best in test

For adding something on top in Poland and reaching an overall score of 919 dots in mobile network benchmarking survey we proudly award this certificate to

T–Mobile Polska S. A.

Score 919 out of 1000 in Total
Score 310 out of 320 in Voice Services
Score 443 out of 480 in Data Services
Score 165 out of 200 in Crowdsourced Quality

Hakan Ekmen

Hakan Ekmen
Chief Executive Officer Telecommunication

Best in Test 02 20

umlaut

Measurement Overview

umlaut tested and measured the performance of its voice and data services on smartphones in comparison to other LTE/UMTS/GSM mobile radio networks in metropolitan and rural areas of Poland.
The audit was done as a performance benchmark performed by umlaut between January 13th 2020 and February 10th 2020 in cities and towns as well as on connection roads. Dedicated measurements have been executed as drive tests outdoors using a Samsung Galaxy S9 cat16 Smart–phone 1000 Mbit/s Download / 105 Mbit/s Upload.
All data measurements have been performed in 4G preferred mode. Voice measurements have been done in 4G/4G preferred mode on both sides, while call origin has been alternated.

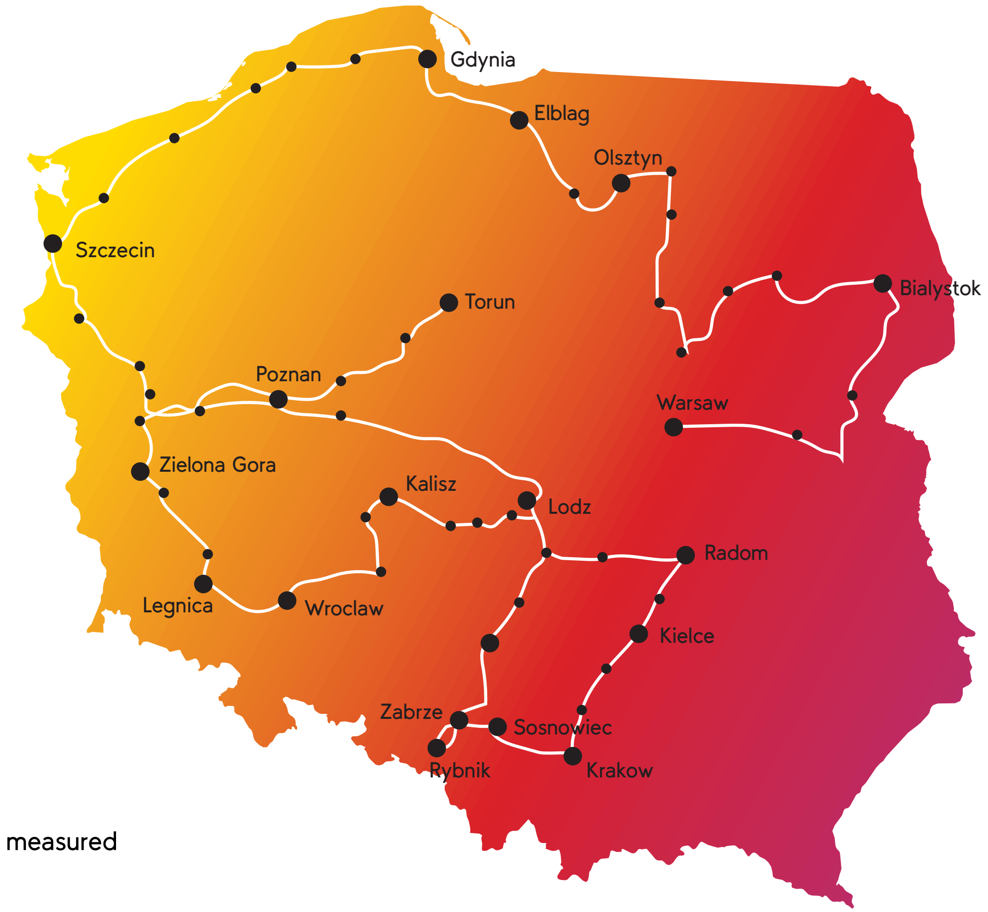
In addition crowdsourced performance data has been collected and evaluated between CW34 2019 and CW05 2020.
The following pages provide a comparative overview about the performance results observed for the different tested service types.

Measurement setup

Drivetest	Voice	Data
Device	Samsung Galaxy S9	Samsung Galaxy S9
Test Cases	Mobile–to–Mobile (M2M) Side1 (4G preferred: Volte) to Side2 (4G preferred: Volte) 115 sec call window 70 sec call duration 15 sec call setup timeout Multi–RAB traffic injection on both sides	Data 4G preferred CA HTTP DL datastream 7s HTTP UL datastream 7s HTTP 5MB DL fixed file transfer HTTP 2.5MB UL fixed file transfer Web Browsing – Kepler ETSI Ref. Page 10 Live web pages (5 http / 5 https) 2 YouTube HD video ~ 45s 1 YouTube live stream ~ 45s
Mobility and Route Types	100% Drivetest 52% in Cities, 17% in Towns and 31% on Roads	
Samples	Total 18,145	Total 184,549
Dates	24 measurement days January 13th 2020 – February 10th 2020	
Crowd Data Assessment	24 weeks CW34 2019 – CW05 2020	

Testing areas

Drive route

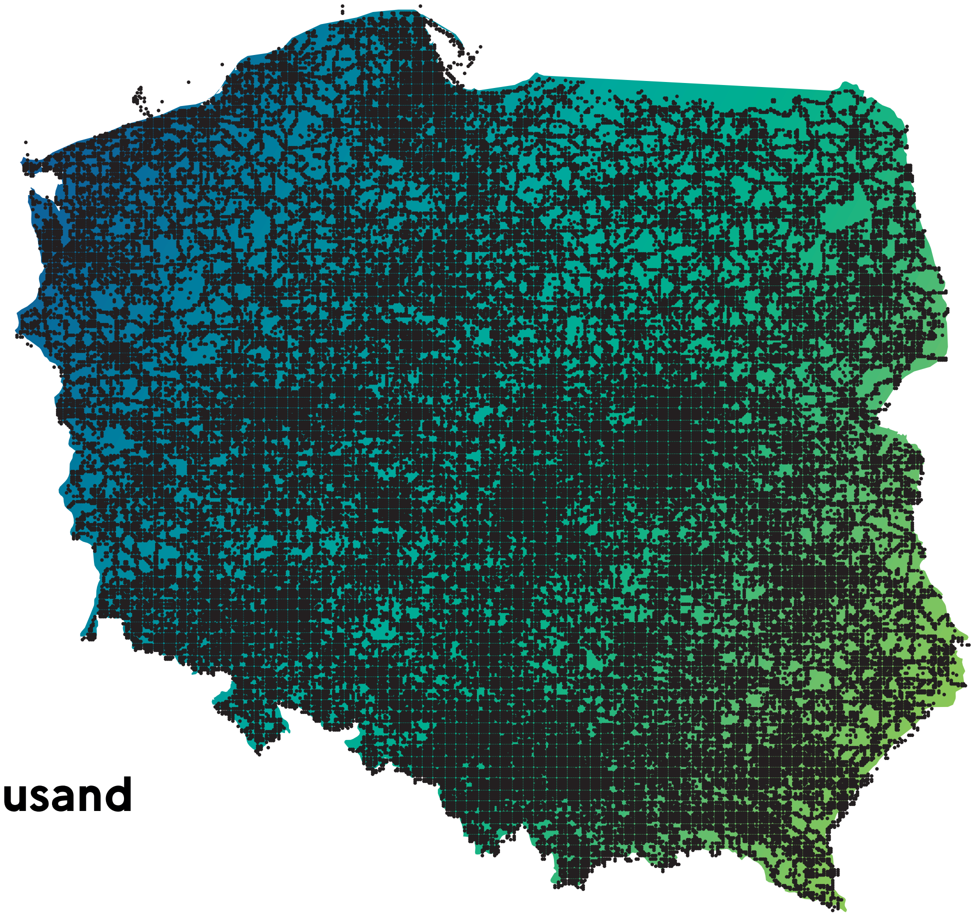

Gdynia
Elblag
Olsztyn
Szczecin
Torun
Bialystok
Poznan
Warsaw
Zielona Gora
Kalisz
Lodz
Radom
Legnica
Wroclaw
Kielce
Zabrze
Sosnowiec
Rybnik
Krakow

22 %
of population measured

11000 km
measuring distance

Testing areas

Crowdsourcing based test area



30.1 thousand
Users

182.661 km^2
size of tested area

Claims

Best in test
T–Mobile Polska S. A.

Best in data
T–Mobile Polska S. A.

Best in voice
T–Mobile Polska S. A.

Methodology

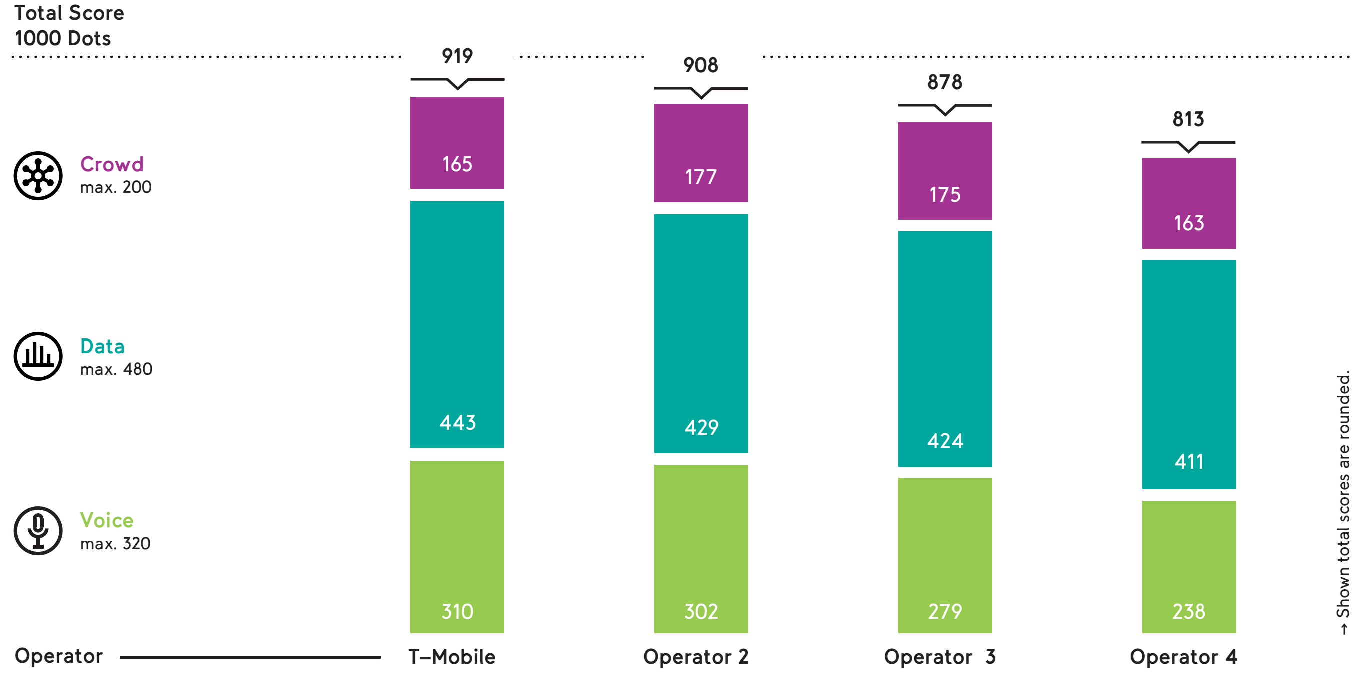
The leader in mobile benchmarking, umlaut, has analyzed the mobile networks of Poland with regards to mobile network performance. We measure smartphone voice and data performance based on extensive drivetests – from major metropolitan areas to smaller cities and connection roads.

We objectively define the routes and test methodology and publish the results through certificates or public benchmark reports.

As the de–facto industry standard, our benchmarking methodology focuses on customer–perceived network quality and covers a wide range of mobile services. Today, more than 200 mobile networks in more than 120 countries are being evaluated by our unique scoring methodology. It allows a technical analysis that is unprecedented in its level of detail and enables comparisons between the network performance and capability of each mobile network. Our public benchmarks as well as the certificate benchmarks help network operators to demonstrate how well they are delivering wireless connections to consumers, business users and enterprises and reveals the areas of improvement.

Score and breakdown

T–Mobile achieved the highest overall score among competitors with 919 dots out of 1000.



Overall score considering Voice, Data and Crowdsourcing.

Total score

		T–Mobile	Operator 2	Operator 3	Operator 4
Voice	max. 320	310	302	279	238
Cities Drivetest	192	97%	95%	89%	75%
Towns Drivetest	64	99%	97%	95%	78%
Roads Drivetest	64	94%	90%	73%	71%
Data	max. 480	443	429	424	411
Cities Drivetest	288	93%	91%	91%	88%
Towns Drivetest	96	90%	84%	90%	84%
Roads Drivetest	96	92%	90%	78%	79%
Crowdsourced Quality	max. 200	165	177	175	163
Crowd	200	83%	88%	88%	82%
Total	1000	919	908	878	813

Shown scores are rounded.

Achieved percentage of the maximum score in each of the different data services.

Data	Service Group	max	T-Mobile	Operator 2	Operator 3	Operator 4
Cities	Web Browsing	64,0	97%	96%	96%	97%
	File Download	80,0	91%	86%	87%	81%
	File Upload	80,0	93%	92%	91%	90%
	YouTube	64,0	93%	91%	92%	87%
Towns	Web Browsing	21,3	97%	94%	96%	94%
	File Download	26,7	86%	80%	85%	79%
	File Upload	26,7	89%	88%	89%	83%
	YouTube	21,3	88%	74%	91%	82%
Roads	Web Browsing	21,3	96%	94%	85%	88%
	File Download	26,7	94%	91%	83%	81%
	File Upload	26,7	89%	87%	72%	76%
	YouTube	21,3	89%	87%	71%	70%

Achieved percentage of the maximum score in each of the different crowdsourcing services.

Crowd	Service Group	max	T-Mobile	Operator 2	Operator 3	Operator 4
Country	Operational Excellence	60	97%	100%	100%	97%
Urban	Voice Coverage	13	97%	95%	96%	97%
	Data Coverage	17	96%	96%	98%	98%
	4G Coverage	29	88%	88%	91%	83%
	DL Data Speed	17	40%	62%	56%	39%
	UL Data Speed	8	10%	47%	36%	10%
Non-urban (Benchmark view)	Voice Coverage	7	100%	100%	99%	100%
	Data Coverage	9	100%	100%	100%	100%
	4G Coverage	15	99%	99%	99%	99%
	DL Data Speed	9	47%	67%	65%	46%
	UL Data Speed	4	30%	40%	35%	23%
Non-urban (Own network view)	Voice Coverage	2	100%	100%	99%	100%
	Data Coverage	2	100%	100%	100%	100%
	4G Coverage	4	98%	98%	98%	98%
	DL Data Speed	2	33%	54%	47%	23%
	UL Data Speed	1	23%	28%	21%	12%

Voice KPI overview

Achieved values of all networks under test in each of the relevant Voice Key Performance Indicators (KPIs) for the geographical categories "Cities", "Towns" and "Roads".

Voice	Service Group	Unit	T-Mobile	Operator 2	Operator 3	Operator 4
Cities	Qualifier	[%]	99,7	99,6	98,4	99,1
	Call Setup Time	[s]	1,4	1,7	2,7	7,2
	Call Setup Time (P90)	[s]	1,7	2,0	3,0	8,7
	Speech Quality (AVG)	[MOS-LQO]	4,4	3,8	4,5	3,6
	Speech Quality (P10)	[MOS-LQO]	3,8	3,2	4,0	3,0
	Multirab connectivity	[%]	99,9	99,9	99,9	98,4
Towns	Qualifier	[%]	99,9	99,9	99,3	99,2
	Call Setup Time	[s]	1,4	1,8	2,6	6,4
	Call Setup Time (P90)	[s]	1,7	2,1	3,1	8,1
	Speech Quality (AVG)	[MOS-LQO]	4,4	3,8	4,4	3,6
	Speech Quality (P10)	[MOS-LQO]	3,8	3,2	3,9	3,1
	Multirab connectivity	[%]	100,0	99,9	100,0	99,2
Roads	Qualifier	[%]	98,5	97,9	93,4	97,8
	Call Setup Time	[s]	1,6	1,9	2,9	7,0
	Call Setup Time (P90)	[s]	2,1	2,2	4,4	8,8
	Speech Quality (AVG)	[MOS-LQO]	4,3	3,7	4,2	3,5
	Speech Quality (P10)	[MOS-LQO]	3,5	3,0	3,2	3,0
	Multirab connectivity	[%]	99,0	99,9	98,7	91,6

Data Services KPI overview

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geographical category "Cities".

Data Cities	KPI Name	Unit	T-Mobile	Operator 2	Operator 3	Operator 4
HTTP Live Page DL Smartphone	Qualifier	[%]	99,9	99,8	99,8	99,9
	Overall Session Time	[s]	1,2	1,3	1,4	1,3
HTTP Static Page DL Smartphone	Qualifier	[%]	99,9	99,9	99,8	99,9
	Overall Session Time	[s]	1,0	1,2	1,2	1,1
HTTP 5MB DL Smartphone	Qualifier	[%]	99,9	99,8	100,0	99,9
	Average Session Time	[s]	1,8	2,5	2,3	3,7
	90% faster than	[Mbit/s]	15,2	9,3	10,4	4,7
	10% faster than	[Mbit/s]	77,5	54,4	76,6	65,3
HTTP 2500KB UL Smartphone	Qualifier	[%]	100,0	99,9	99,7	99,9
	Average Session Time	[s]	1,3	1,5	1,5	1,7
	90% faster than	[Mbit/s]	9,8	9,0	8,2	7,2
	10% faster than	[Mbit/s]	33,4	32,8	38,0	33,1
HTTP DL FDTT	Qualifier	[%]	99,8	99,9	99,5	99,6
	Average Data Rate	[Mbit/s]	76,2	63,2	64,0	42,4
	90% faster than	[Mbit/s]	19,8	13,6	15,2	8,4
	10% faster than	[Mbit/s]	151,4	131,3	130,7	89,7
HTTP UL FDTT	Qualifier	[%]	99,9	99,8	99,7	99,7
	Average Data Rate	[Mbit/s]	27,6	27,1	29,2	28,4
	90% faster than	[Mbit/s]	9,7	9,8	8,1	7,1
	10% faster than	[Mbit/s]	42,1	40,5	55,3	45,9
YouTube	Qualifier	[%]	99,4	99,0	99,2	98,5
	Start Time	[s]	1,1	1,3	1,4	1,2
	AVG Resolution	[p]	911	913	912	908
YouTube Live Smartphone	Qualifier	[%]	99,3	99,1	99,4	98,4
	Start Time	[s]	1,3	1,4	1,6	1,4
	AVG Resolution	[p]	1027	1031	1029	1027

Data Services KPI Overview

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geo–graphical category "Towns".

Data Towns	KPI Name	Unit	T-Mobile	Operator 2	Operator 3	Operator 4
HTTP Live Page DL Smartphone	Qualifier	[%]	99,8	99,6	99,8	99,5
	Overall Session Time	[s]	1,2	1,4	1,3	1,4
HTTP Static Page DL Smartphone	Qualifier	[%]	99,9	99,6	99,8	99,6
	Overall Session Time	[s]	1,0	1,3	1,2	1,1
HTTP 5MB DL Smartphone	Qualifier	[%]	100,0	99,8	99,7	99,7
	Average Session Time	[s]	2,4	3,2	1,9	4,5
	90% faster than	[Mbit/s]	8,3	7,2	11,8	3,5
	10% faster than	[Mbit/s]	74,2	55,7	79,2	67,8
HTTP 2500KB UL Smartphone	Qualifier	[%]	100,0	100,0	100,0	100,0
	Average Session Time	[s]	1,8	1,9	1,9	2,8
	90% faster than	[Mbit/s]	6,5	6,8	6,1	3,6
	10% faster than	[Mbit/s]	29,3	29,8	32,8	30,3
HTTP DL FDTT	Qualifier	[%]	99,9	99,3	98,9	99,7
	Average Data Rate	[Mbit/s]	60,0	52,0	67,4	41,8
	90% faster than	[Mbit/s]	10,6	7,1	15,3	6,4
	10% faster than	[Mbit/s]	127,9	110,4	137,3	98,7
HTTP UL FDTT	Qualifier	[%]	100,0	100,0	100,0	99,5
	Average Data Rate	[Mbit/s]	20,7	21,4	23,4	20,8
	90% faster than	[Mbit/s]	6,2	5,5	6,0	3,9
	10% faster than	[Mbit/s]	37,8	38,6	46,9	39,5
YouTube	Qualifier	[%]	98,8	96,2	99,4	98,6
	Start Time	[s]	1,2	1,3	1,4	1,3
	AVG Resolution	[p]	900	908	912	895
YouTube Live Smartphone	Qualifier	[%]	98,2	96,2	98,7	95,9
	Start Time	[s]	1,3	1,4	1,6	1,4
	AVG Resolution	[p]	1022	1020	1033	1012

Achieved values of all networks under test in each of the relevant Data Key Performance Indicators (KPIs) for the geo–graphical category "Roads".

Data Roads	KPI Name	Unit	T-Mobile	Operator 2	Operator 3	Operator 4
HTTP Live Page DL Smartphone	Qualifier	[%]	99,5	99,3	96,9	97,6
	Overall Session Time	[s]	1,3	1,4	1,5	1,5
HTTP Static Page DL Smartphone	Qualifier	[%]	99,5	99,2	97,0	98,0
	Overall Session Time	[s]	1,1	1,3	1,3	1,3
HTTP 5MB DL Smartphone	Qualifier	[%]	99,7	99,6	98,7	98,5
	Average Session Time	[s]	2,7	3,3	4,6	6,1
	90% faster than	[Mbit/s]	7,5	6,7	5,1	2,9
	10% faster than	[Mbit/s]	77,0	63,7	79,8	63,6
HTTP 2500KB UL Smartphone	Qualifier	[%]	99,7	99,6	97,2	97,9
	Average Session Time	[s]	2,6	2,7	4,0	4,2
	90% faster than	[Mbit/s]	3,9	4,0	2,1	1,9
	10% faster than	[Mbit/s]	26,4	26,5	28,1	31,4
HTTP DL FDTT	Qualifier	[%]	99,9	99,2	96,4	97,9
	Average Data Rate	[Mbit/s]	58,6	51,5	65,9	38,6
	90% faster than	[Mbit/s]	8,4	8,0	5,9	5,1
	10% faster than	[Mbit/s]	127,1	113,0	141,1	86,4
HTTP UL FDTT	Qualifier	[%]	99,8	99,2	95,1	96,6
	Average Data Rate	[Mbit/s]	17,2	16,4	17,1	19,7
	90% faster than	[Mbit/s]	4,2	3,6	2,0	2,1
	10% faster than	[Mbit/s]	33,6	32,9	37,5	43,8
YouTube	Qualifier	[%]	98,0	97,3	92,3	93,4
	Start Time	[s]	1,2	1,3	1,4	1,5
	AVG Resolution	[p]	904	906	910	889
YouTube Live Smartphone	Qualifier	[%]	97,8	97,0	93,1	89,9
	Start Time	[s]	1,4	1,5	1,8	1,6
	AVG Resolution	[p]	1019	1021	1009	1012

Crowdsourced Quality KPI overview

Achieved values of all networks under test in each of the relevant Crowd Key Performance Indicators (KPIs) for the geographical categories "country", "urban" and "non–urban".

Crowd	Service Group		Unit	T–Mobile	Operator 2	Operator 3	Operator 4
Country	Operational Excellence	Degraded days	[d]	1	0	0	1
		Degraded periods	[h]	2	0	0	2
Urban	4G Coverage	Quality of Coverage	[%]	97,0	97,1	97,8	95,8
	Data Coverage	Quality of Coverage	[%]	99,4	99,4	99,7	99,7
	DL Data Speed	P90 EA Top Throughput	[Mbit/s]	37.1	53.6	48.2	36.6
	UL Data Speed	P90 EA Top Throughput	[Mbit/s]	5.3	10.6	8.2	5.2
	Voice Coverage	Quality of Coverage	[%]	99,8	99,8	99,8	99,8
Non–urban (Benchmark view)	4G Coverage	Test Area Coverage	[%]	99,6	99,8	99,6	99,6
	Data Coverage	Test Area Coverage	[%]	100,0	100,0	99,9	100,0
	DL Data Speed	P90 EA Top Throughput	[Mbit/s]	20.5	26.3	25.6	20.3
	UL Data Speed	P90 EA Top Throughput	[Mbit/s]	3.2	4.0	3.6	2.7
	Voice Coverage	Test Area Coverage	[%]	100,0	100,0	99,9	100,0
Non–urban (Own network view)	4G Coverage	Test Area Coverage	[%]	99,3	99,3	99,5	99,3
	Data Coverage	Test Area Coverage	[%]	100,0	100,0	99,9	99,9
	DL Data Speed	P90 EA Top Throughput	[Mbit/s]	17.8	22.3	20.4	16.4
	UL Data Speed	P90 EA Top Throughput	[Mbit/s]	2.7	3.0	2.6	2.2
	Voice Coverage	Test Area Coverage	[%]	100,0	100,0	99,9	100,0

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