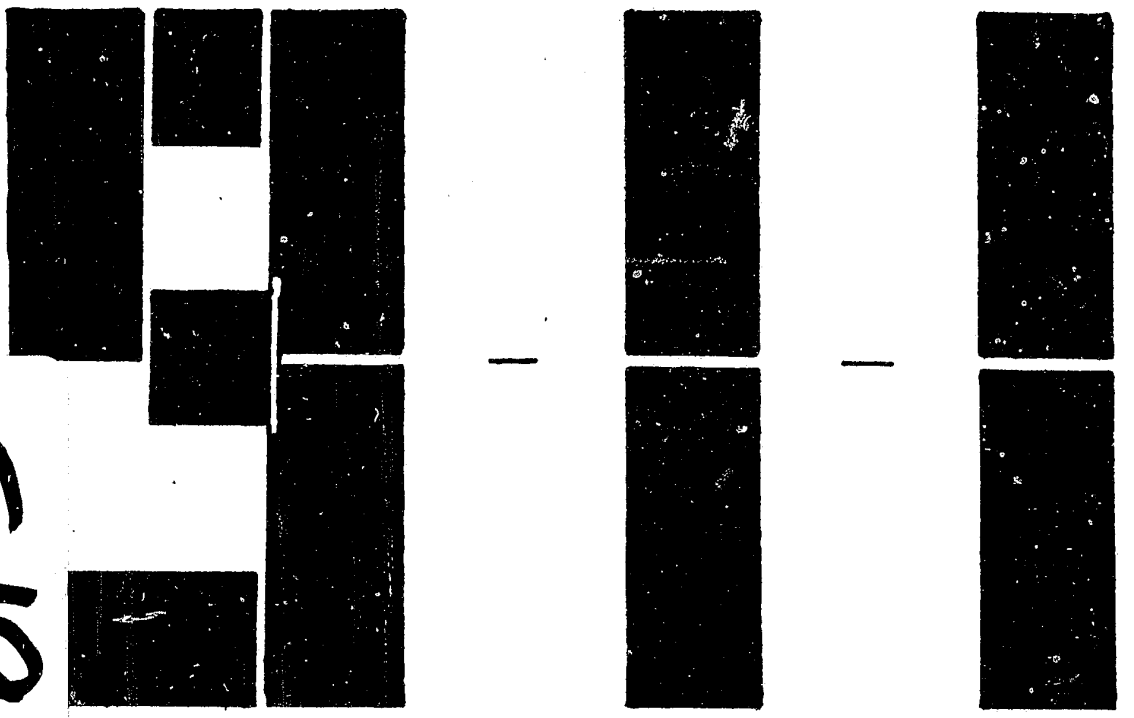
STATE OF IOWA

DEPARTMENT OF GENERAL SERVICES

DIVISION OF COMMUNICATIONS



SYSTEM STANDARDS

AND

PLANNING GUIDELINES MANUAL

BY GERALD M. GRAVES

CHAPTER I - INTRODUCTION

THE MANUAL AND ITS USE

This manual has been prepared to facilitate understanding of 911, and to assist the planners and implementers in meeting the requirements of Iowa.

The essence of the manual is to make 911 planning and implementation as easily understood as possible.

A wide range of planning and technical assistance is available without charge. The Division of Communications, Department of General Services of the State of Iowa has planners and engineers familiar with "911" systems. Local governments may request assistance through their Health Planning Councils, Area Crime Commissions, or directly.

HISTORY OF 911

Nine-One-One (911) is a three-digit emergency telephone number adopted by the telephone industry as a nationwide emergency number. It replaces seven-digit numbers most often difficult to remember in an emergency. It is important to note that 911 is simply a short, easy-to-remember telephone number that will shorten the time in the total emergency response cycle between the detection of an event and the dispatch of assistance to that event. In some situations, implementation of 911 can result in a reduction of costs to an agency or agencies and the elimination of duplicated services.

The Emergency Telephone Number 911 contains three major advantages for the citizen seeking emergency aid: (1) it is faster to dial than a seven-digit number; (2) it is easier to remember one number for all emergencies; and (3) the number will be universal throughout the State. It is quite common for a citizen to call "operator" to report an emergency. In this case, the telephone operator is faced with finding the number for the appropriate service agency and transferring the call. It is sometimes difficult to reach a telephone company operator because of busy conditions on the system. A 911 Public Safety Answering Point (PSAP) operator, on the other hand, is or will be trained to deal with emergency citizen requests and has direct access to speeding emergency services to the assistance of the citizen calling.

The universal emergency number concept was initially introduced in Great Britain in the late 1930's when "999" was designated the nation-wide telephone number to be used in emergencies.

In Belgium, "900" is used as the emergency calling number and has been in operation since 1964. In Denmark, the emergency number is "000" and in Sweden "9000".

The significant fact in all these systems which has proven effective over the years is that the calls all come into a central emergency reporting center of some type, irrespective of who has the responsibility for manning the center.

The initial stimulus for a nationwide emergency telephone number in the United States can be attributed to the International Association of Fire Chiefs. They advocated in 1957 a single nationwide telephone number for reporting fires.

In 1967, the President's Commission on Law Enforcement and Administration of Justice supported the concept of a single universal emergency telephone number for use in the United States.

In response to urgings of concerned citizens and officials for a universal emergency telephone number, the American Telephone and Telegraph Company (AT&T) announced, on January 12, 1968, that 911 would be made available throughout the country. Since then over 500 systems have been placed in operation serving more than 15% of the U.S. population. More than 100 new systems are scheduled for this year. Cities range in size from 700 to 7 million population and include Chicago, Omaha, Burlington, Ames, and Waverly among others.

The states of California, Louisiana, New York, Florida and Massachusetts have passed legislation requiring 911 service statewide and are currently developing county and regional implementation plans. Several bills have been introduced into Congress in support of nationwide 911, but none have passed into law. The Department of Transportation (DOT) and other federal agencies are actively encouraging local implementation.

CHAPTER II - STANDARDS FOR A 911 SYSTEM

911 SYSTEM STANDARDS

A critical factor in any emergency is the time lag between the reporting of the incident and the dispatching of emergency units. The time lapse caused by indecision, wrong numbers, or in looking up an emergency number can often be critical. To minimize this delay, it is necessary to employ operational standards applicable to 911 system operations.

The operational standards as established are requirements with which all 911 systems shall comply. These standards, developed in cooperation with local public safety agencies and the telephone industry, provide the parameters for 911 systems. As revisions are necessary, the State of Iowa, DOC will be responsible for updating and distribution.

The mandatory technical standards as established represent technical requirements to insure that the 911 system is functional. These must be complied with in all 911 systems.

OPERATIONAL STANDARDS

Call Answering - 911 Answering Point

1. During the average busy hour of each shift of the busy day, all calls will be answered within 15 seconds. To meet this standard, consideration must be given to the number of 911 lines, answering positions, and call processing time, etc.

2. All 911 lines shall have visual and audible indication of an incoming call.

Operations - 911 Answering Point

1. The PSAP will operate seven days per week, 24 hours per day with operators on duty.

2. The terminating trunks from the serving central office to the PSAP shall provide at least a grade of service for not more than one busy in 1000 attempts during average busy hour for 911 calls.

3. The primary published emergency number will be 911.

4. All PSAP's will maintain interagency communications capabilities for emergency coordination purposes.

5. Written procedures and appropriate training will be provided to the operators and documented.

6. The date and time of receipt for each 911 emergency call shall be documented (written or tape recorded).

7. In the "Transfer Method," a 99% reliability of transferred calls from a PSAP to responding agencies shall be maintained. All transferred calls shall be monitored by the PSAP operator to insure the call has been properly transferred and answered.

8. Access control and security of PSAP's and associated dispatch centers shall be designed to prevent disruption of operations.

Desirable Features

The following is a listing of desirable features, but are not mandatory standards. Agencies who have the resources should strive to incorporate these features.

1. When employing the Transfer Method, the system should be so designed as to provide for transfer without placing the calling party on hold.

2. If all incoming PSAP positions are busy, the calls waiting should reach a recorded message informing the caller that:

   a. The 911 emergency number has been reached, and an operator will answer as soon as possible.

   b. Major emergency incidents, once reported, will be placed on the recorder to advise callers action has been taken. The caller will be advised to remain on the line if the call is nonrelated to this incident.

3. All incoming 911 telephone calls be tape recorded and retained for at least 30 days.

4. A short-term recording and replay capability be provided for each operator position.

5. Physical environmental factors affecting human effectiveness should be engineered to provide the best possible lighting, acoustics, etc.

MANDATORY TECHNICAL STANDARDS

Standard Tones

Standard tone signals (audible ringing, busy tone, and all trunks busy) will be provided to the 911 calling party in the normal manner. The tone signal received on all calls will be the same as that received on 911 calls.

Incoming 911 Emergency Line/Trunk Requirement

There will be a minimum of two incoming 911 line/trunks regardless of the level of service.

The 911 trunking between central offices shall be designed, at a minimum, to provide the same level of service as exists for the Direct Distance Dialing network.

Transfer

Whenever the "Transfer Method" is employed, special equipment considerations must be made. This method calls for the PSAP attendant to directly connect the incoming 911 line or trunk to another communication line, to signal out on the second line, and complete the call through to a third party who will initiate action. Whenever the "Transfer Method" is employed, the secondary circuit in the "Transfer" shall be a properly designed dedicated facility, such as a switchboard (PBX or PABX) extension, a direct tie line/trunk, or microwave facility.

Intercept

The telephone company shall provide mechanical intercept of 911 calls from nonparticipating central offices contiguous to the 911-serving central offices whenever equipment arrangement code conflicts are not involved.

Service Measurements

The telephone company may take regular service measurements on the 911 terminating trunk group to determine the actual grade of service being experienced. These service measurements should provide a basis for corrective action which would achieve the objective grade of service. As necessary, the telephone company will provide the involved agencies with an appropriate report on the grade of service for the terminating line/trunk.

Safeguarding of Circuits

1. All facilities associated with 911 service shall be equipped at all exposed terminations, including central office distributing frames, with protective devices that prevent accidental workman contact. Each protected termination shall be marked so as to make it easy to distinguish circuit identity.

2. Safeguarded circuits shall not be opened, grounded, short circuited, or manipulated in any way by telephone company workmen until the local test desk obtains prior circuit release from the appropriate 911 PSAP.

3. Supervision shall assure that all telephone company employees, whose normal activities may involve contact with facilities associated with the 911 service, are familiar with safeguarding of facilities procedures.

Emergency Power

Emergency electrical power shall be provided for the PSAP environment that will insure continuous operations and communications (telephone, radio, etc.) during a commercial power outage. Such power should start automatically in the event of power failure. A 48 hour fuel supply is a minimum.

No-Coin 911

1. The provision of no-coin calling from pay telephones involves a variety of technical standards depending on the design of telephone central office and station equipment now in use. Present arrangements vary widely between telephone companies as well as between exchanges served by the same telephone company.

2. The provision of no-coin calling shall be based on technical standards developed by each telephone company as required. In all cases, the end result will allow a 911 call to be completed without the deposit of a coin. Phasing such cutover should be incorporated into local planning, and will vary according to the telephone company's ability to absorb such costs.

Desirable Technical Standards

The following is a list of desirable features, but are not mandatory standards. Agencies who have the resources should strive to incorporate these features.

1. Alternate central office entrance and telephone cable routes for

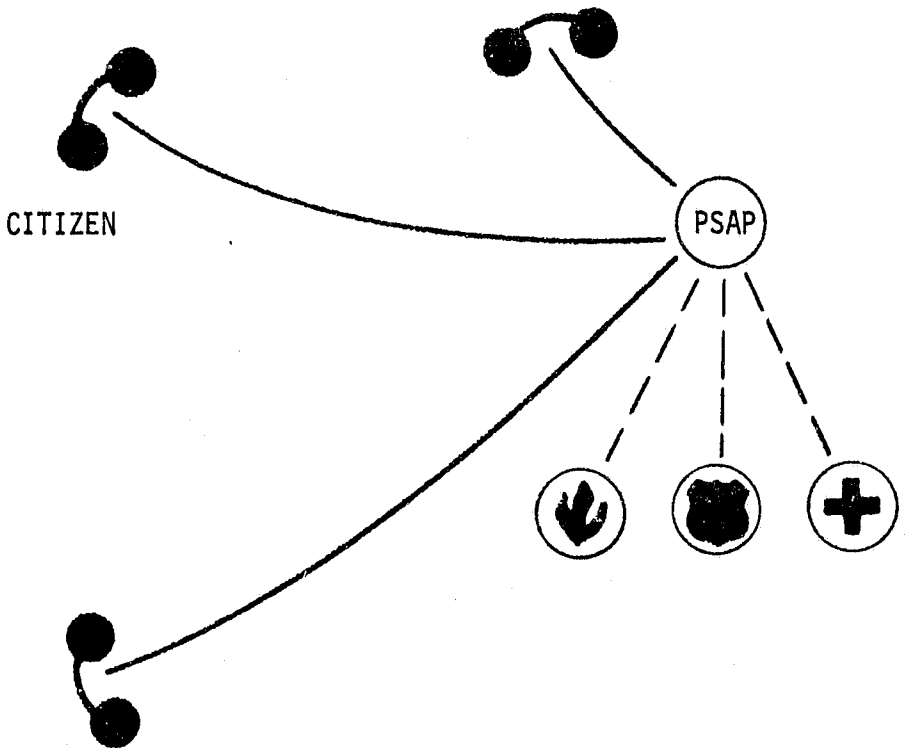
telephone communications.

2. Alternate entrance route for primary power.
3. Alternate means of communicating with public safety agencies.
4. Underground cable and entrance to PSAP.

CHAPTER III - THE 911 SYSTEM

BASIC 911 SYSTEM

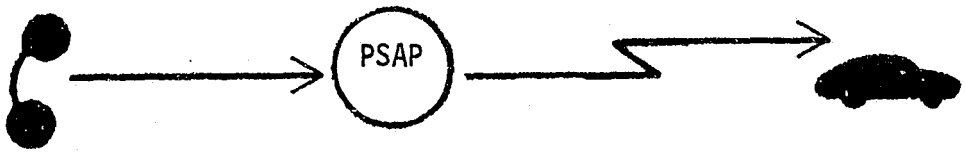
The "basic 911 system" allows a person dialing 911 to be connected to a PSAP via normal telephone facilities. All 911 calls from lines served by a central office or central offices will be routed to a PSAP. The following illustration depicts a basic 911 system.



METHODS OF RESPONSE

There are four methods of response as defined in a basic or sophisticated 911 system. Each 911 system is to provide the capability of at least three of these methods. They are:

1. Direct Dispatch Method. In the "Direct Dispatch Method," all call answering and dispatching is done by the personnel at the PSAP.

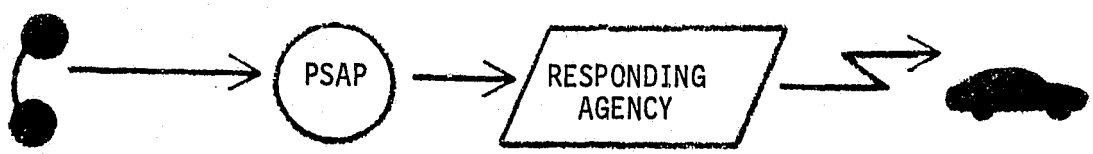


CITIZEN

PUBLIC SAFETY ANSWERING POINT

DELIVERY OF SERVICE TO CITIZEN

2. Relay Method. In the "Relay Method" of response, the call is answered at the PSAP where the pertinent information is gathered; and then the interrogator relays that information to the proper public safety agency for dispatch or action.



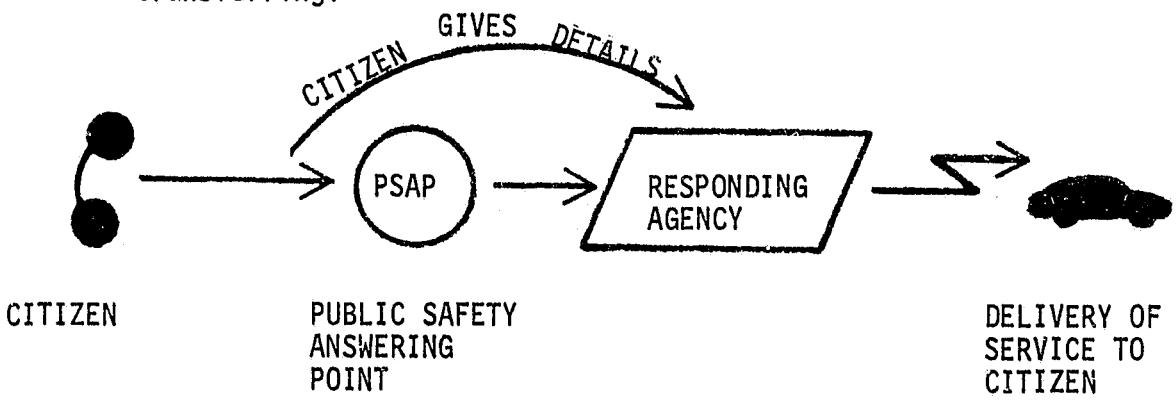
CITIZEN

PUBLIC SAFETY ANSWERING POINT

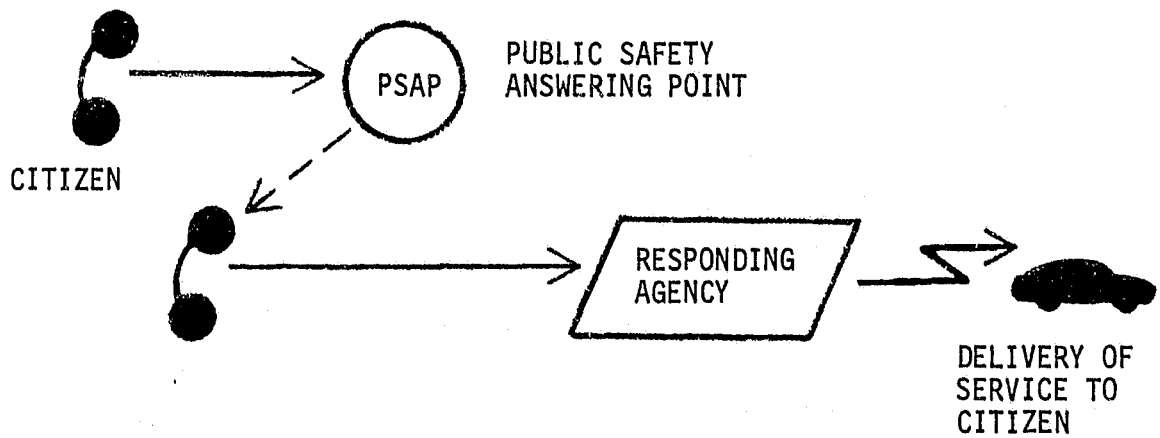
DELIVERY OF SERVICE TO CITIZEN

METHODS OF RESPONSE - cont'd

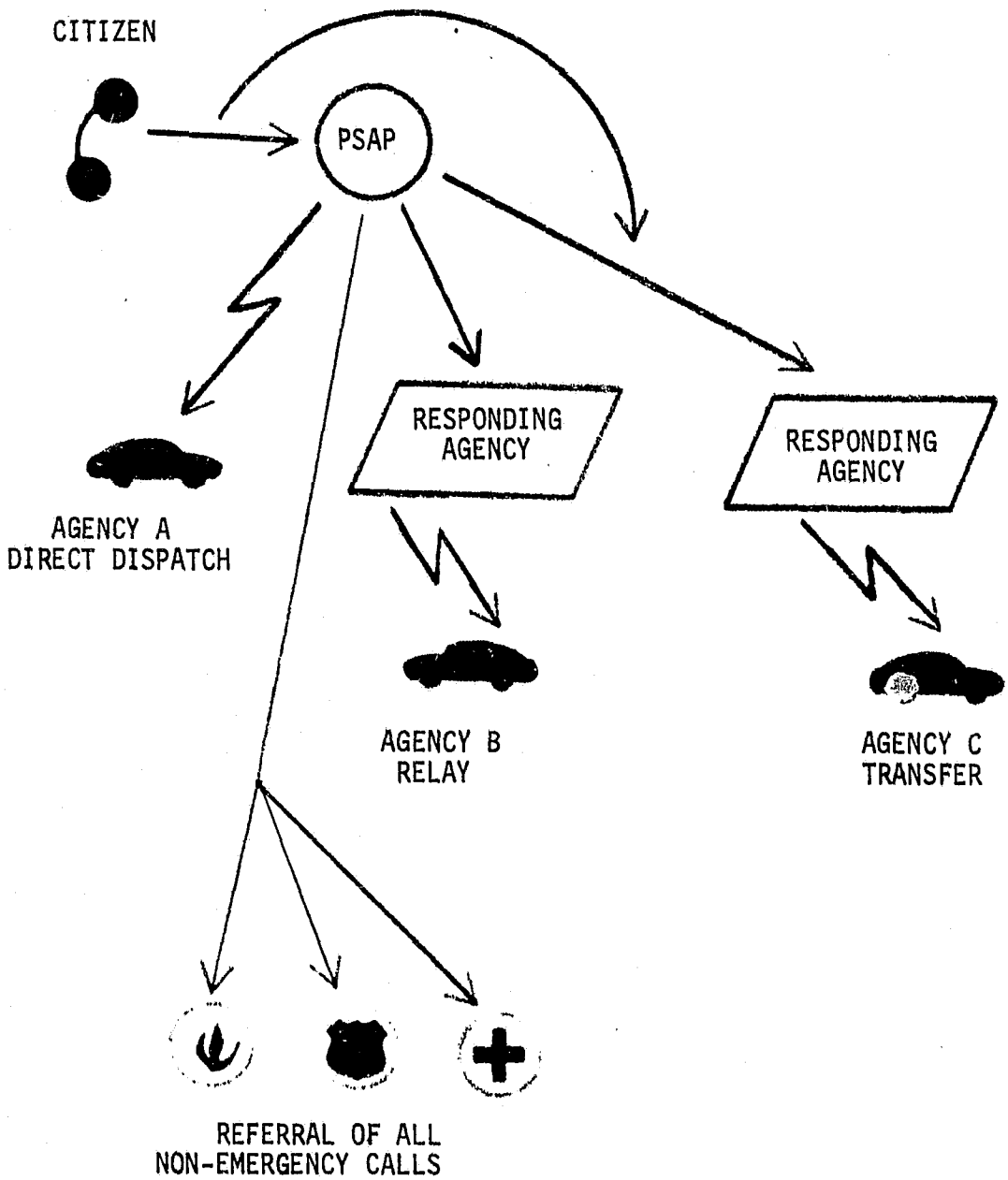
3. Transfer Method. In the "Transfer Method," the interrogator would determine the proper responding agency and would directly connect the caller to that agency that would perform the necessary dispatching. Note: Transfer Methods should be devised to eliminate putting an emergency call on hold while transferring.



4. Referral Method. In the "Referral Method," the call would go to the PSAP where the interrogator would determine the nature of the call and would refer the caller to the telephone number of the proper agency he is seeking. The caller would then reinitiate his call. This method is not desirable, but can be used as a back-up for non-participating agencies. This method is to be used to handle non-emergency calls.



TYPICAL COMBINATION OF METHODS



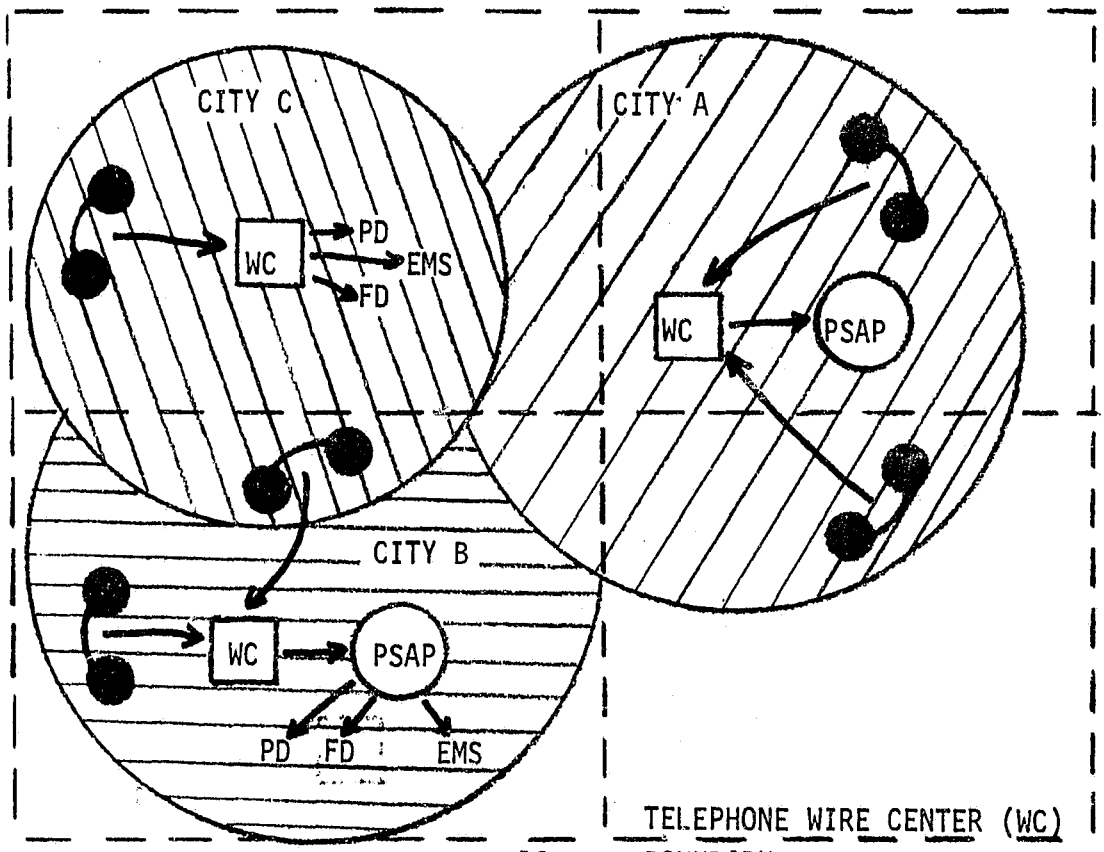
BASIC 911 (DECENTRALIZED SYSTEM) CONFIGURATION

This exhibit illustrates basic decentralized 911 with three telephone wire centers and three cities.

City A is a system that utilizes the Direct Dispatch Method. There are telephones that are within the city boundaries (shaded areas) and out of the city boundaries, but all of them are within the same telephone wire center (dotted line). When 911 is dialed from any one of these telephones, the call is routed to City A's PSAP since a central office cannot differentiate between city boundaries. Emergency 911 calls originating in Cities B and C would require the Relay, Transfer, or Referral Method to be used to put the caller in contact with the appropriate public safety agency.

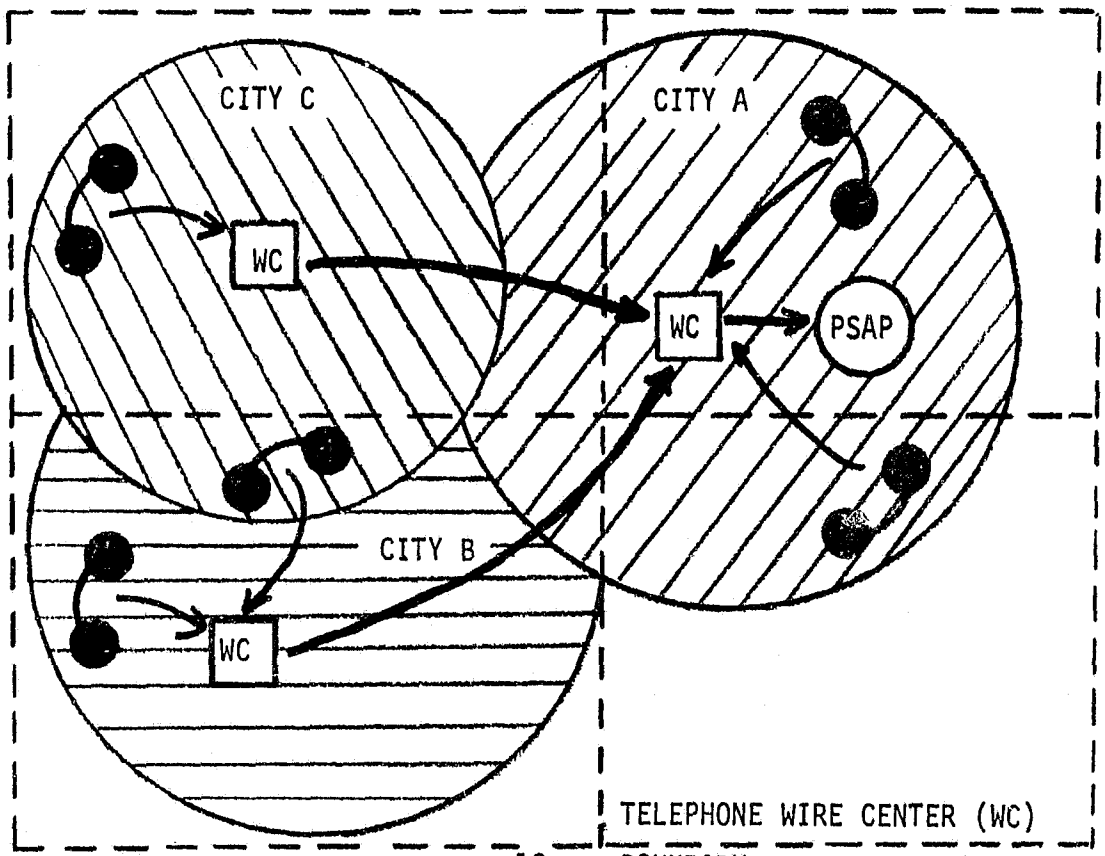
City B depicts a system utilizing the Transfer Method. The caller dialing 911 reaches the PSAP where the call is transferred to the proper agency. Again, out-of-jurisdiction calls would be relayed, transferred, or referred to the proper PSAP.

In City C where 911 has not been implemented, calls for fire, police, and ambulance services are dialed direct using separate seven-digit numbers.



BASIC 911 (CENTRALIZED SYSTEM) CONFIGURATION

This exhibit illustrates a basic centralized 911 system with the same three telephone central offices and cities employing one central PSAP. In each of the cities, all 911 calls are answered at a central PSAP. Each city would then be served by a combination of the four response methods previously outlined (Direct, Relay, Transfer, or Referral).



SOPHISTICATED 911 SYSTEM

The "Sophisticated System" deals not only with external system considerations to the PSAP, but also with internal system configurations within the PSAP. Therefore, a "Sophisticated 911 System" is simply a basic system with one or more of the following features:

- Called Party Hold-enables the PSAP operator to control the connection for confirmation and tracing of a call.

- Distinct Tone-alerts PSAP operators to calling party disconnects.

- Forced Disconnect-allows PSAP operators to force release of the 911 incoming line.

- Re-ring -enables PSAP to ring back a calling telephone party.

- Selective Routing-will automatically route a predetermined geographical area to a PSAP serving that area regardless of municipal and wire center boundary alignments.

- Automatic Number Identification (ANI)-automatically displays the addresses of the calling number at the PSAP.

- Automatic Location Identification (ALI)-automatically displays the addresses of the calling telephone at the PSAP.

- Central Office Identification-when a PSAP serves more than one central office, dedicated lines or trunks are used to identify each central office.

--PLANNING FOR THE 911 SYSTEM

PLANNING CONSIDERATIONS FOR 911

There are many factors which have to be considered and resolved for 911 to be successful. This chapter discusses some of the major issues involved and provides a checklist for agencies to use in 911 planning.

It cannot be stressed enough in planning the operational stage of 911 that the development and implementation of an effective and successful system is a multijurisdictional process which, almost by definition, demands cooperation of adjacent and abutting jurisdictions. Systems should be centralized to the extent that is feasible. Centralization is encouraged and should be considered within the planning stages for 911 implementation. The telephone company central office (wire center) boundaries, the smallest manageable unit for 911 purposes, are determined by various economic and geographic constraints. Political boundaries are rarely concurrent with central office boundaries. Consequently, there is much overlapping of central office and political boundaries.

Nonconcurrent political and central office boundaries present no real problem with regard to almost any other telephone service. With 911, however, overlapping boundaries can mean substantial problems unless there is adequate planning and cooperation among the participants.

In providing 911 service to any given jurisdiction, a number of telephone exchanges may be involved. For those central offices which lie wholly within the jurisdiction, there is no particular problem. There will be central offices (wire centers), however, which serve several adjacent communities. Citizens in the adjacent community in the same central office area would then be able to dial 911 and instead of reaching their own police or fire department, would get that of another agency. Intrajurisdictional cooperation is paramount in this situation because some procedure must be established to handle the calls from another community and then dispatch, relay, transfer, or refer them to appropriate emergency service. The critical point, however, is that some form of cooperation between jurisdictions is essential in the planning stage and that adherence to the minimum standards is agreed upon.

Careful consideration should be given to planning a 911 system so that it will provide the minimum number of contact points between the calling party and the responding agency.

The following checklists are provided as a guide to the activities which are usually necessary in order to develop a 911 system. Not all the activities listed here will apply to every community.

911 Participants and Organization Check List

The participants in a 911 system in the State must include:

- law enforcement services and
- fire services or
- emergency medical and ambulance services

As an option, other emergency services may be included. For example:

- poison control
- suicide prevention
- civil defense
- public works
- drug abuse centers
- private ambulance service
- others

The first step in planning is to identify the involved geographic area and then formulate a planning task force including representatives of the affected areas. The task force should meet and set about planning the 911 system implementation. Each city, county, and agency has an individual responsibility to satisfy the requirements and the time schedules specified by law.

Planning Decisions Checklist

1. Formation of a planning task force.

- County Administrative Officer
- City Administrative Officer
- Sheriffs, Chiefs of Police
- Fire Chiefs
- Emergency Medical Representatives
- Representatives from Other Emergency Service Agencies
- Civil Defense Local Director
- Elected Officials (e.g., mayors, councilmen, supervisors, etc.)
- State Communications Division 911 Coordinators
- Representatives of Citizens' Groups
- Telephone Company Representatives
- Federal Agencies (Coast Guard, Forest Service, Military Installations)
- Others as needed

2. Review of existing information on 911.

   - Written materials
   - Contacts with communities already having 911
   - Iowa Communications Division 911 Coordinators

3. Decision about area

   - Central office boundary considerations
   - Single or jultijurisdictional participation
   - 911 calls from foreign exchange lines
   - Costs

4. Inventory of emergency services in the proposed 911 area.

   - Fire Services: Local, State, and Federal
   - Law Enforcement Agencies: Local, State, and Federal
   - Ambulance Services
   - Hospitals
   - Poison Control Centers
   - Suicide Prevention Centers
   - Drug Abuse Centers
   - Civil Defense Agencies
   - Weather Warning Stations
   - Public Works Departments
   - Others

5. Selection and location of PSAP.

   - Law Enforcement Communication Center
   - Fire Station
   - Hospital
   - Separate Communications Center

6. Manpower requirements
   - 24 hours per day
   - 7 days per week

7. Decide answering center mode of operation.

   - Direct dispatch
   - Relay information
   - Transfer
   - Referral to another number
   - Combinations of above

8. Equipment considerations.

   - Basic 911 Service
   - Automatic Location Identification
   - Called Party Control Features
     - -Called Party Hold
     - -Ring Back
     - -Forced Disconnect
   - Central Office Identification
   - Automatic Number Identification
   - Alternate Cable Routing with two routes to PSAP
   - Foreign Exchange Service
   - Emergency Power
   - Other

9. Costs

   - Who will be the one agency billed by the telephone company
   - How will total cost be prorated
   - How will costs be financed

Planning Activities Checklist

1. Coordination with neighboring jurisdictions, if multijurisdictional system.

   - Inclusion of representatives on planning team
   - Arrangements for sharing responsibility for operating answering center
   - Cost sharing arrangements

2. Assignments of responsibilities and drawing up of cooperative agreements with participating agencies.

3. Establishment of procedures for handling 911 calls.

   - For emergency calls
   - For multilingual calls
   - For nonemergency calls
   - For nuisance or false alarm calls
   - Others

4. Planning of publicity campaign.

   - 911 publicity coordinated with telephone company directories
   - Television, radio, newspapers
   - Printed materials
   - Telephone stickers
   - Decals or signs painted on public safety vehicles
   - Presentations to school and citizens' groups
   - Other publicity activities

It should be noted that individuals using PBX, PABX, and Centrex must still dial an outside access code before dialing 911 as is required today to make an outside emergency call. (i.e. 9-911)

EQUIPMENT CONSIDERATIONS

There are many factors to be considered in 911 equipment needs. The following list provides a framework which will aid operational agencies in identifying their equipment needs:

- Number of emergency lines required
- Compliance with minimum operational and technical standards
- The number and location of participating emergency agencies involved
- The use and integration of presently available and planned communications facilities, such as two-way radio, teletype, etc.
- Expected amount of emergency traffic and personnel required to handle it during normal and peak periods

The specific equipment needs will be dictated by features of a basic or sophisticated 911 system. Below is a guide listing features that comprise equipment in a basic or sophisticated system.

- Basic 911 System
  - -Minimum of Two Serving Lines
  - -Overflow Answering
  - -Recording of Calls
  - -Other
- Sophisticated 911 System*
  - -Called Party Hold
  - -Ring Back
  - -Automatic Line Identification
  - -Direct Trunking
  - -Central Office Identification
  - -Automatic Number Identification
  - -Selective Routing
  - -Forced Disconnect

*Use of any one of these features would by definition be considered a sophisticated system.

As a minimum, three of the four methods described must be employed at the PSAP. These methods cover the procedure for handling an emergency call. They are:

- Direct Dispatch
- Relay
- Transfer
- Referral

Each one of these methods requires certain types of equipment considerations. Communications Division and telephone industry representatives can provide assistance and guidance in equipment needs for a particular situation.

Technical Information Regarding Equipment

The following technical information is provided regarding equipment that would possibly be used in a 911 system:

Terminating Considerations. The basic equipment required for call answering can range from an individual pushbutton type telephone to a large pushbutton answering system, multiple switchboard, or automatic call distribution system. Most of the equipment can be furnished by the telephone industry under their current tariff schedules. Where certain configurations of equipment required are not offered in current industry tariffs, special assembly tariffs or contracts will be developed for a specific application. Also, there is a variety of equipment available from private vendors which may suit individual system needs.

Key Telephone Equipment. Incoming 911 lines, two-way lines, and direct tie lines are terminated on pushbuttons, usually provided in multiples of six or ten. The pushbutton modules are wired to an associated telephone set, headset, handset, or speaker-phone. An incoming call on a line is noted by flashing lamp associated with pushbutton and, an audible signal. Pushing the button answers the call. Pushbutton operated holding features allow calls to be held while other calls are answered or originated.

Switchboard Equipment. Switchboards, PBX's, and PABX's are available in manual and automatic versions and also in cord type or cordless, i.e., pushbutton or lever switch, attendant operation.

Emergency Reporting Switchboard Equipment. These switchboards are designed to answer calls from streetside emergency telephones

as well as central office lines and usually are (or can be) equipped to "transfer" calls to other locations. Calls are answered by both pushbutton and cord and jack methods described above.

Automatic Call Distributor. Equipment to distribute large volumes of incoming calls to attendants not already working on calls or to "store" calls until attendants become available.

Centrex. A type of private branch exchange in which incoming calls can be dialed direct to any extension without an operator's assistance. Outgoing and intercom calls are dialed by the extension users.

COST ESTIMATES

There is a general agreement among the telephone companies in the United States that they will make central office modifications to provide 911 capability without charge. The equipment cost for basic 911 may, therefore, be minimal. Additional costs will be incurred for a sophisticated 911 system depending on what features are implemented. There will be no charge to the citizen for 911 calls.

There will be charges for lines serving the PSAP, for lines from switching centers outside the local service area, and for lines from the PSAP to agencies providing emergency services. Charges for these lines are based on mileage and on the 911 system design. It is unfortunate that some systems are abandoned entirely when mileage charges are judged excessive for any one part of the system proposed.

A system designed for multijurisdictional or regional operation which provides for the consolidation of services can, in many instances, result in cost savings and efficiencies.

Exhibit 4-1 illustrates cost responsibilities between the telephone company, telephone users, and the public safety agencies. The solid line indicates costs of trunks and equipment which are provided by the telephone companies at no charge. The dotted line shows equipment and trunk costs which are paid by public safety agencies. For example: (From the C.O. to the PSAP). The broken line depicts those lines and equipment costs presently paid by telephone users. This serves as a guide in determining 911 costs. Local telephone representatives should be consulted for definite costs.

Exhibit 4-2 illustrates a 911 cost diagram including personnel. Exhibit 4-2 also depicts cost catagories for any 911 system. They are:

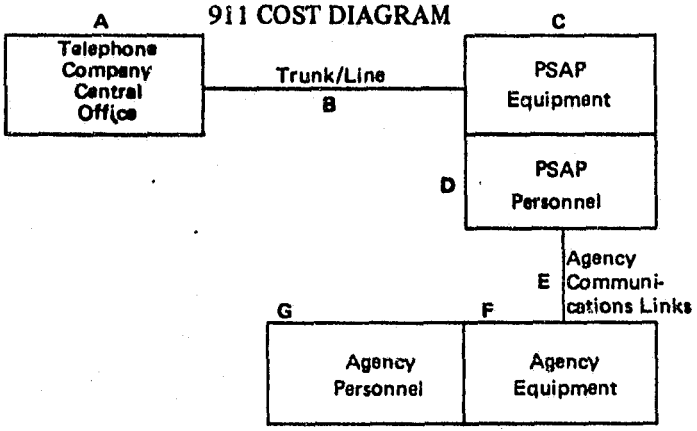
- Telephone company central office 911 switching
- Trunks and lines to PSAP
- PSAP equipment
- PSAP personnel
- Trunks and lines to agency
- Agency equipment
- Agency personnel

The costs will vary depending upon the agency's system configuration and purchase or lease considerations.

Exhibit 4-3 is a worksheet to determine present communication costs.

Exhibit 4-4 provides a cost worksheet to tabulate estimated and final cost figures in each of the cost responsibility categories.

Exhibit 4-2
911 COST DIAGRAM



A. Telephone company provides "basic 911 code" at no charge.

B. 911 Trunk lines (minimum 2) and backup or nonemergency lines (paid by user).

C. PSAP equipment (i.e., telephones, switchboard, desks, etc.)(paid by user).

D. PSAP personnel (provided by user).

E. Agency communications links (i.e., transfer lines, direct lines, radio, etc.)(paid by user or agency).

F. Agency equipment (i.e., telephones, switchboards, etc.)(paid by agency).

G. Agency personnel (i.e., dispatchers, etc.)(provided by agency).

Exhibit 4-3
PRESENT COSTS

	Number of Lines	Cost Per Line	Total Cost
Emergency Lines			
1. Law Enforcement Agencies			
2. Fire			
3. Emergency Medical (Ambulance)			
Emergency Lines Between Agencies			
1. Law Enforcement Agencies			
2. Fire			
3. Emergency Medical (Ambulance)			
	Number of Positions	**Unit Cost**	**Total Cost**
Terminating Equipment Positions			
1. Law Enforcement Agencies			
2. Fire			
3. Emergency Medical (Ambulance)			
GRAND TOTAL			

Exhibit 4-4
COST WORKSHEET

	PSAP COSTS		AGENCY COSTS		TOTAL COSTS	
	One Time	Recurring	One Time	Recurring	One Time	Recurring
TRUNK/LINES TO PSAP						
PSAP EQUIPMENT						
1.						
2.						
3.						
4.						
PSAP PERSONNEL						
TRUNK/LINES TO AGENCIES		OR				
AGENCY EQUIPMENT						
1.						
2.						
3.						
AGENCY PERSONNEL						
TOTAL						

MINIMUM STANDARDS for 911 LINES

to be

ANSWERED at the ANSWERING POINT (PSAP)

COMM CTR. LOCATION COUNTY	COMM CENTER DESIGNATION COUNTY-CITY	RADIO DISPATCH POSITIONS #	EMERGENCY REQUEST TELEPHONE LINES #	OPERATORS COMBINED RADIO/TELE	OPERATORS TELE	MANNING PEAK SHIFT	MANNING DAILY STAFF	ESTIMATED DISPATCH STAFF TOTAL
1	ADAIR	1	2	1		1	3	5
2	ADAMS	1	2	1		1	3	5
3	ALLAMAKEE	1	3	1		1	3	5
4	APPANOOSE	1	3	1		1	3	5
5	AUDUBON	1	2	1		1	3	5
6	BENTON	2	3	2		2	5	7
7	BLACKHAWK	2	4	2		2	5	7
7	WATERLOO	4	10	3	1	4	8	12
7	CEDAR FALLS	1	5	1	1	2	5	7
8	BOONE	2	3	2		2	5	7
9	BREMER	2	3	2		2	5	7
10	BUCHANAN	2	3	2		2	5	7
11	BUENA VISTA	2	3	2		2	4	6
12	BUTLER	2	3	2		2	4	6
13	CALHOUN	1	3	1		1	3	5
14	CARROLL	2	3	2		2	5	7
15	CASS	2	3	2		2	4	6
16	CEDAR	2	3	2		2	4	6
17	CERRO GORDO-MASON CITY	3	7	2	1	3	7	10
18	CHEROKEE	2	3	2		2	4	6
19	CHICKASAW	1	3	1		1	3	5
20	CLARKE	1	2	1		1	3	5
21	CLAY	2	3	2		2	4	6
22	CLAYTON	2	3	2		2	1	6
23	CLINTON-CLINTON	3	7	2	1	3	8	12
24	CRAWFORD	2	3	2		2	4	6
25	DALLAS	2	3	2		2	5	7
26	DAVIS	1	2	1		1	3	5
27	DECATUR	1	2	1		1	3	5
28	DELAWARE	2	3	2		2	4	6

MINIMUM STANDARDS for 911 LINES

to be

ANSWERED at the ANSWERING POINT (PSAP)

COMM CTR. LOCATION COUNTY	COMM CENTER DESIGNATION COUNTY-CITY	RADIO DISPATCH POSITIONS #	EMERGENCY REQUEST TELEPHONE LINES #	OPERATORS COMBINED RADIO/TELE	OPERATORS TELE	MANNING ESTIMATED PEAK SHIFT	MANNING ESTIMATED DAILY STAFF	MANNING ESTIMATED DISPATCH STAFF TOTAL
29	DES MOINES-BURLINGTON	3	7	2	1	3	7	10
30	DICKINSON	1	3	1		1	3	5
31	DUBUQUE CO.	2	4	2		2	5	7
31	DUBUQUE CITY	4	11	3	1	4	1	12
32	EMMET	1	3	1		1	3	5
33	FAYETTE	2	4	2		2	5	7
34	FLOYD	2	3	2		2	4	6
35	FRANKLIN	1	3	1		1	3	5
36	FREMONT	1	2	1		1	3	5
37	GREENE	1	3	1		1	3	5
38	GRUNDY	1	3	1		1	3	5
39	GUTHRIE	1	3	1		1	3	5
40	HAMILTON	2	3	2		2	4	6
41	HANCOCK	1	3	1		1	3	5
42	HARDIN	2	3	2		2	4	6
43	HARRISON	2	3	2		2	4	6
44	HENRY	2	3	2		2	4	6
45	HOWARD	1	3	1		1	3	5
46	HUMBOLDT	1	3	1		1	3	5
47	IDA	1	2	1		1	3	5
48	IOWA	2	3	2		2	4	6
49	JACKSON	2	3	2		2	4	6
50	JASPER	2	4	2		2	5	7
51	JEFFERSON	2	3	2		2	4	6
52	JOHNSON	2	3	2		2	5	6
52	IOWA CITY	3	6	2	1	3	6	9
53	JONES	2	3	2		2	4	6
54	KEOKUK	1	3	1		1	3	5
55	KOSSUTH	2	3	2		2	4	6
56	KEE	2	5	2		2	6	9
57	LINN	2	4	2		2	5	7
57	CEDAR RAPIDS	5	15	4	2	7	14	21
57	MARION	1	3	2		2	4	6

MINIMUM STANDARDS for 911 LINES

to be

ANSWERED at the ANSWERING POINT (PSAP)

COMM CTR. LOCATION COUNTY	COMM CENTER DESIGNATION COUNTY-CITY	RADIO DISPATCH POSITIONS #	EMERGENCY REQUEST TELEPHONE LINES #	OPERATORS COMBINED RADIO/TELE	OPERATORS TELE	MANNING ESTIMATED PEAK SHIFT	MANNING ESTIMATED DAILY STAFF	MANNING ESTIMATED DISPATCH STAFF TOTAL
58	LOUISA	1	2	1		1	3	5
59	LUCAS	2	3	2		2	4	6
60	LYON	1	3	1		1	3	5
61	MADISON	1	3	1		1	3	5
62	MAHASKA	2	3	2		2	5	7
63	MARION	2	3	2		2	5	7
64	MARSHALL-MARSHALLTOWN	2	5	2		2	6	9
65	MILLS	2	3	2		2	5	7
66	MITCHELL	2	3	2		2	5	7
67	MONONA	2	3	2		2	4	6
68	MONROE	2	3	2		2	5	7
69	MONTGOMERY	1	2	1		1	3	5
70	MUSCATINE-MUSCATINE	2	4	2		2	5	7
71	O'BRIEN	2	3	2		2	4	6
72	OSCEOLA	1	2	1		1	3	5
73	PAGE	2	3	2		2	4	6
74	PALO ALTO	1	3	1		1	3	5
75	PLYMOUTH	2	3	2		2	4	6
76	POCAHONTAS	1	3	1		1	3	5
77	POLK	2	5	2		2	6	9
	DES MOINES	5	18	5	3	8	18	26
	W. DES MOINES (W. HTS. CLIVE, URBANDALE)	2	6	2	1	3	6	9
78	POTTAWATTAMIE	2	4	2		2	5	7
	COUNCIL BLUFFS	3	9	3	1	4	9	13
79	POWESHIEK	2	3	2		2	4	6
80	RINGGOLD	1	2	1		1	3	5
81	SAC	2	3	2		2	4	6
82	SCOTT	2	3	2		2	5	7
82	DAVENPORT	4	12	3	2	5	11	17
82	BETTENDORF	2	5	2		2	4	6

MINIMUM STANDARDS for 911 LINES

to be

ANSWERED at the ANSWERING POINT (PSAP)

COMM CTR. LOCATION COUNTY	COMM CENTER DESIGNATION COUNTY-CITY	RADIO DISPATCH POSITIONS #	EMERGENCY REQUEST TELEPHONE LINES #	OPERATORS COMBINED RADIO/TELE	OPERATORS TELE	MANNING ESTIMATED PEAK SHIFT	MANNING ESTIMATED DAILY STAFF	MANNING ESTIMATED DISPATCH STAFF TOTAL
83	SHELBY	2	3	2		2	4	6
84	SIOUX	2	4	2		2	5	7
85	STORY	2	3	2		2	5	7
	AMES	2	6	2	1	3	6	9
86	TAMA	2	3	2		2	4	6
87	TAYLOR	1	2	1		1	3	5
88	UNION	1	3	1		1	3	5
89	VAN BUREN	1	2	1		1	3	5
90	WAPELLO-OTTUMWA	2	4	2		2	5	7
91	WARREN	2	4	2		2	4	6
92	WASHINGTON	2	3	2		2	4	6
93	WAYNE	1	2	1		1	3	5
94	WEBSTER-FORT DODGE	2	6	2	1	3	6	9
95	WINNEBAGO	1	3	1		1	3	5
96	WINNESHIEK	2	3	2		2	5	7
97	WOODBURY	2	3	2		2	4	6
	SIOUX CITY	3	11	3	2	5	11	16
98	WORTH	1	2	1		1	3	5
99	WRIGHT	2	3	2		2	4	6

-IMPLEMENTATION AND CONTINUED 911 OPERATIONAL CONSIDERATIONS

IMPLEMENTATION ACTIVITIES

The planning of a 911 system should provide a logical base for the implementation of the system. Important factors to be considered in implementation are:

- Budgeting for 911 system - Consideration and mutual understanding of responsibilities for funding the 911 system must be documented.

- Public education programs - Continuous review of programs and updating must be considered.

- Telephone equipment modifications - These must be thought out and designed for operational agency needs.

- Training of 911 operators - The type of training, duration, and responsibility must be delineated and understood by all.

- Priority for accepting 911 calls - These procedures have to be documented.

- Discouraging nonemergency use of 911 - This is imperative to insure effectiveness of the 911 system.

- Record keeping activities - The types of records maintained and uses have to be understood and documented. Records regarding usage, time, number of calls, etc., have to planned for implementation of 911.

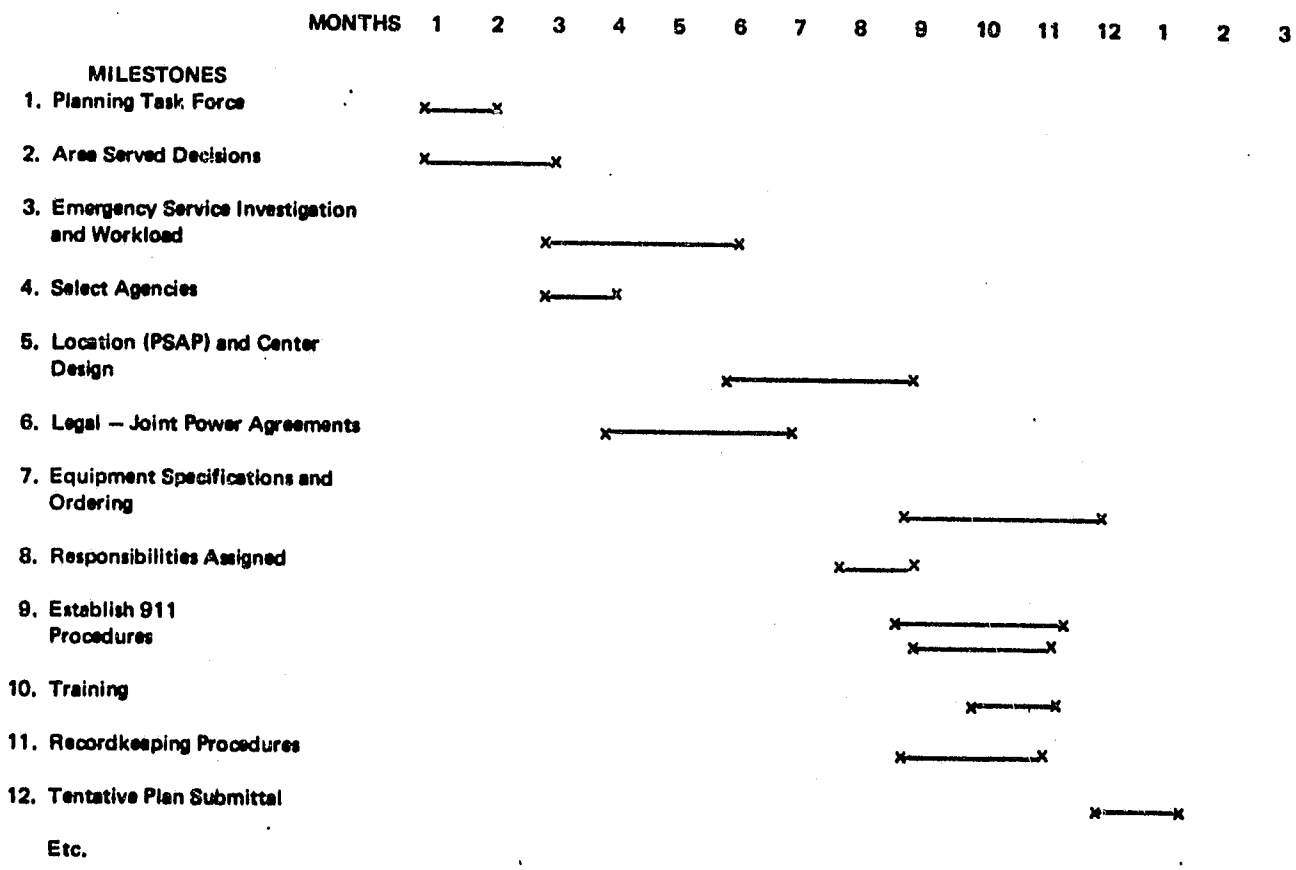
ASSESSING CONTINUED OPERATIONAL CONSIDERATIONS

Once the 911 system has been implemented a program for continued assessment should be enacted. This would concern the following:

- Ongoing Training
- Expansion Considerations
- Workload Measurement
- Statistics and Records
- Public Education Programs

These activities are essential to assessing future needs of a 911 system. Each of these areas for continued assessment must be given consideration.

Exhibit 5-2. Example of a Typical Milestone Chart



"911" PRO AND CON

No analysis of "911" will be complete without an objective answer to the questions -"Why do we need "911" in the first place?" - "Is it a viable service worth the price?" - "Does it serve a useful purpose for any community, regardless of size?" - "Are the benefits primarily for selected local areas only, or do the benefits warrant a nationwide commitment?" - "What phases of a "911" program become the responsibility of municipal public officials?" - the public at large? - the telephone industry?"

Following the Bell System announcement in January, 1968, public reaction was generally favorable. The idea of a universal emergency number appealed to large segments of the public, city officials and legislators. The program was given strong endorsement by the press in most parts of the country.

There were, nevertheless, dissenters as well, most notable among public safety officials who argued that there was no clear need for a single emergency number.

The PROS:

- Those in favor visualize the benefits of simply remembering only one number to call for help in any emergency situation, no matter where the person happened to be - at home, on business in a strange city, traveling with family on vacation, etc.

- Dialing a short, easily remembered number would undoubtedly be the fastest means of summoning emergency assistance when needed. The time spent in searching for the number of the appropriate agency is greatly reduced.

- Many people without the ability to find listed numbers in the telephone book - such as the illiterate, the young, the retarded, or non-English speaking - could easily become accustomed to dialing a universally recognized 3-digit number.

- No telephone operator need intervene to ascertain what safety agency to call and place the call.

- 911 is faster than dialing 0 because the operator must determine the nature of the location of the emergency incident, find the appropriate seven digit number, extend the call and then the caller must repeat his emergency information to the public safety agency.

- Dialing 911 results in fewer dialing errors due to transposing numbers or missing digits.

- The 911 call answering person may be able to hold a line open and rering the calling telephone even if the caller hangs up his telephone if the 911 system employs a dedicated trunk network. This rering feature has virtually completely eliminated false fire alarms and false bomb reports in several areas. With call hold, the calling telephone location can be traced by the telephone company even if the calling phone is hung up.

- It is possible to disconnect lines if someone attempts to tie up all incoming lines by dialing 911 from many phones and not hanging up.

- With 911, it is possible to arrange pay telephones so that the emergency number can be dialed and connected without a coin.

- Precious time is saved in reaching the proper agency to summon help; time, which, in most cases, must be measured in seconds if an effective response is to be achieved.

- The built-in coordination made possible by centralized reporting provides for maximum efficiency in dispatching equipment and forces. More than a single agency is often required to handle emergencies.

- People under stress are much more likely to remember a simple 8-digit number than a 7-digit number.

- It is necessary as a public service, even more so than a few years back because of our high crime rates and the limited capability of police forces to provide indepth coverage over all areas.

- Implementing "911" does not mean that all present safety agency numbers will be eliminated. Agencies should retain their own administrative telephone numbers if they so desire.

- The savings in response time means more lives and property saved.

- Provides for more effective segregation of calls so emergency calls can be handled by emergency operators and the non-urgent calls handled by others.

- Crime is so rampant on the streets today, people don't know whom to call. A common number is the answer.

- If Great Britain has found a single number emergency reporting system beneficial for over 25 years, why hasn't the U.S. implemented such a system long before now?

- The installation of "911" will not lead to more emergencies. Those emergency calls now being generated are going to seven-digit numbers. Call patterns may be drifted somewhat, but should not create more emergencies. Emergencies are reported more because of reporting ease.

The CONS:

- It is contended by some that "911" is a political football- that the decision to implement the system in many areas was politically motivated; not at the request of public safety organizations nor the initiative of telephone companies.

- In the view of some officials "911" is not a viable reporting arrangement unless some means of Automatic Location Identification can be provided.

- Benefits do not justify the costs to establish and operate reporting centers.

- The public support is lacking.

- Cooperation between the jurisdictions involved is an insurmountable problem.

- Parochial conflicts between agencies are too difficult to resolve. Who's going to control the dispatching function? Who's going to be in charge?

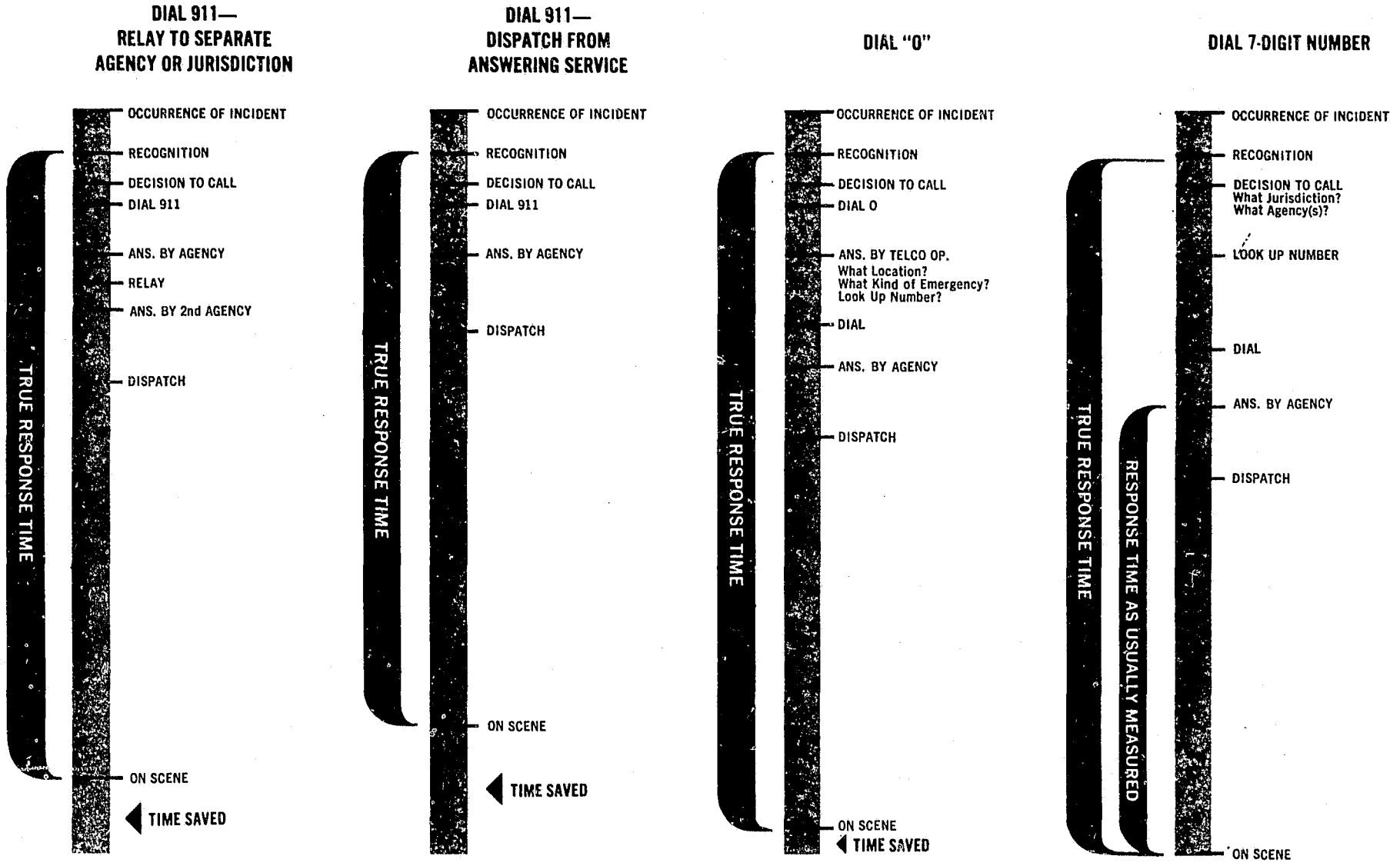
- The costs of rearrangements and code changes on the part of the telephone companies run into the millions. This means higher telephone rates to the public.

- It is not economically feasible to make the number "911" available in lots of areas except over a period of several years.

- Everyone in the same community area may not get the benefit of "911" at the same time.

- The handling of calls through a reporting center will delay rather than shorten response times.

TIME SAVED BY DIALING 911



SUMMARY

Although many communities have recognized the benefits of "911", in the final analysis its implementation on a large scale has been slow due mainly to jurisdictional problems and conflicts.

Basic "911" service has been implemented so far only in those areas where:

1) the telephone central office areas and the political jurisdictions were reasonably compatible;

-or-

2) interjurisdictional cooperation was achieved and the problems of overlapping solved by establishing a common answering point.

Almost without exception, strong local leadership on the part of elected officials has been the prime mover in the cause of "911" in the areas which have it.

"911" Progress

Despite the commitment of the telephone industry, the implementation of "911" has not been as rapid as originally conceived due to lack of universal acceptance of the concept. From the telco standpoint, "911" service produces no revenues of consequence - in most cases, none whatsoever. Every installation requires equipment rearrangements to some degree, some relatively minor--some extremely costly. Most telcos, nonetheless, have attempted to promote community understanding of the "911" concept, being ready, willing, and able to render any needed assistance where serious steps are taken by the local authorities.

In general, the policies of the independents conform with the following resolutions adopted by the United States Independent Telephone Association in:

1) That they endorse the use of "911" as a Universal Emergency Number <u>if all</u> public safety agencies within any exchange agree to share the number and provide for its operation.

2) That they oppose the use of "911" for any <u>single</u> public safety agency since this may develop requests for additional special numbers which cannot be made available.

3) That until "911" is an active number it be connected to an appropriate special intercepting trunk or a device which immediately notifies the calling party his call cannot be completed (the cost of providing such interception to be a major consideration).

4) That each member company analyze its own equipment requirements for provision of "911" service and determine the costs.

5) That each member company meet with representatives of all public safety agencies within an exchange area to explain all items in connection with offering "911" as a Universal Emergency Number.

6) That each company consider preparing a letter summarizing the conclusions reached in (5) above, which should be sent to each agency asking for an acknowledgement of its receipt and concurrence in its contents.

7) Where responsibility would be divided between the Independent and Bell (or another Independent) that Independent managements insist on being a part of any discussions with public safety agencies involving Independent exchanges."

Resistance to Centralized Answering Points

It is paradoxical that the public at large is not realizing the full benefits of "911" (except in limited areas) because of a lack of enthusiasm in setting up centralized answering points. A 911 answering point can be anything from simple telephone instruments in a county sheriff's office or police desk to a multi-jurisdictional command and control center.

Also there is a lack of enthusiasm in many areas on the part of the telephone industry in promoting "911" unless somewhat pushed into it by municipalities who recognize the need and attempt to overcome the political and jurisdictional complications inherent in this type of undertaking.

Every reason one can think of has been expounded in resisting "911":

- "Centralized answering means we are putting all our eggs in one basket -"

- "Centralized answering means centralized dispatch which we don't want -"

- "The public won't use it if they have it -"

- "The whole system will be jammed the first time a major disturbance occurs -"

- "Political subdivisions are not going to give up their dispatching functions -"

- "Only the fire department can handle fire reports -"

- "Only the police department can handle police reports -"

- "We (communities) cannot agree to combining jurisdictions for reporting purposes -"

- "Once you cross jurisdictional lines, you get into tax problems - people problems - legal problems - political problems - responsibility problems - money problems - dispatching problems - "

The list is endless, depending on the view point of the objector.

Behind the public scene, thousands of man hours have been spent by telephone companies in developing "911" plans for consideration of local governments. Basic "911" proposals for dozens of communities - some county-wide areas- have been designed by the telephone companies (both Bell and Independents) and await resolution of interjurisdictional problems.

GLOSSARY

This glossary is provided to establish a uniformity of terms and terminology. All plans, reports, and other communications to or from Communications Division, State of Iowa shall adhere to the terms covered in the glossary.

ALI - Automatic Location Identification: identifies location of incoming call by street address.

ALTERNATE ROUTING - To have two or more different routes for 911 lines from the central office to the Public Safety Answering Point (PSAP).

ANI - Automatic Number Identification; identifies the telephone number of the incoming call.

AREA CODE - The three-digit code used when dialing calls from one Numbering Plan Area to another.

AUDIBLE SIGNAL - Buzzer or bell indicating a sound to indicate an incoming call.

AUTOMATIC CALL ROUTING - (See SELECTIVE ROUTING).

AUTOMATIC CALL DISTRIBUTOR - ACD - Equipment to distribute large volumes of incoming calls to attendants not already working on calls or to "store" calls until attendants become available.

BASE RATE - The established telephone exchange service rate, exclusive of mileage, for main telephone, auxiliary line, or trunk line service.

BASE RATE AREA - That portion of the exchange area within which exchange service, other than rural line service, is offered at base rates for each grade of service without mileage or highway construction charges.

CALLED PARTY HOLD - Enables the public safety answering point to control the connection for confirmation and tracing of a call.

CENTRAL OFFICE - Sometimes called a wire center; the smallest subdivision within the telephone system which has relatively permanent geographic boundaries.

CENTRAL OFFICE IDENTIFICATION - When a large answering point serves more than one central office area, it is possible to identify the central office forwarding the call by dedicated trunking from the central office to the PSAP.

CENTREX - A type of private branch exchange in which incoming calls can be dialed direct to any extension without an operator's assistance. Outgoing and intercom calls are dialed direct by the extension users.

CNIL - Calling Number Identification and Location; sometimes used by the telephone industry in referring to the combination of automatic number identification and automatic location identification.

DDD - Direct Distance Dialing; telephone service which permits subscribers to dial their own long distance calls without the aid of an operator.

DIAL TONE FIRST - Allowance of a 911 call to be completed without the deposit of a coin.

DID - Direct Inward Dialing; an outside call dialed directly to an extension without going through the switchboard which serves an office, store, building, etc. (Centrex Service).

DIRECT DISPATCH METHODS - All call answering and dispatching is done by the personnel at the public safety answering point.

DOD - Direct Outward Dialing; a reverse direction of DID; an extension user dials "out" without switchboard operator assistance.

EAS - Extended Area Service; telephone service that allows subscribers in an exchange area to pay flat monthly or measured rates instead of long distance charges for calls to nearby exchange areas. See EXCHANGE.

EMERGENCY CALL - A call that requires immediate action.

ESS - Electronic Switching System; a modern central office with programmable phone switching logic.

EXCHANGE - A defined area, served by one or more telephone central offices, within which the telephone company furnishes service.

FORCED DISCONNECT - The compability of the 911 PSAP to disconnect a 911 call to avoid caller jamming of the incoming phone lines.

FOREIGN EXCHANGE SERVICE - A telephone line associated with an exchange foreign to the exchange in which it is installed.

JOINT EXERCISE OF GOVERNMENTAL POWERS - An agreement formed under Chapter 28E of the Code of Iowa to permit state and local governments to make efficient use of their powers by enabling them to provide joint services and facilities with other agencies and to

cooperate in other ways of mutual advantage.

JURISDICTIONAL CALL ROUTING - Automatic routing of call to a predesignated answering point having jurisdiction over the geographical area from which the call originates.

KEY TELEPHONE EQUIPMENT - An instrument that has the capability of multiple line terminations. Each line is accessed by depressing associated button (key).

LOCAL SERVICE AREA - That area that can be called without incurring multimessage units or a toll charge.

MESSAGE UNIT - The unit of measurement for charging for local message use, based upon time and distance.

MULTIJURISDICTIONAL SYSTEM - A system covering more than one political boundary or agency.

NETWORK - 1. A series of points interconnected by communications channels.

2. The switched telephone network is the network of telephone lines normally used for dialed telephone calls.

3. A private line network is a network of communications channels confined to the use of one customer.

NO-COIN DIALING - (See DIAL TONE FIRST.)

OVERFLOW ANSWERING - An answering position for every 911 line serving a PSAP.

PABX - Private Automatic Branch Exchange; see PBX explanation.

PBX - Private Branch Exchange; a telephone switchboard with many stations not individually identifiable to the telephone company's switching network.

PSAP - Public Safety Answering Point; the initial answering location of a 911 call.

PUBLIC AGENCY - "Public agency" means the state, and any city, county, city and county, municipal corporation, public district, or public authority located in whole or in part within this state which provides or has authority to provide firefighting, police, ambulance, medical, or other emergency services.

PUBLIC SAFETY AGENCY - "Public safety agency" means a functional division of a public agency which provides firefighting, police, medical, or other emergency services.

REFERRAL METHOD - Calling party referred to a secondary number.

RELAY METHOD - The call is answered at the PSAP where the pertinent information is gathered and then the interrogator relays that information to the proper public safety agency for their action. This can be accomplished by radio, intercom, telephone, etc.

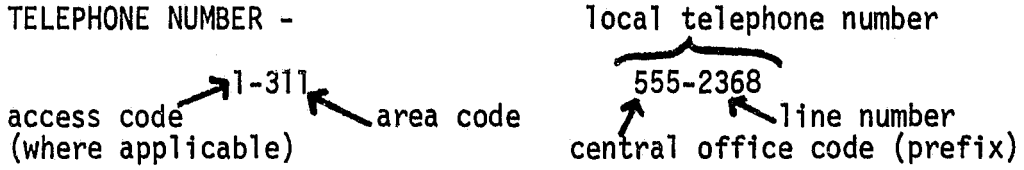
RING BACK - Permits the answering point to ring the hung up telephone on a held circuit; this feature is useful when a calling party has failed to provide all necessary information to the answering point before hanging up.

SELECTIVE ROUTING - Selective routing is a feature that regardless of municipal and telephone company wire center boundary alignments the 911 caller is automatically routed to the proper PSAP serving his community.

SWITCHED NETWORK - A complex of diversified channels and equipment that automatically routes communications between the calling and called person or data equipment.

TELEPHONE LINE - A telephone line from a telephone company central office that is connected to key or nonkey telephone equipment.

TELEPHONE NUMBER -



TRANSFER METHOD - The PSAP interrogator determines the proper responding agency and connects the caller to that agency that would perform the necessary dispatching in accordance with prearranged plans with cooperating agencies.

TRUNK - A telephone line from a telephone company central office to a subscriber's PBX or PABX equipment.

UNLISTED - Telephone numbers not listed in directories, such as for public telephones and certain private lines.

WIRE CENTER - (See CENTRAL OFFICE.)

Appendix A

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DIAL 911 for EMERGENCIES

Planning Guide for Implementation Meeting

-Community responsibilities.
-The following is intended only as a guide, pointing out some of the factors which the community may encounter in establishing 911. No attempt was made to indicate an order or priority or to cover all contingencies.
-Participation
-Emergency Services
*-Which services will participate initially (police and fire minimum)
-Which services will be added later and when (ambulance, poison control, utility trouble-shooter, etc.)
-What manpower must be contributed by agencies
*-What area(s) will be serviced (city, county, region)
-911 Public Safety Answering Point (PSAP)
*-Where will PSAP be located
-Who will staff PSAP
-What are manpower requirements
-24-hour day
-7-day week
-Costs
*-Who will be responsible for the telephone bill
-City
-County
-Regional Council
-How will the total cost be prorated
-Per capita
-Assessed valuation
-Financing
-Federal grant
-Bond issue
-Normal budget allocation
-Operation
-How will calls be handled
-Which calls will be directly dispatched
-Which calls will be transferred
-Which calls will have information relayed
-Which calls will be referred to another number
-Resolution of jurisdictional problems
-Boundaries
-Command and control

-Appoint Implementation Committee to resolve problems and handle details

Send a letter requesting nine-one-one service to the telephone company(s). Items marked with an asterisk should be answered in your letter. The letter should be signed by the elected public officials for public agencies. Heads of agencies should sign for non-public agencies. All agencies to be served must sign. A copy of the letter should be sent to the Iowa Department of General Services, Communications Division.

END