

## **Chapter 8**

# **BSNL WiMax Deployment Strategies**

## **BSNL Wi-MAX Deployment Strategies**

### **1.0 Introduction**

BSNL is the first telecom service provider in India to provide Wi-MAX services. Wi-MAX technology provides fixed as well as fully mobile high speed broadband connectivity along with roaming feature. It provides users a thrilling Internet browsing experience. Initially, BSNL deployed its own network in certain circles but later on it has gone with franchisee model wherein the franchisee shall share revenue with BSNL. The franchisee shall install, operate and maintain the network alongwith marketing of Wi-MAX services while BSNL shall provide infrastructure like space, power, media, spectrum etc.

In this chapter, following topics shall be covered:-

- Wi-MAX services offered by BSNL
- Wi-MAX spectrum allotted to BSNL
- Wi-Max deployment options
- BSNL Wi-MAX deployment strategies
- Wi-MAX deployments status in BSNL
- Wi-MAX connections status
- Wi-MAX numbering scheme
- Wi-MAX tariffs plans

#### **Learning objectives:-**

At the end of the chapter, the participants will be able to understand Wi-MAX services offered by BSNL, deployment strategies adopted by BSNL, status of Wi-MAX deployments in BSNL, Wi-MAX numbering scheme, Wi-MAX tariffs plans etc.

### **2.0 Wi-MAX services offered by BSNL**

BSNL offers following services through Wi-MAX technology:-

- High speed broadband connectivity upto 7 Mbps
- Leased Lines
- VPN Services
- Web based Video Conferencing

BSNL Wi-MAX services have many advantages like:-

- Data Download/Upload at very high speed upto 7 Mbps
- Superior Performance
- World's latest wireless broadband technology
- Very low cost and low starting tariff
- Wide range of user friendly tariff plans

BSNL offers large variety of Customer Premises Equipments (CPEs) including Outdoor, Indoor and USB dongles from which customers can choose as per their application requirements.

- **Indoor :** Indoor CPE is best suited for Home/Office users. It can be used in moving vehicle also.
- **Dongle:** Small Dongle can be connected directly to PC / Laptop via USB port.
- **Outdoor:** Outdoor CPE is suitable for remote and rural areas. It can be used upto 15 Km distance (Line of sight) from BTS site depending upon RF environment.

The coverage distance of different types of CPEs is as under:-

Sr. no.	RF environment	CPE type	Coverage (Approx. cell radius in Km )
	Urban	USB Dongle	1.5 (non-LoS)
	Urban	Indoor CPE	2.5 (non-LoS)
	Urban	Outdoor CPE	8 (Line of Site)
	Rural	Outdoor CPE	15 (Line of Site)

### 3.0 Wi-MAX Spectrum allotted to BSNL

DoT allotted Broadband Wireless Access (BWA) spectrum to BSNL as per its policy announced in August, 2008. The spectrum allotted to BSNL for provisioning of Wi-MAX services is as under:-

- (a) **20 MHz (2x10 MHz) in FDD mode** for Gujarat, Maharashtra and Andhra Pradesh Circles:-

2535 MHz to 2540 MHz uplink  
2540 MHz to 2545 MHz downlink

2635 MHz to 2640 MHz uplink  
2640 MHz to 2645 MHz downlink

- (b) **20 MHz in TDD mode** for rest of Circles  
2645 +/- 10 MHz with 2645 MHz being the central frequency

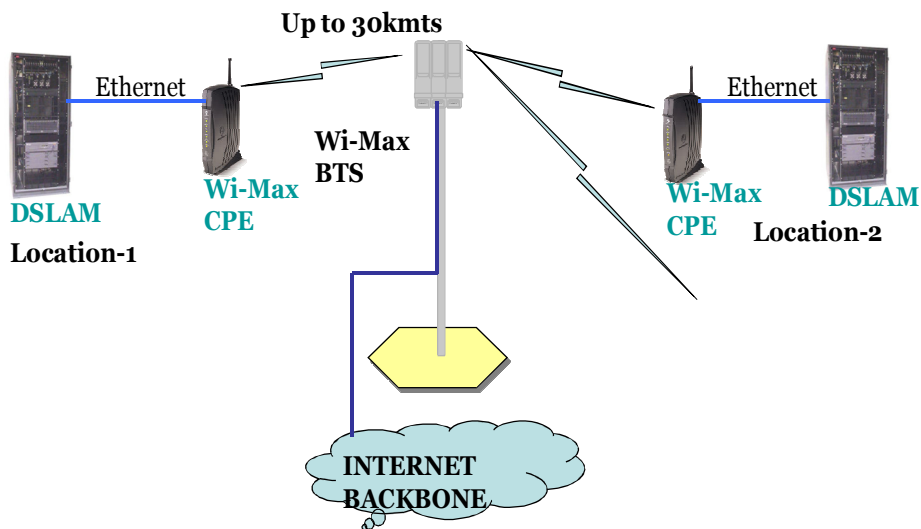
#### 4.0 Wi-MAX deployment options

Wi-MAX systems can be deployed by service providers for various applications like:-

##### 4.1 Wi-MAX as backhaul for remote DSLAM

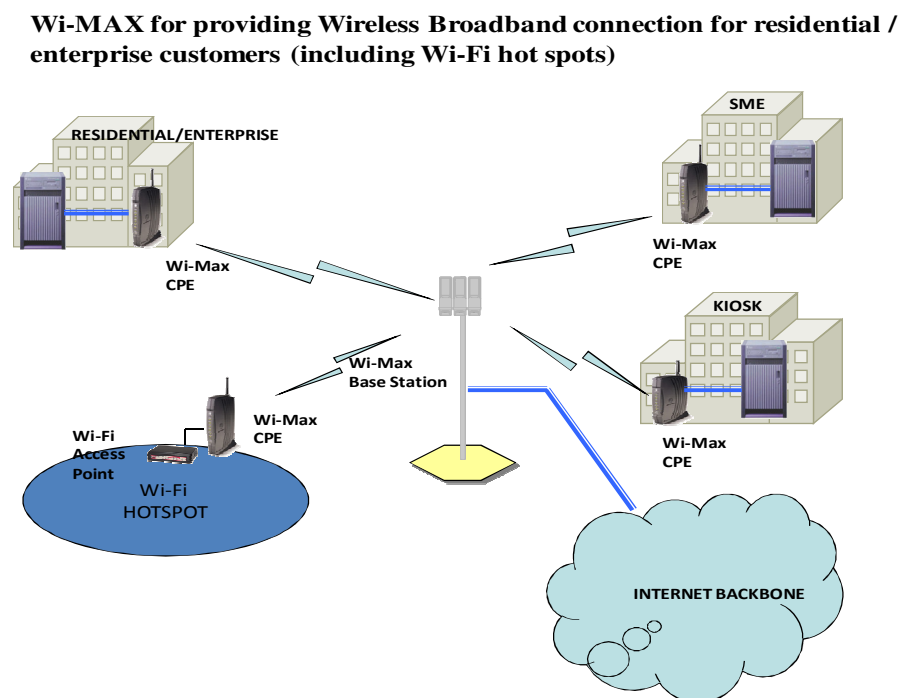
Wi-MAX system can be used as backhaul for remote DSLAM connectivity as shown in the figure below. The users are serviced by DSLAM located in the vicinity of users. The DSLAM aggregates internet traffic and sends it to Wi-MAX CPE generally co-located. The CPE carries DSLAM traffic to internet network through Wi-MAX BTS located at a distance upto 30 KM from CPE location.

Use of Wi-MAX as backhaul for Remote DSLAM



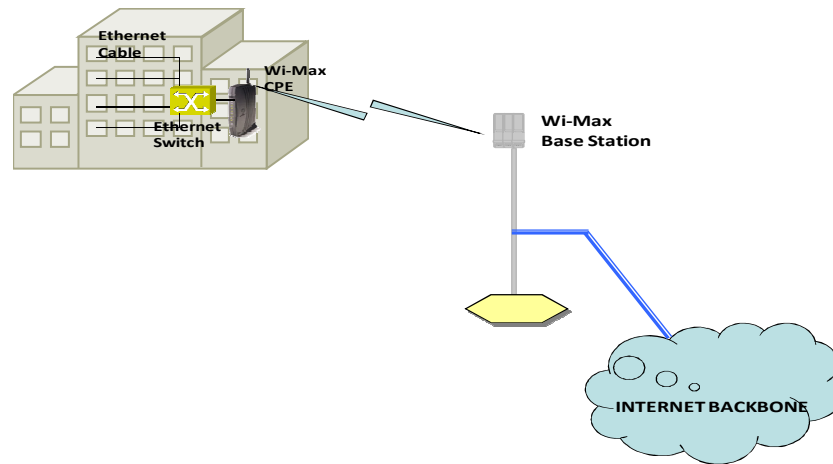
#### 4.2 Wi-MAX for wireless broadband connection to residential / Enterprise customers (including Wi-Fi Hot Spots)

Wi-MAX system is used for providing wireless broadband connections to residential customers, enterprise customers, small & medium enterprise customers, Info-kiosks etc as shown in the diagram given below. Wi-MAX also finds application in providing wireless broadband connectivity to Wi-Fi Hot Spots in a in-building or campus areas. The Wi-Fi access point is connected to the CPE.

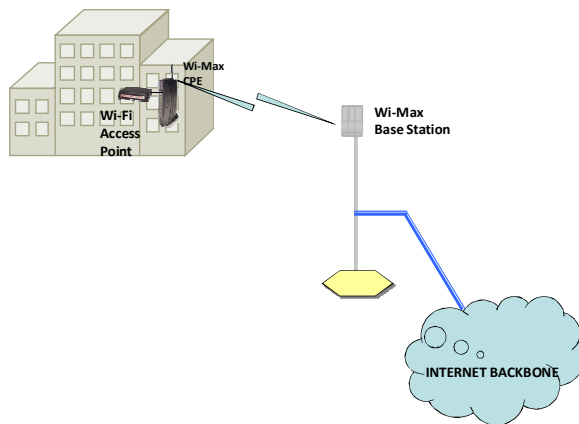


#### 4.3 Wi-MAX for Broadband connection for Enterprise customers (LAN cases)

The Wi-MAX technology can also be used to provide broadband connections to enterprise customers having their own local area network within the campus/buildings. The Wi-MAX CPE is connected to the LAN switch. The LAN users can access the broadband services/internet through the Wi-MAX network. The diagram for showing Wi-MAX connectivity to LAN switch in the premises of enterprise customers can be seen on the next page.

**Use of Wi-MAX for Broadband connection to residential/enterprise customers (LAN cases)****4.4 Use of Wi-MAX as backhaul of Wi-Fi Hot Spots**

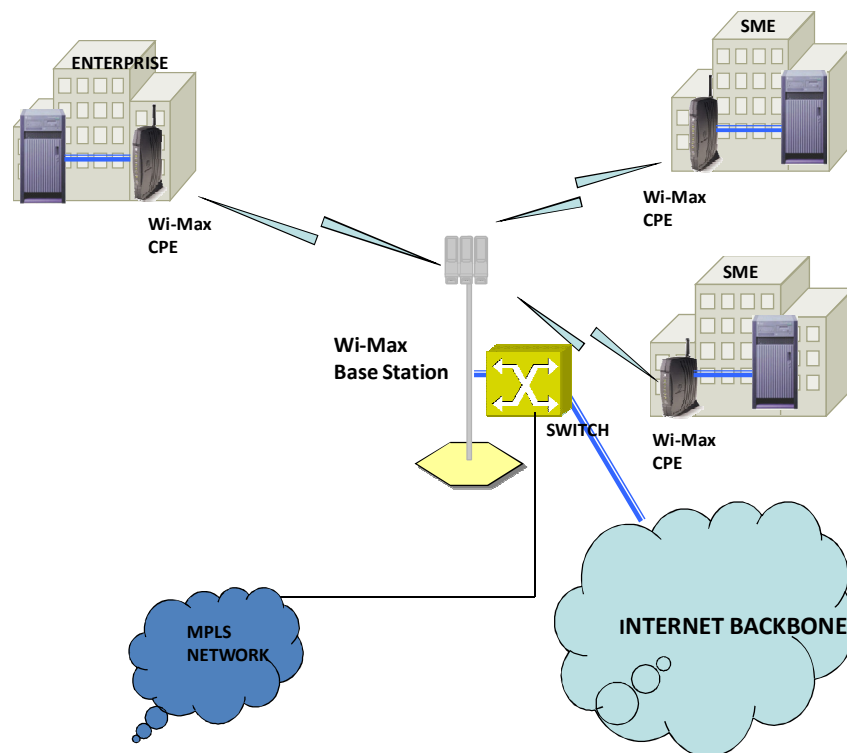
Wi-MAX technology can also be used as backhaul of Wi-Fi Hot Spots. The users are provided wireless connections through Wi-Fi access points in a building/premise. The Wi-Fi access point aggregates the traffic from different users and the combined traffic is transported to Internet backbone through Wi-MAX backhaul link.

**Use of Wi-MAX as a backhaul for WI-FI hot spots**

#### 4.5 Wi-MAX for providing MPLS-VPN connectivity

The Wi-MAX technology can also be used to provide MPLS-VPN connectivity to various offices of an enterprise customer so as to form a VPN network. In such applications, the Wi-MAX technology is being used as a last mile connectivity option to various locations of the customer.

#### Wi-MAX for providing MPLS-VPN connectivity



#### 5.0 BSNL Wi-MAX deployment strategies

BSNL has been the first operator to deploy Wi-MAX technology in India. The various deployment strategies adopted by BSNL for Wi-MAX technology are as under:-

- Wi-MAX trial project.
- Deployment in rural areas as project under Department of Information Technology (DIT).
- Own deployments by BSNL in Punjab and Kerala Circles.

- Deployment through M/s Soma Network in Gujarat, Maharashtra and Andhra Pradesh Circles on revenue sharing basis.
- In remaining 16 LSAs, deployment is through franchisee on revenue sharing agreement basis through Expression of Interest.

### **5.1 BSNL trial project**

BSNL undertook a trial project on Wi-MAX in year 2006 by placing an order on M/s Motorola. The high lights of the project were as under:-

- 8 Wi-MAX BTS were installed at Bangalore, Kolkata, Pune, Ahmedabad, Hyderabad, Pinjore, Rohtak and Panipat.
- BTS at Pinjore, Rohtak and Panipat were meant for rural applications.
- 120 CPEs were procured for urban and rural applications.
- Customers were allowed to procure own CPEs (Aperto make only).
- Frequency spectrum used 3.3 - 3.4 Ghz.
- Each BTS designed to provide upto 36 Mbps bandwidth.
- Each CPE could provide up to 10 Mbps speed.
- BTS to serve upto 30 Km (LoS) and upto 2 Km (non-LoS).
- Tariff was same as broadband connection.

### **5.2 Wi-MAX Rural Phase-I Project**

BSNL has undertaken deployment of Wi-MAX in rural areas as a project to provide broadband connectivity to Rural Common Service Centres being set up by Central/State governments in different blocks throughout the country. This project is funded by Department of Information Technology, Government of India. The high lights of the project are as under:-

- The project aims to provide wireless broadband connectivity to 11666 Rural Common Service Centres (CSCs) in 1000 Blocks throughout the country.
- Southern Telecom Project Circle, Chennai was authorized for Execution of the Project.
- A Purchase Order to M/s HCL Infosystems Ltd was issued for North and East areas for supply, installation and commissioning of 592 BTS and core equipments.



- Another Purchase Order to M/s Gemini Communications Ltd was issued for South and West areas for supply, installation and commissioning of 408 BTS and core equipments.
- The supplier's scope includes supply, installation, commissioning and Maintenance.
- BSNL has to provide Infrastructure like space, power, tower, media etc.
- Services have been launched in phases from December, 2009 onwards

The status of Wi-MAX Rural Phase-I project as on 31.03.2011 is shown in the table given below:-

#### **Status of Wi-MAX Rural Phase-I project as on 31.03.2011**

<b>S. No.</b>	<b>Company</b>	<b>BTS delivered</b>	<b>BTS installed</b>	<b>BTS integrated</b>	<b>AT offered</b>	<b>AT done</b>	<b>Circles covered</b>
1.	M/s HCL	592	592	585	565	501	AS/JKD/MP/NE-I&II/UP(E)&(W)/WB/CHGR/HR/BR/PB/UTRL/HP/RJ
2.	M/s Gemini	408	385	344	320	158	TN/KTK/AP/MH/GJ/OR
	<b>Total</b>	<b>1000</b>	<b>977</b>	<b>829</b>	<b>865</b>	<b>659</b>	

### **5.3 Wi-MAX Rural Phase-II Project**

BSNL has also undertaken another Wi-MAX rural project known as Rural Phase-II. This project is also funded by DIT. The highlights of the project are as under:-

- The project aims to install 6851 BTSs for providing wireless broadband connectivity to cover 51000 Rural Common Service Centres.
- The Purchase Orders have already been issued to M/s Gemini (for 2707 BTS), M/s ICOMM (for 1357 BTS) and M/s ZTE (for 1718 BTS).
- Advance Purchase Order (APO) has been issued to M/s VMCL (for 1069 BTS).

The status of Wi-MAX rural phase-II project as on 31.03.2011 is shown in the table on next page:-

**Wi-MAX Rural Phase-II BTS Status on 31.03.2011**

S. No.	Company	No of BTS to be delivered	BTS delivered	BTS installed	BTS integrated	A/T offered	A/T done	Circles covered
1.	M/s Gemini	2707	50	0	0	0	0	PB/HR/RJ/ GJ/MH/MP /CHGR
2.	M/s ICOMM	1357	678	585	0	0	0	UP(W)/AS/ WB/UTRL/ KTK/AP/TN
3.	M/s ZTE	1718	1498	999	592	0	0	BR/JKD/UP(E)
4.	M/s VMCL	APO issued for 1069 BTS in October, 2010						CHTD/OR/HP /NE-I&II/J&K
	<b>Total</b>	<b>6851</b>	<b>2226</b>	<b>1584</b>	<b>592</b>	<b>0</b>	<b>0</b>	

**5.3 Services to be provided from CSCs**

The following services are proposed to be delivered through Common Service Centres:-

- Payment of utility bills
- Issue of birth certificates
- Land records
- All applications associated with e-governance projects of State Governments
- Video conferencing enabling tele-medicine and tele-education
- High speed internet browsing

**5.4 BSNL Urban project for Kerala & Punjab Circles**

BSNL has its own Wi-MAX deployments in Kerala and Punjab Circles. The main features of the Wi-MAX urban project undertaken by BSNL in these two circles are as under:-

- Purchase Order for supply of 450 BTS was awarded to M/s ICOMM under Wi-MAX Urban Project (Kerala).
- Wi-MAX services were launched on 27.02.2010 at Ernakulum in Kerala.
- Other parts of Kerala Circle are being covered gradually as per BTS deployments.
- Purchase Order for supply of 350 BTS was awarded to M/s Huawei under Wi-MAX Urban Project (Punjab).

- Wi-MAX services were launched on 31.03.2010 in 22 cities/towns of Punjab Circle.

The status of Wi-MAX urban deployment as on 31.03.2011 is shown in the table given below:-

#### **Urban Wi-MAX BTS Status as on 31.03.2011**

S. No.	Company	BTS delivered	BTS installed	BTS integrated	AT offered	AT done	Circles covered
1.	M/s Huawei	350	346	341	341	333	Punjab
2.	M/s ICOMM	450	450	449	449	444	Kerala
	Total	800	796	790	790	777	

#### **5.5 Wi-MAX deployments through M/s SOMA Networks**

BSNL had entered into a franchisee agreement with M/s Soma Networks for Wi-MAX deployments in Gujarat, Maharashtra and Andhra Pradesh Circles. The salient points of the project are as under:-

- It is an agreement based on revenue share model.
- A total of 3,000 Base Stations are to be deployed in Gujarat, Maharashtra and Andhra Pradesh.
- Wi-MAX services were launched in Gujarat in January, 2009.
- Wi-MAX services were launched in Andhra Pradesh and Maharashtra in April, 2009.

#### **5.6 Franchise Agreements for Wi-MAX deployments**

In October/November,2010, BSNL has signed franchisee agreements with following companies to deploy Wi-MAX network on franchisees basis:-

- With M/s Teracom for Karnataka, Rajasthan and Bihar Circles.
- With M/s Take Solutions for Tamil Nadu, UP (W) and Orissa Circles.
- With M/s Starnet for Chennai District and H. P. Circles.

The salient features of the franchisee agreements are as under:-

- It is based on revenue share model.

- Equipment installation, O & M, Marketing etc. are to be carried out by the concerned Franchisee.
- BSNL has to provide power, space, media and Bandwidth.
- Franchisees are required to launch services after six months of the signing of agreement i.e. April/May, 2011.

STP, Chennai has floated Expression of Interest (EoI) for West Bengal, Assam, North-East, J & K, Kolkata and M. P. Circles. The bids are to be opened in April/May, 2011.

LOI for rollout of Wi-MAX services in Haryana Circle was cancelled.

### 5.7 Rollout Obligation of Franchisees

Agreements with franchisees are being entered into from time to time. As per agreement, rollout schedule in terms of capacity and number of subscribers is given below for Type “A”, Type “B” and Type “C” circles:-

LSA : Metro or A type	CUMULATIVE CAPACITY NUMBERS					
	On the day of Comm. Launch of Services	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
Total Aggregate Capacity	5000	200000	500000	800000	900000	1000000
No of Subscribers Provisioned	0	45000	180000	399000	720000	900000

LSA : B type	CUMULATIVE CAPACITY NUMBERS					
	On the day of Comm. Launch of Services	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
Total Aggregate Capacity	4000	160000	400000	640000	720000	800000
No of Subscribers Provisioned	0	30000	120000	270000	480000	600000

LSA : C type	CUMULATIVE CAPACITY NUMBERS					
	On the day of Comm. Launch of Services	End of Year 1	End of Year 2	End of Year 3	End of Year 4	End of Year 5
Total Aggregate Capacity	2000	80000	200000	320000	360000	400000
No of Subscribers Provisioned	0	12000	48000	108000	192000	240000

**Metro/A type LSAs:** - Chennai, Kolkata, Tamilnadu, Karnataka

**B Type LSAs:** - Haryana, Rajasthan, MP (MP Circle & Chattisgarh Circle), UP (East), UP (West) (UP (W) and Uttarakhand), West Bengal (West Bengal, Andman & Nicobar & Sikkim State)

**C Type LSAs:** - Himachal Pradesh, Bihar (Bihar & Jharkhand Circle), Orissa, Assam, J & K, North East States (Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Manipur and Tripura )

## **6.0 Wi-MAX connections status as on 31.03.2011**

The working connection status as on 31.03.2011 is shown below:-

- No. of Wi-Max connections (BSNL): 10702
- No. of Wi-MAX connections (SOMA): 3124
  - Leading Circles for BSNL
    - Punjab Circle : 4524
    - Kerala Circle : 3177
  - Leading Circles for SOMA
    - Gujarat Circle : 2205
    - Maharashtra Circle: 667

## **7.0 Wi-MAX numbering scheme**

BSNL Corporate office vide its letter no. MOB-6/Wimax/2011/01 dated 05.04.2011 has standardized a numbering scheme to be followed for Wi-MAX customers. The salient points of the numbering scheme are as under:-

- Wi-MAX subscribers are to be identified by 10 digit alpha-numeric number.
- The first character to signify the Circle to which subscriber belongs as given in the table on next page.
- The next character would be either B or F, with B signifying BSNL connection and F signifying Franchisee connection.

- The next character would be either 1 or 2, with 1 signifying Post-paid and 2 signifying Pre-paid connections.
- Next seven characters on position 4 till 10 will be numeric and would represent the unique number allotted to the subscriber.

**Allotment of codes to Circles for Wi-MAX numbering scheme**

Sl. No.	Name of Circle	Alphabet Fixed
1	Andhra Pradesh	A
2	Bihar	B
3	Chattisgarh	C
4	Andaman & Nikobar	D
5	UP(East)	E
6	Jharkhand	F
7	Gujrat	G
8	Haryana	H
9	Himachal Pradesh	I
10	Jammu & Kashmir	J
11	Kolkata TD	K
12	Kerela	L
13	Chennai TD	M
14	North East I	N
15	Orissa	O
16	Punjab	P
17	North	Q
18	Rajasthan	R
19	Assam	S
20	Tamilnadu	T
21	Uttranchal	U
22	West Bengal	V
23	UP West	W
24	Karnataka	X
25	Madhya Pradesh	Y
26	Maharashtra	Z

**8.0 Wi-MAX Tariff Plans**

To meet varying requirements of different users, BSNL offers variety of user friendly tariff plans for Wi-MAX services which are as under:-

- CSC Tariff Plans
- Urban Tariff Plans
- Rural Tariff Plans

**CSC Post-Paid Tariff Plans**

Particulars	WI CSC 400	WI CSC 1000	WI CSC UL 999	WI CSC UL 1500
Bandwidth	512Kbps to 2 Mbps		512 Kbps	512 Kbps
Fixed monthly charges (Rs.)	400	1000	999	1500
Free data usage limit/month	4 GB	8 GB	Unlimited	Unlimited
Usage charges beyond free limit (Rs./MB)	0.60	0.40	NA	NA
Free E-mail IDs and space	One E-Mail ID with 5 MB space			
Security deposit	One month FMC			

**Wi-MAX Urban Tariff Plans-I**

Particulars	WI 220	WI 350	WI 750	HOWI 999
Bandwidth	512 Kbps to 2 Mbps			
FMC	220	350	750	999
Discounted annual payment option	2200	3500	7500	9990
FMC for I/D & O/D CPE	50	50	50	50
FMC for USB dongle	40	40	40	40
Free usage/month	400 MB	1 GB	4 GB	Unlimited
Usage charges beyond free limit (Rs./MB)	0.80	0.80	0.80	NA
Free E-mail ID/space	1/5 MB	1/5MB	1/5 MB	2/5 MB
SD	One month FMC			

**Wi-MAX Urban Tariff Plans-II**

Particulars	BUWI UL 1999	BUWI UL 3500	BUWI UL 7000
Bandwidth	512 Kbps-2 Mbps	1 Mbps	2 Mbps
FMC	1999	3500	7000
Discounted annual payment option	19990	35000	70000
FMC for I/D & O/D CPE	40	40	40
FMC for USB dongle	30	30	30
Free usage/month	Unlimited	Unlimited	Unlimited
Usage charges beyond free limit (Rs./MB)	NA	NA	NA
Free E-mail ID/space	4/5 MB	2/5MB	2/5 MB
SD	One month FMC		

**Wi-MAX Rural Tariff Plans-I**

Particulars	Rural USO 140	Rural USO 210
Bandwidth	256 Kbps	256 Kbps
FMC	140	210
Download/Upload limit	4 MB	1 GB
Usage charges beyond free limit (Rs./MB)	0.60	0.60
FMC for rent of CPE	220 for Indoor, 260 for Outdoor, 150 for USB	



**Wi-MAX Rural Tariff Plans-II**

Particulars	Unlimited Wi-MAX 256 Kbps
Bandwidth	256 Kbps
One time installation charges	Rs. 750
FMC	1000
Discounted annual payment option	100000
Free E-Mail IDs/space	2/5 MB
Download/Upload limit	Unlimited
Security deposit	One month FMC

**Wi-MAX pre-paid tariff plans:** BSNL has also introduced Wi-MAX pre-paid tariffs plans which are:-

- Volume based prepaid recharge vouchers for unlimited speed
- Top up vouchers for volume based plans
- Validity vouchers for volume based plans

## 9.0 Conclusion

Wi-MAX is a promising broadband wireless access technology. Since BSNL has been the first operator in India to roll out Wi-MAX services, we should capitalize this head start and first mover advantage to garner as much as market share as possible. After completion of Broadband Wireless Access (BWA) spectrum auction by DoT, other operators are likely to roll out broadband wireless services soon. Therefore, BSNL as an organisation needs to gear up itself so as to be ready to face stiff competition ahead.

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