

For Immediate Release

Information note to the Press (Press Release No. 90 /2017)

Telecom Regulatory Authority of India

TRAI Releases Report on Independent Drive Tests conducted in five cities viz. Dehradun, Warangal, Thrissur, Dhanbad and Amritsar.

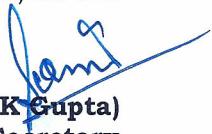
New Delhi 24th October, 2017: TRAI through its agency conducted Independent Drive Tests (IDT) in five cities viz. Dehradun, Warangal, Thrissur, Dhanbad and Amritsar. Drive tests were conducted to assess the network quality provided by cellular mobile telephone service providers for voice and data services. The drive tests were conducted in the five cities as per the details given below:-

S.No.	City	Licensed Service Area	Period of Conducting IDT	Summary of Results of IDT
1)	Dehradun	UP-West	9 th to 11 th August 2017	Annexure-A
2)	Warangal	AP	9 th to 11 th August 2017	Annexure-B
3)	Thrissur	Kerala	7 th to 11 th August 2017	Annexure-C
4)	Dhanbad	Bihar	7 th to 11 th August 2017	Annexure-D
5)	Amritsar	Punjab	21 st to 24 th August 2017	Annexure-E

2. The Key Performance Indicators (KPIs) were assessed for the networks of all telecom service providers operating in the region. KPIs for voice services were Coverage; Call Setup Success Rate; Drop Call Rate; Block Call Rate, Handover Success Rate; Rx Quality. KPIs for data services were Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay and Latency.

The complete report is available at TRAI website www.analytics.trai.gov.in

3. In case of any clarification, please contact, Shri. Asit Kadayan, Advisor (QoS) at Tel. No. +91-11-2323-0404 or at email.id: advqos@trai.gov.in


(S K Gupta)
Secretary

Annexure-A

Report on Independent Drive Test conducted in Dehradun from 9th to 11th August 2017

The drive test in the city of Dehradun in UP-West LSA was conducted for a period of 3 days during 9th to 11th August, 2017. It covered a route of approximately 300 KMs and data tests conducted on 6 hotspots. Cellular mobile telephone service providers included namely Aircel, Airtel, Idea, Tata, BSNL, RCOM, Telenor, Vodafone, MTS, and Jio. Tests included 2G, 3G, 4G and CDMA radio access technologies.

The summary of the Service Provider's performance on the key parameters based on Independent Drive Test is given here under:-

Voice Call	2G								CDMA	
	Aircel	Airtel	BSNL	Tata*	Idea	RCom**	Telenor***	Vodafone	MTS **	Tata*
Call Attempt	507	521	516	304	510	461	481	523	503	327
Blocked Call Rate (%)	0.79%	0.0%	0.39%	2.63%	0.59%	3.25%	0.00%	0.38%	0.40%	0.61%
CSSR (Accessibility)	99.21%	100.0%	99.61%	97.37%	99.41%	96.75%	100.00%	99.62%	99.60%	99.39%
Dropped Call Rate (%)	0.80%	0.77%	0.97%	1.69%	0.39%	1.57%	0.62%	0.00%	0.80%	0.62%
Mobility HOSR (%)	98.77%	99.07%	97.10%	97.47%	96.77%	100.00%	97.00%	96.93%	100.00%	100.00%
Rx Quality (%)	97.5%	95.1%	97.7%	97.2%	97.6%	98.0%	97.9%	97.8%	93.1%	93.5%

Voice Call	3G					VoLTE	
	Airtel	BSNL	Tata***	Idea	Vodafone	Jio	
Call Attempt	521	515	509	522	524	513	
Blocked Call Rate (%)	1.54%	0.00%	2.55%	1.72%	0.19%	0.78%	
CSSR% (Accessibility)	98.46%	100.00%	97.45%	98.28%	99.81%	99.22%	
Dropped Call Rate (%)	0.97%	1.36%	0.60%	1.17%	0.00%	1.18%	
Mobility HOSR (%)	99.52%	99.96%	100.00%	99.77%	99.94%	99.68%	
Rx Quality (%)	85.5%	96.4%	97.4%	95.6%	95.2%	89.9%	

*Tata 2G (ICR) & Tata CDMA (ICR) was not measured on 1st day, resulting in lesser # of call attempts

**Calls did not initiate in the outskirts of the city for RCOM 2G due to lack of coverage

***Call which are failed due to termination number issue are not included in results for Telenor 2G (109 failure) and Tata 3G (48 failure).

Data Services	Airtel 3G	BSNL 3G	Tata 3G	Idea 3G	Vodafone 3G	Airtel 4G	Idea 4G	Jio 4G	RCom 4G	Telenor 4G	Vodafone 4G
Download Throughput (Mbps)	3.1	1.6	2.6	4.5	4.1	4.1	5.7	5.4	5.0	4.6	3.2
Upload Throughput (Mbps)	1.8	1.2	1.2	2.1	1.4	4.0	5.4	3.3	3.0	2.1	2.3
Web Browsing Delay (sec)	10.6	13.3	7.5	7.3	14.3	7.9	7.1	8.5	7.3	5.8	6.3
Video Streaming Delay (sec)	4.6	8.7	1.9	1.6	1.3	4.5	1.3	1.7	4.1	2.4	1.2
Latency (msec)	292	95	100	178	-	187	131	152	120	84	-

Data Services 2G	Aircel 2G	Airtel 2G	BSNL 2G	Tata 2G	Idea 2G	RCom 2G	Telenor 2G	Vodafone 2G*	MTS CDMA	Tata CDMA
Download Throughput (Kbps)	107.5	85.5	119.8	134.1	87.5	37.0	82.3	191.5	523.0	569.0
Upload Throughput (Kbps)	62.5	44.3	57.1	49.4	67.5	32.0	57.6	96.7	213.0	271.0
Web Browsing Delay (sec)	25.0	25.2	25.8	31.0	26.3	24.9	30.9	25.5	41.4	36.4
Latency (msec)	275	254	219	313	363	277	301	-	215	187

* Vodafone has disabled ICMP on its network

Annexure-B

**Report on Independent Drive Test conducted in
Warangal from 9th to 11th August 2017**

The drive test in the city of Warangal in AP LSA was conducted for a period of 3 days during 9th to 11th August, 2017. It covered a route of approximately 300 KMs and data tests conducted on 4 hotspots. Cellular mobile telephone service providers included namely Aircel, Airtel, Idea, Tata, BSNL, Telenor, RCOM, Vodafone and Jio. Tests included 2G, 3G, 4G and CDMA radio access technologies.

The summary of the Service Provider's performance on the key parameters based on Independent Drive Test is given here under:-

Voice Call	2G								CDMA
	Aircel	Airtel	BSNL*	Tata **	Idea	RCom	Telenor	Vodafone	Tata**
Call Attempt	628	643	555	562	650	636	621	663	500
Blocked Call Rate (%)	0.16%	0.93%	0.54%	0.00%	0.00%	0.31%	0.00%	0.15%	1.40%
CSSR% (Accessibility)	99.84%	99.07%	99.46%	100.00%	100.00%	99.69%	100.00%	99.85%	98.60%
Dropped Call Rate (%)	0.00%	0.00%	0.36%	1.07%	0.31%	0.32%	0.16%	0.00%	1.00%
Mobility HOSR (%)	97.65%	99.30%	99.11%	99.21%	99.04%	100.00%	97.82%	99.74%	97.65%
Rx Quality (%)	99.28%	98.98%	99.43%	98.90%	97.44%	99.10%	99.04%	99.52%	94.80%

Voice Call	3G				VoLTE
	Aircel	Airtel	BSNL*	Idea	Jio
Call Attempt	657	645	540	650	622
Blocked Call Rate (%)	0.76%	0.31%	0.74%	0.15%	0.16%
CSSR% (Accessibility)	99.24%	99.69%	99.26%	99.85%	99.80%
Dropped Call Rate (%)	0.00%	0.31%	0.93%	0.31%	0.00%
Mobility HOSR (%)	100.00%	99.40%	99.20%	99.90%	99.84%
Rx Quality (%)	99.09%	91.94%	99.10%	97.44%	92.88%

* BSNL has less number of call attempts as there was a delay in acquiring the SIM cards (provided by TSP), 20% of day 1 was not covered.

**~100+ calls in Tata & Tata CDMA did not initiate in the outskirts of Warangal City due to lack of coverage.

Data Services	Aircel 2G	Airtel 2G	BSNL 2G	Tata 2G	Idea 2G	RCom 2G	Telenor 2G	Vodafone 2G*	Tata CDMA
Download Throughput (Kbps)	167.2	149.7	167.8	181.5	91.0	79.8	105.6	155.4	101.86
Upload Throughput (Kbps)	39.6	56.3	87.4	76.7	48.8	74.7	71.3	63.3	86.4
Web Browsing Delay (sec)	27.3	27.1	20.5	27.3	32.6	28.3	26.1	27.2	36.44
Latency (msec)	464	239	160	569	330	362	324	-	373

Data Services	Aircel 3G	Airtel 3G	BSNL 3G	Idea 3G	Airtel 4G	Idea 4G	Jio 4G	RCom 4G	Telenor 4G
Download Throughput (Mbps)	5.1	4.5	3.7	5.0	8.9	9.4	6.8	6.2	4.4
Upload Throughput (Mbps)	2.6	1.9	2.6	2.0	6.0	5.0	3.0	2.5	3.7
Web Browsing Delay (sec)	10.0	8.3	7.9	9.3	6.7	5.9	5.3	6.6	7.6
Video Streaming Delay (sec)	2.2	5.4	3.6	7.4	1.8	3.0	1.7	2.0	3.1
Latency (msec)	55	93	59	107	76	101	134	145	93

* Vodafone has disabled ICMP on its network

Annexure-C

Report on Independent Drive Test conducted in Thrissur from 7th to 11th August 2017

The drive test in the city of Thrissur in Kerala LSA was conducted for a period of 5 days during 7th to 11th August, 2017. It covered a route of approximately 635 KMs and data tests conducted on 5 hotspots. Cellular mobile telephone service providers included namely Airtel, Idea, Tata, BSNL, RCOM, Vodafone, MTS, and Jio. Tests included 2G, 3G, 4G and CDMA radio access technologies.

The summary of the Service Provider's performance on the key parameters based on Independent Drive Test is given here under:-

Voice Call	2G						CDMA	
	Airtel	BSNL	Tata*	Idea	RCOM*	Vodafone	MTS*	Tata*
Call Attempt	920	931	729	952	754	934	782	648
Blocked Call Rate (%)	0.00%	0.30%	1.20%	0.90%	3.10%	0.10%	0.60%	0.80%
CSSR% (Accessibility)	100.00%	99.70%	98.80%	99.10%	96.90%	99.90%	99.40%	99.20%
Drop Call Rate (%)	0.70%	0.90%	0.40%	1.60%	2.20%	0.00%	1.90%	1.20%
Mobility HOSR (%)	99.30%	98.90%	99.30%	99.50%	99.90%	99.10%	100.00%	100.00%
Rx Quality (%)	98.10%	97.70%	98.20%	92.80%	97.10%	99.10%	82.40%	84.70%

Voice Call	3G					VoLTE	
	Airtel	BSNL	Tata	Idea	Vodafone	Jio	
Call Attempt	917	927	727	937	911	916	
Blocked Call Rate (%)	0.20%	1.60%	1.50%	0.90%	0.40%	0.90%	
CSSR% (Accessibility)	99.80%	98.40%	98.50%	99.10%	99.60%	99.10%	
Drop Call Rate (%)	0.90%	4.90%	1.40%	0.30%	0.30%	0.80%	
Mobility HOSR (%)	100.00%	100.00%	99.80%	99.90%	100.00%	99.90%	
Rx Quality (%)	97.60%	75.30%	95.10%	96.10%	98.70%	89.40%	

* Calls in Tata, RCOM, & CDMA TSP's did not initiate at the outskirts of Thrissur City due to lack of coverage.

Data Services	Airtel 3G	BSNL 3G	Tata 3G	Idea 3G	Vodafone 3G	Airtel 4G	Idea 4G	Jio 4G	RCom 4G	*Vodafone 4G
Download Throughput (Mbps)	4.9	1.6	3.6	4.2	5.2	13.2	5.0	15.0	12.3	8.6
Upload Throughput (Mbps)	2.2	1.6	2.7	2.0	3.0	4.4	7.4	6.0	5.9	6.5
Web Browsing Delay (sec)	6.0	13.4	9.9	9.4	7.4	8.4	5.8	5.1	5.2	5.9
Video Streaming Delay (sec)	1.7	5.5	1.9	5.0	2.6	1.4	3.4	0.8	1.2	1.1
Latency msec)	171	192	183	184	140	110	146	132	117	-

Data Services	Airtel 2G	BSNL 2G	Tata 2G	Idea 2G	RCom 2G	Vodafone 2G	MTS CDMA	Tata CDMA
Download Throughput (Kbps)	99.4	95.6	105.4	104.8	81.6	105.7	714.0	466.9
Upload Throughput (Kbps)	53.1	55.9	67.0	50.6	61.7	74.2	325.6	237.9
Web Browsing Delay (sec)	32.3	28.7	27.8	30.9	29.0	23.6	26.5	31.5
Latency (msec)	284	234	680	277	289	231	92	124

*Vodafone has disabled ping on its 4G network

Annexure-D

**Report on Independent Drive Test conducted in
Dhanbad from 7th to 11th August 2017**

The drive test in the city of Dhanbad in Bihar including Jharkhand LSA was conducted for a period of 5 days during 7th to 11th August, 2017. It covered a route of approximately 659 KMs and data tests conducted on 6 hotspots. Cellular mobile telephone service providers included namely Aircel, Airtel, Idea, Tata, BSNL, RCOM, Vodafone, Telenor and Jio. Tests included 2G, 3G, 4G and CDMA radio access technologies.

The summary of the Service Provider's performance on the key parameters based on Independent Drive Test is given here under:-

Voice Call	2G								CDMA
	Aircel	Airtel	BSNL	Tata	Idea	RCom	Telenor	Vodafone	Tata
Call Attempt*	748	921	952	812	933	568	867	831	880
Blocked Call Rate (%)	0.67%	1.85%	4.41%	2.22%	0.64%	2.29%	2.19%	0.24%	1.14%
CSR% (Accessibility)	99.33%	98.15%	95.59%	97.78%	99.36%	97.71%	97.81%	99.76%	98.86%
Dropped Call Rate (%)	2.69%	1.77%	2.86%	2.77%	1.08%	2.52%	0.94%	2.65%	1.84%
Mobility HOSR(%)	98.70%	96.00%	94.20%	99.00%	99.60%	99.70%	98.20%	99.60%	100.00%
Rx Quality	96.90%	95.08%	95.85%	96.17%	98.16%	93.44%	96.65%	96.75%	88.5%

Voice Call	3G						VoLTE
	Aircel	Airtel	BSNL	Idea	RCom	Vodafone	Jio
Call Attempt*	734	942	806	861	575	813	930
Blocked Call Rate (%)	1.23%	1.91%	2.61%	1.28%	3.83%	2.34%	0.11%
CSR% (Accessibility)	98.77%	98.09%	97.39%	98.72%	96.17%	97.66%	99.89%
Dropped Call Rate (%)	3.17%	1.95%	4.08%	1.88%	4.16%	2.64%	0.11%
Mobility HOSR(%)	99.10%	99.10%	88.80%	99.80%	99.90%	100.00%	99.80%
Rx Quality	94.01%	92.89%	94.10%	96.70%	88.41%	87.53%	73.54%

* In most of the TSPs, calls did not initiate at the outskirts of Dhanbad city due to lack of coverage

Data Services	Aircel 2G	Airtel 2G	BSNL 2G	Tata 2G	Idea 2G	RCom 2G	Telenor 2G	Vodafone 2G*	Tata CDMA
Download Throughput (Kbps)	117.9	109.1	137.4	81.2	168.2	106.1	92.3	82.7	640.2
Upload Throughput (Kbps)	49.2	52.3	45.3	38.0	75.7	67.9	37.0	42.5	270.0
Web Browsing Delay (sec)	28.2	28.6	28.2	24.7	29.9	25.7	26.6	28.7	27.8
Latency (msec)	252	320	219	283	369	276	372	-	203

Data Services	Aircel 3G	Airtel 3G	BSNL 3G	Idea 3G	RCom 3G	Vodafone 3G*	Airtel 4G	Idea 4G	Jio 4G	Telenor 4G
Download Throughput (Mbps)	5.5	5.2	2.8	5.0	1.5	5.9	4.3	11.4	5.4	1.8
Upload Throughput (Mbps)	1.1	1.6	2.6	2.6	1.0	1.5	4.8	6.7	1.9	1.6
Web Browsing Delay (sec)	11.3	11.8	10.6	8.8	13.0	12.8	10.5	6.6	9.1	10.4
Video Streaming Delay (sec)	4.5	5.2	5.5	1.8	3.7	2.3	3.7	1.5	2.3	2.8
Latency (msec)	289	271	135	169	191	-	155	142	168	108

* Vodafone has disabled ping in there network

Annexure-E

**Report on Independent Drive Test conducted in
Amritsar from 21st to 24th August 2017**

The drive test in the city of Amritsar in Punjab LSA was conducted for a period of 4 days during, 21st to 24th August 2017. It covered a route of approximately 600 KMs. Cellular mobile telephone service providers included namely Aircel, Airtel, Idea, Tata, BSNL, RCOM, Vodafone, and Jio. Tests included 2G, 3G, 4G and CDMA radio access technologies. Data Test could not be performed due to suspension of internet services in Punjab by the Order of Government of India.

The summary of the Service Provider's performance on the key parameters based on Independent Drive Test is given here under:-

Voice Call	2G							CDMA
	Aircel**	Airtel	BSNL	Idea	RCOM	Tata	Vodafone	
Call Attempt	743	855	842	816	770	810	844	620
Blocked Call Rate (%)	0.0%	1.9%	0.1%	0.1%	0.5%	0.2%	0.0%	0.3%
CSSR% (Accessibility)	100.0%	98.1%	99.9%	99.9%	99.5%	99.8%	100.0%	99.7%
Drop Call Rate (%)	0.4%	0.1%	1.3%	0.1%	1.4%	0.2%	0.0%	0.2%
Mobility HOSR (%)	99.4%	98.8%	98.2%	99.0%	99.8%	99.6%	98.5%	100.0%
Rx Quality (%)	98.2%	98.5%	98.5%	97.8%	97.8%	97.9%	97.4%	95.8%

Voice Call	3G							VoLTE
	Aircel**	Airtel	BSNL	Idea	RCOM*	Tata*	Vodafone	
Call Attempt	642	856	850	810	743	788	839	831
Blocked Call Rate (%)	1.4%	2.1%	0.5%	0.6%	2.6%	0.3%	0.2%	0.1%
CSSR% (Accessibility)	98.6%	97.9%	99.5%	99.4%	97.4%	99.7%	99.8%	99.9%
Drop Call Rate (%)	0.8%	0.2%	0.8%	0.2%	1.0%	1.0%	0.4%	0.0%
Mobility HOSR (%)	99.9%	99.7%	98.5%	100.0%	99.8%	100.0%	99.8%	99.7%
Rx Quality (%)	92.5%	97.3%	98.2%	95.4%	96.6%	96.8%	94.6%	90.4%

*RCOM & Tata CDMA calls did not initiate at the outskirts of Amritsar city due to lack of coverage
 ** In Aircel approximately 100+ calls did not mature due to issue in the termination # during 20% of the drive on 1st day
