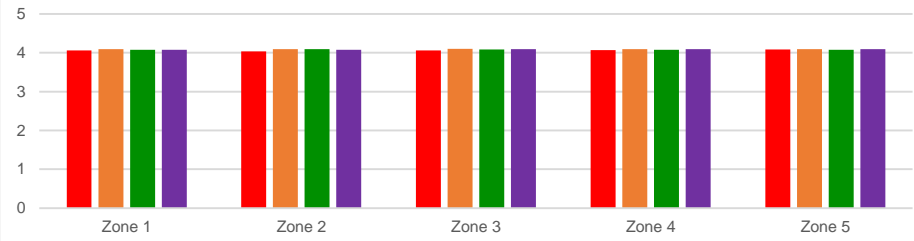
Freezing Time



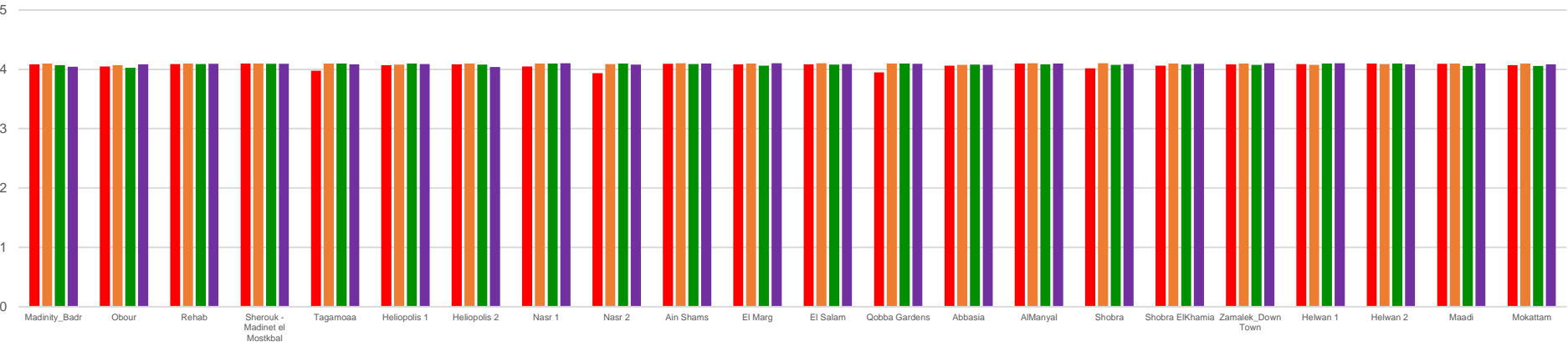
Video Quality [VMOS] - Overall



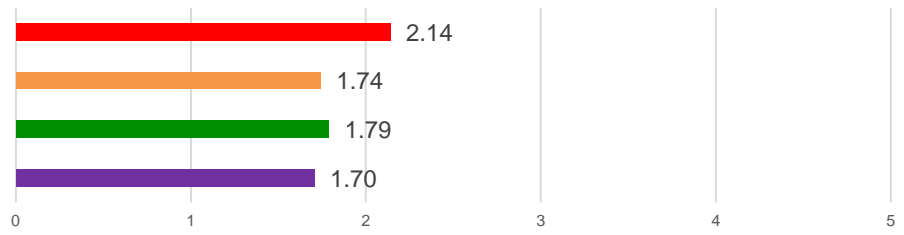
Video Quality [VMOS] - Zones



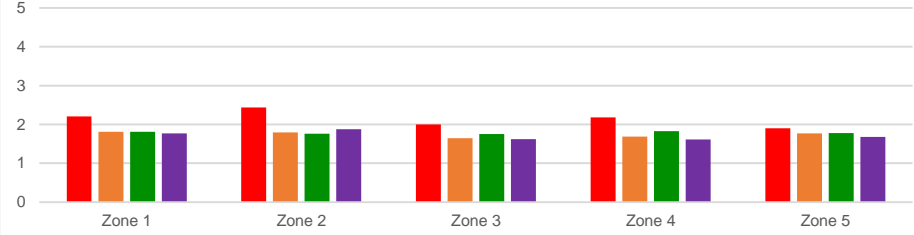
Video Quality - VMOS



Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

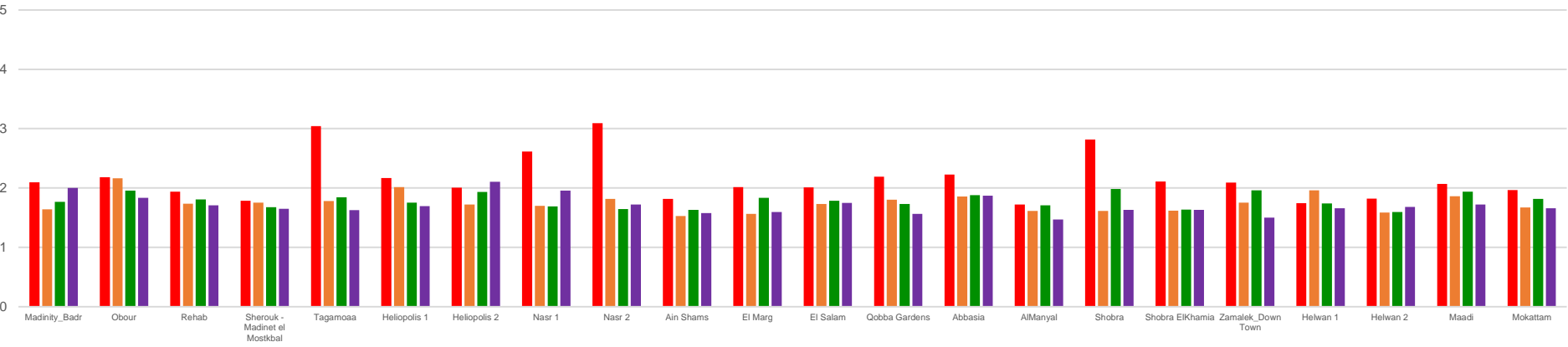
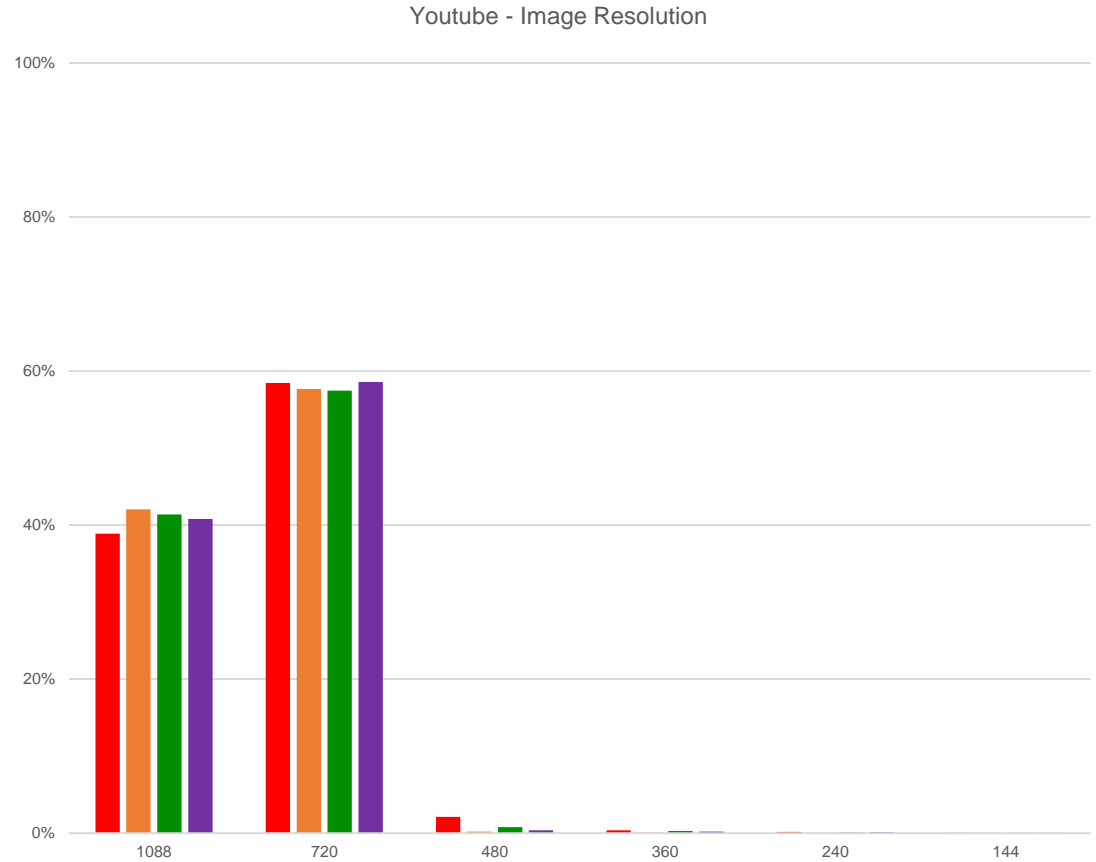


Image Resolution







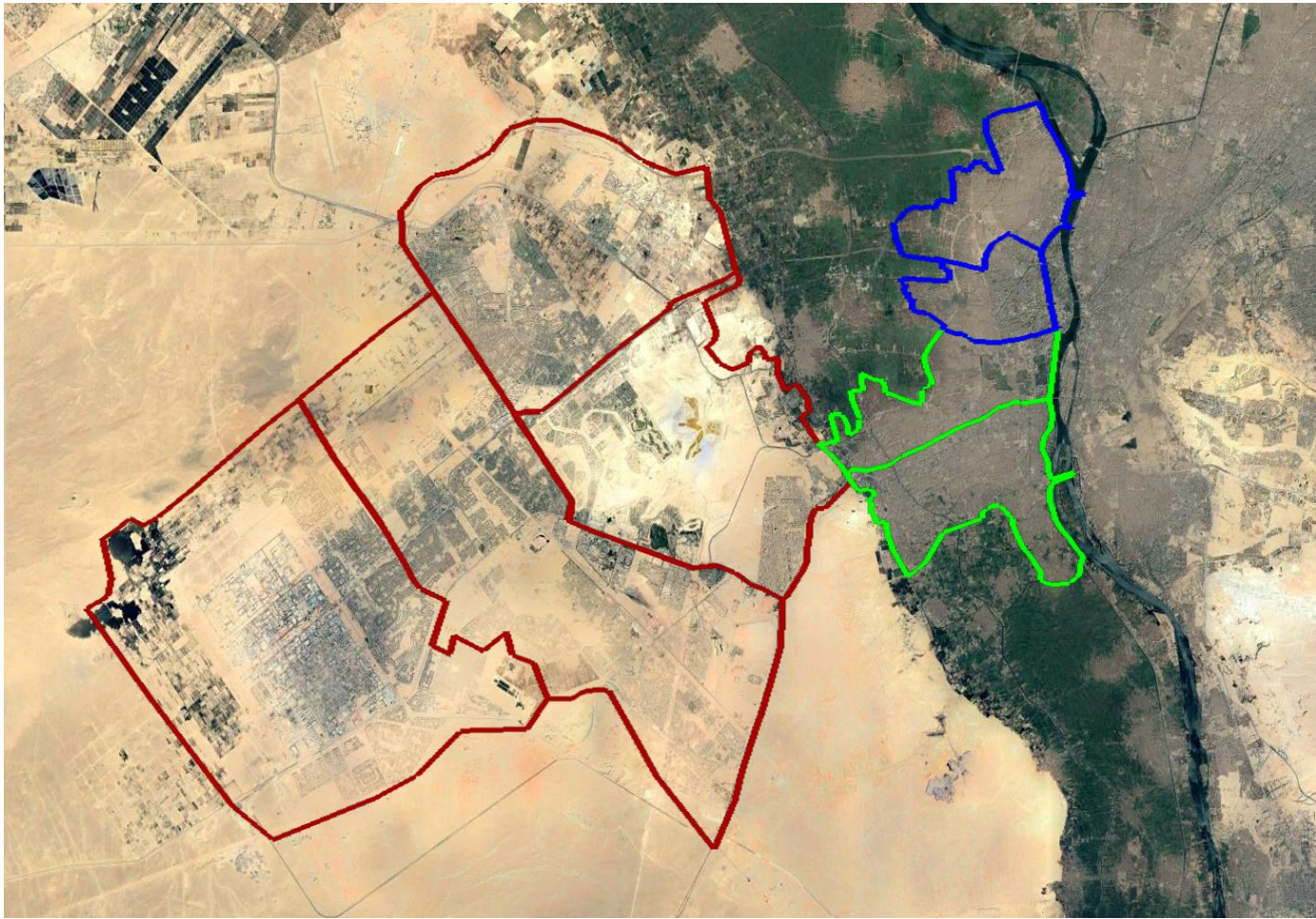
**Giza  
Region  
KPIs**

# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
- 4. Voice Service Quality & Performance - Giza**
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

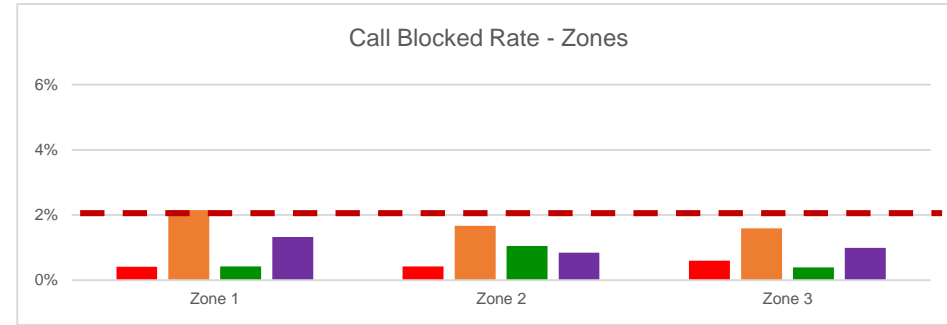
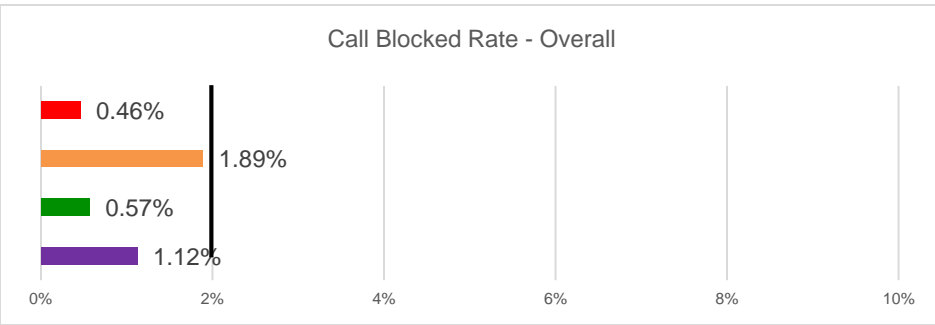
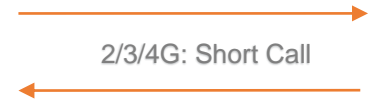
# Zones Definition



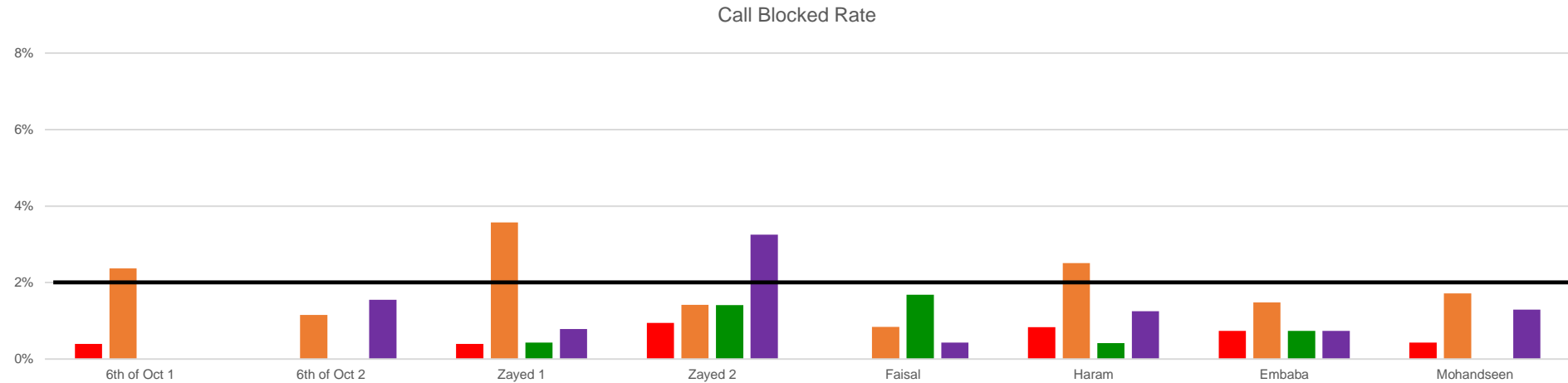
### Giza

<b>Giza Z1</b>	Zayed 1 Zayed 2 6th of Oct 1 6th of Oct 2
<b>Giza Z2</b>	Faisal Haram
<b>Giza Z3</b>	Embaba Mohandseen

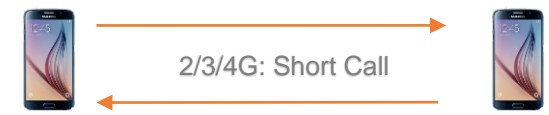
# Accessibility: Call Blocked Rate



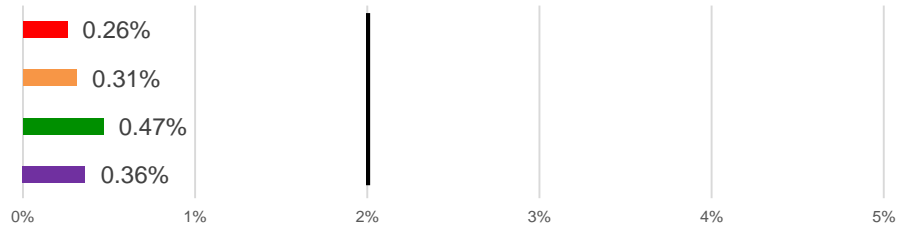
**Call Blocked Rate** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).



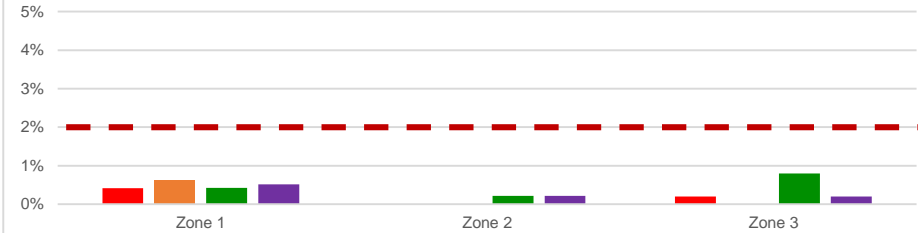
# Retainability: Call Dropped Rate



Voice Call Dropped Rate - Overall

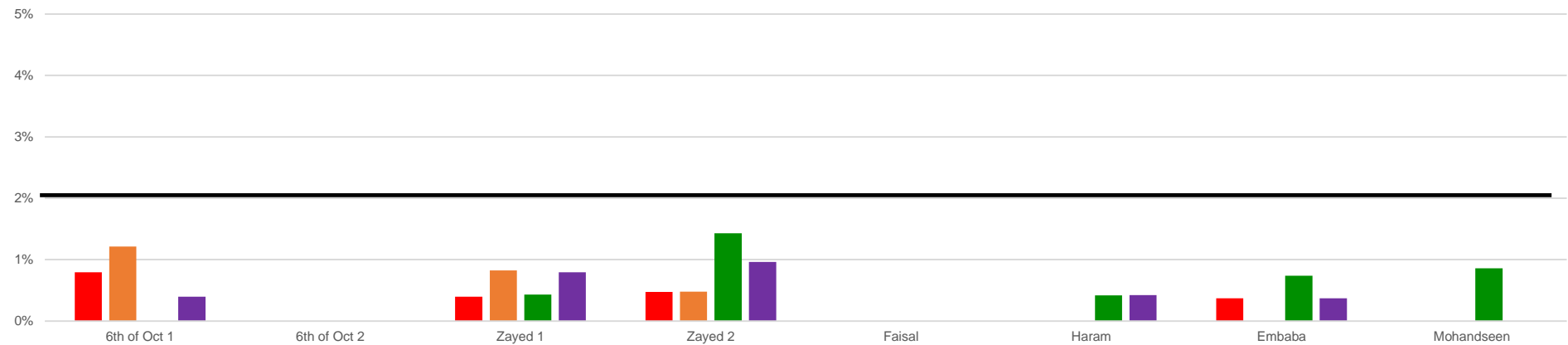


Voice Call Dropped Rate - Zones

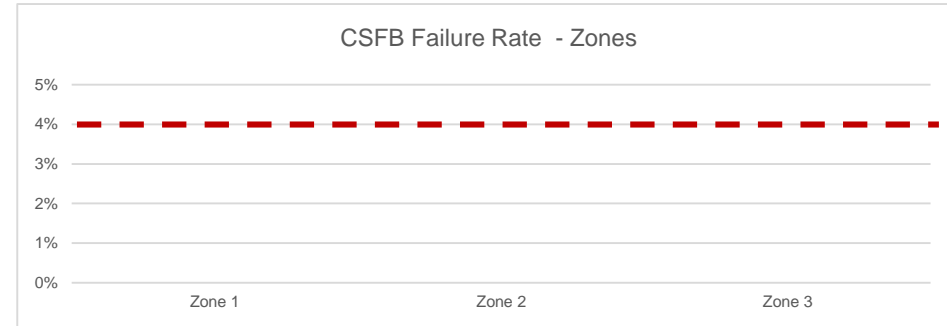
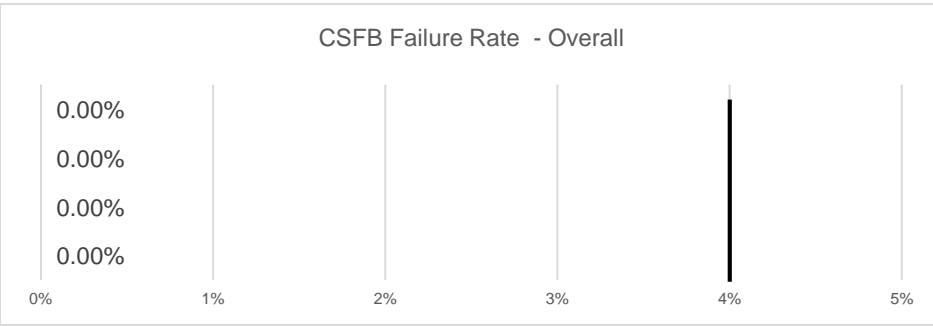
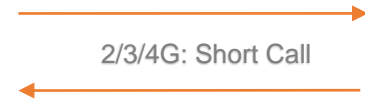


Voice Call Retainability is represented by call drop rates.

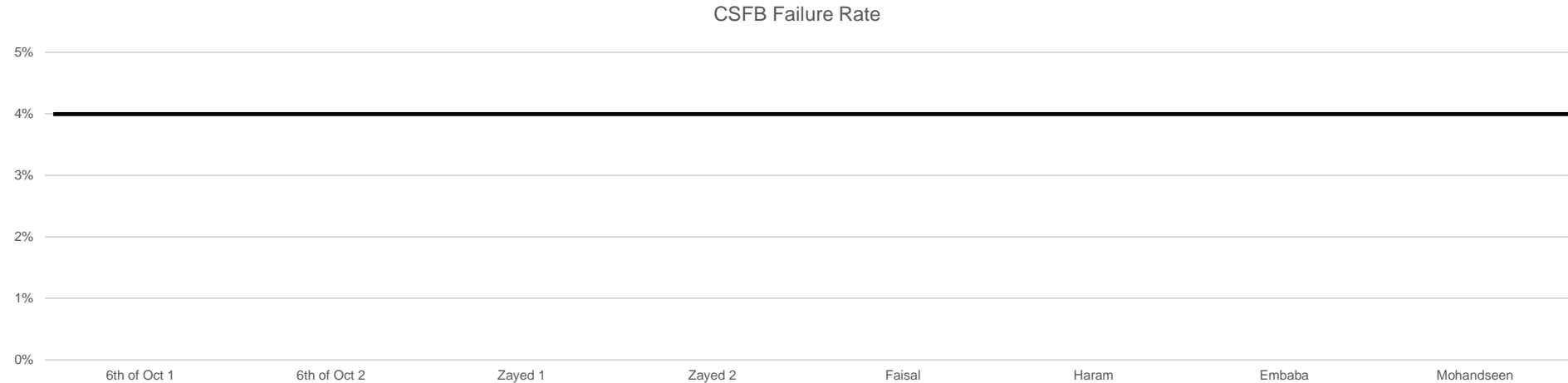
Voice Call Dropped Rate



# Accessibility: CSFB Failure Rate [%]



**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



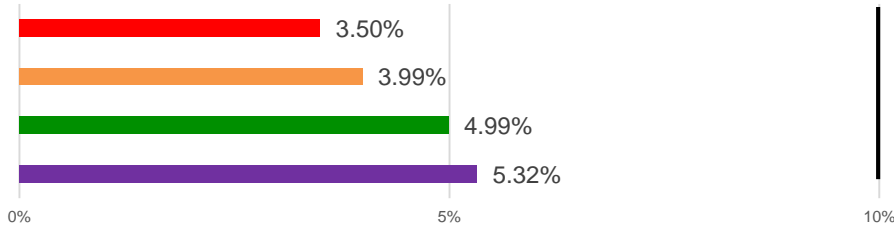
# Speech Quality: MOS Voice Speech Quality < 2.8



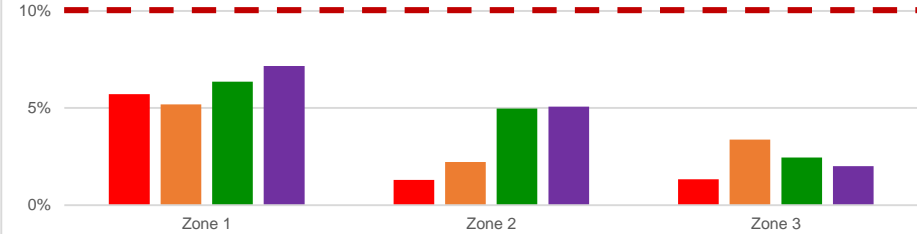
2/3/4G: Short Call



Voice Speech Quality on Sample < 2.8 - Overall

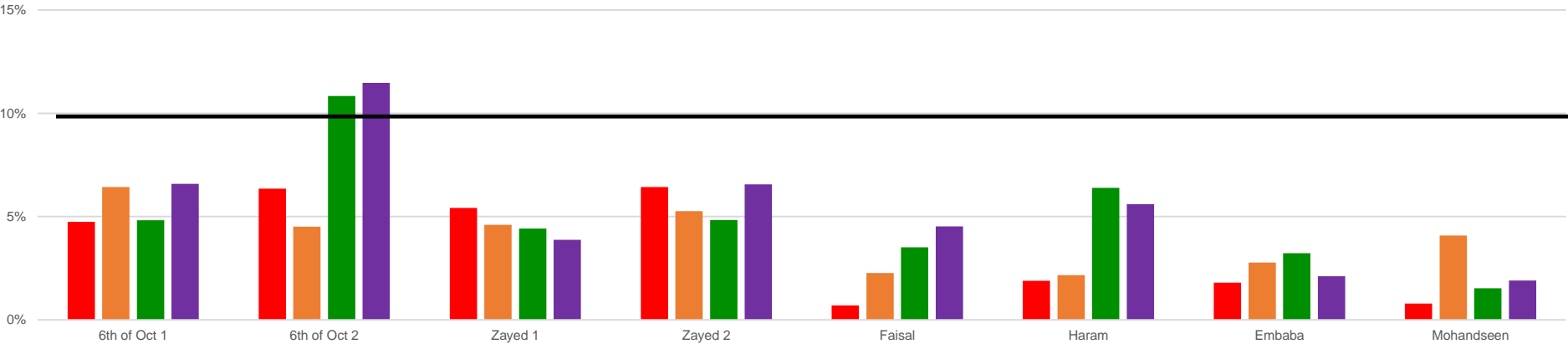


Voice Speech Quality on Sample < 2.8 - Zones

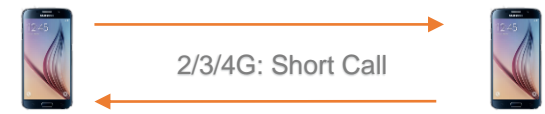


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

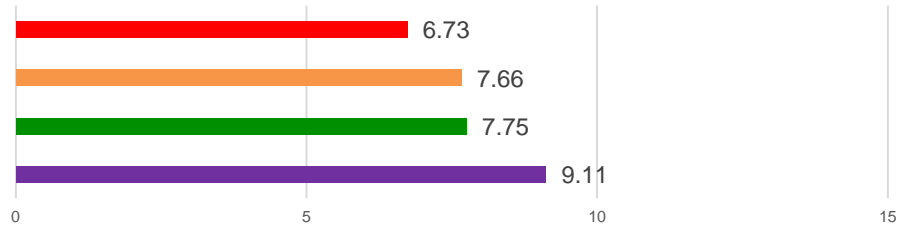
Voice Speech Quality on Sample < 2.8



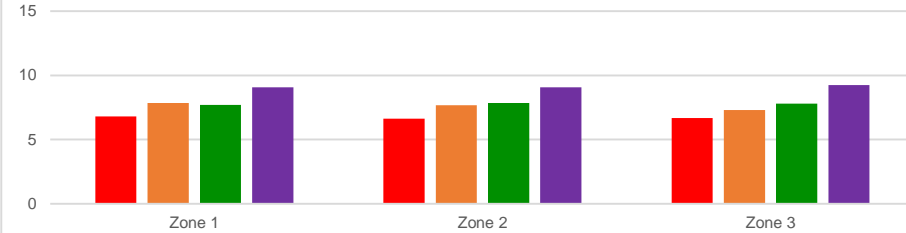
# Accessibility: Call Access Time [sec.]



Call Access Time - Overall

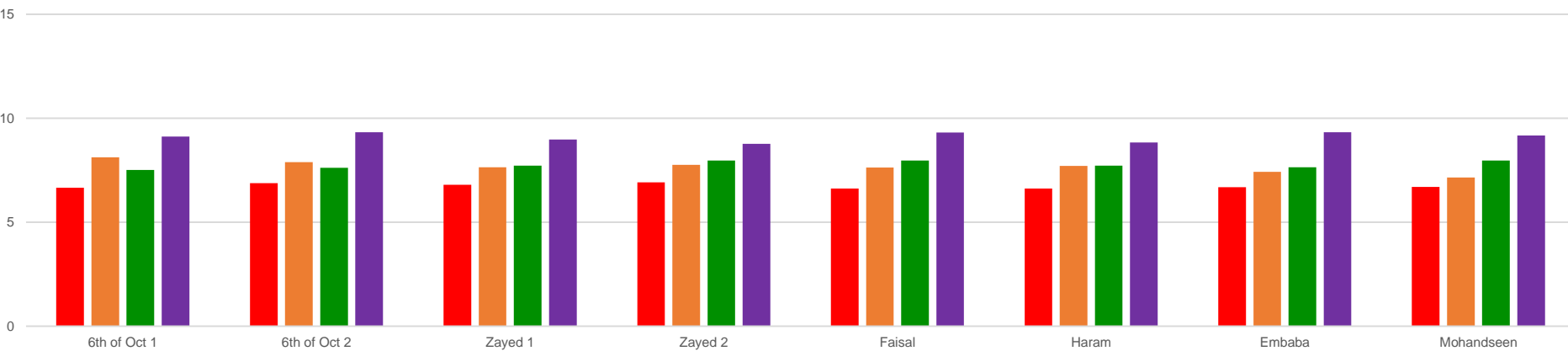


Call Access Time - Zones



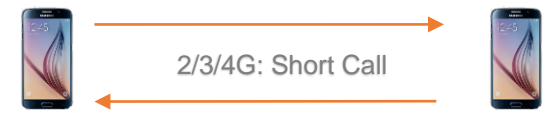
**Call Access** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

Call Access Time

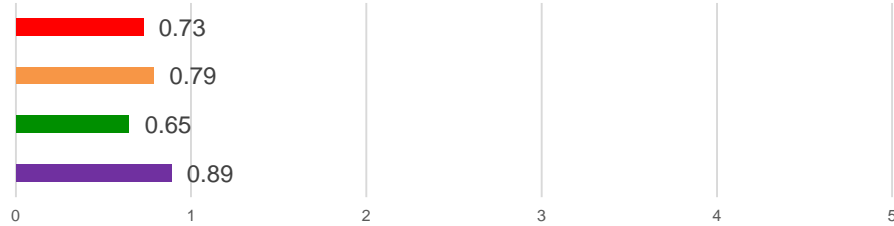




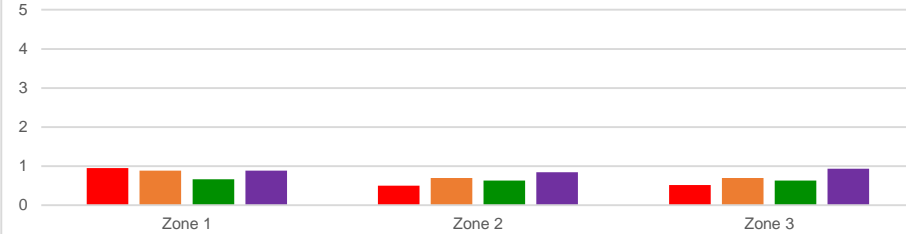
# Accessibility: CSFB Delay [sec.]



Circuit Switch Fall Back Delay - Overall

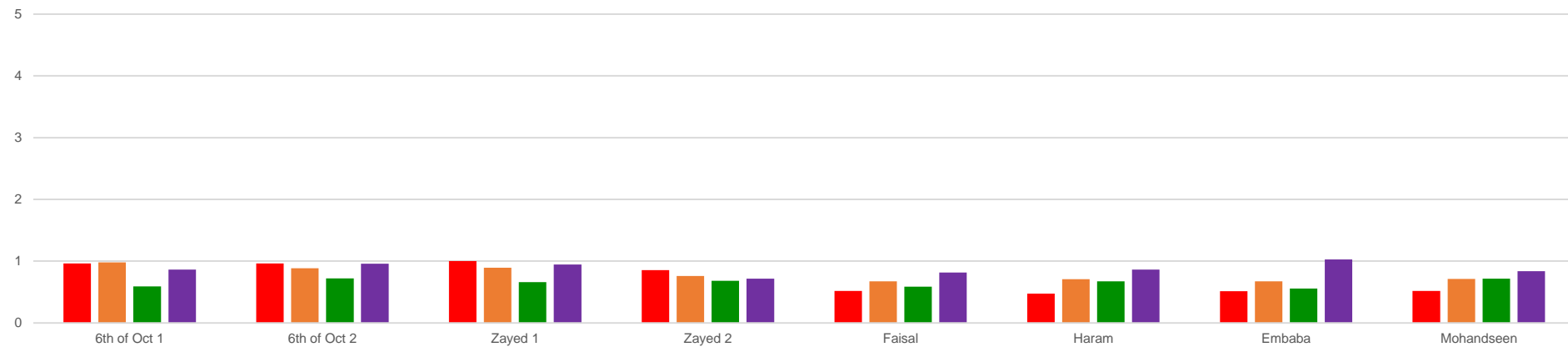


Circuit Switch Fall Back Delay - Zones

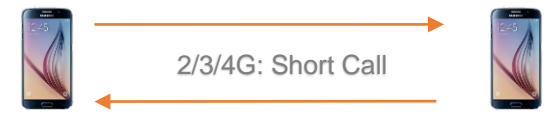


**CSFB Delay** represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

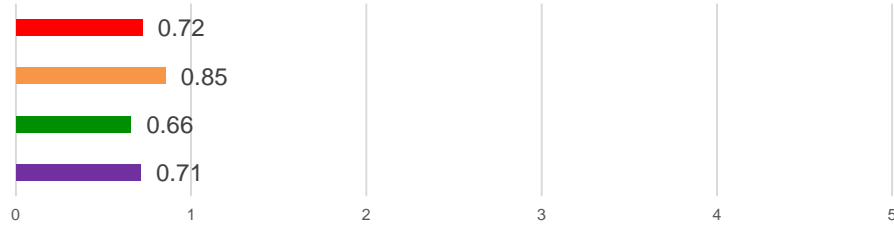
Circuit Switch Fall Back Delay



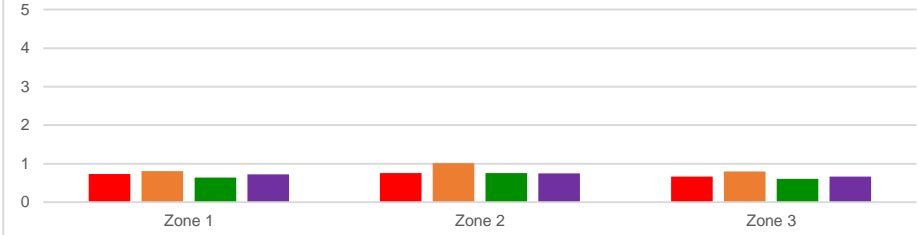
# Accessibility: Telephony Return Delay [sec.]



Telephony Return Delay - Overall

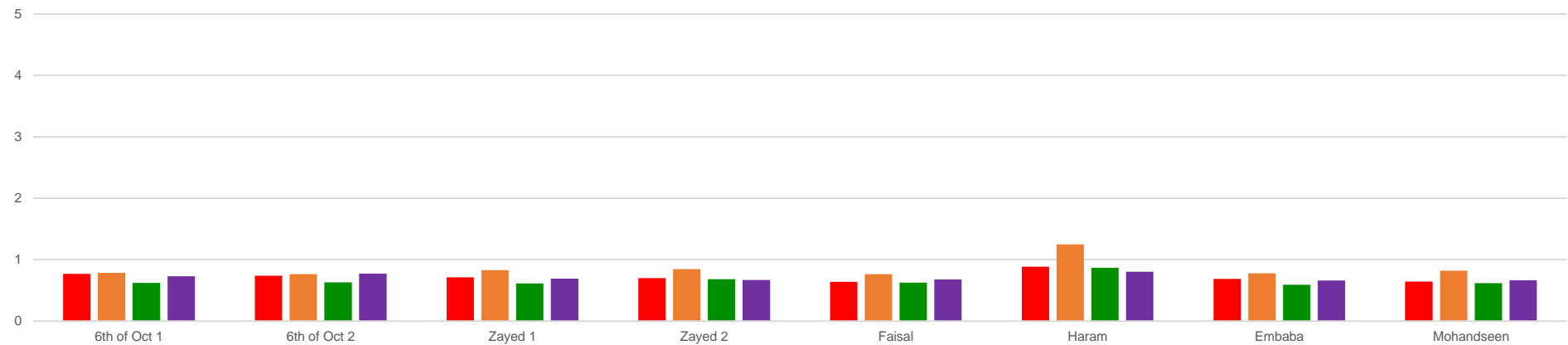


Telephony Return Delay - Zones



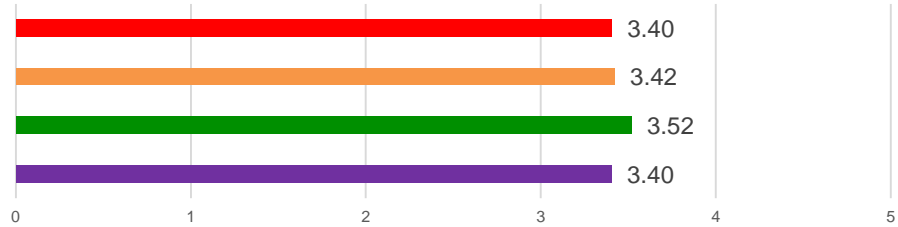
**Telephony Return Delay** measures the time that a UE uses to re-join the LTE (4G) network after call end

Telephony Return Delay

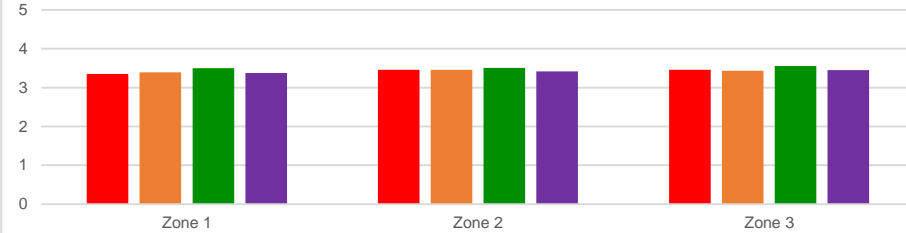


# Speech Quality: MOS Scores

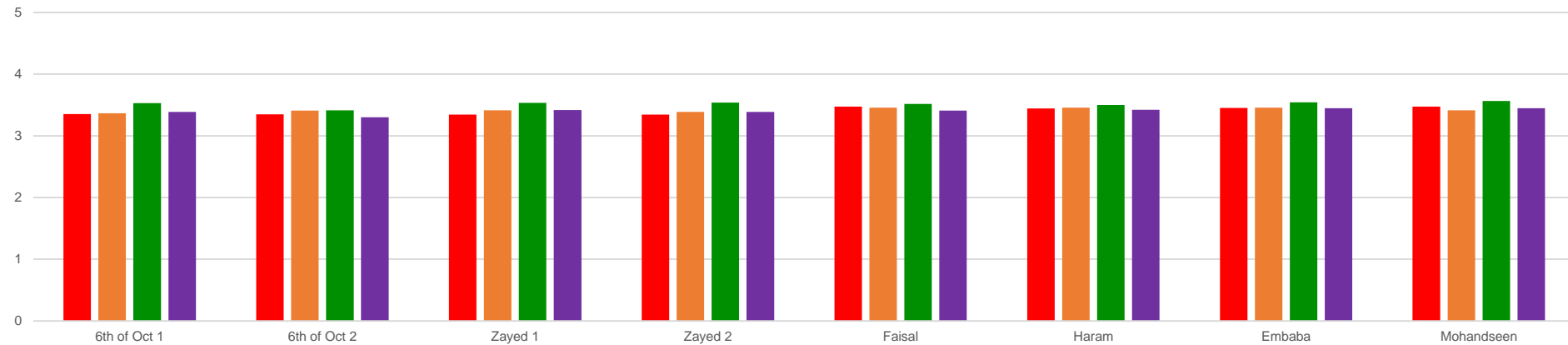
Voice Speech Quality - Overall



Voice Speech Quality - Zones



Voice Speech Quality



# Speech Quality: Call technology Usage & Codec Base Usage

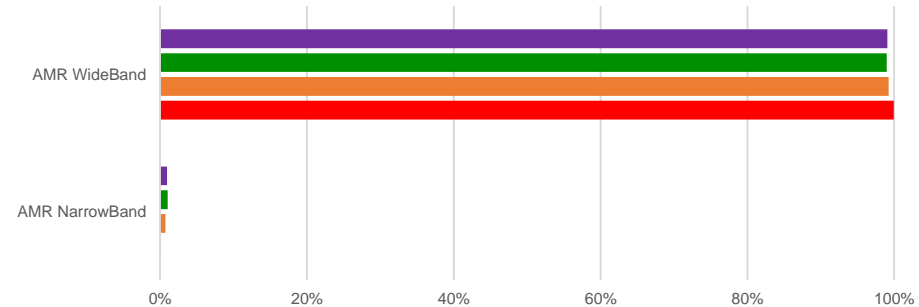
Call Technology Usage Overall



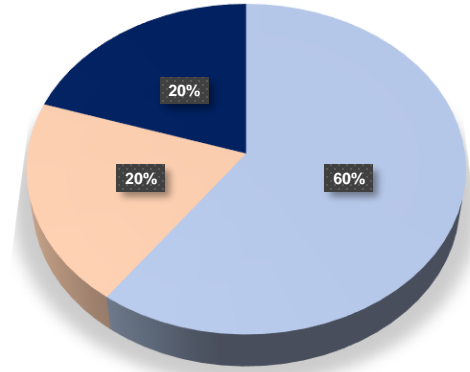
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

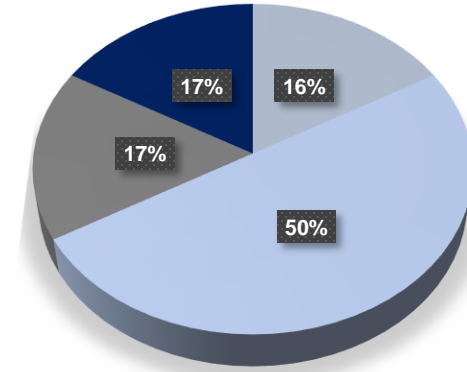
Codec Base Usage



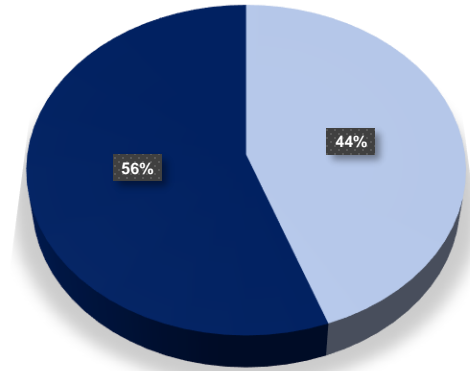
# Analysis: Dropped Calls Causes



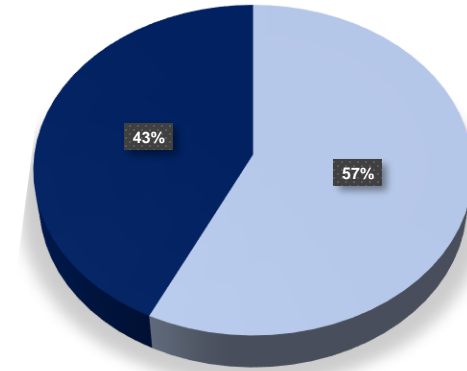
- 3G Quality
- Mobility Issue
- RAN Issue



- 2G Quality
- 3G Quality
- Core Network
- RAN Issue

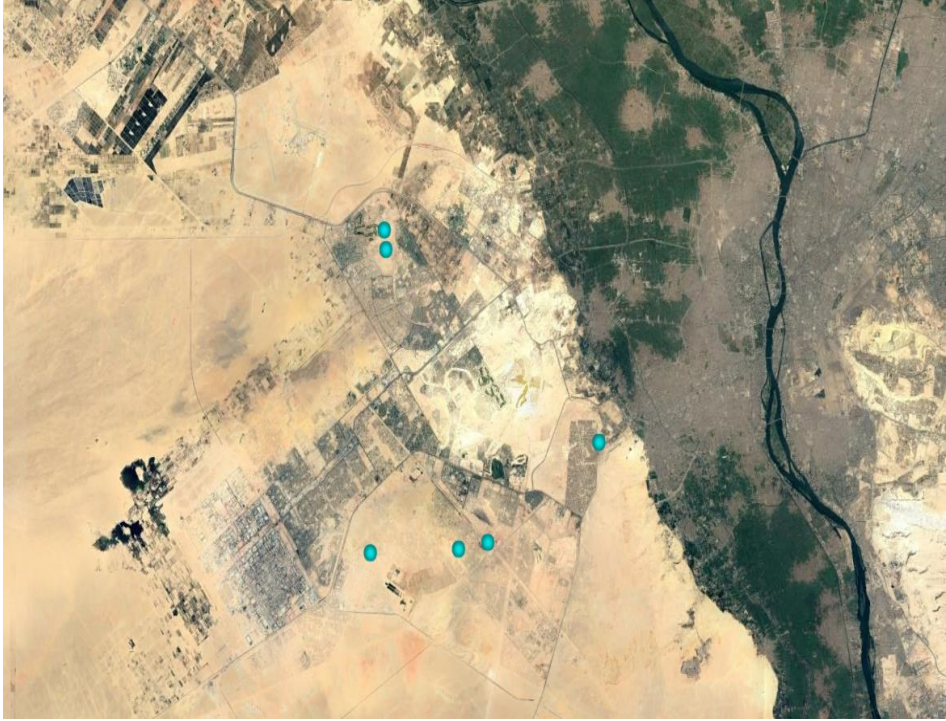
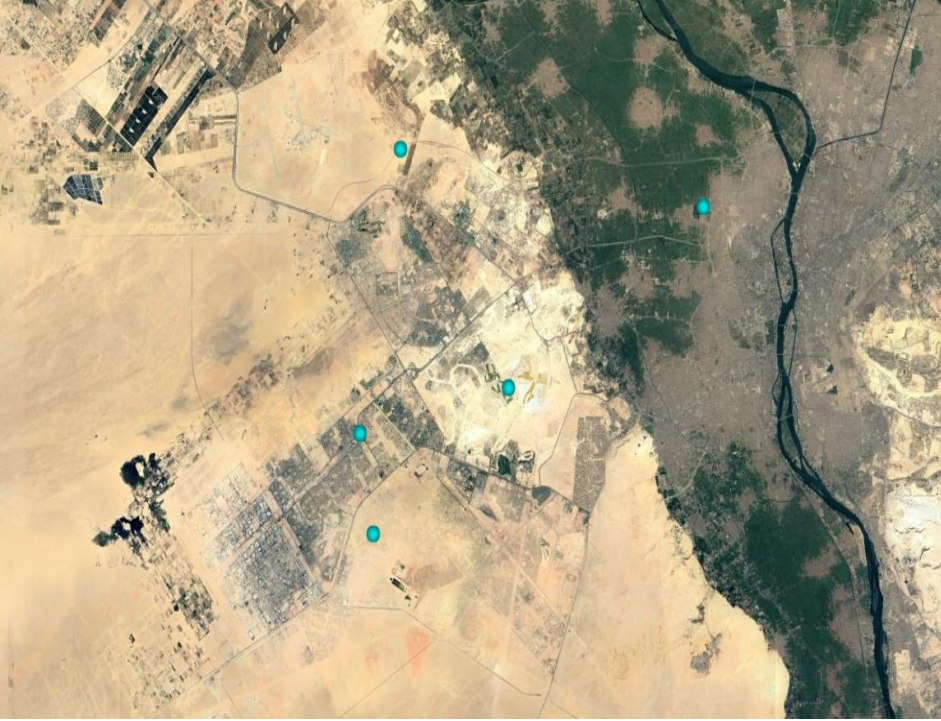


- 3G Quality
- RAN Issue

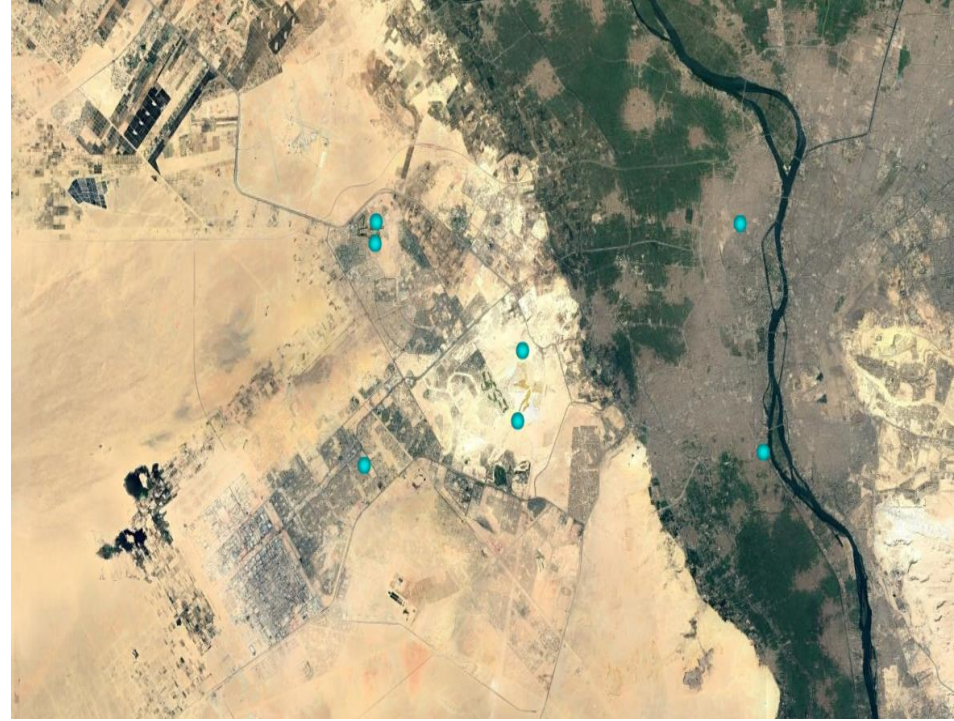


- 3G Quality
- RAN Issue

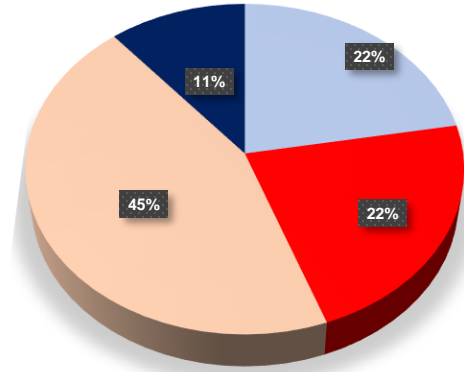
# All Operators: Dropped Calls Locations 1/2



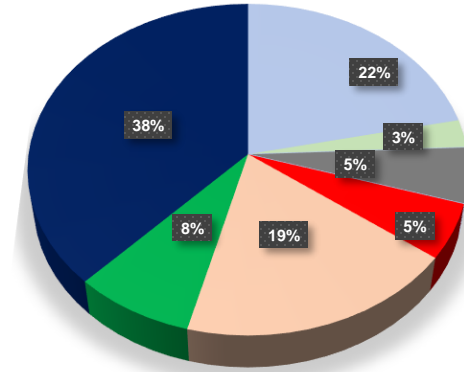
# All Operators: Dropped Calls Locations 2/2



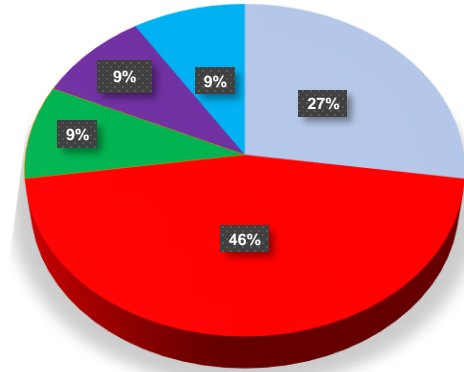
# Analysis: Failed Calls Causes



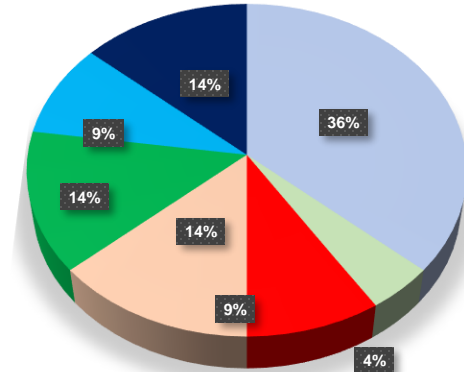
- 3G Quality
- CSFB Issue
- Mobility Issue
- RAN Issue



- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- RAN Issue



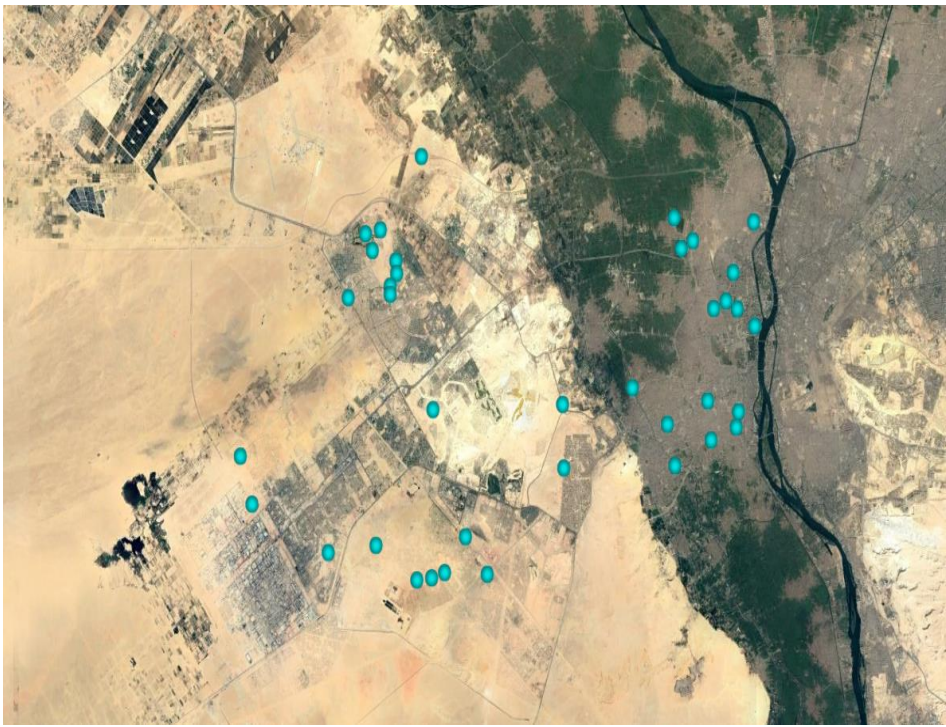
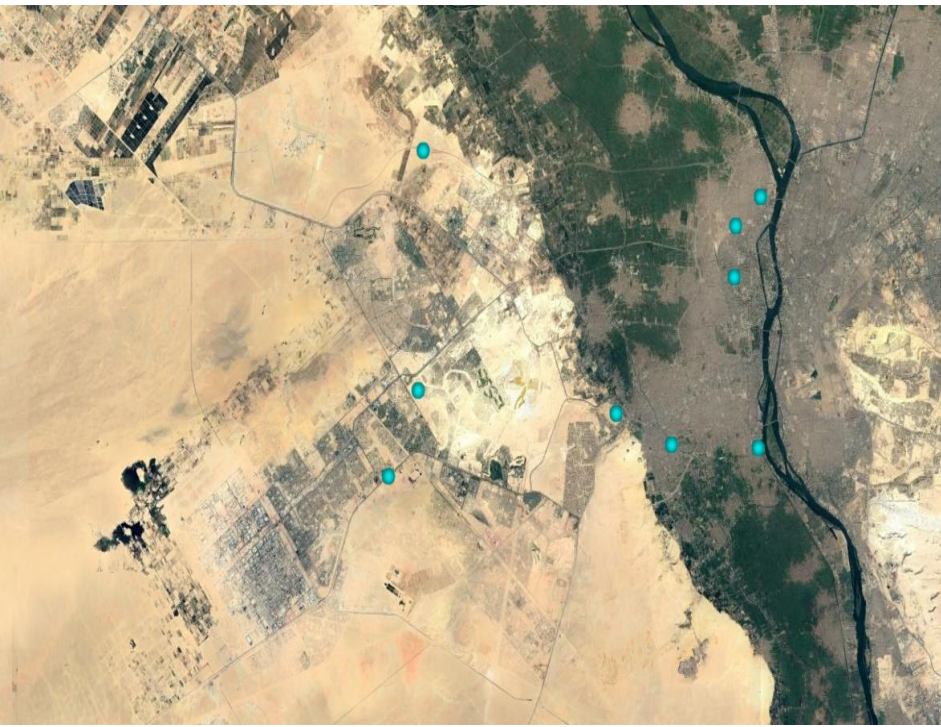
- 3G Quality
- CSFB Issue
- No service
- Other
- Paging Issue



- 3G Quality
- 4G Quality
- CSFB Issue
- Mobility Issue
- No service
- Paging Issue
- RAN Issue



# All Operators: Blocked Calls Locations 1/2



# All Operators: Blocked Calls Locations 2/2



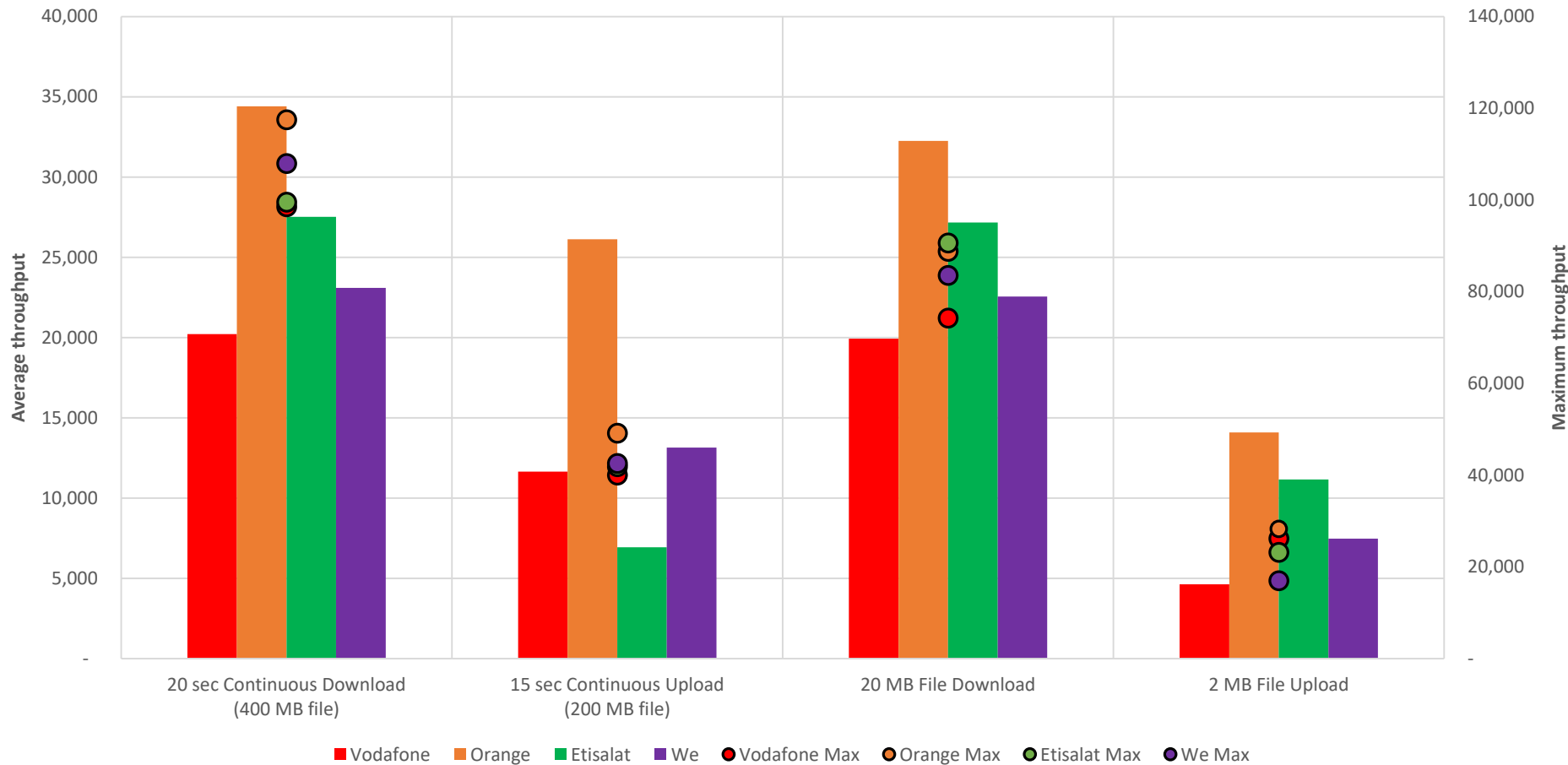
# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
- 5. Data Service Quality & Performance – Giza**
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

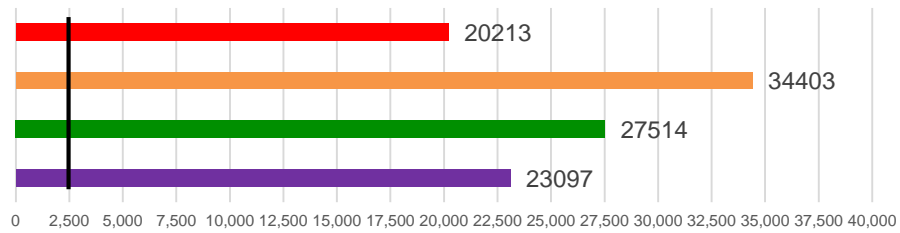
## NETWORK PERFORMANCE TEST

## USER EXPERIENCE TEST

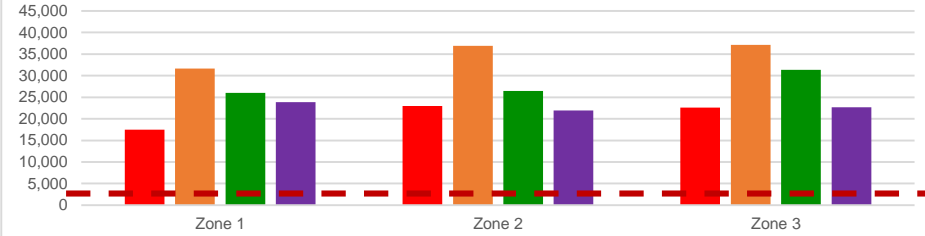


# FDTT HTTP Download Transfer Throughput – Network Performance

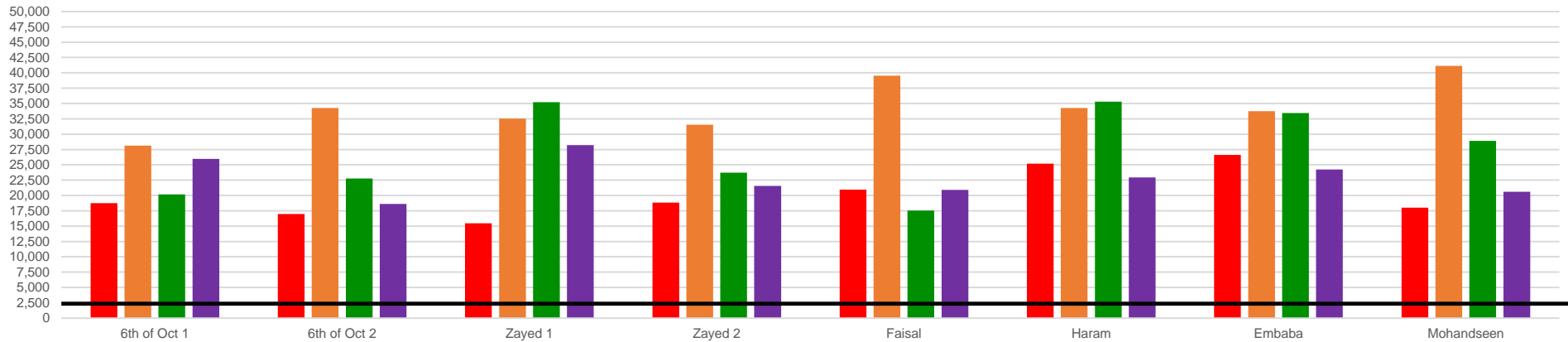
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones

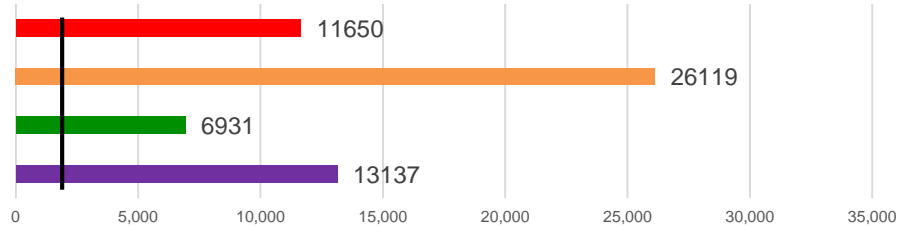


400 MB File FDTT HTTP Download Throughput [kbps]

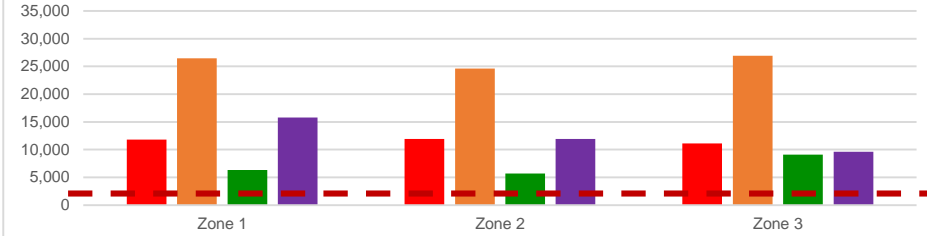


# FDTT HTTP Upload Transfer Throughput – Network Performance

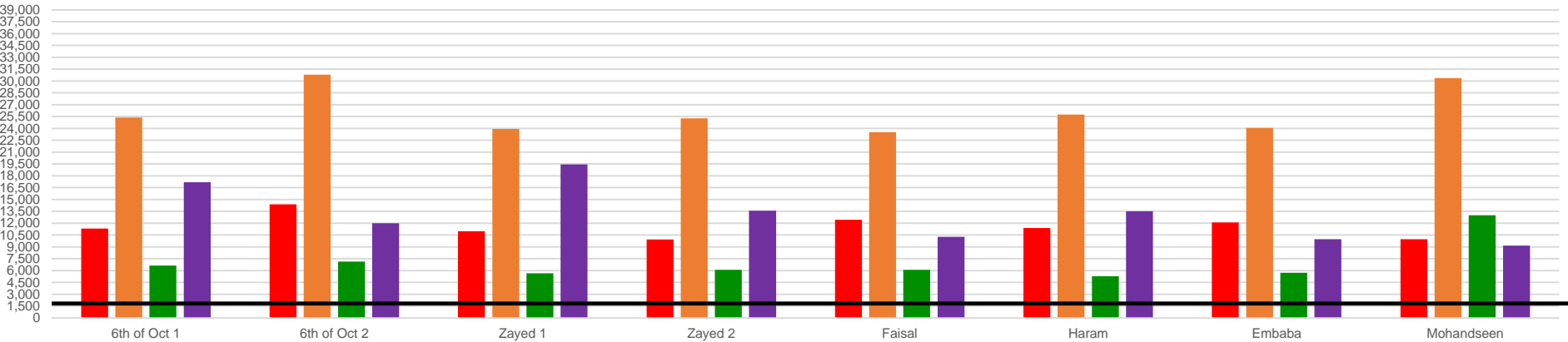
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones

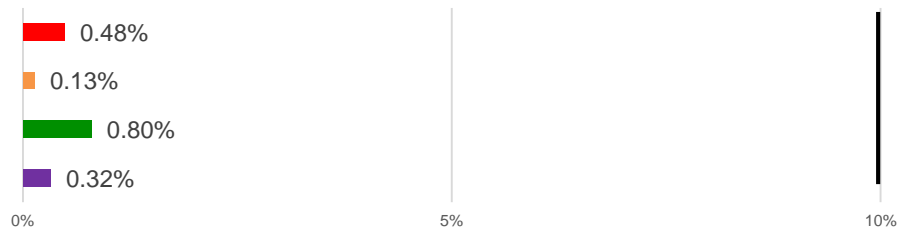


200 MB FDTT HTTP Upload Throughput [kbps]

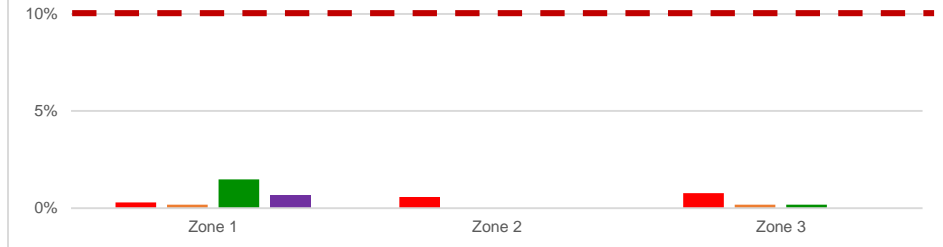


# HTTP Download Session Blocked Rates

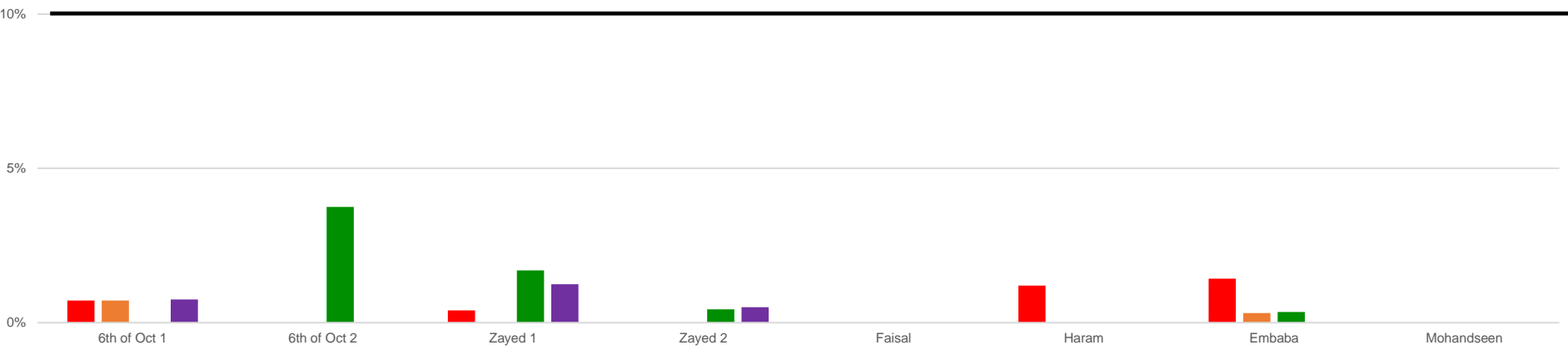
Download Session Blocked Ratio - Overall



Download Session Blocked Ratio - Zones

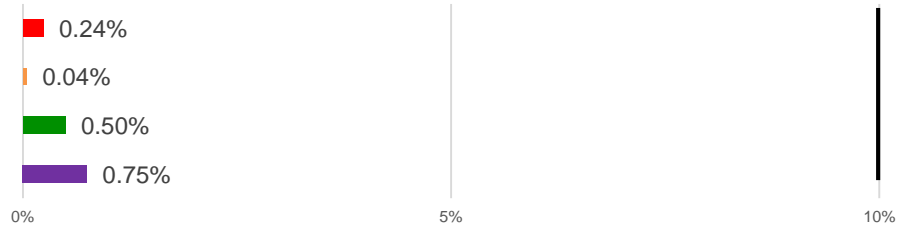


Download Session Blocked Ratio

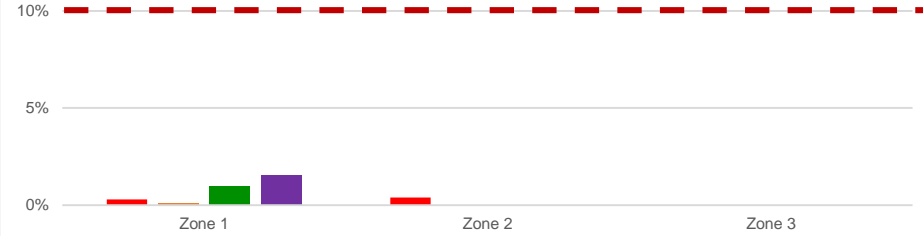


# HTTP Upload Session Blocked Rates

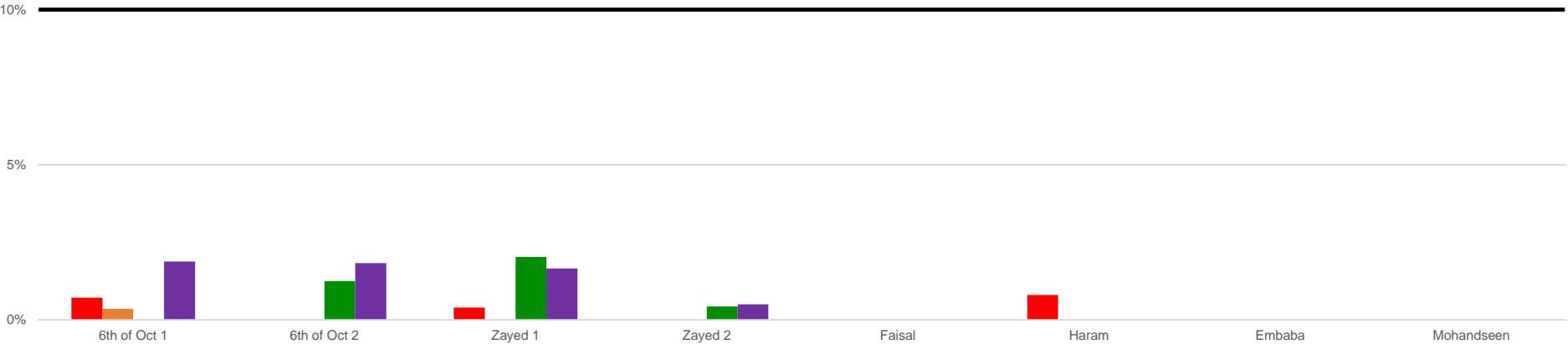
Upload Session Blocked Ratio - Overall



Upload Session Blocked Ratio - Zones



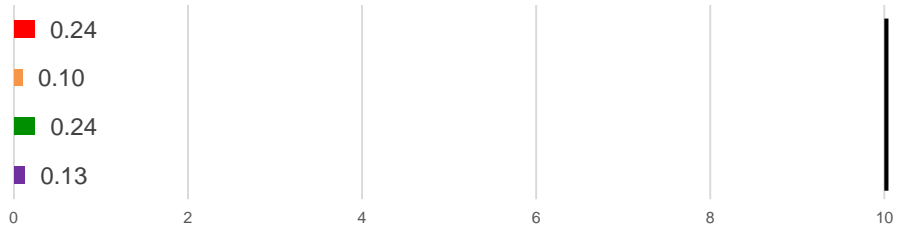
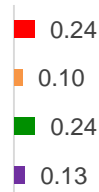
Upload Session Blocked Ratio



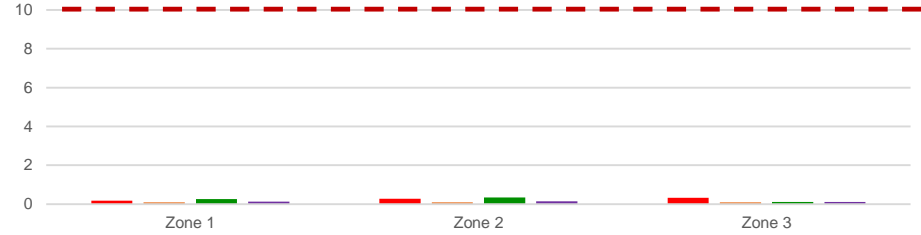


# HTTP Download Average Session Setup Time

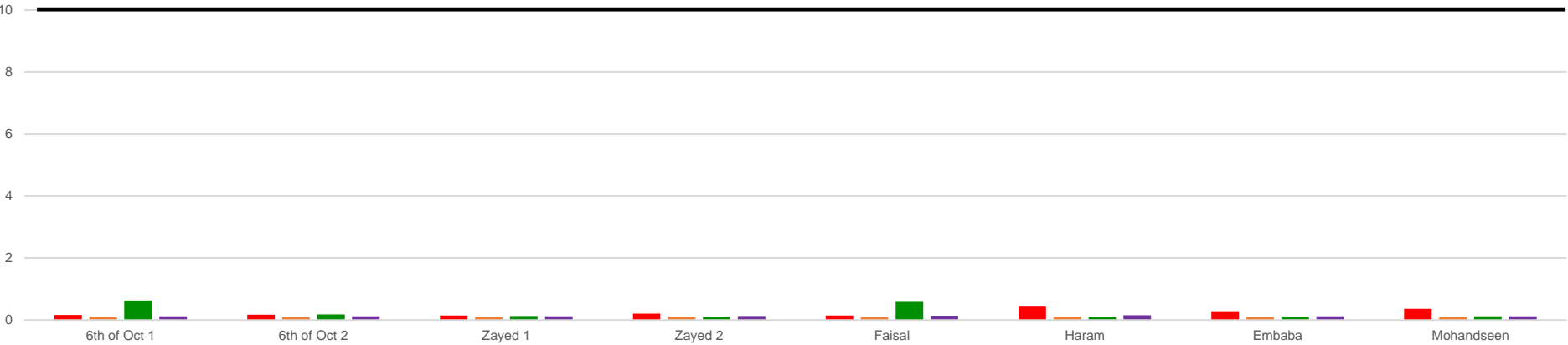
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

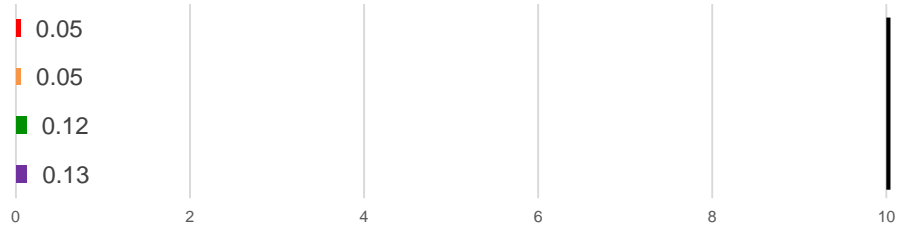


Average Session Setup Time [sec]

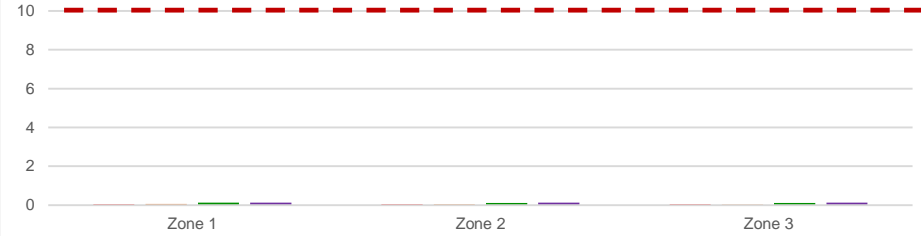


# HTTP Upload Average Session Setup Time [sec]

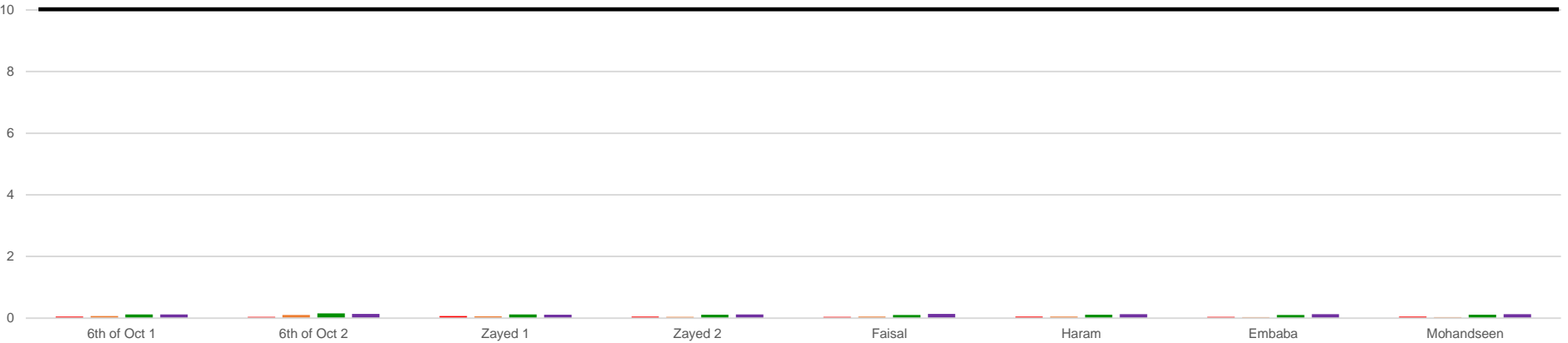
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

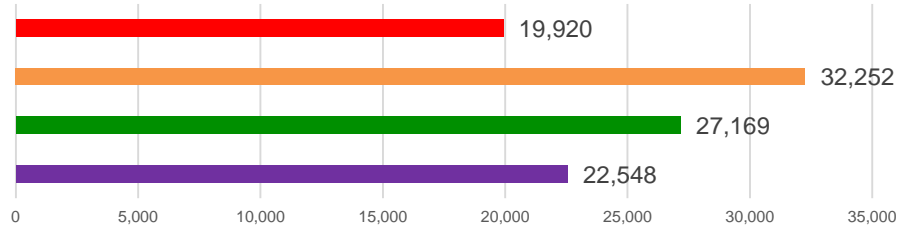


Average Session Setup Time [sec]

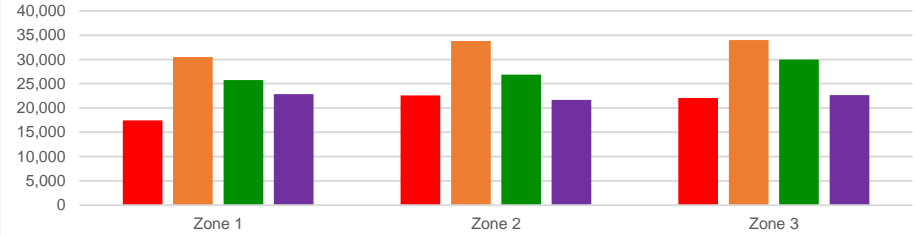


# HTTP Download Throughput – Customer Experience

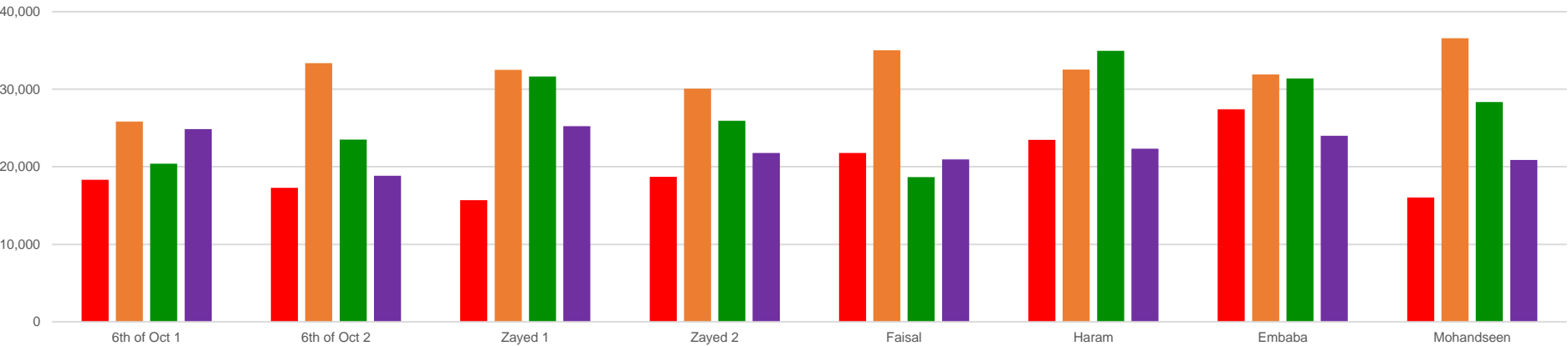
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones

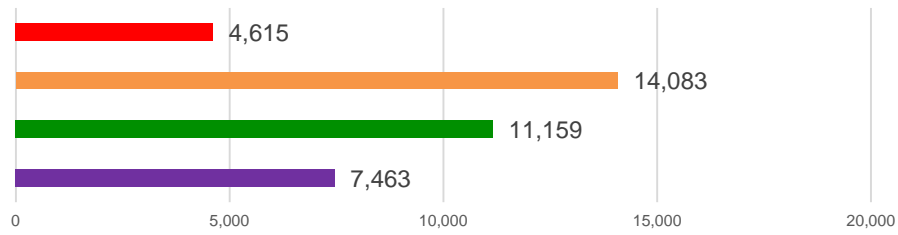


20MB Download Throughput [kbps]

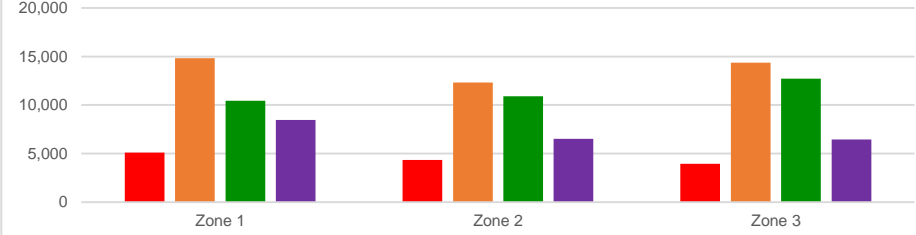


# HTTP Upload Throughput – Customer Experience

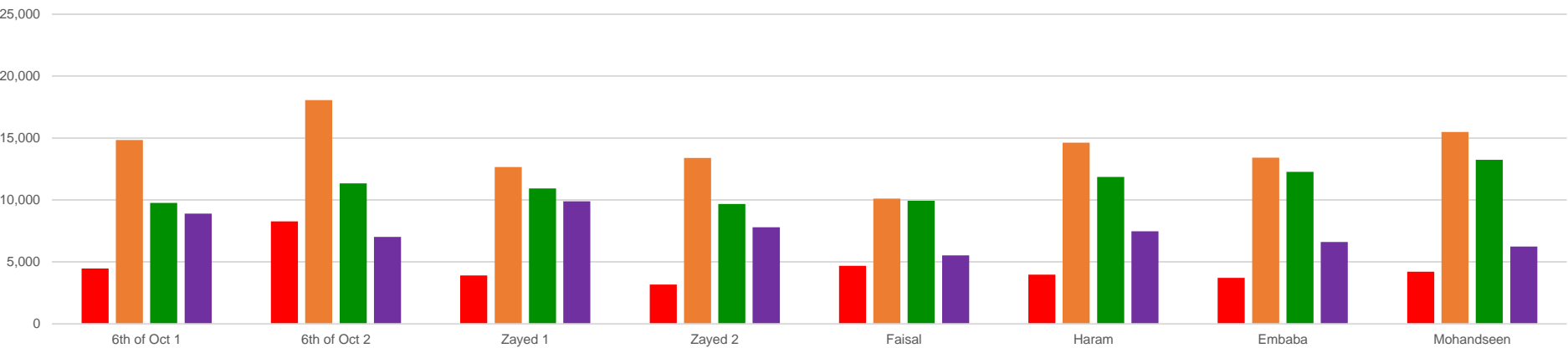
### 2MB Upload Throughput [kbps] - Overall



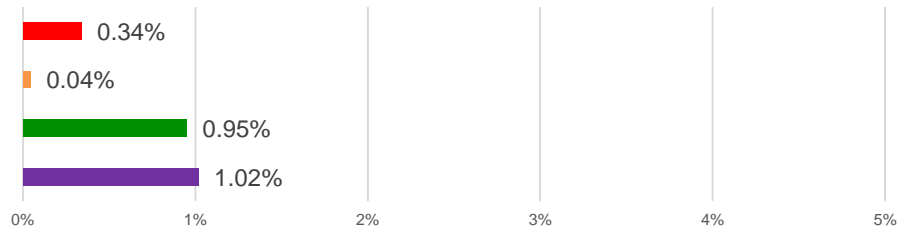
### 2MB Upload Throughput [kbps] - Zones



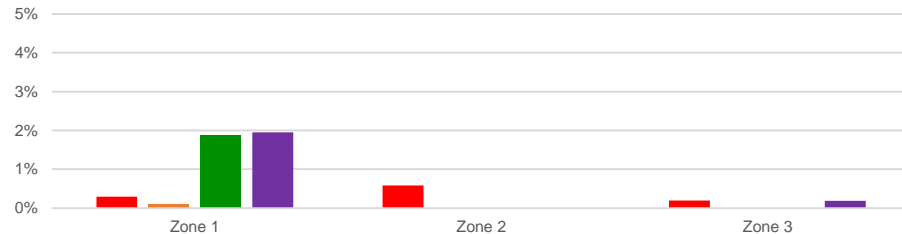
### 2MB Upload Throughput [kbps]



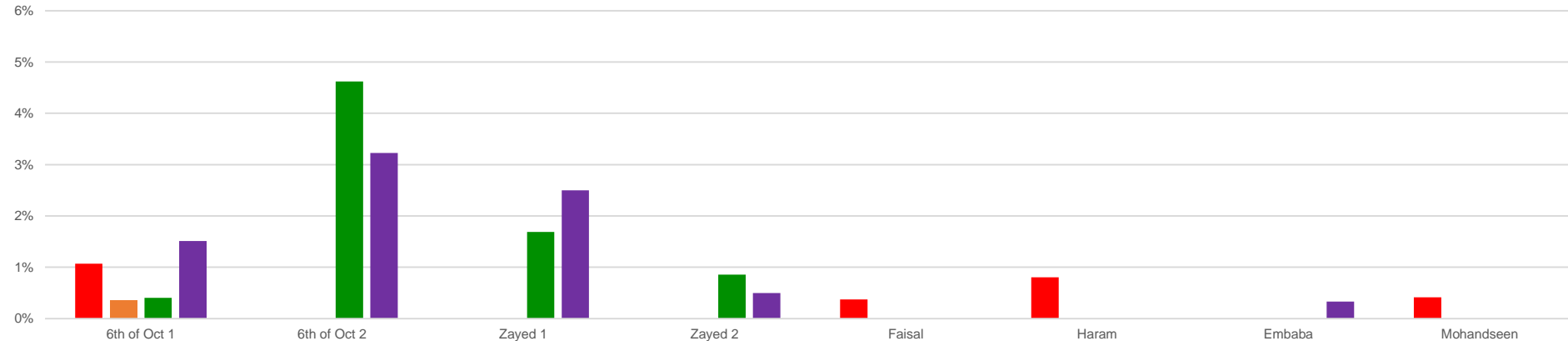
Session Failure Ratio - Overall



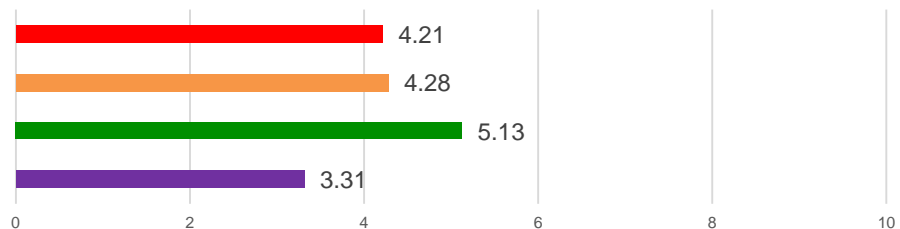
Session Failure Ratio - Zones



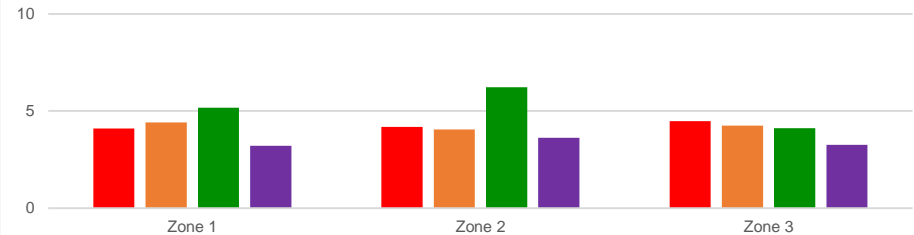
Session Failure Ratio



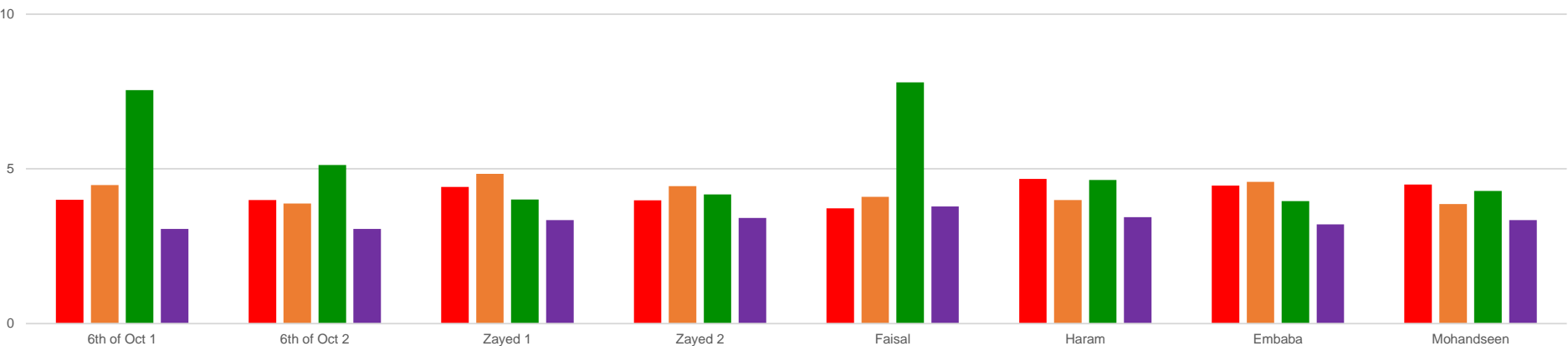
Average Session Time - Overall



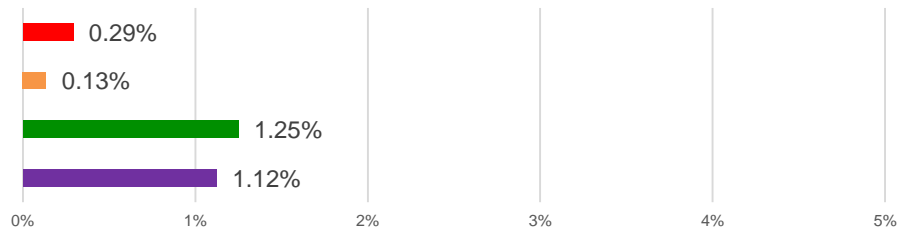
Average Session Time - Zones



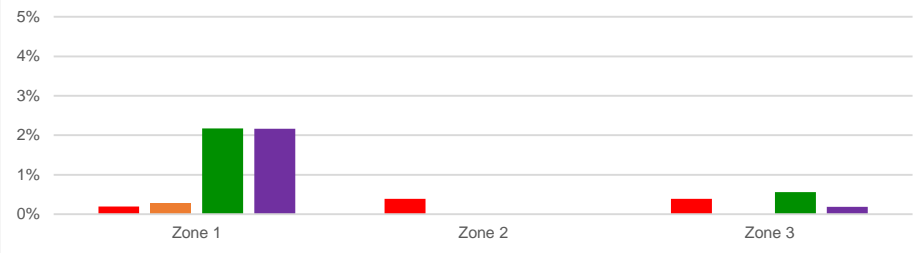
Average Session Time



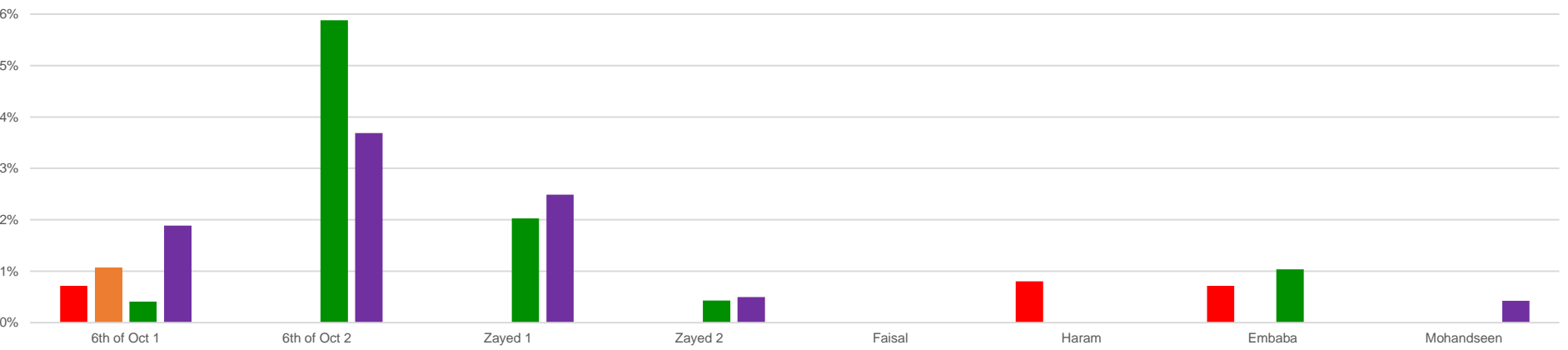
Session Failure Ratio - Overall



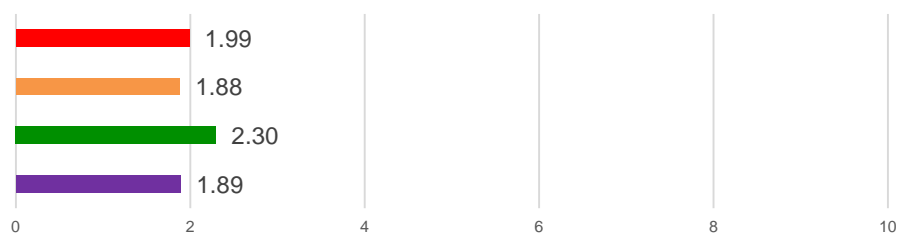
Session Failure Ratio - Zones



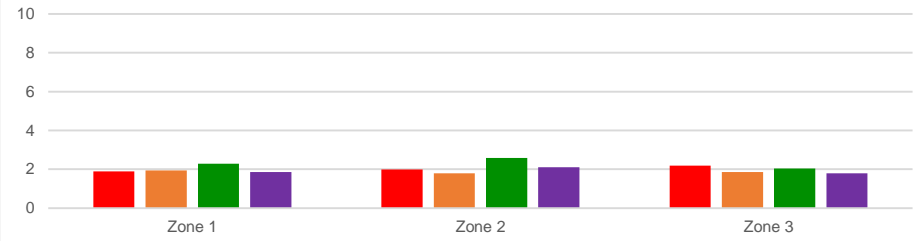
Session Failure Ratio



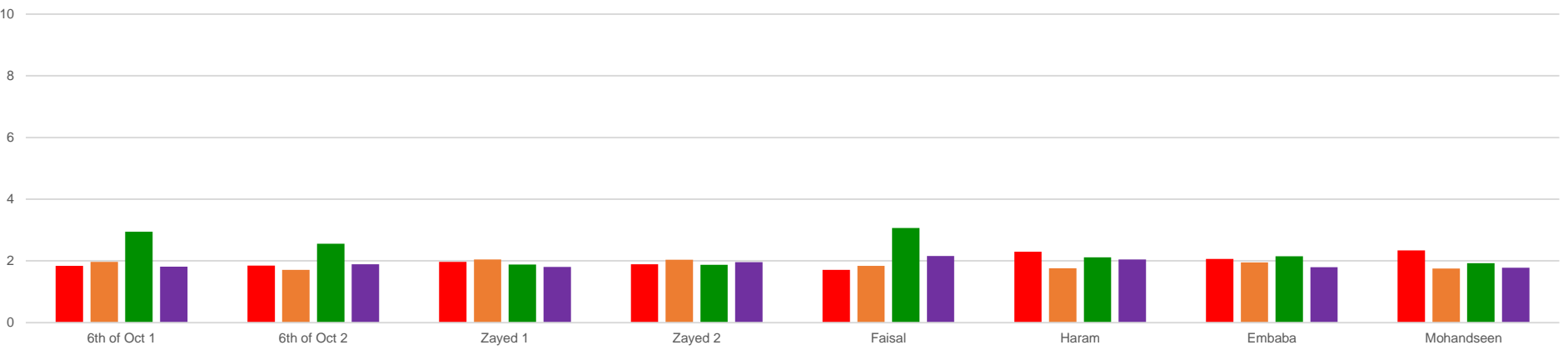
Average Session Time - Overall



Average Session Time - Zones



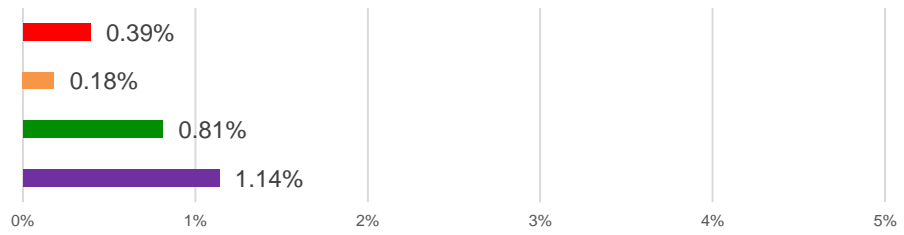
Average Session Time



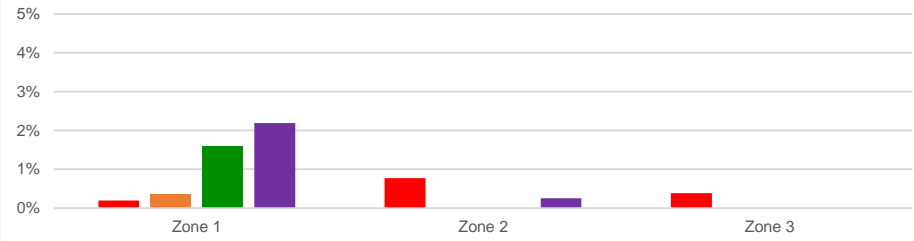


# YouTube Session Failure Ratio

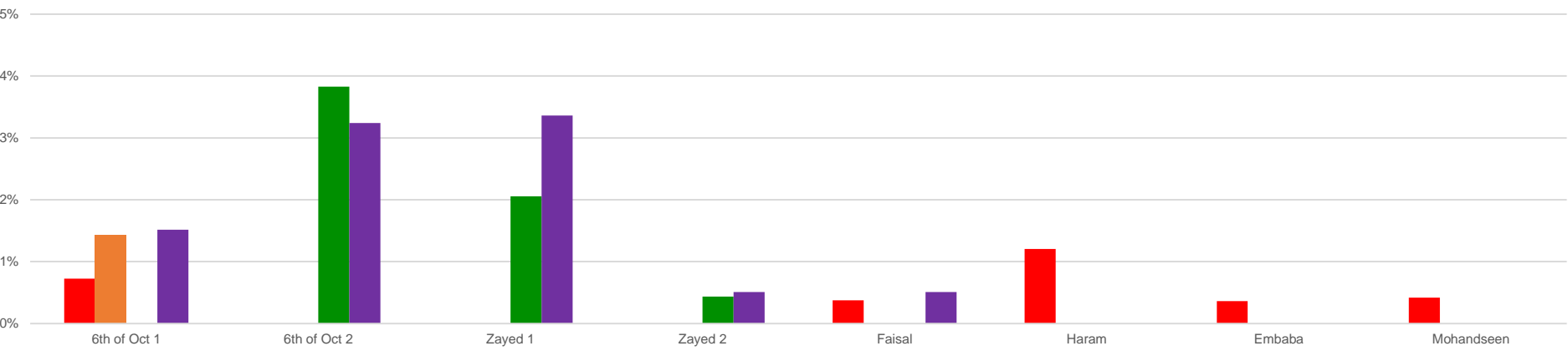
YouTube Session Failure Ratio - Overall



YouTube Session Failure Ratio - Zones

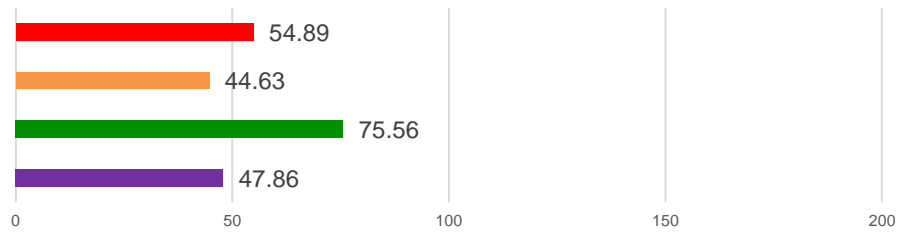


YouTube Session Failure Ratio

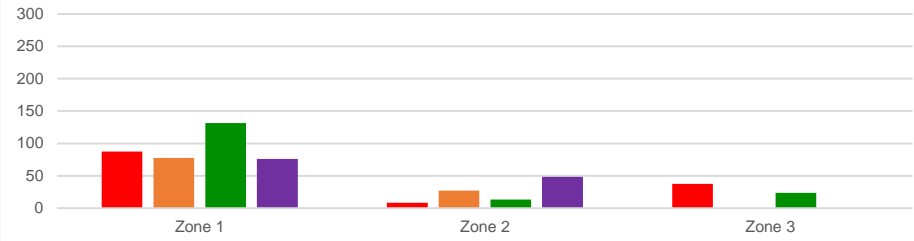


# YouTube Freezing Time [msec]

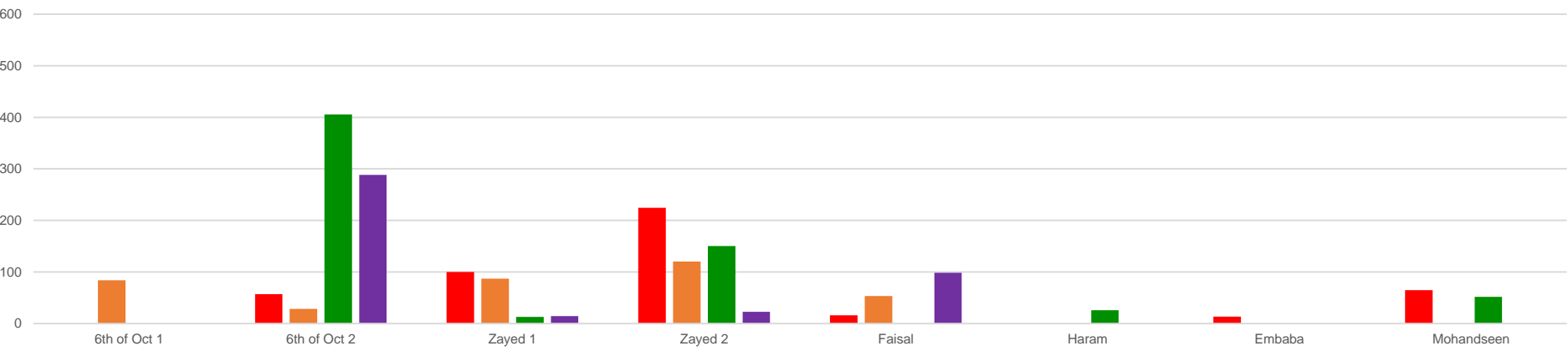
Freezing Time - Overall



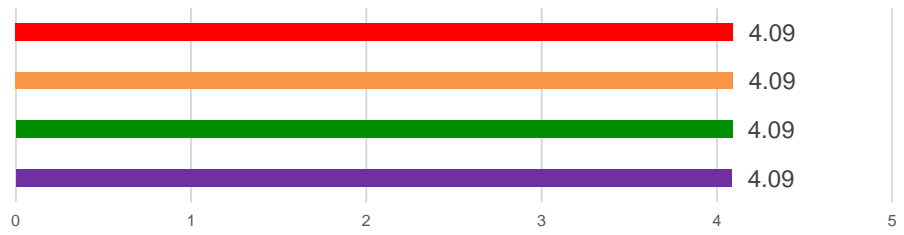
Freezing Time - Zones



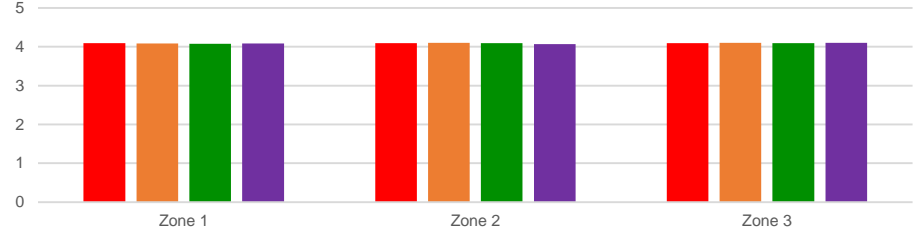
Freezing Time



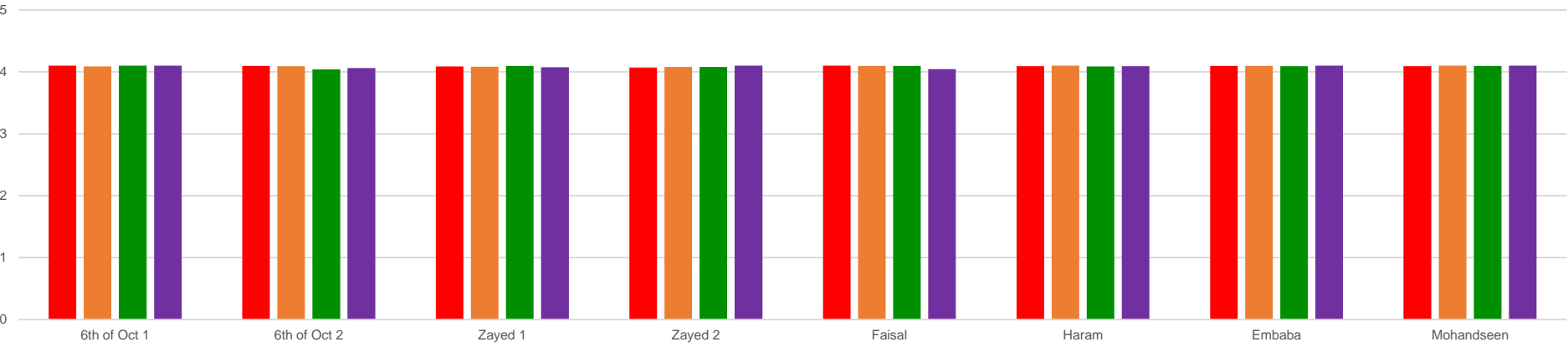
Video Quality [VMOS] - Overall



Video Quality [VMOS] - Zones

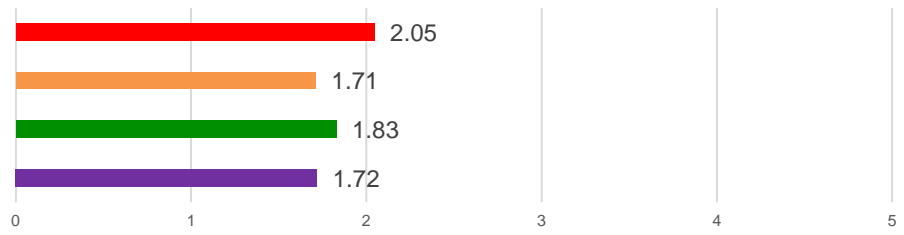


Video Quality - VMOS

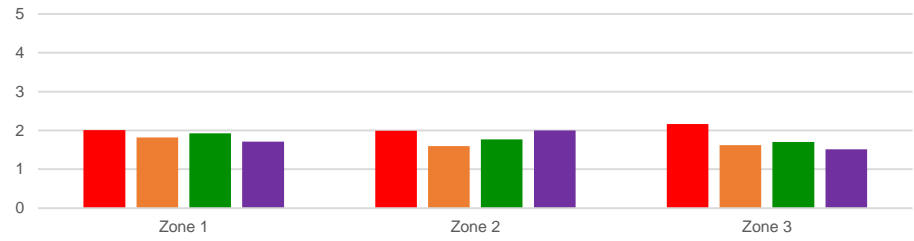


# YouTube Time to 1<sup>st</sup> Picture

Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

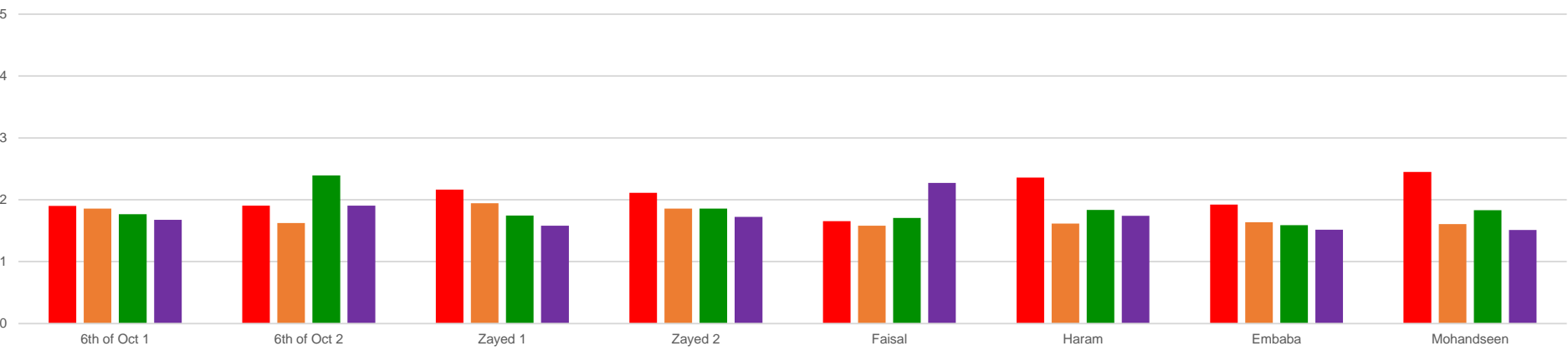
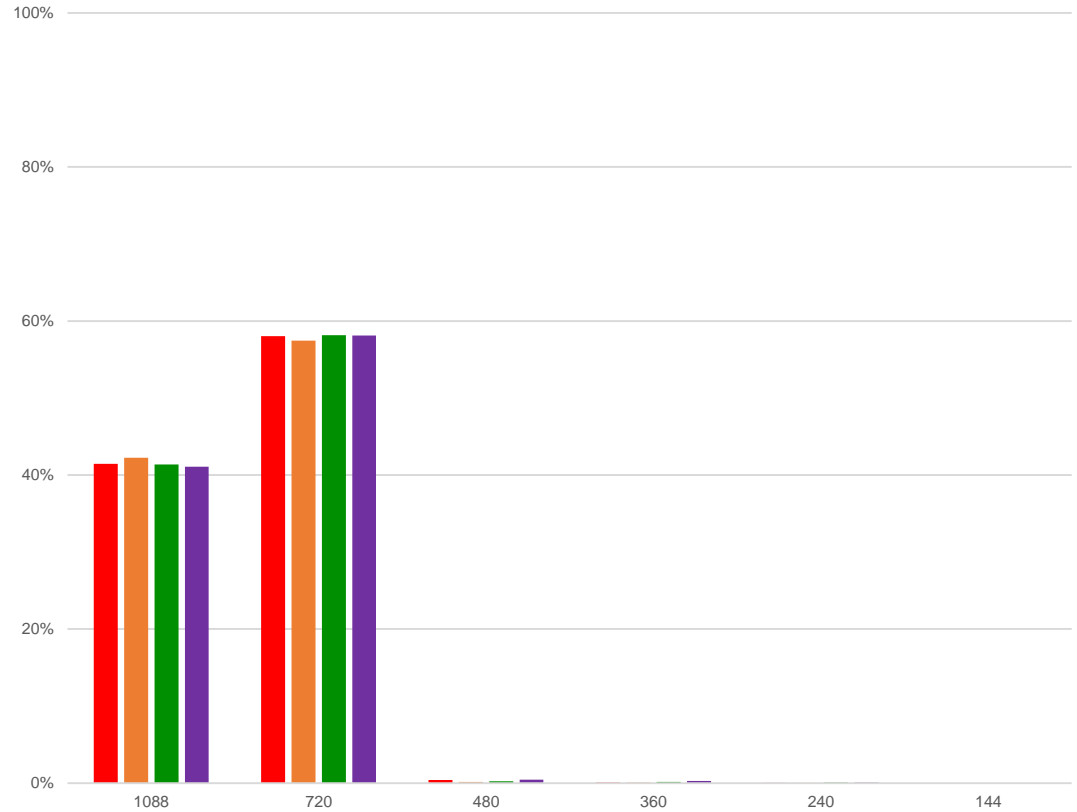


Image Resolution

Youtube - Image Resolution





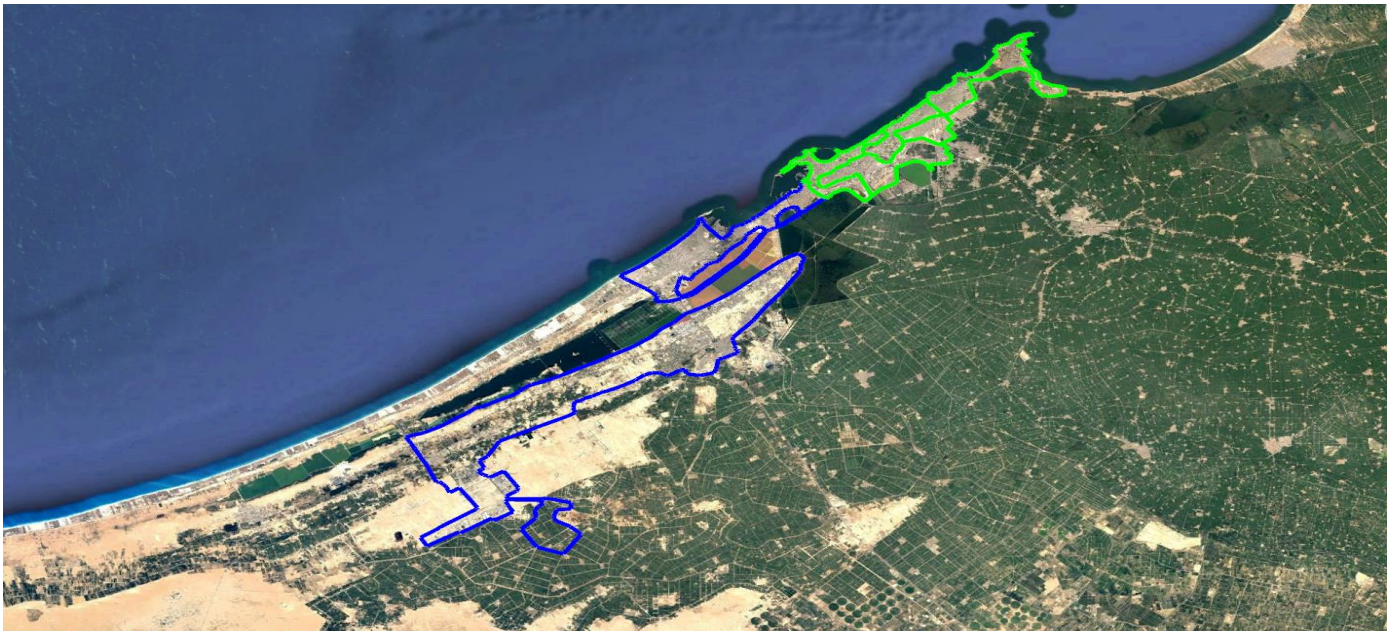
# Alexandria Region KPIs

# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
- 6. Voice Service Quality & Performance - Alexandria**
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8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

# Zones Definition

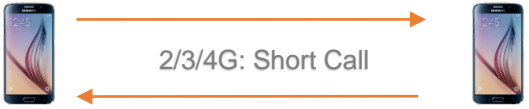


## Alexandria

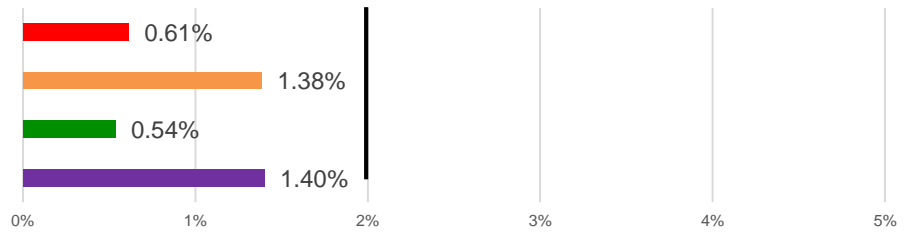
Alex Z1	East1
	East2
	East3
	East4
	East5
Alex Z2	West 1
	West 2
Alex Z3	Matrouh Northcoast



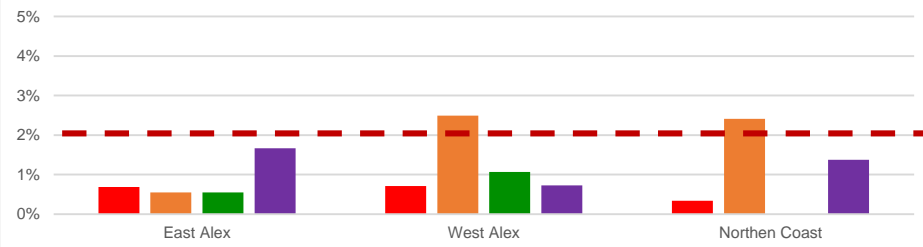
# Accessibility: Call Blocked Rate



Call Blocked Rate - Overall

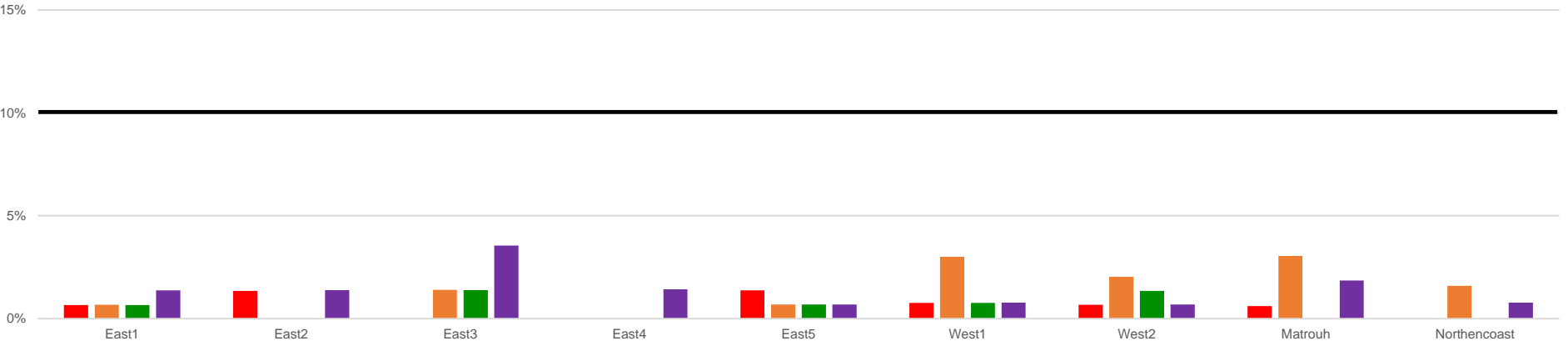


Call Blocked Rate - Zones

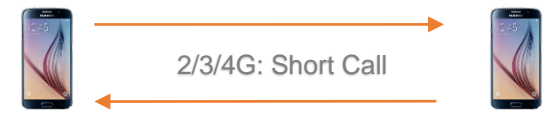


**Call Blocked Rate** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

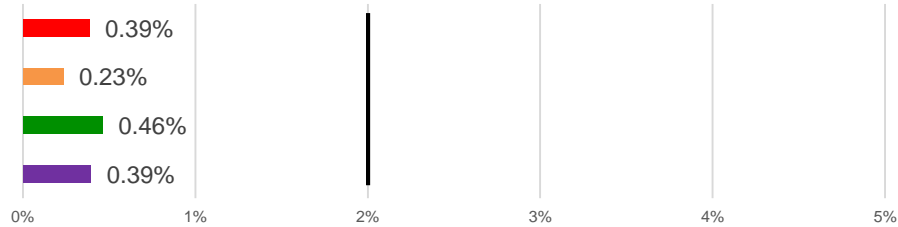
Call Blocked Rate



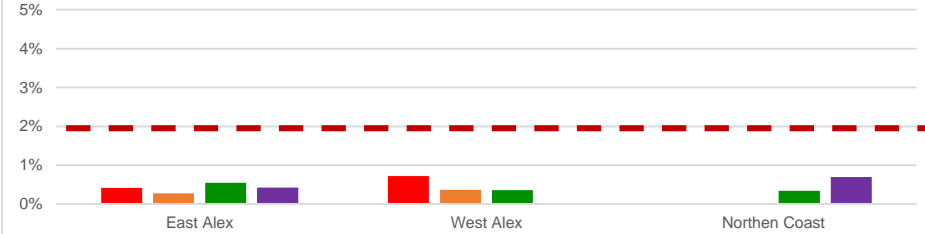
# Retainability: Call Dropped Rate



Voice Call Dropped Rate - Overall

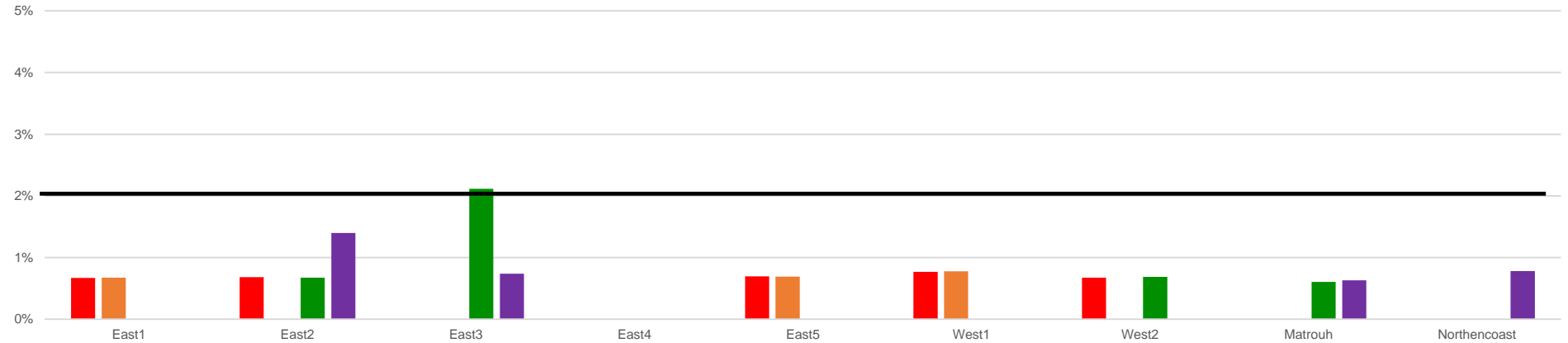


Voice Call Dropped Rate - Zones



Voice Call Retainability is represented by call drop rates.

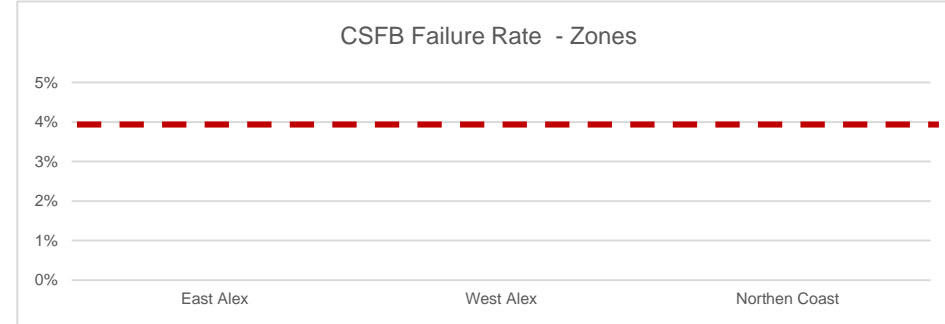
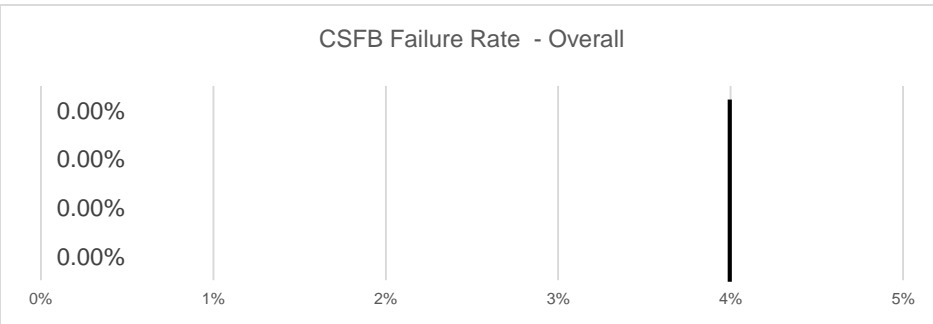
Voice Call Dropped Rate



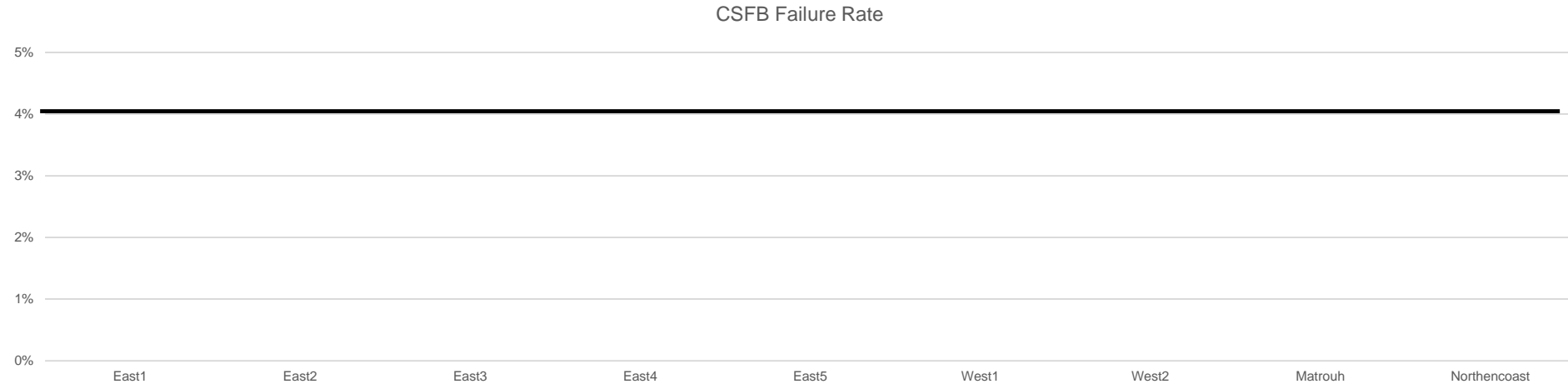
# Accessibility: CSFB Failure Rate [%]



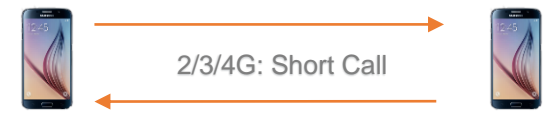
2/3/4G: Short Call



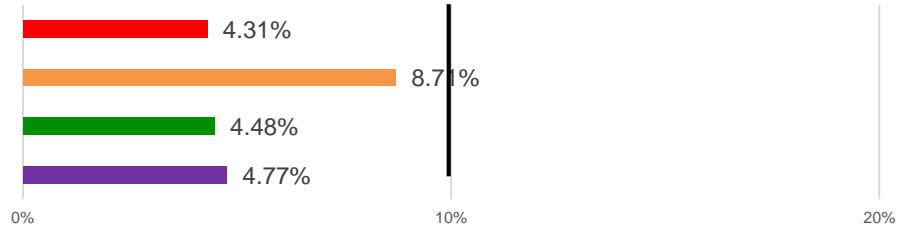
**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



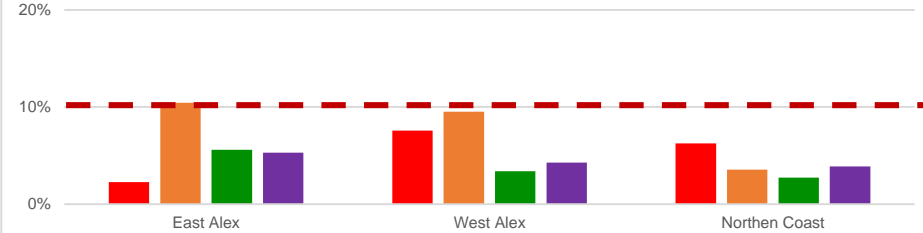
# Speech Quality: MOS Voice Speech Quality < 2.8



Voice Speech Quality on Sample < 2.8 - Overall

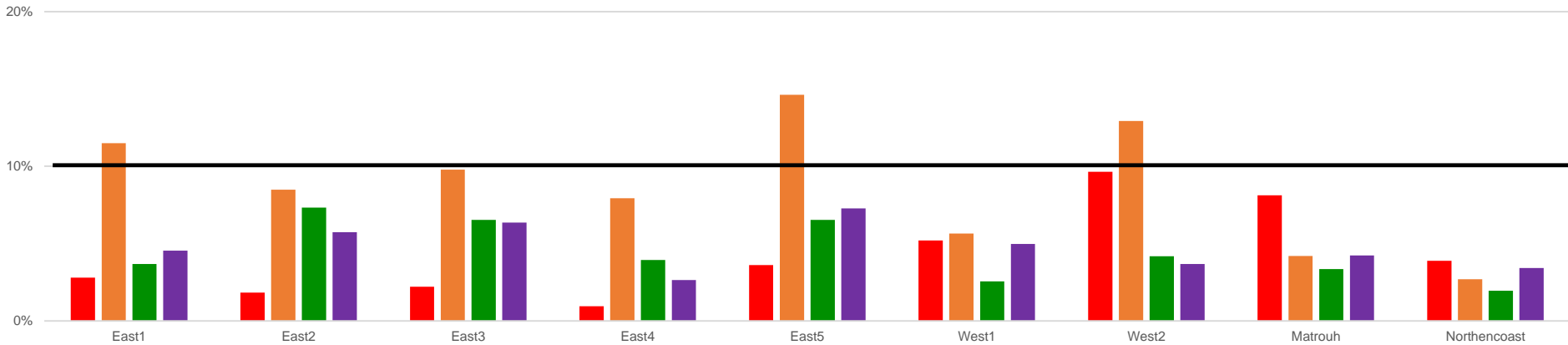


Voice Speech Quality on Sample < 2.8 - Zones

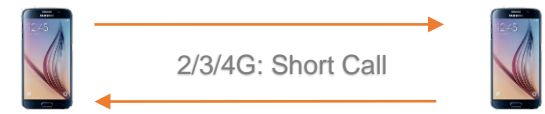


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

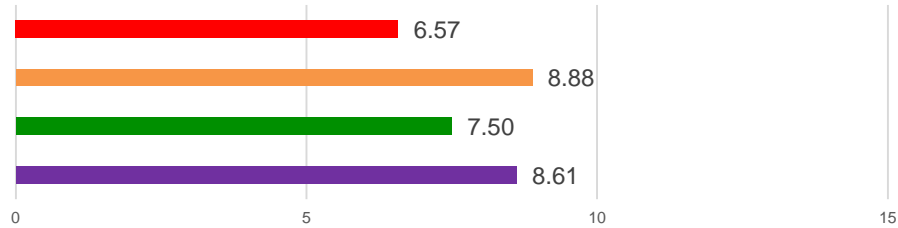
Voice Speech Quality on Sample < 2.8



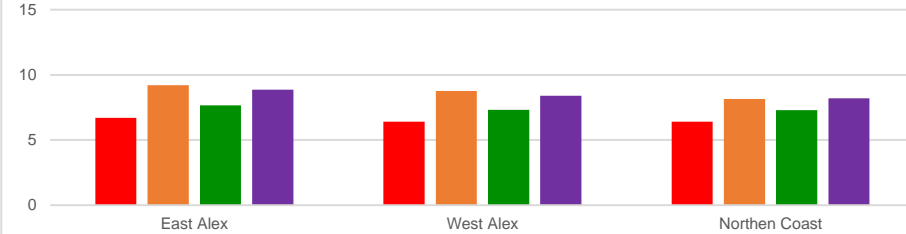
# Accessibility: Call Access Time [sec.]



Call Access Time - Overall

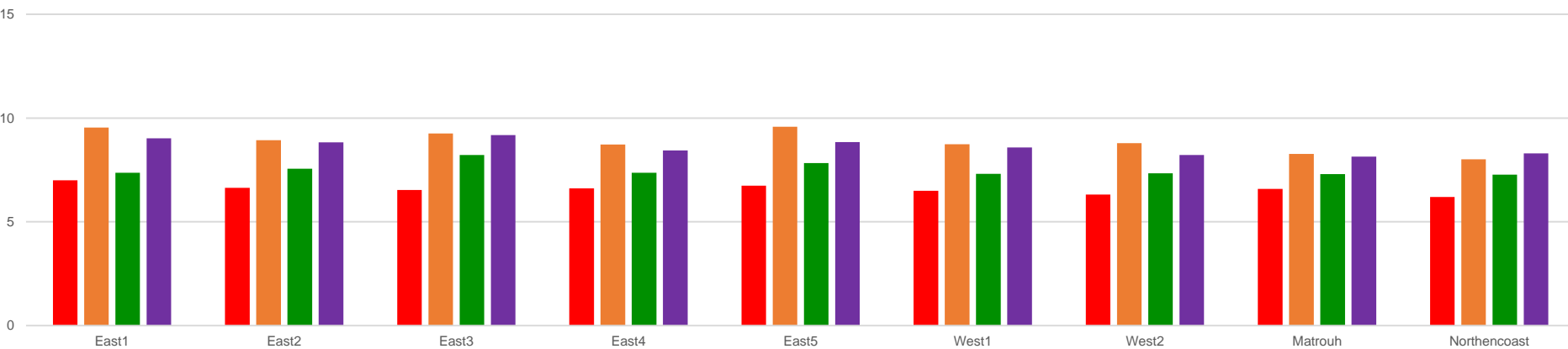


Call Access Time - Zones

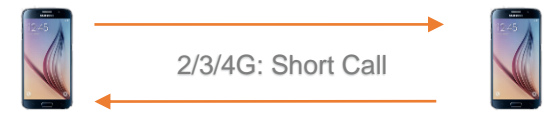


**Call Access Time** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

Call Access Time



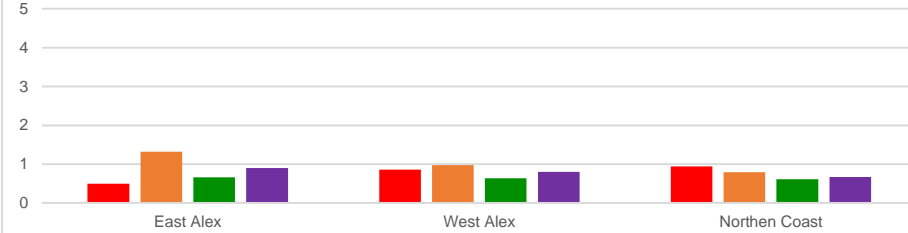
# Accessibility: CSFB Delay [sec.]



Circuit Switch Fall Back Delay - Overall

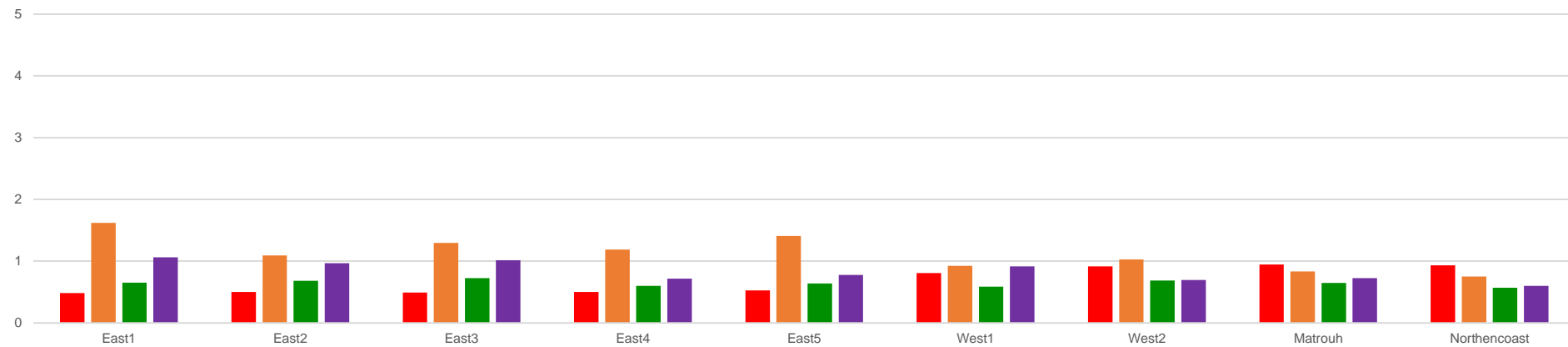


Circuit Switch Fall Back Delay - Zones

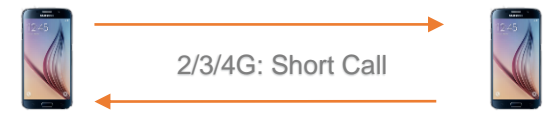


**CSFB Delay** represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

Circuit Switch Fall Back Delay



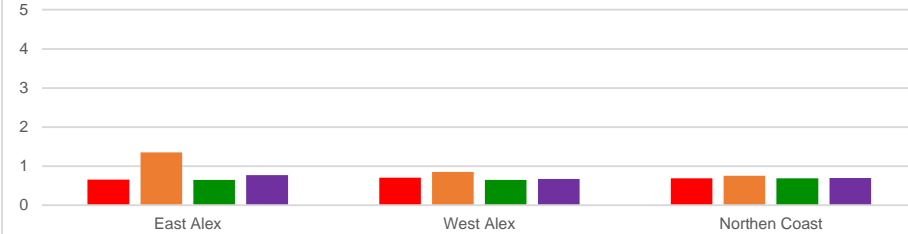
# Accessibility: Telephony Return Delay [sec.]



Telephony Return Delay - Overall

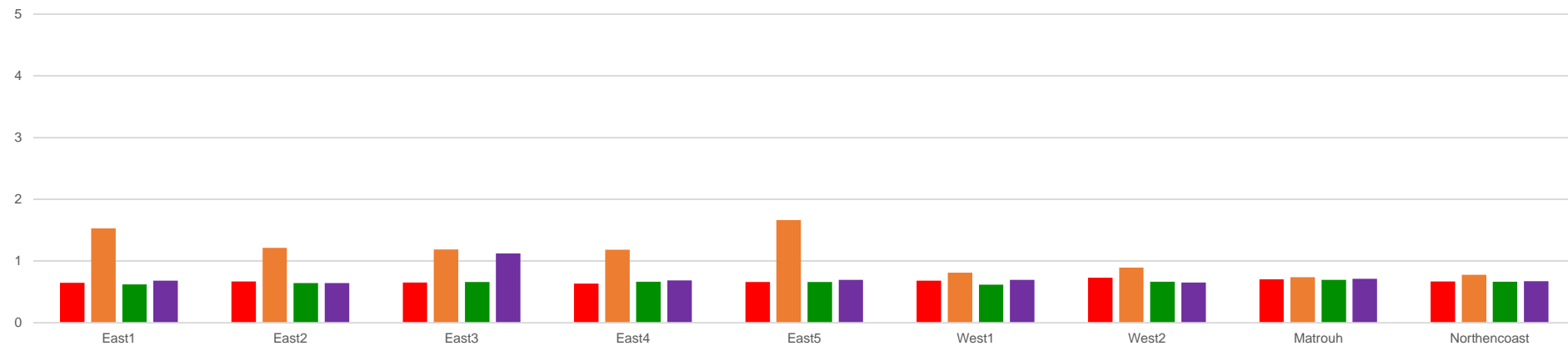


Telephony Return Delay - Zones



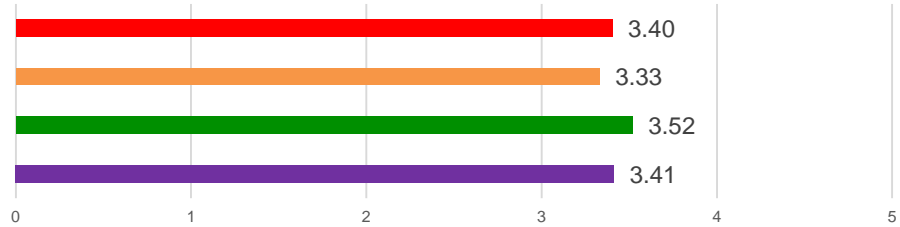
**Telephony Return Delay** measures the time that a UE uses to re-join the LTE (4G) network after call end

Telephony Return Delay

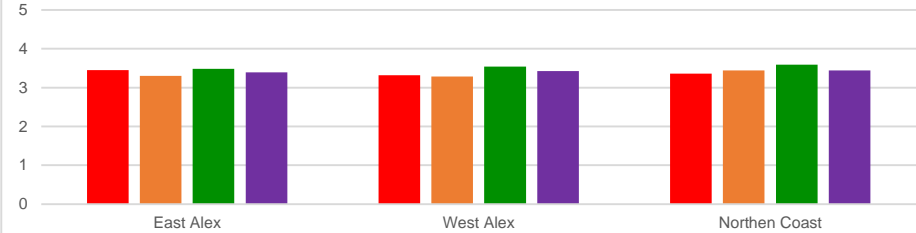


# Speech Quality: MOS Scores

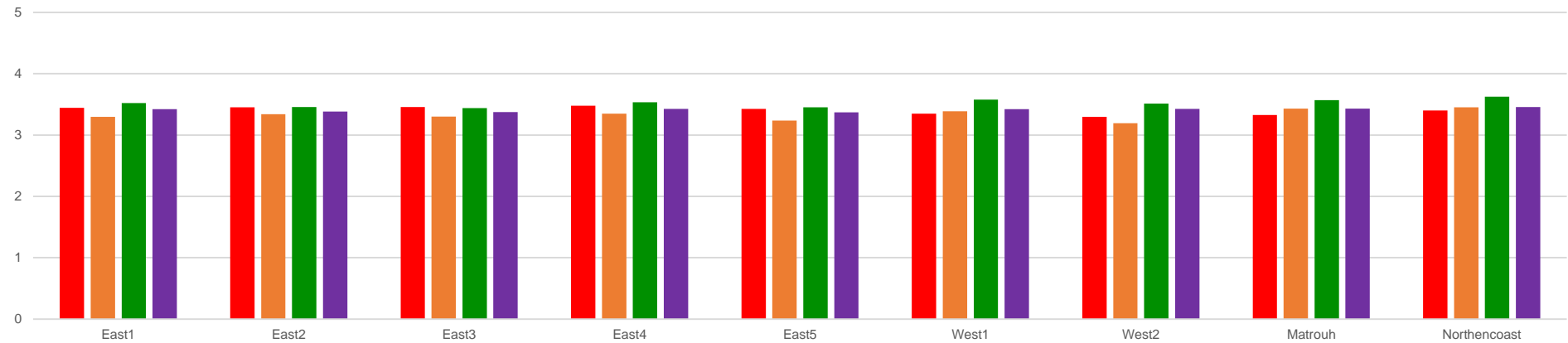
Voice Speech Quality - Overall



Voice Speech Quality - Zones



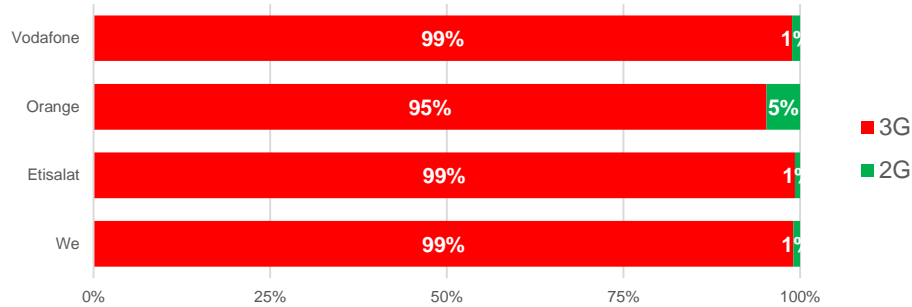
Voice Speech Quality





# Speech Quality: Call technology Usage & Codec Base Usage

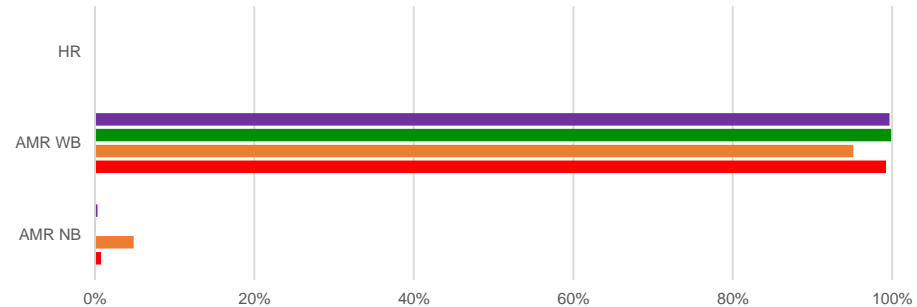
Call Technology Usage Overall



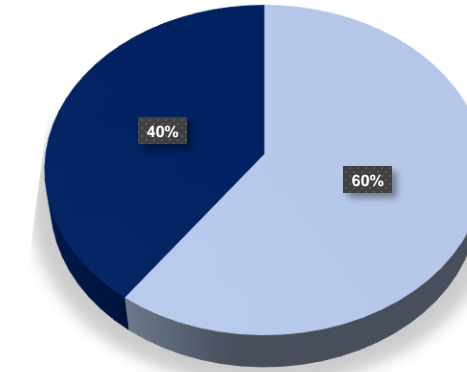
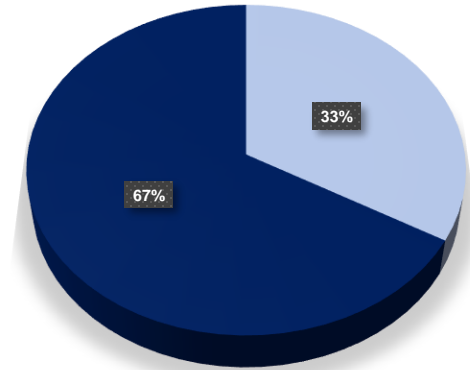
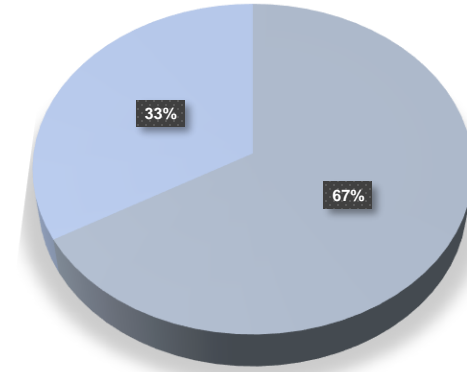
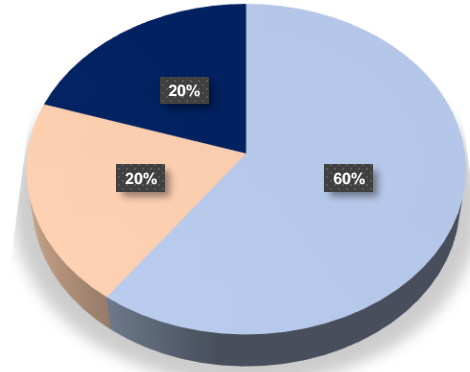
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

Codec Base Usage



# Analysis: Dropped Calls Causes



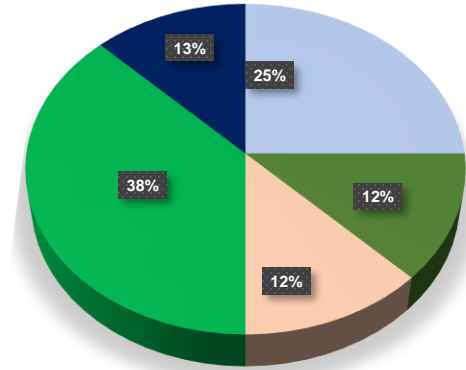
# All Operators: Dropped Calls Locations 1/2



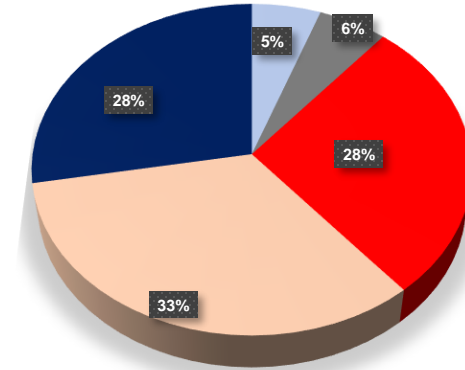
## All Operators: Dropped Calls Locations 2/2



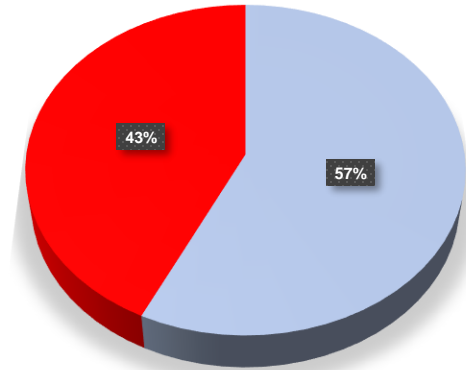
# Analysis: Failed Calls Causes



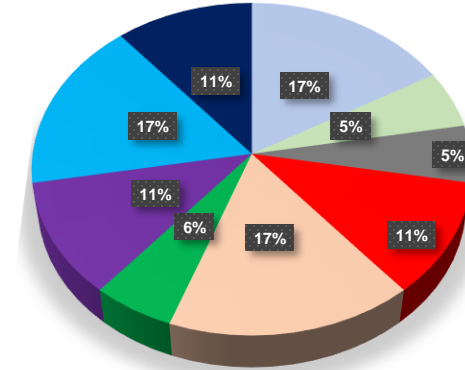
- 3G Quality
- 4G Coverage
- Mobility Issue
- No service
- RAN Issue



- 3G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- RAN Issue

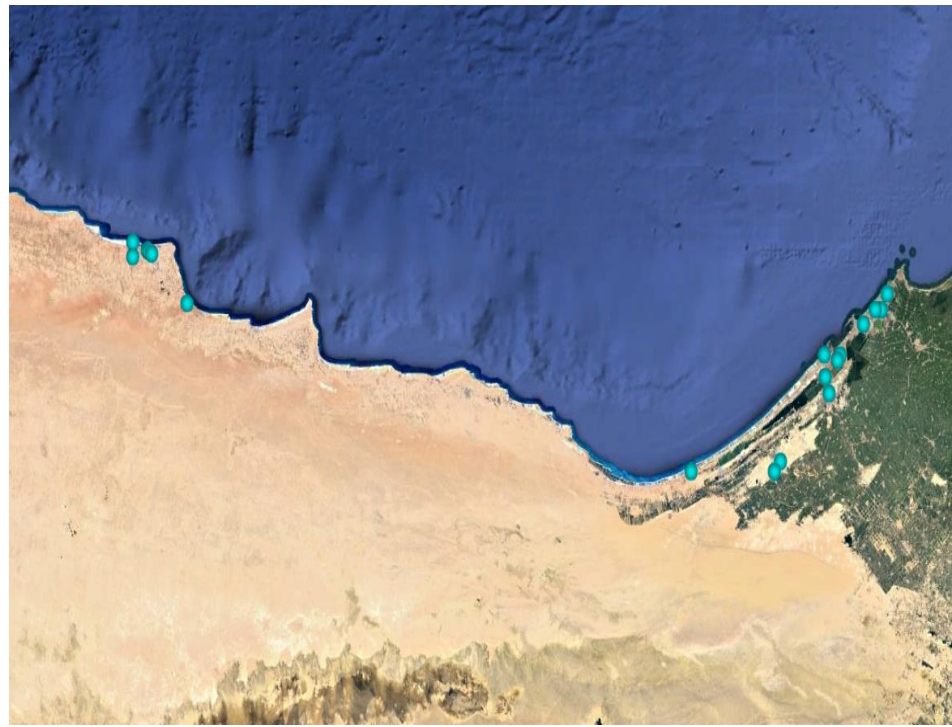


- 3G Quality
- CSFB Issue



- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

# All Operators: Blocked Calls Locations 1/2



## All Operators: Blocked Calls Locations 2/2



# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria

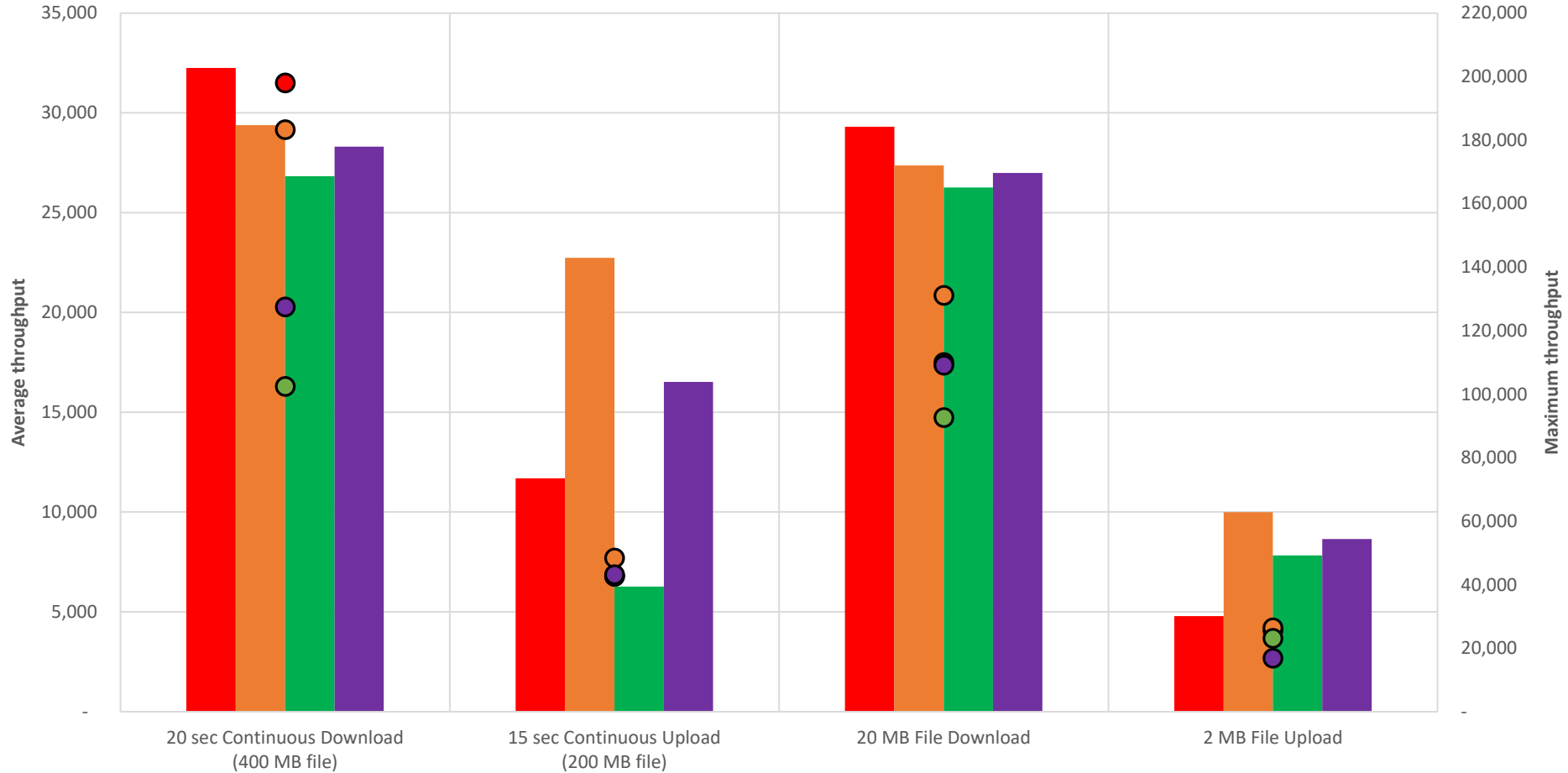
## **7. Data Service Quality & Performance - Alexandria**

8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes



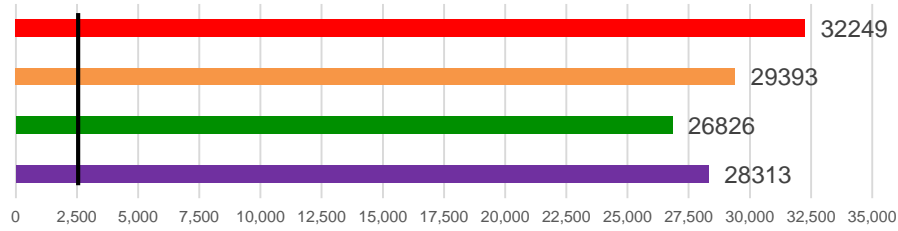
## NETWORK PERFORMANCE TEST

## USER EXPERIENCE TEST

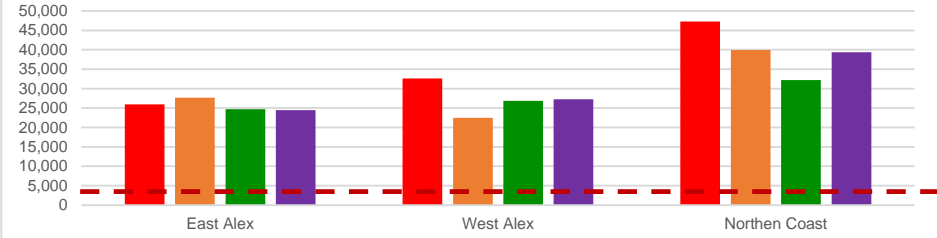


# FDTT HTTP Download Transfer Throughput – Network Performance

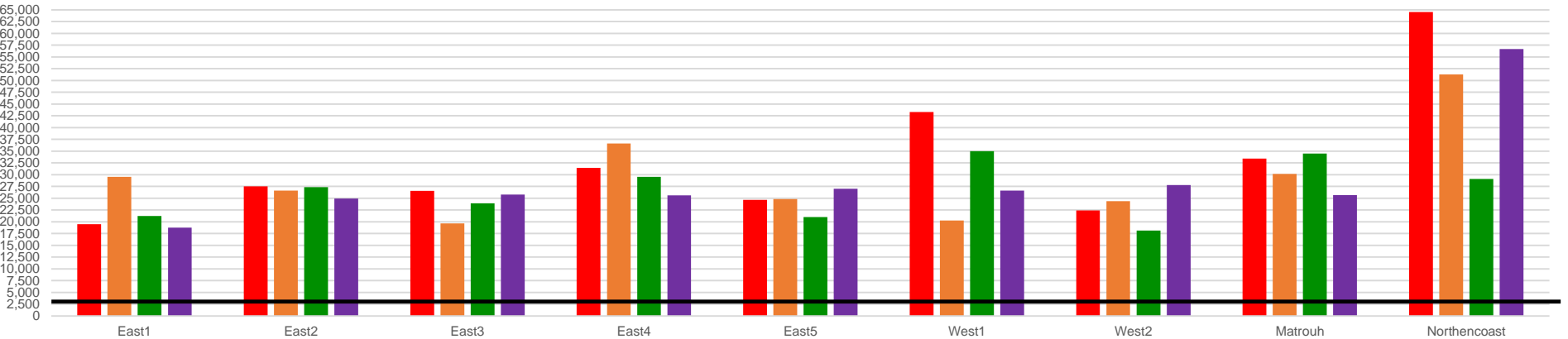
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones

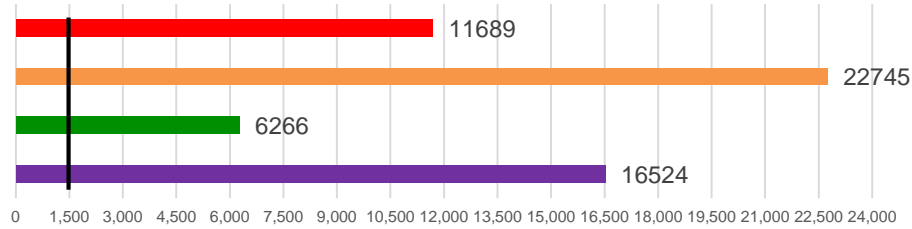


400 MB File FDTT HTTP Download Throughput [kbps]

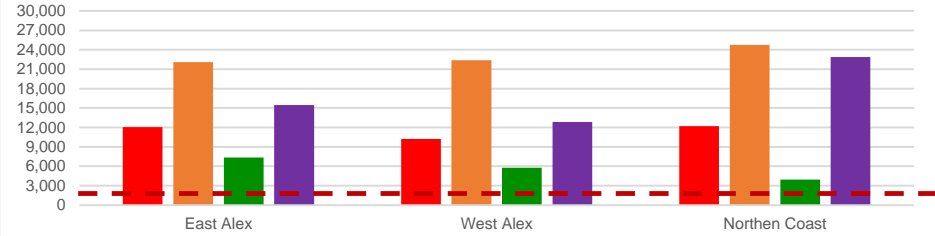


# FDTT HTTP Upload Transfer Throughput – Network Performance

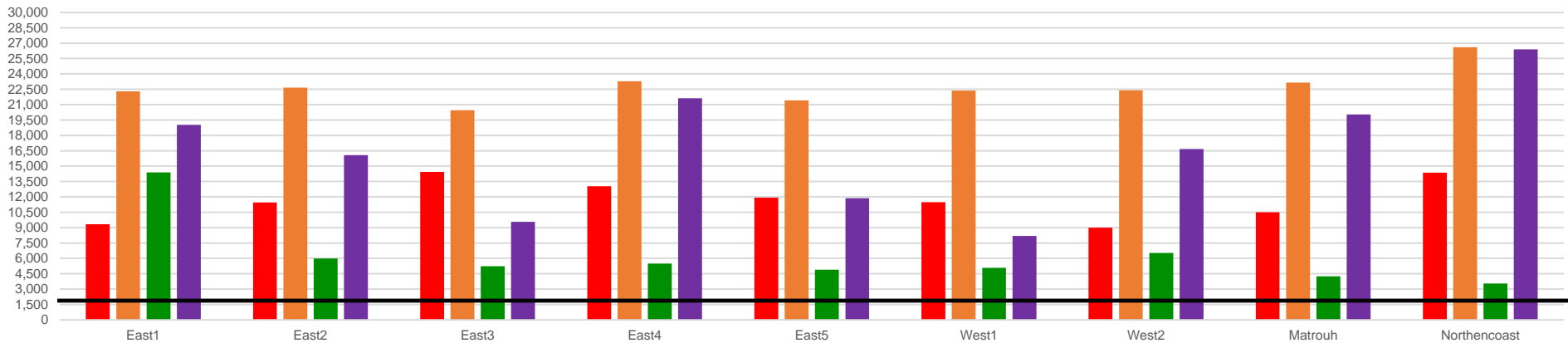
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones

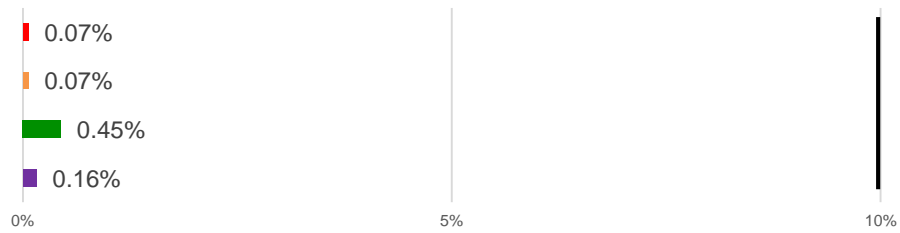


200 MB FDTT HTTP Upload Throughput [kbps]

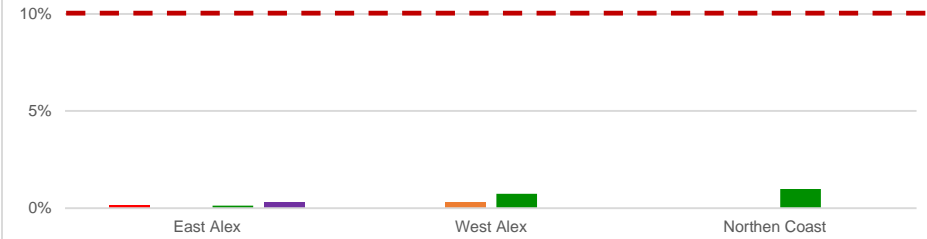


# HTTP Download Session Blocked Rates

Download Session Blocked Ratio - Overall



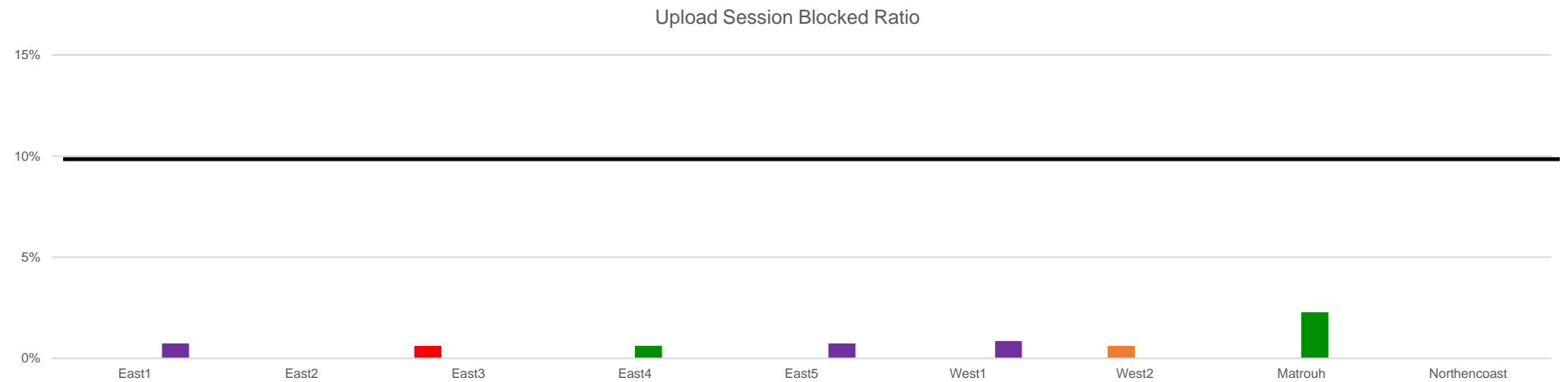
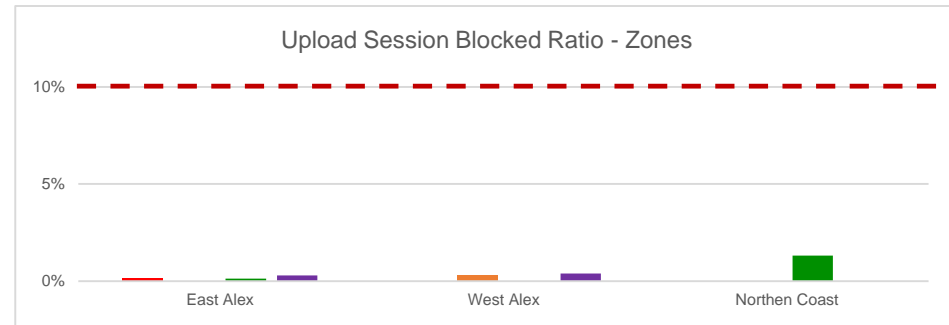
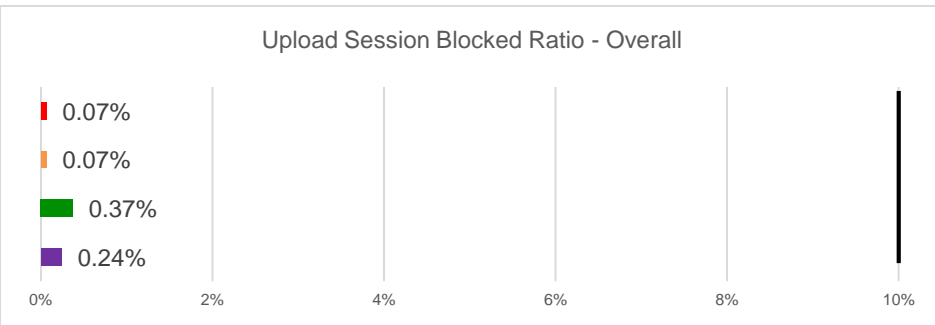
Download Session Blocked Ratio - Zones



Download Session Blocked Ratio

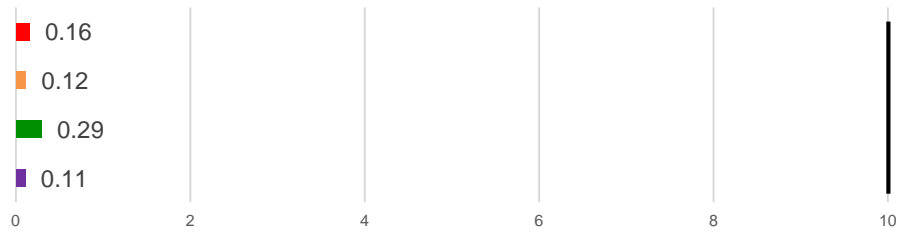
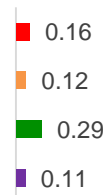


# HTTP Upload Session Blocked Rates

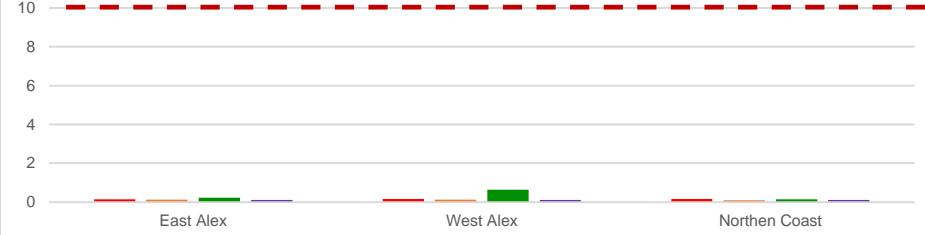


# HTTP Download Average Session Setup Time

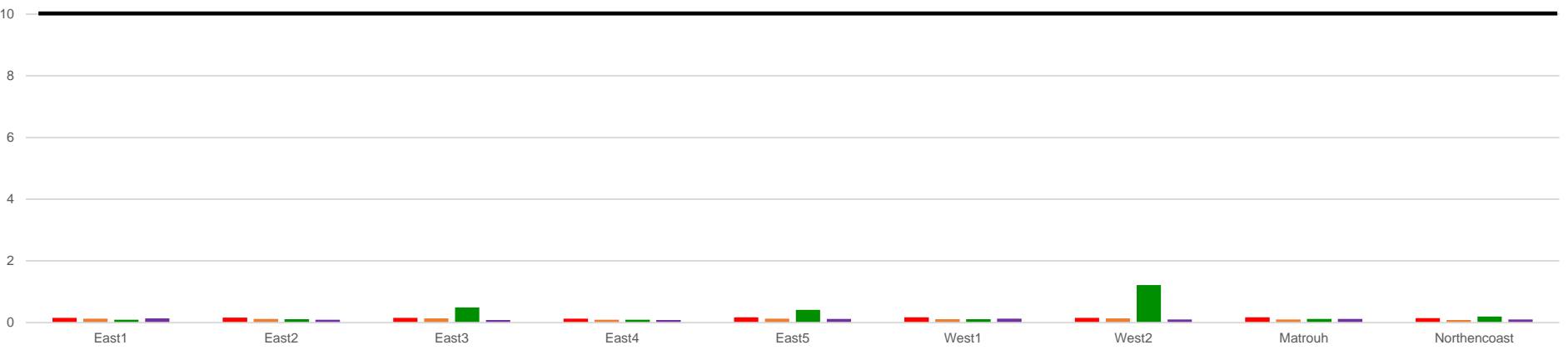
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

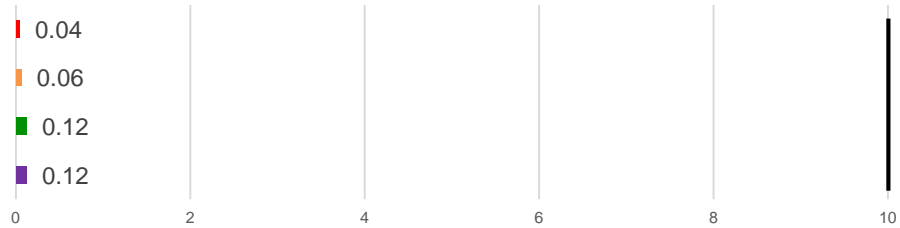


Average Session Setup Time [sec]

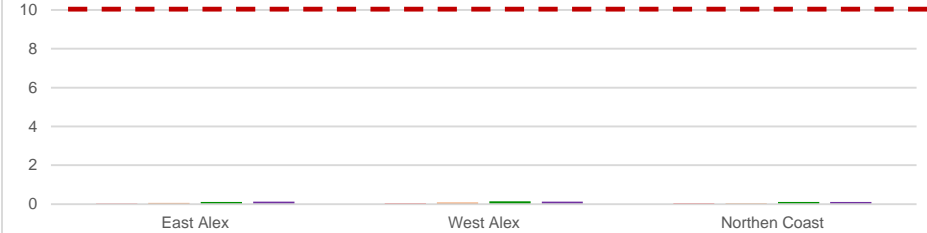


# HTTP Upload Average Session Setup Time

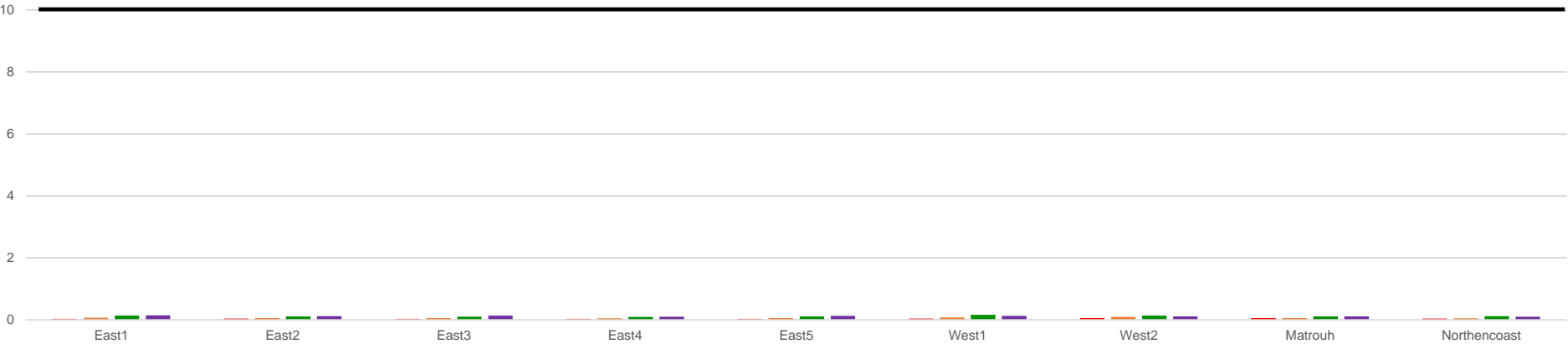
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

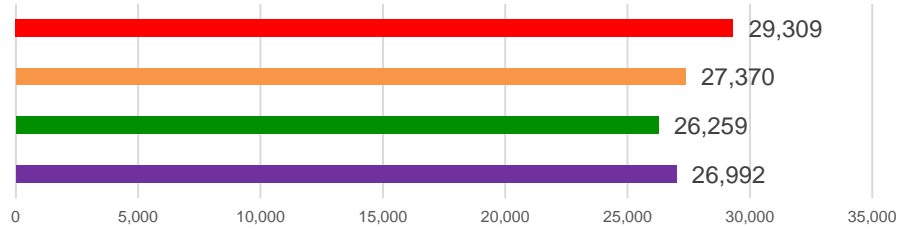


Average Session Setup Time [sec]

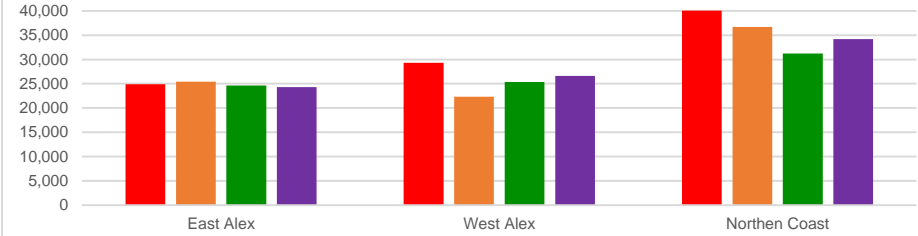


# HTTP Download Throughput – Customer Experience

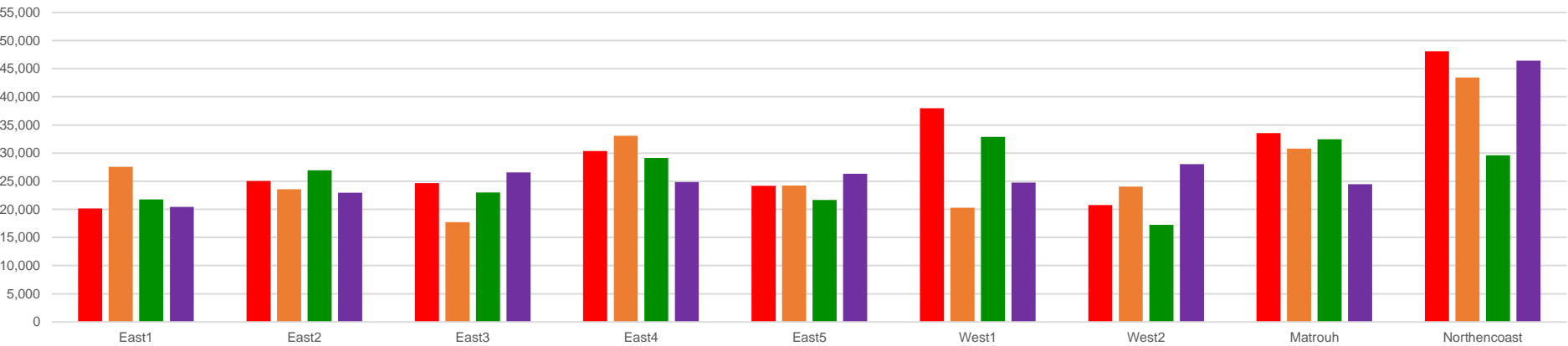
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones



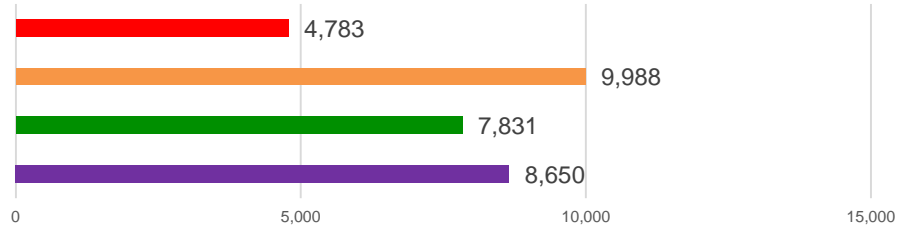
20MB Download Throughput [kbps]



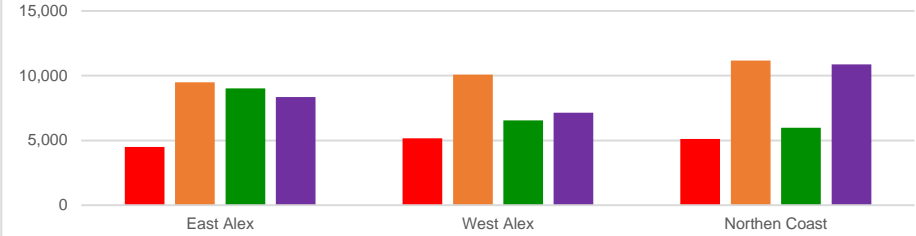


# HTTP Upload Throughput – Customer Experience

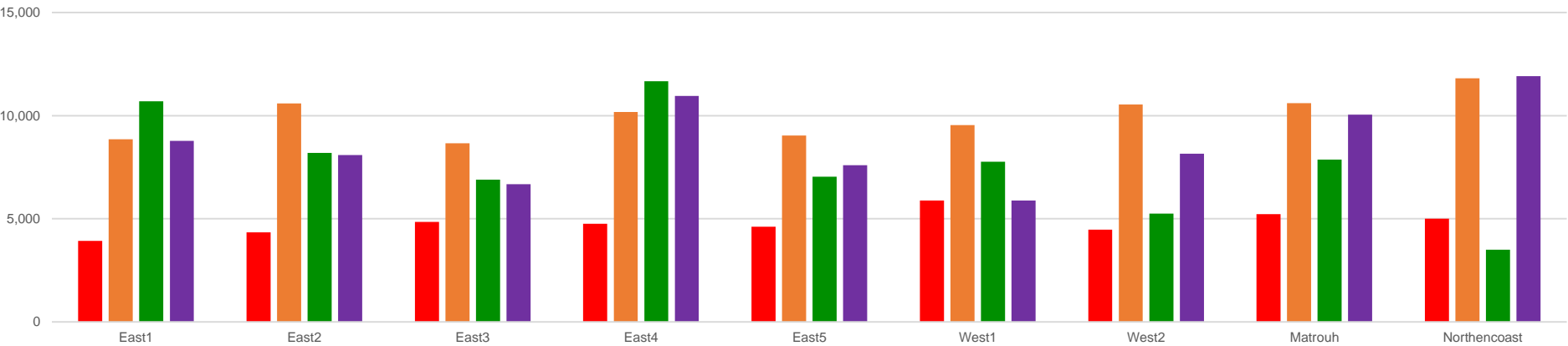
2MB Upload Throughput [kbps] - Overall



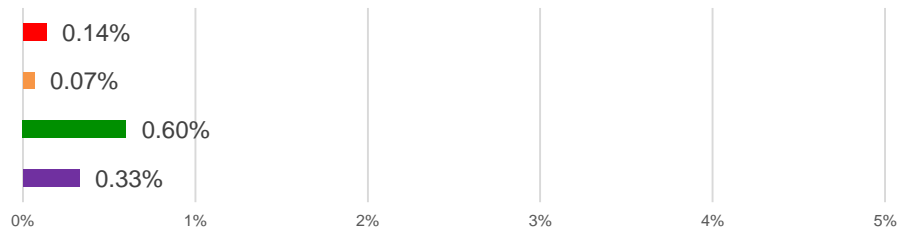
2MB Upload Throughput [kbps] - Zones



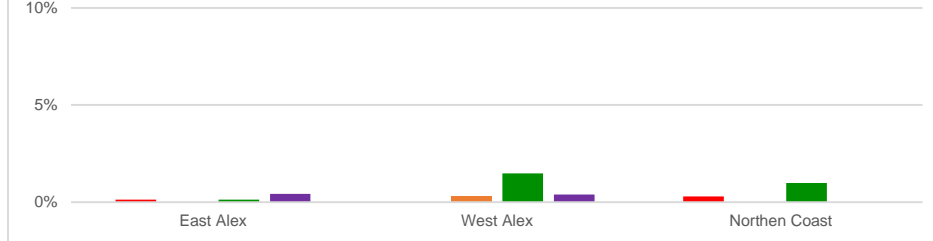
2MB Upload Throughput [kbps]



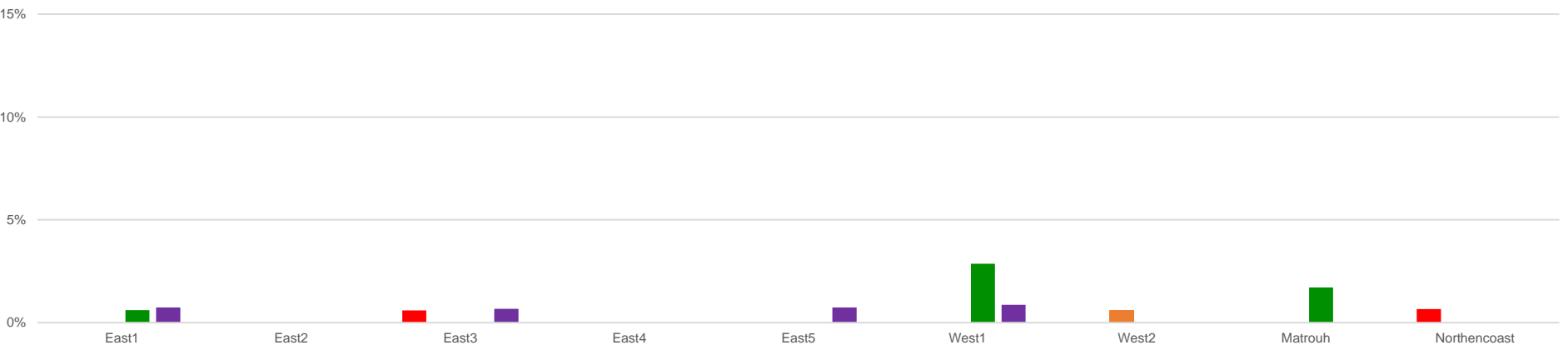
Session Failure Ratio - Overall



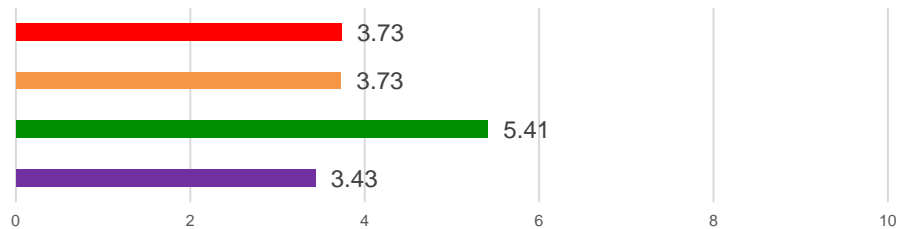
Session Failure Ratio - Zones



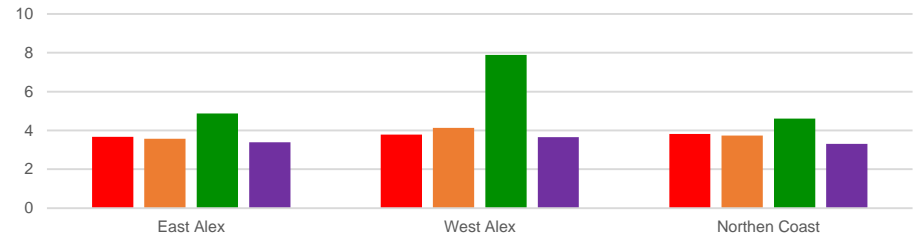
Session Failure Ratio



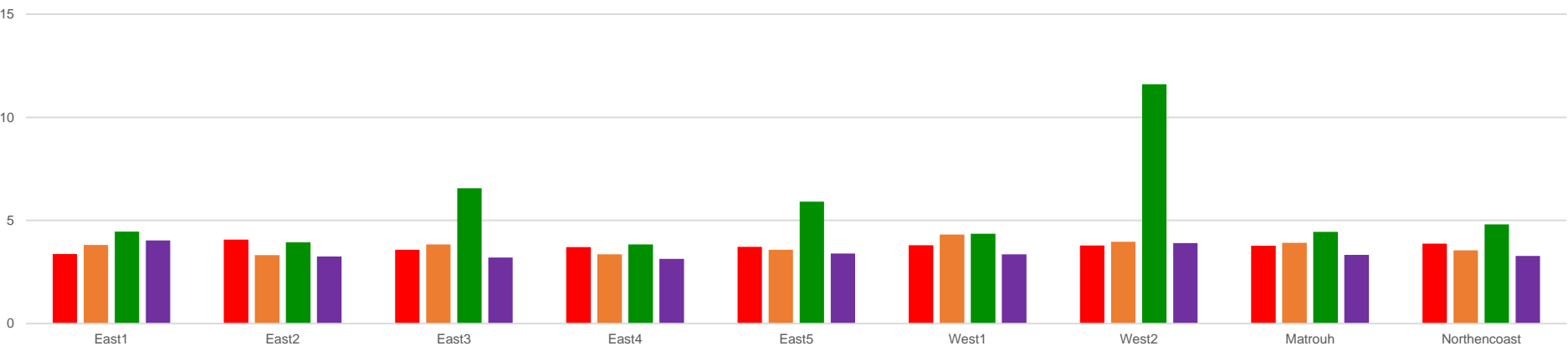
Average Session Time - Overall



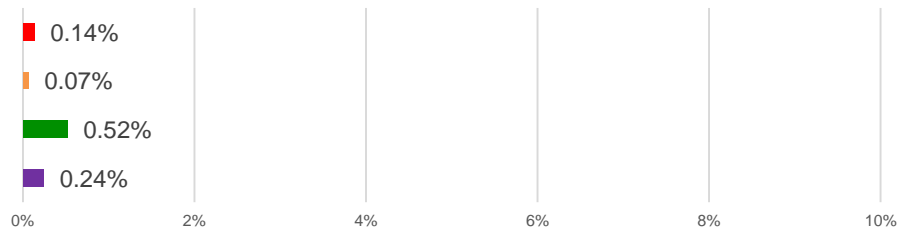
Average Session Time - Zones



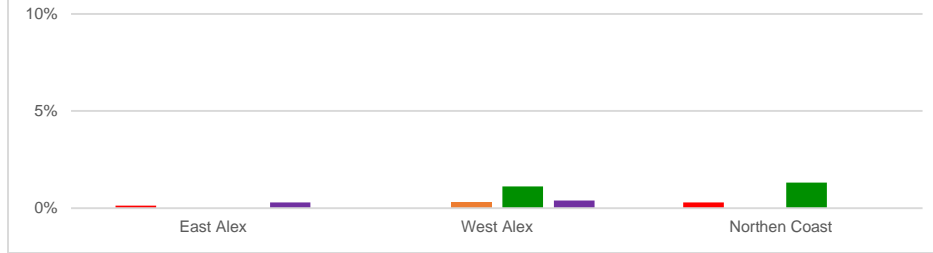
Average Session Time



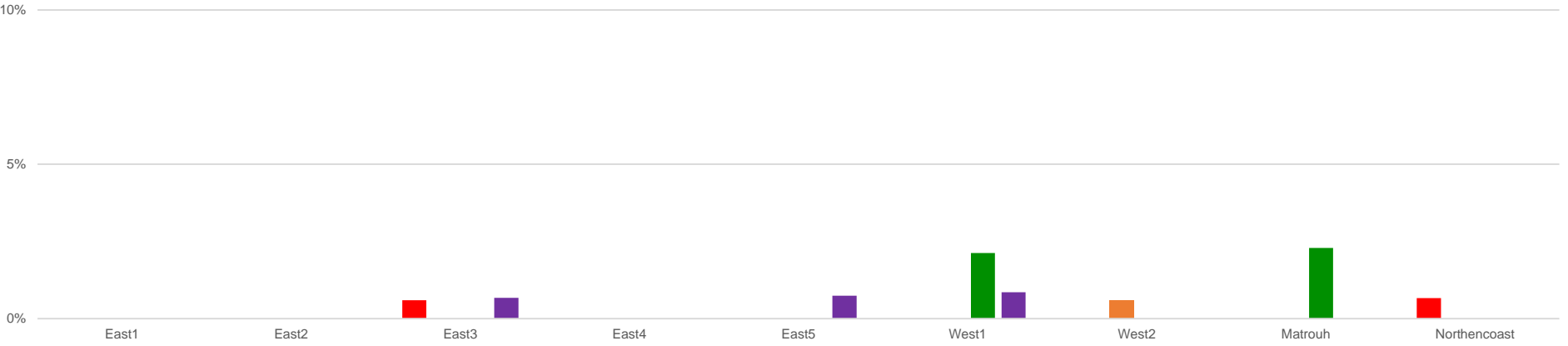
Session Failure Ratio - Overall



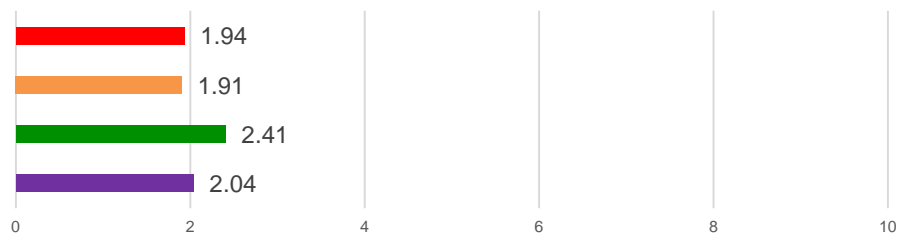
Session Failure Ratio - Zones



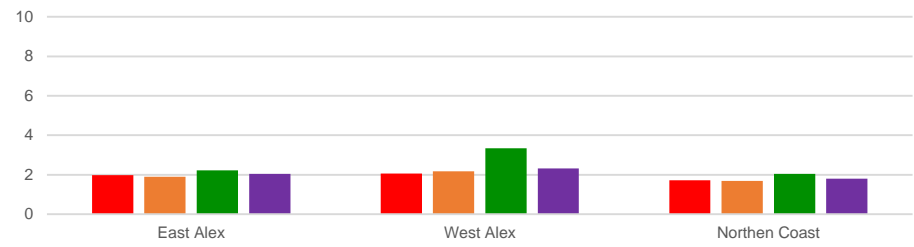
Session Failure Ratio



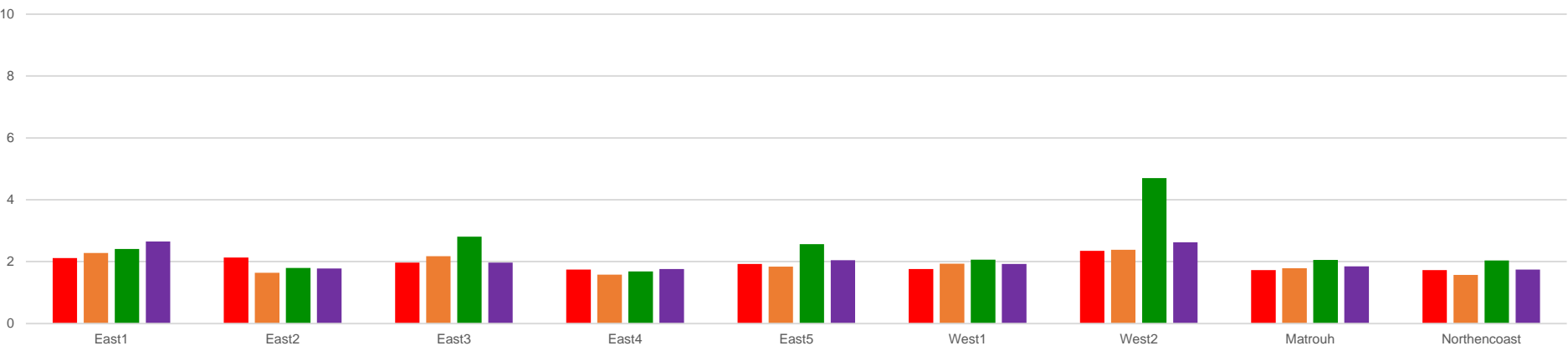
Average Session Time - Overall



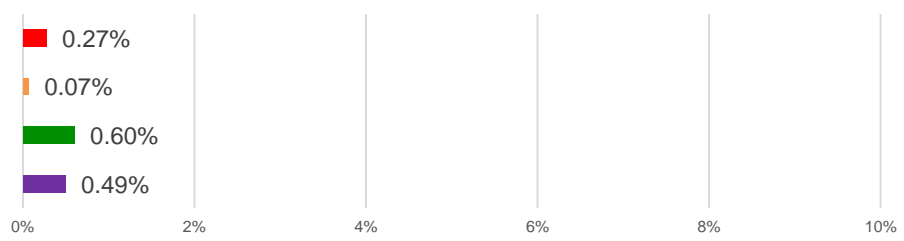
Average Session Time - Zones



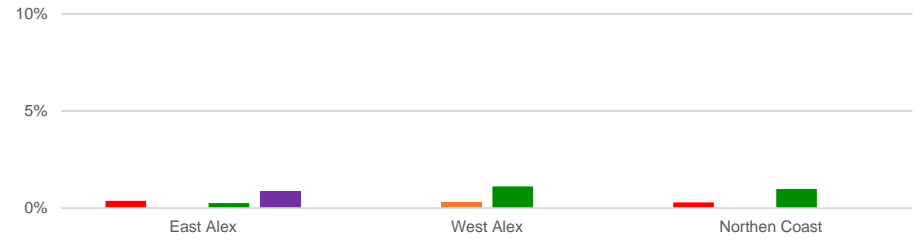
Average Session Time



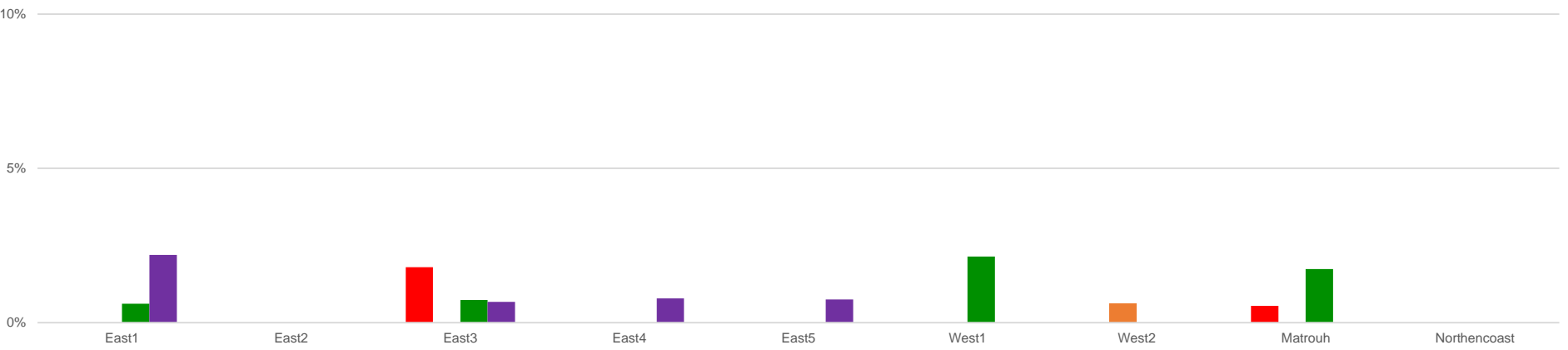
YouTube Session Failure Ratio - Overall



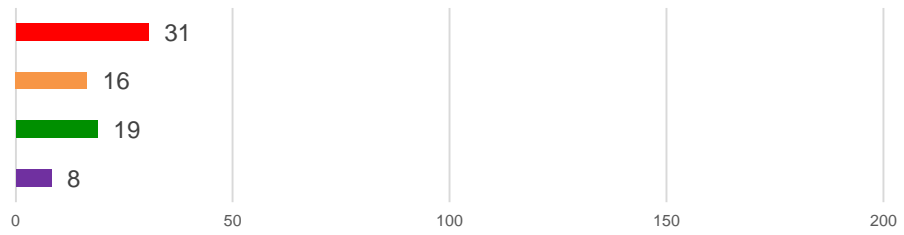
YouTube Session Failure Ratio - Zones



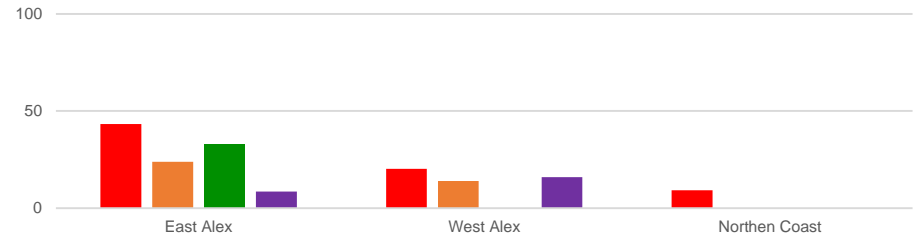
YouTube Session Failure Ratio



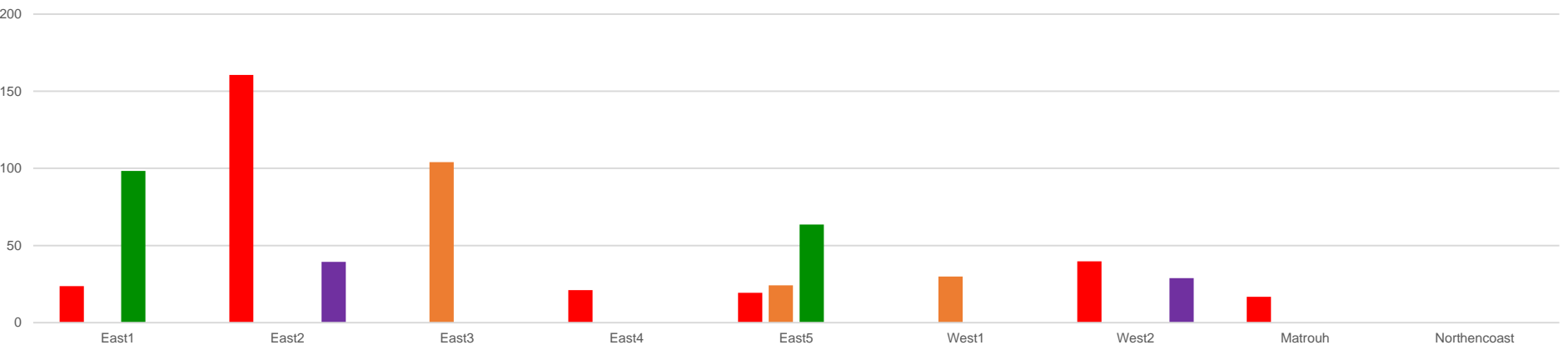
Freezing Time - Overall



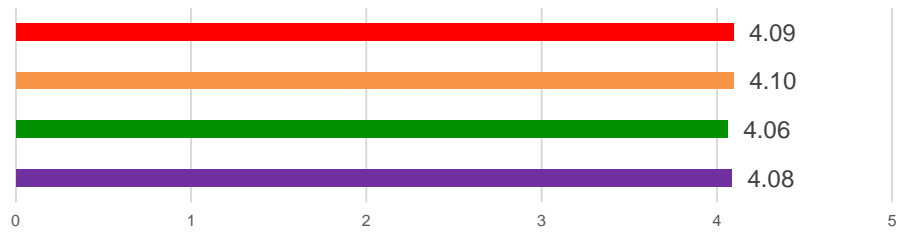
Freezing Time - Zones



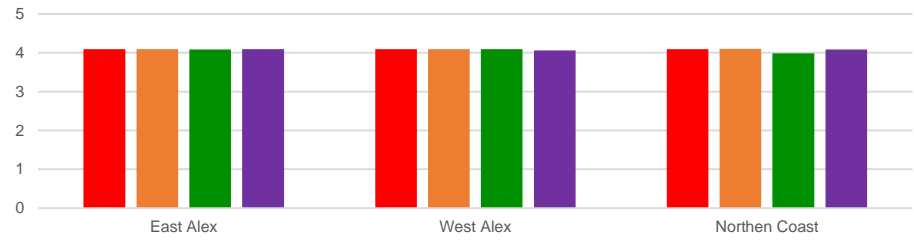
Freezing Time



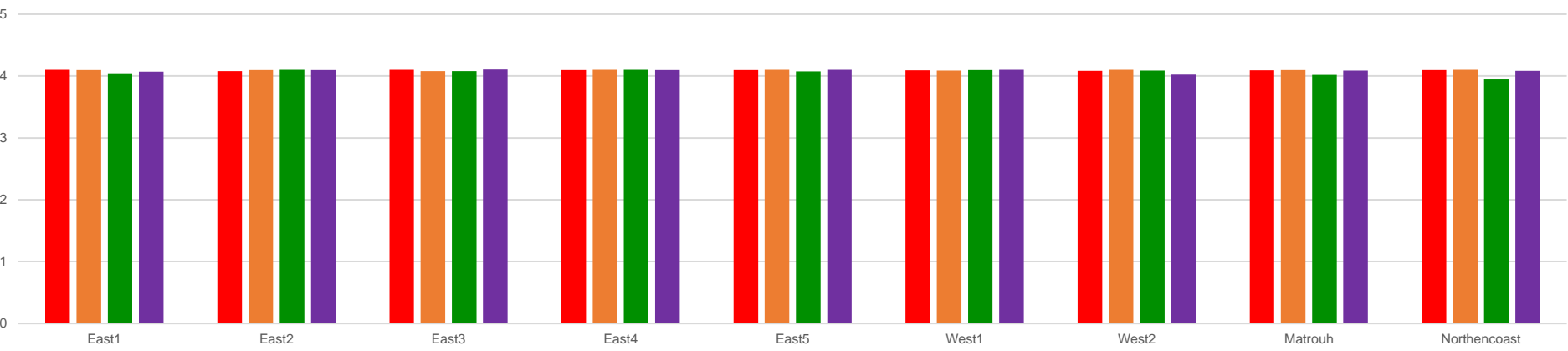
Video Quality [VMOS] - Overall



Video Quality [VMOS] - Zones

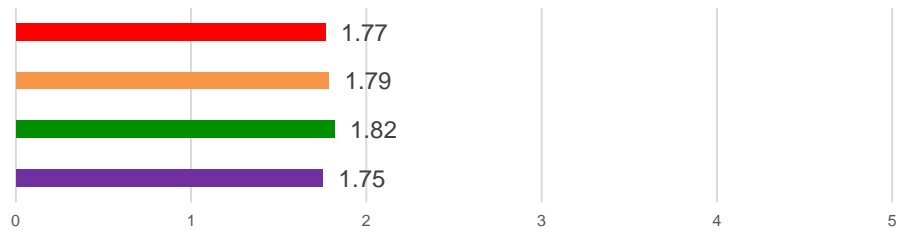


Video Quality - VMOS

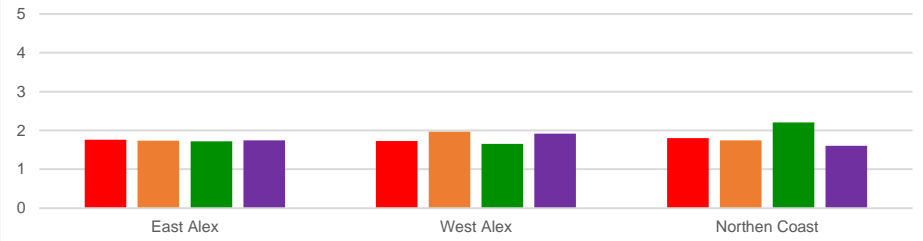




Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

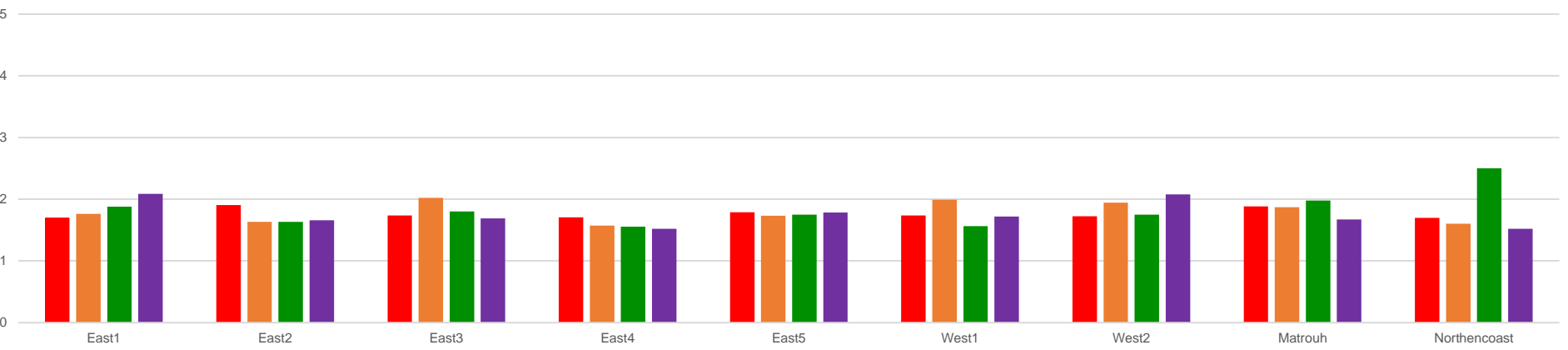
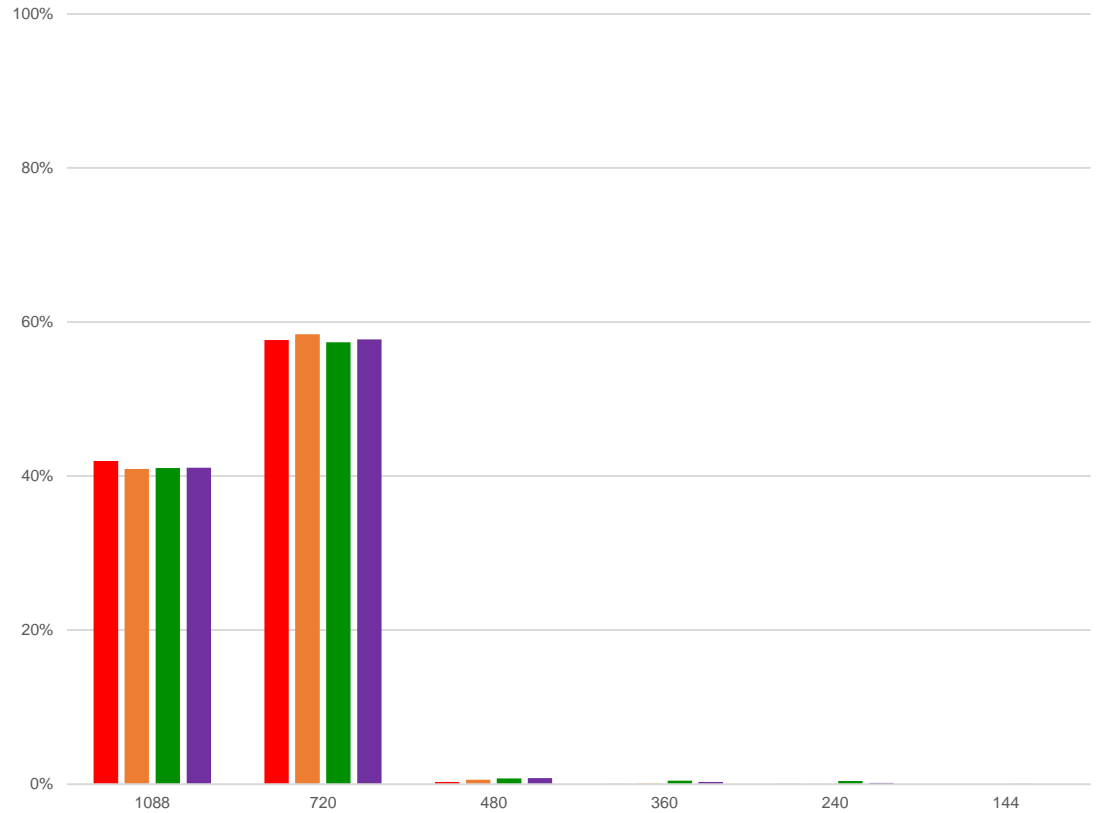


Image Resolution

Youtube - Image Resolution



A large circular graphic with a white center and a blue border, containing the text 'Delta Region KPIs'. The background of the slide is a photograph of a lush green field with a line of palm trees in the distance under a clear sky.

## **Delta Region KPIs**

# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
- 8. Voice Service Quality & Performance - Delta**
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

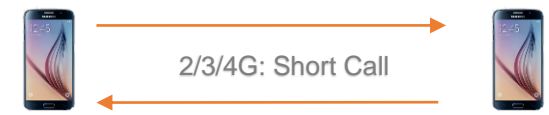
# Zones Definition



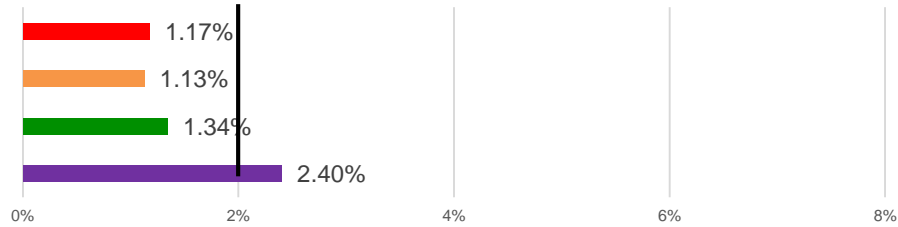
**Delta Cities**

Delta Z1	Banha Qalyoub Qanatir
Delta Z2	10th of ramadan  Faqous Zagazig
Delta Z3	Damnhour  Kafr Eldawar
Delta Z4	Kafr el Zayat  Tanta - Mahalla
Delta Z5	Desouk  Kafr El sheikh
Delta Z6	Mansoura  Senbelawen
Delta Z7	Domyat  Ras El bar
Delta Z8	Menoufbagour  Shebin el Koum

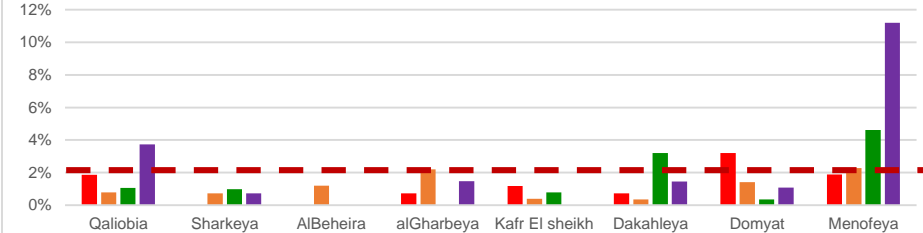
# Accessibility: Call Blocked Rate



Call Blocked Rate - Overall

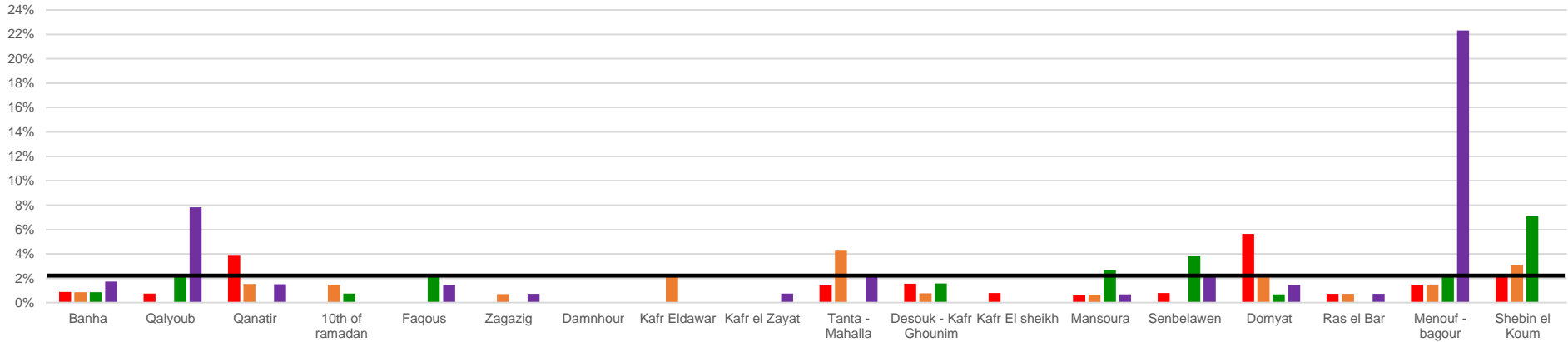


Call Blocked Rate - Zones

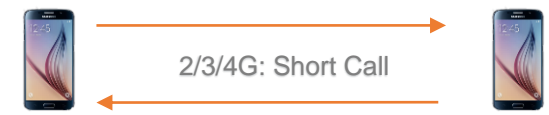


**Call Blocked Rate** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

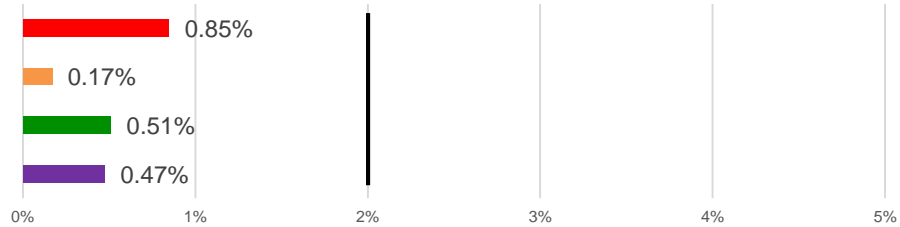
Call Blocked Rate



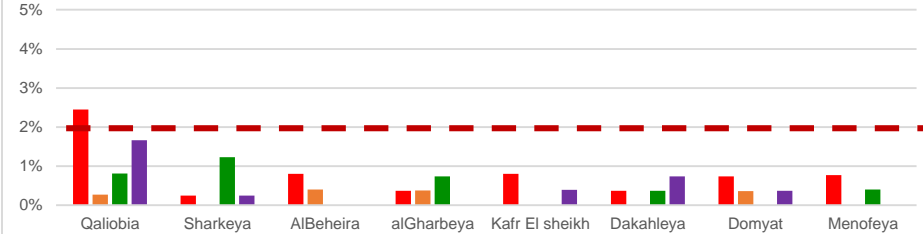
# Retainability: Call Dropped Rate



Voice Call Dropped Rate - Overall

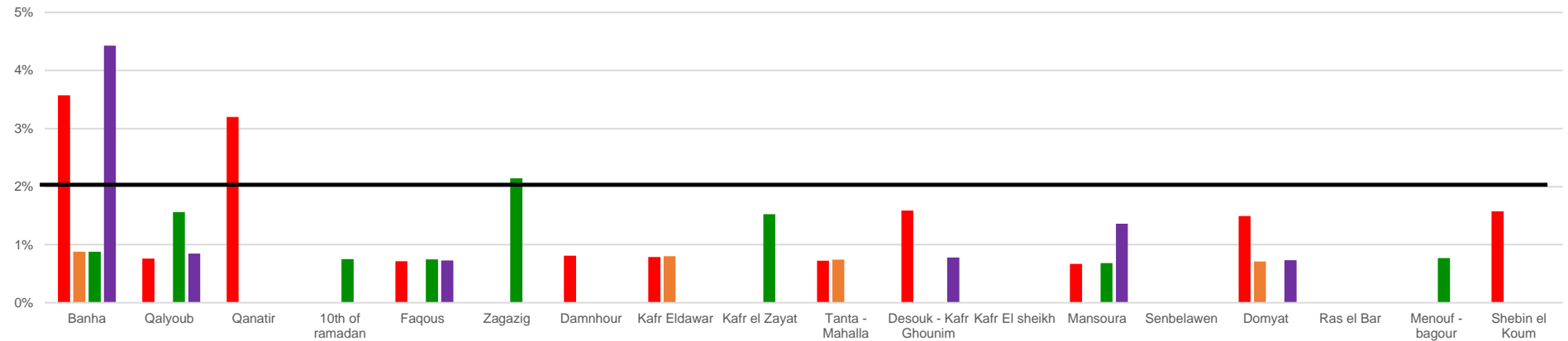


Voice Call Dropped Rate - Zones



Voice Call Retainability is represented by call drop rates.

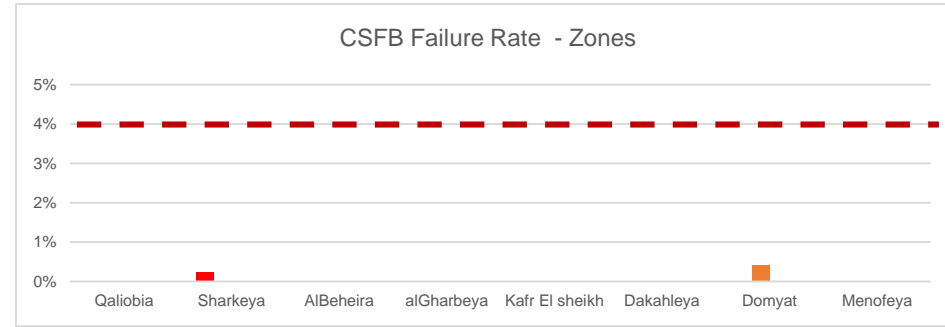
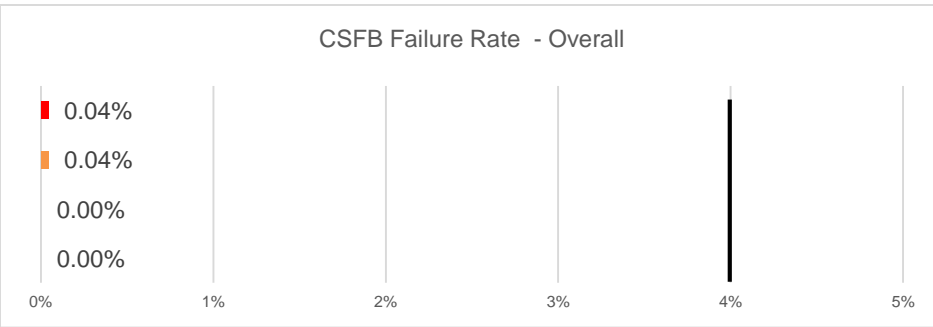
Voice Call Dropped Rate



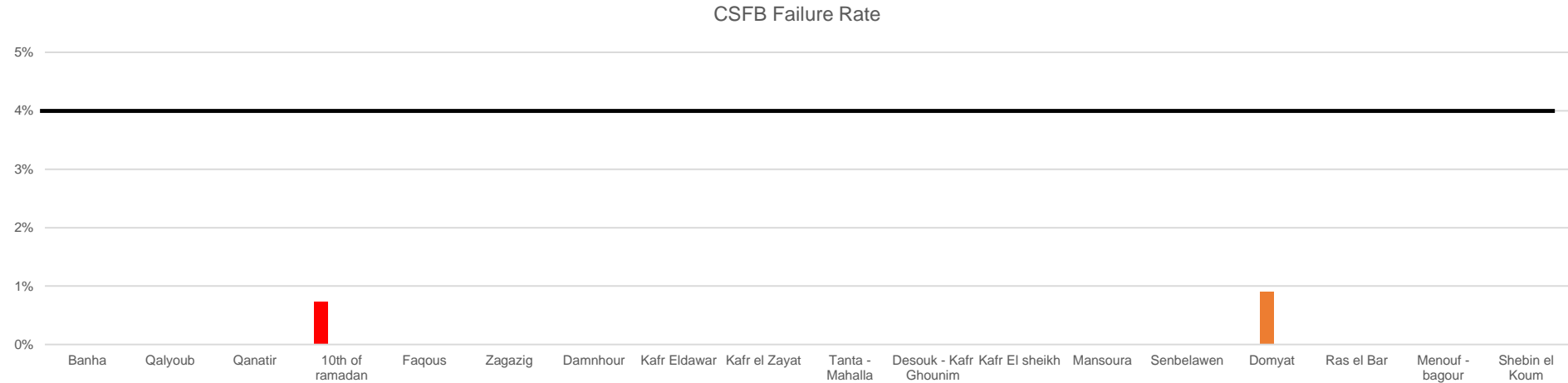
# Accessibility: CSFB Failure Rate [%]



2/3/4G: Short Call



**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.





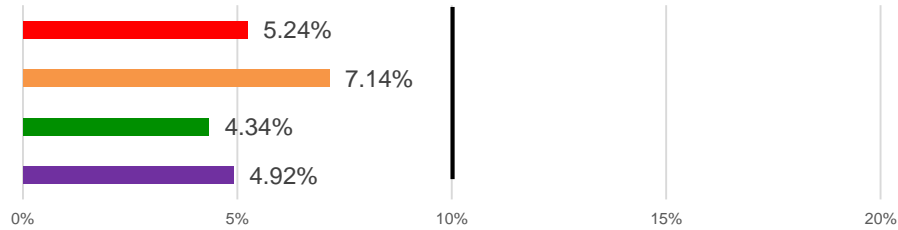
# Speech Quality: MOS Voice Speech Quality < 2.8



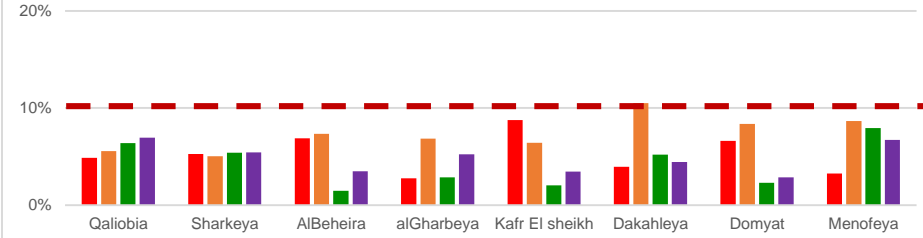
2/3/4G: Short Call



Voice Speech Quality on Sample < 2.8 - Overall

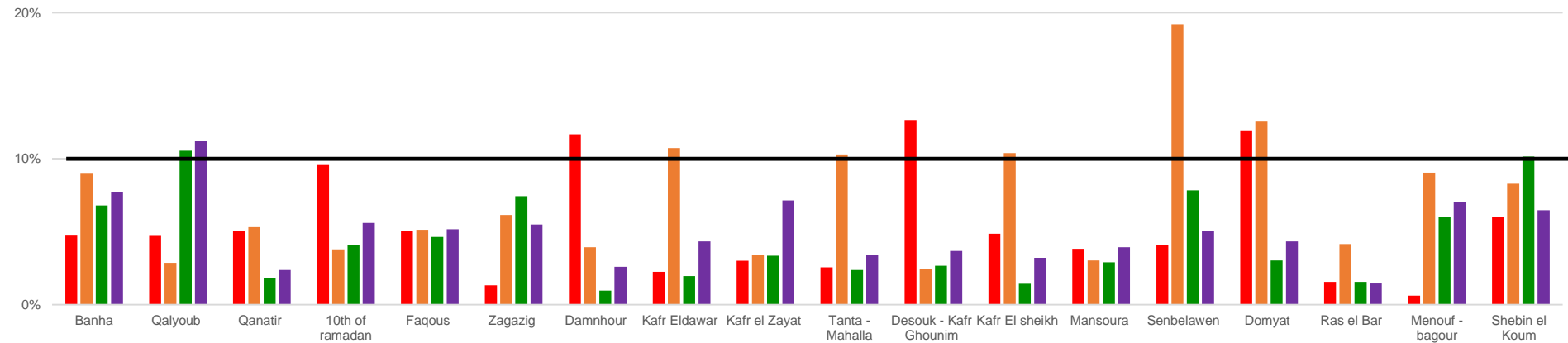


Voice Speech Quality on Sample < 2.8 - Zones

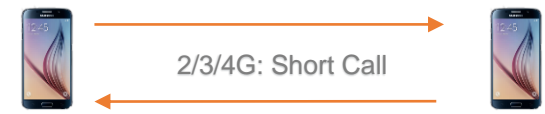


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

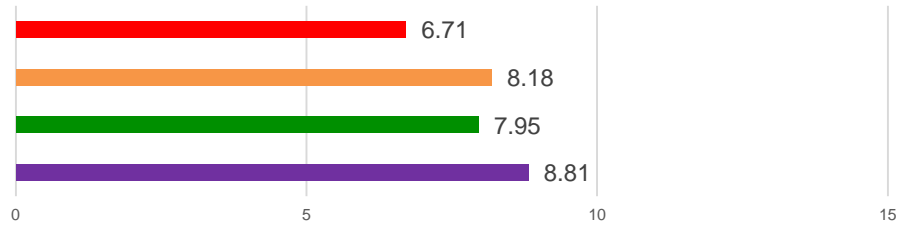
Voice Speech Quality on Sample < 2.8



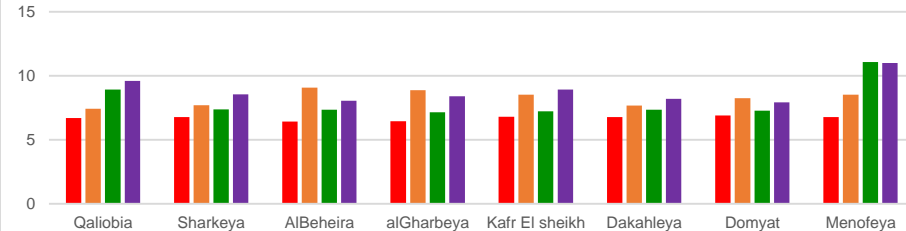
# Accessibility: Call Access Time [sec.]



Call Access Time - Overall

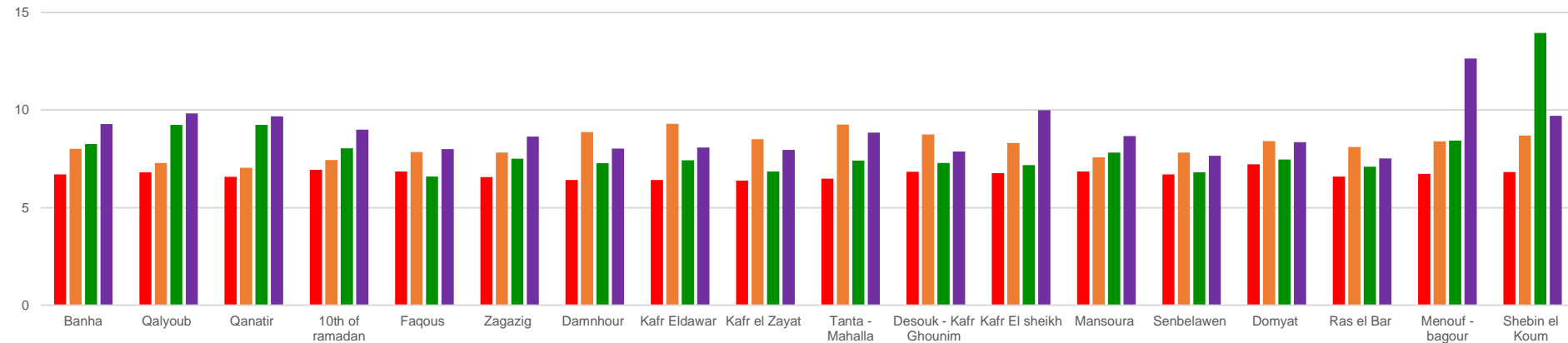


Call Access Time - Zones

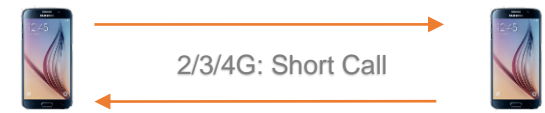


**Call Access** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

Call Access Time



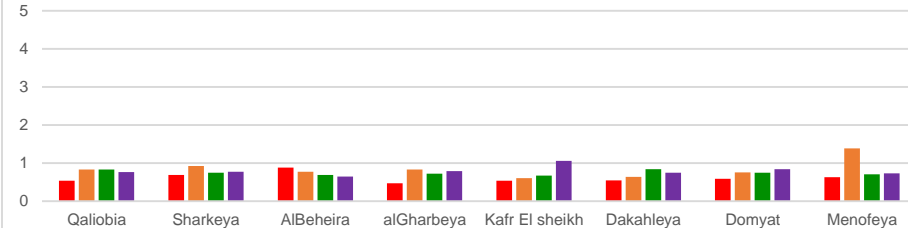
# Accessibility: CSFB Delay [sec.]



Circuit Switch Fall Back Delay - Overall

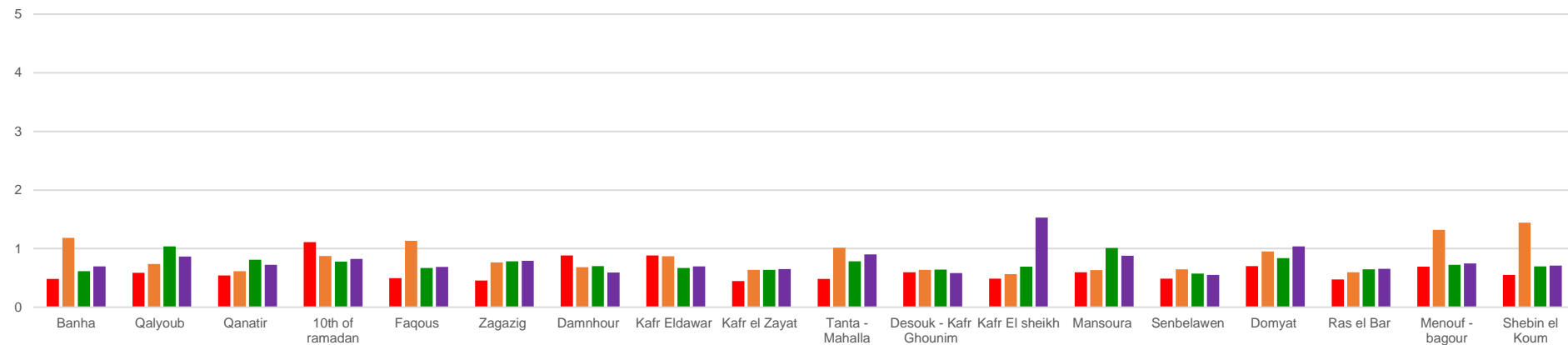


Circuit Switch Fall Back Delay - Zones

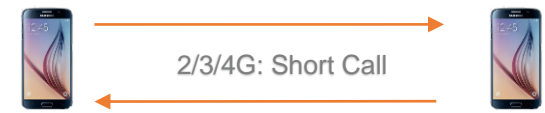


**CSFB Delay** represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

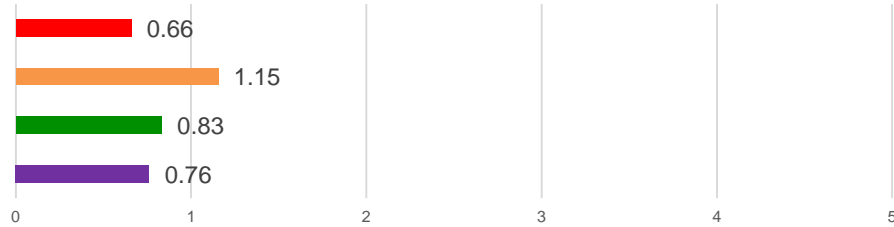
Circuit Switch Fall Back Delay



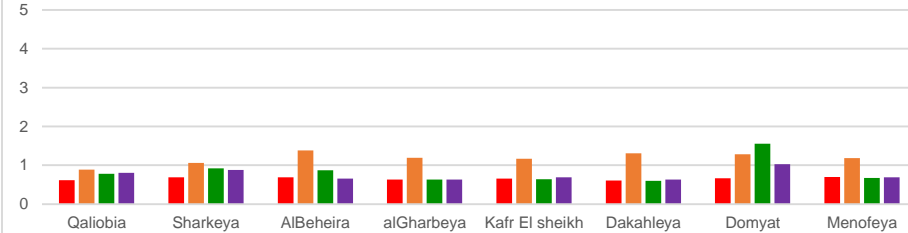
# Accessibility: Telephony Return Delay [sec.]



Telephony Return Delay - Overall

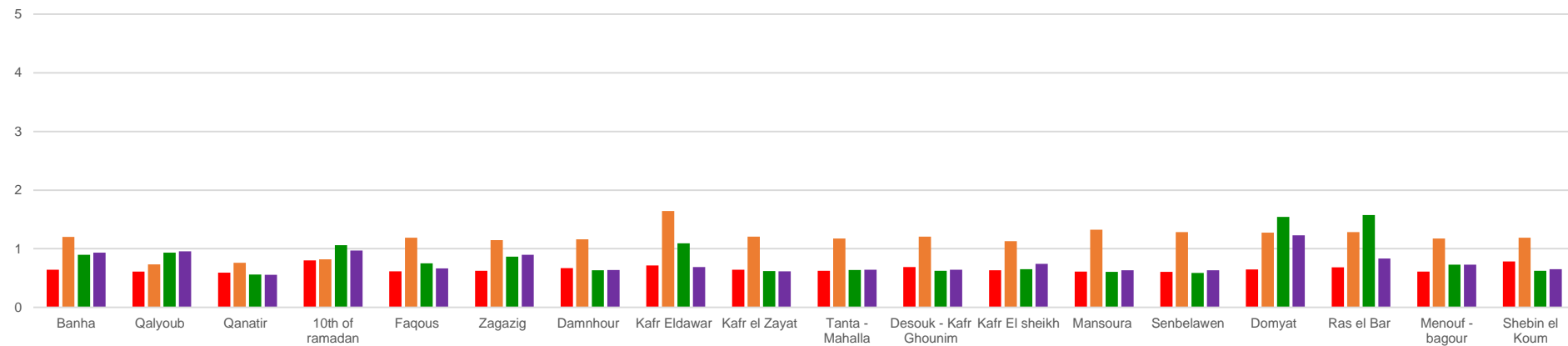


Telephony Return Delay - Zones



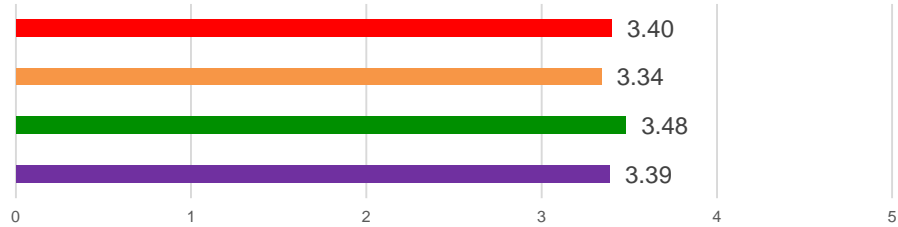
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end

Telephony Return Delay

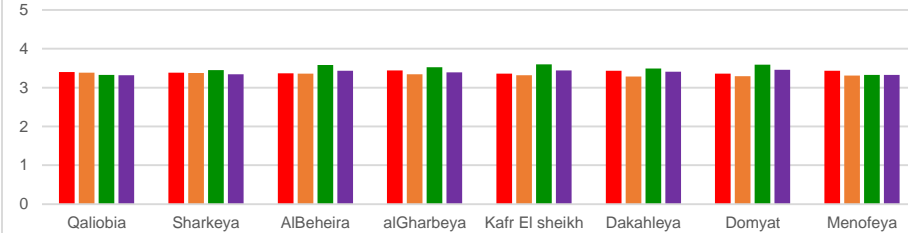


# Speech Quality: MOS Scores

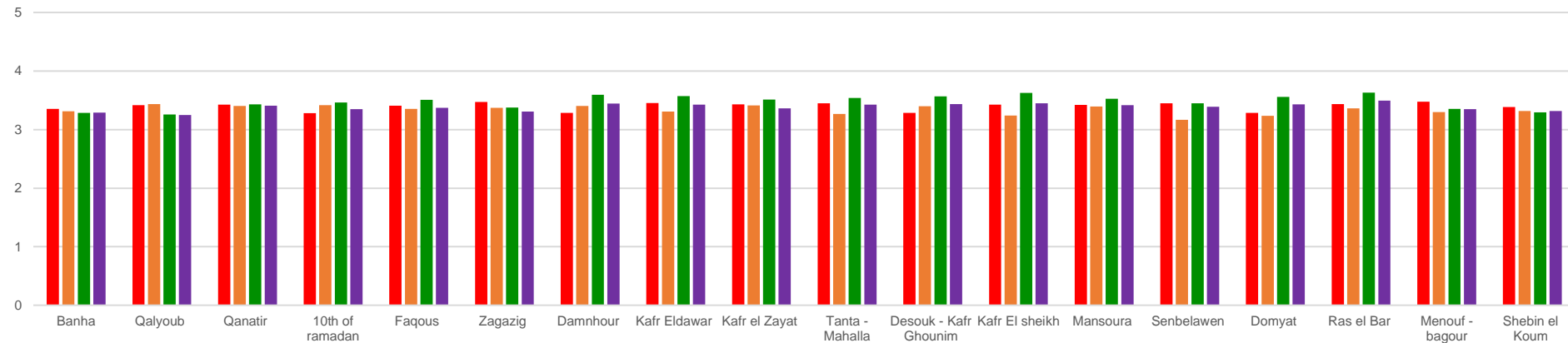
Voice Speech Quality - Overall



Voice Speech Quality - Zones

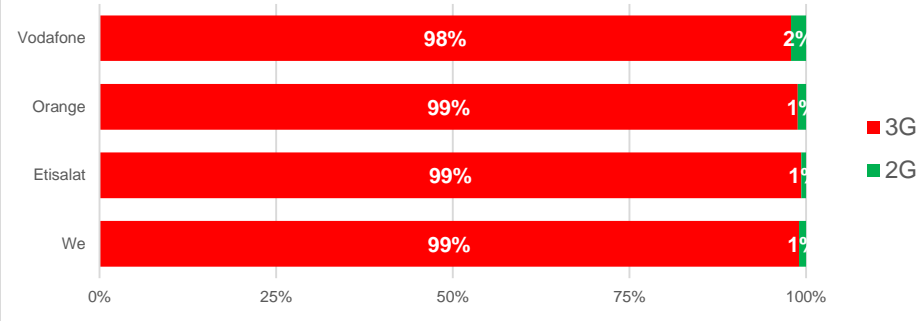


Voice Speech Quality



# Speech Quality: Call technology Usage & Codec Base Usage

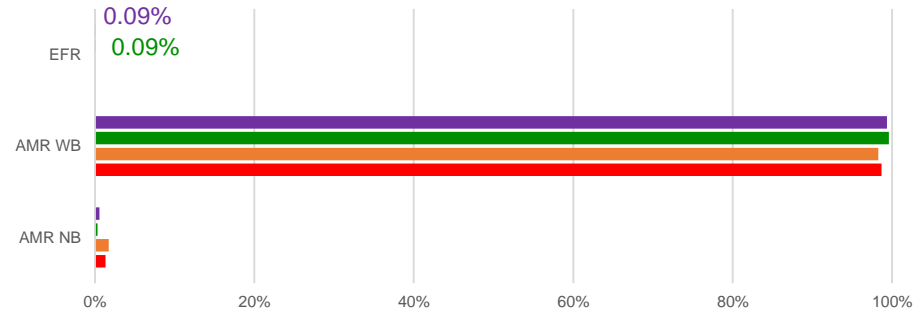
Call Technology Usage Overall



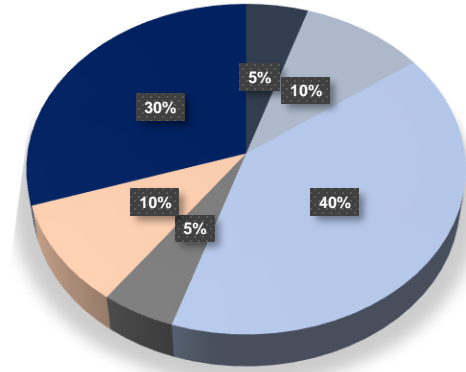
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

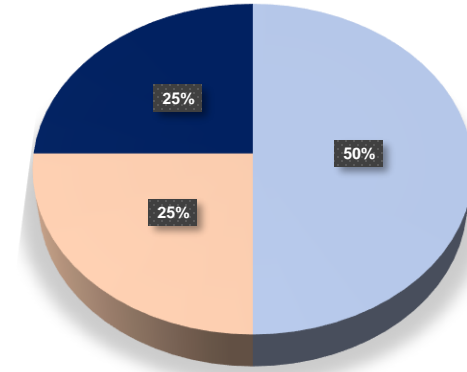
Codec Base Usage



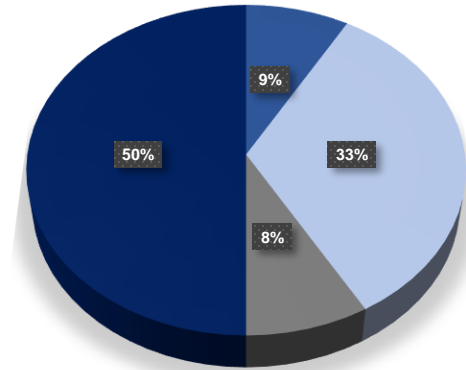
# Analysis: Dropped Calls Causes



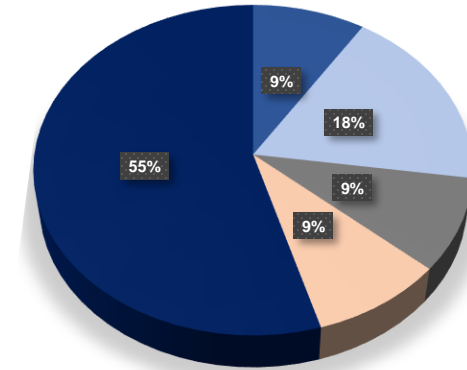
- 2G Coverage
- 2G Quality
- 3G Quality
- Core Network
- Mobility Issue
- RAN Issue



- 3G Quality
- Mobility Issue
- RAN Issue



- 3G Coverage
- 3G Quality
- Core Network
- RAN Issue



- 3G Coverage
- 3G Quality
- Core Network
- Mobility Issue
- RAN Issue

# All Operators: Dropped Calls Locations 1/2

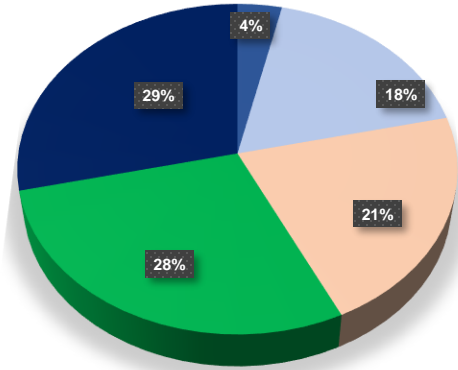




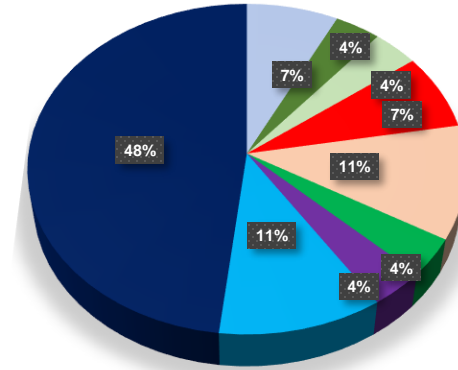
# All Operators: Dropped Calls Locations 2/2



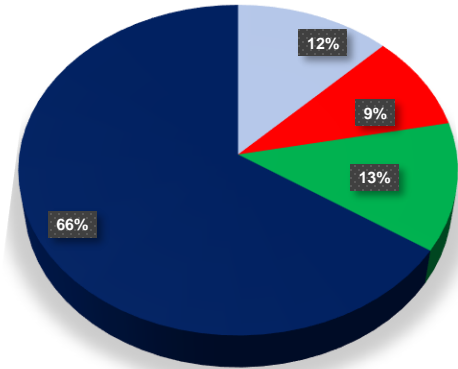
# Analysis: Failed Calls Causes



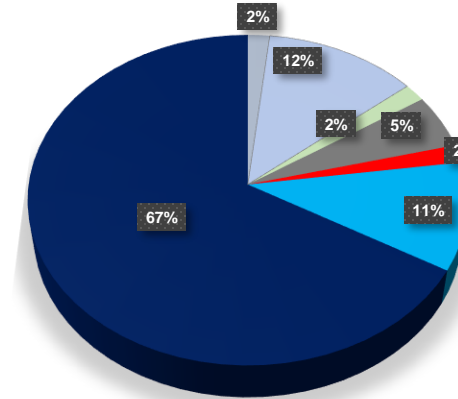
- 3G Coverage
- 3G Quality
- Mobility Issue
- No service
- RAN Issue



- 3G Quality
- 4G Coverage
- 4G Quality
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

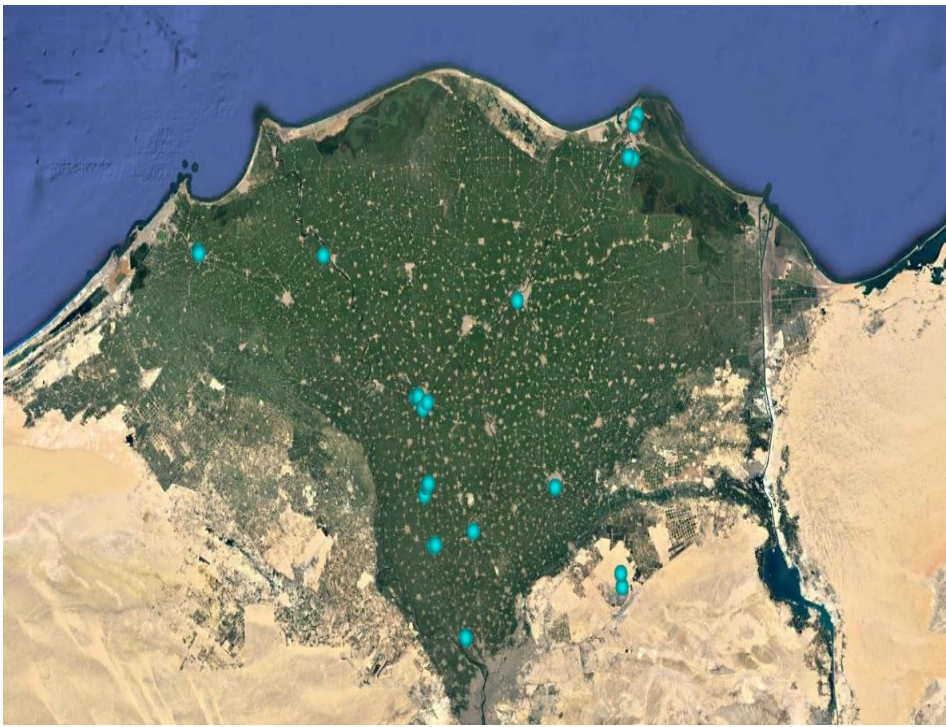
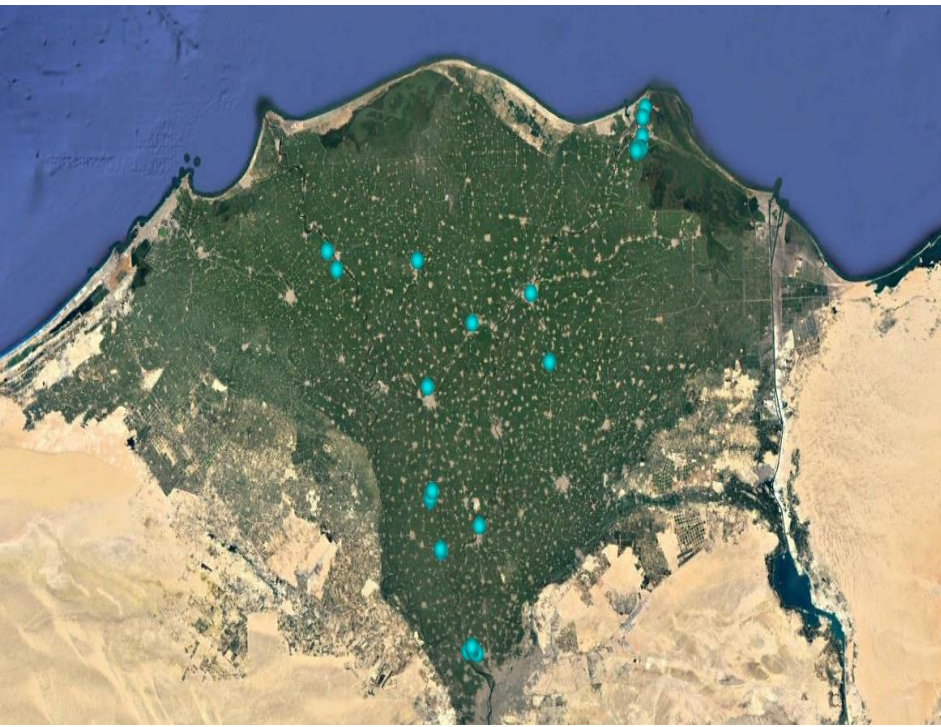


- 3G Quality
- CSFB Issue
- No service
- RAN Issue

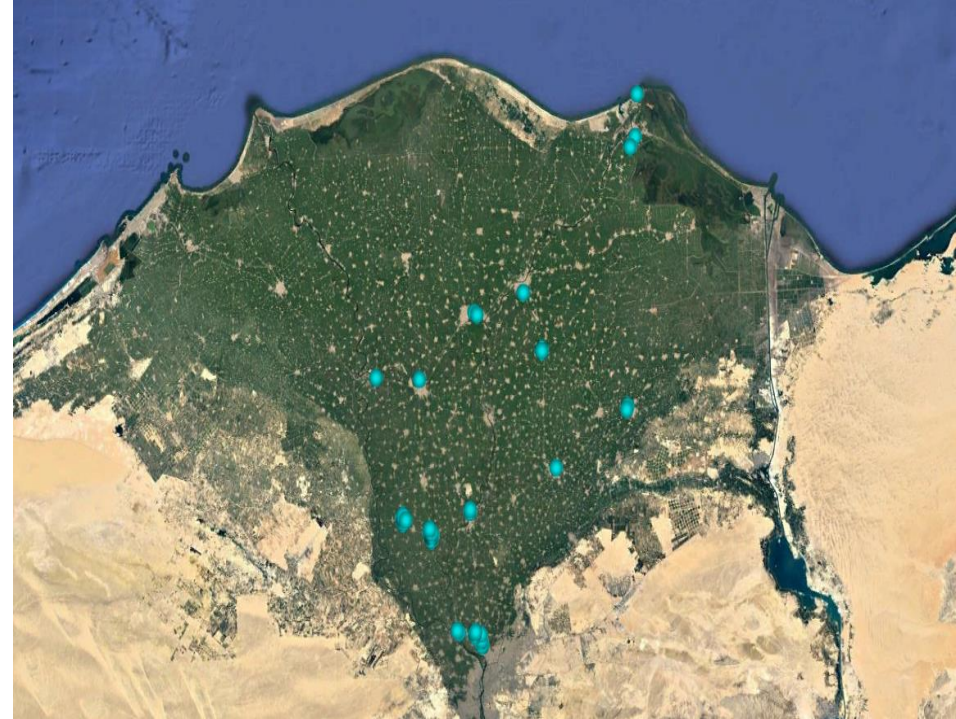


- 2G Quality
- 3G Quality
- 4G Quality
- Core Network
- CSFB Issue
- Paging Issue
- RAN Issue

# All Operators: Blocked Calls Locations 1/2



## All Operators: Blocked Calls Locations 2/2



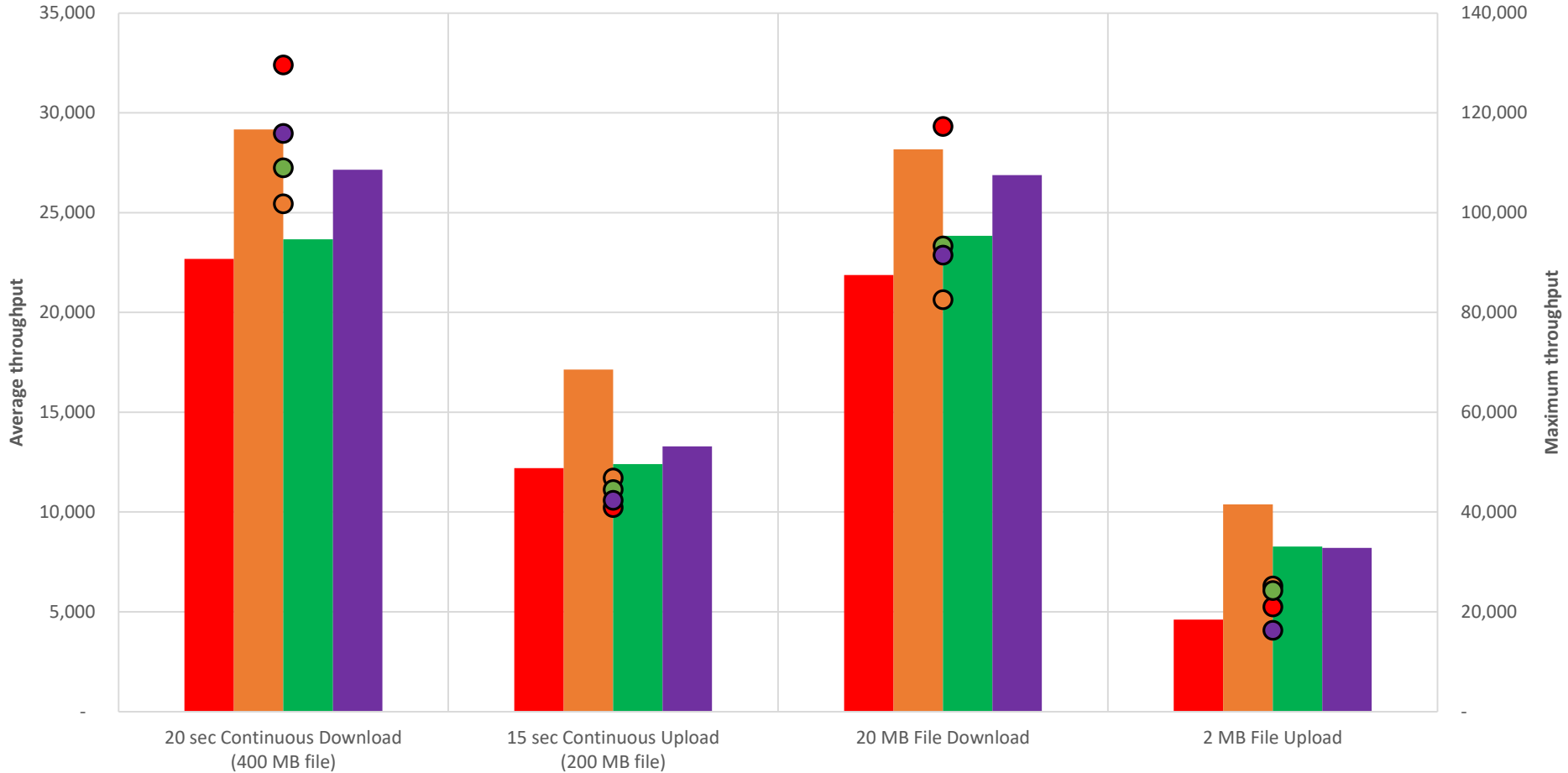
# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
- 9. Data Service Quality & Performance – Delta**
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

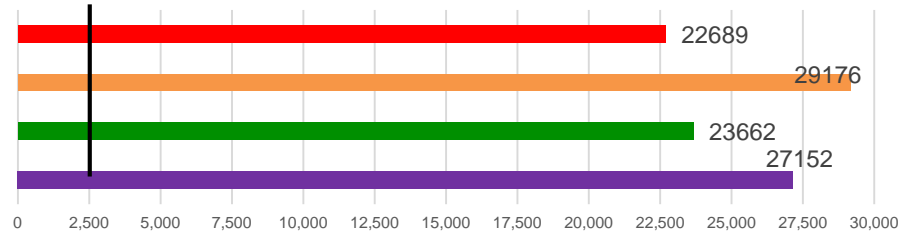
## NETWORK PERFORMANCE TEST

## USER EXPERIENCE TEST

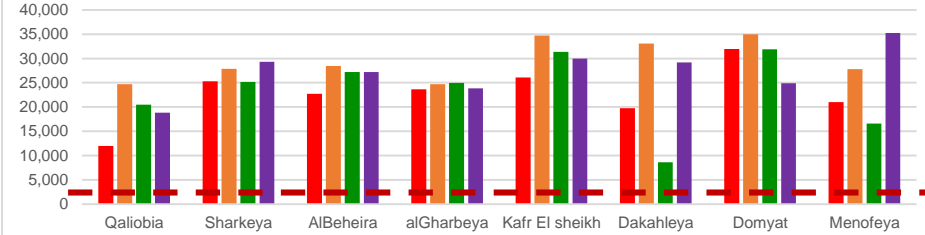


# FDTT HTTP Download Transfer Throughput – Network Performance

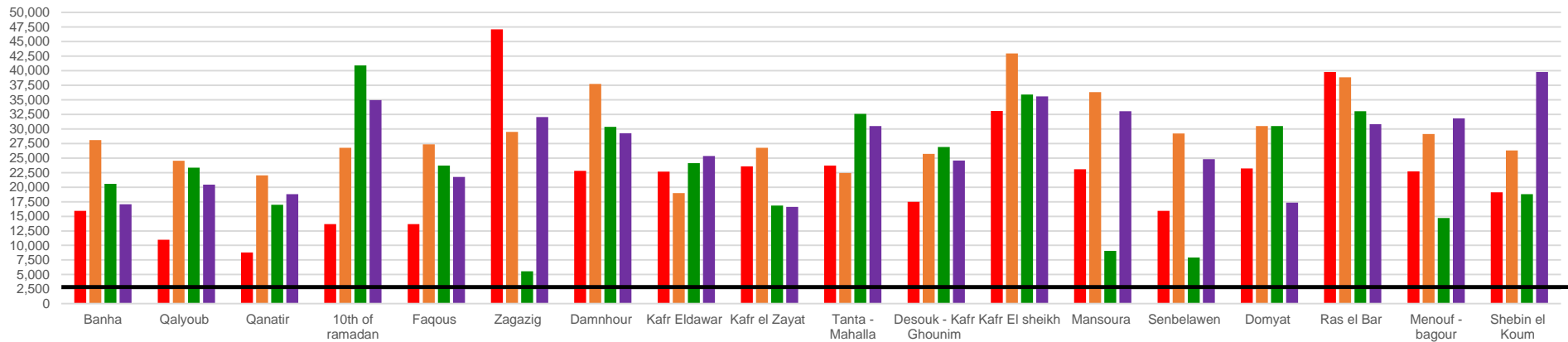
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones

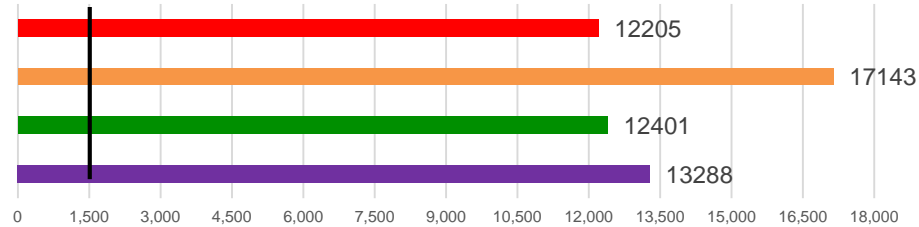


400 MB File FDTT HTTP Download Throughput [kbps]

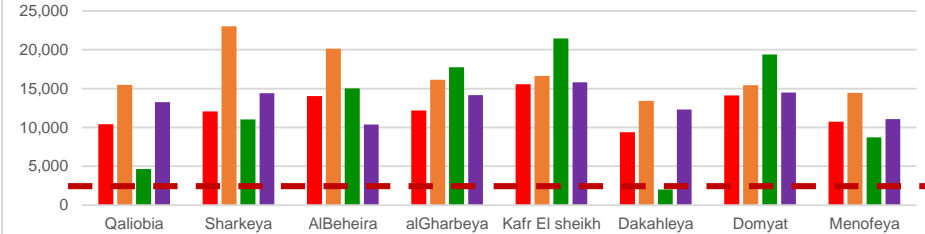


# FDTT HTTP Upload Transfer Throughput – Network Performance

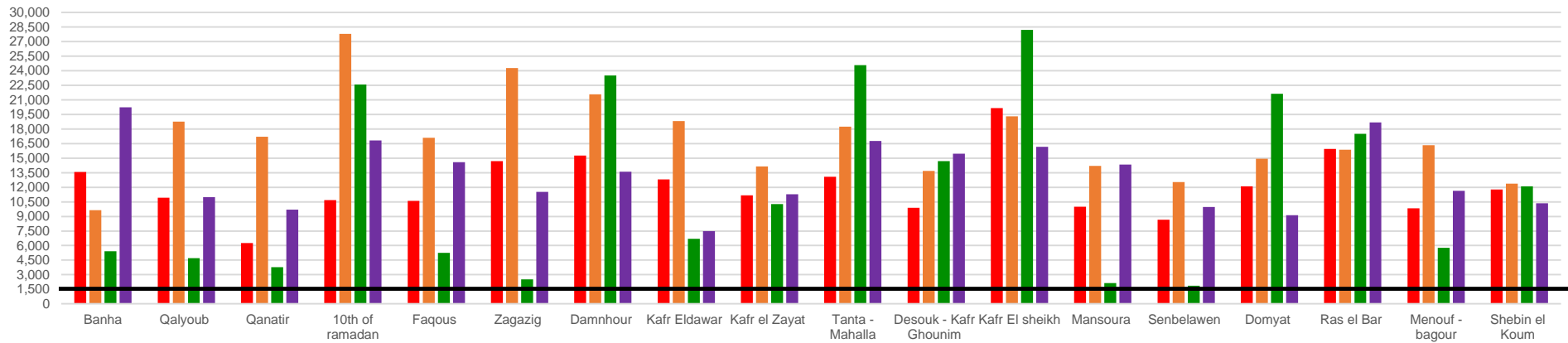
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones



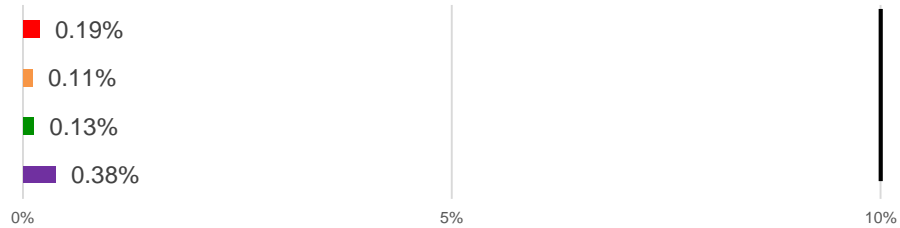
200 MB FDTT HTTP Upload Throughput [kbps]



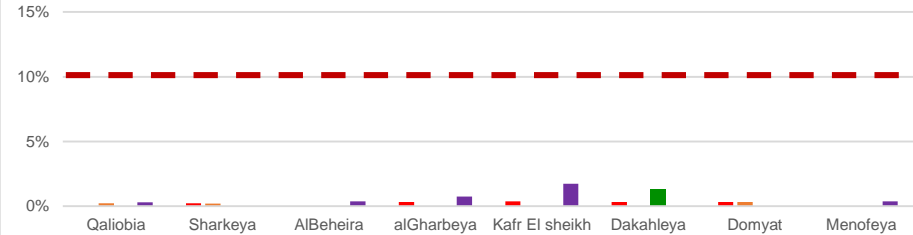


# HTTP Download Session Blocked Rates

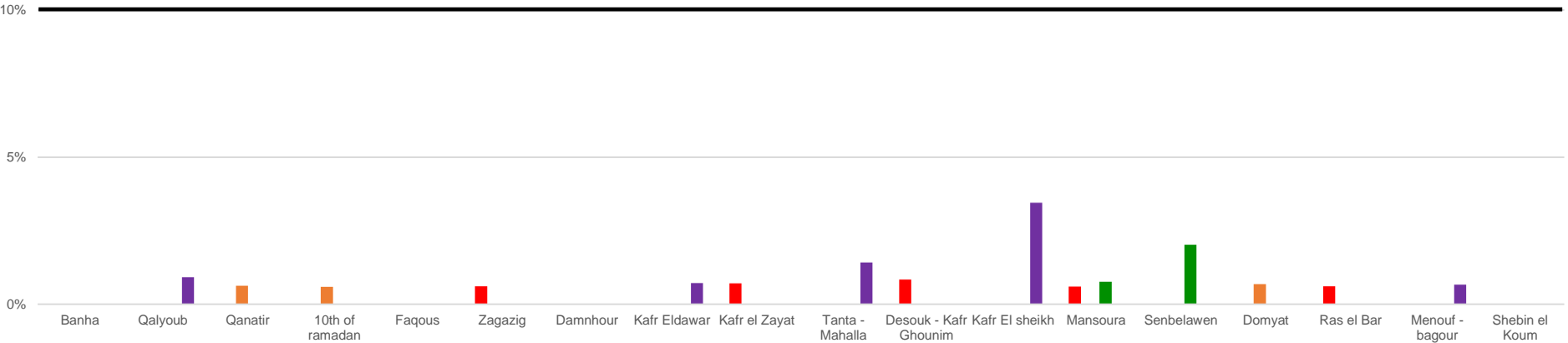
Download Session Blocked Ratio - Overall



Download Session Blocked Ratio - Zones

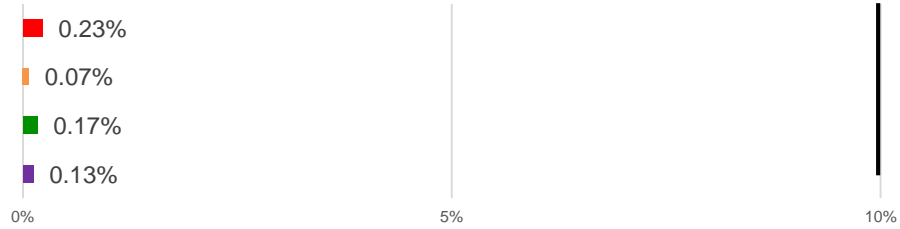


Download Session Blocked Ratio

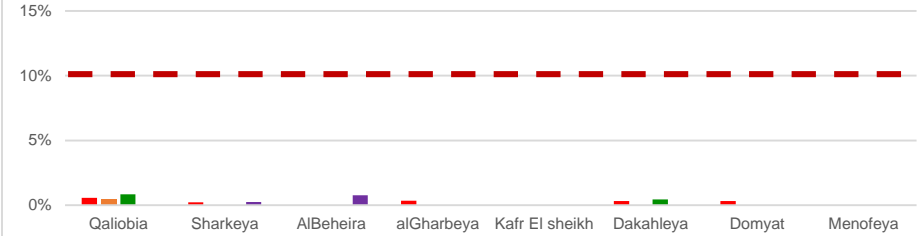


# HTTP Upload Session Blocked Rates

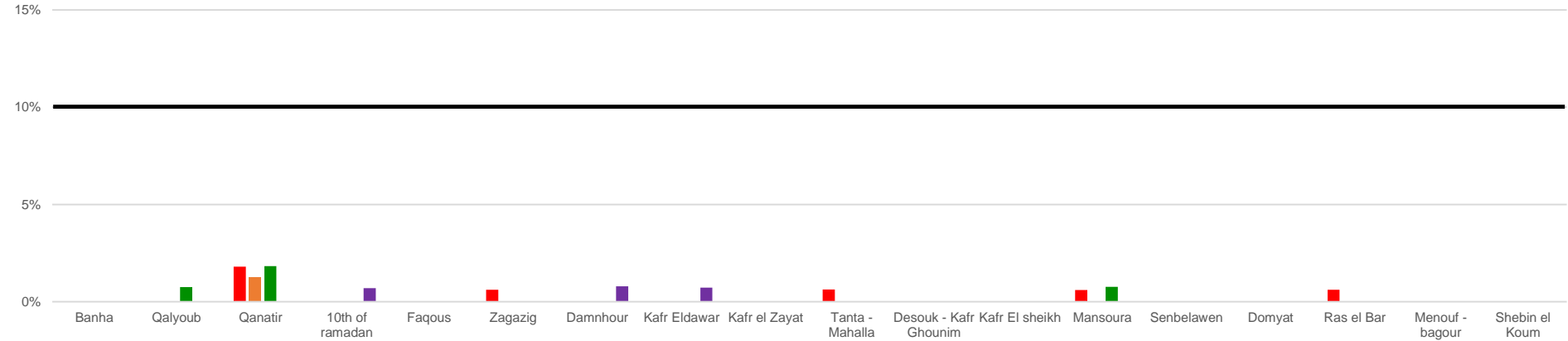
Upload Session Blocked Ratio - Overall



Upload Session Blocked Ratio - Zones

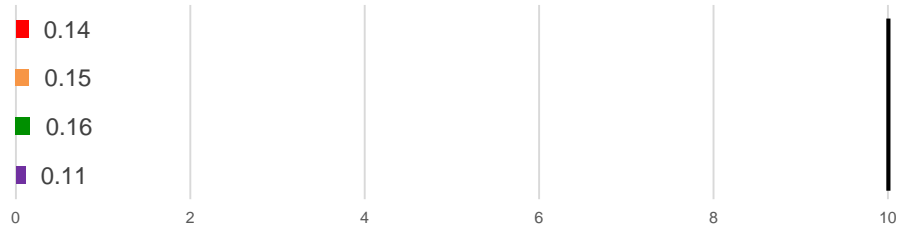


Upload Session Blocked Ratio

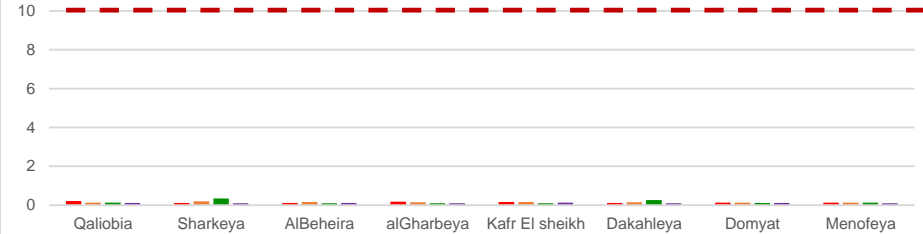


# HTTP Download Average Session Setup Time

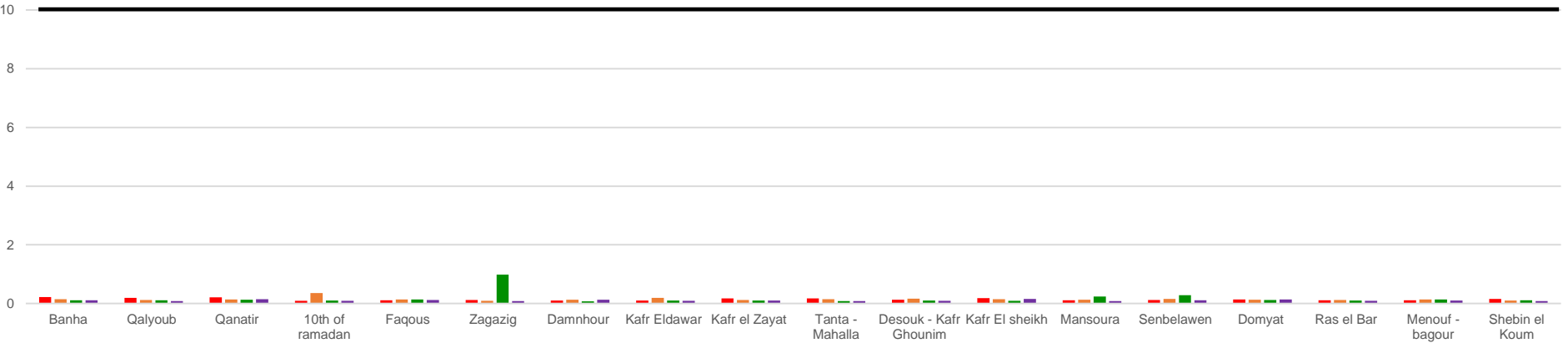
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

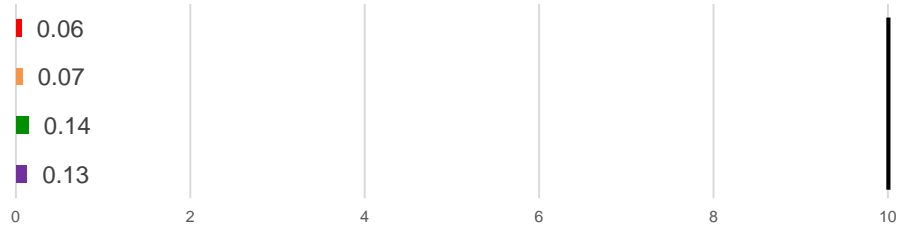


Average Session Setup Time [sec]

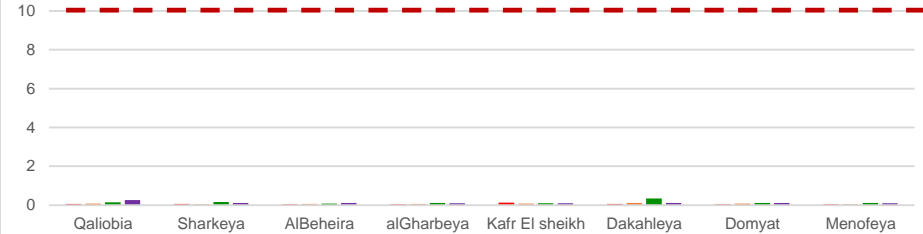


# HTTP Upload Average Session Setup Time

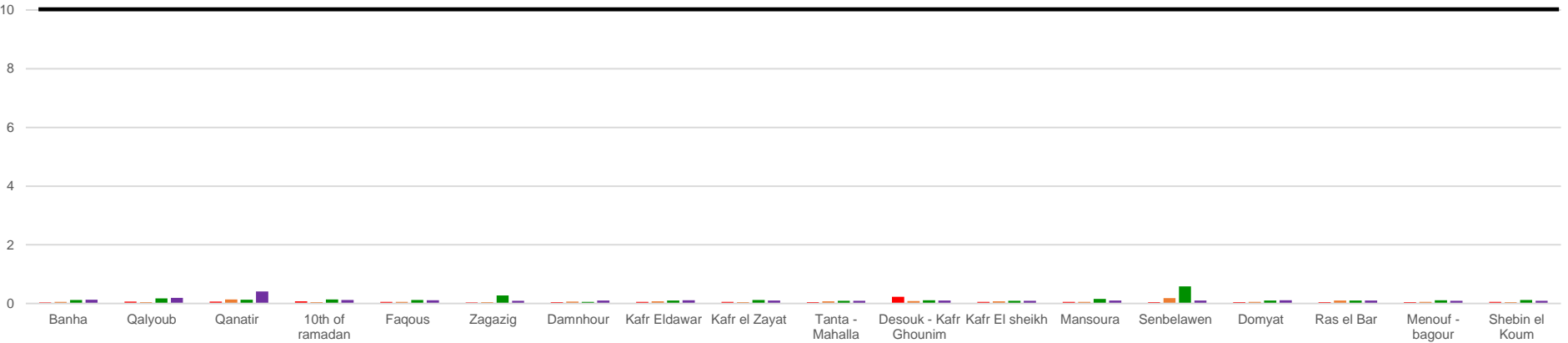
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

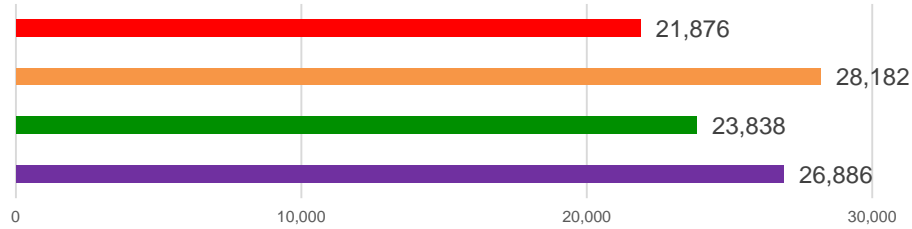


Average Session Setup Time [sec]

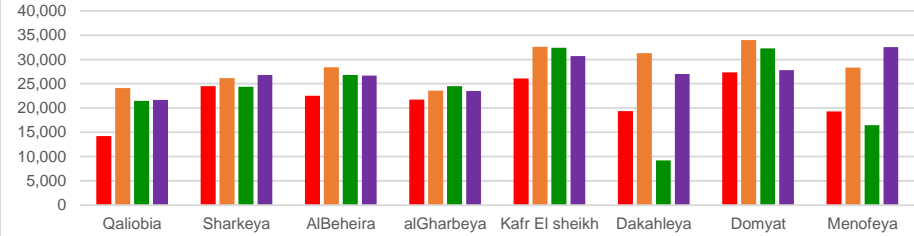


# HTTP Download Throughput – Customer Experience

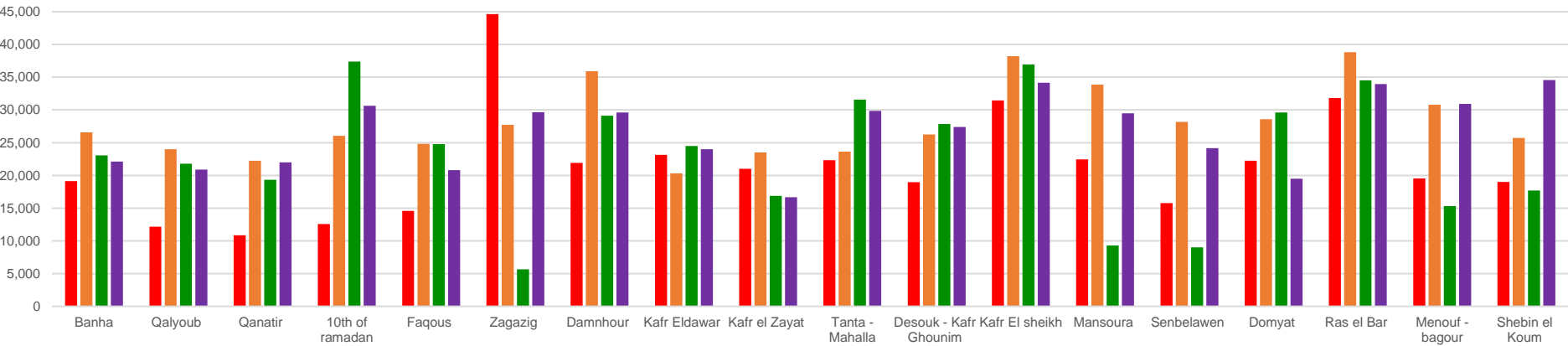
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones

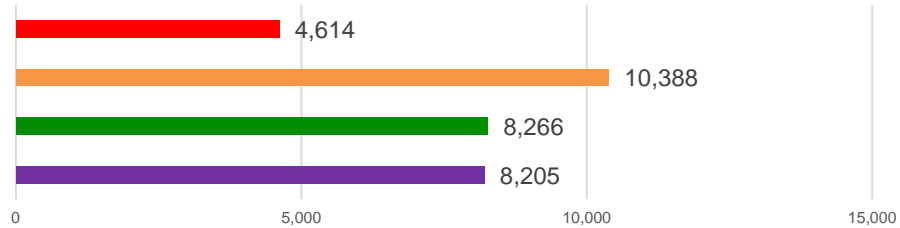


20MB Download Throughput [kbps]

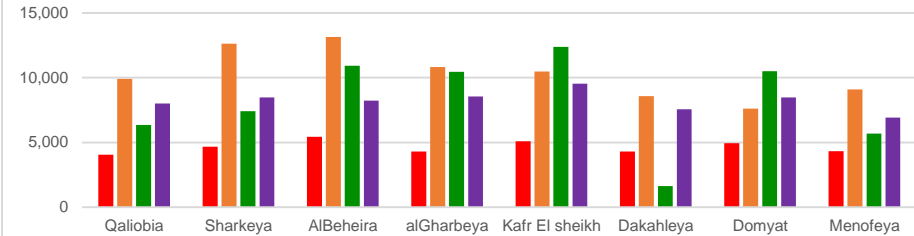


# HTTP Upload Throughput – Customer Experience

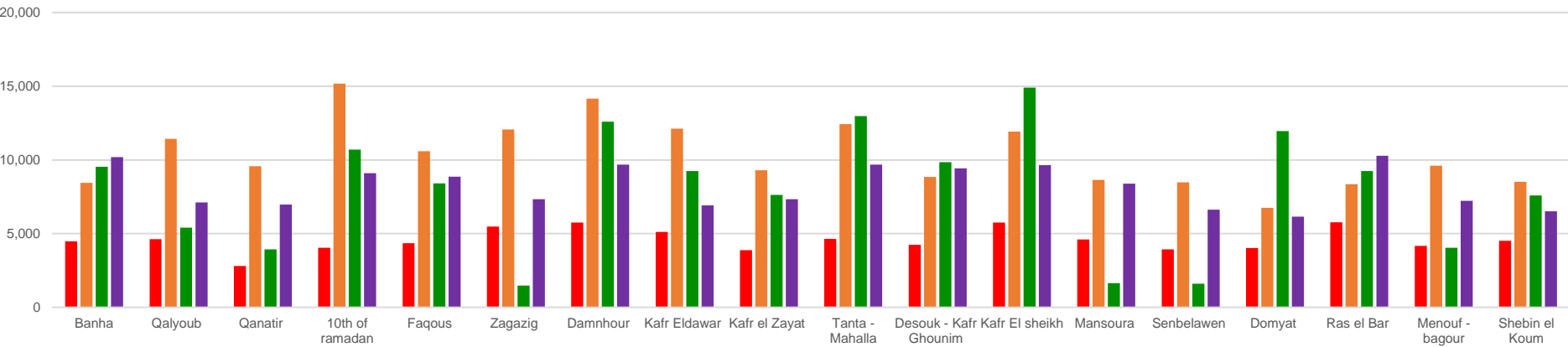
2MB Upload Throughput [kbps] - Overall



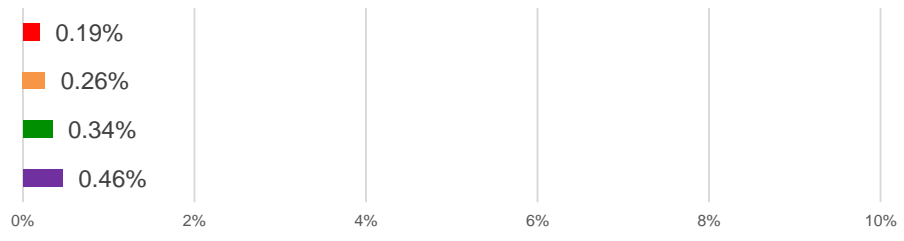
2MB Upload Throughput [kbps] - Zones



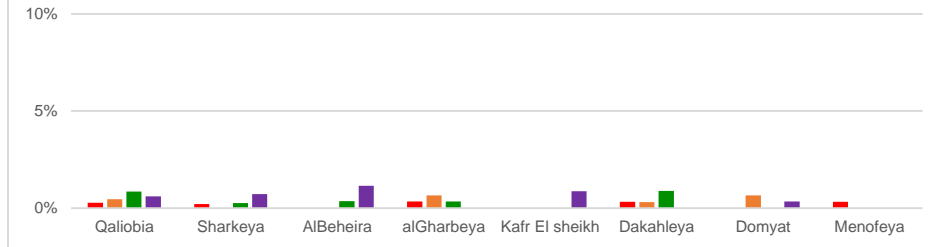
2MB Upload Throughput [kbps]



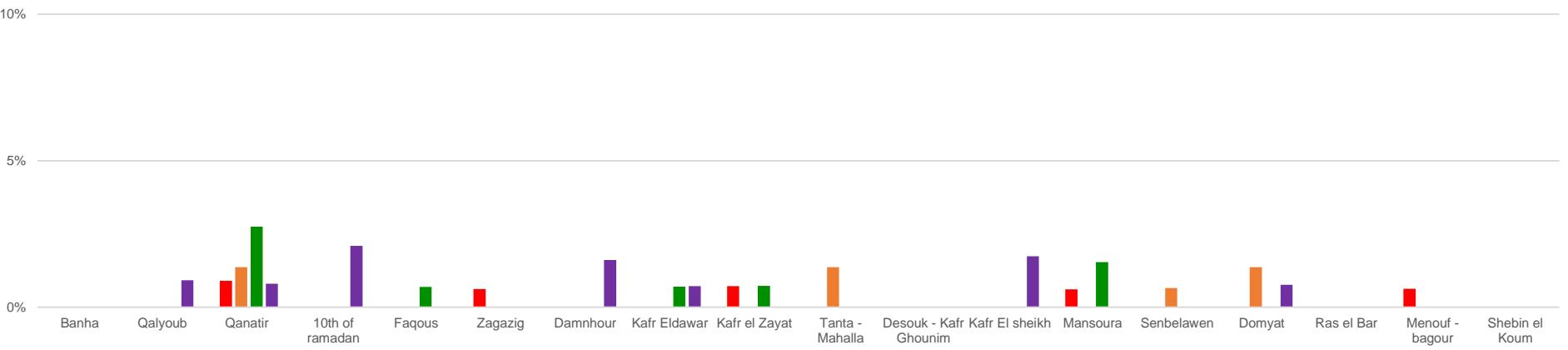
Session Failure Ratio - Overall



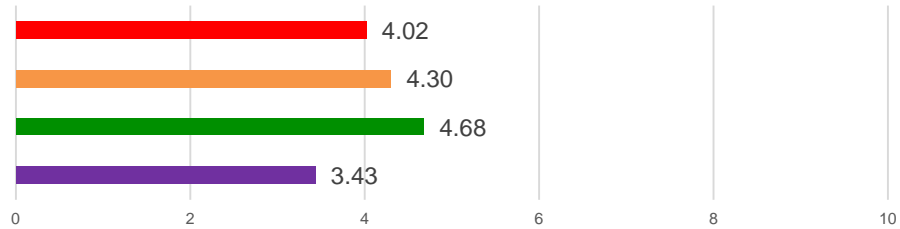
Session Failure Ratio - Zones



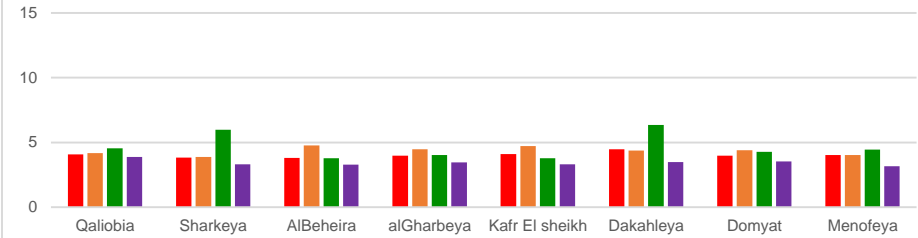
Session Failure Ratio



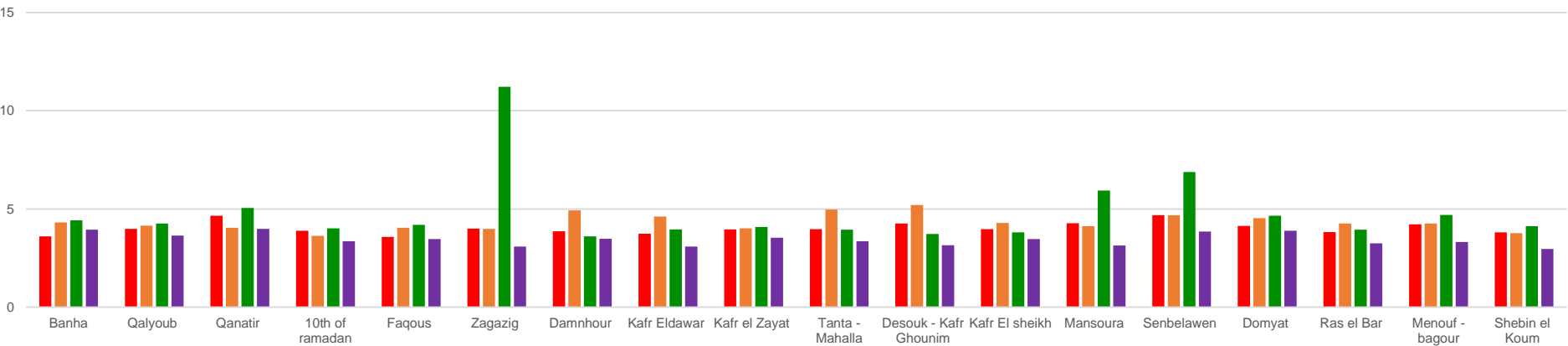
Average Session Setup - Overall



Average Session Setup - Zones

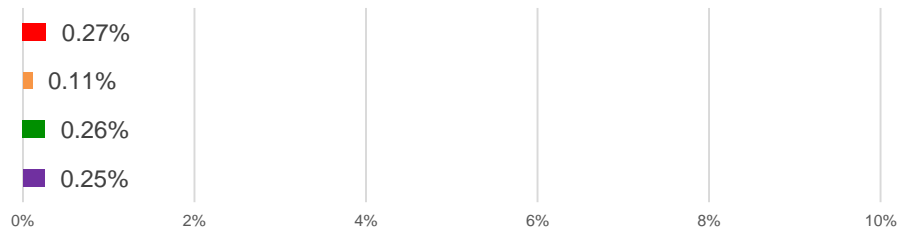


Average Session Time

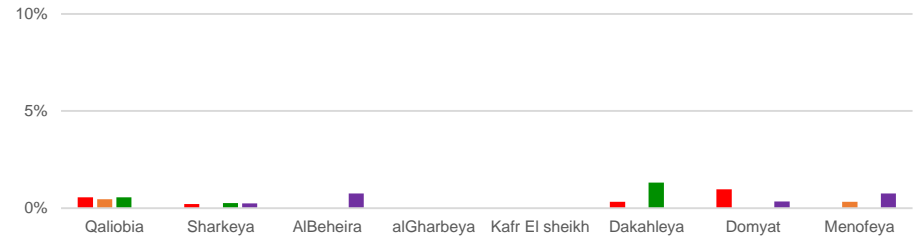




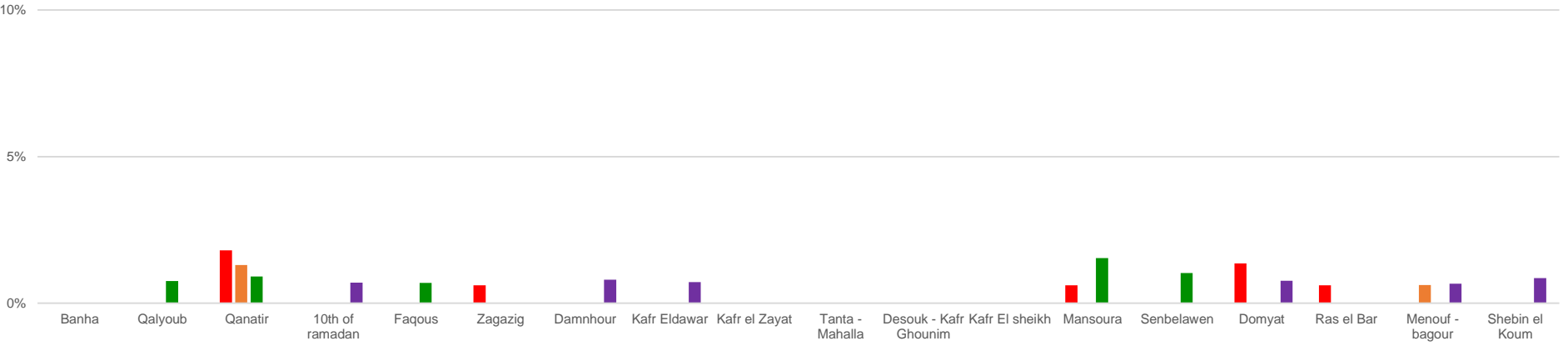
Session Failure Ratio - Overall



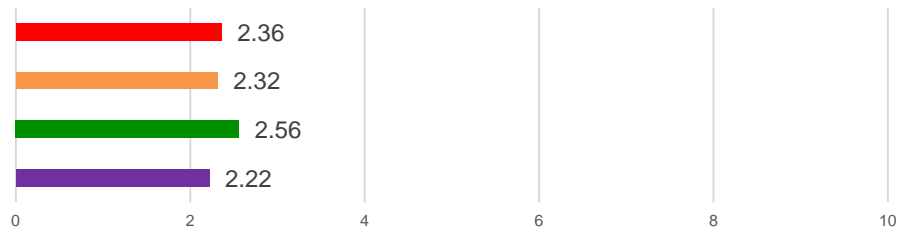
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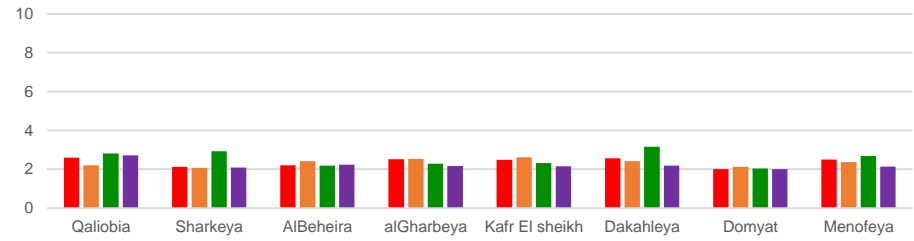
Session Failure Ratio



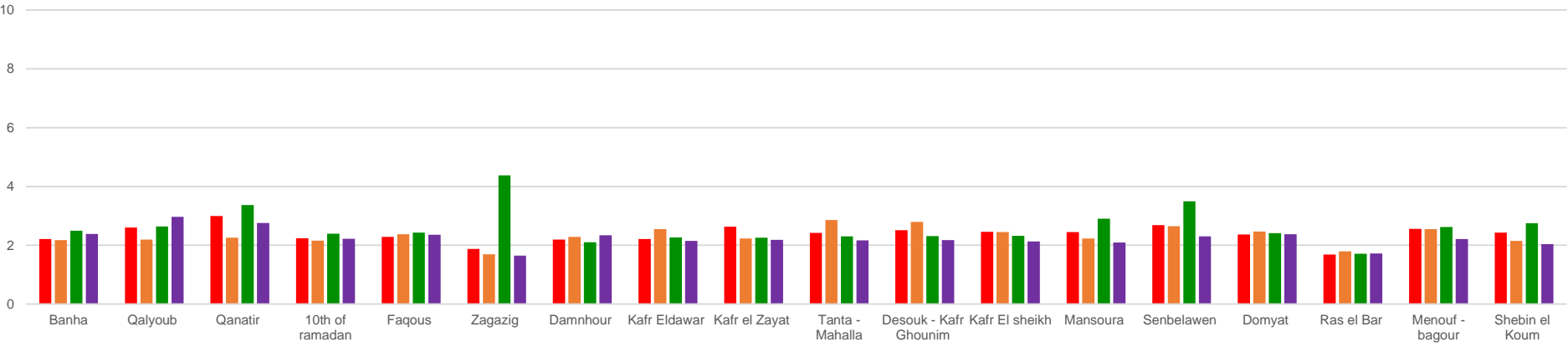
Average Session Setup - Overall



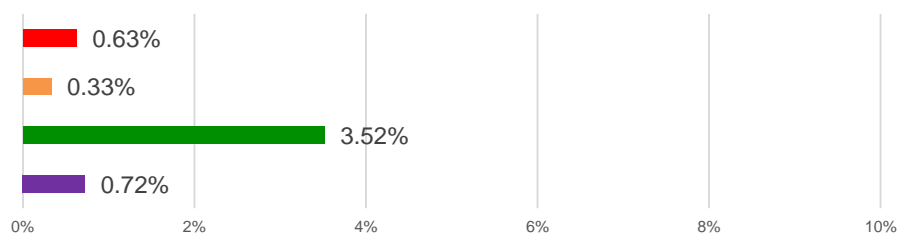
Average Session Setup - Zones



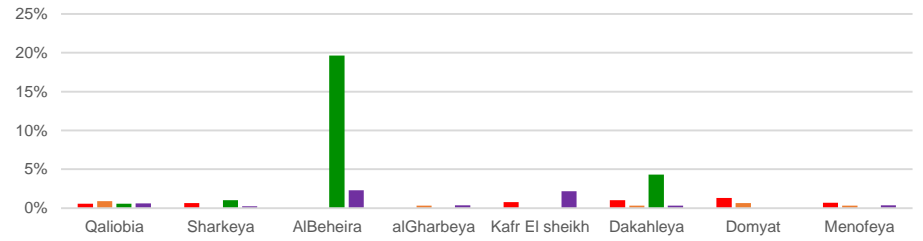
Average Session Time



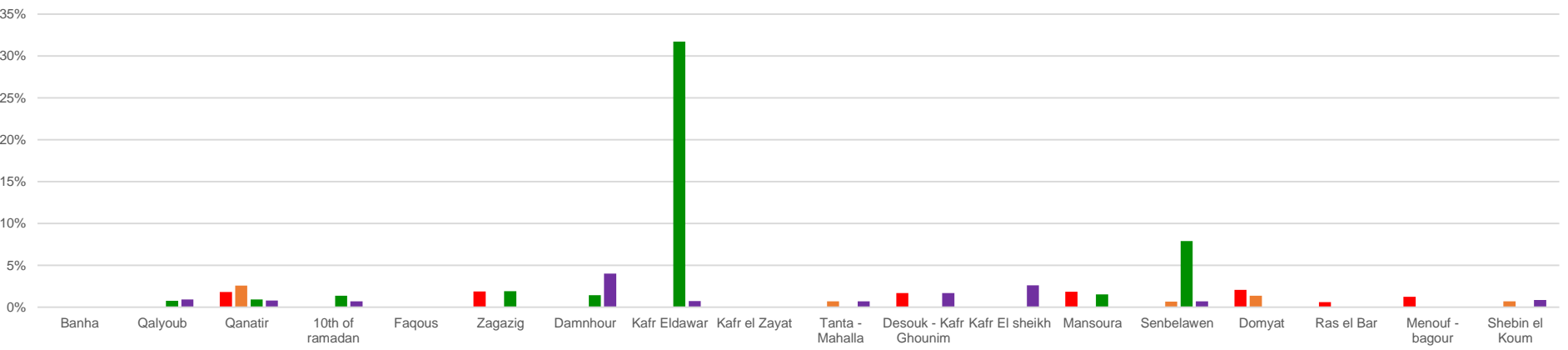
YouTube Session Failure Ratio - Overall



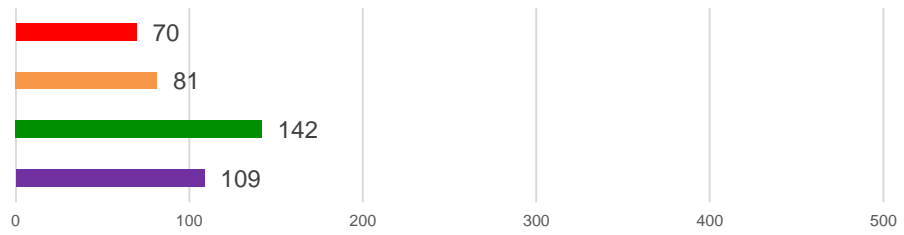
YouTube Session Failure Ratio - Zones



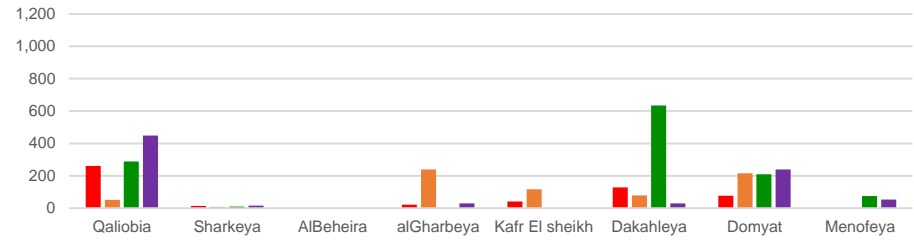
YouTube Session Failure Ratio



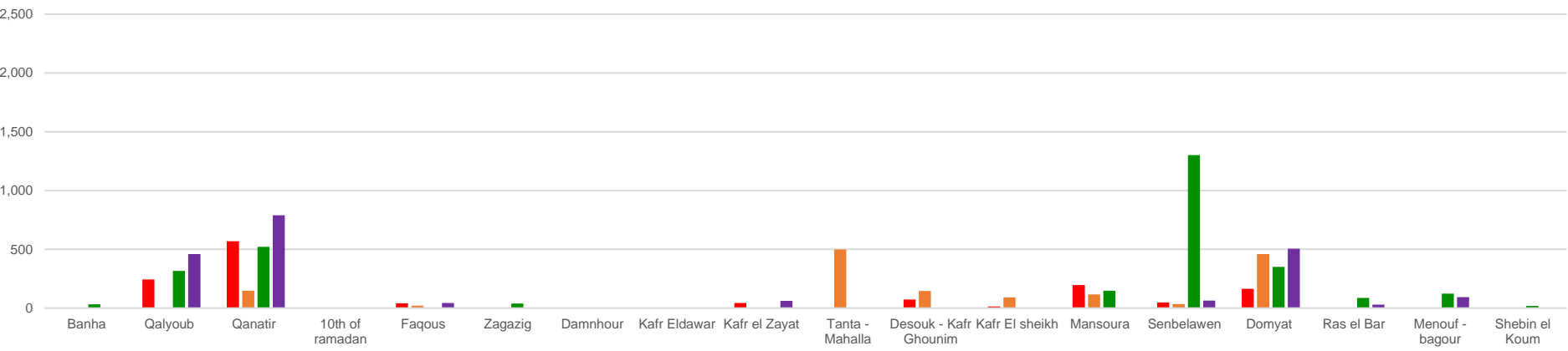
Freezing Time - Overall



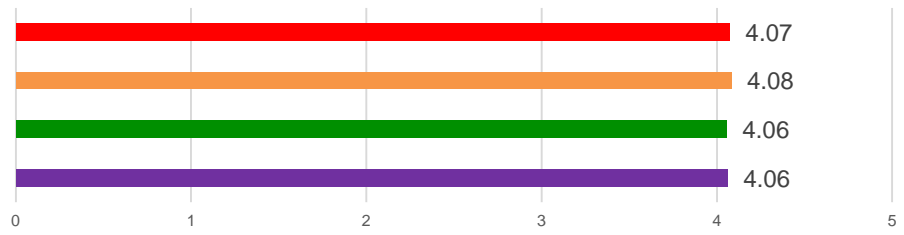
Freezing Time - Zones



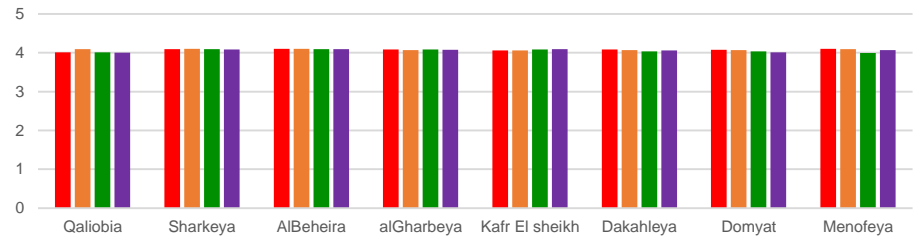
Freezing Time



Video Quality [VMOS] - Overall



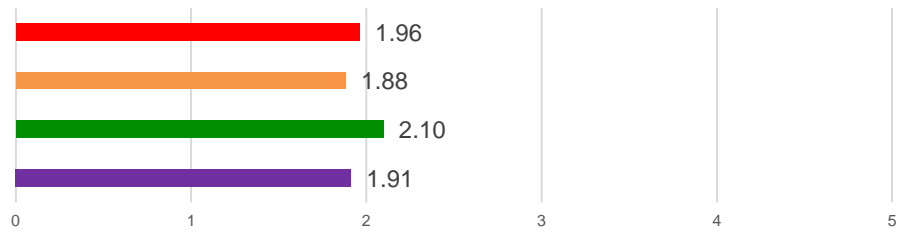
Video Quality [VMOS] - Zones



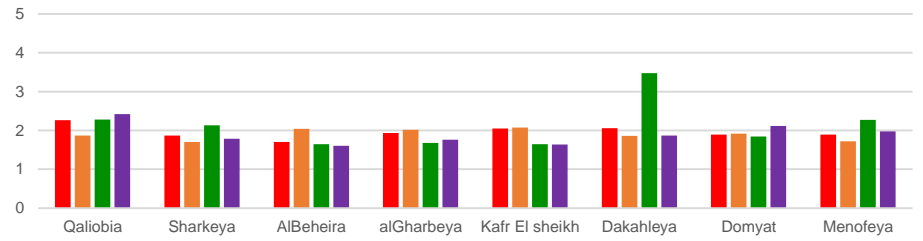
Video Quality - VMOS



Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

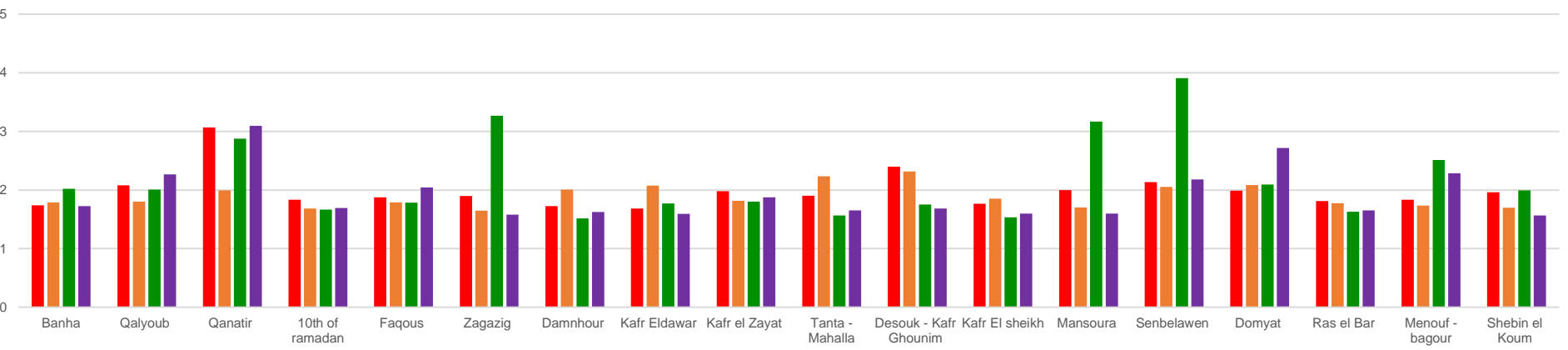
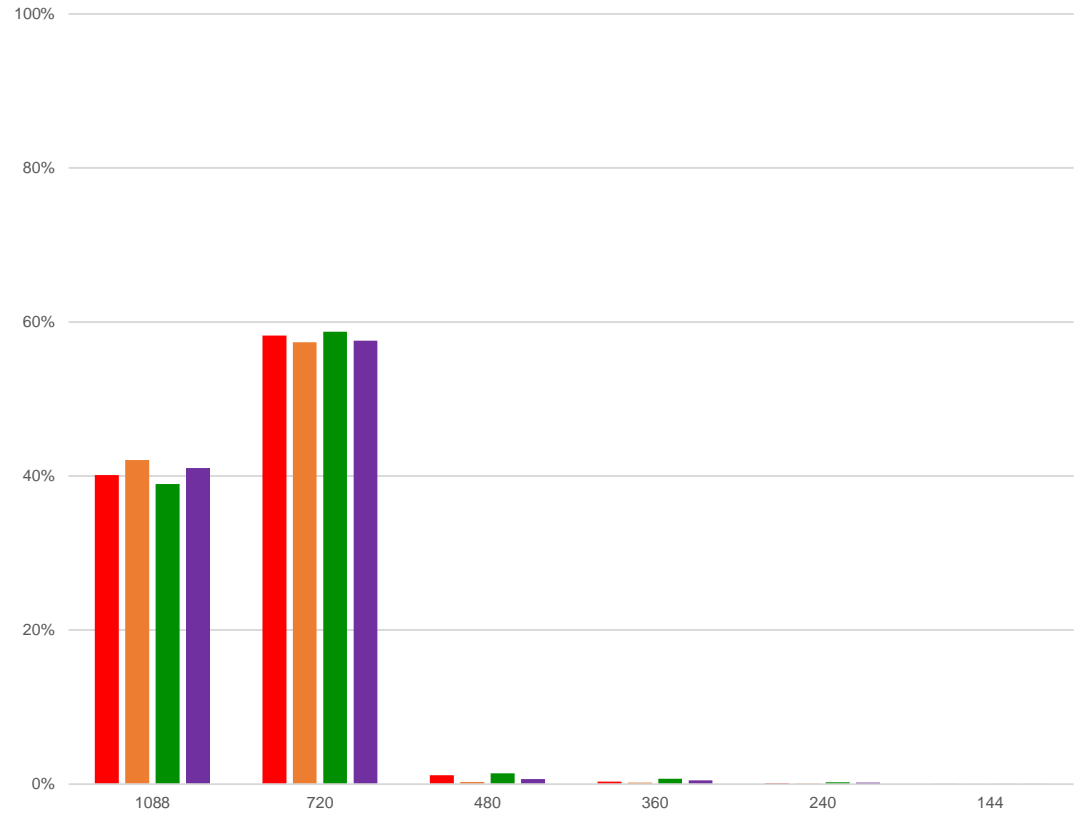


Image Resolution

Youtube - Image Resolution





**Canal  
Region  
KPIs**

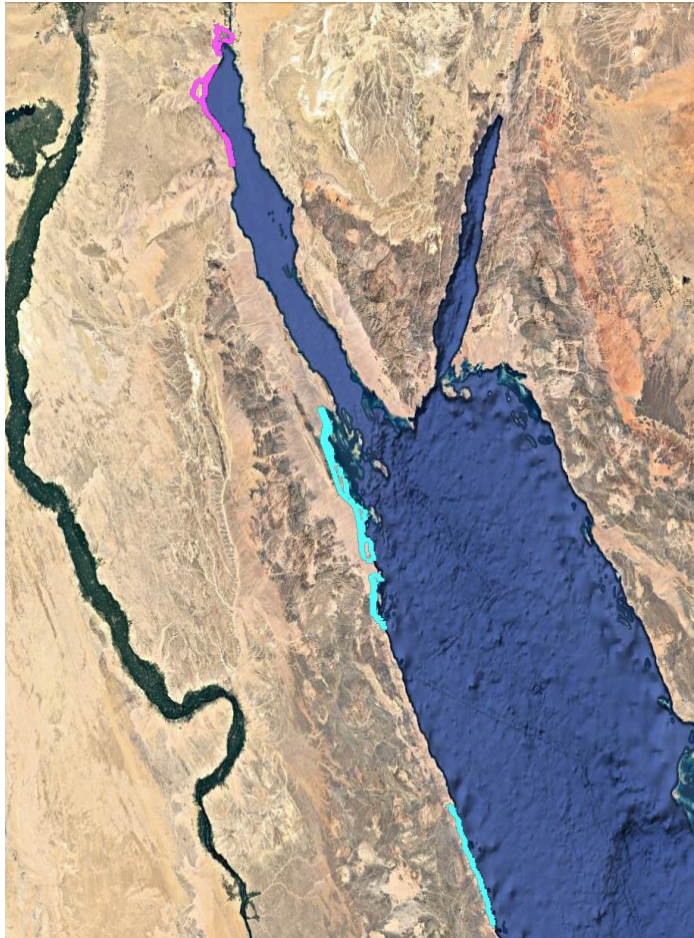


# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
- 10. Voice Service Quality & Performance - Canal**
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

# Zones Definition



### Canal City

Canal Z1	Fayed Abou Sultan Ismailia Qantara
Canal Z2	Sokhna Suez
Canal Z3	PortSaid
Canal Z4	Hurghada

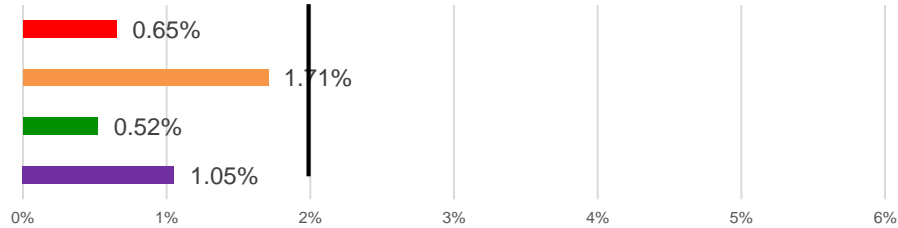
# Accessibility: Call Blocked Rate



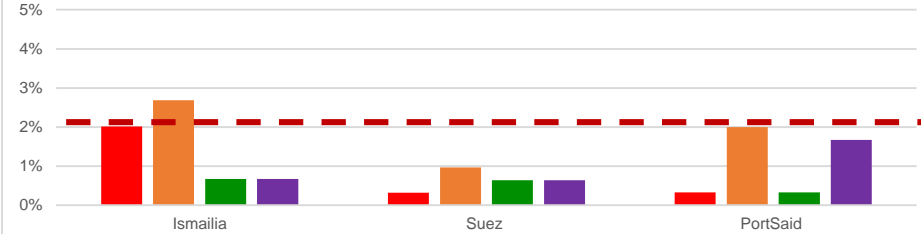
2/3/4G: Short Call



Call Blocked Rate - Overall

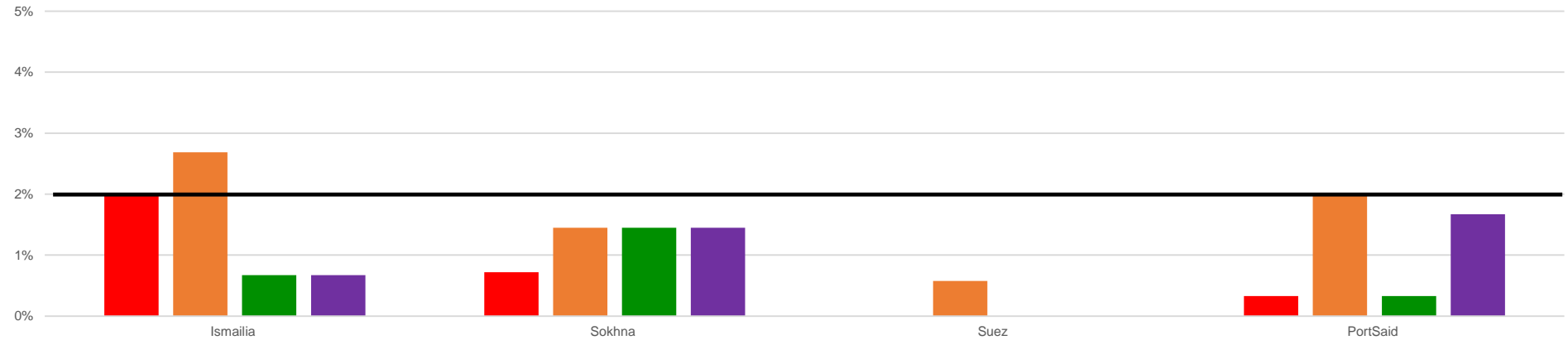


Call Blocked Rate - Zones

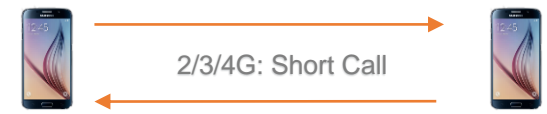


**Call Blocked Rate** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

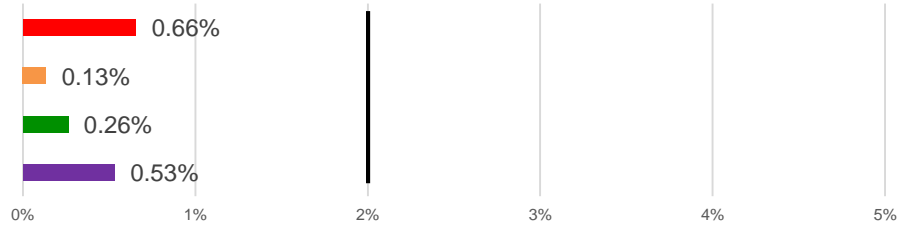
Call Blocked Rate



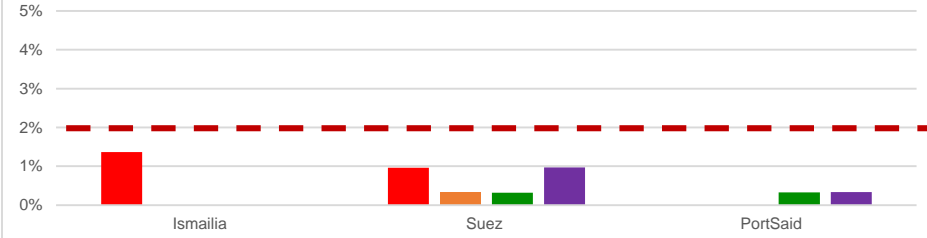
# Retainability: Call Dropped Rate



Voice Call Dropped Rate - Overall

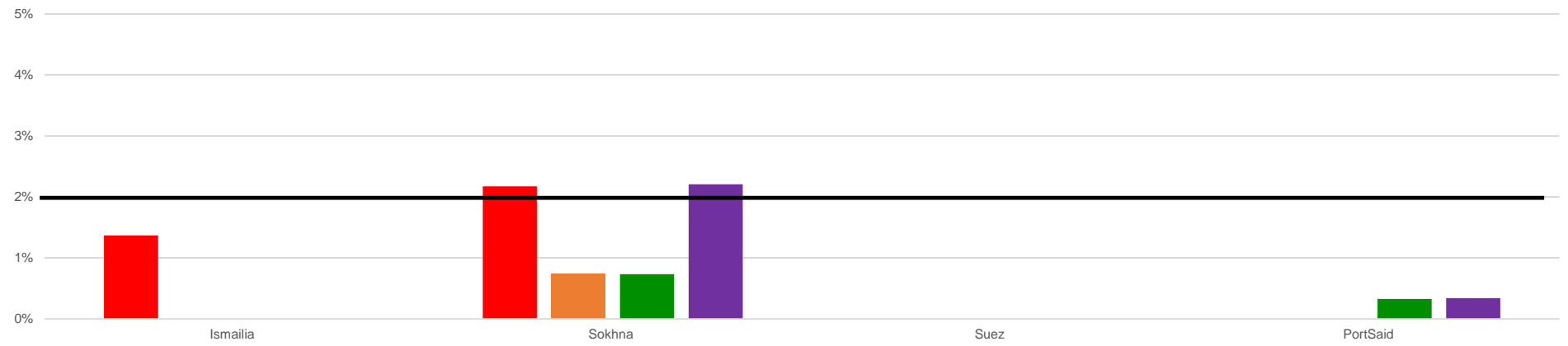


Voice Call Dropped Rate - Zones

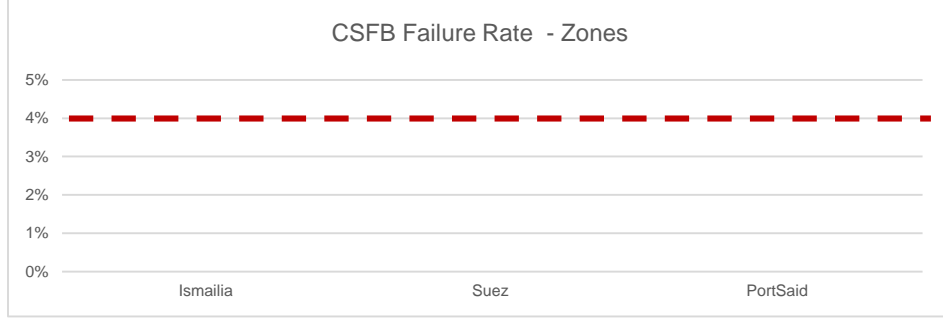
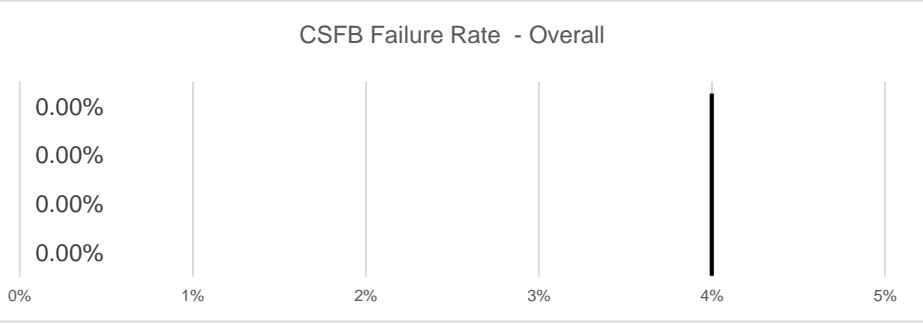
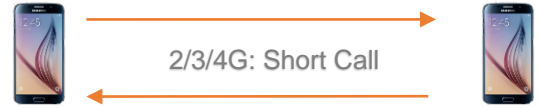


Voice Call Retainability is represented by call drop rates.

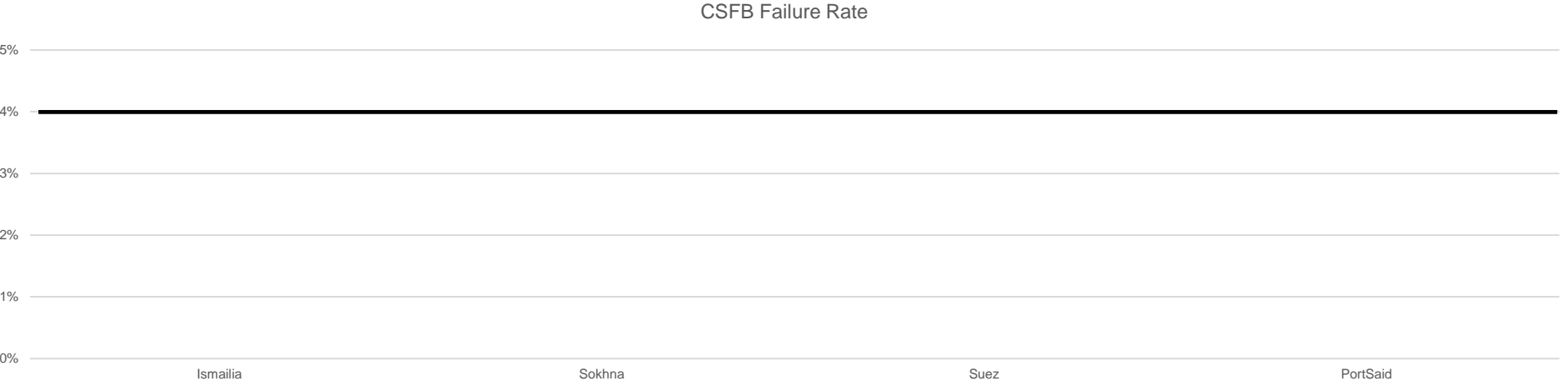
Voice Call Dropped Rate



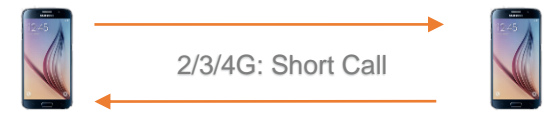
# Accessibility: CSFB Failure Rate [%]



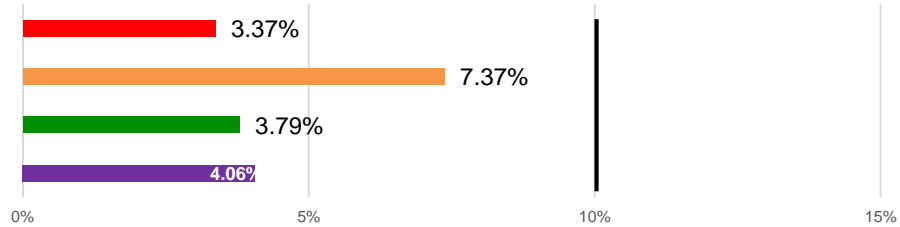
**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



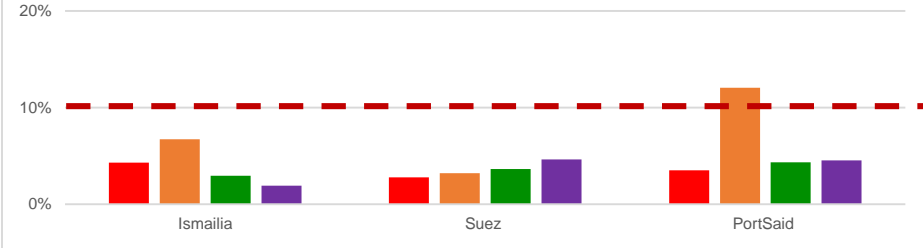
# Speech Quality: MOS Voice Speech Quality < 2.8



Voice Speech Quality on Sample < 2.8 - Overall

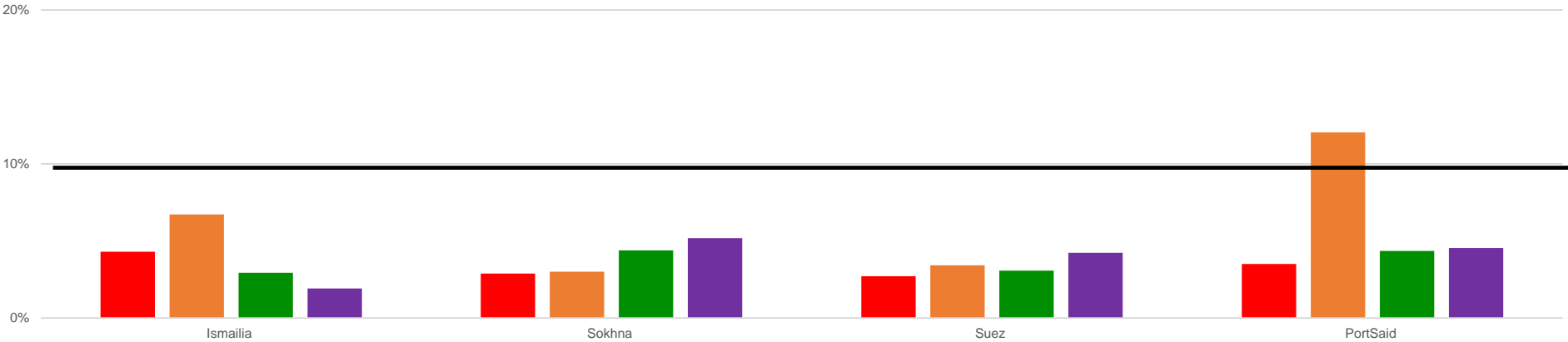


Voice Speech Quality on Sample < 2.8 - Zones

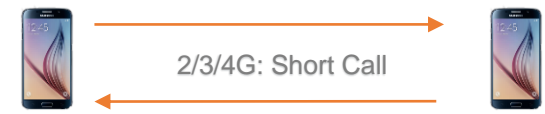


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

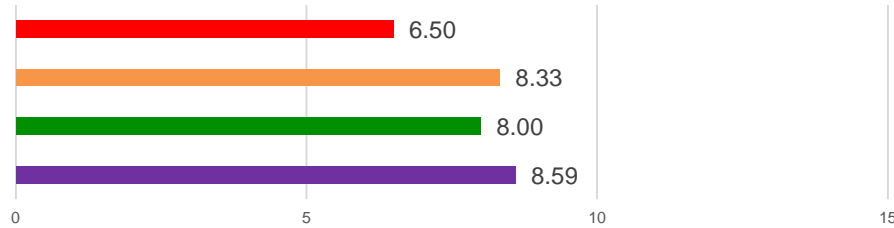
Voice Speech Quality on Sample < 2.8



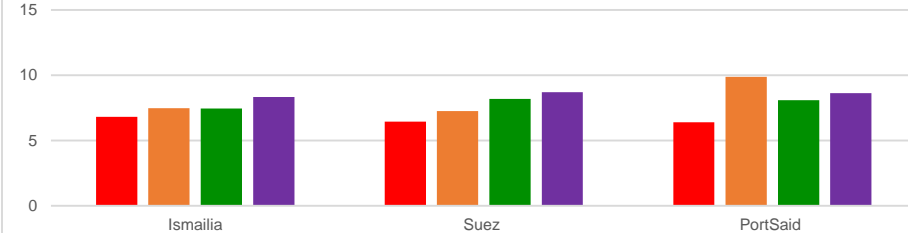
# Accessibility: Call Access Time [sec.]



Call Access Time - Overall

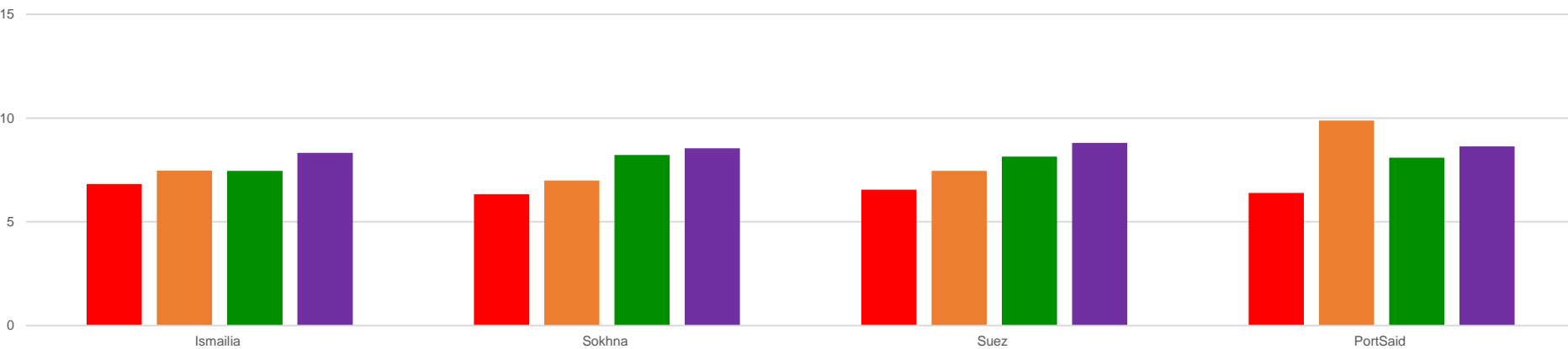


Call Access Time - Zones

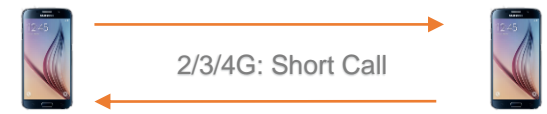


**Call Access** represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

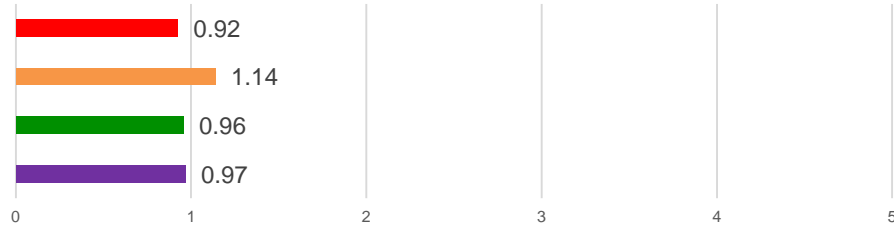
Call Access Time



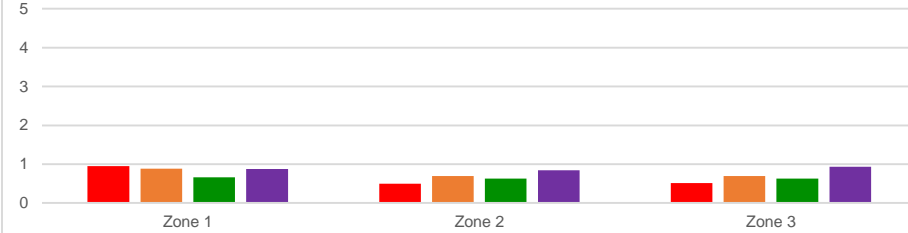
# Accessibility: CSFB Delay [sec.]



Circuit Switch Fall Back Delay - Overall

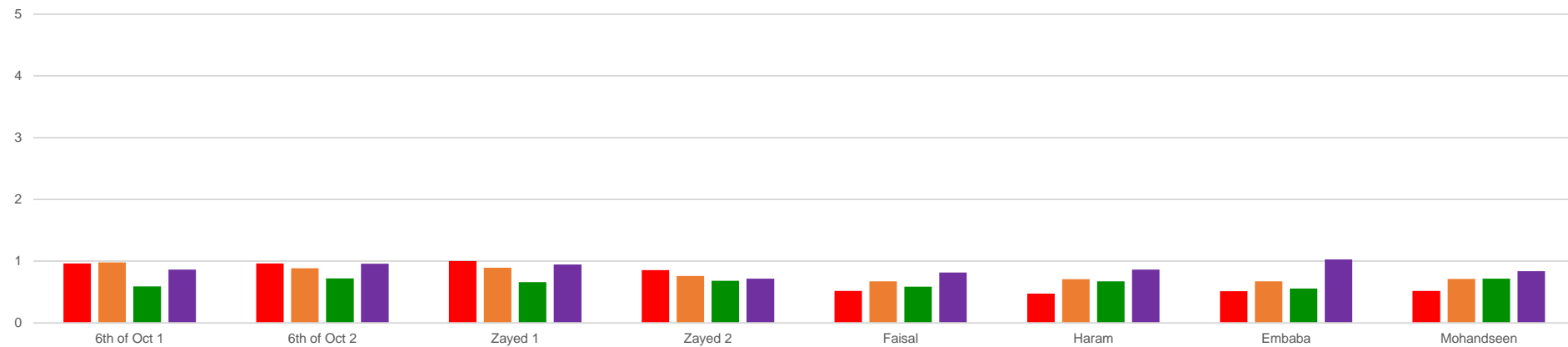


Circuit Switch Fall Back Delay - Zones



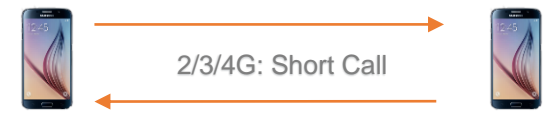
**CSFB Delay** represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

Circuit Switch Fall Back Delay

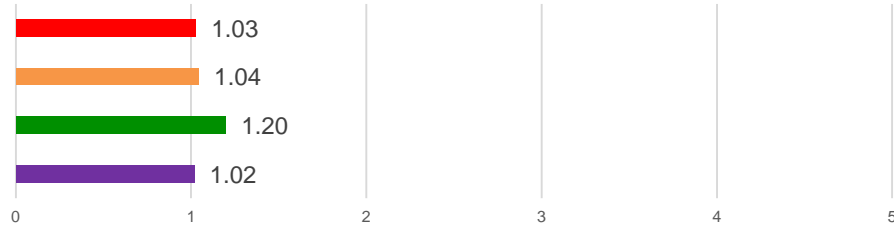




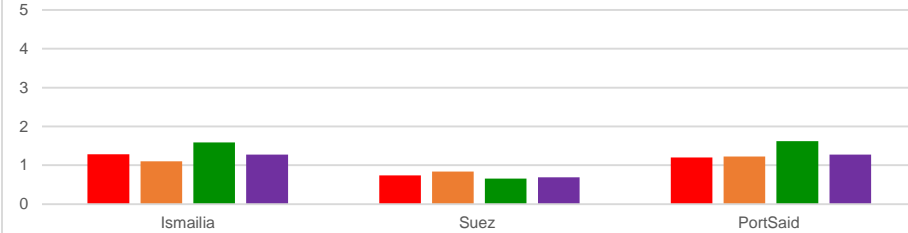
# Accessibility: Telephony Return Delay [sec.]



Telephony Return Delay - Overall

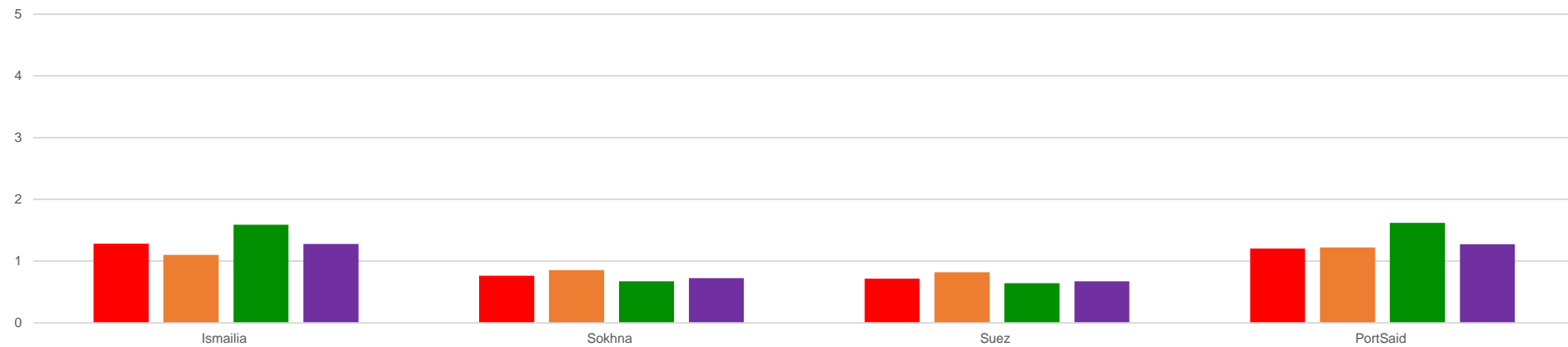


Telephony Return Delay - Zones



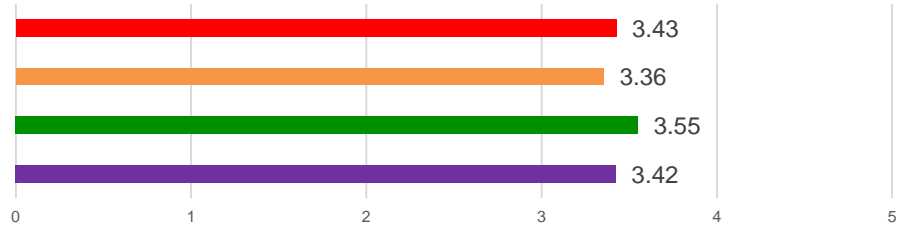
**Telephony Return Delay** *measures the time that a UE uses to re-join the LTE (4G) network after call end*

Telephony Return Delay

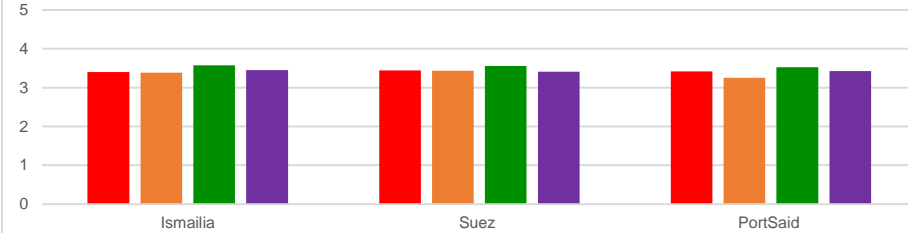


# Speech Quality: MOS Scores

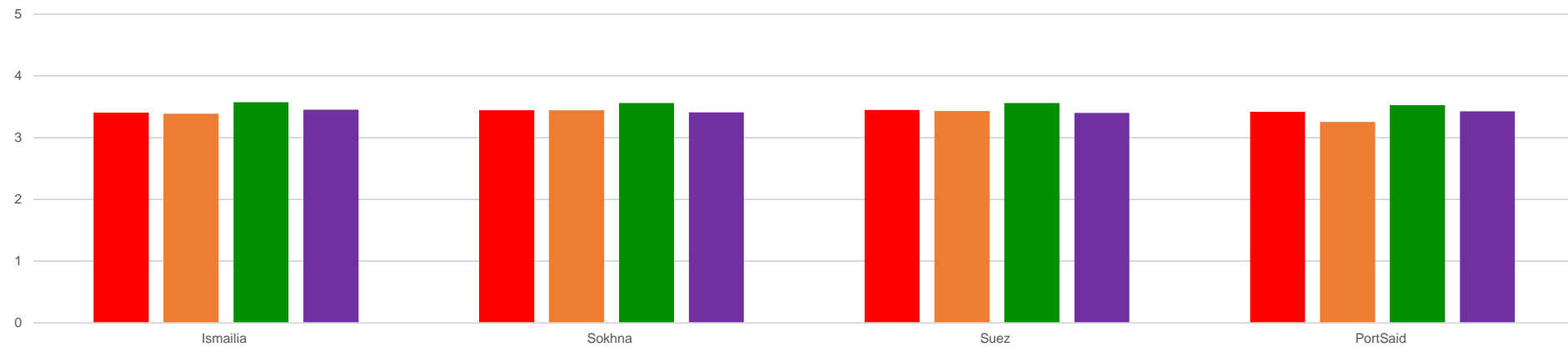
Voice Speech Quality - Overall



Voice Speech Quality - Zones



Voice Speech Quality



# Speech Quality: Call technology Usage & Codec Base Usage

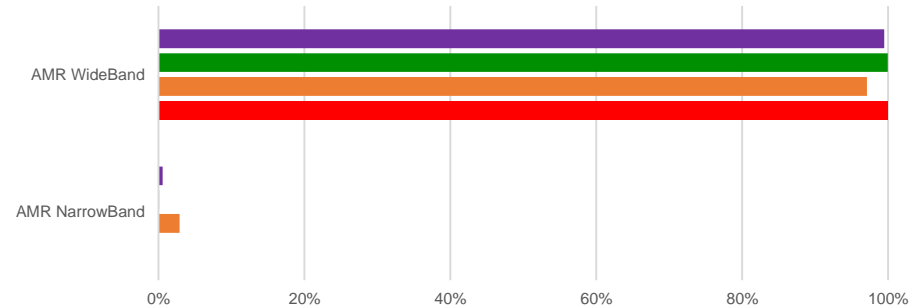
Call Technology Usage Overall



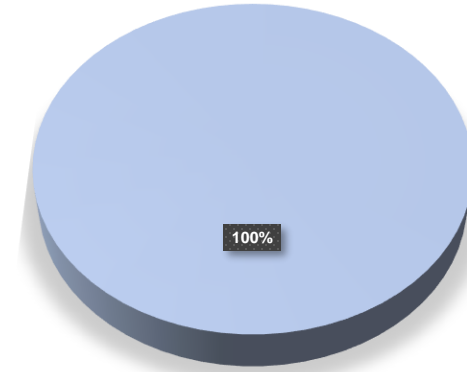
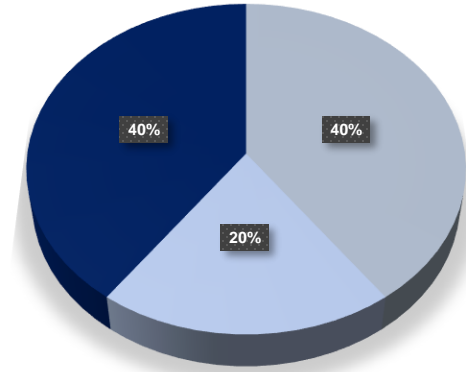
**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

Codec Base Usage

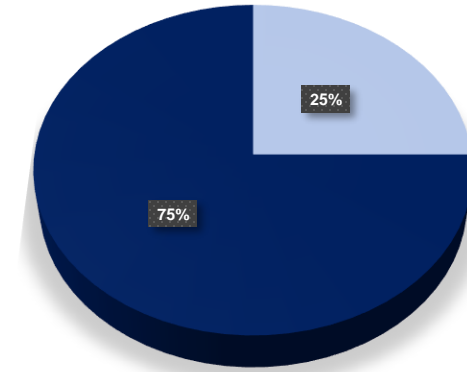
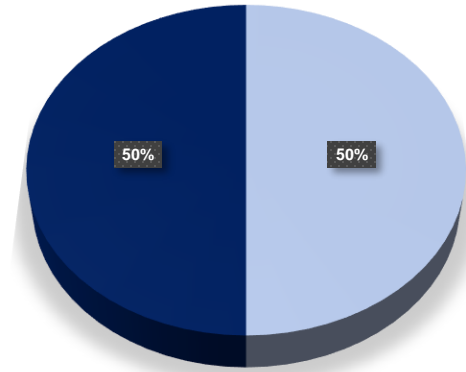


# Analysis: Dropped Calls Causes



- 2G Quality
- 3G Quality
- RAN Issue

■ 3G Quality



- 3G Quality
- RAN Issue

■ 3G Quality  
■ RAN Issue

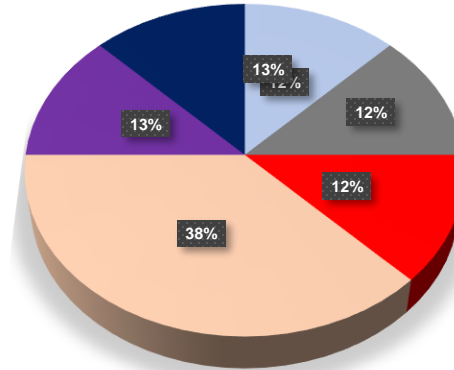
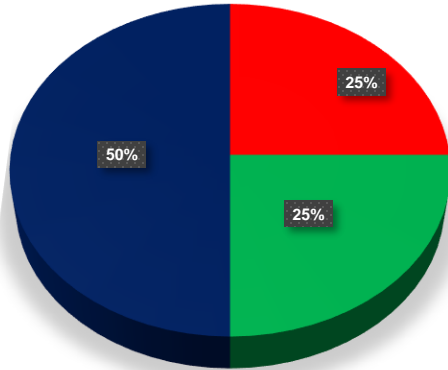
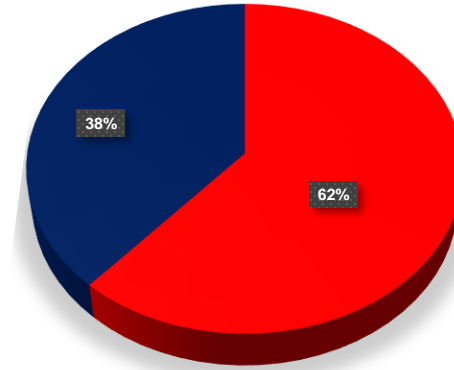
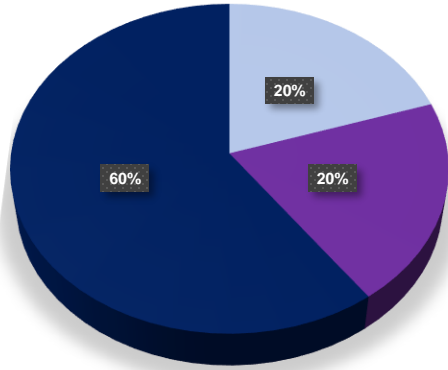
# All Operators: Dropped Calls Locations 1/2



## All Operators: Dropped Calls Locations 2/2



# Analysis: Failed Calls Causes



- No service
- Other
- RAN Issue

- CSFB Issue
- RAN Issue

- CSFB Issue
- No service
- RAN Issue

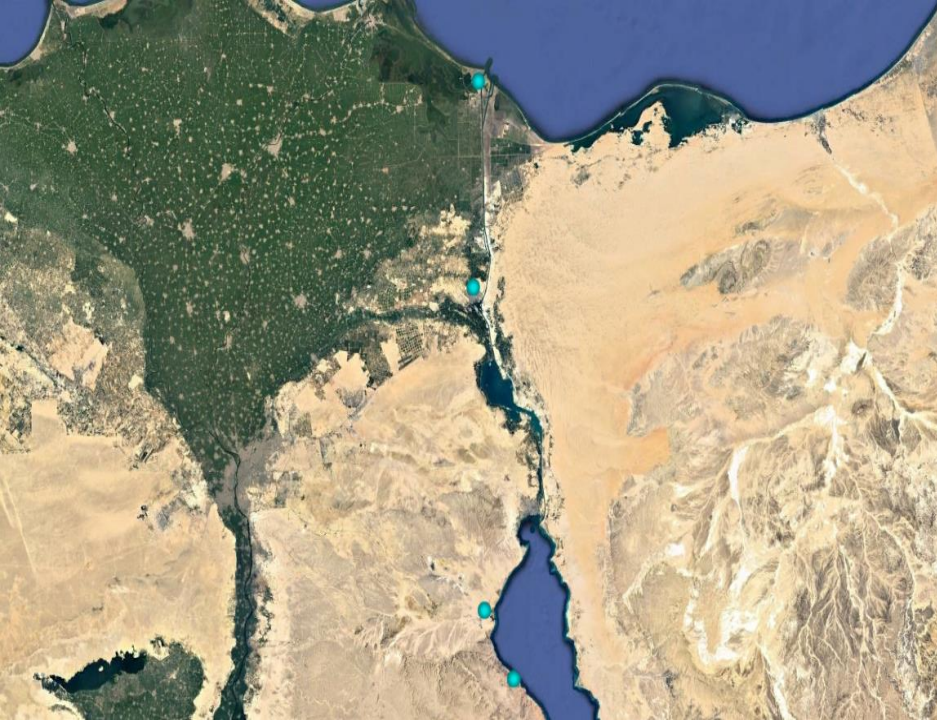
- 3G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- Other
- RAN Issue

# All Operators: Blocked Calls Locations 1/2





# All Operators: Blocked Calls Locations 2/2



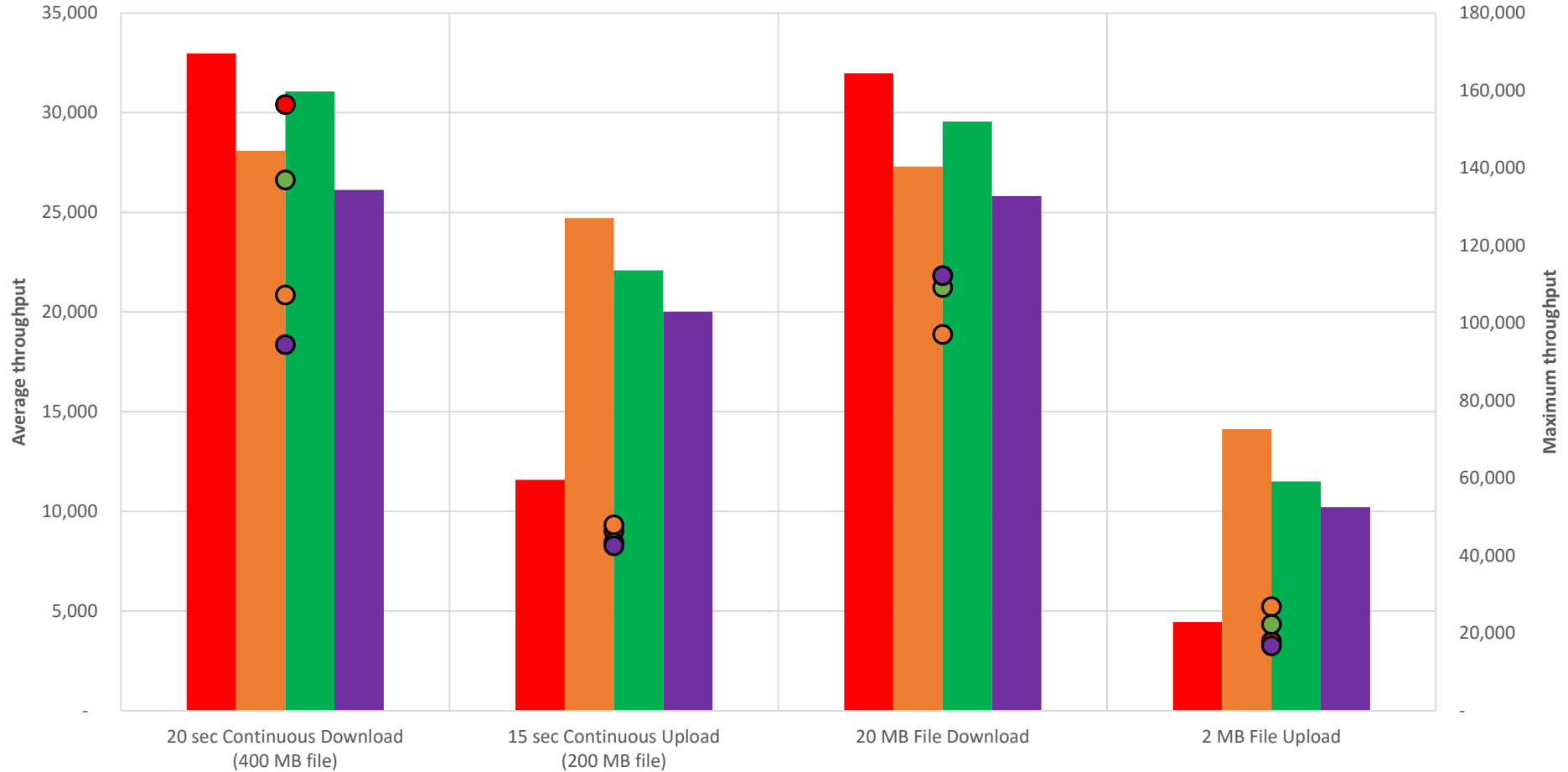
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10. Voice Service Quality & Performance - Canal
- 11. Data Service Quality & Performance – Canal**
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

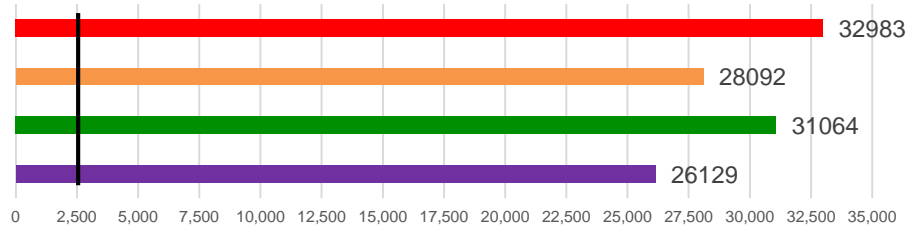
## NETWORK PERFORMANCE TEST

## USER EXPERIENCE TEST

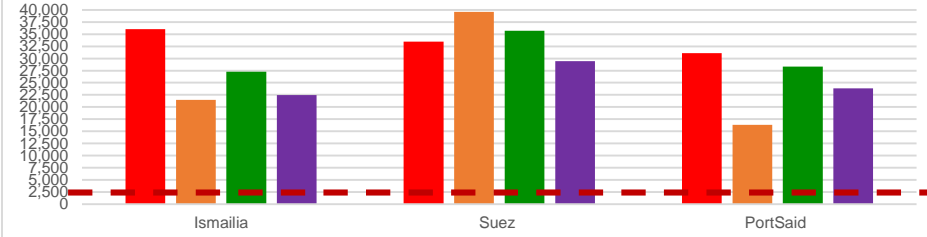


# FDTT HTTP Download Transfer Throughput – Network Performance

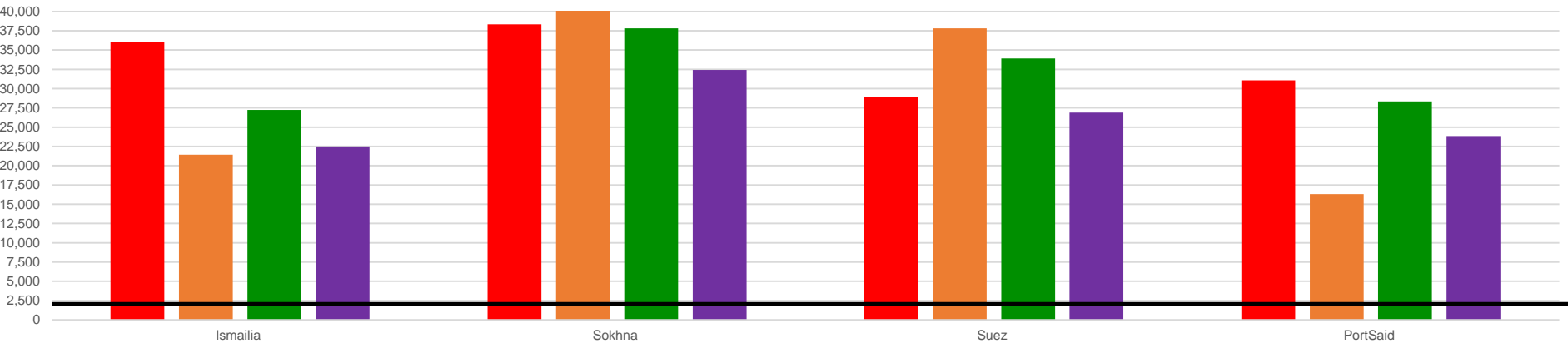
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones

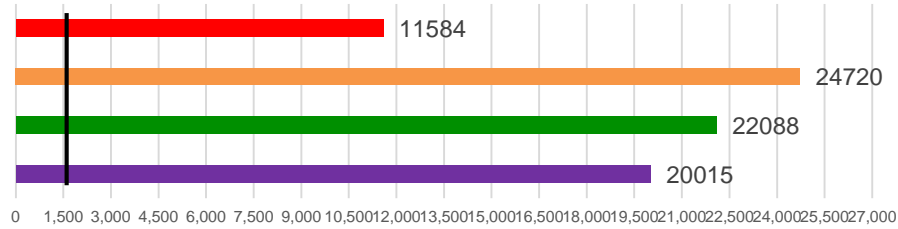


400 MB File FDTT HTTP Download Throughput [kbps]

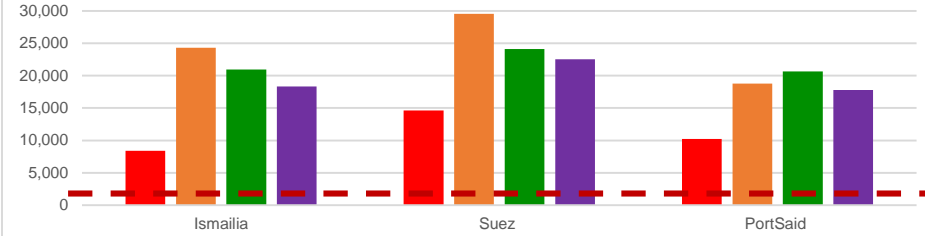


# FDTT HTTP Upload Transfer Throughput – Network Performance

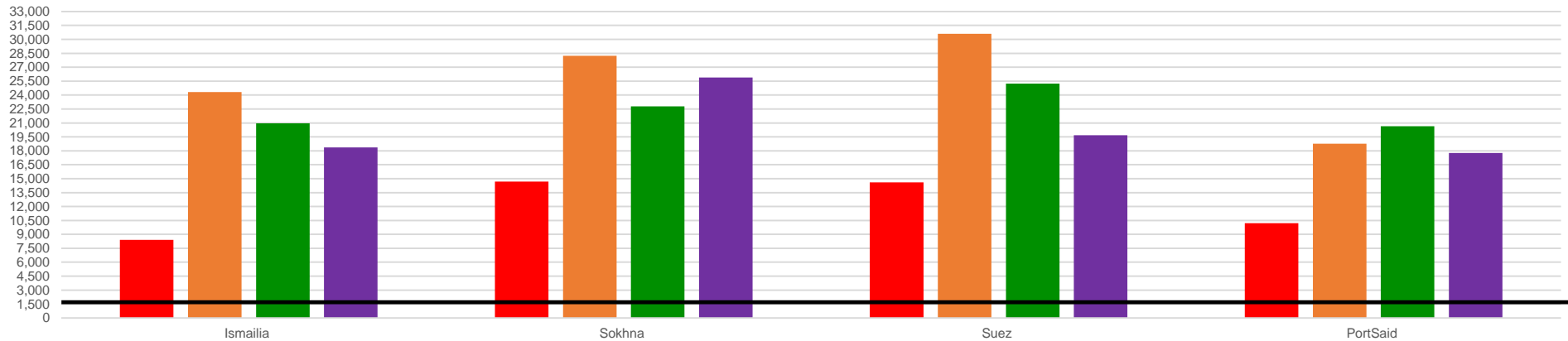
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones



200 MB FDTT HTTP Upload Throughput [kbps]

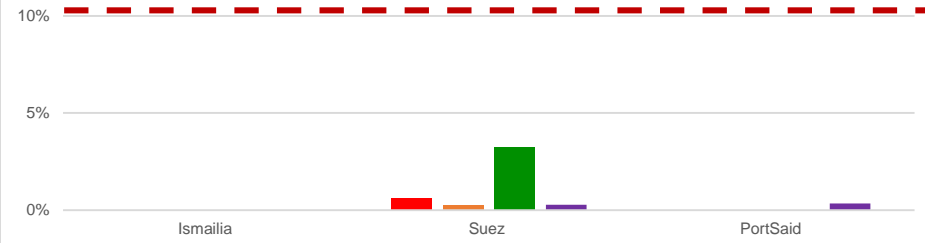


# HTTP Download Session Blocked Rates

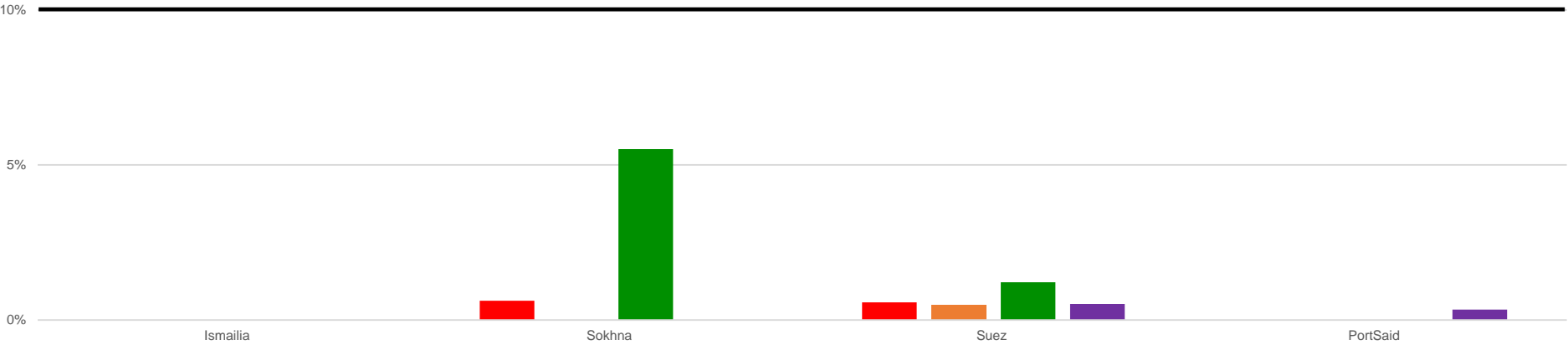
Download Session Blocked Ratio - Overall



Download Session Blocked Ratio - Zones

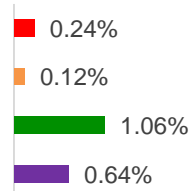


Download Session Blocked Ratio

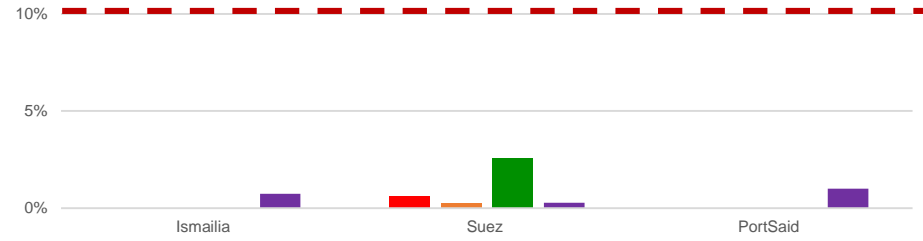


# HTTP Upload Session Blocked Rates

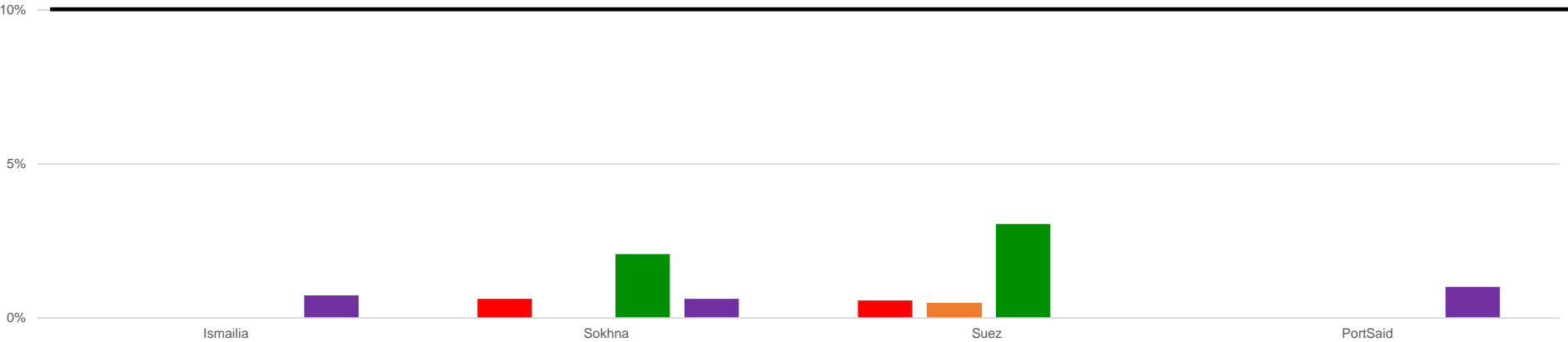
Upload Session Blocked Ratio - Overall



Upload Session Blocked Ratio - Zones



Upload Session Blocked Ratio

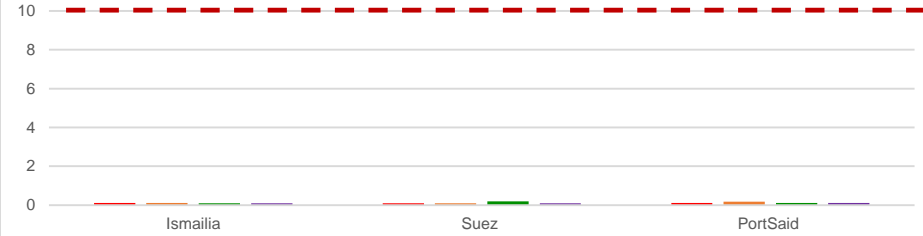


# HTTP Download Average Session Setup Time

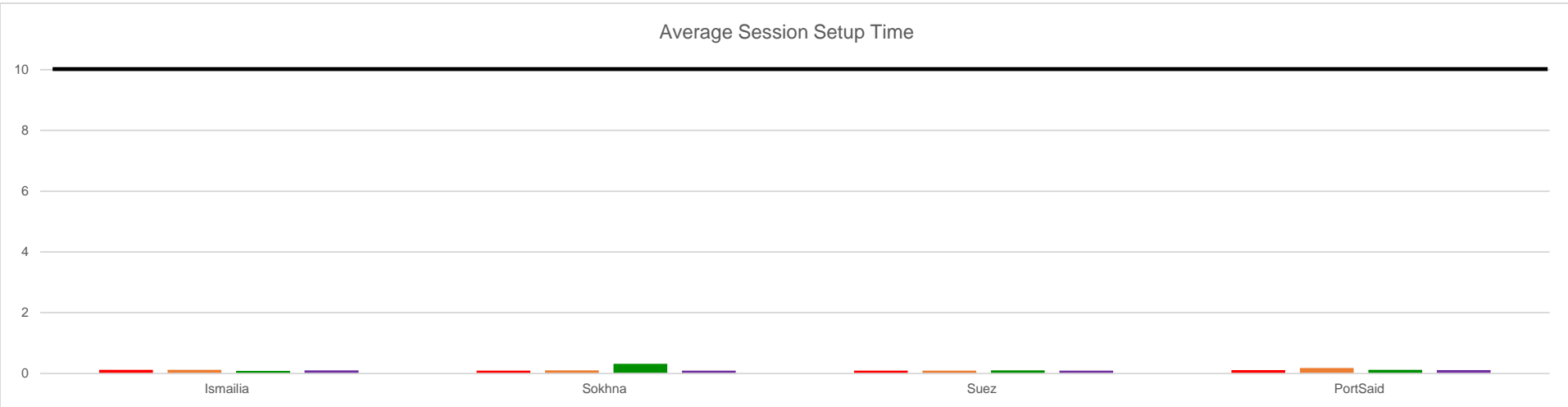
Average Session Setup Time [sec] - Overall



Average Session Setup Time - Zones



Average Session Setup Time



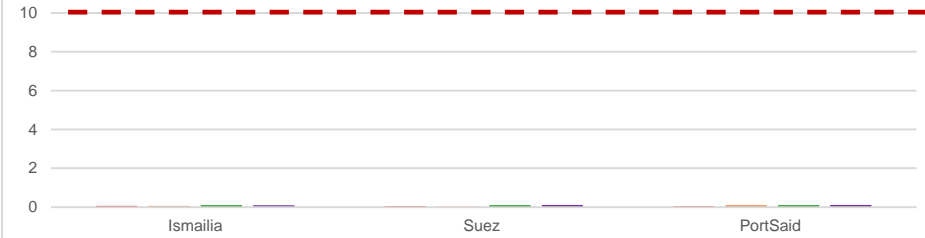


# HTTP Upload Average Session Setup Time

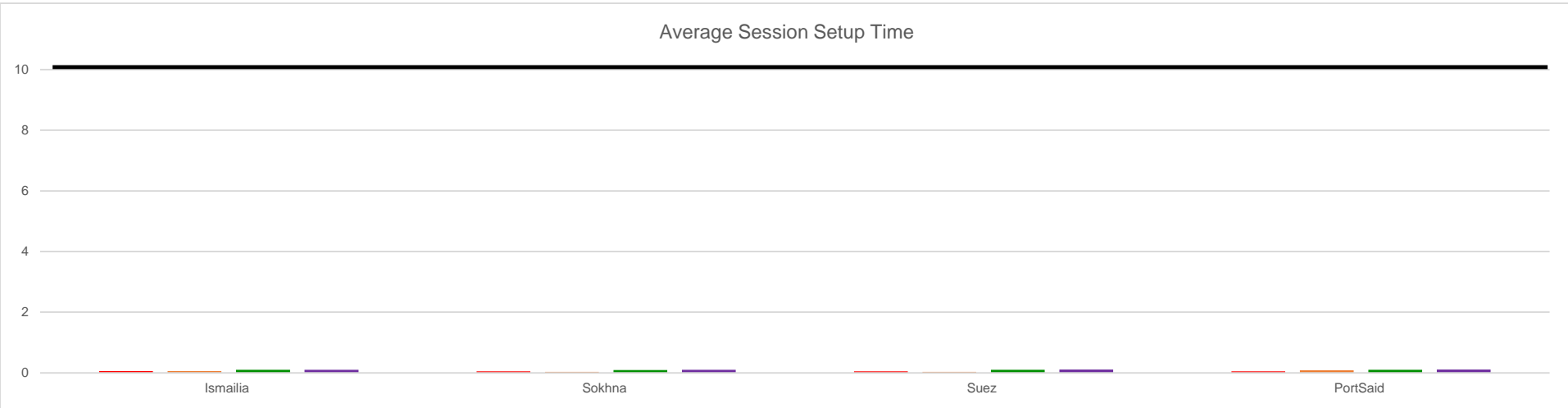
Average Session Setup Time [sec] - Overall



Average Session Setup Time - Zones

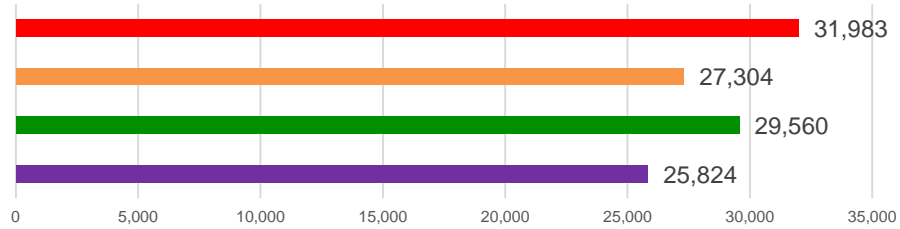


Average Session Setup Time

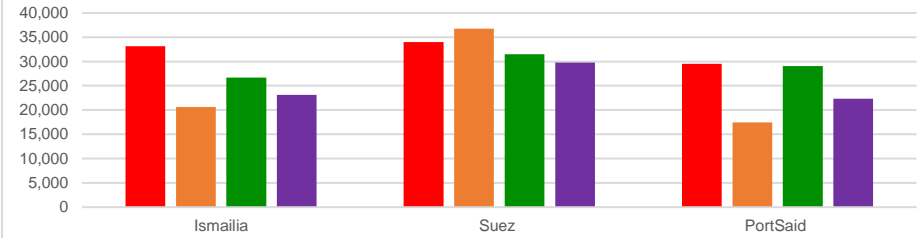


# HTTP Download Throughput – Customer Experience

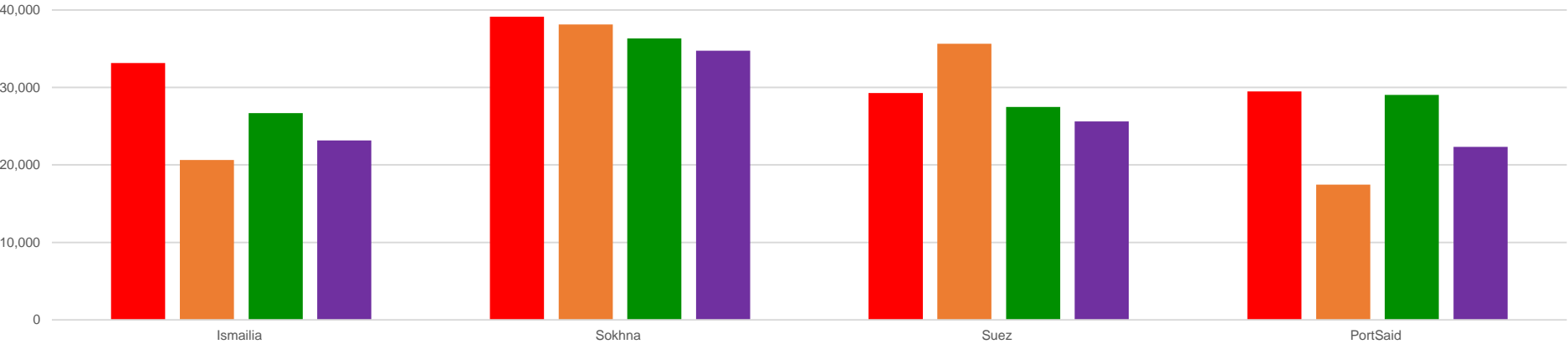
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones

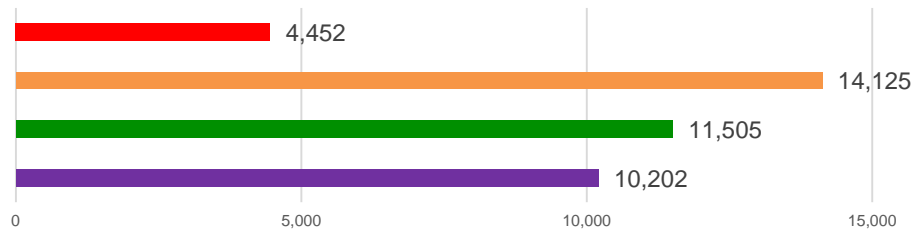


20MB Download Throughput [kbps]

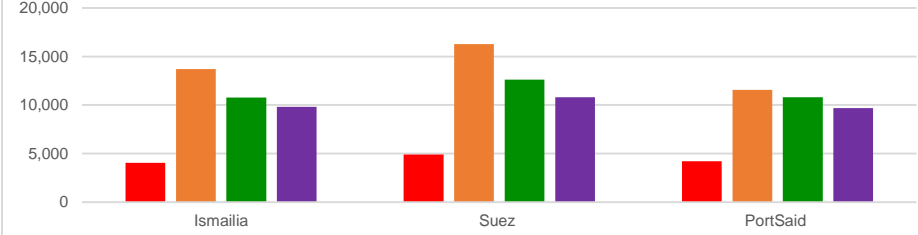


# HTTP Upload Throughput – Customer Experience

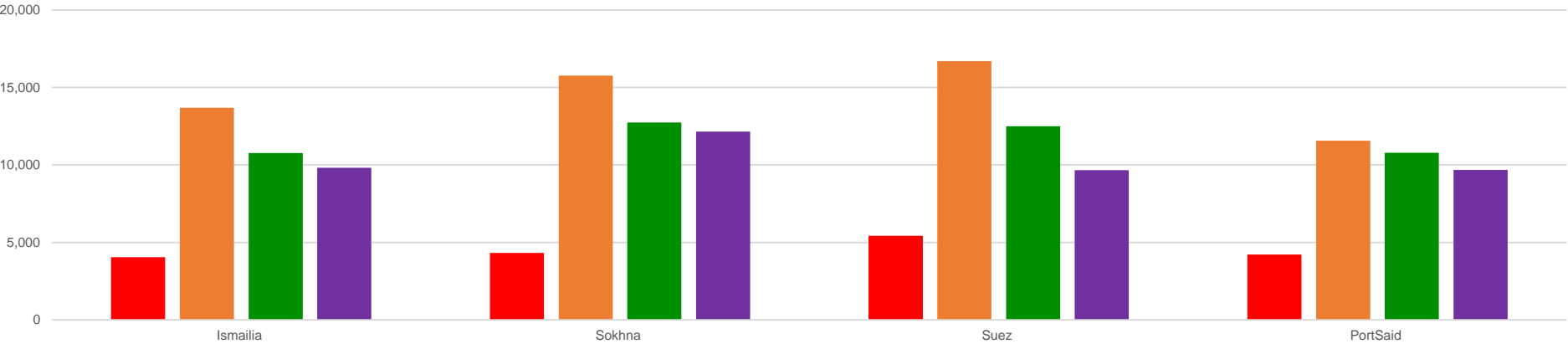
2MB Upload Throughput [kbps] - Overall



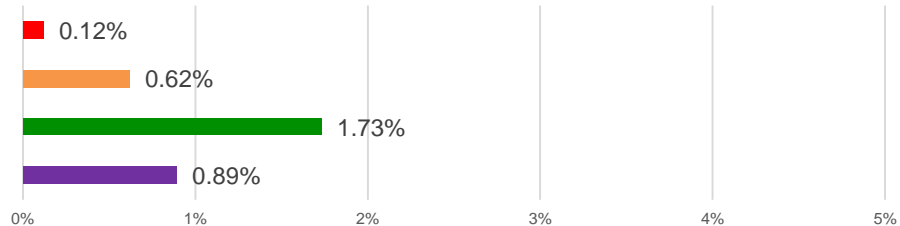
2MB Upload Throughput [kbps] - Zones



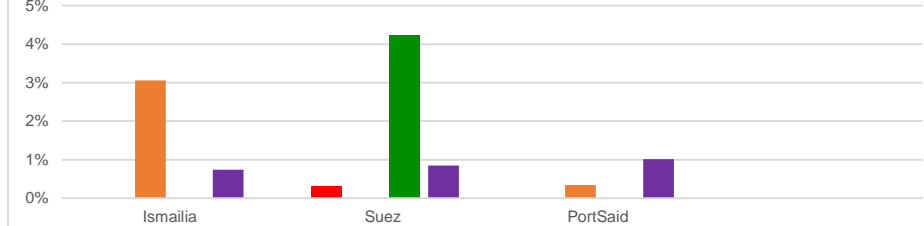
2MB Upload Throughput [kbps]



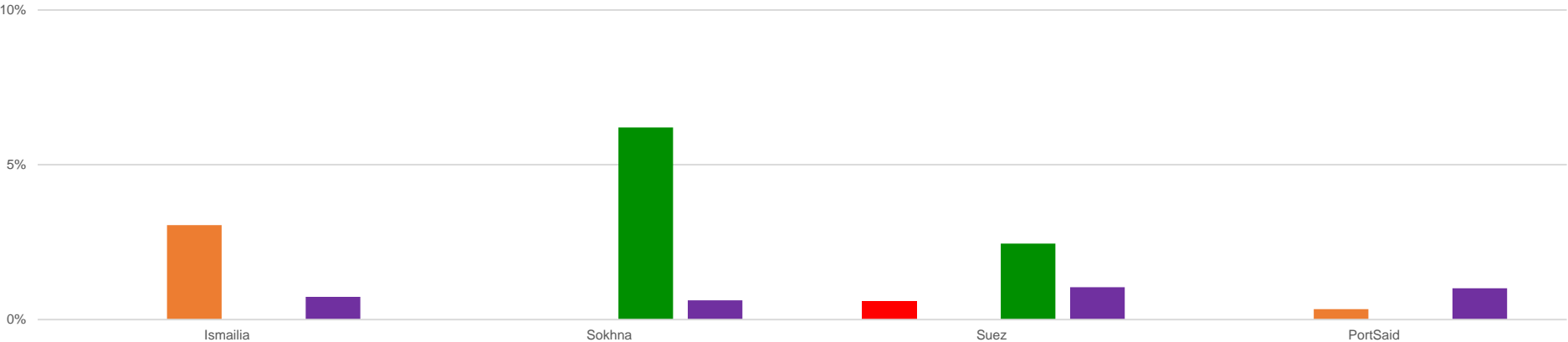
Session Failure Ratio - Overall



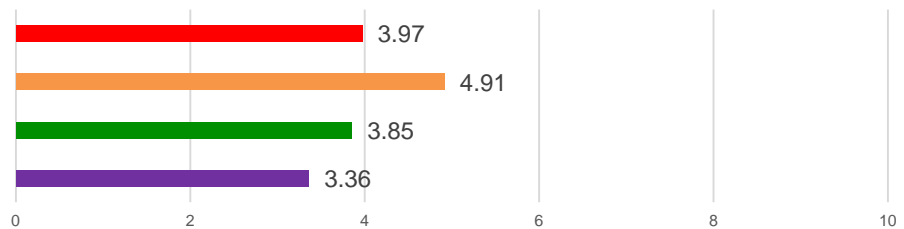
Session Failure Ratio - Zones



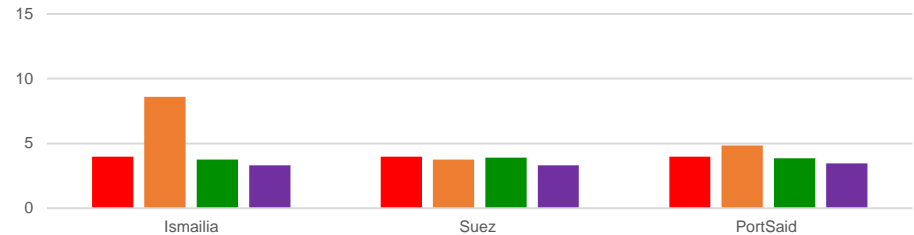
Session Failure Ratio



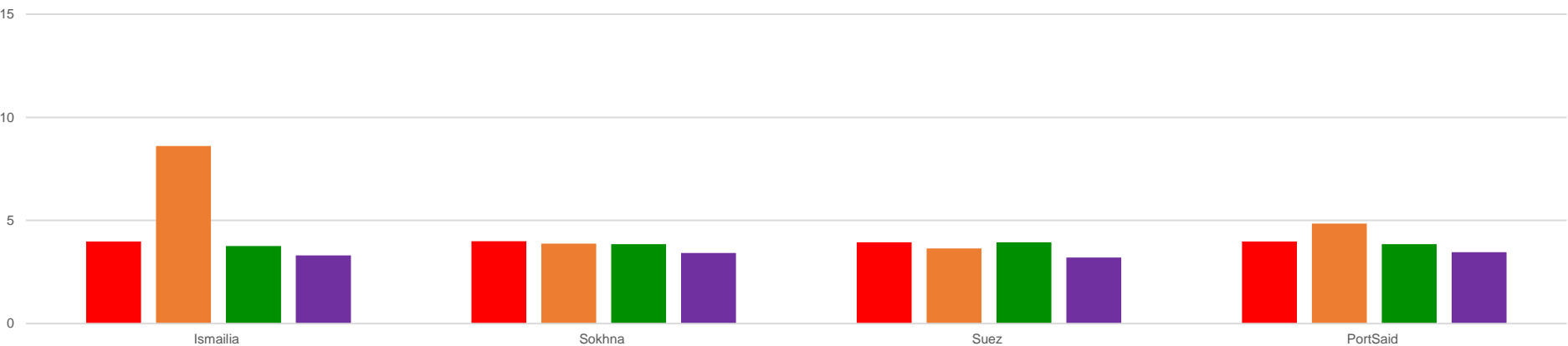
Average Session Time - Overall



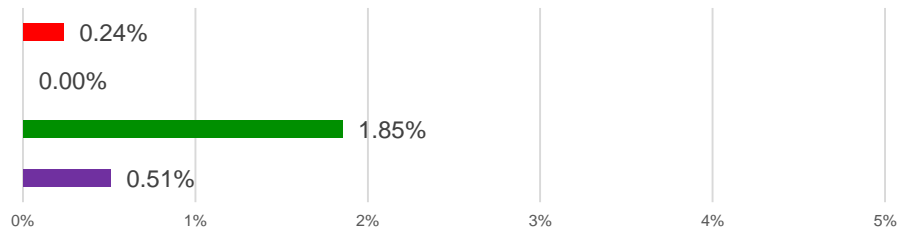
Average Session Time - Zones



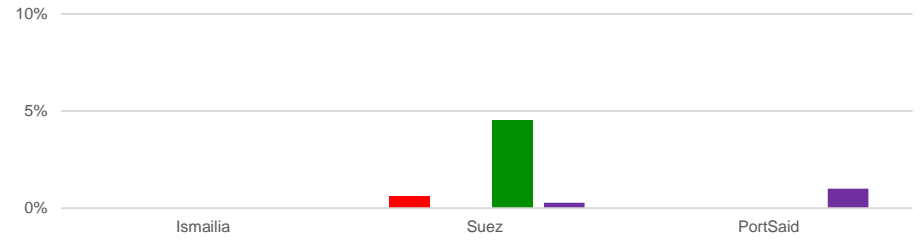
Average Session Time



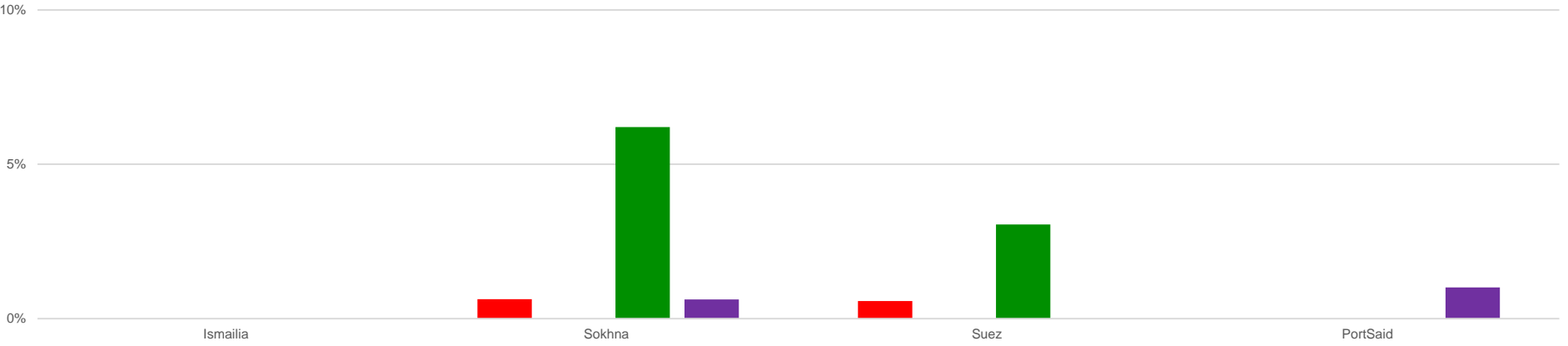
Session Failure Ratio - Overall



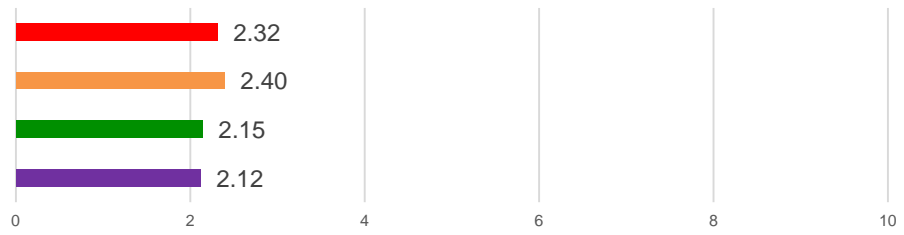
Session Failure Ratio - Zones



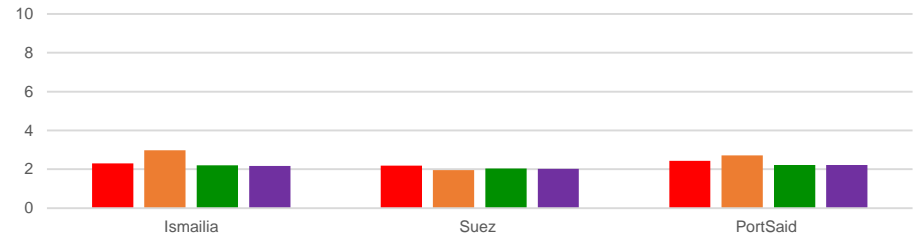
Session Failure Ratio



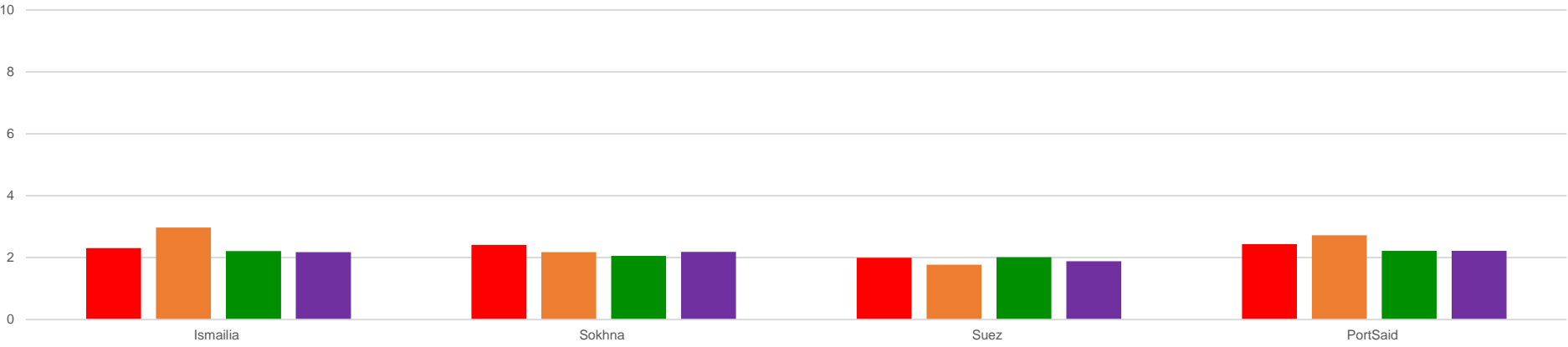
### Average Session Time - Overall



### Average Session Time - Zones

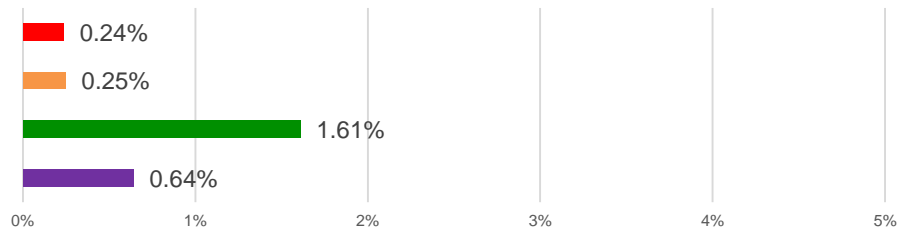


### Average Session Time

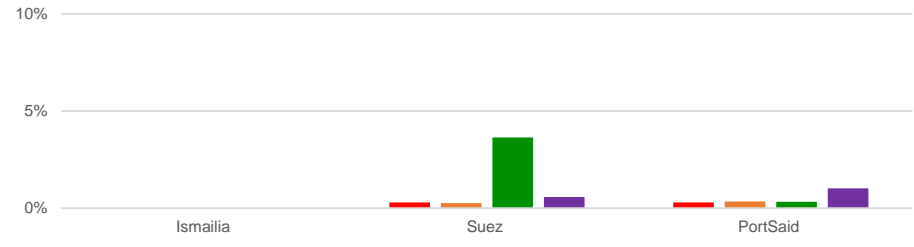


# YouTube Session Failure Ratio

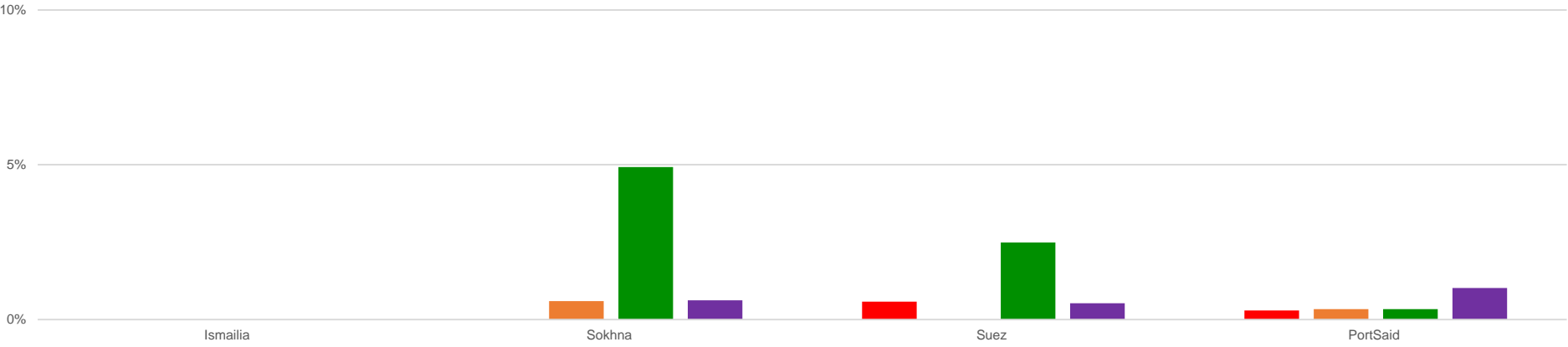
YouTube Session Failure Ratio - Overall



YouTube Session Failure Ratio - Zones



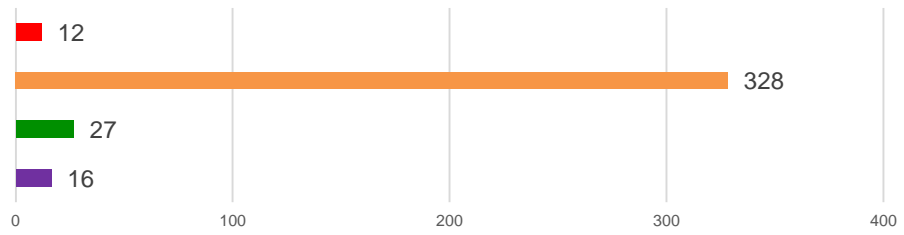
YouTube Session Failure Ratio



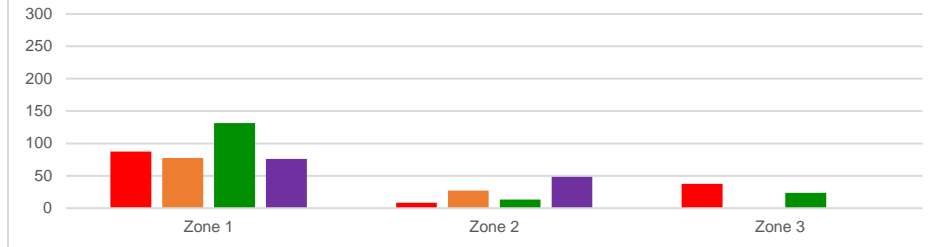


# YouTube Freezing Time [msec]

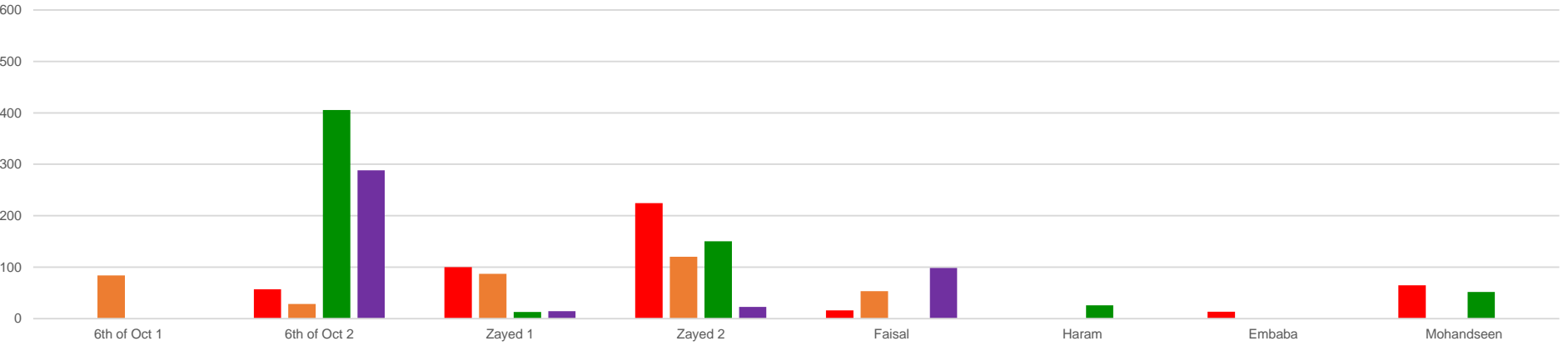
Freezing Time - Overall



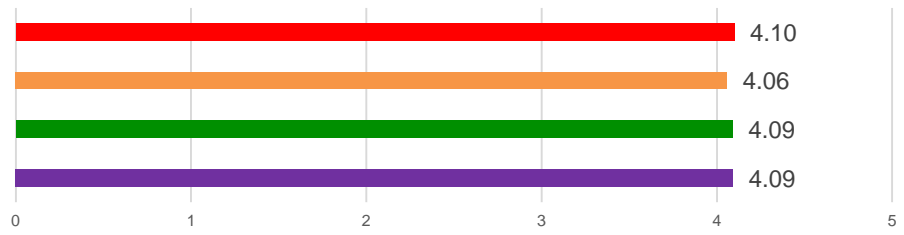
Freezing Time - Zones



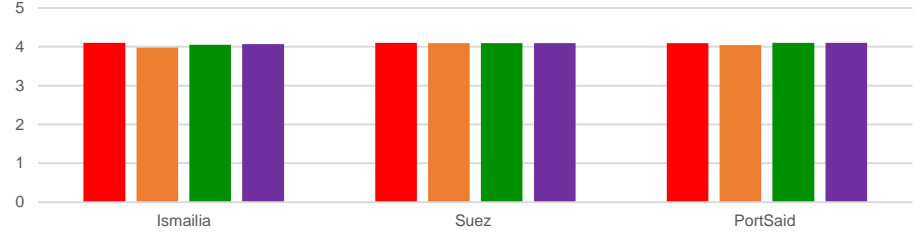
Freezing Time



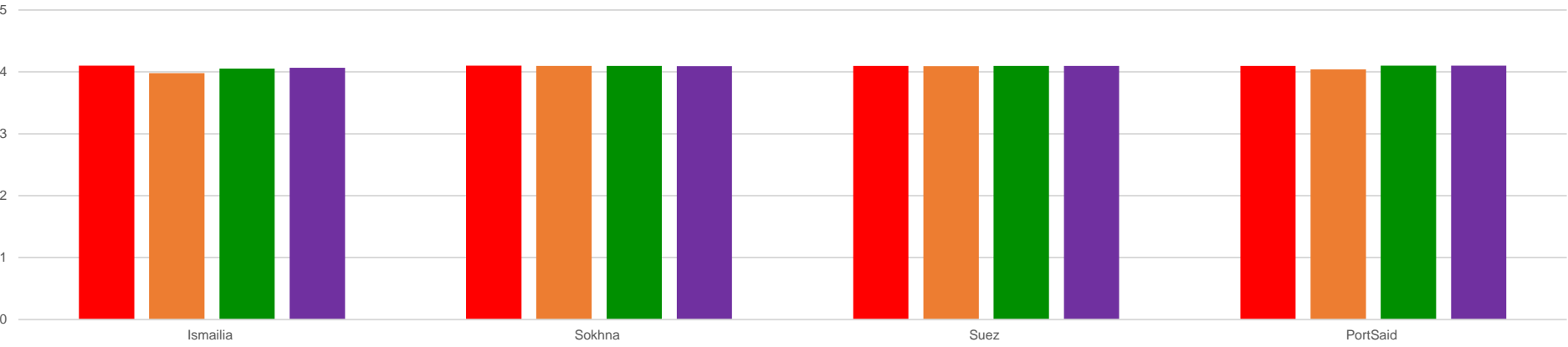
Video Quality [VMOS] - Overall



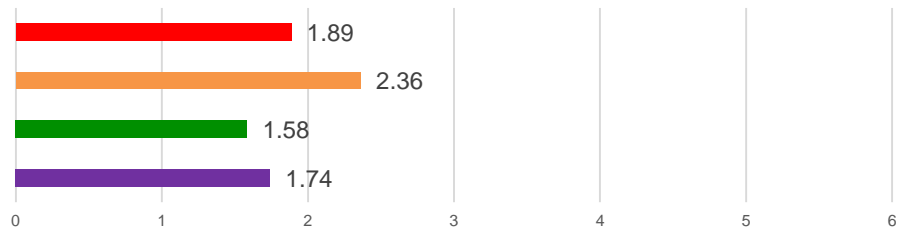
Video Quality [VMOS] - Zones



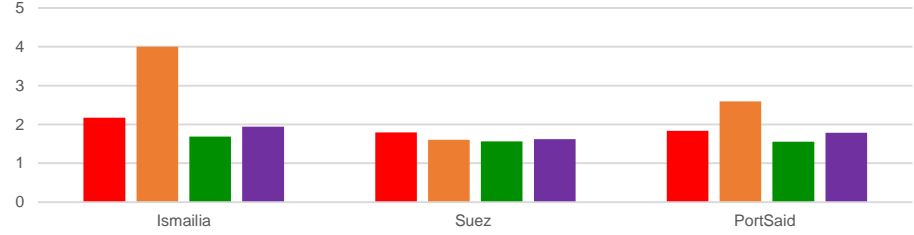
Video Quality - VMOS



Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

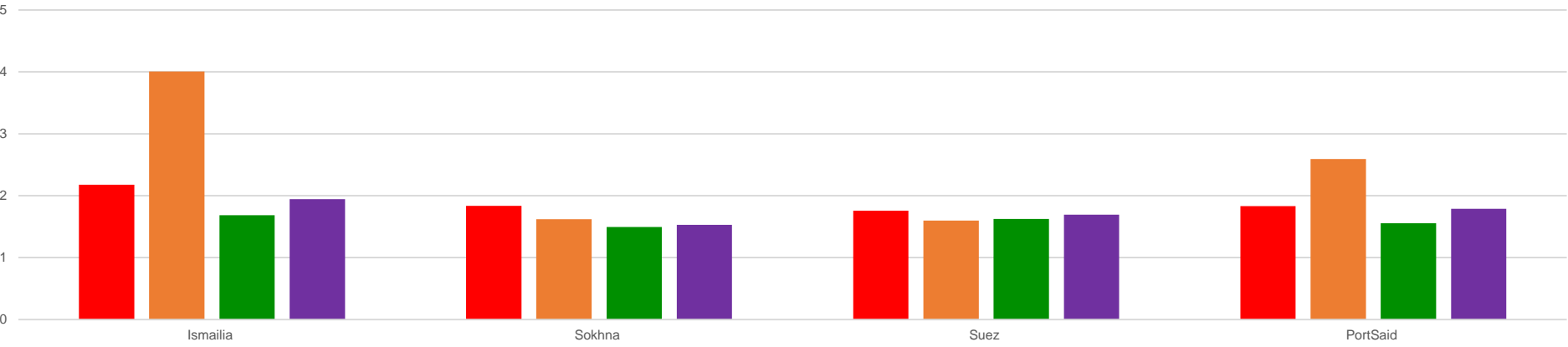
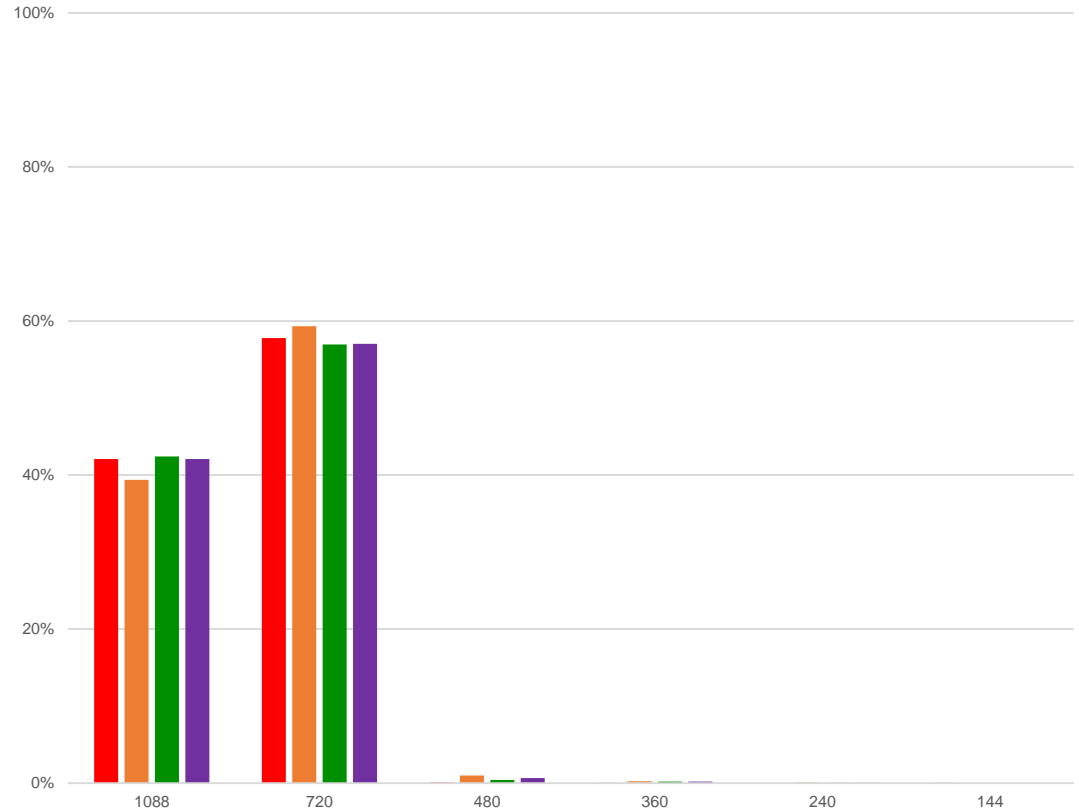


Image Resolution

Youtube - Image Resolution





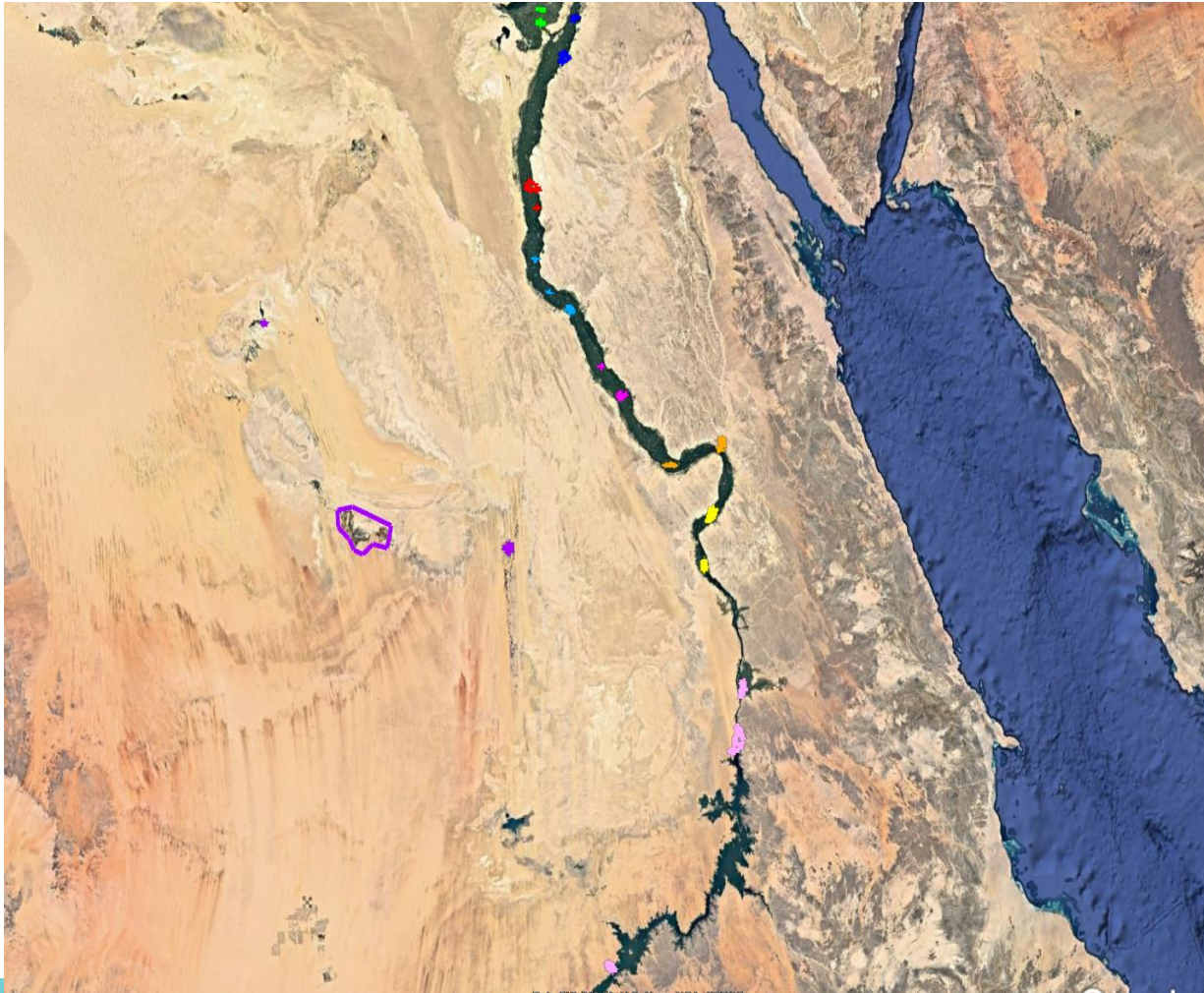
# Upper Egypt Region KPIs

# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
- 12. Voice Service Quality & Performance – Upper Egypt**
13. Data Service Quality & Performance – Upper Egypt
14. Annexes

# Zones Definition



## Upper Egypt

Upper Z1	Fayoum SinurisTirsa
Upper Z2	BanySwif Wasta
Upper Z3	AbuQurqas Menya
Upper Z4	Asyut DayroutManfalout
Upper Z5	Sohag TahtaAkhmim
Upper Z6	Kharga Dakhla Farafra
Upper Z7	Qena Nagaa
Upper Z8	Esna Luxor
Upper Z9	Aswan Abu Semble Komombo

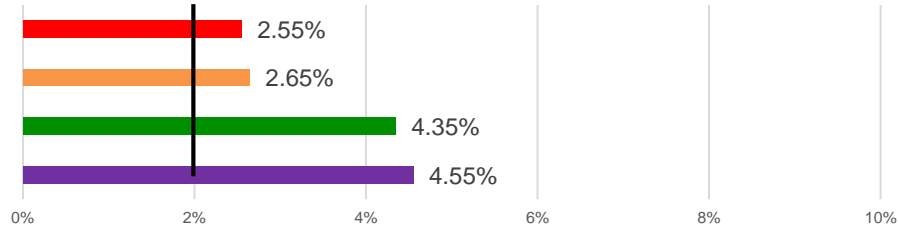
# Accessibility: Call Blocked Rate



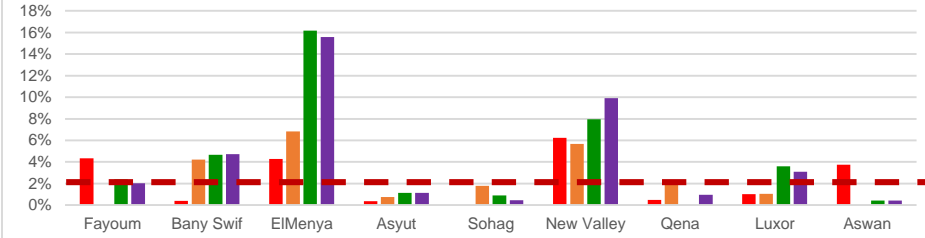
2/3/4G: Short Call



Call Blocked Rate - Overall

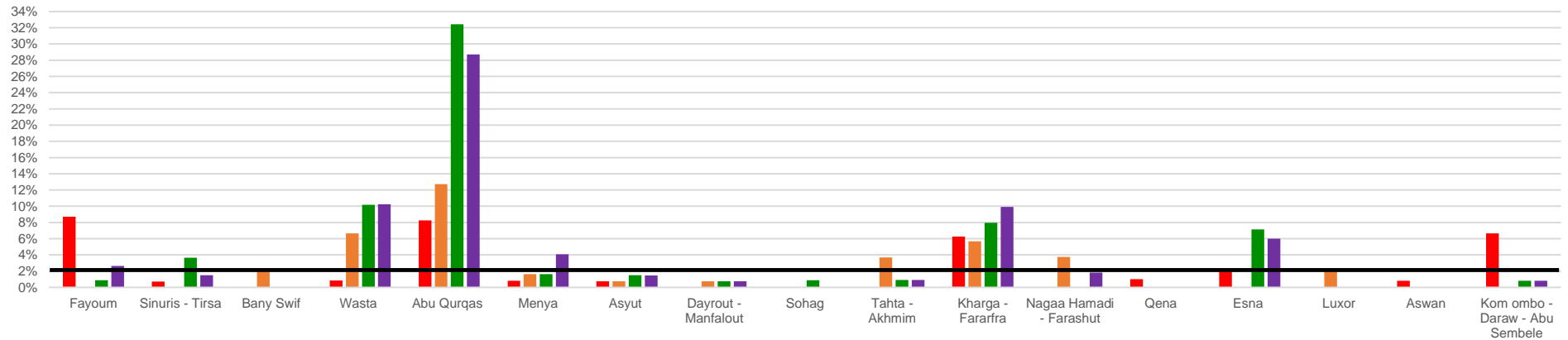


Call Blocked Rate - Zones



**Call Blocked Calls** represents the ratio between unsuccessful call attempts and all calls made (both successful & unsuccessful).

Call Blocked Rate





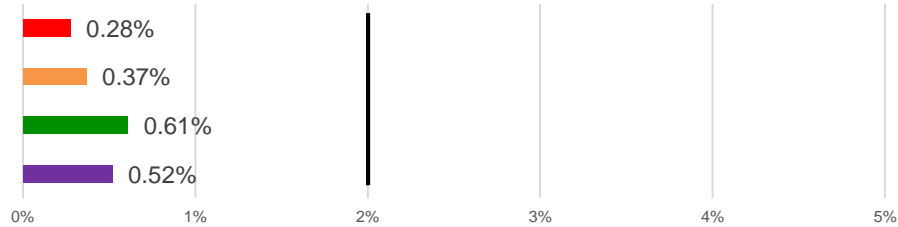
# Retainability: Call Dropped Rate



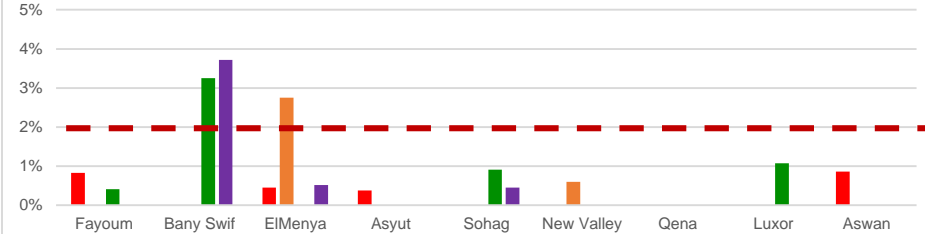
2/3/4G: Short Call



Voice Call Dropped Rate - Overall

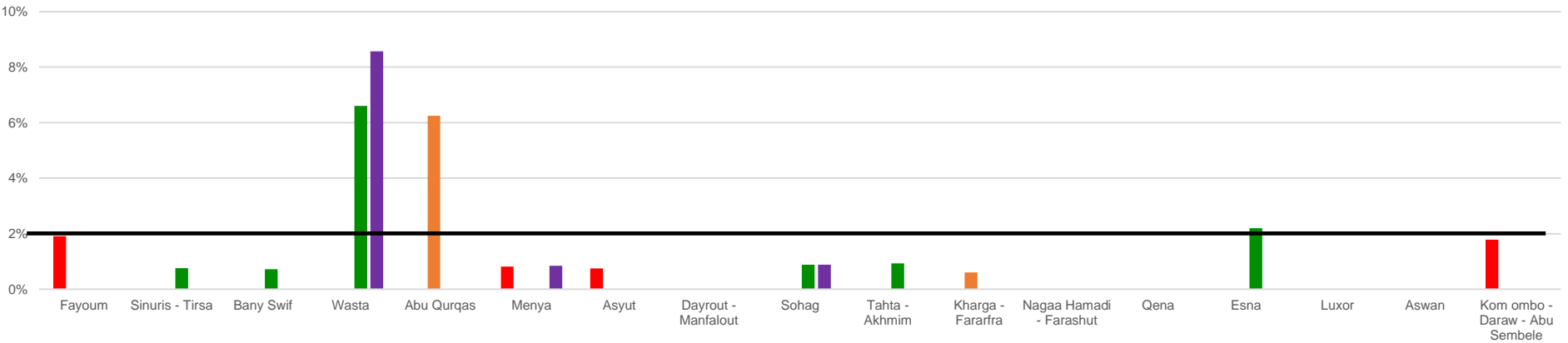


Voice Call Dropped Rate - Zones



Voice Call Retainability is represented by call drop rates.

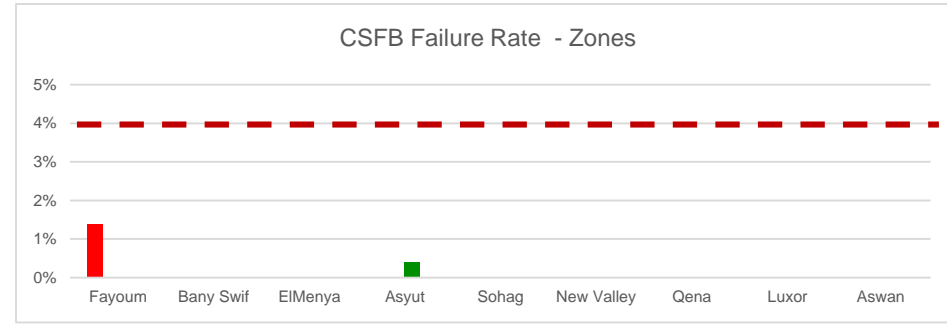
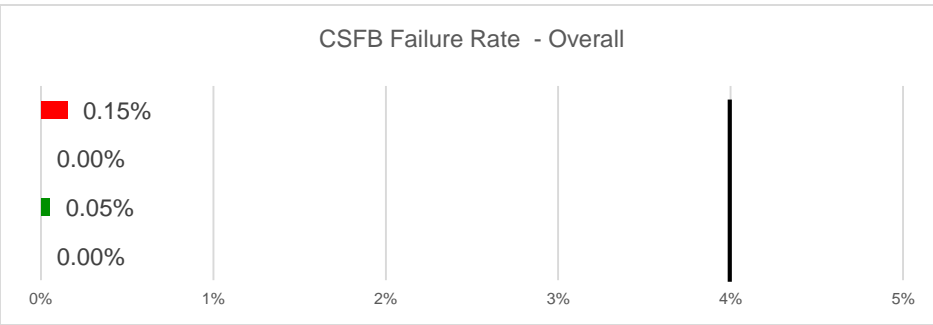
Voice Call Dropped Rate



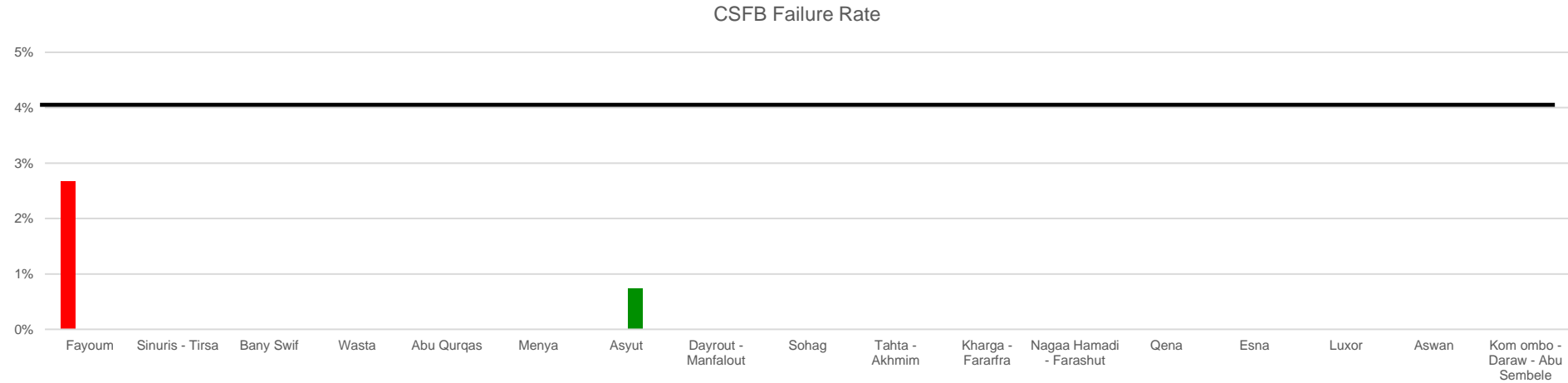
# Accessibility: CSFB Failure Rate [%]



2/3/4G: Short Call



**CSFB Failure Rate** represents the ratio between unsuccessful fall back attempt to lower technology than 4G (LTE) and all calls made (both successful & unsuccessful). When there is 4G (LTE) present before starting the session.



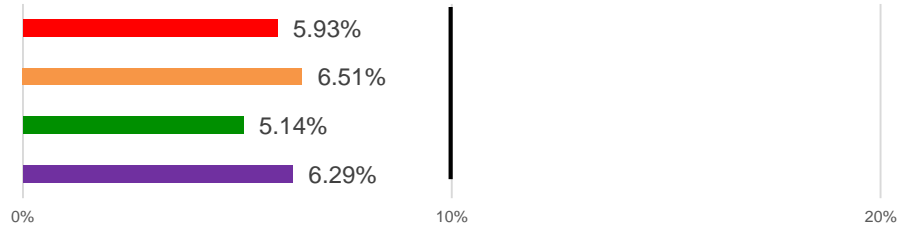
# Speech Quality: MOS Voice Speech Quality < 2.8



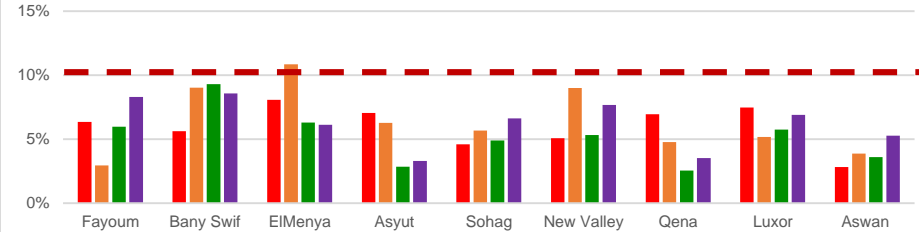
2/3/4G: Short Call



Voice Speech Quality on Sample < 2.8 - Overall

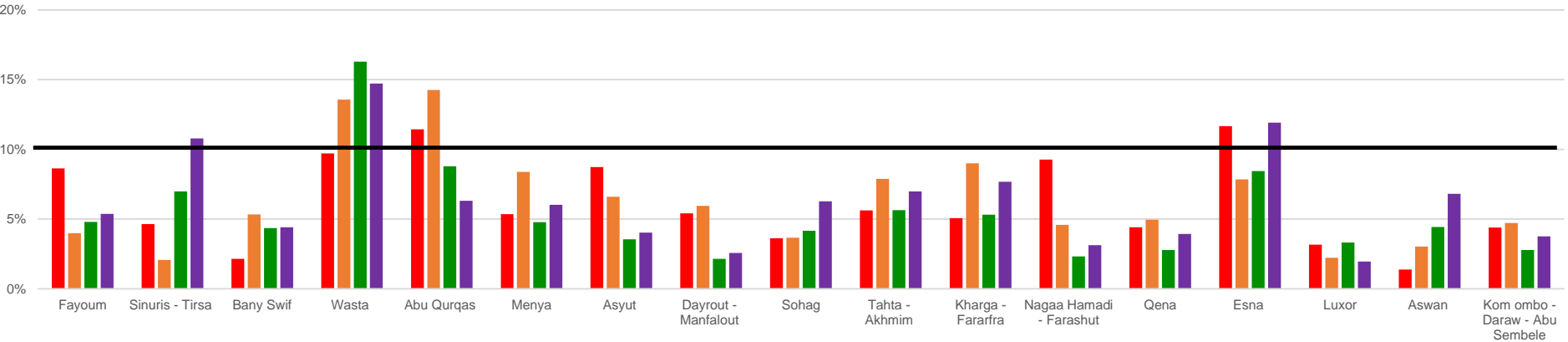


Voice Speech Quality on Sample < 2.8 - Zones

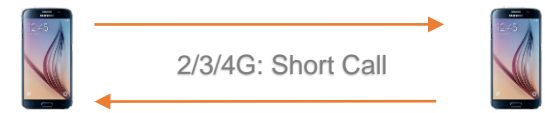


**MOS Voice Speech Quality < 2.8** represents the ratio between total number of MOS samples less than 2.8 all collected MOS samples

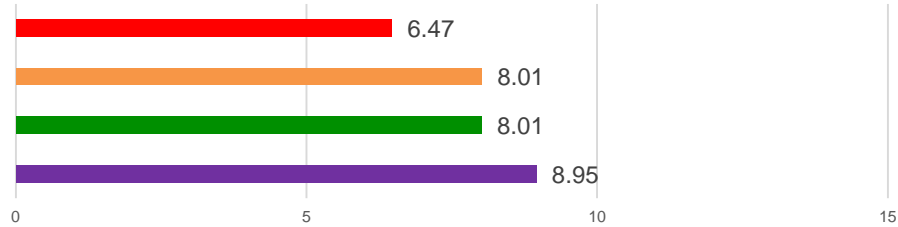
Voice Speech Quality on Sample < 2.8



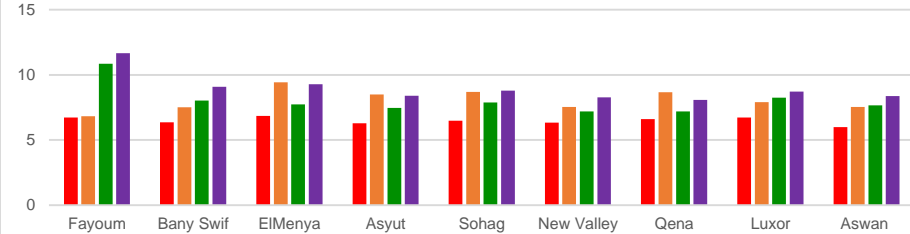
# Accessibility: Call Access Time [sec.]



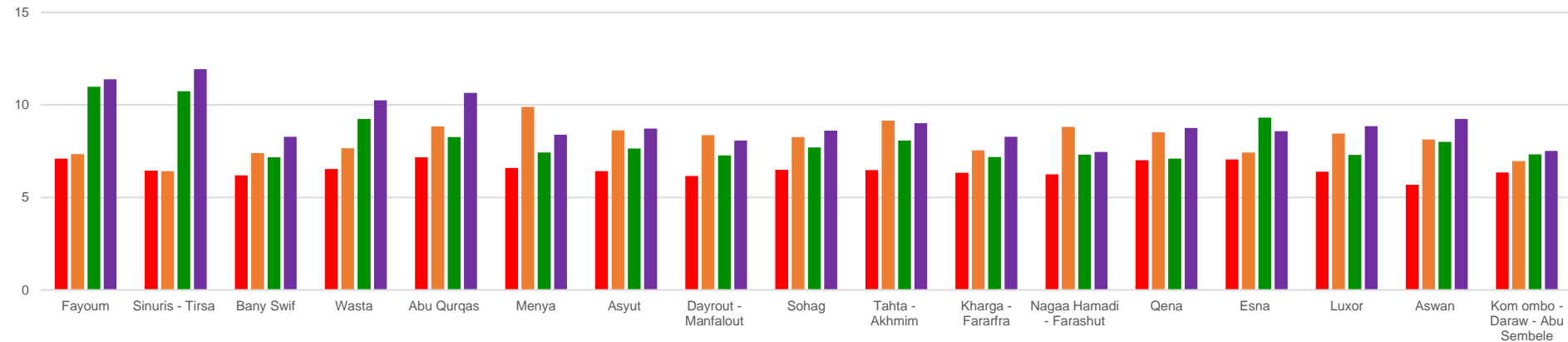
Call Access Time - Overall



Call Access Time - Zones



Call Access Time



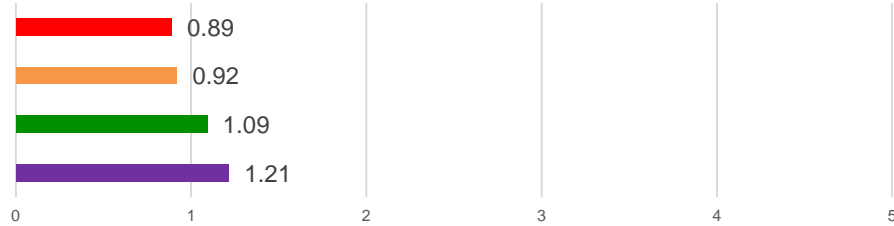
# Accessibility: CSFB Delay [sec.]



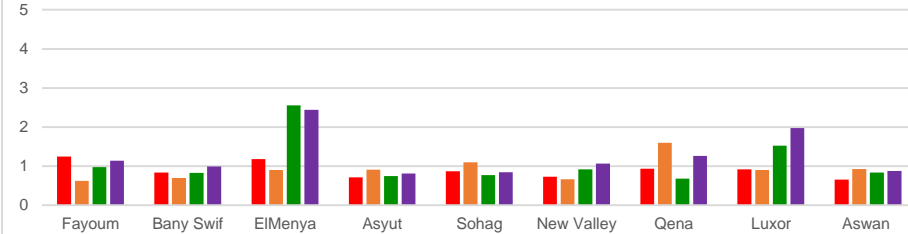
2/3/4G: Short Call



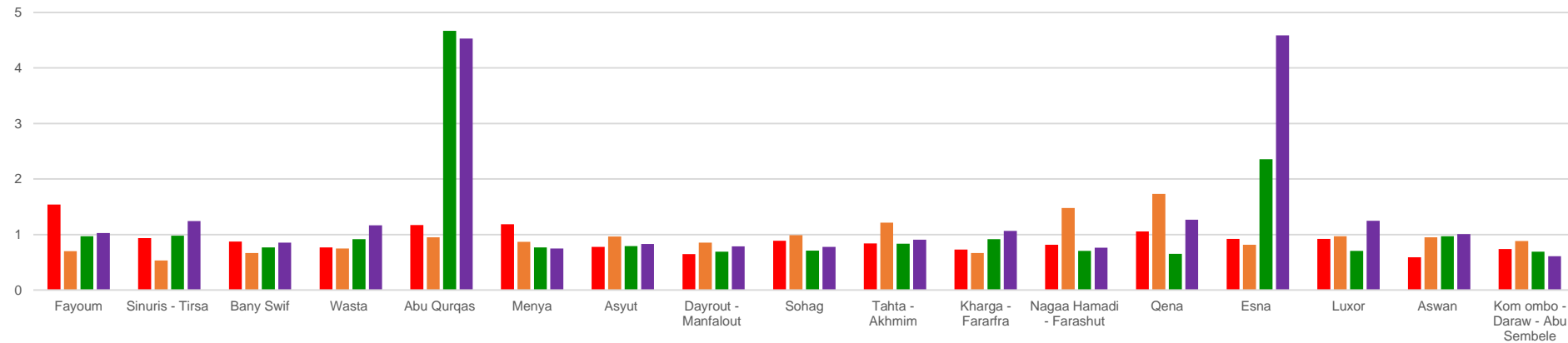
Circuit Switch Fall Back Delay - Overall



Circuit Switch Fall Back Delay - Zones



Circuit Switch Fall Back Delay



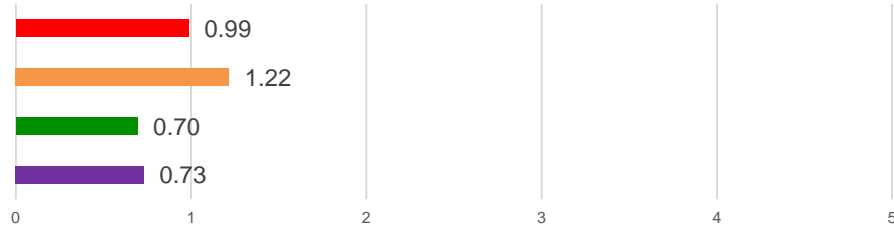
# Accessibility: Telephony Return Delay [sec.]



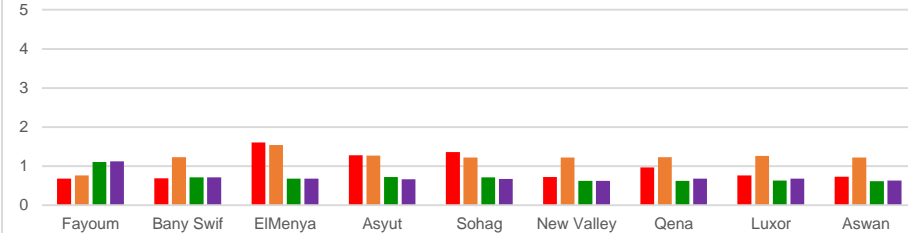
2/3/4G: Short Call



Telephony Return Delay - Overall

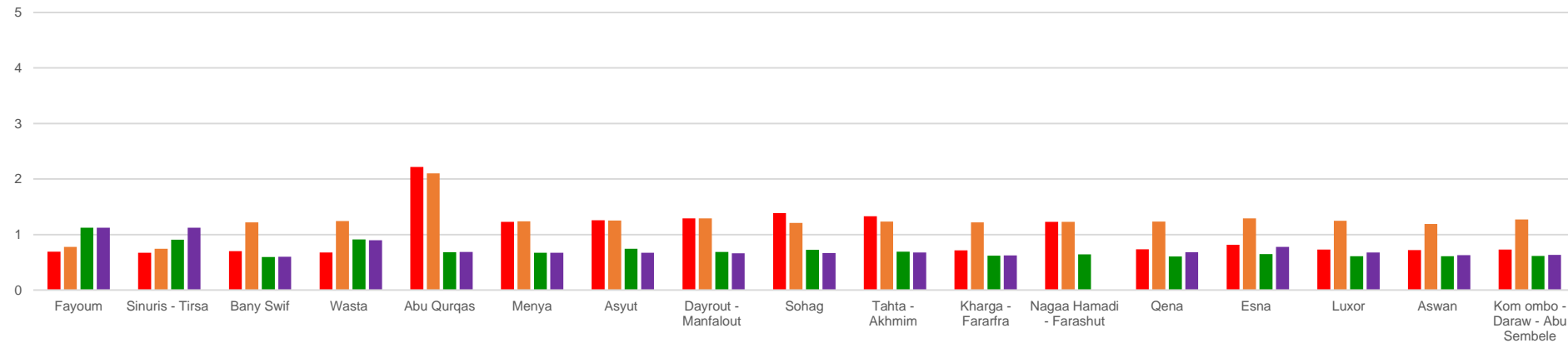


Telephony Return Delay - Zones



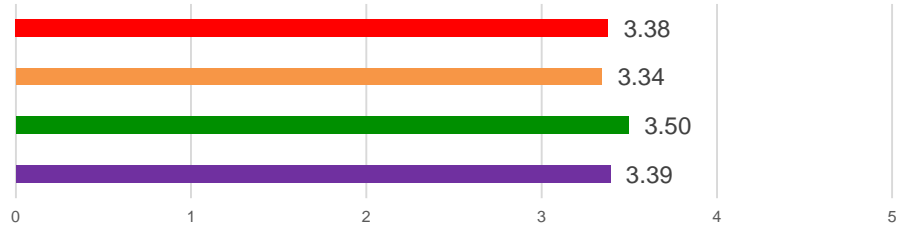
Telephony Return Delay measures the time that a UE uses to re-join the LTE (4G) network after call end

Telephony Return Delay

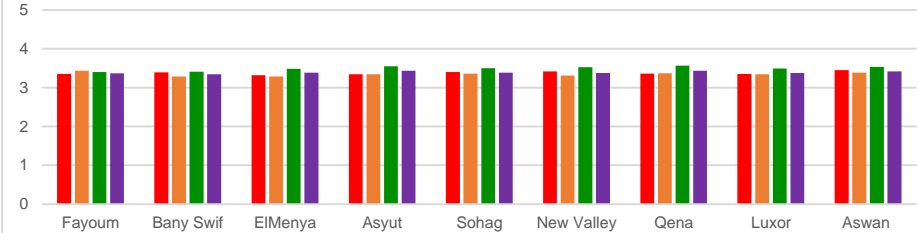


# Speech Quality: MOS Scores

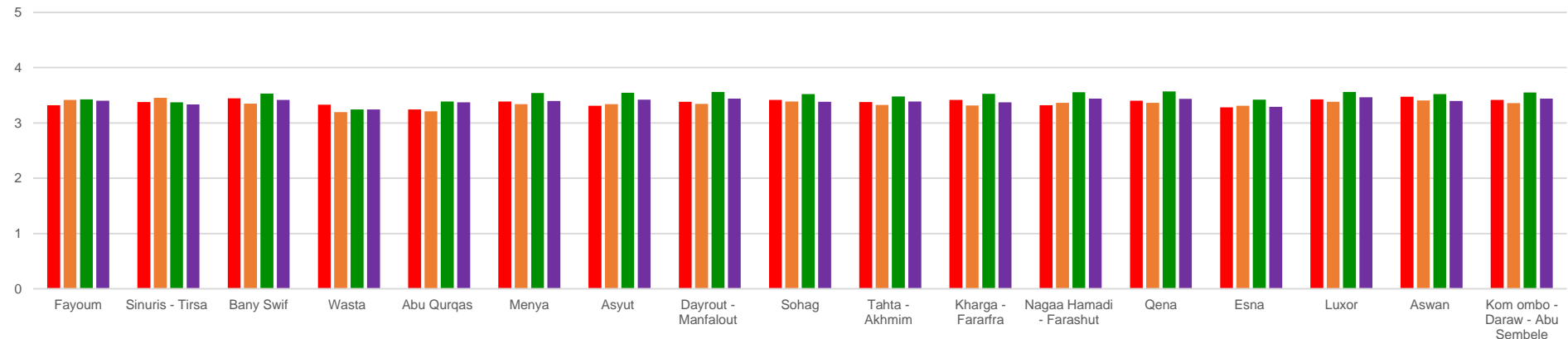
Voice Speech Quality - Overall



Voice Speech Quality - Zones

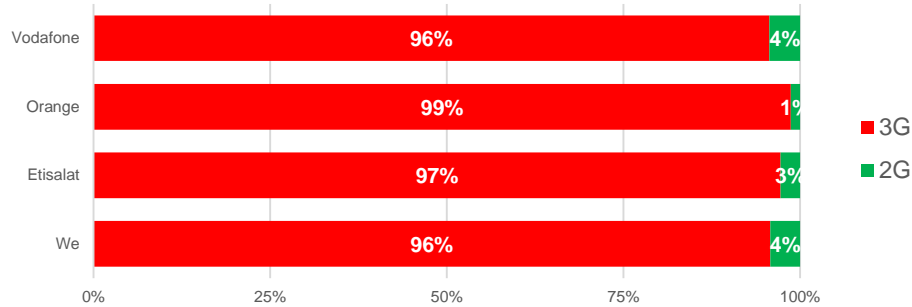


Voice Speech Quality



# Speech Quality: Call technology Usage & Codec Base Usage

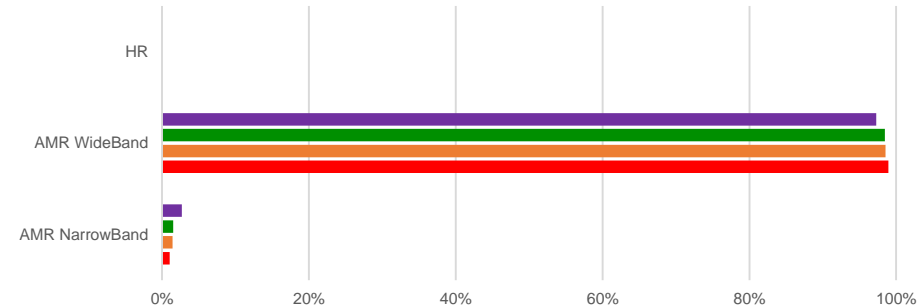
Call Technology Usage Overall



**Call technology Usage** represents the call technology used over call period. The more calls on 3G (UMTS) the better MOS served.

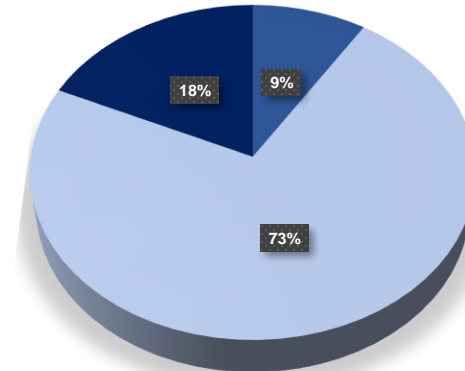
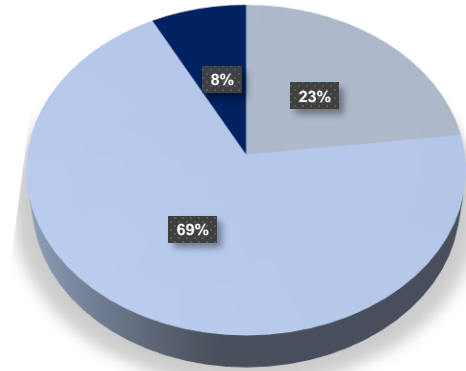
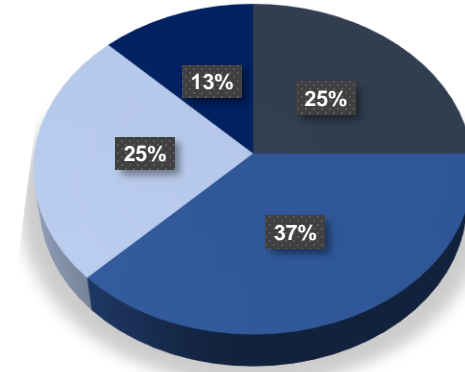
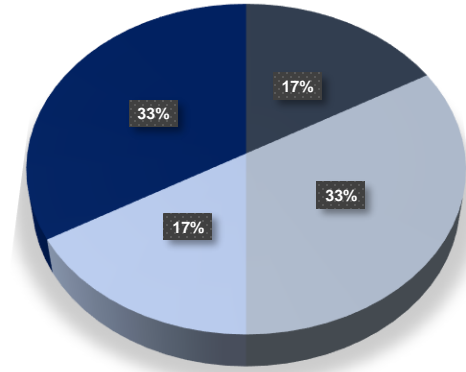
**Codec Base Usage** represents the codec used over the call where AMR wideband (AMR WB) leads to better voice quality experience by the end user than the AMR Narrowband (AMR NB)

Codec Base Usage

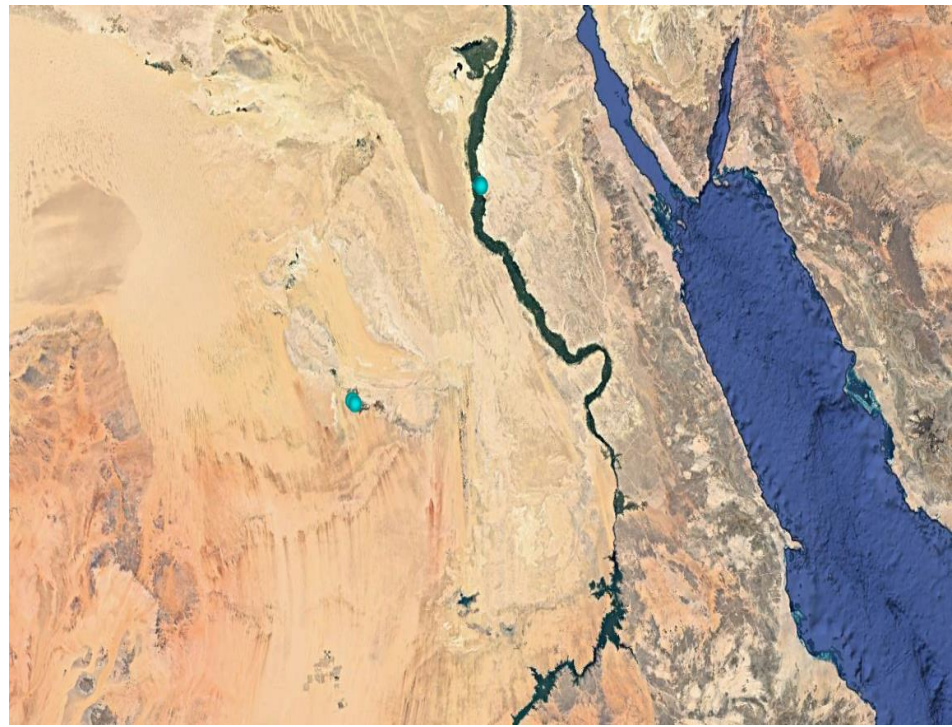
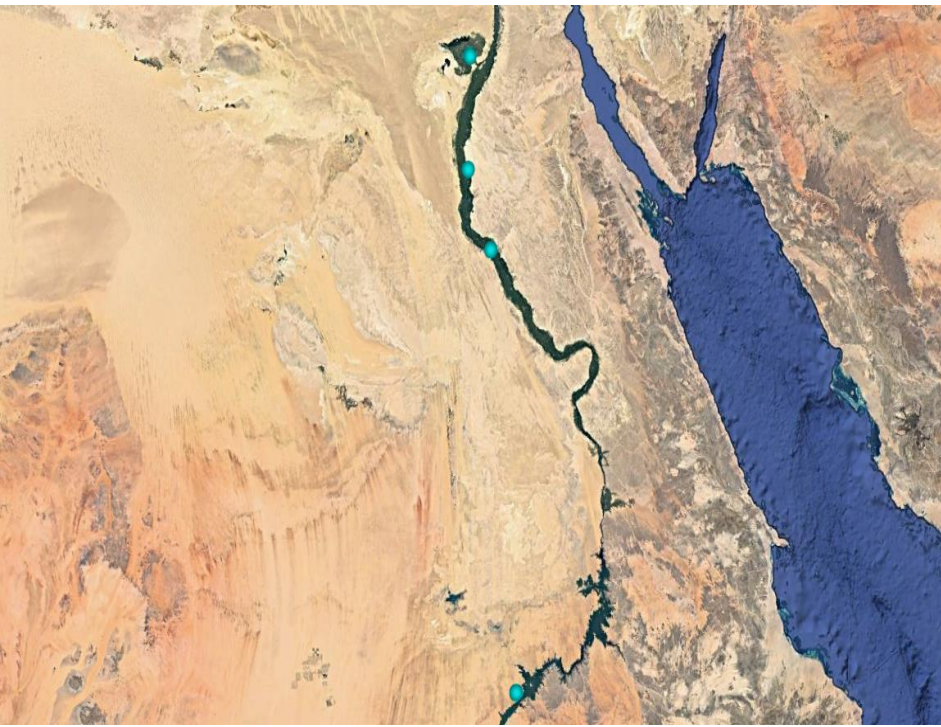




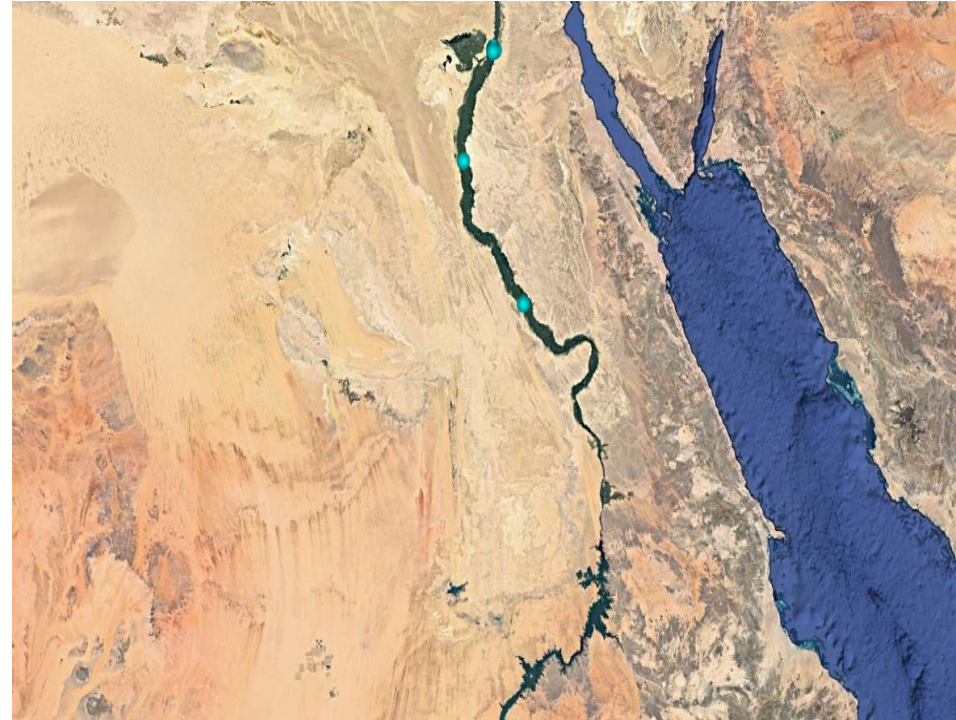
# Analysis: Dropped Calls Causes



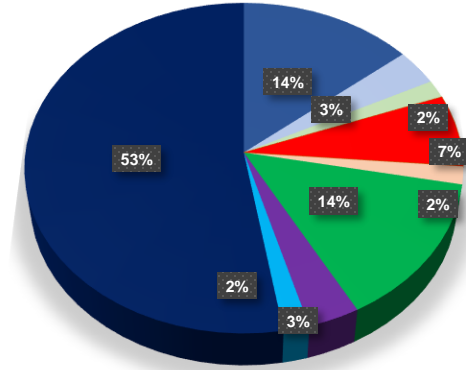
# All Operators: Dropped Calls Locations 1/2



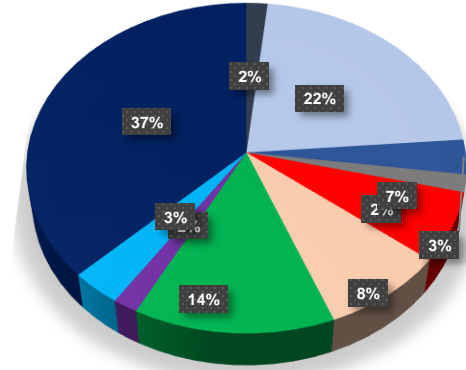
## All Operators: Dropped Calls Locations 2/2



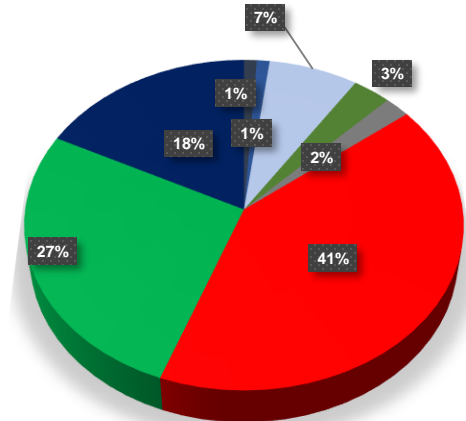
# Analysis: Failed Calls Causes



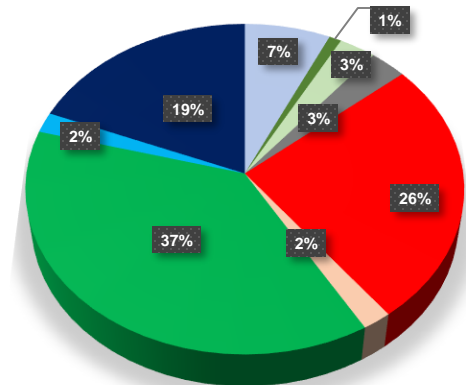
- 3G Coverage
- 3G Quality
- 4G Quality
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue



- 2G Coverage
- 3G Coverage
- 3G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Other
- Paging Issue
- RAN Issue

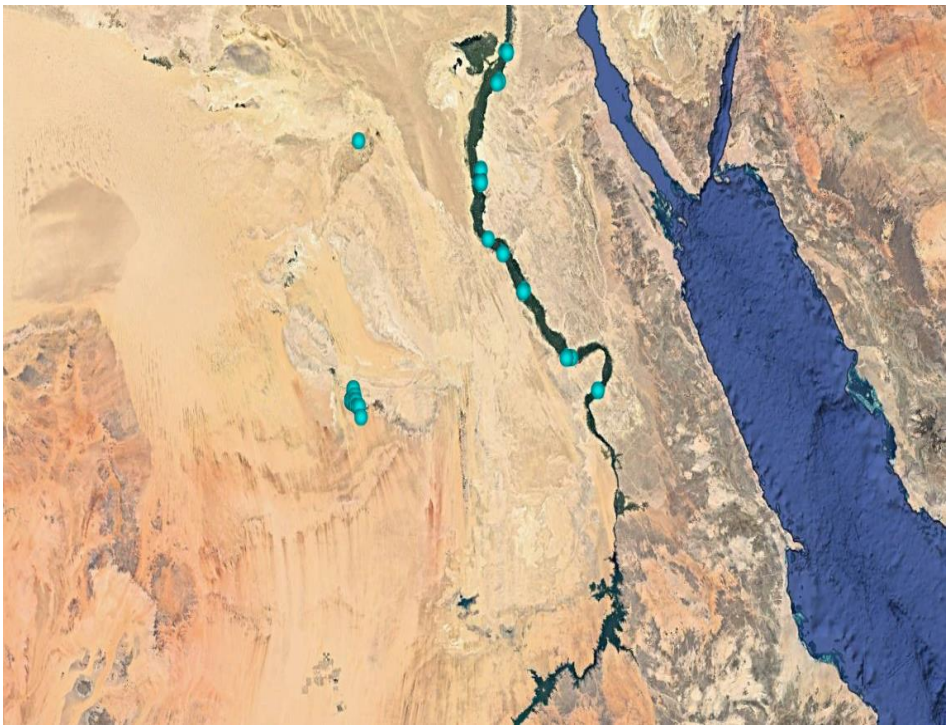
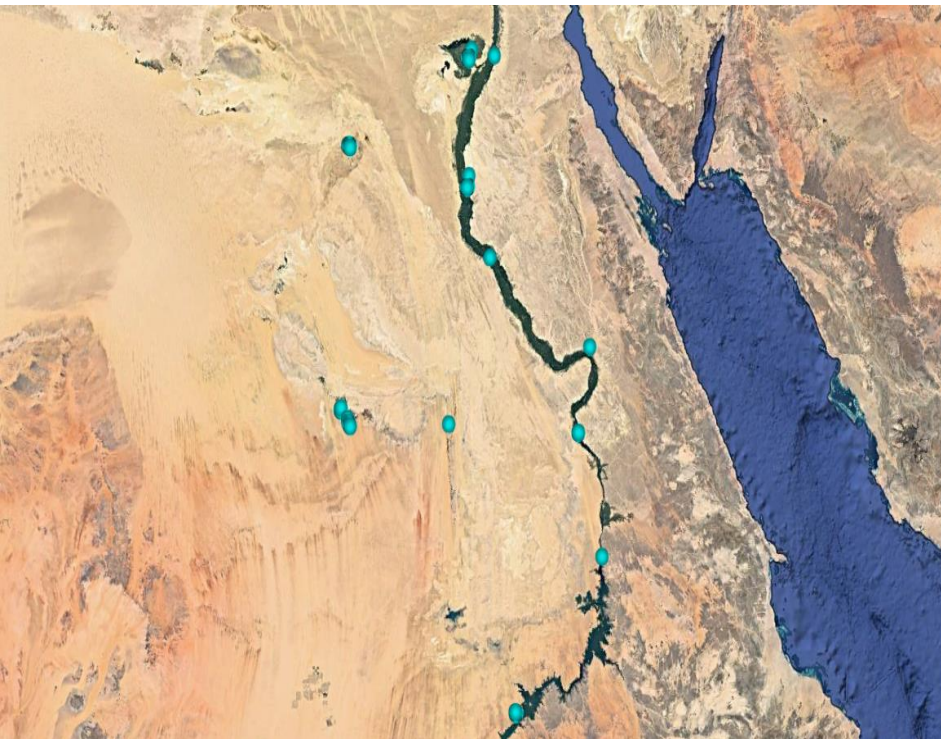


- 2G Coverage
- 3G Coverage
- 3G Quality
- 4G Coverage
- 4G Quality
- Core Network
- CSFB Issue
- No service
- RAN Issue

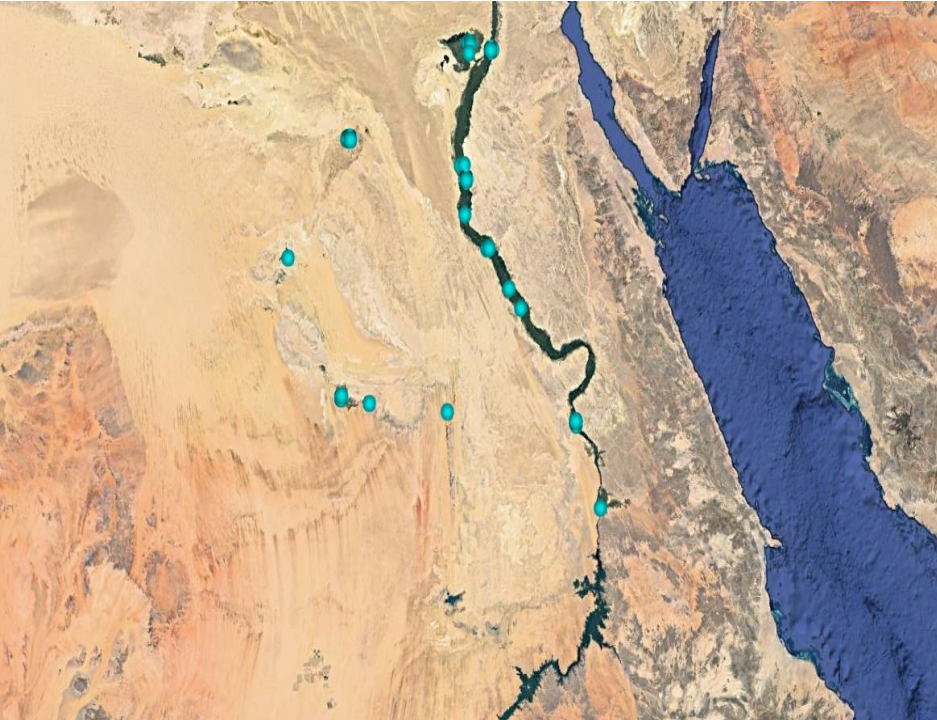


- 3G Quality
- 4G Coverage
- 4G Quality
- Core Network
- CSFB Issue
- Mobility Issue
- No service
- Paging Issue
- RAN Issue

# All Operators: Blocked Calls Locations 1/2



# All Operators: Blocked Calls Locations 2/2



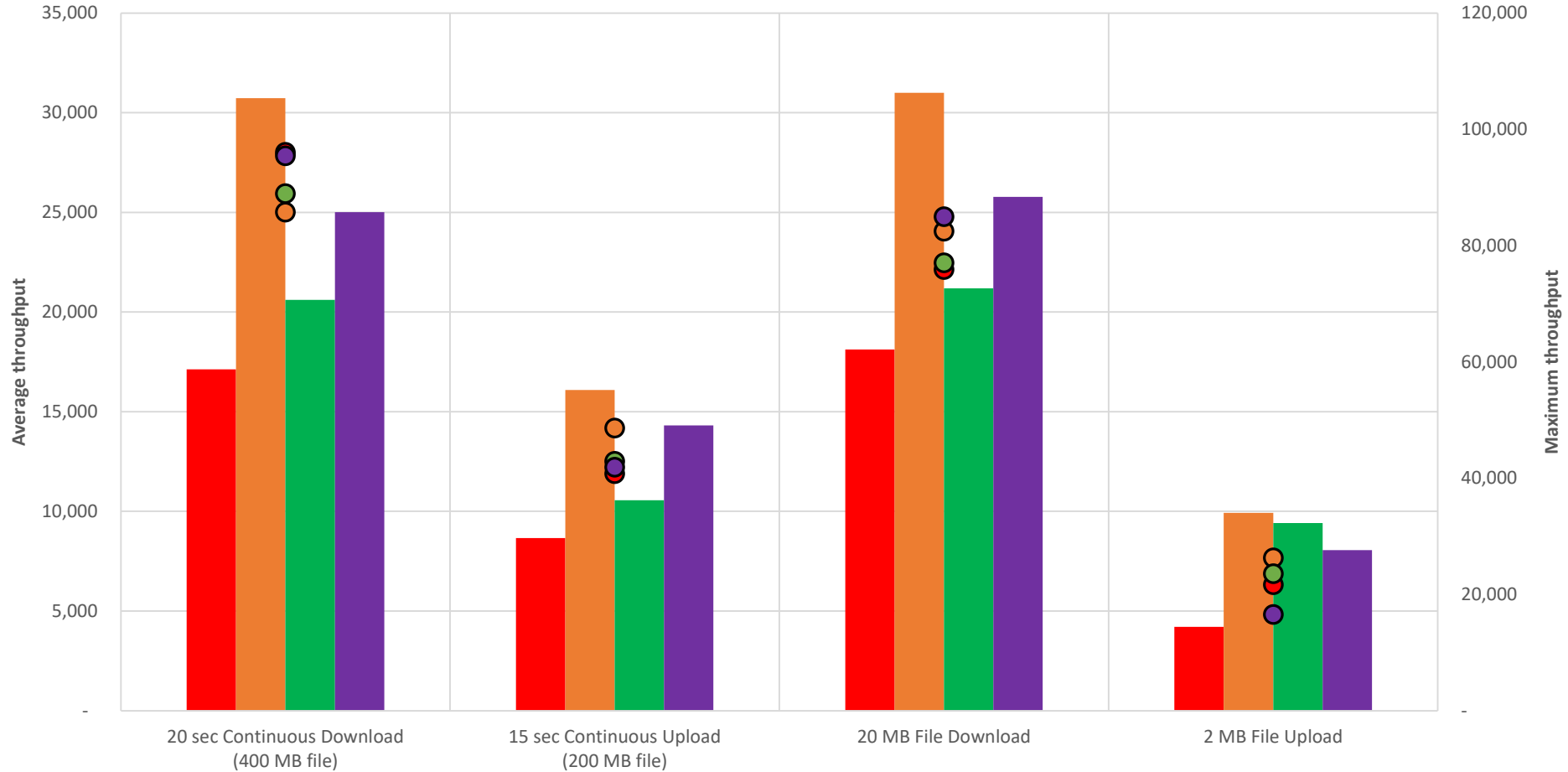
# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
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7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
- 13. Data Service Quality & Performance – Upper Egypt**
14. Annexes

## NETWORK PERFORMANCE TEST

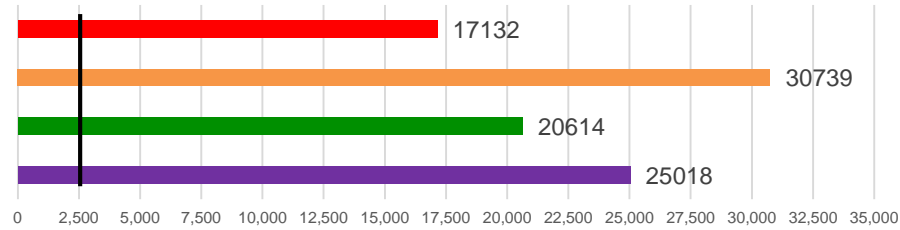
## USER EXPERIENCE TEST



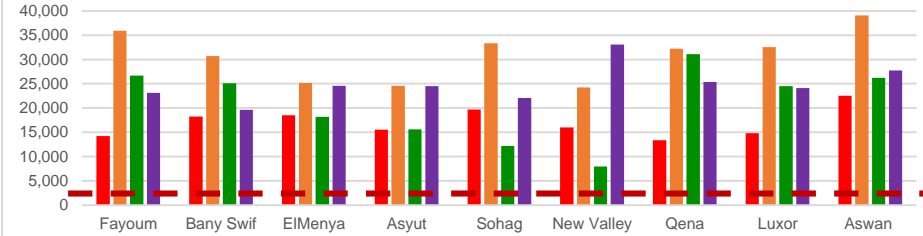


# FDTT HTTP Download Transfer Throughput – Network Performance

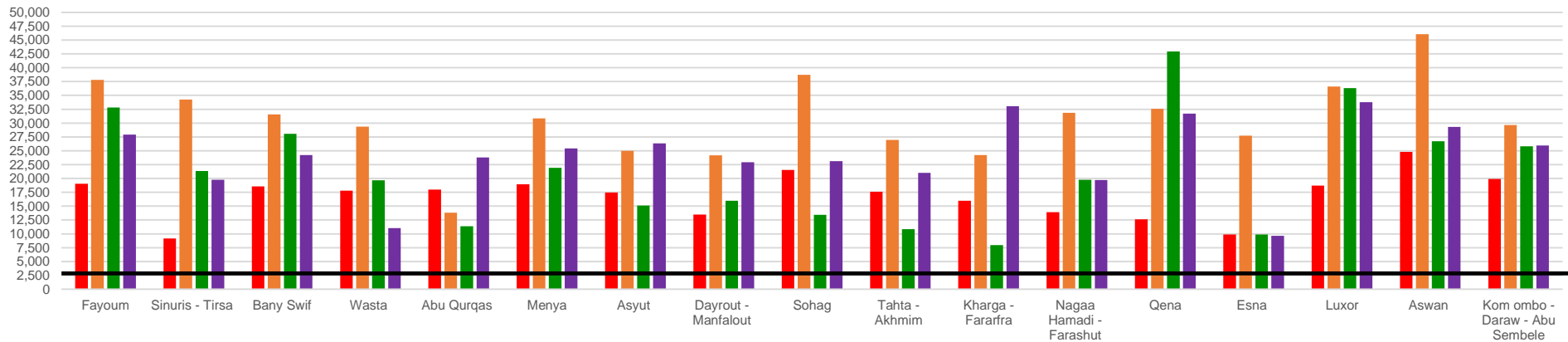
400 MB File FDTT HTTP Download [kbps] - Overall



400 MB File FDTT HTTP Download Throughput [kbps] - Zones

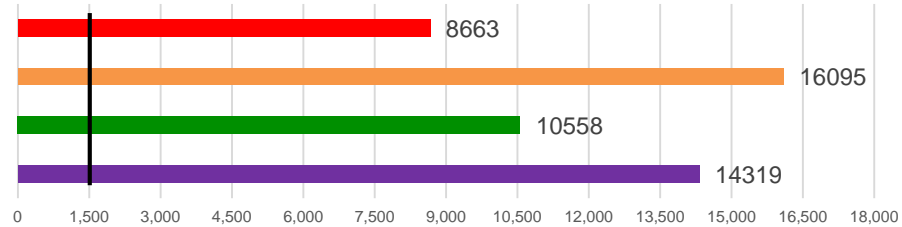


400 MB File FDTT HTTP Download Throughput [kbps]

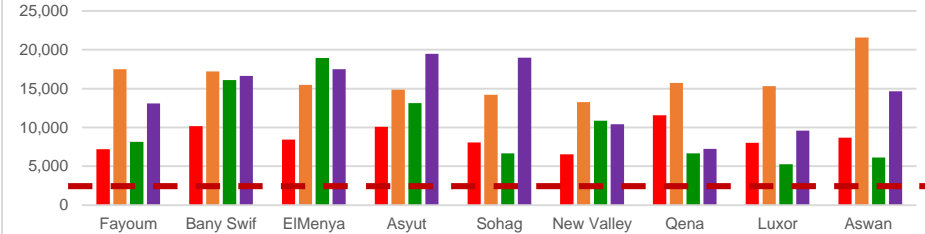


# FDTT HTTP Upload Transfer Throughput – Network Performance

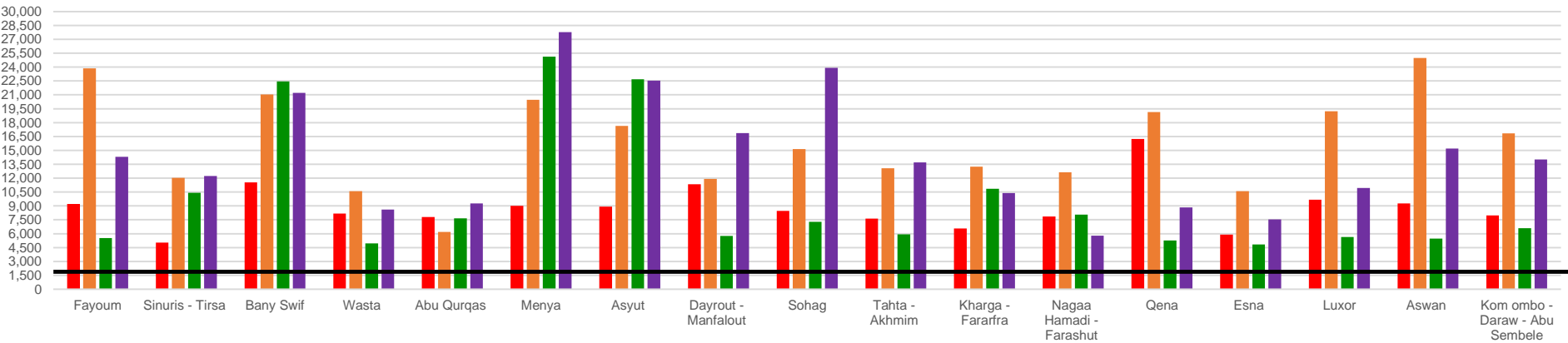
200 MB FDTT HTTP Upload Throughput [kbps] - Overall



200 MB FDTT HTTP Upload Throughput [kbps] - Zones

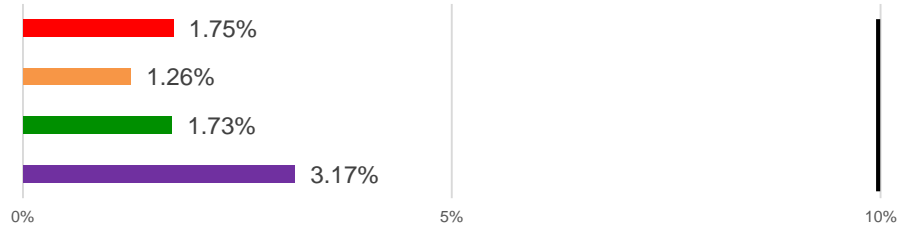


200 MB FDTT HTTP Upload Throughput [kbps]

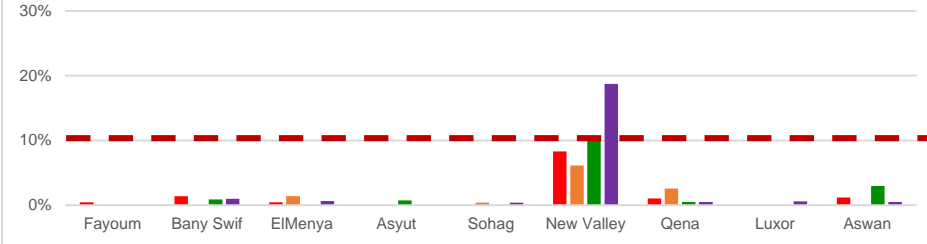


# HTTP Download Session Blocked Rates

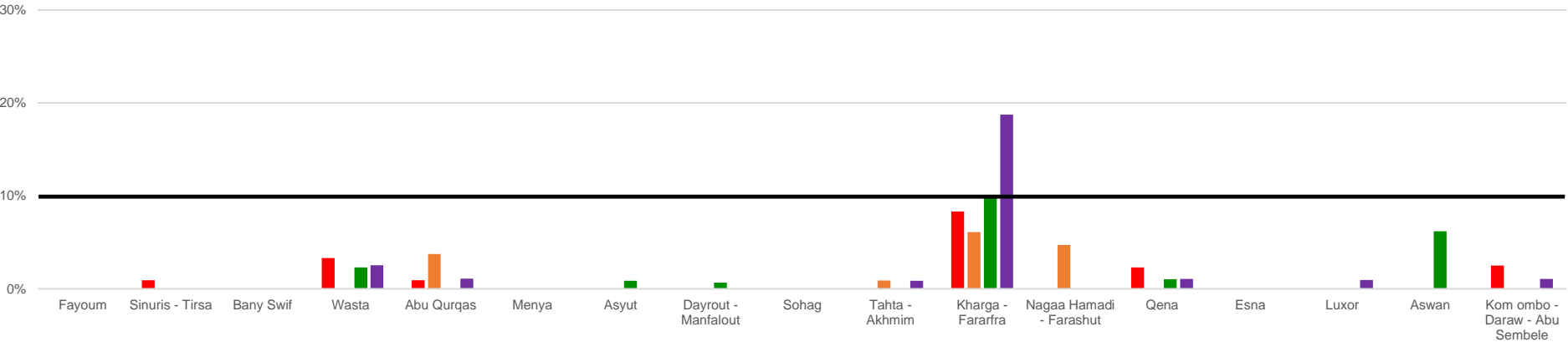
Download Session Blocked Ratio - Overall



Download Session Blocked Ratio - Zones

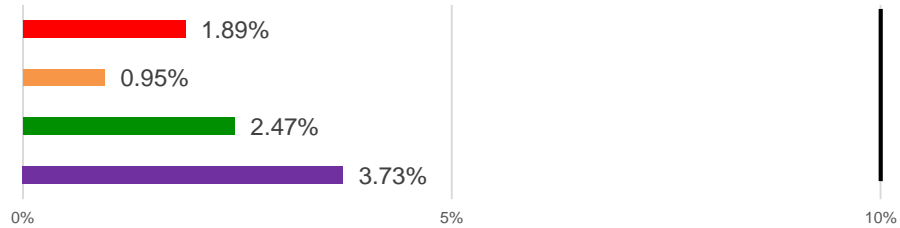


Download Session Blocked Ratio

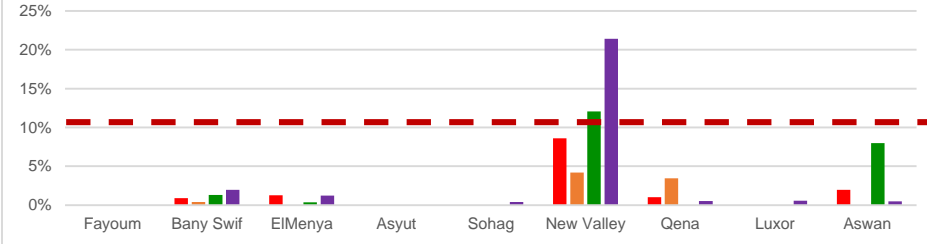


# HTTP Upload Session Blocked Rates

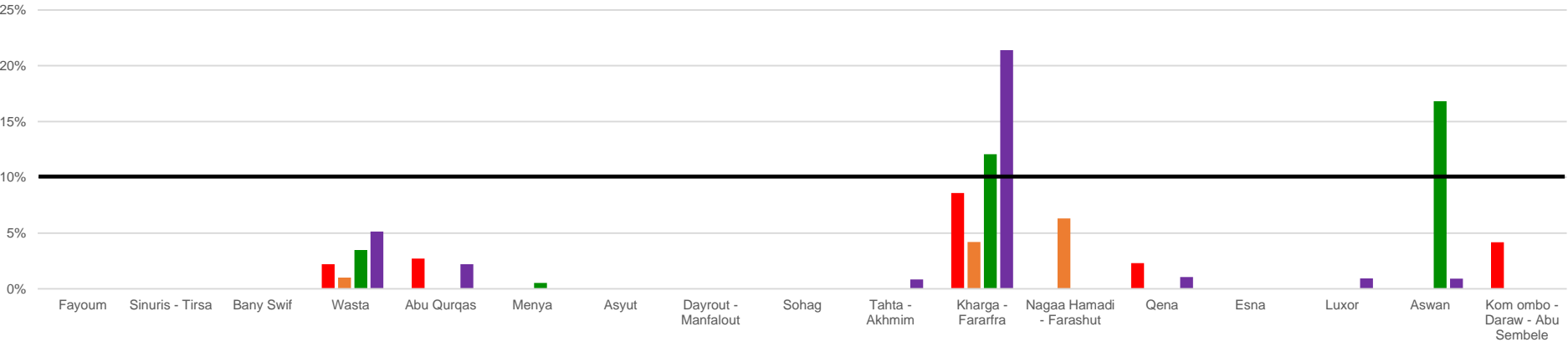
Upload Session Blocked Ratio - Overall



Upload Session Blocked Ratio - Zones



Upload Session Blocked Ratio

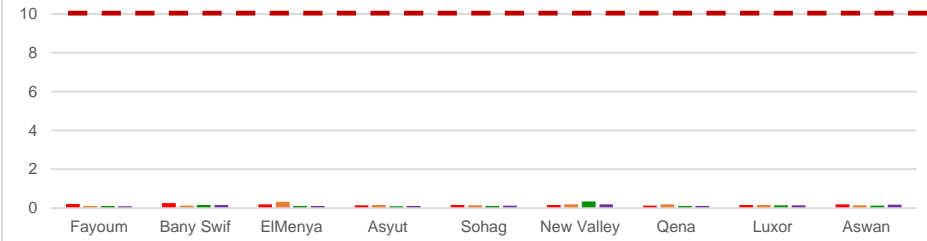


# HTTP Download Average Session Setup Time

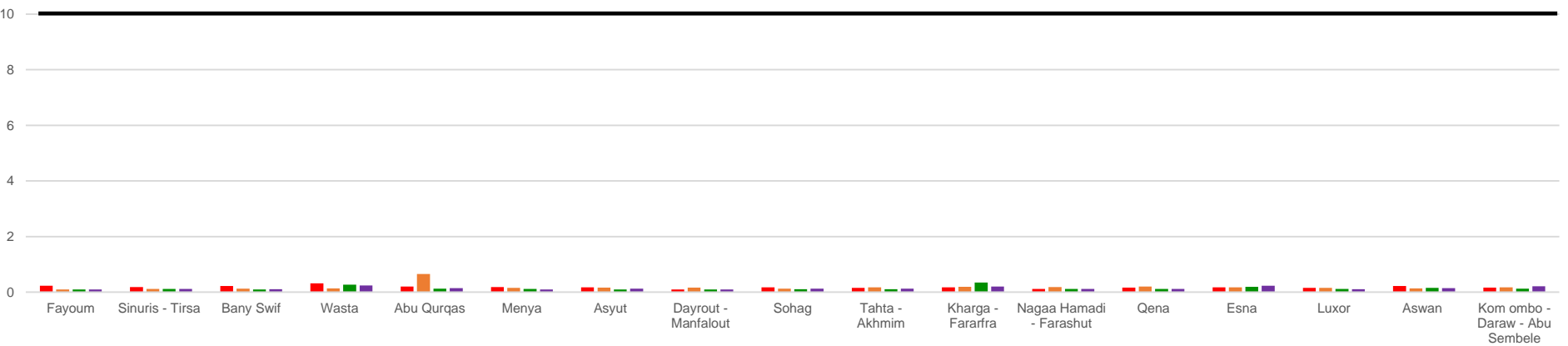
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

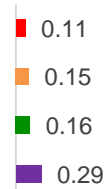


Average Session Setup Time [sec]

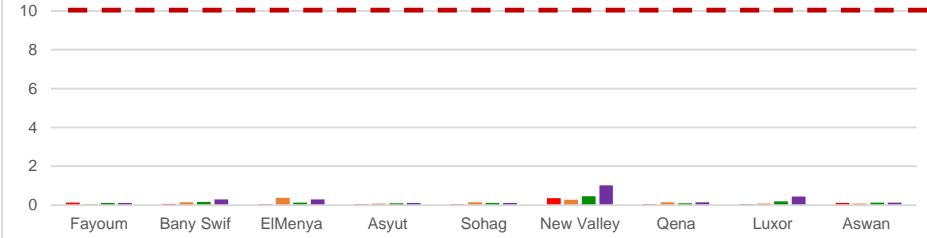


# HTTP Upload Average Session Setup Time

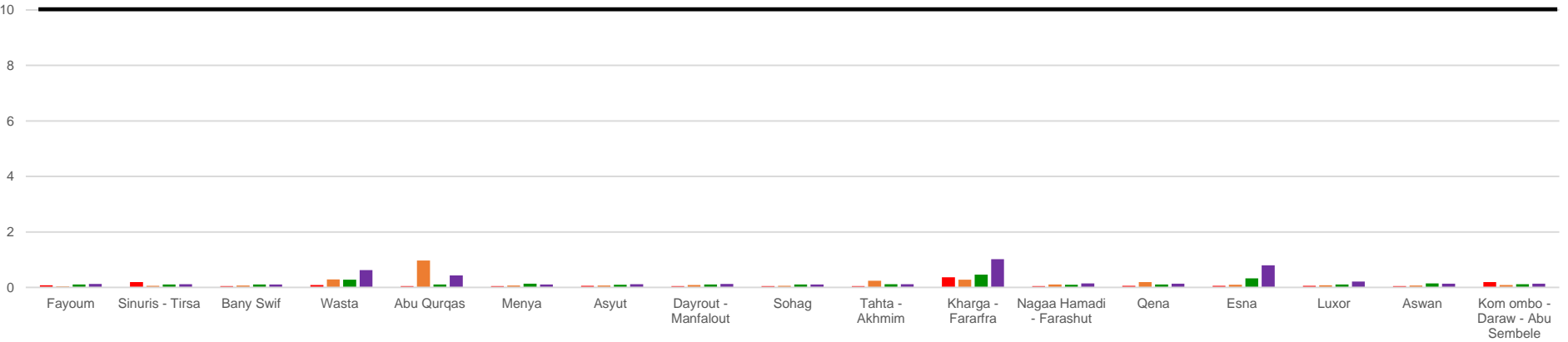
Average Session Setup Time [sec] - Overall



Average Session Setup Time [sec] - Zones

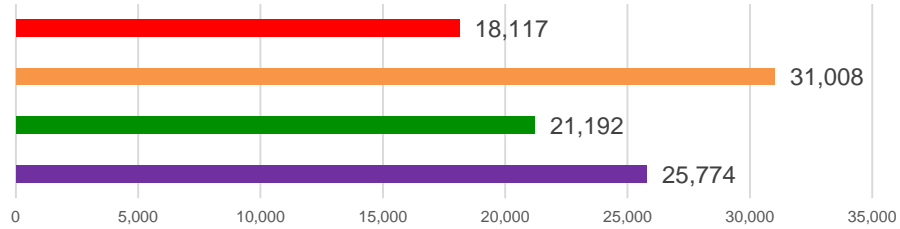


Average Session Setup Time [sec]

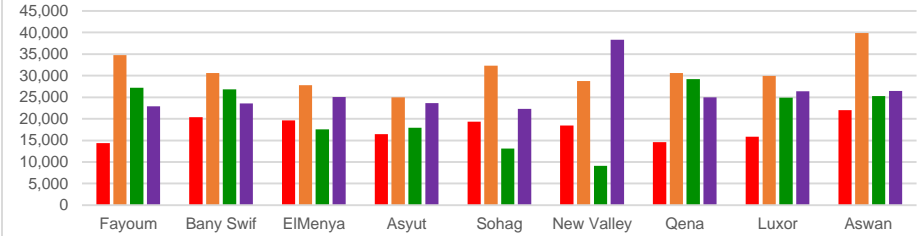


# HTTP Download Throughput – Customer Experience

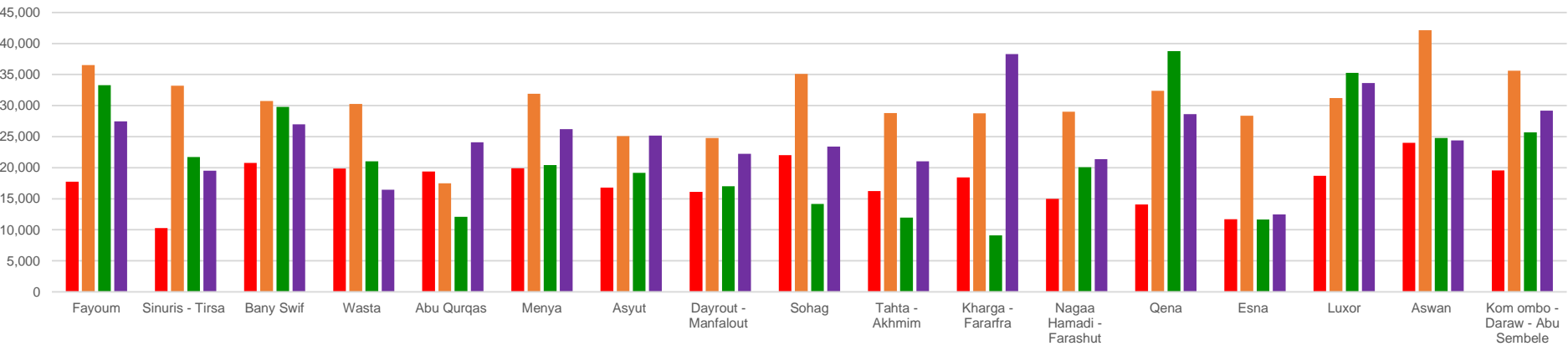
20MB Download Throughput [kbps] - Overall



20MB Download Throughput [kbps] - Zones

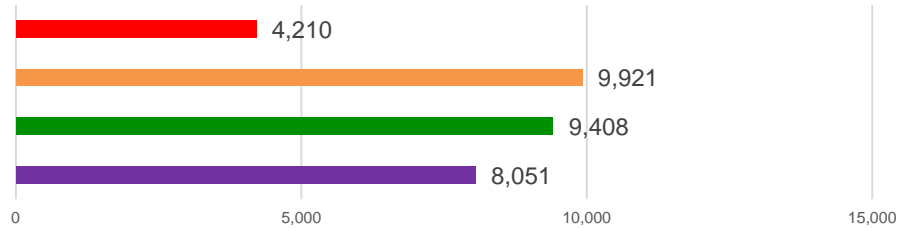


20MB Download Throughput [kbps]

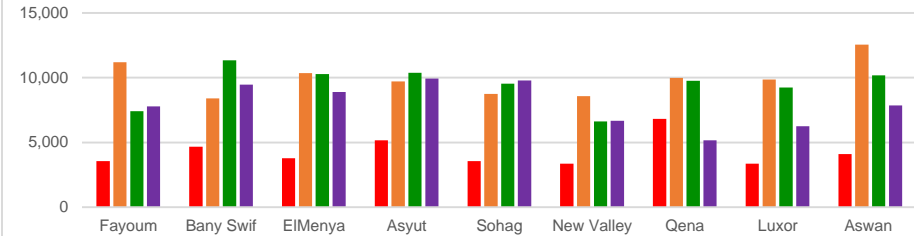


# HTTP Upload Throughput – Customer Experience

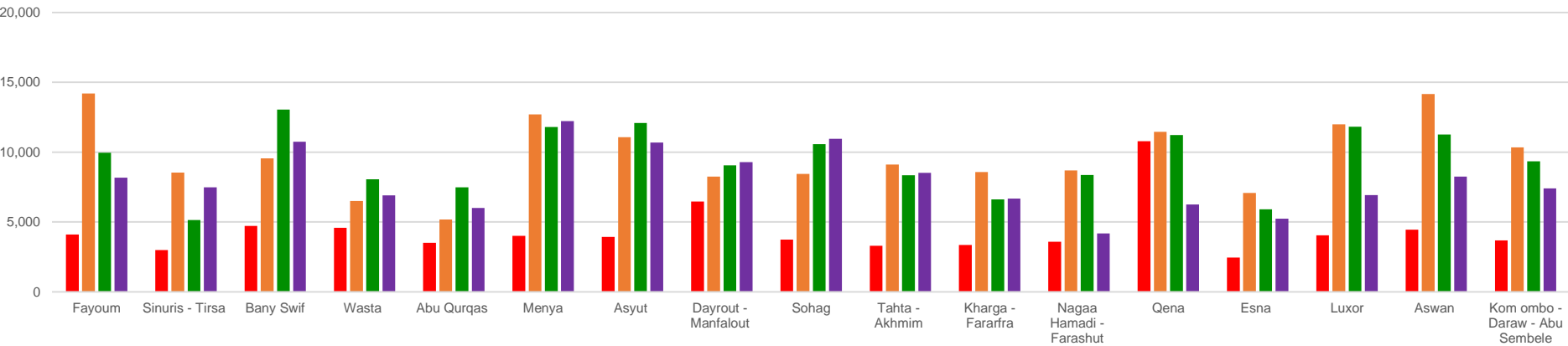
2MB Upload Throughput [kbps] - Overall



2MB Upload Throughput [kbps] - Zones

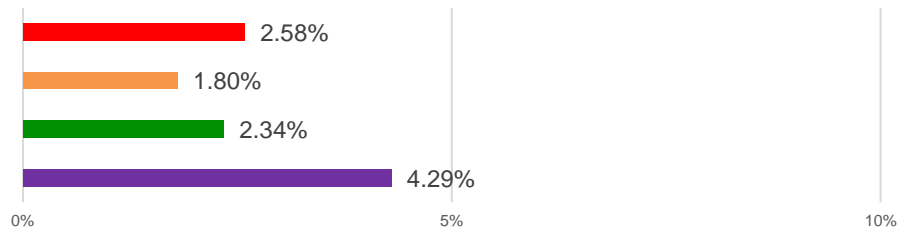


2MB Upload Throughput [kbps]

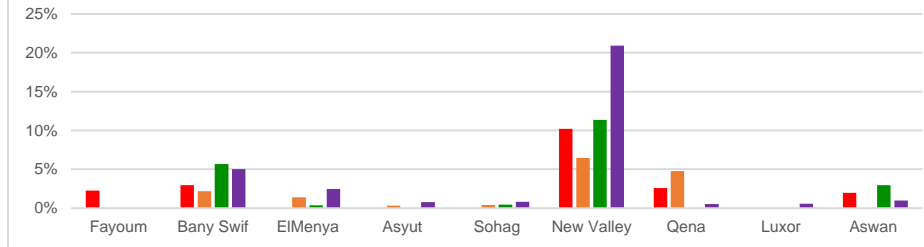




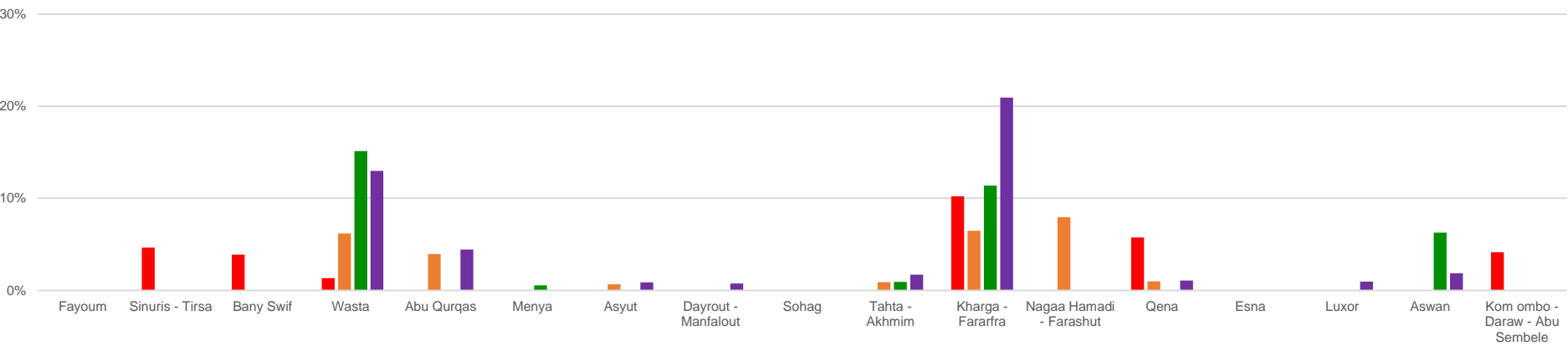
Session Failure Ratio - Overall



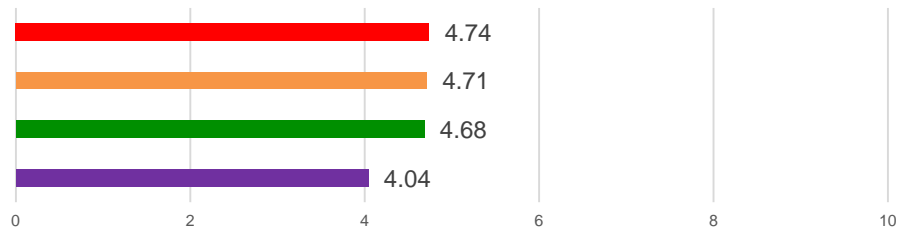
Session Failure Ratio - Zones



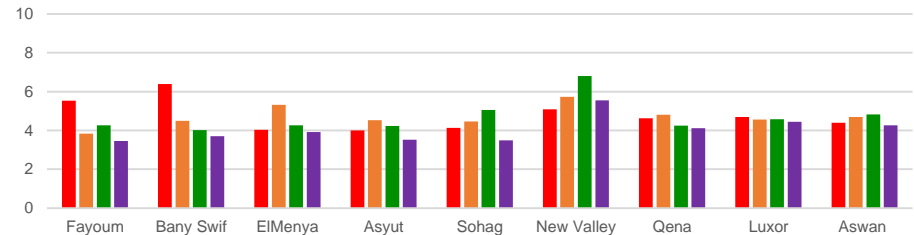
Session Failure Ratio



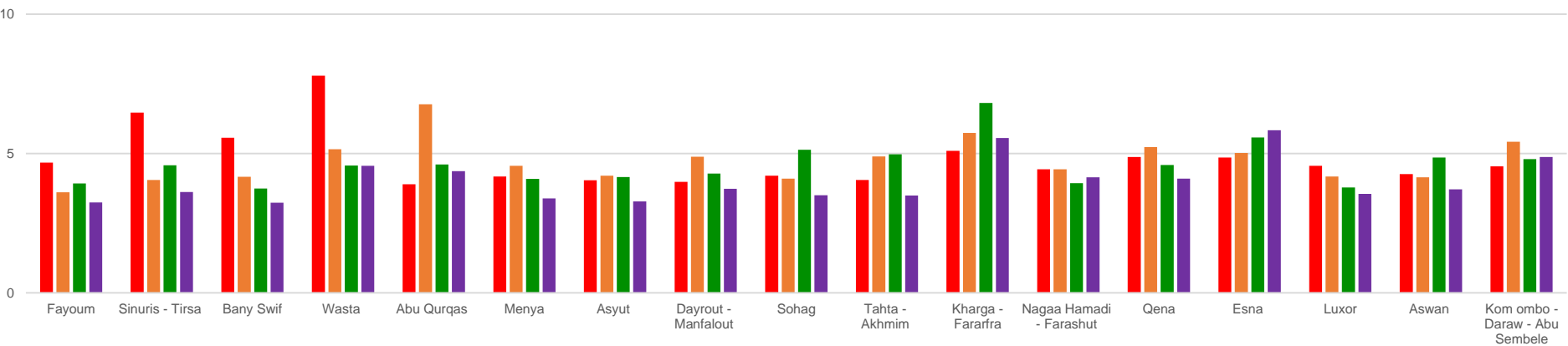
Average Session Time - Overall



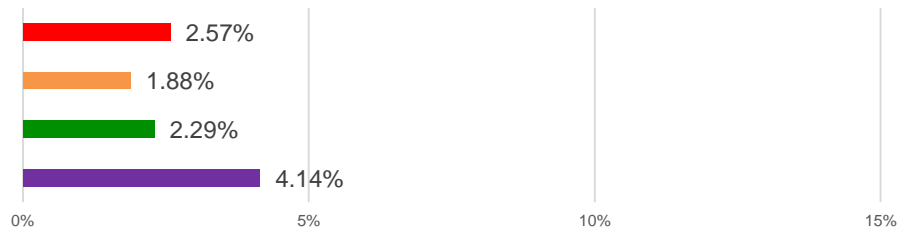
Average Session Time - Zones



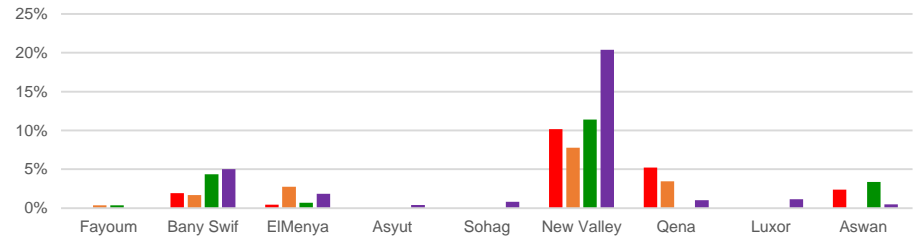
Average Session Time



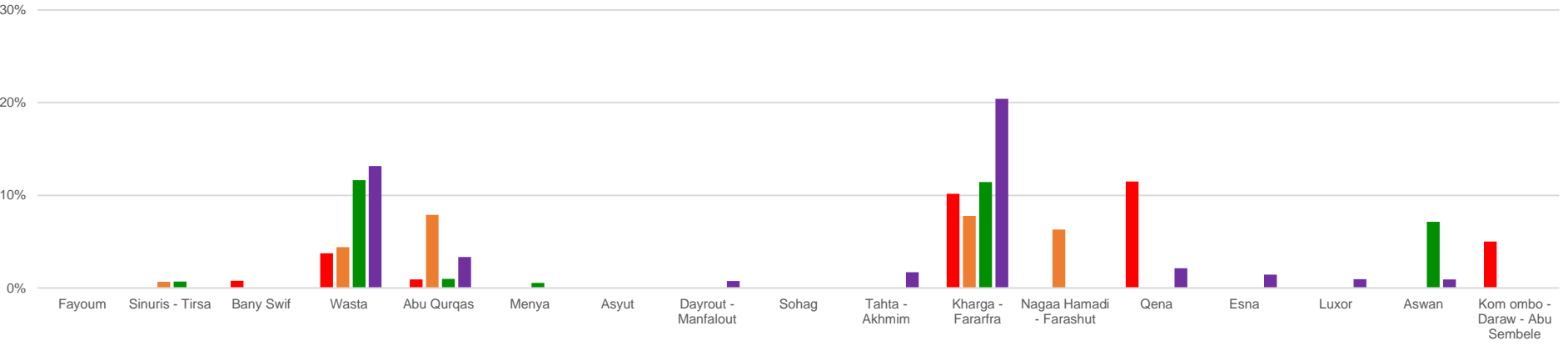
Session Failure Ratio - Overall



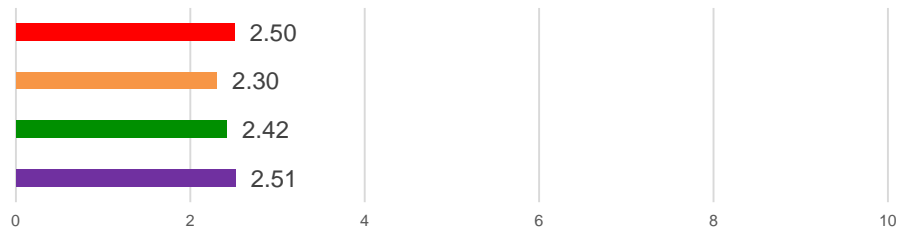
Session Failure Ratio - Zones



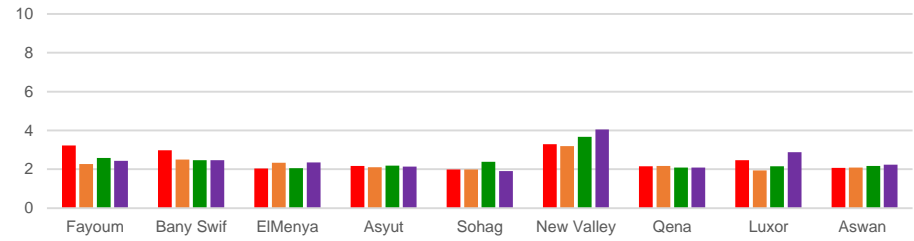
Session Failure Ratio



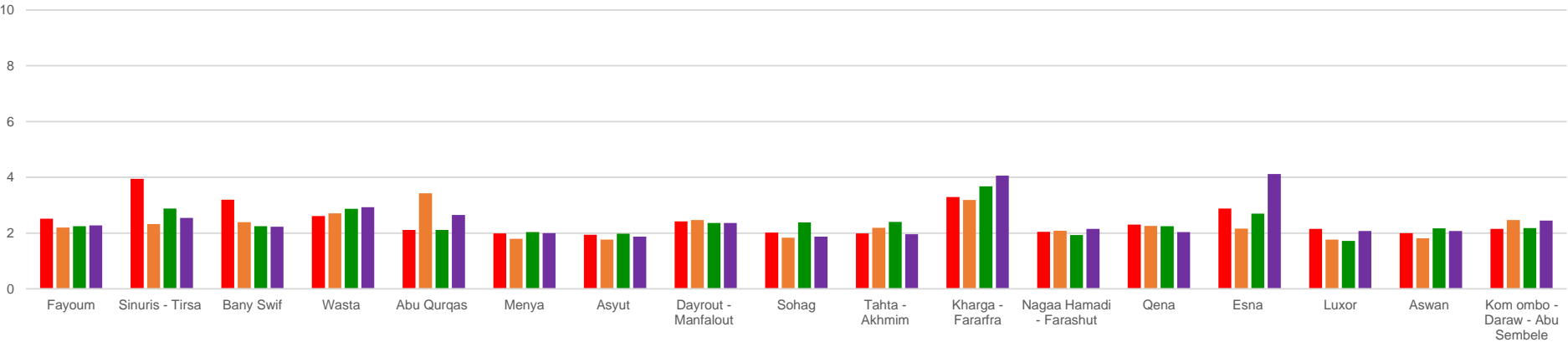
Average Session Time - Overall



Average Session Time - Zones

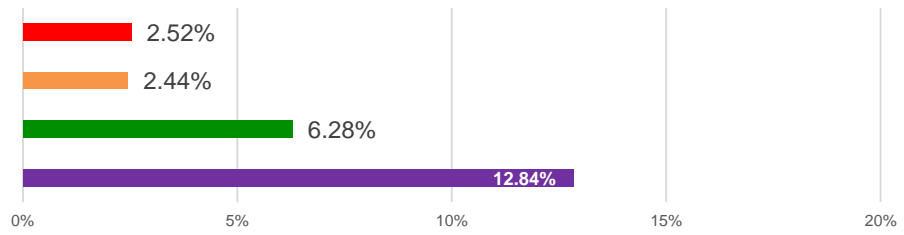


Average Session Time

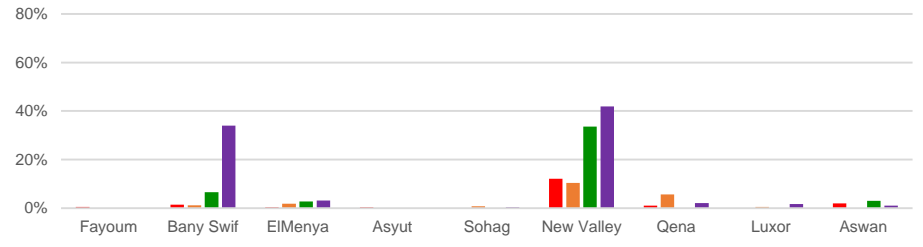


# YouTube Session Failure Ratio

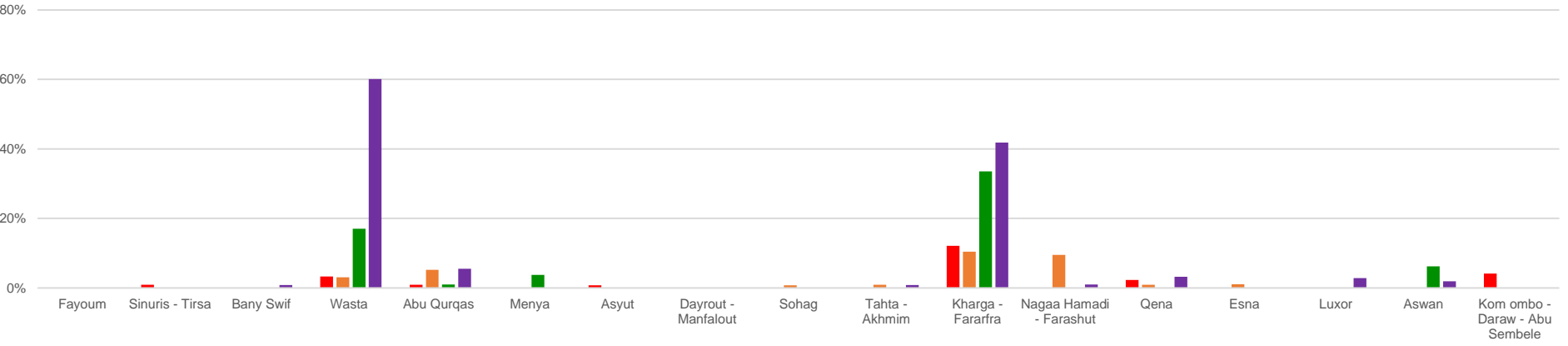
YouTube Session Failure Ratio - Overall



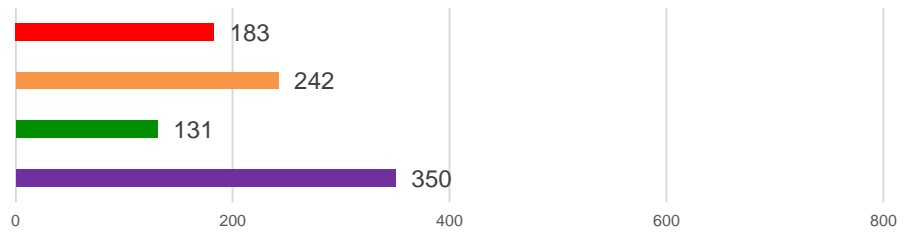
YouTube Session Failure Ratio - Zones



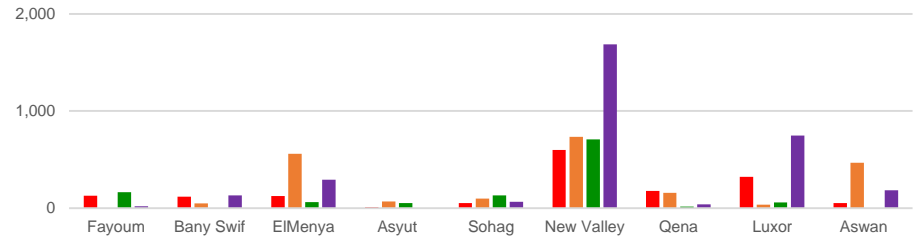
YouTube Session Failure Ratio



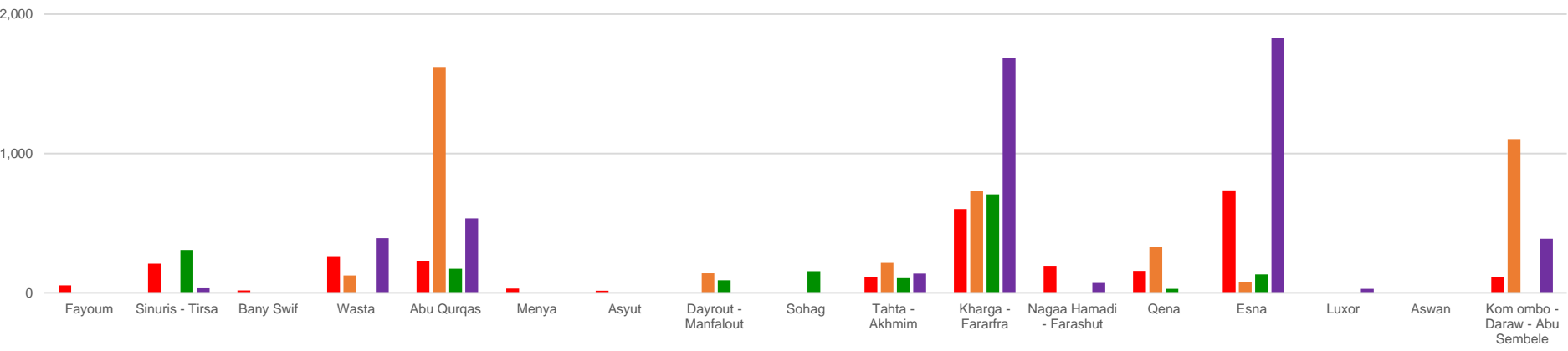
Freezing Time - Overall



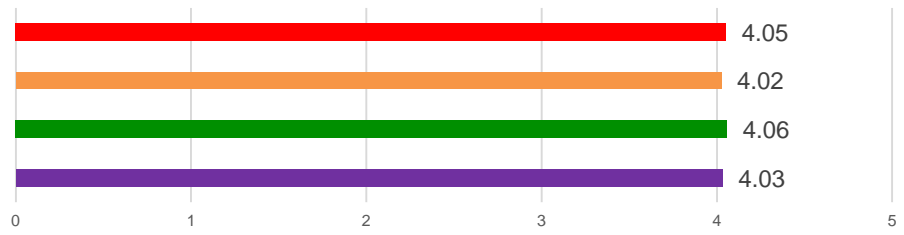
Freezing Time - Zones



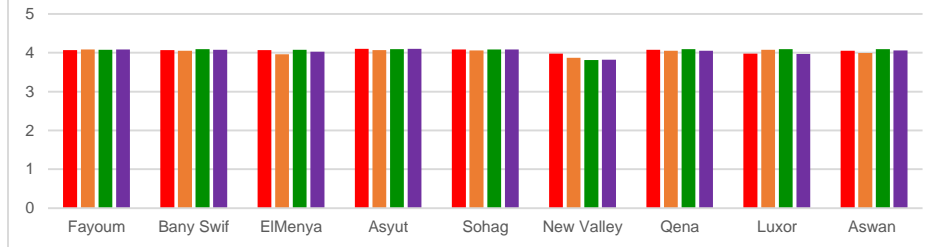
Freezing Time



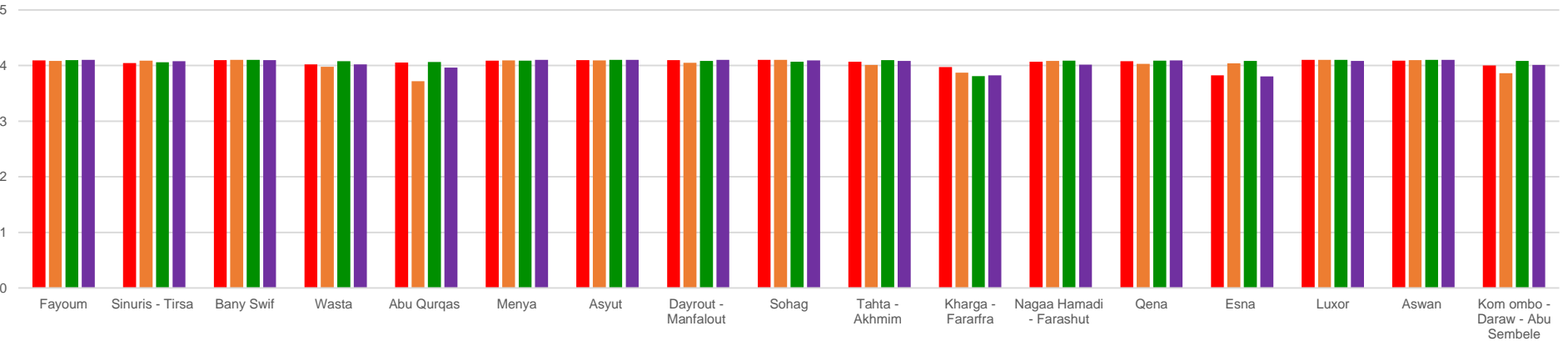
Video Quality [VMOS] - Overall



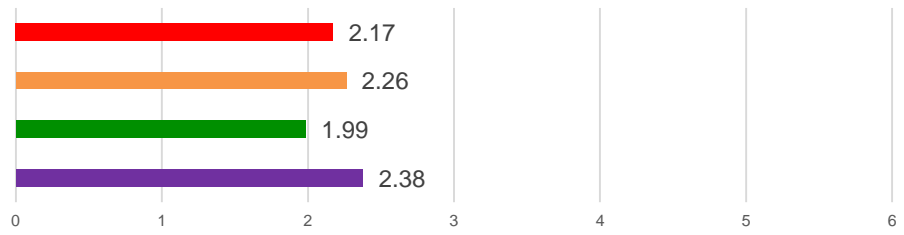
Video Quality [VMOS] - Zones



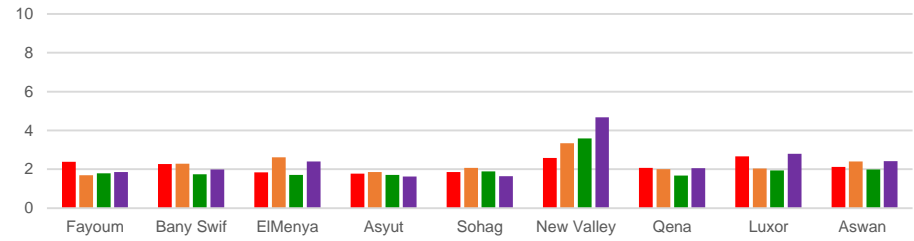
Video Quality - VMOS



Time to First Picture [s] - Overall



Time to First Picture [s] - Zones



Time to First Picture [s]

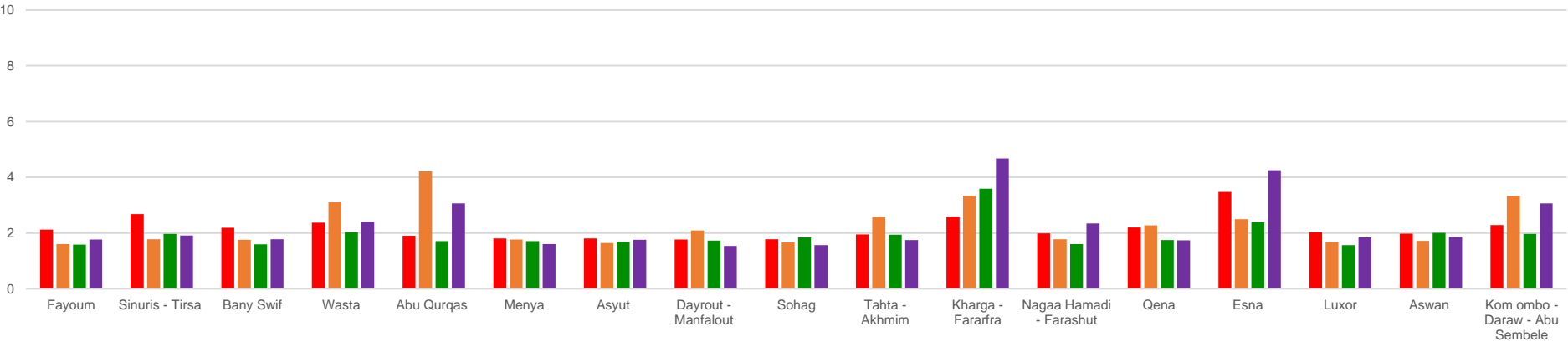
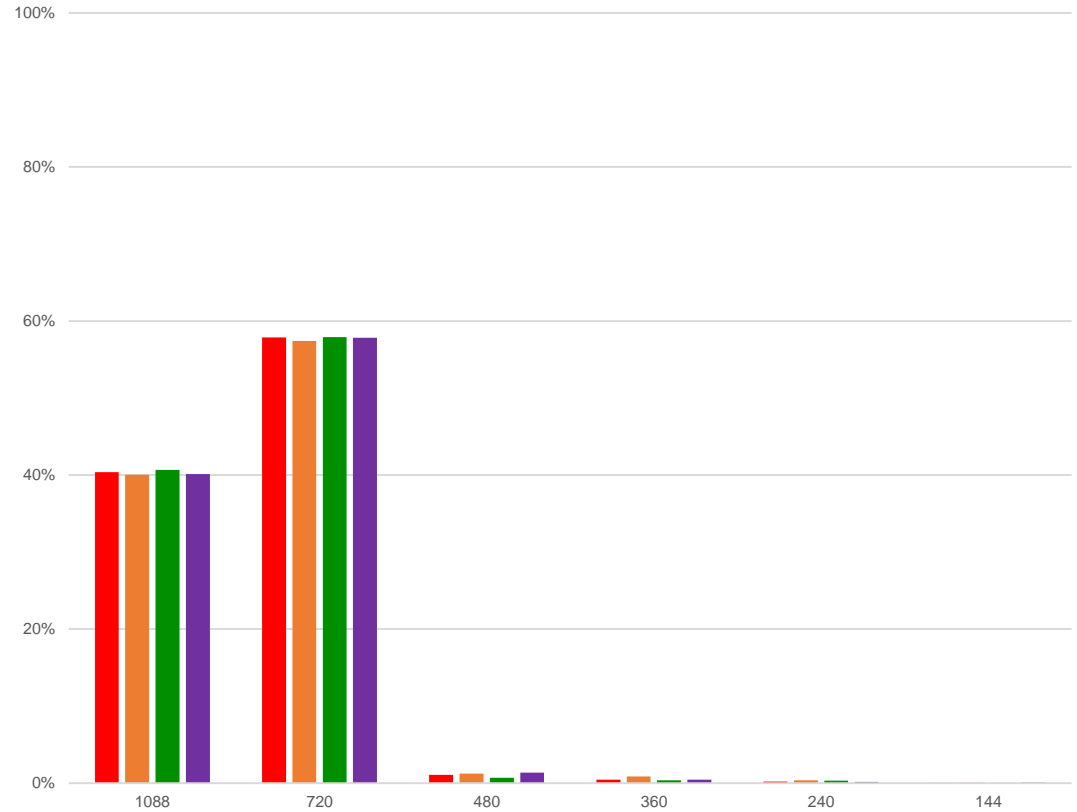




Image Resolution

Youtube - Image Resolution



# AGENDA

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1. Executive Summary
2. Voice Service Quality & Performance - Cairo
3. Data Service Quality & Performance – Cairo
4. Voice Service Quality & Performance - Giza
5. Data Service Quality & Performance – Giza
6. Voice Service Quality & Performance - Alexandria
7. Data Service Quality & Performance - Alexandria
8. Voice Service Quality & Performance - Delta
9. Data Service Quality & Performance – Delta
10. Voice Service Quality & Performance - Canal
11. Data Service Quality & Performance – Canal
12. Voice Service Quality & Performance – Upper Egypt
13. Data Service Quality & Performance – Upper Egypt

## **14. Annexes**

# KPI definitions - Voice KPIs

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## **Call Blocked Rate: (licensed KPI)**

The percentage of unsuccessful call setup attempts to the total number of call attempts in a specified period.

Threshold value = 2 %

## **Call Dropped Rate: (licensed KPI)**

The percentage of dropped or interrupted calls without the subscriber's permission after successful call establishment to the total number of successfully established attempts.

Threshold value = 2 %

## **Bad Speech Voice Quality Rate: (licensed KPI)**

The percentage of bad speech voice calls (less than 2.8) scored on MOS score which is a measure for end-to-end (mouth to ear) speech quality of a voice service call to the total number of completed calls. Threshold value = 10 %

## **CSFB Call Setup Failure Rate (licensed KPI)**

The ratio between unsuccessful CSFB Call setup attempts to all successful CSFB Call setup attempts for the calling UE.

Threshold value = 4 %

## **Call Access: (non-Licensed KPI)**

Represents the period of time elapsed from the sending of a complete destination address (target number) to the setting up of a call to the receiving terminal.

## **CSFB Delay: (non-Licensed KPI)**

Represents the period of time to overlay 3G/2G environment instead of handling calls in 4G (LTE). Depending on the CSFB strategy.

## **Telephony Return Delay: (non-Licensed KPI)**

Measures the time that a UE uses to re-join the LTE (4G) network after call end

# KPI definitions - Data KPIs

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## **Session Blocked Rate: (Licensed KPI's)**

The Percentage ratio of number of data sessions setup that failed to attach on the network data domain to the total number of sessions.

## **Average Session Setup Time: (Licensed KPI's)**

The time taken in seconds to access network data domain averaged over all sessions.

## **Average http download throughput: (Licensed KPI's)**

The average rate of successful data downloaded over a communication channel. The throughput is measured in bits per second (bit/s or bps).

## **Average http Upload throughput: (Licensed KPI's)**

The average rate of successful uploaded data over a communication channel. The throughput is measured in bits per second (bit/s or bps).

## **YouTube Session Failure: (Non-Licensed KPI's)**

Stream session failure rate in percentage equal Total number of Streams / Total number of failed Streams .

## **Freezing Time: (Non-Licensed KPI's)**

Average freezing during stream in milliseconds. The relative amount of freezing in the stream, that is, the ratio between the total time of freezings and the video sequence duration.

## **Video Quality: (Non-Licensed KPI's)**

Average of visual quality from an average of visual quality per video stream. The predicted MOS value lies in the range of 1 to 5, where 1 stands for bad, and 5 for excellent stream quality.

## **Time to 1st Picture: (Non-Licensed KPI's)**

Average Time to first picture appear in seconds for the sessions.

## **Image Resolution: (Non-Licensed KPI's)**

The total percentage of Image resolutions using in the clips.

## **Browsing Session Failure: (Non-Licensed KPI's)**

The percentage of failed browsing sessions.

## **Browsing Session Time : (Non-Licensed KPI's)**

Presents the average time needed for browsing (download) a webpage.

# Causes Definition will be added

Classification	Definition
2G Coverage	Weak GSM (2G) Coverage
2G Quality	Weak GSM (2G) Quality
3G Coverage	Weak UMTS (3G) Coverage
3G Quality	Weak UMTS (3G) Quality
4G Coverage	Weak LTE (4G) Coverage
4G Quality	Weak LTE (4G) Quality
Core Network	Problem related to core recourses not radio recourses
CSFB Issue	Problem related to transfer the call to lower than LTE (4G) technology
Mobility Issue	Problems related to transfer call from one base station to another
No service	No service
Paging Issue	Problem related to delayed or missing paging
RAN Issue	Problems related to grant the radio access
Other	Timeouts

# Quantitative Information

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Calls	License Target value
Call Blocked Rate	2%
Dropped Call Rate	2%
Speech Voice Quality	10%
CSFB Call Setup Failure Rate	4%

Calls	License Target value
Session Blocked Rate	10%
Average Session Setup Time	10 Sec
Average http download throughput	2.5 Mbps
Average http upload throughput	1.5 Mbps

THANK YOU

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