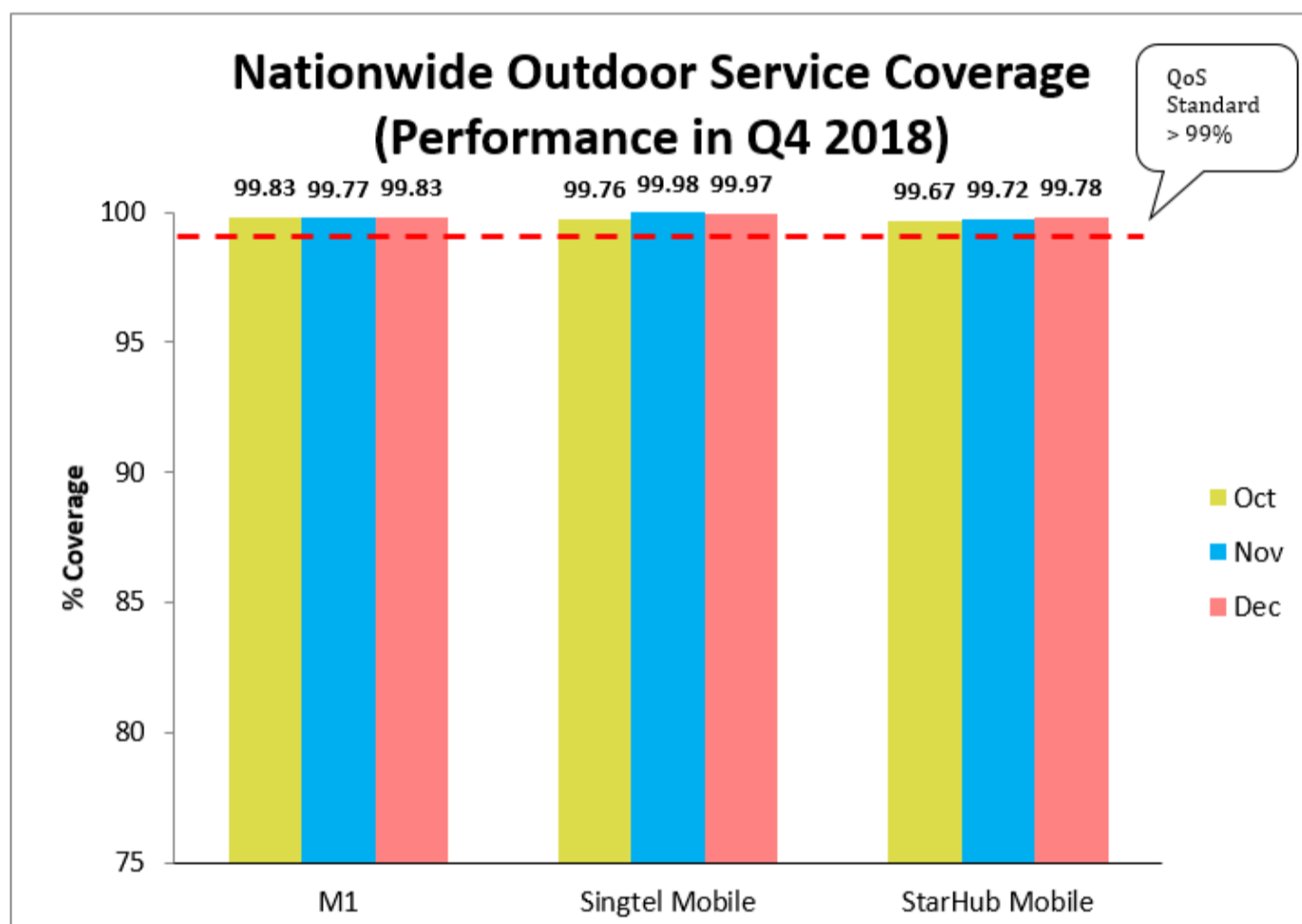


# Quality of Service Performance Results for October – December 2018

## Nationwide Outdoor Service Coverage

This indicator measures the Nationwide Outdoor Service Coverage for the 4G cellular mobile networks. Service coverage is determined by signal strength. The availability of service coverage is the ability of a cellular network to achieve the minimum signal strength of at least -109dBm. Under IMDA's 4G Service QoS framework, mobile operators are required to achieve Nationwide Outdoor Service Coverage of > 99%. In order to better measure the end users' experience\*, IMDA uses mobile phones to collect the signal strength data points.



\*Based on IMDA's coverage performance surveys which included nationwide outdoor drive test and areas such as housing estates/town centres, outdoor recreational areas and above ground MRT tracks.

**Note:** End users' individual experience may differ due to different models of handset used, handset settings, number of users in the vicinity, etc.

## Tunnel Service Coverage

This indicator measures the service coverage for the 4G cellular mobile network within road and MRT tunnels. Tunnel service coverage measures the percentage of data points collected in a tunnel from a 4G cellular mobile network that achieve a minimum signal strength of at least -109dBm. The tunnel areas surveyed by IMDA include all road and MRT tunnels in Singapore. Under IMDA's 4G Service QoS framework, mobile operators are required to achieve a service coverage of > 99% for all road and MRT tunnels. In order to better reflect end users' experience, IMDA uses mobile phones to collect the signal strength data points.

**IMDA's Performance Survey Period: Q4 2018**

<b>M1</b>	<b>Singtel Mobile</b>	<b>Starhub Mobile</b>
<b>Compliance standard: &gt; 99% for all road and MRT tunnels</b>		
<b>Central Expressway (Road Tunnel)</b>		
Pass	Pass	Pass
<b>Kallang-Paya Lebar Expressway (Road Tunnel)</b>		
Pass	Pass	Pass
<b>Fort Canning Tunnel (Road Tunnel)</b>		
Pass	Pass	Pass
<b>Woodsville Tunnel (Road Tunnel)</b>		
Pass	Pass	Pass
<b>Marina Coastal Expressway (Road Tunnel)</b>		
Pass	Pass	Pass
<b>North South Line (MRT Tunnel)</b>		
Pass	Pass	Pass
<b>East West Line (MRT Tunnel)</b>		
Pass	Pass	Pass
<b>Changi Airport Line (MRT Tunnel)*</b>		
Fail	Fail	Fail
<b>Circle Line (MRT Tunnel)</b>		
Pass	Pass	Pass
<b>North East Line (MRT Tunnel)</b>		
Pass	Pass	Pass
<b>Downtown Line (MRT Tunnel)</b>		
Pass	Pass	Pass

**Note:** End users' individual experience may differ due to different models of handset used, handset settings, number of users in the vicinity, etc. The tunnel service coverage results are based on IMDA's coverage performance surveys.

\*The mobile operators had failed to meet the 4G QoS standard of > 99% for the Changi Airport Line due to delays in completing the enhancement works. IMDA expects the mobile operators to work closely with the relevant parties to complete the enhancement works as soon as possible.

