

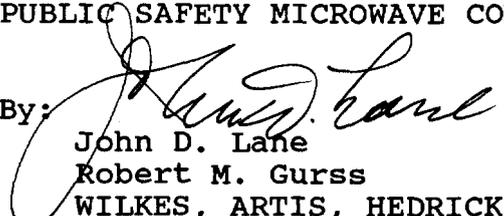
CONCLUSION

The Public Safety Microwave Committee commends the Commission for recognizing the need to prevent relocation of existing public safety use of the 2 GHz microwave bands. However, PSMC urges the Commission to take further steps to allow state and local governments to add new and expanded microwave facilities in the 2 GHz bands, at least when alternatives are unavailable. If co-primary mobile operations are licensed in the 2 GHz band, the Commission must also establish rules to prevent any interference to state and local government microwave communications, which are critical to the safety of life and property.

Respectfully submitted,

PUBLIC SAFETY MICROWAVE COMMITTEE

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June 8, 1992



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January 15, 1992

The Honorable Alfred C. Sikes
Chairman
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: General Docket No. 90-314

Dear Mr. Chairman:

On behalf of the Public Safety Microwave Committee (PSMC), this is in reply to your letter dated December 26, 1991, in which you requested a response to the following questions:

Could the needs of existing licensees in the 1.8 to 2.2 GHz band, especially public safety licensees be fully met by fiber? At what cost? By when? Can sufficient redundancy to protect against outages be achieved with fiber? At what cost? Who should bear the expense of such a shift if it were to occur?

Various members of the PSMC, including APCO and the Los Angeles County Sheriff's Department, have previously submitted information to the Commission in this and related proceedings explaining that fiber is not a viable alternative to 2 GHz microwave facilities. The following briefly reiterates those arguments. I have also attached a report prepared by the State of California (which has also already been filed with the Commission) which provides further detail on the fiber issue.

The needs of public safety licensees in the 1.8 to 2.2 GHz band cannot be fully met by fiber. Public safety agencies have spent billions of dollars to build microwave facilities in the 1.8 to 2.2 GHz band to provide the "backbone" for emergency mobile radio communications systems. These 2 GHz microwave "backbone" systems provide the critical link which connects dispatch centers with

remotely located transmitter/receiver radio sites. Therefore, disruption of the backbone will have a devastating effect on police, fire, emergency medical, forestry, highway and other critical public safety services. Unlike microwave, fiber and other wireline systems are susceptible to disruption from natural and man-made events. Storms, mud slides, forest fires, and earthquakes can cause serious outages in wireline services. Yet, it is during such events that dependable mobile public safety communications are most important. Wireline systems are also subject to disruption caused by construction crews (the infamous "backhoe fading" problem).

Aside from the danger of disruption, fiber is also impracticable for many locations currently served by microwave. In many states, microwave facilities link mountain top and other remote wilderness areas. Extending fiber to such locations would be difficult if not impossible because of terrain and environmental concerns. Unlike microwave, wireline communication also requires rights of way. Even if the lines could be built, the remoteness of the lines would heighten the danger from breakages in the line because of the difficulty of making prompt repairs.

As explained in the attached statement from the State of California, microwave communication has proven to be far more reliable than fiber in times of emergency. In those rare instances when microwave outages occur, the location of the problem can be quickly ascertained (unlike wireline breaks which can occur anywhere along the line) and repairs are relatively easy to make. Also, many microwave systems have built in redundancy to increase reliability. Therefore, public safety cannot rely upon fiber to meet all of the needs now served by 2 GHz microwave systems.

Your letter asked whether "sufficient redundancy to protect against outages [can] be achieved with fiber?" In theory, the answer is yes. However, redundancy, in this context means running separate lines, presumably along separate rights of way (otherwise breakages are also likely to be "redundant"). While redundancy might prevent outages due to some types of disruptions (such as "backhoe fading"), it would not prevent damage from storms, forest fires, earthquakes, or other natural disasters, which cause failures at multiple points in a wireline system. In any event, adding redundant fiber links would obviously double the already extraordinary cost of installing fiber as a substitute for microwave. As discussed below, even without adding redundancy, the cost of fiber in most instances is simply not economically practical.

The cost of replacing microwave systems with fiber would be extraordinary, even in those situations where it might otherwise be feasible. Los Angeles County estimates that the cost to replace its seventeen (17) 2 GHz microwave paths with a non-redundant above-ground fiber system (which is less expensive, but also much less reliable than below-ground installations) would be \$18 million. This estimate assumes partial use of existing poles and available rights of way. However, the actual construction would have to include some underground installations to meet local regulations (and to provide greater protection from storm damage) and some rights of way would have to be purchased, adding considerably to the estimate.

Other public safety agencies have provided similar estimates. The Kentucky Division of Telecommunications estimates that building inter-city fiber links along existing rights of way in non-mountainous areas would cost approximately \$40,000 per mile. The Minnesota Department of Transportation (DOT) recently installed a 50 mile urban fiber system which cost \$100,000 per mile. The high cost occurred, in part, because of the need to cross bridges and roadways, a typical requirement for public safety communications systems. The Minnesota DOT also notes that while some rural areas can be wired with fiber for less, many other remote areas, especially in the rocky Lake Superior North Shore area would involve per mile costs that meet or exceed urban costs. Even in those instances where state agencies control the necessary rights of way and terrain does not pose insurmountable obstacles, the cost of replacing microwave systems with fiber is prohibitive. For example, the Ohio Turnpike Commission estimates that the cost of replacing its 265 miles of microwave links with fiber would be between \$14 million and \$19 million. Also note that replacing a typical 20 mile microwave link is likely to require far more than 20 miles of fiber because of the need to follow rights of way, rather than line of sight. For example, the State of California recently determined that replacing a two mile rural microwave path would require 13 miles of fiber.

To the extent that existing microwave users may be required to be displaced from the 1.8 to 2.2 GHz band, the cost of appropriate replacement systems must be borne by new users of the band. If required, this would include many public safety systems which are new or recently built pursuant to FCC approved regional plans. However, as I noted in my testimony at the en banc hearing, reimbursement mechanisms are not the complete answer to public safety's needs. Many public safety microwave systems cannot be replaced at any cost. After our bitter experience with the proposed Direct Broadcast Satellite (DBS), public safety is also dubious of vague promises for future reimbursement.

Alfred C. Sikes

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January 15, 1992

Finally, your letter asked when public safety would be able to move its microwave operations to fiber. Even assuming that state and local governments were given unlimited funds, and that terrain obstacles did not exist, it would still require many years to make the conversion to fiber because of the need to acquire the rights of way necessary to build wireline systems.

The Public Safety Microwave Committee stands ready to respond to any further inquiries that the commission may have on this issues. Copies of this letter have been filed with the Secretary for General Docket 90-314.

Sincerely,

SHERMAN BLOCK, SHERIFF



**B. E. Wenke, Captain
Communications and Fleet
Management Bureau**

Attachment

cc: All Commissioners
Dr. Thomas Stanley
Mr. Robert Pepper