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Regulatory Studies Program
**Public Interest Comment on
Public Safety Communications Interoperability¹**

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The Regulatory Studies Program (RSP) of the Mercatus Center at George Mason University is dedicated to advancing knowledge of the impact of regulation on society. As part of its mission, RSP conducts careful and independent analyses employing contemporary economic scholarship to assess rulemaking proposals from the perspective of the public interest. Thus, this comment on the Federal Communications Commission's (FCC's) Notice of Proposed Rulemaking on public safety communications interoperability does not represent the views of any particular affected party or special interest group, but is designed to evaluate the effect of the Commission's proposals on overall consumer welfare.

I. Introduction

The FCC should be commended for its ongoing proceedings to address the communications interoperability problem faced by public safety agencies. Ideally, all first responders should be able to communicate with one another whenever the need arises. Unfortunately, agencies and jurisdictions that should be able to talk to each other often cannot because their communications systems are not interoperable. As they use different frequencies or transmission standards, one agency's radios cannot receive or transmit messages to another agency's radios. A 2004 survey by the U.S. Conference of Mayors found that about a quarter of cities polled did not have a communications link between their police and fire departments.² More than 80 percent reported that they did not have the capability to communicate with FEMA, the FBI, and other federal agencies.³ Forty-nine percent of cities said they are not interoperable with the state police, and 44 percent reported an accident within the preceding year in which a lack of interoperable communications made response difficult.⁴

¹ Prepared by Jerry Brito, senior research fellow, Mercatus Center at George Mason University. This comment is one in a series of Public Interest Comments from Mercatus Center's Regulatory Studies Program and does not represent an official position of George Mason University.

² THE UNITED STATES CONFERENCE OF MAYORS, INTEROPERABILITY SURVEY: A 192-CITY SURVEY 6 (2004).

³ *Id.* at 7.

⁴ *Id.* at 8.

Despite the resources that have been dedicated to it, the interoperability problem persists. To find a long-term solution that enables completely interoperable communications between all necessary emergency responders, we cannot limit our thinking to the current system of public safety spectrum allocation, funding, or acquisition. Conventional approaches to interoperability include patching two or more incompatible radio systems using a gateway,⁵ or simply encouraging agencies to better coordinate their radio deployments without clear incentives for them to do so. These practical approaches should be taken immediately to improve interoperability.

However, Congress has tasked the FCC with assigning 24 MHz of prime spectrum in the 700 MHz band that it allocated to public safety as part of the Digital TV transition. This is a grand opportunity to identify the root causes of the lack of interoperability and then address those causes. It is an opportunity to conduct a “wholesale assessment of long-term spectrum needs” and policy.⁶ In this proceeding the FCC has taken the first steps toward that goal by proposing a national shared-use network.⁷ These are steps in the right direction, and while its proposal is a radical departure from historical public safety spectrum allocation, the Commission can be bolder still in ensuring robust interoperable networks for first responders.

II. Causes of the Problem: Balkanization

The Commission should be particularly commended for acknowledging that the current system of assigning spectrum licenses to individual jurisdictions helps create an environment of balkanized and incompatible radio systems.⁸ In fact, this policy is the root cause of the interoperability problem because it causes a collective action problem.⁹

The term collective action refers to activities that, in order to be successful, require two or more persons or entities to coordinate their efforts.¹⁰ Collective action is therefore group action meant to further the interests of the group.¹¹ A collective action problem is simply a situation in which the rational course of action for the individual members of the group does not coincide with the group-oriented course of action necessary to obtain the “collective good.”¹² As a student of the

⁵ In telecommunications, a gateway is a network node that allows interfacing with another network using different protocols. In essence, two networks are patched together at a gateway, which translates the differing protocols.

⁶ FEDERAL COMMUNICATION COMMISSION, 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 3 (Dec. 19, 2005) [hereinafter Needs Report].

⁷ Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, 72 Fed. Reg. 1,201 (Jan. 10, 2007) [hereinafter “NPRM”].

⁸ NPRM at 6.

⁹ Jerry Brito, *Sending Out an S.O.S: Public Safety Communications Interoperability as a Collective Action Problem*, FED. COMM. L.J. (forthcoming 2007), available at <http://papers.ssrn.com/abstract=960769> (explaining that the interoperability problem is a collective action problem).

¹⁰ TODD SANDLER, COLLECTIVE ACTION: THEORY AND APPLICATIONS I (1992).

¹¹ *Id.* at 1.

¹² *Id.* at 3-4.

collective action problem has summarized, “individual rationality is not sufficient for collective rationality.”¹³

In his seminal work, *The Logic of Collective Action: Public Goods and the Theory of Groups*, economist Mancur Olson showed that large groups usually do not act collectively absent outside compulsion or an independent inducement to individual group members.¹⁴ The problem of public safety interoperability is a classic example of the collective action problem that Olson described.¹⁵ We can apply Olson’s theory of groups to public safety communications to show that although interoperability might be in the common interest of all public safety entities, individual entities have little incentive to assume the costs of achieving it.

We often assume that if a group of individuals has a common interest, they will work together to achieve their common goal. One of Olson’s greatest insights was that the size of a group determines whether its individual members will act collectively. Small groups have a better chance of acting collectively for two reasons. First, an individual member of a small group may be better off if the collective good is provided even if she has to bear its entire cost.¹⁶ That member will therefore undertake to provide the good herself even if she cannot exclude others from its benefits. Olson called such groups “privileged.”¹⁷ Second, in a sufficiently small group, if one member stops contributing for the collective good, the cost to the other members will rise noticeably such that they might refuse to continue making contributions themselves, and the collective good would no longer be provided.¹⁸ Realizing that this would be the outcome, a member of a small group that values the collective good more than his contribution will likely continue to contribute. Olson called these groups “intermediate” groups.¹⁹

Members of a large group, however, may share a common interest in the collective good but nevertheless fail to coordinate. Olson called these large groups “latent” groups because they have the potential to be spurred to collective action either through compulsion or individual incentive. He explained:

[The “latent” group] is distinguished by the fact that, if one member does or does not help provide the collective good, no other member will be significantly affected and therefore none has any reason to react. Thus an individual in a “latent” group, by definition, cannot make a noticeable contribution to any group effort, and since no one in the group will react if he makes no contribution, he has no incentive to contribute. Accordingly, large or “latent” groups have no incentive to act to obtain a collective good because, however valuable the collective good

¹³ *Id.* at 3

¹⁴ MANCUR OLSON, *THE LOGIC OF COLLECTIVE ACTION* 2 (1965).

¹⁵ Viktor Mayer-Schonberger, *Emergency Communications: The Quest for Interoperability in the United States and Europe*, 7 INT’L J. COMM. L. & POL’Y 2 (2002/2003) at n.89 and accompanying text.

¹⁶ OLSON, *supra* note 14, at 49-50.

¹⁷ *Id.* at 49-50.

¹⁸ *Id.* at 44.

¹⁹ OLSON, *supra* note 14, at 50.

might be to the group as a whole, it does not offer the individual any incentive to pay dues to any organization working in the latent group's interest, or to bear in any other way any of the costs of the necessary collective action.²⁰

The group for our purposes is the universe of all potentially interoperable public safety entities. The collective good is interoperable communications. Every member of the group—i.e., every public safety agency—would presumably benefit from interoperability, and it is thus a goal they all share. However, the group is very large and thus latent. There are about 50,000 potentially interoperable public safety agencies in the United States²¹ with an estimated 2.2 million personnel.²² Applying Olson's theory, we see that no single public safety agency can make a noticeable contribution to a group effort to achieve interoperability, and since no one in the group will react if another agency makes no contribution, public safety agencies have no incentive to contribute. Olson also pointed out that the larger a group is, the higher the cost of organizing the group will be, and therefore "the smaller the fraction of the total group benefit any person acting in the group interest receives, and the less adequate the reward for any group-oriented action[.]"²³

We can therefore see that the collective action problem exists because there are about 50,000 public safety agencies independently building their own communications networks. This balkanization of public safety networks is a result of the federal spectrum policy doling out licenses to each of those agencies. The effect of this policy is that each recipient of a public safety license—that is, each agency or jurisdiction—must build out and operate its own communications system. This arrangement has the advantage of letting each agency or jurisdiction tailor its radio system to its own unique needs.²⁴ At the same time, however, it has the effect of creating a large "latent" group of over 50,000 licensees. Absent coordination, these independent public safety licensees will not interoperate with the other licensees in the group. As we have seen, members of large groups lack an incentive to coordinate, and public safety agencies also often face disincentives as well.²⁵ As a consequence, they build custom systems independently of each other, and these systems generally do not interoperate.²⁶

²⁰ *Id.* at 50.

²¹ The number of public safety agencies in the U.S. has been estimated to be around 50,000, although an exact number is not available. *See* Sen. John McCain, *Floor Speech On Interoperable Communications For Public Safety Officials* (Sep 13, 2005) available at http://mccain.senate.gov/index.cfm?fuseaction=Newscenter.ViewPressRelease&Content_id=1607 (estimating the number at 50,000); WILLIAM L. PESSEMIER, *TOP PRIORITY: A FIRE SERVICE GUIDE TO INTEROPERABLE COMMUNICATIONS* 11 (International Association of Fire Chiefs 2006) (estimating the number at over 50,000); Mayer-Schoenberg, *supra* note 15, at n.33 and accompanying text (estimating the number at almost 60,000).

²² PUBLIC SAFETY WIRELESS NETWORK, *A Priority Investment for America's Future* 5 (1999).

²³ OLSON, *supra* note 14, at 48.

²⁴ JON M. PEHA, *FROM TV TO PUBLIC SAFETY: THE NEED FOR FUNDAMENTAL REFORM IN PUBIC SAFETY SPECTRUM AND COMMUNICATIONS POLICY* 5 (New America Foundation, *Wireless Future Program Working Paper No. 15*, Oct. 2006).

²⁵ For example, agencies compete with each other for resources, power and prestige. Police and firefighters, for example, often vie for the same municipal dollars. As a result, strained relationships between public safety agencies are typical in most American cities. New York City's "battle of the badges"—ongoing disputes over authority between the city's police and fire departments that have at times ended in physical confrontation—is a case on point.

The balkanization of public safety communications is not only an impediment to interoperability, but also results in pure waste. This is because thousands of uncoordinated, independent communications networks use more spectrum and equipment than if a coordinated approach were employed. For example, public safety spectrum licenses can only be assigned for a particular band with a certain number of channels.²⁷ A small agency with only a few officers would nevertheless be given such an assignment even if they did not use all the capacity.²⁸ In contrast, a family or a small business can purchase only the number of mobile communications handsets it needs from a commercial provider thereby leaving the rest of the available channels to other consumers.

Carnegie Mellon engineering professor Jon Peha has calculated that the number of antennas deployed by public safety entities nationwide correlates less with population or geographic area than with the number of political jurisdictions.²⁹ This means that more antennas are put up and more spectrum is used than is necessary to cover an area simply because local agencies and jurisdictions do not coordinate to share antennas and spectrum. Peha also points out that “the number of antenna towers, base stations, and repeaters used by a public safety agency are largely independent of the number of responders using that agency’s wireless system where this number does not exceed 100 users and 85% of U.S. public safety agencies support no more than 100 users.”³⁰

In that city, the NYPD’s Emergency Services Unit, “which carries out functions that in other cities would be handled by the fire department, has increasingly encroached on the fire’s department’s ground.” John Buntin, *Battle of the Badges*, GOVERNING (Sep. 2005) available at <http://www.governing.com/articles/9police.htm>. Both agencies have laid claim to command at emergency scenes that involve hazardous materials, and their respective unions have vigorously lobbied city officials for the brief. It is not surprising, then, that the 9/11 Commission found that the NYPD and FDNY “each considered itself operationally autonomous” and therefore “were not prepared to comprehensively coordinate their efforts in responding to a major incident [on 9/11].” NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES, FINAL REPORT OF THE NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES 285 (2004). See also 9/11 COMMISSION STAFF, *Staff Statement Number 13*, Eleventh Public Hearing Of The National Commission On Terrorist Attacks Upon The United States: Day One, Morning Session 102 (May 18, 2004) available at http://www.9-11commission.gov/archive/hearing11/9-11Commission_Hearing_2004-05-18.pdf; Joshua Brustein, *Revisiting 9/11, Reworking 911*, GOTHAM GAZETTE (May 24, 2004) available at <http://www.gothamgazette.com/article/20040524/200/989>; William K. Rashbaum & Michelle O’Donnell, *City Police and Fire Department Pledge Cooperation in Disasters*, N.Y. TIMES (July 12, 2003).

²⁶ PEHA, *supra* note 24, at 5.

²⁷ Jon M. Peha, *How America’s Fragmented Approach to Public Safety Wastes Money and Spectrum*, PROC. TELECOMM. POLICY RESEARCH CONF. 8 (Sep. 2005) available at http://web.si.umich.edu/tprc/papers/2005/438/Peha_Public_Safety_Communications_TPRC_2005.pdf.

²⁸ *Id.* at 8.

²⁹ *Id.* at 8.

³⁰ *Id.* at 8 (citing Booz, Allen & Hamilton, *Cost Study Data Characterization Report*, The Public Safety Wireless Network (PSWN) Program, Feb. 1999.).

In contrast, a commercial network operator will not employ more spectrum or equipment than necessary to produce a given amount of communications capacity at a certain quality level.³¹ Commercial management of spectrum has been shown to be consistently more efficient than government management.³² Unlike public safety users, commercial carriers have an incentive, as well as greater freedom, to combine into larger and more efficient networks.³³ Public safety agencies do not have the same incentives because they do not face the true cost of spectrum. One reason they do not face a cost of using spectrum is that they receive their spectrum for free. In addition, they cannot sell or lease it. If they could sell or lease the spectrum, they would have to take into account what economists call the “opportunity cost” of using the spectrum: the revenues they would give up by using the spectrum themselves instead of letting someone else use it.

For example, as the price of a good decreases, its consumption increases. Because public safety agencies are faced with an artificially low opportunity cost, they will be induced to use more spectrum than would otherwise be efficient and therefore waste spectrum.³⁴ In contrast, public safety agencies face correct opportunity costs when it comes to patrol cars and guns. Instead of direct gun or car subsidies, police departments are given budgets wherein they weigh the money’s alternative uses.³⁵ Faced with alternative uses for a budget, a police department will presumably not buy more guns or cars than it needs or can use.

Assigning licenses to end-user agencies also generates waste because public safety agencies do not have a comparative advantage in designing and building communications systems. Economist Thomas Hazlett has likened the current public safety spectrum policy to “shipping each police department tons of steel, plastic and rubber to make them responsible for constructing their own patrol cars.”³⁶ More aptly, it is like shipping them the materials and then letting them contract with Ford or Toyota to build for them a custom-tailored car. Most public safety agencies will contract with communications services firms like Motorola to build their custom system. This is inefficient because it inhibits economies of scale from being achieved. While Ford can build thousands of one car model cheaply, if it had to design and build only 300 squad cars, those cars would no doubt be much more expensive. The same applies to radio communications. While a mobile carrier such as T-Mobile has millions of customers on its network over which to amortize an investment in an advanced network, the typical police department has fewer than a hundred officers.

³¹ Mark M. Bykowsky & Michael J. Marcus, *Facilitating Spectrum Management Reform via Callable/Interruptible Spectrum*, PROC. TELECOMM. POLICY RESEARCH CONF. 15 (Sep. 13, 2002) at 9-10, *available at* <http://tprc.org/papers/2002/147/SpectrumMgmtReform.pdf>.

³² See Gerald R. Faulhaber & David Farber, *Spectrum Management: Property Rights, Markets, and the Commons* (unpublished manuscript on file with author) *available at* http://assets.wharton.upenn.edu/~faulhabe/SPPECTRUM_MANAGEMENTv51.pdf.

³³ Thomas W. Hazlett, *Is Federal Preemption Efficient in Cellular Phone Regulation?*, 56 FED. COMM. L.J. 155, 201-202 (2003).

³⁴ Bykowsky & Marcus, *supra* note 31, at 10

³⁵ Joshua Marsh, *Secondary Markets in Non-Federal Public Safety Spectrum*, PROC. TELECOMM. POLICY RESEARCH CONF. 8 (Sep. 2004) at 8, *available at* <http://web.si.umich.edu/tprc/papers/2004/384/tprc.pdf>.

³⁶ Thomas W. Hazlett, *Katrina’s radio silence*, FINANCIAL TIMES (Oct. 24, 2005).

III. Solutions: Commercial Provision, Shared Use, and National Provision

There are ways that a collective action problem can be overcome or avoided altogether. Mancur Olson posited that members of a latent group could be induced to rationally act in a group-oriented way only through a “separate and ‘selective’” incentive.³⁷ By this he meant that a new incentive would be required that “operates, not indiscriminately, like the collective good, but rather *selectively* toward the individuals in the group.”³⁸ Olson called latent groups that acquire a collective good through selective incentives “mobilized” because they have been stimulated into action.³⁹

Consumers who want to utilize wireless communications could conceivably license spectrum and build their own radio systems. If they did this, they would have to coordinate their actions in order to talk to each other. However, consumers have incentives to simply subscribe to an existing wireless network: it is cheaper than building a new system from scratch and because subscribing to a network gives you access to everyone else on that network. Any collective action problem is thus avoided because the *individual rationality* (choosing the cheapest and most effective alternative) coincides with the *collective rationality* (interoperability). Commercial wireless carriers who themselves have an incentive to offer the right mix of price and quality to consumers provide the individual incentive.

Commercial provision of first responder communications is therefore a viable solution to the collective action problem that results in a lack of interoperability. It is technically and practically feasible for a private firm to create a network on which it leases communications capacity to public safety agencies, much like commercial wireless phone carriers sell subscriptions to consumers. A public safety agency might join such a network if it was offered a selective incentive, such as lower costs, better quality, or some other benefit that it could internalize. Public safety agencies that subscribe to the same network would be interoperable by virtue of being on the same system. An interconnection requirement could ensure interoperability among the subscribers of different networks.

The Commission should therefore be commended for the service model it has proposed, which is basically the commercial provision of public safety communications. The FCC plan would allow a national licensee to offer first responders broadband service for a fee. The Commission stops short of proposing that a for-profit commercial entity—our preferred approach—should be the licensee, and that will be addressed below. Nevertheless, the same logic that applies to commercial provision of wireless services could apply to any entity that operates on a fee-for-service basis. Not only would commercial provision of public safety communications create the right incentives for public safety agencies to overcome their collective action problem, it is also more efficient than the existing system of self-provisioning.

The Commission should also be commended for recognizing the benefits of allowing private entities to share in public safety spectrum. A shared network vastly increases the economies of

³⁷ OLSON, *supra* note 14, at 51.

³⁸ OLSON, *supra* note 14, at 51.

³⁹ *Id.*, at 51.

scale available to the network. Not only is this more spectrally efficient, which the Commission notes is one of its objectives,⁴⁰ but also creates an incentive for private firms to build a public safety network. The Commission is also correct to recognize that any lease of excess capacity to private entities must be on a preemptible secondary basis in order to ensure priority access for first responders.

Finally, the Commission should be commended for proposing that its new public safety licenses be national in scope. Interoperability is a national problem and requires a national solution. For example, while Shreveport, Louisiana's fire department radio system allows it to communicate with police, EMS, and 50 other agencies in its region, when the Shreveport firefighters traveled to New Orleans to lend a hand in the aftermath of Hurricane Katrina, their radios were useless.⁴¹ Police in the area used a different system that was incompatible with Shreveport's radios.⁴² National networks would avoid these cross-jurisdictional interoperability problems. Additionally, a national footprint would further amplify the economies of scale achieved by allowing commercial customers to share the spectrum.

IV. Opportunities for Improvement

Although the Commission's plan is a welcome departure from the traditional model of public safety spectrum allocation, it falters on two fronts. First, it recommends a "centralized national approach"⁴³ to communications that would create a monopoly service provider for first responder communications. Second, it limits the license to non-profit entities, thus artificially limiting the pool of qualified potential licensees and possibly undermining the beneficial incentives that would be created by the commercial provision of public safety communications services.

A. Monopoly

Rather than encourage competing and interconnecting carriers, the Commission's plan would back one centralized national network that it subsidizes with spectrum. It would therefore create a single incumbent in the market for first responder broadband. Although the Commission states that a nonprofit entity will hold the license, that will not cure the economic inefficiencies of a monopoly.

Managers of a nonprofit public safety network may not seek to maximize profit, but they will seek to maximize some other margin. As the economics literature on public enterprises tells us, that margin is often the organization's budget and/or size of operations.⁴⁴ Managers of a public enterprise, such as a nonprofit public safety network, are able to pursue such goals because they

⁴⁰ NPRM at ¶16.

⁴¹ Jennifer Kerr, *Lack of Interoperability Hampers Agencies*, ASSOC. PRESS, Oct. 16, 2005.

⁴² *Id.*

⁴³ NPRM at ¶ 3.

⁴⁴ See David M. Sappington & J. Gregory Sidak, *Incentives for Anticompetitive Behavior by Public Enterprises*, 22 R. OF IND. ORG. 183 (2003); William Niskanen, *BUREAUCRACY AND REPRESENTATIVE GOVERNMENT* (1971).

face less scrutiny from private capital markets than would private competing networks.⁴⁵ A monopoly nonprofit would also be immune to the discipline imposed by the possibility of takeover bids.⁴⁶ In contrast, competition and profit-orientation is what has driven commercial wireless services to use spectrum efficiently.

A single provider will also not face the same incentives to provide quality service or to innovate that it would if it was competing with other carriers for first responder subscribers. A centralized network means a single choice for first responders. If they are unhappy with service or prices, unlike consumers, they will not have the option to take their business to another network.

To address this concern, the Commission states that the licensee should have an “ability to directly represent all public safety interests.”⁴⁷ The idea is that a network managed by representatives of the users will provide good service and prices. But it’s unclear how the interests of management can be kept completely in line with those of the 50,000-plus agencies that make up the public safety community. Without knowing more about how these managers will be appointed or what incentives they will face, we cannot say for certain that their interests will not diverge from those of at least some customers. In contrast, if there were two or more networks, competition for first responder customers would keep service quality, prices, and innovation in check.

The centralized network that the Commission envisions would also pose a barrier to entry to others who might wish to serve public safety. For example, a new entrant wishing to compete on an equal footing by building out a competing nationwide interoperable communications network for public safety would first have to acquire the spectrum over which to do it. Unless the new entrant was given the spectrum on the same terms as the first licensee, it may face a barrier to entry in the form of a higher average cost relative to the incumbent.⁴⁸ Unlike the incumbent, an entrant would have to purchase its spectrum at auction or acquire it from an existing licensee. The flexible use spectrum available for purchase would have other higher-valued uses than public safety networks, thus precluding any such investment. The monopoly incumbent might also act to prevent entry into its market. Because it does not face an imperative to maximize profits, a non-profit monopoly could set prices below cost or engage in other anticompetitive behavior.⁴⁹ Once entrenched it would be no surprise if an incumbent sought regulatory or legislative relief from potential competition under the guise of protecting cross-subsidies for public safety communications.

Finally, a quasi-governmental body such as the proposed nonprofit licensee will be subject to a type of lobbying that a competitive market actor is not. Different constituencies within the first responder community (i.e. rural vs. urban, federal vs. local) might seek to influence the

⁴⁵ See R. Richard Geddes, *Agency Costs and Governance in the United States Postal Service*, in J. Gregory Sidak, ed., *GOVERNING THE POSTAL SERVICE* (1994), 114–140.

⁴⁶ *Id.*

⁴⁷ NPRM at ¶ 27.

⁴⁸ See William Baumol, John Panzar & Robert Willig, *Contestable Markets and the Theory of Industry Structure* (1982).

⁴⁹ Sappington & Sidak, *supra* note 44, at 184.

nonprofit's decisions. All parties, including would-be competitors, might seek to appeal any decision of the monopoly licensee to the Commission or Congress.

Instead of a "centralized" monopoly licensee, the Commission should consider *competing* fee-for-service public safety licensees. Competition among two or more national public safety broadband networks would not only give first responders a choice of provider, it would spur technological innovation and would ensure that prices are kept in check. Competition among the national CMRS networks has conferred these benefits on consumers, so it is only right that first responders benefit from the same forces. In the NPRM, the Commission recognizes the value of "competitive equipment markets,"⁵⁰ so it is therefore logical that the same should apply to the communications service itself. The only caveat would be that competing public safety networks would have to interconnect to ensure interoperability.

B. Nonprofit

The Commission's proposal envisions a licensee that will design, implement, build-out, and maintain the network.⁵¹ However, it proposes "that no commercial interest may be held in the national license or licensee, and that no commercial interest may participate in the management of the national license."⁵² This is odd since there are several commercial communications companies with the comparative advantage and expertise in designing, building-out, and maintaining wireless broadband networks. A for-profit mission and quality service to first responders should not be considered mutually exclusive ideals.

For example, the UK's Airwave public safety communications network is a commercial venture.⁵³ It is a nationwide interoperable network that is privately owned and maintained by telecommunications firm O2 Wireless. Public safety agencies subscribe to the network for a monthly fee.

The UK's experience with interoperability is very similar to the U.S.'s and could offer some constructive lessons. Before the Airwave initiative, most public safety radios in the UK had been deployed in the 1970s and were becoming obsolete.⁵⁴ Much like the U.S. system, public safety agencies there had been historically assigned different bands of the spectrum and had the autonomy to develop their own communications systems.⁵⁵ "This [] led to disparate technology evolution and procurement cycles within each agency, making pragmatic levels of interoperability difficult to achieve."⁵⁶

⁵⁰ NPRM at ¶ 2.

⁵¹ NPRM at ¶ 27.

⁵² *Id.*

⁵³ General information about this venture is available at <http://www.airwaveservice.co.uk>.

⁵⁴ Steve Worrall, *An International Study of Radio Interoperability 8* (Dec. 2005) (unpublished manuscript on file with author) available at <http://www.bapco.org.uk/?page=BAPCOBursary2005%20report.pdf>.

⁵⁵ *Id.*

⁵⁶ *Id.*

In 1993, following a major review of public safety radio communications, the UK's Home Office decided to develop a new system.⁵⁷ It further decided that the new system would be procured on a national—rather than local or agency-by-agency—basis.⁵⁸ Once built, the police and fire services, as well as any other public safety agency that wished to opt-in, would share the new national network.⁵⁹

The government produced an outline business case for the network and sought bids from the private sector to build and operate it.⁶⁰ Several firms competed for the contract, which was ultimately awarded to British Telecommunications (BT) in 2000.⁶¹ In 2001, BT spun off its public safety communications business into a separate company called O2.⁶² O2 completed deployment of the network, called Airwave, in 2005.

The terms of O2's spectrum license require that only organizations with a public safety mission be allowed to subscribe to Airwave.⁶³ Ofcom, the UK's telecommunications regulator, publishes a list of "eligible sharers" that now includes almost 200 organizations.⁶⁴ To become an "eligible sharer" an organization must apply to Ofcom and demonstrate a public safety mission.⁶⁵ However, an organization need not be a government agency. For example, the Royal Society for Prevention of Cruelty to Animals (RSPCA), a charity that serves much the same purpose as the American Humane Society, joined the Airwave network in 2006.⁶⁶ Ofcom has also allowed utilities to join the network.⁶⁷

Additionally, O2 is not obligated to serve an agency simply because that agency is on the list, nor is an agency on the list obligated to contract with O2 for its communications needs.⁶⁸

⁵⁷ NATIONAL AUDIT OFFICE, PUBLIC PRIVATE PARTNERSHIPS: AIRWAVE: REPORT BY THE COMPTROLLER AND AUDITOR GENERAL 1 (Apr. 11, 2002) *available at* http://www.nao.gov.uk/publications/nao_reports/01-02/0102730.pdf [hereinafter "NAO Report"].

⁵⁸ NAO Report at 1 & 10 ("Local procurements were discounted, since they were unlikely to achieve any economies of scale in the costs of procurement or in the prices to be paid for the new systems.").

⁵⁹ NAO Report at 1 & 10.

⁶⁰ NAO Report at 1 & 10-12.

⁶¹ NAO Report at 1.

⁶² NAO Report at n.a.

⁶³ NAO Report at 16; O2, AIRWAVE: ACCESS TO THE SERVICE, *available at* <http://www.airwaveservice.co.uk/airwave13.asp>.

⁶⁴ OFCOM, LIST OF SHARER ORGANIZATIONS (Aug. 2006) *available at* http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/business_radio/emergency/airwave_list.pdf.

⁶⁵ NAO Report at 3; O2, AIRWAVE: ACCESS TO THE SERVICE, *available at* <http://www.airwaveservice.co.uk/airwave13.asp>.

⁶⁶ Press Release, O2, RSPCA signs up to the Airwave service (Jul. 3, 2006) *available at* http://www.airwaveservice.co.uk/airwave14_1002.asp.

⁶⁷ Telephone Interview with Donna Ralston, Head of Civil Contingencies, O2 Airwave (Aug. 24, 2006); *see also* OFCOM, LIST OF SHARER ORGANIZATIONS (Aug. 2006) *available at* http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/business_radio/emergency/airwave_list.pdf.

⁶⁸ O2, AIRWAVE: ACCESS TO THE SERVICE, *available at* <http://www.airwaveservice.co.uk/airwave13.asp>.

Agencies are free to deploy other communications solutions, including building custom-built networks.⁶⁹ As O2 \ has an incentive to induce potential subscribers to become its customers, it actively markets to public service agencies that are not subscribers.⁷⁰ Public safety agencies continue to solicit bids from several companies to provide their communications systems. If O2 succeeds in persuading an agency to join its national interoperable network, it is only because it provided a positive selective incentive. The ever-increasing number of interoperable agencies on the Airwave network is itself, no doubt, a consideration that makes the network selectively attractive to public safety agencies.

To allow for local flexibility, O2 was required to offer tiered levels of service. It offers a “Core Service” of interoperable voice communications that all subscribers receive, and several optional “Menu Exclusive Services.”⁷¹ Agencies can choose locally which, if any, of the additional services they wish to add to their package. (RACOM offers similar optional services, such as GPS and data applications.⁷²) Finally, there are “Menu Competitive Services.”⁷³ These are products and services that O2 or competing firms can provide. There is a competitive market for all equipment—including handsets, vehicle-mounted radios, and dispatch terminals—as well as installation, maintenance, and repair.⁷⁴ O2 also guarantees that the network will be available 93.4% of the time and will pay compensation to its subscribers if it is not.⁷⁵ There are also guarantees for coverage area and “Menu Exclusive” options to extend coverage if an agency desires.⁷⁶

Unlike the UK system, the Commission’s proposal rightly would allow commercial users to share in the public safety network’s excess capacity. The proposal calls for the national licensee to lease that excess capacity to commercial users, and it is for this reason that it is hesitant to allow a commercial carrier to own and operate the network. That is, the Commission wants the licensee to ensure that any commercial use of the network is on an unconditional preemptible basis and have “the discretion to terminate such commercial use when the interest of public safety so demand.”⁷⁷

⁶⁹ *Id.*

⁷⁰ Telephone Interview with Donna Ralston, Head of Civil Contingencies, O2 Airwave (Aug. 24, 2006).

⁷¹ *Id.*; NAO Report at 11. Optional menu services include extra capacity for “high risk locations such as football stadia,” “guaranteed handheld coverage,” and “guaranteed in-building penetration[.]” NAO Report at 12.

⁷² Telephone Interview with Michael Miller, President and CEO, RACOM Communications (Nov. 7, 2006).

⁷³ NAO Report at 11; Telephone Interview with Donna Ralston, Head of Civil Contingencies, O2 Airwave (Aug. 24, 2006).

⁷⁴ Telephone Interview with Donna Ralston, Head of Civil Contingencies, O2 Airwave (Aug. 24, 2006); NAO Report at 11.

⁷⁵ Telephone Interview with Donna Ralston, Head of Civil Contingencies, O2 Airwave (Aug. 24, 2006); NAO Report at 34. The 93.4% figure was negotiated by O2 and the agencies. If the agencies had wanted a higher level of reliability, they could have demanded that, but it would likely have increased the cost.

⁷⁶ NAO Report at 34.

⁷⁷ *Id.*

However, unconditional priority for first responders—as well as interoperable interconnection among carriers in the case of competing networks—are requirements that license or contract terms can ensure. For example, RACOM Wireless, a small company in Marshalltown, Iowa, provides shared communications to both public safety and commercial users with unconditional priority for first responders. RACOM's advanced wireless network is privately owned and built on non-public-safety spectrum licensed to the company. Contractual relationships alone have ensured first responder priority.

Gregg Miller started the company in 1972 and first offered wireless communications to farmers.⁷⁸ It used G.E. analog wireless telephone technology over 800 MHz spectrum that the FCC licensed to RACOM.⁷⁹ As cell phones became more prevalent in the 1980s, Miller transitioned RACOM to the public safety communications business. In 1994, the Polk County Sheriff's Office—which serves Des Moines—solicited bids to build a new radio communications system for the police force. RACOM, Motorola, M/A-COM, and others submitted proposals. RACOM won the contract contingent on voter approval of a bond issue to fund the new network. Before the election, however, RACOM's competitors engaged in a successful public relations campaign against the bond issue, which failed at the polls.

The sheriff office's communications system was about 20-years-old, however, and needed at least an interim replacement. City Council members spoke with Miller, and together they came up with a plan. RACOM had its existing 800 MHz commercial network. The Council could raise enough money to buy radios to work on that network, and RACOM could just charge them a monthly access fee. Miller soon had the next obvious thought: Why should this only be an intermediate solution?

The Polk County Sheriff's Office became the first public safety subscriber to the RACOM network, and to this day RACOM's private network is that agency's primary means of voice communications. The network is completely interoperable, which means that any user on it can talk to any other user. Most public safety agencies in RACOM's service area—such as the Sioux City police and fire departments—use RACOM's network for their communications.⁸⁰ However, the network also carries communications from many commercial customers, such as private roadwork contractors and industrial plants, including those of John Deere and Rockwell Collins.⁸¹ Utilities, such as gas, water, and electric, also subscribe to the RACOM network.⁸² Today, the RACOM network carries traffic from about 10,000 radio units, 70 percent of which belong to public safety users. Fifteen percent of the users are utilities, and the other fifteen are private enterprises. The network handles over 50 million voice calls a month over 100 individual tower sites.

⁷⁸ Telephone Interview with Michael Miller, President and CEO, RACOM Communications (Nov. 7, 2006).

⁷⁹ *Id.*

⁸⁰ Telephone Interview with Gregg Miller, President and CEO, RACOM Communications (Aug. 11, 2006).

⁸¹ *Id.*

⁸² *Id.*

Day-to-day, police, fire and other agencies keep to their own service's channels.⁸³ It is not a free-for-all in which everyone can hear everyone.⁸⁴ However, in case of emergency, first responders do have the ability to switch to each others' channels or to predetermined "incident channels" to coordinate.⁸⁵ They can also talk to commercial users of the network to coordinate response to an emergency.⁸⁶ In other systems, firefighters often have to radio their dispatchers to request that they telephone the gas utility's dispatcher who in turn will radio a technician to ask her to turn off service to a building.⁸⁷ The RACOM network avoids this communications daisy chain is because firefighters can communicate directly with utility technicians.⁸⁸

RACOM negotiates the charges for use of the network with each subscriber. Customers purchase their own radio units and pay a monthly charge for each handset they use. That charge depends on the capacity required by the customer. For example, a prison on RACOM's network that only needs localized communications pays \$3 to \$4 per month per handset, while other public safety agencies requiring better service pay about to \$15 to \$25.⁸⁹ Network usage is unlimited.⁹⁰

The novelty of joining a commercial network certainly put off some public safety agencies. But as Gregg Miller would point out to them, the alternative was for a private company—often RACOM itself—to build and maintain a custom communications network. If an agency can trust a private company to be responsible for its proprietary communications network, why distrust a private network serviced by the same technicians?

The Iowa Department of Public Health's Health Alert Network (HAN) was RACOM's first statewide customer.⁹¹ HAN is responsible for communications and an alert system for all hospitals, labs, county emergency managers, state veterinarians, and several other public health users of communications. Before switching to the RACOM network, there was no interoperability between hospital radio communications.⁹² Today, HAN encompasses 99 local public health agencies and 117 local hospitals across Iowa, all of which can communicate with each other and with anyone else on the RACOM network.⁹³ Taking a cue from HAN's success

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.*; Telephone Interview with Michael Miller, President and CEO, RACOM Communications (Nov. 7, 2006).

⁸⁷ Telephone Interview with Gregg Miller, President and CEO, RACOM Communications (Aug. 11, 2006); Telephone Interview with Michael Miller, President and CEO, RACOM Communications (Nov. 7, 2006).

⁸⁸ *Id.*

⁸⁹ Telephone Interview with Gregg Miller, President and CEO, RACOM Communications (Aug. 11, 2006).

⁹⁰ Extra charges apply for special services such as interconnecting with the telephone network or GPS applications. Telephone Interview with Michael Miller, President and CEO, RACOM Communications (Nov. 7, 2006).

⁹¹ Telephone Interview with Tom Boeckmann, Chief, Health Alert Network, Iowa Department of Public Health (Sep. 15, 2006).

⁹² *Id.*

⁹³ *Id.*

with the RACOM network, the state Department of Agriculture and the state's law enforcement intelligence system have also switched to using RACOM's private network.⁹⁴

"I am totally convinced now that we are better off with the public-private partnership [with RACOM] than just a public solution," says Tom Boeckmann, HAN's chief. "If a tower is down, the company's reputation is on the line. They're not going to put it off to Monday morning. It's cheaper for us to contract with them for maintenance and just as stable if not more than if the state was running it itself."⁹⁵

The main concern expressed by skeptical public safety agencies about the RACOM network—and likely the main concern about any private system—is the reliability of a system that is shared with commercial customers. For his part, Boeckmann says HAN's users barely ever notice the private customers are on the same network.⁹⁶ However, he says, he did discuss prioritization when he first contracted with RACOM.⁹⁷ On the RACOM network, public safety users can preempt private users whenever necessary.⁹⁸

Allowing commercial entities to seek national public safety licenses would greatly enlarge the pool of qualified applicants. It would also bring private investment capital to bear on public safety networks. Additionally, if more than one license is issued, the same incentives created by competition that have made the CMRS market successful will be available to public safety. Writing about a commercial public safety network in Austria, Professor Victor Mayer-Schonberger explained,

Having a private company construct and maintain the network infrastructure required for a shared communications system provides a number of advantages over public financing of a shared network. First, it requires no initial investment from the public sector. The network is built by a private-sector actor that arguably has better financing expertise than a public sector organization and a keener desire to keep expenses in check. Agencies are charged a flat monthly fee per radio handset for using the network. This permits them to budget sensibly and to switch to the new network without having to pay up front for all, or even a portion, of the initial investment. ... As with all network infrastructures, the setup offers strong incentives to the network provider to sign up agencies to use the service. Although this does not solve the collective-action problem [immediately], it shifts it to the network provider, which arguably has better expertise than agencies in how to overcome it. For example, as with other telecommunication markets, fee

⁹⁴ *Id.*

⁹⁵ Telephone Interview with Tom Boeckmann, Chief, Health Alert Network, Iowa Department of Public Health (Sep. 15, 2006).

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ Telephone Interview with Gregg Miller, President and CEO, RACOM Communications (Aug. 11, 2006); PSWAC Report at Appendix E, page 28 ("[RACOM's] Law enforcement radios have "ruthless preemption" privileges and can immediately preempt business user channels if law enforcement needs another channel.").

structures are possible that provide incentives for agencies to switch, and the earlier the switch, the cheaper.⁹⁹

Additionally, such an approach would also address some of the inefficiencies that result from the existing balkanized system. For one thing, economies of scale will be improved. Unlike public safety agencies, which are limited to the number of users on their force, a commercial network will be able to spread the cost of the network over all of its subscribers, perhaps encompassing several agencies and jurisdictions. In this way, agencies that would otherwise not coordinate will share the same network and not only achieve interoperability, but also use spectrum more efficiently.¹⁰⁰ In large part this is possible because commercial carriers design their networks to maximize revenue.¹⁰¹ That means making the most efficient use of the spectrum at their disposal by eking out from it all the possible communications capacity, while maintaining a level of quality acceptable to their customers.¹⁰² Unlike public safety licensees, a commercial carrier will not deploy more towers or spectrum than it needs to adequately serve a geographic area or population because doing so would affect their bottom line. Finally, public safety agencies will be freed from having to design and deploy their own systems and will instead be able to rely on a professional provider with a competitive advantage in interoperable communications systems.¹⁰³

V. Recommendations

Private commercial provision of public safety communications is not only possible, but also efficient and, most importantly, addresses the collective action problem that is the main impediment to interoperability. As RACOM, O2, and their subscribers make evident, public safety agencies can effectively purchase the communications capacity they need from private networks without having to build and maintain their own custom systems. Users of a shared network are interoperable by default. Additionally, as RACOM—and to a lesser extent O2—demonstrate, public safety users can successfully share a network with private commercial users thereby broadening economies of scale.

The structure of an ideal commercial shared-use public safety communications system would be much like today's wireless telephone network, with multiple competing national carriers that all interconnect. Instead of creating one centralized national network, the Commission should consider issuing two or more spectrum licenses subject to certain public safety obligations,

⁹⁹ Mayer-Schoenberg, *supra* note 15.

¹⁰⁰ *Id.* (“Sharing network infrastructures among public safety agencies ... will at least permit agencies to share the cost of building and maintaining the infrastructure. It will still be underutilized outside of emergencies, but at least every agency will not have to operate its own overprovisioned and underutilized network and instead will share with other agencies.”).

¹⁰¹ Marsh, *supra* note 35, at 4 (citing the FCC Spectrum Policy Task Force Report at 10) (“Recent studies have shown that bands in use by CMRS providers (as well those used by television providers) are highly utilized, while surrounding land mobile bands—notably, public safety and others—have lower, more variable use.”)

¹⁰² Bykowsky & Marcus, *supra* note 31, at 9-10

¹⁰³ Today, public safety agencies contract with communications firms to deploy their communications systems. However, they ultimately build custom systems at the direction of the agency. Also, it is in the financial interest of these firms to service as many custom installations as possible.

including interconnection and prioritization.¹⁰⁴ Issuing two or more licenses—perhaps using all 24 MHz of public safety spectrum in the 700 MHz band—would avoid the establishment of a strong incumbent monopolist. Ideally, these licenses would be assigned by auction to avoid rent seeking, as well as to potentially raise funds for public safety to use to pay for service, although this would require auction authority from Congress.

If achieving interoperability is the ultimate goal, then requiring interconnection among competing carriers is crucial. It is conceivable that shared-use networks would voluntarily interconnect, if only because commercial users of the network might demand the benefits of increased network effects.¹⁰⁵ However, because interoperability will be the prime objective of a new policy, interconnection should be required between all licensees.

As the Commission notes, another key requirement to which competitive public safety licenses should be subject is prioritization—giving public safety users priority over commercial users in shared networks. This can be achieved either by a term in the spectrum license, or through terms in a contract for service. Because the spectrum at issue is allocated for public safety, a license term would be more appropriate.

VI. Authority

The Commission asks for comment on whether it has the authority to implement its plan.¹⁰⁶ Section 337 of the Communications Act requires the FCC to allocate 60 MHz of spectrum in the 700 MHz band.¹⁰⁷ It requires that 36 MHz be allocated for commercial use and 24 MHz be allocated “for public safety services.”¹⁰⁸ According to the Act,

The term “public safety services” means services—

(A) the sole or principal purpose of which is to protect the safety of life, health, or property;

(B) that are provided—

- (i) by State or local government entities; or
- (ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services; and

(C) that are not made commercially available to the public by the provider.¹⁰⁹

¹⁰⁴ For example, the Verizon plan reportedly would deploy a national network using 12 of the 24 MHz slated for public safety in the DTV transition. A second network on the other 12 MHz could provide competition.

¹⁰⁵ Gerald W. Brock, *Interconnection Policy and Technological Progress*, 58 FED. COMM. L.J. 445, 452 (explaining that the Internet is unregulated but interconnected).

¹⁰⁶ NPRM at ¶ 46.

¹⁰⁷ 47 USC § 337(a).

¹⁰⁸ 47 USC § 337(a)(1) and (2).

¹⁰⁹ 47 USC § 337 f)(1).

The FCC proposal to award a national license to a nonprofit licensee that represents public safety interests likely passes muster on parts (A) and (B) of the definition. The principal purpose of the network will be to protect life, health, or property, so it complies with part (A). As a nonprofit, the licensee the Commission envisions will be a nongovernmental organization whose primary mission is the provision of public safety service. Additionally, the nonprofit will be authorized to provide service by its subscribers, which will be “governmental entit[ies] whose primary mission is the provision of” public safety, so it complies with part (B).¹¹⁰

Part (C) of the definition, however, raises the question of whether it is only the “public safety services” that cannot be made available commercially to the public, or instead whether *only* “public safety services” can be made available over the public safety allocation. As we explained, Congress directed the FCC to allocate 36 MHz for “commercial use” and 24 MHz for “public safety services.” It then defined “public safety services” as services that “are not made commercially available[.]” The question is, can an additional allocation be made over the 24 MHz of public safety spectrum that would allow for commercial use? Or did Congress intend the commercial-use-free public safety services allocation to be the exclusive allocation? Because Congress divided the 60 MHz of spectrum into commercial and public safety allocations at the same time, a strong argument could be made that it intended to create two separate spheres. At the very least, to the extent that a service will be “made commercially available to the public by the provider,” a new allocation will be necessary.

Of course, the statutory definition of “public safety services” also precludes the alternative plan that we have proposed. However, to the extent that Congress has to amend the Act in order to allow the commercial use of public safety spectrum envisioned by the Commission’s plan, it should amend the statute in a manner that would also allow the Commission to license commercial entities to provide service over spectrum allocated for public safety. To the extent that the Commission does indeed have the authority to allow commercial services over unused parts of public safety spectrum, it can use this authority in a manner more consistent with the ideas presented above.

First, the “public safety services” definition allows “nongovernmental organizations” authorized by public safety to provide service. There is no reason to interpret this clause as requiring a nonprofit entity. A corporation can be for-profit and nevertheless take very seriously a responsibility to deliver public safety service, as do RACOM in Iowa or O2 in the UK. The latter entity was even until recently a public safety subsidiary of British Telecom, a larger and much more diversified corporation. The Commission should therefore seriously consider commercial entities as national licensees. There is no reason to believe that companies with a public safety mission, such as Cyren Call, or public safety subsidiaries of diversified carriers, like Verizon or T-Mobile, would be any less qualified than a nonprofit.

¹¹⁰ Part (B)(ii) is a bit circuitous and therefore confusing. It defines public safety services as services that are provided by nongovernmental entities that “are authorized by a governmental entity whose primary mission is the provision of such services[.]” If by “such services” we are meant to understand “public safety services”—the very thing being defined—then it is a bit circuitous. More likely, “such services” refers simply to the public safety services explained in part (A), protecting life, health, and property.

Second, the Commission should create not one, but two national licenses. Doing so would ensure competition, which would foster innovation, good service, and lower prices. The Commission can use the other 12 MHz of public safety spectrum in the 700 MHz band for a second license. While this would disrupt the plans of many in the public safety community who have been expecting to use this spectrum for quite some time, the trade-off would be worth it. As the Commission has recognized, the continued balkanization of public safety spectrum is not in the best interest of first responders. The Commission's instant plan is a radical departure from how public safety spectrum has been assigned. It should be bold and use all 24 MHz to create competing public safety licenses.

VII. Conclusion

As we saw on 9/11, the lack of public safety communications interoperability has serious consequences. Current public safety spectrum policy creates about 50,000 independent licensees, which causes a collective action problem. Because public safety communications users are balkanized into such a large group, they individually have little incentive to act in a group-oriented way to achieve interoperability. Additionally, because they are not allowed to sell or lease their spectrum to willing commercial buyers, it is unlikely a private firm will be able to provide a competing wireless communications network.

If our goal is a national interoperable public safety communications network with the economies of scale and standardization that entails, we should reconsider the policies of spectrum balkanization and apartheid. Spectrum should be allocated for commercial provision of public safety communications. Licensees should be required to interconnect, and first responders must have priority on shared networks. At least two competing licensees would help prevent the establishment of a strong incumbent monopolist.

Walky-Talky and O2 show us that the private provision of interoperable public safety communications is possible and can act as a selective incentive that helps evade the collective action problem. In addition to this, RACOM shows us that first responders and commercial parties can share such a network, increasing economies of scale, spectral efficiency, and providing another financial incentive for entrepreneurs to offer a network. Entrepreneurial firms like RACOM have showed us the way to interoperability, we only need to change policy to achieve it.

**APPENDIX I
RSP CHECKLIST**

Element	Agency Approach	RSP Comments
1. Has the agency identified a significant market failure?	Does not apply.	The Commission is charged by Congress with assigning the public safety spectrum Congress has allocated in the 700 MHz range as the Commission sees fit.
2. Has the agency identified an appropriate federal role?	Spectrum license assignments are a wholly federal role. Grade: A	
3. Has the agency examined alternative approaches?	The FCC does not offer alternatives to its proposed centralized national network. Grade: C	The FCC's plan is a radical departure from how public safety spectrum has been historically assigned. In that sense it is considering a novel alternative approach. However, within its framework of creating a national public safety license, it does not consider creating multiple competing licenses or allowing for-profit entities to hold those licenses.

Element	Agency Approach	RSP Comments
4. Does the agency attempt to maximize net benefits?	<p>Although the costs and benefits of the proposed rule are difficult to ascertain, the FCC has likely taken steps in the right direction.</p> <p>Grade: B</p>	<p>The increases in spectral and economic efficiency that a shift to shared-use spectrum would bring are likely to offset any costs associated with precluding other public safety uses of the 700 MHz spectrum. The FCC, however, probably underestimates the costs of creating one monopoly national licensee.</p>
5. Does the proposal have a strong scientific or technical basis?	<p>The FCC relied on research by academics such as Jon Peha.</p> <p>Grade: A</p>	<p>The FCC relies on engineering evidence that shared-use spectrum is more spectrally efficient than the current practice of exclusive use by public safety.</p>
6. Are individual choices and property impacts understood?	<p>The FCC would create a centralized national network, leaving first responders with no alternative.</p> <p>Grade: D</p>	<p>The FCC seems to understand that a national license would help solve the problem of balkanization. However, it underestimates the value of giving first responders a choice between competing networks. It also does not consider the benefits a profit incentive for network operators.</p>