DEVELOPMENT AND DISTRIBUTION OF AN AUDIOVISUAL BRIEFING ON 911 SERVICE

Final Task Report
7543-79-FR-128

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Prepared for:

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Contract J-LEAA-010-8

SRI Project 7543, Task 4.2

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A. Introduction

This is the final report of Task 4.2 of contract number J-LEAA-010-8 between the Law Enforcement Assistance Administration (LEAA) and SRI International entitled "Dial 911 Systems Assessment and Transfer--Phase II." The purpose of Task 4.2 was to develop an audiovisual presentation on 911 service and to consider several supplementary aspects of the presentation. Such a presentation is urgently needed to assist 911 planners in understanding 911 system requirements.

A proposal for Task 4.2, entitled "Development and Distribution of an Audiovisual Briefing on 911 Services," was submitted in December 1978 and approved by the LEAA GPM, then Mr. Norbert W. Schroeder, in January 1979. This report describes the results of the Task 4.2 study.

B. Development of the Audiovisual Presentation

The study began with the development of visual and associated textual materials that covered the following major information categories:

- A brief history of the development of single emergency telephone numbers.
- A description of the value of 911 in public emergency service systems.
- The status of 911 and its development.
- Examples of 911 implementations.
- Approaches to developing 911 systems and potential problems in their development.
- State-of-the-art 911 system features and their advantages.
- Sources of information on 911, and current efforts at the federal level.

To provide a general overview of 911 for 911 planners, it was decided to limit the presentation to about 1/2 hour (considered a maximum for most general audiences)--or no more than 100 35 mm slides. LEAA and SRI believed that more extensive presentations on specific 911 system features (for example, advanced features such as Selective Routing, Automatic Number Identification, and Automatic Location Identification) could be developed at a later date, if needed.

A draft of the visual and associated script materials was submitted to the GPM in early April for comment. His comments were incorporated into the materials and a revised audiovisual presentation was made to the 911 Advisory Committee on 25 April 1979, in Atlanta, GA. Many valuable comments were received from the Committee (see Appendix A for a list of Committee members); these were incorporated into the material in time for its presentation at the National 911 Conference--called by Roger Reinke of the Department of Commerce--in Milwaukie on 16 May 1979. SRI solicited and incorporated comments from the attendees of the conference before the presentation was prepared in its final form.

The results of this extensive review process is a 93-slide audio-visual presentation, the script of which is included as Appendix B of this report. Ten sets of slides in carousels, 10 scripts, and 10 audio cassettes with inaudible slide-advancing signals were prepared as the final product on this task. These were provided to LEAA on 17 September 1979.

C. Ancillary Considerations of the Presentation

LEAA also tasked SRI to consider (1) the feasibility of using audible or inaudible signals on the audio cassettes, (2) the costs and feasibility of providing multiple copies of the presentation, and (3) the costs of SRI distribution of the presentation. The results of these tasks are presented in this section.

1. The Feasibility of Inaudible Signals on 911 Tapes

Standard cassette tape has two recording tracks on each side. These allow the dialog to be recorded on one track and an audible "beep" or inaudible "signal" to be recorded on the other. With an audible signal, the presenter is notified that the slide should be changed on the screen. With an inaudible signal, a 1000-Hz signal is recorded on the track for approximately 1/2 second; it triggers the slide projector to advance the slide.

Audible Signals--The audible "beep" clearly notifies the presenter to advance the slide. It allows the presenter to keep pace with the recorded dialog. Unfortunately, the "beep" also notifies most of the listening audience that a change should be made and thus it can be a distraction, especially if the presenter is ahead or behind the dialog in changing slides. If the presenter is not familiar with the presentation, rapid sequencing of slides (as indicated by frequent tones) may surprise him/her. Also, the presenter may become engrossed in the show and fall behind in the changing of the slides.

Inaudible Signals--Synchronized sound-slide projectors are required for the use of inaudible signals. The recorded, inaudible signal automatically advances the slide at the prearranged place. Wollensak, Creaton, Singer-Caravelle, Kodak, Buhl Fairchild, and Bell and Howell all make this type of sound-slide machine. The major advantages are that the automatic changing eliminates any problems of the operator being unfamiliar with the timing of the presentation.

The disadvantages are that many potential presenters of the 911 slide show at the state and local level may not have these machines. Simple carousel or stack machines are generally found, but the synchronized sound-slide machines are more scarce because they are generally much larger and retail for in excess of $300.

Recommendations--On the basis of these considerations, it is recommended that:

- The inaudible signal be recorded on the cassette, since it is very inexpensive and many presenters who have the equipment will prefer the automatic method of slide change.
- A copy of the script be provided with each slide set, so that any presenter--even those with little experience with audiovisual presentations--will be able to know by visual means where to advance the slides without an audible tone.

2. Costs and Feasibility of Multiple Copies of the Slide Show

It is SRI's judgment that large numbers of copies of the 911 slide show should not be made at this time because (1) the demand for the presentation is not yet known and (2) some of the information will become out of date in a short time. Also, much information that should prove valuable to 911 planners has not yet been obtained from the 911 project.

One problem of mass production of the slide show is that of packaging for the intended user. While copying slides is straightforward and inexpensive, no device is yet available for collating them in the proper order and position--it must still be done manually. Since there is 1 correct and 7 incorrect positions in which a slide can be placed in a machine, the slides should not be shipped to the presenter in the standard slide boxes obtained from the film processor. It is recommended that each slide presentation be placed in a slide carousel in the proper order and position, thereby eliminating confusion, frustration, and perhaps embarassment by the presenter.

The approximate costs in current prices of the elements of multiple reproduction and packaging are as follows:

Specific Cost Element	Unit Costs	5 Sets	50 Sets	100 Sets
1. Reproduction of 90 slides	$ 31.50	$157.50	$1,575.00	$3,150.00
2. Purchase of carousels	8.15	40.75	408.00	815.00
3. Filling carousels in order	12.00	60.00	600.00	1,200.00
4. Reproducing script	700.00	715.00	790.00	880.00
Total	$751.65	$973.25	$3,373.00	$6,045.00

It is recommended that:

- SRI develop no more copies of the 911 slide presentation than the 10 already requested by the LEAA Systems Development Department.
- The presentation packages include: a carousel with all slides placed in the carousel in proper position and order; a script having printed dialog, pictures, and slide advance marks; and a list of instructions to the presenters.
- An announcement of the availability of the 911 slide show be placed in LEAA's Newsletter, the Criminal Justice Newsletter, the Crime Control Digest, and other professional journals for fire, emergency medical agencies, and communications.
- SDD and/or SRI be responsible for dispensing the copies of the presentation request, keeping track of them, and documenting the number of presentations, and the number of persons in attendance.
- At a later date in the project, when the major products and results are available, an updated version of the slide show or, perhaps, a training movie be developed.

3. Estimated Costs of Producing Multiple Copies of the 911 Cassette

Reproduction of 5, 50, or 100 copies of the 911 cassette tape is relatively inexpensive. The master tape is on a reel that includes the voice and inaudible signals. These are transferred to a master cassette, which is set up in the studio at the appropriate volume and speed. A high-speed "gang" recorder is used, which can record up to 10 cassettes at once in a few seconds.

The costs of multiple reproductions include the costs of the blank tape and the recording fee and are as follows at current prices:

5 Cassettes	$ 17.50
50 Cassettes	175.00
100 Cassettes	350.00

4. Costs of Distributing Slide Show Materials by SRI

The process for preparing and mailing slide presentation packages to requesting agencies or persons would be as follows:

- SRI will develop a mailing list to include state planning agencies, regional and metropolitan planning agencies, and EMS planning organizations of communities of a specified population size.
- SRI will prepare the required number of carousels, slides, scripts, tapes, and instruction sheets.
- Each package will be wrapped and labeled with addressee and return information.
- SRI's mail department will add required postage and place all packages in the possession of the mail service.

The estimated costs for these elements of the mailing process at current rates are as follows:

		Cost Per 100
1.	Develop mailing lists	$ 600
2.	Prepare carousels	6,045
3.	Prepare and wrap packages for mailing	300
4.	Attach required postage*	350
5.	Place in mail service	50
	Total	$7,345

D. Summary

The audiovisual 911 presentation prepared in this task was developed through several iterations with experts in the 911 area. The presentation has been well received by most viewers and should enable LEAA to effectively assist local 911 planners in developing an understanding of 911.

Because of the impending availability (from other study efforts underway on this contract) of more comprehensive 911 information, SRI recommends that LEAA develop no more than the current 10 presentation packages. When additional information is available, LEAA should consider revising and/or augmenting the presentation.

*Current post office quote for a package of the weight of the carousel, slides, script, tape, instruction sheet and wrapping is $3.50 for first class and $2.61 for parcel post between the Bay Area and Washington, DC. Actual costs would be less for west, midwest, and sunbelt deliveries.

Appendix A

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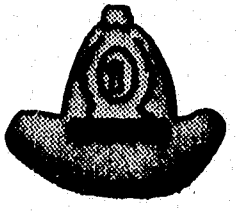
Appendix B

911 AUDIOVISUAL SCRIPT

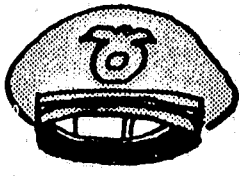
UPDATE on... 911

MAY 1979

THE EMERGENCY TELEPHONE NUMBER



FIRE



ENFORCEMENT

EMERGENCY MEDICAL

I INTRODUCTION (1)

Public safety agencies have always had a legal and moral responsibility to respond to public calls for emergency assistance as effectively as possible. (2)

If a caller knows whom to call and how to do it before an emergency develops, it is possible to:

- Reduce anxiety and fear
- Prevent further physical, emotional or mental damage
- Help the public feel safer and
- Save lives in many instances

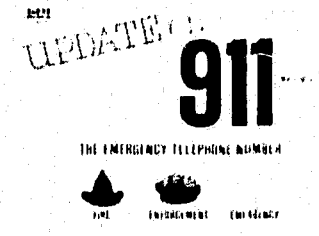
The need for rapid response is obvious in such emergencies as fires, crimes, and critical medical situations; it is also important for bomb threats, suicide attempts, floods, earthquakes and damaged utility lines. (3)

Emergencies are generally more traumatic for small children and for persons with special problems, such as those with physical, mental, or emotional disabilities, and those who do not speak english. (4)

II BUT HOW CAN PUBLIC SAFETY AGENCIES BE MORE RESPONSIVE IN EMERGENCIES?

This can be done simply by minimizing time and confusion, first for the caller in contacting the right agency and then for the agency as it responds to the emergency.

1



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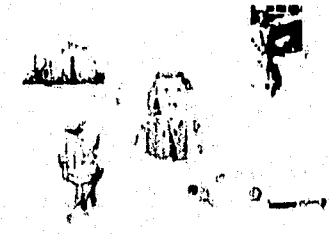

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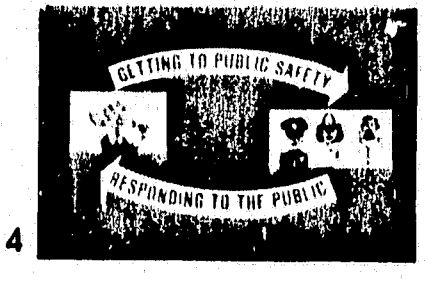
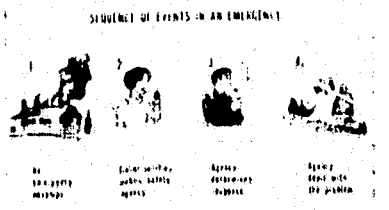


(5)
An emergency generally comprises four basic events or phases. (PAUSE) In two of these, time of response is either not involved, as in the developmental phase, or is already minimized in the last or response phase as a result of the training and experience inherent in Public Safety Agencies. (6)

During events 2 and 3, however, the time of response can be reduced by simplifying procedures for contacting a public agency and for determining the appropriate response.

(7)
For example, if a person encounters an emergency in a community that has 911 service, minutes can be saved in dialing that number at home, at work, or from a public telephone. On the other hand, if an emergency develops in a non-911 community, the caller has several alternatives any one of which usually consumes more time than would the dialing of the three digits "911". (8) The choices are to:

- dial the operator and ask for help
- know or read "posted" emergency numbers
- look up the correct 7-digit number in the phone directory, or
- perhaps, do nothing



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A CALLER SEEKS HELP THROUGH 911

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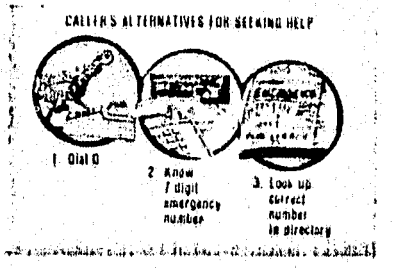

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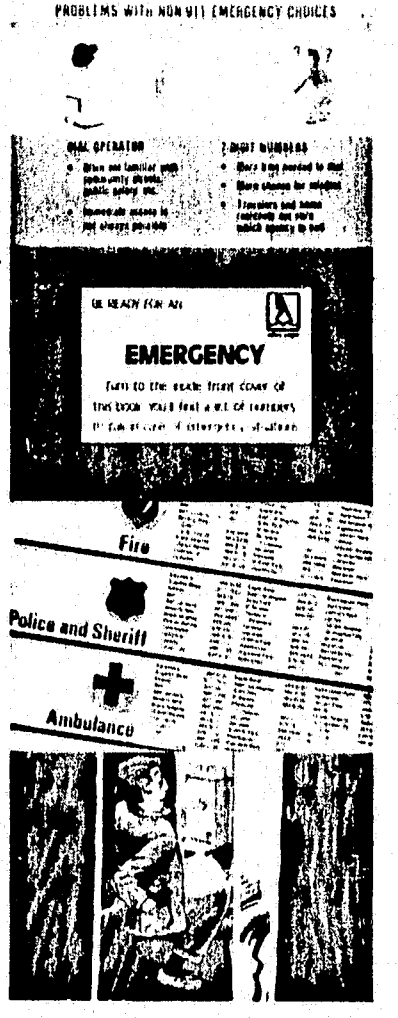
Some Communities that have adopted 911, have reported nearly 20% more emergency calls after the changeover. The simplicity of making a 911 call apparently encourages people to report emergencies more readily than in the past. (9)

Each of the alternatives for the caller in a non-911 area can have serious implications in an emergency. For example:

- The operator serving a given area may be located many miles away and may not be familiar with the community, street names, jurisdictional boundaries, or Public Safety Agencies where the emergency has occurred.
- Where large numbers of calls are being handled, access to an operator may be delayed. (10)
- Research has shown that many residents, as well as travelers in a community, do not know which Public Safety jurisdiction they are in. (11)
- Often, in an emergency, the large arrays of 7-digit Public Safety numbers posted in the phone book require time-consuming study with no real assurance that the right number will be picked. (12)

Emergency calls placed from a telephone booth can be even more complicated, especially if coins are required. Balancing a telephone directory, finding the correct change, and dialing a 7-digit number, while in an agitated state of mind, can be a real challenge. (13)



To better understand the actual experiences of emergency callers, SRI International conducted a survey of 165 persons, in 1974, who had recently called police, fire or emergency medical agencies in Santa Clara County, (14) California. Here are some of the results:

- 61% Of the callers knew or had their emergency number posted
- 18% Dialed the operator for help, and
- 21% Looked up the number in their telephone directory (15)
- For all callers, an average of 2 minutes elapsed from the moment they decided to call for help until they reached the right agency. Callers of two busy agencies reported access times of up to 9 minutes (16)

A similar survey conducted by SRI of 450 emergency callers in the Portland, Oregon area revealed the following:

- 55% Of the callers knew or had their emergency number posted (as opposed to 61% in Santa Clara).
- 23% Dialed the operator, and
- 22% Looked up the number in the directory (17)
- 13% Of those who called for municipal police assistance called two or more agencies before getting the correct one
- 21% Needing fire assistance got the wrong agency on the first call, and
- 31% Needing the Sheriff's Department in the 4-county area called one or more police agencies first. (18)

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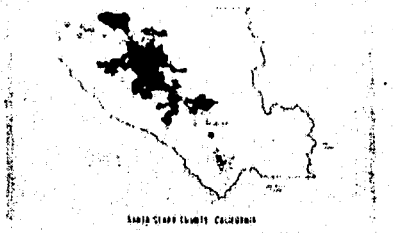

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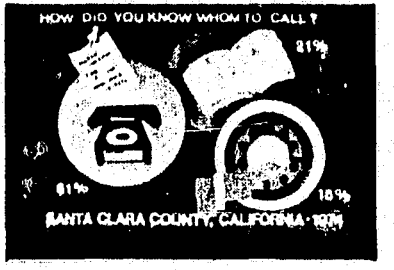

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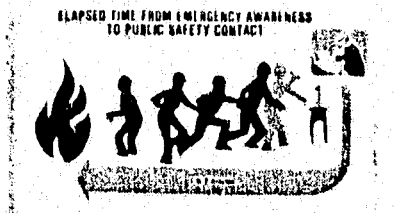

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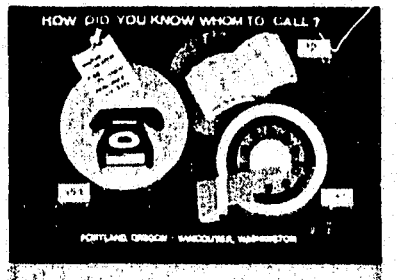

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How many agencies did you contact before getting the right one?

	ONE ONLY	TWO OR MORE
POLICE	87%	13%
SHERIFF	69%	31%
FIRE	79%	21%
TOTAL	79%	21%

If the correct agency was contacted on the first attempt, the elapsed time from the decision call was 2.7 minutes — if the call was relayed or transferred to a second agency this time increased to 3.4 minutes. (19)

III IN 1968, TO REDUCE THE CONFUSION OF HOW AND WHOM TO CALL IN AN EMERGENCY, 911 WAS INTRODUCED AS A UNIVERSAL EMERGENCY TELEPHONE NUMBER IN THE UNITED STATES. (20)

What has happened in the development of 911 in the years since the telephone industry agreed to make that number available to customers throughout the nation? (21)

How many areas have this service?

What technological advancements have occurred?

What should communities consider when planning for 911?

This slide presentation addresses these and other questions, and provides insight into 911 development in the United States. (22)

The concept of a single National Emergency Number is not new: in 1937, Great Britain implemented such a system with 999 as the number. In Belgium, 900 is used and in Denmark it is 000. Sweden uses 4 digits: 9000. (23)

The 1968 agreement to adopt 911 in the United States was significant because it heralded a major shift in public policy regarding the notification of Public Safety Agencies in emergencies.

- Prior to that time, the telephone industry had traditionally lent its "DIAL OPERATOR" service to the forwarding of emergency calls from the public to Public Safety Agencies.

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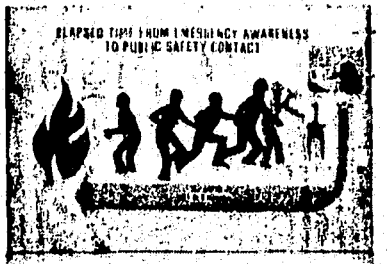

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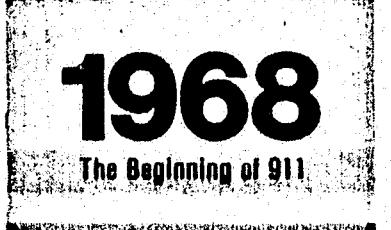

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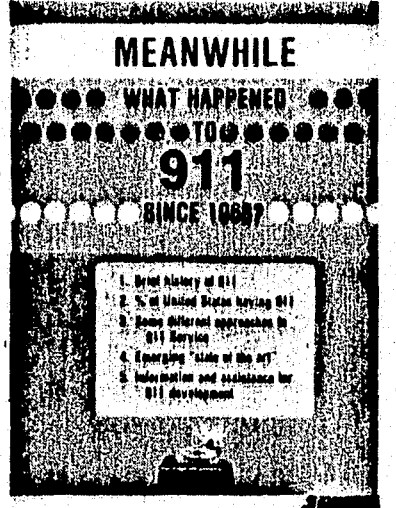

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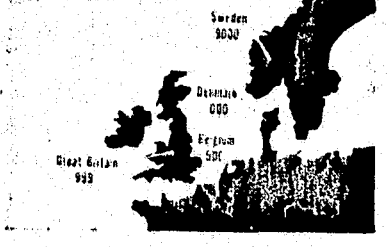

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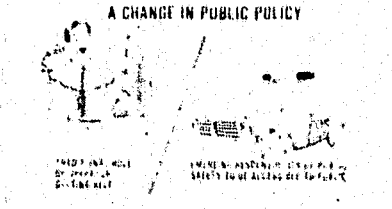


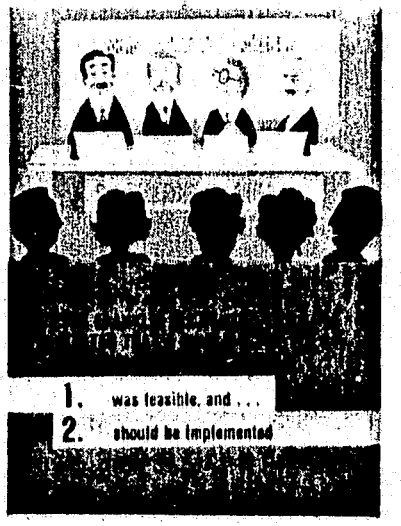
While the 1968 agreement did not mean that telephone operators would not handle emergency calls in the future, it did encourage Public Safety Agencies to take more responsibility for ensuring that emergency calls are directed to the right agency. (24)

In 1968, the Franklin Institute in Philadelphia hosted a national conference to discuss adoption of a National Emergency Number. The conference was jointly sponsored by the Departments of Justice, Transportation, and Health, Education and Welfare. (25)

The Franklin Institute subsequently undertook a study for the National Science Foundation and concluded that:

- A single National Emergency Number was feasible and that
- 911 Should be implemented on a nationwide basis (26)

Several national organizations joined in advocating use of the Universal Emergency Number. (27)



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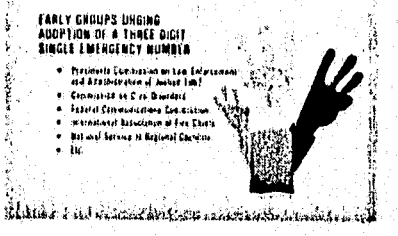

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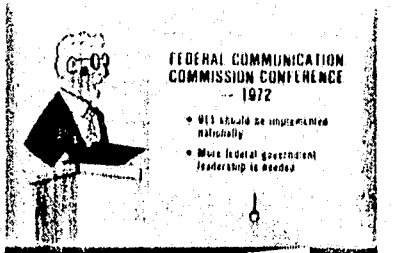
In 1972, the Federal Communications Commission convened a national conference of persons interested and experienced in 911 and concluded that:

- 911 should be implemented nationally, and that
- More federal government leadership and promotion were needed. (28)

In 1973, the Office of Telecommunications Policy of the Executive Office of the President issued bulletin number 73-1 entitled "THE NATIONAL POLICY FOR EMERGENCY TELEPHONE NUMBER 911". The basic elements of the policy for federal executive agencies are shown here. Of particular interest are three distinct roles for 911 development. That is,

- Local agencies were to develop and implement 911 services
- The states were to assist local agencies
- The federal government was to provide information, advice, and assistance. (29)

Meanwhile, starting in 1968, local systems began to develop. By the end of that year, nine were in operation, ranging from Hebron, Nebraska, a community of 2000 people, to New York City where nearly 8 million persons were served. (30)



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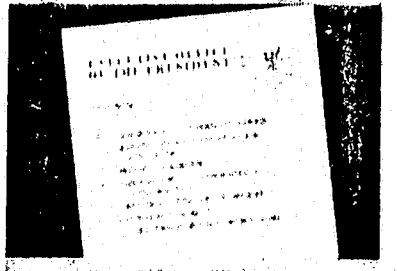
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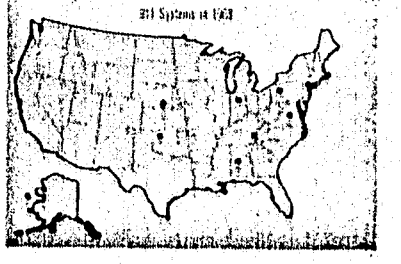
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According to telephone company records, the numbers of 911 systems have grown at a modest rate:

- 44 New services were established in 1969
- An average of 71 per year from 1970 to 1974
- Just over 90 installations per year in 1975 and 1976
- By June of 1976, there were nearly 600 systems in operation. (31)

The principal characteristics of these systems are:

- Most serve a single city or county
- The median population served is about 22,000 people
- 81% of the systems provide call-answering for law enforcement, fire, ambulance, and emergency medical organizations. (32)

But how close are we to a single, National Emergency Number? (33)

- As of early 1977, only 27% of the nation's 215 million people lived in communities providing 911 service
- Today, in only 4 states are 75% or more of the population covered
- In four states the service is provided to between 50 and 74%
- Between 25 and 49% of the populations in 12 states have access to 911, and
- 30 States range from 0 to 24% coverage of their population. (34)

In some areas of the country, the incidence of communities having the service is high; in others only a few have been developed. (35)

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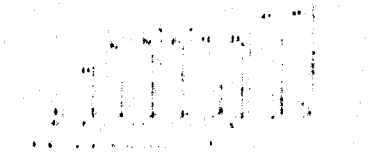

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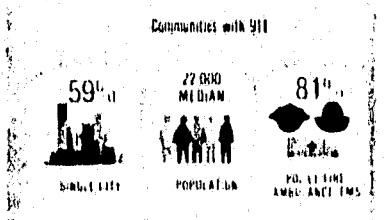

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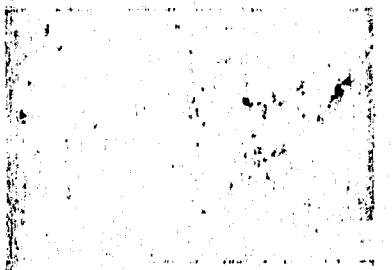

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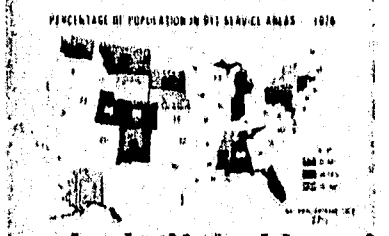

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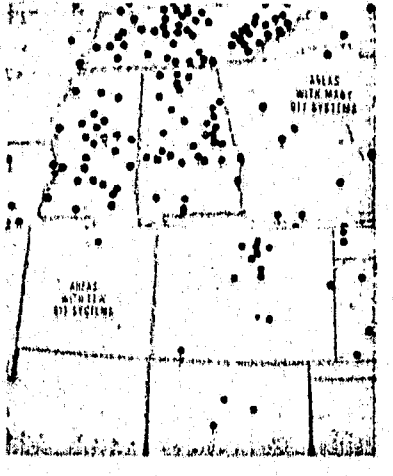

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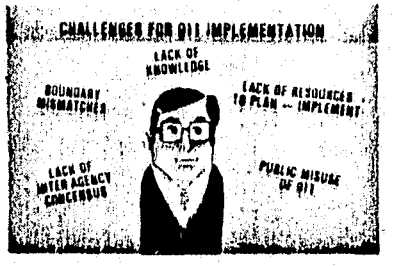
This uneven distribution is potentially hazardous for those travelers who receive the service in their home community and are accustomed to its use. If they encounter an emergency in a non-911 area, they could experience a serious delay in obtaining help. (36)

IV MANY CHALLENGES WERE FACED BY EARLY IMPLEMENTERS OF 911. EACH OF THE FIRST 600 COMMUNITIES TO PUT 911 INTO OPERATION PROBABLY FACED ONE OR MORE OF THE FOLLOWING PROBLEMS.

- Telephone central office boundaries that don't match municipal or other jurisdictional boundaries
- A lack of technical expertise
- A lack of funds for planning and implementing the service
- Lack of agreement among Public Safety agencies on system design and management
- Lack of public knowledge of how and when to use 911 (37)

Boundary mismatches between telephone central offices and political jurisdictions present some of the greatest challenges to 911 implementation, especially in large, complex metropolitan areas.



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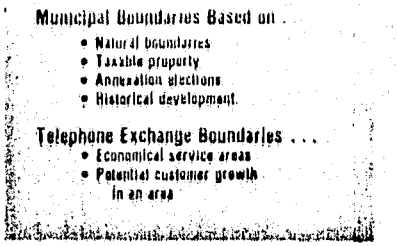
The mismatches occurred because the boundaries were developed for different purposes.

- Political boundaries are based on various historical and political factors, while
- Telephone service area boundaries are based on economically feasible service areas and projected growth and changes in customer demand. (38)



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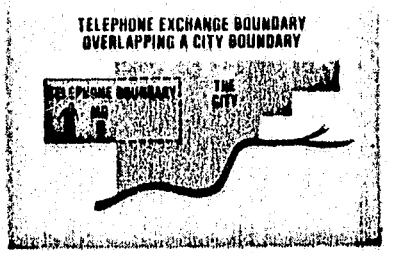
- Mr. C lives just outside of the city. The telephone central office serving him lies partially in and partially out of the city. The city wishes to install 911. In the process, it must decide whether to order the service for this telephone central office area, knowing that it cannot divide the area but must either take all of it or none. If the city does order the service for the area, Mr. C can dial 911 in an emergency but the city Public Safety Answering Point or PSAP will answer; not the agencies that service Mr. C's area.
- The PSAP may refer Mr. C to the correct agency; it may relay his message or it might transfer his call to the neighboring agency. (39)
- On the other hand, Ms. D lives in the same telephone central office area, but, inside the city limits. If the city orders 911 for her area, she will receive the service, but if 911 is not ordered for that area, she will have to select and dial 7-digit numbers in emergencies while the rest of the city will have 911. (40)



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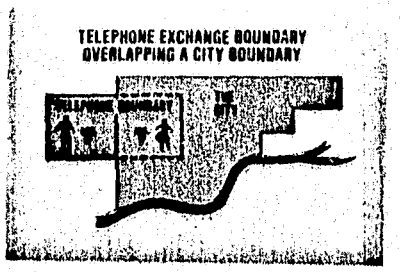

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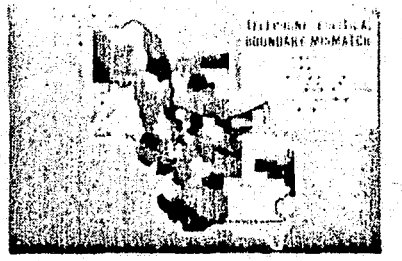
The solution of boundary mismatch problems can be formidable in large, metropolitan areas, especially those with many suburban municipalities. This map of the Portland, Oregon—Vancouver, Washington **metropolitan** area illustrates this. The area has:

- 2 state boundaries
- 5 counties
- 41 municipalities
- Over 1 million people and
- 13 separate telephone companies (41)



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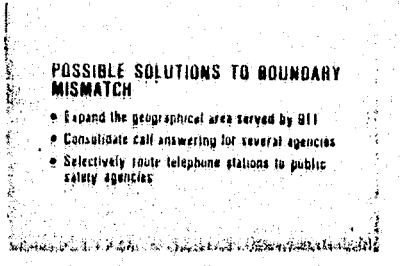
Three general approaches are used to overcome boundary mismatch:

- First—the geographical service area can be expanded to include most of the jurisdictions and population in the area of concern
- Second—call answering can be consolidated so that calls are answered by fewer Public Safety Answering Points, or PSAPs
- Third—calls can be selectively routed to the appropriate PSAP (42)



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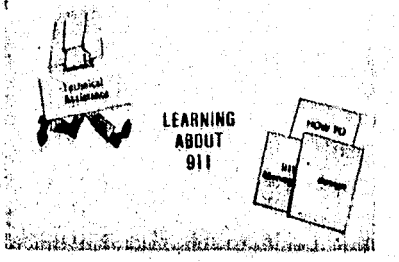
Lack of local expertise in 911 matters can be overcome in several ways:

- Many communities have sought and received assistance from the telephone companies in their area
- Consultants and technical assistants from government and private organizations have helped states and many communities to prepare master plans and technical designs
- A growing body of literature is available on 911 planning and implementation (43)



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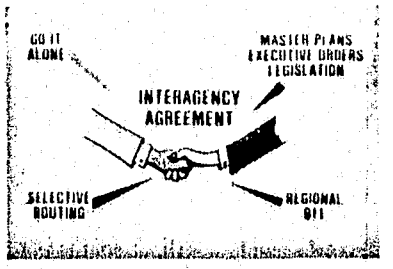
Concensus among local Public Safety Agencies on the management, design, and control of 911 can be obtained in several ways:

- 60% Of the systems operating by 1977 were designed to serve a single jurisdiction, thus reducing the need for interagency concensus on system design.
- A number of county-wide systems serve both the county and the various municipal agencies lying within the county. Examples are Suffolk County, New York, Broward County, Florida, and York County, Pennsylvania.
- Interagency agreements have been reached in many areas for relaying and transfering calls.
- Selective routing of calls within political jurisdictions to the appropriate PSAP helps reduce possible interagency disagreements. (44)
- Several states have passed legislation, issued executive orders, or established master plans which provide interagency guidelines or requirements. (45)



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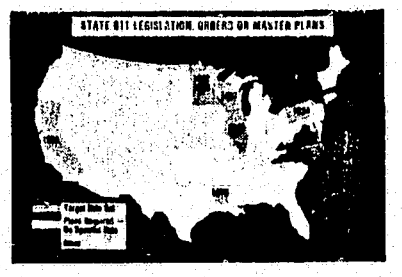

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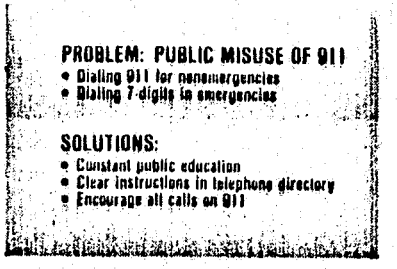
Public misunderstanding, misuse, or lack of awareness is a common problem in new 911 systems. The problem usually takes two forms: the public either uses 911 for administrative or other non-emergency purposes or they continue to call the old 7-digit emergency numbers. Among the solutions for this problem are:

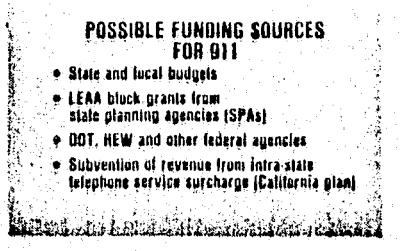
- Continued public education campaigns on the proper use of 911
- Creative listing of 911 in the telephone directory to encourage its use and discourage its abuse
- Adapting of the 911 service to the behavior of the public rather than attempting to make the public conform to present 911 procedures. One county encourages the public to make all calls, emergency or non-emergency, on 911. The PSAP sorts out the urgent calls from the others. (46)



45

Financial aid for planning and implementing 911 has been provided from one or more of these sources:

- State and local budgets and contributed services
- LEAA block grants from state planning agencies
- Federal grants from the Departments of Transportation, Health Education and Welfare, and others
- Subvention of revenue received by the state from surcharges on intrastate telephone services (47)



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V IN PLANNING A 911 SERVICE, A COMMUNITY SHOULD CONSIDER SUCH BASIC FACTORS AS:

- The precise geographical area to be served
- The Public Safety Agencies that will be involved
- The number and locations of Public Safety Answering Points
- The precise boundaries of telephone central offices and jurisdictional areas and how and to what degree they correspond

It is also desirable to consider the current and projected workloads of the Public Safety Agencies; in essence, a determination of the future demand for 911. (48)

Based on these general concerns, a number of specific determinations must be made, such as:

- The types of facilities, equipment, and personnel and other assets that will be needed
- The levels of service that are to be designed into the system to handle incoming calls
- What telephone facilities and operational capabilities are available, particularly in signalling, switching, trunking, and data retrieval
- The policies, procedures, and protocols that will be observed to ensure that all emergency calls are routed quickly to the appropriate agencies. (49) As an example, it is necessary to decide whether the PSAP will also act as a dispatching agency.

  Or, if it will transfer calls to the dispatcher of the response agency, (50) or whether the PSAP will take the incoming information and relay it to the dispatching agency. (51)

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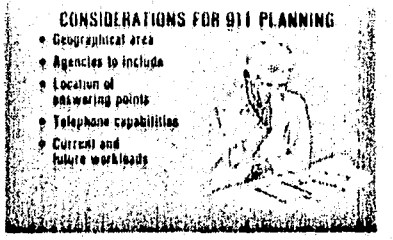

48

SOME SPECIFIC CONSIDERATIONS FOR PLANNING 911 SERVICES

- Resources required for planning, implementing and operating
- Modifications to facilities, equipment and staffing
- Levels of service desired
- Desired telephone system features and capabilities
- Procedures, policies and practices to be followed
- Call handling methods (call transfers, relays, etc.)

49

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VI COMMUNITIES HAVE DEVELOPED 911 IN A NUMBER OF WAYS: (52)

Sandusky, Ohio adopted the single city approach. Established in 1969, the system serves 34,000 people. All police, fire, and emergency medical calls are answered on the 911 number.

- The system was implemented with local funds, and its operation financed under the general operating budget.
- The director reports that even after 10 years of operation and frequent public education campaigns, many callers still report emergencies via the 7-digit numbers. (53)

Lincoln Nebraska found it expedient to adopt a multi-agency or regional approach. This system is served by the Lincoln police and fire departments, by the Lancaster County Sheriff's Office, and by 17 rural fire protection districts.

- The system was begun in 1969 as a result of interest and direction by the local Civil Defense Agency which originally operated the system on a part time basis.

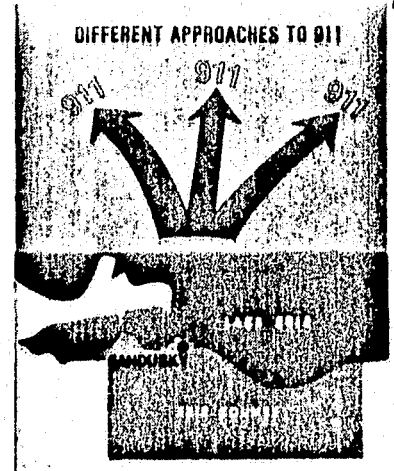
- In late 1978, the system was moved into a consolidated communications center, funds for which were provided by 5 federal agencies. (54)
- The center continues to deal with the usual problems of:

  Callers continuing to use 7-digit numbers, probably because these numbers are still listed in the telephone directory

  Boundary mismatches in 5 areas on the perimeter of the county

  Significant differences in pay rates among personnel handling police and fire calls. (55)

51



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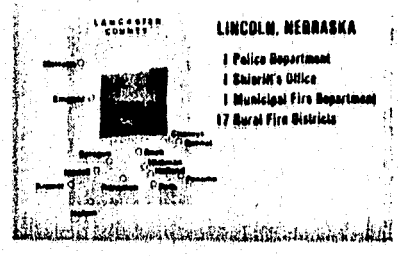

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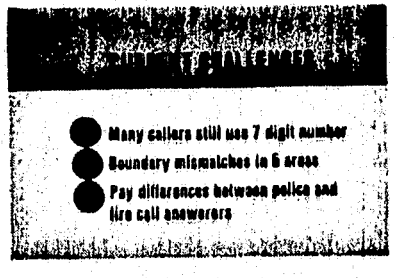

The Washington D.C. area exemplifies large-scale use of 911. The District of Columbia and 6 contiguous Maryland counties all provide this service.

- The District system was implemented in 1972, but experienced difficulties with some boundary mismatches until the various counties also implemented 911, starting with Prince Georges in 1973. Charles and Montgomery Counties followed in 1974; then Saint Marys and Calvert Counties in 1977; and, finally Howard County in 1978. (56)
- Interestingly, the Montgomery County system is not advertised to the public as an "EMERGENCY ONLY" number. Instead, Public Safety Vehicles and public relations brochures instruct the public to dial 911 for all police, fire and medical assistance. (57)

55

VII A NUMBER OF ENGINEERING FEATURES ARE AVAILABLE IN SOME AREAS OF THE COUNTRY THAT CAN ENHANCE THE EFFECTIVENESS OF 911 SYSTEMS. FOR EXAMPLE:

- The CALLED PARTY HOLD FEATURE — that allows the PSAP to control the connection in order to confirm or trace a call
- A RING-BACK — capability that permits the PSAP to call back a telephone that has been hung up
- SWITCHHOOK STATUS — wherein lighted lamps indicate whether a line is on-hook or off-hook
- A FORCED DISCONNECT — feature that allows the PSAP to disconnect an incoming 911 call
- IDLE CIRCUIT TONE — the provision of a distinctive tone that indicates when a circuit is idle. (58)

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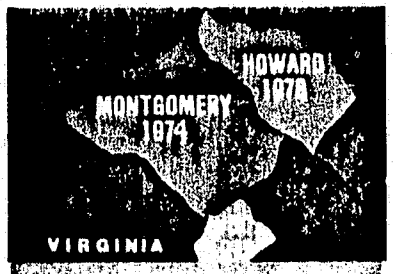

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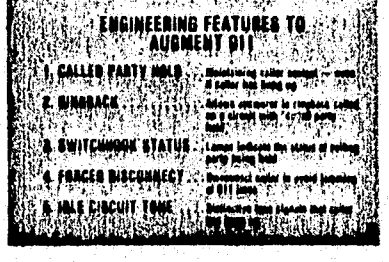
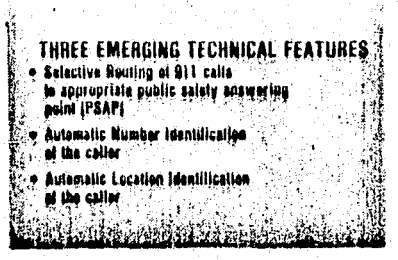


Three additional telephone system features are being used increasingly to enhance the accessibility and responsiveness of Public Safety Agencies in emergency situations. The new features are:

- Selective Routing—which automatically routes a call to the approved Public Safety Answering Point
- Automatic Number Identification—wherein the number of a caller is displayed at the PSAP
- Automatic Location Identification—which displays the address of the calling station.

A closer look at these advanced features will reveal their potential advantages for emergency callers and Public Safety Agencies. (59)



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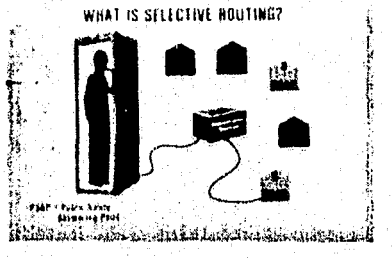
Selective Routing ensures that most of the uncertainty as to which agency a caller should contact in an emergency is eliminated by automatically routing the call to the designated PSAP for that area.



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It permits Public Safety Agencies to retain their own answering function in appropriate circumstances instead of delegating that function as is often required in consolidated PSAPs. (60)

Selective Routing is a major feature of the 911 system that was implemented in Alameda County California in 1978. Established on a demonstration basis with the help of the Law Enforcement Assistance Administration, the system includes:

- 14 Police Agencies
- The County Sheriff's Office
- 23 Fire Departments and
- 6 Emergency medical entities

The system serves over 1 million people, 12% of whom live in unincorporated areas. (61)

The Alameda system uses 16 primary and 5 secondary PSAPs. The primaries comprise law enforcement agencies in some cities and combined Police and Fire Departments in others.

Selective Routing in this system works essentially as follows: (62)

- If a resident of the city of Fremont experiences an emergency, (63)
- And he or she or a neighbor dials 911, (64)
- The call would automatically be routed to the Fremont Police Department which is the primary PSAP for that city. (65)
- If the call is for fire or emergency medical assistance, the Alameda system employs a single button transfer feature which automatically transfers the call to the secondary answering point.

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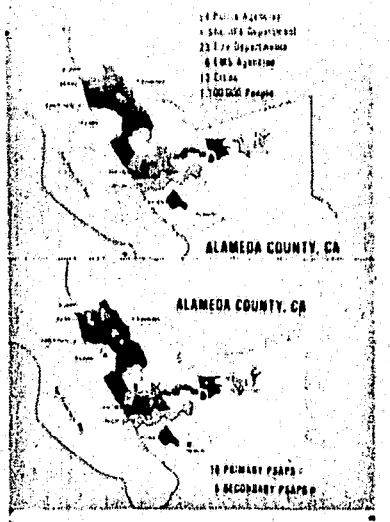

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While Selective Routing is useful in expediting 911 calls between agencies in different basic jurisdictions, it also provides administrative flexibility and (66) convenience for a single political jurisdiction. For example, the city of Chicago was able to route its 911 telephone calls to conform with the city's police radio zones. (67)

- Call handlers are arranged in the Communications Department in accordance with 13 specific radio zones. Emergency calls from within each radio zone are routed to the call handler who is familiar with that area.

- Three secondary PSAPs — two for fire, the other for medical emergencies — are used. (68)
- As used in Chicago and in other, similar configurations, Selective Routing enables administrators to equalize call volumes and workloads among the different areas of the city and the PSAPs serving them. As workloads change, the radio zones and the Selective Routing computer file can be reconformed to provide uniform work distribution. (69)

Dade County, Florida is another user of Selectively Routed 911. The system is similar in some respects to that of Alameda County. It serves:

- The County Sheriff's Office
- 26 Municipal Police Departments
- 23 Fire and Rescue Departments
- The Florida Highway Patrol and
- The Florida Division of Forestry (70)

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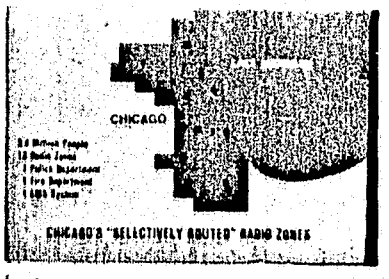
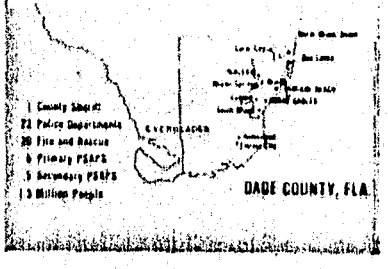


68 CHICAGO'S "SELECTIVELY ROUTED" RADIO ZONES



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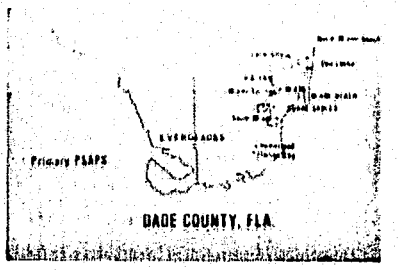
However, since only 5 PSAPs are used in answering calls to these agencies, some functional consolidation of call answering and dispatching was incorporated into the system.



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Calls for service by 44 Public Safety Agencies are processed in the Dade County PSAP which is operated by the Sheriff's Office.

In addition to Selective Routing, (71) the Chicago and Alameda County systems use Automatic Number Identification which displays the caller's telephone number as the call comes into the PSAP.

- Even though the caller may hang up, the ANI feature enables the PSAP to call back to verify information, obtain missing data, or provide instruction. (72)
- On one occasion, a potential suicide called a PSAP refusing to give his address but, his telephone number appeared on a display, permitting his address to be found through a reverse directory.
- In another instance, a 6-year old boy was visiting his grandmother when she collapsed. He dialed 911 but couldn't provide much useful information. (73) But with the grandmother's number appearing on a display it was possible to use a reverse directory to obtain the address. This in turn enabled an ambulance to arrive in time to save the grandmother. (74)

The third new telephone system feature, Automatic Location Identification or ALI, can help the PSAP to obtain information that:

- A caller doesn't give because of emotional stress
- Or can't give because of physical or emotional duress
- Or, that a caller doesn't want to give for malicious reasons (75)

A 1971 survey conducted by the National Academy of Engineering in the New York City Police Department, revealed that in nearly 18% of all emergency calls, the circumstances were such that immediate location information could have saved in excess of 20 seconds in processing the calls.

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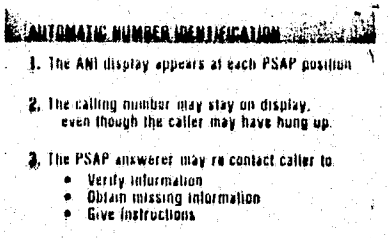

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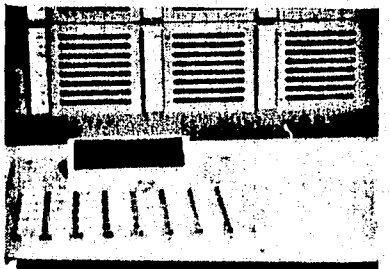

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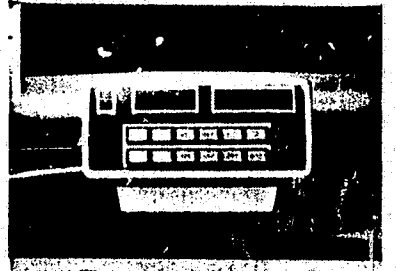

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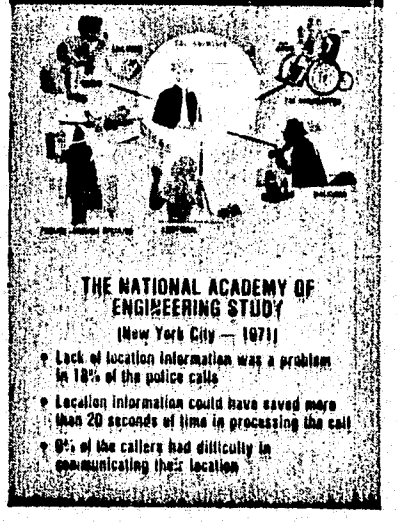


75

The same survey also showed that 9% of the callers had difficulty in describing their location to the call handlers. (76)

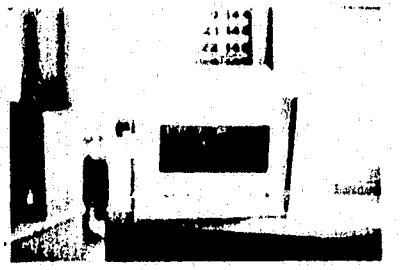
The City of Chicago has the ALI feature in operation. As a call comes in, the display shows the telephone number and address of the caller, the radio (77) zone in which the caller is located (in this case, zone 13), and the secondary PSAP (here, it is, South Chicago Fire, represented by the letter "S").

The information in the lower right hand corner of the display identifies the trunk line involved—in this case, number 53. (78)

Just how valuable are these engineering features?

The Law Enforcement Assistance Administration (with the help of SRI International) is trying to answer this question by means of a study to:

- Analyze Selective Routing, Automatic Number Identification, and Automatic Location Identification as they operate in the Alameda and Chicago systems.
- The study will also assess the costs and benefits of these features, and
- Document and report the findings for agencies operating or planning 911 services. (79)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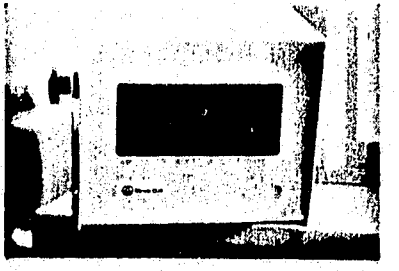
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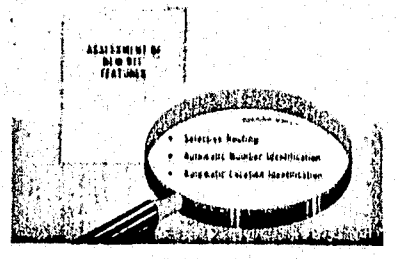

78

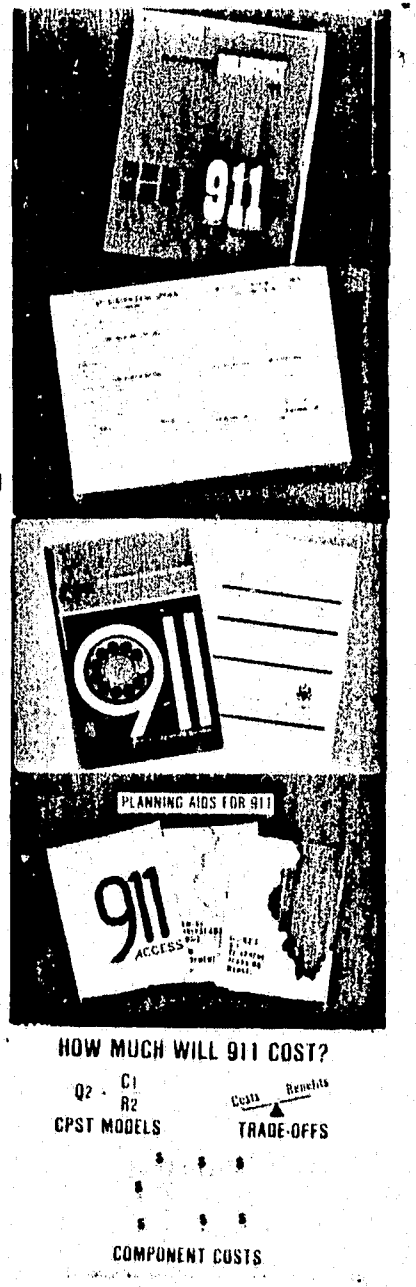
VII TO PROVIDE INFORMATION TO COMMUNITIES WHO WISH TO IMPLEMENT OR UPDATE A 911 SYSTEM, LEAA IS PREPARING A NATIONAL DIRECTORY OF 911 SYSTEMS AND IS SURVEYING ALL KNOWN AGENCIES THAT PROVIDE THE SERVICE. (80)

- The directory will provide information on historical, operational, technical, administrative, and fiscal characteristics of the reported systems.
- The purpose is to provide a ready reference document for planners and practitioners to enable them to learn how communities of similar size and circumstances have approached 911 and what their experience has been.
- The directory will be available in late 1980. (81)

A number of 911 reports, documents, and plans are available, such as the "Handbook for Community Planning", published by Office of Telecommunications Policy in 1973. (82)

As a means for providing step-by-step suggestions for implementing 911, LEAA contemplates the preparation of a series of planning manuals. (83)

To provide local planners with accurate and timely cost estimating tools, SRI International is conducting an analysis to identify suitable mathematical models for estimating 911 costs. It will also identify the cost impacts of different 911 and associated communication elements and will discuss some of the different 911 components and alternatives. (84)



In addition to the informative documents, LEAA has been able to provide limited technical assistance to selected communities. However, budgetary constraints prevent LEAA from providing technical assistance for all requestors,

Most of LEAA funds expended on 911 planning and implementation have been allocated through state planning agencies using block grant funds.

Research projects, experiments and technology development having potential for nationwide application are funded from LEAA's Discretionary Funds. These are funds that are not distributed to state planning agencies. (85)

IX IN SUMMARY: (86)

- Nearly 11 years have elapsed since AT&T announced the availability of 911 as a single Emergency Assistance Access Number. (87)
- As a matter of federal executive policy, 911 has been recommended as the National Emergency Number. (88)
- Approximately 100 new installations of 911 are made each year in this country. (89)
- While most of the residents of some states have access to Public Safety Agencies through 911, only 27% of the nation's population is served by the National Emergency Number. (90)

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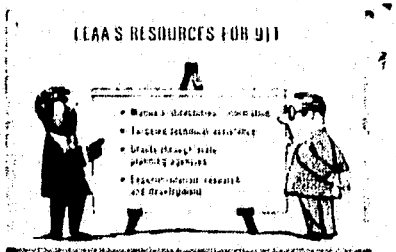

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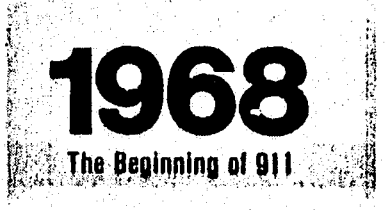

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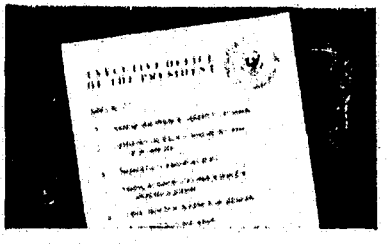

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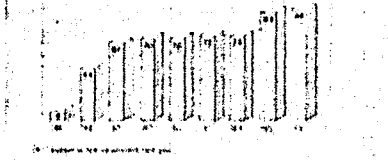
ANNUAL GROWTH OF 911 SERVICE IN THE U.S.



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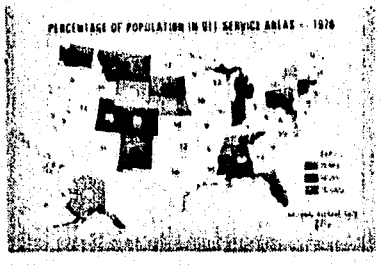


- A few states are taking a comprehensive and fairly aggressive approach to obtaining 911 services for their citizens (91)

- New technology and second generation systems are being developed that may significantly improve the public access to Public Safety Agencies in emergency situations (92)

- LEAA and other federal agencies are committed to providing leadership and assistance as directed in the 1973 executive bulletin. This includes:

  Technical assistance

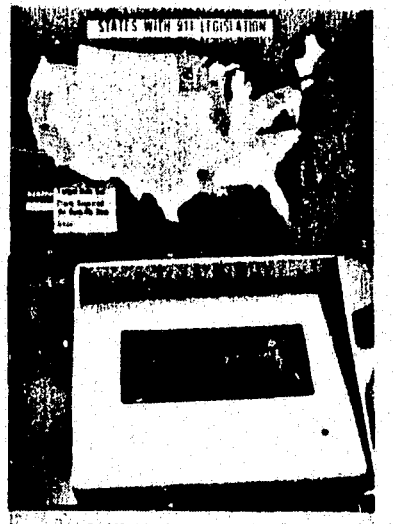
  Information, and

  Financial aid to state and local governments

  - To the end that 911 may be installed on a national basis, providing the service to all Americans as rapidly as resources and local conditions permit (93)

  - Thus making 911 truly a "national emergency telephone number".

90



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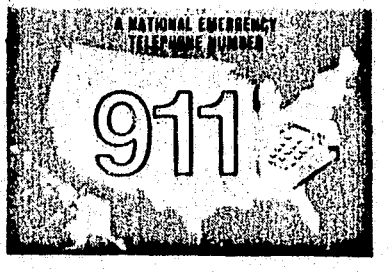

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