Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Spectrum and Service Rules for Ancillary	)	IB Docket No. 07-253
Terrestrial Components in the 1.6/2.4 GHz	)	RM-11339
Big LEO Bands	)	

COMMENTS OF OPEN RANGE COMMUNICATIONS, INC.

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Summary

Open Range Communications supports Globalstar's request to expand its existing ATC authority to encompass all of the L-Band and S-Band MSS spectrum which it does not share with other terrestrial or MSS licensees. Open Range has designed a rural broadband network that will eventually provide 50 million rural Americans portable and mobile broadband services that rival or exceed the services available in urban areas. The network takes advantage of economies of scale, state of the art technology, and deployment strategies to bring to rural Americans broadband services that have been unavailable in the past. Open Range intends to work with Globalstar to deploy this network using ATC spectrum so that service will be available not only in rural communities but at any location between those communities as well.

To make this network deployment possible Globalstar will require that the Commission grant access to all of the available unshared spectrum on which it is licensed to provide MSS services. There is no reason to reduce the grant of ATC authority based on interference concerns. Standard interference mitigation techniques such as filtering and synchronization, employed by the industry for many years, can be used to avoid interference. Open Range urges the Commission to grant Globalstar expanded ATC authority at the earliest possible time so that deployment of this long-needed network may begin

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Open Range Communications, Inc. ("Open Range") hereby submits comments in support of the Commission's proposal to authorize Globalstar, Inc. to deploy Ancillary Terrestrial Component ("ATC") services using all of its unshared L-Band and S-Band licensed spectrum. As described below, Open Range intends to work with Globalstar to deploy ATC and MSS services in rural communities throughout the U.S. Additional ATC spectrum beyond that now licensed to Globalstar is required to support the deployment of this network. This network will make available to rural communities mobile broadband services which are unavailable in much of rural America today and will provide the first broadband service of any kind in many of these communities.

I. Introduction

Open Range was formed in 2004 with a vision to build an advanced wireless network that will close the broadband gap between rural and urban areas of the country. When the network is built, the services it will provide will be more flexible, less expensive, and easier to use than the

services now available in many urban areas. In Phase I the network will serve 6.5 million people in 546 communities. In subsequent phases the network will be expanded to additional communities eventually reaching 50 million rural residents. For the first time, rural residents in small towns will have the same opportunities for communication, web browsing and connectivity enjoyed by those living in larger American cities.

Open Range supports Globalstar's request to provide ATC services using all of the MSS spectrum that it is not required to share with other MSS or terrestrial wireless operators. This includes the frequency ranges of 1610-1617.775 MHz in the L-band and 2483.5-2495 MHz in the S-band. Extending Globalstar's ATC authorization in this manner will support expanded broadband and telecommunications services in rural America, long a goal of the Commission. In addition the expanded provision of broadband services, combined with the unique services afforded by low earth orbit satellite systems, will bring new service offerings to these often ignored areas.

With regard to the requested ATC operating range within the S-band, Open Range believes that adequate operational procedures, including the synchronization of adjacent channel systems, already exist to protect against interference between ATC and BRS/EBS operators. Additionally, application of the current service rules for BRS/EBS operators to the extended S-band ATC operations as suggested by the Commission affords the same level of adjacent channel interference protection to BRS-1 operators from interference by ATC operators that is afforded within the BRS/EBS bands between two BRS/EBS operators where no guard bands exist. Indeed, the chance of interference occurring between ATC and BRS-1 operators is minimized with the current 1.0 MHz guard band without the need for expansion of that guard band.

II. The Proposed Rural Broadband Network

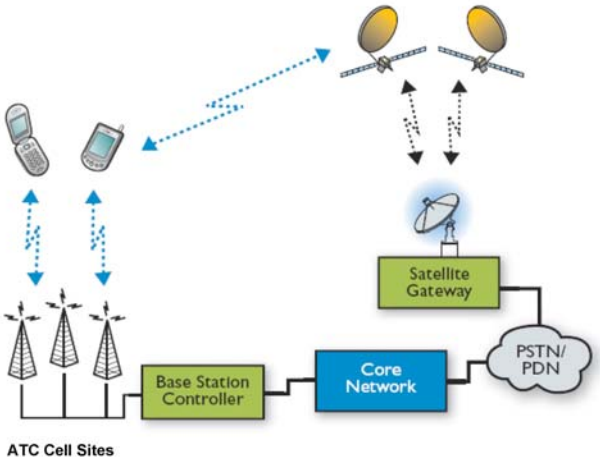
The proposed network will make available wireless broadband services in rural locations in the United States under the United States Department of Agriculture Rural Utility Service (RUS) program. To that end, Open Range has been approved for a $268M loan to provide service to 518 small communities around the country. Service will also be provided to an additional 28 adjacent communities utilizing other funding sources. Utilization of the Globalstar ATC spectrum will provide the opportunity for affordable, ubiquitous service to these communities. The "last mile" technology chosen for delivering service to end users will be standards-based WiMAX, consistent with the announced technology choices of other operators in the United States in the BRS/EBS band.

These comments describe the strategy underlying this network and explain how the offering is unique. They also discuss some of the insights gained in the process of developing the network over the past three years. As might be expected there are good reasons why broadband development in rural areas has lagged that in urban areas and Open Range believes that the network described here provides a solution to that problem. Key issues confronted and resolved relate to spectrum, technology and the scale and structure of the network. These efforts will result in a network having the potential to transform the lives of many rural Americans and the communities in which they live.

III. Spectrum Requirements For a Rural Broadband Network

Because the network will be deployed using ATC spectrum customers will be able to use the network not only in the targeted communities but throughout the U.S. and most of the world. This means that a user in a rural market will have a service with capabilities that surpass those now provided in urban areas by the largest cable, telephone, and wireless companies. In fact,

unlike wireless services today, users will not lose coverage simply because they happen to be located more than a few miles from the nearest interstate highway. Instead, users will see a broadband terrestrial and satellite network that will be available anytime, anywhere it is needed. The integrated network is depicted in the figure below.



The spectrum licensed to Globalstar for its ATC services, when expanded to include all of its unshared L-Band and S-Band frequencies, provides an ideal platform for the deployment of rural broadband services. By granting Globalstar's request for ATC authorization across all of its unshared MSS spectrum the Commission will make possible the delivery of broadband services in a time frame not normally afforded to rural America in new technology roll outs. Authorization of the maximum spectrum currently authorized for Globalstar's unshared MSS use is required to support this objective. The advantageous propagation characteristics of the L-band will allow provision of unique and specialized services to rural America. An ATC assignment of the full 11.5 MHz of unshared spectrum available in the S-band will ensure that broadband services meet the service needs in local communities, and remain compatible with user roaming to larger markets through use of the same technology standard.

The Globalstar MSS/ATC spectrum is licensed on a nationwide basis. This is important because the rural communities that will be served by the proposed network are scattered

throughout the U.S. Nevertheless, no matter where in the U.S. a small community is located it can be served economically using the Globalstar spectrum. It would be prohibitively expensive to deploy such a network by acquiring spectrum piecemeal. The communities to be served are generally very small, some having fewer than 500 persons, and are dispersed geographically. The location and size of these communities does not correspond well with the geographical divisions (RSA, MSA, REAG, etc.) commonly used by the FCC in licensing wireless services. The FCC-licensed geographical areas are far larger than the area of one, or a few, rural communities that will receive service from this network. Acquiring a large service area for the purpose of serving only one or two small towns within it would be unaffordable. This is one reason why rural broadband has been slow to develop. Any service provider which acquires one of the FCC-licensed geographical areas must first serve the largest urban areas within that territory in order to justify its investment in spectrum. For this reason service to the rural portion of that territory is deferred – often indefinitely. The nationwide availability of MSS/ATC spectrum and the pre-existing use of that spectrum for satellite services make possible the construction of a broadband network focused specifically on rural areas.

The existing 5.5 MHz paired ATC spectrum licensed to Globalstar is not sufficient to support deployment of the proposed network. The network will be deployed using WiMAX technology. WiMAX channels are specified in a variety of bandwidths including 3.5 MHz, 5 MHz and multiples of these. As the Phase I deployment proceeds the existing 5.5 MHz will be exhausted in the second year and the full unshared bandwidth requested by Globalstar will be needed to support completion of the Phase I network. At that time, it will be necessary to deploy three 3.5 MHz S-band WiMAX channels in many markets. This, together with the need to have available some frequency agility to avoid potential interference, necessitate access to the entire

11.5 MHz of unshared spectrum. For this reason Open Range urges the FCC to act favorably on Globalstar's request for ATC authority for all of its unshared spectrum.

IV. No Expansion of the Existing Guardband is Necessary

Considering the nature of the RUS program and eligible markets, most of the proposed service areas are far from major metropolitan networks. Many of these markets would not normally be included in major technology roll outs until years after the initiation of service in major markets, if at all. The very nature of the markets significantly reduces the chance of adjacent channel interference. In planned deployment scenarios, most base stations would be sufficiently far apart as to negate the need for any operational coordination. Even with adjacent base stations operating with a 3 mile cell radius (6 mile base-to-base separation), Open Range anticipates no adjacent channel interference issues. The application of industry standard filtering technology will minimize adjacent channel interference whether the adjacent channels are ATC/BRS-1 or channels within the BRS/EBS band. However, if adjacent channel operations are close to each other and the potential for interference exists, standard operational procedures exist to minimize the impact of any interference. These operational procedures have been employed through years of successful use for adjacent TDD system operation.

The proposed network will use standards-based WiMAX technology in the S-band, consistent with the announced plans of other BRS/EBS operators. Synchronization of TDD WiMAX systems can be used to avoid interference between systems and can be accomplished through operational coordination if systems are within close proximity to each other. The Commission has recognized that synchronization is an effective means of avoiding interference:

> "Wi-Max technology, which is based on IEEE standard 802.16, avoids interference by synchronizing the timing of potentially competing transmissions so that the various transmitters are

> assigned to discrete time slots. Although the transmitters operate on the same frequency, their transmissions do not overlap in time and therefore do not interfere with each other."[1]

Similarly, application of the BRS/EBS service rules, specifically those defined in 47 C.F.R. §27.53 and suggested by the Commission in the NPRM, can also be utilized to minimize or completely eliminate adjacent channel interference. Indeed the current BRS/EBS and MSS band plans have an advantage over current exclusive BRS/EBS band operations in this regard due to the existence of the current 1.0 MHz guard band that is not afforded within the BRS/EBS band. BRS/EBS adjacent channel operators have no guard band to protect adjacent geographic operations and rely solely on FCC service rules and operational coordination to synchronize networks. Thus, approval of ATC operations in the full unshared MSS band from 2483.5 to 2495 MHz will provide greater protection than is afforded between other BRS/EBS operators. For this reason, Open Range supports approval of the entire 11.5 MHz available. Various channelization scenarios can then be used to maximize throughput, coordinate spectrum sharing with MSS operations, and coordinate operations with BAS Channel 10 operators as is currently required.

V. Network Design for Rural Broadband Service

When planning for this network began, it became clear that many of the targeted rural communities were served by a patchwork of relatively scattered providers including local telephone operators, cable companies and wireless internet service providers who served some of these communities with fixed location services. Other communities had no service at all. The

[1] *In the Matter of Wireless Operations in the 3650-3700 MHz Band, Memorandum Opinion and Order*, 22 FCC Rcd 10421, 10433 n.73. See also *In the Matter of Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band, Notice of Proposed Rulemaking*, 22 FCC Rcd 17035, 17066 n.116 ("To avoid causing interference, it could also be necessary for licensees operating TDD and HFDD systems on adjacent channels to synchronize their systems so that their base stations will transmit and receive at the same time").

challenge was to determine how the economics of rural service could be improved, and how experience in the urban network industry could be brought to bear in serving rural markets.

It is clear that many of the rural networks operating today do not benefit from the advantages of scale. This can affect a wide variety of factors from the cost of purchasing equipment to the cost of providing customer service, billing, and other functions. To address this, the network will be deployed using a common architecture and standards-based equipment that can be purchased in volume. The network will be complemented by an efficient marketing, customer service and operations staff throughout the communities served, organized to take advantage of economies of scale. The network will employ over 500 people in the target communities, many of whom will be located in the towns that are served.

One key finding was that the cost of connecting rural areas to the Internet backbone can be prohibitive. This problem was solved by developing large scale Internet backbone arrangements with key national backhaul providers who have network facilities accessible from the target markets. The backhaul network is depicted in the figure below.

Consumers in both urban and rural areas increasingly demand the ability to use broadband on a mobile basis anywhere they go and will rely upon the ease and simplicity of broadband applications on the move. The service provided in rural towns today, where it exists,

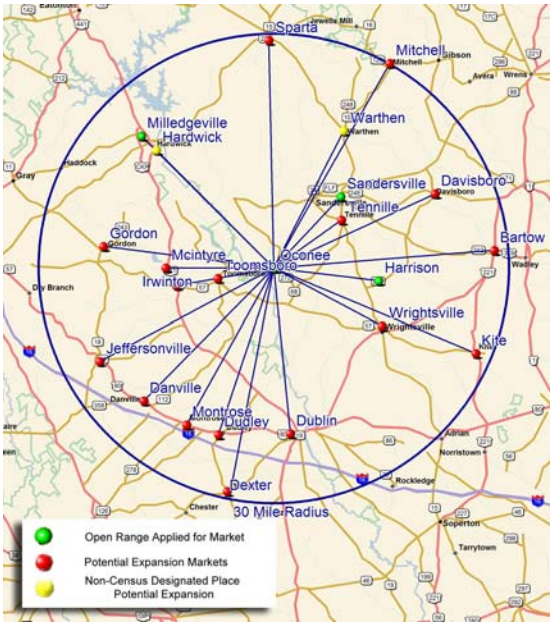
is generally available only to fixed locations, is limited in geographic scope and does not allow customers to use the service anywhere outside the immediate vicinity of a particular home or office within the limited service area of the existing provider.

Through the advent of portable and mobile broadband technologies such as WiMAX, consumers will find the same flexibility and ease of use that they now enjoy with voice offerings. The next ten years will see consumers, regardless of where they live, continue to change how and where they use technology. Today consumers use the cellular phone in a way that supports their needs. Broadband will follow this same path and consumers will demand that broadband evolve from being a fixed service assigned to a physical location into a dynamic service available to users wherever they are located.

VI. Network Deployment for Rural Broadband Service

The target communities will be built in clusters. Clustering the initial markets in certain states will improve the efficiency of the construction and operation of the network. It will also increase the likelihood that a customer in one community will be able to access the system in a nearby community. The Phase I markets are clustered in the seventeen states (Alabama, Arkansas, California, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Nebraska, Nevada, New Jersey, New York, Ohio, Pennsylvania, South Carolina, and Wisconsin) shown in the figure that follows.

ATC service will be extended to smaller towns using a “beachhead” concept. The network will serve many small communities which today have no broadband service of any kind. In order to serve these small communities economically, it is necessary first to establish a beachhead in a larger neighboring market. The larger market is connected to the Internet backbone through the microwave network. By bringing Internet connectivity to a nearby larger town on a self-sustaining basis, the additional service to the smaller town can be provided economically. This would not be possible without using the intermediate community as a beachhead. An example of this can be seen in the service that will be provided to Oconee, GA. Oconee is one of the 546 Phase I markets. By providing service to Oconee, it becomes possible to extend the network to approximately 19 additional small communities located within a 30-mile radius of Oconee. Currently there are 3 additional Phase I markets to be served through this beachhead. The total number of people to be served under the current plan is approximately 26,000 persons in 32 square miles. The total potential for this beachhead is approximately 56,000 persons representing 85 square miles of coverage. The figure below shows the communities around Oconee that may be served through this beachhead.

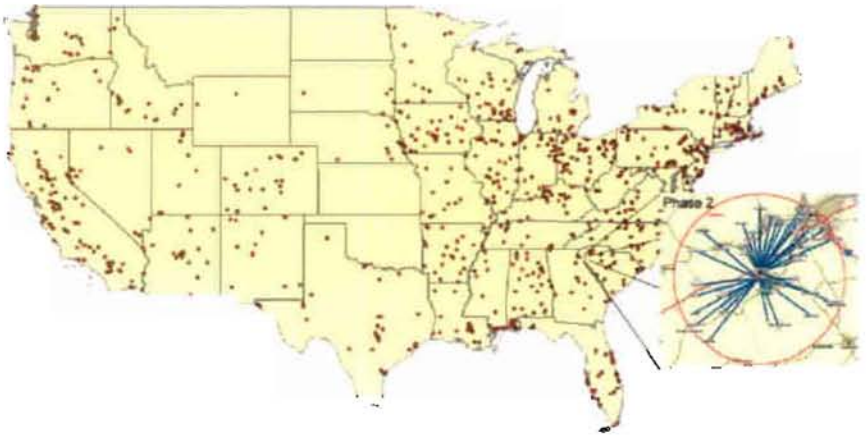


The "beachhead" approach can be applied to all of the markets in the Phase I build out. By fully exploiting the beachhead opportunity throughout all of the markets that will eventually be served it will be possible to reach thousands of additional communities with populations below 5,000, representing millions of rural residents. The state-by-state application of the beachhead approach is shown in the following figure.

State	# of Cities	POP2000	Avg Pop/City
AL	233	435,241	1,868
AR	188	330,324	1,757
AZ	62	125,269	2,020
CA	275	638,944	2,323
CO	93	178,430	1,919
CT	60	127,709	2,128
DE	36	71,149	1,976
FL	188	466,147	2,480
GA	147	270,436	1,840
IA	327	467,770	1,430
ID	60	96,576	1,610
IL	531	874,115	1,646
IN	242	402,412	1,663
KS	11	23,296	2,118
KY	162	266,450	1,645
LA	128	253,118	1,977
MA	112	286,582	2,559
MD	79	165,020	2,089
ME	57	137,349	2,410
MI	204	397,866	1,950
MN	123	184,304	1,498
MO	176	287,561	1,634
MS	81	146,241	1,805
NC	281	519,689	1,849
ND	6	9,447	1,575
NE	65	77,426	1,191
NH	30	59,513	1,984
NJ	209	545,603	2,611
NM	68	133,736	1,967
NV	21	52,050	2,479
NY	384	797,275	2,076
OH	496	963,061	1,942
OK	28	41,948	1,498
OR	95	175,145	1,844
PA	670	1,322,691	1,974
RI	7	16,897	2,414
SC	166	340,505	2,051
SD	43	54,984	1,279
TN	145	286,745	1,978
TX	229	401,841	1,755
UT	66	131,115	1,987
VA	121	217,083	1,794
VT	39	61,412	1,575
WA	142	320,703	2,258
WI	298	518,673	1,741
WV	115	188,137	1,636
WY	10	12,265	1,227
Grand Total	**7,309**	**13,880,253**	**1,899**

Without using the beachhead approach, it is unlikely that many of these towns would receive broadband service for the foreseeable future and it is very unlikely that they would receive fully portable and mobile broadband.

The network described as "Phase I" is the first step of a multi-step service deployment in rural America. Current plans call for extending this network to serve up to 50 million rural residents. The expansion is shown in the figure below. This network, when fully constructed, will quite literally transform the lives of many people in rural America.



VII. Conclusion

Open Range urges the Commission to act expeditiously on Globalstar's request to expand its ATC authority. The additional ATC spectrum will support the deployment of a rural broadband network that will eventually provide 50 million rural Americans ubiquitous mobile broadband service that is superior to many of the services available in urban areas. Rural broadband service has for a number of years been one of the Commission's highest priorities. It has been a key goal of Congress and the Executive Branch as well. Numerous programs and initiatives have been have been launched to promote this objective. The network described in these comments is a major step in the pathway toward achievement of this long sought objective. Open Range urges the Commission to grant the requested expansion of Globalstar's ATC authority at the earliest possible time.

Respectfully submitted,

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