

Re: Data Processing

Following is a report from the Treasurer regarding four matters that pertain to Data Processing.

RECOMMENDATIONS:

THAT authority be given to purchase 16K additional core storage for the system 360 Model 20 at a cost of \$43,805; and

THAT a loan of this sum be obtained from The Royal Bank of Canada at a rate of prime plus $\frac{1}{2}$ % (currently 10%), repayable within five years (\$941.50 per month, \$11,298.00 annually); and

THAT authority be given for the hiring of two extra programmers, one now to assist in the immediate reprogramming job necessary for the tax bill and the second by May 1 for the exclusive use of the Municipal Assessor.

* * * * *

18 February 1974

TO: MUNICIPAL MANAGER
FROM: MUNICIPAL TREASURER
RE: DATA PROCESSING

Currently, we are faced with four serious problems in the Data Processing Department:

1. The Province of B.C. has announced that there will be a new form of tax bill in mandatory use by the municipalities in 1974. Details will become available after the budget is brought down in the House.
2. We have insufficient programmers on staff to cope with existing work levels, let alone look after the increased work load that will result from this latest move of the Government.
3. We have insufficient core storage available in the computer to ensure efficient output of the computer and of the programmers.
4. If the additional core storage is not ordered soon, it will likely become unobtainable.

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COUNCIL MEETING Feb. 25/74

The Municipal Act prescribes the form of tax bill that must be used by municipalities. Burnaby incorporates this onto a punch card which saves approximately 210 hours in keypunch and verifying time. This means that office records are quickly updated after the volume of tax receipts are on hand in the first week of July each year. However, this form of tax bill has its drawbacks, mainly the length of time in which it takes to obtain delivery from the supplier - at least seventy-five days after obtaining printer's proof.

An order for the bills went forward on 28 January 1974. On receipt of the Provincial announcement, this order was cancelled but as it will be several weeks before the form of the new tax bill becomes available, the supplier has refused to give us a slot in the production line. This means that if we are to use a punch card, the due date for taxes must be advanced from 3 July to at least 7 August.

This step, if followed, would cost the Corporation upwards of one hundred and fifty thousand dollars in extra interest charges and loss in interest earnings on money that would otherwise be invested.

The alternative is to use a paper bill produced locally. This has not the advantages of the punch card and will slow down our processing time. Hopefully, though, its use will permit us to meet normal deadlines, although at a cost higher than in previous years.

In any event, the upcoming changes in the form of the bill will require extensive work on computer programs and this work comes at a time when our programmers are already fully employed.

A computer is a wonderful instrument, but it can only do what it is told. It must be instructed in a language it can understand and this requires the services of persons specially skilled in writing the language.

One great value of a computer is that one batch of information can be employed in a great many ways. However, to extract the information requires the services of a programmer. As a consequence, the four programmers on staff are constantly altering existing programs to change the output of data as required. Additionally, they are writing new programs, as well as converting the many punch card programs on hand from the previous card oriented 360 Model 20 system to the magnetic tape and disc oriented machine now in use.

Adverting to the first mentioned problem on hand, existing programmers will be re-deployed as required to the problem on hand and deadlines for their normal production will be advanced to a date in the future - as awkward as this may prove to be.

In our judgment, this step is better than attempting to have the work done by contract through one or other of the private computer firms. It will take some time for a stranger to analyse our problems so that he can write adequate programs. Our people have this background and can proceed as soon as the information concerning the new tax bill becomes available.

With respect to problem two, the four programmers on staff are fully engaged, yet work flow from the Assessment and Planning Departments, as well as Treasury and Personnel, is such that we can no longer meet the deadlines that have been established.

In 1971, Burnaby's card oriented system 360 Model 20 system was converted to magnetic tapes and discs. This, as was planned, opened new horizons in the handling of statistical data and the manipulation of arithmetic and algebraic calculations. At the time of conversion, all of the programs and master files of data were in punch form. Now, three years later, there

are ten such systems entailing 136 programs still in punch card form.

Programmers' time has primarily been used on conversion of the large bulk systems such as assessment, taxation and payrolls and new work.

Insofar as the card oriented programs are concerned, they can remain in that form provided that they do not take up too much central processor time. Currently, the equipment is operating three second shifts a week. This will be extended to five second shifts a week before long. A rewrite of the programs would save much of this time and volumes are rising to such an extent that a rewrite will become necessary before long to permit more volume to be handled by the machine.

Attached for the members of Council only are reports from the Assessor and the Director of Planning regarding needs that are not currently being met. Indications are that to cope with their problems and others arising from Treasury and Personnel Departments, two additional programmers should be engaged.

In this respect, it is interesting to note that the following work was performed for the Assessment Department in 1973:

Miscellaneous analyses	\$ 381.67
File upkeep	15,366.23
Appraisals	6,986.07
Rolls and notices	3,941.87
Local improvement rolls	3,307.18
Sales analyses	1,594.20
Sewer rolls	1,558.89
	<u>\$ 33,136.11</u>

This is the equivalent of salaries payable to three clerks, yet the work performed represents the efforts of many times this number of personnel. Additionally, some of the work performed is too difficult to be done manually at reasonable cost.

With respect to the third problem, our master file for assessments is now becoming so large that it must be transferred to two reels of magnetic tape. The consequence of this is that either of two steps must be taken:

There are about twenty programs involved. Each must be altered to cope with the two reels. A rewrite of all of them would take about twelve months of a programmer's time. Furthermore, a rewrite of the master file update would take a further six months. The cost of this process is about \$38,815.

An alternative is to purchase additional core storage (16K) at a cash cost of \$43,805 amortized at the rate of \$11,298 per annum over a five year period. In addition to permitting the use of multi tapes without extensive reprogramming, additional core storage will permit more efficient use of programmers. Currently, they are working within the constraints of 16K. Demands on the computer are now such that it takes two or more programs of 16K capacity to perform a single task.

What often happens is that after a programmer has written his program, he will find it too large for the computer. Then he must devise ways of cutting its size or to subdivide it into two or more parts. This, of course, is not an efficient use of his time. Larger core storage will get rid of this problem in many instances. This is one of the reasons why many installations have such large core storage - Vancouver, for example, with 64K, and on order, a Honeywell with 514K. However, core storage costs money and for this reason Burnaby has made do with less capacity than is available. Now, however, the savings involved will far exceed the cost of the additional 16K in storage.

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Herein lies the final problem. When Burnaby acquired its 360 Model 20 card system in 1965 it was one of the first in Vancouver. The 360 Model 20 was one of the first of a new generation in computers. At the time, I.B.M. had a plan available to municipalities which made it cheaper to buy the equipment over 55 months than to rent it. In 1968 Burnaby opted to buy it on this time purchase plan. Purchase price was \$113,896.14. When the decision to upgrade to tapes and discs was made on 20 December 1971, the central processor was returned to I.B.M. and the multi-function card machine and the printer were retained. A new central processor, together with a tape drive, was obtained from I.B.M., and a disc drive from the Telex Corporation. The central processor and tape drives cost \$153,000 and are being financed through The Royal Bank of Canada over five years. Telex Corporation itself is financing the disc drive over 39 months. Current monthly payments amount to \$4,000, including interest and service costs. Granted, this equipment would cost us \$5,344 per month in rentals plus periodic adjustments ad infinitum. As it is, at the end of three years, we will own all of the equipment and may expect to realize perhaps \$20,000 on its sale, whenever that may be.

Provided Burnaby gets five years of use out of the equipment, it is cheaper to buy the equipment than to rent it. From time to time, I.B.M. and the computer companies bring out more advanced models. This causes existing equipment to become obsolete. Nevertheless, these obsolete models continue to be serviced by the manufacturer and there continues to be a market for them. For example, I.B.M. 1401 and 1620 Models have not been made for years, but there are still many in use and occasionally change hands. B.C. Institute of Technology, for example, has a Model 1620 in use in its teaching programs. The Model 20 has been replaced with the System 3. The Model 20 is now obsolete.

However, the time comes when core storage can no longer be obtained for these obsolete models. Such is becoming the case with the Model 20. Orders are of special manufacture. The next batch will be processed in May or June this year. Subject to approval of Council, the company has tentatively accepted an order for this batch. This step is necessary to ensure that our order will be in the production line. If Council does not approve within the next month, our order will be cancelled.

It is appreciated that Council has asked the Regional District to look into the possibility of a data processing centre for use by all members of the District. It is respectfully suggested that this is a problem separate from the matter on hand. Our problems are immediate and should be given prompt attention and not await the outcome of the deliberations of the Regional District.

It is appreciated, too, that we currently are in a belt-tightening process. It is respectfully suggested that data processing is not the place to do it at this time. The proposed expenditure now will more than pay for itself.

RECOMMENDATIONS

THAT authority be given to purchase 16K additional core storage for the System 360 Model 20 at a cost of \$43,805; and

THAT a loan of this sum be obtained from The Royal Bank of Canada at a rate of prime plus 1/2% (currently 10%), repayable within five years (\$941.50 per month, \$11,298.00 annually); and

THAT authority be given for the hiring of two extra programmers, one now to assist in the immediate reprogramming job necessary for the tax bill and the second by 1 May for the exclusive use of the Municipal Assessor.


MUNICIPAL TREASURER

BM:gw
Attach.

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COUNCIL MEETING Feb. 25/74

THE CORPORATION OF THE DISTRICT OF BURNABY

INTER-OFFICE COMMUNICATION

TO: Municipal Manager

DEPARTMENT:

DATE: Feb 1/74

FROM: Municipal Assessor

DEPARTMENT:

OUR FILE #

SUBJECT: 18-01 Assessment

YOUR FILE #

The major portion of this budget involves salaries and employee benefits (\$339,635). It is impossible to reduce these without dismissing staff and if that was requested I would argue strongly against it. My reasons follow.

You will recall that by memo of November 30, 1972 I indicated the need for additional appraisers and subsequently permission was granted for employing 3 Realty Appraisers I in 1973. It was understood that the need for these additional positions would be reviewed in 1975 and 1976 when 3 of the older appraisers retire.

The arguments that I put forward in November 30, 1972 have not altered. The workload has increased and there are compelling reasons why more of our systems should be converted to E.D.P. The next one we have planned involves capturing the inventory of the majority (about 25,000) of the residences in Burnaby in an E.D.P. format to facilitate analyses, to reduce the time and effort required for subsequent individual reappraisals, to eliminate the need for completing new field cards when rates are changed and to permit us to simplify and make more flexible our reassessment program.

The cost of the conversion is principally related to programming and is estimated by Dennis Miller to require 1 Programmer for at least 1 year and the continuing need of about $\frac{1}{4}$ of a Programmer's time for maintenance. Thus the estimated programming costs are \$15,000 to \$20,000 initially and about \$3,000 annually thereafter.

The benefits promise to reduce the time required to reappraise by 30% to 40% and to eliminate the extremely costly process of completing new field cards (an appraiser can complete an average of 8/day) when the need to change the rates becomes obvious (at least once every 10 years).

The reduction of time for reappraisal represents between \$50,000 and \$60,000. This saving would be spread over a 4 to 5 year period.

The elimination of the need for completing new field cards when rates change represents a continuing average yearly saving of 625 appraiser days/year. (On the premise

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that their production will increase to 12/day if a new field card is not required and a rate change is necessary every 10 years ($\frac{25,000}{(12-8) \times 10} = 625$). This is equal to a yearly saving of about \$30,000.

Thus the summary of cost and benefit is as follows: -

	<u>Initial</u>	<u>Annual Thereafter</u>
Cost	\$15,000 to \$20,000	\$ 3,000
Benefit	\$50,000 to \$60,000	\$30,000

These figures are admittedly estimates but they relate to the experience of others.

The dollar savings are obvious. In addition the other benefits upon which it is difficult to place a monetary value are extremely worthwhile as the change will permit us to use a wide variety of system options in the future.

We have done a lot of preparatory work in anticipation of this change and can start using the appropriate new forms within 6 months. The constraints on our progress are almost entirely involved with programming. We should preferably be testing programs by late summer of 1974 and to make such progress would require the intensive involvement of 2 or 3 programmers between now and then.

Originally we had hoped that a grant from C.M.H.C. would provide the extra funds for this program and for research to extend the usefulness of this basic "bread and butter" program. Our application was turned down and subsequent inquiries haven't made me optimistic that the decision will be reviewed. Our present plans as detailed in the body of this memo have been altered to reflect this lack of support and to revert to basic considerations not involving research.

Because of C.M.H.C.'s decision and your request for economy we have reduced the budget item 18-01-15 to permit one short visit by Dennis Miller to guide us in making the necessary changes.

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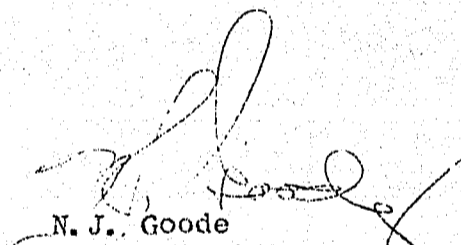
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You may have some concern about us pushing on with our individual programs when there is so much talk about the use of either regional or provincial central E.D.P. facilities. In my view either of these alternatives may be thrust upon us but the time required for the decision to be made, the necessary integration to take place and programs to be produced at the relatively sophisticated level that we are involved with will be at least 3 years. So to postpone our own local changes because of the uncertainty will have the effect of postponing the considerable benefits in the hope that some of the costs will be defrayed by others.

In summary, I strongly urge that the Assessment staff complement not be reduced and that the 2 additional programmers not be deleted from the budget. Further, as the requested additional computer core storage will simplify the programmer's task in compiling this program and in dealing with other sophisticated programs, I recommend that every effort be made to retain it in the Annual Budget.


N. J. Goode
MUNICIPAL ASSESSOR

c.c. Treasurer

NJG/sl

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MANAGER'S REPORT NO. 15

COUNCIL MEETING Feb. 25/74

THE CORPORATION OF THE DISTRICT OF BURNABY

INTER-OFFICE COMMUNICATION

TO: Municipal Manager

DEPARTMENT:

DATE: Nov. 30/72

FROM: Municipal Assessor

DEPARTMENT:

OUR FILE #

SUBJECT: Assessment Department Staff Requirements

YOUR FILE #

In the 1973 Provisional Budget there are a number of amounts in Codes 18-01-10, 18-01-20, and 18-01-30 to cover costs of additional staff for this department. This memo provides a detailed explanation of the reasons for this request.

Abnormal Workload for Two to Three Years

The appraisal work load in the next two or three years is substantially greater than normal as there are two special programs which should be started in 1973 and completed as soon as practicable. The first one is a reappraisal program of a class of industrial and commercial properties in which a number of assessment deficiencies have been noted. To resolve the problems a change in appraisal approach is indicated. We estimate that five appraisers could do this in one year.

The second program involves a much more complex problem as it relates to the conversion of our present residential appraisal system to one utilizing the capabilities of the computer.

At present the method used to establish improvement assessments is cumbersome and most inefficient. During a normal period it takes six appraisers to review the 27,000 residences in Burnaby once every five or six years. This period is further extended when new manual values are being used as field cards have to be replaced and all the detailed calculations, involving the new rates, carried out for each building. At such times, the appraisers are only using their valuation skills for very short periods as so much clerical effort is required to produce the new cards.

Most of these problems can be eliminated or minimized if E.D.P. is used. This has been amply demonstrated by many jurisdictions in Canada and the U.S. Such a change is also a necessary first consideration when more accurate and sophisticated systems, such as Multiple Regression Analysis, are to be used to establish assessed values.

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Municipal Manager

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November 30, 1972

Before attempting the change we must undertake some local research and explore in detail what others are doing, to make sure that our approach will provide a solution which will best fit our future needs.

Our plans at present in this regard involve an intensive review of 500 to 1,000 sales (we have been promised assistance in this by U.B.C. and the Real Estate Board), continuing review of the literature to determine the experience of others, and a visit to a community where such a change has already been made.

Another part of the changeover is the transference of the present information on 27,000 field cards to the Data Bank. This is not a straightforward operation as items have not been uniformly inserted on the field cards and some items are just inferred by an appraisers shorthand. The staff's opinion at present is that, because of these problems, the change must be done by appraisers. If done in this manner, it would take six appraisers over a year to accomplish. Because this would be such a misuse of the appraisers' abilities and would be so expensive in terms of time and money, we didn't use this alternative for any predictions contained in this report and we are exploring alternatives with the assistance of IBM specialists. As a solution has not yet been found, a nominal sum of \$5,000 was included in code 18-01-10 to do at least a portion of the job in 1973.

Alternative Methods of Dealing with the Problems

If we pursue our objectives with our present staff, our normal reassessment program would be lengthened - so that the time lag between reviews would be ten to fifteen years, whereas it is generally recognized that a normal cycle should be completed every five years - and the quality of the Roll would suffer.

If we don't pursue our objective of adapting our residential assessments to E.D.P. our difficulties will increase each year and inevitably additional staff will be required to cope with them. Another consequence would be that without E.D.P. capabilities we will be unable to upgrade our assessments and make them more equitable.

Proposal

The workload respecting these two programs should be completed in a two or three year period and after that there should be a return to relative normalcy.

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Municipal Manager

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November 30, 1972

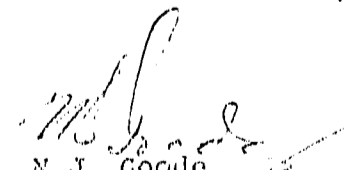
So, in effect, the need is for additional temporary appraisal staff during this period. This ordinarily would be awkward to arrange but it just happens that three of the Assessment Department staff are due to retire in this period. They include:

<u>Name</u>	<u>Class Title</u>	<u>Pay Grade</u>	<u>Date of Retirement</u>
S. May	Realty Appraiser I	23	May 6, 1975
A. Mallett	Realty Appraiser I	23	Feb. 11, 1976
J. Rowlatt	Business Tax Valuator	21	Sept. 25, 1976

Thus, it is proposed that three Realty Appraisers I (pay grade 23) be employed as soon as possible so that a total of nine Realty Appraisers I would be on staff. This number could be reduced back to six as the retirements take place. The only difference being that a Business Tax Valuator (pay grade 21) will have been replaced by a Realty Appraiser I (pay grade 23). This I do not consider very serious, as by that time, we will most likely need an additional permanent staff member to handle our normal workload.

Past and Future Changes in Staff

There have been no additions to the Assessment Department staff since I was appointed Assessor in August, 1966. This was principally due to increases in efficiency made possible by the twenty to thirty E.D.P. programs which have been developed and put into use in that period. It was my opinion originally, that this process of developing E.D.P. programs to improve our efficiency and stabilize our work force could continue indefinitely, with only upgrading necessary to recognize the increasing sophistication of approach. Subsequently, I had some doubts, and in making a prediction of staff needs in December 1969 for planning the Municipal Hall extension, I estimated that two additional staff members would be required by 1974 and a further two would be needed by 1979. The problems that I can foresee in the development of the Residential E.D.P. program, and the detailed projections I have made because of them have strengthened this opinion. However, it will be easier to establish the number and type of additional permanent staff required after two or three years have elapsed, so I propose to make a further evaluation of our needs when each employee retires.


N. J. Goode
MUNICIPAL ASSESSOR

NJC/nmc

THE CORPORATION OF THE DISTRICT OF BURNABY

TO: DIRECTOR OF PLANNING

18 January, 1974

FROM: C. R. LOWTHER

SUBJECT: INFORMATION SYSTEM

The purpose of this memorandum is to indicate:

- (1) The status of the data which has been extracted from the files.
- (2) How and at what times this data will be updated.
- (3) The next data which we intend to extract from the files in the near future.
- (4) Some anticipated demands on the system during 1974.
- (5) Some bottlenecks which are appearing.

ITEMS NO. (1) AND (2) - (STATUS AND UPDATING)

Refer to Table I, attached hereto, which covers both status and updating.

ITEM NO. (3) - NEXT DATA TO BE EXTRACTED FROM THE FILES.

The next data which should be extracted from the files for key-punching and entry into computer storage, has been discussed with Mr. Chilton, Mr. Stenson, Mr. Belhouse and Mr. Luk Sun. As the result of these discussions, the following is our intended program.

(a) Fire Incidence

Mrs. Gillies is presently extracting from the Fire Department records, a list of fires which took place during 1972 and 1973. Mr. Chilton and Mr. Belhouse specially require this data for their forthcoming firehall location study. The data required for the study was also discussed in detail with the Fire Chief. Being recorded are:-

- (1) Date of fire
- (2) Time of fire
- (3) Firehall answering fire
- (4) Travelling time to reach fire
- (5) Location by block number.

All fires for 1972 have been entered on to the recording forms and 1973 will be completed shortly.

It is intended that this record be updated annually by adding the fires for the latest year. This accumulated data will be of use to the Fire Chief as well as to the Planning Department, and the Fire Department's own coding has been incorporated into the data to be entered into the computer program.

(b) School Enrollments

These will be added annually and attached to the School Catchment Areas. This was requested by Mr. Chilton and Mr. Belhouse, and the purpose is to allow combination of this data with other data for school expansion studies etc.

TO: Director of Planning

18 January, 1974

FROM: C. R. Lowther

SUBJECT: Information System

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(c) Employees

Statistics Canada economic file, whenever it is ready, will not provide the data required on employees. Data on employees will be useful in updating and checking transportation proposals, particularly when labour force data is obtainable from the census.

It is intended to obtain employee data from the "Contacts Influential" directory which gives employee ranges for each individual enterprise. To increase accuracy, a telephone poll will be made of the larger concerns. (Say 100 employees and up). It is intended to use summer student help for this. This employee data will be entered into the computer and updated thereafter, either every year or every two years, depending on time available and the urgency of the need for employee data.

(d) Building Permit Values

Both Mr. Belhouse and Mr. Stenson indicated a need for this. One use would be to obtain an indication of the value of construction within certain Community Plan areas during certain five year intervals, so that an idea of relative construction activity since adoption of the Community Plans can be gauged.

(e) Percentage of Undeveloped Land on each Parcel

Required for population and density studies, and, in conjunction with other data, for development area studies.

It is intended to obtain this data on a parcel-by-parcel basis, through use of the new aerial photographs.

(f) Number of Exterior off-street Parking Spaces

Required for forthcoming studies of parking requirements and parking ratios etc, leading to a policy recommendation on a method for providing parking (private, municipal, shared etc.)

It is intended to obtain this also from aerial photographs.

(g) Number of Interior off-street Parking Spaces

Required for studies referred to in (f) above. This will require obtaining the data from the building plans.

(h) Gross Floor Area per Building

Will require obtaining data from building plans. Will be required if the Apartment Study is updated.

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TO: Director of Planning

18 January, 1974

FROM: C. R. Lowther

ITEM 18

SUBJECT: Information System

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ITEM NO. (4) - SOME ANTICIPATED DEMANDS ON THE SYSTEM DURING 1974

The following studies are expected to make demands on the system during 1974.

- (a) The Firehall Study. (data required as soon as possible following completion of recording forms).
- (b) School Expansion Study. Data on school enrollments related to school catchment areas. Required by June 1974.
- (c) District wide Study of Population Densities Based on Anticipated Developments. Data on dwelling units by type, zoning and land use by square footage or acreage, including developed and undeveloped land. All related to neighbourhood study areas. Required by June 1974 for density studies.
- (e) Off-Street Parking Study. Requiring data on existing parking and building permit values for different time periods.
- (f) Updating of Apartment Study - gross floor areas required.
- (g) Development Area Studies. (Mr. Luk Sun) Various data items required, including ownership, vacant land, zoning etc.

ITEM NO. (5) - AN APPARENT BOTTLENECK

Due to a very heavy workload it is apparent that the Data Processing Division is finding it difficult to undertake work required by this department within reasonable time limits.

As an example, the recording forms for the data items, Sanitary Sewer, Storm sewer, Combined storm and sanitary, frontage and area, were completed by this department and forwarded to the Data Processing Division on July 25, 1973. A second batch of forms covering Land Use Classification and dwelling units in apartments was forwarded to the Data Processing Division at the end of August 1973. While all these data items have been keypunched, they still have not been entered into the computer storage.

In October 1973 we were informed that there was no point in entering new batches of data on to the recording forms as no more Planning data could be handled until March 1974, when the new list of updated co-ordinates will be available. As a result, instead of starting on new data, some of the existing data was updated.

This means in effect that data which has been recorded by this department will require updating with the new co-ordinates in March 1974 before the initial batch was entered into the computer. We would, for example, have liked to have used the Land Use Classification data for Mr. Chilton's Neighbourhood Improvement Grant Study, but had to use the Assessment Department's manual classification because our Land Use classes had never been entered into the computer.

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TO: Director of Planning

18 January, 1974

FROM: C. R. Lowther

SUBJECT: Information System

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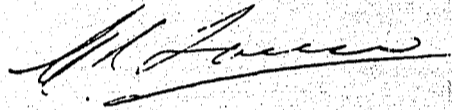
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We asked on January 14, 1974 for a relatively straightforward printout for the Neighbourhood Grant Study. We have been informed that in order to have this material by our required deadline of January 31, 1974, the Data Processing Division will have to work overtime.

My point is that it is evident that a bottleneck is appearing. Data which we have sent down months ago has not yet been entered. During this current year we have a good deal more new data to have entered (as listed in this memo) and a lot of updating. And this is all putting data into the system. We are only just starting to ask for data out of the system, which requires the writing of further programs.

I can foresee some trouble on the horizon in that we will not be able to obtain the use we need of the information system, unless some advance steps are taken to eliminate this bottleneck.

It is my suggestion that a discussion be held on the whole question, probably at the Department Head level. But I will have a word with you about this when you have had a chance to read this memorandum.



C. R. Lowther
PLANNER II

CRL:ea
c.c. Information Clerk

INFORMATION SYSTEM - PROGRESS REPORT - TABLE I

Item	Extracted from Files and Entered in Recording Forms	Key Punched	Included in Computer Program	Accurate to	Method of Updating	Updating Date of Completion	Time to Update	Comments
Zoning	Yes	Yes	Yes	Dec. 31, 1972	Zoning Clerk supplies by-law changes to Information Clerk on regular basis.	Mar. 15 - Apr. 15 Current updating when time available	1 month together with Items 2, 3, 4, 5.	Included in computer up to Dec. 31, 1972. Also on recording forms further updated up to Oct. 10, 1973. Manual list will be sent to data processing. Comparison will be made to identify missing coordinates after Court of Revision, in March 1974. Following receipt of list of new coordinates the zoning changes of the previous year will be assigned to these co-ordinates.
Census Tract	Yes	Yes	Yes	Dec. 31, 1972	Census maps received from Statistics Canada	Mar. 15 - Apr. 15	1 month together with Items 1, 3, 4, 5	
Neighbourhood Study Areas	Yes	Yes	Yes	Dec. 31, 1972	Changes to be received from Senior Planner on annual basis between Dec. 1 and Mar. 1	Mar. 15 - Apr. 15	1 month together with Items 1, 2, 4, 5	
Traffic Zones	Yes	Yes	Yes	Dec. 31, 1972	No changes anticipated at the present time	Mar. 15 - Apr. 15	1 month together with Items 1, 2, 3, 5	

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MANAGER'S REPORT NO. 15
COUNCIL MEETING Feb. 25/74

INFORMATION SYSTEM - PROGRESS REPORT

No.	Item	Extracted from Files and Entered in Recording Forms	Key Punched	Included in Computer Program	Accurate to	Method of Updating	Updating Date of Completion	Time to Update	Comments
5	School Catchment Areas	Yes	Yes	Yes	Dec. 31, 1972	Senior Planner supplies new boundaries annually in September.	Mar. 15 - Apr. 15	1 month with Items 1, 2, 3, 4	
6	Sanitary Sewer	Yes	Yes	No	Dec. 31, 1972	Assessment Dept. updates. Goes onto computer around Court of Revision time (Mar.)	Apr. 16 - Apr. 18	2 days	
7	Storm Sewer	Yes	Yes	No	Dec. 31, 1972	Manual check of Engineering files	Apr. 18 - May 9	3 weeks	
8	Land Use Classification	Yes	Yes	No	Mar. 1, 1973	Field work. Use of revised Assessment files, (manual classification) and Assessment's land use files.	May 10 - July 22	10 weeks	
9	No. of Dwelling Units for Apartments	Yes	Yes	No	Mar. 1, 1973	As above	May 10 - July 22		
10	Combined Storm & Sanitary	Yes	Yes	No	Dec. 31, 1972	Manual check of Engineering files	July 23 - Aug. 6	2 weeks	

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INFORMATION SYSTEM - PROGRESS REPORT

No.	Item	Extracted from Files and Entered in Recording Forms	Key Punched	Included in Computer Program	Accurate to	Method of Updating	Updating Date of Completion	Time to Update	Comments
11	Septic Tanks	Yes	Yes	No	Dec. 31, 1972	Manual comparison of sanitary and storm and combined listing.	Aug. 7 - Aug. 13	5 days	
12	Frontage	Yes	Yes	No	Dec. 31, 1972	From new plans Land Registry listing of changed & new coor- dinates from Data Pro- cessing (Subdivision Listing)	Aug. 14 - Sept. 18	5 weeks	
13	Area	Yes	Yes	No	Dec. 31, 1972	From new plans Land Registry listing of changed & new coor- dinates from Data Pro- cessing (Subdivision Listing)	Aug. 14 - Sept. 18	5 weeks	

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15 February, 1974

RECEIVED

FEB 15 1974

TO: MUNICIPAL MANAGER
FROM: DIRECTOR OF PLANNING
SUBJECT: INFORMATION SYSTEM -
REQUIREMENTS OF PLANNING DEPARTMENT

MUNICIPAL MANAGER'S
OFFICE

PURPOSE

This report is in response to your directive at the staff meeting of February 8, 1974, that a study be undertaken which would compare the differences in costs and benefits between obtaining Planning data manually versus use of the services of the Data Processing Division.

APPROACH USED

Our approach was to take as examples data lists required for three sample studies. One of the examples was a real study, recently completed. The other two are hypothetical studies of the type which we intend to undertake during the current year.

The first study, the real one, involved a comparison of the time and cost which would have been involved if the whole data list had been extracted and tabulated manually, with the actual time and cost which was incurred when the data was obtained through E.D.P. The data was already on tape because it was needed by other departments, and so there were virtually no costs attributable to the Planning Department for extracting data from the files in order to have it placed in computer storage as a prelude to computer output. This study accordingly offered a very simple and useful comparison.

In the case of the second and third studies, the hypothetical ones, firstly a straight comparison was made of the time and cost of getting all the data manually, versus the time and cost of programming and printing by the Data Processing Division. This straight comparison was made in the case of the Data Processing Division, on the basis that the data had already been entered into computer storage.

The rationale behind excluding costs of extracting the data and getting it into computer storage, is that most of this work has been completed and paid for; it is in the nature of an existing investment from which one now intends to derive a benefit.

But in a recent discussion with the Treasurer, he considered that the costs of putting the data into the system should be shown, to provide a comprehensive picture of cost differentials. And so, for the two hypothetical studies, we have also indicated the costs incurred in taking the data from the office files as a prelude to its being entered into computer storage. We did not however, indicate any costs for entering data which has already been entered into storage initially to meet the needs of other departments.

It is important to bear in mind that although we have shown costs for entering data prior to storage, they cannot with validity, be attributed to an individual study. There are two reasons for this. Firstly, in practice each item of data is extracted from the files and listed in batches with other items of data, to cover the whole Municipality. On a per unit basis, it is much more efficient and less expensive to enter data on this basis for the whole Municipality (approximately 36,000 properties), than it is to enter it just for one study (e.g., 900 properties).

A second reason why it is not really valid to attribute these input costs to any particular study is that once a data item (e.g., zoning) has been entered on to tape, it can be used repeatedly for further studies, however many of these there happen to be.

The following shows the results of the comparisons made in our three sample studies.

COST COMPARISON OF A STUDY RECENTLY UNDERTAKEN

On February 7, 1974, a study was presented to Council which provided the basis of an application to the Provincial Department of Housing for assistance under the Neighbourhood Improvement Program of the National Housing Act. Data for this study was needed urgently in order to meet the deadline for the application.

The Planning Department requested the following information from the Data Processing Division, for four Neighbourhood Study Areas:-

Unit Type	EFFECTIVE AGE					ASSESSED BUILDING VALUES					Total Units
	Prior to '30	'31 '40	'41 '50	'51 '60	'61 '74	\$ 0- 4,999	\$ 5,000- 9,999	\$ 10,000- 14,999	\$ 15,000- 19,999	\$ 20,000+	
Single Family											
Duplex											
Row Houses											
Apts.											
Totals											

The Data Processing Division, due to the pressure of other essential work, was not able to produce this data for three weeks. But the actual time taken and cost incurred to undertake the work was as follows:

Ref. No.	Item	Hours	Cost \$
1.	Programming and Systems Work	14.50	114
2.	Key punching and verifying	1.66	11
3.	Compiling and testing program	1.66	108
4.	Running of report	.50	33
Totals		18.32	266.

For comparison purposes an estimate has now been made of the time which it would have taken to prepare this data in the form in which it was required for the study, without the benefit of the services of the Data Processing Division. This estimate is shown below.

Ref.No.	Item	Hourly Wage of Staff \$	Man Hours	Cost \$
1.	The drawing up of a list of street names and block numbers included in the four study areas	4.12	.75	3.09
2.	The setting up of a chart for accumulation of the data by type	4.12	.75	3.09
3.	Information extracted manually from two different books in the Assessment Department files, grouped and tabulated. Based on approximately 1½ minutes per property in the areas studied	4.12	121.00	498.00
Totals			122.50	504.18

In summary then this data would take about 123 hours to obtain manually, and would cost over \$500. By using the Data Processing Service the data, once work was started upon it, was obtained in 18 hours at a cost of only \$266. Put another way, the manual method would cost nearly twice as much and take nearly seven times as long to produce the required data.

Two comments on this particular study are firstly, that with the exception of the Neighbourhood Study Area numbers, the Planning Department for this particular study did not in fact have to extract data manually as a preparatory step to having the groupings and summations conducted by the Data Processing Division. This was because the data already was in the computer, placed there to meet the needs of other departments. A second point is that if similar data were required in the future, this program could now be adapted for future use at greatly reduced cost.

COST COMPARISON FOR A SAMPLE ELEMENTARY SCHOOL PROPERTY
ACQUISITION STUDY BY SCHOOL CATCHMENT AREA

The following table is a list of the data needed for the study of a hypothetical school catchment area, to determine the amount of additional school property which should be acquired. (Refer to following table headed "Sample of one Elementary School Property Acquisition Study").

The table indicates the source, the number of hours and the labour cost involved if the data had to be obtained without the benefit of programming and the use of the computer.

For the purposes of the example, it has been assumed that the school catchment area contains single and two-family dwelling units and apartment units, for a total of about 900 properties.

SAMPLE OF ONE ELEMENTARY SCHOOL PROPERTY ACQUISITION STUDY (By School Catchment Area)

Ref.No.	Item	Source	Staff	Description of Operation	Hourly Wage of Staff \$	Man Hours	Cost \$
1.	Number of Single Family Dwelling Units	Assessment	Planning Assistant (2)	Pulling out assessment cards and transferring information on to a prepared table	4.12	13.33	54.92
2.	Number of Two Family Dwelling Units	Assessment	Planning Assistant (2)	ditto	4.12	13.33	54.92
3.	Total Number of Apartment Dwelling Units	Assessment	Planning Assistant (2)	Search Assessment Department files for apartment buildings and transfer information on to a chart.	4.12	7.50	30.90
4.	Population	Planning	Assistant Director of Planning-Long Range	Calculation by multiplying the different kinds of dwelling units previously calculated by the appropriate estimated average ratio of persons per unit. Transfer information on to prepared table and include population increases estimated for development of vacant land.	10.67	7	74.69
5.	Number of Children Elementary School Age	Planning	Assistant Director of Planning-Long Range	Calculation by multiplying the different kinds of dwelling units by determined ratios of children per unit. Following an estimate of the number of different kinds of units which are expected to be developed on vacant land within the forecast period, a calculation of the number of school children will then be obtained by again applying appropriate ratios	10.67	7	74.69

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Sample of One Elementary School Property Acquisition Study (By School Catchment Area)

Ref.No.	Item	Source	Staff	Description of Operation	Hourly Wage of Staff \$	Man Hours	Cost \$
6.	Vacant Land	Planning	Planning Assistant (2)	Calculation of the amount of vacant land to be developed residentially within the forecast period by reference to community plans, and by using legal map measurements where land acreage is already calculated and a planimeter when it is not	4.12	3	12.36
7.	Zoning	Planning	Planning Assistant (2)	Listing of properties by co-ordinate numbers and identification of same on legal property maps and identification of zoning by comparison with zoning maps. Transfer of information on to a prepared table.	4.12	40	164.80
8.	Land Use	Planning	Planning Assistant (2)	Combined walking and driving to determine use of buildings. Tabulation of results by property addresses.	4.12	40	164.80
9.	School Catchment Area	School Board	Planning Assistant (2)	The time involved is nominal if only one school catchment area is involved.	N/A	N/A	N/A
TOTALS						131.00	632.00
(To Nearest Hour and Dollar)							

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If this request were processed by the Data Processing Division, the time and cost would be as follows:-

Ref. No.	Item	Hours	Cost
1	Programming and Systems Work	15	\$ 117.93
2	Testing and debugging	1.5	97.50
3	Key punching (Program and detail file)	7.5	48.75
4	Running of report	.6	39.00
Totals		24.6	303.18

In order to get the required data into the system before it can be extracted in the form required, work is required to extract the data from the files so that it can be keypunched. In the case of this particular study, this has already been undertaken. The cost of assembling from the files the data not already on tape for this study, is estimated at \$372, and the time involved - 90 hours. But this cost cannot all be attributed to this one study since the information once on tape, can be used for a variety of different studies. It must be considered as a 'starting up' cost.

What this all means is that once the basic data is on tape, the data for a report of this type can be obtained with 24 hours of work at a cost of \$303. If the data were obtained manually, it would take five times as long to obtain, (131 man hours), and would cost more than twice as much (\$632.). Prior to use of E.D.P. there are certain 'start-up costs' which cannot be attributed with validity to any one such study.

In discussion, the Assistant Director of Planning - Long Range Planning and Research, (Mr. Chilton) has indicated that provided data can be obtained within the time made possible by E.D.P. it is his intent to undertake a school expansion study of the whole Municipality in the current year. Since our example study covers only one school catchment area, it can readily be appreciated that the savings in time and cost for a Municipal wide study would be considerable. Of perhaps even greater significance is that if E.D.P. could not be used, it might well prove impossible to complete this important study this year.

COST COMPARISON FOR A SAMPLE EXAMINATION OF ONE MATURE RESIDENTIAL AREA

Shown below is a list of the data needed for the examination of a hypothetical mature residential study area which would be required to determine whether the area, or a part of it, would be suitable for redevelopment, probably for apartment or commercial use, or a combination thereof.

For the purposes of this example it has been assumed that the study area is one of average size and density, containing about 150 apartment units and about 800 single and two-family units.

The cost of preparing the report following receipt of the data, typing the report and mapping, have deliberately been excluded from the estimates since this work would have to be done regardless of the method or speed with which the data is obtained.

The following table "Sample Examination of one Mature Residential Study Area" indicates the time and labour costs involved if all the data for this study were to be obtained and tabulated manually.

SAMPLE EXAMINATION OF ONE MATURE RESIDENTIAL AREA (By Neighbourhood Study Area)

Ref.No.	Item	Source	Staff	Description of Operation	Hourly Wage of Staff \$	Number of Man Hours	Cost of Obtaining Data \$
1.	Mailing Address of Each Property	Assessment	Planning Assistant(2)	Pulling out of Assessment cards and transferring information on to a prepared table.	4.12	13.33	54.92
2.	Name of Owner of Each Property	Assessment	Planning Assistant(2)	ditto	4.12	13.33	54.92
3.	Number of Single Family Dwelling Units	Assessment	Planning Assistant(1)	ditto	4.12	13.33	54.92
4.	Number of Two Family Dwelling Units	Assessment	Planning Assistant(2)	ditto	4.12	13.33	54.92
5.	Total Number of Apartment Units	Assessment	Planning Assistant(2)	Search Assessment Department files for apartment buildings. Transfer the number of units in each building on to a chart.	4.12	7.50	30.90
6.	Effective Age	Assessment	Planning Assistant(2)	Extraction of data from a book in the Assessment Department and transference of it on to a prepared table	4.12	11.25	46.35
7.	Gross Floor Area of Residential Buildings	Assessment	Planning Assistant(2)	ditto	4.12	11.25	46.35

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Sample Examination of One Mature Residential Area (By Neighbourhood Study Area)

Ref.No	Item	Source	Staff	Description of Operation	Hourly Wage of Staff \$	Number of Man Hours	Cost of Obtaining Data \$
8.	Population	Planning	Asst. Director-Long Range Planning & Research	Multiplication of the different kinds of dwelling units previously calculated, by the appropriate estimated average ratio of persons per unit. Transfer information on to prepared table.	10.67	1.00	10.67
9.	Zoning	Planning	Planning Assistant(2)	Listing of properties by co-ordinate number and identification of same on legal property maps. Identification of zoning by comparison with zoning maps.	4.12	40.00	164.80
10.	Parcel Acreage	Assessment	Planning Assistant(2)	Calculation of areas where applicable. Use of planimeter on odd-shaped lots, using the legal property maps.	4.12	60.00	247.20
11.	Land Use	Planning	Planning Assistant(2)	Combined walking and driving to determine use of buildings. Tabulation of results by property addresses.	4.12	40.00	164.80
12.	Assessed Value	Assessment	Planning Assistant(2)	Extraction of data from a book in the Assessment Department and transference of it on to a prepared table.	4.12	11.25	46.35
13.	Neighbourhood Study Area	Planning	Planning Assistant(2)	Assuming that only one neighbourhood study area was involved, the time involved in this operation would be nominal	N/A	N/A	N/A
TOTALS				(To nearest hour and dollar)		235.00	977.00

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Once all the required input data is in the system, the time and cost involved in obtaining a printout for the Planning Department study would be as follows if the services of the Data Processing Division were used:-

Ref. No.	Item	Time (hours)	Cost \$
1.	Systems and Programming	15.00	117.93
2.	Testing and debugging	1.50	97.50
3.	Key punching (Programs and detail file)	7.50	48.75
4.	Report running	.60	39.00
Totals		24.60	303.18

Costs of extracting data from the files to be entered as input for the computer would be \$607 and the number of hours 147. But in fact this work has already been undertaken, and since the data once on tape can be used for a number of different future studies, this 'start up' cost cannot be attributed with any validity to any one study.

The net picture then is that, with the input data in computer storage, it would involve 24 hours of work and a cost of \$303 to obtain a computer printout for the Planning Department to conduct the study. On the other hand, it would take nine times as long (235 hours) and would cost more than three times as much (\$977) to obtain the data for the study if only the manual method is used.

Mr. Chilton has indicated that there will likely be two studies of this type conducted by the Planning Department provided that the data can be obtained in the time which is possible when E.D.P. is used. Without the use of E.D.P. such studies in all likelihood would not be feasible.

CONCLUSIONS

In the report discussed at the staff meeting of February 8, 1974, we pointed out the delays encountered in our dealings with the Data Processing Division, and our concern about the future. This, coupled with an examination of the Planning Department's expected data requirements for the current year and the results of the above cost and time comparisons, lead to the following conclusions.

- (1) Steps should be taken at this time to hire the necessary staff in the Data Processing Division so that the requirements of the Planning Department in the current and subsequent years can be met without undue delay.

In addition to the studies mentioned above, other studies are intended for 1974, as mentioned in the report of January 18, 1974 discussed at the staff meeting of February 8, 1974. These include the Firehall study, the off-street parking study, and development area studies being conducted by Mr. Luk Sun, of which about six are expected in 1974.

The Data Processing Division should now be staffed so that the data required for the above reports can be forwarded promptly when it is requested, and not merely provided on a low priority basis after the demands of other departments have been met.

Conclusions

- (2) If prompt service cannot be provided, the great advantage of E.D.P. will be lost.

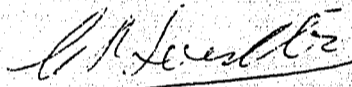
Studies which we will embark upon if we can obtain our data quickly, will not be practical if we have to wait weeks or months for our printouts.

- (3) Once the base data is on tape, there are very significant savings to be obtained, in terms of both time and cost, by using the services of the Data Processing Division.
- (4) If the necessary Data Processing staff is not provided, considerable costs which have already been incurred to enter the base data into storage, will be wasted.

In the case of the studies we are now intending to conduct, the majority of the input data has already been extracted from the files and entered on to recording forms. Much of it has already been key-punched and has been placed on tape. If lack of sufficient staff in the Data Processing Division precludes our obtaining the service which we require to complete our reports on time, we will obtain none of the benefits which we are hoping to derive from this base work.

RECOMMENDATION

It is recommended THAT the necessary staff additions now be made to the Data Processing Division so that the information requirements of the Planning Department can be met.



C. R. Lowther
PLANNER II

(for)

A. L. Parr,
DIRECTOR OF PLANNING

CRL:ea
c.c. Municipal Treasurer
Planner II (CRL)