

QOS STANDARDS FOR 3G PUBLIC CELLULAR MOBILE TELEPHONE SERVICE (prior to 1 April 2012)

This is applicable to **Facilities-Based Operators (“FBOs”) providing 3G Public Cellular Mobile Telephone Service (“PCMTS”)**. Please note that all FBOs providing 3G PCMTS will be required to submit to IDA their QoS performance for the “Compliance Indicators” and “Monitoring Indicators” as set out below, on a quarterly basis. For consistency, IDA will apply the same QoS standards for the 3G PCMTS performance survey conducted by IDA.

(A)	Performance Indicators (for Compliance¹)	QoS standards
(1)	Service coverage²	
(a)	- On street level coverage	>95%
(b)	- In-building coverage (within and outside of CDB)	> 85% (for public access areas ³)
(c)	-Tunnels coverage	>95%

¹ For each instance of non-compliance, a financial penalty of S\$5,000 per standard per month may be imposed.

² The on-street level service coverage shall be > 95% for each defined test route. Test routes will include all major and small roads and expressways but excludes all car parks. The in-building service coverage shall be > 85% per building that includes all public access areas of buildings within CBD and outside CBD, including the first basement level.

³ Public access areas refer to areas that are generally accessible to the public without any restriction. For the purpose of in-building radio coverage, the public access areas within a building are classified into three categories:

(a) Main Lobby Area

(b) High Traffic Area

(i) Podium floors of tower building;

(ii) Multi-storey car parks (above level ground); and

(iii) Basement levels where services are made available to the public (e.g. shops, food courts, supermarkets)]

(c) Basement Car Park Area (refers to car parks at basement level 1 where the above (b)(iii) does not apply)

(B)	Performance Indicators (for Monitoring)	QoS standards
(1)	Network Availability⁴ Base Stations (BS) Mobile Switching Centre (MSC) (a) Total outage time (hrs/min) in a month (b) No. of day with >15min outage (c) Worst outage time over 24hr period in a month	For monitoring
(2)	Network Congestion During Busy Hour⁵ (a) Total number of base stations/cells as at end period (b) % of network congestion for the busiest cell during busy hour (c) % of cells with >5% reduced GOS during busy hour	For monitoring
(3)	Success rate for PSTN and Mobile Originated Calls⁶ (a) Success rate for PSTN and mobile originated calls during busy hour in the busiest/worst cell locality	For monitoring
(4)	Average Call Set-up Time for⁷ (a) Land to mobile calls (b) Mobile to land calls (c) Mobile to mobile calls	For monitoring

⁴ Network availability is a measure of the degree to which the BSs/MSCs are operable and not in a state of failure or outage at any given point of time. It measures the downtime of the BS and the MSC over a month but excludes all planned service downtime for any maintenance or software upgrades.

⁵ The acceptable congestion level experienced within the network should be such that not more than 5% of cells should be experiencing > 5% reduced GoS during busy hour and/or at any one time.

⁶ A successful call attempt refers to a call from a calling party who is successfully switched through to the called party, or receives busy tone when the called party is engaged speaking.

⁷ The average call set-up time refers to the total time taken for setting up a call i.e., from the time when the last key is depressed to the time when a tone or signal from the network for successful connection. The call set-up time shall include all time taken for encryption and authentication features, but shall exclude additional delay caused by any call forwarding features.

(5)	Drop call rate of PSTN and mobile originated calls during busy hour⁸	
(a)	Drop call rate of PSTN and mobile originated calls	For monitoring
(b)	Localities where drop call rates exceeds 5%	
(6)	Complaints on coverage per 1000 subscribers	For monitoring
(7)	Data Throughput Speed⁹	For monitoring

Note: The “busy hour” refers to the one-hour of the day with the highest traffic Erlang based on 24-hour daily measurement, for the whole month including weekends and public holidays.

⁸ The drop call rates refer to the percentage of actual calls originated from the PSTN and mobile phones that are terminated abnormally. This include calls that failed due to : (a) mobile subscribers moving into poor cell coverage areas; (b) subscribers moving into cells that are experiencing congestion; and (c) calls that are not properly terminated.

⁹ Average FTP download speed of 5 MB file from a reference server.