AGREEMENT TO PROVIDE TECHNICAL SERVICES

PARTIES:

THE CITY OF PORTLAND, OREGON, a municipal corporation of the State of Oregon (City), 1220 S.W. Fifth Avenue, Portland, Oregon 97204; and

MICHAUD, COOLEY, HALLBERG, ERICKSON AND ASSOCIATES
310 Plymouth Building, Minneapolis, Minnesota 55402

EFFECTIVE DATE:

The effective date of this Contract is _____, 1980

RECITALS:

(1) The City has determined that it is in its best interest to contract for the design of a 911 system.

(2) The Contractor has represented to the City that it has the technical capabilities and staff time and expertise to design a 911 system on the terms defined in this agreement; and

(3) The City and Contractor have each carefully inspected the Contract Documents identified in the agreement and certifies to each other that those documents are complete and accurate in every respect and comprise the final agreement of the parties;

(4) The City's authorized agent for the purpose of administration of this contract is the Project Manager, Ms. Merry Hanson. The Consultant's authorized agent for administration of this contract is Mr. Robert Erickson, Corporate Vice President.

(5) The Consultant shall assign Mr. Ronald Vegemast as Project Manager.

Now, therefore, in consideration of the mutual covenants herein, the parties agree as follows:

1. Contract Documents

Contract Documents consist of:

(a) This agreement;

(b) "A Request for Proposal for Engineering and Management Alternatives for the Implementation of 911, an Emergency Telephone Number" (RFP) dated October 31, 1979.

(c) Proposal of Contractor entitled "Professional Engineering Services Associated with 911 Service Planning and Implementation" Numbered 4101 and dated November 30, 1979.

(d) Statement of Work Dated December 26, 1979.

The whole of the RFP is incorporated and effective as written notwithstanding language indicating that further referenece may be made before incorporation.

The true, complete and final copies of the afore-described documents are those filed in the office of the City Auditor on December 27, 1979.

The Contract Documents from the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Bidding Documents. The Contract may be amended or modified only by a Change Order as herein defined.

In the event of an inconsistency between the Contract Documents, the inconsistency shall be resolved by giving precedence in the following order:

(a) This Agreement

(b) Statement of Work, Dated December 26, 1979

(c) Contractor's Proposal, No. 4101

(d) City's Request for Proposal (RFP)

2. Duties of Contractor

Contractor will furnish all materials, labor, engineering and services necessary to study and design a basic and expanded 911 system in accordance with Contract Documents.

The services include all labor and skills necessary to produce the final result required by the Contract Documents. The final result includes each obligation, recommendation, or choice contained in Contractor's Proposal and selected or to be selected by the City unless specific direction is contained in the Statement of Work.

3. Period of Performance

Performance as set forth herein will commence on the date on which Notice to Proceed is issued by City and all portions of the work shall be completed on or before the last day of the fifth month thereafter.

4. Compensation

The City agrees to pay to the Consultant, the total sum of $34,125.00 according to the following schedule:

Upon approval of Task A -	$ 4,289.00
Upon approval of Task B -	5,477.00
Upon approval of Task C -	4,289.00
Upon approval of Task D -	4,096.00
Upon approval of Task E -	2,993.00
Upon approval of Task F -	2,322.00
Upon approval of Task G -	10,659.00

5. Final Acceptance

Upon successful completion of a one-hundred twenty (120) day operations monitoring as described in the Contract Documents, Contractor shall notify City of completion of its obligations hereunder and request final payment of retainage. Upon receipt, City Council shall consider this request and accept the 911 System and authorize final payment of retainage if it finds that the Contract is complete.

6. Insurance

The Consultant shall carry errors and omissions insurance in the amount of $100,000 with a deductible amount not to exceed $25,000 for the duration of this contract.

7. Risk of Loss

Contractor shall take and assume all responsibility for its intentional or intentional or negligent acts. As between Contractor and the City, the Contractor shall bear all losses and damages directly resulting to it, or to the City, on account of Contractor's intentional or negligent acts arising out of its activities under the Contract. Should damage or destruction from such intentional or negligent acts occur to the contracted work, the work shall be repaired or replaced without cost to the City to the end that the final results required by the Contract Documents are avilable to the City at the costs set forth therein.

Consultant agrees to indemnify and save and hold the City, its agents and employees harmless from any and all claims or causes of action arising from the performance of this contract by the Consultant or the Consultant's agents or employees. This clause shall not be construed to bar any legal remedies the Consultant may have for the City's failure to fulfill its obligations pursuant to this contract.

8. Changes

A Change Order is a written order from the Commissioner in Charge or the City Council only.

The City Commissioner in Charge is authorized to order such changes as do not in the aggregate increase the Contract sum by more than ten percent (10%). The cost of the additional work and any additional time required shall be reasonable and relate only to that required for the specific change and will be paid by the City. Other changes shall be authorized by the City Council only.

9. Contrator's Right to Terminate Contract

Should the work be stopped by an public authority for a period of thirty (30) days or more, through no fault to the Contractor, or should the work be stopped through act or neglect of the City for a period of thirty (30) days, or should the City wrongfully fail to pay the Contractor any payment within thirty (30) days after it is due, then the Contractor, upon seven (7) additional days written notice to the City to correct such action, may stop work or terminate the Contract and recover from the City payment for all work properly executed at the Contract rate.

10. City's Right to Terminate Contract

The City reserves the right to terminate this contract at any time if any of the provisions of the contract are violated by the Consultant or by any of his subcontractors. In the event of such termination the City may retain all sums due under the contract and both the Consultant and his Surety shall be liable under his errors and ommissions insurance for all losses, expenses and damages caused to the City by reason of the Consultant's failure to complete the contract and Surety shall be required, at the City's option, to complete the project. Notwithstanding such termination, the Consultant and his Surety shall remain liable under the terms of the contract for work performed prior to such termination. The City Project Manager will determine the payment due contract for work performed prior to the date of contract termination.

11. Subcontractors

A subcontrator is a person or organization who has a direct contract with the Contractor to perform any of the work. The Contractor, as soon as practical after the award of the Contract, shall furnish City with a list naming all subcontractors proposed for the work. City may reasonably reject any subcontractor proposed for reasons of skill, experience, personnel policy, or financial ability. Notice of rejection of a subcontractor shall be given within five (5) days of receipt of Contractor's list.

Any contract awarded hereunder or any part thereof, will not be transferred, sublet or assigned without prior written approval of the City's Project Manager.

12. Miscellaneous Legal Requirements

1. All statutory, charter and ordinance provisions that are applicable to public contracts in Portland, Oregon shall be complied with.

2. This Contract is made in Oregon and the statutory and common law of Oregon shall apply. Should a dispute arise hereunder, the trial forum for settlement thereof shall be the Circuit Court of the State of Oregon.

3. Consultant represents to the City that he has investigated the project and understands its scope and requirements and has the professional expertise and time available to perform the services required herein in a timely and professional manner.

4. No official or employee of the City, who is authorized in his or her capacity to accept or approve, or to take part in decisions regarding this project, shall have any financial or personal interest in this contract.

13. Liquidated Damages

The Consultant shall be liable to the City as fixed, agreed and liquidated damages for each and every calendar day of delay: $100 per calendar day, payable only if one or more tasks are incomplete at the end of work period five as described in said Proposal Number 4101, submitted November 30, 1979.

14. News Releases

News releases pertaining to this project shall not be made without prior City approval, obtained through the Project Manager.

15. Patent Indemnity

The applicant agrees to hold harmless, indemnify and if requested by the City defend, to any claim or action brought against the City based on a claim that the system supplied by the Consultant or his subcontractor infringes a patent or copyright. The foregoing is subject to the following condition:

That should the system become, or in the Consultant's opinion is likely to become, the subject of a claim of infringement of a patent or copyright, the City shall permit the Consultant to replace same with a non-infringing product or midify it so it becomes non-infringing, so long as thre replacement or modification provides equal or better performance. Any additional costs incurred pursuant to this section are the responsibility of the Consultant.

In witness whereof, the parties have caused this agreement to be executed on the dates specific below, the City acting pursuant to Ordinance No. _____.

Date: _____.

Approved as to Form:

_____
City Attorney

City of Portland

By _____
MAYOR

By _____
COMMISSIONER OF PUBLIC WORKS

Michaud, Cooley, Hallberg, Erickson and Associates

By _____

Corporate Vice President
(Title)

STATEMENT OF WORK

The following tasks describe the work to be performed under the terms and conditions of the contract between the City of Portland and Michaud, Cooley, Hallberg, Erickson and Associates, Inc.

Statement of Work

The contractor shall prepare prelminary and detailed systems designs for the Basic 911 system and a preliminary systems design for the Expanded 911 system, as described in Attachment 1 of the RFP. Any system design must maintain the integrity of the dispatching procedures for each agency to be served as described in Attachment 2 of the RFP.

Completion of the following tasks and deliverables will be required for successful completion of the contract. Alternative approaches may be proposed, but shall be a separate section entitled, "Alternative Approaches." A written report (with 20 copies) must be submitted to the Project Director upon the completion of each task. Reports will be reviewed by the User/Provider Board within 10 days of receipt.

Task 1: Prepare workplan for completion of Basic and Expanded 911. The workplan is to include major milestones and dates for completion of preliminary and detailed system designs for Basic 911 and a preliminary system design for Expanded 911. The workplan and milestones are subject to approval by the Project Manager.

Task 2: Prepare preliminary design for Basic 911 system as described in Attachment 1 of the RFP. This design should include a basic proposal with alternatives for equipment, staffing, call handling, procedures and provider interfaces with estimated costs for each alternative. The preliminary

(b) "A Request for Proposal for Engineering and Mangagement Alternatives for the Implementation of 911, an Emergency Telephone Number" (RFP) dated October 31, 1979.

(c) Proposal of Contractor entitled "Professional Engineering Services Associated with 911 Service Planning and Implementation" Numbered 4104 and dated November 30, 1979.

The whole of the RFP is incorporated and effective as written notwithstanding language indicating that further reference may be made before incorporation.

The true, complete and final copies of the afore-described documents are those filed in the office of the City Auditor on December 27, 1979.

The Contract Documents from the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the Bidding Documents. The Contract may be amended or modified only by a Change Order as herein defined.

In the event of an inconsistency between the Contract Documents, the inconsistency shall be resolved by giving precedence in the following order:

(a) This Agreement

(b) Statement of Work, Dated December 26, 1979

(c) Contractor's Proposal, No. 4101

(d) City's Request for Proposal (RFP)

2. Duties of Contractor

Contractor will furnish all materials, labor, engineering and services necessary to study and design a basic and expanded 911 system in accordance with Contract Documents.

The services include all labor and skills necessary to produce the final result required by the Contract Documents. The final result includes each obligation, recommendation, or choice contained in Contractor's Proposal and selected or to be selected by the City unless specific direction is contained in the Statement of Work.

3. Period of Performance

Performance as set forth herein will commence on a Monday within two calendar weeks after the Consultant receives the executed contract from the City of Portland. All portions of the work shall be completed on or before the last day of the fifth month thereafter.

Task 3: Prepare a detailed design for the system selected by the Project Manager for implementation of Basic 911. The detailed design is to include:

a. Network configuration for incoming and outgoing telephone lines. The configuration should include the specific system features suggested in Attachment 1 of the RFP. Cost information shall be provided for the final configuration.

b. Complete specifications and costs for equipment to perform the required functions. The specifications are to include consoles and any other equipment and supplies necessary to perform the required functions. Potential vendors for any or all equipment are to be listed.

c. Complete description and costs of staffing and organization of the 911 answering center. This is to include a functional organization chart, physical layout, job descriptions for each staff position, any furniture and equipment not included in b., materials and supplies and staff training requirements.

d. Recommendations for efficient call-handling procedures, including the interface between the 911 answering center and each provider agency. The recommendations should include appropriate 911 operator protocols, forms and instructions for written communications. The call transfer method of response is to be used for primary providers. Call relay and call referral may be used for agencies outside Multnomah County, agencies receiving infrequent emergency calls and non-emergency calls.

e. Recommendations for appropriate modifications to existing inter-jurisdictional agreements to improve resolution of the mismatch between telephone prefix and jurisdiction agency boundaries. These agreements will be supplied to the successful vendor.

f. Provide a methodology for the development of the management information system requirements described in Attachment 1 of the RFP.

g. Provide direct communication links (other than 911) between Police, Fire, and EMS.

Task 4: Prepare an implementation plan for Basic 911. The plan is to include detailed tasks, responsibility for completion of tasks, start and completion dates for each task, estimated work hours for each task and identification of interdependent tasks. The tasks are to be divided into the following categories or an alternative acceptable to the Project Manager:

1. Equipment procurement, installation and testing.
2. Facilities planning, including physical layout, furniture and equipment and security.
3. Staffing, including testing, hiring, training and evaluation.
4. Telephone system conversion.
5. Public information, including press releases, telephone book modifications and any other appropriate media to ensure adequate preparation of the citizens for the new system.
6. Cutover plan.

Task 5: Prepare a Request for Proposal (RFP) for system procurement (Basic 911). The RFP is to include the following:

a. Objectives of RFP

b. Specifications and statement of work, including minimum hardware requirements, optional hardware and maintenance and training requirements.

c. General conditions, including bid and contract requirements.

d. Proposal format instructions.

e. Appropriate appendices, such as sample forms for response, performance standards and definitions.

Task 6: Prepare preliminary design for Expanded 911 as described in Attachment 1 of the RFP. All of the requirements of Basic 911 are to be included. The design must address requirements and estimated costs for three (3) separate types of Expanded 911 systems:

1. Selective call routing.
2. Selective call routing with Automatic Number identification.
3. Selective call routing with Automatic Number Identification and Automatic Location Identification.

These designs should include alternatives, with advantages and disadvantages of each, for equipment, staffing, procedures, and and provider interfaces with estimated costs for each alternative. The preliminary design should include recommendations of the most efficient alternative(s) to be pursued in detailed design. Price/performance analsysis is to be included in the recommendation. The preliminary designs are subject to the approval of the Project Manager.

Task 7: Twenty-five copies of the final report shall be delivered to the Project Manager. The document will use a high quality printing process which provides copies suitable for reproduction.

14899

PROPOSAL
TO
CITY OF PORTLAND

PROFESSIONAL ENGINEERING SERVICES
ASSOCIATED WITH
911 SERVICE PLANNING AND IMPLEMENTATION

DATE: November 30, 1979

MCHE PROPOSAL NUMBER: 4101

MICHAUD, COOLEY, HALLBERG, ERICKSON AND ASSOCIATES, INC.
CONSULTING ENGINEERS
310 PLYMOUTH BUILDING
MINNEAPOLIS, MINNESOTA 55402
(612) 339-4941

L48902

MICHAUD.COOLEY.HALLBERG.ERICKSON & ASSOCIATES,INC.
CONSULTING ENGINEERS
310 PLYMOUTH BUILDING, MINNEAPOLIS, MINNESOTA 55402 • 612-339-4941

November 29, 1979

Ms. Merry Hanson, Project Manager
Office of Commissioner of Public Works
City Hall, Room 414
1220 S.W. Fifth Avenue
Portland, Oregon 97204

Dear Ms. Hanson:

Enclosed is a Technical Proposal from our firm to provide professional engineering services associated with 911 service planning and implementation. A fee proposal is provided in a separate letter.

Since this work involves the preparation of technical procurement specifications, this work may need to be performed by or under the direct supervision of an engineer registered in Oregon. If this proves to be the case, Mr. Vegemast will apply for an engineering license in Oregon.

By submission of this proposal, we indicate our intentions to adhere to the provisions described herein and we will enter into a contract to perform the work as described in this proposal.

Questions regarding this proposal should be directed to Mr. Ronald Vegemast or Ms. Pamela Hallberg.

We thank you for this opportunity to submit this proposal. Mr. Vegemast will be pleased to appear before your consultant selection committee for an oral review of our proposal.

Sincerely,

MICHAUD, COOLEY, HALLBERG, ERICKSON
& ASSOCIATES, INC.

Robert L. Michaud, P.E.,
President

RLM:kmn
Enclosure

CONTENTS

SECTION I

BUSINESS ORGANIZATION

Michaud, Cooley, Hallberg, Erickson & Associates, Inc., originated in 1946 as, Richard W. Evans, Mechanical Engineer. The firm experienced a series of changes as a result of expansion, and in 1956, became Richard W. Evans & Associates, Consulting Engineers; and Evans, Michaud, Cooley, Hallberg, Erickson & Associates, Inc. Consulting Engineers, in 1960. In 1968, the firm changed again to Michaud, Cooley, Hallberg, Erickson & Associates, Inc., Consulting Engineers, as it is presently known.

The December, 1978, issue of Specifying Engineer listed MCHE as the tenth largest consulting engineering firm in the United States. The firm currently has 100 employees engaged in mechanical, electrical and communications engineering, large site master planning, feasibility and planning studies and large scale system design. The firm is incorporated in the State of Minnesota and maintains offices in downtown Minneapolis. Currently, MCHE serves clients at local, regional, national and international levels averaging approximately 100 million dollars worth of installed projects annually.

The Communications Systems Engineering Division of the firm was formed in 1972 to provide specialized design engineering work in areas of public safety communications, including 911 systems, communications control centers, computer aided dispatch systems, two-way mobile radio, microwave radio and telephone applications.

The firm has twice received national recognition for engineering achievement from the Consulting Engineers Council of the United States.

STAFF

The firm's staff of engineers are top professionals in their fields and are given full authority and responsibility for the work they perform. A complete support staff of draftsmen, technicians and clerical workers provides ancillary services to the professional personnel. The entire professional and support staff has a proven record of successful accomplishment of major projects based upon their abilities and cooperation in working together as a team.

LIBRARY

An extensive library of pertinent materials related to all aspects of the firm's work is maintained on an up-to-date basis. In addition, the Communications Division has its own library of books, periodicals, trade journals and current manufacturers' literature which supplements work done in the field of public safety communications engineering and related areas. The firm subscribes to major periodicals relative to its work and receives manufacturers' updated catalogues and data sheets for new products on a continuous basis.

In addition to the firm's library, the Minneapolis Public Library and the library of the Univeristy of Minnesota, Institute of Technology are readily available to the staff for additional information and research.

PRINTING AND PUBLICATIONS

A wholly owned subsidiary of MCHE has facilities for high volume reproduction of reports and specifications. The subsidiary, located on the premises, has employees who are expert in serving client needs in blueprinting, collating, punching and binding, plus color reproduction for reports, displays and charts.

SECTION II
STATEMENT OF THE PROBLEM

This section of the proposal describes the situation as it exists in the City of Portland which has resulted in the need for this planning work and the objective for this work is then stated. A procedure and methodology to be followed in achieving the objective is outlined in Section IV.

SITUATION

The citizens and various public safety agencies of the City of Portland and Multnomah County have recognized the many advantages of a 911 telephone system for emergencies.

A Citizens Coordinating Committee was established to explore the feasibility of a 911 system, to gather some preliminary data and to recommend an approach for obtaining a 911 system in a speedy and efficient manner.

Several implementation problems have been discovered which affect 911 system design. The existing telephone exchange areas within the City and the County do not always correspond to political subdivisions or public safety service areas. This means that portions of the County will not be included in the 911 service area and portions of neighboring counties will be included. Selective routing of 911 calls will eliminate these problems and is being considered by the City of Portland and Multnomah County.

After evaluation of several options, the City and County have recommended the implementation of a Basic 911 System as soon as possible with conversion to expanded 911 with ANI and ALI at a

SECTION I

BUSINESS ORGANIZATION

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The firm has twice received national recognition for engineering achievement from the Consulting Engineers Council of the United States.

Michaud, Cooley, Hallberg, Erickson & Associates, Inc., is an independent consulting firm and is not affiliated with any supplier of equipment.

COMPUTER ASSISTED ENGINEERING

Currently, the MCHE professional staff has access to three computer systems. In 1978, this computer capability was more than doubled in size, equipment and complexity.

Since 1977, the firm has operated an in-house, real time computer system which provides remote monitoring and control of building mechanical and electrical systems for maximum power and fuel savings. The computer is used to monitor and control systems in many major buildings in the Minneapolis area to reduce energy consumption. This computer system is operated 24 hours a day, seven days a week by MCHE personnel.

A batch processing computer system was installed late in 1978 which is used for energy monitoring for many large, multi-facility corporations across the country. Data is collected and analyzed monthly for each building to determine if energy is being used efficiently. This computer also performs all accounting functions for the firm.

In addition, a terminal connected to an off-premise, time-shared computer system is available for use in engineering studies by all members of the professional staff. At present, the firm maintains sixteen program routines for special engineering design calculations in this computer system.

STAFF

The firm's staff of engineers are top professionals in their fields and are given full authority and responsibility for the work they perform. A complete support staff of draftsmen, technicians and clerical workers provides ancillary services to the professional personnel. The entire professional and support staff has a proven record of successful accomplishment of major projects based upon their abilities and cooperation in working together as a team.

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An extensive library of pertinent materials related to all aspects of the firm's work is maintained on an up-to-date basis. In addition, the Communications Division has its own library of books, periodicals, trade journals and current manufacturers' literature which supplements work done in the field of public safety communications engineering and related areas. The firm subscribes to major periodicals relative to its work and receives manufacturers' updated catalogues and data sheets for new products on a continuous basis.

In addition to the firm's library, the Minneapolis Public Library and the library of the Univeristy of Minnesota, Institute of Technology are readily available to the staff for additional information and research.

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A wholly owned subsidiary of MCHE has facilities for high volume reproduction of reports and specifications. The subsidiary, located on the premises, has employees who are expert in serving client needs in blueprinting, collating, punching and binding, plus color reproduction for reports, displays and charts.

ACCOUNTING

All accounting areas, including job cost accounting, are performed on the in-house computer system. The accounting department has many years of experience in maintaining appropriate records for local, state and federal contracts.

MEMBERSHIPS

Members of the firm maintain memberships and are active in many technical and professional engineering organizations. Among these are the following:

Associated Public Safety Communications Officers (APCO)
Consulting Engineers Council of the United States
National Society of Professional Engineers

FINANCIAL STATEMENT

The stock for Michaud, Cooley, Hallberg, Erickson & Associates, Inc. is entirely held by the four Owners: Mr. Robert Michaud, Mr. Sherm Cooley, Mr. Warren Hallberg and Mr. Robert Erickson. The firm does not publish financial documents such as Annual Reports or Statements of Earnings; therefore, none are submitted with this proposal. We refer you instead to the institution named below for reference of the financial strength of this firm:

Northwestern National Bank
Seventh Street and Marquette Avenue
Minneapolis, Minnesota 55402
(612) 372-8123

Address
Michaud, Cooley, Hallberg, Erickson & Associates, Inc.
Consulting Engineers
310 Plymouth Building
Minneapolis, Minnesota 55402
(612) 339-4941

SECTION II
STATEMENT OF THE PROBLEM

This section of the proposal describes the situation as it exists in the City of Portland which has resulted in the need for this planning work and the objective for this work is then stated. A procedure and methodology to be followed in achieving the objective is outlined in Section IV.

SITUATION

The citizens and various public safety agencies of the City of Portland and Multnomah County have recognized the many advantages of a 911 telephone system for emergencies.

A Citizens Coordinating Committee was established to explore the feasibility of a 911 system, to gather some preliminary data and to recommend an approach for obtaining a 911 system in a speedy and efficient manner.

Several implementation problems have been discovered which affect 911 system design. The existing telephone exchange areas within the City and the County do not always correspond to political subdivisions or public safety service areas. This means that portions of the County will not be included in the 911 service area and portions of neighboring counties will be included. Selective routing of 911 calls will eliminate these problems and is being considered by the City of Portland and Multnomah County.

After evaluation of several options, the City and County have recommended the implementation of a Basic 911 System as soon as possible with conversion to expanded 911 with ANI and ALI at a

later date. Assistance is needed at this point to develop a detailed technical design of the 911 System and to provide guidance and assistance during implementation.

PROJECT OBJECTIVE

The primary goal of this project is to achieve implementation of a 911 System for the City of Portland and Multnomah County which is efficient and cost effective. The 911 System selected and its funding must command a consensus opinion of public officials involved and agencies providing services.

SECTION III
MANAGEMENT SUMMARY

This section describes how the project will be managed to ensure the most effective use of personnel in achieving a high level of task accomplishment in accordance with the project schedule. An effective management plan and application of the plan are essential to the ability of a firm to perform the work described. Background data listing relevant qualifications of staff personnel is included in a separate section.

A fundamental concept basic to the project management plan is maintaining a single contact path between the Project Manager and an official designated by the contracting agency. The single contact path is important to assure that project personnel and the contracting agency will be fully aware at all times of all aspects of the work. The single contact path does not mean that contract personnel cannot interact with agency personnel other than the designated contact, but it does mean that:

- Contacts should be arranged through the Project Manager.

- The Project Manager should participate in the interaction or be fully informed about all pertinent aspects of the activity.

PROJECT MANAGER

The Project Manager will be Ronald Vegemast, P.E., Vice President of Michaud, Cooley, Hallberg, Erickson & Associates, Inc. As indicated in his resume, Mr. Vegemast has all the background, training and experience required to manage this project, including

business management training and experience. He has an in-depth 911 experience including extensive association with all previous 911 planning in the metropolitan area, and he has public safety dispatch center and mobile radio system design and implementation experience. He has successfully managed varied communication projects for nearly twenty years for firms of all sizes.

Mr. Vegemast will report directly to Mr. Robert E. Erickson, Executive Vice President of MCHE, who will periodically review the work in progress. Mr. Erickson will be responsible for all contractual matters.

MANAGEMENT METHODS

The project manager will be responsible for all work products and for compliance with all work schedules.

He supervised the preparation of every subsection of this proposal. He will continue this relationship to the work through involvement in every subtask of the project until it is completed. This means that his professional expertise will be reflected in every aspect of the work. As a result, there will be a continuity throughout the work which will be reflected in a balanced and cohesive completed project.

He will manage the project by the following methods:

1. He will plan each subtask and assign all work to personnel. Assignments will include a review of the objectives, schedule, and relationship of work to the project as a whole.

2. He will conduct weekly meetings with MCHE team members to review progress, results, conclusion and recommendations.

3. He will analyze status and assign additional personnel where required to conform to schedule.

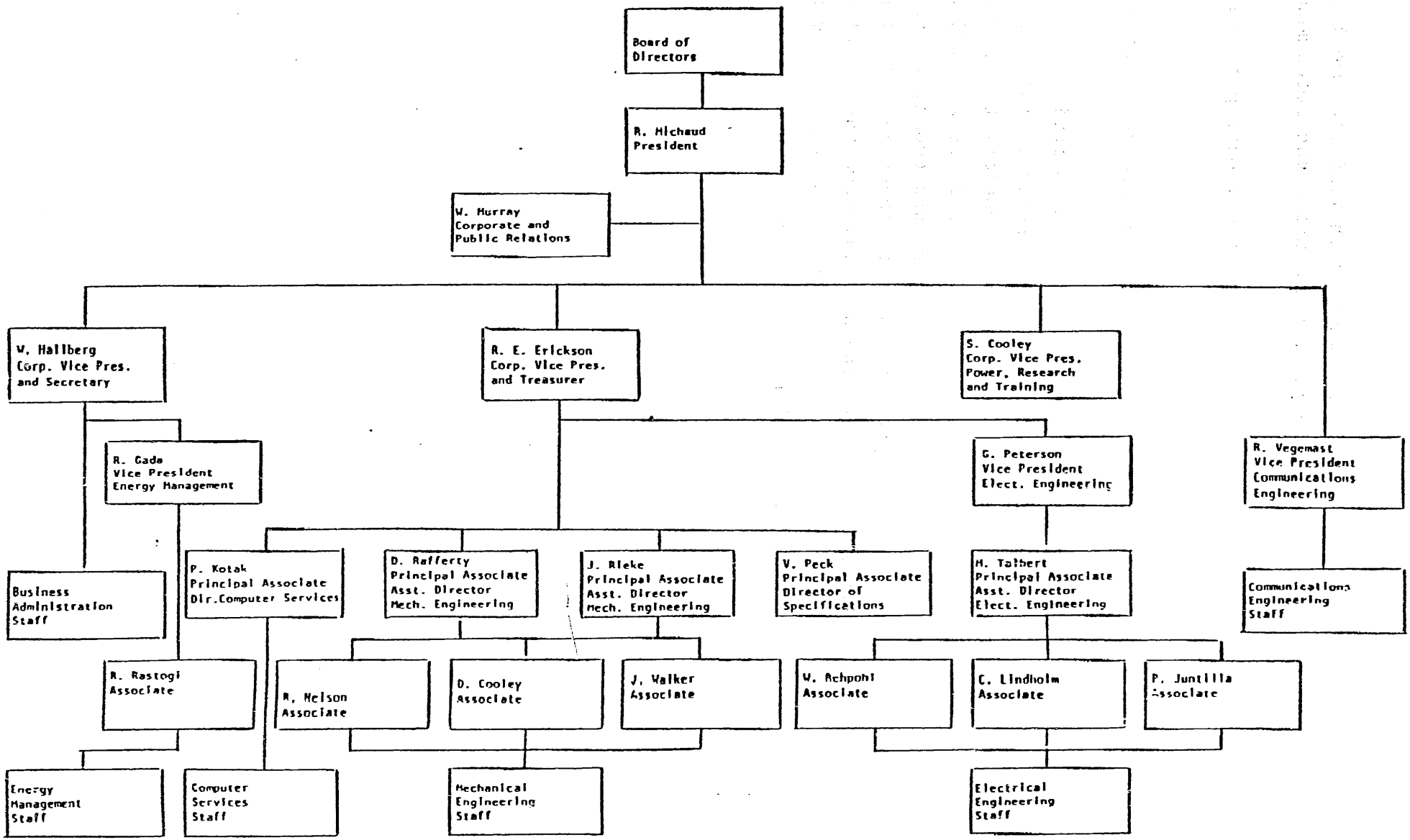
4. He will review and approve all output products before delivery.

5. He will schedule and conduct meetings to review status and other matters associated with the project. The schedule for accomplishment of subtasks will conform to the overall project schedule. That project schedule is a vital and indispensable component in managing and coordinating the project. It highlights the interdependencies of tasks and alerts participats of upcoming activities and completion dates. The schedule will serve as a checklist to measure progress and flag problem areas which could delay completion dates.

An organizational chart is included at the back of this section as Figure III-1 and a project organizational chart is included as Figure III-2.

MICHAUD,COOLEY,HALLBERG,ERICKSON AND ASSOCIATES INCORPORATED
CONSULTING ENGINEERS
310 PLYMOUTH BUILDING MINNEAPOLIS, MINNESOTA 55402

FIGURE III-1



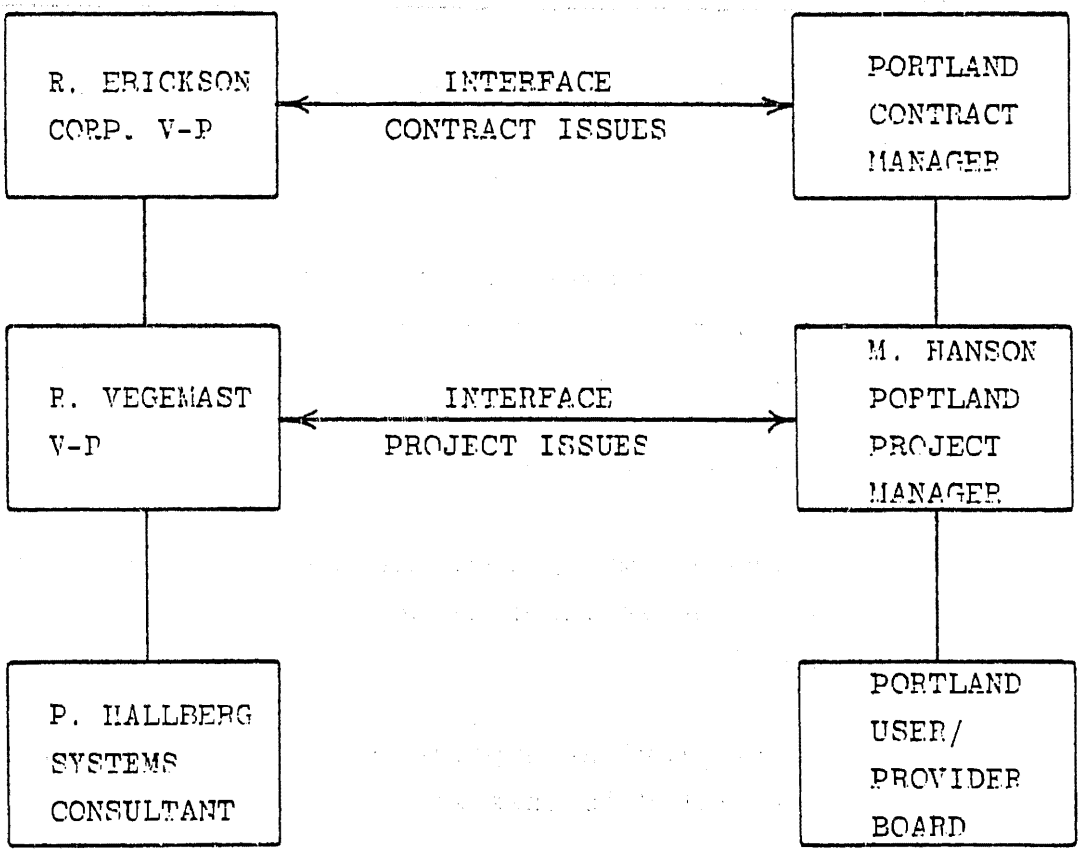


FIGURE III-2

PROJECT ORGANIZATIONAL CHART

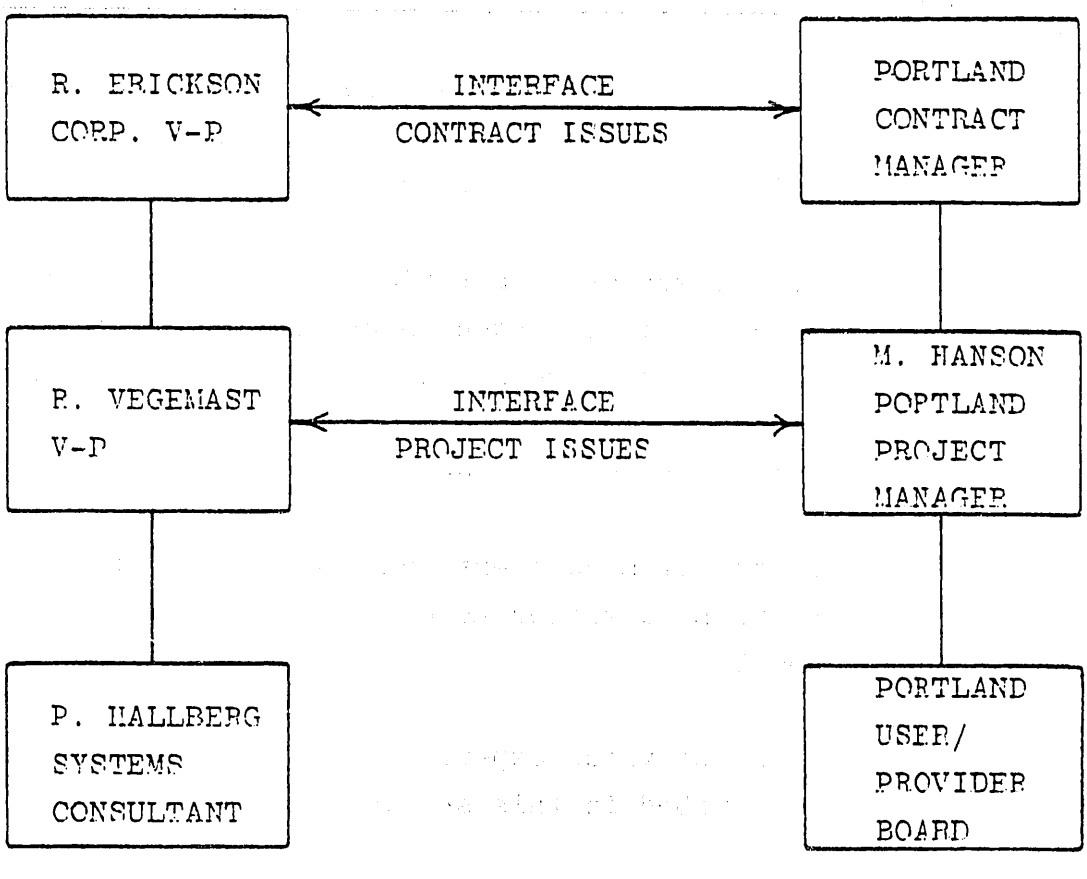


FIGURE III-2

PROJECT ORGANIZATIONAL CHART

SECTION IV

PROJECT PLAN

In this section, each activity is sub-divided into subtask activities which form a detailed program of work. Discussion of subtasks includes a description of output to be delivered.

After the discussion of subtasks, a period of performance and manpower allocation chart is included which shows utilization of all manpower as well as a time relationship of task performance.

Other sections of the proposal provide:

- A description of project management and the qualifications of the staff members to be assigned as described in this section of the proposal.

- A description of the previous experience of the firm in work similar to that described in this section of the proposal.

- A description of the corporate facilities available to support the work of the staff on this project.

Throughout the performance of this work, the Portland Manager will be able to monitor progress and performance by reviewing and approving the results of each task as it is completed and before subsequent task work begins. This will assure the Project Manager that the work is on schedule and that the final result is likely to meet expectations.

METHODOLOGIES

PLANNING PROCEDURE

This firm has been involved in nearly 100 911 planning activities since 1972. By 1977, our planning procedures had developed to the point that we wrote a booklet on 911 planning entitled, Planning Manual for 911 Implementation in Minnesota. A copy of that booklet is submitted with this proposal.

Since that time, we have developed more sophistication in our planning activities particularly in regard to techniques for estimating volumes of 911 calls generated from parts of specific telephone company central office service areas. These techniques are briefly described under Task B in this section of the proposal.

We know of no other consultant who has developed these estimating techniques.

COMPUTER MODEL

Estimates of the cost of 911 service with selective routing, ANI and ALI features are difficult to obtain. AT & T has not provided cost data on this advanced form of 911 service to the Bell System operating companies. The only advanced 911 systems operating are in Chicago and in Alameda County, California. The Chicago 911 system differs substantially from the system that is needed in the City of Portland, and there is no cost breakdown data available for that system. The Alameda County system is a research and development project funded by the federal government and no applicable cost data is available which applies to an operating system which is to be ordered in the near future.

Some cost data on selective routing system elements is available from Northwestern Bell Telephone Company that has designed a system to meet the needs of the Minneapolis-St. Paul region. That data along with the cost of tariff items has been used by this consultant, acting alone, without the involvement of the telephone companies to estimate the cost of a selective routing 911 call delivery system in Maricopa County, Arizona. These estimates may prove to be incorrect by some margin when AT & T finally decides on a selective routing hardware and software configuration and costs can be estimated accurately.

ANI and ALI feature costs have been estimated by this consultant based on estimates made for Monroe County, New York by Rochester Telephone Corporation. Rochester Telephone Corporation is an independent telephone company and may not be using an ANI/ALI equipment configuration that is similar to what AT & T will recommend as a standard to Bell operating companies.

All of this information has been incorporated into a computer model that can quickly compute costs for alternative selective routing 911 system configurations. Even if the absolute cost figures produced prove inaccurate when firm pricing is available, the output of this model is useful for comparing systems on a relative cost basis.

This model can be adapted to provide more accurate cost data for Basic 911 System configurations.

This model will be used in the Tasks B and F work as described in this section.

We know of no other consultant that has a computer model for estimating costs for 911 systems.

TASK PLAN

TASK A - PREPARE WORKPLANS

SUBTASK A1:

Prepare a work plan similar in form to a PERT plan without estimated time for accomplishment of subtasks but which will show planned completion time for all subtasks. This plan will include all subtasks of the Basic and Expanded 911 Tasks.

SUBTASK A2:

Describe alternative system configurations that will be considered during the preliminary system description tasks for both the Basic 911 and Expanded 911 Systems.

SUBTASK A3:

Prepare an outline for each output product in sufficient detail so as to generally indicate the content and organization of each. Outlines will be prepared for:

1. The preliminary Basic 911 System description.
2. The detailed Basic 911 System design.
3. The Basic 911 implementation plan.
4. The Basic 911 request for proposal.
5. The preliminary Expanded 911 System description.
6. The final report.

In addition to the outlines, we will, where possible, submit previously prepared documents as examples of the format, detail and printing to be used for these documents.

SUBTASK A4:

Prepare a letter report in 20 copies of the work plan. One copy of each example document in Subtask A3 will be submitted.

TASK B - PREPARE PRELIMINARY BASIC 911 SYSTEM DEFINITION

SUBTASK B1:

Determine the 911 service area for each public safety answering point. This service area will be the geographic area encompassed by the telephone exchanges in which the majority of the main stations are within the law enforcement service areas dispatched by the answering point.

Based on our experience, we believe that it is unlikely that the telephone company knows the number of main stations served by an exchange that are on either side of a political subdivision boundary. This number will be estimated by determining the area on either side of the political subdivision boundary by superimposing a grid on a map and counting squares of areas. The number of main stations will then be estimated on the basis of these proportional areas and a factor which is indicative of the density of the population living in these areas.

SUBTASK B2:

Determine the number of direct dedicated 911 trunks from each central exchange office to each answering point by following these steps:

1. Determine the percentage amount by which activity during busy hour exceeds the daily average in the Portland area.

2. Determine the percentage amount by which activity during busy month exceeds the daily average in the Portland area.

3. Draw a contour map of the Portland area in which the contour lines represent lines of equal 911 call volume during the busy hour of the busy month. (See the last page of the Maricopa County report submitted with this proposal for an example of a contour map.)

4. Determine the population living in each exchange area by multiplying the number of main stations by the average population per main station figure for the Portland area.

5. Use our previously developed computer program to calculate the number of trunks from each exchange based on the call volume of the contour map and the population calculation for each exchange area. Two alternative grades of service will be run - one based on one busy on the first dialing attempt for each 100 attempts during the busy hour of the busy month and one busy for each 1000 attempts.

SUBTASK B3:

Determine the number of calls per day requiring redirection to other dispatch centers for each primary public safety answering point. This calculation will be based on the following two factors:

1. Calls from outside the political subdivisions but inside the service area will be estimated by multiplying number of main stations times number of persons per main station times the calls per thousand population figure taken from the contour map.

2. Calls for agencies dispatched elsewhere, including other fire services, will be estimated on the basis of the ratio of that agency's calls to the total number of calls.

SUBTASK B4:

Evaluate call transfer and call relay as call redirecting options. For each option, we will use work measurement techniques to estimate time delay and we will estimate cost considerations for both options. We will also describe the public relations considerations of both methods. Included will be an evaluation of three call transfer methods.

SUBTASK B5:

Evaluate the potential for, value and cost of special feature options including call hold, rering, forced disconnect, Automatic Number Identification and Automatic Location Identification.

SUBTASK B6:

Based on the estimated total incoming call volume and the number of redirected calls, we will describe the numbers and types of call answering equipment available for both call redirecting options and for the special feature options.

SUBTASK B7:

Estimate staffing levels in numbers of persons for each answering point for the two redirecting options and based on the two different grades of answering performance.

SUBTASK B8:

Evaluate alternative means of providing toll-free 911 emergency telephone service to people using the Cascade Locks central office including microwave and proprietary cable lines. This evaluation will be based on a modified present value technique over the life of the equipment with factors for inflation of tariffs and maintenance costs applied.

SUBTASK B9:

Prepare a letter report of alternatives described in operational and cost terms. Alternatives will include:

1. Two redirection alternatives with three sub-options for the call transfer option.

2. Two grades of service alternatives.

3. Special feature alternatives.

4. Microwave and cable line alternatives.

We will recommend a Basic 911 system configuration from among these alternatives.

TASK C - DETAILED BASIC 911 SYSTEM DESIGN

SUBTASK C1:

Prepare a detailed requirements description for the system selected by the Portland Project Managers that will be suitable for inclusion in the Task E RFP. Estimate costs for this system.

SUBTASK C2:

Prepare a detailed system description letter report based on the system alternatives selected by the Portland Project Manager after reviewing the Task B report. This report will also address all of the other issues listed on Pages 13 and 14 of the RFP and emergency power requirements and inbound trunk routing through at least two central offices over trunk groups entering two sides of the answering building.

TASK D - IMPLEMENTATION PLAN

SUBTASK D1:

Prepare a modified PERT chart plan for implementing the Basic 911 system design. Elements of the PERT plan will include:

1. Equipment procurement, installation and testing.

2. Facilities planning, including physical layout, furniture and equipment and security.

3. Staffing, including testing, hiring, training, evaluation, compensation and career paths. Available APCO information on operator testing and training will be utilized. We will base compensation recommendations on national and Portland area data.

4. Telephone system conversion.

5. Public information (See the Maricopa County, Arizona report submitted with this proposal for similar previously completed work.)

6. Selection of a contracting agent for the system including microwave and proprietary cable lines.

SUBTASK D2:

Prepare a letter report with the modified PERT chart showing start and stop dates for each element, float time for each element and with the critical path clearly identified. The report will contain a description and discussion of each element.

TASK E - PROCUREMENT DOCUMENTATION, BASIC 911 SYSTEM

SUBTASK E1:

Prepare requirements specifications suitable for ordering Basic 911 telephone service and for competitive bidding of answering equipment and microwave and/or proprietary cable lines. These specifications will include City of Portland bidding requirements and maintenance, training, documentation and acceptance criteria. An example of a similar specification is Specifications for a 911 Telephone Call Delivery System for the Twin Cities, Seven County

Metropolitan Area, submitted separately with this proposal. We believe that the quality of our 911 specifications is unmatched by any other consultant. These specifications will be submitted in draft form to the Portland Project Manager for review and approval. They will be published in final form after approval during the preparation of the final report of Task G.

TASK F - PRELIMINARY EXPANDED 911 DESIGN

SUBTASK F1:

Using the computer model, analyze cost for twelve alternative selective routing configurations for the Portland area similar to the work performed previously in Maricopa County, Arizona. (See Maricopa County report included with this proposal.) The twelve alternatives will include selective routing of all exchanges from which calls requiring redirection originate and selective routing for only those exchanges from which more than ten redirected calls originate each day.

Those two alternatives will be repeated two more times for systems with ANI and two more times for systems with ANI and ALI.

Those six alternative configurations will then be run once for one busy per 100 calls and also for one busy per 1000 calls on the first attempt during busy hour of busy month.

SUBTASK F2:

Prepare a letter report which will include a description of the twelve alternative configurations with costs and advantages and disadvantages listed. This report will include recommendations for a system configuration and for a procedure leading to implementation of the system recommended.

TASK G - FINAL REPORT

SUBTASK G1:

Prepare a draft of a final product in which the output products data from Tasks B, C, D and F are organized into a single document.

SUBTASK G2:

Twenty copies of this draft will be deliverd by express mail to the Portland Project Director. Mr. Vegemast will travel to Portland for one day, five working days after mailing of the report, to receive comments to the draft.

SUBTASK G3:

The report will be modified as appropriate and printed and delivered in twenty-five copies. The report will include a cover and GBC binding and the printing will be the same as the Maricopa County report submitted with this proposal.

TASK H - MONTHLY PROGRESS REPORTS

We will submit a monthly letter form progress report showing actual versus planned activities with explanations of variances from plan. No financial data will be supplied with these reports since we are proposing a fixed price contract with billings related to milestones.

ITEMS TO BE PROVIDED BY THE CITY OF PORTLAND

The following items must be provided by the City of Portland on the start date:

Standard City of Portland specification conditions for electronic equipment procurements.

Telephone tariff data for direct trunks, key telephone equipment and ACD.

Name and telephone number of an employee of the telephone company knowledgeable in 911 issues.

A map of telephone company central office service areas related to political subdivision boundaries.

A list with future projections, of main stations served by each central office.

A description of ANI capability by central office.

Locations of #1 ESS Central Offices that can be used to selectively route calls.

Locations, on a map, of primary and secondary 911 answering locations.

Definition of what kinds of requests for service will be accepted on 911.

A list of present average 911 call volume by political subdivision for as many areas as possible.

Variations in activity by hour of the day, day of the week and by month of the year.

Present and projected population figures for political subdivisions.

PERIOD OF PERFORMANCE AND MANPOWER ALLOCATION

All of the tasks of this project will be performed by or under the direct supervision of Mr. Ronald Vegemast.

Ms. Pamela Hallberg will collect and analyze data, operate the computerized model, perform research tasks, prepare the specifications for the Basic 911 System and assist with report writing.

Because of other project work schedules, we may wish to add or substitute another systems consultant of equivalent experience and capability to Ms. Hallberg to assure completion of the project on schedule. No addition or substitution will occur without the prior written approval of the Portland Project Manager.

As indicated on the chart, we expect that 13% of the time spent on this project will be on-site in Portland.

Figure IV-1 shows the time relationship of tasks and the planned involvement of staff personnel in each task. It should be noted that the plan, in compliance with RFP provisions, requires accomplishment of a large project on a very tight schedule basis. Completion on schedule involves review and approval by the Portland Project Manager at several points. We strongly support the involvement of the Project Manager and others in this work as it proceeds and the review and approval of work at task completions; however, the consultant has no control over the time that will be required for this review and approval process. Subsequent work should not proceed until the previous work is accepted. Therefore, provision for approval time is made in the time relationship and manpower involvement plan of Figure IV-1.

	Start	Work Period 1	Approval Period 1	Work Period 2	Approval Period 2	Work Period 3	Approval Period 3	Work Period 4	Approval Period 4	Work Period 5	Finish	R. Vegemast	P. Hallberg
		TASK A										60 (1)	20
				TASK B								60 (1)	60 (2)
						TASK C						60 (1)	20 (2)
								TASK D				60	20
								TASK E				10	80
				TASK F								5	25
										TASK G		40 (1)	80
		TASK H										5 (1)	20 (1)
R.V.		61		63		64		71		41		300 (5)	
P.H.		24		84		29		104		84			325 (5)

All numbers in parenthesis are days on site in Portland

All other numbers are manhours of involvement

MICHAUD-COOLEY-HALLBERG-ERICKSON & ASSOCIATES, INC.
CONSULTING ENGINEERS
510 PLYMOUTH BUILDING - MINNEAPOLIS, MINN. 55403
(612) 339-4941
400 SIBLEY ST., ST. PAUL, MINN. 55101
(612) 224-5591

DRAWN BY RBII | COMM. NO. | SHEET NO. | CHECKED BY | DATE | OF SHEETS

FIGURE IV - 1 TASK AND MANPOWER INVOLVEMENT

Following is a description of each element of the plan shown in Figure IV-1.

1. START

Start will be a Monday within two calendar weeks after the consultant receives an executed contract from the City of Portland. MCHE will execute the contract within ten days after receiving a contract with acceptable terms from the Portland City Auditor.

Task 1 will be accomplished during Work Period 1 which will not exceed 14 calendar days after start. Approval Period I for review and approval of the workplan output product of Task 1 by the Portland Project Manager.

Work Period 2 will begin 2 working days after receipt of approval in writing from the Portland Project Manager. The sum of the Work Period 1 and Work Period 2 time will not exceed 30 calendar days.

Approval Period 2 shall be for review and approval of the preliminary Basic 911 system description output product of Task 2 by the Portland Project Manager.

Work Period 3 will begin 2 working days after receipt of approval in writing from the Portland Project Manager. The sum of time in Work Periods 1, 2 and 3 will not exceed 60 calendar days.

Approval Period 3 will be for review and approval of the detailed Basic 911 System design output product of Task 3 by the Portland Project Manager.

Work Period 4 will begin 2 working days after receipt of approval in writing from the Portland Project Manager of the detailed Basic 911 system design. The sum of time in Work Periods 1, 2, 3 and 4 will not exceed 90 calendar days.

Approval Period 4 will be for review and approval of the Basic 911 System implementation plan, the Basic 911 System RFP and the Expanded 911 preliminary design output products of Tasks 4, 5 and 6.

Work Period 5 will begin 2 working days after receipt of approval in writing from the Portland Project Manager of the Basic 911 system implementation plan, Basic 911 System RFP and the Expanded 911 preliminary design. The sum of time in Work Periods 1, 2, 3, 4 and 5 will not exceed 120 calendar days. No liquidated damages will be assessible unless one or more tasks are not completed by the end of Work Period 5.

SECTION V

PRIOR EXPERIENCE

The successful performance of this project requires technical expertise in communications systems engineering, communications control center design, computer technology and engineering economics. The professional staff personnel of Michaud, Cooley, Hallberg, Erickson & Associates, Inc., have attained skill in all of these areas and have extensive experience applicable to this project.

We believe that the extent of our experience in computer aided dispatch systems and related digital technology serving public safety is unmatched in any other consulting firm. We further believe that the quality of the result of our previous work is higher than that produced by other consultants. We will be prepared to provide evidence of the high level of our work products at an oral review before the consultant selection committee.

Included in this section of the proposal are descriptions of representative projects of the firm. These projects have been selected based on the following criteria.

A. To illustrate previous experience with the application of computer technology including mobile digital communications to police and fire operations.

B. To illustrate professional competence and skills offered in performing this work.

C. To provide references attesting to the performance of the professional staff on these projects since all of the projects described have been performed by the Communications Systems Division staff who will be assigned to this project.

PROJECT: 911 Planning in Minnesota

LOCATION: State of Minnesota

CONTACT: Mr. Herman Hamre
Telecommunications Division
G-4 Administration Building
50 Shurburn Street
St. Paul, MN 55155
(612) 296-7104

DESCRIPTION OF PROJECT:

The Michaud, Cooley, Hallberg, Erickson & Associates, Inc., Communications Systems Division staff has been continuously involved with 911 planning efforts in Minnesota since 1972. As a result of this project, the staff developed over eighty 911 operational and/or implementation service plans for counties and local areas throughout the State of Minnesota.

As a result of extensive data collecting, three documents were prepared and published. Basic Planning Data for 911 Implementation in Eighty Minnesota Counties, contains a listing of basic data collected in eighty Minnesota counties. 911 Planning In Minnesota, contains background data and summary 911 plans for 80 Minnesota counties. Finally, Planning Manual for 911 Implementation in Minnesota, was prepared to provide planning guidance to local officials involved in 911.

A current project for the State of Minnesota is to assist 30 counties in developing a final plan for 911 service in their county.

PROJECT: 911 Planning in the Twin Cities

LOCATION: Twin Cities, Seven County Metropolitan Area

CONTACT:: Mr. Mark Westman
Metropolitan Council
300 Metro Square Building
St. Paul, Minnesota 55101
(612) 291-6539

DESCRIPTION OF PROJECT:

This firm performed all 911 planning for the seven county Minneapolis-St. Paul metro area. Working with the Metropolitan Council of the Twin Cities area, and the 911 Technical Advisory Committee, a subcommittee of the Council, preliminary system design has been accomplished and specifications have been prepared for competitive bidding for a 911 selective routing network.

The system is an advanced 911 system which includes selective routing of calls to 28 answering points, ANI and calls for bids on the ALI feature. The bid specification encourages bids by private telephone equipment suppliers as well as operating telephone companies.

In addition, we assisted each of the seven county 911 Planning Committees by developing a plan for their county. These individual county plans were the basis for the regional 911 specification.

ANI and ALI must interface with the City of Minneapolis Computer Aided Dispatch (CAD) system so that the CAD can insert this data automatically into the event message format.

PROJECT: CAD and 911 for Monroe County

LOCATION: Monroe County, New York

CONTACT: Mr. Richard Wilson, President
Monroe County Legislature
407 County Office Building
Rochester, New York 14614
(716) 428-5255

DESCRIPTION OF PROJECT:

In December, 1978, the Monroe County 911 Planning Committee contracted with MCHE to assist in their planning work. This staff and the committee met regularly through April, 1979 to discuss preliminary issues.

Conclusions and recommendations resulting from the meetings were transmitted in a report to the Monroe County Legislature entitled, Recommended Direction for Implementation of 911 Service in Monroe County, New York, prepared by this staff.

We have recommended a non-selective routing form of 911 call delivery system and consolidated dispatch with CAD technical approach for the county-wide 911 system. The consolidated Emergency Communications Center will serve all ambulance, fire and law enforcement agencies in Monroe County. ANI and ALI insertion features will be incorporated into the CAD system design.

The recommendations were discussed at 22 public meetings throughout the County and are widely supported by public safety officials. On September 5, 1979, the Monroe County Legislature by a vote of 28 to 1 adopted our recommended plan and by a vote of 27 to 2 instructed the County Manager to engage this firm to design the CAD and 911 call delivery systems.

This is an example of how support for funding advanced systems can be generated among public officials when the appropriate information is presented in a complete, clear and concise manner.

PROJECT: 911 System Planning for Maricopa Association of Governments

LOCATION: Maricopa County, Arizona

CONTACT: Mr. Dennis Smith
Criminal Justice Coordinator
Maricopa Association of Governments
1820 West Washington
Phoenix, Arizona 85007
(602) 254-6308

DESCRIPTION OF PROJECT:

The primary objective of this project is to achieve implementation of a county-wide 911 emergency telephone system. The services of this firm were obtained to assist a Technical Advisory Committee (TAC) to the Maricopa Association of Governments to obtain that goal.

The work to be performed consists of a variety of tasks from preliminary cost estimates for several alternative technical approaches through design and implementation of the complete system.

Much of the initial phase of the work is to assist the TAC in reaching a consensus on the technical approach to be implemented based on cost estimates and related information prepared by this staff. This phase of the project has been completed and the committee is recommending to the Maricopa Association of Governments a fully selective routed, expanded type of 911 system.

PROJECT: Telecommunication System Design for Basin Electric Power Cooperative

LOCATION: Bismarck, North Dakota

CONTACT: Mr. Richard Weber
Manager of Department of Personnel Development
Basin Electric Power Cooperative
1717 East Interstate Avenue
Bismarck, North Dakota 58501
(701) 223-0441

DESCRIPTION OF PROJECT:

The involvement of this staff on this project is to assist Basin Electric personnel in the planning, design and implementation of a comprehensive PBX telephone system for the headquarters building in Bismarck.

The telephone system will be expandable to 1200 stations and will have many advanced features. The switch will be able to interface with microwave equipment and data transmission for present and future needs. Active least cost routing, station message detail recording, long distance call cost accounting and other electronic management features will be bid in addition to normal telephone operations.

The project consists of three distinct phases. First, a feasibility report is issued which presents data collected and establishes a direction for the technical approach to be implemented. The second phase is preparation of a requirements specification, assistance during bidding and evaluation of bids received. The final phase is observation and assistance during implementation and acceptance inspection.

Basin Electric is planning a cut-over date of September 15, 1980.

PROJECT: Public Safety Communications System for the City of Aurora

LOCATION: Aurora, Colorado

CONTACT : Mr. Mike Coburn
Director of Communications
City of Aurora
11501 East Alemeda Drive
Aurora, CO 80012
(303) 340-2200 Ext. 314

DESCRIPTION OF PROJECT:

This staff has planned, designed and provided continuing engineering services during installation of many public safety dispatch centers, mobile radio networks and related systems. The Aurora system is a large, comprehensive system designed around an advanced computer aided dispatch system and includes mobile radio networks with satellite receivers.

The emergency center will initially have seven console positions and one supervisor's position. The telephone equipment design was performed by MCHE to handle 911 and regular seven-digit emergency calls.

The project in Aurora also included redesigning the radio communications network. The CAD System incorporates digital dispatching via mobile digital terminals (MDT's) in police vehicles and mobile printers in the fire units. Police officers have access to files and data stored in the computer via their MDT's.

PROJECT: Communication System for the City of Westminster

LOCATION: Westminster, Colorado

CONTACT: Division Chief, Lynn Rowe
Westminster Police Department
3031 West 76th Avenue
Westminster, Colorado 80030
(303) 429-1546

DESCRIPTION OF PROJECT:

This system includes a communications center and mobile radio systems serving the police and fire departments. Telephone equipment and trunking configurations were also included.

The communications center was designed around a three-position modular radio control console with transmit and receive access to eleven radio channels. Police and fire radio page encoders, CCTV controls, multi-button key telephone instruments and satellite receiver controls are panel mounted in the console.

The mobile radio systems include primary and backup base stations for the fire channel and for two police channels. Both police and fire utilize uhf repeater channels. One police and the fire channel use satellite receivers at two sites.

This project is an example of our performance on a non-CAD Communications Center. Westminster is a suburb of Denver and the Communications Center is medium sized.

PROJECT: Public Safety Communications System for the City of Minneapolis

LOCATION: Minneapolis, Minnesota

CONTACT: Lt. Patrick Farrell
Project Director
Minneapolis Police Department
Room 136, City Hall
Minneapolis, Minnesota 55402
(612) 348-4569

DESCRIPTION OF PROJECT:

This project is a comprehensive emergency center design, which includes a mobile radio network with satellite receivers, MDT and microwave links, computer aided dispatch, telephone system design including call distribution and ANI and ALI insertion into the CAD event message. In addition, the mechanical HVAC and electrical design, including lighting, of the center was performed by this firm.

Arthur D. Little Systems, Inc., was selected from five competing bidders in Minneapolis to provide the CAD equipment. The Minneapolis System is designed for a combined police, fire and emergency medical service use. The new communications center will be equipped for 9 complaint takers (4 - 5 in use initially), a supervisor's console, 3 police dispatchers, 1 police information operator's position, a two-position fire console, a two-position emergency medical service console, and a two-position emergency operations console which is designed to handle natural disasters, i.e., floods, tornadoes or major incidents like plane crashes or hostage situations.

The CAD system is scheduled to cut-over at the end of November, 1979.

PROJECT VI

MANPOWER

Staff resumes are included in this section for the primary people to be assigned to this project. Other staff members may become involved to help meet the project schedule when deemed necessary by the Project Manager.

The primary work location of personnel assigned to this project and the percent of time of personnel devoted to this project is discussed in Section IV of this proposal.

Ronald G. Vegemast
Vice President

Mr. Vegemast has complete technical and administrative responsibility and authority for the firm's Communications Systems Engineering Division. His responsibilities include planning, project management, business development and the training and recruiting of personnel.

Mr. Vegemast's telephone system, 911, mobile radio system and communications control center design experience is extensive. His communications control center design credits range from single wireline controller centers to the computer-assisted, 19-operator center for Minneapolis' police, fire and ambulance services. He is well acquainted with his field and has kept abreast of the "state-of-the-art" through his tours of manufacturer's facilities, attendance at conventions and visits to emergency dispatch centers around the country. His activities have included on-site surveys and measurements of many dispatch center operations, riding police patrol in more than a dozen cities and counties and continuous review of current communications engineering. He has made on-site visits to review 911 systems in operation at more than 40 locations throughout the United States.

A 1955 graduate of the University of Minnesota (B.S.E.E., Communications option), he is a Registered Professional Engineer in Minnesota, Kentucky and Colorado. He has written numerous magazine articles for professional and technical journals. Mr. Vegemast is a past President of the Minnesota Society of Professional Engineers and he is also a member of the Consulting Engineers Council of the United States and the Associated Public Safety Communications Officers, Inc.

Pamela J. Hallberg
Systems Consultant

Ms. Hallberg, as a systems consultant, performs design engineering and technical writing assignments for the firm's Communications Systems Engineering Division. She has participated in many communications design projects including public safety emergency centers, mobile radio systems, 911 and PBX telephone systems.

Ms. Hallberg's work has included preliminary design, specification writing and assistance to bidders. She conducts research, feasibility evaluations and she maintains a working knowledge of telephone tariff data and of FCC and FAA requirements for radio systems and license applications.

Ms. Hallberg performs most of the PBX telephone system design work accepted by the firm. On these assignments, she works with clients to determine needs and deficiencies in the present system, and then recommends action that will eliminate those deficiencies. She also writes performance specifications for the PBX equipment, and maintains a library of manufacturer's literature for knowledge of the state-of-the-art in telephone equipment.

A 1977 graduate of Valparaiso University, Ms. Hallberg has a Bachelor of Science degree. She also is a participant in the Michaud, Cooley, Hallberg, Erickson & Associates, Inc., in-house technical studies program.

SECTION VII
AUTHORIZED NEGOTIATORS

Questions related to this proposal or scope of the proposed work should be directed to Mr. Ronald Vegemast. The following two persons are the authorized personnel to negotiate a contract of this type: Mr. Robert L. Michaud and Mr. Robert E. Erickson. Both can be reached at the regular business telephone number, (612) 339-4941.

SECTION VIII

ADDITIONAL INFORMATION AND COMMENTS

Enclosed as supplemental material are copies of:

Recommended Direction for Implementation of 911 Service in Maricopa County, Arizona, prepared by Michaud, Cooley, Hallberg, Erickson & Associates, Inc., September 30, 1979;
and
Specifications for a 911 Telephone Call Delivery System for the Twin Cities, Seven County Metropolitan Area;
and
Planning Manual for 911 Implementation in Minnesota.

REQUEST FOR PROPOSAL

FOR ENGINEERING AND MANAGEMENT ALTERNATIVES FOR THE IMPLEMENTATION OF 911 AN EMERGENCY TELEPHONE NUMBER

THE CITY OF PORTLAND, OREGON

OFFICE OF THE

COMMISSIONER OF PUBLIC WORKS

CLOSING DATE
NOVEMBER 30, 1979
4:00p.m. P.D.T.

PUBLISHED October 31, 1979

PROPOSAL INFORMATION

148992

1.1 Issuing Office

This Request for Proposal (RFP) is released by the City of Portland referred to in the rest of this document as City. The Project Manager has issued the RFP and is the sole point of contact for this procurement action. Proposers are instructed specifically not to contact any other person of the City or County with regard to any aspect of this procurement prior to public announcement of award. Proposals and all correspondence relating to this RFP will be submitted to:

Merry Hanson, Project Manager
Office of Commissioner of Public Works
City Hall Room 414
1220 S.W. Fifth Avenue
Portland, Oregon 97204

1.2 Inquiries

Inquiries concerning any areas which, in the proposer's opinion, require clarification or correction, shall be directed to the Project Manager. All inquiries must be submitted in writing, and all questions and answers will be distributed to all recipients of this RFP.

1.3 Incurring Costs

This request for proposal does not commit the City to pay any costs incurred by any Applicant in the submission of a proposal, or in making necessary studies or designs for the preparation thereof, or for procurring or contracting for the items to be furnished under the RFP.

1.4 Proposal Acceptance Period

Proposals must state the period of time for which they are valid and may be accepted by the City. A proposal offering less than sixty (60) calendar days for acceptance from the closing date for receipt of proposals may be considered nonresponsive and may be rejected.

1.4.1 Modification of Proposal

An offer to modify the proposal which is received from the successful proposer after award of contract which makes the terms of the proposal more favorable or advantageous to the City will be considered, and may thereafter be accepted. To be effective, every modification must be made in writing over the signature of the proposer.

1.4.2 Withdrawal of proposal

Proposers may withdraw their proposals in person, or by written or telegraphic request which is received prior to the scheduled closing time for filing proposals. Negligence on the part of the proposer in preparing his proposal confers no right to withdraw his proposal after the scheduled closing time for filing proposals.

1.4.3 Addenda to Plans or Specifications

Requests for additional information or for interpretation of the specifications shall be delivered to the Project Manager in writing, at least four (4) days before the date set for submission of proposals. If, in the opinion of the Project Manager, additional information or interpretation is needed by the proposer, an addendum will be issued to all known specification holders. The provisions of any written addenda issued by the Project Manager at least forty-eight (48) hours before the time set for the opening of proposals shall be binding upon the proposers, and failure of proposer to obtain such addenda shall not excuse him from complying therewith, if he is awarded the contract.

1.4.4 Clarification of Proposals

The Project Manager reserves the right to obtain clarification of any point in a firm's proposal or to obtain additional information necessary to properly evaluate a particular proposal. Failure of a proposer to respond to such a request for additional information or clarification could result in rejection of that firm's proposal(s).

1.5 Closing Date

Proposer's proposals must be received by the Project Manager not later than 4:00 p.m., Portland time on the thirtieth day of November, 1979. Send bids to address named in 1.1. Bids will be opened at 10 a.m. December 3 at the address named in 1.1 in Room 321.

1.6 Proposal Evaluation Criteria

The final configuration and successful applicant will be selected by an evaluation committee. The criteria listed below will be some of the factors considered in awarding a contract.

1. Experience and capability of the contractor in telephone system design.
2. Experience and qualifications of personnel assigned.
3. Management structure of the contractor and project team.
4. Ability to meet project timetable.

   Preliminary design for Basic 911 - 30 days from contract award.

   Detailed design for Basic 911 - 50 days from contract award.

   Preliminary design for Expanded 911 - 60 days from contract award.
5. Ability to interface with existing dispatch (non-radio) systems.
6. Ability to develop alternative 911 systems.
7. Bid price.
8. Adequacy of the design proposal.

1.7 Announcement of Award

Announcement of the contract award will be made (by the Project Manager) within twenty-one(21) days of the closing date. This announcement will will be made after notification to all responsive proposers of the status of their proposal.

1.8 News Releases

News releases pertaining to this project shall not be made without prior City approval, obtained through the Project Manager.

1.9 Acceptance of Proposal Content

The City may wish to incorporate the successful proposer's complete proposal (or portions thereof) into the subsequent contract by reference or otherwise. Proposals are to be prepared in a manner calculated to permit such incorporation.

1.10 Proposal Bid Format

Proposers shall submit their proposals in the format contained in Section II, Proposal Format.

1.11 Oral Presentations

Oral presentations to supplement the proposer's proposal may be required by the City.

1.12 Financial Statement

Each proposer shall submit a document reflecting the financial strength of its firm. Examples include: Annual Report for 1978, Earnings Statement, etc..

1.13 Right to Retain a Consultant

The City shall have the right to retain consultant firms in an advisory capacity to assist in the evaluation of proposals submitted in response to this RFP, to review the progress reports and technical reports submitted by the contractor, and to assist the Project Manager and User/Provider Board in other matters.

1.14 Rights to Submitted Material

All responses, inquiries or correspondence relating to or in reference to this RFP, and all reports, charts, displays, schedules, exhibits and other documentation produced by the proposers will become the property of the City when received by the Project Manager.

1.15 Number of Copies

Proposers shall submit twenty(20) sealed copies of their proposals.

1.16 Non-Discrimination

No proposal will be considered unless the proposer is certified as an EEO Affirmative Action Employer as prescribed by Chapter 3.100 of the Code of the City of Portland. All applicants not currently certified should file the required documentation with:

Contract Compliance Division Phone: 248-4696
Room 209, City Hall
1220 S.W. Fifth Avenue
Portland, Oregon 97204

This certification must be filed at least five(5) days prior to the Proposal Opening. FAILURE TO ACHIEVE CERTIFICATION BY THE PROPOSAL OPENING DATE AND TIME SHALL RESULT IN THE RETURN OF YOUR PROPOSAL UNOPENED.

1.17 Signing of Proposals

The submission and signature of a proposal shall indicate the intention of the proposer to adhere to the provisions described in this RFP and a commitment to enter into a binding contract.

Proposals which are signed for a partnership shall be signed in firm name by at least one partner or in firm name by Attorney-in-fact. There must be attached to any proposal signed by Attorney-in-fact a Power of Attorney evidencing authority to sign proposals.

Proposals which are signed for a corporation shall have the correct corporate name thereon and signature of authorized officer of corporation manually written below the corporation name. The title of the office held by the person signing for the corporation shall appear below the signature of the officer.

Proposals which are signed by an individual doing business under a firm name shall be signed in the name of the individual doing business under the proper firm name and style.

1.18 Conflict of Interest

A proposer filing a proposal thereby certifies that no officer, agent, or employee of the City who has a pecuniary interest in this proposal has participated in the contract negotiations on the part of the City, that the proposal is made in good faith without fraud, collusion, or connection of any kind with any other proposer for the same call to proposals, and that the proposer is competing solely in its own behalf without connection with, or obligation to, any undisclosed person or firm.

1.19 Proposal Guaranty

The proposal made by the successful proposer will become contractual obligations if acquisition action ensues. Failure of the successful proposer to accept these obligations in a contractual agreement may result in cancellation of the award.

Unless covered by an annual bid bond filed in the Office of the City Auditor, all proposals must be accompanied by a certified or cashier's check payable to the order of the City of Portland, or a Surety bond for the single proposal submitted, in the amount of ten per cent (10%) of the amount of the total bid; said amount to be forfeited as liquidated damages in case the proposer shall fail to execute the contract within ten (10) days after receiving said Contract from the City Auditor for execution.

The bid guaranties will be retained in accordance with the provisions of Section 5.44.030 (Retention of Bid Guaranty) of the Code of the City of Portland, Oregon. If a bid bond is submitted in lieu of a certified check, such bond shall be on the form included with the specifications. (ATTACHMENT 3.)

1.20 Rejection of Proposals

The City reserves the right to reject any or all proposals received, or waive as a result of this RFP.

1.21 Disputes

In case of any doubt or differences of opinion as to the items to be furnished hereunder of the interpretation of the provisions of this RFP, the decision of the Project Manager shall be final.

1.22 Contract Requirements shall consist of the following:

1.22.1 Performance Bond

A performance bond in the amount of bid price shall be required of the successful proposer upon contract acceptance. This bond, in part or all, is to be forfeited to the City of Portland in the event that the terms of the contract are not met in total by the successful proposer.

1.22.2 Time shall be considered the essence of any contract awarded hereunder. If a successful bidder fails to complete the work within the time specified in any contract awarded hereunder or any extension thereof by the City, actual damage to the City for the delay will be substantial but will be difficult or impractical to determine, and therefore, in lieu thereof the successful bidder and/or his Surety shall be liable to the City as Fixed, agreed and liquidated damages for each and every calendar day of delay: $100 per calendar day.

Non-performance includes a failure to provide any deliverable item within the time tables specified in the contract documents.

1.22.3 Assignment of Contract

Any contract awarded hereunder or any part thereof, shall not be transferred, sublet or assigned without prior written approval of the Project Manager. The proposal should include a list of any subcontractors that will be a part of the project study.

1.22.4 Termination of Contract

The City reserves the right to terminate any contract awarded hereunder, at any time if any of the provisions of the contract are violated by the contractor or by any of his subcontractors. In the event of such a termination the ctiy may retain all sums due under the contract and both the contractor and his Surety shall be liable under his performance bond. for all losses, expenses and damages caused to the City by reasm of the Contractors failure to complete the contract and Surety shall be required, at the City's option, to complete the project. Notwithstanding such termination, the contractor and his Surety shall remain liable under the terms of the contract for work performed prior to such termination. The project manager will determine the payment due contractor for work performed prior to the date of contract termination.

1.23 Patent Indemnity

The applicant agrees to hold harmless, indemnity and if requested by the City defend, to any claim or action brought against the City based on a claim that the system supplied by the contractor or his sub-contractor infringes a patent or copyright. The foregoing is subject to the following condition:

> That should the system become, or in the contractor's opinion is likely to become, the subject of a claim of infringement of a patent or copyright, the City shall permit the contractor to replace same with a non-infringing product or modify it so it becomes non-infringing, so long as the replacement or modification provides the same or better performance.

SECTION II

PROPOSAL FORMAT

Contractor proposals must be submitted in the format outlined below.

2.1 Part I: Business Organization

State the full name and address of your organization, and if applicable, the branch office or other subordinate element that will perform or assist in performing the work hereunder. Indicate whether you operate as an individual, partnership or corporation; if as a corporation, include the state in which you are incorporated. State whether you are licensed to operate in the State of Oregon.

2.2 Part II: Statement of the Problem

State in sufficient terms your understanding of the problem presented by this RFP and of your role in its solution.

2.3 Part III: Management Summary

Provide an overview explanation and chart showing project leadership, reporting responsibilities, and study team interfaces with the City and County personnel and its consultants. If sub-contractors are to be utilized, a management structure shall be provided for these firms.

2.4 Part IV: Work Plan

Describe your technical plan for accomplishing the work. Indicate the number of man days you have allocated to each task. Include a display, time related, showing each milestone, task and decision point in your plan. Clearly indicate:

2.4.1 The steps you will take in going from the conceptual design (Attachment 1) to the detailed design specifications.

2.4.2 The specific technical factors you will consider in accomplishing 2.4.1 above with an indication of the technical depth to which you will treat each.

2.4.3 The definitiveness of your resultant design specifications.

2.4.4 List of deliverable items. As a result of work performed in Section III.

2.4.5 Identify specific tasks which must be performed by the City.

2.5 Part V: Prior Experience

As part of your proposal, include relevant corporate experience and a brief statement concerning the recent experience of persons from your firm who will be actively engaged in the proposed effort. Do not include corporate experience unless persons who will work on this project participated in that experience and do not include experience obtained prior to 1974. Emphasize experience directly applicable to this RFP. Indicate for whom the work was performed and the calendar year in which it was completed.

2.6 Part VI: Manpower

The names and qualifications of all non-clerical personnel to be assigned to the project shall be presented. State the primary work location of these personnel during the time they will be engaged in the study. Estimate the per cent of his or her time each individual will devote to the work. Identify key individuals by name and title. Provide resumes of all non-clerical personnel.

2.7 Part VII: Authorized Negotiators

Include the name and telephone numbers of personnel of your organization authorized to negotiate the proposed contract.

2.8 Part VIII: Additional Information and Comments

Include any other information that is believed to be pertinent but not specifically required elsewhere.

2.9 Part IX: Cost and Price Analysis

The information requested in this section is required to support the reasonableness of your quotation and is for City internal use only. Your established method of costing may be used and should be described. This portion of the proposal must be bound and sealed separately from the remainder of the proposal. Use the following format:

2.9.1 The proposal should clearly state where (Portland or elsewhere) various portions of the contract work will be performed.

2.9.2 Manpower

Itemize so as to show the following for each category of personnel.

a. Category; e.g., project manager, senior analyst, etc.

b. Estimated hours.

c. Rate per hour.

d. Total cost for each category and for all manpower needs.

2.9.3 Cost of Supplies and Materials

2.9.4 Other Direct Costs

2.9.5 General and Administrative Burden of Overhead

Indicate base used and basis therefore, percentage and total.

2.9.6 Transportation Costs

Show travel costs and per diem separately.

2.9.7 Project Cost Schedule

Estimate the percentage of total effort expended for each major milestone listed in the work plan.

2.10 Taxes

Taxes, whether State or Federal, shall not be included in the proposal prices. Tax exemption certificate will be provided by the City on request.

SECTION III

REQUIREMENTS AND STATEMENT OF WORK

3.1 Statement of Work

The contractor shall prepare preliminary and detailed systems designs for both the Basic 911 system and the Expanded 911 system, described in Attachment 1. Any system design must maintain the integrity of the dispatching procedures for each agency to be served as described in Attachment 2.

Completion of the following tasks and deliverables will be required for successful completion of the contract. Alternative approaches may be proposed, but shall be a separate section entitled, "Alternative Approaches." A written report (with 20 copies) must be submitted to the Project Director upon the completion of each task.

3.1.1 Reports will be reviewed by the User/Provider Board within 10 days of receipt

Task 1: Prepare workplan for completion of Basic and Expanded 911 within two weeks of contract award.
The workplan is to include major milestones and dates for completion of preliminary and detailed system designs for both Basic and Expanded 911. The workplan and milestones are subject to approval by the Project Manager.

3.1.2

Task 2: Prepare preliminary design for Basic 911 system as described in Attachment 1, 30 days from contract award.
This design should include a basic proposal with alternatives for equipment, staffing, call handling, procedures and provider interfaces with estimated costs for each alternative. The preliminary design should include recommendations of the most efficient alternative(s) to be pursued in the detailed design. The preliminary design is subject to the approval of the Project Manager. Factors which should be considered in the design include:

a. Review of telephone traffic data which will be supplied to the successful vendor. Contractor should comment on this data in light of their knowledge of other 911 systems, and the demographic characteristics of Multnomah County which will be supplied to the successful vendor.

b. Make a sight survey of Kelly Butte, Fire Alarm Telegraph and Fire District #10 to determine current call handling procedures and hardware presently being used (additional information in Attachment 2).

c. Do the following in order that call answering time does not exceed 20 seconds:

1. Determine the number of incoming trunks
2. Determine the number of direct transfer lines between agencies
3. Determine the number of 911 operators
4. Determine alternative means of providing toll-free emergency service for people using telephones in the Cascade Locks central office (374 prefix) to include the following:
   a. Telephone lines
   b. Microwave
   c. Cable lines

   A cost effective study should accompany each alternative.

3.1.3

Task 3: Prepare detailed design within 60 days of contract award for the system selected by the Project Manager for implementation of Basic 911.

The detailed design is to include:

a. Network configuration and costs for incoming and outgoing telephone lines. The configuration should include the specific system features suggested in Attachment 1 to be implemented.

b. Complete specifications and costs for equipment to perform the required functions using the criteria sggested in Attachment 1. The specifications are to include consoles and any other equipment and supplies necessary to perform the required functions. Potential vendors for any or all equipment are to be listed.

c. Complete description and costs of staffing and organization of the 911 answering center. This is to include a functional organization chart, a physical layout, job descriptions for each staff position, any furniture and equipment not included in b., materials and supplies and staff training requirements.

d. Recommendations for efficient call-handling procedures, including the interface between the 911 answering center and each provider agency. The recommendations should include appropriate 911 operator protocols, forms and instructions for written communications. The call transfer method of response is to be used for primary providers. Call relay and call referral may be used for agencies outside Multnomah County, agencies receiving infrequent emergency calls and non-emergency calls.

e. Recommendations for appropriate modifications to existing inter-jurisdictional agreements to improve resolution of the mismatch between telephone prefix and jurisdiction agency boundaries. These agreements will be supplied to the successful vendor.

f. Suggest a methodology for the development of the management information system requirements described in Attachment 1.

g. Provide direct communication links (other than 911) between Police, Fire and EMS.

3.1.4

Task 4 Prepare an implementation plan for Basic 911 within 90 days from contract award

The plan is to include detail tasks, responsibility for task, start and completion dates for each task, estimated work hours for each task and identification of interdependent tasks. The tasks are to be divided into the following categories or an alternative acceptable to the Project Manager:

1. Equipment procurement, installation and testing.
2. Facilities planning, including physical layout, furniture and equipment and security.
3. Staffing, including testing, hiring, training and evaluation.
4. Telephone system conversion.
5. Public information, including press releases, telephone book modifications and any other appropriate media to ensure adequate preparation of the citizens for the new system.

3.1.5

Task 5 Prepare a Request for Proposal (RFP) for system procurement (Basic 911) within 90 days of contract award

The RFP is to include the following:

a. Objectives of RFP
b. Specifications and statement of work, including minimum hardware requirements, optional hardware and maintenance and training requirements
c. General conditions, including bid and contract requirements
d. Proposal format instructions
e. Appropriate appendices, such as sample forms for response, performance standards and definitions

3.1.6

Task 6 Prepare preliminary design for Expanded 911 as described in Attachment 1 within 60 days of contract award

All of the requirements of Basic 911 are to be included. The design must address requirements and estimated costs for three(3) separate types of Expanded 911 systems:

1. Selective call routing.

2. Selective call routing with Automatic Number Identification.

3. Selective call routing with Autmoatic Number Identification and Automatic Location Identification.

These designs should include alternatives, with advantages and disadvantages of each, for equipment, staffing, procedures, and provider interfaces with estimated costs for each alternative. The preliminary design should include recommendations of the most efficient alternative(s) to be pursued in detailed design. Price/performance analysis is to be included in the recommendation. The preliminary designs are subject to the approval of the Project Manager.

In addition to the deliverables above, the Contractor will be required to submit monthly progress reports showing actual versus planned activities with explanations of any variances from the workplan and detailed monthly financial reports. These reports will be submitted to the Project Manager.

3.1.7

Task 7: Twenty-five copies of the final report shall be delivered on March 15, 1980. The document will use a high quality printing process which provides copies suitable for repreduction.

ATTACHMENT 1

BASIC AND EXPANDED 911 SYSTEM REQUIREMENTS

A1.1 BASIC 911

All callers dialing 911 from either a residence, business, or coin telephone are to be routed to a 911 Answering Center which is to be located at the Emergency Communications Operations Center. The BASIC 911 system design must meet the following criteria:

A1.1.1 Incoming calls to the 911 Answering Center must be distributed in such a manner to permit a 911 operator to respond to calls in the most efficient manner, i.e., first call in is first call answered. All calls must be voice recorded.

A1.1.2 All calls received by the 911 operator will be viewed as emergency calls and transferred directly to the appropriate agency or terminated. The 911 operator must remain on the line until the transfer has been completed.

911 calls which are determined by the 911 operator as administrative or mis-directed will be transferred to a recorded message.

A1.1.3 Each agency will determine the nature of the call. All calls of an administrative or mis-directed nature (to be defined by each agency separately) will be transferred to a tape recording which informs the caller that he/she has reached an emergency number -- consult telephone directory for appropriate telephone number. All calls which

can be handled by report must be terminated by the agency. The report taker must then call the citizen back to gather the report information.

A1.1.4 All 911 calls will be passed to one of three places:

Law Enforcement Dispatch at Kelly Butte

Emergency Medical Services at Kelly Butte

Fire Alarm Telegraph Office at Northeast 21 and Pacific.

It is anticipated that Fire 10 and Portland Fire will have consolidated dispatch by December of 1980. This consolidated dispatch will be located at Portland Fire Bureau.

A1.1.5 A total time for 911 call handling (first ring to transfer) must not exceed 20 seconds.

A1.1.6 The 911 Operator will answer the call "911 Emergency. Do you need Fire, Medical or Police assistance? (Caller respond.) Don't hang up. I'm transferring you to . . . " In order to prevent "lost" calls Portland Police Bureau wants a ninety (90) day test period during which time the phone number will be data collected by the 911 Operator. They will accept assurances given that:

a.) the system will be adequately tested before cutover.

b.) automatic ringback be available to the 911 operator after the call has been transferred to the proper agency.

A1.1.7 Automatic alarms shall not be allowed to access 911.

A1.1.8 Access to emergency aid in boundary mismatch areas will be accomplished in the following ways:

a) A seven digit number (760-6911) will ring at the 911 console. This seven digit number will help alleviate the boundary mismatch problem.

b) Toll free access to emergency help must be available to people in the Cascade Locks Central Office (374 prefix).

A1.1.9 The citizen must choose whether he/she wants help from Police, Fire or Emergency Medical. The first agency contacted will become the primary and responsible agency, and will assume coordination.

A1.1.10 The 911 console must have the capability to inform the 911 operator when all lines to an agency are busy. This indicator must differentiate between Police, Fire and EMS lines. When all lines are busy to the proper agency, the 911 operator must ask the following questions:

a) Is a life immediately in danger?

b) Is property immediately in danger?

c) Is there a crime in progress?

If the answer to a, b, or c is yes, the operator will have the capability at the 911 console to notify Fire, EMS or Police, both visually and audibly, that a "hot" call is waiting.

If the answer is no to question 2, 3 and 4 above the 911 operator must say:

"All the _____ lines are busy at this time. I will put you through to the _____, but you will be on hold until an operator is free."

A1.11. For a single emergency generating many calls:

A recording capability must be located behind the 911 position. All calls coming to 911 will be transferred to the proper agency. After the transfer and the agency actually receiving the call a recorded message must be available. During times when a single emergency generates many calls a recorded message will be laid down and activated by the dispatch co-ordinator to say:

"We have a _____emergency. If you are calling about the _____emergency please hang up to free the telephones. Thank you for calling to report the problem. If you are calling about an emergency of another nature -- please stay on the line -- don't hang up -- the first available operator will be able to help you."

A1.12. The system must provide for the collection of management information for 911 traffic and staffing analysis. Figure A is a list of information and reports included in the present police system. Figure B is a list of some data which could be gathered by a new ACD.

FIGURE A

DATA GATHERED
Calls per hour Average calls per hour Half shift average hourly call count Average total call counts for each day of the month Half-shift average hourly total calls Calls for the month Total calls
% of calls waiting over X seconds Expected % Average Wait Time (AWT) Hourly % AWT Half-shift % AWT Hourly average wait per call Number of AWT calls during the month Month's % AWT calls
Wait per call Number of calls receiving busy Number of calls answered in less than X seconds Length of calls waiting in queue Number of calls placed on queue Number of calls transferred to avoid lengthy hold
Number of calls transferred into hold Number of hang-ups before answered Average call process time Average talk time Average work time after hang-up Average hold time % Occupancy
Hourly average call process time Half split call process time Average call process time for a month Number of calls originated by each operator Number of calls transferred into system Number of calls transferred out Length of wait (idle) time between calls
Call taking staff Hourly average call taking staff Half split-shift call taking staff Average call taking staff over the month

FIGURE B

REPORT GROUPS

A report group can be defined by any criteria, i.e., A or B status, EMS operator, age, sex, etc. A group can be redefined momentarily 1E. EMS operator to B status, B status to A status. This group redefinition can be done without disrupting the data gathering process - thus giving management more flexibility. An analysis of any operator or group of operators can be performed based on the following data:

- Number of calls transferred in
- Number of calls transferred out
- Length of occupancy
- Length of idle time
- Length of call processing time
- Length of after call work time
- Length of out-going calls

TRUNK GROUPS

Trunk groups can be defined in almost any terms, i.e., calls transferred to EMS or Fire; calls originating from various parts of town; 911 calls, etc. Data can be gathered to give the following information on trunk groups: (printed every two hours)

- Number of incoming calls
- Number of calls receiving busy
- Length of phone usage
- Trunks not used for two hours
- Trunks busy for two hours
- Trunks on which trouble occurs

BOUNDARY MISMATCH CALLS

Number of calls from other jurisdictions by Central Office

Number of calls coming in on the seven digit numbers.

In addition to the system requirements above, the following system features are to be analyzed in terms of price-performance. The Project Manager will determine which features will be included in the system based on this analysis.

Forced Disconnect

The forced disconnect feature allows the 911 answering center attendant to disconnect any call on a 911 trunk. This feature prevents intentional jamming of the 911 answering center by persons dialing all of the 911 trunks and refusing to hang up. The Forced Disconnect feature can be provided for simple 911 configurations using local facilities, and for multi-central office configurations using either direct or telephone network interoffice trunk facilities.

Idle Circuit Tone Application

This feature provides a means of determining upon answering a call whether the calling party has already disconnected or whether the caller is still off hook but unable to speak. If the caller abandoned the line just before the 911 answering center attendant answered, a distinct tone is applied to the 911 answering center. If the caller is unable to verbally respond but is still on the line, no tone will be heard. The feature can be provided with either direct or regular network interoffice trunks.

Called Party Hold

This feature enables the 911 answering center attendant to retain control of the call connection and to hold the line up for manual tracing even if the calling party goes on-hook. This is a useful feature to locate people who did not communicate all of the data needed for response by the 911 answering center and to trace nuisance calls. Called Party Hold can only be provided with direct dedicated trunk facilities.

Ringback

This feature is used in conjunction with Called Party Hold to ringback a held connection after the calling party has gone on-hook before the 911 answering center has obtained all of the necessary emergency data. Single party service and direct dedicated trunks are required.

Switchhook Status Indication

This feature allows the 911 answering center to monitor, by means of supervisory lamps, the status of a calling party being held. This is a desirable feature, especially if Called Party Hold is provided, because it will help insure that the caller's line is not unnecessarily held up after the emergency call is completed. Direct dedicated trunks are required.

Visual Identification of Incoming Lines

When direct dedicated trunks are used in a multi-central office 911 system, the names of the originating offices can be affixed to the incoming lamps to tell which office the call is coming from.

Dial Tone First

Dial Tone First (DTF) or coin free dialing allows a caller to dial 911 from a pay telephone without depositing coins.

A1.2 EXPANDED 911

In addition to the features provided by BASIC 911, there are three major features to be investigated for inclusion in EXPANDED 911. The first, selective routing, is necessary if the system is expanded. The second and third, Automatic Number Identification (ANI) and Automatic Location Identification (ALI), are desirable for implementation if cost-performance analysis proves their efficiency and effectiveness.

A1.2.1 Selective Routing

Selective call routing is a process by which Central Office (CO) equipment analyzes the originating phone number and "decides" whether that number is within 911 and jurisdictional boundaries, and routes accordingly. Two primary factors affect selective call routing. Before the telephone being served by an exchange can be selectively routed, each CO must have the capability of automatically determining and forwarding the telephone number of the calling telephone. All COs serving Multnomah County and the City of Portland have these capabilities. Also, each 911 system area being selectively routed must either have access to a CO with electronic switching equipment or install a special computer. PNB has several COs with this electronic switching equipment, some of which can function as a Control Office to deliver selective routing to the whole system.

Tables A and B define the magnitude of the boundary problem areas. These figures are to be used in price-performance analysis.

TABLE A

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MAJOR PROBLEM AREAS

The major problem areas for the City of Portland are:

Central Office	Portland Mainstations	Approximate Problem Magnitude
Pacific NW Bell		
Cypress	2,474	8,805
Lake Oswego	973	11,449
Oak Grove/ Milwaukie	246	21,524
TOTAL	3,693	41,778

The major problem areas for Multnomah County are:

Central Office	Mult. County Mainstations	Other Mainstations
Pacific NW Bell		
Cascade Locks	94	410
North Plains	9	1,899
General Telephone		
Orient	500	2,373
Somerset	83	6,049
Cascade Utilities		
Aims	55	93
Rose Valley		
Scappose	50	2,573
TOTAL	791	13,397
CITY/COUNTY TOTAL	4,484	55,175

TABLE B

OTHER PROBLEM AREAS

Other boundary problem areas for the City of Portalnd are:

Central Office	Portland Mainstations	Approximate Problem Magnitude
Pacific NW Bell		
Cherry	16,693	6,079
Harold	12,868	1,027
Prospect	25,661	4,462
TOTAL	55,222	11,568

Other problem areas for Multnomah County are:

	Central Office	Mult. Cty. Mainstations	Other Mainstations
	Pacific NW Bell		
	Burlington	573	112
	Cascade Utilities	981	18
	TOTAL	1,554	130
City/County	TOTAL	56,776	11,698

In these areas there are more Multnomah County citizens than other County citizens and the only options open are to include all citizens in the CO (even those in other Counties) in the 911 service area and make some interagency arrangements or selectively route the calls.

The preceding telephone statistics were provided by Pacific Northwest Bell in April of 1979.

A1.2.2 Automatic Number Identification

Automatic Number Identification (ANI) means the ability to identify the telephone number of every caller for billing purposes. In the language of 911, however, ANI means forwarding the caller's telephone number to the PSAP where special equipment translates the data into a visual display of the caller's number at the attendant position. The central office, as a requirement for ANI, must be able to identify each caller's number and forward that number to the PSAP. The PSAP equipment must be compatible with Telco equipment to receive this data. Direct dedicated trunks are also required.

A1.2.3 Automatic Location Identification

This feature uses the ANI feature and expands upon it by using the caller's telephone number to search a computer data file which contains an address or location coordinate for every telephone number. Both the caller's number and location are then displayed at the PSAP attendant position. As with the ANI feature, direct dedicated trunks are required.

Computer alternatives to be addressed in the system design should include a dedicated computer system and direct connection with telephone company computer system.

ATTACHMENT 2

PRESENT EMERGENCY SERVICES
(DISPATCHING PROCEDURES)

A 2.0 General System Information

The following material is based upon the conceptual system design presented in Attachment 1 and supportive background material in Reference 1. Specific references are listed, where applicable.

A 2.1 Using Agencies

a 911 Emergency Communications system will be installed for the City of Portland and Multnomah County, Oregon. The system detail design shall include the requirements of the agencies listed below.

A 2.1.1 Portland Police Bureau

The Portland Police Bureau provides police protection for the 386,000 residents of metropolitan Portland. To accompllish its duties, the Portland Police Bureau employs a force of over 700 sworn officers and expends an annual budget of over $25,000,000.

A 2.1.2 Multnomah County Department of Public Safety

The Multnomah County Department of Public Safety (MCDPS) provides law enforcement protection to the urban, suburban and rural areas of Multnomah County, not protected by agencies of other incorporated cities such as Portland and Gresham. The MCDPS is responsible for the safety of approximately 250,000 residents scattered over a geographical area of nearly 423 square miles and dispatches for all Multnomah County law enforcement agencies outside of the City of Portland.

A 2.1.3 Portland Bureau of Fire

The Portland Bureau of Fire (PBF) is a large metropolitan fire department with a budget (1979-80) of approximately $20,000,000 and a membership of 685 personnel. There are 26 engine companies; three

fireboats; a communications complex including telephones and public address land-lines, a radio network, and a municipally-owned fire alarm telegraph system; three rescue units; and other specialized equipment.

A2.1.4 Rural Fire Protection Districts

Rural Fire Protection Districts (RFPD) are autonomous fire suppression agencies existing throughout Multnomah County and supplying fire protection services to outlying areas. There are now five Rural Fire Districts in Multnomah County. These five districts are: RFPD 10, 12 (Errol Heights), 14 (Corbett), 20 (Skyline), and Gresham. District 20, District 14, and the City of Gresham are volunteer departments. Only Districts 10 and 12 are staffed with paid fire-fighting personnel, and 12 is only partially paid.

Rural Fire District 10, the largest of the RFPDs, covers a 90 square mile area of Multnomah County containing 160,000 people. RFD 10 has 9 stations and its own command control center for alarm receipt and dispatch. There are 208 fully-paid employees. The equipment inventory includes 3 rescue units, 10 engines, 10 reserve pumps, 3 trucks and 1 chemical unit.

A2.1.5 Emergency Medical Services (EMS)

The Emergency Medical Central Dispatch System, authorized by the City and County, is being developed by the Bureau of Emergency Communications in conjunction with the EMS Director. The probable start date is early 1980.

A2.2 Communications Systems Procedures

There are four communications systems with which 911 must interface: Police at Kelly Butte, EMS at Kelly Butte, Portland Fire at 915 NE 21st, and Rural Fire District 10 at 1927 SE 174th Avenue.

A2.2.1 Police Communications System at Kelly Butte (Exhibit A gives more detailed information about the physical layout of Kelly Butte).

In 1976, the dispatching procedure at Kelly Butte became computer aided. The radio system, the telephone

system, computer system operations equipment, digital terminals and data gathering will be reviewed.

a. Radio System

The Police radio system in use today was designed to correct several major deficiencies in the old system. Prior to initiating today's system, the Police agencies used separate frequencies as well as separate dispatch centers. The equipment in use was obsolete and the radio nets were overcrowded.

The new radio system uses the latest technology in communications. It operates on a 450 MHG high-band frequency reserved for police and fire agencies.

Dispatch transmissions are broadcast to all mobile and portable radios from selectable transmitter sites chosen to provide the strongest possible signal. The vehicles and portable radios transmit back through the voting receiver which, in turn, selects the strongest possible signal for rebroadcast.

When a mobile or portable radio transmits, the sites which receive the transmission relay it via telephone lines to the center. Equipment at the center selects the best message and that is what the dispatcher/operator hears. This system operates on all nine nets covering law enforcement activity for which the center has responsibility and is the basis of the excellent car-to-car reception as well. A repeater is used to duplicate the strongest signal for rebroadcast.

In a highly mobile situation, such as a high speed chase, a dispatcher may broadcast on more than one net at the same time by using a special "simul-cast" feature.

Each dispatcher radio control equipment is operated by a separate mini-computer which senses a request from the dispatcher and automatically accomplishes the proper radio switching. All of the dispatch consoles are equipped with a back-up radio system in the event of a computer failure.

The radio system also provides monitoring and transmission capabilities on other agency frequencies. These frequencies are monitored as a precaution in the event of disaster or telephone line failure.

The radio system is micro-wave activated. Micro-wave units have removed the need for telephone land-lines by sending the data through the air waves. Micro-wave enhancement has also eliminated the line trouble that has been a major cause of radio problems from the mobile/hand-held radios using the voting receiver system.

b. Telephone System

Calls for police service were originally routed through a manually operated switchboard and then transferred throughout the police agencies by the switchboard operators. Today's Automatic Call Distributor, or ACD, replaced 31 switchboard operators. In the ACD system, a single phone number, 760-6911, is used in the City/County area to call for police help. Using 13 incoming lines the system automatically transfers calls to the first operator available. A call-taking coordinator monitors the call-taking positions using an automatic device which gives an audible signal when calls are waiting and makes automatic recorded announcements to waiting callers.

The call-taking coordinator is responsible for posting data on the number of incoming calls and calls waiting. An automatic counter records this information on an hourly basis. The current center goal is to answer each call within 20 seconds. If a call is not answered within 20 seconds, the caller will receive a recorded message.

The equipment at each call-taking position allows the operator to answer emergency lines, transfer incoming calls to other agencies, signal the coordinator for assistance, and use a speed-dial to call special emergency response numbers.

c. Computer System

The City/County Computer Assisted Dispatch System (CAD) is one of the most sophisticated systems in use today by any police agency. It was designed with several basic requirements: a fail-safe for at least 98% reliability; to allow background programs and enhancements to be run without interrupting the normal operations; and to provide a complete, automated record of all processed law enforcement activity.

The two mini-computers are solely dedicated to the police system and operate in tandem with one on-line and the other an idle or ready mode. In the event that the on-line computer fails, the second computer will take over. Three discs, or files provide storage of programs. One disc is shared and contains all of the current transactions regardng address verification, incidents, unit status and history. The other two contain programs which operate the system.

Action taken on all incidents is recorded on both a a computer printout and magnetic tape. The printout makes information from the computer available to the operations personnel should the computer fail. Printouts are stored at the center for 7 months. Each

Transaction History Tape covers a 24-hour period and is processed for use in management reports at a separate off-site facility.

d. Operations Equipment

The call-taking position is the work area for those operators who receive the incoming calls for police assistance. This position is the first stage in the dispatch process. The operator has special equipment information aids which include microfiche, speed dial telephone, call play-back recorder, and ACD telephone. Each position is also equipped with a complete CAD input terminal including a cathode ray tube (CDT) display unit. A specially designed, function coded keyboard at each position is used to record incoming information for the computer.

The Address Verification File is a major part of the CAD system. This file is designed to verify an address on the basis of one of four entries: route and box, street address, intersection or a landmark. It also assigns the call automatically to the proper dispatching operator when it is forwarded.

The dispatcher has much of the same equipment as the call-taking operator plus a thermal printer to provide special police unit information, detailed descriptions of wanted persons and vehicles, and data for general broadcast; two CRT screens which assist the dispatcher in maintaining current unit status and tracking calls waiting for dispatch. Status slots are available for manual operation in the event of computer failure. The radio and telephone equipment is located in a special console designed to provide easy access to each area dispatcher.

Service desk positions are also dispatch units, though they are not often used for precinct dispatch. The operators at these units provide various services for the police field units such as checking criminal history files, vehicle registration and arrest warrant information, and ordering tow trucks, fire suppression units, ambulances, etc. The service desk positions have separate computer terminals which provide the operators with access to local, state and national police records information systems.

The report writing station is used to take reports over the phone on incidents which do not require the dispatch of police field units. A report writer is available on each shift except the 11 p.m. to 7 a.m. shift. The report writing station has complete dispatch capability and can be used in the event of an emergency as a back-up unit to one of the primary dispatch consoles.

The call-taking coordinator has supervisory responsibility for all work done by the call-taking operators. The coordinator's position is located in proximity to incoming call receipt operators. The coordinator can monitor individual telephone conversations and assist where needed with individual calls. The coordinator is also responsible for maintainig daily shift call data, the 24-hour tape logging recorder, and the deaf teletypes, which is a system that allows deaf complainants to communicate their requests for police service. This supervisor also assists the dispatch coordinator with information for the news media and calls from other agencies.

The dispatch coordinator, primarily a sworn position, has the responsibility of monitoring four dispatch radio nets, four fire radio nets and two disaster radio nets, along with numerous special incoming telephone lines. Front door entry and perimeter building security cameras are monitored here as well as computer failure detection equipment. The coordinator has all radio nets available to him as well, and may be instrumental in handling "hot incident" calls such as when a net is closed for a special tactical operation or when an operation involves several police agencies. The location of the position is adjacent to the four main dispatch consoles.

Both coordinators have complete access to all computer related display equipment and may call up indvidual or summary information on any active or closed call in the system.

e. Mobile Digital Terminals

Approximately 25 police vehicles are now equipped with Mobile Digital Terminals (MDTs). MDTs are mini-computers which have access to a state and nationwide police records information system. MDTs can also be used to send routine car-to-car and car-to-comunicatons center messages. The MDT system is operated by a special message switching computer located at the center. The computer is a Varian/Univac V-77 400. The computer routes the requests from the MDT to the CAD system and vice versa and provides the interface with the state and national police information systems.

f. Call Handling Procedures

The incoming calls on the main police emergency number are handled in a two-tiered configuration. The first tier consists of emergency operators (A) whose function is to screen incoming calls to determine whether they

fit the priorities one or two on a scale of five which encompass all police responses for the County-wide system. Priorities one and two are primarily life threatening (or near life threatening) incidents or a crime in progress. If the call fits either of these priorities it is immediately processed by the receiving operator who gathers the following information and enters it into the computer:

Incident Format

Name of Complainant
Location
Address of Complainant if different from location
Phone Number
Brief Description of Incident
Vehicle Information
Suspect in the Area
Direction of Travel
When Left
Weapon
What Type of Weapon

Computer Added Information (automatically)

Time Call Received
Time Sent to Dispatch
When Dispatched
Additional Information
Incidents in the Area

If the incident is an extremely "hot" one, as soon as the address has been entered into the computer, the call can be forwarded to the dispatch operator for dispatch with the remainder of the information following as soon as it has been collected.

The CAD collects and processes the in-progress and historical record for each incident and provides for verification of address by means of a variety of entry methods. The AVF automatically assigns each incident to a specific dispatcher responsible for a given geographic area. In addition, CAD provides information on nearby in-progress incidents and hazardous situations, traffic impediments, etc., by means of a special cross-referencing portion of the AVF.

If the call is transferred to the second tier or B operation, the B system operator first screens the call for termination, transfer out of the system, assignment of priority three or four or call-back on priority five a police phone report).

The A-B phone system is designed to keep the A phone operators free to process high priority calls. The BOEC primary performance measure (% exceeding acceptable wait time) is based on a measure of the efficiency of these operators.

In additon to these operators, police record clerks are used to handle all calls or phone reports which have been determined to be appropriate. These reports are taken via call-backs unless the clerk is not busy when the operator determines that a report should be taken.

g. Dispatch Procedures

As soon as the incident information has been collected by the call receiving or secondary operator, it is forwarded via computer to the operator responsible for the geographic area to which the response will be made. There are up to three areas currently used to cover the City of Portland and a fourth which covers the County, Gresham and Troutdale. The dispatch operator then dispatches the call in priority order to an available police unit. The computer makes a suggested unit assignment from available units by summarizing calls waiting for dispatch by priority as well as available units. In addition to the summary, the dispatch operator has access to detailed information on each call, including hazards and nearby incidents.

The dispatcher thus remains in contact with the unit for the remainder of the incident.