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

In the Matter of	)
	)
Reallocation of 30 MHz of 700 MHz	)
Spectrum (747-762/777-792 MHz)	)
From Commercial Use	)
	)
Assignment of 30 MHz of 700 MHz	)
Spectrum (747-762/777-792 MHz)	)
to the Public Safety Broadband Trust for	)
Deployment of a Shared	)
Public Safety/Commercial	)
Next Generation Wireless Network	)

To: The Commission

PETITION FOR RULE MAKING

CYREN CALL COMMUNICATIONS CORPORATION

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EXECUTIVE SUMMARY

On January 13, 1982, in a blinding snow storm, a commercial jet crashes into the 14th Street bridge in the Nation's capital, dropping passengers and crew into the icy waters of the Potomac River below. Police, fire and emergency medical rescue teams from surrounding jurisdictions arrive at the scene, finding a desperate situation made worse because of incompatible radio systems.

> "You had every imaginable frequency, and every imaginable brand and type of radio, and every imaginable kind of agency converging on that snowy riverbank, on that January afternoon at 4:30. It was a mess. But what it did was to reinforce what public safety had been saying, both to Congress, and to the Commission for at least the previous four years. That then, as now, public safety needs more spectrum on which to operate, and more common spectrum on which to operate."
>
> -- Steve Souder, Federal Communications Commission Public Safety National Coordination Committee (November 16, 2001).

Two decades later, on September 11, 2001, two American planes are hijacked by terrorists and crashed into the World Trade Center in New York City. Police and fire are unable to communicate, seriously undermining rescue and response efforts.

> "Not only will the ability of first responders to communicate with each other help save the lives of those first responders, it will also help save the lives of New Yorkers who are caught in the next attack."
>
> -- Charlie Suisman, "A Request For Your Help," Manhattan User's Guide (February 17, 2006).

In September 2005, Hurricane Katrina slams into the Gulf Coast, swamping New Orleans and inflicting massive damage on the entire infrastructure of several Gulf Coast states. Relief efforts are hampered by the lack of reliable communications.

> "One of the problems that Katrina has put into bold relief is the impact of cascading communication snafus on the quick response to disasters."
>
> -- Phil Windley, "Upgrading first-responder comm. Problems not an easy fix," ZD Net Government (September 15, 2005).

The Federal Communications Commission (the "FCC" or "Commission") is at a critical juncture. It has an immediate, time-limited opportunity to transform America's public safety communications capabilities and, thereby, help fulfill America's obligation to the Nation's first

responders. The wireless facilities on which the public safety community currently relies will not support the functionalities and features needed to discharge all of their vital responsibilities in the 21st century. The situation is serious today and will worsen in the years and decades to come absent a radical rethinking of public safety communications requirements and solutions.

Cyren Call Communications Corporation ("Cyren") [1] proposes a revolutionary solution. By asking that the remaining 30 MHz of uniquely suitable Upper 700 MHz band of spectrum be assigned for public safety use to create a nationwide, interoperable, broadband public safety network, Cyren joins many other organizations that support deployment of such a network.[2] Coupling this 30 MHz of spectrum with an innovative licensing scheme and spectrum lease authority will permit public safety to forge a public/private partnership with commercial operators, a partnership that is essential to funding an advanced broadband network optimized to satisfy public safety communications needs and, at the same time, positioned to deliver broadband service to consumers.

Specifically, Cyren respectfully requests the Commission to initiate a Notice of Proposed Rule Making to reallocate 30 MHz of commercial 700 MHz spectrum (747-762/777-792 MHz) ("700 MHz Spectrum") to this entirely new shared network. Cyren recommends that the FCC provide for a single, nationwide, broadband network with the authorization issued to a single licensee known as the Public Safety Broadband Trust (the "Broadband Trust" or the "Trust," as described in detail *infra)*. The Trust should be required to lease capacity on this 700 MHz spectrum to commercial operators who will fund network infrastructure deployment in exchange

[1] *See* Attachment A for a description of the company and its principals. These individuals already have been instrumental in revolutionizing the commercial wireless industry. They now are prepared to devote the same dedication and ingenuity to helping deliver an advanced broadband network of unprecedented spectrum efficiency, functionality and affordability to the public safety community.

[2] *See*, e.g, Comments filed in response to Federal Communications Commission Requests Comment on Spectrum Needs of Emergency Response Providers, *Public Notice*, WT Docket No. 05-157, 20 FCC Rcd 7774 (April 28, 2005); *see also* Attachment B.

for the opportunity to serve commercial subscribers on the substantial amounts of network capacity not being used by public safety.[3]

This proposal is predicated on the following:

- **Upper 700 MHz C and D Block Spectrum** – It is in the public interest for the Federal Government to assign this uniquely appropriate spectrum to a public safety licensee to facilitate deployment of a single nationwide, broadband, all IP network.[4]

- **Public Safety Broadband Trust** – The right to utilize this spectrum should be held perpetually in trust for the American public. Public safety should be encouraged to propose and the FCC to approve representatives of local, state and federal entities to act as trustees for the Broadband Trust that will hold the license for this 30 MHz broadband network with all the rights and responsibilities that status entails. All levels of government, for the first time, will share a single network with coverage throughout the nation.

- **Commercial Host** – Public safety cannot finance a network of this scope, nor could it afford future upgrades to keep the system "evergreen" as technology advances. The Broadband Trust must structure lease arrangements with commercial providers capable of building this advanced network. In exchange, these commercial operators will have the right to use network capacity to deliver commercial broadband service to urban and rural communities, as long as doing so does not impede public safety communications.

- **Public Safety Interoperability Bridge/Network Specifications** – The Broadband Trust must establish technical parameters that include as a core design element the capability of acting as an interoperability bridge that can tie together legacy local, state and federal systems, as well as those operated by members of critical infrastructure industries whose participation can be vital in emergency situations. The Trust also will develop specifications that ensure a robust, redundant, reliable, and secure network built to public safety specifications, including capacity, coverage and application requirements, yet still consistent with the need to attract ongoing participation by commercial providers.

[3] Except during emergencies, the utilization of the network by public safety for day-to-day requirements represents only a small fraction of the capacity generated on a broadband 30 MHz network. For the reasons described in this Petition, the Commission should waive FCC Rule Section 90.20(h) to permit the spectrum lease arrangement that is a critical element in the Cyren proposal.

[4] Cyren recognizes that this 700 MHz Spectrum has been designated in the Communications Act, 47 U.S.C. § 151 *et seq.*, to be auctioned for commercial purposes. However, it believes that the public interest demands that this designation be revisited and already has committed itself to pursuing legislative relief. See Exhibit I for an analysis of the economic rationales in support of the proposed reallocation prepared by Alan Pearce, Ph.D.

- **Network Management** – The Broadband Trust must have the right to engage a qualified third party such as Cyren to manage the deployment and ongoing operation of this network under the direction and control of the Broadband Trust, to coordinate public safety and commercial usage, and to obtain for public safety users the benefits of scale economies.

This Petition describes the current state of public safety communications, the future of public safety requirements and the unique suitability of 700 MHz spectrum propagation characteristics with public safety coverage requirements. It highlights a point already well known to the public safety community, to the Commission and to the Federal Government generally:

> Without adequate funding…it is likely that public safety would be unable to implement a nationwide, interoperable broadband network.[5]

Cyren believes that the solution lies in engaging the financial engine of the commercial marketplace in the public/private spectrum lease partnership proposed herein. The Petition outlines an innovative approach to fund, build and manage such a combined network under the authority of the Public Safety Broadband Trust. Recognizing that there may be variations on the details of how best to ensure the successful deployment of the proposed network, this petition is a vehicle to initiate public debate on this critical issue.

The **desire** to deploy this network exists throughout government, including the first responder community itself, fueled by a need to improve preparedness after terrorist attacks on our soil and natural disasters of catastrophic dimensions. The **mean**s to deploy it are available as demonstrated in this Petition. America now must determine if it has the **wil**l to deliver to public safety the integrated, nationwide broadband network it and the public it serves deserve.

[5] *See* Report to Congress on the Study to Assess the Short-Term and Long-Term Needs for Allocations of Additional Portions of the Electromagnetic Spectrum for Federal, State, and Local Emergency Response Providers, WT Docket No. 05-157 at ¶ 30 (Dec. 16, 2005) ("Public Safety Needs Report").

I. INTRODUCTION

Five years after the most horrific enemy attack on American soil, catastrophic communications failures such as those experienced during Hurricane Katrina are sobering confirmation that the capabilities of the majority of our emergency response providers are not keeping pace with the rest of the wireless world – leaving them and the rest of the population at risk.[6]

> The inability to communicate was a critical element at the World Trade Center, Pentagon, and Somerset County, Pennsylvania, crash sites, where multiple agencies and multiple jurisdictions responded. The occurrence of this problem at three very different sites is strong evidence that compatible and adequate communications among public safety organizations at the local, state and federal levels remain an important problem.[7]

The situation has not improved and will only worsen in the years to come absent a radical rethinking of public safety communications requirements and solutions.

The FCC has been a steadfast ally of public safety and unquestionably is committed to addressing its communications needs. But neither the FCC alone, nor all the forces of government have been able to resolve the conundrum that defines public safety communications: Public safety has the most demanding technical, operational and geographic communications requirements, but lacks the volume of users and organizational structure needed to elicit innovative product development, attract application developers or drive down equipment costs. The gaps in functionality and in cost between consumer-based commercial systems and public safety systems are widening at an accelerating pace. Teenagers with cell phones subsidized by

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[6] A 2006 State Homeland Security Directors Survey administered by the National Governor's Association identified the top homeland security priority as "Developing interoperable communications for first responders." *2006 State Homeland Security Directors Survey*, National Governor's Association. Likewise, the White House's Hurricane Katrina report noted that basic communications operability was the primary challenge following the storm. White House *Hurricane Katrina Report* (February 23, 2006).

[7] *See* The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States (2004) at 397.

their service providers routinely have capabilities that are the envy of police, fire, and EMS emergency response providers who instead pay a dear price for less feature-rich radios on which their lives and ours may depend.

Cyren proposes an innovative, transformational, but eminently practical, solution to this critical problem. This solution will:

- **Allocate 30 MHz of 700 MHz Spectrum to its Highest Use:** The Cyren solution presumes that protection of the public's safety and welfare remains the highest priority of the American government. To the extent that interest is best served by reallocating the Upper 700 MHz C and D Blocks for a shared public safety/commercial network, it is appropriate for the Federal Government to revisit the current allocation scheme.

- **Enable Nationwide, Cross-Jurisdictional, Cross-Community Interoperability:** The Cyren solution will create, for the first time, a national public safety network for use by local, state and federal agencies specifically designed to facilitate interoperability among network users and also to act as an interoperability bridge for legacy public safety and critical infrastructure systems.

- **Deliver Exceptional Functionality:** The Cyren solution harnesses the complementary strengths of the public and private sectors in deployment of an all IP broadband network with reliability, durability, redundancy and security features defined by public safety. The network will be built to meet the demanding functional needs of first responders, but will enjoy the economic advantage of building on commercial technologies.

- **Leverage an Innovative Licensing and Spectrum Management Approach:** The Cyren solution includes an innovative licensing approach designed to overcome the organizational and financial barriers that historically have frustrated attempts to build broadly accessible, interoperable public safety networks and to promote spectrum management conducive to meeting public safety's very specific and unique operational needs -- rather than through the more rigid "command-and-control" model[8] that is ill-suited to a network of this scope.

- **Create Public/Private Partnership:** The Cyren solution is premised upon the creation of a Public Safety Broadband Trust charged with stewardship of this

[8] "The traditional process of spectrum management in the United States has been described as the "command-and-control" model because of the strict control and oversight exercised by the government. The command-and-control model process involves four steps: allocation, adoption of service rules, assignment and enforcement." Federal Communications Commission Spectrum Policy Task Force, Report of the Spectrum Rights and Responsibilities Working Group at 3, ET Docket No. 02-135) (Nov. 15, 2002). This same term has been used in reference to traditional public safety systems wherein operations are controlled strictly through a central command function.

spectrum on behalf of the public and with responsibility for ensuring deployment of an innovative national network platform for public safety and commercial broadband operations by leveraging the commercial engine of the private sector. Lease arrangements with commercial providers will maximize efficient use of this spectrum through a process of dynamic capacity assignments.

- **Foster Broadband Services in America's Underserved Communities:** The Cyren solution will deliver a nationwide 700 MHz broadband network for public safety and general public use in underserved communities, particularly those in less populated areas, thereby ensuring that the untempered influence of normal market forces will not raise the wall between the technology "haves" and "have-nots" in this country even higher.

Therefore, Cyren respectfully requests the Commission to initiate a Notice of Proposed Rule Making to reallocate 30 MHz of commercial 700 MHz spectrum (747-762/777-792 MHz) ("700 MHz Spectrum") to this entirely new, shared network. Cyren recommends that the FCC provide for a single, nationwide network with the authorization issued to the Broadband Trust. The Trust, in turn, will enter into a public/private partnership with commercial wireless providers who will be charged with the responsibility for deploying the network for use by both public safety and commercial subscribers.

II. PUBLIC SAFETY REPRESENTS A UNIQUELY CHALLENGING ENVIRONMENT FOR ADVANCED COMMUNICATIONS.

A. The State of Public Safety Communications

Public safety is and always has been an integral part of the telecommunications landscape. The FCC has maintained a collaborative relationship with this community and has accorded the needs of its users among the highest of the agency's priorities. The public safety community itself has devoted significant resources promoting improved communications capabilities. Organizations such as the Association of Public-Safety Communications Officials-International, Inc. ("APCO"), the International Association of Fire Chiefs ("IAFC"), the International Association of Chiefs of Police ("IACP"), the National Public Safety and

Telecommunications Council ("NPSTC") and SAFECOM, a communications program of the Department of Homeland Security's Office for Interoperability and Compatibility, have dedicated themselves to this effort.

These users also have been well-served by the efforts of Motorola, Inc., M/A-Com, Inc., E.F. Johnson Company, Ericsson, Inc., Lucent Technologies, Inc. and other equipment manufacturers that design products for this specialized market segment. These companies all have endeavored to provide technically excellent, rugged and reliable equipment suited to the particular requirements of public safety operations within the confines of this demanding, yet highly fragmented, marketplace.[9]

Despite these efforts, there are pressing, indeed growing, public safety needs that remain unsatisfied with no obvious solution for resolving them either in the short term or long term. The Commission and Congress historically have responded to the need for additional public safety capacity by allocating more spectrum in whatever bands are available at the time. The result is a mix of bands within communities and across the nation without any mechanism for ensuring interoperability among systems.

Additional frequencies address only one aspect of the public safety communications quandary. Spectrum is essential, but alone it does not resolve operational and economic factors that historically have frustrated efforts to make public safety communications the preeminent model that, by rights, it should be. Moreover, not only the amount, but the contiguity, of spectrum is essential when contemplating a broadband network such as that proposed by Cyren. It is not possible to reconfigure or redeploy non-contiguous, narrowband allocations designed to facilitate traditional "command-and-control" public safety systems into a spectrum block of

[9] Cyren is confident that these companies will provide meaningful input on the instant proposal and will support a network dedicated to satisfying advanced public safety requirements, given their decades-long commitment to meeting public safety communications needs.

adequate size to support such a network, particularly since these channels support functioning systems. Thus, the collective technical expertise of public safety representatives and equipment manufacturers cannot address the systemic problems that have left public safety communications largely outside of the wireless revolution that has emerged in the commercial marketplace.

First among those inhibitors is the highly fragmented nature of this user group. The traditional "command-and-control" approach to awarding channels for public safety use, a function of the best technology existing at that time, ensured levels of self-sufficiency and independence that were considered essential to reliable communications, but at the cost of interoperability. With technology historically focused on narrowband operations, the FCC rules attempted to marry individual channels to particularized needs. The technical requirements applicable to various public safety allocations, for the most part, do not require standardization of equipment even when used for similar purposes. As a result, agencies within a single jurisdiction may be unable to communicate easily with one another. Communications between adjacent jurisdictions often are severely limited and inadequate for emergency situations. Interoperability across local, state and federal levels is situational and ad hoc, at best.

That model has evolved somewhat through the deployment of multi-user, statewide or even regional trunked systems, and admittedly they are impressive examples of cooperative efforts among multiple jurisdictions.[10] Yet such systems are the exception rather than the rule, few are comprehensive, and none have either the contiguous spectrum or a technology that could support next generation applications.

[10] One successful and technically innovative example is the Washington, DC Wireless Accelerated Responder Network ("WARN"), a citywide municipal wireless public safety broadband network pilot program. The program is designed to demonstrate advanced broadband public safety applications. WARN is available to the District's government agencies, as well as federal users and other governmental partners throughout the metropolitan area. WARN has successfully demonstrated the practical capabilities of broadband public safety applications and has been used during the 2005 International Monetary Fund meetings, the 2005 Presidential Inauguration, and other events. In 2006, WARN was awarded the IACP Excellence in Technology award. The Utah Communications Agency Network ("UCAN") is another example of a multi-jurisdictional public safety network.

User group fragmentation is not the only barrier public safety faces in achieving the goal of a modern, flexible, nationwide, interoperable wireless communication solution. The limited funding for public safety communications facilities presents difficult problems as well. Governmental authorities have a never-ending list of priorities, all of which require financing.[11] Monies are as likely to be needed for fire engines as for fire radios. In the best of times, it is difficult for communications officials to secure adequate financing to build, maintain, and upgrade, much less replace, their systems, particularly given the lengthy budget cycles and uncertain economic climates under which they operate. When funding is available, it typically is doled out in annual appropriations. Those funds are better suited to paying for recurring operating expenses rather than large-scale undertakings such as the infrastructure costs associated with communications systems deployment.[12] Deficits at the municipal, state and federal levels, whether driven by efforts to prosecute a global war on terrorism, by an extraordinary series of natural and manmade disasters, by skyrocketing fuel costs or by other causes, place substantial strains on government's ability to fund capital-intensive projects.[13]

Even if public funds were available for some agencies in certain jurisdictions to deploy more advanced facilities, once built there never has been ongoing funding sources to keep them "evergreen."[14] Systems inevitably become outdated, but are not able to be replaced, or even

[11] "The alarming decline in first responder funding from the federal government and the F[irst] R[esponse] C[coalition]'s new estimate that first responders will be underfunded by $100.2 billion by 2008 raise enormous concerns about America's security." American's First Responders and the Federal Budget: A Study of Rhetoric Versus Reality, prepared by First Response Coalition (March 2005).

[12] As discussed *infra*, the network solution proposed by Cyren Call eliminates a need for public safety infrastructure investment for just this reason.

[13] By contrast with shrinking government funding, the availability of private capital is at record levels. There is ample financing that can be tapped for high-growth opportunities such as wireless communications, including for the commercial build-out of the broadband network proposed herein.

[14] For example, Michigan is reported to have spent $200M for a system designed to serve 7,600 users. A system in Pennsylvania will serve some 6,000 users at a cost of approximately $222M. Florida has spent $325M for a system with an anticipated user base of only 6,000. It is not likely that taxpayers will soon ante up additional funding to upgrade or replace these systems that have per capita costs of $26,315, $37,000 and $54,166 respectively. The

significantly upgraded, for many years. Emergency providers are left, at best, with what qualified as state-of-the-art equipment when the system was originally selected, but without the ability to "refresh" its capabilities as technology advances.

The problem is exacerbated by the public safety community's inability to command a meaningful market response to its communications needs. It is sadly ironic that the wireless users with the most demanding operational requirements, requirements dictated by their unique public responsibilities, constitute only a very small segment of the expanding wireless marketplace. They simply do not carry adequate market weight to drive advanced, yet cost-effective, communications solutions commensurate with their needs.

Consumer wireless subscriber unit costs have plummeted while system applications for those users have become more diverse and exotic. That wireless army already represents hundred of millions of units in the United States alone and is growing each day. By contrast, the core first responder community is estimated as fewer than three million persons nationwide.[15] The entire public safety market may be smaller than thirteen million users. The fact that these entities make their choices on a system-by-system, agency-by-agency basis from among equipment with incompatible transmission technologies further diminishes whatever collective market power the group otherwise might have.

The result is predictable, albeit unfortunate for users and manufacturers alike. The public safety community, even collectively, is not numerous enough to provide the type of business opportunity that exists in the commercial wireless marketplace. Instead, equipment suppliers must recover the research and development costs of this very demanding user group over a

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statewide systems in New York and Texas, each of which is expected to cost more than $1B, are unlikely to be replaced in the foreseeable future, irrespective of technological enhancements.

[15] For purposes of this Petition, Cyren considers the core first responder community to be comprised of law enforcement, fire service and emergency medical service personnel at the local, state and federal levels.

relatively small customer base. Under these conditions, the marketplace cannot operate at optimal efficiency.

To the extent public safety systems remain islands unto themselves, they never will have the spectrum depth or economic clout to command the features and functionalities that their responsibilities increasingly will demand and that the FCC has identified as essential for public safety communications in the 21st Century. They will not achieve meaningful levels of interoperability across bands and service areas.

B. Public Safety Communications Requirements in the 21st Century

The Commission recently conducted an in-depth investigation into the spectrum requirements of public safety.[16] In its December 19, 2005, Report to Congress regarding the short-term and long-term needs of federal, state and local emergency responders, the FCC identified the following as the first two of its principal findings:

- Emergency response providers would benefit from the development of an integrated, interoperable nationwide network capable of delivering broadband services throughout the country.

- While commercial wireless technologies are not appropriate for every type of public safety communication, there may now be a place for commercial providers to assist public safety in securing and protecting the homeland.[17]

Cyren agrees with the Commission's findings. It also agrees with the public safety community that has urged the FCC to identify true broadband spectrum opportunities for public safety operations.[18] These findings lead inevitably to an ambitious, revolutionary approach to public safety communications and Cyren has fashioned this proposal in response to those findings.

[16] *See* n. 5 *supra*.
[17] Public Safety Needs Report at 3.
[18] *See*, *e.g.*, Letter dated Feb. 6, 2006 to Michael J. Wilhelm, Chief, Public Safety and Critical Infrastructure Division, Wireless Telecommunications Bureau, FCC from Vincent R. Stile, Chair, National Public Safety Telecommunications Council. *See also* Public Safety Needs Report at ¶ 65.

Thus, this proposal addresses a need already identified by the Commission, the public safety community, and Congress. This most critical segment of the wireless marketplace must have access to a robust, interoperable, broadband network that matches or exceeds the capabilities of commercial systems, including the ability to implement technical improvements as they are developed.

The issue is not whether first responders at the local, state and federal levels deserve such a network. They unquestionably do. It is not whether there is sufficient, contiguous, unencumbered spectrum in the optimal portion of the electromagnetic band to support such a network. There assuredly is – at least at present. The solution is the 30 MHz of 700 MHz Spectrum currently allocated for commercial use and scheduled to be auctioned no later than January 2008 which is ideally suited for this purpose.

The compelling need for the reallocation of this spectrum was described with chilling clarity by a coalition of public safety organizations:

> Our first responders need better tools than the terrorists already have, and this starts with sufficient spectrum available to support modern, scaleable dedicated and secure broadband wireless networks for public safety.[19]

It would be unconscionable should America fail to heed this clarion call.

[19] Comments of the Spectrum Coalition for Public Safety, FCC 05-80 at pp 2-3.

III. THE 700 MHz C AND D BLOCKS ARE ESSENTIAL TO DEPLOYMENT OF A NATIONWIDE, COMMERCIALLY FUNDED PUBLIC SAFETY BROADBAND NETWORK.

Wireless communications is the victim of its own success. As the cost of equipment and service drops and the variety of offerings increases, the demand for spectrum grows unabated despite admirable efforts by wireless carriers and manufacturers to keep pace. This escalating demand for capacity has pushed systems to spectrum bands at the upper edge of utility for certain types of wireless applications. Reduced propagation in higher bands may not be a significant issue for localized systems such as mesh networks and WiFi, or even for adding capacity to existing commercial networks that typically limit their coverage to areas of more concentrated population, but the coverage/cost equation can prove an insurmountable obstacle for building an entirely new mobile network.

A. 700 MHz Offers Uniquely Suitable Propagation Characteristics for Public Safety

All spectrum is not created equal. Different bands have different characteristics and, therefore, are better suited to particular types of wireless services. In general, the lower the band, the greater the propagation which translates into broader coverage from a single transmitter. The same range can be achieved in higher frequency bands by building more transmitters, but only at a substantial cost.

This 700 MHz Spectrum offers the only unassigned band where mobile operations with the requisite coverage for public safety operations will not be prohibitively expensive.[20] Unlike most other spectrum users, first responders do not have the luxury of limiting their operations to markets with significant population density. They must be able to communicate throughout their areas of responsibility. Their terrestrial coverage must have as broad a geographic reach as is

[20] *See* Attachment B for description of the cost/coverage advantages of 700 MHz spectrum. Stifel Nicolaus Equity Research Industry Update (Mar. 16, 2006).

technically possible and financially sustainable.[21] Should public safety be required to meet its coverage requirements in higher bands, significantly more infrastructure would be needed to cover the same geography which would substantially increase initial equipment costs, the complexity of building a network, and ongoing operating expenses.[22] These additional costs would make building the network proposed in this Petition entirely impractical.

The 700 MHz Spectrum is the prime, soon-to-be-unencumbered[23] contiguous band for public safety broadband operations. The FCC and Congress already have determined that 700 MHz is optimally suited for public safety usage. Indeed, Congress has expressly recognized that 700 MHz is ideal for providing first responders with channels earmarked for interoperable communications.[24] Cyren submits that the C and D Blocks at 700 MHz, because of favorable propagation characteristics and contiguous bandwidth, represent the only practical opportunity for deployment of the nationwide, interoperable, broadband mobile communications network supporting local, state and federal emergency response providers envisioned by Congress.

B. Public Safety's Existing 24 MHz Allocation at 700 MHz is Not a Substitute

In particular, the existing 24 MHz public safety allocation within the 700 MHz band could not and should not be used for the network proposed by Cyren.[25] The increased expense of building a system to more costly public safety specifications dictates that the nationwide, broadband network proposed herein cannot be financed except by pairing it with a

[21] Even with the unprecedented breadth of Cyren's terrestrial build out, coverage will need to be supplemented by satellite service in less populated regions. *See* Section III C.
[22] It is axiomatic that all parties seek the "best" spectrum; that is, the spectrum that permits them to meet their needs at the lowest cost and with the easiest deployment. In this instance, the Commission must weigh the suitability of 700 MHz for developing a new, nationwide, terrestrial public safety footprint versus making it available to add capacity to the facilities of existing commercial networks with defined, much more limited coverage.
[23] *See* 47 U.S.C. § 337(a)(1); Reallocation of Television Channels 60-69, the 746-806 MHz Band, ET Docket No. 97-157, *Report and Order*, 12 FCC Rcd 22953 (1997); *see also* The Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251 § 3004 (1997), codified at 47 U.S.C. §337.
[24] *See* Pub. L. No. 108-458, 118 Stat. 3638 (2004), codified at 6 U.S.C. § 413.
[25] *See* Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, First Report and Order and Third Notice of Proposed Rulemaking, 14 FCC Rcd 152 (1998).

complementary commercial opportunity that promises sufficient capacity to justify the multi-billion dollar investment that will be required to deploy the system. That would not be possible on the existing 24 MHz allocation for which public safety already has identified requirements that dictate a variety of transmission formats with varying bandwidths to support different applications.[26] The remaining capacity would be inadequate for combined public safety/commercial broadband usage.

The Commission recently initiated a rule making proceeding in which it is investigating whether the existing 24 MHz band plan should be modified to accommodate some broadband channels.[27] While Cyren believes the configuration of that 24 MHz allocation is a matter within the expertise of the public safety community, the proximity of these bands suggests that at some future date it may be appropriate to synchronize their regulations to derive even greater spectrum efficiencies. In the meantime, however, equipment manufacturers have developed products and systems have been sold based on the current allocations and rules. System deployment already is underway in some areas. These activities should not be put on hold or in any way discouraged while the merits of the Cyren proposal are debated. Rather, they should be accommodated by the Commission as expeditiously as possible so that the status of public safety communications does not deteriorate pending resolution of the issues raised in this Petition.

[26] Reallocating the 700 MHz Spectrum to public safety also safeguards the possibility of integrating this spectrum with the existing 24 MHz public safety allocation at some future date. That opportunity would be forfeited should this 700 MHz Spectrum be auctioned for purely commercial operations.

[27] Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communications Requirements Through the Year 2010, WT Docket No. 96-86, Eighth Notice of Proposed Rulemaking, FCC 06-34 (rel. Mar. 21, 2006).

C. The Network Proposed by Cyren Will Deliver Broadband Capability Nationwide for Public Safety and General Public Use

The instant proposal represents an innovative solution to two, complementary public interests: the urgent need for an interoperable broadband network for first responders and the desire to bring broadband capability to the general public in underserved communities. The Broadband Trust will hold the license for the authorization and ensure that it is built to public safety specifications, but, as detailed in Section IV, construction of that network is entirely dependent on participation by commercial service providers. That, in turn, will result in the provision of broadband commercial service on an unprecedented geographic scale.

Cyren already has explained that radio coverage is one of the most critical components of a public safety grade network. This is true whether covering a single small town in South Dakota or the entire nation as proposed by Cyren. Yet, America is a vast country with virtually every type of terrain represented within it, including extensive deserts, dense forests and rugged mountain ranges that are uninhabited. It is not realistically possible to provide one hundred percent (100%) terrestrial radio coverage throughout the country as that would include areas where there is no or extremely sparse population.

The network proposed by Cyren would consist of 37,000 transmitter sites that collectively cover 99.3% of the nation's population. This represents coverage of 90% of all counties throughout the nation, and 100% of counties with a population density of greater than 5 people per square mile.[28] The result is 75% terrestrial geographic coverage of the contiguous United States and 63.5% of the entire nation.[29] This is vastly superior to any terrestrial broadband commercial service available today or anticipated in the foreseeable future. This

[28] Site availability should be significantly simplified since the Broadband Trust will hold the license and presumably will have access both to existing public safety sites and to the powers of eminent domain.
[29] *See* Attachment C. Hawaii and Puerto Rico are not shown on the map, although these areas have 100% terrestrial coverage.

coverage will deliver the advanced voice and data capabilities of an all IP broadband network to public safety and the general population in areas of the country that have not yet seen digital cellular service.

Areas outside the proposed terrestrial coverage will be addressed as well. First, the proposed network includes an overlay satellite component that will extend the reach of the network to effectively 100% of the geography of the United States.[30] Satellite coverage also offers an important redundancy to the network, a critical feature in situations when infrastructure is damaged over a large geographic area as demonstrated so dramatically during and immediately following Hurricane Katrina.[31]

Further, Cyren expects to work closely with the rural commercial wireless community that is based in areas where providing terrestrial coverage creates unique economic challenges based on sparse population. These operators already hold licenses to operate in some of the most sparsely populated regions of the country.[32] Their communities of interest complement Cyren's intended terrestrial coverage. A collaborative effort between the Broadband Trust and these providers should establish the market opportunity and the economic justification to extend their coverage beyond the current limits. It will produce the best opportunity to date for rural America to join in the broadband revolution.

Thus, the Commission has a unique, highly time-sensitive opportunity to make the 700 MHz Spectrum available for shared public safety/commercial use. Absent this compelling need, an auction of this spectrum for exclusively commercial operation might well be appropriate as

[30] Even satellite coverage is not entirely ubiquitous due to areas of extreme terrain where natural shielding prevents signal penetration.
[31] *See* Public Safety Needs Report at ¶¶ 28-9.
[32] For example, s*ee* Attachment D which depicts the licensed operating areas of certain members of the Rural Cellular Association. When compared with the Cyren terrestrial coverage map included as Attachment C, it is apparent that the active participation of such operators could contribute significantly to a more ubiquitous terrestrial deployment.

the public unquestionably derives many benefits from such services. In this instance, however, a choice must be made. Should the entire 60 MHz of available 700 MHz spectrum be auctioned in early 2008, including the 30 MHz Cyren proposes be devoted to a shared public safety/commercial broadband network, the opportunity to deploy that network will be irretrievably lost. **No alternative spectrum will prove an adequate substitute.**

IV. A PUBLIC/PRIVATE PARTNERSHIP IS ESSENTIAL TO DEPLOYMENT OF A 700 MHz PUBLIC SAFETY BROADBAND NETWORK

A. A First-in-Class Broadband Network Will Advance Public Safety and Commercial Interests

> From the Oklahoma City bombing to the 9/11 attacks on New York and the Pentagon to the aftermath of Hurricane Katrina, we are reminded all too frequently about the importance of interoperable wireless communications systems to emergency response and recovery units. Both satellite and terrestrial-based wireless networks are absolutely essential to the successful work of first responders. **Bandwidth – used effectively – saves lives.**[33]

The wireless industry unquestionably has embraced broadband technologies as essential to support communications applications unachievable on narrowband spectrum. Just as analog technology has been abandoned in favor of digital in most large-scale communications systems, broadband now is displacing both because of its superior functionalities and spectral efficiencies.

The deployment of a truly advanced broadband mobile network such as that proposed by Cyren is directly and specifically dependent on access to sufficient bandwidth. Today's commercially available broadband technologies require either 1.25 MHz or 5 MHz channels. Emerging mobile broadband technologies can require up to a 10 MHz channel. Reassignment of the 700 MHz Spectrum would provide the Broadband Trust with the bandwidth platform to select from among the most advanced broadband wireless options available or currently under

[33] Freeing Our Unused Spectrum: Toward a 21st-Century Telecom Policy; Technology CEO Council at p. 7, Feb. 2006 (emphasis added) (Technology CEO Council Report).

development including, but not limited to, CDMA2000, UMTS, OFDM and 802.x.[34] Emergency response providers often have adequate, if not interoperable, voice capability. The key benefit of the network proposed herein is the opportunity to provide those users with their current capabilities, as well as access to multiple, simultaneous services such as real-time video, streaming video, low latency data applications, and large file transfers.

The FCC already has identified certain applications that would be available on such a network:

- delivery of rapid warnings and messages pertaining to criminal activity, including AMBER Alerts;
- video surveillance during emergency incidents;
- real-time text messaging and e-mail;
- delivery of high resolution digital images; and
- ability to obtain location and status information of personnel and equipment in the field.[35]

The City of New York has suggested that broadband would permit public safety users the ability to access map, building layouts, federal and state anti-crime databases, full-motion video to and from emergency scenes, and biological, chemical, nuclear and radiological monitoring and control.[36] Exhibit II identifies other advanced features and functionalities tailored to emergency responder needs that a shared public safety/commercial platform will support.

While each of these enhancements will contribute significantly to public safety operations, Cyren has not lost sight of the bedrock capability on which the lives of all first responders rely. Users that elect to shift all of their communications operations to this shared

[34] Exhibit II is a detailed analysis of the proposed system's capabilities and includes a description of the spectrum bandwith/technology choice matrix.
[35] Public Safety Needs Report. at ¶ 26.
[36] Comments of the City of New York cited in Public Safety Needs Report in. n. 234.

public safety/commercial broadband wireless network also will have push-to-talk service with latency that is equal or superior to that available on equipment built to the APCO-25 standard.[37]

An advanced broadband network also will create a unique opportunity to address the complex problem of interoperability in public safety communications. Of course, interoperability will not be an issue for public safety organizations operating on the network. The Trust will be able to establish a wide range of protocols for dynamic grouping of users with speed and flexibility unmatched on other public safety systems. The dilemma has been how to tie together users with different radios operating in different bands when they need to communicate with one another in times of emergency. As it will not be possible for all public safety users to migrate to this broadband network immediately (or in some cases ever),[38] it is essential that the network permit some level of incident-specific integration of radios programmed for and operating on other systems and bands, at least in the context of multiple organizations responding to emergency situations. That capability will be available through the network proposed by Cyren.

The Cyren proposal will create, for the first time, a truly interoperable national public safety network. All of the public safety users who obtain their mobile and other wireless communications services over this network – whether local, state or federal – will be assured of a common frequency plan, a common technology platform, compatible equipment and consistent network functionality and performance. This will be true whether they are operating in their

[37] This effectively zero latency will not be achievable when operating on the satellite component of the network. *See, e.g.*, Comments of Mobile Satellite Ventures Subsidiary LLC on Public Safety Needs Report at 12 (Apr. 28, 2005).

[38] There are instances in which existing, conventional, analog systems may remain optimal for the day-to-day operations of certain public safety users. For example, the propagation characteristics of VHF frequencies are ideal for coverage over large, heavily forested areas such as those patrolled by the National Forest Service. Cyren does not suggest that these systems should be replaced by the broadband network it has proposed. It does submit that creating a nationwide network with complementary terrestrial and satellite coverage could provide currently unavailable interoperability functions that would be enormously beneficial to such users in times of emergency.

home jurisdiction or in another location. In addition, the network will be designed with the capability of functioning as an interoperability bridge to legacy systems for users that have not migrated to the network.

As part of the solution, Cyren Call is proposing building an all IP backbone network that is Project 25 compliant and public safety grade into which existing legacy networks can be plugged. This interim solution will allow for voice interoperability while the enhanced broadband network is being constructed. It also will allow current systems to have a useful life prior to migrating to the new broadband network. Further, it will create a path for a smooth transition from the old network to the new with some users operating on both networks for a period of time as they confirm quality and reliability.

It is envisioned that this network will serve as a flat IP platform capable of allowing communications among users on the oldest public safety systems, the latest P-25 networks, and the new broadband network itself. A series of gateways will be tied together with an IP backbone which in the event of an emergency would allow voice communications among multiple organizations and jurisdictions. [39]

As part of the solution, Cyren Call also will integrate a satellite gateway in the event the terrestrial networks are damaged or otherwise unavailable. Terrestrial build-out of the entire nation will not be possible for the reasons Cyren has described already. Nonetheless, those areas still will be tied to the other public safety and commercial user populations through a satellite overlay network that will provide coverage in areas that cannot economically justify a terrestrial network and redundancy everywhere; a ubiquitous back-up communications system when no terrestrial network coverage is available.

[39] Cyren is aware of numerous vendors who have what appear to be useful solutions for interoperability using hardware and software. Cyren expects these vendors to file comments in this proceeding.

This approach, depicted graphically below, is a transition solution. It is effective only if the agencies requiring interoperability have their own transmitting towers in the area. However, in terms of the history of public safety interoperability, it is a giant step forward.

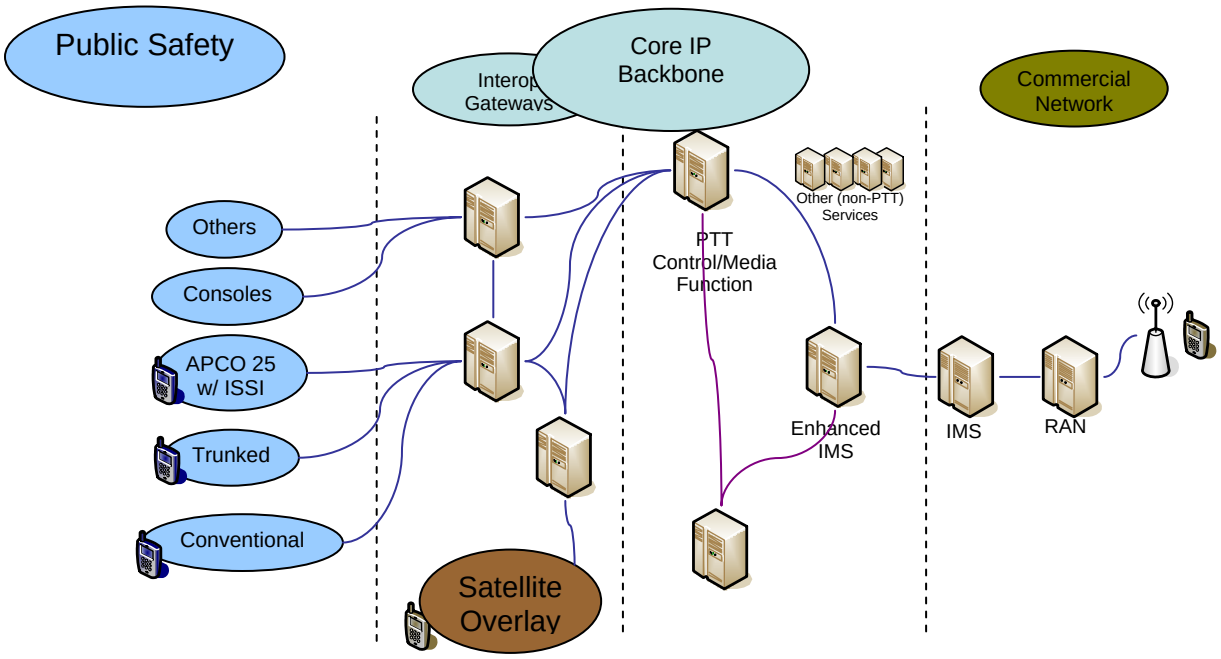

Figure 1 *shows the interoperability bridge between Cyren's proposed network and currently operating public safety systems.*

B. Only A Commercial Engine Will Drive Broadband Deployment

Cyren built its proposal around the findings in the FCC's Public Safety Needs Report. However, in that same document, the FCC also identified the formidable challenge of funding a comprehensive network:

> In additional to adequate spectrum and efficient technology, the realization of a nationwide interoperable broadband mobile communications network also would require sufficient funding. While of significant benefit to public safety, implementation of such a network would likely be costly….Without adequate funding…it is likely that public safety would be unable to implement a nationwide, interoperable broadband network. In addition, absent adequate funding, cash-strapped public safety entities could implement broadband systems

> that are less capable and efficient and do not include a nationwide interoperable feature, which could create gaps in a nationwide system.[40]

Regrettably, the Commission's analysis is correct. Its conclusion was echoed by the Technology CEO Council which has called on Congress to establish a "multiyear funding mechanism to assist public safety organizations and other government agencies in deploying advanced technologies that use spectrum more efficiently and to make their network interoperable."[41]

It may be that the government, at some future date, will make available the billions of dollars required to build a truly advanced public safety network - and also will earmark the ongoing funding needed to maintain and consistently upgrade such a system. But even if that possibility were a certainty, which it clearly is not, that solution is not optimal.

Indeed, even if the government were able to fund a public safety broadband project at 700 MHz, both as to initial implementation and ongoing maintenance and technology refreshment, it is questionable whether it would be fiscally prudent to spend billions of dollars to deploy a stand-alone public safety network of this magnitude. As spectrum that is usable for mobile operations becomes increasingly scarce, it is incumbent upon all users, including local, state and federal public safety entities, to maximize utilization of the channels allotted to them. Given the significant efficiencies that can be derived from a properly designed and managed 30 MHz broadband network, it no longer serves the public interest to maintain the spectrum silos that historically have segregated the operations of local, state and federal public organizations. Further, technology such as that proposed on this network obviates the need to reserve for exclusive public safety utilization spectrum resources and related capacity that, outside the context of emergency or catastrophic events, largely will lay fallow.

[40] Public Safety Needs Report at ¶ 30.
[41] Technology CEO Council Report at p. 3.

This "better solution" from a spectrum efficiency perspective also presents an unprecedented opportunity for public safety to share a network with commercial users and have the infrastructure build-out financed by the commercial operations. The economic benefits of this approach are obvious. It would avoid dedicating taxpayer dollars to construct a system with an upfront *per user* capital cost of perhaps hundreds of thousands of dollars - even if spread over the entire local, state and federal user base.[42] This public/private partnership arrangement could be accomplished by the Commission expanding the vision articulated in its secondary market proceeding and extending its spectrum lease provisions to this unique public safety authorization.[43]

In that proceeding the Commission recognized the efficiencies achieved through secondary licensing and stated that the development of secondary markets meets the Commission's objectives "to encourage the development of broadband services to all Americans, promote increased facilities-based competition among service providers, enhance economic opportunities and access for the provision of communications services, and enable development of additional and innovative services in rural areas."[44] All of these important objectives are met by the instant proposal. While the FCC permits secondary leasing in many circumstances for numerous service categories, licensees on public safety spectrum are expressly prohibited from entering into secondary market agreements except under limited circumstances.[45] The preclusion is intended to protect the public safety community generally from injudicious action by a given licensee in allowing its spectrum to be used for other than public safety operations.

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[42] *See* n. 14 *supra*. The per user cost of the network proposed herein, if spread only among the core public safety/first responder user group members, would far exceed even the very significant costs of the systems described in that note.
[43] *Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking*, WT Docket No. 00-230 (rel. September 2, 2004), p. 3. *See also, Report and Order and Further Notice of Proposed Rulemaking*, 18 FCC Fcd 20604 (2003). *See generally*, Spectrum Policy Task Force, ET Docket No. 02-125.
[44] *Id.* at 3.
[45] *See* 47 C.F.R. § 90.20(h).

That limitation may be reasonable when applied to narrowband channels which should be returned to the FCC for use by other eligible entities in the event the licensee does not need the capacity. Those same concerns do not arise in the context of an advanced network such as that described in this Petition where usage is determined by capacity requirements at a given point in time rather than discrete channel assignments. The Commission has noted that secondary lease agreements expand "the scope of available wireless services and devices and [enable] more efficient and dynamic use of spectrum to the ultimate benefit of consumers throughout the country."[46] As outlined in this Petition, the use of secondary market agreements creates the first self-sustaining business case model for public safety. The existing restriction on leasing of public safety spectrum certainly does not outweigh the tangible benefits of capitalizing on commercial operations to fund deployment of a broadband network that will be designed, managed and shared by public safety.

Others also have recognized the importance of harnessing the benefits of free market principles through secondary proceedings to promote more efficient use of public safety spectrum. For example, Joshua Marsh states "[i]f the FCC were to permit secondary markets in public safety spectrum, several types of markets might emerge that could benefit both public safety agencies and the public at large."[47] Marsh outlines several possible spectrum scenarios for public safety using secondary markets and notes that "each provides more flexibility in spectrum management – potentially putting more underutilized spectrum into the hands of those

[46] Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, WT Docket No. 00-230, 19 FCC Rcd 17503 at 17506 (2004) (citing *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 00-230, 18 FCC Rcd 24817 (2003)).
[47] Marsh, Joshua. "Secondary Markets in Non-Federal Public Safety Spectrum." p. 17.

who value it the most and providing a mechanism by which the market can alleviate interference."[48]

Shifting the infrastructure build-out cost to the commercial side of the partnership is critical to the success of this proposal. Public monies that otherwise might be devoted to a less feature-rich system deployment instead will be available for other first responder communications purposes. Public safety users will be responsible only for the reasonable, pay-as-you-go costs of their own equipment, which itself will be available at a discount in response to the combined size of the public safety/commercial user base. They also will pay usage-based service charges, including amounts to fund research and development activities focused on public safety-specific devices, services and solutions. In addition, those charges will fund network administration and coordination, as well as some portion of network upgrade expenses.

For these reasons, Cyren believes the public/private partnership proposed herein is the best, most economically feasible and most practical solution available from both a public policy and fiscal policy perspective.

C. The Framework for a Shared 700 MHz Public Safety/Commercial Broadband Network

There are essential building blocks for deploying a nationwide, IP-based, broadband mobile network capable of delivering innovative data applications as well as traditional public safety grade voice services and able to support an interoperability bridge with other local, state and federal governmental systems. This network will be constructed, maintained properly and upgraded when appropriate, provided the following steps are taken:

- Initiation of a process whereby the initial Broadband Trust is established based on recommendations of local, state and federal governmental organizations;

[48] *Id.*

- Issuance of a license for the 700 MHz Spectrum to the Trust with specific authority to enter into leases with qualified carriers to construct, operate and maintain the network;[49]

- Establishment by the Trust of network protocols and procedures that provide public safety entities with software "lock and key" control over their operations that in all critical respects are substantially equivalent to the physical control exercised over public safety facilities in traditional "command-and-control" operations;

- Authority for the carriers to provide commercial service on the network subject to maintaining a flexible, as-demanded level of network capacity to meet event-driven, emergency public safety requirements;

- Recognition that the Trust must engage an agent to drive "evergreen" technology development consistent with public safety specifications, to oversee network deployment, to manage the inter-relationship of public safety and commercial operations, and to assist the Trust in all activities related to the network.

Adoption of a regulatory framework that includes these elements will provide a 21st Century solution to emergency response provider 21st Century communications requirements.

1. Sharing the Network

Public safety agencies bear a responsibility for protecting the public safety and welfare, a responsibility that cannot be assigned, transferred or out-sourced. This singular obligation historically has discouraged public safety entities from relying on communications facilities to meet critical requirements other than those under their direct, physical command and control.[50] The implementation of regional and even statewide trunking systems in recent years has required participating organizations to balance the cost and operational benefits of a shared radio system against the surrender to the organizing entity of the autonomous authority typical of public safety

[49] *See* 47 C.F.R. §§ 1.9010, 1.9020, The spectrum leasing rules provide two options: the spectrum management lease and the *de facto* transfer lease. The question of which is preferable in the context of this public/private arrangement should be explored in the rule making proceeding.

[50] Governmental entities providing public safety services to public bodies receive certain liability protections. Likewise, private entities such as the commercial carriers and network manager that provide similar services to public bodies must be granted comparable "sovereign immunity" liability protections. These protections are a critical element to justify the significant financial investments required by the private sector to provide services on behalf of public safety to the public at large. Cyren intends to seek Congressional action in respect to providing the immunity that will be required.

operations. Those arrangements have worked because decision making remains under the control of public safety individuals or organizations that are representative of the agency participants. Understandably, however, the emergency response provider community largely has remained unwilling to move critical activities to commercial systems whose specifications they do not determine and whose operations, practices and policies they cannot direct.

It is uniquely the deployment of an all IP, advanced, broadband technology on a 30 MHz allocation that permits Cyren to propose a common, "shared" network, one that blends the economic advantages of commercial operations without sacrificing the controls essential to reliable public safety usage. The spectrum efficiency derived from having these disparate user groups sharing a single network is, by itself, a compelling rationale for adopting the regulatory framework proposed herein. It validates the FCC's most progressive thinking on spectrum management and would be unachievable but for the technology drivers that have delivered this IP-based broadband opportunity.

Cyren appreciates that public safety users historically have been reluctant to rely on commercial systems. Headlines decrying bottleneck congestion during large-scale emergencies are "red flags" for users whose need for reliable communications is greatest during just such events. This type of operational gridlock will not occur on this network since the network itself will be designed to ensure dynamic capacity assignments during emergencies that always favor public safety usage. The more common problems with commercial operations - such as scheduling maintenance windows, insufficient battery backup at transmitter sites, and unreliable T1s - will be addressed at the outset since the Trust will be establishing system specifications.

Thus, public safety organizations (through the Broadband Trust as the nationwide licensee) and customers of the commercial operators (as 700 MHz Spectrum lessees) will share

an advanced, IP-based broadband network utilizing an industry standard technology. Commercial operations will have presumptive access to whatever capacity is not being utilized by public safety, while public safety will have preemptive access to whatever capacity is needed to satisfy its requirements at any given point in time. The essence of this shared network is depicted graphically below:

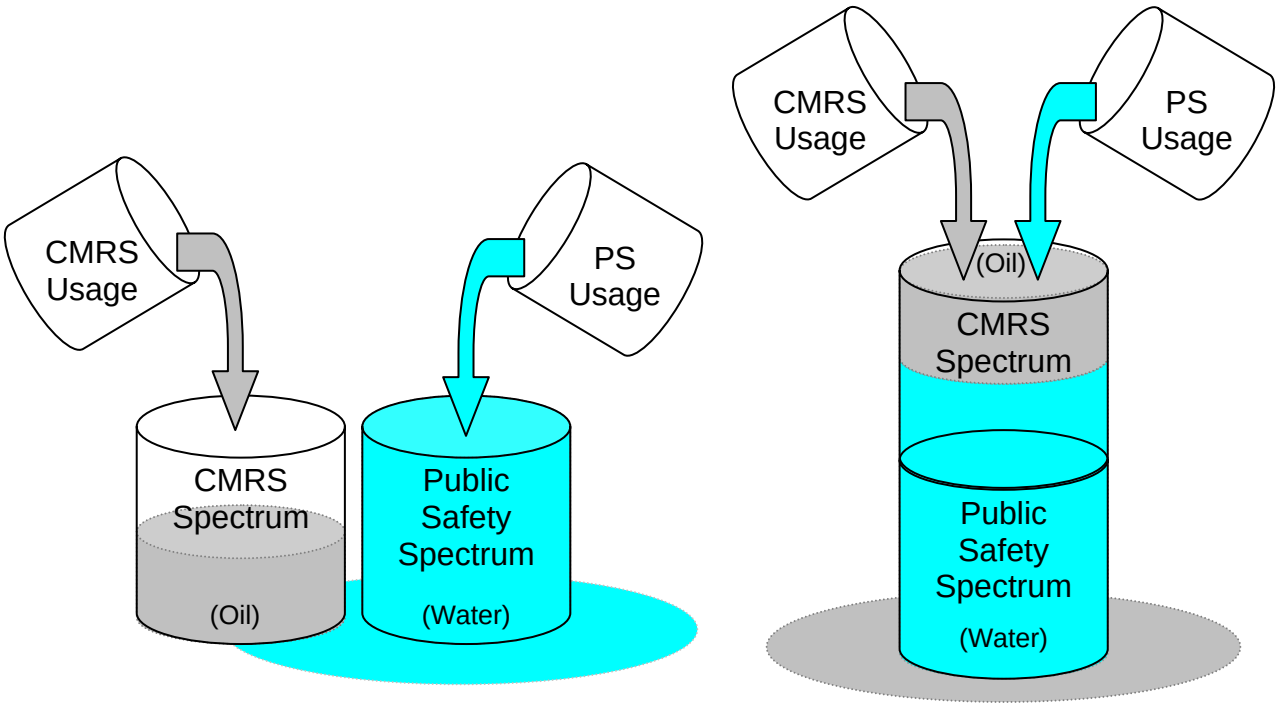

Figure 2 *depicts how public safety and commercial services will share a single network licensed to public safety providing public safety preemptive access to whatever spectrum is needed to satisfy its requirements at any point in time.*

This system design will provide an elegant structure of checks and balances that optimizes efficient utilization of this spectrum. Public safety and commercial users each will make use of their respective portions of the overall network capacity, transparent to the others' operations, until an emergency requires public safety to preempt some portion of the commercial capacity. After the event is over, each user group will revert automatically to its normal claim on

overall network capacity. On a day-to-day basis, public safety has relatively limited capacity requirements; its needs are only sporadically intense. By contrast, commercial usage tends to be consistent from day-to-day with predictable peak periods. In the context of a shared network, public safety will learn to weigh an inclination to reserve spectrum when it is not needed against the cost of unnecessarily displacing commercial operation. Importantly, this "capacity-on-demand" approach eliminates what on narrowband spectrum is the unavoidable, but spectrally wasteful, practice of maintaining channels for emergency purposes only. Ample capacity will be accessible whenever public safety needs it, but it will be available for productive commercial use at all other times.

There also will be an inherent tension between the features and coverage desired by the Broadband Trust and the commercial operators' evaluation of the network that can be funded, maintained and refreshed. If public safety's expectations are unrealistic, they will be tempered by the economic realities that the commercial side brings to this project. On the other hand, a commercial operator who is unwilling to satisfy legitimate public safety requirements will not be selected to participate. The result will be a balanced, fiscally prudent approach to network deployment, operation, and expansion.

2. Selecting Commercial Operators

(a) Legal/Operational Qualifications

The Broadband Trust will need to consider a number of factors when selecting commercial partners. Obviously these lessees must meet all basic FCC qualifications for spectrum lessees. They also must have demonstrable technical, financial and operational capabilities that will permit them to fulfill their obligations in deploying the most advanced wireless system in the nation, consistent with the more rigorous specifications imposed by the

Trust. The novel process by which the Trust will test applicants' financial commitments and also fund network deployment is described more fully *infra*.

There is, however, an additional consideration dictated by the unique coverage requirements of public safety systems. A typical commercial system is built to serve markets of greatest population concentration and the corridors that connect them. As a commercial carrier reaches beyond populated areas, a rigorous cost benefit analysis is conducted to support the extension of cell site coverage. By contrast, public safety must operate wherever there are people or property to protect, however sparsely scattered. The network proposed by Cyren, of necessity, is national in scope. There undoubtedly will be numerous commercial entities eager to participate in its deployment in population centers. Some may already be providing commercial service in these markets; others may be new entrants that could provide competitive vigor to a consolidating wireless marketplace.

Yet it also is essential that the network be built out in more rural communities where prospective providers likely will be fewer. For this reason, the Broadband Trust should look to existing commercial operators as partners outside the major metropolitan areas. Companies with proven track records in operating successful wireless systems in less populated markets clearly represent the best choice for this purpose. Such operators have hands-on experience in building viable wireless businesses in challenging environments. They are able to recommend market delineations that make operational and economic sense in the more rural environments with which they are familiar. Rural carriers even may have existing infrastructure that can host this network, thereby reducing upfront costs and creating a viable economic opportunity in communities that national carriers typically avoid. Many likely have strong working relationships already with the public safety agencies in the markets they serve. They will be

highly motivated to provide the quality of service this network will demand both to the first responder and to the commercial user communities in their marketplaces. Cyren expects this segment of the wireless industry to be a capable, committed partner of the Broadband Trust.

(b) Commercial Carrier Financial Commitment

Competitive bidding is an appropriate means of assigning spectrum to the party that values it most from among competing applicants. Spectrum auctions have proven to be a fair, fast and effective means of awarding licenses in many circumstances and also have contributed substantial monies to the Federal Treasury.

Nonetheless, both Congress and the Commission have confirmed that the generation of revenue is a fortuitous byproduct of, and not the motivation for, spectrum auctions. They recognize that the dollars paid for the acquisition of spectrum are then unavailable for other purposes such as system deployment, at least until recovered from subscribers in the form of usage charges. It is, in essence, a zero sum game and credible arguments have been presented that auctions may even cost the government money over the long-term.[51]

Under Cyren's proposal, it is not necessary to determine whether the 700 MHz Spectrum license should be auctioned by the FCC. Congress already has determined that spectrum used to provide public safety services is exempt from competitive bidding.[52] The Trust, consisting of representative public safety entities, will be the sole licensee of the 700 MHz Spectrum and is exempt from any auction obligation.

Nonetheless, Cyren believes that a novel auction approach conducted not by the FCC, but by the Trust, could play an important role in ensuring nationwide network deployment. For example, it recommends that the Broadband Trust consider employing a "negative auction" as

[51] *See* Exhibit I for a discussion of this perspective.
[52] *See* 47 U.S.C. § 309(j)(2)(a).

part of the carrier selection process.[53] Each applicant for lessee rights in a market would identify either how much it would pay for the right to deploy in that market or, alternatively, how much funding it would need to justify network build-out and subsequent operations. While the party's economic proposal would not necessarily be determinative in identifying the optimal lessee, as qualifications other than financial also will be important for the reasons previously described, it would provide a mechanism for using the superior economics of major market operations to support rural deployment.[54] Monies paid by providers to secure spectrum lease rights in the more populated, economically self-sustainable urban market areas would be used to help fund build-out in markets where population density and growth potential would not normally justify deployment of a broadband network. This "Robin Hood" approach to maximizing system coverage is similar to the Universal Service Fund concept in which the cost of telephone service in rural or high cost areas is subsidized by all telephone network users.[55] It is amply justified by the overall public benefit in having a truly nationwide, advanced public safety network.

Thus, monies that would have been collected in a public auction instead will be used to finance development and implementation of the most advanced wireless system in the nation, tailored specifically to the requirements of public safety users. The overall public interest unquestionably is served by foregoing an immediate contribution of auction dollars to the Federal Treasury in favor of using those same dollars to deploy the nationwide network proposed herein.

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[53] *See* Attachment E for a discussion of auction issues relevant to the instant proposal.
[54] Because the FCC generally has relied on Economic Areas ("EA") and larger geographic groupings to define auction properties and has established population coverage as the benchmark for retaining spectrum, it is not surprising that carriers have gravitated toward serving the population cores in their markets and that smaller, less urban carriers have not had meaningful opportunities to participate in auctions that use those geographic definitions.
[55] *See* 47 U.S.C. § 254.

3. Public Safety Financial Commitment

A public/private partnership is essential if public safety ever is to have access to a truly advanced network with the types of capabilities envisioned by the Commission and by Congress. There is no realistic opportunity for public safety to self-fund such an undertaking. However, if these users can avoid the substantial up-front cost of infrastructure build-out, there will be funds available to purchase or lease IP-based, broadband-capable end user units, pay network airtime charges consistent with the capabilities of the network, and participate in the ongoing funding of network and technology upgrades to keep the system "evergreen."[56] The cost of subscriber units will be driven down to levels heretofore unavailable to first responders since these units, although built to public safety specifications, will contain many of the same components as those in subscriber units deployed by commercial network users.[57] For the first time, there will be a broad enough user base to achieve the cost efficiencies that make cell phones and other wireless devices well within the means of virtually the entire population.

Network airtime charges obviously must be set within a range acceptable to the general public safety community, but are needed for several reasons. First, although public safety will avoid billions of dollars of infrastructure expense, it must assume a reasonable portion of the ongoing cost of operating and maintaining the network. Second, these charges are an important spectrum management tool. Public safety, like all users of the public airwaves, must manage its spectrum utilization prudently and for the general public interest. As the licensee, public safety will have access to the entire network capacity when and as long as needed to fulfill safety-

[56] The largely static characteristics of traditional private systems constructed by public safety entities too often have required total system replacement rather than selective updating of software and components to take advantage of technology advances.

[57] Cyren expects other wireless user categories, including, but not limited to, those in critical infrastructure industries, to have a keen interest in operating on this network with units built to public safety technical specifications.

related obligations. However, to the extent doing so may displace commercial operations, the economic engine of the network, it is appropriate to maintain an economic discipline on public safety's capacity usage.

Additionally, since one key feature of the network is its nationwide interoperability, it is important that it be accessible to public safety and commercial users whether located in urban or less populated areas. Communities with smaller populations often have commensurately smaller budgets to fund communications activities. Similar to the negative-auction concept described *supra*, the Broadband Trust should set and manage the public safety usage fees at a uniform nationwide level to promote network participation in smaller communities with higher costs since enhanced interoperability benefits the public interest generally.

Finally, it is imperative that public safety participate in funding and thereby influence the public safety-oriented aspects of network upgrades. As discussed previously, technical stagnation is one of the fundamental problems with public safety communications. It is exceedingly difficult to upgrade or replace systems because their initial deployment costs are so substantial. With typical technology development cycles now running no more than 24 months and lengthy public safety funding and bidding processes, even state-of-the-art systems can short-change first responders within a brief time after, and sometimes even before, deployment. Competitive pressures on the commercial side will be a powerful motivation for carriers to keep the network "evergreen," but public safety also will be responsible for participating in that important effort.

4. Managing the Network

a) Role of the Broadband Trust

The Broadband Trust – the entity holding the single public safety license for the 30 MHz of spectrum – is essential to Cyren's proposal. The public safety community must be assured that the organizations that comprise the Trust fully and fairly represent the interests of first responders at the local, state and federal levels. It must be confident that the Trust is capable of developing technical, operational and coverage specifications for this network that will satisfy public safety requirements. That community must be certain that the Trust has the skills needed to manage an advanced network of this size and scope, including overseeing the relationship between the public safety usage it represents and the commercial operation, the viability of which is the foundation on which public safety operations are made possible.

For example, before the public safety community will embrace the use of a shared network, safeguards must be in place to ensure that operations will be, in important respects, as secure, confidential and responsive to individual user control as under a traditional "command-and-control" system. The Broadband Trust will be responsible for defining the software "locks and keys" of a mobile, technically advanced network to satisfy those criteria and for overseeing their implementation. The Trust also will remain responsible for meeting whatever construction timelines and coverage standards are conditions to its license. Thus, it will need to develop tools for measuring carrier deployment status and prophylactic measures should those efforts fall behind schedule in any market (or should service in a market be discontinued after construction) so that nationwide coverage and interoperability are maintained.[58] Because the Trust will speak with one voice to technology vendors and other providers on behalf of all public safety users on

[58] The Trust should have substantial latitude in defining and managing coverage obligations, consistent with the flexibility inherent in the FCC's spectrum leasing rules.

the network, it will have significant leverage to dictate product development and negotiate attractive terms.

Cyren anticipates that the FCC will establish a process similar to that used when selecting the North American Numbering Plan Administrator in appointing the initial Broadband Trust members.[59] The Commission will have authority to approve the organizations that participate as public safety representatives during the first term of the Trust as well as the structure of the Trust itself, including the process by which new, qualified representatives replace existing organizations at pre-determined intervals. The Utah Communications Agency Network (UCAN) is one model the Commission might consider when considering organizational structures for the Trust. Others undoubtedly will be suggested during the rule making process since the Broadband Trust concept is one that has worked well in other instances.

b) Role of Cyren – Network Manager

While the Broadband Trust is vital to the success of this initiative, it will need experienced, qualified assistance in ensuring the success of this network. The Trust will play the essential role in defining network specifications and user controls and in establishing the protocols necessary to establish user priorities and interoperability. However, by definition, the Trust's members will have other responsibilities. They cannot be expected to devote full-time attention to this undertaking. Even if they could, management of a network of this scope and complexity will demand highly specialized skills that are not likely to be found within the Trust itself.

Cyren envisions a number of responsibilities that will devolve to the network manager. They include the following: (i) assisting the Trust in defining terrestrial coverage requirements, reliability levels, redundancy arrangement, Quality of Service levels, and other network criteria;

[59] *See NANP Administration Third Report and Order*, 12 FCC Rcd 23071.

(ii) assisting the Trust in evaluating technology options; (iii) assisting the Trust in establishing capacity requirements and procedures for seizing additional capacity when necessary; (iv) developing procedures to manage the Trust's relationship with the commercial carrier lessees; (v) overseeing carrier compliance with network deployment, other lease requirements and network protocols on behalf of the Trust; (vi) negotiating with equipment and service vendors on behalf of the Trust to obtain optimal pricing and packages; (vii) establishing procedures for and managing ongoing network operations in areas such as activation and deactivation of units, formation of talk groups, and interoperability; (viii) developing technology and product "roadmaps" for public safety, including processes for keeping the network "evergreen" through technology upgrades; and (ix) administering revenue streams on behalf of the Trust, including distribution of negative auction monies; and (x) establishment and distribution of network usage charges consistent with supporting nationwide participation and other billing and collection activities.

It is beyond question that the Trust will need to engage a qualified entity such as Cyren to manage this project under the Trust's direction and control. It is recognized that the selection of a manager will be entirely at its will.

IV. CONCLUSION

For the reasons set forth above, Cyren respectfully requests the FCC promptly to initiate a rule making proceeding to consider this proposal. The men and women who put their lives at risk every day to protect us deserve America's best wireless technology. For too many years we have failed them.

CERTIFICATE OF SERVICE

I, Linda J. Evans, a secretary in the law office of Lukas, Nace, Gutierrez & Sachs, Chartered, hereby certify that I have on this 27th day of April, 2006 caused to be hand delivered a copy of the foregoing to the following:

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