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Wiley, Rein & Fielding

1776 K Street, N.W.
Washington, D.C. 20006
(202) 719-7000

Robert L. Pettit
(202) 719-7019
rpettit@wrf.com

Fax: (202) 719-7049
www.wrf.com

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January 24, 2000

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-A325
Washington, DC 20554

Via Hand Delivery

Re: Notice of Oral *Ex Parte* Presentation in WT Docket No. 99-168.

Dear Ms. Salas:

In accordance with Section 1.1206 of the Commission's rules, this letter will memorialize an oral *ex parte* presentation by Richard Barth and Leigh Chinitz of Motorola, and Richard Wiley and myself of this office, to Commissioner Harold Furchtgott-Roth and Bryan Tramont.

In addition to issues previously discussed by Motorola in this proceeding, the presentation included a discussion of the opposition of public safety agencies to the introduction of cellular architectures in the public safety guard bands. In this regard, the experience of public safety entities with cellular-like systems was also discussed. The substance of the presentation is reflected in the enclosed written materials, copies of which were left with Commissioner Furchtgott-Roth and Mr. Tramont.

In accordance with the Commission's rules, an original and one copy of this letter are being provided for inclusion in the relevant docket file. If you have any questions or need any additional information, please let me know.

Very truly yours,

Robert L. Pettit
Counsel for Motorola, Inc.

Enclosures

cc: The Honorable Harold Furchtgott-Roth
Bryan Tramont, Esquire

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The Effect of Cellular Architectures in the Public Safety Guard Bands

- Congress has directed the Commission to "ensure" that Public Safety spectrum in the 700 MHz band is protected from interference. This unequivocal directive is based on the Public Safety community's need to be certain that its critical communications are not interrupted by other users. As APCO recently put it, "When potential interference to public safety communications is at issue, the Commission must have certainty, not broad proposals for untested technology".

- To implement Congress' direction, the Commission has created guard bands adjacent to the Public Safety allocation. The guard bands will be made available for limited purposes defined by technical and operational criteria designed to ensure that commercial users of the guard bands fully and effectively protect Public Safety.

- Years of experience have proven that the two-way systems used for internal purposes by commercial businesses are effective spectrum neighbors to Public Safety systems.

  ⇒ The systems are of similar design, have similar technical and operational characteristics, and may readily be coordinated with Public Safety systems.

  ⇒ As such, the Commission may have a high degree of confidence that use of these types of two-way systems in the guard bands will "ensure" that Public Safety is protected from interference.

- However, systems that employ a cellular-like architecture offer no such assurance. In fact, there is a high likelihood that such systems would interfere with Public Safety uses.

  ⇒ This is why *all* public safety entities filing in response to the Commission's Public Notice – including the International Association of Chiefs of Police, the Association of Public-Safety Communications Officials-International, Inc., the Major Cities Police Chiefs Association, the American Association of State Highway and Transportation Officials, and the Land Mobile Communications Council – *unequivocally oppose* use of cellular architectures in the guard bands.

  ⇒ In part, their opposition is based on real-world experiences with cellular interference at 800 MHz. This interference is depicted in the March 1999 article in *Mobile Radio Technology* discussing interference to Washington County's (Oregon) public safety system. (See attached.)

  ⇒ Cellular architectures simply offer many more interference points. In fact, Motorola's analysis – using NTIA's figures and a very conservative methodology – shows that a typical cellular overlay would contain some 64 separate base stations within a typical 10-mile Public Safety service radius. The interference "holes" created by such an architecture would create objectionable interference within an aggregate of 9.5 square miles of the Public Safety system's service area and would create complete outages in an area of 4.6 square miles.

⇒ Even this analysis assumes that the cellular-like system would employ no-gain antennas. Injecting even small amounts of gain into the system's base station antennas would geometrically increase the amount of interference. Nor does it seek to evaluate the potentially innumerable subscriber transmitter sites, which, of course, would also cause interference.

⇒ Motorola's analysis is an extension of the work submitted by the NTIA which concluded that "the distance separation that is required to prelude interference to a public safety receiver can be relatively large. This is especially true when the commercial transmitter has a low power (*e.g.*, minimum attentuation of the out-of-band emissions) in conjunction with a high gain antenna."

- Nor have the proponents of cellular architectures in the Public Safety guard bands demonstrated that they would "ensure" protection of Public Safety.

  ⇒ FreeSpace Communications essentially admits that its operations would create interference holes – but argues that they're relatively small. Even under its "best case" scenario, numerous interference holes, up to 100 meters in diameter, would be created.

  ⇒ Cellular architecture proponents failed to participate in the comment rounds of this proceeding. Thus, their proposals have not been subject to the intense scrutiny intended by the Commission's notice-and-comment processes.

  ⇒ Even in their *ex parte* filings, cellular architecture proponents have been all over the lot in their proposals and appear to have no fixed plan how to prevent interference to Public Safety systems.

- The introduction of cellular architectures into the Public Safety guard bands is not necessary to provide for broadband wireless Internet. Other spectrum – including other spectrum at 700 MHz – is available for FreeSpace and similar users.

- In short, Motorola has demonstrated that the overlay of a cellular architecture in the public safety guard bands – will cause interference to public safety uses. Accordingly, far from "ensuring" that Public Safety is protected – as directed by Congress – the Commission's adoption of FreeSpace's proposals will, in fact, "ensure" that interference will occur.

RFI/EMI ISSUES

A CONFLICT OF PUBLIC INTEREST

Conflicts between 800MHz commercial mobile radio service and public safety communications have cropped up across the country. When does nuisance interference become harmful--life threatening--interference, and how can it be identified and solved?

By Joe Kuran

Police, fire and emergency medical services agencies depend on radio communications to protect people and property. Any type of interference to the operation of dedicated public safety frequencies diminishes an agency's ability to provide service, and it endangers the public. A situation we encountered in Northwest Oregon in 1998 demonstrated that commercial mobile radio services (CMRS), particularly enhanced specialized mobile radio (EMSR), through frequency use, site placement and output power, can seriously interfere with nearby public service communications.

Operational overview

Washington County includes the Tualatin River Valley and mountainous terrain on the western outskirts of the Portland metropolitan area in Northwest Oregon. The Washington County Consolidated Communications Agency (WCCCA) provides emergency dispatch radio communications for 21 public safety agencies in Washington County, as shown in Figure 1, below right. Washington County covers 842 square miles, with a population of 350,000. In 1991, voters approved a levy to construct a new 9-1-1 system that included a Motorola Smartnet trunking system.

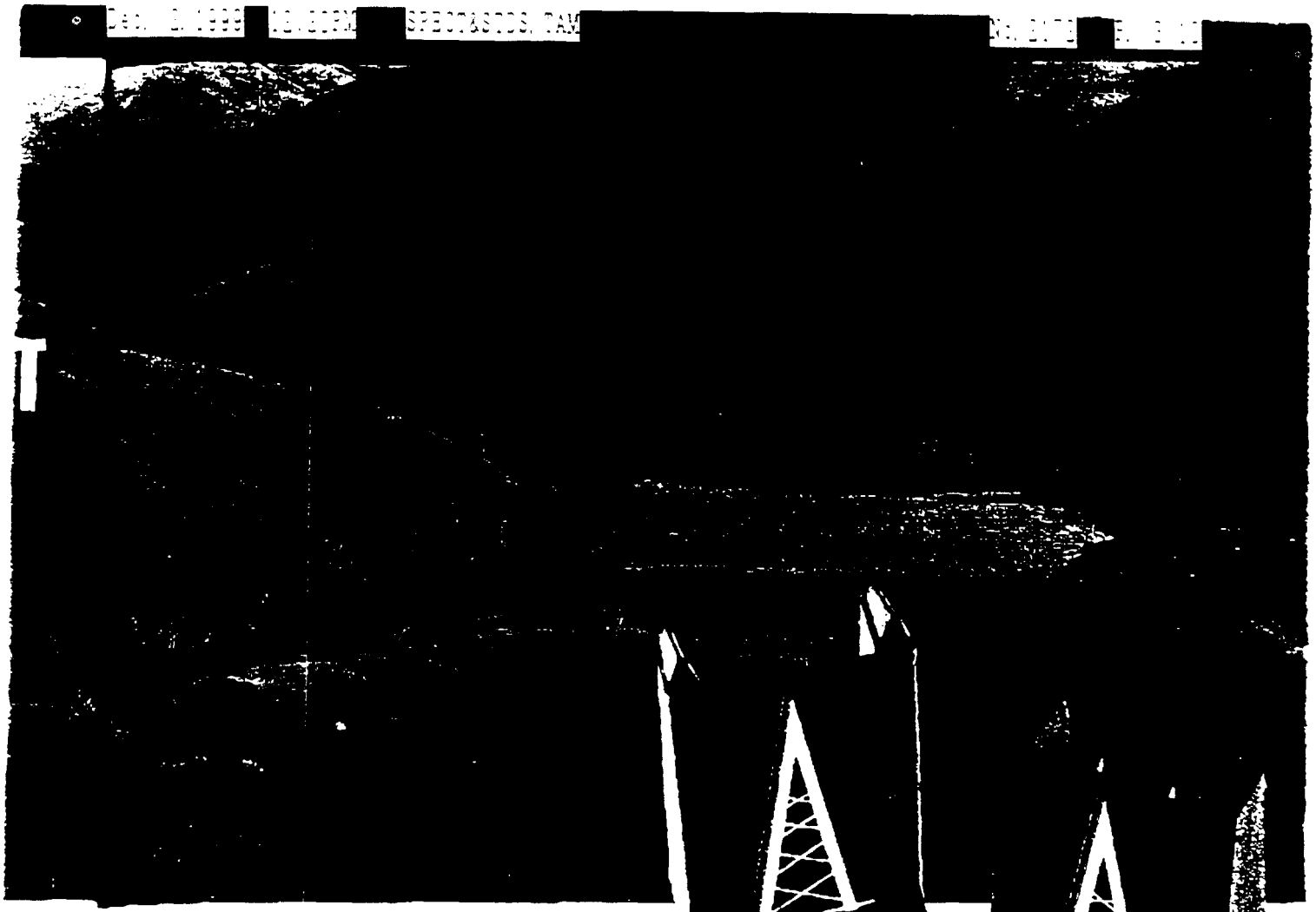
Because of limited resources and limited available frequencies, a 10-channel trunked simulcast system was chosen. This system would give WCCCA maximum area coverage with a minimum number of frequencies. WCCCA constructed four simulcast sites with 10 frequencies each. Given the large area that had to be covered, four sites were strategically chosen and, as with traditional radio systems, the repeater sites were installed on mountaintops for maximum coverage. (See Figure 2 on page 18.) With this design, WCCCA can provide radio service for more than 2,000 users, covering about 63% of Washington County. This system gives WCCCA good mobile coverage and fair portable coverage on the valley floor, which contains the bulk of the population.

The one big limitation of WCCCA's system is good portable radio coverage inside certain buildings. To overcome this building penetration problem, WCCCA has installed bi-directional amplifiers in many buildings, such as the county jail. Some high-traffic buildings, such as the Washington Square shopping mall, had to be excluded from in-building coverage. Due to the extreme expense and difficulty in establishing who would be the responsible party, no bi-directional amplifiers were ever installed, so presently there is marginal public safety coverage in this commercial area.

Defining interference

There are several types of radio interference. *Co-channel interference* occurs between similar frequency channels used in the same geographic area. *Adjacent-channel interference* can be caused by a transmitter operating on a channel bordering either side of the channel in question. The transmitter sidebands mix with the carrier being received on the desired channel, creating noise or "splatter." Interference can also be caused by electromagnetic interruptions. *Harmful*

Kuran is technical systems manager for the Washington County Consolidated Communications Agency, Beaverton, OR. He is the frequency coordinator for the state of Oregon for the Association of Public-Safety Communications Officials—International.



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interference has a specific connotation. As defined by the *Communications Standard Dictionary*, it is

> "...any *emission, radiation* or *induction* that endangers the functioning or seriously degrades obstructs, or repeatedly interrupts a *communication service* such as a *radio navigation service*, a *search and rescue communications*, or a *weather service*. It is assumed that these services are operating in accordance with approved standards, regulations and procedures. Harmful interference causes *circuit outages* and *message losses*, as opposed to interference that is merely a nuisance or annoyance that can be overcome by appropriate measures. In order to be harmful interference, it must seriously degrade the performance of the *communications, radar*, or other *electrical* or *electronic system*."

Interference with public safety communications from properly operated commercial radio services has traditionally not been a problem in our operating area. As with our own system, land mobile repeater sites were located on mountaintops and end users were on the valley floor. When the 800MHz (824MHz–849MHz and 869MHz–894MHz bands) cellular service was introduced, with cell sites located on the valley floor, there were still few problems. Public safety 800MHz bands (806MHz–821MHz and 851MHz–866MHz) enjoyed adequate separation from cellular.

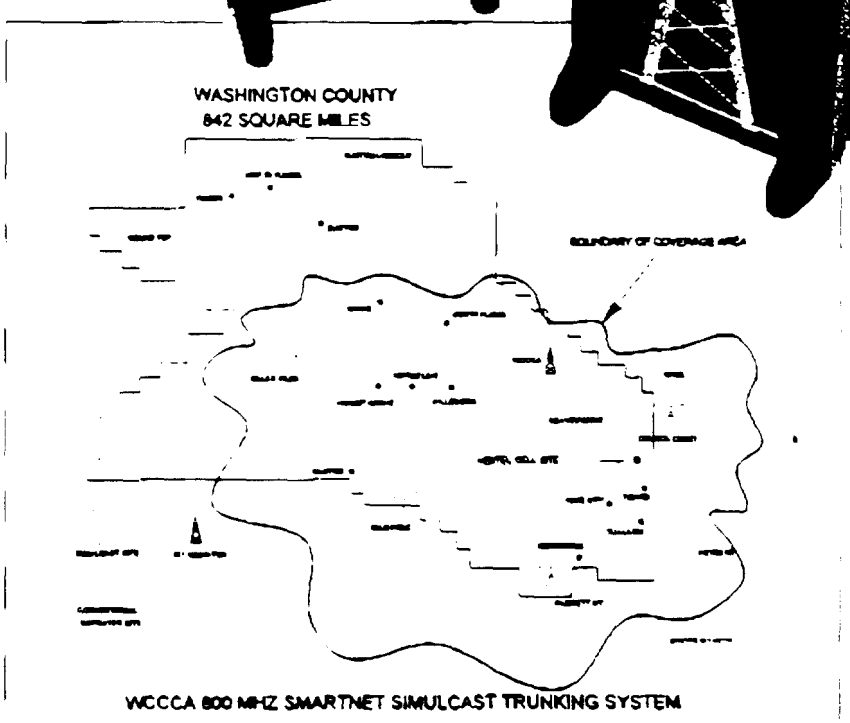


Figure 1. This map of Washington County, OR, shows the general area of WCCCA's 800MHz service area. Using simulcast trunking, WCCCA covers a large area, using only 10 frequencies, and supports more than 2,000 users. All simulcast sites are on mountaintops for maximum coverage. A Nextel site (center) is on the valley floor.

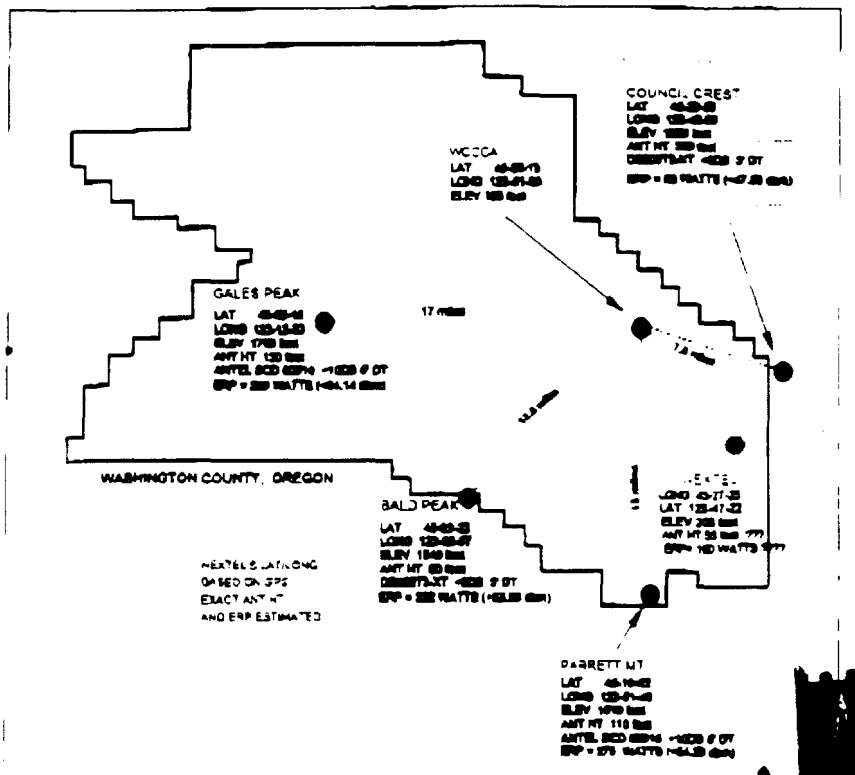
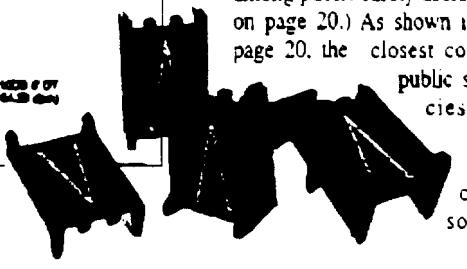


Figure 2. Technical details of WCCCA's 800MHz repeater sites. Elevation comparisons are made between the WCCCA sites and the Nextel site under study.

which was also grouped in one bandpass, while public safety was grouped in another. This situation changed with the introduction of 800MHz ESMR into the valley.

Enter ESMR

The FCC band plan for the 1998 800MHz SMR auctions divided the band into three pools: a public safety, industrial/land transportation and business pool, a general category pool, and an SMR category pool. The pools are interspersed from 810.25MHz to 816MHz and from 855.25MHz to 861MHz. In the FCC's 800MHz auction that closed in December 1997, McLean, VA–based Nextel Communications was the high bidder for the Portland-Salem, OR, economic area, which at that time encompassed an estimated 2,310,060 pops. The operator began service in 1998, placing 800MHz (806MHz–821MHz and 851MHz–866MHz bands) cell sites on the valley floor, among public safety users. (See Figure 3 on page 20.) As shown in Figure 4 on page 20, the closest commercial and public safety frequencies come to each other is four 25kHz channels away, so there is no



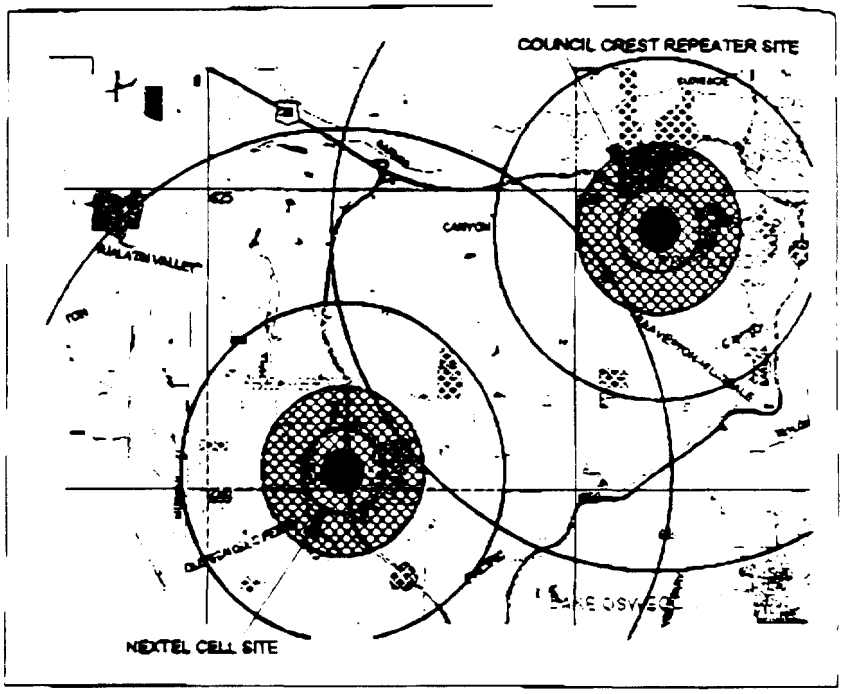
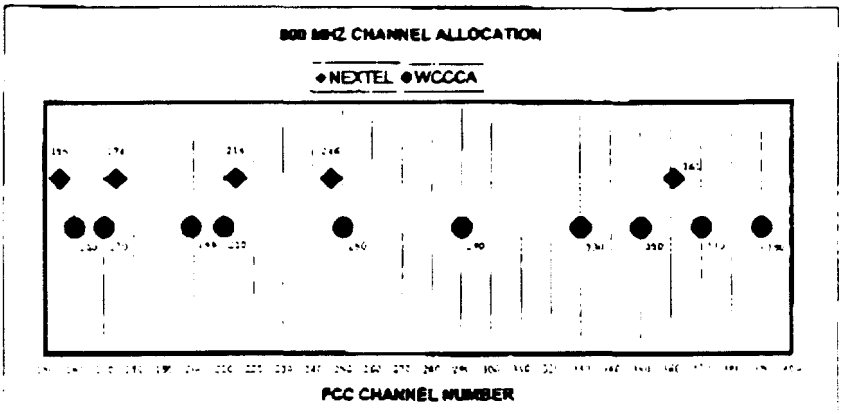


Figure 3. The relationship between Nextel and WCCCA's closest 800MHz trunking site. The color bands show the relative field strength from the two sites. WCCCA's Council Crest site is located on a mountaintop to provide wide-area coverage. Nextel's site is on the valley floor, in the heart of WCCCA's core radio service coverage area.



FCC CHANNEL NUMBER	FREQUENCY (MHz)	CHANNEL USER	SPACING TO CLOSEST FREQUENCY (kHz)
155	854.5625	NEXTEL CH. 309	
160	854.9875	WCCCA CH. 10	100
170	855.2375	WCCCA CH. 9	75
174	855.3375	NEXTEL CH. 347	
199	855.9625	WCCCA CH. 8	600
210	856.2375	WCCCA CH. 7	75
214	856.3375	NEXTEL CH. 427	
246	857.1375	NEXTEL CH. 491	
250	857.2375	WCCCA CH. 6	75
290	858.2375	WCCCA CH. 5	1075
330	859.2375	WCCCA CH. 4	750
350	859.7375	WCCCA CH. 3	250
361	860.0125	NEXTEL CH. 721	
370	860.2375	WCCCA CH. 2	200
390	860.7375	WCCCA CH. 1	700

Figure 4. The relationship between the commercial frequencies and Washington County's 800MHz frequencies. The closest commercial frequency is at least four 25kHz channels away. Therefore, the interference is not adjacent-channel interference.

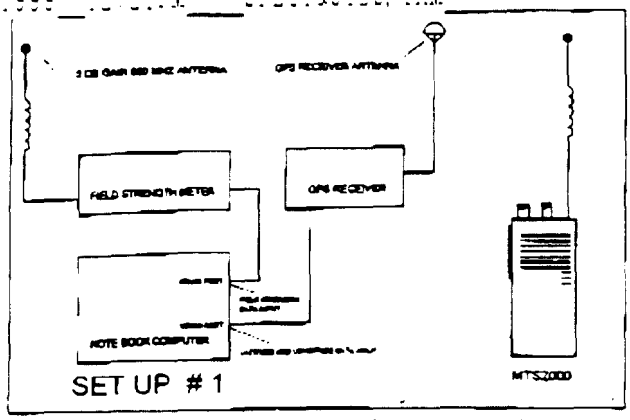


Figure 5. Field strength meter test measurement setup. A Z-Technology model R-505 meter was used. The GPS receiver provides location information to the notebook computer, an NEC Versa 5080X, running STI-9400 Mobile Signal Analysis System software from Survey Technologies.

possibility of adjacent-channel interference. However, because the band plan for 800MHz intermixes commercial frequencies with public safety frequencies, there is no chance of any group bandpass filters, as in the case of cellular. A problem was brewing, as we soon found out.

When we get behind closed doors—only

The first incident to bring an interference issue to the attention of WCCCA was a radio service complaint from one of the fire departments. This fire station, one of 33 in the county, is designated Fire Station 253. It serves one of the busiest areas of the county because it is next to a major freeway and next to the Washington Square

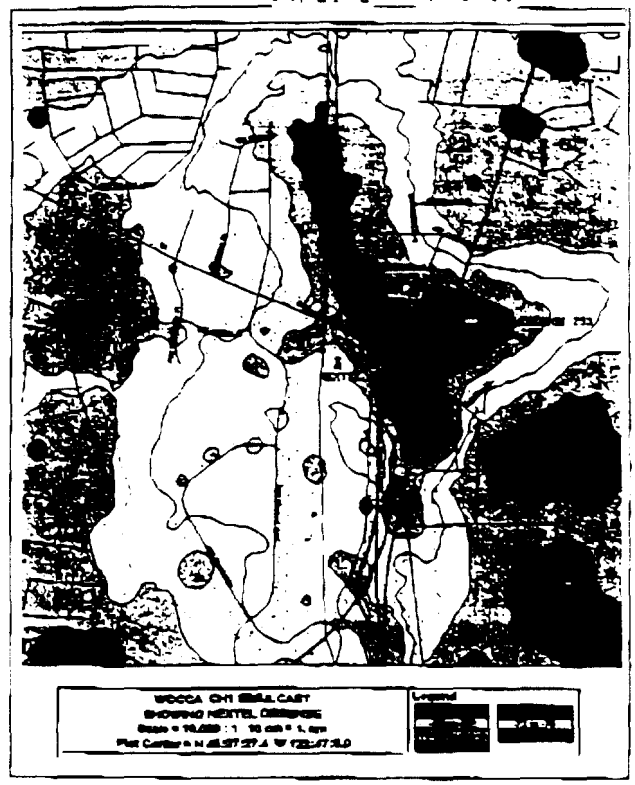


Figure 6. This signal strength contour map depicts the 800MHz coverage of WCCCA's system. The red area indicates what the agency first thought was a 'hole' in its radio system. Later, the area was found to match closely to the signal contour from the commercial site. The red area shows where the portable radios stopped receiving.

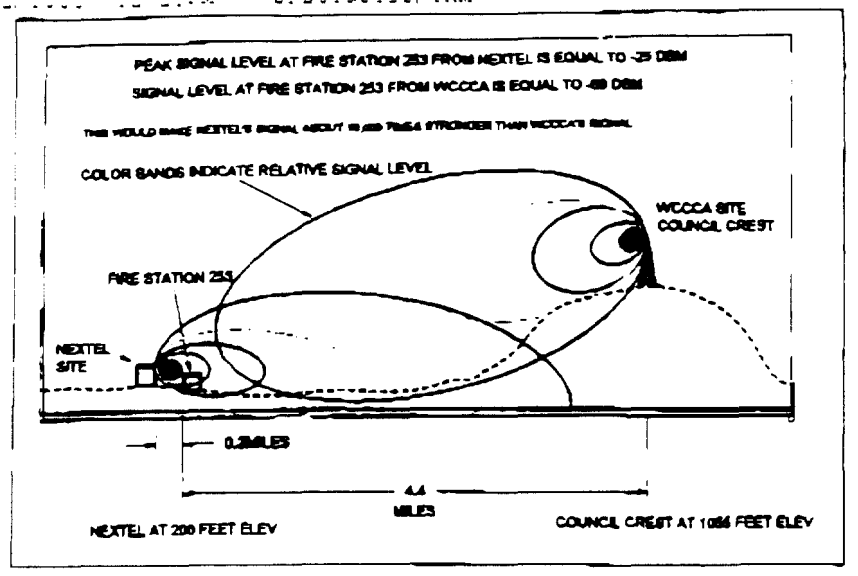


Figure 7. The geographic relationship between the Nextel site and the Washington County 800MHz repeater site. Usually, 800MHz trunked simulcast systems are located in high places (mountaintops) for maximum radio coverage. The commercial site's situation on the valley floor greatly increases the chances for creating interference.

shopping mall, where, as mentioned before, we have no in-building coverage.

The engine company is equipped with an 800MHz Motorola Spectra radio, an 800MHz Motorola VRM 600/DATA 911 mobile data terminal (MDT) and several 800MHz Motorola MTS2000 portable radios. The station is also equipped with an 800MHz base radio used for "tapping out" the station. ("Tapping out," a carry-over term from the old days of alerting stations by Morse telegraph, is the emergency alerting system that rings the station bells and turns on the lights.)

The engine company first complained to WCCCA Technical Services about poor radio communications. Its main complaint was that it was difficult to hear what fire dispatch was saying. This created a life-threatening situation because Station 253 was not always getting tapped out. The base radio was not always responding to the alerting signal.

WCCCA's technical staff began troubleshooting the problem. The usual procedures, such as checking antenna and receiver performance, revealed no evidence of a problem. Attention was then directed to the trunking system itself. At first, the WCCCA technicians thought there might be a simulcast phasing error. This, too, proved to be a dead end. The next area of investigation was determining the signal strength at, and around, Station 253.

The expected signal strength level should be about −65dBm at Station 253. This is based on calculations for ideal conditions (our closest trunking site is only 4.4 miles away), with an average of 58W ERP and with 9dB antenna gain and 3° antenna downtilt. As shown in Figure 5 on page 22, a Z-Technology R-505 field strength meter (range, 0dBuV to +110dBuV; accuracy ±2dB), a GPS receiver and a notebook computer were mounted in a jeep to log field strength readings of WCCCA's control channel #1 (860.7375MHz). (See Figure 6 on page 22) Computer analysis and mapping of signals

Figure 8. A signal-strength contour of the Nextel site. The blue and magenta plots show where Nextel's signal level is −38dBm or greater. Our tests demonstrated that in an area of greater than −38dBm, our portable radios stopped receiving any signals.

was performed with the STI-9000 Mobile Signal Analysis System from Survey Technologies. At first, the field strength reading around the station did not make a lot of sense. Some areas had the expected field strength level, and then there were areas where the signal dropped off to nothing. At first, WCCCA thought there was a signal hole in the simulcast system coverage. Because Station 253 has a relatively low elevation, WCCCA came to believe that this might be normal. However, because this involved public safety communications, WCCCA felt that it needed a more definitive explanation.

Two key issues led WCCCA to start suspecting an "outside" interference problem. First, it was discovered that the portable radios worked better inside the engine bay with the bay door closed. Second, the base radio got a more intelligible signal from fire dispatch using an inside antenna than when it was connected to the main outside antenna.

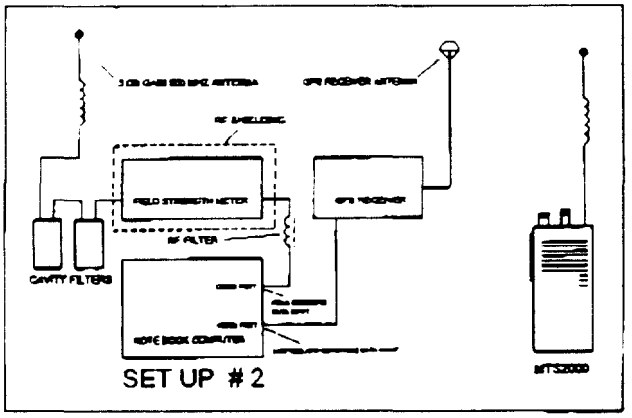


Figure 9. The same test measurement setup as shown in Figure 2, with the addition of cavity filters and RF shielding to overcome the massive commercial RF signal.

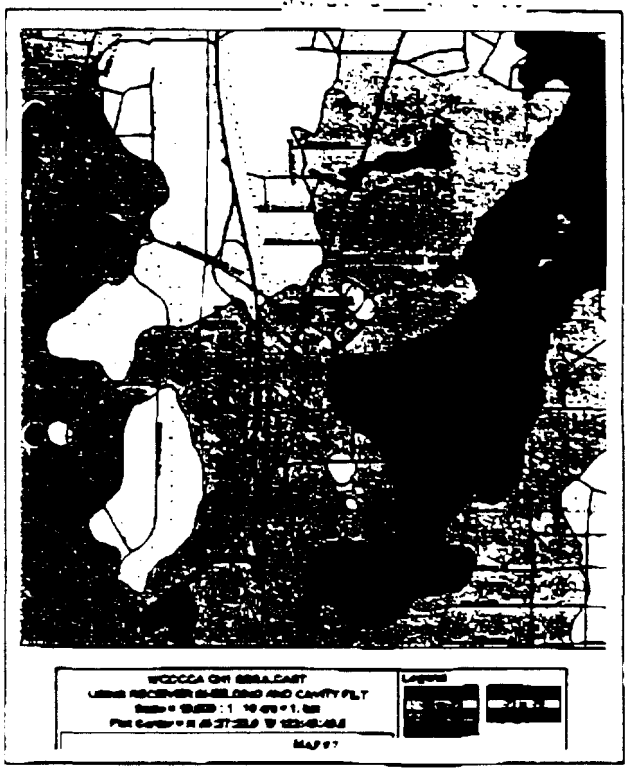


Figure 10. This contour map was generated to verify that WCCCA's 800MHz system actually had some radio coverage in this area. (Refer to the second test setup shown in Figure 3 on page 20.) By using extensive RF shielding and filtering, WCCCA was able to acquire enough readings in this area to demonstrate there was not a 'hole' in the coverage.

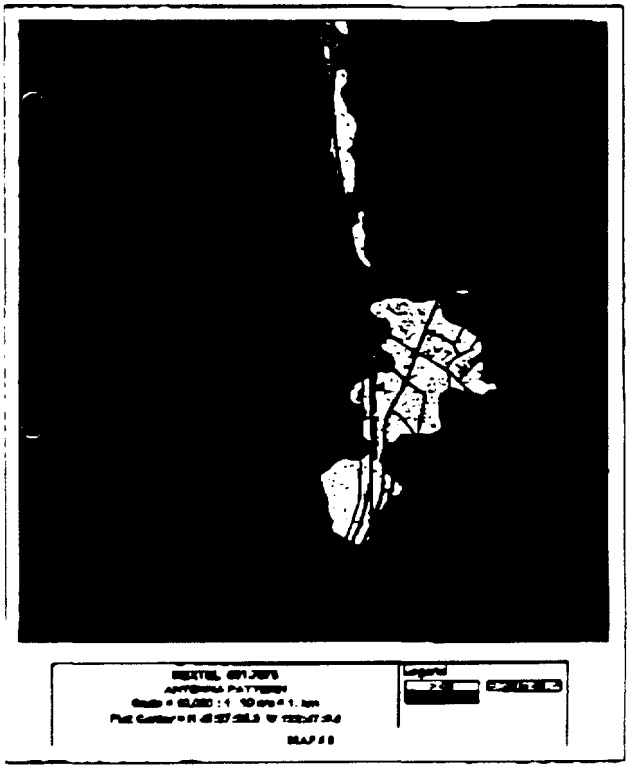
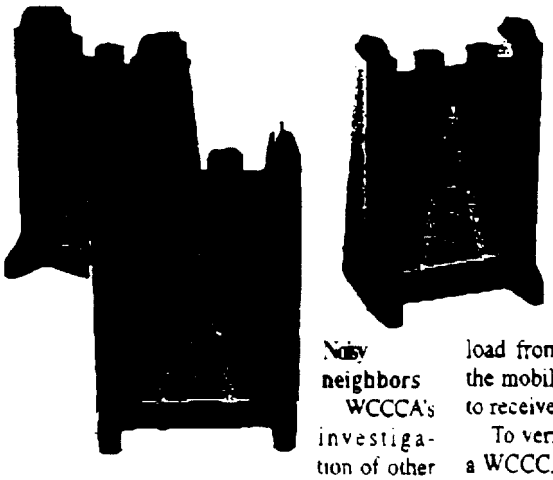


Figure 11. This contour map is a composite of those shown in Figures 9 and 10. The yellow area indicates where the WCCCA's radios stopped receiving. This area is where Nextel's signal strength is greater than -38dBm—roughly the same area where the radios encountered problems. ('Greater than -38dBm' can be *much* greater. Readings as high as -25dBm were sampled in this area, then averaged with the others.)



Noisy neighbors

WCCCA's investigation of other radio systems in the area discovered that a Nextel Communications site was located about ¼ mile to the west of Station 253, as shown in Figure 7 on page 24. The site uses Motorola integrated digital enhanced network (IDEN) technology and 12 repeaters that constantly transmit data. The measured field strength at Station 253 from the Nextel site peaked out at about −25dBm. The signal level from WCCCA's simulcast system averages about −69dBm at Station 253. During the signal strength tests as shown in Figure 6, the meter would not function properly in close proximity to the constantly keyed commercial repeaters.

During the testing, a Motorola MTS2000 portable radio was also tuned to monitor WCCCA's control channel. When the field strength meter would cease to function, the portable radio would also cease to function. (The red area in Figure 6 indicates those areas.) That is why the portable radios worked better in the engine bay with the bay door closed. The metal bay door actually provided enough RF shielding to let the radio barely receive Fire Dispatch. With the bay door open, the radios lost all reception. When Engine 253 had to respond to an accident, the call was sent to the MDT, but as soon as the bay door was opened, mobile data experienced a high error rate, and the message was scrambled.

Also, because of the RF overload from the commercial repeater signal, the mobile radio on Engine 253 was unable to receive a clear signal from Fire Dispatch.

To verify the condition, Nextel agreed to a WCCCA request to shut down its site for a brief period. A portable radio was immediately able to receive Fire Dispatch loud and clear in the open air in front of the station. A receiver desense test conducted at the station indicated that the Spectra receiver was being desensed 20dB or more by the commercial site transmitters. We now faced a situation of harmful interference from a commercial source operating within FCC guidelines.

Mapping the effect

To map out the exact area of harmful interference being generated from the commercial site, the test procedure was repeated. This time, the field strength meter was tuned to one of Nextel's frequencies (861.7875MHz). Figure 8 on page 26 shows the antenna pattern from the commercial site. The blue area, which indicates an average signal level greater than −38dBm, corresponds roughly to the red area in Figure 6. This is the same area in which the portable radios would stop receiving.

To verify that WCCCA's trunking system actually provided coverage in the area of interference from the commercial site, some extra measures had to be taken. With the assistance of a local Motorola engineer, the measuring equipment was modified, as shown in Figure 9 on page 26.

The field strength meter was surrounded with an aluminum shield. RF filtering was added to all power sources and to data cables that were connected to the meter. Dual-cavity filters were also added to the antenna input. The field strength meter and cavity filters were tuned to WCCCA's control channel #1. Again, the entire area was driven to collect an entirely new set of data points, as shown in Figure 10 on page 26. The RF shielding and filter allowed the field strength meter to operate 90%–95% of the time in close proximity to the Nextel site. This verified that WCCCA's system was actually providing signal in that area. Figure 11 on page 26 is a composite of maps from the three-part measurement procedure. The yellow area shows the area where public safety's portable radios stopped receiving and where mobile radios received substantial interference and had difficulty receiving emergency broadcasts from Fire Dispatch.

Motorola review

An engineering review by Motorola concluded that it was "evident that Nextel's IDEN sites in Washington County are serious communications 'holes' in key urban areas for public safety communications."

The report determined that the initial commercial activation of the first six channels presented heightened interference, but the expansion to 12 channels created the RF environment in which WCCCA's radios ceased to function.

The report also noted that following the short-duration system shutdown that Nextel made at WCCCA's request, Nextel used an HP spectrum analyzer to check the purity of its signals. The tests showed that the site was within specification and that spurious emissions or noise were below the noise floor of the analyzer (−118dBm). Measurements indicated that the 12-channel site produced 600W ERP composite total, using 2° downtilted omnidirectional antennas, also within specifications.

Bench tests by Motorola to duplicate the problem found that control channel reception was negligibly affected by high levels of interference (+13dBm and more) as *long as the interfering frequencies were spaced 1.5MHz or more* from the control channel frequency. Spacing tighter than 1.5MHz caused the control channel to blank in a symmetrical bell curve. Within just a few hundred kilohertz of the control channel, a

Congress calls on FCC to address interference problems

UTC, the Telecommunications Association, has been educating congressional representatives on the dangerous interference problems that many utilities and pipelines currently face. The UTC has described cases in which utilities couldn't dispatch crews in critical emergencies because of interference.

The threat to public safety, therefore, prompted UTC to seek a regulatory solution that would protect the critical communications systems of utilities and pipelines from harmful interference. In December 1998, 11 members of Congress wrote a bipartisan letter to the Federal Communications Commission calling for swift action.

The letter read that "interference from non-public safety-related radio users put at risk the lives and safety of utility and pipeline maintenance and emergency response crews," and threaten public safety. The letter stated that "in one particular case, a utility mobile dispatcher was unable to contact its field crews to shut off gas to a burning building because of continuous interference from a limousine paging service."

The number of cases of harmful interference continues to grow, and reportedly, 12 states have reported interference cases.

H.R. 4813, the "Critical Infrastructure Radio Systems Protection Action of 1998," has been introduced, directing the FCC to adopt rules to "ensure the on-going protection from harmful interference of private land mobile frequencies used by utilities and pipelines to protect life, health and property," according to the letter to Kennard.

The 11 Congressional representatives, including nine members currently serving on the influential House Commerce Committee, warned that should the FCC not move to address the problem, "Congress will be certain to take appropriate action when we reconvene." ■

varying number of interfering frequencies could blank the receiver with as little as −24dBm.

The engineering report concluded that "although the interference-handling capability of Motorola radio receivers is good, the sheer brute strength of the continuous-duty IDEN site transmitters planted in the same immediate vicinity and on the same subband as local public safety communications systems will spell problems for communications reliability in those areas. The issue is further aggravated by installation of IDEN sites in the same heavily populated areas (where) public safety also needs heightened communications reliability."

Moving toward resolution

This was the only site on which WCCCA performed extensive tests. Several other ESMR sites are located in Washington County, and spot-checking has found the same harmful interference. As commercial sites are added to improve coverage, public safety coverage will deteriorate.

Since the testing phase, Nextel has cooperated by cutting its ERP at the site back by half, and reducing the number of active channels from 12 to eight. Some frequencies were also relocated. This has decreased the zone of interference from ¼ mile to ⅛ mile at the local level.

In January, Motorola contacted WCCCA to arrange to send an engineering team assembled from its IDEN and RF design groups. After analyzing the problem in the lab, this team will follow up with real-world field tests.

A wakeup call to the the industry

The commercial mobile radio service in this case, Nextel, cooperated with local public safety in working toward a resolution of the interference issue. However, the same technical conflict is probably taking place all across the country. The national office of APCO has taken an interest in the problem, and Oregon's congressional delegation has expressed concern.

The FCC has looked at the problem, but concluded that because both parties in this case have valid FCC licenses and are operating within engineering specifications, there is nothing the agency can do. No one mentioned the band plan that contributed to the problem in the first place.

It's analogous to a shipping channel that is used for critical cargo. The government allows some contractor to build an underwater structure in the middle of the channel, just below the surface, and then does not tell the shippers that it is there.

The FCC, manufacturers, commercial service providers and public safety agencies need to examine the consequences to public safety, particularly in populous areas, resulting from certain band plans, power levels and site locations. Improved frequency coordination and RF design are essential to dealing with interference. ■

The Views Of Public Safety Agencies
On Cellularized Technology In Adjacent Frequency Bands

PRO	CON
None	**International Association of Chiefs of Police: (representing more than 16,000 police executives)** • IACP "strongly oppose[s] the use of cellular and cellular-type architecture in the guard bands". • This is based in part on "[r]ecent complaints by IACP members relative to interference caused from cellular type systems to their police radio systems in the 800 MHZ bands. • "We again urge the Commission to only permit compatible land mobile systems in the guard bands".
	Association of Public-Safety Communications Officials-International, Inc.: • "generally opposes the use of cellular or cellular-type architectures in the guard bands. There is simply too much risk of interference to critical services that protect the safety of life and property". • While APCO has indicated that "as a theoretical matter, . . . [certain steps] could substantially reduce the potential for interference" from cellular architectures like FreeSpace's, "APCO has serious doubts as to whether the proposed interference protection can be achieved as a practical matter, and whether rules of general applicability implementing such protections could be developed and enforced". • "[W]e have grave concerns as to whether [the cellular architecture proposed by FreeSpace] would work in reality." • The bottom line: "When potential interference to public safety communications is at issue, the Commission must have certainty, not broad proposals for untested technology."

	<u>Major Cities Police Chiefs Association</u>: "[O]ur members' experience at 800 MHz in Phoenix, Arizona, and the TWA 800 tragedy, to [c]ite only two, has demonstrated that public safety and high density, commercial use systems such as ESMRs and cellular systems, are not good spectrum neighbors with public safety."
	<u>Land Mobile Communications Council</u> (whose members include the International Association of Fire Chiefs, the Central Station Alarm Assn., the International Municipal Signal Assn., and the National Association of State Foresters in addition to APCO and AASHTO): • "To avoid harmful interference to public safety users in the 746-806 MHz band, the LMCC strongly urges the Commission not to allow any commercial providers using cellular-like system architecture to operate in the 6 MHz designated as the guard band." • The Commission should "*carefully* craft technical rules in the guard bands that will provide for the maximum protection for public safety users in the adjacent bands and which are premised on ***proven*** interference-avoidance techniques." (Emphasis in original)
	<u>The American Association of State Highway and Transportation Officials</u>: • "We are concerned that the operation of systems employing cellular-like frequency re-use pattern could result in greater interference and RF "noise floor" considerations which would not occur if the usage is limited to traditional wireless telecommunications usage." • "Licensees operating in the guard bands immediately adjacent to the Public Safety frequency bands should be technically equivalent to Public Safety systems infrastructures which are best exemplified in Land Mobile Radio systems operations."