LAW ENFORCEMENT ASSISTANCE ADMINISTRATION (LEAA)

POLICE TECHNICAL ASSISTANCE REPORT

SUBJECT	Review of Computer-Aided Dispatch Procurement Specifications
REPORT NUMBER	76-002-035
FOR	New Orleans, Louisiana, Police Department
	Population: 1,091,953
	Police Strength (Sworn): 1,383
	Total: 1,837
	Square Mile Area: 197
CONTRACTOR	Public Administration Service 1776 Massachuestts Avenue Northwest Washington, D.C. 20036
CONSULTANT	Robert L. Marx
CONTRACT NUMBER	J-LEAA-002-76
DATE	March 4, 1976

FILE
RO Work

TABLE OF CONTENTS

FORWARD

The technical assistance reported in this paper was requested by Superintendent Clarence Giarrusso of the New Orleans Police Department. Sergeant Robert Oehlke was designated as the major point of contact within the department. The assistance requested relates generally to a current procurement for a computer-aided dispatch system including computer equipment and programs, mobile digital terminals, new radio equipment, and modifications to existing radio equipment. Five proposals to accomplish the specified work have been received, and are now being evaluated within the department.

I. INTRODUCTION

In September 1975, New Orleans Police Department issued bid specifications for a large scale Computer Aided Dispatch (CAD) system including a turnkey computer facility, 50 mobile digital terminals with radio transceivers, and modification to about 900 existing radios for use in the new system environment. Subsequently a bidders' conference was held, and bids were submitted on 1 December 1975 by five contenders: Planning Research Corporation, E-Systems, Motorola, Kustom, and General Electric.

The bids received vary widely in price, computer size, and other important parameters. None of the bids is entirely responsive to the original bid specifications. New Orleans Police Department must decide whether to reject all bids, select a vendor and enter negotiations, or allow all bidders to submit new bids. No formal method exists to select one of these options, nor is there a formal methodology to select the most appropriate vendor if a decision is made to proceed in that manner.

If the decision is made to proceed, the preparation of a contract which provides sufficient protection to the department becomes the next problem.

In the remainder of this paper I describe certain problem areas noticed during my brief visit to the department, describe the implications of those problem areas for the current procurement, and make specific recommendations which will result in a course of action leading to successful CAD system implementation.

During the course of the study the following people provided information concerning the department and the procurement. Of course sole responsibility for the findings and recommendations belongs to the author.

Superintendent C. B. Giarrusso
Deputy Chief L. Turner
Major J. Murry
Captain R. Falcon
Captain S. Fury

Sergeant C. Schlesinger
Sergeant R. Oehlke
Officer C. Lopes
Mister J. Lopez

II. UNDERSTANDING OF THE PROBLEM

The five bids received varied in price between $1.4 million and $2.3 million. Such a wide variance suggests, although not conclusively, that the bidders may not have had a common understanding of the problem. This inference is made more plausible by the wide variance in computer capacity proposed by the vendors, ranging from a PDP 11/35 with 64 kilobytes of memory in one case to an Interdata 7/32 with 256 kilobytes of memory at the other extreme. This variance represents perhaps a factor of 10 difference in computer power. This is understandable, since the bid specification did not contain throughput specifications, but only functional specifications; that is, the vendors were told generally what had to be done, but were not told how often it had to be done.

In other respects the bid specification was extremely tight. For example the specification of the mobile digital terminal was so precise that no existing terminal actually meets the specification.

The specification clearly attempted to describe the Kustom terminal to the exclusion of the E-Systems terminal and Motorola terminal (which are the only other terminals presently in production). It is evident that the vendors understood this, since the "independent" bidders (i.e. those who don't make terminals themselves) both bid the Kustom terminal.

A similar situation occurred in the case of the displays (CRT's) to be used in the dispatch center. By specifying such minute details as the type of memory to be used, potential candidates were limited to essentially one, the Lear Siegler ADM-2. This is a much less bothersome problem than that of the MDT's since the performance characteristics of CRT's affect total system performance much less than those of MDT's.

The bids also show a wide variance in performance time, ranging from system installation/acceptance after 10 months in one case, to 24 months in another.

Another aspect of the problem facing the department relates to the availability of space for the enlarged dispatching system. Space has not yet been identified for the new system, nor have the funds for the preparation of the space been obtained. At least the possibility exists that the system could be ready before there is any place to put it.

Finally, there are problem aspects related to the costs and benefits of the CAD system. I was unable to find any analyses which show the expected lifetime costs of the system over the next 10 years or so, nor any findings that the CAD system would reduce staff, decrease police response time, lead to more efficiency, or otherwise earn its keep.

III. FINDINGS AND CONCLUSIONS

The decision to use the "system manager" approach to the procurement has led to a situation in which the best implementation team may not have bid the best computer configuration, or the best radio equipment may not be coupled with the best mobile terminals, etc.

Overly stringent bid specifications, especially in the areas of MDT's and CRT's, pushed vendors to equipment selection decisions they may not have made otherwise. (Incidentally, I am convinced that this overspecification happened unintentionally).

The omission of throughput specifications from the bid specification resulted in a wide range of system capabilities being proposed, some of which are probably much less than the department really needs and others much more. In one case the result could be a useless system for the department, and in the other case operating costs much higher than needed to get the job done.

Reliability specifications are provided for several components of the system, but a full system reliability specification, which describes the proportion of time the system is fully operational as compared to operating in a degraded mode or completely inoperable, is not provided.

System documentation, and especially system software documentation, is not required in the procurement. The result could be a system which cannot be maintained by the department without the external presence of the contractor.

No lifetime cost figures for the system are available. Such costs would include all future equipment maintenance, future purchases to equip the rest of the fleet, etc. Without such costs the department and the city are buying a "pig in a poke".

Whereas the bid specification required the vendors to use directly the geographic base file being built in New Orleans, the proposals seem very vague on this point, mostly

requiring that the file be presented to the vendors in a form to be specified by the vendor. Getting the file into such form may be impossible, or may be possible but expensive for the city.

The digital equipment identifier to be placed in existing portable radio equipment is seen as a unique identifier without meaning as to present location or assignment, and apparently will be displayed in the dispatch center in that way. Without some way of automatically converting the identifier to an assignment identifier, the data will be useless for operational purposes.

The number of mobile digital terminals being procured (50) is too large to represent a minimum test, and too small to fully equip the fleet. Because of basic incompatibilities between terminals of different manufacturers, the department is making an irreversible decision in this area unless it keeps the procurement so small that it can really scrap the test models and switch brands after the initial experience.

The absence of adequate space for installation of the system puts the whole procurement in danger, since space preparation and refurbishment may well be the longest lead-time item in the entire program.

IV. RECOMMENDATIONS

The department should move promptly to determine exactly what space is going to be provided for the system, determine the modifications needed for the space, get a commitment for the necessary funds, and determine the earliest date at which the space can be ready for system installation. Unless there is evidence that the space can be available in time for orderly installation, the entire procurement should be deferred.

A throughput model for the system should be developed and made part of the system specification. For example, the department now makes about 65 dispatches during a peak hour. A specification for 100 dispatches per hour should be adequate. Specification of maximum dispatchable units and 50 other units at any one time should be adequate, as should a total of 70 units each making 5 inquiries per hour via MDT. Status changes at the rate of six per hour per dispatchable unit and two per hour for other units should also be adequate. With specifications such as the above (refined by the department), the system should be required to process all functions with a maximum delay of four seconds.

The MDT procurement should be reduced to 25 units or so, with a contract provision allowing the purchase of up to 200 additional units at the same price over the next two years. This technique limits risk in case of unsatisfactory performance while allowing rapid expansion if the units are worthwhile.

The present five bidders should be informed that either the Kustom or E-Systems MDT is satisfactory, while the Motorola terminal is not. Presently the E-Systems terminal is excluded because it uses a CRT; the Kustom terminal is excluded because not all of its 256 character display is generally available; and the Motorola terminal is excluded because its display is much smaller than the required 256 characters.

On the basis of these recommendations, primarily in the areas of terminal acceptability and throughput, the five vendors should be allowed to submit modified bids if they desire, making changes in the specification or price of any system component.

In the revised bids the vendor should be required to provide information concerning the frequency and expected duration with which the system will occupy each of the following performance levels: fully operational in all respects, CAD operational but MDT not, MDT operational but CAD not, both CAD and MDT non-operational. These data should be sufficiently detailed to allow their incorporation into the contract as acceptance standards.

In the revised bids the vendor should be required to provide full documentation for all software. Documentation should include program narratives, listings, source and object decks, flow charts, file organizations, coding conventions, and all other data necessary to allow in-house program maintenance.

In the revised bids vendors should be required to provide computer translation of the unique equipment identifiers from both MDT's and portables into a man-readable code related to the present assignment of the person holding the equipment.

In the revised bids the vendors should be required to submit firm bids for equipment maintenance on the computer-related equipment. They should be permitted to specify either 24-hour service or normal business hour maintenance, as necessary, to assure that total system availability (i.e. the probability that both CAD and MDT subsystems are available) remains above 99 per cent.

A formal criterion for vendor selection should be stated. It should be of the form: the winning bid will represent the lowest 10-year cost to achieve the functional, performance, and throughput specifications described. Costs should include the original procurement, equipment maintenance, and additional procurement of MDT's to equip the fleet (including spares to provide the necessary number in working order), but should not

include the costs of dispatchers or program maintenance. Vendors should be required to provide the necessary data to make the evaluation.

The contract should have tough and explicit clauses concerning system functions, system reliability, and system capacity. These clauses should be enforced through acceptance tests based on actual performance under real or simulated loading in the department. At least 15 per cent of the total contract price should be withheld until all acceptance tests have been satisfactorily completed.

Because of its extreme importance to the system, the department may wish to add more specifications for the MDT, especially in the areas of data rate and human factors. The ability to mount the MDT in the car without hindering front seat movement, and the effect of higher data rate on channel loading and the use of centention versus polling could justify such further specification. Since the result of such further additions would be to exclude one of the two remaining MDT alternatives and force a sole source procurement, it should not be done unless a strong case can be made.

END