

REPORTS
REGULAR COUNCIL MEETING
1989 FEBRUARY 27

February 24, 1989

TO: MEMBERS OF MUNICIPAL COUNCIL

FROM: MAYOR WILLIAM J. COPELAND,
CHAIRMAN,
ELECTRONIC SYSTEMS REVIEW COMMITTEE

SUBJECT: FURTHER COMPUTERIZED INFORMATION SYSTEMS REVIEW ACTIVITIES

RECOMMENDATIONS:

1. THAT Brian Mullen be contracted to undertake a review of the alternatives open to Burnaby to provide Burnaby with an up to date Human Resources Management System that is integrated and consistent with other Burnaby computer systems, such contract not to exceed a cost of \$40,000 and to be completed by September 1, 1989.
2. THAT Mr. Mullen be asked to rank all of the alternatives he identifies based on a cost/benefit analysis of each alternative.
3. THAT staff and the Electronic Systems Review Committee develop Terms of Reference for the hiring of a consultant or consultants to undertake a review of all of Burnaby's computerized information systems in order to answer the questions set out below, such work to be coordinated with Mr. Mullen's work above, at a cost not to exceed \$50,000 and to be completed by September 1, 1989.

R E P O R T

SUMMARY:

In late 1984, Burnaby adopted a Strategic Plan for Information Management. This plan covered hardware acquisition, software development, organization and staffing, budget and so on. It has been updated a number of times since then but has not to date been subject to a critical review. In late 1988, in response to growing concerns about one particular system, the Human Resources Management System (HRMS), Council hired a consultant, Brian Mullen, to review that system. His review identified a number of problems and shortcomings with the HRMS which must be addressed reasonably soon. In addition, in late 1988 PlanGraphics, Inc. completed a review of Burnaby's spatial (mapping) computer systems. Neither report was intended, however, as an overall review of Information Management in Burnaby and that task remains outstanding.

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A. HUMAN RESOURCES MANAGEMENT SYSTEM - SOLUTION (PROBLEM SOLVING) PHASE

Brian Mullen of Information Systems Planning Corp. (I.S.P.) submitted his report "Audit of the Corporation of the District of Burnaby HRMS (Human Resources Management Systems) with a plan to Evaluate and Recommend Alternative Courses of Action" dated January 27, 1989 to Burnaby Council.

- He concluded
- the current system is unreliable
 - the current system is difficult to enhance and maintain
 - the current system is straining the resources of the MIS department and the user areas.

He proposed that the Corporation should fully evaluate alternative courses of action to overhaul or replace the HRMSystem.

Council has accepted his report and agreed with his conclusions. The current HRMSystem must be overhauled or replaced. Independent consulting assistance is required to delineate a complete and credible set of alternatives or options and to assess each of those (see attachment A). Each option will have:

- Costs
- acquisition and/or development
 - staff time
 - outside expertise
 - ongoing maintenance
 - possible hardware changes, etc.

- and benefits
- ease of operation and maintenance
 - functionality
 - adaptability to change
 - time to put in place
 - integration with other systems, etc.

and these must be valued so that a cost benefit ratio can be calculated for each option. Further, it is crucial that any HRMS solution dovetail with recommendations regarding Burnaby's overall hardware and software systems array. Thus, it is essential that in doing his work Mr. Mullen work closely with the consultant or consultants carrying out the overall review described below.

Mr. Mullen has the ability to carry out the necessary work (see attachment B) and has agreed to do so. The Purchasing Agent advises it has been the practice of the Corporation of Burnaby to directly employ a particular consultant for a project if that consultant has worked on an earlier phase or phases of the same or similar work and if that consultant was first selected from a review of a number of alternative consultants. Mr. Mullen believes he can complete this phase by September 1, 1989 at a cost of not more than \$40,000. He will deliver to Council a report that sets out all of the options open to Burnaby and ranks them on the basis of cost benefit analysis. His report on this phase will be reviewed by Management and such other expertise as the Electronic Systems Review Committee may choose to employ after which it will be presented to Council to select the option that provides the greatest benefit for the least cost subject to integration with other systems and recommendations from the work next described. An implementation plan will need to then be developed for the selected option.

B. COMPUTERIZED INFORMATION MANAGEMENT- REVIEW (PROBLEM IDENTIFICATION) PHASE

Since the first Strategic Plan for Information Management was adopted in late 1984, it was intended that an audit or review be carried out to ensure that the direction being followed by Burnaby is appropriate to changed circumstances and conditions. It is important that this review be undertaken without further delay.

The purpose of this review would be to seek answers to questions as follows:

- is the overall direction being pursued in managing information appropriate in today's environment?
- has the Corporation received "good value" from its investment in hardware and software? Do the benefits exceed the costs?
- is Burnaby trying to do "too much, too quickly"?
- has the goal of integration of systems and data been lost sight of and should it be revived?
- are spatial (mapping/graphic) systems receiving the prominence they deserve? Are the spatial systems adequately integrated with other systems and widely enough available for use?
- is the Burnaby Public Library computer system properly integrated with Burnaby's overall computer system?
- are priorities driven by maximizing net benefits?
- is the MIS department appropriately organized and adequately staffed?
- are committees and task forces used effectively and efficiently?
- how does Burnaby compare to other municipalities in its use of computers to manage information?
- what should constitute the key elements of a Strategic Plan for the next three to five years? What level of expenditures on MIS (hardware, software development, ongoing operations) would be appropriate for Burnaby?
- what is the long term viability of Burnaby's hardware and software? Can it readily adapt to change or is it becoming obsolete?
- how can we ensure the system is able to respond to changing user requirements and facilitates installation of new releases of software?
- what measures of effectiveness and efficiency might be used in the future and how and when should these be reported to management and Council?
- what systems should be put in place to ensure a free flow of information up and down the organization? Are there adequate "checks and balances"?
- should a periodic (quarterly?) reporting format be introduced so Council would be regularly aware of ongoing costs, time, problems, questions of integration?

All of the questions above will be incorporated into a set of Terms of Reference that will be developed by staff and the Electronic Systems Review Committee. Those terms will make it clear that the consultant or consultants carrying out the overall review will need to coordinate efforts with Mr. Mullen's work on the HRMSystem. The terms will also point out that a spatial systems review has already been completed by PlanGraphics, Inc. The consultant or consultants for the overall review will be asked to comment on the PlanGraphics conclusions (see Attachment C) and will have to ensure that there is an integration of Mr. Mullen's HRMS work, the PlanGraphics, Inc. work, and their own review. No solution can be pursued in isolation.

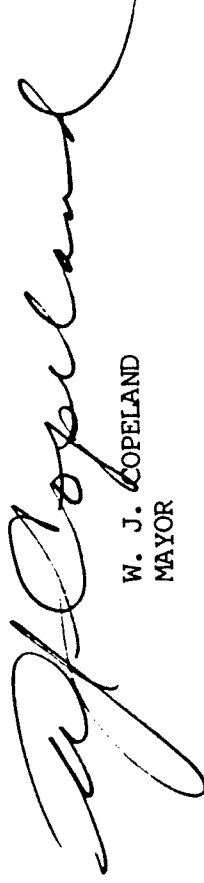
By March 31, 1989 a list of consultants who possess both the theoretical expertise and practical experience to carry out this assignment will have been created by Council and staff. The potential consultants will be provided with a copy of this report and other necessary background material and will be given an opportunity to meet with Council and staff as necessary to enable them to submit a proposal to carry out this assignment. Proposals will be evaluated by Council and staff and a consultant (or consultants) will be selected to complete the review.

The successful consultant(s) will be expected to review all relevant background material and documentation including the Strategic Plan of 1984 and subsequent revisions. A number of interviews with Council members, senior management, MIS staff and others will have to be undertaken. When the review is concluded the consultant(s) report will be reviewed by:

- the Municipal Manager and Management Committee
- the Computer Advisory Committee
- MIS staff
- further independent expertise as deemed appropriate by the Mayor

The draft report with all comments as provided by the above will then be considered by the Electronic Systems Review Committee of Council who will then report to Council with the review and such recommendations as they feel appropriate to propose.

It is expected that the review will operate in parallel with Mr. Mullen's work concluding by September 1, 1989 at a cost not exceeding \$50,000.



W. J. COPELAND
MAYOR

ATTACHMENT A

JAN. 6, 1989 PLAN OF ACTION FOR BURNABY HRMS SYSTEM. Page No. 4.

3 Objectives of the Alternatives Evaluation Study (Stage 2)

To provide a sound basis for the municipality to decide what is the appropriate course of action to take with the HRMS system.

To fully evaluate the following alternative courses of action to overhaul or replace the HRMS system.

Continuing with the existing software package from IA.
Identify and evaluate other HR software packages on the VAX.
Identify and evaluate microcomputer packages.
External Payroll Services such as those provided by banks.
Evaluate costs with returning to the manual system.

Compare the costs and risks of continuing with the existing system with costs and risks associated with each of the alternatives. The following cost components will be included in the analysis:

Acquisition price for the HR software (and hardware):

On going maintenance costs.

Operating costs.

Future flexibility and requirements for modifications.

Compatibility and integration with other Burnaby systems.

A detailed comparison of the alternatives will be presented along with a estimate of the costs and risks of each alternative. A course of action will be recommended to Council for approval.

From: Proposal to The Corporation of the
District of Burnaby to perform an
evaluation of the HRMS

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ATTACHMENT B

Jan 6, 1989 Plan of Action for Burnaby HRMS system. Page no. 6

6 Resume of Brian Mullen, ISP consultant

Mr. Mullen has over twenty years experience in the computer industry on mainframe, mini and micro computer systems. He has been project leader or consultant on dozens of projects including ICBC, BC Telephone, Port of Vancouver. Prior to forming I.S.P. information systems planning corp., he was B.C. manager of the Consulting Division of Boeing Computer Services, Canada Ltd.

Mr. Mullen most recent large project was for the Human Resources department of BC Telephone. He was the project leader on information system developed on a VAX computer using the ORACLE relational database management system from December 1987 to July 1988.

Mr. Mullen undertook the initial feasibility study and requirements definition for the City of Nanaimo when they purchased their first computer system in 1976. The three month study was completed with a presentation to Council that was accepted. The recommended software was purchased from the Municipality of Surrey.

Mr. Mullen prepared detailed Payroll requirements specifications for Canem Systems, Subsidiary of Bental Group so he has some knowledge of the complexity of payroll.

Mr. Mullen has wide experience in defining requirements and selecting software. He was the consultant on the project that selected the Interactive Graphics Mapping system for the forestry division of MacMillan Bloedel in 1976.

He has spoken over two dozen times to conferences and professional organizations including Canadian Information Processing Society, Data Processing Management Association, EDP Auditors Association and the Association for Systems Management. His last presentation at CIPS Perspective 88 conference at Canada Place in November 1988 was attended by 186 people.

Mr. Mullen is active in the local information processing industry. He was a founding member of the Vancouver PC Users Group and served as the program chairman for the first 18 months. He was program Co-chairman for the DPMA Update 83 conference in Vancouver. He was also the Consulting Editor for the Auerbach Database Management Series.

Brian Mullen teaches courses in Project Planning, Systems Analysis, Database Design and Systems Design at the University of B.C., University of Calgary and the BC Systems Corporation. He has a M.Sc. from the University of B.C. in Theoretical Physics.

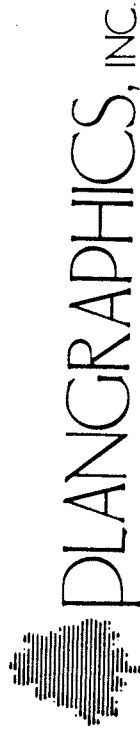
I.S.P. information systems planning corp. was founded in 1979. Its clients include BC Telephone, ICBC and Westcoast Transmission.

FROM: Proposal to The Corporation of the
District of Burnaby to perform an
evaluation of the HRMS

PRESENTED BY:

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ATTACHMENT C



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DISTRICT OF BURNABY
SPATIAL SYSTEMS STUDY
FINAL REPORT

Submitted to:

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Submitted by:

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February 6, 1989

EXECUTIVE SUMMARY

PlanGraphics has been retained to assess the District of Burnaby's automated mapping/geographic information system and to recommend actions that will expand the utilization of spatial data processing within the District. This final report discusses and makes recommendations regarding the following issues:

- Management and organizational structure
- Application opportunities
- Technology issues
- Database issues
- Education and training
- Finance and administration
- Implementation approach.

Fifteen years ago, when the District began implementing its spatial analysis system, the intent was to produce more efficiently the base maps that governmental functions require: base maps containing planimetric, topographic, and parcel information.

While this extensive database was being developed, the technology matured. With each enhancement to hardware and software came additional capabilities. With these capabilities came increased expectations on the part of users and would-be users. Burnaby has accomplished much and is now poised to build upon its prior investments and existing resources to meet those growing needs and expectations.

The following discussions summarize PlanGraphics' findings and recommendations.

MANAGEMENT AND ORGANIZATIONAL STRUCTURE

Currently, the District uses its Spatial Analysis System (SAS) as a sophisticated drafting tool, a limited use that does not realize its full potential. To take full advantage of the system, the District needs a carefully planned management structure. In Section 2, PlanGraphics compares centralized versus distributed structures and concludes that, first of all, a Spatial Analysis Support Organization (SASO) should be established. Second, individual departments that contribute to, use, and share spatial data should develop substantial departmental competence in specific aspects of the spatial analysis system.

Three options are considered for the organization of the SASO:

1. An expanded role for an existing operating department, such as Mapping and Drafting within the Engineering Department, or a subunit of the Planning Department.
2. The role of the Information Systems Department could be expanded to include the SAS.
3. PlanGraphics recommends the third option, which is the expansion of the Administrative and Community Services Department to include the SASO.

More specifically, the new division should be given sufficient resources to provide for: the operational integrity of a network of processors and the system's software resources; establishing and enforcing operational procedures and database standards; serving as a database administrator that provides consulting and application development assistance to departments without internal resources; augmenting the technical capacities of departments with internal resources; and providing services and products, on a cost-reimbursable basis, to organizations and individuals outside the municipal government.

Regarding committee roles, PlanGraphics recommends that the Spatial Systems Subcommittee be retained and expanded to function as a users committee, offering technical advice to the Director of Spatial Analysis Systems.

For operational and strategic planning, PlanGraphics recommends that the District adopt a bi-level continuing planning process that prepares annual budgets and long-range plans (three and five years) for the SAS. In addition, the District should identify and assess application opportunities for the SAS, assign priorities to each application, and distinguish between those that can be supported with existing resources and those that will require additional investments.

APPLICATION OPPORTUNITIES

Applications should drive the District of Bumaby's activities and investments in the SAS. The District should analyze thoroughly all potential applications for its departments. PlanGraphics has prepared a descriptive list of potential applications, which is in Appendix A.

PlanGraphics' formal recommendations regarding applications are: first, to prepare an applications implementation plan based on the analysis called for above; and second, to prepare annual applications needs updates, based on strategic plans submitted by each department

TECHNOLOGY ISSUES

The District's current SAS has not kept pace with advancing technology and cannot support all of its potential users. To expand the system's configuration, three technical issues must be addressed:

1. Software and application issues

Although Synercom Technology, Inc., the mapping software vendor, has provided valuable support and improvements, the software is limited. However, Synercom has provided means to tailor the system for specific applications, which would allow wide-spread corporate use of the spatial system. PlanGraphics recommends that corporate-wide application design be based on the results of the applications analysis, and should consider the programming support needs of all potential users.

Software deficiencies could be handled in one of three ways. The software could be replaced by another product, an expensive alternative. The software could be supplemented by new software for specific functions. The third alternative is to pressure Synercom to address the deficiencies of its product. This last alternative is recommended by PlanGraphics.

2. Hardware configuration issues

The spatial system currently is based on a VAX 11/750 central processor unit, which is inadequate to serve the needs of any but its existing customers. An expanded system configuration is needed that will provide adequate processing power, yet will keep hardware costs to a minimum.

There are two basic approaches to system expansion, which can be described as "centralized" and "distributed" processing. The centralized approach would require the District to replace the existing VAX 11/750 with a central processor large enough to handle all current and future users. The distributed configuration uses multiple processing units; new users can be added to the system easily because each has a processor built into his workstation.

PlanGraphics makes the following recommendations regarding hardware configuration:

- The District's needs and the issues of application and database development should be addressed before making an overall hardware configuration and expansion plan.
- The Spatial Analysis Support group should address hardware issues systematically, preparing an overall plan and a cost/benefit analysis.
- The distributed processing approach should be seriously considered.
- The hardware plan should include an electrostatic plotter for Mapping and Drafting.
- The Spatial Analysis Support group should survey and select small inexpensive screen copy units for use with workstations.

3. Corporate system integration issues

Many potential SAS applications will require access to data that currently reside on the corporate DEC system, such as addresses, tax assessment information, client service information, etc. To share this data requires integration between the two databases. PlanGraphics considered two alternatives. One is the periodic transfer of data between machines in large quantities during non-peak hours. The other alternative is to establish a real-time link that would allow the spatial system to work with corporate data as though it were local.

PlanGraphics recommends linking the spatial system to the corporate system via a local area network such as DECNET. In addition, PlanGraphics recommends integrating the spatial system database with the corporate database as much as possible. This would include links with PTS, LIPS, and other such applications.

DATABASE ISSUES

To date, database conversion has been hampered due to limited staffing and their need to do other kinds of work. Since many of the District's potential applications require additional data layers, alternative approaches to data conversion are needed.

PlanGraphics recommends the District develop detailed data conversion specifications for in-house conversion as well as contract conversion. Further, the District should retain a contractor to convert the data layers needed to support the applications defined as high priority in the applications analysis. The data layers will be maintained by District departments.

PlanGraphics also recommends that District departments convert and maintain their own data layers when they have a relatively small volume of data that serves departmental needs.

The District's current database has been created using a common geographic frame of reference -- the UTM coordinate values of the District's geodetic control network. PlanGraphics recommends that remaining graphic data layers be converted using the control network as a spatial reference.

In the 1970s, the standard datum for North American geographic horizontal coordinates was redefined and named NAD 83. Burnaby's database uses the older NAD 27 datum. PlanGraphics recommends that the District acquire or develop software to convert the mapping database to NAD 83.

EDUCATION AND TRAINING

An important issue is District personnel's lack of Spatial Analysis System understanding and expertise. District staff need additional training in the use of the Synercom system.

PlanGraphics recommends that the District obtain training from Synercom and use Synercom's courses as models for developing in-house training programs.

To make the training more effective, employees should be assigned real tasks to which they can apply their new skills.

FINANCE AND ADMINISTRATION

There are three considerations involved in financing the SAS; each depends on the level of the District's commitment to maximize existing investments and build additional capabilities to meet application needs. The three considerations are:

1. Budget requirements for personnel, hardware, software, databases, education, and technical assistance.
2. Potential revenue from the sale of services and products outside the District.
3. Financing the investments.

Table 7-1 in Section 7 summarizes anticipated costs associated with the SAS. Table 7-2 presents hypothetical allocations of budget to operating costs enterprise funds, and computer system reserves. Table 7-3 projects these allocations through two calendar years and three fiscal years.

PlanGraphics recommends that the District budget sufficient funds to implement the recommendations of this report and that the budget be made available over the next two calendar years and three fiscal years.

PlanGraphics also recommends that the District develop a plan and the ability to market the products and services of the SAS to recover a portion of its operating costs. Marketing can begin as soon as the base maps are updated. An aggressive program should be in place during the second year.

IMPLEMENTATION APPROACH

The recommendations outlined in this executive summary, and described in detail in the final report, suggest the range of activities needed to achieve a satisfactory spatial system. Figure 8-1 illustrates these activities and shows their interdependence. The figure does not indicate the time required to conduct each activity, nor does it describe the requirements of each activity in detail. It does indicate the sequence that should be followed to avoid unnecessary delays in system development.