

# The 2026 Mobile Network Test in the Netherlands

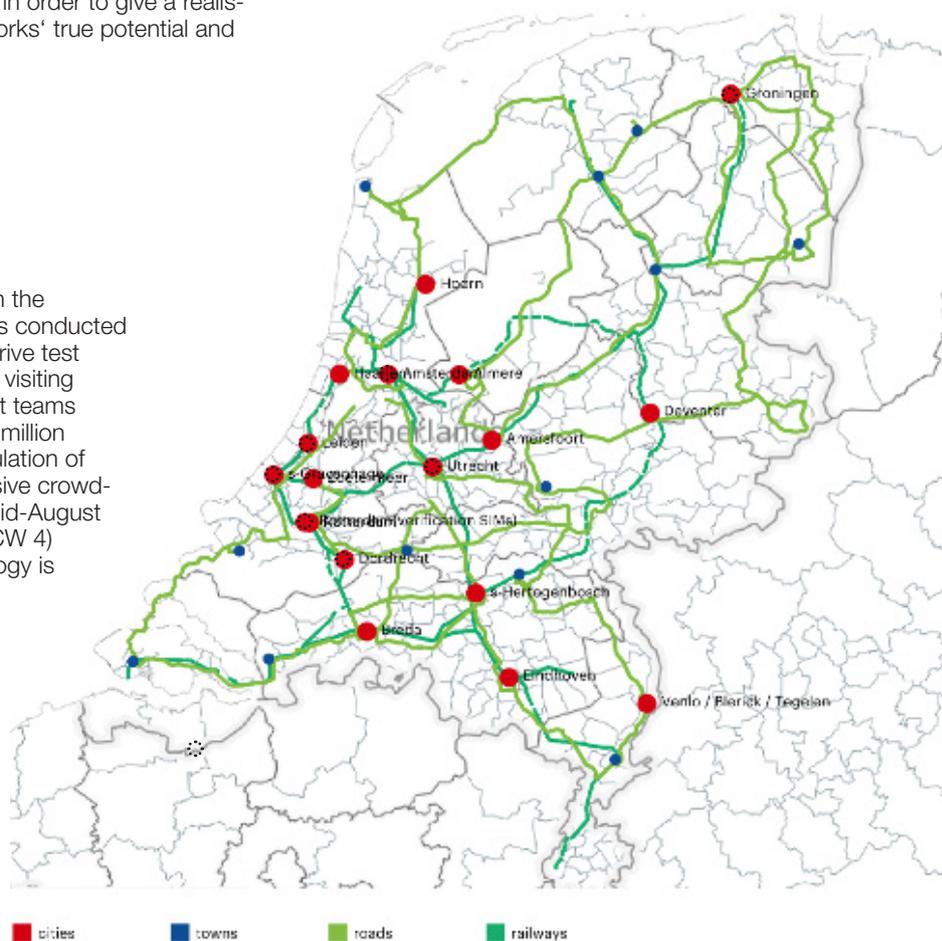
**For the eleventh time, we – umlaut and connect – have conducted our comprehensive benchmark of the mobile networks in the Netherlands. Its results show three outstanding operators and a photo finish at the top.**

The carefully designed methodology of our 2026 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.

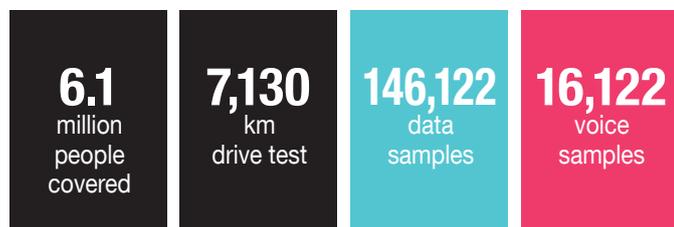
We have thoroughly weighed these components in order to give a realistic and conclusive assessment of the rated networks' true potential and performance.

## Scope

The 2026 umlaut connect Mobile Network Test in the Netherlands consists of drive tests and walk tests conducted from January 14th to February 3rd, 2026. Four drive test cars together covered a total of 7130 kilometres, visiting 17 cities and 12 towns. Additionally, two walk test teams visited eight cities. The test areas account for 6.1 million people, or approx. 34.9 percent of the total population of the Netherlands. In addition, the results of extensive crowd-sourcing analyses, considering 24 weeks from mid-August 2025 (calendar week 33) to mid-January 2026 (CW 4) are included in the score. Our detailed methodology is described on pages 12/13.



### DRIVE TEST AND WALK TEST FACTS



### CROWDSOURCING FACTS



# The 2026 Mobile Network Test in the Netherlands

## The Dutch Mobile Operators

### Odido

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 Apex 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 between 7 and 8 million. Thus, 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 Netherlands' 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 2025, the company reported a total number of 4.6 million consumer subscribers and 2.3 million business subscribers which adds up to 6.9 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 Netherlands, 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. Up to February 2026, the joint company VodafoneZiggo was owned 50% by the Vodafone Group and 50% by Liberty Global. At this point, Liberty Global announced to purchase Vodafone Group's 50% stake in VodafoneZiggo, which is to be transferred to a new holding company, Ziggo Group. Vodafone Group will receive a 10% share in Ziggo Group. At the end of 2025, VodafoneZiggo reported over 5 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 Netherlands' 5G spectrum auction in mid 2024, VodafoneZiggo also additionally acquired 100 MHz of spectrum in the 3.5 MHz band. ■

# The 2026 Mobile Network Test in the Netherlands

## Results at a Glance



**KPN** wins our Mobile Network Test in the Netherlands with the highest score awarded in umlaut's 2026 benchmarking season so far. The grade "outstanding" is well deserved with results on the highest level in all three evaluation categories, Voice, Data and Crowdsourcing. In addition, KPN is local champion in Amsterdam, The Hague and Rotterdam and Co-Winner together with Odido in Eindhoven. In our detailed look at the state of the 5G roll-out, KPN shows a 5G share of 100% in big cities and only slightly lower results in towns, on roads and even on railways.



## Odido

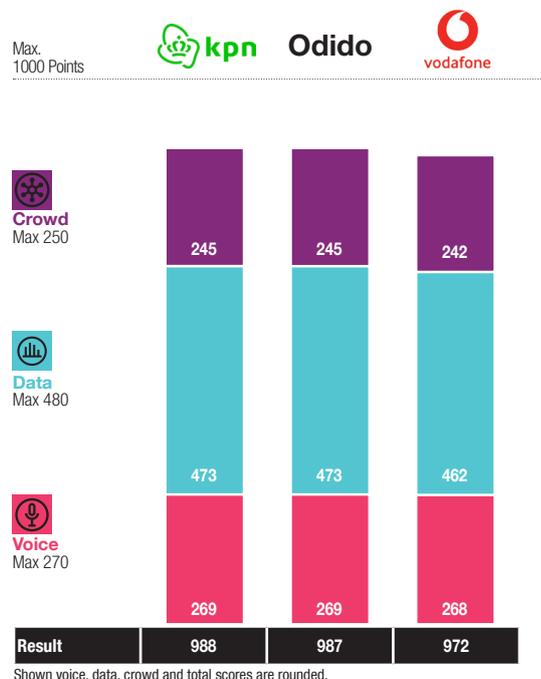
**Odido** follows at a razor-thin margin and also shows an impressive performance in all tested categories. With the rounded results, only one score point separates this operator from the overall winner. Odido is slightly ahead in the voice drivetests performed on Dutch roads, the data drive tests in smaller towns as well as in the crowdsourced coverage and download tests by data rates. Above that, Odido is local champion in Utrecht and co-winner together with KPN in Eindhoven. Our 5G analysis shows high 5G shares in all evaluated scenarios for the Odido network.

## vodafone ziggo

**Vodafone** ranks in a strong third place, also achieving the overall grade "outstanding". In the Voice assessment, the operator scores just one point behind KPN and Odido, scoring at eye level in the big cities and smaller towns. Vodafone's data results are still outstanding, but fall a little behind those of the other two contenders. In the crowdsourced results, Vodafone achieves the highest results in the Download assessment by speed classes. In its 5G deployment, the operator still heavily uses dynamic spectrum sharing (DSS), but delivers high 5G coverage with this technology in cities, towns, on roads and railways.

| Overall results       |                         | Netherlands               |                           |                           |
|-----------------------|-------------------------|---------------------------|---------------------------|---------------------------|
| Voice, Data and Crowd |                         | KPN                       | Odido                     | Vodafone                  |
| <b>VOICE</b>          | max. 270 Points         | 269                       | 269                       | 268                       |
| Cities Drive test     | 121,50 P.               | 100%                      | 100%                      | 99%                       |
| Cities Walk test      | 40,50 P.                | 100%                      | 100%                      | 100%                      |
| Towns Drive test      | 54,00 P.                | 100%                      | 100%                      | 100%                      |
| Roads Drive test      | 33,75 P.                | 99%                       | 100%                      | 99%                       |
| Railways Walk test    | 20,25 P.                | 100%                      | 98%                       | 99%                       |
| <b>DATA</b>           | max. 480 Points         | 473                       | 473                       | 462                       |
| Cities Drive test     | 216,00 P.               | 99%                       | 99%                       | 96%                       |
| Cities Walk test      | 72,00 P.                | 99%                       | 99%                       | 96%                       |
| Towns Drive test      | 96,00 P.                | 98%                       | 99%                       | 97%                       |
| Roads Drive test      | 60,00 P.                | 99%                       | 99%                       | 97%                       |
| Railways Walk test    | 36,00 P.                | 97%                       | 96%                       | 94%                       |
| <b>CROWD</b>          | max 250 Points          | 245                       | 245                       | 242                       |
| Crowd                 | 250,00 P.               | 98%                       | 98%                       | 97%                       |
| <b>connect</b>        | Rating max. 1000 Points | <b>988</b><br>outstanding | <b>987</b><br>outstanding | <b>972</b><br>outstanding |

All values rounded to whole numbers. Points and percentages were calculated internally to three decimal places. The total score sums can therefore differ from the sum of the category results.



"This year's result is a true photo finish between KPN and Odido, with Vodafone coming in third, but with also an outstanding result. The score gap between KPN and Odido may be tiny, but according to connect's scoring principles, it still justifies a distance of one score point between KPN and Odido and thus KPN taking the winning position. However, the performance of Odido and also Vodafone takes place on the highest level, which we reward with the grade outstanding. Congratulations to all three Dutch mobile operators! Their customers can be happy to be able to choose between three high-performing mobile networks, which make providers in many other countries envious."

Bernd Theiss, Head of Testlab, connect

# The 2026 Mobile Network Test in the Netherlands

## Voice

### CITIES DRIVE TEST

KPN AND ODIDO

#### KPN AND ODIDO SLIGHTLY AHEAD IN VOICE DRIVETESTS IN DUTCH BIG CITIES, VODAFONE ALMOST EQUALLY STRONG

In the voice tests conducted by umlaut's test cars while driving in 17 of the Netherlands' big cities, all three operators show perfect or near perfect results. In a really tight race, KPN and Odido take the lead in this category, with KPN showing 99.9% success ratios and a slightly higher P10 value for speech quality and Odido achieving a success ratio of 100% with a minimally lower measured speech quality. Vodafone loses one percentage point by combining 99.9% success ratio and the slightly lower MOS value of 4.6 for the measured speech quality.

### CITIES WALK TEST

ALL OPERATORS

#### KPN, ODIDO AND VODAFONE ON A PAR IN VOICE WALKTESTS CONDUCTED IN BIG DUTCH CITIES

In the walk tests, conducted in Amsterdam, Dordrecht, Groningen, the Hague, Leiden, Rotterdam and Utrecht, all three Dutch operators share the impressive result of a full 100% of the possible score points. With 100% success ratios, an impeccable speech quality MOS value (P10) of 4.7 and call setup times of 1 second or less, customers of KPN, Odido and Vodafone can expect almost perfect voice connections.

### TOWNS DRIVE TEST

ALL OPERATORS

#### KPN, ODIDO AND VODAFONE ALSO SCORING ON A PAR IN VOICE DRIVETESTS CONDUCTED IN SMALLER DUTCH TOWNS

In the voice tests conducted by umlaut's test cars while visiting 12 smaller towns of the Netherlands (see route map on page 1), all operators again share the top position, achieving a whopping 100% of the achievable score. This means that even in smaller towns, Dutch customers of any of the three evaluated networks can expect almost perfect telephony.

### ROADS DRIVE TEST

ODIDO

#### ODIDO SLIGHTLY AHEAD IN VOICE TESTS ON DUTCH ROADS, FOLLOWED AT A MINIMAL GAP BY KPN AND VODAFONE

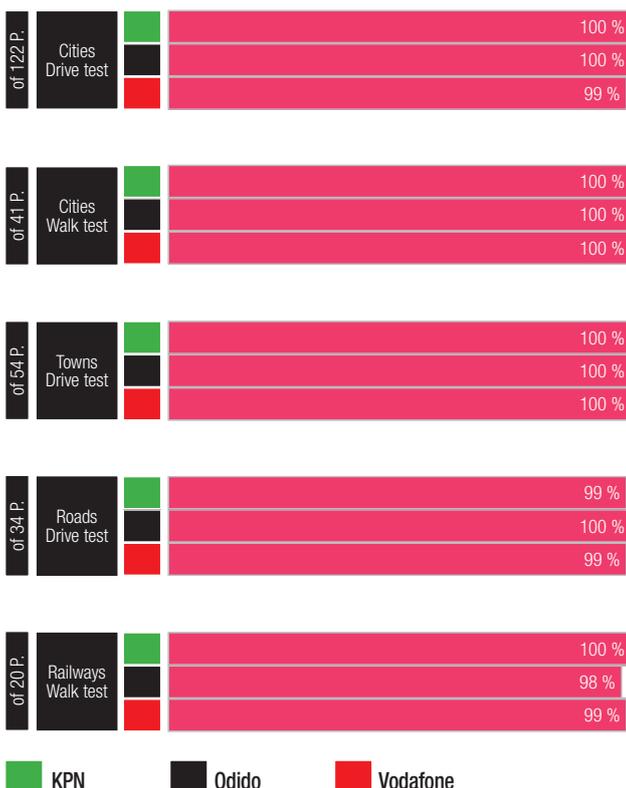
When it comes to the results of the voice tests performed while driving on Dutch roads, Odido takes a narrow lead due to the highest success ratios and also otherwise excellent KPIs. KPN and Vodafone only fall one percentage point behind, which is still a top result which other operators in other countries would be longing for. For Dutch motorists, this bears the good news that they can expect near-perfect voice connectivity even when driving their cars in the Dutch countryside, or more precisely on the Netherlands' connecting roads.

### RAILWAYS WALK TEST

KPN

#### KPN AHEAD IN VOICE TESTS ON DUTCH RAILWAYS, VODAFONE AND THEN ODIDO FOLLOW AT VERY CLOSE DISTANCE

In the voice tests performed by the test teams while travelling in trains through the Netherlands, KPN manages to still achieve an impressive 100% success ratio and consequently 100% of the achievable score in this category. Vodafone follows at a very close gap, still offering a 99.6% success ratio and only slightly longer call setup times. Odido comes in third at a distance of another percentage point, showing a success ratio of 99.3%. These ratios and the other measured KPIs are nothing but excellent in the difficult environment of running trains.



| Voice (Telephony)                             |       |       |          |
|---|-------|-------|----------|
| Operator                                      | KPN   | Odido | Vodafone |
| <b>VOICE CITIES (DRIVE TEST)</b>              |       |       |          |
| Success Ratio (%)                             | 99.9  | 100.0 | 99.9     |
| Call Setup Time 10% faster than (P90, s)      | 0.5   | 0.6   | 1.0      |
| Speech Quality 90% better than (P10, MOS-LQO) | 4.7   | 4.6   | 4.6      |
| <b>VOICE CITIES (WALK TEST)</b>               |       |       |          |
| Success Ratio (%)                             | 100.0 | 100.0 | 100.0    |
| Call Setup Time 10% faster than (P90, s)      | 0.5   | 0.6   | 1.0      |
| Speech Quality 90% better than (P10, MOS-LQO) | 4.7   | 4.7   | 4.7      |
| <b>VOICE TOWNS (DRIVE TEST)</b>               |       |       |          |
| Success Ratio (%)                             | 100.0 | 100.0 | 100.0    |
| Call Setup Time 10% faster than (P90, s)      | 0.5   | 0.6   | 1.0      |
| Speech Quality 90% better than (P10, MOS-LQO) | 4.7   | 4.6   | 4.6      |
| <b>VOICE ROADS (DRIVE TEST)</b>               |       |       |          |
| Success Ratio (%)                             | 99.8  | 100.0 | 99.8     |
| Call Setup Time 10% faster than (P90, s)      | 0.5   | 0.7   | 1.0      |
| Speech Quality 90% better than (P10, MOS-LQO) | 4.6   | 4.6   | 4.5      |
| <b>VOICE RAILWAYS (WALK TEST)</b>             |       |       |          |
| Success Ratio (%)                             | 100.0 | 99.3  | 99.6     |
| Call Setup Time 10% faster than (P90, s)      | 0.6   | 0.7   | 1.0      |
| Speech Quality 90% better than (P10, MOS-LQO) | 4.7   | 4.5   | 4.6      |

■ KPN
 ■ Odido
 ■ Vodafone

# The 2026 Mobile Network Test in the Netherlands

## Data

### CITIES DRIVETEST

#### KPN AND ODIDO

#### KPN AND ODIDO LEADING ON A PAR IN BIG CITIES DATA DRIVETESTS, VODAFONE FOLLOWING CLOSELY

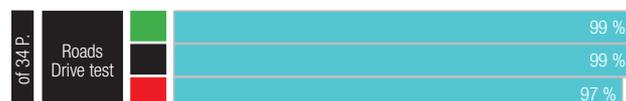
In the data drivetests conducted in big Dutch cities, KPN and Odido score on a par and achieve 99% of the possible points. On an overall very high level, KPN shows slightly higher data rates in some of the file download tests, while Odido achieved slightly better KPIs in some of the file upload tests. Vodafone follows at close distance with some success ratios and other KPIs falling slightly behind the results of KPN and Odido – but still performing on the highest level.

### CITIES WALKTEST

#### KPN AND ODIDO

#### KPN AND ODIDO ALSO LEAD IN BIG CITIES DATA WALKTESTS, VODAFONE FOLLOWS AT SMALL GAP

The results seen in the big cities data drivetests are also confirmed by the data walktests conducted in the Netherlands' bigger cities. Again, KPN and Odido share the top position here, with Vodafone following at a close distance. As in the drivetests, KPN and Odido show 100% success rates in many of the tested use cases, while Vodafone achieves success rates typically between 99.5% and 99.9%. This, however, denotes an excellent data reliability for all three operators. A more detailed analysis shows that all three operators use a high share of 5G NR on 3500 MHz for conveying downlink data traffic in the cities. KPN shows a significant share of NR 2CA + LTE 3CA in the Downlinks, while Odido mainly uses NR 2CA + LTE 2CA.



■ KPN
 ■ Odido
 ■ Vodafone

| Data (Cities; Drive test)                      |             |             |            |
|--|-------------|-------------|------------|
| Operator                                       | KPN         | Odido       | Vodafone   |
| <b>WEB PAGE DOWNLOAD</b>                       |             |             |            |
| Success Ratio / Avg. Session Time (%/s)        | 100.0/0.9   | 100.0/0.8   | 99.9/0.9   |
| <b>FILE DOWNLOAD (10MB)</b>                    |             |             |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.5   | 100.0/0.6   | 100.0/1.2  |
| 90%/10% faster than (Mbit/s)                   | 166.3/381.1 | 109.3/325.2 | 41.1/137.2 |
| <b>FILE UPLOAD (5MB)</b>                       |             |             |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.9   | 100.0/0.8   | 99.9/1.7   |
| 90%/10% faster than (Mbit/s)                   | 34.4/89.6   | 34.4/100.3  | 13.3/78.0  |
| <b>FILE DOWNLOAD (7 SECONDS)</b>               |             |             |            |
| Success Ratio (%)                              | 100.0       | 100.0       | 99.9       |
| 10% faster than (Mbit/s)                       | 1054.7      | 1082.9      | 545.6      |
| Speed > 20Mbit/s / 100Mbit/s (%)               | 100.0/99.1  | 99.9/97.4   | 99.3/79.3  |
| <b>FILE UPLOAD (7 SECONDS)</b>                 |             |             |            |
| Success Ratio (%)                              | 100.0       | 100.0       | 99.9       |
| 10% faster than (Mbit/s)                       | 162.5       | 177.6       | 113.3      |
| Speed > 2Mbit/s / 5Mbit/s (%)                  | 100.0/99.9  | 99.9/99.8   | 99.9/99.6  |
| <b>YOUTUBE VIDEO</b>                           |             |             |            |
| Success Ratio/Start Time (%/s)                 | 99.7/1.2    | 99.9/1.2    | 99.5/1.5   |
| Average Video Resolution (p)                   | 1078        | 1080        | 1080       |
| <b>YOUTUBE LIVE</b>                            |             |             |            |
| Success Ratio/Start Time (%/s)                 | 99.8/1.7    | 100.0/1.7   | 99.7/1.9   |
| Average Video Resolution (p)                   | 1076        | 1080        | 1076       |
| <b>CONVERSATIONAL APP</b>                      |             |             |            |
| Success Ratio / Speech Quality P10 (%/MOS-LQO) | 100.0/4.4   | 100.0/4.3   | 100.0/4.1  |
| <b>INTERACTIVITY E-GAMING</b>                  |             |             |            |
| Success Ratio / Interactivity E-Gaming (%)     | 99.9/91.7   | 100.0/90.5  | 99.6/82.9  |
| <b>INTERACTIVITY VIDEO CHAT</b>                |             |             |            |
| Success Ratio / Interactivity Videochat (%)    | 99.8/96.0   | 99.7/95.8   | 99.4/91.1  |

| Data (Cities; Walk test)                       |             |             |            |
|--|-------------|-------------|------------|
| Operator                                       | KPN         | Odido       | Vodafone   |
| <b>WEB PAGE DOWNLOAD</b>                       |             |             |            |
| Success Ratio / Avg. Session Time (%/s)        | 100.0/0.8   | 100.0/0.9   | 99.9/1.0   |
| <b>FILE DOWNLOAD (10MB)</b>                    |             |             |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.5   | 100.0/0.7   | 100.0/1.0  |
| 90%/10% faster than (Mbit/s)                   | 160.3/382.8 | 108.6/346.0 | 43.4/196.8 |
| <b>FILE UPLOAD (5MB)</b>                       |             |             |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.7   | 100.0/0.8   | 99.7/1.4   |
| 90%/10% faster than (Mbit/s)                   | 44.7/93.9   | 42.2/100.8  | 19.1/88.5  |
| <b>FILE DOWNLOAD (7 SECONDS)</b>               |             |             |            |
| Success Ratio (%)                              | 100.0       | 100.0       | 99.8       |
| 10% faster than (Mbit/s)                       | 1099.5      | 1117.8      | 634.6      |
| Speed > 20Mbit/s / 100Mbit/s (%)               | 99.8/99.7   | 99.5/94.2   | 99.0/85.1  |
| <b>FILE UPLOAD (7 SECONDS)</b>                 |             |             |            |
| Success Ratio (%)                              | 100.0       | 100.0       | 99.5       |
| 10% faster than (Mbit/s)                       | 175.8       | 180.4       | 138.8      |
| Speed > 2Mbit/s / 5Mbit/s (%)                  | 100.0/100.0 | 99.8/99.7   | 100.0/99.5 |
| <b>YOUTUBE VIDEO</b>                           |             |             |            |
| Success Ratio/Start Time (%/s)                 | 99.7/1.2    | 99.8/1.2    | 99.7/1.4   |
| Average Video Resolution (p)                   | 1080        | 1080        | 1078       |
| <b>YOUTUBE LIVE</b>                            |             |             |            |
| Success Ratio/Start Time (%/s)                 | 99.5/1.7    | 99.3/1.7    | 98.8/1.9   |
| Average Video Resolution (p)                   | 1080        | 1080        | 1078       |
| <b>CONVERSATIONAL APP</b>                      |             |             |            |
| Success Ratio / Speech Quality P10 (%/MOS-LQO) | 100.0/4.5   | 100.0/4.4   | 100.0/4.2  |
| <b>INTERACTIVITY E-GAMING</b>                  |             |             |            |
| Success Ratio / Interactivity E-Gaming (%)     | 100.0/91.9  | 99.8/91.2   | 98.8/83.8  |
| <b>INTERACTIVITY VIDEO CHAT</b>                |             |             |            |
| Success Ratio / Interactivity Videochat (%)    | 99.8/96.4   | 100.0/96.4  | 99.3/92.8  |

# The 2026 Mobile Network Test in the Netherlands



## Data

### TOWNS DRIVETEST

ODIDO

#### ODIDO SLIGHTLY AHEAD IN DATA DRIVE TESTS IN TOWNS. KPN AND THEN VODAFONE FOLLOW AT SMALL GAPS

In the 12 smaller towns visited by umlaut's drivetest teams, Odido achieves a slightly higher score than its competitors. This lead is won by slightly higher data rates in some of the tested use cases. KPN and then Vodafone follow at a gap of one percentage point between each other. Success rates are overall high at all three operators and reach 100% in many of the tested scenarios.

### ROADS DRIVETEST

KPN AND ODIDO

#### IN THE DATA DRIVETESTS PERFORMED ON DUTCH ROADS, KPN AND ODIDO ONCE MORE TAKE THE LEAD, SCORING ON A PAR. VODAFONE FOLLOWS CLOSELY BEHIND

The data measurements performed by umlaut's test cars on the Netherlands' roads are of particular interest for motorists. In this category, KPN and Odido take the lead and score on a par, in particular showing higher data rates than Vodafone, which follows at a gap of two percentage points. However, the success ratios are very high in all three mobile networks, so data connectivity is provided very reliably on Dutch roads.



Photo: Jannisimo - shutterstock

### Data (Towns; Drive test)

| Operator                                       | KPN         | Odido      | Vodafone   |
|--|-------------|------------|------------|
| <b>WEB PAGE DOWNLOAD</b>                       |             |            |            |
| Success Ratio / Avg. Session Time (%/s)        | 100.0/0.9   | 100.0/0.9  | 100.0/1.0  |
| <b>FILE DOWNLOAD (10MB)</b>                    |             |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.6   | 100.0/0.7  | 100.0/1.2  |
| 90%/10% faster than (Mbit/s)                   | 124.3/339.8 | 89.1/292.0 | 41.0/117.1 |
| <b>FILE UPLOAD (5MB)</b>                       |             |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/1.0   | 100.0/1.1  | 100.0/1.9  |
| 90%/10% faster than (Mbit/s)                   | 27.0/82.8   | 23.4/88.9  | 12.0/72.3  |
| <b>FILE DOWNLOAD (7 SECONDS)</b>               |             |            |            |
| Success Ratio (%)                              | 100.0       | 100.0      | 100.0      |
| 10% faster than (Mbit/s)                       | 835.7       | 994.8      | 455.6      |
| Speed > 20Mbit/s / 100Mbit/s (%)               | 100.0/97.7  | 100.0/96.3 | 98.2/79.1  |
| <b>FILE UPLOAD (7 SECONDS)</b>                 |             |            |            |
| Success Ratio (%)                              | 100.0       | 100.0      | 100.0      |
| 10% faster than (Mbit/s)                       | 147.0       | 161.9      | 100.0      |
| Speed > 2Mbit/s / 5Mbit/s (%)                  | 100.0/99.7  | 100.0/99.8 | 100.0/99.3 |
| <b>YOUTUBE VIDEO</b>                           |             |            |            |
| Success Ratio/Start Time (%/s)                 | 99.7/1.3    | 100.0/1.3  | 99.5/1.4   |
| Average Video Resolution (p)                   | 1079        | 1080       | 1078       |
| <b>YOUTUBE LIVE</b>                            |             |            |            |
| Success Ratio/Start Time (%/s)                 | 99.5/1.8    | 99.8/1.8   | 99.8/1.9   |
| Average Video Resolution (p)                   | 1077        | 1080       | 1079       |
| <b>CONVERSATIONAL APP</b>                      |             |            |            |
| Success Ratio / Speech Quality P10 (%/MOS-LQO) | 100.0/4.4   | 100.0/4.3  | 100.0/4.1  |
| <b>INTERACTIVITY E-GAMING</b>                  |             |            |            |
| Success Ratio / Interactivity E-Gaming (%)     | 100.0/91.3  | 99.8/88.5  | 99.3/83.4  |
| <b>INTERACTIVITY VIDEO CHAT</b>                |             |            |            |
| Success Ratio / Interactivity Videochat (%)    | 99.5/95.6   | 98.5/94.7  | 99.2/90.7  |

### Data (Roads; Drive test)

| Operator                                       | KPN         | Odido      | Vodafone   |
|--|-------------|------------|------------|
| <b>WEB PAGE DOWNLOAD</b>                       |             |            |            |
| Success Ratio / Avg. Session Time (%/s)        | 100.0/0.9   | 100.0/0.9  | 100.0/1.0  |
| <b>FILE DOWNLOAD (10MB)</b>                    |             |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.6   | 100.0/0.7  | 100.0/1.3  |
| 90%/10% faster than (Mbit/s)                   | 104.9/340.4 | 86.0/268.5 | 39.2/105.3 |
| <b>FILE UPLOAD (5MB)</b>                       |             |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/1.2   | 100.0/1.2  | 100.0/2.0  |
| 90%/10% faster than (Mbit/s)                   | 20.0/80.2   | 18.8/89.1  | 9.2/63.9   |
| <b>FILE DOWNLOAD (7 SECONDS)</b>               |             |            |            |
| Success Ratio (%)                              | 100.0       | 100.0      | 100.0      |
| 10% faster than (Mbit/s)                       | 849.7       | 825.6      | 332.7      |
| Speed > 20Mbit/s / 100Mbit/s (%)               | 100.0/95.6  | 99.7/94.2  | 97.6/75.9  |
| <b>FILE UPLOAD (7 SECONDS)</b>                 |             |            |            |
| Success Ratio (%)                              | 100.0       | 100.0      | 100.0      |
| 10% faster than (Mbit/s)                       | 132.9       | 145.9      | 84.4       |
| Speed > 2Mbit/s / 5Mbit/s (%)                  | 100.0/100.0 | 100.0/99.7 | 99.7/99.4  |
| <b>YOUTUBE VIDEO</b>                           |             |            |            |
| Success Ratio/Start Time (%/s)                 | 100.0/1.3   | 100.0/1.4  | 100.0/1.5  |
| Average Video Resolution (p)                   | 1078        | 1079       | 1080       |
| <b>YOUTUBE LIVE</b>                            |             |            |            |
| Success Ratio/Start Time (%/s)                 | 99.7/1.8    | 99.7/1.9   | 100.0/1.9  |
| Average Video Resolution (p)                   | 1079        | 1079       | 1080       |
| <b>CONVERSATIONAL APP</b>                      |             |            |            |
| Success Ratio / Speech Quality P10 (%/MOS-LQO) | 100.0/4.2   | 100.0/4.2  | 100.0/4.0  |
| <b>INTERACTIVITY E-GAMING</b>                  |             |            |            |
| Success Ratio / Interactivity E-Gaming (%)     | 100.0/89.5  | 99.4/85.6  | 99.7/82.7  |
| <b>INTERACTIVITY VIDEO CHAT</b>                |             |            |            |
| Success Ratio / Interactivity Videochat (%)    | 96.8/94.0   | 98.8/90.9  | 97.2/89.7  |

# The 2026 Mobile Network Test in the Netherlands

## Data

### RAILWAYS WALKTEST

KPN

#### KPN TAKES A NARROW LEAD IN RAILWAYS DATA TESTS, FOLLOWED CLOSELY BY ODIDO AND THEN VODAFONE

The walktests that were conducted on Dutch trains, are clearly the most demanding measurement scenario. Here, KPN takes the overall lead, closely followed by Odido. Success ratios of 100% or close to that and impressive data rates show that commuters and travelers on Dutch short and long distance trains can expect a very high level of data connectivity. This also applies to Vodafone, which falls slightly behind in this aggregation. But a fulfillment rate of 94% would be something that mobile operators in other countries would dream of.



#### Data (Railways; Walk test)

| Operator                                       | KPN        | Odido      | Vodafone   |
|--|------------|------------|------------|
| <b>WEB PAGE DOWNLOAD</b>                       |            |            |            |
| Success Ratio / Avg. Session Time (%/s)        | 100.0/1.0  | 99.9/1.0   | 99.5/1.1   |
| <b>FILE DOWNLOAD (10MB)</b>                    |            |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/0.9  | 100.0/1.0  | 100.0/2.0  |
| 90%/10% faster than (Mbit/s)                   | 67.7/323.1 | 50.7/255.6 | 19.2/105.5 |
| <b>FILE UPLOAD (5MB)</b>                       |            |            |            |
| Success Ratio/Avg. Session Time (%/s)          | 100.0/3.0  | 100.0/3.4  | 99.7/4.0   |
| 90%/10% faster than (Mbit/s)                   | 6.0/70.8   | 4.8/72.5   | 4.7/60.0   |
| <b>FILE DOWNLOAD (7 SECONDS)</b>               |            |            |            |
| Success Ratio (%)                              | 100.0      | 100.0      | 100.0      |
| 10% faster than (Mbit/s)                       | 715.5      | 726.6      | 436.9      |
| Speed > 20Mbit/s / 100Mbit/s (%)               | 98.2/88.0  | 98.5/85.9  | 91.0/57.1  |
| <b>FILE UPLOAD (7 SECONDS)</b>                 |            |            |            |
| Success Ratio (%)                              | 100.0      | 99.7       | 99.7       |
| 10% faster than (Mbit/s)                       | 107.2      | 117.3      | 68.7       |
| Speed > 2Mbit/s / 5Mbit/s (%)                  | 98.2/95.1  | 98.1/91.7  | 97.8/91.7  |
| <b>YOUTUBE VIDEO</b>                           |            |            |            |
| Success Ratio/Start Time (%/s)                 | 99.7/1.5   | 99.7/1.4   | 99.4/1.8   |
| Average Video Resolution (p)                   | 1080       | 1080       | 1077       |
| <b>YOUTUBE LIVE</b>                            |            |            |            |
| Success Ratio/Start Time (%/s)                 | 100.0/1.8  | 98.8/1.8   | 99.7/2.2   |
| Average Video Resolution (p)                   | 1075       | 1077       | 1073       |
| <b>CONVERSATIONAL APP</b>                      |            |            |            |
| Success Ratio / Speech Quality P10 (%/MOS-LQO) | 100.0/4.0  | 99.9/4.2   | 100.0/4.0  |
| <b>INTERACTIVITY E-GAMING</b>                  |            |            |            |
| Success Ratio / Interactivity E-Gaming (%)     | 96.9/85.2  | 96.0/83.9  | 96.3/75.6  |
| <b>INTERACTIVITY VIDEO CHAT</b>                |            |            |            |
| Success Ratio / Interactivity Videochat (%)    | 94.8/92.0  | 92.0/90.7  | 94.8/88.0  |

5G

#### KPN SHOWS HIGHEST SHARE OF SAMPLES WITH 5G, ODIDO DELIVERS HIGHER AVERAGE AND P90 DATA RATES. VODAFONE ACHIEVES SLIGHTLY HIGHER 5G SHARES WITH 5G NSA AND 5G-DSS COMBINED

5G is the standard setting in our measurements. But to shed light on the progress of the 5G roll-out, we regularly 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 delivered by this technology. However, this assessment does not consider other aspects such as 5G coverage or the latencies of 5G-only connections, which is why we do not identify a separate 5G winner. That said, in this assessment KPN shows the highest share of samples with 5G in all scenarios. We see slightly lower 5G shares in Odido's network, however, where 5G is provided, Odido delivers slightly higher average and P90 (10% faster than) data rates.

Vodafone is the only Dutch operator that still relies heavily on Dynamic Spectrum Sharing (DSS), particularly in the big cities, but to a relevant degree also in towns, on roads and on railways. Interestingly, in the cities and on the railways, the operator achieves slightly higher data rates with DSS than seems in its 5G-only samples. This may probably be explained with the bandwidths of the specific frequency combinations used by Vodafone in the Netherlands. Taking Vodafone's combined shares of 5G and 5G-DSS into account, Vodafone achieves slightly higher 5G shares than Odido in all aggregations, but still ranges behind KPN.

| Data Rates 7s Download | KPN    |          |                        | Odido |          |                        | Vodafone |          |                        |
|------------------------|--------|----------|------------------------|-------|----------|------------------------|----------|----------|------------------------|
| Samples with 5G        | Share  | Ø (Mbps) | 10% faster than (Mbps) | Share | Ø (Mbps) | 10% faster than (Mbps) | Share    | Ø (Mbps) | 10% faster than (Mbps) |
| Cities Drive test      | 100.0% | 613.5    | 1054.7                 | 96.0% | 657.9    | 1090.8                 | 48.4%    | 262.7    | 531.0                  |
| Cities Walk test       | 100.0% | 640.1    | 1099.5                 | 95.7% | 674.4    | 1118.8                 | 21.7%    | 321.1    | 631.9                  |
| Towns Drive test       | 99.7%  | 490.4    | 836.5                  | 96.8% | 611.3    | 997.5                  | 75.5%    | 229.9    | 458.0                  |
| Roads Drive test       | 99.7%  | 419.5    | 852.1                  | 94.8% | 456.4    | 829.4                  | 84.9%    | 195.4    | 341.0                  |
| Railways Walk test     | 99.7%  | 367.4    | 716.2                  | 93.9% | 414.2    | 737.2                  | 62.7%    | 147.3    | 393.2                  |
| Samples with 5G-DSS    | Share  | Ø (Mbps) | 10% faster than (Mbps) | Share | Ø (Mbps) | 10% faster than (Mbps) | Share    | Ø (Mbps) | 10% faster than (Mbps) |
| Cities Drive test      | -      | -        | -                      | -     | -        | -                      | 48.8%    | 287.7    | 569.3                  |
| Cities Walk test       | -      | -        | -                      | -     | -        | -                      | 76.3%    | 380.9    | 636.9                  |
| Towns Drive test       | -      | -        | -                      | -     | -        | -                      | 21.5%    | 221.9    | 461.6                  |
| Roads Drive test       | -      | -        | -                      | -     | -        | -                      | 11.4%    | 180.8    | 327.1                  |
| Railways Walk test     | -      | -        | -                      | -     | -        | -                      | 32.1%    | 260.7    | 524.8                  |

# The 2026 Mobile Network Test in the Netherlands

## Crowd

### BROADBAND COVERAGE

ODIDO

#### ODIDO LEADS BY A SMALL MARGIN IN ANALYSIS OF BROADBAND COVERAGE

In the analysis of Broadband Coverage, Odido takes a narrow lead. In Coverage Reach (see definitions on page 13), KPN is slightly ahead, Odido and Vodafone are tied and following at a small gap. In the assessment of Time on Broadband, Odido is slightly ahead of KPN, with Vodafone following at a more distinct distance. All in all, the Coverage KPIs are very high, showing excellent availability of all three networks.

### DOWNLOADS BY SPEED CLASSES

VODAFONE

#### VODAFONE LEADS IN DOWNLOAD ANALYSIS BY SPEED CLASSES, FOLLOWED BY KPN AND THEN ODIDO

In the analysis of download data rates by speed classes, Vodafone shows the best results, with the highest shares in all speed classes. KPN follows on second place and Odido on third. While KPN and Odido score on a par in the Basic Internet class (minimum of 2 Mbps), KPN achieves a higher share in the demanding UHD Video class (at least 20 Mbps). In the HD Video class (at least 5 Mbps), Odido is slightly ahead of KPN.

### UPLOADS BY SPEED CLASSES

KPN

#### KPN AHEAD IN UPLOAD ANALYSIS BY SPEED CLASSES, FOLLOWED BY ODIDO AND THE VODAFONE

In the upload assessment by speed classes, KPN shows higher shares both in the Basic Internet class (minimum of 2 Mbps) as well as in the HD Video class (at least 5 Mbps). In both KPIs, Odido follows on second rank and Vodafone on third. Again, all three operators show convincing results.

### DOWNLOADS BY DATA RATES

ODIDO

#### ODIDO SHOWS HIGHEST DATA RATES IN ACTIVE DOWNLOAD TESTS, FOLLOWED BY KPN AND THEN VODAFONE

In the category of download performance by data rates, Odido achieves higher average and P90 (10 percent of the measured values faster than) data rates. Here, KPN comes in second and Vodafone third. In the P10 evaluation (90 percent faster than), KPN ranks second behind Vodafone, but ahead of Odido.

### UPLOADS BY DATA RATES

KPN AND ODIDO

#### KPN AND ODIDO BOTH AHEAD IN ACTIVE UPLOAD TESTS, FOLLOWED BY VODAFONE

In the actively measured upload data rates, KPN and Odido share the first rank. KPN is slightly ahead in the average throughputs as well as in the P10 value (90 percent of the measured values faster than), while Odido takes the lead in the P90 (10 percent faster than) assessments. Vodafone ranks third in all three examined KPIs.

### LATENCY

KPN

#### KPN PROVIDES SHORTEST LATENCIES, FOLLOWED BY ODIDO AND THEN VODAFONE

KPN also shows the overall best results in the latency category. In the OTT Voice class (roundtrip times up to 100 ms) however, Odido is slightly ahead. KPN's lead is manifested in the Gaming class (up to 50 ms) as well as the most demanding class, High End Gaming (up to 20 ms). The higher the requirements, the more distinct becomes the leeway of Vodafone's latency results.



Photo: 99707674 - shutterstock

### VOICE

KPN AND ODIDO

#### KPN AND ODIDO SCORE ON A PAR IN HD VOICE AVAILABILITY, CLOSELY FOLLOWED BY VODAFONE

In the analysis of the availability of HD voice connections (i.e. Voice over LTE), KPN and Odido achieve the same result and thus share the first place. Vodafone comes in second with a relatively close distance behind the other two operators.

### STABILITY

KPN AND ODIDO

#### KPN AND ODIDO AHEAD TOGETHER IN CROWD-SOURCED ASSESSMENT OF TRANSACTION STABILITY, FOLLOWED AT A SMALL GAP BY VODAFONE

In the Stability category, which looks at the success rates of regular transaction tests, KPN and Odido again achieve the same result and thus share the first rank in this category. Vodafone follow at a comparatively small distance.

| Crowdsourcing                              |            |            |            |
|--|------------|------------|------------|
| Operator                                   | KPN        | Odido      | Vodafone   |
| <b>BROADBAND COVERAGE</b>                  |            |            |            |
| Coverage Reach (%)                         | 99.9       | 99.7       | 99.7       |
| Time on Broadband (%)                      | 99.6       | 99.7       | 99.2       |
| <b>DOWNLOADS BY SPEED CLASSES (ACTIVE)</b> |            |            |            |
| Basic Internet Class (%)                   | 99.6       | 99.6       | 99.9       |
| HD Video Class / UHD Video Class (%)       | 97.8/90.1  | 98.1/87.9  | 99.2/90.6  |
| <b>UPLOADS BY SPEED CLASSES (ACTIVE)</b>   |            |            |            |
| Basic Internet Class (%)                   | 97.9       | 96.1       | 95.9       |
| HD Video Class (%)                         | 91.3       | 87.2       | 86.3       |
| <b>DOWNLOADS BY DATA RATES (ACTIVE)</b>    |            |            |            |
| Avg. Throughput (Mbps)                     | 170.5      | 225.7      | 134.4      |
| 90%/10% faster than (Mbps)                 | 20.7/376.0 | 18.9/497.0 | 21.0/307.5 |
| <b>UPLOADS BY DATA RATES (ACTIVE)</b>      |            |            |            |
| Avg. Throughput (Mbps)                     | 40.9       | 40.0       | 33.6       |
| 90%/10% faster than (Mbps)                 | 5.7/94.2   | 4.1/99.0   | 3.8/80.8   |
| <b>LATENCY</b>                             |            |            |            |
| Gaming Class / OTT Voice Class (%)         | 97.2/99.0  | 97.0/99.2  | 95.2/98.8  |
| Highend Gaming Class (%)                   | 42.9       | 29.7       | 9.6        |
| <b>VOICE</b>                               |            |            |            |
| HD Voice (%)                               | 99.3       | 99.3       | 98.8       |
| <b>STABILITY</b>                           |            |            |            |
| Transaction Success (%)                    | 98.8       | 98.8       | 97.9       |

# The 2026 Mobile Network Test in the Netherlands

## 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 to the basic KPIs of the crowdsourcing – thus conveying an impression of the standard performance 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 state 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.

### VOICE

#### ODIDO LEADS IN VOICE RELIABILITY, FOLLOWED BY KPN AND VODAFONE WHO SHARE SECOND PLACE

In the overall assessment of the Reliability of voice connections, Odido achieves the highest score, with KPN and Vodafone following at a gap of just one point and sharing the second rank. Odido scores a little higher in the drivetests, while KPN achieves a slightly higher score in walktests.

### DATA

#### ODIDO LEADS IN DATA RELIABILITY, FOLLOWED BY KPN AND THEN VODAFONE

Looking at Reliability in the Data tests, Odido also leads – again based both on a slightly higher score in the drivetests. Here, KPN and Vodafone score on a par. In the walktest scores, there is a tie between KPN and Odido. Vodafone follows at a small gap.

### CROWD

#### KPN AHEAD IN CROWDSOURCING, FOLLOWED BY ODIDO AND THEN VODAFONE

In the crowdsourced Reliability KPIs, KPN takes a narrow lead with a distance of one score point ahead of Odido. Vodafone follows on third place with a gap of another score point behind Odido. Still, all sub-scores as well as the total reliability scores are equivalent to the grade “outstanding”.

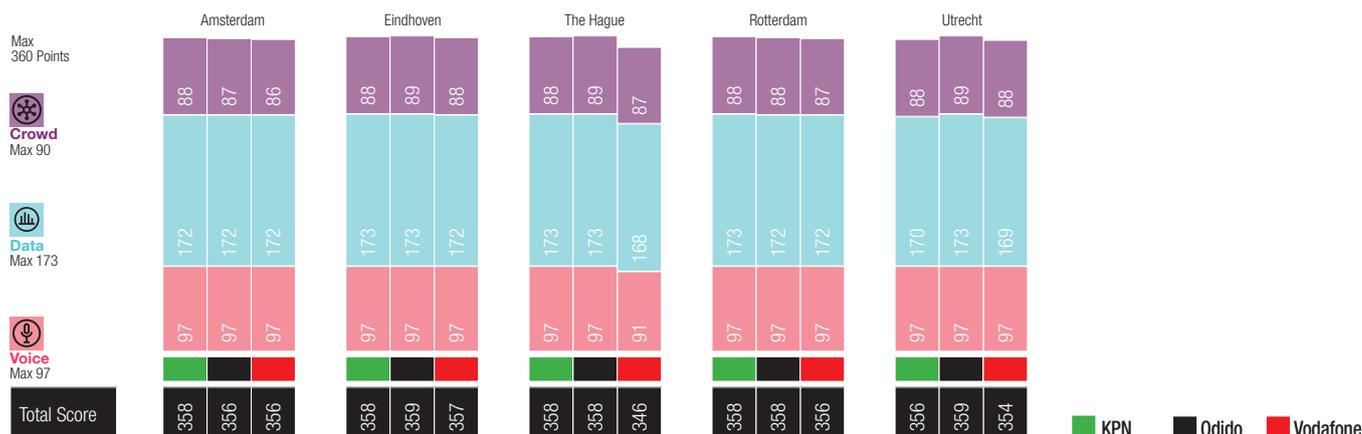
| Reliability  |                 |                    |                    |                    |
|--------------|-----------------|--------------------|--------------------|--------------------|
| Operator     |                 | KPN                | Odido              | Vodafone           |
| <b>VOICE</b> | max. 162 Points | 161                | 162                | 161                |
| Drive test   | 126             | 99%                | 100%               | 99%                |
| Walk test    | 36              | 100%               | 99%                | 99%                |
| <b>DATA</b>  | max. 288 Points | 286                | 287                | 283                |
| Drive test   | 223             | 99%                | 100%               | 99%                |
| Walk test    | 65              | 99%                | 99%                | 97%                |
| <b>CROWD</b> | max. 150 Points | 147                | 146                | 145                |
| Crowd        | 150             | 98%                | 98%                | 97%                |
| <b>Sum</b>   | <b>600</b>      | <b>594</b>         | <b>595</b>         | <b>589</b>         |
|              |                 | <b>outstanding</b> | <b>outstanding</b> | <b>outstanding</b> |

All values rounded to whole numbers. Points and percentages were calculated internally to three decimal places. Interim results may therefore differ slightly from the values given.

### RELIABILITY IN CITY SCORES

#### KPN LEADS RELIABILITY ASSESSMENT IN AMSTERDAM, ODIDO AND VODAFONE SHARE SECOND PLACE THERE. KPN AND ODIDO CO-WINNERS IN THE HAGUE AND ROTTERDAM. ODIDO IS LOCAL CHAMPION IN EINDHOVEN AND UTRECHT.

The Reliability Assessment of the Netherlands’ largest cities (also see next page), shows similar tendencies than the overall results in these cities, but differ in some details. KPN leads this assessment in Amsterdam and co-leads it together with Odido in The Hague and Rotterdam. Odido is the local champion in Eindhoven and Utrecht. In Amsterdam, Odido and Vodafone share the second place behind KPN. In Eindhoven, KPN and Vodafone follow behind Odido at a distance of one score point between each other. In The Hague, consistent with the overall city scores, Vodafone shows some opportunity for improvement – however still achieving an outstanding reliability result. In Rotterdam, Vodafone follows two score points behind the leading KPN and Odido. And in Utrecht, KPN reaches the second and Vodafone the third place with relatively small score gaps between each other.

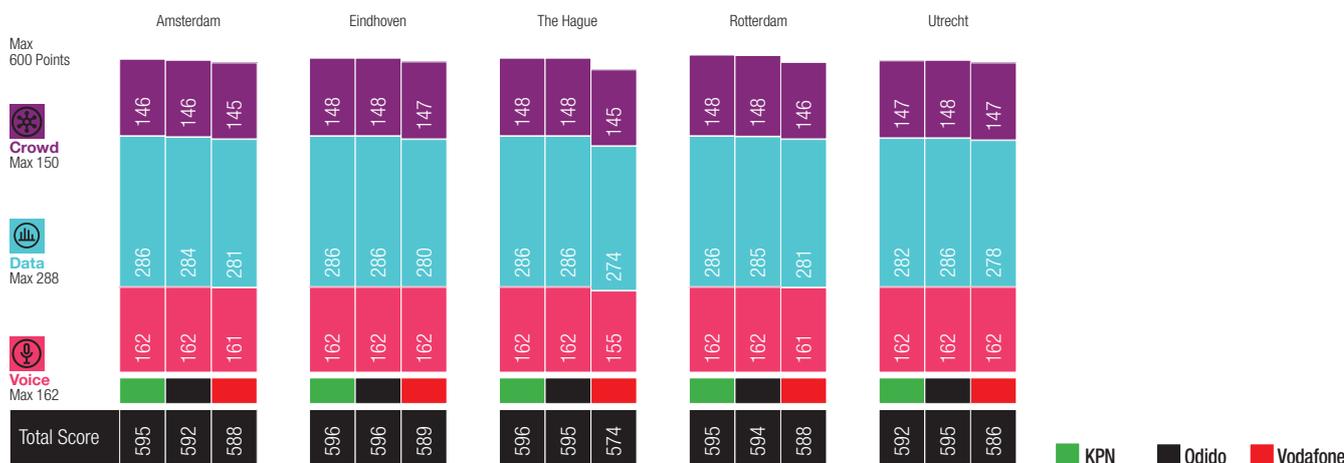


All values rounded to whole numbers. Points and percentages were calculated internally to three decimal places. The total score sums can differ from the sum of the category results.

# The 2026 Mobile Network Test in the Netherlands

## 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.



All values rounded to whole numbers. Points and percentages were calculated internally to three decimal places. The total score sums can therefore differ from the sum of the category results.

### AMSTERDAM

#### KPN LEADS IN AMSTERDAM, ODIDO RANKS SECOND AND VODAFONE THIRD

The Netherlands' 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 achieves the highest score here. Second-placed Odido ranks on a par with KPN in the Voice and Crowd categories, but falls two points behind in the data assessment. In the total score, rounding effects build up to a gap of three points. Vodafone ranks third in all three sub-categories as well as in the total score.

### THE HAGUE

#### KPN LEADS IN THE HAGUE, ODIDO RANKS SECOND AT A VERY SMALL GAP, VODAFONE CLEARLY BEHIND, BUT STILL OUTSTANDING

In the North Sea city, we also see a tight race: KPN leads with a razor-thin margin. Due to rounding effects in the calculation with decimal places, Odido falls one point behind, although the rounded category scores are the same. Vodafone comes in third with a more pronounced gap than in other Dutch cities. The leeway can be seen in all three categories, Voice, Data and Crowd.

### EINDHOVEN

#### KPN AND ODIDO ON A PAR IN EINDHOVEN, VODAFONE FOLLOWS AT A SMALL GAP

In the Nordbrabant city, KPN and Odido take the lead together with achieving exactly the same sub-scores in all three categories, Voice, Data and Crowd. Vodafone scores on a par with KPN and Odido in the Voice assessment, but falls behind one point in the Crowd score and six points in the data score. Still, also Vodafone achieves an outstanding result in the overall assessment in Eindhoven.

### ROTTERDAM

#### KPN AHEAD IN ROTTERDAM, FOLLOWED AT A GAP OF ONE POINT BY ODIDO AND AT A MORE DISTINCT DISTANCE BY VODAFONE

In the famous port city, KPN takes the lead, with Odido following at a gap of one point which can be clearly assigned to a slightly lower performance in the Data category. Vodafone comes in third, at small gaps to the other two operators in all tested categories, most distinctly in the Data assessment.

### UTRECHT

#### ODIDO CLEARLY AHEAD OF KPN IN UTRECHT, VODAFONE COMES IN THIRD AT NOTICEABLE DISTANCE

In the Netherlands' fourth biggest city, located in the center of the country, Odido takes the lead with a score advantage of three points ahead of KPN. This lead becomes most obvious in the Data category, but can also be seen in the Crowd score. In the Voice assessment, KPN, Odido and also Vodafone score on a par. In the Crowd assessment, KPN and Vodafone share the second rank, in the Data category, the distance of Vodafone to second-placed KPN is a little more pronounced.

## Fairness and Transparency

Given a difference of 0.7 points between the first and second placed on a 1000-point scale, we also pondered whether it is justified to name only one test winner. But our benchmark has been prepared for a tight field of performance for years. The individual results, which are only shown in a 1-point score grid for better clarity, are calculated internally with the highest accuracy, just like the total result summed up from these interim values and then rounded to the full score.

This prevents a network operator from profiting from especially advantageous decimal places in comparison to others. This procedure, owed to fairness, which we have also made transparent with footnotes for years, leads this year to KPN becoming the test winner with a lead of 0.7 points. Deciding otherwise would be contractionary past best practice in all other benchmarks performed with this methodology, in the Netherlands and elsewhere.

Anyone who initially thinks of a tie with a 0.7 point lead on a 1000-point scale should consider that the difference between the weakest and the best operator in this year's Mobile Network Test in the Netherlands is just 16 points. In this context, 0.7 points is a difference of over 4 percent, so the gap is actually not that small.

In the highly competitive Dutch market, there is naturally also a hard fight for a good position in the connect and umlaut network test. One network operator then sometimes accuses the other of serving the test cars and teams better than their normal customers. If we receive such an accusation, umlaut re-measures the corresponding performance values with SIM cards unknown to the network operator and outside of the usual measurement cycles.

If differences between the results of these cross-check measurements and those of the standard network test can be identified before the start of the network test, the affected operator is asked to stop the according behaviour. Confirmed differences in the performance of the network test smartphones compared to anonymously used comparison devices would lead to the disqualification of the manipulating network operator. Fortunately, there was no reason for this in the 2026 Mobile Network Test in the Netherlands.

The Crowdsourcing KPIs depend on statistically sampling the actual networks. The results might become biased if samples are taken into account that do not adhere to the statistical distribution, which is why our fair play rules forbid this. In cases where we suspect that samples do not originate from regular user behavior, we take cleansing action to protect the fair play rules. However, we do so without sanctioning unless there is conclusive proof of the originator and that the affected samples are actually an attempt of manipulation.

# The 2026 Mobile Network Test in the Netherlands

## 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 twelve smartphones. For each network operator, a Samsung Galaxy S24 Ultra took the voice measurements, and another S24 Ultra 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 S24 Ultra 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.

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 three smartphone types were used per network operator for the same measurements as in the drive tests. The walk test teams transport the smartphones in backpacks or trolleys equipped with powerful batteries. The firmware of the test smartphones corresponded to the original network operator version in each case.

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.

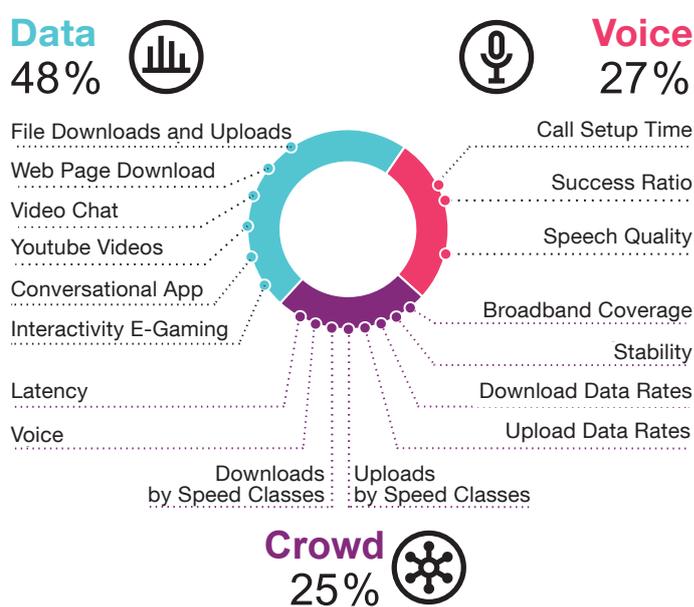
### Voice connections

Voice connections account for 27% of the overall result. To this end, mobile-to-mobile telephone connections were established and their *success rates*, *call set-up times* 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 in the background at the same time. The transmission quality was evaluated using the POLQA (Perceptual Objective Listening Quality Analysis) wideband method, which is suitable for HD voice. With the exception of Drei in Austria, voice telephony was handled exclusively via VoLTE.

### Data connections

The data measurements account for 48% of the result. To evaluate *website downloads*, several popular live sites (dynamic) and the ETSI reference site known as the Kepler site (static) were accessed.



In addition, there is a preliminary version of its designated successor (working title: „Newton“) developed by umlaut, which ETSI is currently assessing.

Furthermore, 10 and 5 MB files were downloaded and uploaded, respectively, to determine the performance of smaller data transfers. We also determined the data rate over a 7-second period when *uploading and downloading* large files. Since Youtube dynamically adjusts the playback resolution to the available bandwidth, our Youtube evaluation takes into account the *average image resolution* of the videos as well as the *success rate* and the *time until playback starts*.

An over-the-top voice connection (OTT) is represented by the *conversational app* test case. To do this, we set up a voice channel using the SIP and STUN protocols with the OPUS codec and determined the *success rate* and *voice quality*.

In addition, our measurements simulated a highly interactive UDP multiplayer session to determine the latency of the connection and any packet loss using the *e-gaming interactivity* test point. A *video chat* was also included in the test scope. It measures latency, packet delay and data rates in both directions. The e-gaming and video chat tests follow the ITU-T G.1051 recommendation. >>

# The 2026 Mobile Network Test in the Netherlands

## Methodology

### Crowdsourcing

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

To obtain the data basis for the analyses, a large number of popular apps collect the parameters described below in the background – provided that users have agreed to the completely anonymous data collection.

At specific intervals (from one second to 15 minutes), samples are collected and sent daily to umlaut's cloud servers, where the data is then processed. These reports contain only a few bytes, so they have little impact on the user's data volume.

### Broadband Coverage

To determine the quality of broadband coverage, umlaut laid out a grid of approximately 2 x 2 km tiles ("evaluation areas", EAs) over the test area.

For the determination of *coverage reach*, 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 in this way was divided by the maximum number of points achievable (three points per EA in the "union footprint" – the area of the respective country measured by all participants with their smartphones).

We also looked at the *time on broadband* – the proportion of time with broadband coverage. This indicates how often a user had 4G or 5G reception during the observation period – regardless of the EAs in which the samples were collected. To do this, umlaut compares the samples that have 4G/5G coverage to the total number of samples.

Important: The percentages determined for these parameters reflect the respective degree of fulfilment of these KPIs – not the percentage of 4G/5G coverage of area or population.

### Data rates and Latency

The measurements of *download and upload data rates and latency* were carried out independently of the EAs and focused on the individual experience of each user. Samples that were collected via Wi-Fi or with flight mode activated, for example, were filtered out by umlaut prior to the analysis.

To check the maximum possible throughput, umlaut carried out active measurements of upload and download data rates several times a month. These measurements determine the *amount of data transferred within 3.5 seconds*. For these values, we consider the average data rate, the P10 value (90% of the measured values faster than – a good approximation of the typical minimum speed) and the P90 (a look at the peak values).

To take into account the fact that many mobile phone tariffs throttle the data rate, umlaut also defined three different application-related speed classes: for *basic internet*, at least 2 Mbps must be achieved, *HD video* requires 5 Mbps and *UHD video* requires 20 Mbps.

Similarly, the latency of data packets is also assigned to an application-related class: round-trip times of up to 100 ms are sufficient for the *OTT voice* class, less than 50 ms qualifies a sample for *gaming* and less than 20 ms for *high-end gaming*.

### Telephony

The *HD voice* parameter shows the proportion of the user's voice connections that were established using Voice over LTE (VoLTE) or Voice over WiFi (VoWiFi) and thus support HD quality.

### Stability

Based on the success rates of the download, upload and browsing tests, as well as additional connection tests, umlaut also calculates the percentage of *successful transactions*.

### Reliability

The reliability assessment is not a separate category, but rather an additional consideration of the previous results. To this end, umlaut divides all measured values into basic or everyday requirements ("qualifier KPIs") and values related to peak performance ("differentiator KPIs").

The reliability rating only takes into account the qualifier KPIs from the voice and data category and the basic crowdsourcing results. This makes it possible to determine how well the network meets everyday requirements.

