connect

The 2025 Mobile Network Test in the Netherlands

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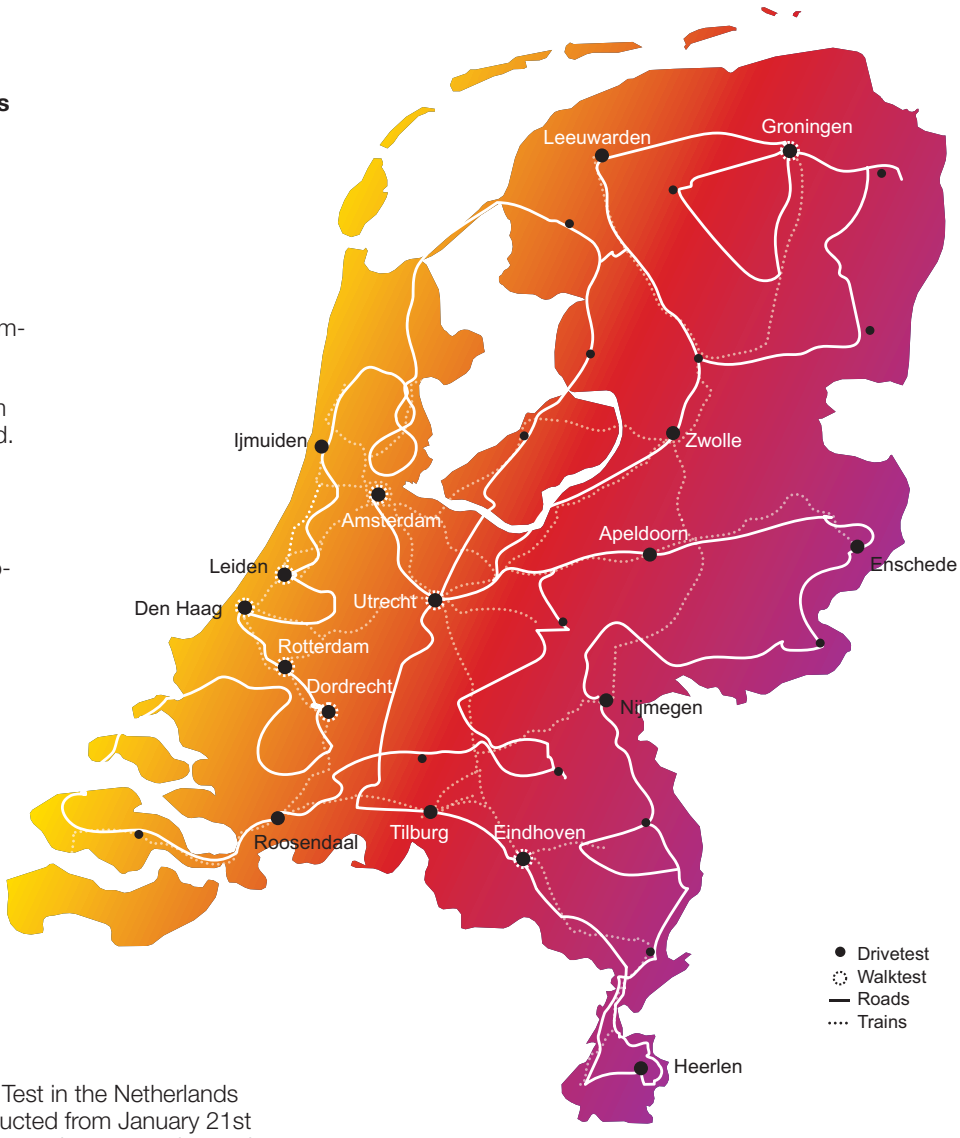
For the tenth time, we – umlaut and connect – have conducted our comprehensive benchmark of the mobile networks in the Netherlands. Its results show three outstanding operators.

The carefully designed methodology of our 2025 benchmark in the Netherlands represents a holistic approach to network benchmarking. It combines drive tests and walk tests for executing detailed voice and data measurements under controlled circumstances combined with a sophisticated crowd sourcing methodology. The drive tests and walk tests allow for the maximum capabilities of the networks to be evaluated. Crowdsourcing provides profound insights into the overall coverage of voice, data and 5G services as well as real world User Download Speeds and Latencies. We have thoroughly weighed these components in order to give a realistic and conclusive assessment of the rated networks' true potential and performance.



Scope

The 2025 umlaut connect Mobile Network Test in the Netherlands consists of drive tests and walk tests conducted from January 21st to January 31st, 2025. Four drive test cars together covered a total of 6850 kilometres, visiting 17 cities and 14 towns. Additionally, two walk test teams visited eight cities. The test areas account for 5.88 million people, or approx. 34.2 percent of the total population of the Netherlands. In addition, the results of extensive crowdsourcing analyses, considering 24 weeks from mid-August 2024 (calendar week 33) to late January 2025 (CW 4) are included in the score. Our detailed methodology is described on pages 14/15.

DRIVE TEST AND WALK TEST FACTS

5.88	6850	129,847	16,704
million people covered	km drive test	data samples	voice samples

CROWDSOURCING FACTS

1042	24	99.77%	99.97%
million samples	weeks (mid-August 2024 to late January 2025)	of built-up area covered	of population covered

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The Dutch Mobile Operators

In 2000, Deutsche Telekom bought a minority of the Dutch mobile network operator Ben, which was later extended to a 100 percent acquisition. In 2003, Ben was renamed T-Mobile Netherlands, with the brand "Ben" becoming a "no-frills" offer within its portfolio. In 2007, T-Mobile NL additionally acquired Orange. At the end of 2018, the company completed its acquisition of Tele2. In 2020, T-Mobile NL also acquired the former virtual network operator Simpel.
In autumn 2021, T-Mobile NL was acquired by the private equity investors Apax and Warburg Pincus. In September 2023, the operator was rebranded Odido.
In Q1 2022, the company reported figures for T-Mobile NL for the last time. In these, it reported approx. 7.2 million mobile customers. At the time of writing, estimations for Odido's number of mobile customers range in a magnitude of 8 million. This can not be verified by official publications of the operator, but it can be assumed that Odido still has the largest mobile customer base in the Netherlands.
Odido switched off 2G in June 2023 and now offers 3G, 4G/LTE and 5G NSA.
T-Mobile NL (today Odido) launched 5G soon after the end of the spectrum auction in July 2020. It meanwhile claims that around 98 percent of the Dutch population lives within its 5G coverage area. In the Netherland's additional 5G spectrum auction in mid 2024, Odido additionally acquired 100 MHz of spectrum in the 3.5 MHz band.

The Koninklijke PTT Nederland N.V. emerged from the privatisation of the formerly state-owned PTT in 1998.
The company focuses on marketing its flagship KPN brand, however with Simyo and Youfone, it also has offerings in the "no-frills" segment.
For 2024, the company reported a total number of 4.5 million consumer subscribers and 2.3 million business subscribers which adds up to 6.8 million mobile customers (excluding wholesale SIM cards). In connect's assessment this makes KPN the second largest mobile operator in the Netherlands.
KPN offers 2G/GSM and 4G/LTE and 5G NSA. The phaseout of 3G in KPN's mobile network was completed by April 2022, which the company used to refarm its spectrum to 4G and 5G.
KPN launched 5G at the end of July 2020, reaching about half of the Dutch population at the start. Meanwhile, the company claims to have reached a population coverage for 5G of more than 98 percent.
In the mid 2024 additional 5G spectrum auction in the Netherland's, KPN acquired an additional 100 MHz of spectrum in the 3.5 MHz band.

The Dutch subsidiary of the international Vodafone Group acquired the operator Libertel in 2003, forming Vodafone Netherlands. In 2016, it merged with the cable and fibre operator Ziggo.
Today, 50 percent of the joint company VodafoneZiggo is owned by the Vodafone Group and another 50 percent by Liberty Global.
At the end of 2024, VodafoneZiggo reported approx. 5.6 million mobile customers. So, based on the information available to us, we assess VodafoneZiggo to be the currently smallest of the three Dutch mobile networks.
The company operates 2G and 4G/LTE, and was the first Dutch operator to phase out 3G in order to devote its spectrum to 4G and 5G NSA.
At the end of April 2020, VodafoneZiggo was the first carrier to offer 5G in the Netherlands, starting on already available frequencies and later extending the service to spectrum acquired in the frequency auction which had ended in July 2020.
Meanwhile, VodafoneZiggo claims to have reached national coverage with 5G.
In the Netherland's 5G spectrum auction in mid 2024, Vodafone-Ziggo also additionally acquired 100 MHz of spectrum in the 3.5 MHz band.

Note: Claims about network coverage reported here are based on the operators' own statements, and are in no way benchmark results determined by umlaut.

The 2025 Mobile Network Test in the Netherlands

Results at a Glance

KPN wins our Mobile Network Test in the Netherlands with the highest score achieved so far in our international mobile network benchmarks. It achieves the grade "outstanding" and improves by two points over its result from the previous year. The lead is manifested by an advantage of two score points over Odido which KPN achieves in the Voice assessment. In addition, KPN is also slightly ahead in the Reliability assessment and shows the highest share of 5G samples collected in our drivetests and walktests.

Odido ranks second, also achieving the overall grade "outstanding". Compared to previous year's result, the operator improved by an impressive nine points. In the Data and Crowdsourcing categories, Odido scores on a par with overall winner KPN. In the voice category, Odido falls behind by a small gap of two score points, mainly due to its results in the railways. In our Reliability assessment the gap to KPN is just one point and in our view at 5G, Odido showed the highest data rates in all aggregations.

Vodafone ranks in a strong third place, also achieving the overall grade "outstanding". Despite the yearly increasing requirements of our test, the operator maintains its strong result from the previous year – which means it has effectively somewhat improved. In the voice category, Vodafone is almost equally strong as its two competitors, in the Data and Crowd categories, the gaps are small. In our 5G assessment, Vodafone shows high shares, relying heavily on Dynamic Spectrum Sharing (DSS).

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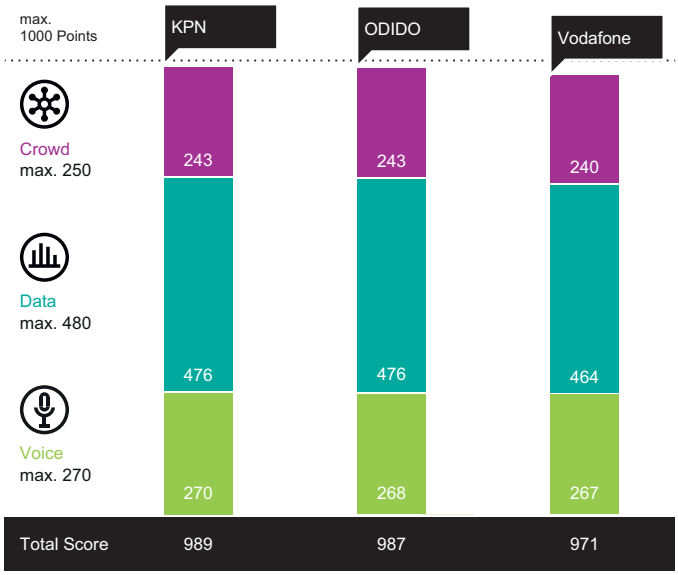
BEST IN TEST
KPN
2/2025
MOBILE NETWORK TEST IN THE NETHERLANDS
www.connect-testlab.com

"In a neck-and-neck race, KPN again takes the overall win ahead of Odido. We regularly see see the highest scores in our international benchmarks in the Netherlands. This year was no exception, with KPN, Odido and Vodafone once again showing outstanding results. Congratulations to them all! These results are also confimed in the Reliability assessment, which shows a high performance level at everyday requirements. In addition, the 5G deployment in the Netherlands shows clear improvements particularly in terms of data rates."

Hakan Ekmen, Global Networks Lead, Comms Industry and CEO umlaut

Overall Results		KPN	ODIDO	Vodafone
Voice	max. 270.00 P.	270	268	267
Cities (Drivetest)	121.50	100%	100%	99%
Cities (Walktest)	40.50	100%	100%	98%
Towns (Drivetest)	54.00	100%	100%	98%
Roads (Drivetest)	33.75	100%	100%	99%
Railways (Walktest)	20.25	100%	96%	98%
Data	max. 480.00 P.	476	476	464
Cities (Drivetest)	216.00	100%	99%	98%
Cities (Walktest)	72.00	99%	99%	94%
Towns (Drivetest)	96.00	99%	99%	97%
Roads (Drivetest)	60.00	99%	99%	99%
Railways (Walktest)	36.00	98%	97%	93%
Crowd	max. 250.00 P.	243	243	240
Crowd	250.00	97%	97%	96%
Connect Rating	max. 1000 P.	989	987	971

Percentages and points rounded to integer numbers.
For the calculation of points and totals, the accurate, unrounded values were used.



All scores shown in this document are rounded.

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Voice

KPN AND ODIDO ACHIEVE FULL AMOUNT OF SCORE POINTS IN BIG CITIES VOICE DRIVETESTS, VODAFONE FOLLOWING VERY CLOSELY

CITIES DRIVETEST

KPN & ODIDO

KPN and Odido both achieve the full number of possible score points in the voice tests, conducted by umlaut's test cars while driving in the Netherland's big cities. With 99 percent of the possible points, Vodafone follows at a very small gap. All three operators offer high success ratios and high speech quality.Only in terms of call setup times, Vodafone falls slightly behind.

KPN AND ODIDO ALSO ACHIEVE FULL AMOUNT OF SCORE POINTS IN BIG CITIES VOICE WALKTESTS, VODAFONE FOLLOWS AT CLOSE DISTANCE

CITIES WALKTEST

KPN & ODIDO

In the walktests, conducted in Amsterdam, Den Haag, Dordrecht, Eindhoven, Groningen, Leiden, Rotterdam and Utrecht, KPN and Odido share the first place in the voice assessment and, as in the drivetests, achieve the full number of possible points. Vodafone follows at a minor gap of two percentage points.

KPN AND ODIDO ON A PAR ACHIEVING 100 PERCENT OF POSSIBLE POINTS IN SMALLER TOWN VOICE DRIVE-TESTS. VODAFONE FOLLOWS AT A MINIMAL GAP

TOWNS DRIVETEST

KPN & ODIDO

In the voice tests conducted by umlaut's test cars while visiting 14 smaller towns of the Netherlands (see route map on page 1), KPN and Odido also take the lead together, achieving the full amount of possible points. As in the walktest conducted in larger urban areas, Vodafone follows closely at a gap of two percentage points.

KPN AND ODIDO ALSO ACHIEVE FULL AMOUNT OF POINTS IN THE VOICE DRIVETESTS ON THE ROADS, VODAFONE FOLLOWS AT VERY CLOSE DISTANCE

ROADS DRIVETEST

KPN & ODIDO

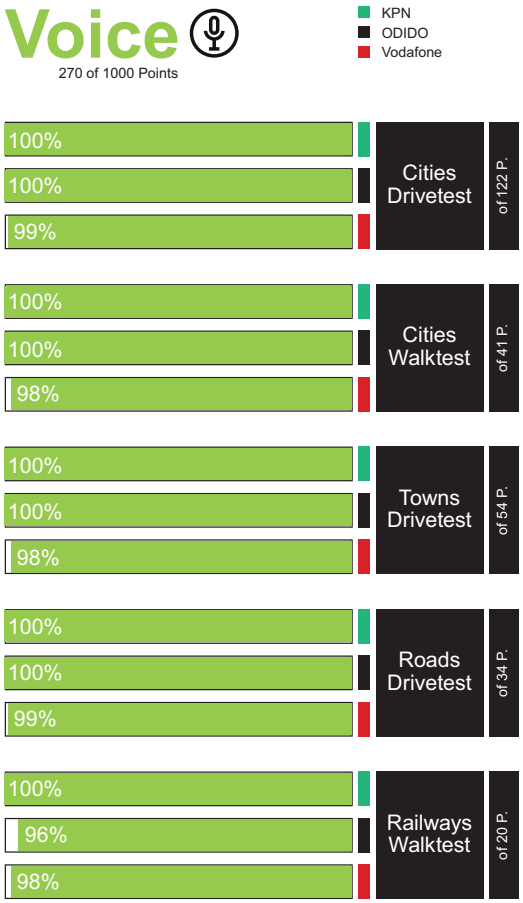
As in the drive tests performed in the larger cities and smaller towns, KPN and Odido also achieve a 100 percent of the possible score, sharing the top rank in the voice drivetests on Dutch roads. Again, Vodafone follows at minimal distance. The high performance level makes conducting phone calls while driving in the Netherlands most convenient.

HIGH LEVEL OF PERFORMANCE IN VOICE TESTS ON DUTCH RAILWAYS. KPN LEADS, VODAFONE FOLLOWS ON SECOND RANK, ODIDO RANKS THIRD

RAILWAYS WALKTEST

KPN

In the most demanding voice test scenario, the tests performed in Dutch trains, KPN again achieved the full amount of points. Here, Vodafone follows on the second rank, showing slightly lower call success ratios and longer call setup times. Odido comes in third with still very good results, but falling a little behind the performance of second-placed Vodafone.



Operator	KPN	ODIDO	Vodafone
Cities (Drivetest)			
Sucess Ratio (%)	100.0	100.0	100.0
Call Setup Time P90 (s)	0.6	0.5	1.1
Speech Quality P10 (MOS-LQO)	4.7	4.6	4.6
Cities (Walktest)			
Sucess Ratio (%)	99.9	100.0	99.7
Call Setup Time P90 (s)	0.6	0.5	1.1
Speech Quality P10 (MOS-LQO)	4.7	4.7	4.7
Towns (Drivetest)			
Sucess Ratio (%)	100.0	100.0	99.7
Call Setup Time P90 (s)	0.6	0.5	1.0
Speech Quality P10 (MOS-LQO)	4.7	4.6	4.5
Roads (Drivetest)			
Sucess Ratio (%)	100.0	100.0	99.8
Call Setup Time P90 (s)	0.6	0.6	1.1
Speech Quality P10 (MOS-LQO)	4.5	4.5	4.5
Railways (Walktest)			
Sucess Ratio (%)	99.9	98.7	99.5
Call Setup Time P90 (s)	0.6	0.6	1.1
Speech Quality P10 (MOS-LQO)	4.6	4.5	4.5

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Data

KPN AHEAD IN BIG CITIES DATA DRIVETESTS

In the data drivetests conducted in big Dutch cities, KPN takes the lead. Odido and Vodafone follow at close distance with one percentage point between each of them. KPN and Odido both use mainly 3500 MHz for their 5G downlink traffic, while Vodafone mostly uses 1800 MHz. In the KPN samples, we see a significant share of 5G New Radio 2CA plus LTE 3CA (carrier aggregation) in all scenarios, while Odido uses NR plus LTE 5CA.

CITIES DRIVETEST

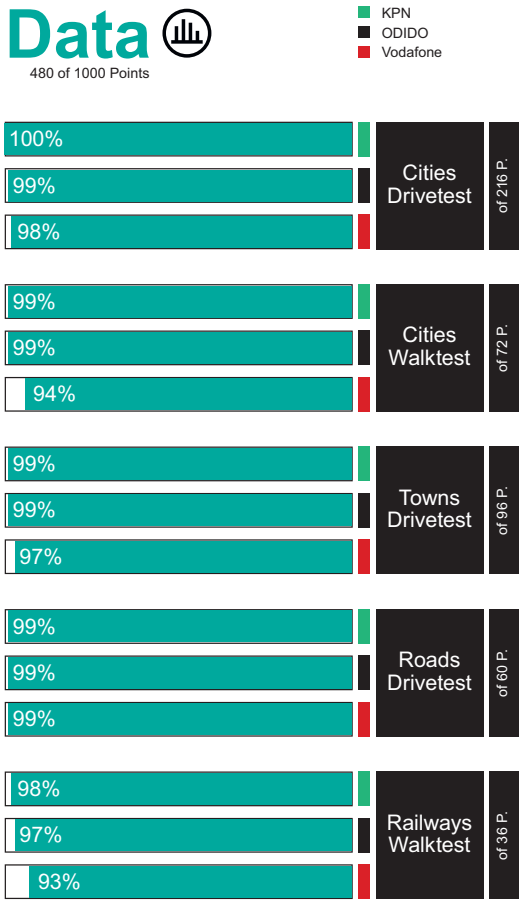
KPN

KPN AND ODIDO LEADING ON A PAR IN BIG CITY DATA WALKTESTS

In the walktests conducted in the Netherlands' bigger cities, KPN and Odido both reach 99 percent of the possible points, while Vodafone falls a little behind at a gap of five percentage points. The gap of Vodafone's results becomes for example visible in the download and upload data rates, in the success ratios of file uploads or in the tests examining the interactivity of e-Gaming.

CITIES WALKTEST

KPN & ODIDO



Data Cities (Drivetest)	KPN	ODIDO	Vodafone
Web-Page Download			
Success Ratio/Avg. Session Time (%/s)	100.0/0.7	100.0/0.7	100.0/0.9
File Download (10 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.6	100.0/0.6	100.0/1.3
90%/10% faster than (Mbps)	111.7/298.5	113.3/341.9	45.0/153.3
File Upload (5 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.8	100.0/0.8	100.0/1.2
90%/10% faster than (Mbps)	36.0/97.3	39.1/113.3	22.8/79.4
File Download (7 Seconds)			
Sucess Ratio (%)	100.0	99.9	100.0
10% faster than (Mbps)	1039.8	1053.9	403.8
Speed > 20Mbps / 100Mbps (%)	100.0/97.2	99.9/96.9	98.4/72.1
File Upload (7 Seconds)			
Sucess Ratio (%)	100.0	100.0	100.0
10% faster than (Mbps)	163.1	181.9	105.8
Speed > 2Mbps / 5Mbps (%)	100.0/99.9	100.0/99.9	99.9/99.8
Youtube			
Success Ratio/Start Time (%/s)	100.0/1.1	100.0/1.1	100.0/1.4
Average Video Resolution (p)	1080	1080	1079
Youtube live			
Success Ratio/Start Time (%/s)	100.0/1.7	100.0/1.6	99.8/1.9
Average Video Resolution (p)	1080	1080	1080
Conversational-App			
Sucess Ratio (%)	100.0	100.0	100.0
Speech Quality P10 (MOS-LQO)	4.3	4.3	4.0
Interactivity e-Gaming			
Success Ratio/Interactivity e-Gaming (%)	100.0/91.3	100.0/88.7	99.3/78.4
Interactivity Videochat			
Success Ratio/Interactivity Videochat (%)	99.5/95.9	99.4/94.5	98.3/91.8

Data Cities (Walktest)	KPN	ODIDO	Vodafone
Web-Page Download			
Success Ratio/Avg. Session Time (%/s)	100.0/0.7	100.0/0.8	99.6/1.0
File Download (10 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.6	100.0/0.7	100.0/1.5
90%/10% faster than (Mbps)	137.7/325.2	80.4/358.7	46.3/227.8
File Upload (5 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.9	100.0/0.9	99.0/1.9
90%/10% faster than (Mbps)	45.6/95.4	39.8/111.7	16.9/84.9
File Download (7 Seconds)			
Sucess Ratio (%)	100.0	100.0	100.0
10% faster than (Mbps)	1104.9	1097.3	632.2
Speed > 20Mbps / 100Mbps (%)	99.6/98.8	99.6/90.2	95.9/75.5
File Upload (7 Seconds)			
Sucess Ratio (%)	99.8	99.8	99.2
10% faster than (Mbps)	171.3	176.2	114.5
Speed > 2Mbps / 5Mbps (%)	100.0/99.8	100.0/99.6	98.8/97.3
Youtube			
Success Ratio/Start Time (%/s)	99.8/1.1	100.0/1.1	99.8/1.5
Average Video Resolution (p)	1080	1080	1080
Youtube live			
Success Ratio/Start Time (%/s)	99.8/1.7	100.0/1.7	99.0/2.1
Average Video Resolution (p)	1079	1080	1079
Conversational-App			
Sucess Ratio (%)	100.0	100.0	99.9
Speech Quality P10 (MOS-LQO)	4.4	4.4	4.1
Interactivity e-Gaming			
Success Ratio/Interactivity e-Gaming (%)	99.8/91.8	99.6/88.9	98.0/77.7
Interactivity Videochat			
Success Ratio/Interactivity Videochat (%)	99.8/96.6	99.0/95.5	98.1/91.1

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Data

KPN AND ODIDO LEADING ON A PAR IN DATA DRIVE-TESTS IN TOWNS WITH VODAFONE CLOSELY BEHIND

In the data drivetests performed in the visited smaller towns, KPN and Odido once again share a fulfilment rate of 99 percent, with Vodafone following at a small gap of two percentage points. The performance differences can be seen, for example, in the data rates achieved in the file download and upload tests. But the success ratios are comparably high in the towns as in the larger cities.

TOWNS DRIVETEST

KPN & ODIDO

ALL THREE DUTCH MOBILE OPERATORS ON A PAR WITH VERY GOOD RESULTS IN DATA DRIVETESTS ON ROADS

In the data tests performed by our test cars on Dutch roads, KPN, Odido and Vodafone jointly achieve a fulfillment rate of 99 percent. The high level of the results and particularly the success ratios in this category are excellent news for motorists who want to use any kind of data services while driving in their cars on Dutch roads.

ROADS DRIVETEST

ALL OPERATORS

Photo: Hadrian, shutterstock

Data Towns (Drivetest)	KPN	ODIDO	Vodafone
Web-Page Download			
Success Ratio/Avg. Session Time (%/s)	99.9/0.8	100.0/0.8	100.0/0.9
File Download (10 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.7	100.0/0.7	100.0/1.2
90%/10% faster than (Mbps)	91.5/261.1	87.6/298.5	49.4/142.0
File Upload (5 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/1.0	100.0/1.0	100.0/1.4
90%/10% faster than (Mbps)	27.9/90.6	26.2/97.1	16.5/77.1
File Download (7 Seconds)			
Sucess Ratio (%)	100.0	100.0	100.0
10% faster than (Mbps)	743.1	878.7	312.9
Speed > 20Mbps / 100Mbps (%)	100.0/95.2	99.3/92.9	97.0/75.9
File Upload (7 Seconds)			
Sucess Ratio (%)	100.0	100.0	100.0
10% faster than (Mbps)	144.2	164.1	101.4
Speed > 2Mbps / 5Mbps (%)	100.0/99.8	99.8/99.6	99.8/99.8
Youtube			
Success Ratio/Start Time (%/s)	100.0/1.2	100.0/1.2	100.0/1.3
Average Video Resolution (p)	1080	1080	1080
Youtube live			
Success Ratio/Start Time (%/s)	100.0/1.8	100.0/1.9	99.5/2.1
Average Video Resolution (p)	1080	1080	1078
Conversational-App			
Sucess Ratio (%)	100.0	100.0	100.0
Speech Quality P10 (MOS-LQO)	4.2	4.2	4.0
Interactivity e-Gaming			
Success Ratio/Interactivity e-Gaming (%)	99.8/90.8	99.1/85.8	99.8/79.4
Interactivity Videochat			
Success Ratio/Interactivity Videochat (%)	99.3/94.6	99.1/93.1	98.6/90.7

Data Roads (Drivetest)	KPN	ODIDO	Vodafone
Web-Page Download			
Success Ratio/Avg. Session Time (%/s)	99.9/0.8	100.0/0.9	100.0/0.9
File Download (10 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/0.8	100.0/0.9	100.0/1.4
90%/10% faster than (Mbps)	73.0/256.2	73.8/266.5	36.0/150.4
File Upload (5 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/1.1	100.0/1.5	100.0/1.5
90%/10% faster than (Mbps)	21.2/86.2	15.8/91.6	14.0/80.2
File Download (7 Seconds)			
Sucess Ratio (%)	100.0	100.0	100.0
10% faster than (Mbps)	684.0	771.5	329.9
Speed > 20Mbps / 100Mbps (%)	100.0/94.1	99.0/88.9	98.3/75.1
File Upload (7 Seconds)			
Sucess Ratio (%)	100.0	99.7	100.0
10% faster than (Mbps)	136.0	143.2	108.8
Speed > 2Mbps / 5Mbps (%)	100.0/100.0	99.7/99.0	99.7/98.3
Youtube			
Success Ratio/Start Time (%/s)	100.0/1.2	100.0/1.3	100.0/1.4
Average Video Resolution (p)	1080	1080	1080
Youtube live			
Success Ratio/Start Time (%/s)	99.7/1.8	100.0/1.9	100.0/2.0
Average Video Resolution (p)	1080	1080	1080
Conversational-App			
Sucess Ratio (%)	99.8	99.8	100.0
Speech Quality P10 (MOS-LQO)	4.0	3.9	3.9
Interactivity e-Gaming			
Success Ratio/Interactivity e-Gaming (%)	99.7/88.9	98.7/82.4	97.9/81.4
Interactivity Videochat			
Success Ratio/Interactivity Videochat (%)	98.6/93.5	98.0/87.9	98.3/88.8

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Data

KPN AHEAD IN RAILWAYS DATA TESTS, ODIDO FOLLOWS AT CLOSE DISTANCE, AND VODAFONE AT A LITTLE MORE DISTINCT GAP

In the walktests that were specifically conducted on Dutch trains, KPN holds up a very high level of performance. Odido follows closely behind at a gap of just one percentage point. Vodafone ranks third at a more distinct gap. However, compared to the results of railway data tests in other countries, all three Dutch operators show very high results.

RAILWAYS WALKTEST

KPN

Data Railways (Walktest)	KPN	ODIDO	Vodafone
Web-Page Download			
Success Ratio/Avg. Session Time (%/s)	99.8/0.8	99.9/0.9	99.6/1.0
File Download (10 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/1.0	100.0/1.0	99.7/2.5
90%/10% faster than (Mbps)	54.4/268.5	51.1/284.2	16.1/137.0
File Upload (5 MB)			
Success Ratio/Avg. Session Time (%/s)	100.0/2.2	100.0/2.6	100.0/3.5
90%/10% faster than (Mbps)	9.2/77.1	7.2/83.3	4.6/58.4
File Download (7 Seconds)			
Sucess Ratio (%)	99.7	99.7	99.3
10% faster than (Mbps)	674.9	756.7	261.0
Speed > 20Mbps / 100Mbps (%)	98.7/83.6	98.7/83.7	88.5/47.2
File Upload (7 Seconds)			
Sucess Ratio (%)	99.7	100.0	100.0
10% faster than (Mbps)	114.5	113.6	63.3
Speed > 2Mbps / 5Mbps (%)	99.7/96.8	98.7/94.4	97.7/91.9
Youtube			
Success Ratio/Start Time (%/s)	100.0/1.4	100.0/1.3	98.7/1.7
Average Video Resolution (p)	1080	1080	1080
Youtube live			
Success Ratio/Start Time (%/s)	100.0/2.0	99.4/2.0	97.7/2.4
Average Video Resolution (p)	1079	1080	1077
Conversational-App			
Sucess Ratio (%)	99.8	100.0	99.9
Speech Quality P10 (MOS-LQO)	3.9	4.0	4.0
Interactivity e-Gaming			
Success Ratio/Interactivity e-Gaming (%)	97.8/85.8	97.4/80.9	94.5/72.5
Interactivity Videochat			
Success Ratio/Interactivity Videochat (%)	94.3/91.5	96.0/89.7	95.5/87.3

KPN SHOWS HIGHEST SHARE OF 5G SAMPLES IN ALL AGGREGATIONS, ODIDO SHOWS HIGHEST 5G DATA RATES

Our measurements assume that 5G is the standard. But to shed light on the progress of the 5G rollout, we look at the results of the KPI "Data rates of the 7 second Download tests". This gives a good indication of the data rates which are supported thanks to the 5G technology. But as this assessment does not limit the overall results to the 5G-related aspects or factors such as 5G coverage or the measured latencies of 5G-only connections, we do not identify a separate 5G category winner.

That said, in this assessment, KPN shows the highest share of 5G samples in all aggregations – in cities and towns, on the roads and on trains. Odido also achieves a considerably high share of 5G samples and shows the highest 5G data rates in all aggregations. Other than KPN and Odido, Vodafone relies heavily on 5G Dynamic Spectrum Sharing (DSS) and uses this bridging technology to realise the bigger part of its also very high 5G coverage.
Compared to the results of this analysis from the previous year, we see a pleasing increase in the observed data rates for all Dutch operators.

5G

Photo: Nbeaw, Shutterstock

Data rates 7s Download	KPN			Odido			Vodafone		
Samples with 5G	Share	Average (Mbps)	10% faster than (Mbps)	Share	Average (Mbps)	10% faster than (Mbps)	Share	Average (Mbps)	10% faster than (Mbps)
Cities – Drivetest	99.7%	522.4	1040.6	92.2%	652.3	1075.1	12.1%	357.5	711.0
Cities – Walktest	100.0%	632.4	1104.9	82.4%	676.0	1122.3	27.6%	493.4	813.8
Towns – Drivetest	99.8%	359.4	744.2	90.5%	525.1	921.7	19.1%	117.8	199.7
Roads – Drivetest	99.7%	337.3	688.2	91.6%	408.5	776.3	17.0%	122.6	216.1
Trains – Walktest	100.0%	316.8	674.9	87.6%	440.4	795.6	28.5%	115.2	301.0
Samples with 5G-DSS	**Share**	**Average (Mbps)**	**10% faster than (Mbps)**	**Share**	**Average (Mbps)**	**10% faster than (Mbps)**	**Share**	**Average (Mbps)**	**10% faster than (Mbps)**
Cities – Drivetest	0.1%	416.9	416.9	–	–	–	84.5%	175.7	318.0
Cities – Walktest	–	–	–	–	–	–	69.7%	185.4	374.0
Towns – Drivetest	–	–	–	–	–	–	75.0%	188.8	329.9
Roads – Drivetest	–	–	–	–	–	–	78.5%	202.1	338.4
Trains – Walktest	–	–	–	–	–	–	64.3%	129.0	263.9

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The 2025 Mobile Network Test in the Netherlands

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Crowd

ODIDO LEADS IN COVERAGE REACH AND TIME ON BROADBAND. KPN AND ODIDO SCORE ON A PAR IN COVERAGE QUALITY. VODAFONE FOLLOWS AT NARROW GAP

In the Coverage assessment overall, Odido takes a narrow lead, with the highest results in Coverage Reach and Time on Broadband (see definitions on page 15). In these metrics, KPN follows closely on second rank. In the Coverage Quality assessment, KPN and Odido score on a par. In each of the three Coverage KPIs, Vodafone follows at a narrow gap.

BROADBAND COVERAGE

ODIDO

VODAFONE AND KPN AHEAD IN PASSIVE DOWNLOAD ANALYSIS, ODIDO FOLLOWS AT SMALL DISTANCE

In the passively observed download data rates, Vodafone is leading in the Basic Internet class (minimum of 2 Mbps). KPN is ahead in the HD Video class (at least 5 Mbps) and in the demanding UHD Video class (at least 20 Mbps). In the latter two classes, Vodafone scores second. The gaps to the respective runner-ups are small in each case.

DOWNLOADS PASSIVE

VODAFONE & KPN

ODIDO LEADING IN ACTIVE DOWNLOAD ANALYSIS

The actively performed download tests are conducted to better approximate the maximum performance of a mobile internet connection. Odido leads in the overall assessment of this category, due the highest average and P90 (10 percent faster than) throughputs. Vodafone shows the highest P10 (90 percent faster than) result and ranks second in the average throughput, while KPN shows the second highest P90 KPI.

DOWNLOADS ACTIVE

ODIDO

Operators	KPN	ODIDO	Vodafone
Broadband Coverage			
Coverage Quality (%)	99.6	99.6	99.4
Coverage Reach (%)	98.5	99.4	97.1
Time on Broadband (%)	99.6	99.7	99.1
Download Speed (Passive)			
Basic Internet Class(%)	96.0	95.6	96.1
HD Video Class / UHD Video Class (%)	91.0/36.7	90.2/34.9	90.4/36.2
Download Speed (Active)			
Avg. Throughput (Mbit/s)	107.5	181.9	109.3
90% / 10% faster than (Mbit/s)	14.9/228.2	16.6/427.5	22.5/226.6
Upload Speed (Active)			
Avg. Throughput (Mbit/s)	33.9	33.0	22.9
90% / 10% faster than (Mbit/s)	4.2/77.2	3.7/77.3	2.9/51.6
Latency			
Gaming Class / OTT Voice Class (%)	96.8/98.8	96.2/98.7	93.6/98.0
High End Gaming (%)	30.4	16.4	10.0
Voice			
HD Voice (%)	99.1	99.2	98.7
Stability			
Transaction Success (%)	98.0	98.1	97.3

KPN AHEAD IN ACTIVE UPLOAD TESTS

In the active Upload tests, KPN takes the overall lead by showing the highest average and P10 throughputs. In the P90 KPI, Odido takes a narrow lead ahead of KPN and is also closely behind in the other KPIs. In this category, Vodafone ranks third in all examined KPIs, but still shows viable results.

UPLOADS ACTIVE

KPN

ODIDO LEADS IN HD VOICE AVAILABILITY, CLOSELY FOLLOWED BY KPN

In the analysis of the availability of HD voice connections (i.e Voice over LTE with the current state of mobile network implementations in the Netherlands), Odido takes the first place, followed at a narrow gap by KPN. Vodafone ranks third with all three operators showing an overall high score level.

VOICE

ODIDO

KPN SHOWS THE HIGHEST SHARES IN ALL LATENCY CLASSES, ODIDO RANKS SECOND

In the latency category, KPN shows the highest shares in all three examined classes: In the more relaxed OTT Voice class (roundtrip times up to 100 milliseconds) as well as in the Gaming class (up to 50 ms), Odido follows at close distance. In the most demanding Highend Gaming Class (up to 20 ms), the gap becomes a little more pronounced. Vodafone ranks third in all considerations.

LATENCY

KPN

ODIDO CLOSELY AHEAD OF KPN IN CROWDSOURCED ASSESSMENT OF TRANSACTION STABILITY

In the Stability category, which looks at the success rates of regular transaction tests, Odido leads at a narrow gap ahead of KPN. Vodafone comes in third at a slightly more pronounced gap.

STABILITY

ODIDO

A Closer Look at Radio Standards

Looking at the expansion from 5G NSA to 5G SA, what developments can be observed in the networks? This question can best be answered by a crowdsourcing analysis.

The progress of the expansion of mobile networks is no longer only reflected in the answer to the question 'Is 5G available?'. The next step in 5G roll-outs is the development from 5G non-standalone (NSA, shared core network with 4G) to 5G standalone (SA, own 5G core network).

As we have deliberately not yet included 5G SA in our drive tests and walk tests for compatibility and performance reasons, the development can best be read from the crowdsourcing data collected by umlaut. The table below shows what proportion of the samples were received via which radio standard. We show the percentage values at the beginning and the end of this year's observation period – but for the entire data pool, without the filtering carried out in the crowd discipline.

The fact that the 5G shares in this analysis are considerably lower than the numbers observed in our drive tests and walk tests can be easily explained: The "take rates" of 5G (i.e. the number customers who both have a suitable smartphone and tariff) are much smaller than the actual coverage or presence of respective 5G cells in the mobile networks.

As could be expected, the share of 2G/3G is decreasing in favour of the other network technologies, We have not yet seen 5G standalone samples at any of the three Dutch mobile networks. The small declines in the 5G NSA shares at Odido and KPN can be explained with statistical tolerance ranges and small fluctuations in the data basis (supported apps etc.) of this analysis. However, we observe a visible increase in the 5G NSA shares in the Vodafone network.

Photo: Robyn McNeill, shutterstock

Crowdsourcing samples	KPN		Odido		Vodafone	
Month	August 24	January 25	August 24	January 25	August 24	January 25
2G/3G	1.8%	1.3%	1.4%	1.0%	5.8%	2.9%
4G	83.2%	84.0%	62.8%	63.3%	58.9%	51.1%
5G Non-Standalone	15.0%	14.7%	35.8%	35.7%	35.3%	46.0%
5G Standalone	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Reliability

Reliability is not an additional category of our tests, but rather a different angle of looking at the results: For each KPI, our scoring distinguishes between "Qualifiers" (the expected basic performance) and "Differentiators" (the additional performance that exceeds the expected basics). The view at Reliability limits itself to most of the Qualifiers and the basic KPIs of the crowdsourcing – thus conveying an impression of the standards, a user can reasonably expect from a mobile network. The reference values in this representation are therefore only the subset of score points which we assigned to the Qualifiers. The resulting scores provide information about the reliability with which an operator offers its network services.

This approach concentrates on the compulsory basics instead of the highest peaks of a network's performance. It shows that, analogous to the overall assessment, all three Dutch operators also achieve outstanding results in Reliability – overall and in the separate categories (Voice, Data and Crowd).

Operator			KPN	ODIDO	Vodafone
Voice	max. 162 points		162	161	160
Drivetest		126	100%	100%	99%
Walktest		36	99%	98%	97%
Data	max. 288 points		287	287	284
Drivetest		223	100%	100%	99%
Walktest		65	99%	99%	95%
Crowd	max. 150 points		145	145	143
Crowd		150	96%	96%	95%
Total	max. 600 points		594	593	587

KPN CLOSELY LEADS IN VOICE RELIABILITY
In the overall assessment of the Reliability of voice connections, KPN achieves the highest score, closely followed by Odido and then Vodafone, each of them just one score point apart. While the voice drivetests show perfect or almost perfect results for all three contenders, the differences become a little more pronounced in the walktests: In this subcategory, KPN is clearly ahead, followed by Odido and then Vodafone, each at a gap of one percentage point.

VOICE
KPN

KPN AND ODIDO AHEAD ON A PAR IN DATA RELIABILITY
In the Reliability assessment in the Data tests, KPN and Odido score on a par with both achieving perfect results in the drivetests and almost perfect results in the walktests. In the drivetests, Vodafone follows again by a gap of just one percentage point. In the walktests, the distance of Vodafone behind the two leading operators KPN and Odido is a little more pronounced.

DATA
KPN & ODIDO

KPN AND ODIDO LEAD ON A PAR IN CROWDSOURCED RELIABILITY, VODAFONE FOLLOWS AT CLOSE GAP
In the crowdsourced KPIs, KPN and Odido share the first rank in terms of achieved score points, while Vodafone follows by a close gap of two score points. In the rounded representation of percentages, Vodafone is only one percentage point behind KPN and Odido.

CROWD
KPN & ODIDO

Photo: wjarek, shutterstock

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The 2025 Mobile Network Test in the Netherlands

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City Scores

In addition to the nationwide assessment, it is always interesting to have a closer look at a more regional level. Thus, we have analysed the individual results in the five largest cities of the Netherlands this year again. The results provide residents with valuable insights into which of the three operators has the highest performance in their regional environment.

KPN AND ODIDO ON A PAR IN EINDHOVEN, VODAFONE ON STRONG SECOND RANK.
In the Nordbrabant city, KPN and Odido take the lead together. With also strong results, Vodafone follows at a gap of six points. In the Voice assessment, all three operators score on a par. In the Crowd category, Odido and KPN score on a level, with Vodafone following at a distance of one point. In the data category, KPN and Odido are also equal, with Vodafone following at a slightly more pronounced distance.

EINDHOVEN
KPN & ODIDO

KPN CLOSELY AHEAD OF ODIDO LEADING IN AMSTERDAM
The Netherland's capital has also the largest number of inhabitants among the Dutch cities. This makes it particularly worthwhile for all operators to present themselves at their best in Amsterdam. This year, KPN takes a narrow lead ahead of Odido, with Vodafone following at a slightly wider gap. In terms of voice, KPN and Odido score on a par. In the Crowdsourcing, Odido is one point ahead of KPN. KPN secures its narrow lead with an advantage of two points in the Data category.

AMSTERDAM
KPN

KPN AHEAD IN ROTTERDAM, ODIDO FOLLOWING AT VERY CLOSE GAP. KPN AND ODIDO ON A PAR IN VOICE AND CROWD; IN VOICE, VODAFONE ALMOST EQUALLY STRONG
In the famous port city, KPN takes the lead, with Odido following at a gap of one point. In the Voice category, KPN and Odido score on a par, Vodafone is one score point behind. In the Data category, KPN secures its lead over Odido at a gap of one score point. Here and in the Crowdsourcing, where KPN and Odido are equal again, Vodafone falls behind a little more pronounced.

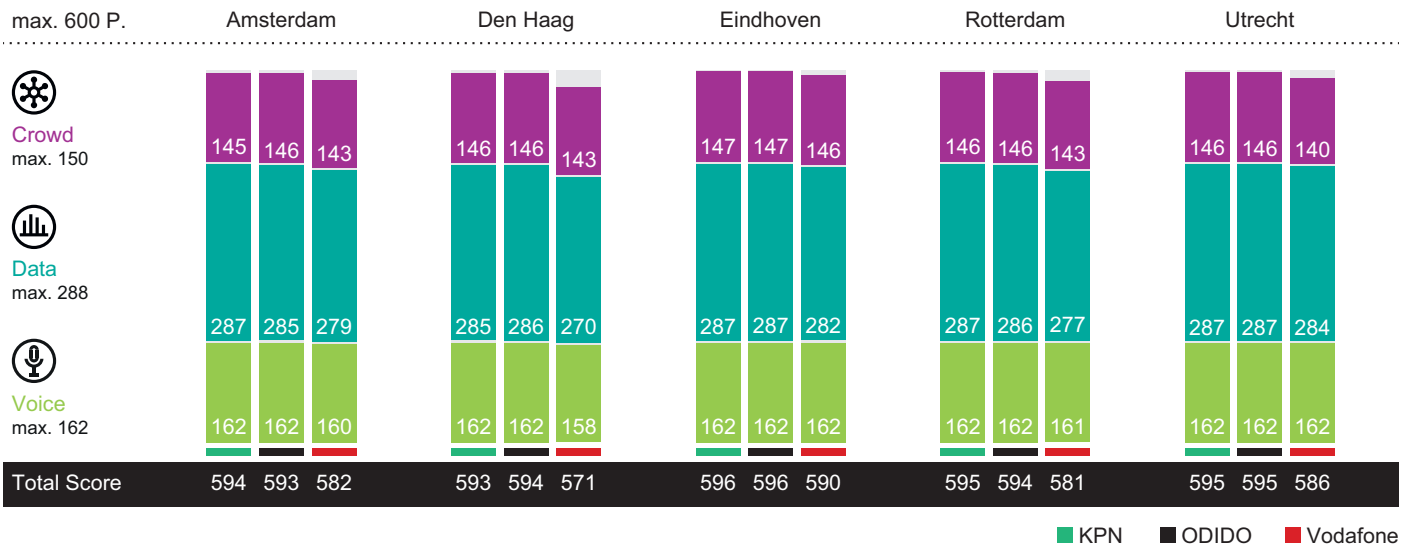
ROTTERDAM
KPN

ODIDO LEADS IN DEN HAAG, CLOSELY AHEAD OF KPN
In the North Sea city, we also see a close race: Odido leads with an advantage of one score point ahead of KPN. While both score on a par in the Voice and Crowd categories, Odido's lead is manifested in the Data category. Vodafone falls behind in all three categories and at an even more pronounced gap compared to the nation's capital.

DEN HAAG
ODIDO

KPN AND ODIDO ON A PAR IN UTRECHT. IN VOICE CATEGORY, ALL THREE OPERATORS SCORE ON A PAR
In the Netherland's fourth biggest city, located in the center of the country, KPN and Odido once more score on a par, achieving identical scores in all three categories of this test. Vodafone scores on a level with KPN and Odido in the Voice category, but falls behind a little more distinctly in the Data and Crowdsourcing assessments.

UTRECHT
KPN & ODIDO



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The 2025 Mobile Network Test in the Netherlands

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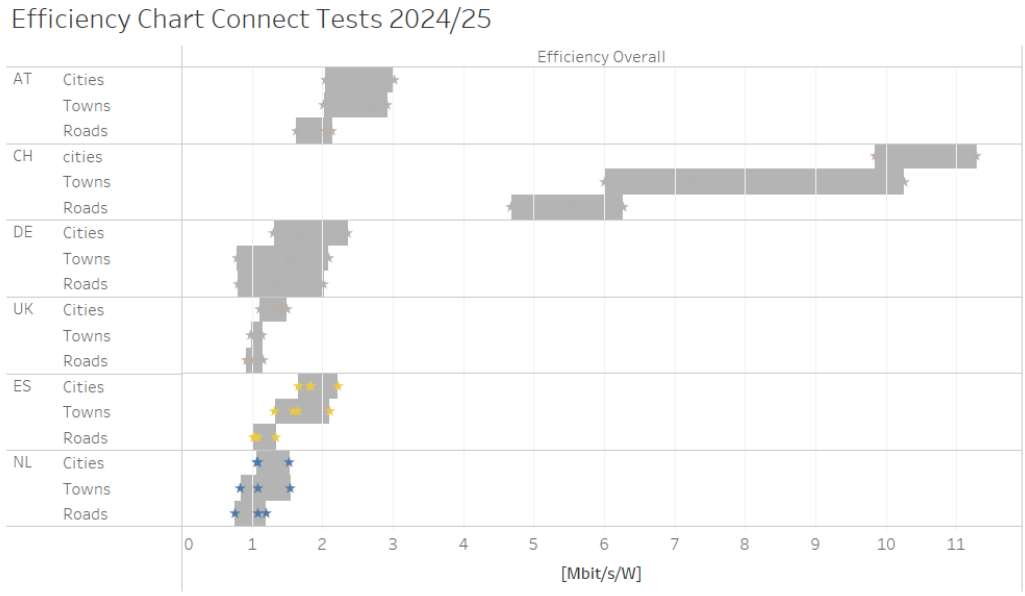
Case Study: Energy Effiency

The energy efficiency of mobile networks is becoming increasingly important. How can operator successes be measured?

Mobile network operators must reduce the operating costs of their networks and become climate-neutral in the long term. The Radio Access Network (RAN) is the most energy-hungry component of a mobile network. Saving just a few percent of its energy consumption can amount to millions of kilowatt hours and euros per year.
umlaut has analysed how the data collected in drive and walk tests can be used to determine how the networks use a not insignificant proportion of the energy consumed in the RAN: the energy used for active transmission to users. The results also allow conclusions to be drawn about the operator's overarching efficiency strategy. This case study is however not a part of our official assessment.
The approach presented here relates the speed at which the networks transmit data to the smartphone to the transmission power required for this. The result is a value with the unit Mbps per Watt.
To test this, umlaut carried out this analysis for the 7-second file download – one of the test items that pushes the performance of a network to the limit.
The value determined in this way is influenced by a variety of factors – for example, the spatial arrangement of the base stations, the operator's network coverage strategy via macro, micro and pico cells as well as the number, technlology and configuration of frequency bands used and the mobile radio technologies deployed on them.
The table below shows the range of this KPI for a number of European key markets and the various operators who are active there, separated for the areas or scenarios of cities, towns and roads. We have deliberately decided not to reveal the results by operator in order to not suggest any kind of evaluation. However, the ranges shown illustrate that the presented approach can reveal significant differences between individual operators and considered scenarios.

Photo: posteriori, shutterstock



The chart shows the average efficiency of downlink transmission power (in Mbps per Watt) in various countries and various scenarios. The bars visualise the range between the network operator with the lowest and the one with the highest average efficiency. (Higher values = higher efficiency)
The overall higher level in Switzerland can be explained with the particularly restrictive regulations for electromagnetic emmissions in this country.

Fairness and Transparency

Testing a mobile network involves more than just measuring, analysing and writing about the result. Transparency for all parties and ensuring that everyone plays by the same rules is paramount. To achieve this, connect and umlaut have developed a set of best practices over the past 30 years of testing mobile networks.

Informing the operators at an early stage about the basic parameters of our tests is among the things, we found helpful during the years. A framework lists the smartphones and the firmware installed on them, the KPIs to be measured and the basic scheme for scoring them. A timeline for the test, with some contingency, is also made transparent in the framework, and operators are encouraged to comment on the information.

We are open to feedback but reserve the right to reject inappropriate claims. Close to the start of the benchmark, we ask all operators to abide by our fair play rules, which are designed to ensure that each network operates under test conditions in the same way as it does for real customers. If we or another operator see a potential violation of our rules, we investigate.

If we see a problematic behaviour, we immediately ask the operator to stop it, and if the benchmark has already started, we remove the affected samples from our measurements.

In this context we always keep our eyes on evolving technologies. This is of course somewhat of a challenge for umlaut and connect, but a challenge we are happy to accept for the benefit of our customers.

Photo: Frans Blok, shutterstock

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The 2025 Mobile Network Test in the Netherlands

umlaut Part of Accenture

Methodology

The umlaut connect Mobile Network Test is the result of extensive drivetests and walktests, combined with a sophisticated crowdsourcing analysis.

Logistics
connect's network test partner umlaut sent four measurement vehicles through the country, each equipped with nine smartphones. For each network operator, a Samsung Galaxy S23 took the voice measurements, and another S23 established the connections for the test case "conversational app" (see section "Data connections" below). For the actual data test, we used a third Samsung Galaxy S23 per operator. For all measurements, the smartphones were set to "5G preferred" – so wherever supported by the network, the data tests took place via 5G. The firmware of the test smartphones corresponded to the original network operator versions.

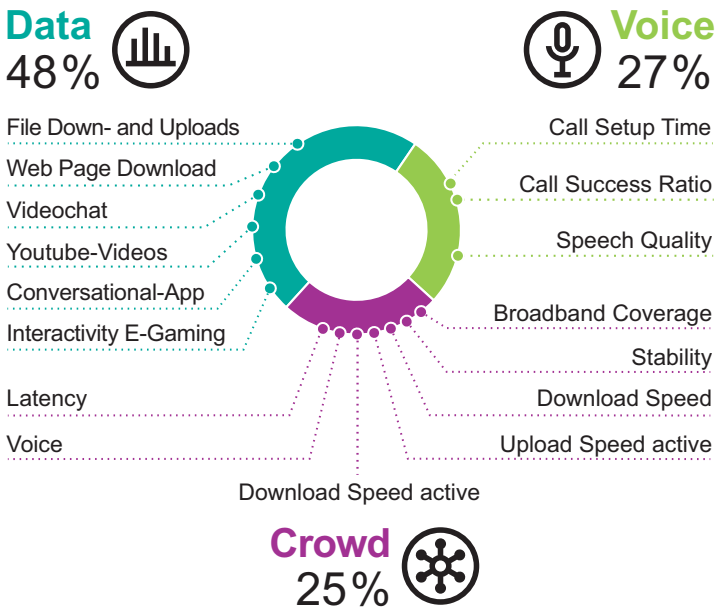
In addition to the drive tests, two walk test teams carried out measurements on foot in each country, in zones with heavy public traffic such as railway station concourses, airport terminals, cafés, public transport and museums. The walk test programme also included journeys on long-distance railway lines. For the walk tests, the same smartphone types were used per network operator for the same measurements as in the drive tests. The walk test teams transported the smartphones in backpacks or trolleys equipped with powerful batteries.

The drive and walk tests took place between 8 am and 10 pm. For the drive tests, two vehicles were in the same city, but not in the same place, so that one car would not falsify the measurements of the other. On the connecting roads, two vehicles each drove the same routes, but one after the other with some time and distance between them. For the selection of the test routes, umlaut created four different suggestions for each country, from which connect blindly selected a route.

Voice connections
Voice connections account for 27 percent of the overall result. For this purpose, mobile telephone calls were established from vehicle to vehicle ("mobile-to-mobile") and their success rates, call set-up time and voice quality were measured. The smartphones of the walk test teams made calls to a stationary (smartphone) remote station for the voice tests.

To ensure realistic conditions, data traffic took place simultaneously in the background. The transmission quality was assessed using the POLQA wideband method suitable for HD voice. '5G non-standalone preferred' was configured on all phones, with voice telephony being handled via VoLTE.

Data connections
The data measurements account for 48 percent of the total result. Several popular live pages (dynamic) and the ETSI reference page



known as the Kepler page (static) were retrieved to assess internet page calls. In addition, umlaut developed a preliminary stage of a designated successor to the Kepler page (working title: 'Newton'), which ETSI is currently considering.

Furthermore, 10 MB and 5 MB files were downloaded and uploaded, respectively, in order to determine the performance for smaller data transfers. We also determined the data rate within a 7-second period when uploading and downloading large files. As YouTube dynamically adapts the resolution to the available bandwidth, the evaluation takes into account the average image resolution of the videos as well as the success rate and the time until playback starts.

A typical over-the-top voice connection (OTT) is represented by the "conversational app" test case. To do this, we set up a voice channel via the SIP and STUN protocols using the OPUS codec and determined the success rate and voice quality. In addition, for our test point "Interactivity of eGaming" our measurements simulated a highly interactive UDP multiplayer session to determine the latency times of the connection and any possible packet losses.
A video chat is also part of the test scope, which follows the ITU-T G.1051 recommendation. It measures latencies, packet delays and data rates in both directions.

>>

Methodology

Crowdsourcing
Crowdsourcing results accounted for 25 percent of the overall rating. They show which network performance actually reaches the user – however, the end devices and tariffs used also have an impact on these results.

To obtain the data basis for these analyses, thousands of popular apps recorded the parameters described below in the background – provided the user agreed to the completely anonymous data collection. In slightly simplified terms, measured values are recorded in 15-minute intervals and transmitted to the umlaut servers once a day. The reports only contain a few bytes, so they hardly burden the user‘s data volume.

Broadband Coverage
In order to determine the broadband *coverage reach*, umlaut laid a grid of 2 x 2 km tiles (“Evaluation Areas“, in short EAs) over the test area. A minimum number of users and measured values had to be available for each EA. For the evaluation, umlaut awarded one point per EA if the network under consideration offered 3G coverage. Three points were awarded if 4G or 5G was available in the EA. The score achieved was divided by the achievable number of points (three points per EA in the “union footprint“ – the area of the respective country measured by all test participants with their smartphones).

We also looked at the *coverage quality*. For each operator, it indicates the average percentage of 4G or 5G coverage on an EA, averaged over all EAs in the ‘common footprint‘- this describes the area in which samples are available from all operators.

In addition, the *time on broadband* indicated how often a user had 4G or 5G reception in the period under consideration – regardless of the EAs in which the samples were recorded. For this purpose, umlaut sets the samples that show 4G/5G coverage in relation to the total number of all samples. Important: The percentage values determined for all three parameters reflect the respective degree of fulfilment – and not a percentage of 4G/5G mobile coverage in relation to area or population.

Data rates and Latencies
The *passive* determination of *download data rates* and *latencies* was carried out independently of the EAs and focused on the experience of each user. Samples that were captured via Wi-fi or when flight mode was activated, for example, were filtered out by umlaut before the analysis.

To take into account that many mobile phone tariffs throttle the data rate, umlaut defined three application-related speed classes: *Basic internet* requires a minimum of 2 Mbit/s, *HD video* requires 5 Mbit/s and *UHD video* requires 20 Mbit/s. For a sample to be valid, a minimum amount of data must have flowed in a 15-minute period. Similarly, the *latency* of the data packets is assigned to an application-related class: Roundtrip times up to 100 ms are sufficient for *OTT voice services*, less than 50 ms qualify a sample for *gaming* and less than 20 ms for *high-end gaming*. This way, the evaluation also does justice to the fact that the passively observed data rates depend on the applications used in each case.

In order to better assess the maximum possible throughput, umlaut also conducted *active* measurements of *upload* and *download* data rates once a month. They determine the amount of data transferred in 3.5 seconds. For the determined values, we consider the average data rate, the P10 value (90% of the values higher than the specified threshold, a good approximation of the typical minimum speed) and the P90 (10% above this threshold), a view at the peak values.

HD Voice
The parameter *HD voice* shows the proportion of the user‘s voice connections that were established in HD quality – and thus via VoLTE (Voice over LTE). A prerequisite was that the smartphone supports this standard.

Stability
Based on the success rates of the download, upload and browsing tests as well as additional connection tests, umlaut also examined when a broadband connection could be used at all. The averaged and weighted results define the percentage of *transaction success*.

Reliability
umlaut divides all measured values into basic requirements (“Qualifier KPIs“) and values related to peak performance (“Differentiator KPIs“). The presentation of *reliability* takes into account only the “Qualifier KPIs“ from the voice and data category as well as the basic KPIs from crowdsourcing. This makes it possible to determine how well a mobile network fulfils everyday requirements.