



Malaysian Communications and Multimedia Commission
Suruhanjaya Komunikasi dan Multimedia Malaysia

Public Inquiry Report

Review of the Mandatory Standards for Quality of Service (Wireless Broadband Access Service) – Determination No.1 of 2016

3 July 2021

This Public Inquiry Report was prepared in fulfilment of Sections 61 and 65 of the Communications and Multimedia Act 1998.

Content

Section

1	Summary of the Public Inquiry.....	3
1.1	Introduction.....	3
1.2	Public Inquiry Exercise.....	3
1.3	Structure of the Public Inquiry Report.....	4
2	Input from the Public Inquiry.....	5
2.1	Revision on the Interpretation Part.....	5
2.2	Revision on the QoS Standards.....	6
2.3	Revision of the Applicable Guidelines.....	17
3	Summary of Commission’s final views.....	22
4	The Way Forward.....	26

1. Summary of the Public Inquiry

1.1. Introduction

- 1.1.1. The Mandatory Standards for Quality of Service (“MSQoS”) for Wireless Broadband Access Services covers the network performance of the delivery of data over the internet protocol for mobile broadband systems. This MS focuses on the performance of existing network including Long Term Evolution (LTE) network. MS on 5G network will be determined at a later stage.
- 1.1.2. The Public Inquiry (“PI”) for the revised MSQoS emphasizes on the network performance parameters in which the Malaysian Communications and Multimedia Commission (“MCMC”) considers, would significantly improve the end user experience and enhance network capacity monitoring, towards better service delivery.
- 1.1.3. For information, the set of QoS parameters in this MS are referring to minimum requirements for a single user, regardless whether the user is in urban or rural areas, as long as within the coverage of the service provider. This is different from an average value accumulated over a particular area such as at state or national level.
- 1.1.4. In steering the industry to deliver enhanced quality of service (“QoS”) for consumers, the proposed revisions of the mandatory standards are based on international best practices where possible and seeks to strengthen and streamline the QoS framework for current and future technologies. The revised MSQoS is targeted to be effective once the existing MSQoS is revoked.

1.2. Public Inquiry Exercise

- 1.2.1. In the PI document on the proposed revision of the MSQoS for Wireless Broadband Access Service issued on 8th April 2021, the MCMC outlined the proposed QoS parameters pertaining to:
 - i. Proposed revision on the interpretation part of the standards;
 - ii. Proposed revision on the QoS standards, indicators, measurement, notification and reports; and
 - iii. Proposed revision on the applicable guidelines.

- 1.2.2. The PI document invited feedback from public and relevant stakeholders on MCMC's proposed standards. The PI document specifically sought comments for all proposed revisions and the general views of the standards.
- 1.2.3. By the end of the PI period at 12 noon on 4th June 2021, MCMC received eight (8) submissions from the following parties:

No.	Submitting Parties	Submission Date
1.	Celcom Axiata Berhad ("Celcom")	4 th June 2021
2.	Digi Telecommunications Sdn Bhd ("Digi")	4 th June 2021
3.	Maxis Broadband Sdn Bhd ("Maxis")	4 th June 2021
4.	SEA Telco Engineering Services Sdn Bhd ("Redtone")	4 th June 2021
5.	Telekom Malaysia Berhad ("TM")	4 th June 2021
6.	U Mobile Sdn Bhd ("U Mobile")	4 th June 2021
7.	YTL Communications Sdn Bhd ("YTL")	4 th June 2021
8.	Khazanah Research Institute ("KRI")	4 th June 2021

Table 1: List of respondents to the PI

- 1.2.4. MCMC considered these eight submissions and summary of comments/suggestions are outlined in further sections of this report in which this PI Report is presented within the 30-day requirement from the closing date of submissions, as stipulated under section 65 of the Communications and Multimedia Act 1998 ("CMA").
- 1.2.5. MCMC proposes to issue a Commission Determination that will reflect the Commission's final views expressed in this PI Report in respect of the MSQoS for Wireless Broadband Access Service.

1.3. Structure of the PI Report

- 1.3.1. The remainder of this PI Report is structured to provide context for MCMC's questions for comments, as follows:
 - i. Section 2 provides the summary of input received on the proposed changes;
 - ii. Section 3 describes MCMC's final views of the framework and responses; and
 - iii. Section 4 highlights the way forward.

2. Input from the Public Inquiry

2.1. Revision on the Interpretation Part of the Standards

QUESTION 1: THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO THE INTERPRETATION PART OF THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	Celcom agrees with all the proposed interpretations stated in Part A without comments.
Digi	Digi agrees with all the proposed interpretations stated in Part A without comments.
KRI	Offers no feedback for the proposed interpretations stated in Part A.
Maxis	Maxis agrees with the proposed interpretations stated in Part A with comments for "wireless broadband access service" interpretation is in line with ITU's recommendation.
Redtone	Redtone agrees with all the proposed interpretations stated in Part A and have no objection on the proposed "wireless broadband access service" interpretation.
TM	<p>TM proposes for amendments on the definition of "Service Provider" to be as follows:</p> <ul style="list-style-type: none"> i. "Service Provider" means Celcom, Maxis, Digi and U Mobile who hold an Applications Service Provider and or a Network Service Provider which provide wireless broadband access service; ii. "Smaller Service Provider" means an Applications Service Provider or a Network Service Provider, which provides wireless broadband access service other than a Service Provider. <p>TM's view of this segregation is to provide the "Smaller Service Provider" to use their reasonable endeavors to meet the QoS standards in the Determination but shall not be subject to any sanctions.</p> <p>TM agrees with the proposed interpretations with comments on "wireless broadband access service" interpretation to include relevant wireless broadband standard definition instead of ISDN.</p>
U Mobile	U Mobile has no comments on the proposed interpretations.

YTL	YTL has no comments on the proposed interpretations and proposed packages that are being offered at 3Mbps or below should not be included in the same standard.
-----	---

Table 2: Response on interpretation part

2.2. Revision on the QoS Standards

2.2.1. Network Latency

QUESTION 2: THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO NETWORK LATENCY (PING TIME) STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Proposed network latency standards in the PI:	
Network latency must be not more than 150ms, 90% of the time based on test sample.	
Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> • Celcom disagrees with MCMC’s proposed network latency standards in the PI. • Regulators in developed countries tend to promote self-regulation or allow market forces to push for better QoS for wireless broadband, hence no stringent standards are set for compliance. • Celcom proposes to amend the QoS standard for network latency to: <p style="margin-left: 20px;">“Average network latency for all states in Malaysia must be not more than 100ms over 1 year period, based on data from crowdsourcing application i.e. Ookla.”</p> <p style="margin-left: 20px;">AND</p> <p style="margin-left: 20px;">Static test could be used for audit purposes ‘as and when’ deemed necessary whereby the results are not subjected to enforcement/penalty. With proposal below:</p> <p style="margin-left: 20px;">“network latency must not be more than 150ms, 80% of the time based on test sample”</p>
Digi	<ul style="list-style-type: none"> • Digi disagrees with MCMC’s proposed network latency standards in the PI.

	<ul style="list-style-type: none"> Digi proposes to amend the QoS standards for network latency via reporting based on crowdsourcing data such as Ookla: "Network Latency not more than 100ms based on crowdsource data reported at state level in a quarterly reporting period" Crowdsource data is matched to the internal process Digi works with in planning to enhance and upgrade the network to meet customer's needs. Crowdsource data is also used to analyze and monitor the network performance and quality and optimization tasks for the improvement of services to customers.
KRI	<ul style="list-style-type: none"> Offers no comments on network latency proposal but proposes for minimum standards to be raised and to look into new elements or indicators for monitoring QoS.
Maxis	<ul style="list-style-type: none"> Maxis disagrees with the proposed revision of the network latency standards in the PI. Consideration should be given to unplanned network outages, issues related to devices, connectivity to remote areas via microwave and multiple hops needed before the traffic could reach the destination. Maxis proposes to amend the QoS standards for network latency to be measured and submitted quarterly based on crowdsourcing data such as Ookla and static test audits conducted shall be for the purpose of monitoring and not for enforcement. The proposal for both are: "Latency of not more than 150ms, 80% of the time for the state or nationwide measurement."
Redtone	<ul style="list-style-type: none"> Redtone agrees with the proposal.
TM	<ul style="list-style-type: none"> TM Group disagrees with the proposed revision of the network latency standards in the PI. Proposal in PI is only suitable if the crowdsourcing method is used. Through crowdsourcing, more sampling is available based on real traffic samples. TM proposed to amend the QoS standard for network latency to: "Not more than 100ms at 90% of the time using crowdsourcing method;" OR "Not more than 150ms at 80% of the time for static test method"

U Mobile	<ul style="list-style-type: none"> • U Mobile disagrees with the proposed revision of the network latency standards in the PI. • The proposed standard for 90% of the time will not result in any marked differences in customer experience but will incur significant cost increases in the near term, which no doubt will invoke further pressure towards price increases for the service provider. • U Mobile proposes for the latency standards to be based on yearly nationwide average. Proposal: "Not more than 150ms at 80% of the time for static test method"
YTL	<ul style="list-style-type: none"> • YTL disagrees with the proposed revision of the network latency standards in the PI. • 90% of the time based on test sample is too stringent as ICMP ping packet has the lowest priority and based on best effort. • YTL proposes for a 2 tier latency value to differentiate Peninsular Malaysia and East Malaysia standards: Peninsular Malaysia: 150ms, 70% of the time, based on test samples for Peninsula Starting 2023 East Malaysia: 200ms, 70% of the time, based on test samples for East Malaysia Starting 2023.

Table 3: Response to network latency standards

2.2.2. Broadband Speed (Throughput)

QUESTION 3: THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO BROADBAND SPEED (THROUGHPUT) STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Proposed broadband speed standards in the PI:

- a) Throughput of wireless broadband service for both TDD and FDD technology shall be not less than 2.5Mbps, 90.0% of the time based on test sample.
- b) Throughput of FWA service shall not be less than 25Mbps, 90% of the time based on test sample.

Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> • Celcom disagrees with the proposed revision of the throughput standards. • Global practice of light regulation should be considered. • Celcom highlighted that as stated by Body of European Regulators for Electronic Communications (“BEREC”), there is no need for intervention when there is good availability of internet access service offers with satisfactory quality (i.e. without degradation) at a reasonable price, and the possibility and ease of switching is sufficient (such as Malaysia) • Concerned that the substantial cost for implementing high/ inappropriate QoS standard imposed by MCMC will eventually increase the deployment cost for wireless broadband in Malaysia, or at the least, competitive pricing declines will be impacted. • Celcom proposes the following: <p style="margin-left: 40px;">“Average throughput of wireless broadband service for both TDD and FDD technology for all states in Malaysia shall be not less than 10Mbps over 1 year period, based on data from crowdsourcing application i.e. Ookla.”</p> <p style="margin-left: 40px;">Remove the standard for FWA from the Mandatory Standard for Quality of Service (Wireless Broadband Access Service) as FWA should have same standard as wireless broadband.</p> <p style="margin-left: 40px;">AND</p> <p style="margin-left: 40px;">“throughput of wireless broadband service for both TDD and FDD technology shall be not less than 2.5Mbps, 80% of the time based on test sample” to be used as reference and not subject to enforcement.</p>
Digi	<ul style="list-style-type: none"> • Digi disagrees with the proposed revision of the throughput standards. • Digi proposes the following: <p style="margin-left: 40px;">Broadband Speed (Throughput) shall be done via reporting based on crowdsourcing data on the following standards:</p> <p style="margin-left: 40px;">“Not less than 10Mbps (averaged) based on Crowdsourc data reported at state level in a quarterly reporting period”</p> <p style="margin-left: 40px;">The above proposal will apply to TDD, FDD and FWA technologies as currently all these services are utilizing</p>

	<p>the same network resources and there is no differentiation applied to the allocation within the network.</p>
KRI	<ul style="list-style-type: none"> • KRI proposes for the minimum standards should be raised to be aligned with the national digital aspiration.
Maxis	<ul style="list-style-type: none"> • Maxis agrees with the required minimum network throughput of 2.5Mbps but at 80% of the time. • Maxis proposes service providers to measure and submit quarterly reports based on crowdsourcing data for example Ookla based on the following standard: "Throughput of not less than 2.5Mbps, 80% of the time for the state or nationwide measurement." • On-site static test audit shall be conducted based on the same proposed standard for monitoring and not for enforcement. • Maxis states that by using crowdsourced data, the actual customer experience can be gauged as the data samples are huge and true reflection of millions of subscribers in Malaysia compared to drive test/static test methodology where only limited test samples are gathered per state.
Redtone	<ul style="list-style-type: none"> • Redtone declares that their current package is on Wimax technology but it has no objection on the proposed standard.
TM	<ul style="list-style-type: none"> • TM disagrees with the proposed revision of the throughput standards as it is challenging to meet with the current spectrum allocation and the constraint of not able to carrier aggregate 2.6GHz TDD and 2.3GHz TDD due to unsupported current technology. • TM proposes for the following if the spectrum constraints above are eliminated: "not less than 10Mbps average within LTE network using the crowd sourcing methodology; OR "not less than 2.5Mbps, 80% of time for Static test for both TDD/FDD"
U Mobile	<ul style="list-style-type: none"> • U Mobile agrees with the required minimum network throughput of 2.5Mbps but at 80% of the time. • U Mobile propose the following on a yearly basis: "Not less than 2.5Mbps, 80% of the time based on nationwide measurement"

	<ul style="list-style-type: none"> FWA to have same standard as above as it shares same network resources.
YTL	<ul style="list-style-type: none"> YTL proposes gradual increment based static test: <p>Year 2023: "Not less than 1.5Mbps, 80% of time"</p> <p>Year 2025: "Note less than 2.5Mbps, 80% of time"</p> As for FWA, YTL proposes the following: <p>"Not less than 70% of subscribed bandwidth, 80% of the time base on sample"</p>

Table 4: Response to broadband speed standards

2.2.3. Packet Loss

QUESTION 4: THE COMMISSION SEEKS VIEWS ON THE PROPOSED CHANGES TO PACKET LOSS STANDARD FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Proposed packet loss standards in the PI:	
Packet loss must be not more than 0.5% , calculated based on the test sample.	
Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Celcom disagrees with the proposal and proposes for the packet loss standard to be removed from the MSQoS (Wireless Broadband Access Service). Customer experience in wireless broadband is mainly evaluated by the throughput (internet speed) and latency (response time). Throughput and latency are also known as service level metrics.
Digi	<ul style="list-style-type: none"> Digi disagrees with the proposal and proposes for the packet loss standard to be removed from the MSQoS (Wireless Broadband Access Service). Proposes the focus to be on indicators that directly impact customer experience which is mainly the broadband speed and latency measurements and not the intermediary or infrastructure related elements i.e. packet loss and utilization.

KRI	<ul style="list-style-type: none"> Offers no comments on packet loss proposal but propose for minimum standards to be raised and to look into new elements or indicators for monitoring QoS.
Maxis	<ul style="list-style-type: none"> Maxis disagrees with the proposal and proposes for the packet loss standard to be removed from the MSQoS (Wireless Broadband Access Service). Maxis states that it is sufficient to measure the customer experience based on the throughput and latency.
Redtone	<ul style="list-style-type: none"> Redtone disagrees with the proposal. Proposes for packet loss not more than 1.0% based on Wimax technology limitations.
TM	<ul style="list-style-type: none"> TM disagrees with the proposal and proposed for the packet loss standard to be removed from the MSQoS (Wireless Broadband Access Service). TM states that it is sufficient to measure the customer experience based on the throughput and latency.
U Mobile	<ul style="list-style-type: none"> U Mobile disagrees with the proposal and proposes for the packet loss standard to be removed from the MSQoS (Wireless Broadband Access Service). Network performance indicators have been measured via throughput and latency
YTL	<ul style="list-style-type: none"> YTL proposed to have a gradual increment on the packet loss standard over a number of years, as below : Year 2023 : not more than 2.5%; and Year 2025 : not more than 2%

Table 5: Response to packet loss standards

2.2.4. Base Station Utilization

QUESTION 5: THE COMMISSION SEEKS VIEWS ON THE PROPOSED NEW STANDARD ON ENODEB UTILIZATION FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Proposed base station utilization standards in the PI:	
Average aggregated % of PRB utilization (per base station (eNodeB)) for the duration of 3 months shall not be more than 80% and shall be rectified within 7 days.	
Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Celcom disagrees with the proposal and proposes for the base station utilization to be removed from the MSQoS (Wireless Broadband Access Service). Celcom is of the view that there should be no QoS standards be set for the intermediary or infrastructure related

	<p>elements such as eNodeB utilization and backhaul utilization.</p> <ul style="list-style-type: none"> Concerns are on the substantial cost for implementing high/inappropriate QoS standards imposed by MCMC on eNodeB utilization and backhaul utilization will eventually increase the deployment cost for wireless broadband in Malaysia. To amend the standard for monitoring purposes only with the following proposal: <p>“Aggregated % of PRB utilization (per base station (eNodeB)) for the duration of 3 months shall be submitted to the Commission quarterly for monitoring purposes.”</p>
Digi	<ul style="list-style-type: none"> Digi disagrees with the proposal and proposes for the base station utilization to be removed from the MSQoS (Wireless Broadband Access Service). Proposes for the Service Provider to manage the eNodeB utilization on a self-regulation basis to provide a better service to customers. Data on eNodeB utilization may be reported on quarterly basis for review and reporting only, if required.
KRI	<ul style="list-style-type: none"> KRI proposes for a new indicator that could monitor signal degradation and network capacity in an area.
Maxis	<ul style="list-style-type: none"> Maxis disagrees with the proposal and proposes for the base station utilization to be removed from the MSQoS (Wireless Broadband Access Service). Maxis is in view that not all high traffic instances cause service degradation. Best practice indicates principle-based approach, as opposed to detailed operational requirements.
Redtone	No comment.
TM	<ul style="list-style-type: none"> TM disagrees with the proposal and proposes that the base station utilization reporting is for monitoring and information purposes only, with the following amendments: <p>“Base station (eNodeB) utilization is average aggregated % of PRB utilization (per base station) for the duration of 3 months should be not more than 80% to trigger for an urgent action and Service Provider should revert only on solution within 7 days from the submission date.”</p> <ul style="list-style-type: none"> Service Provider should revert only with solutions within 7 days from the submission date instead of rectification within 7 days. This indicator is a subset of the throughput, latency and packet loss indicator. Enforcing this indicator may result in

	double penalty should there be non-compliance by the service provider.
U Mobile	<ul style="list-style-type: none"> U Mobile disagrees with the proposal and proposes that the reporting is for monitoring purposes only and not for compliance. Service level indicators have been measured via throughput and latency, and if utilization is added as a compliance indicator, any breach would result in a double penalty. Regulators globally do not impose utilization as a QoS compliance indicator.
YTL	<ul style="list-style-type: none"> YTL disagrees with the proposal and proposes that base station utilization be submitted quarterly solely for information/good practice purpose only and not as a mandatory standard.

Table 6: Response to base station utilization standards

2.2.5. Backhaul Utilization

QUESTION 6: THE COMMISSION SEEKS VIEWS ON THE PROPOSED NEW STANDARD ON BACKHAUL UTILIZATION FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Proposed backhaul utilization standards in the PI:	
Average aggregated % of backhaul utilization of any base station shall not be more than 80% and shall be rectified within 7 days.	
Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Celcom disagrees with the proposal and proposes for the backhaul utilization to be removed from the MSQoS (Wireless Broadband Access Service). Celcom is of the view that there should be no QoS standards be set for the intermediary or infrastructure related elements such as eNodeB utilization and backhaul utilization. Concerns are on the substantial costs for implementing high/inappropriate QoS standards imposed by MCMC on eNodeB utilization and backhaul utilization will eventually increase the deployment costs for wireless broadband in Malaysia. To amend the standard for monitoring purposes only with the following proposal:

	<p>"Average aggregated % of backhaul utilization of the base station for the duration of 3 months shall be submitted to the Commission quarterly for monitoring purposes."</p>
Digi	<ul style="list-style-type: none"> • Digi disagrees with the proposal and proposes for the backhaul utilization to be removed from the MSQoS (Wireless Broadband Access Service). • Data on backhaul utilization may be reported on quarterly basis for review and reporting only, if required.
KRI	<ul style="list-style-type: none"> • KRI proposes for a new indicator that could monitor signal degradation and network capacity in an area.
Maxis	<ul style="list-style-type: none"> • Maxis disagrees with the proposal and proposes for the backhaul utilization to be removed from the MSQoS (Wireless Broadband Access Service). • Maxis is in view that not all high traffic instances cause service degradation. • Best practice indicates principle-based approach, as opposed to detailed operational requirements.
Redtone	<ul style="list-style-type: none"> • Redtone disagrees with the proposal and proposes that the utilization report is for monitoring purposes only.
TM	<ul style="list-style-type: none"> • TM disagrees with the proposal and proposes that the backhaul utilization reporting is for monitoring and information purposes only, with the following amendments: <p>"Backhaul utilization is average aggregated % of backhaul utilization of any base station for the duration of 3 months should be not more than 80% to trigger for an urgent action and Service Provider should revert only on solution within 7 days from the submission date"</p> <ul style="list-style-type: none"> • Service Provider should revert only with solutions within 7 days from the submission date instead of rectification within 7 days. • This indicator is a subset of the throughput, latency and packet loss indicator. Enforcing this indicator may result in double penalty should there be non-compliance by the service provider.
U Mobile	<ul style="list-style-type: none"> • U Mobile disagrees with the proposal and proposes that the reporting is for monitoring purpose only and not for compliance. • Service level indicators have been measured via throughput and latency, and if utilization were added as a compliance indicator, any breach would result in a double penalty. • Regulators globally do not impose utilization as a QoS compliance indicator.

YTL	<ul style="list-style-type: none"> YTL disagrees with the proposal and proposes that backhaul utilization be submitted solely for information/good practice purpose only and not as a mandatory standard.
-----	--

Table 7: Response to backhaul utilization standards

2.2.6. Fixed Wireless Access (FWA)

QUESTION 7: THE COMMISSION SEEKS VIEWS ON THE PROPOSED NEW STANDARD FIXED WIRELESS ACCESS FOR THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Celcom proposes for the new FWA standard to be removed from the Mandatory Standards. No network prioritization for FWA service over other wireless broadband services and no dedicated spectrum being deployed for FWA. Hence, the FWA users will have similar network experience as the other wireless broadband users. The FWA package is sold based on quota and not speed whereby the service is provided based on best effort basis similar to other wireless broadband products. Over regulation/high standards set will have negative effects on the innovation of wireless broadband products including FWA.
Digi	<ul style="list-style-type: none"> Digi proposes for the FWA services to be reported as part of the wireless broadband service and following the same standards as the wireless broadband service as it is utilizing the same network resources.
KRI	Offers no comments on FWA.
Maxis	<ul style="list-style-type: none"> Maxis proposes for the FWA standard to be the same with wireless broadband standard as both services are using the same network and partitioning is not practical as FWA load varies from site to site and it is quota based which will impact the cost effectiveness of FWA initiative as an interim solution while waiting for fiber expansion. Industry has been supportive of utilizing FWA for selective Corporate Social Responsibility (CSR) activities for many initiatives and if the MSQoS for this service is prohibitive, it will cease to be cost effective for these activities.

Redtone	Offers no comments on FWA.
TM	<ul style="list-style-type: none"> TM Group is unable to comply with 25Mbps throughput at 90% of time with its existing spectrum allocation. TM proposes the following: <p>“not less than 10Mbps average within LTE network using the crowd sourcing methodology;”</p> <p>OR</p> <p>“not less than 2.5 Mbps, 80% of time for static test for both TDD/FDD”</p>
U Mobile	<ul style="list-style-type: none"> U Mobile proposes FWA and wireless broadband to have the same standard as both share the same network resources; there is no dedicated network or service prioritization – thus FWA should not have a separate standard.
YTL	<ul style="list-style-type: none"> YTL proposes for FWA and wireless broadband to have the same standard or 70% of the subscribed bandwidth, 80% of the time for FWA.

Table 8: Response to FWA

2.3 Revision of the Applicable Guidelines

2.3.1 Methodology

QUESTION 8: THE COMMISSION SEEKS VIEWS ON THE PROPOSED MEASUREMENT METHODOLOGY AS STATED IN THE GUIDELINES OF THE COMMISSION DETERMINATION ON MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Celcom proposes to amend the measurement methodology to reflect measurement utilizing crowdsourced data obtained from crowdsourcing application. Therefore, the proposed guidelines is not applicable to self-reporting based on crowdsourcing application. Reporting to be 30 days after end of each quarter.
Digi	<ul style="list-style-type: none"> Proposes for further review of the methodology to be updated into the guidelines later.
KRI	Offers no comments on guidelines.

Maxis	<ul style="list-style-type: none"> • Maxis proposes crowdsourced data to be used for the calculation of Mandatory Standards. Crowdsourced data includes samples collected during static and mobility. For audit or customer complaints verification by MCMC, the proposed methods can be used. • Crowdsourced data samples are done directly by subscribers and does not require a third party to conduct the assessment. • For audit or complaint location verification, the assessment can be conducted either by MCMC or by their appointed consultants.
Redtone	<ul style="list-style-type: none"> • Proposes for the removal of assessments on complaints from consumers to allow service providers time to assess, identify issues and provide resolutions before any assessment is done.
TM	<ul style="list-style-type: none"> • TM proposes for the measurement to be based on crowdsourcing methodology because it is a reference for benchmarking network performance worldwide, more samples and optimize resources utilization. • On-site measurements are only for complaint resolution. Require complaint location to be given time for service providers to resolve before measurement. • TM proposes that test method and test locations shall be predefined and not up to Commission's discretion.
U Mobile	<ul style="list-style-type: none"> • U Mobile proposes for changes to paragraph 13 on service coverage - change 'or' to 'and' for item 'a'. Removal of item 'c' on consumer complaints to allow service providers reasonable time to resolve issues in the complaints areas. • Proposes for the multi thread test. • Disagrees with 50 locations/month (150 per quarter). Proposes for 120 locations per quarter, which translates to 480 locations nationwide per year. "All region" in each quarter instead of all states. • Reports should be submitted on quarterly basis instead of monthly, which is at the 15th of each quarter. • Amendments to the report template on table 2 as it is duplication of utilization report.
YTL	<ul style="list-style-type: none"> • Proposes for the static test methodology to be retained. • Test locations cannot be limited to only complain locations and should be distributed/balanced/mixed with other common public locations within the operator's published coverage areas to give a fair assessment of the quality of the network.

Table 9: Response to the applicable guidelines

2.3.2. Enforcement on each location measured

QUESTION 9: THE COMMISSION SEEKS VIEWS ON THE PROPOSAL TO ENFORCE THE MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE) ON EACH OF THE LOCATION MEASURED AS STATED IN THE GUIDELINES OF THE COMMISSION DETERMINATION.

Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> Proposes for this to be enforced on a yearly basis based on the average value of all the locations measured using crowdsourcing application i.e. Ookla. No regulator in the world enforces the mandatory standards for QoS based on each of the locations measured. Extensive cost for implementing high/inappropriate QoS standards. Provides balance between good customer experience and affordable cost
Digi	<ul style="list-style-type: none"> Any enforcement of the MSQoS to be performed yearly based on the averaged nationwide results. The network is constantly undergoing optimization, rollout of new and upgrade of sites among other activities where constant attention is given towards improving customer's experience.
KRI	<ul style="list-style-type: none"> Offers no comments.
Maxis	<ul style="list-style-type: none"> Maxis proposes for the performance to be reported for each state, but enforcement is to be carried out at national level. Maxis disagrees with MCMC's proposal to enforce the standard per location measured. Crowdsourced data allows collection of subscriber experience throughout the week including workdays, weekends and public holidays reflecting the real experience of usage. For the audit or complaint location verification done by MCMC, the assessment can be limited to workdays.
Redtone	<ul style="list-style-type: none"> Enforcement should be done on yearly basis and nationwide as this would give room to manage the optimization and overall improvement of the service.
TM	<ul style="list-style-type: none"> Any revision of the MSQoS guidelines to enforce the MSQoS should be made yearly and based on the averaged nationwide results. Service providers will have enough time to implement the improvement plan.
U Mobile	<ul style="list-style-type: none"> U Mobile disagrees with enforcement based on each location.

	<ul style="list-style-type: none"> • QoS at each location does not reflect the network’s actual performance. • The sample size is too small to be used for enforcement of the Mandatory Standard. • Overall customer experience is better reflected with a higher sample size – thus nationwide measurement should be used to determine overall network performance.
YTL	<ul style="list-style-type: none"> • Fair distribution of locations for testing within the operator's advertised coverage areas. To exclude areas served by site(s) planned maintenance/upgrades, 3rd party network outages (due to fiber cut, power failure, etc.), 3rd party site access restriction and force majeure. • YLC proposes that enforcement be based on annual data rather than data for a specific quarter. This will take into account improvements made by service providers.

Table 10: Response to the enforcement part

2.3.3. General views

QUESTION 10: THE COMMISSION SEEKS VIEWS ON ANY OF THE GENERAL CHANGES PROPOSED TO THE GUIDELINES OF THE COMMISSION DETERMINATION ON MANDATORY STANDARD FOR QUALITY OF SERVICE (WIRELESS BROADBAND ACCESS SERVICE).

Submitting Party	Comments
Celcom	<ul style="list-style-type: none"> • To exempt the wireless broadband service providers from being responsible for failure that is beyond its control such as failure due to other service providers/third party, force majeure or non/low coverage. • Crowdsourced data methodology is considered for cost efficiency and without overstressing the QoS to increase network cost and consequently consumers cost. • Relaxation is required due to 3G sunset.
Digi	<ul style="list-style-type: none"> • Proposes for further review of the methodology to be updated into the guidelines later.
KRI	<ul style="list-style-type: none"> • To gain commitment from the industry in providing better quality to users in all areas, the standards and methodology shall reflect the current usage. • Infrastructure element must be monitored such as service coverage, signal degradation and traffic utilization.
Maxis	<ul style="list-style-type: none"> • For crowdsourced methodology, the latency will be performed via http response. For crowdsource data, the measurement of file size will be done dynamically based on the available bandwidth.

	<ul style="list-style-type: none"> • For audit or complaint location verification which will be conducted by MCMC, Maxis proposes the following requirements: <ul style="list-style-type: none"> • FTP: Multi-thread (minimum 5) • Ping \geq 32bytes • File Size = 500MB • Minimum LTE CAT 12
Redtone	<ul style="list-style-type: none"> • For Redtone, for Wireless service for consumer i.e. Wimax, only have 6 locations to date in Sabah, hence only able to carry out test on 6 locations. • Reports to be submitted on quarterly basis by 30th of the following month
TM	<ul style="list-style-type: none"> • When testing the network performance, the non-compliance which are due to any of the following events beyond control is to be excluded: <ul style="list-style-type: none"> ○ Damage to network facility due to third party, force majeure, facility failure, faulty testing equipment, site being blocked by new development, problem related to MyIX. • Testing of 15 sites per quarter for static test. • Monthly measurement report on quarterly basis on the 30th. • Remove the PRB and Backhaul utilization columns as it is also updated in the utilization report.
U Mobile	<ul style="list-style-type: none"> • All measurement tools used by MCMC to measure network quality must be consistent. • Routine calibration of test measurement tools to ensure accuracy. • A grace period of a minimum of 12 months for service providers to:– make the necessary preparations from the commencement date of any new standards introduced, coordination among services providers, as well as engaging any 3rd parties through tenders etc. Analyse and fine-tuning of network parameters, configuration and conduct optimization is required after completion of the 3G sunset project implementation.
YTL	<ul style="list-style-type: none"> • Performance of networks should be based on end results such as throughput rather than composition of the network elements such as PRB or backhaul utilisation. PRB and backhaul requirements should be viewed as good practices. • A minimum grace period of 12 months to be given for the enforcement of the standards.

Table 11: Response on the general views of the standards

3. Summary of The Commission’s Final views

The following section summarizes Commission’s final views based on feedbacks received from the PI and taking into consideration the interest of the public:

Question No.	Commission’s final view
1	<ul style="list-style-type: none"> • “Wireless broadband access service” means a wireless connectivity of communication bandwidth service that is faster than primary rate interface of Integrated Services Digital Network (ISDN) of 2.0Mbps. • Proposal to segregate service provider to two categories is not feasible as to protect paying consumers’ rights, all service providers shall be subjected to the mandatory standards.
2	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • Network latency shall be $\leq 150\text{ms}$, 90% of time, based on static test. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • Network latency will be performed from test points within Malaysia to a test server located in Klang Valley. • The proposed parameters has taken into consideration the long distance connection between test points to the test server especially for Sabah and Sarawak. • Lower latency could be achieved by 5G network, which will be included in the later development of MSQoS. • Latency of $\leq 150\text{ms}$ would be able to provide good user experience. • Reflects the minimum network performance parameters per user, aspired by Jendela initiative. • Crowdsource data collected in a non-controlled environment. Hence, there are avenues for manipulation of data that may result in an inaccurate reporting, which is not suitable for regulatory instrument such as MS. • Crowdsource data on a nationwide level as suggested by majority of the service providers, will not able to represent per location basis to identify and mitigate specific problematic areas for certain users. Therefore, static test is considered

	<p>the practical option in order to gauge the service and to protect the consumers.</p>
<p>3</p>	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • Download throughput for: <ol style="list-style-type: none"> a) Wireless broadband shall be ≥ 2.5Mbps, 90% of time, for all network TDD and FDD, based on static test. b) FWA shall be ≥ 25Mbps, 90% of time, for all network TDD and FDD, based on static test. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • The parameters set are not an average of an area but individual user or device, taking into consideration all possible worst-case scenario in urban and rural, where coverage is advertised. • The 2.5Mbps throughput is able to provide seamless individual user experience for HD (720p) video streaming on mobile device. • FWA network is using the same network resources as wireless broadband for current LTE service. However, it is expected that FWA may be a prominent solution as an alternative to fixed broadband service for home users. Therefore, the standard for FWA must be higher than wireless broadband to provide good experience for multiple home broadband users. • The increase in standards will encourage service providers to invest on network expansion in improving QoS. • Nature of mobile broadband service, which is susceptible to propagation loss, line-of-sight, terrain condition and interference, has been taken into account. • Crowdsource data collected in a non-controlled environment and there are avenues for manipulation of data, which would result in an inaccurate reporting. • Crowdsource data on a nationwide level will not able to represent per location basis to identify and mitigate specific problematic areas for certain users. Therefore, static test is considered the practical option in order to gauge the service and to protect the consumers.
<p>4</p>	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • Packet loss must be not more than 0.5%, calculated based on the test sample.

	<p><u>Justifications:</u></p> <ul style="list-style-type: none"> • MCMC opined that it is not sufficient to represent user experience on network performance by measuring latency and throughput only. • Based on data gathered from MCMC measurements from previous year, there are certain areas that recorded high packet loss rate by service providers, even though the service was connected to LTE network.
5 & 6	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • Monthly average % of network utilization (including but not limited to PRB, backhaul, aggregated layer, etc) per base station for the duration of 3 months (quarterly) shall not be more than 80% and shall be rectified within 7 days. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • The combination of PRB and backhaul utilization are important part of overall network capacity monitoring. • The inclusion of network utilization for the intermediary or infrastructure element will encourage service provider to ensure adequate capacity allocated for every serving site. • Standard set to ensure better service availability and reliability for consumers. • Taking into account the surge of data traffic due to low mobile broadband prices and free internet daily quota for public.
7	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • As stated in response to question 3 above. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • FWA network is using the same network resources as wireless broadband for current LTE service, but it is expected that FWA will be a prominent solution as an alternative to fixed broadband service to home consumers. Therefore, the standard for FWA must be higher than wireless broadband to provide good experience for home broadband users. • FWA services are provided in areas with good wireless broadband coverage. Therefore, with the use of indoor modems the minimum requirements on download throughput as proposed in this report is achievable. • Encourage service providers to invest on network expansion in improving users' experience.

8	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • The method of measurement is by static test. • Reporting to be provided on quarterly basis for both measurements and utilization report, by the 30th of the following month of each quarter. • Service provider is required to conduct a minimum of 120 test locations in each quarter covering all regions, evenly distributed. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • The use of crowdsource is a good indicator to gauge the average network performance on a larger scale, such as state and nationwide level. • However, on a specific location basis, static test will ensure users with genuine problems are being considered. • Crowdsource data collected in a non-controlled environment and there are avenues for manipulation of data, which would result in an inaccurate reporting. • This method may not be suitable for regulatory instrument.
9	<p><u>Standards:</u></p> <ul style="list-style-type: none"> • This MSQoS shall be enforced on per location basis. <p><u>Justifications:</u></p> <ul style="list-style-type: none"> • As proposed in the PI, this is to ensure that problematic areas are rectified as soon as it is feasible. • Encourage service providers to ensure that adequate network quality is provided for all coverage locations. • Standards set are to ensure each user are able to obtain service as advertised by the service provider.
10	<ul style="list-style-type: none"> • The purpose of the MSQoS is to ensure the level of service is maintained at an optimum level. • Any failure that is beyond the service providers control such as failure due to other service providers/ third party, force majeure, etc. will be looked into on a case-by-case basis. • General views provided will be assimilated into the MSQoS where possible, and if not implemented in the current revision, it will be explored in the next revision.

Table 12: The Commission’s final views on the standards

4. The Way Forward

- MCMC is of the view that the proposed revision of the MSQoS for Wireless Broadband Access Service will ensure enhancements to existing levels of quality of service by the service providers and further improve consumers' experience.
- In selecting a particular benchmark for the quality of service, MCMC endeavors to make certain that the benchmark is meaningful to the customer and will enable them to assess and make informed decisions on the levels of quality they are experiencing. The benchmark will be equally useful for MCMC to gauge the performance of the service providers in fulfilling its role to monitor the industry.
- MCMC intends to consider all the general views and proposed approaches, from respondents to improve the state of the wireless broadband services in Malaysia.
- The revised MSQoS for Wireless Broadband Access Service will take effect starting 1st August 2021 and the existing MSQoS will be revoked.