1. **Drive test route Map:** (Ranchi City and Latehar District - Bihar LSA)
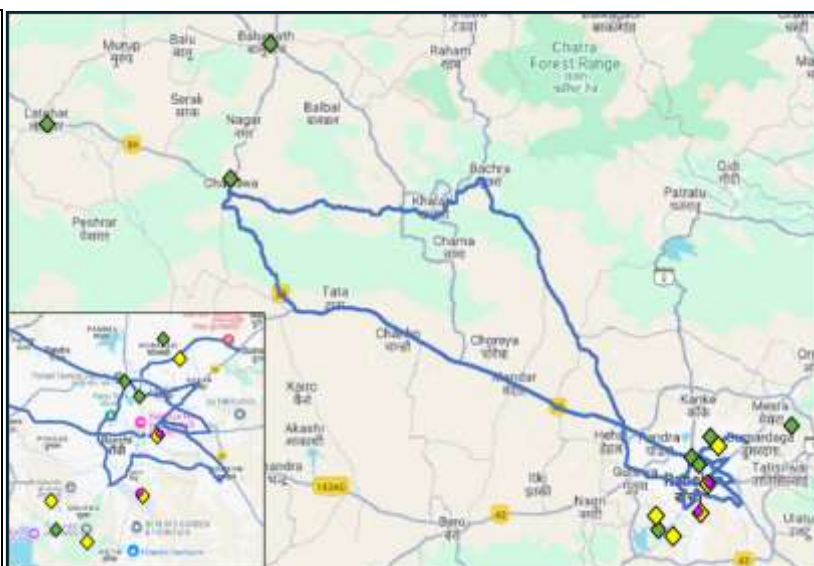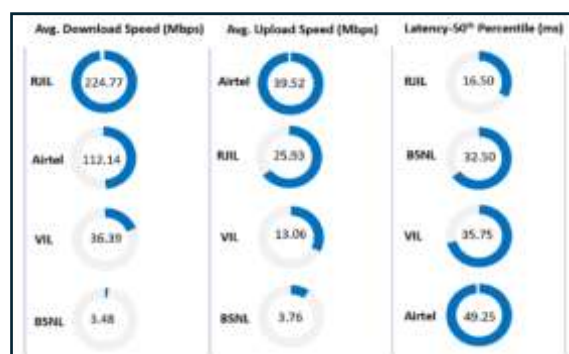
This route map indicates the routes covered in independent drive test in Ranchi City and Latehar District under Bihar LSA.

Legends for the Drive Tests route & area are as below

Legends
- City
- Interoperator
- Hotspot
- Walk test

2. **Performance against key QoS parameters:**

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score.

CSSR		CST		DCR		Mute call		MOS	
Airtel	100.00%	RJIL	0.72	RJIL	0.28%	RJIL	1.95%	VIL	4.44
RJIL	88.80%	Airtel	1.82	Airtel	0.29%	Airtel	2.43%	Airtel	3.97
BSNL	88.92%	VIL	1.93	VIL	4.93%	VIL	6.11%	RJIL	3.88
VIL	77.55%	BSNL	2.93	BSNL	10.94%	BSNL does not Provide VoLTE/VoWiFi Service		BSNL	2.58

Avg. Download Speed (Mbps)		Avg. Upload Speed (Mbps)		Latency-50th Percentile (ms)	
RJIL	224.77	Airtel	39.52	RJIL	16.50
Airtel	112.14	RJIL	25.93	BSNL	32.50
VIL	36.39	VIL	13.06	VIL	35.75
BSNL	3.48	BSNL	3.76	Airtel	49.25

Summary-Voice services	Summary-Data services
Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 100.00%, 88.92%, 98.60% and 77.55% respectively in Auto-selection mode (5G/4G/3G/2G).	**Data Download performance (Overall):** Average download speed of Airtel (5G/4G/2G) is 112.14 Mbps, BSNL (4G/3G/2G) is 3.48 Mbps, RJIL (5G/4G) is 224.77 Mbps and VIL (4G/2G) is 36.39 Mbps.

Call Setup Time: Airtel, BSNL, RJIL and VIL have Call setup time of 1.82, 3.93, 0.72 & 1.93 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.29%, 10.94%, 0.28% & 4.93% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, RJIL and VIL have silence call rate 2.43%, 1.95% and 4.11% respectively in packet switched network (5G/4G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have Average MOS of 3.97, 2.58, 3.88 & 4.44 respectively.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 39.52 Mbps, BSNL (4G/3G/2G) is 3.76 Mbps, RJIL (5G/4G) is 25.93 Mbps and VIL (4G/2G) is 13.06 Mbps.

Data performance - Hotspots (in Mbps):
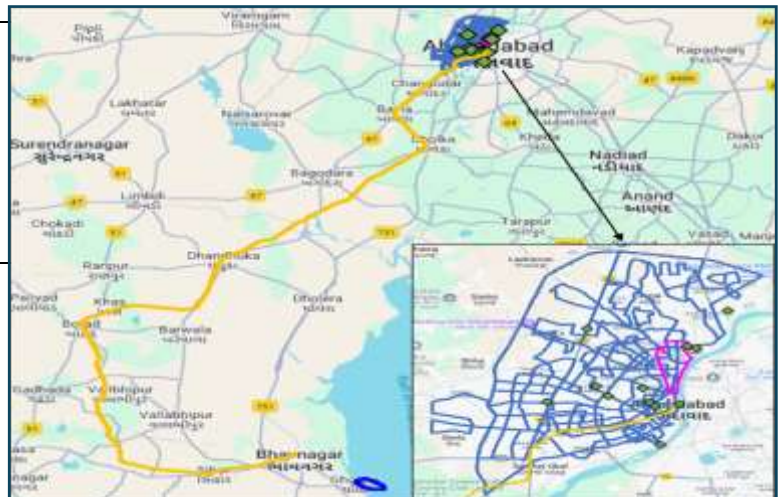Airtel- 4G D/L: 77.85   4G U/L: 12.28
        5G D/L: 138.16   5G U/L: 35.18
BSNL- 4G D/L: 6.08   4G U/L: 5.17
RJIL-   4G D/L: 62.19   4G U/L: 13.37
        5G D/L: 289.62   5G U/L: 34.25
VIL-   4G D/L: 38.95   4G U/L: 15.40

Note- "D/L" Download speed, "U/L" Upload speed

Annexure-B

1. **Drive test route Map:** (Ahmedabad and nearby area - Gujarat LSA)

This route map indicates the routes covered in independent drive test in Ahmedabad and nearby area under Gujarat LSA.

Legends
- City
- Interoperator
- Hotspot
- Railway
- Coastal

2. Performance against key QoS parameters:

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score.
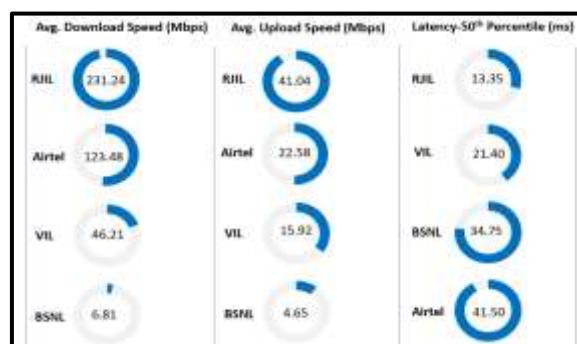

Summary-Voice Service

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 99.28%, 84.77%, 100.00% and 99.88% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL and VIL have call setup time of 1.40, 1.59, 0.70 & 0.80 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.12%, 3.98%, 0.00% & 0.12% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate of 0.18%, 7.61%, 0.18% and 0.71% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 4.02, 3.03, 3.99 & 4.45 respectively.

Summary-Data Service

Data Download performance (Overall): Average download speed of Airtel (5G/4G/2G) is 123.48 Mbps, BSNL (4G/3G/2G) is 6.81 Mbps, RJIL (5G/4G) is 231.24 Mbps and VIL (4G/2G) is 46.21 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 22.58 Mbps, BSNL (4G/3G/2G) is 4.65 Mbps, RJIL (5G/4G) is 41.04 Mbps and VIL (4G/2G) is 15.92 Mbps.

Data performance - Hotspots (in Mbps):
Airtel-	4G D/L: 27.25	4G U/L: 7.92
	5G D/L: 132.50	5G U/L: 34.05
BSNL-	4G D/L: 9.63	4G U/L: 11.14
RJIL-	4G D/L: 62.74	4G U/L: 21.82
	5G D/L: 355.92	5G U/L: 55.07
VIL-	4G D/L: 35.17	4G U/L: 12.54

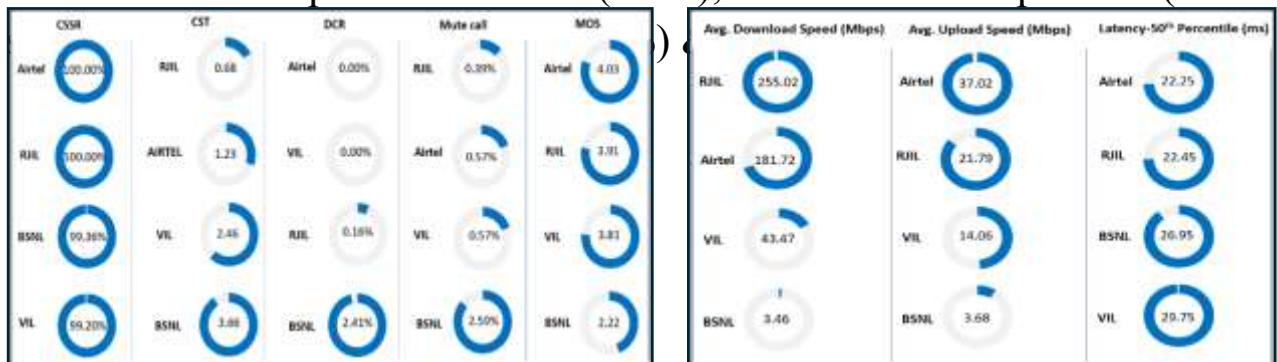**Note-** "D/L" Download speed, "U/L" Upload speed

1. **Drive test route Map:** (Panipat city - Haryana LSA)

| This route map indicates the routes covered in independent drive test in Panipat city under Haryana LSA. | |

Legends
- ■ City
- ■ Interoperator
- ■ Hotspot
- ■ Walk test

2. **Performance against key QoS parameters:**

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli

CSSR		CST		DCR		Mute call		MOS	
Airtel	100.00%	RJIL	0.68	Airtel	0.00%	RJIL	0.39%	Airtel	4.03
RJIL	100.00%	AIRTEL	1.23	VIL	0.00%	Airtel	0.57%	RJIL	3.91
BSNL	99.36%	VIL	2.46	RJIL	0.18%	VIL	0.57%	VIL	3.83
VIL	99.20%	BSNL	3.68	BSNL	2.41%	BSNL	2.50%	BSNL	2.22

Avg. Download Speed (Mbps)		Avg. Upload Speed (Mbps)		Latency-50ᵗʰ Percentile (ms)	
RJIL	255.02	Airtel	37.02	Airtel	22.25
Airtel	181.72	RJIL	21.79	RJIL	22.45
VIL	43.47	VIL	14.06	BSNL	26.95
BSNL	3.46	BSNL	3.68	VIL	29.7%

Summary-Voice Service

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 100.00%, 99.36%, 100.00% and 99.20% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL and VIL have call setup time of 1.23, 3.66, 0.68 & 2.46 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.00%, 2.41%, 0.16% & 0.00% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 0.57%, 2.59%, 0.39% and 0.57% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 4.03, 2.22, 3.91 & 3.81 respectively.

Summary-Data Service

Data Download performance (Overall): Average download speed of Airtel (5G/4G) is 181.72 Mbps, BSNL (4G/3G/2G) is 3.46 Mbps, RJIL (5G/4G) is 255.02 Mbps and VIL (4G/2G) is 43.47 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G) is 37.02 Mbps, BSNL (4G/3G/2G) is 3.68 Mbps, RJIL (5G/4G) is 21.79 Mbps and VIL (4G/2G) is 14.06 Mbps.

Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 11.57   4G U/L: 12.30
       5G D/L: 189.06   5G U/L: 42.50
BSNL- 4G D/L: 4.03   4G U/L: 9.85
RJIL- 4G D/L: 40.86   4G U/L: 7.24
       5G D/L: 194.05   5G U/L: 20.73

Note- "D/L" Download speed, "U/L" Upload speed in 4G & 5G technology have not been observed in MTNL at hotspot locations.

Annexure-D

1. Drive test route Map: (Una & Mandi City and nearby area – Himachal Pradesh LSA)
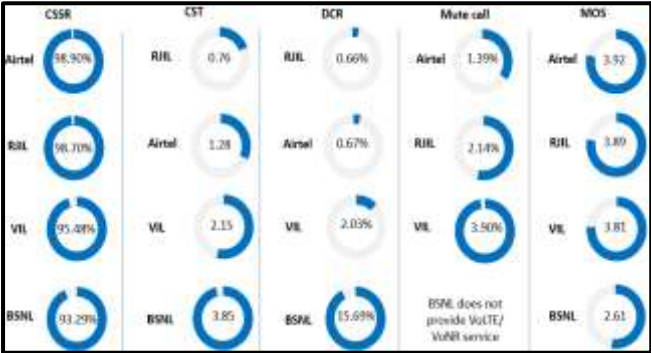
This route map indicates the routes covered in independent drive test in Una & Mandi City and nearby area under Himachal Pradesh LSA.

2. Performance against key QoS parameters:

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score

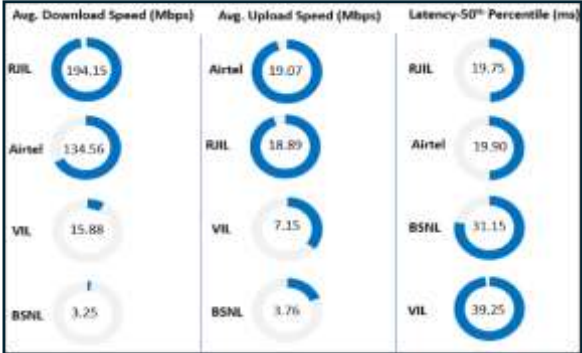

Summary-Voice services
Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 98.90%, 93.29%, 98.70% and 95.48% respectively in Auto-selection mode (5G/4G/3G/2G).
Call Setup Time: Airtel, BSNL, RJIL & VIL have call setup time of 1.28, 3.85, 0.76 and 2.15 seconds respectively in Auto-selection mode (5G/4G/3G/2G).
Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.67%, 15.69%, 0.66% and 2.03% respectively in Auto-selection mode (5G/4G/3G/2G).
Call Silence/Mute Rate: Airtel, RJIL and VIL have silence call rate of 1.39%, 2.14% and 3.90% respectively in packet switched network (4G/5G).
Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 3.92, 2.61, 3.89 and 3.81 respectively.

Summary-Data services

Data Download performance (Overall): Average download speed of Airtel (5G/4G/2G) is 134.56 Mbps, BSNL (4G/3G/2G) is 3.25 Mbps, RJIL (5G/4G) is 194.15 Mbps and VIL (4G/2G) is 15.88 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 19.07 Mbps, BSNL (4G/3G/2G) is 3.76 Mbps, RJIL (5G/4G) is 18.89 Mbps and VIL (4G/2G) is 7.15 Mbps.

Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 59.56   4G U/L: 18.20
          5G D/L: 572.97   5G U/L: 62.30
BSNL- 4G D/L: 5.27   4G U/L: 12.73
RJIL- 4G D/L: 59.52   4G U/L: 14.55
         5G D/L: 326.39   5G U/L: 53.38
VIL-   4G D/L: 14.30   4G U/L: 6.55

Note- "D/L" Download speed, "U/L" Upload speed

1. Drive test route Map: (Chikmagaluru City- Karnataka LSA)
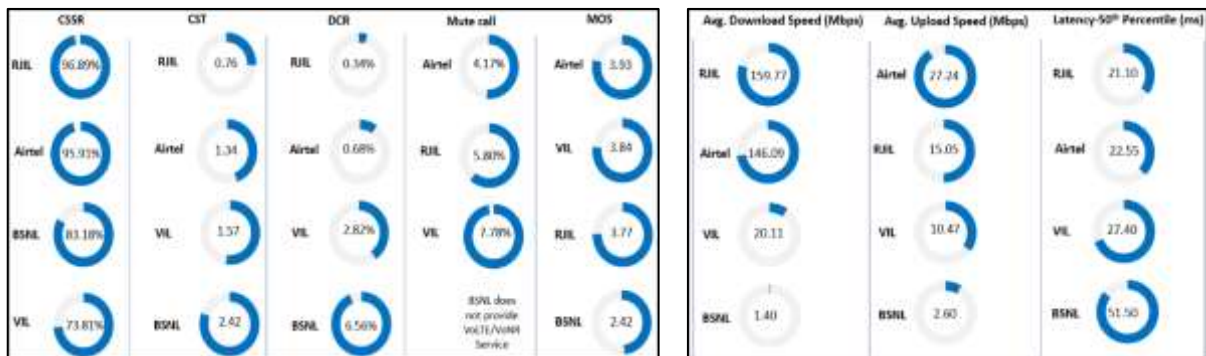
This route map indicates the routes covered in independent drive test in Chikmagaluru City under Karnataka LSA.	

Legends
City
Interoperator
Hotspot
Walk test
Highway

2. Performance against key QoS parameters:

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score

Summary-Voice services

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 95.91%, 83.18%, 96.89%, and 73.81% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL & VIL have call setup time of 1.34, 2.42, 0.76 and 1.57 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.68%, 6.56% 0.34% and 2.82% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, RJIL and VIL have silence call rate of 4.17%, 5.80% and 7.78% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 3.93, 2.42, 3.77 and 3.84 respectively.

Summary-Data services

Data Download performance (Overall): Average download speed of Airtel (5G/4G) is 146.09 Mbps, BSNL (4G/3G) is 1.40 Mbps, RJIL (5G/4G) is 159.77 Mbps and VIL (4G/2G) is 20.11 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G) is 27.24 Mbps, BSNL (4G/3G) is 2.60 Mbps, RJIL (5G/4G) is 15.05 Mbps and VIL (4G/2G) is 10.47 Mbps.
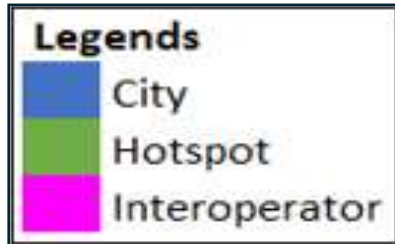
Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 25.70   4G U/L: 13.24
        5G D/L: 260.34   5G U/L: 38.00
BSNL- 4G D/L: 1.23   4G U/L: 5.44
RJIL- 4G D/L: 38.16   4G U/L: 6.76
        5G D/L: 137.86   5G U/L: 17.77
VIL-   4G D/L: 26.65   4G U/L: 15.86

Note- "D/L" Download speed, "U/L" Upload speed

1. **Drive test route Map:** (Chennai City- Tamil Nadu LSA)

This route map indicates the routes covered in independent drive test in Chennai City under Tamil Nadu LSA.	

2. **Performance against key QoS parameters:**

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion Score

Summary-Voice Service

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 100.00%, 94.03%, 100.00% and 100.00% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL and VIL have call setup time of 0.52, 1.74, 0.77 & 1.66 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.00%, 6.67%, 0.16% & 0.00% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 0.00%, 5.71%, 0.56% and 0.55% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 4.02, 2.94, 3.95 & 4.47 respectively.

Summary-Data Service

Data Download performance (Overall): Average download speed of Airtel (5G/4G) is 164.35 Mbps, BSNL (4G/3G/2G) is 4.44 Mbps, RJIL (5G/4G) is 283.41 Mbps and VIL (4G/2G) is 31.80 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G) is 37.11 Mbps, BSNL (4G/3G/2G) is 3.34 Mbps, RJIL (5G/4G) is 32.61 Mbps and VIL (4G/2G) is 18.57 Mbps.

Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 41.08   4G U/L: 14.56
          5G D/L: 142.27   5G U/L: 50.83
BSNL- 4G D/L: 6.55   4G U/L: 6.31
RJIL- 4G D/L: 52.41   4G U/L: 9.36
          5G D/L: 249.07   5G U/L: 26.61
VIL-   4G D/L: 54.57   4G U/L: 23.78

Note- "D/L" Download speed, "U/L" Upload speed

1. Drive test route Map: (Ayodhya city– UP (East) LSA)

This route map indicates the routes covered in independent drive test in Ayodhya city under UP (East) LSA LSA.

Legends for the Drive Tests route & area are as below

Legends
City
Interoperator
Hotspot
Walk Test

2. Performance against key QoS parameters:

CSSR: Call Setup Success Rate (in %), **CST:** Call Setup Time (in milli seconds), **DCR:** Drop Call Rate (in %) & **MOS:** Mean Opinion

Summary-Voice Service

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have call setup success rate of 99.62%, 97.05%, 100.00% and 98.87% respectively in auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL and VIL have call setup time of 1.21, 3.32, 0.68 & 0.59 seconds respectively in auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate of 0.00%, 0.36%, 0.19% & 0.00% respectively in auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, RJIL and VIL have silence call rate 0.56%, 0.25% & 2.48% respectively in packet switched network (5G/4G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 3.99, 2.57, 3.93 & 4.34 respectively.

Summary-Data Service

Data Download performance (Overall): Average download speed of Airtel (5G/4G) is 110.47 Mbps, BSNL (4G/3G) is 6.29 Mbps, RJIL (5G/4G) is 196.10 Mbps and VIL (4G/2G) is 54.69 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G) is 29.32 Mbps, BSNL (4G/3G) is 5.03 Mbps, RJIL (5G/4G) is 34.11 Mbps and VIL (4G/2G) is 20.07 Mbps.

Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 22.42   4G U/L: 6.86
       5G D/L: 109.90   5G U/L: 49.45
BSNL- 4G D/L: 5.34   4G U/L: 8.57
RJIL- 4G D/L: 58.56   4G U/L: 15.07
      5G D/L: 105.84   5G U/L: 42.64
VIL-   4G D/L: 58.37   4G U/L: 17.38

Note- "D/L" Download speed, "U/L" Upload speed

1. Drive test route Map: (Moradabad City and Highway: Dehradun to Badrinath – UP (West) LSA)

This route map indicates the routes covered in independent drive test in Moradabad City and Highway from Dehradun to Badrinath under UP (West) LSA.
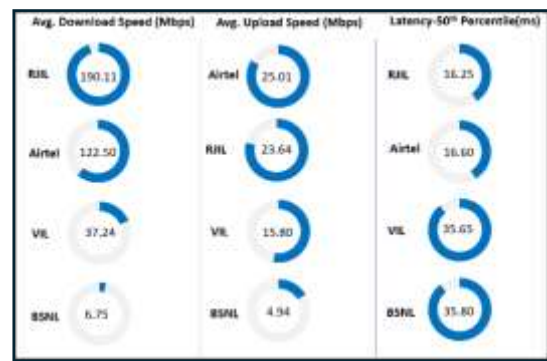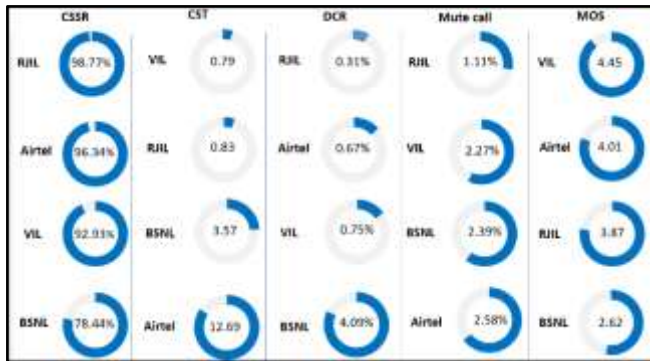Legends for the Drive Tests route & area are as below

Legends
City
Interoperator
Hotspot
Highway

2. ...... **key QoS parameters:**

...... Success Rate (in %), **CST:** Call Setup Time (in milli seconds ...... Rate (in %) & **MOS:** Mean Opinion

Summary-Voice services			

Summary-Voice services

Call Setup Success Rate: Airtel, BSNL, RJIL and VIL have 96.34%, 78.44%, 98.77% and 92.93% Call setup success rate respectively in Auto-selection mode (5G/4G/3G/2G).

Call Setup Time: Airtel, BSNL, RJIL & VIL have Call setup time of 12.69, 3.57, 0.83 and 0.79 seconds respectively in Auto-selection mode (5G/4G/3G/2G).

Drop Call Rate: Airtel, BSNL, RJIL and VIL have drop call rate 0.67%, 4.09%, 0.31% and 0.75% respectively in Auto-selection mode (5G/4G/3G/2G).

Call Silence/Mute Rate: Airtel, BSNL, RJIL and VIL have silence call rate 2.58%, 2.39%, 1.11% and 2.27% respectively in packet switched network (4G/5G).

Mean Opinion Score (MOS): Airtel, BSNL, RJIL and VIL have average MOS of 4.01, 2.62, 3.87 and 4.45 respectively.

Summary-Data services

Data Download performance (Overall): Average download speed of Airtel (5G/4G/2G) is 122.50 Mbps, BSNL (4G/3G/2G) is 6.75 Mbps, RJIL (5G/4G) is 190.11 Mbps and VIL (4G/2G) is 37.24 Mbps.

Data Upload performance (Overall): Average upload speed of Airtel (5G/4G/2G) is 25.01 Mbps, BSNL (4G/3G/2G) is 4.94 Mbps, RJIL (5G/4G) is 23.64 Mbps and VIL (4G/2G) is 15.80 Mbps.

Data performance - Hotspots (in Mbps):
Airtel- 4G D/L: 20.48   4G U/L: 13.89
       5G D/L: 274.99 5G U/L: 46.51
BSNL- 4G D/L: 10.06   4G U/L: 4.81
RJIL- 4G D/L: 24.95   4G U/L: 13.46
       5G D/L: 240.16 5G U/L: 36.99
VIL-   4G D/L: 33.43   4G U/L: 16.42

Note- "D/L" Download speed, "U/L" Upload speed