The Use of a Word Processor (Mini-Computer) for Traffic Record Keeping and Reporting

DONALD W. WATERMAN
Special Projects Manager
Indianapolis DOT

The mini-computer is just another piece of office equipment which will do nothing until an operator enters a set of instructions. These instructions are commonly called a program. It will store these instructions in its memory and when data is entered, will process that information accordingly. The computer will then print out the results on command. For this presentation, I will exclude the single purpose computers and micro hand helds which are now available.

Our department entered the mini computer field two and a half years ago due to increasing pressures for more information of greater accuracy than we had been able to furnish previously. These pressures, in part, were generated from our legal department whose attorneys are becoming bogged down in today's volume of damage claims directed toward our city government.

The direct benefits to the Traffic Engineering Division however have been equally important and helpful.

Before I discuss the advantages of having a mini computer system, let me talk for a moment about the system hardware and some of the problems you can expect in trying to get a new system established.

Your first hurdle may very well be your own central data processing personnel. Two years ago the mini computer was considered a toy. Today, in some places, that attitude still exists. This attitude must be overcome, for the mini computer is emerging as an important tool for managers and administrators alike—but it should not be confused or compared with the present central data processing functions. A balanced blend, in a spirit of cooperation, will be necessary before we can realize the maximum capabilities of both the CDP and mini computer systems.

The mini-computers now available have a distinct function. The fact that they may be capable or large and complicated data processing routines sometimes distorts the most productive applications for which they are designed. Even though it is available, I believe it would be a misuse of this equipment to hookup all kinds of extra gear to increase
its capacity—something like putting a jet engine in a 1940 Ford. It is
my considered opinion that the mini computer has many functions
which can pay great dividends without competing with the CDP for
volume operations.

To determine in your organization which functions are approp­
riate for mini computer adaptation, you may well be advised to
look at some of your most routine record keeping procedures. I believe
we all tend to continue systems over the years so long as good old Miss
Smith is around and the file cabinet doesn’t overflow. But an honest
evaluation of present practices may produce great savings in time and
quality, and that should be your only objective in making this deter­
mination. Time savings alone can quickly pay the initial cost of this ef­
f ort.

To find those functions tailored for the mini computer you might
look for some of the following conditions.

(1) Do you frequently process routine information or reports
which must be readily available to your staff?
(2) Will the information be collected and processed generally in
small batches?
(3) Will summaries of the information be required? How often?
Must they be produced quickly, for immediate action?
(4) Will the process free a staff member of present routine fu n c­
tions?
(5) Is the information currently being used and is it necessary to
your day to day operation?
(6) Does the information require frequent updating?
(7) Is the volume within the capacity of the mini computer or at
least can it be divided and processed in sections?
(8) Do you have the staff assets to manage and operate a mini
computer system?
(9) Can you produce accurate information to establish and up­
date your data files? Will your present staff respond to the
procedural changes necessary to supply current and accurate
information to the computer operator?

These are among the considerations which must be examined to decide
the appropriate course of action.

Above all, mini computers are not for everyone. Before making a
decision to establish a system, I suggest you assign an interested staff
member to explore the many sources of information available. The
most productive of which will be an agency which is now operating a
system and may have similar requirements to your own. Their ex­
perience and mistakes will be of great help. Suppliers of computer
hardware will be the least helpful at this point. Until you have
established the need and ability of your agency to manage a mini computer, the hardware salesman may confuse the issue.

After the need is established, you will have ample time to contact the various hardware suppliers. At this time you may be amazed by the great variety of functions that each of these hardware groups can offer. It is my experience that we tend to become awed by these many games, noises, calculations, graphics, telephone interconnects and gadgets that can be connected to today's mini computers; but I tend to believe that most of these are of little value to the efficient data processing functions which you will be looking for in your system.

To the other extreme, you will find hardware that is rigidly tied to the programs written and furnished by the manufacturer of the equipment. You will not have the flexibility to custom program the equipment for your own needs because of the complicated language used or that the manufacturer simply will not supply the memory access instructions to enable you to get inside the memory of the computer.

The right hardware is in the market place. With some effort and help from present users, you will be able to find the right equipment for your application.

Following is a brief list of minimum features and supplier services that should be considered when looking for a mini system. I will deal with minimum requirements for maximums are only contingent on how much money you have in your budget for this purpose.

(1) 48K RAM (memory)
(2) Basic language programing
(3) Video screen
(4) Five-foot disk storage (two if possible)
(5) Good selection of software

Software includes the programs supplied by the manufacturer of the equipment to enable the machine to perform a specific task. Two such programs available with most popular systems are a word processing routine and a file handling routine. These two programs are being used with our equipment and have been of great value to our division.

(6) Instruction for beginning programmers
(7) Assistance in program writing
(8) Complete maintenance service
(9) Convenient source for supplies and forms
(10) Line printer

Quality hardware that will meet the above requirements is available at costs in the area of $4,000; however, this cost will quickly translate into a savings if your system is properly planned and managed.

The education and training required to write simple programs and
to operating the system is becoming less formal as the industry develops. Many individuals today are, through self instruction and short courses and suppliers assistance, becoming proficient in developing fairly sophisticated programs in their field of interest. Today’s machines are in many homes, schools, and private computer clubs in many communities around the state. Consultants, custom programmers, and even hobbists are available in many areas to assist with the tailored program writing you may require. But don’t overlook the staff person who is personally interested in mini computers. For he knows your needs and may be your best approach to the task of developing your system.

The Indianapolis Traffic Engineering Division has for years maintained a great volume of records which are incidental to normal traffic engineering responsibilities. Accident records, traffic counts, speed studies, operations and maintenance records for 650 signalized intersections, sign installation and repair records, bus zone schedules, street cut permits and inspections—the list seems endless. The daily effort being made to manually maintain these records was enormous. We knew that we had the information but it was a monumental job to retrieve the material in a form that would convince the courts the information was complete and accurate.

The time was right, we had to do something; and we did. In the past several months, using our mini computer and a file handling routine, we are now bringing the problem under control. In addition, we are processing our 48-hour traffic count work sheets and the calculation of our spot speed study data on the mini computer. We have experienced a saving of 400 man hours annually on these two functions alone and we are able to keep the improved accuracy as a bonus.

Forty-eight hour traffic count data is taken from the traffic volume counter tapes and manually calculated to determine the ADT. The traffic volume data on the tapes is also entered directly into the mini computer for preparing reports. Due to an active traffic count program conducted since 1970, our division processes approximately 1,500 scheduled and special reports annually. Using the mini computer we now process each report in less than five minutes versus 20 minutes using the manual method. This alone saves 375 man hours annually.

Control of the maintenance records for our 650 signalized intersections was actually our first functional use of the mini computer. We developed a data base which included all traffic control devices in Marion County including state owned equipment, school zone markers and misc controls. If it used electricity, we have it in the data base. Special care is used to keep this file current and accurate as it forms the
base for several reports which we find useful in our day to day operation.

One such report is our monthly signal maintenance register which lists each intersection and device in Marion County. This book contains information on each call for maintenance received during the month of September 1981.

The entries give us a quick reference to the number of calls made to each intersection, the date/times, a code to indicate the problem reported and found, and the technician who made the call. If additional information is required, we can quickly find and reference the technician's field notes or interview the technician for more details.

To give you an idea of the magnitude of this problem alone, our maintenance calls average 1,200 each month. They are recorded as received on the technician's field work sheet and the work sheets are filed daily at the end of each shift. When the Legal Division asks, "how many service calls did you make to a particular intersection in 1981," and this is not an uncommon question, the old filing method required us to manually examine 14,400 entries on the field worksheets. After you have answered a few of these inquiries you just know there has to be a better way and we think we found it. Our register is that answer.

The data base of electrical consuming devices has been used in many ways for it seems that each program developed leads to another application that will provide staff with important and helpful information.

Some of the programs we have developed and now have operating in our system are as shown below.

(1) Traffic signal maintenance records
(2) Traffic count ADT summary sheets
(3) Spot speed data summary sheet
(4) Street cut permits and inspections
(5) Parking ordinance summary schedule
(6) Speed zone summary schedule
(7) Bus zone location schedule
(8) Pavement marking schedule
(9) DOT employee seniority list
(10) Employee attendance records
(11) Engineering division fixed asset list
(12) Committee mailing lists
(13) Word processing routine
(14) Electrical cost summary (signal devices)
(15) Hug a warm puppy routine

We have developed these programs by writing in house with some assistance from our equipment supplier or have used software they pro-
vide. In either case, we are moving into more complicated fields as our experience grows and feel we can make continued progress into the engineering functions of the Traffic Engineering Division.

In summary, I assure any skeptic of the mini computer that he is fighting a losing battle. Without some considered thought of the subject, you will soon find yourself among those who have not yet decided if they should or should not purchase a television set or fly in a jet airplane. The demands for rapid and accurate information both from file retrieval and calculation of traffic data dictate a move into the mini computer field. Central data processing has taken us far, but for day to day, quick response, short run data, we have to look elsewhere and for the Indianapolis Traffic Engineering Division we are, with some notable success, solving this problem with the mini computer.

If there is anyone who would like to contact us concerning further information on any part of the system we are operating, I certainly invite you to call. We will be happy to be of assistance in any area possible.