FCC 94-237

RECEIVED
DEC 30 1994
FCC MAIL ROOM

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

In the Matter of	)	
	)	CC Docket No. 94-102
Revision of the Commission's rules	)	
to ensure compatibility with	)	RM-8143
enhanced 911 emergency calling systems	)	

DOCKET FILE COPY ORIGINAL

COMMENTS ON THE
NOTICE OF PROPOSED RULE MAKING
Released October 19, 1994

Offered by: *PERTECH AMERICA, INC.*
One Illinois Center
111 East Wacker Drive, Suite 500
Chicago, Illinois 60601

Michael J. Celeski,
Vice President

No. of Copies rec'd 0+9
List ABCDE

PERTECH

PERTECH AMERICA INC
PERSONNEL TECHNOLOGIES INC

ONE ILLINOIS CENTER • 111 EAST WACKER DRIVE • #500 • CHICAGO, ILLINOIS 60601 • 312.616.9484

RECEIVED
DEC 30 1994
FCC MAIL ROOM

December 26, 1994

Office of the Secretary
Federal Communications Commission
Washington, D. C. 20554

Ref.: Docket No. 94-102

Dear Commissioners:

PERTECH AMERICA, INC. respectfully submits the enclosed material as Comments on the Commission's Notice of Proposed Rule Making to revise the Commission's rules to ensure compatibility of PBX and wireless telephone services with Enhanced 9-1-1 emergency calling systems.

PERTECH is a systems consulting firm with extensive experience in Public Safety communications. As vice president of the firm I appreciate this opportunity to provide information and comments that may improve the state of E9-1-1 service throughout our country. I have included a short description of my background at the front of Exhibit 1 of these Comments.

Our comments are based primarily on the requirements of Public Safety Answering Point personnel. In addition to personal PSAP operational experience, I recently conducted a national survey of emergency caller location identification requirements for both APCO and NENA. Exhibit 1 contains the full report of that survey.

We trust you will find this material both pertinent and useful in your deliberations.

Sincerely,

Michael J. Celeski

Michael J. Celeski

Vice President

PERTECH AMERICA, INC.

TABLE OF CONTENTS

SECTION PAGE

SUMMARY 2

1. APPLICABILITY OF RULES 3

2. STANDARDS 4

3. ON-PREMISE SECURITY CONTACTS 7

4. EQUIPMENT LABELING 7

5. PHASE-IN PERIODS 8

6. WIRELESS 9-1-1 FEATURE PRIORITIES 9

7. PRIVACY CONSIDERATIONS 10

EXHIBIT 1 - ALI REQUIREMENTS SURVEY 10

Summary

These comments are directed toward the topics listed in the Table of Contents. Within each topic the specific paragraph number of the NPRM is cited for reference.

In the first section we propose that the Commission's rules on 9-1-1 be applied to any organization which provides access to dial tone. Section 2 discusses the use of standards for E9-1-1 and recommends that NENA be designated as an advisory body to the Commission. Additionally, we suggest that wireless 9-1-1 grades of service be equivalent to wireline 9-1-1 grades of service and, that the definition of Trunk Interface be expanded to include new technologies, such as fiber optics and ISDN. Section 3 recommends that the telephone number of any on-premises security agent be included in the ALI display to the PSAP call-taker. Section 4 cautions against the use of equipment labels that infer 9-1-1 service in areas where it is not yet available. Section 5 recommends that the TIA's evolutionary paths be used as the basis for phasing-in various wireless 9-1-1 features. Section 6 recommends that the Commission consider requiring the wireless industry to provide a call-back number before requiring them to provide cell site or cell sector location information. Section 7 comments on Right to Privacy issues. Finally, Exhibit 1 is a report on the ALI requirements of PSAPs as reported in a national survey conducted by this writer for NENA and APCO. It is provided as a basis for the Commission's consideration of Public Safety end-user requirements.

1. Applicability of Rules

Par. 21:

The identification of "responsible parties" should include Public Safety Answering Points, not only public safety agencies. Many agencies are served by a joint, or consolidated, PSAP. Furthermore, recent discussions about *privatization* of governmental services has included the subject of emergency services call-taking and dispatching. Some commercial services already exist to receive and forward emergency calls from motorists using cellular telephones. Therefore, any definition of "responsible party" in regard to emergency services communication should ensure that the pertinent rules and regulations apply to <u>all</u> answering points, whether operated by a public safety agency, quasi-governmental, or private service organization.

When considering whether the proposed rules must be applied where the equipment serves a physically small location, the Commission might consider using language similar to that developed during the NENA/APCO ALI Requirements survey:

> "These rules shall apply to ... and any single floor area which is so expansive as to hinder immediate location of the caller."

Par. 29:

The Commission's rules apply to <u>all</u> providers of access to the Public Switched Network, not merely the traditional LECs that have commonly provided 9-1-1 service to date. Alternative providers of "dial tone" (be they wireline, wireless, cable or other technology) should be required to adhere to the same set of rules regarding 9-1-1 service.

Footnote 40:

As introduced above, all services that will be capable of "providing dial tone" should be subject to Enhanced 9-1-1 compatibility requirements. This could include mobile satellite, cable TV/telephone and other services that are, or will be, competing to provide access to other telephones. The ultimate test that the Commission might apply in determining a service's subjugation to E9-1-1 compatibility is whether the end-user believes that he/she can use the instrument to call for police, fire, or emergency medical assistance. If a communications service is implemented for the sole purpose of closed, private connection between previously identified and authorized users, no expectation of summoning public safety agency response would exist. However, if the service (even though private) provides a means of communicating with people outside of the system, an expectation might be created that the end user could call for emergency aide using that particular instrument. This situation would then necessitate system compatibility with E9-1-1 service.

2. Standards

Par. 27:

The NENA standards for information protocol are currently an appropriate format for transmitting information about 9-1-1 calls. These standards are widely published and available. NENA devotes considerable time and effort to examining their standards and updating them as appropriate. With today's rapidly changing technologies, standards are continually being revised.

We would urge the Commission to require adherence to NENA's standards *by reference* in the Report and Order. In this manner, the Commission's requirements will continuously reflect current standards. The Commission might also consider establishing a formal role for NENA similar to that fulfilled by APCO in the public safety radio service. For example, APCO's efforts in Project 16 and Project 25 have been of considerable benefit to the Commission with regard to establishing rules affecting public safety radio systems. As new technologies (e.g., geographic coordinate data) are developed for the 9-1-1 telephone service, NENA would be an appropriate body to develop new standards and/or advise the Commission on the proposed technology's efficacy.

Par. 33:

As discussed in our comments for Par. 27, NENA is an appropriate organization to assist the Commission in establishing 9-1-1 standards. However, we agree more with the APCO/KSI concepts of establishing performance requirements rather than requiring adherence to specific technical standards. Our suggestion of a formal APCO-like role for NENA would provide the wireless industry with the flexibility to develop alternative solutions within NENA-approved guidelines while the Commission would retain ultimate regulatory authority over the industry.

There is one fundamental technical requirement that should be established for all providers 9-1-1 service, however. Whatever technologies are developed, termination of a wireless 9-1-1 call at the PSAP should be on the same lines or trunks as wireline 9-1-1

calls. An increase in the number of trunks serving a PSAP should only be necessitated by an increase in the number of calls being received by the PSAP. Some early suggestions for connecting wireless callers have included installing separate dedicated trunks, or even radio receivers at the PSAP. These types of solutions would not only result in additional costs to the PSAPs; they would also create periodic dilemmas for the call-takers: When both wireline and wireless 9-1-1 lines are ringing, which should be answered first? Either could be a life-threatening situation. Such a choice should not be imposed upon already stressed emergency service telecommunicators. We believe that 9-1-1 call queuing, distribution and network "choking" are issues that are more aptly handled by installed technologies than by harried humans.

Par. 43:

We agree that federal standards for grade of service are not warranted at this time. Grades of service for wireline 9-1-1 networks today differ from jurisdiction to jurisdiction. We would suggest that if grade of service is addressed in the Report and Order, the Commission simply require that wireless 9-1-1 grade of service be equivalent to the wireline grade of service being provided within the same locale.

Section 68.320:

The definition of Trunk Interface should no longer be limited to "analog two-wire or four wire channels...." Several agencies are currently considering the implementation of new technologies such as fiber optics and ISDN to terminate 9-1-1 calls at their PSAP.

3. On-Premise Security Contacts

Par. 23:

The NENA-APCO ALI survey (Exhibit 1) asked PSAP personnel two questions regarding on-premises security agents. The first question was whether or not the ALI display at the call-taker's station should include the telephone contact number of an on-premise security agent. This concept received approval by 85% of the respondents. The second question asked whether call-bridging between the caller, the PSAP, and the security agent should be provided. This resulted only in a 47% positive response.

The data seem to suggest that PSAPs prefer to speak directly with the caller without any intermediaries. This allows clear concise instructions by trained emergency service telecommunicators. Should further information about a particular premise be needed by the PSAP, displaying the contact telephone number within the ALI record would provide the means to obtain it. We therefore suggest that in lieu of requiring any notification to (or conferencing with) an on-premises security agent, the appropriate contact telephone number be provided to call-takers with other ALI information.

4. Equipment Labeling

Par. 31:

Any universally required labeling or cautions imprinted on PBX equipment must be carefully crafted to avoid confusion to the emergency caller. This is especially true for callers who are in areas that are not yet served by 9-1-1. Therefore, any reference to the method of dialing 9-1-1 should only be publicly displayed on equipment that is installed in areas in which 9-1-1 service is available.

Par. 55:

The proposed labeling included in this section raises the same issue of confusing the caller as we raised in Par. 31. "You may use this transmitter to dial for help through 911" is not a universally valid statement. Should the user of the transmitter be located in an area of the country that does not have 9-1-1 service, repeated futile attempts to dial those digits could result in extreme consequences. We suggest not including a universal reference to 9-1-1 until 9-1-1 is universal.

5. Phase-In Periods

Par. 38:

With respect to phase-in periods, we suggest that the Commission look to the four "evolutionary paths" established during the TIA's August '94 Joint Experts Meeting on wireless access to 9-1-1. These paths represent a thoughtful effort to establish a reasonable framework for implementing full Enhanced 9-1-1 capability in the wireless industry. The paths do, however, need established timeframes. We defer to those commentors from the industry to advise the Commission on dates that are reasonable both in terms of financial impact and technological capability.

6. Wireless 9-1-1 Feature Priorities

Par. 49 - 52:

We urge the Commission to examine the results of the ALI survey, included with these comments as Exhibit 1. The data regarding approximate and exact location information versus call back telephone number indicate a different order of implementing these features than is described in the NPRM.

The survey indicates that PSAPs would much rather have a call-back number if the only potential alternative feature were *approximate* location. This suggests that rather than requiring cell site/sector identification within one year after the Report and Order, and Re-ring/call-back capability three years later, the reverse should be required. If however, *exact* caller location information is possible prior to call back number, the wireless industry should provide this feature first. Further discussion and complete data surrounding this position is provided in Exhibit 1.

Appendix B:

Based upon the results of the ALI survey, we suggest that items 7 & 8 (Called Party Hold and Call-back/Re-ring) be elevated in priority above item 3 (callers' geographic location) on the feature priority list. This rearrangement of feature priority assumes that the geographic location is only approximate (i.e., cell sector, cell site). If exact geographic location can be provided (as defined in Exhibit 1) the prioritization should remain as stated.

7. Privacy Considerations

Par. 57:

A person calling 9-1-1 is generally assumed to have yielded at least some portion(s) of the Right to Privacy. The Public's Safety has historically been found to outweigh an individual's right to anonymity when calling to report an emergency. Arguments proposed in favor of a caller's right to privacy have primarily focused on the caller's *identity* not the caller's *location.* The identity is provided to PSAPs through ALI as telephone owner or subscriber billing information. Similar Right to Privacy arguments could be raised in regard to providing permanent Home Register or temporary Visitor Register information. However, providing geographic coordinate location data does not compromise the identity of the caller. This type of information thus should not raise a privacy issue.

Exhibit 1 - ALI Requirements Survey

The following exhibit is respectfully submitted to assist the Commission in its deliberations of automatic location identification of wireline and wireless 9-1-1- callers. It describes PSAP requirements for ALI as reported in a national survey conducted for APCO and NENA. Both fixed and mobile types of caller location are addressed in the report.

AUTOMATIC LOCATION IDENTIFICATION

A SURVEY OF

PUBLIC SAFETY ANSWERING POINT REQUIREMENTS

by

MICHAEL J. CELESKI

VICE PRESIDENT

TABLE OF CONTENTS

Section Page

ABOUT THE AUTHOR....2

BACKGROUND....3

DISCUSSION....4

DEMOGRAPHICS....4
LOCATION ACCURACY REQUIREMENTS....5
INFORMATION DISPLAY PARAMETERS....7
LOCATION INFORMATION ELEMENTS....8
Altitude/Height....9
Common Places/Vanity Addresses....10
Prviate Security Contacts....10
Fixed Locations....10

CONCLUSIONS & RECOMMENDATIONS....13

DATA....15

ABOUT THE AUTHOR

Mike Celeski is the Vice President of PERTECH AMERICA, Inc., a Public Safety systems consulting firm. He assists public safety agencies in designing communication and information management systems. He is also available to assist the public safety vendor community in product development and system design.

Prior to founding PERTECH, Mike was an Industry Consultant in the Ameritech Public Safety Group. He was the Senior Design Project Manager of that group and was responsible for designing turnkey public safety communications systems. He was employed at Ameritech for almost four years, and worked on more than thirty systems in the Midwest, ranging from the Village of Alsip (pop. 17,000) to the City of Chicago (pop. 2.8M).

Before joining Ameritech, Mike was a sworn officer of the Chicago Police Department. During his sixteen year career, he served as a Patrol Officer, 9-1-1 Call Taker and Police Dispatcher, Patrol Sergeant, Training Division Sergeant, and as the Assistant Project Manager for the CPD's Public Safety Communications Study. This last assignment led Mike to his involvement with NENA and APCO.

During the two and a half year CPD Needs Assessment, Mike assisted NENA with the first revisions of the Illinois Emergency Telephone System Act, which enabled public safety agencies to fund many of their current modernization efforts. For APCO, Mike developed and analyzed the user questionnaires that formed the basis of the Southern Lake Michigan 800 MHz Regional Plan, and compiled the written draft of the Plan. He continues to assist in drafting proposed 9-1-1 legislative amendments, and recently helped compile the Illinois APCO chapter's Comments on the FCC's proposed VHF/UHF Spectrum Refarming.

Mike has a Bachelor's degree in Psychology from DePaul University in Chicago, and a Diploma in Police Administration from the Northwestern University Traffic Institute (the "Long Course").

Mr. Celeski can be contacted at (708) 425-7292.

BACKGROUND

The research described in this report was initiated at the First Annual NENA Telco/Vendor Conference held in Nashville, Tennessee during February, 1994. The author participated in the "Wireless Track" that considered problems posed to Enhanced 9-1-1 by the impending proliferation of mobile telephone networks (notably, PCS).

During the discussion, many ideas were put forth as to how to locate a wireless caller dialing 9-1-1. Many technologies, such as Global Positioning Satellite (GPS) and Radio Directional Finding (RDF) were explored. However, it quickly became apparent that before a method(s) of *how* to locate an emergency caller was chosen, we needed to determine *what* information actually is required by the Public Safety Answering Points (PSAPs).

In other words, exactly what information does a PSAP call taker need to determine the location of an emergency. Does the call taker need to know what floor of a building the caller is on? Does the call taker need to know how far up a mountain that a rock climber is? Are geographic coordinates required to determine the exact location of a farmer in his field who is reporting an accident with his tractor?

To answer these types of questions, it was decided to survey the active members of both NENA and APCO. This report documents the results of that survey and offers an initial interpretation of the data.

DISCUSSION

Demographics

A total of 623 surveys were returned and analyzed (NENA = 522; APCO = 101). Approximately ten more (including some from New Zealand) were received too late for analysis. PSAP personnel who belong to both APCO and NENA were requested to complete the survey only once. To the best knowledge of this researcher, no duplicate surveys were received.

Responses were tabulated from 46 states, 3 Canadian Provinces and 1 Other country (Sweden). 59% of the respondents were PSAP Managers or Administrators; approximately 16% were PSAP supervisors; and close to 10% of the respondents were call takers/dispatchers. (See Figure 1).

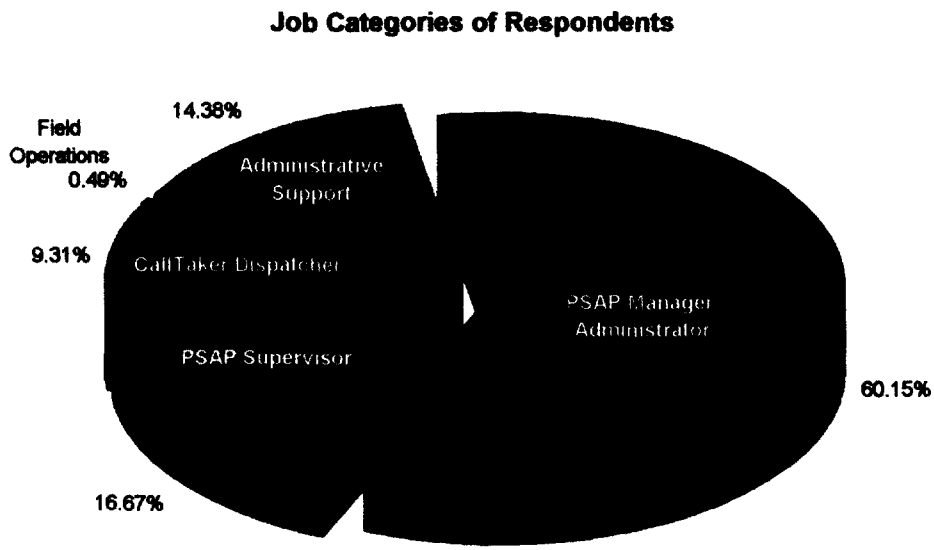

Figure 1

Location Accuracy Requirements

The questionnaire began with items that were designed to measure how *accurate* location information has to be. Initially, two forced choice questions were given. Respondents were informed that near-term wireless technology may allow only the transmission of either ANI or ALI, but not both. They were then asked to choose between call back number and approximate location, and call back number and exact location. Figure 2 illustrates the results of these two questions.

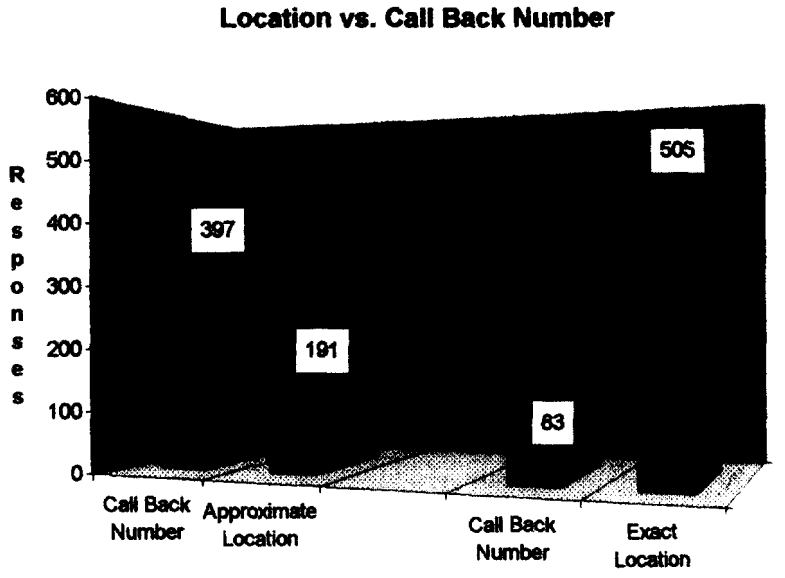

Figure 2

From the illustration, it is clear that *exact* location information is preferred over a call-back number. However, if only an *approximate* location can be provided (e.g., cell sector), the PSAPs would prefer having a telephone number to call the complainant back.

Following up on these questions, we then asked what constitutes *exact* location information. The survey item listed specific distances of 100, 220, and 440 yards, plus an open-ended choice of "Varies, but accurate enough to locate the caller within _____ minutes of (field unit) arrival."

Figures 3 & 4 depict the responses given to the location accuracy question. A little more than three-fifths of the persons responding chose the "Variable" answer, with an average on-scene caller locating time of 2.36 minutes. The shortest fixed distance (100 yards) was chosen by another 31% of the respondents.

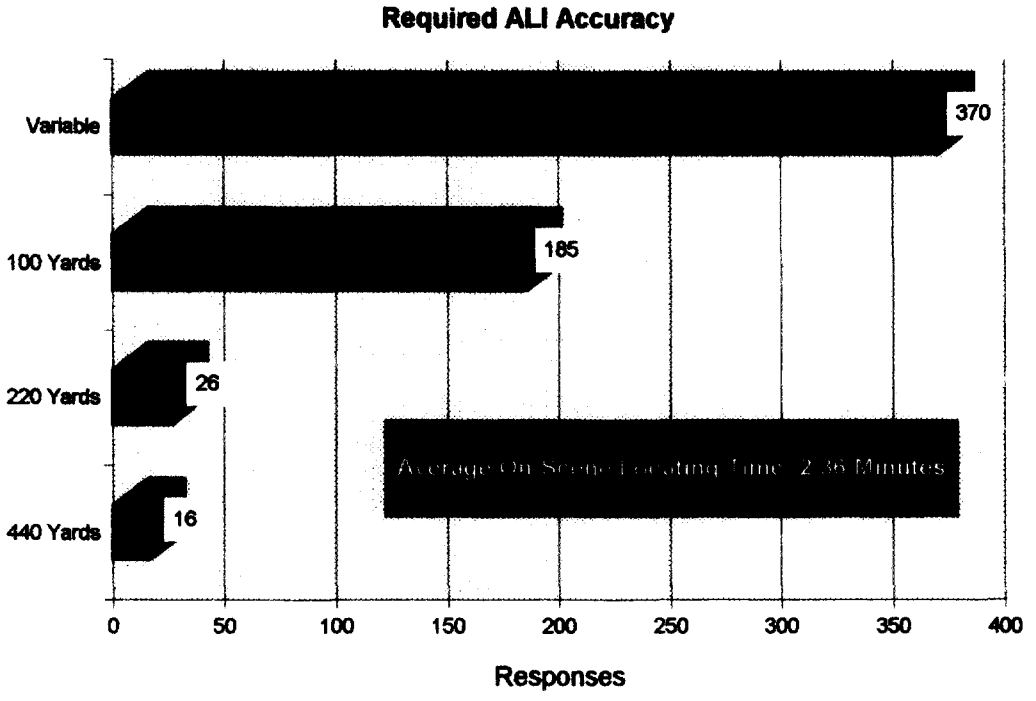

Figure 3

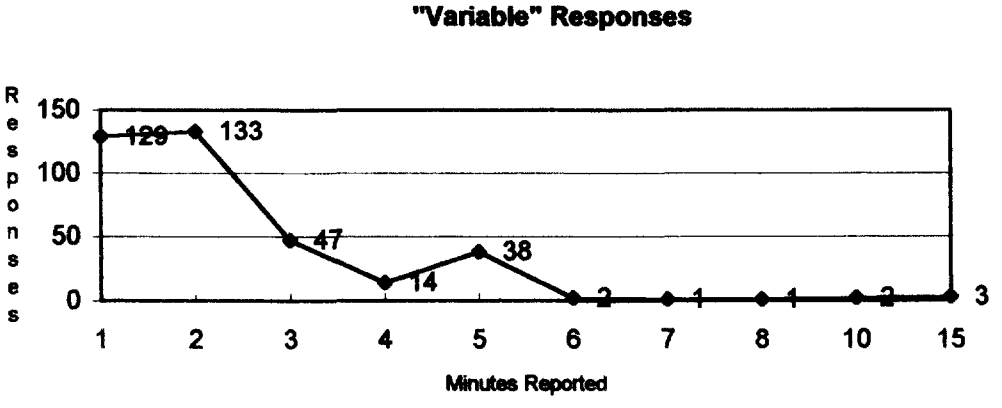

Figure 4

Information Display Parameters

Figure 5 shows that whatever information is supplied to PSAP call takers, it must be displayed rather quickly. 61% of the respondents indicated that the location information should be displayed within five seconds of receiving the voice call on 9-1-1. Only ten percent would accept a delay of longer than ten seconds.

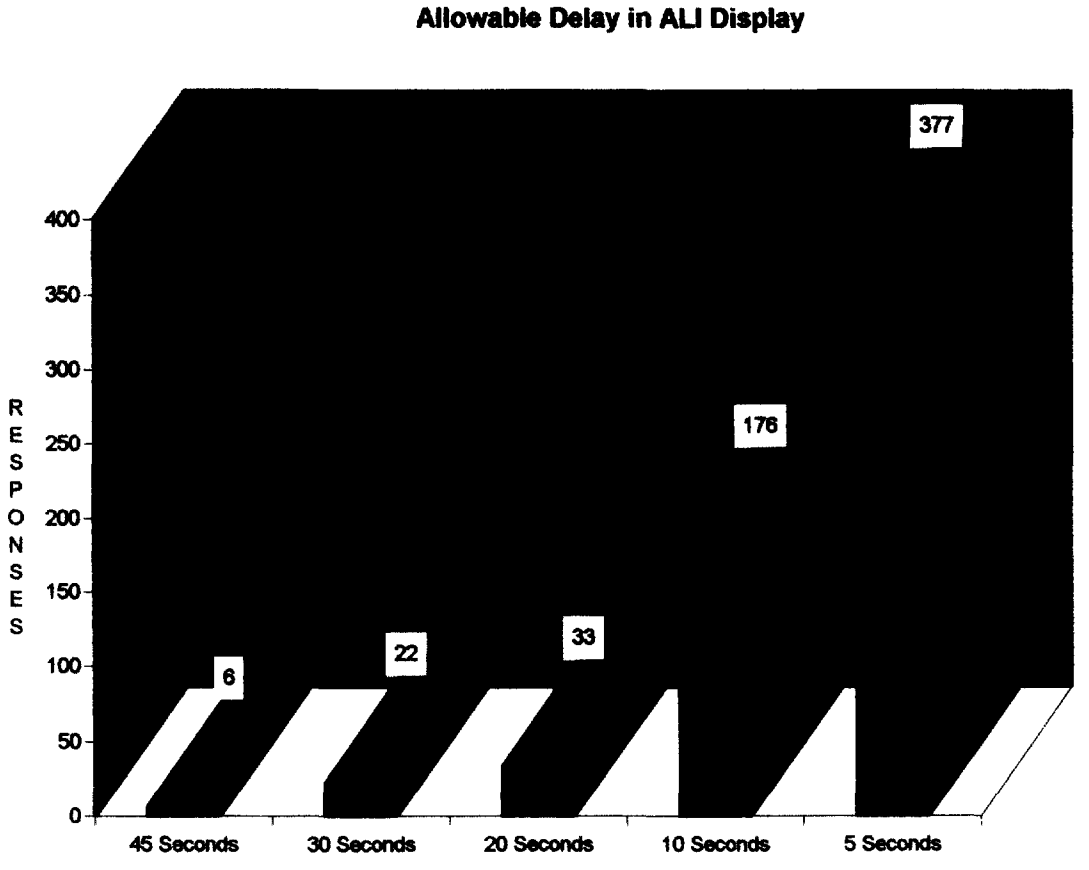

Figure 5

These results are understandable when considering that the average duration of an emergency call is approximately sixty to seventy seconds. That is, within a minute, most PSAP call takers have to ascertain who is calling, the nature of the emergency, and where it is located. This is a monumental task when dealing with excited, frantic callers who can't explain where they are at.

Figure 6 shows how frequently PSAPs desire notification of a mobile caller's changing location. A three-fifths majority asked that Dynamic, Real-Time reporting be provided for those caller's who do not stop moving while placing a call to 9-1-1.

Mobile Caller Location Change Updating

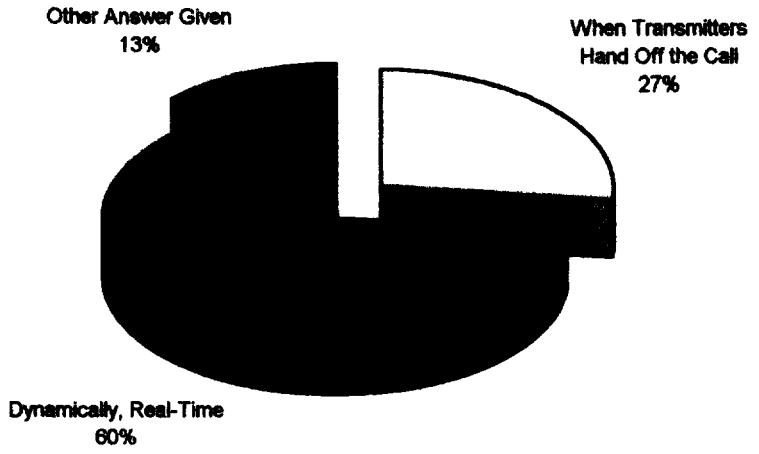

Figure 6

Location Information Elements

The elements of information which accurately identify a caller's specific location can vary widely. Emergency callers are either indoors or outdoors. Indoor callers can generally be identified by a particular street address. However, the street address does not usually state the specific area of the building (e.g., room, floor number, etc.) of the caller. In large building complexes (high rise, campuses, etc.), determining the caller's location takes considerably more effort and time.

For outdoor callers, the location problem becomes even more complex. For example, an outdoor caller may be traveling in an automobile down a specifically named or marked roadway. An outdoor caller may also be working in a particular farm field or construction site. He/she could also be backpacking in the woods or mountains. The advent of telephone services to such "unaddressable" locations will require non-traditional elements of location information.

We thus attempted to measure the necessity of several characteristics of outdoor and indoor locations for satisfactory PSAP determination of the caller's location. The first characteristic was the altitude or height at which the caller is located.

Altitude/Height

Figure 7 shows that, for both indoor and outdoor locations, this is apparently not a critical element of location description. We underscore the word apparently and caution against a quick interpretation of these results. It is this researcher's belief that the negative skew of responses in these two questions was influenced by the use of the terms "altitude" and "height."

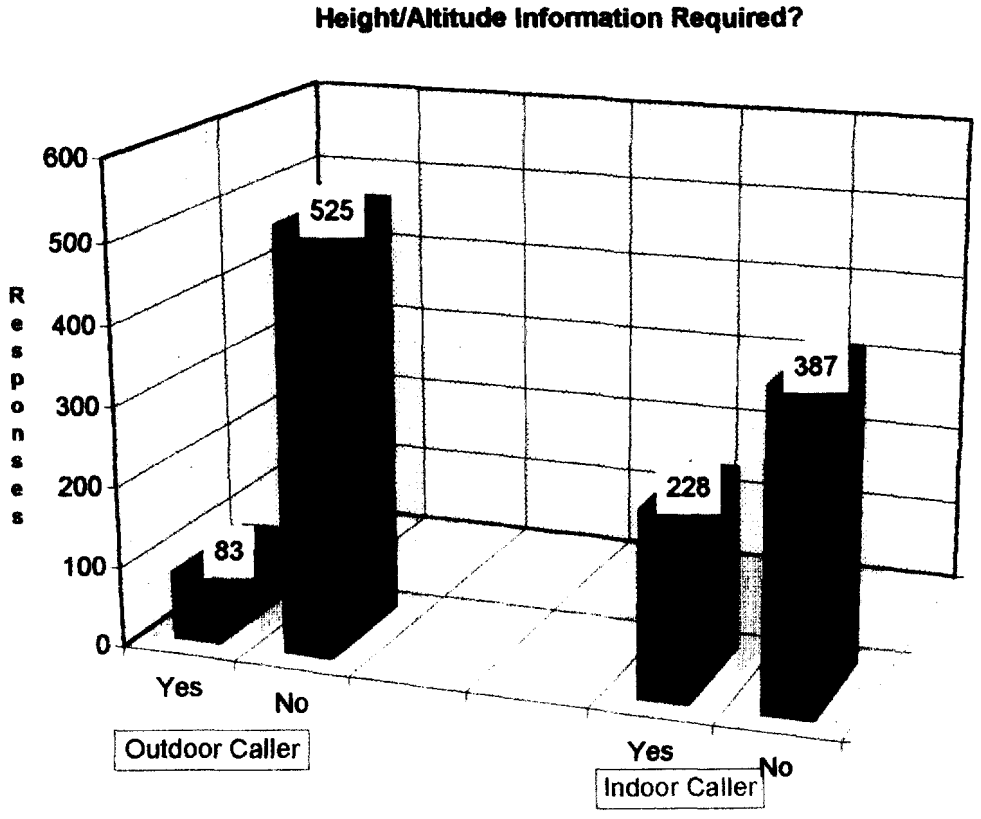

Figure 7

The fact that the vast majority of respondents reported that "altitude" is not a required characteristic of a caller's location does not necessarily mean that they do not need to know where, in a hilly or varied terrain, the caller is at. Rather, it simply means that they generally have no use for a *display* of a statistic such as "535 feet above sea level." Furthermore, many respondents crossed out the word "height" and wrote in the word "floor" on the indoor question.

Common Places/Vanity Addresses

In urban and suburban areas, addressing schemes are increasingly employing Vanity Addresses or Common Place names. Buildings are referred to by "marketable" addresses such as *One IBM Plaza, Two Illinois Center* and the like. While this type of address appears prestigious on a company's letterhead, it offers no location information to a PSAP call taker.

Therefore, we asked whether the ALI data base should incorporate a Common Place name field. The response was an overwhelming 94% in favor. When asked whose responsibility it was for maintaining such information, over half (52%) suggested the 9-1-1 service provider (or Telco); 21% thought that the governing jurisdiction ought to maintain the information; 14% believed that this was a responsibility of the PSAP; and about 12% offered other suggestions, consisting primarily of joint responsibility between the Telco and the Jurisdiction.

Prviate Security Contacts

Another element not contained in current ALI data bases (but desired by PSAP personnel) is the telephone number of a private security agency on the premises. 85% of the respondents voted in favor of including this information in the ALI record. The need for three-way call bridging with the security agent is less clear. Only 47% requested that call conferencing with the security agent be included within 9-1-1 service.

Fixed Locations

As wireless telephone sytems proliferate, they will be used more and more from indoor fixed locations as well as outdoor locations. Therefore, the final portion of the survey consisted of four categories of fixed locations. Residential locations were divided into Single Family, Multiple Family and Transient (Hotels/Motels/Dormitories). Non-residential locations were combined into one category of Commercial, Office, School or Industrial areas.

Tables 1 through 4 list the mean ratings of the criticality of specific location description elements for each category. Each element was rated according to the following scale:

1 = "Do Not Provide"
2 = "Not Necessary"
3 = "Desirable"
4 = "Critical To Operations"

We reiterate our caution against premature conclusions about *technical* location terms. The following data show that the technical terms of "Latitude/Longitude, Altitude, and State Plane Coordinates" received the lowest ratings. However, non-technical terms

such as Apartment Number, Floor Number, and Floor/Section Area (which relate to coordinate data) received very high ratings. This supports the argument that PSAP personnel want as much location information as possible, but in a clear, easy to understand format. They do not want a display of technical information such as X/Y/Z coordinates.

SINGLE FAMILY DWELLINGS	AVERAGE (MEAN) RATING
Street Address (including City, Township, etc.)	3.97
Latitude/Longitude	2.17
Altitude	1.94
State Plane Coordinates	2.01
Location on Lot	2.81

Table 1

MULTIPLE FAMILY DWELLINGS	AVERAGE (MEAN) RATING
Street Address (including City, Township, etc.)	3.97
Latitude/Longitude	2.17
Altitude	2.03
State Plane Coordinates	2.05
Name of Complex	3.40
Bldg./Annex Name or #	3.62
Floor Number	3.62
Apt. Number	3.89

Table 2

HOTELS, MOTELS, DORMITORIES	AVERAGE (MEAN) RATING
Street Address (including City, Township, etc.)	3.96
Latitude/Longitude	2.17
Altitude	2.03
State Plane Coordinates	2.05
Name of Complex	3.54
Bldg./Annex Name or #	3.64
Floor Number	3.67
Room Number	3.86

Table 3

COMMERCIAL, OFFICE, SCHOOL, or INDUSTRIAL AREAS	AVERAGE (MEAN) RATING
Street Address (including City, Township, etc.)	3.96
Latitude/Longitude	2.18
Altitude	2.02
State Plane Coordinates	2.06
Name of Complex	3.56
Bldg./Annex Name or #	3.66
Floor Number	3.65
Floor Section/Area	3.56
Room Number	3.81

Table 4