PLANNING MANUAL FOR 911 IMPLEMENTATION IN MINNESOTA

PLANNING MANUAL FOR 911 IMPLEMENTATION IN MINNESOTA

Prepared By:

Michaud, Cooley, Hallberg, Erickson & Associates, Inc.
Consulting Engineers
Minneapolis

MCHE Commission Number: 05415

Commissioned By:

State of Minnesota
Department of Administration
Telecommunications Division
St. Paul

Funded By:

Governor's Commission on Crime Prevention and Control
St. Paul

Grant Number: 2306012075

February 22, 1977

FOREWORD

911 was established as the national emergency telephone number in 1973. Implementation of 911 service is, however, a local responsibility. The purpose of this manual is to provide the information needed by local officials to investigate, plan and implement 911 service with minimum outside assistance.

Included in this manual are:

A. 911 background information for briefing purposes.

B. A list of suggested participants in the planning process.

C. Planning procedures and guidelines.

This manual contains comprehensive information procedures for 911 planning. Because individual public safety agencies have differing characteristics to which 911 service must be adapted, some outside planning assistance may be required. For information about 911 planning assistance that may be available and for information about any Minnesota 911 legislation, public officials should contact the Telecommunications Division, Department of Administration, Room G-4, Administration Building, St. Paul, Minnesota 55155.

Funding for this project was provided by a grant to the Minnesota Department of Administration from the Governor's Commission on Crime Prevention and Control. The funds for this manual were provided through the Law Enforcement Assistance Administration block grant program under the Safe Streets Act of 1968, as amended, and the Crime Control Act of 1976, PL 94-503. Necessary matching funds were provided by the Minnesota Legislative Advisory Committee.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF APPENDICES

I. 911 BACKGROUND INFORMATION

I. 911 BACKGROUND INFORMATION

A. The Reason for a Universal Telephone Number

In emergency situations, whether related to law enforcement, or fire or medical, or any combination of these services, response time is a critical element in the success rate for saving lives and reducing the loss of or damage to property. In most emergency situations, a call is made to a public safety agency with a request for assistance. There are many factors which contribute to the time delay between the recognition of an emergency situation and the reaching of personnel at a public safety agency who can dispatch assistance. That delay could add an average of several minutes to the total response time which could contribute to a needless loss of life and property in Minnesota.

This initial delay can be reduced if a person can dial 911 from any telephone in Minnesota at any time to receive assistance for any kind of emergency.

B. The Reason Why 911 was Selected as the National Emergency Number

The first official mention of the need for a nationwide emergency telephone number in the United States was the 1958 recommendation of the International Association of Fire Chiefs (IAFC) that a single nationwide fire reporting telephone number be adopted.

In 1967, the President's Commission on Law Enforcement and the Administration of Justice, and the President's Commission on Civil Disorders, expressed strong interest in a national emergency telephone number.

The concept of a universal emergency telephone number was not new inasmuch as England had been using 999 nationwide since 1937. Other European countries utilizing universal emergency numbers include Belgium (900), Denmark (000), and Sweden (9000).

The American Telephone and Telegraph Co. (AT&T) recommended in 1963 that the number 911 be used in the United States. This number was selected for several reasons: no area codes or exchange prefixes used 911 (prefixes are the first three digits of a seven digit telephone number); no telephone exchanges in the country used 911 as a special service code (such as 311, 411 or 811); conversion costs to free up the code in existing central office equipment were less than other combinations; 911 was an easily remembered number; it could be dialed in the dark; and it was more unlikely to be randomly dialed by young children playing with the telephone.

C. The Current Status of 911 Nationally

As of January 1977, nearly 600 areas in the United States had 911 service. These 911 systems now serve approximately 45 million people or about 20% of the United States population.

Several states have passed legislation which requires implementation of 911 as a statewide emergency telephone number. California was the first state to adopt such legislation. Since then, some form of mandatory requirement involving 911 implementation has been enacted in Louisiana, Florida, New York, Massachusetts and Illinois. Both Wisconsin and Minnesota have introduced 911 bills in the 1977 legislative sessions.

A number of major cities in the United States have implemented 911 programs during the past several years. These include New York City, Washington, D.C., Philadelphia, Denver, Detroit, Omaha and Seattle.

D. 911 Planning in Minnesota

Planning of 911 programs in Minnesota started in 1969 with the first implementation of a system by the City of Windom, followed in 1972 by the City of Austin. Other communities implementing systems later were: St. James, Faribault, and East Grant Forks (in conjunction with Grand Forks, North Dakota).

With interest in 911 beginning to develop throughout the state, the Minnesota Department of Administration recognized a need for an early planning effort to prepare for more consistent development of 911 in Minnesota. The Department realized that 911 systems had to meet local situations as well as county needs.

In 1974, a consulting firm was retained to assist the State Department of Telecommunications in developing 911 system concepts and obtaining data for planning for each Minnesota county. This data was to be used as a foundation for future 911 activities. Local officials would be expected to modify or update the information as necessary for the eventual implementation of 911 service.

The consultant had to collect basic data on each county's public safety agencies, telephone exchanges

and companies. This was accomplished through personal contacts and interviews throughout the state during 1974-1975. Data was published in 1975 in a report, *Basic Planning Data for 911 Implementation in Eighty Minnesota Counties,* Michaud, Cooley, Hallberg, Erickson & Associates, Inc. Comprehensive data for the seven county Minneapolis-St. Paul metropolitan area was published in a separate report and is on file with the Metropolitan Council offices in St. Paul.

These activities produced a heightened interest in 911 and resulted in the ultimate implementation of 911 service in Zumbrota, Moorhead, Rochester, Morton, Redwood Falls and Duluth, plus the start of detailed planning in the seven-county metropolitan area.

During 1976, the 911 planning phase was completed for all counties in the state. System concepts and planning data were developed and presented by the consultant at public meetings to county officials of each county in Minnesota. As a result of these meetings, officials in several counties appointed planning committees to work with the consultants to review individual plans and develop appropriate configurations that could feasibly be implemented. In those counties where selection of a 911 plan was not acted upon, or approved, the consultant recommended a plan commensurate with the county's requirements and resources. These recommended plans are summarized in the report, ***911 Planning in Minnesota,*** **1976, Michaud, Cooley, Hallberg, Erickson & Associates, Inc.**

II. PRELIMINARY 911 PLANNING

II. PRELIMINARY 911 PLANNING

A. Local Commitment

Effective planning for 911 implementation requires a significant commitment from local officials. As 911 planning will be a new experience, local groups and agencies must be relied upon to provide expertise and leadership.

Representatives of some of the following groups could be members of the planning committee:

1. The county board
2. County staff (coordinator, civil defense director, auditor)
3. County law enforcement (sheriff, police chiefs)
4. County fire personnel
5. County emergency medical personnel
6. Local telephone companies
7. Elected officials
8. Prominent citizens
9. Others as appropriate

The members of the planning committee will have to have a good understanding of the magnitude of the planning process and be willing to accept the necessary commitment to develop the plan.

B. The Planning Sequence

1. **County Board Resolution**
   The appropriate group to initiate 911 planning is the County Board. The Board should lend authority to the project by passing a general resolution in support of 911 and by concurrently establishing a committee to start the planning. (See Appendix A for a sample Board resolution.)

2. **Charge to the Committee**
   Before the planning committee gets under way, the major planning elements of a 911 system should be defined by the County Board. Along with these elements, the Board should set a date for completion of the task. The major planning elements are:

   a. The area to be served by the 911 system.
   b. The location of the 911 answering point(s).
   c. The methods for dispatching calls from the answering point to emergency personnel.
   d. The basic type of telephone trunking used in routing 911 calls to the answering point(s).

   (Appendix B contains a detailed discussion of these elements.)

3. **Technical Assistance**
   During the preliminary planning sequence, technical advice may be required to supplement the information outlined in this manual. The purpose in seeking such assistance would be to develop options and associated cost estimates for consideration by the committee.

   Information regarding the availability of technical advice can be obtained from the Telecommunications Division, Department of Administration, Room G-4, Administration Building, St. Paul, Minnesota 55155.

4. **Committee Organization and Education**
   a. **The First Meeting.** The first meeting should be to introduce the subject of 911 and to organize the committee. A chairperson should be elected and a secretary designated to prepare and distribute minutes, meeting notices and copies of other materials. A meeting schedule should be established and agreed upon so the work of the committee will be completed by the date specified by the Board of Commissioners.
   b. **The Second Meeting.** Prior to the second meeting, the chairperson or secretary should obtain and distribute background information about 911 to the committee. This background information should include:
      - If passed, a copy of Minnesota 911 legislation.
      - Information explaining the value of 911 (Appendix C).
      - Data on the status of 911 in Minnesota and the United States (provided in Section I of this manual).
      - Data on telephone exchange areas and public safety agencies (contained in preliminary 911 plans on file with the county auditor).
      - The suggested plan or plans for the 911 service area (on file with the county auditor).
      - Recommended year of implementation (negotiated with telephone companies).

   During the meeting, this background information should be reviewed. A discussion of the basic information will most likely lead to a requirement to obtain

additional information about local public safety operations.

c. **Continuing Meetings.** Additional meetings should be conducted until a consensus is reached by the committee regarding the four major elements described in Item 2 (Charge to the Committee) of the Planning Sequence. This agreement should then be submitted as a recommendation to the Board.

5. **Board Action on Major Planning Elements**
The Board should review the major planning recommendations of the committee. Assuming the Board approves the recommendations, they would then instruct the committee to prepare a complete configuration plan in accordance with Section III of this manual.

III. DEVELOPMENT OF CONFIGURATION PLAN

III. DEVELOPMENT OF CONFIGURATION PLAN

A. Planning Guidelines

After a consensus has been reached regarding the four major planning elements (page 3), a configuration plan can be developed. The configuration plan will be used for price estimations by the telephone companies. Initial and recurring costs are important considerations; implementation cannot be achieved without a price agreement.

Before development of the plan begins, the committee should refer to Appendix D which contains suggested State of Minnesota 911 Planning Guidelines. Although they are not official at this time, they may become official rules in the future. They have been prepared to assist in the development of a uniform level of 911 service throughout the State.

B. Four Major Planning Elements

Appendix E is an example of a configuration plan format designed to assist the local committee in writing a plan that considers the Planning Guidelines and the essential features to an operational system.

Items A through D of the plan format should be completed in reference to the four major planning elements described in Section II, Item B-2. The non-applicable parts of D should be crossed out.

The number of direct lines needed depends upon the population of the exchange service area, the grade of service required, and eventually the cost of those lines. The telephone companies can provide assistance in this area. The Norman County configuration plan is provided as an example in Appendix F.

C. Additional Operational Planning

1. **Advanced Features**
   Besides the four major planning elements, there are several operational options which can be provided. The advantages of these options and their features are described in Part E of this section.

   Features which are not wanted, or cannot be provided by the telephone companies, may be deleted from the plan. However, the optional features of call-hold and re-ring can only be provided where dedicated 911 trunks are installed and telephone company equipment can accommodate these features.

2. **Back-Up**
   In the event that 911 should become inoperative, some alternate method of reaching the answering point should be provided. The center will need to have an administrative telephone number to conduct regular business. The current seven-digit telephone number should be kept as a back-up number for a period of time after cutover because of previous wide public usage.

D. Administrative Telephone Capability

The administrative telephone capability is included as a part of the back-up system mentioned above, and does not need to be a separate item of equipment in the plan.

E. Public Safety Answering Point Equipment

Answering point equipment is an integral part of the answering point operation and is described in Part G of Appendix E. Following are some general guidelines for the selection of this equipment:

1. **Source of Telephone Equipment**
   Telephone answering equipment may be leased from the telephone company serving the public safety answering point, or this equipment may be purchased. If the equipment is purchased, a maintenance agreement should be included.

2. **Number of Answering Instruments**
   At least two telephone answering instruments should be ordered for every answering point. Push button or rotary dial telephones may be selected, and, depending on the need, two or more administrative lines may be utilized.

3. **Touch Tone or Rotary Dial Dialing**
   Though more expensive, the touch tone system, if available, is recommended because it is faster than rotary dialing. The extra cost must be evaluated in relation to frequency of use.

4. **Maps**
   Maps are needed by public safety answering point personnel to define the 911 service area, the service area of each public safety agency and the areas covered by mutual aid agreements. These maps should be in

prominent display for immediate reference by PSAP personnel.

5. **Other Telephone Lines**
   Depending on distance and other operational requirements, private telephone lines may be run from the answering point to a fire station, hospital, or law enforcement agency. These lines may or may not be charged to the operation of the 911 center as, in many cases, the requesting agency pays for the service.

F. Concurrent Planning

The following items do not necessarily have to be included in the 911 planning process but they could assist in the prevention of some problems (these items are included in part H of Appendix E).

1. **Systematic Addressing**
   Providing the most appropriate emergency assistance in the shortest possible time requires precision in every step of the communications process. One of the most important steps is the ability to determine and to be able to tell response personnel the exact location of an emergency event in the shortest time possible.

   To assist in reducing response time, it is preferable to have a specific street address or geocoded location for every parcel of property in the county. In some counties, location systems are already in use. Where there is no such system, the planning committee should investigate the possibility of implementing a system either before or simultaneously with the cutover to 911.

2. **Mutual Aid Agreements**
   Mutual aid agreements are currently in existence throughout the state, particularly among fire departments. These agreements are entered into to help neighboring jurisdictions under circumstances where the normal force is committed elsewhere or the scope of the emergency is too large for one department to handle. These pacts can be expanded to allow, under certain circumstances, neighboring agencies to initially respond to a call for help when they are closer to the event than the agency that normally provides service.

   Mutual aid pacts should compensate for the costs of such assistance and should provide for immediate notification of the jurisdiction normally involved.

   Insurance coverage should be reviewed and changed, if necessary, to cover mutual aid activities.

   The 911 planning committee may recommend that copies of mutual aid agreements be in the 911 emergency center.

IV. CONFIGURATION PLAN APPROVAL

IV. CONFIGURATION PLAN APPROVAL

A. Cost Approximations

The first step in the process of gaining approval of the configuration plan as developed in Section III is to give a copy of the plan to the appropriate companies providing service in order to get cost information. The Minnesota Telephone Association has recommended that the telephone company which provides telephone service to the answering point be the coordinator for price information and installation of the system. Guidelines, suggestions and recommendations to help planning and implementation of 911 by telephone companies are included in *Minnesota Telephone Association 911 Planning Guide,* published in 1976, by the Minnesota Telephone Association, 712 Osborne Building, St. Paul, Minnesota 55102.

Estimated 911 system costs have been developed for each Minnesota county for which a 911 plan had not been approved by December 30, 1976. These costs are summarized in Table 1.

Table 1 lists expenses estimated for a 911 system with enough dedicated trunks so that less than one call in every 100 will get a busy signal on the first try. Public safety answering point equipment consists of two multi-button key type telephones. The number of 911 lines will be determined by the density of telephones and the number of exchanges. No special features such as call-hold, re-ring and forced disconnect and no special alerting equipment is included.

In some counties, cost estimates will be well within the ability to pay from local sources alone. In other counties, the ability to pay for such services from local sources will be marginal, and in some counties it will be virtually impossible. To determine final costs for 911 service, it is recommended that a plan be completed in the event that funding assistance becomes available. Information about funding sources is included in Section V of this manual.

B. County Board Review

Once the configuration plan has been prepared and the cost approximations have been submitted, the county board should review the documents to satisfy itself that the information is sufficient to proceed with a public meeting or meetings. If more information is necessary, it should be obtained before proceeding further.

C. Public Meeting

When the plan and pricing data is acceptable, the county board may announce a public meeting to review and discuss the program. Public safety and elected officials throughout the county should be specifically invited. Citizen reaction to the plan is important in securing support for implementation.

D. Community Support

The plan may be submitted by the county to officials of political subdivisions in a 911 service area with a request for a resolution of support for the recommendations.

E. County Board Approval

If there appears to be general support for the recommendation, the County Board of Commissioners should formally adopt the plan and designate individuals or a group to proceed with implementation. Participants could include the county sheriff, the county staff, and county civil defense director, or city government personnel.

TABLE 1
Estimated Cost for Basic 911 Telephone Service in Minnesota Counties Without 911 Plans as of December 30, 1976

County	Annual Cost
Aitkin	$18,648
Becker	11,988
Beltrami	18,960
Benton	2,808
Big Stone	7,140
Blue Earth	14,592
Brown	13,668
Carlton	10,632
Cass	26,148
Chippewa	6,000
Chisago	8,904
Clay	12,912
Clearwater	8,196
Cook	4,452
Cottonwood	6,624

TABLE 1
(Continued)

County	Annual Cost
Crow Wing	$19,812
Dodge	5,532
Douglas	13,080
Faribault	16,884
Filmore	17,772
Goodhue	18,204
Grant	7,320
Houston	9,660
Hubbard	7,356
Isanti	3,960
Itasca	31,380
Kanabec	1,788
Kandiyohi	14,004
Kittson	8,136
Koochiching	12,252
Lac Qui Parle	6,288
Lake	9,384
Lake of the Woods	3,816
Le Sueur	6,324
Lincoln	4,944
Lyon	10,344
Mahnomen	1,668
Marshall	20,124
Martin	10,884
Mc Leod	9,852
Meeker	$ 6,708
Mille Lacs	11,388
Morrison	15,204
Murray	6,660
Nicollet	6,240
Nobles	14,508
Ottertail	35,424
Pennington	3,132
Pine	19,044
Pipestone	5,868
Polk	32,904
Pope	7,260
Red Lake	4,524
Redwood	16,428
Renville	11,016
Rock	5,172
Roseau	6,108
St. Louis	76,800
Sherburne	8,664
Sibley	6,396
Stearns	43,452
Stevens	4,008
Todd	10,980
Traverse	4,632
Wabasha	10,896
Wadena	6,120
Watonwan	6,888
Wilkin	5,460
Winona	11,988
Wright	22,020
Yellow Medicine	16,164

V. IMPLEMENTATION

V. IMPLEMENTATION

A. Funding

As mentioned in Section IV-A, there can be considerable differences in cost requirements between counties. It is expected that there will be some financial assistance available from state or federal sources to assist in 911 implementation. The amount and source of these funds is subject to constant change. For information about the current status of funding, contact the Telecommunications Division, Department of Administration, Room G-4 Administration Building, St. Paul, Minnesota 55155.

Regardless of what outside assistance for funding is available, there will be some cost for 911 services that must come from local sources. The County Board of Commissioners, in cooperation with local units of government, must come to some agreement as to how these costs will be paid.

B. Joint Powers Agreements

Final agreement must be obtained on the exercise of joint powers in the sharing of service and/or cost. Such agreements currently exist and in many cases, a simple review of those agreements is appropriate.

C. Ordering Telephone Service

After funding is provided for, and joint power agreements are exercised, a contract for service must be negotiated between the designated organization and the telephone companies providing the service. An installation cutover date should be established.

D. Public Education

As soon as the 911 system has been ordered from the telephone companies, plans should be made for a public information program.

Releases should be written for radio, newspaper and television coverage informing the public on the capabilities and proper use of the 911 system.

Information programs can be designed for presentation to school children, senior citizens and other special groups. When telephone companies issue new directories they should indicate that 911 is the primary emergency telephone number in the service area. Billboards and postings in public telephone booths can be used to inform people traveling through the area about 911.

The committee should include recommendations regarding public education as part of the plan. Every effort should be made to inform all of the people who live within the service area about 911.

E. Concurrent Planning

If a systematic addressing system and changes in mutual aid agreements are planned, they must be coordinated by the planning group with the 911 implementation date.

F. Personnel Training

911 call answering personnel will receive a variety of requests for emergency assistance. To assure effective service, procedures of these agencies should be easily understood and personnel should receive formal training accordingly.

Answering personnel must also be thoroughly familiar with all of the capabilities of their equipment used for answering 911 calls and for alerting public safety personnel.

Answering personnel are occasionally required to provide interim medical advice until medical personnel can reach the scene or until the caller can be connected by telephone to medical personnel. Special emergency medical training should be provided to answering personnel in accordance with recommended local standards.

Fire support training can help personnel give advice regarding actions to take until assistance arrives during fire events.

In general, an effective training curriculum can be developed and administered by public safety personnel at the local level through a coordinated effort of the agencies concerned. The 911 planning committee should review needs and make specific training recommendations as part of its 911 plan.

VI. GLOSSARY

VI. GLOSSARY

Busy Hour Call Volume	The average number of calls that are received during the busiest hour of a 24-hour day.
Call Extending	The process of electrically connecting a received call to a different location without the calling party having to hang up and dial again.
Call Hold	The capability of the answering point equipment to maintain connection to the calling party's telephone after the calling party has hung up.
Call Referral	The process of giving the calling party a telephone number to call for the service required.
Call Relay	The process of receiving a message from a calling party and passing that message either verbally or in written or visual form to a different location.
Call Transferral	The process of connecting a calling party to a dispatcher who handles and dispatches the call.
Central Office	Telephone equipment which serves the local telephone subscriber, and provides entry into long distance service.
Circuit	A telecommunications path over which information may flow.
Conversion Cost	That cost which telephone companies must spend to allow each telephone central office to recognize and accept the 911 number and switch the call outbound.
Dedicated Trunk	A telephone circuit which is used exclusively for one purpose. (In this case the circuit would only be used for 911 calls.)
Dialtone First	Configuration of a pay telephone to allow dialing 911, 411, or 0 without the need for depositing a coin.
Direct Dispatch	A method whereby answering personnel at 911 centers select and dispatch personnel and equipment.
EMS	Emergency Medical Services – A term used by Health Planners to cover ambulances, personnel, communications, emergency rooms, physicians and nurses involved in providing emergency medical assistance.
Exchange	See Telephone Exchange.
Forced Disconnect	Forced disconnect allows the called party to disconnect the call at will.
LEC	Law Enforcement Center.
Mutual Aid Agreements	Cooperative agreements between neighboring public safety agencies permitting emergency services beyond or adjacent to their normal service areas.
Point-to-Point Radio Channel	A radio frequency which allows one emergency base station to communicate by radio with another emergency base station (usually neighboring counties in this application).
Prefixes	The first three digits of a seven-digit telephone number. Each prefix identifies an individual telephone exchange.

Preliminary Plan	A tentative plan based upon available information but likely to change. When general agreement on the preliminary plan occurs, it is possible to develop a specific, final plan.
PSAP	Public Safety Answering Point.
Public Safety Agencies	Any public group charged with the protection of life and property in the areas of law enforcement, fire protection, emergency medical services, civil defense, etc.
Re-ring	The capability which permits the continued connection and ring-back to a calling party from the PSAP after the calling party has hung up.
Service Area	The area which is served by a single 911 public safety answering point.
Tandem Trunk	A telephone trunk that goes from one telephone exchange through a second central office to get to a third exchange.
Tariff Rate	A government regulated rate that a utility may charge for specific services.
Telephone Exchange	A grouping of central office equipment identified by the first three digits of a seven-digit telephone number.
Telephone Trunk	A telephone line between central offices which serves different users at different times.
Toll Trunk	A telephone trunk used for long distance service.

APPENDIX A

APPENDIX A. SAMPLE COUNTY RESOLUTION

RESOLUTION

RESOLVED, that the Board of County Commissioners of _____ County, endorses the concept of a countywide 911 emergency telephone service and is committed to the eventual implementation of such a program on the earliest date feasible for completion of such service.

This resolution adopted by the Board of County Commissioners at their session of _____, 197___.

APPENDIX B

APPENDIX B. THE FOUR MAJOR 911 PLANNING ELEMENTS

Element A: The Area to be Served

After careful study, the county jurisdictional boundary appears to define best the area to be served. Unfortunately, 911 calls can be routed to only one location for each telephone exchange (without costly computer equipment) as the telephone service areas normally do not match county boundaries. Since calls cannot be automatically separated out of exchanges (except primarily in the Twin Cities Metropolitan Area) which cross county boundaries, some basic compromises must be made.

One compromise which must be made is to define a service area by the boundary of a telephone exchange or a group of telephone exchanges. This approach presents no problem for those exchanges which lie entirely within a county's borders. Those exchanges which lie in two or more counties, however, create some unique call handling problems that must be addressed in the planning process.

No matter where the 911 calls are answered for those exchanges which lie in several counties, some of those calls will be answered by the "wrong" public safety answering point.

The most effective way to minimize the effect of this situation is to route all 911 calls to the answering point which services the majority of people who live in an exchange area. If this procedure is followed, approximately 94% of all 911 calls in the state will be answered at the appropriate answering point. The handling of the calls is discussed in Element D, below.

These criteria were used in describing the recommended service area for each county and are contained in preliminary 911 plans on file with each county auditor. If, for economic or other reasons, an answering point serving several counties is contemplated, the same criteria apply. It is probable that all counties will not convert to a 911 system simultaneously, and temporary arrangements will have to be made to assist people who might dial 911 by mistake.

Element B: The Location of the Public Safety Answering Point(s)

Available information indicates that approximately 80% of all calls for emergency service are for law enforcement assistance. Almost all counties have a 24-hour law enforcement facility and that facility is the most likely candidate for a 911 public safety answering location.

The important difference between existing emergency answering locations and potential 911 answering points is that the 911 points must be prepared to accept and answer all emergency calls to include law enforcement, fire and emergency medical services. If a facility is not equipped for 24-hour answering of emergencies, it cannot serve as a 911 public safety answering point.

Before basic agreement can be obtained for participation by fire and EMS agencies, a discussion of the alerting methods described in Element C may be required. All of the available methods are acceptable except call referral. In some counties, multiple answering points may be appropriate.

Provision of 911 does not provide a significant cost difference to justify by itself consolidation of answering/dispatching facilities. Any evaluation of consolidation must be made comparing the operating of separate facilities only, with or without 911.

Element C: The Methods of Dispatching Calls

Once a 911 call is received, the answering person has four basic methods of dispatching calls to the appropriate agency. It is important in the preliminary planning phase that these methods are reviewed with the participating public safety agencies, not only to inform them but to gain their cooperation.

All public safety agencies involved can be alerted by any one of the following dispatching methods regardless whether an initial call is received at a local or neighboring 911 PSAP.

1. Direct Dispatch — A method whereby answering personnel at 911 centers select and dispatch response personnel and equipment.
2. Call Transferral — The process of connecting a calling party to a dispatcher who both answers the call and dispatches.
3. Call Relay — The process of receiving a message from a calling party and passing the message either verbally or in written or visual form to a different location.
4. Call Referral — The process of giving the calling party a telephone number to call for the service required. (This method is not recommended for emergency situations.)

Element D: Telephone Routing to be Used

Three methods for routing calls from a telephone company central office to the answering point should

be considered by the 911 planning committee: **direct dedicated trunks, tandem dedicated trunks,** and **in-wats lines.**

Direct dedicated trunks are telephone lines dedicated to a specific use. In the case of 911, these lines are used only for incoming emergency calls. The caller does not have to compete with the rest of the telephone network for an open line. The number of lines that should be provided should insure the probability that less than one caller in 100 will receive a busy signal on the first try during a normal busy hour.

Tandem dedicated trunks allow the user to route a group of trunks to an intermediate location and combine them into a reduced number of trunks in order to reduce the mileage charges from that point to the PSAP. The main disadvantage to this trunking arrangement is the loss of the capability to incorporate call-hold, re-ring, and forced disconnect features.

Tandem trunking is technically not feasible in some telephone exchanges.

In-wats is the third alternate for routing incoming calls to the PSAP. In-wats allows a caller to dial a distant location without charge. The party receiving the call pays a monthly rate for the use of this line.

If in-wats is used in a 911 system, a caller would simply dial 911 and a special switching unit would automatically dial the in-wats number and connect the call. Routing calls in this manner may result in savings to a county since the charges for in-wats may be less than the accumulated mileage charges for direct or tandem dedicated trunks.

The planning committee should keep in mind that if the additional features of call-hold, re-ring, and forced disconnect are wanted, then direct dedicated trunking is the only option available to them. However, if they wish to have 911 without these features, then either tandem trunking or in-wats lines are possible options.

The committee should verify all options available with the local telephone companies as technical difficulties may prevent the use of them in some areas (see Section III).

APPENDIX C

APPENDIX C. BENEFITS OF 911

Although public safety agencies in Minnesota have continuously sought to maintain the highest level of assistance and service to their communities, they can be provided with a number of significant benefits through a properly implemented 911 program.

Chief among these benefits is the time that can be saved from the point of initial awareness of an emergency to actual on-site assistance. Measured in minutes or even seconds, reducing this span of time can be critical in responding effectively to most emergency calls.

A better coordination of multiple emergency services, analysis of assistance needed and call priority is also possible with 911. Through a central public safety answering point, unnecessary duplication of services can be avoided and a more effective scheduling of personnel and resources made possible.

Once fully implemented, communities generally develop a confidence in 911 which contributes to a better informed public and an increased awareness of public safety assistance efforts.

A. Factors Causing Delay in Emergency Calls

In Minnesota, there are thousands of emergency telephone numbers in use. For any particular location, there are invariably different numbers to call for help from the individual public safety agencies. Compounding this problem is the fact that police, fire, ambulance, and the sheriff frequently serve different geographical areas so that next door neighbors may, for example, be served by the same police agency but different fire departments.

Several surveys have shown that only about 20% of all adults have memorized even one of these several emergency telephone numbers in their own local area. Even this knowledge of one number useful in one area limits reporting emergencies because:

- People frequently work and live and shop in different areas.
- People traveling are unfamiliar with local procedures for handling emergency calls.
- The average person moves several times in his lifetime.
- Boundaries of areas served by public safety agencies change occasionally, as do corresponding emergency telephone numbers.

Additional complications are –

- If a person is not at home or work, the identity of the city may not be known.
- Even at home, a person may not know which of several ambulance services to call or has no way of knowing what ambulances are in or out of service. This may necessitate calling a second or third service to find an available ambulance.
- Some agencies are not staffed 24 hours per day. Dialing 0 can introduce a delay if the operator is handling other calls. When reached, the operator must then determine the nature and location of the emergency and take additional time trying to locate the right response agency. This can be a complicated task when the operator may be many miles from the emergency location. The operator could realistically make two or more calls to reach the right agency.
- Time can be lost while looking for a directory and then finding the correct number.

Other difficulties encountered by persons trying to call for emergency help which result in time loss include:

- Calling the wrong agency, e.g., calling police when an ambulance is needed because only the police number is known.
- Emergencies requiring service from multiple agencies.
- No coin for a pay telephone.
- Misdialing due either to calling the number above or below the correct one, transposing numbers or dialing too fast.
- Many emergency calls in Minnesota involve a long distance charge; to avoid the charge, persons have been known to try to handle a problem by themselves.
- A light source is often required to aid in looking up and dialing telephone numbers.

With these factors in mind, it is not at all surprising that careful studies have determined that this "lost" time ranges from 1.60 to 3.83 minutes. It is after this time that response agencies are first alerted to respond.

B. Save Time – Dial 911

If 911 is available statewide, persons confronted with any emergency situation anywhere need only dial 911 to get all types of assistance, immediately, with these advantages:

- 911 is easy to use.
- 911 is fast.
- 911 is always answered.
- 911 can be dialed from a pay telephone without use of a coin.
- 911 can be dialed in the dark.
- 911 can be taught to be used by children who are too young to read.
- 911 calls are free to the caller.

C. The Power of 911

911 will save time, probably one minute or more in total response time by public safety agencies.

A personal rule of thumb of an Assistant Chief of the Minneapolis Fire Department helps emphasize this point: "The first five minutes of a fire are equivalent to the next five hours." National figures indicate that the temperature of a fire will approach 1000°F in five minutes producing superheated air which can kill humans instantly and cause explosive flaming of wood. Many other flammable materials can explosively flame at lower temperatures.

Stanford Research Institute concludes in *911 in Florida, A System Concept* that a one minute reduction in response time to fires in Florida will cause a reduction of loss in residential fires of 11% and a reduction of loss in non-residential and non-building fires of 2%. A reduction of that magnitude in fires alone will more than offset the cost of implementing 911 statewide in Minnesota. In addition, lives lost due to heat or products of combustion gases will certainly decrease if one minute can be saved in total response time.

In emergency medical situations, if breathing is stopped, brain damage may begin after three or four minutes. Death may occur in six to ten minutes. Saving one minute in total response time in this situation is very important. Fast action is also required in cases of heart stoppage, arterial bleeding and other serious medical problems.

The saving of time can be an equally important factor whether a response unit is able to reach the scene of an emergency within three to four minutes or even ten to fifteen minutes. In those areas where emergency vehicles have to be dispatched from distant points, call answering personnel may extend the caller directly to an emergency center for first-hand advice and instructions until assistance is forthcoming. No matter at what level emergency services are provided, the saving of time is vital to the successful rendering of aid to the individual.

To appreciate the full power of 911, consider a caller in a rural area faced with a serious medical emergency involving a family member. This caller is under stress and may even be hysterical. Speed and ease of calling for help are important. The caller uses the nearest phone, dials 911 and the person answering may:

- Radio dispatch the law enforcement unit (police, sheriff or state patrol) already in the field and nearest to the scene of the emergency for immediate first aid or paramedical treatment.
- Dispatch a fire-medical rescue unit if needed.
- Dispatch the nearest available ambulance.
- Extend the caller to a hospital emergency room or doctor for advice.
- Tell emergency unit personnel what the situation is at the scene, what adivce is being given and what to expect when arriving.
- Advise the first unit at the scene which support units are enroute and their estimated time of arrival.

In this situation, by dialing 911, the caller saves time, can be given emergency advice and can expect assistance from the nearest appropriate response unit. Thus, through 911, all responding units are coordinated by trained personnel using modern radio equipment for the most rapid and effective method of providing emergency assistance. Compare this to a situation where the caller is under stress and is attempting to contact the appropriate public safety agency, possibly after placing multiple telephone calls.

D. Extra Features Available With 911

1. **Call Hold and Re-Ring**
   The person answering the 911 call is able to hold a line open and re-ring the calling telephone, even if the caller hangs up his telephone, when the 911 system employs a dedicated trunk network. This re-ring feature has proved to eliminate false fire alarms and false bomb reports based on experiences in several cities. With call hold, the calling telephone location can be traced by the telephone company even after the calling phone is hung up.

2. **Forced Disconnect**
   With this feature, 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.

E. Indirect Benefits of 911

Many indirect benefits have occurred after 911 service has been implemented. For instance, when public safety answering personnel serve multiple agencies, the need for a high level of proficiency becomes apparent and is soon acquired through specialized communications center training which results in better emergency service to the public.

Personnel at public safety answering points working with all types of emergency service agencies are ultimately able to identify problem areas where improvements in these services can be made.

The experience of coordinating the efforts of multiple safety agencies through 911 can also be invaluable in large scale emergency situations where broad areas may be endangered by the spread of hazardous materials due to explosions or transport accidents.

APPENDIX D

APPENDIX D. STATE OF MINNESOTA 911 PLANNING GUIDELINES

As part of any planning, it is recommended that basic rules or standards for 911 service be maintained throughout Minnesota. It is further recommended that the public be fully informed on the proper use of 911 and the services provided if the public is to be served effectively through such a program. At present, it would appear that when and how to use 911 is frequently confused or misunderstood, and this type of confusion can only weaken 911 programs.

The following ten statements have been recommended as rules to be promulgated to assure uniform minimum acceptable levels of 911 service in Minnesota.

1. The primary published emergency number should consist of the 3-digit number, 911.
2. The only calls for assistance that should be accepted on 911 are those on dire emergencies requiring the dispatching of public safety personnel or which require specialized personal emergency advice; all other calls should be referred to the appropriate seven-digit administrative telephone number.
3. PSAP personnel should be able to alert all law enforcement, fire and emergency medical agencies serving the 911 service area even if those agencies are based outside that service area.
4. PSAP personnel should be able to extend any 911 call over a dial-up or direct telephone line.
5. Telephone exchanges adjacent to those already converted to provide 911 service should have equipment necessary to intercept 911 calls and to direct callers to a seven-digit public safety emergency number by means of a recorded message.
6. Standard tone signals should be provided to the 911 calling party in the normal manner.
7. Remote alarm equipment should not be connected to 911 circuits in any way.
8. All pay telephones should be converted by December 15, 1986, to allow 911 calls to be completed without use of a coin.
9. All answering locations to which 911 calls are routed shall operate 24 hours per day, every day.
10. Once a vehicle has been dispatched in response to a public safety emergency, it should not be recalled solely because the location of the incident is in a neighboring jurisdiction.

Following are guidelines suggested for consideration to assure the most effective level of 911 service. The first two are concerned with implementation of 911 service.

1. When 911 is implemented, one or more seven-digit number lines should be retained because:
   a. Some callers will still use the seven-digit number to call for emergency service.
   b. A number other than 911 is needed for the public to call for non-emergency service.
   c. Lines are needed for outgoing calls.
   d. A separate number is needed if a caller is unable to get through on 911 for any reason.
2. A location system and appropriate maps which can be used by PSAP personnel to quickly determine both the location of a public safety emergency and those response agencies to be alerted, should be provided prior to 911 implementation.

The next five guidelines concern equipment consideration related to 911 implementation.

3. Sufficient 911 lines should be planned so that no more than one out of each 100 911 calls will receive a busy signal on the first try during normal busy hours. The telephone company should be asked to take periodic measurements of call completion rates.
4. Answering equipment should permit answering point personnel to place one call on hold while answering another 911 call.
5. The following features should be evaluated on the basis of service versus cost except where 911 calls are selectively routed:
   a. Call-hold.
   b. Re-ring.
   c. Timed disconnect (forced disconnect where time-out is not provided).
6. Emergency electrical power should be provided for all answering point equipment that will insure continuous operations for a minimum of 24 hours during commercial power outages.
7. Cables and cable entrances to answering points should be underground where conditions permit. Access control and security of 911 answering centers and associated dispatch centers should be designed to prevent disruption of operations.

The following are policy guidelines:

8. Public officials should carefully define what calls will be handled on 911 and what means of providing adequate education for the public will be employed.
9. The date and time of receipt for each 911 emergency call shall be documented.

APPENDIX E

APPENDIX E. 911 CONFIGURATION PLAN FOR _____ COUNTY

Element A: 911 Service Area(s)

The entire geographic area within the _____

_____

telephone exchanges will be included in the _____ County 911 service area.

The specific exchanges served by each PSAP are:

PSAP	Telephone Exchange Areas Served by PSAP
_____	_____
_____	_____
_____	_____

The remaining telephone exchanges serving residents in _____ County will have calls routed as follows:

_____

_____

_____

if and when these counties establish 911 systems. Until that time, residents served by these telephone exchanges will be instructed to use their regular emergency telephone numbers. As a reminder, these telephone exchanges will be provided with equipment to intercept 911 calls and direct callers to a seven-digit emergency number by means of a recorded message.

Element B: Public Safety Answering Point(s)

Incoming 911 calls will be answered at _____. Hereinafter, this (these) location(s) will be referred to as the Public Safety Answering Point(s), or simply PSAP(s).

Element C: Alerting Public Safety Agencies

1. **Normal Alerting Method**

   The primary means of alerting public safety agencies in _____ County will be as follows: (Direct dispatch, call relay, call transfer).

Agency	Alerting Method
_____	_____
_____	_____

Agency	Alerting Method

2. Future Plans

It is suggested that the county investigate the use of radios or radio paging systems for all public safety agencies in the county presently being dispatched by fire-bar or telephone. With the advent of the centralized emergency call answering capability available when 911 becomes operable, radio alerting is by far the fastest mode of dispatching assistance.

Element D: 911 Call Routing

1. Direct Line Routing

Calls from the following telephone exchanges will be routed over direct dedicated lines as indicated.

Exchange	Number of Direct Lines

These direct lines are used exclusively for 911 calls and will be available even if the regular telephone network is overloaded with calls.

2. **In-Wats Routing**

Calls from the following telephone exchanges will be routed over the regular telephone toll network to in-wats numbers at the appropriate PSAP(s).

_____

_____

_____

_____

The following PSAP(s) will have the indicated number of in-wats lines.

PSAP	Number of In-Wats Lines
_____	_____
_____	_____
_____	_____
_____	_____

Element E: Advanced Features

The following special features are to be included on all direct lines as soon as they are available from the telephone companies.

1. **Call-Hold**

With call-hold, when a 911 call is received at the emergency center, only the center operator may release that call. If the calling party hangs up, the call stays connected and can be traced. If the calling party picks up the receiver again, he can talk only to the center operator until the operator releases the call by hanging up.

2. **Re-Ring**

When an operator has a call on call-hold, he may ring back the calling party by using this re-ring feature. This feature may not be available from all telephone companies.

3. **Forced Disconnect**

With this feature, an operator may disconnect any call which is tying up an incoming line. This situation may occur if someone deliberately tries to tie up a line or if the calling party is unable to return the receiver to the cradle. This feature may not be available from all telephone companies.

4. **Call Extending**

With this feature, emergency center personnel may extend a call over another telephone line so that the caller may talk with a person at another location. An example of use of this feature is the extension of a caller with a medical emergency to a hospital emergency room, so that medical personnel might provide advice about what to do until the responding emergency personnel arrive.

5. **Dial Tone First**

With this feature it is possible to dial and complete a 911 call from a pay telephone without use of a coin. This feature should be provided free of charge by the telephone companies based upon state requirements.

Element F: 911 Back-Up

In the event that a caller is unable to get through on 911 for any reason, he will be able to use the seven-digit administration line number (currently used as the emergency number).

Specific contingency plans should be prepared on a local level to handle the possible failure of the entire Public Safety Answering Point operation.

Element G: Answering Point Equipment

1. **Telephone Consoles**

   The termination equipment shall be _____ telephone consoles which will terminate all 911 trunks, administration lines and any direct lines used for dispatch or extension purposes.

2. **Equipment Source**

   The telephone equipment for the PSAP will be leased from _____ Telephone Company as opposed to buying interconnect equipment. The terms of the contract will call for maintenance and/or replacement of equipment by the telephone companies on a high priority basis.

3. All telephone equipment will use (rotary) (touch-tone) dials.

4. Maps of the service area depicting exact agency responsibility boundaries will be provided.

5. Direct telephone lines will be installed between the answering point and the following public safety agency locations:

Answering Point Location	Agency Location
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Element H: Concurrent Planning

1. **Location System**

   Planning for a systematic street numbering or geocoded location system should be initiated in the county. This system should be implemented as soon as possible to encourage its use and to assist present location identification methods.

2. **Mutual Aid Agreements**

   Formal agreements established between public safety agencies operating within the county and with agencies in neighboring counties should be documented and made available at the PSAP. Coded maps should be drawn up indicating the areas served by these agencies. These maps should be in plain view of PSAP personnel at all times.

APPENDIX F

APPENDIX F. 911 CONFIGURATION PLAN FOR NORMAN COUNTY

I. 911 SERVICE AREA

A. Public Safety Answering Point

Incoming 911 calls will be answered at Ada Law Enforcement Center. Hereinafter, this location will be referred to as the Public Safety Answering Point or simply PSAP.

B. 911 Service Area

The entire geographic area within the Ada, Perley, Halstad, Shelly, Gary, Twin Valley, Flom and Borup telephone exchanges will be included in the Norman County 911 service area.

The remaining telephone exchanges serving residents in Norman County will have their calls routed as follows, if and when that county establishes a 911 system:

Fertile, Winger and Beltrami exchange calls will be routed to the Polk County PSAP.

Until that time, residents served by these telephone exchanges will be instructed to use their regular emergency telephone number. As a reminder, these telephone exchanges will be provided with equipment to intercept 911 calls and direct callers to a seven-digit emergency number by means of a recorded message.

II. 911 CALL ROUTING

A. Direct Line Routing

Calls from the following telephone exchanges will be routed over direct dedicated lines as indicated.

Exchange	Number of Direct Lines
Ada	1
Perley	1
Halstad	1
Shelly	1
Gary	1
Twin Valley	1
Flom	1
Borup	1

These direct lines are used exclusively for 911 calls and will be available even if the regular telephone network is overloaded with calls.

III. SPECIAL FEATURES

The following special features are to be included on all direct lines as soon as they are available from the telephone companies.

A. Call-Hold

This feature allows PSAP personnel to maintain control of an incoming call. Only the PSAP personnel can release a call once it has been made. If the calling party hangs up, the call can be traced using this feature.

V. PSAP EQUIPMENT

A. Telephone Consoles

The termination equipment shall be telephone consoles which will terminate all 911 trunks, administration lines and any direct lines used for dispatch or extension purposes.

B. Call Extending

The ability to extend any call to an outgoing trunk or dial up line shall be provided. The dispatcher shall be capable of monitoring an extended call until he feels the calling party has been assisted properly.

C. Equipment Source

The telephone equipment for the PSAP will be leased from Norman County Telephone Company as opposed to buying interconnect equipment. The terms of the contract will call for maintenance and/or replacement of equipment by the telephone companies on a high priority basis.

D. Number of Answering Positions

Two (2) answering consoles will be installed.

E. Hold Capability

The telephone consoles will be capable of placing one call on hold while a second call is answered. This is a separate feature and is independent of the call-hold feature described in Section III.

F. Out Dial

Out Dial will be by means of touch tone dialing.

VI. BACK-UP PROVISIONS

A. 911 Back-Up

In the event that a caller is unable to get through on 911 for any reason, he will be able to use the seven-digit administration line number (currently used as the emergency number).

B. Contingency Plans

Specific contingency plans should be prepared on a local level to handle the possible failure of the entire Public Safety Answering Point operation.

VII. CONCURRENT PLANNING

A. Training

PSAP personnel should receive additional training in the areas of Emergency Medical Service (EMS) and fire support techniques. The level of this training should be established by the participating public safety agencies.

B. Mutual Aid Agreements

Formal agreements established between public safety agencies operating within the county and with agencies in neighboring counties should be documented and made available at the PSAP. Coded maps should be drawn up indicating the areas served by these agencies. These maps should be in plain view of PSAP personnel at all times.

C. Location System

Planning for a systematic street numbering or geocoded location system should be initiated in the county. This system should be implemented as soon as possible to encourage its use and to assist present location identification methods.

D. Pay Station Conversion

The conversion of all pay station telephones to "dial tone first" status should be encouraged. A commitment should be obtained from the participating telephone companies during the negotiations for regular 911 service.

E. Public Education Campaign

Planning for a county-wide public information campaign should begin immediately following the placement of an order for 911 service from the telephone companies. Every possible means should be utilized to inform the people living in and traveling through the area about 911 and its use and the boundaries of the service area.

VIII. 911 SYSTEM FINANCIAL DATA

A. Initial Capital Costs

The initial capital costs that may be expected to accompany 911 can be separated into two categories. The first involves the cost of upgrading existing telephone switching equipment to the status necessary to handle 911 call routing. The second is the actual cost of installing the new terminating equipment required at the PSAP.

In regard to the cost of converting telephone exchange equipment, it is felt that if switching equipment has been upgraded to common control or if the county is willing to wait until the equipment is upgraded according to the regular telephone company conversion schedule, then the conversion cost should be added to the total telephone company investment base. Thus, the county will not be assessed on an initial or recurring basis for the actual conversion of the telephone equipment. If, however, the county wishes to install 911 before the telephone companies have planned for common control conversion, then the county should negotiate a financial settlement for earlier conversion. The current conversion cost will vary widely between exchanges and this cost must be obtained by formal written request from each telephone company.

The installation costs can be approximated and it is estimated that these costs for the Norman County 911 system would be in the neighborhood of $1,500.00. The final figure cannot be determined before a precise design plan is approved.

B. Monthly Recurring Costs

The charges that fall within the category of monthly recurring costs are, for the most part, based on established rates and tariffs and therefore can be estimated with some degree of accuracy. The figures shown here are representative of the monthly charges that can be expected in Norman County for the type of 911 system that has been selected by the 911 planning committee. These figures should not be considered firm nor final until the exact configuration and number of lines (business, direct dedicated and private) is finally determined. At that time, a formal written request to each telephone company should be made by the county board to confirm the monthly charges.

NORMAN COUNTY 911 SYSTEM

PSAP Equipment	Monthly Recurring Costs (Estimated)
8 — Direct Dedicated Trunks to Ada PSAP	$626.00
8 — Trunk Terminations	$160.00
8 — Connections on PSAP Equipment	$ 27.00
2 — Multi-Button Telephone Consoles	$ 35.00
Total Basic Countywide 911 Service:	$848.00
Extra Features Optional:	
Call Extension Capability	$150.00
Call-Hold, Re-Ring and Forced Disconnect on Ada and Perley exchange lines only	$ 50.00

END