Methodology: Mobile Coverage

Using billions of measurements from hundreds of millions of mobile coverage scans submitted by Speedtest® users each day, Ookla® has developed a robust and comprehensive view of worldwide mobile coverage.

We have established an accurate and consumer-relevant methodology using extensive data analytics to determine the best mobile coverage on networks around the world. Our unbiased, data-driven approach controls for extraneous variables and ensures an equitable accounting for all coverage scans.

This document is intended to provide Best Mobile Coverage Speedtest Awards™ recipients and interested parties with transparency into the methodologies used. This document may be shared with regulatory bodies, media, or others, as needed.

Ookla's data analysis process for mobile coverage involves four primary steps: collection, filtering, spatial aggregation, and summarization. The results of that process are then leveraged to calculate and determine the mobile coverage Awards recipients within a country.

Collection

Hundreds of millions of coverage scans are received daily from Android Speedtest users from around the world.

Filtering

Several data quality filters are applied to ensure the data represents true network conditions. Coverage scans are excluded from devices that are misconfigured or do not have access to a network. Because coverage is a spatially-focused metric, only scans with precise and legitimate location information are included.

Spatial Aggregation

Filtered data are grouped by location to a resolution of approximately 100 meters squared, and an operator's coverage in that location is determined using the collection of scans received from devices on that operator's network in that location. During this process, the data are normalized by user, operator, location, and timeframe to create a sample. These samples summarize the coverage scans received from a device on a given network in a given location each day. This ensures that each user gets an equal vote and that results are not swayed by a misconfigured device. A score is assigned to each aggregated location indicating the availability of service offered by each operator at that location. This score is based on whether any level of service and whether 4G service is available.

Summarization

Finally, we summarize the coverage information from all locations to identify the breadth and availability of coverage for each operator. Then we apply a multiplier to avoid confusion that the Coverage Score™ represents a percentage of an area or population with coverage. The Coverage Score combines the area covered by an operator (its footprint) and the overall availability of service that it offers. Footprint is the proportion of aggregated locations in which an operator was seen with service. To obtain the Coverage Score, we multiply this footprint value by the average availability score among all locations in which that operator is present. As a result, the Coverage Score is scaled from 0 to 1000.

Criteria

All Speedtest Awards are based on six months of historical data within the same calendar year, called the award period. By using a six-month time period, coverage can be examined at a fine spatial scale, and any temporary changes in service can be resolved. This also reduces the likelihood that short-term fluctuations in service will significantly influence the analysis.

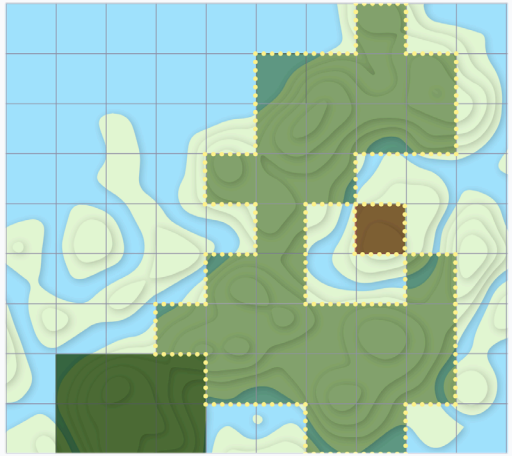
Market Share and Geography

Speedtest Awards are tied to a specific location, for example, a country, state or city. To be considered for the Speedtest Awards, a mobile network must have scans in a minimum of 30% of the total number of locations where mobile service was seen within that geographic region during the specified time range. If a provider is not present in 30% of the total locations within a region, it is an indication that they are not widely available in that region. The intention of the Speedtest Mobile Coverage Award is to identify the mobile networks with the best coverage that are generally available to consumers in a specific geographic area. This threshold allows us to include relevant start-ups or other local providers, while removing those that are otherwise not generally available within the area. For this reason, mobile networks that do not meet the 30% footprint threshold will not be included in the award evaluation.

Eligible Entities

We evaluate every mobile network operator to confirm they are actively providing consumer service in the specified region. All providers must remain an individual entity during the entire award period. Mergers and acquisitions will be taken into consideration when determining provider award eligibility. If a provider no longer has a named presence in the market as a result of a merger or acquisition, they will be excluded from Speedtest Awards consideration. Additionally, test results for a merged or acquired provider will be included in the results of their new parent company on the final merger date, potentially impacting the overall Coverage Score of the parent company.

Footprint



Average Tile Quality

36 Total service tiles with Scans from all providers

29 Scans showing service from selected provider

6 Tiles without Scans from selected provider

30 Tiles with Scans from selected provider

1 Scans showing no service from selected provider

22 1 Tiles with LTE service

7 0.5 Tiles with general service (Non-LTE)

1 0 Tiles with no service

Coverage Score =
Footprint x Average Tile Quality x 1000

(0.81 x 0.85) x 1000 =
688.5

Footprint
29/36 service tiles
0.81

Average Tile Quality
(22 x 1) + (7 x 0.5) + (1 x 0) / 30
0.85