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Data Processing Analysis and Recommendations for the City of McCook, Nebraska

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DATA PROCESSING ANALYSIS AND RECOMMENDATIONS FOR THE CITY OF MCCOOK, NEBRASKA

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I. Scope and Purpose

This report is an analysis with recommendations regarding the data processing needs of the city of McCook, Nebraska. If was undertaken pursuant to an agreement dated February 22, 1982 between McCook and the Center for Applied Urban Research of the University of Nebraska at Omaha. It will provide city officials in McCook with a basis upon which to decide whether to expand and upgrade current automated data processing capabilities.

Recent advances in technology have brought computers within the financial reach of many local governments in America. These advances have also made it possible for local government personnel who are not data processing experts to use computers effectively with little additional training.

The first advance has been the tremendous reduction in the physical size and cost of computers coupled with dramatic increases in their functional capability. Second, the current generation of application programming or software available to local government is characterized by flexibility and "user-friendliness." That is, the programming is designed for interactive use on video terminals by personnel requiring no knowledge of computer technology or programming. One result of these changes is that local governments today can acquire and use computer systems to aid in performing everyday activities and can do

so with a high degree of confidence and at relatively low cost.

II. Acquiring the Technology

Today, a computer system should be viewed as a tool to be used just like any other piece of office equipment. It is an integral part of the work routine, just like a typewriter, the telephone, the adding machine or the filing cabinet.

The city of McCook is in a highly favorable position regarding implementation of a computer system or acquisition of enhanced data processing capabilities. This is so for at least two reasons. First, the city currently relies on a data processing service bureau for partial automation in five functional areas of city government. These are accounting, utility billing, payroll, special assessments and equipment cost accounting. Second, city personnel are familiar with and experienced in the use of data processing and are eager to acquire new and more effective automated capabilities.

Computers are technically feasible in almost all organizations. Technical feasibility, however, is often less important to local governments than several other factors, including:

* Changes in law. Changes in law impose new and different data collection and reporting requirements on local government. These include such things as personnel and civil service requirements, environmental regulation, EEOC requirements, and financial reporting of various kinds that are imposed by state and federal governments. In almost all cases, increased data handling means either additional personnel or the use of new and more productive methods.

* Cost. Cost is perhaps the best understood and most definitive means of determining the feasibility of any new system. Is the new system more or less expensive than current methods? However, although cost may be the best understood criterion for determining feasibility, accurate cost estimates are often difficult to obtain, especially in cities with limited current data processing capability.

A word of caution is in order here. Few local governments which implement computer technology can expect to reduce overall costs. Thus, a strict cost justification for an EDP system may be impossible. At best, a local government can anticipate cost displacement (e.g., the moving of costs from one place in the budget to another) or cost avoidance (e.g., the use of more efficient technology to prevent, avoid or move into the future costs that would otherwise occur). Cost displacement and cost avoidance are strong arguments for implementing computer systems.

* Ease of Operation. Some computer systems can be operated only by technically trained personnel. A factor in favor of the current technology, especially the present generation of mini- and microcomputers, is that in many cases local government personnel who are not trained in the technology can easily operate these systems and a technical staff of programmers is not required.

* Available Programming. The availability of proven, easy-to-use software or programming to make a computer system do what a local government wants, when it wants and how it wants is crucial to system feasibility. Without adequate software, a computer is only an expensive box that fulfills no useful purpose. Software

is available in most functional areas of local government from a variety of sources.

* Growth. An important factor in the feasibility of an EDP system is the extent to which it can grow to meet future city requirements. Not only should the system be capable of accepting more sophisticated uses, but also of accommodating normal growth in city activities.

* Staff Considerations. The degree of acceptance of computer technology by local government staff is a significant consideration in system feasibility. Similarly, the degree of staff competence to perform specific local government functions (e.g., payroll, utility billing, etc.) and staff aptitude and enthusiasm for the use of computers can be constraints on system effectiveness. To put it more plainly, staff support for computerization, competence in positions that will rely on computer technology, aptitude for using automated equipment, and interest or enthusiasm for automation can be most valuable to the effective implementation of a computer system in local government.

* Political Feasibility. Finally, although perhaps the most difficult factor to deal with, political feasibility may well be the single most critical element to the success of computerization in a local government. Political feasibility means the extent to which local elected officials and administrators understand and support the need for an electronic data processing system. In the absence of such support, a local government would be well advised not to proceed with system procurement. On the other hand, the support of these persons can help immeasurably to ensure smooth system acquisition, installation and operation.

Once a local government has reviewed these factors and determined both the need for and feasibility of acquiring new or enhancing existing automated technology, a step-by-step procurement plan should be adopted. This study of McCook's current data processing opeations and future requirements is the first step in such a plan. It will in turn lead to the following activities:

* Action by city officials to determine whether to acquire additional and/or enhanced data processing capabilities should follow immediately after this study.
* In the event the city decides affirmatively, the next step will be development and submittal to data processing vendors of a Request for Proposal (RFP) for an automated system to meet the requirements identified in this study.
* Evaluation of proposals received by the city and selection from among all of the proposals of two or three finalists for additional consideration will follow.
* Next, city officials will be asked to approve the selection of finalists and to authorize further evaluation of these proposals, including visits to local governments with systems installed by the finalists.
* Site visits, detailed evaluations of the remaining proposals and action by city officials to select a system vendor will be the next steps.
* They are followed by negotiation of a contract with the selected vendor.

* Finally, system installation, testing, and acceptance will complete the procurement plan.

The step-by-step plan outlined here is recommended for use by the city of McCook as a method proven effective in numerous local governments throughout the country for computer system acquisition.

III. Current Data Processing in McCook

The current level of data processing in an organization, whether manual or automated, is an indicator of that organizations's need for improved technology. It also provides insight into potential problems that may arise with implementation of newer technology. A review of an organization's data processing operation, finally, allows the development of a cost analysis which can be used, in part, to suggest whether new or enhanced data processing capabilities are justifiable.

The following pages present brief descriptions of current data processing activity in McCook, Nebraska. These are presented in order by major functional area and according to current extent of automated data processing use. Data for this section of the report were provided by McCook city staff in response to questions submitted by CAUR researchers and in personal and telephone interviews.

A. Functional Areas Using Automation

1. Financial Management. Currently, the only financial management functions in McCook that are automated involve batch processing of general fund accounting and reporting. Western Computer Services of North Platte, Nebraska, a computer service bureau, provides monthly general fund accounting reports. These

reports include: transaction edit report, transaction summary, cash report, fund report, revenue report and expenditure report. Data for these reports are provided on floppy disks that are mailed to the service bureau.

2. Payroll. Payroll processing is also provided in batch by Western Computer Services. Checks are run semimonthly for 125 employees for an estimated 3,000 payroll checks per year. In addition, checks are made out monthly for library personnel and retired police and firemen and quarterly for council members and volunteer and rural firefighters. The service bureau provides a transaction edit report, a payroll register and deduction reports with each check run, quarterly payroll reports for tax and social security purposes and annual W-2 reports. The payroll system does not automatically interface with and update the general ledger accounting system or other major financial management subsystems. Data for payroll transactions are provided on floppy disks that are mailed to the service bureau.

3. Utilities. Utility billing is the third major area using automated technology in McCook. Data processing for this function is provided by Western Computer Services.

Public water and sewer service is provided by the city to approximately 3,300 residential, industrial and commercial accounts. Billing is done in three cycles with one-third or around 1,100 customers receiving bills each month. Each customer is billed four times per year. In 1981 the average bill was $50.00.

Data for utility billing are provided on floppy disks that are mailed to the service bureau. The service bureau prepares

utility bills, past-due and shutoff notices, and the following reports: updated master list, input proof list, billing adjustment report, usage report, trial balance, user consumption report, transaction edit list, general ledger, balance sheet and income statement. These are printed reports prepared with each billing.

4. Special Assessments. McCook has an automated special assessment system that is run by Western Computer Services. This system includes 2,500 special assessment accounts in 9 classes covering 250 special assessment projects. Account billing is done annually on the account anniversary and there are billings every month. Data for the billings and charges to the accounts are provided to the service bureau on floppy disks prepared by city staff. In addition to billings the service bureau provides: payment proof list, monthly interest update, assessment notice, bond summary, bond repayment projection report, master list, and balance report.

5. Street Department Reports. On a quarterly basis, Western Computer Services provides the street department with reports on vehicle operating and repair costs. These are used for cost accounting purposes by the street department.

6. Word Processing. The city has a 5 year lease/purchase agreement for an IBM Displaywriter 3 word processing system that is used for correspondence, ordinances and resolutions, keeping the city's official journal, ordinance codification, and for storage and retrieval of various standard documents, forms and letters.

B. Costs of Automated Systems

The city of McCook expects to pay $11,000 to Western Computer Services for data processing services in FY 1982. As described above, these are limited, batch mode services for accounting, payroll, utility billing, special assessment billing and street department reports. The estimated five year cost of these services--assuming no rate increases by Western Computer Services--would be $55,000.

According to the city's contract with Western Computer Services, McCook owns the programming (software) for the special assessment billing system and can purchase the software for street department reports ($500), utility billing ($1,250) and accounting ($1,250). The payroll program and some of the programming associated with the utility billing system are not available to the city.

All are batch programs and, except for the special assessment program, are written RPG. The special assessment program is written COBOL and the payroll program is currently being changed from RPG to COBOL. Documentation and users manuals are available only for the special assessment and payroll programs. These programs run on a Burroughs B 1830 minicomputer at Western Computer Services.

The IBM Displaywriter 3 currently costs the city $326 per month ($3,912 per year). This is an estimated five year cost of $19,560.

McCook also leases an IBM 3741 Data Station on which it produces floppy disks for data entry purposes for Western Computer

Services. The cost is $1,920 per year, a five year cost of $9,600.

The city produces all warrant checks (300 per month) on an antiquated bookkeeping machine. Regardless of future data processing alternatives, McCook will have to replace this machine. The purchase price, not including maintenance, of a used, replacement bookkeeping machine to produce warrant checks is estimated to be $5,000.

Present five year costs for current data processing functions in McCook are:

Western Computer Services	$55,000
IBM Displaywriter 3	19,560
IBM 3741 Data Station	9,600
Replacement Bookkeeping Machine	5,000
Total	$89,160

C. Areas Not Automated

The five functional areas discussed above (excepting word processing) are automated in a very limited sense. First, none of the application systems is fully automated. For example, in the financial management area such important functions as accounts receivable, cash control, accounts payable and purchasing are not automated. Second, the systems that are automated are not integrated. As an example, the payroll system does not automatically update the general ledger or other affected subsystems of the financial management system. Third, the system is neither interactive nor transaction oriented. This means that user personnel must complete coded input forms, prepare floppy disks for the service bureau and perform a variety of other manual transfers of data rather than being able to enter data once through a computer terminal and have the computer auto-

matically update appropriate files and records and perform required calculations. Finally, data processing in McCook relies on a batch processing mode that requires coded input and produces periodic (usually monthly) printed reports. State-of-the-art technology allows users to enter data directly into the computer via terminals, to access data directly in the same manner, to perform unique inquiries, and to minimize the number of printed reports and forms.

In addition to these deficiencies in current automated data processing, several areas in city government in McCook are not automated at all. The most important of these areas include:

* personnel management
* ambulance billing
* equipment management
* police records and reporting

Other, somewhat less important areas that currently do not utilize automated data processing include:

* fire department activities, records and reporting
* records and reporting in the water and sewer system
* housing inspection records
* housing authority management
* street inventory
* street sign inventory
* senior citizen center activities and records
* public library
* parks and cemetery records
* additional word processing uses
* statistical analysis and graphics

IV. Basic Applications to Consider for Computerization

This review of McCook's existing data processing activities suggests the need for and feasibility of new or enhanced automated systems in several areas. The following section presents a summary, in priority order, of the specific functions which, in the opinion of the analysts, should be candidates for the application of state-of-the-art computer technology. Data processing capabilities used by McCook should be based on a transaction oriented, on-line, real-time, multiprogramming system with a unique inquiry/report generating capability that uses standard English language commands.

A. Immediate Consideration (Months 1-18)

The following functions should be considered for immediate automation through the acquisition of new or the enhancement of existing electronic data processing capabilities.

1. Integrated Financial Management. The most immediate need for automation is in the area of financial management. This should include a fully integrated financial management system that could assist in providing for better revenue and expenditure controls and reporting, promote improved cash collection, accountability and cash flow management, and improve other financial management activities. An automated financial management system to meet McCook's needs should be a fully integrated system designed around a general ledger accounting subsystem. All subsystems should automatically update the general ledger and all other affected subsystems. The IFMS system should be a full encumbrance accounting system and should accommodate both accrual and cash management practices. It should include at least the

following major subsystems:

a. Standard (probably existing city) chart of accounts

b. Budgetary accounting

* line item accounting and budgeting
* departmental accounting and budgeting
* fund accounting and budgeting
* program/project accounting and budgeting
* encumbrance accounting
* accrual accounting

c. Accounts receivable

* cash collection and control
* cash distribution
* billing/invoicing

d. Accounts payable

* check preparation
* check reconciliation

e. Cost accounting

* by fund
* by department
* by line item
* by program/project

f. Purchasing

* purchase order and requisition issuance and control
* inventory control

g. Capital assets

* capital asset inventory
* capital asset depreciation
* capital improvement budgeting

h. Forecasting/modeling

* revenue (all sources)

* cash requirements

* indebtedness

* investments

i. Grant management

j. Investment and debt management

k. Risk and insurance management

l. Vendor files

* by vendor

* by item/category

* by department/division/project

* _____ year history

m. Auditing requirements

* transaction files

* trial balances

* audit trail

n. Reporting requirements

(These should be developed by the city manager and finance director prior to submittal of an RFP.)

2. Payroll. The second priority item for automation in McCook is a payroll system which should function as if it were a stand-alone system but which should also be fully integrated into the IFMS and personnel systems. The payroll system should accommodate the budgeting, accounting, forecasting, and auditing requirements of the IFMS accounting system.

An acceptable payroll system should include at least the following components:

a. Payrolls

* semi-monthly (24 periods)
* quarterly
* exceptional

b. Deductions

* all standard deductions
* up to _____ additional deductions
* automatic deduction payments to all payees

c. Types of pay

* regular
* overtime
* military leave
* annual leave
* medical leave
* Workmen's Compensation/injured on duty
* _____ additional categories
* leave without pay (with benefits)
* uniform allowance

d. Types of benefits (deductions and reporting)

* capability to handle up to _____ benefit programs

e. Automatic deposit capability

f. Specific accounting requirements

* by line item
* by department
* by position
* by program/project

g. Unemployment Compensation, Workmen's Compensation and injured on duty reporting and payments

h. EEO reporting

i. Labor negotiations

* labor cost comparisons

* labor cost forecasting/modeling

3. Personnel. An automated system to meet these personnel management needs of the city of McCook should be integrated with the IFMS and payroll systems. The following functions, presented in outline form, should be considered for such a system.

a. Employee file

* detailed information on all employees and retirees, including current status and permanent history

b. Applicant file

* detailed information on all appplicants

* _____ history on-line

* _____ history off-line

c. Detailed activity subsystems

* Recruitment

* Application

* Testing

* Interview

* Selection/rejection

* Hiring

* Training/education/skills

* Safety, including injury and death

* Promotion

* Classification status/change

* Pay status/change

* Disciplinary action

* Insurance
* Pension
* Others as warranted

d. Reports

The employee and applicant files together with the activity subsystems should be used to generate a variety of required reports and analyses. These should include but not be limited to:

* Active employees - detailed and summary
* Retired employees - detailed and summary
* Applicants - detailed and summary
* Application status
* Affirmative action (various)
* Training/skills availability
* Training courses available/conducted
* Safety/injured on duty
* Position vacancies
* Positions filled
* Tests available
* Test scores
* Eligibility lists
* Insurance claims
* Pension status
* Job classification
* Work or performance standards

4. Utility Services. The required utility services system, the third priority for automation in McCook, should support all

utility billing and accounting activities and should include the following subsystems:

a. Utility Billing (budget, estimated and regular billing)

b. Cash collection and distribution

c. Delinquent billing and collection

d. Connect/disconnect scheduling

e. Disconnect notices

f. Meter and route books

g. Complete accounting system

The utility billing system must handle water and sewer billing functions although it should also have the flexibility to accommodate other utilities should they be provided by McCook at some time in the future.

5. Special Assessments. The current special assessment system should be enhanced or new software written to automate the functions associated with this system in an interactive, on-line mode. Proposing vendors should be required to explain how they propose to automate this system using either existing or specially created programming.

6. Street Department Reports. Arrangements should be made either as part of the financial management system or of the equipment management system (recommended for Phase II implementation) to produce cost accounting and other reports on all vehicles and equipment used by the city. Proposing vendors should be required to explain how they propose to automate this system using either existing or specially created programming.

7. Ambulance Billing. Programming should be developed to provide for recording of rescue squad daily calls and ambulance runs and for ambulance billing. Proposing vendors should be required to explain how they propose to automate this system using either existing or specially created programming.

8. Word Processing. Many state-of-art computer systems include full word processing capabilities. Often the combination of word and data processing is a desirable feature for a local government. In this way, for example, data processing terminals can be used for word processing functions, data maintained in the computer's disk storage system can be accessed for in word processing activities (e.g., sending mailings to all utility customers or vendors from whom the city has made purchases), and the power of the computer mainframe used for word processing production.

These additional capabilities, combined with McCook's annual and estimated five year costs of $3,912 and $19,560 for its IBM Displaywriter 3, suggest that consideration be given to investigating the feasibility of an integrated data and word processing system. The RFP that will be prepared if this report is accepted by McCook should require responding vendors to provide cost and other information regarding integrated data/word processing. After review of the proposals, McCook can decide whether to acquire such a capability or retain a stand-alone word processing system.

B. Future Consideration (Months 19-36)

Upon the implementation of the applications recommended above, the city of McCook should consider automation in the

following areas:

1. Equipment Management. The development of detailed requirements for an equipment management system is beyond the scope of this study. However, the following outline of minimum functional requirements for an equipment management system is offered.

a. Equipment

* detailed description of all vehicles and equipment
* unique equipment identifier
* status and condition reports
* depreciation schedule
* assignment (location/staff)
* equipment specifications

b. Maintenance

* record of all repairs (preventative maintenance, emergency, vendor, warranty)
* _____ months' history on-line
* _____ months' history off-line
* billing to departments
* preventative maintenance scheduling

c. Parts Inventory and Control

* detailed parts inventory
* integrated with purchasing system
* critical reorder parameters
* parts control (receipt, issuance, charging, transfer, return)
* handles both used and new parts

d. Work Orders

* labor and parts

* updates equipment, maintenance parts, and performance auditing files

e. Fuel Inventory and control

* detailed description, inventory status, all fuel dispensing stations

* fuel dispensing records

* fuel use by vehicle (and other criteria)

* integrated with purchasing

* critical reorder parameters

f. Productivity/Performance Auditing

* performance standards

* performance reports (actual vs. standards, by type of activity, by repair facility, by employee)

This system should be interactive, on-line, transaction oriented and fully integrated and should be integrated with all apropriate subsystems of the IFMS (e.g., cost accounting, purchasing). It should produce regular required reports which to the maximum extent possible should be exception reports and should be available on-line.

2. Criminal Justice. The primary elements of an automated criminal justice information system include subsystems for record creation, maintenance and retrieval. Such a system should be an on-line, real-time system which is adequately cross-indexed for each of retrieval and maintenance. Further, if economically feasible, this system should interface with the nationwide NCIC system.

An automated police record system should include the

following subsystems:

a. Incident reporting

b. Accident reporting

c. Arrests and booking

d. Basic records

(1) Officer reports

(2) Resource allocation and control

(3) Performance evaluation

(4) Training

e. Crime and activity statistics

(1) Crime analysis

(2) Required reports (state and federal)

f. Jail records

g. Fines and forefeiture collections and accounting sement

h. Warrants and subpoenas

i. Master name index

The confidentiality of records and information maintained by law enforcement agencies is of great concern to the police department and all vendors proposing systems should explain in detail their proposed methods of security.

3. Departmental Records and Inventories. The following record keeping and inventory requirements were listed by several departments. These should be considered for automation only after action has been taken on the priorities listed above. These include:

a. Fire Department

-fire inspections
-fire prevention activities
-inventory and station maintenance

-hazardous materials records
-fire records and reporting

b. Public Works

-refuse container inventory
-street inventory
-street condition
-street sign inventory
-cemetery records
-parks inventory

c. Senior Citizens Center

-senior citizen mailing list
-user statistics
-list of volunteers
-list of programs and services for seniors
-facility and program scheduling
-inventory
-Handi-bus ride scheduling
-monthly financial reporting

d. Public Library

-book acquisition
-card catalogue
-book check-in
-audio visual materials control
-user/circulation statistics
-equipment control
-facility scheduling

e. Housing Authority

-general administration
-financial management
-maintenance on 98 units
-tenant records

Detailed requirements for these and any other systems the need for which might emerge should be developed after implementation of Phase II systems.

V. Alternative Methods of Acquiring Computer Technology

A. Basic Alternatives

There are three basic alternative methods by which the city of McCook can acquire the required computer technology. These are:

* Rely on outside service bureaus for data processing. These agencies can be used to provide either "batch" or "on-line" data processing services;

* Acquire in-house computer hardware and hire technically qualified programmer-analyst staff to develop application software (programming) for the system; or

* Acquire a fully programmed and supported system, including both in-house computer hardware and custom modified application software, to meet the city's requirements. Such a system would be operated by existing city personnel.

B. Evaluation of Alternatives

1. Service Bureaus

(a) Advantages

-Software and hardware are owned and maintained by service bureau;

-A highly qualified staff is available in certain functional areas;

-There are limits on available expertise at service bureau should city wish to initiate more sophisticated data processing systems and capabilities;

-There would be a relatively easy transition to automation from current operations;

(b) Disadvantages

-There can be communications breakdowns and attendant costs;

-Scheduling difficulties are likely to occur;

-Service bureau software is not likely to provide much flexibility;

-The opportunity for expansion is limited and may involve excessive costs;

-The physical location of service bureau may be a limitation;

2. In-House Hardware/In-House Software Development

This alternative is not deemed acceptable for the following reasons:

-The length of time required to create the required software;

-The personnel and cost requirements of in-house software development and support; and

-The limited availability of qualified programmer/analysts with experience in municipal government.

This alternative would take too long, cost too much and involve too much risk for a small local government to implement a data processing system.

3. Fully Programmed and Supported System

(a) Advantages

-The city owns and controls its own system;

-Considerable expansion capability exists--both of hardware and application software elements;

-The software is tested and reliable and modified by the vendor to meet city's specific requirements;

-The system can be operated easily by exiting personnel;

-It provides a relatively easy transition and introduction to EDP;

-The vendor is fully responsibile for system installation and performance per city's specifications for the life of the system.

(b) Disadvantages

-Certain probelms are associated with ownership and control of a computer system, including system depreciation and obsolescence, equipment failure, use scheduling;

-Unanticipated vendor problems can occur;

-Personnel issues involving both training of personnel and personnel fear of/opposition to a system can exist;

-If the system has multiple users (e.g., several city departments), potential management, use and scheduling problems can arise.

C. Recommendation

This study recommends that a Request for Proposal (RFP) be developed to solicit proposals both from service bureaus with on-line time sharing capability and from vendors offering fully programmed and supported systems. As the costs of in-house software development would be excessive, it is therefore recommended that RFP's exclude consideration of systems requiring the in-house development of software.

Section VII and VIII present cost estimates and a recommended configuration for an in-house system.

VI. Issues of Concern

Before a city embarks on a plan for computerization, several issues of concern should be recognized and addressed. Two of the more important such issues concern city personnel and elected officials.

Interviews with personnel in many local governments indicate that a high degree of concern often exists about the impacts of computerization. Generally, this concern involves personnel who are discomfited by the prospect of computerization, who do not fully understand what their roles would be should a computer system be acquired, who fear the technology itself, or who fear being replaced by the computer. Steps should be taken by city administrators to alleviate these concerns where they exist.

Communication with and the involvement of a city's elected officials is essential to successful system development, acquisition and implementation. Efforts, therefore, should be made to

ensure that the elected decision-makers fully understand the reasons behind and the probable effects of implementing computer technology.

All steps in the acquisition and implementation of a computer system should be taken in conjunction with a data processing committee made up of key staff personnel with proper communication to the elected officials. The functions of the committee should be: 1) to review the efforts of the CAUR research team; 2) to facilitate communication about the study to city employees; and 3) to make recommendations to the city council regarding future steps in the procurement process.

VII. Cost Estimate

This section presents estimated costs based on an in-house computer system to meet the data processing requirement of the city of McCook. The recommended configuration of such a system is included and a generalized schematic follows.

A. Immediate Consideration (1-18 Months)

1. Software
   - (a) integrated financial management
   - (b) payroll
   - (c) personnel
   - (d) utility billing
   - (e) special assessment and street department
   - (f) ambulance billing
   - (g) word processing

Cost range: $20,000 to $35,000

2. Hardware

The following hardware configurations is recommended to sup-

port the software systems listed above.

Number	Item
1	Central Processing Unit including operating software
1	Disk Storage System
1	Line Printer
1	Receipt Printer
1	Word Processing Printer
5	CRTs

Estimated five year cost, including maintenance: $50,000 to $65,000.

3. Total Cost

Software	$20,000	to	$ 35,000
Hardware	50,000	to	65,000
Total	$70,000	to	$100,000

B. Future Consideration (19-36 Months)

The computer system acquired by the city for initial applications should have the capacity to be expanded to accommodate all of the application programs suggested for second phase (19-36 months) implementation. These include programming for equipment management, criminal justice information, and systems for record-keeping and reporting for the fire department, public works department, senior citizens center, public library and housing authority. Until detailed requirements for this systems are developed it will not be possible to provide cost estimates or to suggest an appropriate equipment configuration.

VIII. Configuration Schematic

(Should an on-line teleprocessing capability be acquired, CRTs and printers will be required but the CPU and disk drive will be located at the service bureau.)