

QUALITY OF SERVICE OF TELECOMMUNICATION SERVICES IN NEPAL

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BACKGROUND

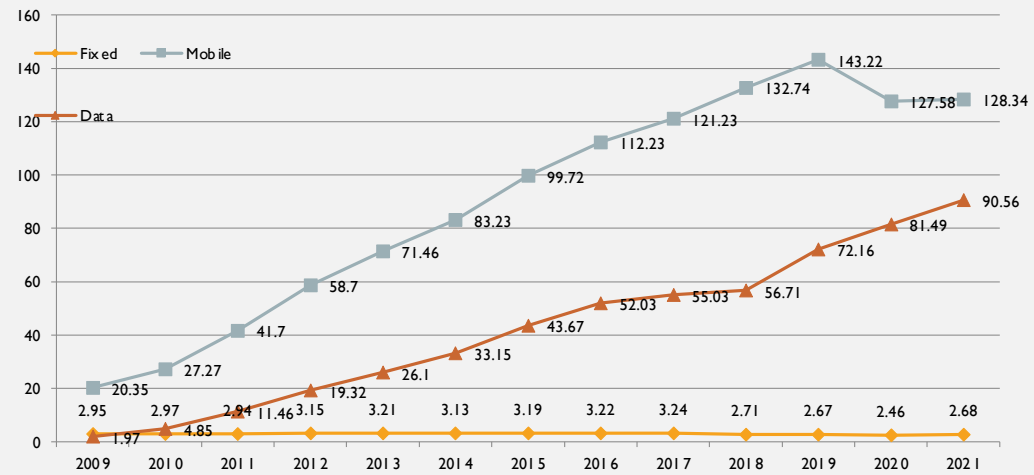
- Telecom/ICT as Key enabler /Tool for socioeconomic development in Cross cutting Sectors
- Every 10% increase in data tele-density increases the GDP of a state increases by 1.3%
- 15th National Plan[076/77-080/81] recognizes Prosperous Nepal, Happy Nepali; Digital Nepal Framework
- Telecom Policy,2060(with amendment 2069),Broadband Policy,2071, ICT Policy 2072, Digital Nepal Framework,2076
- Emerging Technologies: 5G,Optical Fiber-FTTx, IoT,AI

OPERATORS AND TELEDENSITY

S. No.	Name of Services	No. of Licensee
1.	No. of Voice Operators	6
2.	No. of Mobile Operators	4
3.	No. of ISPs	135
4.	Network Service Provider	21
5.	Total No. of Operators	203

S. No	Services	Subscription (%)
Voice		
1.	Fixed	2.81
2.	Mobile	142.68
3.	Total	145.50
Broadband Internet		
1.	Fixed Broadband(Wired)	30
2.	Fixed Broadband (Wireless)	0.40
3.	Mobile Broadband	98.46
Total		128.86

SERVICE GROWTH

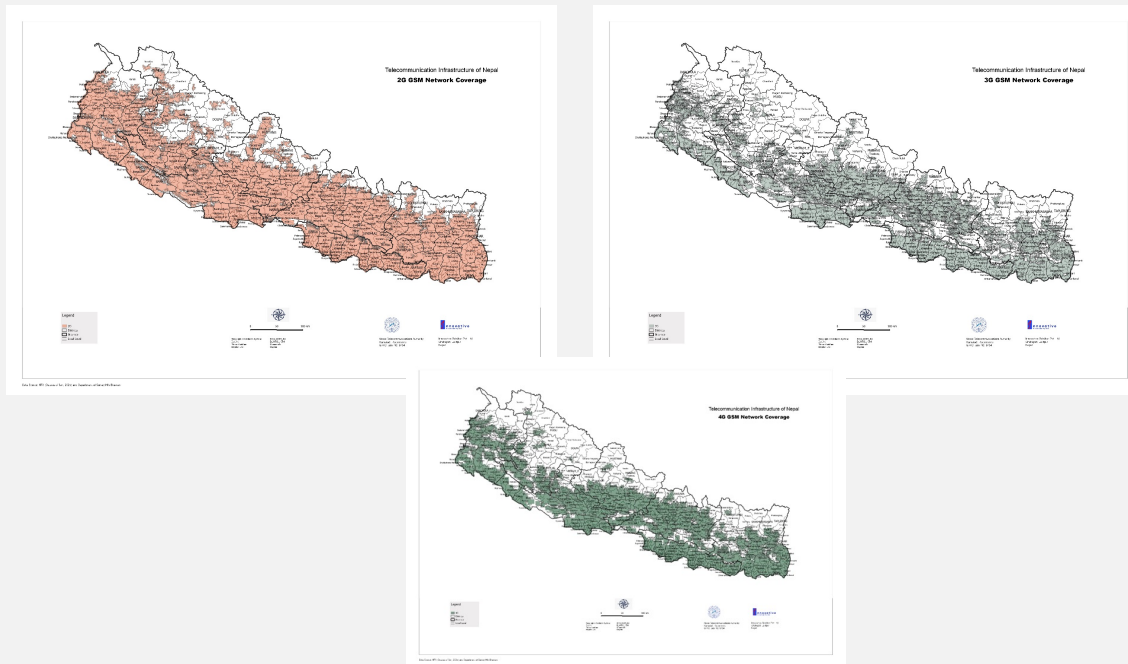


BROADBAND STATISTICS

Services		Subscribers					Total
		NDCL	UTL*	NCELL	STPL	ISPs	
Fixed Broadband (Wired)	ADSL #	500,757	-	-	-	-	500,757
	Cable/ FTTH #	761,111	-	-	-	74,94,867	82,55,978
	Internet Lease Line	1,163	-				1,163
Fixed Broadband (Wireless)	Radio(Wi-Fi) #		-			88538	88,538
	Wi MAX #	27,181	-		-		27,181
Mobile Broadband	3G	9,482,580	-	2,020,586			11,503,166
	4G	10,421,976	-	6,522,019	1,59,446	-	17,103,441
	EVDO	136,573	-				136,573
Total		21,331,341		8,542,605	1,59,446	7,583,405	37,616,797
Services						Subscription (%)	
Fixed Broadband (Wired) #						30.00	
Fixed Broadband (Wireless) #						0.40	
Mobile Broadband						98.46	
Total Broadband (%)						128.86	

Note: Data/Internet Service through GPRS Service is excluded in Broadband Subscription.
 # 1 Connection equal to 4.32 subscribers for fixed broadband (Source : cbs.gov.np)

2G,3GAND 4G COVERAGE MAP



TELECOM INFRASTRUCTURE

OFC Related Data (Nov. 2020)

Operators	in Km
NTC	7200.834
Ncell	2795.9
UTL	84.5
Total	10081.234

VSAT Terminals (2022 June)

Operators	No of VSAT Terminals
NDCL	206
Ncell	11
NSTPL	51

MW links (2022 June)

Operators	NO of links
NDCL	3198
Ncell	3066
Smart	516
UTL	131
NSTPL	148

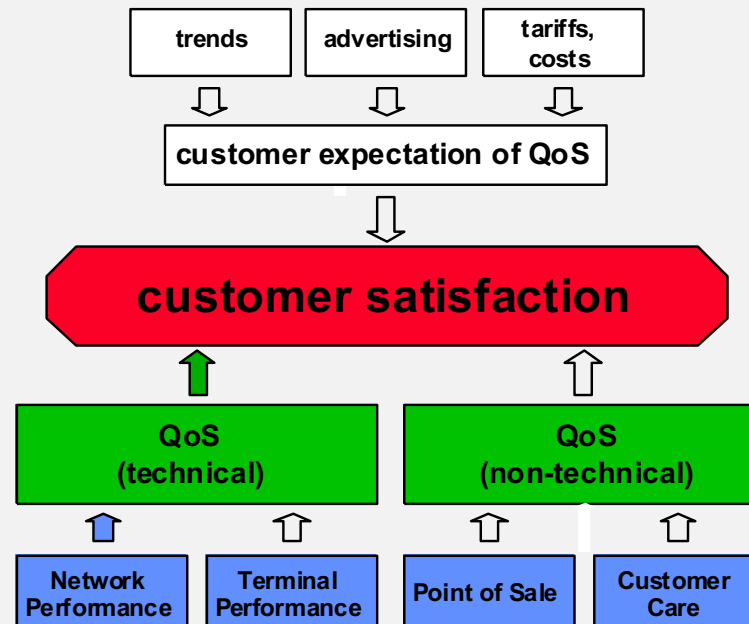
BTS Tower (2022 June)

Operators	Tower Total	2G	3G	4G
NTC	4407	3358	3025	3901
Ncell	3670			
Smart	593	236		357
Total	8670			

QUALITY OF SERVICE AND QUALITY OF EXPERIENCE

- The totality of characteristics of a telecommunications service that bear on its ability to satisfy stated and implied needs of the user of the service
- Characteristics of service can be measured by objective means(KPI)
 - level meter
 - delay counter
 - etc.
- User Perception of quality not limited to the objective characteristics only
- For end users counts the quality that they personally experience (QoE) during their use of a telecommunication service

FACTORS AFFECTING QOS/QOE



LEGAL PROVISIONS RELATED TO QOS

- NTA issued the “Bylaw regarding telecommunication services 2017” using the right provided by the telecommunication act 2053 section 13(f)
- Bylaw identifies the major KPIs and stated the threshold for each
- Provision of regular monitoring via drive test in every quarter for assurance of KPIs compliance
- Sampling monitoring and publication of test results from regulator
- NTA issues a clear instruction to abide by the threshold stated in bylaw in case when operators are not maintaining the quality
- Provision of penalties and compensation for not maintaining the quality
- EXTREME CASE: cancellation of license

VOICE SERVICE RELATED KPI

S.No.	KPIs	Minimum Standard	Measurement Process Technique
For Basic Telecommunications, Basic Telephone and Mobile Service			
1.	Network Downtime	<=1%	Average over a month
2.	Call Connection Time	<=5 Sec	Average over a month
3.	Call Drop Ratio	<=2%	Average over a month
4.	Mean Opinion Scope(MOS)	>=3	As per the ITU-T P.862 as prescribed by the Authority
5.	Intra-Network Call Connection Loss	<=1%	Measured in Busy Hour with min. of 2min interval between two calls with min. of 30 calls per trunk area
6.	Inter-Network Call Connection Loss	<=1%	Measured in Busy Hour with min. of 2min interval between two calls with min. of 30 calls per trunk area
For Mobile Service Only			
1.	Mobile Network Accessibility)	>=99%	Measured through DT as prescribed from the Authority
2.	GoS	<=2%	Measured average over a month

DATA SERVICE RELATED KPI

S.No.	KPIs	Minimum Standard	Measurement Process Technique
For Internet Service Only			
1	Service Activation and Provisioning	> = 95%	Average over a month with service activation within 4 hours
2.	Data Download Success Rate	>=80%	Average over a month Period
3 .	Data Upload Success Rate	>= 75 %	Average over a month Period
4.	Throughput	>=75%	Average over a month in reference to the procured speed
5.	Data Latency	<=250 ms	Average over a month Period
Billing & Customer Complain			
S.No.	KPIs	Minimum Standard	Measurement Process Technique
1.	Billing Performance	Billing Dispute: <=2% Billing Compliant Resolution: - 15 Working Days >= 90 % - 30 Working Days >=95%	Considered during the Billing period or Transaction based upon the total dispute and complaint resolution cases
2.	Complaints Resolution	>=95%	Average over a month period

QOS ISSUES IN BROADBAND INTERNET

- Broadband Internet Service is sold by ISPs on an 'up-to' basis
- Fair Usage Policy
- In practice, there is a disparity between the speed advertised by ISPs and the actual speed achieved by subscribers
- Many Subscribers are not aware of the technical constraints affecting performance of Internet service
- Subscribers also not adequately empowered to make informed choices when entering into SLA with ISPs
- Mismatch in expectation of Internet users- leading to frustration and dissatisfaction

CHALLENGES

Difficult terrain:

- Very difficult to roll out networks
- Signal coverage issues

Rural area- Low population density

- Low number of users
- Economic viability
- Affordability

Lack of Inter organization Coordination

- Network Disruption due to road extension or any construction
- Dependency on other (NEA) for Trunk
- Issue of RoW

Lack of infrastructure

- No electricity or road in many sites
- Issues in sustainability of network

Affordability-Low per capita

- Quality comes with cost
- Maximum consumer cannot afford
- Infrastructure Sharing may reduce the cost

Consumer Awareness

- Low digital literacy
- Digital Divide

NTA'S RECENT STEPS TO MAINTAIN THE QOS

- **Accessibility**
- RTDF funded broadband access network projects
- RTDF funded Backbone network Projects

- **Service Monitoring**
- NTA Speed Test App
- MRTG/Customer Portal
- Regular QoS Measurement through Drive Test and OSS
- Drive test based service monitoring in Province 1, Madhesh and Gandaki
 - Planning to assess the QoS of Fixed Broadband Internet Services and Telecommunication services all over Nepal
- **Customer Support**
- Complaint Handling System
- Provision of Toll Free No
- Provision of Automatic Ticketing System for Support & Maintenance

- **Monitoring System Procurement Plan**
- Benchmarking Tools
- Probing based QoS Measurement
- **Regulation**
- QoS Regulation framework for 4G and 5G Services
- Issued SOPs for Drive test, OSS based QoS measurement system for telcos
- About to issue SOP to assess fixed broadband internet services
- Issued Guideline for CPE devices
- Review in QoS bylaw undergoing

- **Consumer Awareness**
- Series of interaction programs in all

THANK YOU !!