

MEMORANDUM

TO: Members of the Data Processing Review Committee
FROM: John Watson *JW*
SUBJECT: HUD RFP 2-70, Urban Information System Grant

The City has received RFP 2-70 from the Department of Housing and Urban Development. This statement of work invites proposals for the research and development of a comprehensive, integrated municipal information system or sub-system. This is an experiment to learn whether or not a prototype can be developed and successfully operated as a relatively standardized system which can be transferred to other municipalities with a minimum of alterations.

Past approaches to urban information systems have been fragmentary. What is needed is a system formulated as an integral part of municipal operations based on the satisfaction of operational requirements of municipal agencies and maintenance of the data base for that system. To achieve this broad goal, a fourfold integration is required, linking together the following:

1. The processing, analytical and control capabilities of urban information systems.
2. The several complimentary approaches to information development; housekeeping, data bank, model-building, and process control.
3. The various processes of urban administration.
4. The many urban and other governmental entities within a municipality.

There are several basic principles which this project must observe:

1. A fundamental analysis of the entire system and its needs is necessary.
2. The system must be operationally based, i.e. in support of

municipal operations.

3. The system is municipal - oriented, since it is at this level that urban problems and programs are dealt with.
4. Automation rather than computerization of the system is desired.
5. The system must provide for feedback from the community & its government.
6. Since this is an R & D effort, experimentation and innovation are desirable. Careful documentation is an absolute necessity. Success and failures should be explicitly recorded for the benefit of other municipalities.

One complete system and several subsystems will be funded in this project. In general, the functions of a municipality fall in four categories:

1. Public safety - police, fire, inspections
2. Public finance - usually every department has an accounting function, with an overall budget department.
3. Human resources development - health, welfare, education, recreation, etc.
4. Physical and economic development - planning, construction, maintenance, engineering, utilities.

A subsystem comprising one of the above divisions should be completed and tested within two years, while the complete system will have three years.

Respondents are required to propose their respective formation into consortia, consisting of at a minimum the municipality as the prime contractor and a systems/software subcontractor. A college, university, or center subcontractor as a third member of the consortium is urged but

not required. No contractor or sub-contractor may be involved in more than one such project.

A municipality must demonstrate that it has already made a substantial investment of human and material resources into the development of a municipal information system. Existing experience and resources must be utilized to expedite the development of a system. The proposal must have a rational relationship to existing development of an information system or subsystem in the municipality.

The municipality must provide the project leader and leadership for all phases of the project. Assuming that a university or research center is included, the following roles are most appropriate:

- educational and training course design, and orientation connected with the project
- cost/benefit analysis and evaluation of the success & failures
- systems conceptualization
- rationalization of information and decision processes

The systems/computer software organization would perform the following:

- systems conceptualization
- detailed systems design
- programming
- systems & procedures
- detailed documentation & manual preparation
- technical training

The proposal must specify who will do what and when it will be done.

The consortium project team should include the following types of personnel:

- experienced municipal functional and managerial professionals
- municipal government analysts
- computer technicians
- documentation & procedures manual specialists
- researchers, human factors scientists, social scientists
- training specialists
- academicians - political scientists, public administrators, urban-ologists, and information and computer scientists.

The municipality must show evidence of the commitment of all government individuals & units whose cooperation is essential to the scope of work proposed. It must also show a commitment of the following resources to the project:

1. Personnel:

- the mix of talents available
- the specific persons involved, their contribution and relevant background, & the time they will spend on it.
- the relationship of non-project municipal professional employees & policy-making officials to the project.

2. Machines:

- the EDP equipment available
- the support available from suppliers/manufacturers

3. Organization:

- a project leader
- the capability to continue the project beyond the life of the federal funding

The municipality must include a "letter of intent" from all members of the consortium. It must also show evidence of its commitment to utilize the systems in planning, operations, and management.

The consortia involved in the project will maintain a close liaison to discuss common problem areas & expressed needs. Informal status and progress reports will help to keep everyone informed and to reduce duplication of efforts.

Research & development is defined to consist of six steps:

1. Systems analysis
2. Systems Conceptualization
3. Systems Design
4. Systems Development
5. Systems Implementation
6. Systems Evaluation

Each step is closely interrelated and provides inputs to the other. The areas which will require the greatest attention to detail, and which have been merely skimmed in the past, are data acquisition and data base management. Present emphasis should be on an information and decision system rather than a data processing system.

The research and development projects must utilize the systems approach, have clearly stated objectives, and exhibit effective systems management. They must also be based on design concepts that are transferable to other municipalities. The information systems must provide for continuing data base management and development, as well as implementation procedures for data base management.

Data base documentation will include the exact name of each datum, a discussion of its meaning where necessary to be absolutely clear, its source location, the frequency with which it is reported, the range and kind of values associated with it, the meaning of the codes, and the medium, place and identity of its storage. This process should be automated with a minimum of human interfacing wherever possible. The problem of

data compatibility is greatly increased by multi-source reporting. Differences in coding and classification schemes, data names, area definition, reporting dates and period covered will have to be reconciled.

A data access control plan must be developed for the system, governing the release of data in terms of what, who, when and how. Certain data will be considered mandatory, some will be recommended, and some optional by Federal agencies. Geocoding of the data base is also required.

The data system should be open-ended to allow data sharing. Proposals should reflect an interest to employ conventional models of hardware and peripherals which have a capacity appropriate for the system or subsystem. This is necessary if the project is to be transferable to other cities.

This approach permits the conceptualization of incremental development of the information system. At the least sophisticated level are automatic data processing techniques conventionally employed in the administrative affairs of the municipality. These include personnel, finance and property accounting, billing and disbursing, registering and licensing, and other routine tasks. The requirement for software is generally limited to data and files management, cross-tabulation and report generation. The computer processing mode conventionally employed is batch-processing.

A second level of sophistication are hardware and software in support of the control of operation of a municipality. These include scheduling, dispatching, allocation and monitoring, e.g., traffic control, and emergency vehicle dispatching. Emphasis here is on a rapid response capability, and therefore, the on-line, real time mode is more generally appropriate.

A third level of sophistication is in terms of the hardware, software and files required for planning support. Here, both batch processing

and on-line, real time modes are important. Generalized software conventionally required includes PERT and/or CPM for planning and scheduling, simulation and statistical analysis programs.

The remaining level of sophistication is at the policy-making and management level. Here the requirement at its fullest development is for exception-reporting techniques, a planning-programming-budgeting system, automated alerting systems, on-line cross-tabulation and report generation and the cathode ray tube and teletypewriter for on-line displays.

Detailed analysis of current municipal operations is required to determine their relationship to the goals of the system. Existing procedures, forms, records, and reports must be evaluated in terms of the basic functions performed by the city. Points of information generation, processing, and utilization and the extent of this information must also be identified. Decision-flow analyses are also necessary.

Below is a check list of specific capabilities the data processing system should have:

- Capabilities to accept and output data in a variety of forms.
- Capabilities to handle large volumes of data.
- Capabilities to operate on individual values in a data set.
- Capabilities to manipulate and alter data set structure.
- Capabilities for report production and graphic display.
- Capabilities for fact retrieval and analysis.
- Capabilities for data base reference service and documentation.
- Capabilities for process management.

The development of an implementation plan must be effected in coordination with all participating agencies. The plan should outline the steps necessary to implement the system. It should include:

- Hardware and software considerations, i. e., detail the hardware installations and system programming.
- Facility requirements.
- Procedures necessary to integrate the system into operations.
- Discussion of user needs and how the system will meet them.
- Discussion of subsystem development and strategy.
- Definition of external agency relations.
- Automatic data processing policies.
- A central index of information that presently exists in the municipality.

HUD will require that the proposals be submitted prior to 3:00 P.M. (EDT) October 31, 1969. Format for submission will be Part I, Technical and Administrative Data, and Part II, Financial Data. Standardized terms and conditions for federal grant programs will apply to the contract. Proposals will be evaluated by HUD and results of the competition should be known during December, 1969.

Factors in Selection

The selection of participants in this program will be determined by the extent to which each of the items listed below is satisfied in the proposals of respondents. These items are summarized from indicated locations elsewhere in this statement of work. They are listed in the order they appear, and not in order of importance.

1. Objectives of the Project.
2. Selection of project.
3. Emphasis on Fundamental Analysis.
4. Emphasis on operationally based.
5. Emphasis on municipal orientation.

6. Emphasis on automation.
7. Emphasis on providing environmental and governmental feedback.
8. Emphasis on research and development.
9. The type of project. If an information subsystem, the municipal functions which will be grouped together and served by the subsystem should be listed and discussed. If an integrated municipal information system, the functions grouped together in each subsystem should be listed according to subsystem. Full justification should be set forth for departures from the classification of functions in the statement of work.
10. Population of the municipality. Departures from the expressed rule must be justified.
11. Assurance of sufficient level of investment to promise completion of project within the allowed time.
12. Current existing level of investment in municipal information systems.
13. Relationship of the proposal to existing information system development in the municipality.
14. Formation of Consortium and identification of members.
15. Definition of roles of members of the consortium.
16. Range of talents made available by the consortium.
17. Evidence of cooperation.
18. Resource commitment.
19. Letters of intent.
20. Long-range commitment.
21. Plans for extra-consortium participants.
22. Willingness to participate on Inter-Consortium Panel.
23. Concept of Data Acquisition.

24. Concept of Data Base Management.
25. Concept of Data Base Documentation.
26. Concept of Data Compatibility.
27. Concept of Data Access Control.
28. Concept of Data Standardization.
29. Statement of willingness to comply USAC standardized, data lists.
30. Geocoding.
31. Concept of system expansion.
32. Concept of documentation.
33. Concept of Transferability--hardware.
34. Concept of Transferability--software.
35. Concept of Transferability--System design.
36. Concept of Transferability--Documentation.
37. Concept of internal monitoring and evaluation.
38. Statement of willingness to plan a program of briefings and demonstrations.
39. Concept of Research Program.
40. If the comprehensive integrated municipal information system (IMIS) option is exercised: Concept of IMIS.
41. If the municipal information subsystem (MIS) option is exercised: Concept of MIS.
42. Proposal of special area of research.
43. Concept of system perspectives.
44. Definition of effort and mix of resources allocated by tasks.
45. Specification of task time-phasing.
46. Agreement to perform tasks.
47. Agreement to use conventional, non-machine language in programming.

48. Agreement to use conventional, easily transferable programming language(s).
- 49.. Agreement to place all software and related documentation developed in this project in the public domain.
- 50.. Agreement to the principle of program modularity.
51. Agreement to project orientation.
52. Description of organizational arrangements.
53. Dissemination plans.
54. Continuation plans.
- 55.. Existing long-range information system development plan.
- 56.. Relate the proposal to the long-range plan.
- 57.. Identification of probable other resource support for plan.
58. Agreement to maintain a project journal for case study.
59. Agreement to use systems approach.
60. Concept of specifications and characteristics.