CERTIFICATE

ROHDE&SCHWARZ
Make ideas real

Rohde & Schwarz SwissQual AG, as the issuer of this document, certifies that

Telia Eesti AS
Mustamäe tee 3
15033 Tallinn
Estonia

attained the

Best Network Performance Score

for Estonia, assessed during the 2025 nationwide mobile network benchmarking campaign from September 19 to October 11, 2025. We congratulate **Telia Estonia** for ranking first with a score of **829 out of 1000 points**, that corresponds to 83% of the maximum achievable score, on the Rohde & Schwarz Network Performance Score in line with ETSI TR 103 559.

- Network Performance Score for voice service: 380 out of 400
- Network Performance Score for data service: 448 out of 600

Hansmann Axel
CEO Rohde & Schwarz SwissQual AG

Link to the benchmarking campaign details

Scoring methodology in line with ETSI TR 103 559

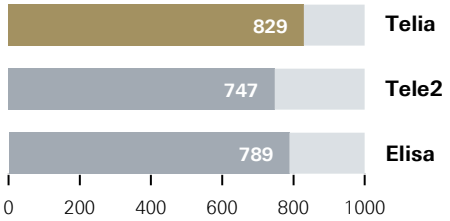
BEST
NETWORK PERFORMANCE SCORE

NETWORK PERFORMANCE SCORE

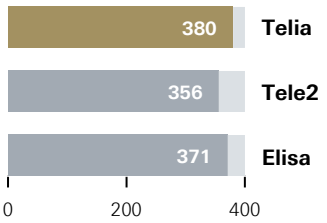
Commissioned by Telia, Rohde & Schwarz SwissQual AG performed a mobile network benchmarking campaign assessing the quality and performance of Estonia's leading mobile operators. The drive-test based data collection campaign was implemented from September 19 to October 11, 2025 and covered Estonia's main cities, towns and roads.

During this mobile network benchmarking campaign, over 12,850 voice calls and over 129,200 individual data service tests were performed to calculate a Network Performance Score in line with ETSI TR 103 559.

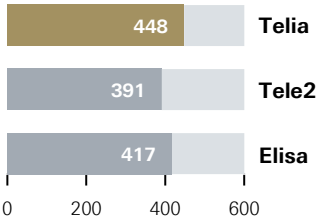
Network Performance Score



Voice Services Score



Data Data Score



Measurement campaign overview

- **Driven kilometers:** 5,740 km
- **Time period:** September 19 to October 11, 2025
  independently selected by Rohde&Schwarz SwissQual AG
- **Test routes:** Covering >64% of Estonian population,
  routes selected independently by Rohde&Schwarz SwissQual AG
  based on population and population density
- **Network operators:** Elisa, Tele2, Telia

MEASUREMENT CAMPAIGN METHODOLOGY

Rohde & Schwarz SwissQual AG applied a fully transparent, harmonized and end-user centric scoring methodology as described in ETSI TR 103 559 and calculates a single overall Network Performance Score in line with this integrative methodology.

The scoring methodology includes essential aspects of popular mobile services and the resulting Network Performance Score reflects user's perceived performance of a mobile network in daily use regardless of the available technologies. The overall Network Performance Score is an aggregation of rated service performance over different regions covered by mobile networks with a state-of-art mobile phone.

- Data collection and analysis follows established standards and rules as defined in ETSI and ITU-T.
- The performance assessment uses tests of popular services in mobile networks, such as voice telephony, data transfer, video and app-specific services.
- The applied methodology provides insights into dedicated service classes and individual KPIs as well as for individual pre-defined geographical or morphologic categories.
- The entire measurement campaign used state-of-the art smartphones supported by all operators in Estonia.
- Data collection and analysis used Rohde&Schwarz SwissQual AG de-facto industry standard benchmarking equipment that supports the Network Performance Score methodology.
- All measurements were performed in 5G preferred mode.

ETSI (European Telecommunications Standards Institute)
ITU-T (International Telecommunication Union-Telecommunication)

MEASUREMENT CAMPAIGN CONFIGURATION AND SETUP

VOICE SERVICE TESTING

Measurement device used for voice telephony testing: Samsung S25+ (SM-S928B)

- Mobile-to-mobile voice calls between two smartphones, VoLTE enabled
- Call length 75s in line with ETSI TS 102 250-2 and TR 102 506
- Alternating speech transmission in both directions using a speech sample in line with ETSI TR 103 138 and defined in ITU-T P.501 Annex D
- Speech Quality measurement in line with ITU-T P.863 POLQA v3
- Success, setup time and speech quality evaluated in line with ITU-T E.804.1

DATA SERVICE TESTING

Measurement device used for voice telephony testing: Samsung S25+ (SM-S928B)

Data transfer

- Successful upload and download of data files to a local cloud server (10MB download and 5MB upload)
- Maximal bitrate measurements in upload and download

Video streaming

- YouTube streaming test in line with ETSI TR 101 578 and ITU-T E.804.1
- Receiving video on demand and live streams for 45s
- Video Quality measurement in line with ITU-T J.343.1
- Success, access time and video quality evaluated

Web Browsing

- Accessing and retrieving web-content from different websites
- Testing of locally popular dynamic sites in different sizes
- In line with ITU-T E.804.1 and ETSI TR 103 733, success and download time evaluated

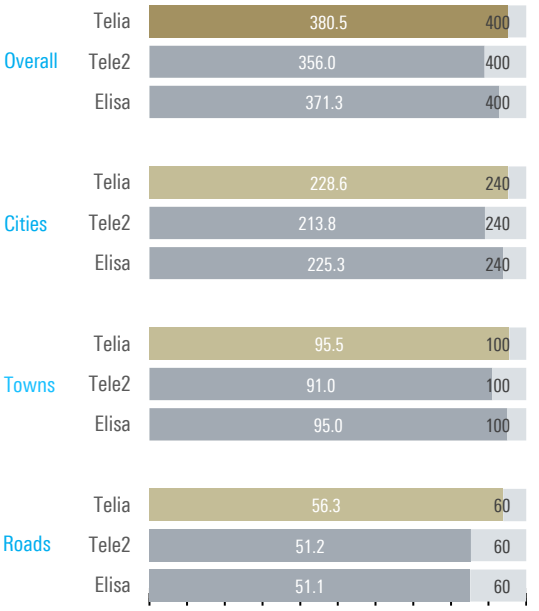
Post to Internet / Social Media

- Uploading data content (files) to WhatsApp (5MB size)
- In line with ITU-T E.804.1, success and transfer time evaluated

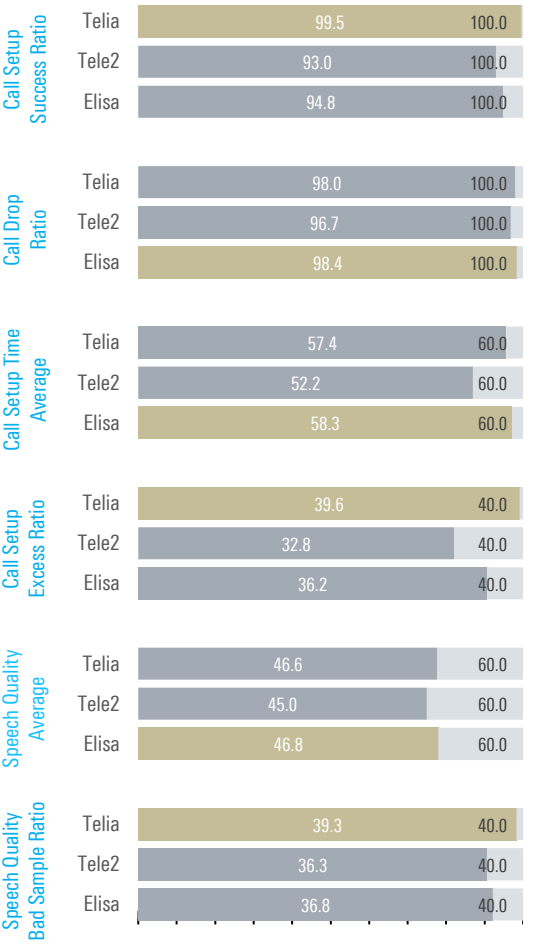
Interactive, real-time transport

- Assessing data latency and evaluating interactivity of transport
- In line with ITU-T G.1051 and ETSI TR 103 559 (v1.2.1)

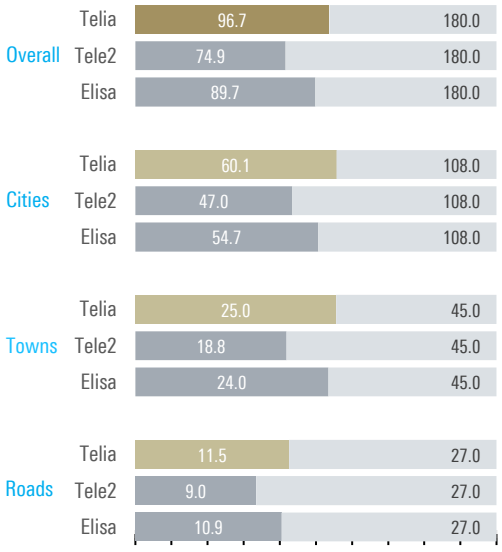
Voice Score per Category



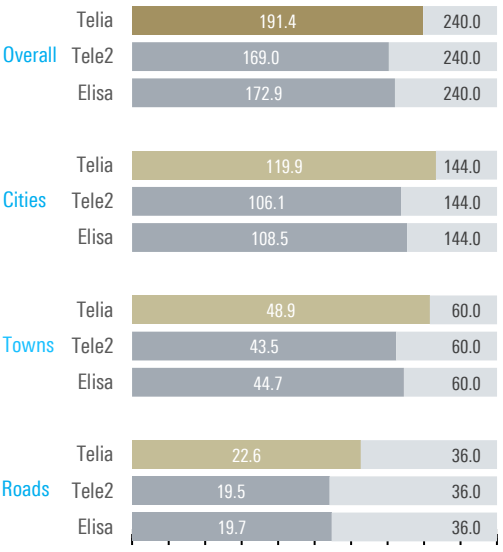
Voice Score per KPI



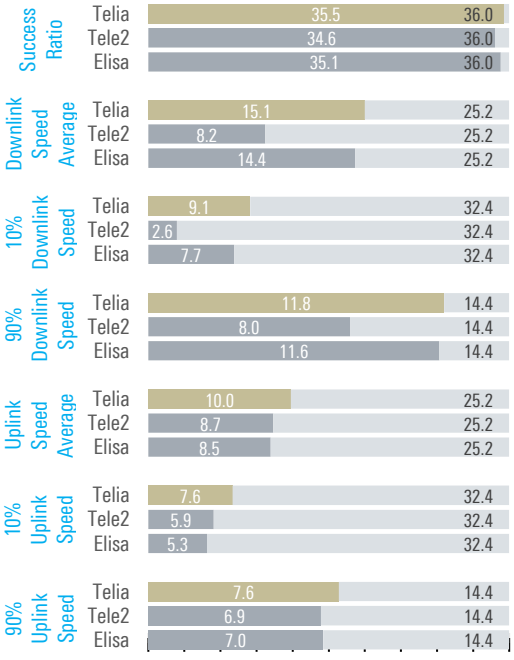
Data Transfer Score per Category



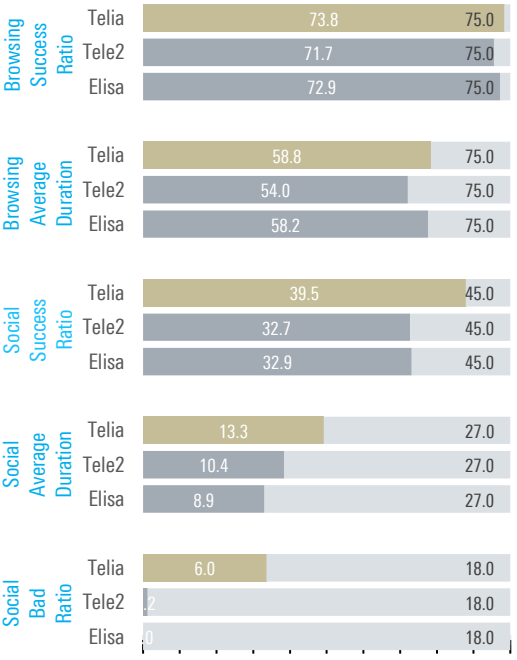
Browsing/Social Media Score per Category



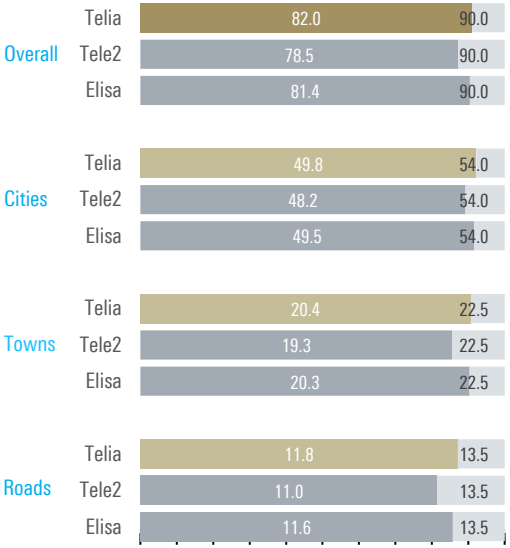
Data Transfer Score per KPI



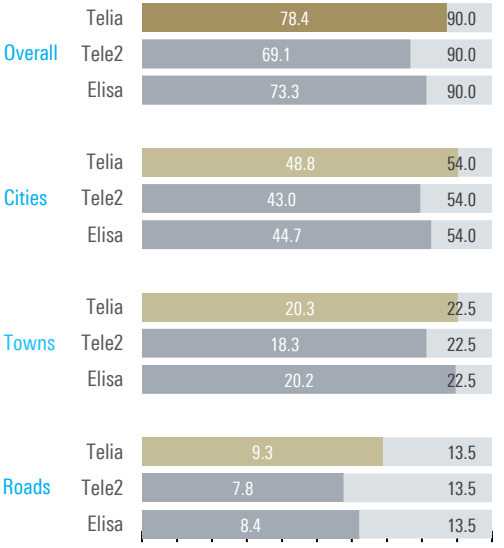
Browsing/Social Media Score per KPI



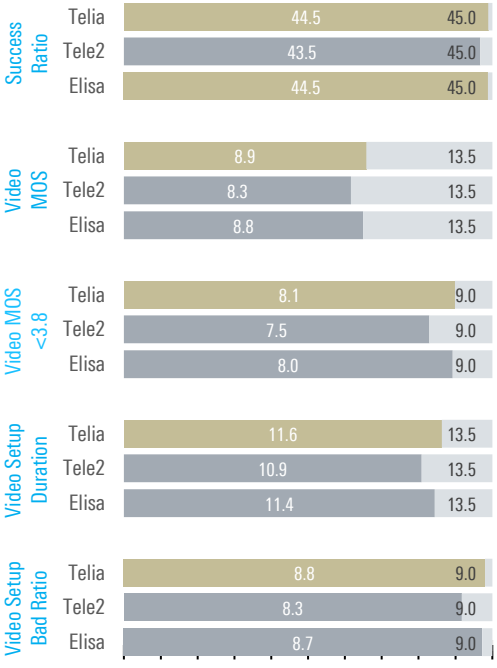
Video Score per Category



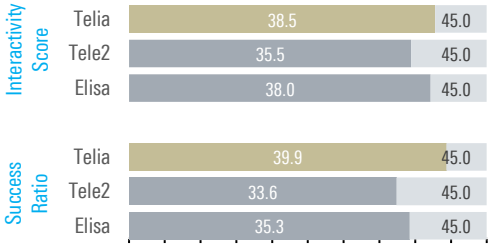
Interactivity Score per Category



Video Score per KPI



Interactivity Score per KPI



VOICE KPIs

Geographical Category	Service KPI	Elisa	Tele2	Telia
City	Call Setup Success Ratio	99.59 %	99.18 %	100.00 %
	Call Drop Ratio	0.00 %	0.14 %	0.14 %
	Call Setup Time	3.17 s	3.97 s	3.29 s
	Call Setup Excess Ratio (>10sec)	0.27 %	0.50 %	0.05 %
	Speech Quality	4.46 MOS	4.38 MOS	4.45 MOS
	Speech Quality Bad Ratio (MOS<1.6)	0.56 %	0.89 %	0.10 %
Town	Call Setup Success Ratio	99.75 %	99.62 %	100.00 %
	Call Drop Ratio	0.13 %	0.25 %	0.13 %
	Call Setup Time	3.17 s	3.75 s	3.31 s
	Call Setup Excess Ratio (>10sec)	0.00 %	0.38 %	0.00 %
	Speech Quality MOS	4.48 MOS	4.40 MOS	4.46 MOS
	Speech Quality Bad Ratio (MOS<1.6)	0.41 %	0.58 %	0.08 %
Road	Call Setup Success Ratio	98.61 %	99.22 %	99.69 %
	Call Drop Ratio	0.47 %	0.39 %	0.08 %
	Call Setup Time	3.35 s	3.97 s	3.36 s
	Call Setup Excess Ratio (>10sec)	0.79 %	0.94 %	0.00 %
	Speech Quality MOS	4.37 MOS	4.29 MOS	4.40 MOS
	Speech Quality Bad Ratio (MOS<1.6)	2.32 %	1.73 %	0.66 %

DATA KPIs

Geographical Category	Service KPI	Elisa	Tele2	Telia
City	HTTP Success Ratio	99.84 %	99.59 %	99.97 %
	HTTP Download Throughput (Average)	528 Mbps	176 Mbps	592 Mbps
	HTTP Download Throughput (10 percentile)	60 Mbps	20 Mbps	104 Mbps
	HTTP Download Throughput (90 percentile)	1003 Mbps	386 Mbps	1082 Mbps
	HTTP Upload Throughput (Average)	47 Mbps	49 Mbps	66 Mbps
	HTTP Upload Throughput (10 percentile)	11 Mbps	13 Mbps	20 Mbps
	HTTP Upload Throughput (90 percentile)	90 Mbps	88 Mbps	119 Mbps
	Web Browsing Success Ratio	99.67 %	99.40 %	99.89 %
	Web Browsing Duration (Average)	0.67 s	0.82 s	0.62 s
	Social Media Success Ratio	97.26 %	96.88 %	99.06 %
	Social Media Duration (Average)	3.15 s	2.88 s	2.28 s
	Social Media Bad Ratio (>5sec)	15.19 %	10.57 %	5.44 %
	YouTube Success Ratio	99.93 %	99.65 %	99.86 %
	YouTube Video Quality	4.48 VMOS	4.45 VMOS	4.51 VMOS
	YouTube Video Quality Bad Ratio	0.69 %	0.83 %	0.41 %
	YouTube Setup Duration	0.75 s	0.93 s	0.65 s
	YouTube Setup Bad Ratio	0.07 %	0.69 %	0.14 %
	Interactivity Success Ratio	96.32 %	96.06 %	98.86 %
	Interactivity Score (Average)	87.95 %	84.24 %	89.81 %

Geographical Category	Service KPI	Elisa	Tele2	Telia
Town	HTTP Success Ratio	99.91 %	99.09 %	100.00 %
	HTTP Download Throughput (Average)	562 Mbps	172 Mbps	592 Mbps
	HTTP Download Throughput (10 percentile)	150 Mbps	14 Mbps	126 Mbps
	HTTP Download Throughput (90 percentile)	981 Mbps	385 Mbps	991 Mbps
	HTTP Upload Throughput (Average)	44 Mbps	45 Mbps	59 Mbps
	HTTP Upload Throughput (10 percentile)	8 Mbps	11 Mbps	17 Mbps
	HTTP Upload Throughput (90 percentile)	87 Mbps	82 Mbps	110 Mbps
	Web Browsing Success Ratio	99.66 %	99.13 %	99.81 %
	Web Browsing Duration (Average)	0.63 s	0.85 s	0.63 s
	Social Media Success Ratio	96.23 %	96.11 %	99.60 %
	Social Media Duration (Average)	3.27 s	2.92 s	2.51 s
	Social Media Bad Ratio (>5sec)	15.08 %	9.14 %	7.37 %
	YouTube Success Ratio	99.81 %	99.03 %	100.00 %
	YouTube Video Quality	4.47 VMOS	4.41 VMOS	4.46 VMOS
	YouTube Video Quality Bad Ratio	1.36 %	2.15 %	1.93 %
	YouTube Setup Duration	0.75 s	0.97 s	0.66 s
	YouTube Setup Bad Ratio	0.19 %	0.97 %	0.00 %
	Interactivity Success Ratio	98.54 %	96.54 %	98.72 %
	Interactivity Score (Average)	89.98 %	85.07 %	90.16 %

Geographical Category	Service KPI	Elisa	Tele2	Telia
Road	HTTP Success Ratio	97.62 %	97.92 %	98.17 %
	HTTP Download Throughput (Average)	352 Mbps	83 Mbps	349 Mbps
	HTTP Download Throughput (10 percentile)	22 Mbps	11 Mbps	19 Mbps
	HTTP Download Throughput (90 percentile)	875 Mbps	197 Mbps	908 Mbps
	HTTP Upload Throughput (Average)	29 Mbps	27 Mbps	42 Mbps
	HTTP Upload Throughput (10 percentile)	3 Mbps	2 Mbps	4 Mbps
	HTTP Upload Throughput (90 percentile)	69 Mbps	65 Mbps	91 Mbps
	Web Browsing Success Ratio	98.12 %	97.91 %	98.54 %
	Web Browsing Duration (Average)	0.76 s	0.91 s	0.80 s
	Social Media Success Ratio	81.50 %	82.60 %	88.20 %
	Social Media Duration (Average)	4.25 s	4.16 s	3.62 s
	Social Media Bad Ratio (>5sec)	23.23 %	21.95 %	18.61 %
	YouTube Success Ratio	99.00 %	98.62 %	99.13 %
	YouTube Video Quality	4.45 VMOS	4.37 VMOS	4.45 VMOS
	YouTube Video Quality Bad Ratio	2.15 %	4.45 %	1.89 %
	YouTube Setup Duration	0.95 s	1.06 s	0.86 s
	YouTube Setup Bad Ratio	1.25 %	1.13 %	0.75 %
	Interactivity Success Ratio	88.40 %	87.79 %	91.58 %
	Interactivity Score (Average)	86.60 %	82.12 %	84.87 %

About Rohde & Schwarz SwissQual AG

Together with teams from the global Rohde & Schwarz group of companies, our employees in the Swiss Rohde & Schwarz SwissQual AG subsidiary develop and market integrated solutions and managed services to test and improve the quality and performance of mobile networks.

Our experts for global benchmarking campaigns plan and run large-scale optimization and benchmarking campaigns and empower customers to make QoE centric business decisions with confidence, to deliver better services with higher quality for their end users, to reduce time to market for new technologies and services and to safeguard and increase the value of their business.

For more information about Rohde&Schwarz products visit:
www.rohde-schwarz.com/mnt

For more information about mobile network testing managed services visit:
www.rohde-schwarz.com/mnt/network-analytics-services

Contact
Rohde&Schwarz SwissQual AG
Riverside Business Park
Niedermattstrasse 8b
CH-4528 Zuchwil
Switzerland

Tel +41 32 686 65 65
sq-info@rohde-schwarz.com

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Telia Estonia sponsored an independent evaluation of its mobile network performance that was conducted by Rohde & Schwarz SwissQual AG. Telia was ranked with the leading performance score in Estonia based on an ETSI approved methodology