

For Immediate Release

Information note to the Press (Press Release No. 94/2018)

Telecom Regulatory Authority of India

TRAI Releases Report on Independent Drive Tests (IDTs) conducted on Highways and Rail Routes

New Delhi, th28 August 2018: TRAI conducted Independent Drive Tests (IDTs) through its appointed agency on eight highways and seven rail routes. IDTs were conducted to assess the network quality provided by cellular mobile telephone service providers for voice service only. The Key Performance Indicators (KPIs) were assessed for the networks of all telecom service providers operating in the route. KPIs for voice services were Coverage; Call Setup Success Rate (CSSR); Drop Call Rate; Block Call Rate, Handover Success Rate and Rx Quality. The details of IDTs conducted are given below:-

Highways:-

Highways	Period of Conducting IDT	Summary of Results of
Bhopal to Damoh	28 th May 2018	Annexure-A
Bhopal to Dhar	29 th May 2018	Annexure-B
Cochin to Trivandrum	30 th June 2018	Annexure-C
Delhi to Amritsar	9 th July to 10 th July 2018	Annexure-D
Delhi to Dehradun	2 nd July 2018	Annexure-E
Kolkata to Berhampore	25 th June 2018	Annexure-F
Kolkata to Jhargram	25 th May 2018	Annexure-G
Portblair to Mayabunder	14 th June 2018	Annexure-H

Railways:-

Rail route	Period of Conducting IDT	Summary of Results of
Bangalore to Chennai	15 th June 2018	Annexure-I
Delhi to Gorakhpur	5 th June to 6 th June 2018	Annexure-J
Delhi to Jammu	5 th July to 6 th July 2018	Annexure-K
Guwahati to Naharlagun	27 th June to 28 th June 2018	Annexure-L
Hyderabad to Nagpur	21 st June 2018	Annexure-M
Hyderabad to Vishakhapatnam	28 th May to 29 th May 2018	Annexure-N
Jaipur to Udaipur	1 st June 2018	Annexure-O



3. The key findings of Independent Drive test are summarized below:

- (i) Bhopal to Damoh: All the TSPs have met the 2% of Drop Call Rate & CSSR except BSNL (2G) & BSNL (3G).
- (ii) Bhopal to Dhar: All the TSPs have met the 2% of Drop Call Rate except BSNL (3G). All the service providers have met CSSR.
- (iii) Cochin to Trivandrum: All the TSPs have met the 2% of Drop Call Rate & CSSR.
- (iv) Delhi to Amritsar: All the TSPs have met the 2% of Drop Call Rate except BSNL (2G) & BSNL (3G). All the service providers have met CSSR except BSNL (3G).
- (v) Delhi to Dehradun: All the TSPs have met the 2% of Drop Call Rate except BSNL (2G) & BSNL (3G). All the service providers have met CSSR except BSNL (3G).
- (vi) Kolkata to Berhampore: All the TSPs have met 2% of Drop Call Rate except BSNL (3G). All the service providers have met CSSR except BSNL (2G).
- (vii) Kolkata to Jhargram: All the TSPs have met 2% of Drop Call Rate except BSNL (2G), Tata(2G) and BSNL(3G). All the service providers have met CSSR.
- (viii) Portblair to Mayabunder: Only Vodafone 2G is meeting the QoS benchmark of 2% Drop Call Rate and CSSR.
- (ix) Bangalore to Chennai: Airtel (2G), Idea(2G), Tata(2G) and RJio are meeting the QoS benchmark of 2% Drop Call Rate. All the service providers have met CSSR except Tata(2G) & Tata(3G).
- (x) Delhi to Gorakhpur: All the TSPs have met the 2% of Drop Call Rate except BSNL(2G), Vodafone(2G), BSNL(3G), Idea(3G) and Tata(3G). All the service providers have met CSSR except BSNL(2G), Tata(2G), BSNL(3G) and Tata(3G).
- (xi) Delhi to Jammu: Idea(2G), Tata(2G) and RJio are meeting the QoS benchmark 2% of Drop Call Rate. All the service providers have met CSSR except BSNL(2G) and Airtel(3G).
- (xii) Guwahati to Naharlagun: Only RJiO is meeting the QoS benchmark of 2% Drop Call Rate. All the service providers have met CSSR.



- (xiii) Hyderabad to Nagpur: Only R JiO is meeting the QoS benchmark of 2% Drop Call Rate. All the service providers have met CSSR except Airtel(2G), BSNL(2G) and Airtel(3G).
- (xiv) Hyderabad to Vishakhapatnam: All the TSPs have met the benchmark of 2% Drop Call Rate except Tata(2G), Vodafone(2G), Airtel(3G) and BSNL(3G). All the service providers have met CSSR except Airtel(2G) and Airtel(3G).
- (xv) Jaipur to Udaipur: Airtel (3G) & R JiO are meeting the QoS benchmark of 2% Drop Call Rate. All the service providers have met CSSR except Tata(2G).
4. The complete report is available at TRAI website www.analytics.trai.gov.in In case of any clarification, please contact, Shri. Asit Kadayan, Advisor (QoS) at Tel. No. +91-11-2323-0404 or at email.id: advqos@traigov.in


28/8/2018
(S.K. Gupta)
Secretary
TRAI

**Report on Independent Drive Test conducted in
Bhopal to Damoh on 28th May 2018**

The drive test on the Highway Route of Bhopal to Damoh was conducted for a period of one day on 28th May 2018 and covered a route of approximately 260 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	200	199	182	195	202
Blocked Call Rate (%)	0.50%	5.03%	0.00%	0.51%	0.50%
CSSR% (Accessibility)	99.50%	94.97%	100.00%	99.49%	99.50%
Drop Call Rate (%)	1.01%	3.17%	1.10%	1.03%	0.50%
Mobility HOSR (%)	98.71%	96.10%	98.66%	99.18%	99.40%
Rx Quality (%)	96.93%	96.40%	96.34%	96.95%	99.05%

Voice Call	3G					VoLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	197	185	174	195	191	199
Blocked Call Rate (%)	4.06%	5.41%	1.15%	2.05%	1.57%	0.00%
CSSR% (Accessibility)	95.94%	94.59%	98.85%	97.95%	98.43%	100.00%
Drop Call Rate (%)	1.06%	5.14%	1.16%	1.57%	0.00%	0.00%
Mobility HOSR (%)	100.00%	95.67%	99.86%	99.27%	99.66%	99.35%
Rx Quality (%)	95.13%	92.96%	93.18%	96.25%	93.50%	80.01%

**Report on Independent Drive Test conducted in
Bhopal to Dhar on 29th May 2018**

The drive test on the Highway Route of Bhopal to Dhar was conducted for a period of one day on 29th May 2018 and covered a route of approximately 287 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	223	227	212	222	253
Blocked Call Rate (%)	0.00%	0.88%	0.00%	0.45%	0.40%
CSSR% (Accessibility)	100.00%	99.12%	100.00%	99.55%	99.60%
Drop Call Rate (%)	0.00%	0.44%	0.00%	0.90%	0.00%
Mobility HOSR (%)	99.11%	97.68%	98.44%	97.80%	100.00%
Rx Quality (%)	97.46%	98.67%	97.87%	97.38%	99.84%

Voice Call	3G					VOLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	230	216	210	214	214	211
Blocked Call Rate (%)	0.43%	0.93%	0.95%	0.93%	0.93%	0.00%
CSSR% (Accessibility)	99.57%	99.07%	99.05%	99.07%	99.07%	100.00%
Drop Call Rate (%)	0.00%	3.74%	0.48%	1.42%	0.47%	0.00%
Mobility HOSR (%)	100.00%	99.06%	99.67%	99.85%	99.92%	99.66%
Rx Quality (%)	95.10%	97.36%	90.88%	95.26%	90.96%	81.31%

**Report on Independent Drive Test conducted in
Cochin to Trivandrum on 30th June 2018**

The drive test on the Highway Route of Cochin to Trivandrum was conducted for a period of one day on 30th June 2018 and covered a route of approximately 250 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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			
	Airtel	BSNL	Idea	Vodafone
Call Attempt	251	256	260	247
Blocked Call Rate (%)	0.00%	0.00%	0.38%	0.00%
CSSR% (Accessibility)	100.00%	100.00%	99.62%	100.00%
Drop Call Rate (%)	0.00%	0.39%	0.39%	0.40%
Mobility HOSR (%)	99.05%	99.44%	100.00%	100.00%
Rx Quality (%)	98.73%	99.61%	98.18%	99.22%

Voice Call	3G					VOLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	256	255	257	249	261	241
Blocked Call Rate (%)	1.17%	0.00%	1.17%	0.80%	0.38%	0.00%
CSSR% (Accessibility)	98.83%	100.00%	98.83%	99.20%	99.62%	100.00%
Drop Call Rate (%)	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%
Mobility HOSR (%)	100.00%	99.45%	99.64%	100.00%	100.00%	100.00%
Rx Quality (%)	98.31%	98.33%	97.93%	98.10%	96.55%	90.38%

**Report on Independent Drive Test conducted in
Delhi to Amritsar from 9th July to 10th July 2018**

The drive test on the Highway Route of Delhi to Amritsar was conducted for a period of two day from 9th July to 10th July 2018 and covered a route of approximately 465 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	401	399	396	389	406
Blocked Call Rate (%)	0.00%	3.76%	0.00%	0.26%	0.25%
CSSR% (Accessibility)	100.00%	96.24%	100.00%	99.74%	99.75%
Drop Call Rate (%)	0.50%	2.60%	0.76%	0.77%	0.00%
Mobility HOSR (%)	99.01%	96.17%	98.27%	98.57%	98.18%
Rx Quality (%)	97.51%	98.44%	97.87%	96.80%	96.45%

Voice Call	3G					VOLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	404	413	394	384	392	393
Blocked Call Rate (%)	0.99%	5.08%	0.51%	1.82%	0.77%	0.51%
CSSR% (Accessibility)	99.01%	94.92%	99.49%	98.18%	99.23%	99.49%
Drop Call Rate (%)	0.25%	6.89%	0.51%	0.80%	1.29%	0.00%
Mobility HOSR (%)	99.89%	98.53%	99.71%	99.87%	99.31%	99.60%
Rx Quality (%)	95.62%	97.68%	93.56%	94.16%	92.90%	77.21%

Annexure-E**Report on Independent Drive Test conducted in
Delhi to Dehradun on 2nd July 2018**

The drive test on the Highway Route of Delhi to Dehradun was conducted for a period of one day on 2nd July 2018 and covered a route of approximately 250 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	230	236	235	225	231
Blocked Call Rate (%)	0.43%	4.24%	0.43%	0.89%	0.00%
CSSR% (Accessibility)	99.57%	95.76%	99.57%	99.11%	100.00%
Drop Call Rate (%)	1.31%	3.10%	0.00%	0.90%	0.87%
Mobility HOSR (%)	99.05%	84.08%	97.40%	98.16%	97.99%
Rx Quality (%)	95.31%	97.31%	96.67%	96.54%	96.62%

Voice Call	3G					VOLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	231	239	243	228	232	228
Blocked Call Rate (%)	0.87%	5.02%	2.06%	0.88%	0.00%	1.75%
CSSR% (Accessibility)	99.13%	94.98%	97.94%	99.12%	100.00%	98.25%
Drop Call Rate (%)	0.44%	8.37%	1.26%	0.44%	0.43%	0.89%
Mobility HOSR (%)	100.00%	98.50%	99.75%	100.00%	99.67%	99.71%
Rx Quality (%)	93.79%	95.32%	88.84%	91.95%	93.75%	86.79%

**Report on Independent Drive Test conducted in
Kolkata to Berhampore on 25th June 2018**

The drive test on the Highway Route of Kolkata to Berhampore was conducted for a period of one day on 25th June 2018 and covered a route of approximately 210 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	228	230	222	233	231
Blocked Call Rate (%)	1.32%	5.22%	0.00%	0.86%	0.00%
CSSR% (Accessibility)	98.68%	94.78%	100.00%	99.14%	100.00%
Drop Call Rate (%)	1.33%	1.38%	0.90%	0.00%	0.43%
Mobility HOSR (%)	99.28%	81.80%	98.51%	96.70%	97.64%
Rx Quality (%)	93.74%	98.75%	98.38%	95.59%	96.50%

Voice Call	3G					VOLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	231	222	218	220	227	220
Blocked Call Rate (%)	1.73%	1.80%	0.00%	1.36%	1.32%	0.45%
CSSR% (Accessibility)	98.27%	98.20%	100.00%	98.64%	98.68%	99.55%
Drop Call Rate (%)	1.76%	3.67%	0.00%	0.92%	0.45%	0.00%
Mobility HOSR (%)	99.80%	83.92%	99.82%	98.25%	99.67%	100.00%
Rx Quality (%)	91.68%	98.85%	88.55%	93.48%	81.90%	81.18%

**Report on Independent Drive Test conducted in
Kolkata to Jhargram on 25th May 2018**

The drive test on the Highway Route of Kolkata to Jhargram was conducted for a period of one day on 25th May 2018 and covered a route of approximately 150 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	106	101	115	88	112
Blocked Call Rate (%)	3.77%	0.99%	2.61%	1.14%	0.00%
CSSR% (Accessibility)	96.23%	99.01%	97.39%	98.86%	100.00%
Drop Call Rate (%)	1.96%	3.00%	0.00%	2.30%	1.79%
Mobility HOSR (%)	98.70%	99.39%	100.00%	96.55%	99.59%
Rx Quality (%)	93.70%	98.44%	97.52%	94.29%	98.16%

Voice Call	3G					VoLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	116	104	115	117	114	111
Blocked Call Rate (%)	0.00%	1.92%	2.61%	1.71%	0.88%	2.70%
CSSR% (Accessibility)	100.00%	98.08%	97.39%	98.29%	99.12%	97.30%
Drop Call Rate (%)	0.86%	2.94%	0.00%	0.87%	0.00%	0.93%
Mobility HOSR (%)	99.41%	93.66%	100.00%	98.25%	100.00%	99.38%
Rx Quality (%)	92.45%	96.90%	96.73%	93.23%	89.24%	77.15%

**Report on Independent Drive Test conducted in
Port Blair to Mayabunder on 14th June 2018**

The drive test on the Highway Route of Port Blair to Mayabunder was conducted for a period of one day on 14th June 2018 and covered a route of approximately 250 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL and Vodafone. Tests included 2G, 3G and CDMA 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	Vodafone	BSNL
Call Attempt	93	154	49	46
Blocked Call Rate (%)	14.0%	17.5%	0.0%	30.4%
CSSR% (Accessibility)	86.0%	82.5%	100.0%	69.6%
Drop Call Rate (%)	2.5%	9.4%	0.0%	21.9%
Mobility HOSR (%)	96.7%	99.3%	100.0%	100.0%
Rx Quality (%)	90.77%	92.5%	94.5%	79.0%

Voice Call	3G
	BSNL
Call Attempt	161
Blocked Call Rate (%)	16.8%
CSSR% (Accessibility)	83.2%
Drop Call Rate (%)	11.2%
Mobility HOSR (%)	99.5%
Rx Quality (%)	88.6%

* Call attempts for Vodafone 2G and BSNL CDMA is comparatively less due to lack of network coverage area



**Report on Independent Drive Test conducted in
Bangalore to Chennai on 15th June 2018**

The drive test on the Railway Route of Bangalore to Chennai was conducted for a period of one day on 15th June 2018 and covered a route of approximately 360 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	172	179	158	182	161
Blocked Call Rate (%)	0.58%	0.00%	0.63%	9.34%	0.62%
CSSR% (Accessibility)	99.42%	100.00%	99.37%	90.66%	99.38%
Drop Call Rate (%)	1.75%	4.47%	0.64%	1.21%	3.13%
Mobility HOSR (%)	97.71%	96.98%	96.42%	97.15%	98.38%
Rx Quality (%)	94.69%	95.98%	92.49%	94.93%	94.99%

Voice Call	3G					VoLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	177	171	165	181	171	169
Blocked Call Rate (%)	1.13%	2.34%	3.03%	6.08%	2.92%	1.18%
CSSR% (Accessibility)	98.87%	97.66%	96.97%	93.92%	97.08%	98.82%
Drop Call Rate (%)	3.43%	4.79%	2.50%	2.94%	3.61%	1.20%
Mobility HOSR (%)	100.00%	98.34%	98.14%	100.00%	99.82%	99.49%
Rx Quality (%)	89.93%	94.75%	83.36%	87.76%	83.59%	87.68%

**Report on Independent Drive Test conducted in
Delhi to Gorakhpur on 5th June to 6th June 2018**

The drive test on the Railway Route of Delhi to Gorakhpur was conducted for a period of two day from 5th June & 6th June 2018 and covered a route of approximately 780 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	444	476	463	478	426
Blocked Call Rate (%)	1.35%	10.50%	0.86%	24.90%	0.70%
CSSR% (Accessibility)	98.65%	89.50%	99.14%	75.10%	99.30%
Drop Call Rate (%)	1.37%	3.99%	1.74%	0.84%	3.31%
Mobility HOSR (%)	97.78%	87.06%	98.07%	96.80%	97.08%
Rx Quality (%)	92.86%	94.95%	96.04%	92.95%	93.36%

Voice Call	3G					VoLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	457	459	459	386	427	443
Blocked Call Rate (%)	3.28%	9.80%	2.18%	18.91%	1.87%	2.93%
CSSR% (Accessibility)	96.72%	90.20%	97.82%	81.09%	98.13%	97.07%
Drop Call Rate (%)	0.68%	6.76%	3.12%	2.24%	1.67%	0.23%
Mobility HOSR (%)	99.17%	97.17%	98.63%	99.78%	99.22%	99.22%
Rx Quality (%)	90.75%	93.38%	93.00%	88.09%	89.34%	79.59%



**Report on Independent Drive Test conducted in
Delhi to Jammu on 5th July to 6th July 2018**

The drive test on the Railway Route of Delhi to Jammu was conducted for a period of two day from 5th July to 6th July 2018 and covered a route of approximately 600 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	303	297	305	295	306
Blocked Call Rate (%)	0.33%	6.73%	0.66%	0.68%	0.33%
CSSR% (Accessibility)	99.67%	93.27%	99.34%	99.32%	99.67%
Drop Call Rate (%)	2.98%	3.61%	1.98%	1.71%	2.30%
Mobility HOSR (%)	98.01%	91.99%	97.76%	97.92%	96.13%
Rx Quality (%)	93.98%	96.11%	96.43%	95.75%	94.49%

Voice Call	3G					VOLTE
	Airtel *	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	259	295	305	285	284	284
Blocked Call Rate (%)	5.02%	3.05%	4.92%	0.35%	1.06%	0.35%
CSSR% (Accessibility)	94.98%	96.95%	95.08%	99.65%	98.94%	99.65%
Drop Call Rate (%)	2.03%	5.24%	3.45%	2.82%	3.91%	0.00%
Mobility HOSR (%)	99.82%	98.86%	99.71%	99.85%	99.50%	98.94%
Rx Quality (%)	90.73%	96.02%	91.48%	91.45%	89.82%	75.55%

Airtel 3G has less number of call attempts due to temporary SIM card issue for 1:30 hours

**Report on Independent Drive Test conducted in
Guwahati to Naharlagun on 27th June to 28th June 2018**

The drive test on the Railway Route of Delhi to Jammu was conducted for a period of one day from 27th June to 28th June 2018 and covered a route of approximately 350 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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			
	Airtel	BSNL	Idea	Vodafone
Call Attempt	235	241	187	224
Blocked Call Rate (%)	3.40%	0.00%	1.07%	0.00%
CSSR% (Accessibility)	96.60%	100.00%	98.93%	100.00%
Drop Call Rate (%)	2.64%	2.49%	4.32%	4.02%
Mobility HOSR (%)	85.23%	97.41%	98.93%	95.45%
Rx Quality (%)	89.76%	93.46%	93.13%	90.45%

Voice Call	3G				VOLTE
	Airtel	BSNL	Idea	Vodafone	Jio
Call Attempt	222	222	182	230	215
Blocked Call Rate (%)	3.60%	1.80%	3.47%	0.43%	0.00%
CSSR% (Accessibility)	96.40%	98.18%	96.53%	99.57%	100.00%
Drop Call Rate (%)	2.34%	2.29%	4.62%	4.37%	0.00%
Mobility HOSR (%)	100.00%	99.69%	99.81%	99.59%	99.44%
Rx Quality (%)	90.05%	93.84%	87.01%	89.85%	78.93%



**Report on Independent Drive Test conducted in
Hyderabad to Nagpur on 21st June 2018**

The drive test on the Railway Route of Delhi to Gorakhpur was conducted for a period of one day on 21st June 2018 and covered a route of approximately 575 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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			
	Airtel	BSNL	Idea	Vodafone
Call Attempt	253	254	236	303
Blocked Call Rate ($\leq 3\%$)	18.97%	5.12%	4.66%	0.99%
CSSR% ($\geq 95\%$)	81.03%	94.88%	95.34%	99.01%
Drop Call Rate ($\leq 2\%$)	4.39%	5.39%	2.22%	3.67%
Mobility HOSR	96.80%	89.21%	98.19%	97.37%
Rx Quality ($\geq 95\%$)	91.50%	94.38%	92.29%	94.18%

Voice Call	3G			VOLTE
	Airtel	BSNL	Idea	Jio
Call Attempt	259	256	297	213
Blocked Call Rate ($\leq 3\%$)	11.20%	3.91%	3.37%	3.76%
CSSR% ($\geq 95\%$)	88.80%	96.09%	96.63%	96.24%
Drop Call Rate ($\leq 2\%$)	5.22%	8.54%	12.89%	0.49%
Mobility HOSR	99.44%	95.68%	98.52%	97.81%
Rx Quality ($\geq 95\%$)	78.24%	91.81%	80.12%	71.72%

**Report on Independent Drive Test conducted in
Hyderabad to Vishakhapatnam on 28th May to 29th 2018**

The drive test on the Railway Route of Hyderabad to Vishakhapatnam was conducted for a period of one day from 28th May to 29th May 2018 and covered a route of approximately 390 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	573	451	477	473	448
Blocked Call Rate ($\leq 3\%$)	28.10%	0.44%	1.47%	2.75%	0.00%
CSSR% ($\geq 95\%$)	71.90%	99.56%	98.53%	97.25%	100.00%
Drop Call Rate ($\leq 2\%$)	0.49%	1.78%	1.49%	3.48%	3.13%
Mobility HOSR	98.36%	97.21%	98.14%	97.81%	98.58%
Rx Quality ($\geq 95\%$)	93.75%	96.33%	94.29%	90.78%	95.23%

Voice Call	3G			VOLTE
	Airtel	BSNL	Idea	Jio
Call Attempt	563	456	471	442
Blocked Call Rate ($\leq 3\%$)	24.69%	2.19%	1.27%	2.71%
CSSR% ($\geq 95\%$)	75.31%	97.81%	98.73%	97.29%
Drop Call Rate ($\leq 2\%$)	2.12%	2.69%	1.51%	0.70%
Mobility HOSR	98.94%	97.47%	99.15%	98.79%
Rx Quality ($\geq 95\%$)	81.25%	95.73%	90.64%	72.45%

**Report on Independent Drive Test conducted in
Jaipur to Udaipur on 1st June 2018**

The drive test on the Railway Route of Jaipur to Udaipur was conducted for a period of one day on 1st June 2018 and covered a route of approximately 430 KMs. Cellular mobile telephone service providers included namely Airtel, BSNL, Idea, Tata, Vodafone and Jio. Tests included 2G, 3G and VoLTE 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				
	Airtel	BSNL	Idea	Tata	Vodafone
Call Attempt	264	264	253	249	268
Blocked Call Rate (%)	1.52%	2.65%	0.40%	7.63%	0.75%
CSSR% (Accessibility)	98.48%	97.35%	99.60%	92.37%	99.25%
Drop Call Rate (%)	2.31%	2.72%	2.38%	3.48%	2.26%
Mobility HOSR (%)	97.47%	98.42%	98.29%	96.11%	98.20%
Rx Quality (%)	87.31%	93.86%	93.42%	86.94%	94.31%

Voice Call	3G					VoLTE
	Airtel	BSNL	Idea	Tata	Vodafone	Jio
Call Attempt	262	226	229	251	247	219
Blocked Call Rate (%)	4.20%	2.21%	0.87%	1.59%	0.81%	1.83%
CSSR% (Accessibility)	95.80%	97.79%	99.13%	98.41%	99.19%	98.17%
Drop Call Rate (%)	1.99%	5.43%	2.64%	2.02%	3.67%	0.00%
Mobility HOSR (%)	99.83%	97.64%	99.92%	99.81%	99.67%	99.11%
Rx Quality (%)	79.00%	92.49%	90.31%	82.55%	87.99%	77.80%

Due to close railway coaches and high speed, GPS signal lost at various part of route for all handset.



Definitions

Call Attempt: An attempt to achieve a connection to device attached to a telecommunication network.

Block Call $\leq 3\%$: A call that is not connected because there is no free channel in radio access network to serve a call attempt.

CSSR (Call Setup Success Rate) $\geq 95\%$: Ratio of Established Calls to Call Attempts.

Drop Call Rate $\leq 2\%$: An ability to maintain a call once it has been correctly established.

Hand over Success Rate (HOSR) $\geq 95\%$: Ratio between successful handovers to handover requested. (Handover is a process by which a mobile telephone call is transferred from one base station to another as the subscriber passes the boundary of a cell).

Rx Quality $> 95\%$: Measure of quality of voice.

Download Throughput: Data transmission rate for downloading a test file from a test server to a test device.

Upload Throughput: Data transmission rate for uploading a test file from a test device to test server.

Web browsing delay (secs): Average time taken to fully load the website tested.

Video Steaming delay (secs): Average time taken to fully download the video tested.

Latency (msecs): Time taken for a packet to reach the receiving endpoint after transmitted from the sending point.

