Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Service Rules for the 698-746, 747-762 and 777-792 MHz Bands	)	WT Docket No. 06-150
Implementing a Nationwide, Broadband Interoperable Public Safety Network in the 700 MHz Band	)	PS Docket No. 06-229

COMMENTS OF SPACE DATA CORPORATION

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TABLE OF CONTENTS

Page

I. INTRODUCTION AND SUMMARY 1

II. THE 700 MHZ D BLOCK RULES SHOULD ACCOMMODATE INNOVATIVE AND COST-EFFECTIVE SOLUTIONS SUCH AS NEAR SPACE TECHNOLOGIES 3

- A. A Network Of SkySite Platforms Offers An Innovative, Cost-Effective Solution For The Shared Network 4
- B. Any Technical Requirements Applied To The Shared Network Should Be Sufficiently Flexible To Allow The Use Of Near Space Technologies. 8

III. ASSIGNING TWO NATIONWIDE LICENSES IN THE 700 MHZ D BLOCK BASED UPON POPULATION DENSITY WOULD HELP INSURE THE SUCCESS OF THE SHARED NETWORK 12

IV. THE COMMISSION SHOULD MAXIMIZE PARTICIPATION IN THE 700 MHZ D BLOCK AUCTION 16

V. CONCLUSION 17

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Space Data Corporation ("Space Data"), in response to the Second Further Notice of Proposed Rulemaking in the above-captioned proceeding ("*700 MHz Second NPRM*"),[1] urges the Commission to allow licensee(s) of the re-auctioned 700 MHz D Block maximum flexibility to use innovative and novel technologies to construct and operate a shared nationwide, interoperable public safety and private broadband network (the "Shared Network"). This approach will help ensure that public safety groups and consumers reap the full benefits of a Shared Network.

I. INTRODUCTION AND SUMMARY.

The proposed Shared Network holds great promise for realizing at last an advanced, nationwide, interoperable public safety network. The novel public-private partnership proposed as a vehicle for implementing this important public benefit, however, has been met with substantial challenges. The Commission and representatives from the public safety and

[1] *See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands Implementing a Nationwide, Broadband Interoperable Public Safety Network in the 700 MHz Band*, Second Further Notice of Proposed Rulemaking, FCC 08-128 (rel. May 14, 2008) ("*700 MHz Second NPRM*").

commercial wireless communities have attempted to find a middle ground between the greater network coverage and robustness required by public safety interests and the impact that the associated increased costs would have on private interests' ability to fund and construct the Shared Network.

Space Data offers three proposals that could assist the Commission in making the 700 MHz D Block spectrum and the Shared Network attractive to investors and operators, yet still achieving the Commission's public safety goals. First, the Commission should ensure that "near space" wireless systems, such as those developed by Space Data be allowed to operate in the D Block. Space Data's near space technology relies upon free-floating, balloon-borne transceivers called SkySite® platforms and offers an innovative, cost-effective solution for building out the Shared Network in rural and underserved areas where it is often prohibitively expensive to build a traditional tower network. Use of near space technology would allow the Shared Network to reach 100 percent of the U.S. population and landmass.

Second, Space Data proposes that the Commission retain its existing broad technical parameters for the Shared Network so that the D Block licensee and public safety broadband licensee have maximum flexibility to use the most efficient and cost-effective technologies available. To the extent the Commission adopts more specific technical requirements, such as those in the proposed Technical Appendix contained in the *700 MHz Second NPRM*, Space Data suggests certain changes to facilitate the use of innovative technologies.

Third, Space Data suggests allocating the D Block into two licenses based upon population density. Specifically, one "urban license" would include all urban areas within the United States while the second "rural license" would include all rural areas. This urban/rural licensing approach would result in greater coverage as well as other cost and operational

efficiencies for the Shared Network. For example, under the urban/rural licensing approach, the Shared Network would cover at least 80 percent of the U.S. landmass in comparison to 45 percent under a one nationwide license approach.

Commercial wireless carriers have demonstrated that there may be a viable business case for building out digital wireless networks with traditional towers to cover up to approximately 98 percent of the U.S. population.[2] However, this level of coverage reaches less than 60 percent of the land mass of the United States and is inadequate for public safety needs. Near space technology, however, can be used in conjunction with a terrestrial network to target the sparsest 10 percent of the U.S. population that resides in the rural areas of the country, as well as some initial service to urban and suburban areas as the terrestrial network is expanded. A hybrid approach that uses both terrestrial and near space technologies would ensure the efficient and economic construction of the Shared Network to the benefit of public safety and commercial users. The Commission should ensure that its rules do not restrict the D Block licensee from taking advantage of these novel approaches.

II. THE 700 MHZ D BLOCK RULES SHOULD ACCOMMODATE INNOVATIVE AND COST-EFFECTIVE SOLUTIONS SUCH AS NEAR SPACE TECHNOLOGIES.

The *700 MHz Second NPRM* seeks comment on "whether there are other terrestrial or non-terrestrial technologies or services that the D Block licensee may utilize to satisfy its performance requirements."[3] Space Data strongly supports the Commission's endeavors to encourage the use of innovative technologies and methods to construct and operate a robust, cost-effective and accessible Shared Network throughout the United States. "Near space"

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[2] *See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993,* Twelfth Annual Report, 23 FCC Rcd 2241, 2303, Table 10 (2008) ("*Twelfth CMRS Report*").

[3] *700 MHz Second NPRM*,¶ 103.

systems such as Space Data's can be deployed quickly to provide high quality, cost-effective, wide area communications to public safety personnel as well as commercial end users. The Commission should retain its existing broad technical parameters for the Shared Network so that the D Block licensee and public safety broadband licensee have the flexibility to use the most efficient and cost-effective technologies that are available.

A. A Network Of SkySite Platforms Offers An Innovative, Cost-Effective Solution For The Shared Network.

Space Data has developed and is operating a balloon-based "near space" communications system that provides wireless services in the South Central United States.[4] Space Data's near space technology would be ideal to provide wireless coverage in rural and unserved areas where the Shared Network's terrestrial towers cannot economically reach.[5] Space Data's SkySite platforms uniformly float at altitudes of between 65,000 and 100,000 feet, effectively

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[4] "Near space" is a relatively new term that encompasses proven technologies that have been integrated into a new type of wireless infrastructure platform: (1) weather balloons that have flown for more than 80 years at a rate of over 800,000 launches per year from 880 sites throughout the world; (2) GPS receivers that allow the weather balloons to be controlled at a specific altitudes above 65,000 feet; and (3) picocells and femtocells that are now of the weight and power class needed to turn a weather balloon into a 20-mile high wireless site. This integrated solution was pioneered by Space Data and has been in commercial use in the South Central United States for more than four years providing messaging services to the energy industry. Space Data's near space network covers more than 20 percent of the landmass of the continental United States and has accrued more than 225,000 flight hours through more than 16,000 launches. This near space technology also has been deployed by the U.S. Air Force under a $49 million Near Space Communications System contract.

Near space technology, which many companies are pursuing, can take several forms, including tethered blimps, high-altitude manned airplanes, high-altitude unmanned airships, unmanned solar airplanes and Space Data's balloon-borne miniature wireless base stations.

[5] Wide use of SkySites has been hampered because of the conventional methods of allocating commercial spectrum in the United States. Near space technologies provide wide area coverage, but traditionally spectrum has been allocated based upon small geographic markets. Thus, the market areas on a particular spectrum block are often highly fragmented by service provider and type of technology used (e.g., GSM, CDMA, and iDEN) and are not conducive to wide area coverage. Further, spectrum blocks that have been auctioned on a regional or national basis (such as the recently auctioned 700 MHz C Block) have been prohibitively expensive. Over time, however, Space Data has aggregated approximately 2 MHz of nationwide 900 MHz narrowband PCS spectrum which it uses to provide messaging and machine-to-machine services.

establishing a wireless site that is close enough to communicate with existing wireless user equipment and handsets developed for use with conventional terrestrial towers, yet is high enough to have clear line of sight to a wide coverage area. In fact, SkySite platforms can reach coverage gaps in hilly and mountainous terrain that traditional terrestrial networks often cannot reach. A constellation of SkySite platforms could blanket large regions with wireless coverage – only 370 SkySite platforms would be needed to provide broadband coverage to 100 percent of the continental United States.[6] Because of the altitude at which SkySite platforms fly, they are not affected by adverse weather conditions.[7]

Near space technologies such as SkySite platforms could offer unique benefits for the Shared Network. Importantly, use of SkySite platforms would dramatically improve the build-out strategy for the Shared Network. Even with the aggressive build out requirements that the Commission previously adopted for the D Block, significant swaths of land in the United States would be left without coverage. For example, providing coverage to 75 percent of the population by the end of the fourth year would cover only six percent of the land mass of the United States.[8] Providing coverage to 95 percent of the population by the end of the seventh

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[6] SkySite platforms can be easily launched by one or two man teams every 12 to 24 hours to create a redundant constellation of SkySite platforms. After 24 to 36 hours, the SkySite platforms parachute safely back to the ground and are recovered and reused. GPS receivers on the SkySite platforms also allow tight control of transmissions, protocol timing, and power near service area borders. Further information regarding Space Data's SkySite network is available in the construction showing for one of Space Data's narrowband personal communications service licenses. *See* ULS File No. 0001900882 (filed Oct. 13, 2004, accepted Jan. 13, 2005).

[7] For example, Space Data's network operated without interruption over its entire coverage area, including much of Louisiana, during Hurricane Katrina. *See* Statement of Gerald Knoblach, Space Data, before the Commission's Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks (Mar. 7, 2006 & Supp. Nov. 18, 2005), *at* http://www.fcc.gov/pshs/docs/advisory/hkip/GSpeakers060306/ACT1046.pdf& http://www.fcc.gov/pshs/docs/advisory/hkip/GSpeakers060306/ACT1049.pdf.

[8] Space Data's coverage estimates are based upon U.S. census block data, which, as the Commission concluded, is the most accurate methodology currently available for measuring build out, coupled with the assumption that each tower covers up to a 100 square kilometer or an average five kilometer radius of

year would only cover 24 percent of the land mass. Providing coverage to 99.3 percent of the population by the end of the tenth year still would cover only 45 percent of the land mass, leaving approximately 55 percent of the land mass of the United States without coverage, perhaps indefinitely. This result would not achieve the goal of ensuring that an interoperable broadband network be available nationwide during emergency and non-emergency situations to first responders, law enforcement, homeland security and other public safety groups.

Unlike a traditional terrestrial tower-based network, a network of SkySite platforms could be deployed very rapidly and economically. Because of the large cell sizes inherent in wide area technologies, the capacity of an individual SkySite platform is less than the capacity available through a land-based tower. For this reason, SkySite platforms are ideal for providing coverage to rural, less populated areas where capacity demand is lower. Thus, a D Block licensee could construct the Shared Network by building a terrestrial system in more urban areas and using SkySite platforms to fill in the rural areas. A nationwide SkySite network could provide primary coverage in rural areas where the terrestrial system has not yet been constructed, as well as some initial service to urban and suburban areas as the terrestrial network is expanded. The terrestrial system then could expand over time as it becomes cost-effective to do so. A nationwide SkySite network also could provide a layer of redundancy in the event the terrestrial system may be rendered inoperable.

Space Data estimates that the total annual cost to blanket the continental United States with fourth generation ("4G") technology SkySite platforms would total approximately $550

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coverage and the assumption that construction occurs first in the most densely populated 100 square kilometers then proceeds to the next most densely populated 100 square kilometers until the required percentage of population or landmass is covered. *See Twelfth CMRS Report*, 23 FCC Rcd at 2245-50.

million.[9] In contrast, constructing a terrestrial system that would cover 99.3 percent of the population (and only 45 percent of the land mass of the continental United States) would cost billions of dollars more than constructing a terrestrial system that would cover 90 percent of the population (and only 15 percent of the landmass of the continental United States). In fact, as demonstrated in Exhibit A, expanding the terrestrial system into less urban areas increases the cost of the system exponentially. Thus, using SkySite platforms in rural areas would not only provide 100 percent coverage of the population and land mass of the United States, but do so more quickly and for substantially less cost.

In addition, a SkySite network offers many of the same benefits that a satellite system offers, including wide area coverage that could continue to function even after terrestrial networks fail, but at significantly less cost. Unlike satellites, use of a SkySite network would not require new handsets or subscriber equipment. Rather, users could continue to use their existing 700 MHz handsets. Further, a SkySite network generally provides lower latency and more capacity than satellites.[10] Moreover, the SkySite network is technologically agnostic and is adaptable in terms of frequency and protocol. For example, the SkySite network could support

[9] This estimate assumes that 370 SkySite platforms would be launched twice a day, and includes costs associated with the 4G technology, balloons, batteries, launch and recovery of the SkySite platforms, and a network of 93 ground stations for backhaul.

[10] For example, the largest planned geostationary satellite antenna can project at most 240 spot beams across the continental United States with a frequency reuse pattern of seven because of interbeam interference. In contrast, 370 SkySite platforms can cover the United States, each with three sectors and a frequency reuse of three. Geostationary satellites have a latency of at least 240 milliseconds, which is the time it takes a radiowave to travel to the satellite and back at the speed of light, while a SkySite platform has a latency of as little as 0.6 milliseconds, allowing for data transmissions with 372 times lower latency than satellites. SkySite platforms are more than 1000 times closer to the earth than geostationary satellites, which allows SkySite platforms, even with small antennas, to project much smaller spot beams onto the ground than the satellites. Accordingly, SkySite platforms can provide more than ten times the capacity of a geostationary satellite for a given bandwidth of spectrum.

CDMA, W-CDMA, WiMax, or LTE protocols.[11] The SkySite network, because it is continually refreshed with new platforms, can keep pace with technology developments in ways that are not possible with satellites, which spend more than ten years in orbit during which hardware upgrades are impossible.

B. Any Technical Requirements Applied To The Shared Network Should Be Sufficiently Flexible To Allow The Use Of Near Space Technologies.

The Commission should ensure that the technical requirements for the Shared Network provide the D Block license and public safety broadband licensee with the flexibility to use a myriad of innovative technologies, including near space technologies such as SkySite platforms. As further explained herein, SkySite platforms operate differently from traditional terrestrial towers. Accordingly, the Commission should maintain the broader technical parameters it initially established for the D Block license and Shared Network. Maintaining these parameters allows flexibility in the design and deployment of the Shared Network and provide the D Block licensee and the public safety broadband licensee the opportunity to negotiate specific technical network requirements. To the extent the Commission adopts more specific technical guidelines or rules in this proceeding, however, it should allow the D Block licensee and public safety broadband licensee to negotiate different technical specifications after the re-auction of the D Block (subject to Commission oversight and approval) if they conclude that such changes would better serve the goals of the Shared Network.[12]

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[11] Similarly, Space Data uses a two-way messaging protocol on its 900 MHz narrowband PCS SkySite network, and digital secure military voice/data protocols have been used on a SkySite network by the U.S. Air Force on military UHF spectrum bands and by the U.S. Border Patrol Service on federal VHF spectrum bands. Space Data also has flown broadband SkySite platforms that provide several megabits per second using OFDM technology on the 5.8 GHz unlicensed band.

[12] Commission oversight and approval will ensure that any newly negotiated technical parameters concerning the Shared Network will not adversely affect adjacent and near spectrum licensees.

In the event the Commission adopts specific technical rules in this proceeding, they should reflect the operating parameters of near space technologies so that the D Block licensee can utilize the technology if it so chooses. For example, as shown in Figure 1 below, because the coverage footprint of a SkySite platform is much larger than an urban area, it would be necessary for the signals from the SkySite platform to overlay the towers in the urban area, otherwise coverage gaps would potentially appear around the urban area. Accordingly, the D Block regulations should require operations in urban areas to accept downlink co-channel interference from SkySite platforms at a level 13 dB below the signal level required at the cell edge to meet the "dense urban" data rates and building penetration as defined in by the Public Safety Spectrum Trust in its Bidders Information Document ("BID"). The attached interference analysis (Appendix 1) demonstrates that such co-channel interference will not adversely affect the operations in the urban area.[13]

A primary benefit of near space technologies is the ability to provide coverage over a very large area. In order to assure essentially ubiquitous coverage in remote rural areas, signals from the SkySite platform will inevitably be present in areas where Shared Network coverage is provided on the same channel band by terrestrial towers, including urban and suburban regions and rural areas where user densities are sufficient to make service from terrestrial towers practical. SkySite platform signals in areas where service is normally provided by terrestrial towers, however, may be advantageous in that it allows the SkySite platform to provide emergency coverage (albeit with reduced capacity) in the event of terrestrial outages.

[13] Space Data's interference analysis assumes that 700 MHz user devices will be programmed such that connecting with the terrestrial tower network will be a higher priority than connecting with the SkySite network.

The attached interference analysis (Appendix 1) examines the interference potential presented by Space Data's hybrid approach, using the operational requirements as specified in the BID. The interference analysis concludes that due to the higher building penetration levels and user data rates required in urban areas as compared to rural areas, a downlink signal level adequate to serve rural areas will be low enough so as to not cause significant interference with service from urban towers that are co-channel with the SkySite platforms. This concept is depicted below in Figure 1.

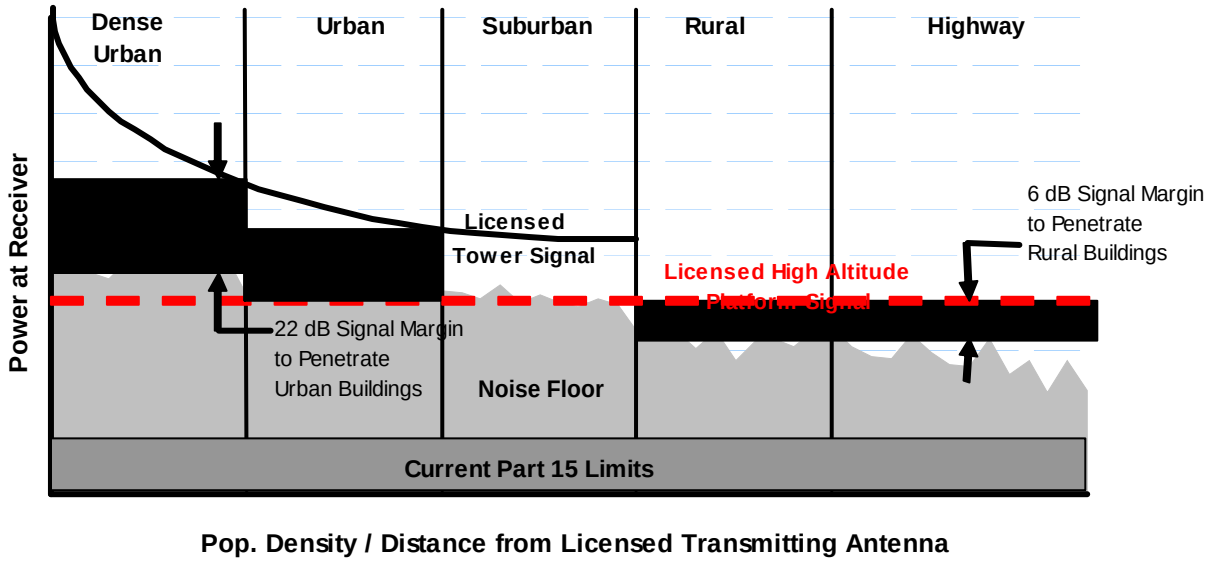

Figure 1: A co-channel signal from a near space platform can overlay an urban area without interference as the signal level from near space platform is uniform across the footprint at a level 6 dB above the rural noise floor, which is far below the signal level required for reliable service in urban areas where building penetration losses are higher and the noise floor is higher. The typical signal from an urban tower falls off quickly as depicted by the heavy black line.

In suburban and rural areas, because the co-channel signal from the SkySite platform would cause interference with towers, the SkySite platforms and towers must operate on different frequencies. Because the required usage density (Mbps / sq. km.) in suburban and rural areas is much lower than in urban areas, the available Shared Network spectrum can be divided between the towers and the SkySite platforms (i.e., part of the bandwidth is used by towers while

another part of the bandwidth is used by SkySite platforms). For example, in an urban area the terrestrial system can use 10 MHz-wide OFDM channels, while in a rural area the terrestrial system and near space system each would use 5 MHz-wide OFDM channels. Using channel bandwidths narrower than 5 MHz also could allow spectrum to be divided between the tower and near space systems in something other than a 50/50 split.[14]

With regard to the Technical Appendix contained in the *700 MHz Second NPRM*, its technical specifications should allow for types of technologies other than traditional towers. For example, the site robustness requirements in the network reliability plan assume only a single layer of coverage from terrestrial towers. A major advantage of a hybrid Shared Network that utilizes terrestrial and near space systems is that the SkySite platforms provide a redundant layer of coverage to every tower. For example, a requirement to have 99.7 percent network reliability can be achieved in many ways. Tower sites can be built to have a 99.7 percent network reliability, which likely requires significant backup power and generators, and in many cases path-redundant backhaul facilities, that add significantly to the cost of each site. Alternatively, the same 99.7 percent network reliability can be achieved through a combination of towers and SkySite platforms, each with a reliability of 94.5 percent.[15] Thus, as there are different ways to

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[14] Furthermore, as long as the user devices in the urban environment using the uplink frequency practice active power control, they would put out only enough power to reach an antenna on a nearby terrestrial tower. Additionally, urban clutter would effectively block the uplink signals of the urban end user equipment from significantly interfering with the uplink signals from rural end users. To further mitigate interference, antenna sectors from a SkySite platform that are fully over geographic areas that have terrestrial towers can be turned off (unless there is a tower outage). To turn off the SkySite without causing coverage gaps, a "buffer zone" of rural towers would need to be constructed around the urban area. The buffer zone should be at least as wide as the diameter of a SkySite platform spot beam or sector, which would be approximately 60 kilometers. As population densities generally slowly decline outside of urban areas, these buffer zones will typically be constructed anyway.

[15] The binomial probability formula: P(x) = nCx * p^x * q^(n-x) where n = number of trials, x = number of successes among n trials, p = probability of success in any one trial, q = probability of failure in any one trial (q = 1 - p), nCx = combinations of n items, choose x, shows that having two sites covering an

achieve the same level of network reliability, regulations should be flexible enough to allow for different network approaches as jointly determined by the D-Block licensee and the public safety broadband licensee.

In addition, the Technical Appendix specifies requirements for the number of hours of backup power or days of generator fuel that must be stored at each terrestrial site. These requirements should allow backup to be accomplished with different technical approaches. For example, SkySite platforms would not carry additional fuel, but additional SkySite platforms could be held over at altitude with sufficient battery life to fill in for any failed SkySite platform until a new SkySite platform is launched and reaches altitude. SkySite platforms also may rely on solar power, which provides predictable power levels because the SkySite platforms float above the clouds.

III. ASSIGNING TWO NATIONWIDE LICENSES IN THE 700 MHZ D BLOCK BASED UPON POPULATION DENSITY WOULD HELP INSURE THE SUCCESS OF THE SHARED NETWORK.

Assigning two nationwide licenses in the 700 MHz D Block spectrum based upon population density would make the D Block spectrum more attractive to both investors and operators. Specifically, the Commission should create one "urban" 700 MHz D Block license that would include all urban areas within the United States, and one "rural" 700 MHz D Block license that would include all rural areas within the United States. Urban and rural areas would be defined based upon the latest U.S. Census data for urbanized areas.[16] In other words, the urban license would include all contiguous, densely settled areas with a population of more than

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area each with 94.5 percent reliability is the same as having one site covering an area with a 99.7 percent reliability.

[16] The U.S. Census Bureau defines urbanized areas as densely settled census block groups and census blocks that meet minimum population density requirements, along with adjacent densely settled census blocks that together encompass a population of at least 50,000 people. *See Urban Area Criteria for Census 2000*, 67 Fed. Reg. 11663, 11667 (Mar. 15, 2002).

50,000, plus a 10 kilometer extension to account for urban growth and wireless signal propagation. The rural license would include all other areas. The map in Exhibit B shows the proposed urban/rural allocation. The urban license would cover approximately 75 percent of the population and ten percent of the landmass in the United States while the rural license would cover the remaining 25 percent of the population and 90 percent of the landmass.

An urban/rural licensing approach provides numerous benefits over other scenarios. First, this approach could encourage additional bidders to participate in the D Block auction. The failed D Block auction demonstrated the difficulties of creating a viable business plan around a single license encompassing both urban and rural areas with very aggressive performance requirements. By offering two separate licenses, however, the pool of potential bidders expands. A stand alone urban license may be more attractive to existing national wireless operators that need more spectrum in urban areas to meet capacity demands, new entrants focusing on major markets, and urban-only carriers interested in expanding into all urban areas. Similarly, a stand alone rural license may be more attractive to existing regional operators or coalitions of rural operators that focus on building out rural areas, and/or new entrants with innovative technologies. A single rural license covering more than 75 million people also would give the rural operator the critical mass necessary to buy infrastructure and user devices in sufficient volume to assure reasonable prices. The Commission also could use combinatorial bidding during the auction to the extent that any bidders want to aggregate the entire 700 MHz D Block spectrum.

Second, Space Data's proposal would maximize the success of a public-private partnership by limiting the number of D Block licensees to two. More than two licensees – for example, if the D Block was auctioned on a regional basis – significantly increases the cost,

complexity and level of the coordination needed between the licensees and the public safety broadband licensee.

Third, the urban/rural licensing approach is economically efficient. Building out urban and rural areas often entails different business and operational undertakings and many companies have developed special expertise in constructing, operating and marketing networks in either urban or rural areas. Space Data's proposal would allow each D Block licensee to focus on the unique aspects of its licensed areas. Some major carriers have used rural affiliates to address this economic challenge, although it has generated additional costs for the creation and management of the affiliates, as well as some unintended costs.[17] Thus, it would be more economically efficient to segregate the spectrum into urban and rural areas prior to an auction.

Fourth, a Shared Network and its users will benefit from greater total coverage and faster build out. For example, the Commission could continue to apply its initial D Block performance requirements to the urban licensee (i.e., 75, 95 and 99.3 percent of the population by the end of four, seven and ten years, respectively). While the 700 MHz D Block failed to obtain more than one bid in Auction No. 73 with these build out requirements, applying this requirement to the urban license which only comprises ten percent of the landmass would be far less onerous to an operator. The Commission also could apply its 700 MHz A, B and E Block milestones to the rural license (i.e., 35 and 70 percent of the licensed area by the end of four and ten years, respectively).[18] The fact that the A, B and E Blocks saw a highly competitive level of bidding in Auction No. 73 implies this level of build out requirements did not dampen bidders' enthusiasm.

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[17] For example, Sprint created rural affiliates to construct rural areas while Sprint focused on major markets. Similarly, Nextel created Nextel Partners to focus on rural areas. The acquisition of Nextel by Sprint subsequently caused legal conflicts with certain affiliates that remain undecided.

[18] The maps in Exhibit C visually depict the terrestrial coverage differences between one nationwide D Block license and an urban and rural D Block license.

Consequently, as the urban license comprises 10 percent of the U.S. landmass, under the urban/rural licensing approach the Shared Network would cover at least 80 percent of the U.S. landmass in comparison to 45 percent under the one nationwide license approach.

Moreover, this licensing approach would no longer require license market boundaries to be drawn along county lines in the 700 MHz D Block.[19] While public safety agencies typically are organized on the county level, licensing on the county level can cause unintended consequences due to large variations in the size of counties. For example, the largest county in the continental U.S. is San Bernardino County, California, which has more than 3.6 times the landmass as the entire state of Connecticut. In San Bernardino County, 90 percent of the population lives in only seven percent of the landmass. If licenses are divided along county boundaries, the operator in San Bernardino will focus on providing service to the one urban corner of the county, potentially leaving towns such as Barstow, Twenty-Nine Palms and Yucca Valley without coverage. Each of these towns has more than 20,000 residents yet to a county-wide operator they represent only four percent of the population. With Space Data's recommended urban/rural licensing approach, these towns would represent 45 percent of the county's population for the rural licensee, making them a priority for the D Block rural licensee. This is not an isolated example as more than half the landmass of the U.S. is composed of counties each of which is larger than Rhode Island.[20]

[19] In past auctions the FCC has allowed licensees the flexibility to select the technology for each licensed market area, which created potential interference between geographically adjacent operators using incompatible technologies if the market boundary divided areas of high usage. This is not an issue in this case, however, because the interoperability requirement of the Shared Network ensures that the urban and rural licensees will have compatible technologies.

[20] More than 380 counties are larger than Rhode Island, which itself has eight small counties, and together these counties are 52 percent of the nation's landmass.

Moreover, to ensure a robust Shared Network the Commission should require the urban and rural D Block licensees to enter into agreements that would allow both commercial and public safety users to roam on each other's D Block system at reasonable rates, terms and conditions. These roaming arrangements will allow public safety and commercial users of either licensee to have nationwide access to the Shared Network by seamlessly roaming on each others' systems. In addition, as discussed in Section II.B. above, the Commission should ensure that its rules provide sufficient flexibility for the D Block licensees to utilize innovative technologies, including Space Data's SkySite platforms. For example, the operational characteristics of near space technologies, such as regarding interference and hardness of sites, differ from traditional terrestrial towers.

IV. THE COMMISSION SHOULD MAXIMIZE PARTICIPATION IN THE 700 MHZ D BLOCK AUCTION.

The Commission should ensure that the broadest pool of bidders possible can participate in the auction for the 700 MHz D Block spectrum. Unnecessary restrictions on participating in the re-auction of the D Block will only further dissuade potential bidders to the detriment of public safety and consumers. In particular, the Commission should continue to apply designated entity ("DE") bidding credits to the D Block. The Commission's DE program has been widely successful in promoting competition and the development of innovative wireless technologies and services and will do so in this case as well. Furthermore, the Commission previously concluded that it served the public interest to exempt any D Block licensee from the "impermissible material relationship" rule for the determination of DE eligibility with respect to lease or resale arrangements involving D Block spectrum capacity.[21] No circumstances have

[21] *See id.*

changed that would warrant reversal of these findings, and it would disserve the public interest to now deny those benefits to entities interested in bidding on the 700 MHz D Block.

V. CONCLUSION.

Public safety and commercial users could significantly benefit by ensuring that innovative and novel technologies can be used to construct and operate the Shared Network. The Commission should ensure that the rules applicable to the 700 MHz D Block spectrum provide maximum flexibility to take advantage of such technologies, including Space Data's near space SkySite platforms, which, when used in conjunction with terrestrial towers, could provide 100 percent broadband coverage to the United States.

Respectfully submitted,

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