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FACILITY UTILIZATION STUDY
UNIVERSITY OF MINNESOTA, DULUTH

FINAL DRAFT REPORT
(Complete)

Lester Gorsline Associates
Arthur D. Little, Inc.

March 12, 1974

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TABLE OF CONTENTS

FOREWORD

LGA/ADL
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The origin of this study was an appropriation made by the Minnesota State Legislature on May 19, 1973, "for a study of the existing buildings on the UMD campus for the purpose of facilitating the fullest practical utilization of space for present programs, and inclusion of additional space for the basic sciences medical program by means of construction of additions to existing structures to accomplish this purpose."

During the summer of 1973, the Planning Office of the University of Minnesota invited proposals from consultants to carry out this study. The fact that the study was being conducted provided an opportunity to include recommendations for the future housing not only of the Medical School but also of the "Social Sciences Complex" -- including the Department of Psychology and the School of Social Development as well as the Division of Social Sciences itself. The consideration of new facilities of the Social Sciences had been going on for some years at UMD and had already resulted in a building request for such housing.

As a consequence of the selection process, which called for written proposals and personal presentations by a number of consultant firms, a contract was signed with Lester Gorsline Associates (LGA) of Terra Linda, California, in association with Arthur D. Little, Inc. (ADL) of Cambridge, Massachusetts. LGA brought to the project a decade's experience in planning for medical schools and other schools of the health professions. ADL (which is the parent firm of LGA) had a record of successful achievement in conducting space utilization studies of general campuses. The consultants were authorized to begin work in the last week of September.

By the terms of their contract, the consultants agreed to undertake the following tasks:

1. Analyze facility implications of present and definitely planned future activities;

2. Conduct a statistical analysis of present space utilization;

3. Determine the suitability for changed uses of applicable existing buildings;

4. Develop findings and recommendations regarding the improvement of space utilization, the most effective housing for the basic medical sciences and the Social Sciences, and the continuing management of campus space.

The present report has been prepared in response to these undertakings.

During the course of this work, the consultants have worked closely with members of the UMD administration, with faculty members assigned part-time to the project, and with an advisory committee constituted to oversee the general progress of the study.

The consultants are particularly appreciative of the contributions of Clifford D. Alexander of the Department of Industrial Education and those of Arthur W. Häfner of the School of Medicine. Mr. Alexander acted as principal coordinator and was particularly effective in correcting and bringing up to date a master inventory of the facilities on the Duluth campus. Dr. Häfner served as principal contact with the School of Medicine.

The members of the advisory committee were:

Milton A. Trapold, Chairman
Clifford D. Alexander
Philip H. Coffman
Wayne W. Daley
Arthur W. Häfner
Edwin W. Haller
Robert L. Heller
Greg Kittelsen
J. Clark Laundergan

Members of the consultant project team who participated in this Facility Utilization Study are listed below.

Larry R. Aull
Paul F. Crowley
Rene M. Dallaire
Charles C. Halbower
Eleanor D. Henry
Kenneth Lamott
Peter Macgowan
Bonnie J. Martz
Jana B. Matthews
Gryffyd Partridge

CHAPTER 1 - SUMMARY OF FINDINGS AND RECOMMENDATIONS

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In this chapter we will briefly summarize the principal findings and recommendations developed during the course of this study. These will be made in four categories: (1) the utilization of facilities for the campus as a whole; (2) housing for the Medical School; (3) housing for the Social Sciences (including the Department of Psychology and the School of Social Development); and (4) the continuing program of space management for the campus as a whole.

A facility utilization study provides an opportunity to examine the relationship between the existing facilities of a campus and its needs and activities. The question most often asked of a facility utilization study is "What is the present utilization rate?" However, the important question is, in fact, "What is the capacity of the existing facilities to accommodate this institution's present and future needs?" Ideally, the intent of such a study is to develop information that will assist the University to meet its educational goals with the most effective use of its resources.

In the course of this project, the consultants have had opportunity to examine fully the facilities of the UMD campus, observing their use, discussing user experience and problems with those who occupy the spaces, and reviewing campus goals, policies and management with the administration of the campus. A detailed statistical survey was conducted to provide a hard basis for subsequent interpretation through the process of observation and interview. In the process of this analysis, the UMD facility inventory was updated and extended and extensive records were developed of the full range of uses of instructional rooms on the campus. These data files were computerized and manipulated for maximum flexibility in analysis and can be maintained by the University for continuing management guidance.

Among the principal problems we have perceived during the study are: (1) a sometimes inequitable distribution of facilities among the various departments and programs; (2) the occasional unavailability of appropriate classrooms when needed; (3) the inadequacy of specialized facilities for some activities; (4) the impact on room utilization of limited faculty budgets; (5) the constraint to campus planning and space management of conducting those operations from the central office in Minneapolis.

Campus-wide Facility Utilization:

The UMD campus was found to be an active and well used facility of the University of Minnesota. Demand pressures are clearly greatest on instructional rooms, both general purpose and specialized, with basic institutional

support and student service activities being adequately housed. However, the problem of spaces for teaching and teaching-support appear to reflect the change in program character and contemporary teaching methodology more than simple enrollment increase. Capacity for some general increase in enrollment remains at the campus, although particular individual deficiencies exist; but serious needs were found for new forms of facilities. This latter must be expected at any institution attempting to maintain itself current with the changes of our times.

Classroom use on the upper campus receives particularly heavy use among UMD instructional facilities, averaging 24.87 room hours (hours per week during which the room is in use for teaching purposes) with 53% of the stations (student seats) occupied when the room was in use. Other uses brought this to 29.73 room hours per week. Classrooms of 30 to 80 stations, the workhorses of higher education, were used for teaching an average of 28 room hours per week with 53% occupancy if one excludes five rooms located on the periphery of the upper campus and having low reported utilization during the fall quarter. This would be regarded as good utilization in most institutions. However, it may be possible to increase it further. The classrooms are used most heavily from 9:30 to 2:30 each day, which is typical of most institutions. Scheduling drops off rapidly after 2:30, reaching a point where only 7% of the classrooms were reported in use for 3:30 courses. Monday and Wednesday were the heaviest days by a significant margin. Use on Tuesday, Thursday, and Friday is reported to be constrained particularly by the current 4-unit scheduling policy. If more flexible scheduling were permitted, it could be possible to increase classroom usage by 10% through simply increasing Tuesday-Thursday-Friday use during the present 9:30 to 2:30 peak period. Further increases after 2:30 may also be possible; but student employment, non-teaching activities, winter weather, and transit access to a commuter campus are all constraints that will have to be worked through. Night use is significant but not large at present. It may increase if the University expands its enrollment of adults and minors with employment obligations.

The stations in rooms are used at a much lower rate than the rooms themselves, with the average at about 50% when the room is in use. This utilization rate varies from room to room, but it is surprisingly constant for aggregated room sizes. Careful scheduling by class size could help this but would result in more classes being held at an awkward distance

from support facilities. Potentially much more effective is taking some of the rooms in various sizes and rearranging chair layouts to support group-discussion type classes in some, and substituting tables and chairs suitable for "paper lab" work in others. Both require increased station areas and both are needed new forms of facilities.

It is important to realize that the traditional general purpose classrooms that used to meet all the requirements of many fields is no longer the only form of classroom nor the only class facility needed. Fields in addition to the hard sciences have moved into the quantitative, technological era. New methods of instruction have also been found effective in giving students the knowledge and skills they will need. One important aspect of this change is the increased use of audiovisual media. At UMD this trend has resulted in the proliferation of materials and equipment in the possession of departments and individual faculty. Still other departments are planning to acquire such resources. Such fragmentation of learning resources is both expensive and inefficient and should be avoided, but the expanding needs of the campus for learning resources must be met. Integration and consolidation of these resources should include the library.

Class laboratory and studio utilization on the campus varies significantly from room to room but averages approximately 14 room hours per week with 83% station occupancy for teaching uses and 25 hours with 57% occupancy for all uses. This is good usage, as one must allow for additional activities such as set-up time and the necessity for students to use the lab for additional study instead of home or library. Use of most labs can be increased significantly, particularly with the scheduling changes discussed above, if enrollment within each course area served is increased. However, campus laboratory need and utilization cannot be looked at in the same way as the classroom. Laboratories by definition are specialized facilities whose use is limited to a restricted group of people. Laboratory requirements must be looked at by assessed demand of the specific group for the specific lab. Most labs are never used to capacity, but they are essential to support particular programs. Most decisions on whether or not to provide a specific laboratory are therefore basically questions of cost benefit regarding the particular program or programs concerned.

The number of majors enrolled as the old rule of thumb for department facility (and budget) needs is not particularly valid for laboratories or for

most other rooms. The service load of many departments, instruction given to students enrolled in majors of other departments, is frequently greater than the load of their own majors. Facility utilization and need evaluation based on utilization must be considered in the light of quantified teaching hour responsibilities. For campus-wide planning and analysis, this is one reason why many institutions are using techniques such as the Induced Course Load Matrix which reveals the quantified impact of each program on all departments of a campus.

Academic departmental facilities on the campus have several deficiencies, primarily in support needs. Faculty and department offices are generally adequate, but 21% are smaller than desirable or are shared, impairing function. The number of offices will be roughly equal to the number needed when construction is completed on the Classroom-Laboratory Building and the spaces are occupied. Correction of size and sharing deficiencies may require additional construction. Many departments also have conference, seminar, or lounge rooms used for a variety of functions, their reported utilization varying by department. No rooms exist that fill the basic function of faculty-student workroom, where individuals or groups can set up projects that may take hours or weeks, with files, large masses of paper, and equipment that includes computer terminals. In today's quantified and technological context, mentioned before, these spaces are the equivalent in many fields of the "research laboratory" in the hard sciences--and even the hard sciences need such workrooms.

Facilities for administration, student services, plant, and central services were also reviewed and were found basically adequate for needs in terms of space. (This study did not include other than space needs for these entities.) All appear to have significant capacity to accommodate growth of the institution without further construction, although minor deficiencies exist and others may occur if growth is experienced.

The lower campus and the Alworth facilities were examined both in conjunction with the upper campus and as separate entities. The Medical School, in the lower campus Laboratory School Building, is discussed at length elsewhere. An engineering-architectural survey of the buildings on the lower campus was conducted by professionals with offices in Duluth. The age, condition, and code problems of Old Main, and the two dormitories, and their distance from the main body of UMD on the upper campus seriously

limit their utilization and potential. By code, fire-exiting problems alone would limit educational occupancy to the basement and first story. The theater in Old Main has serious hazards and should not be used. The Alworth Building is an old residence located at a distance from both campuses. The layout and the remoteness make it inappropriate for its present use and the expanding needs of its present occupant, the School of Social Development.

The text of the report gives a detailed presentation of our findings, conclusions and recommendations, discussions of facility utilization concepts, and our methods. Data developed in the course of the study, including the revised UMD Facility Inventory and the list of uses, is provided with full tables of data manipulations and statistical analysis in a separate technical appendix which will be provided to the University. The computer system developed for the study will also be given the University for their continued use for Duluth and for use on the other campuses of the University.

In summary, UMD campus-wide facilities utilization is good and the buildings meet basic requirements of the campus, although some specific facility deficiencies exist. Our recommendations for possible improvement of utilization and functional adequacy are as follows:

1. Review the present policy on the 4-credit schedule module to allow a more flexible system if possible, and direct additional attention to scheduling classes on Tuesday, Thursday and Friday and after 2:30 in the afternoon.

2. Conduct a survey of students and student employers to determine the extent to which such jobs should be considered as a constraint to afternoon class scheduling.

3. Encourage enrollment in night and Saturday courses by allowing any student to choose day or night classes freely without administrative constraint or classification as a special student and by making this practice known to existing and potential students.

4. Select appropriate general-purpose classrooms of various sizes that presently have approximately 50% or lower average station occupancy and convert them to special purpose classrooms through modification of furnishings. Reduce station count to allow flexible chair groupings,

and substitute tables for tablet-arm chairs in some rooms. Provide limited calculating equipment (secured in locked cabinets or closets where faculty can maintain key access) and other similar items upon justified request as class activity support.

5. Provide additional specialized instructional rooms to meet changing campus-wide educational needs. Limited remodelling of existing classrooms can provide some space for these specialized needs, provided that scheduling arrangements are found to improve utilization of other rooms sufficiently to allow for this diversion of space. Some new construction may be required, but spaces requested for the Social Sciences will probably meet many campus needs. (See the recommendations for Social Sciences and discussions in the text.)

6. Replace faculty offices that are too small or shared and provide workrooms for faculty and/or students for project use. New construction will be required.

7. Coordinate and centralize most learning resource materials and equipment of the campus. Such a Learning Resource Center should be an integral part of the teaching/study activities of the campus, and it should be expected to expand as its role on the campus evolves. It and the production facility should be staffed with people who will encourage and guide the faculty in new techniques. It should be closely coordinated with book materials and facilities. Furthermore, facility plans should not be made piecemeal but carefully planned to serve current needs and provide a flexible response to future developments. A comprehensive reassessment of library and media functions and of facilities alternatives should be made to result in a comprehensive facility action plan.

8. Use of Old Main and the two dormitories on the lower campus and of the Alworth Buildings should be restricted to overflow and "surge" space. Because of condition, layout, and distance from the main campus, they are not suitable for primary campus activities.

9. The provision of new facilities on campus in response to the needs of any particular user should be handled within the context of the campus master plan and should expand the capabilities and comprehensive

design intent of the campus as a whole. Such facilities should not be treated piecemeal to meet the immediate needs of one specific user. They should be designed flexibly with the expectation of continuing changes of occupant and of occupant needs. Space built to meet a particular category of expanding need should be assigned to the most logical users consistent with the master plan, and the organizational unit that occasioned the expansion should be assigned to the most appropriate spaces. Special rooms of use to more than one user should be designed and located where they are accessible to all. "Individual" buildings, particularly when not integrated into the enclosed circulation system, should be avoided as an impediment to flexible space assignment. The campus physical master plan should be one dimension of a campus functional master plan maintained as part of space management and UMD comprehensive planning.

Housing the Social Sciences:

Our findings and recommendations with regard to housing the Social Sciences are as follows:

1. The needs of the Social Sciences for specialized instructional and research space should be met through a combination of renovation and new construction. The magnitude of the project in terms either of area or of dollars cannot be estimated at the present time.

2. Before any further time, effort, and money are devoted to developing new facilities for the Social Sciences, a comprehensive programming effort based on quantified functional analyses should be undertaken. This is necessary to define the needs that must be met and to lead to the development of a master plan for the satisfaction of these needs through renovation of existing facilities and/or new construction. Architectural work should be undertaken only after such a program has been completed.

3. Measures should be taken immediately to relieve the deficiencies which seriously endanger the viability of instructional programs in the Department of Business Administration. This involves primarily the provision of appropriate class laboratories for the preparation of instructors in Business Education.

4. Other departments whose current operations and future development are particularly constrained by their present quarters are Sociology-Anthropology, Geography, Psychology, and Economics. Pending the availability of newly constructed facilities, efforts should be made to alleviate the most severe constraints by the reassignment and/or renovation of existing space.

5. The permanent home of the School of Social Development should be on the upper campus, allowing the School to develop the closest possible integration, both in programs and in facilities, with the Social Sciences departments.

6. We urge that the UMD administration, giving due regard to the requirements of the other departments needing more space or renovations of existing space, make every effort to provide adequate quarters on the upper campus for the entire School of Social Development as soon as this can reasonably be accomplished.

Housing the Medical School:

Our findings and recommendations with regard to housing the Medical School are as follows:

1. The Medical School's present facilities in the remodelled Laboratory School Building, with some additional space in Old Main, are exceedingly well utilized in serving the present needs of two classes of 24 students each. However, even for present activity levels, the School's facilities are severely strained in terms of both quality and quantity.

2. Conditions will become considerably more stringent in the fall of 1974 when the School will accept a freshman class of 36, raising its enrollment to 60 medical students. A temporary solution might be found by moving some non-laboratory functions into Old Main, freeing space in the Laboratory School Building for conversion to research and teaching laboratories. We believe, however, that this solution should be viewed as a strictly temporary alleviation of the immediate problem.

3. We have been advised that permanent facilities for the Medical School should be planned to accommodate an entering class of 48 students. In view of the considerations stated above, neither a student body of this size nor the faculty to teach them can be housed on the lower campus.

4. In the course of our campus-wide utilization study, we have particularly investigated the facilities used by the science departments on the upper campus. As a result of this analysis, we have concluded that sufficient space appropriately located, adaptable, and available does not presently exist on the upper campus to serve the needs of the School of Medicine. The science departments are currently occupying space intended to meet their needs for growth. This space should not be diverted to other uses.

5. New construction on the upper campus will be required and should be planned as quickly as possible. We urge that consideration be given to connecting the Medical School to the sciences "complex" in order to strengthen and enhance the close relationships that already exist between the Medical School, Chemistry, and Biology.

6. Whenever possible, the Medical School and the science departments should share space that can be appropriately used by both. Such space might include classrooms and auditoria and, to a lesser extent, teaching laboratories. It must be kept in mind, however, that the unique needs of the Medical School necessitate highly specialized space that must remain under the direct control of the School, even though it may be available for use by others.

7. We estimate the Medical School will require something approaching 70,000 assignable square feet of new construction in order to accommodate the two-year program with an entering class of 48 students and the faculty required to maintain the quality established for the basic sciences medical program.

A Space Management Program:

Wise and effective physical planning must be based on sound institutional and academic planning. The achievement of true efficiency and the adaptability required to respond to changing needs depends upon the definition of functional facility goals that support both the short-term needs of individual programs and the long-term needs of the campus as a whole.

We believe that this study will provide the first step in creating an on-going management system that will substantially increase UMD's capability to arrive at sound long-term decisions as well as more efficient day-to-day operations.

In order to make such a system an effective tool for planning, we recommend that UMD recruit to its administrative staff and assign to the Provost's office an individual with experience in institutional research. We believe this is the most pressing UMD staff need and should be filled prior to that of a strictly facility-oriented space management role. The need is not only to update continuously the data on which decisions are based, but also to analyze and interpret the impact of this data on all of the questions that are pertinent to arriving at the decisions that will, in the long run, advance the interests of the institution most effectively.

CHAPTER 2 - BACKGROUND

Formerly a state teachers college, the University of Minnesota, Duluth, was established as a coordinate campus of the University of Minnesota on July 1, 1947. Although UMD continues to serve an important role in training elementary and secondary school teachers, the programmatic emphasis in recent years has shifted markedly toward other directions. Of the students graduating in June, 1973, less than half had earned the B.S. degree, which at UMD has identified the programs intended to prepare teachers. More than half had earned either the B.A. degree in their field of interest or the degrees of B.A. in Accounting or B.A. in Business Administration.

Of the four divisions which currently form the organizational structure of the school, Social Sciences carries the greatest teaching load as measured by student credit hours taught (68,724 in 1972-73). The Division of Humanities ranked next (63,035 credit hours), followed by Education and Psychology (53,662 credit hours) and Science and Mathematics (48,390 credit hours).

Another significant development in the recent history of UMD has been the growth of graduate programs leading to the master's degree in art, biology, botany, chemistry, English, geology, history, physics, speech pathology, and zoology. Certain faculty have appointments authorizing them to supervise work at the doctoral level, and a Ph.D. in Chemistry was recently awarded through the all-University Graduate School to a student whose work was done at UMD.

Yet another factor that has contributed to UMD's growing maturity as an institution of higher education has been the establishment of two professional schools: a two-year School of Medicine and a graduate School of Social Development. Both accepted their first students in the fall of 1972. Another professional program, leading to the Associate of Arts degree in Dental Hygiene, accepted its first class in the same year.

In the Fall Quarter of 1947, immediately after its legislative establishment as a coordinate campus, UMD's enrollment was 1,432. Enrollment in the Fall Quarter of 1973 was 5,632. The increase in enrollment has not, however, been in a straight line but has varied somewhat from year to year. The largest increases were recorded in 1964 (17%) and 1965 (18.6%). Since 1954, there has been only one year in which UMD has recorded an

enrollment decline (3.6% in 1971), a decrease in part attributable to changed accounting procedures. In 1972, the increase was 2.3% and in 1973, 2.6%.

UMD is characterized as a "commuter campus" with a majority of the students coming from Duluth and the surrounding nine-county area. During the past ten years, however, the proportion of local students has dropped from 90% to 60%. During the same period, the representation of students from the Twin Cities area has increased from less than 6% to about 32%.

In spite of the increasing numbers of students from outside Duluth, UMD retains its commuter character. Only 27 percent of students live in University housing, while 41 percent live at home or with relatives. The remainder live in off-campus rental housing. For many of these students, the campus is somewhat remote, influencing their patterns of use of campus facilities.

UMD is administered by a provost who reports directly to the president of the University of Minnesota. The provost is assisted by an associate provost and three vice provosts who are responsible for academic administration, student affairs, and business affairs. The Medical School, the School of Social Development, and the Dental Hygiene Program report directly to the provost. The instructional departments, organized in the four divisions that have been described, are under the aegis of the vice provost for academic administration. A UMD faculty member also carries an appointment as assistant dean of the University of Minnesota Graduate School. (See Figure 2-1, Present Administrative Organization.)

During the past year, there has been active discussion of a major revision of the administrative structure of UMD's academic programs. As proposed by the institution's Educational Goals and Facilities Committee, the new organization would replace the present divisional organization with a College of Letters and Science, a College of Education, a School of Business and Economics, and a School of Fine Arts. (See Figure 2-2, Proposed Administrative Organization.) No final decision has yet been reached in this matter.

UMD is a member of the Lake Superior Association of Colleges and Universities, whose membership also includes the College of St. Scholastica

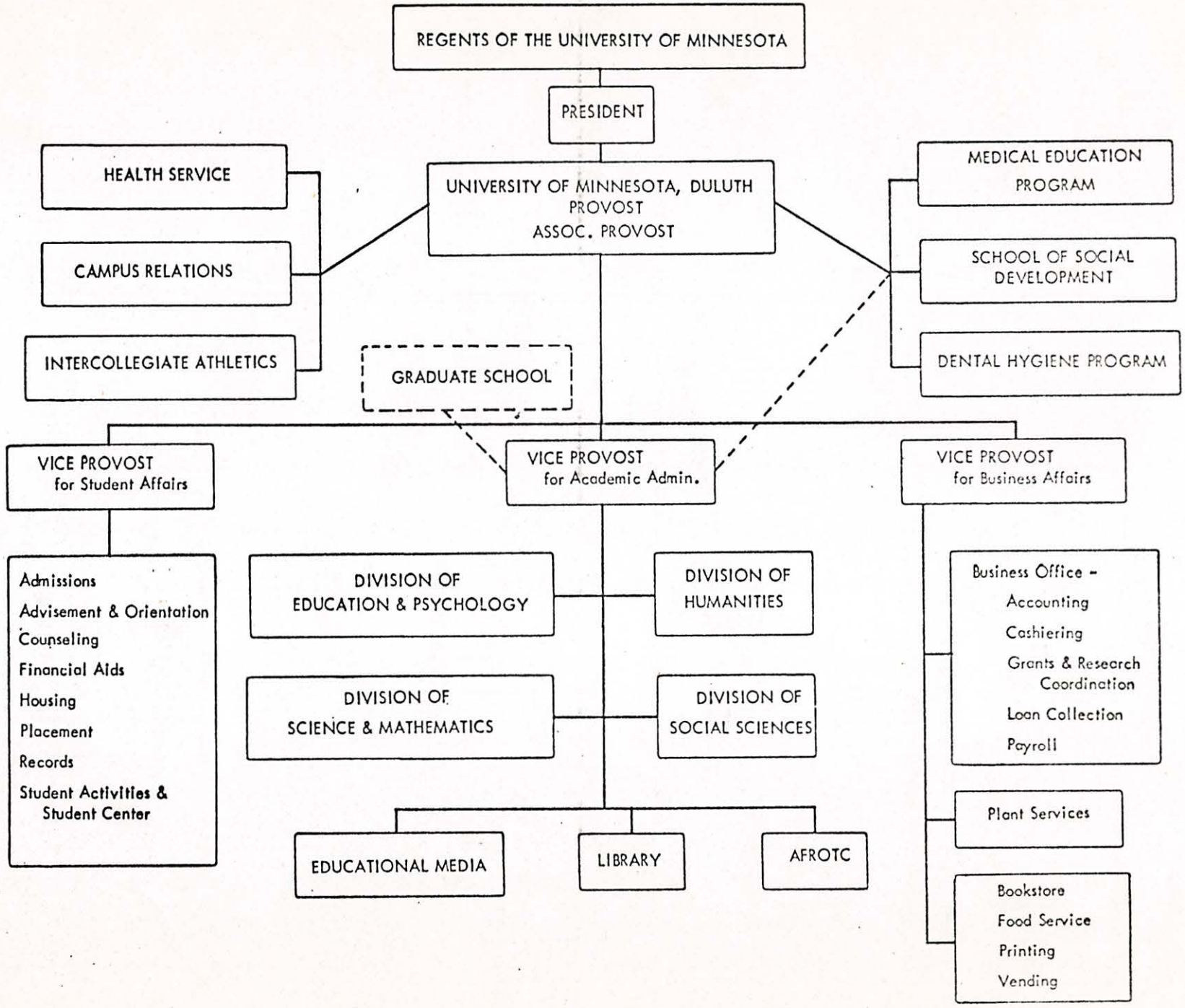

FIGURE 2 - 1. PRESENT UMD ADMINISTRATIVE ORGANIZATION

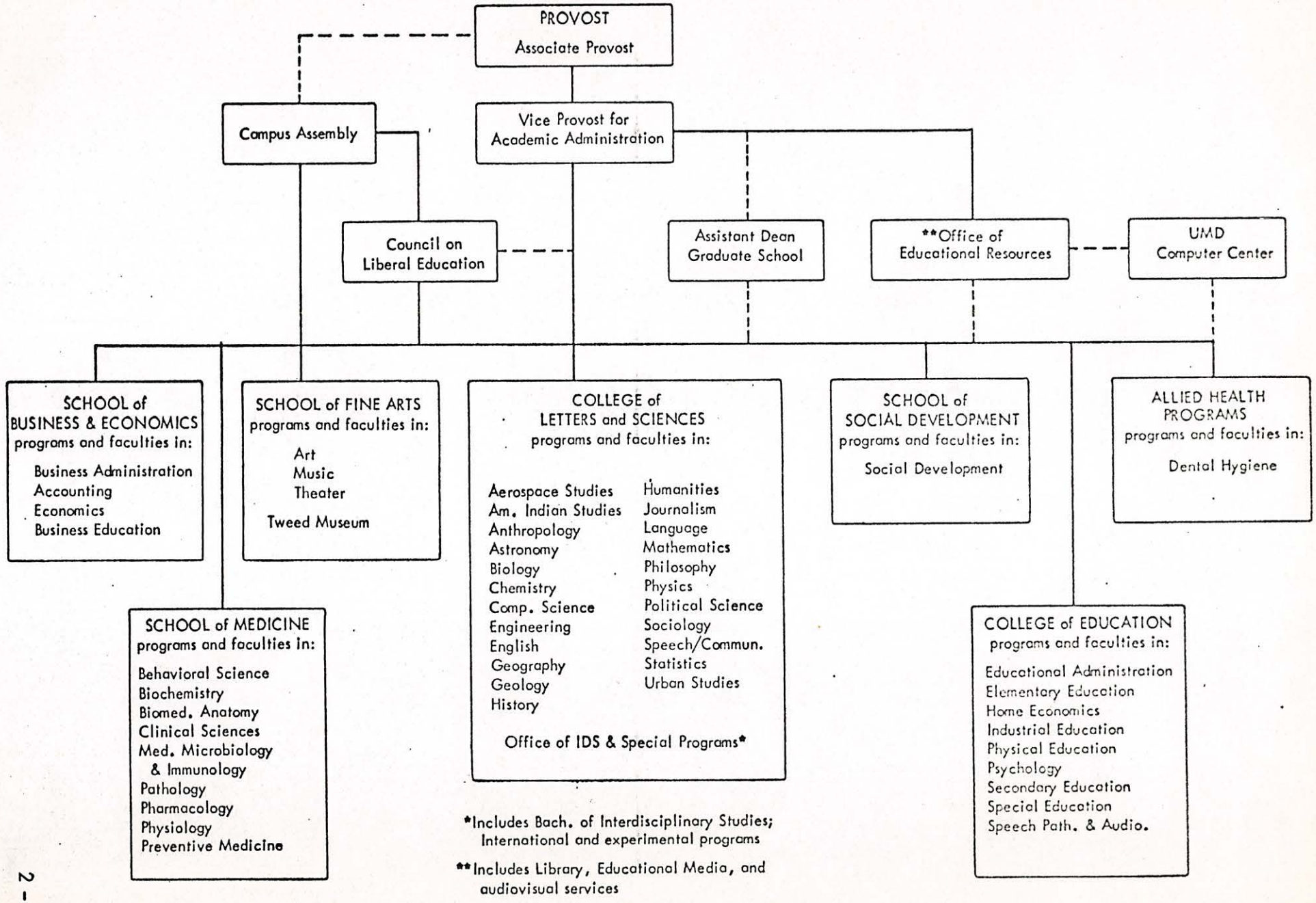

FIGURE 2 - 2. PROPOSED UMD ACADEMIC STRUCTURE

(Duluth), the University of Wisconsin-Superior, Northland College (Ashland, Wisconsin), Mt. Senario College (Ladysmith, Wisconsin), Lakehead University (Thunder Bay, Ontario), and Michigan Technological University (Houghton, Michigan). UMD's relations with St. Scholastica are particularly close, the two institutions having for the past six years operated a cooperative program permitting cross-registration without additional tuition.

UMD's physical facilities are located in the eastern section of Duluth. With the exception of the Medical School and School of Social Development, most instructional programs take place on the "upper" campus, a 227-acre tract which was donated by Duluth citizens and civic groups. The Medical School currently occupies the remodelled Laboratory School Building on the site of the old Duluth State Teachers College now known as the "lower" campus. The other principal building on the lower campus is Old Main -- a building that was constructed in the early 1900's and that is now used for a variety of purposes. (The lower campus is about a 15-minute walk from the upper campus.)

The School of Social Development is more remote, being located in a former residence donated to the University. Other academic facilities include the Limnological Research Center on the shore of Lake Superior.

Several new buildings have arisen on the upper campus during recent years, among them a four-story administration building, new dormitories and apartments, and a food service addition to the Kirby Student Center. Three instructional buildings were under construction during the period of this study. These were the Performing Arts Building, the Classroom-Laboratory Building, and a Physical Education facility. Although planned to serve broader functions, the Performing Arts Building is essentially a campus theatre, with associated work spaces and faculty offices. The Classroom-Laboratory Building currently accommodates the Dental Hygiene Program and the Computer Center. When internal finishing and equipping is completed, the Physics Department will move from its present quarters in the Science Building to the Classroom-Laboratory Building.

Physical planning has been going on in several directions: (1) a campus master plan, or long-range development plan, undertaken by Kenneth Stebbins, a consultant-planner, and the University Office of Physical Planning; (2) a preliminary space program for permanent basic medical sciences facilities, prepared by the firm of Lester Gorsline Associates (LGA);

(3) a building request, prepared by a faculty committee, for a Social Sciences Complex; (4) planning for a Health Sciences Library addition; and (5) the present study of space utilization.

CHAPTER 3 - INTRODUCTION TO THE FACILITY UTILIZATION STUDY

LGA/ADL
March, 1974

CHAPTER 3 - INTRODUCTION TO THE FACILITY UTILIZATION STUDY

The purpose of this chapter is to introduce the reader to the concepts of the study itself in order to give him the means to use this report more effectively. This will be done in the context of the study's relationship to space management, facility planning, and academic/institutional planning.

The question most often asked of a facility utilization study is: "What is the present utilization rate?". However, the important question is, in fact, "What is the capacity of the existing facilities to accommodate this institution's present and future needs?" Ideally, the intent of such a study is to develop information which will assist the University in meeting its educational goals with the most effective use of its resources.

This particular study originated in the need for decisions concerning the construction of additional facilities at the UMD campus. The findings and conclusions of the study will provide a basis for those decisions. The study and ongoing utilization monitoring will also provide the University and those who administer it with a great deal of additional information that can increase management capability for the UMD campus.

The study provides an improved understanding of the facility requirements of activities within the campus, and of the extent to which present facilities satisfy rather than simply house those needs. Problems which current facility users are experiencing can be identified. Policy and operational constraints to improved facility satisfaction and utilization can be revealed. Shifts in facility assignment can result that provide a better match of function with facility. Facility needs and problems can be revealed that lead to equipment changes, remodelling, or requests for new construction.

The information can assist the University administrators to ensure an equitable distribution of available facility resources, minimizing internal friction in the face of continuing competition for limited resources. Utilization data also provides administrators with a better understanding of the capital cost of programs and departments, improving the cost-benefit basis of academic planning and decision making.

A facility utilization study reveals information concerning the uses to which the facilities are put, uses that may not yet have been realized and that have impact on academic or institutional planning and budgeting. Such information may indicate or underscore the significance of shifts in class size or in

teaching methods, shifts in course enrollment that have significant department or program cost implications, and faculty budget problems.

However, a facility study is not a substitute for either a campus master plan or a building design program. Those require major input of additional data and decisions beyond the scope of a study such as this. A facility utilization study provides information at a level that may range from very general to the middle level of detail. Further study and decision-making at all levels is necessary through comprehensive campus planning to explore institutional and departmental goals and objectives and to quantify future needs, and to explore alternatives in how these can best be met by existing and additional campus facilities. Additional work of that nature was required for this study in a specifically defined area: to develop conclusions and recommendations regarding the housing of the Medical School and the Social Sciences. However, this report does not pretend either to restructure the campus master plan or to provide an architectural design program for construction of new facilities.

Comprehensive Management and Planning:

Management of an institution is basically a cycle of the formulation of goals and objectives, development of programs of actions necessary to carry out those actions, implementation of the actions, and evaluation of the results. Executive management has primary responsibility for this process with the participation of appropriate elements of the institution. The cycle depends on decisions -- decisions made on the basis of good information that both identifies alternatives and details their benefits, conditions, and costs.

Planning is basic management with an eye to the future. It is a continuous process, requiring constant revision of existing ideas and "plans" as conditions change and new information becomes available. Ideally, planning is action now that improves the institution's capability for action in the future, rather than commitment now of the future. Its need is all the more critical when the problems and uncertainties of the future multiply, the current case for most campuses in Minnesota. The capabilities for a flexible response to unknown future conditions is based on proper preparation now.

Planning is, of course, an activity that should occur at all levels. What is usually referred to as "institutional" planning is concerned with formulation of broad functional policy decisions and directions and the definition of these in quantitative objectives that provide the necessary fromework for component

planning and action. Program planning is the development of specific sets of courses of action by which the desired ends can be achieved, be they student preparation, research, public service, management, plant operation, or services support. These programs delineate the operational structure of the institution and determine the nature and amount of resources (faculty, staff, budget, equipment, buildings) required to implement the courses of action. Academic planning is concerned specifically with student instruction and study, identifying fields for which the institution should prepare students, defining the needs of student and community/employer in those fields, and selecting the instructional "content" and methods most appropriate to achieve the desired educational product within the context of student characteristics, time, and resources available. The resources required result in budget planning and facilities planning. All are necessarily interdependent; purposes determine actions, actions determine resource requirements, resource availability and context constrain actions and thus objectives.

In this context, there is awareness of the need for both efficient and effective use of resources to achieve the desired ends and educational products. Efficiency has been defined as doing things right, effectiveness as doing the right thing. The development of information necessary to monitor the process and make possible good decisions is critical to good planning and management.

An institution's planning is commonly reported in several documents rather than grouped comprehensively in one. The long-range academic program is one document and reflects the academic functions and activities of the campus. The non-academic activity plans are seldom reported. The long-range budget and its justification section reports expectations for operating resource and capital requirements, and it is usually the only document updated frequently. The campus master plan is often thought of as a comprehensive document (and it should, ideally, be one) but rarely covers more than the campus physical development. It is imperative that physical development be a product of the functional needs of the campus and that the campus physical master plan explore thoroughly the functional requirements and their expression in buildings.

Space management is increasingly recognized as important at most campuses as budget pressures mount and as a better understanding of the management

requirements and processes of higher education grows. Many of the functions are in fact not new but simply receive increased emphasis and coordination. The actual operations vary from institution to institution but one frequently finds today a person or office explicitly titled "space management." This person or office is usually responsible for assignment of facilities to activities, keeping the utilization of those facilities as efficient as possible while meeting the user's needs as effectively as possible, and initiating actions for remodelling or new construction as required for that end.

Space management, campus facility planning, academic planning, and institutional planning are all interdependent fuctions focused on guiding the operation and direction of the institution. The space manager and the institutional planner both need information concerning current facility experience, and a facility utilization study is an effort to provide that information.

The input of facility information into the comprehensive planning and management of UMD is very important, both at the level of individual programs and for the institution as a whole. It is necessary to interpret and use available information and to originate questions that point to and explore critical areas of the institution's operation. The position of the institutional researcher is of great importance, as a catalyst for developing the questions and analyzing information that provides the basis of primary management decisions. These decisions ultimately have the greatest impact on the effectiveness and efficiency of all aspects of the campus operation and its use of operational and capital resources. The most pressing need we have perceived at UMD is to recruit to the Office of the Provost a full-time individual trained and experienced in institutional research.

Fullest Practical Utilization of Space:

The level of space utilization achievable at an institution is dependent upon a complex range of interdependent dynamic factors, which do not lead to simple analysis or explanations. A number of these factors are basic policy decisions concerning the goals and operation of the campus; others reflect the context and conditions.

The most basic determinants of facility utilization are the nature of activities to be housed and the facilities available to house them.

A wide variety of facilities are found at most campuses, including UMD. Even basic categories such as classrooms are not homogenous, reflecting their design and construction building by building over a period of years under conditions, needs, and users that varied with the building. They were frequently designed to specific needs at a point in time of the department or people who were to be the initial occupants.

The activities to be housed also vary greatly, with the greatest differences tending to be at the large multiversity and the least at smaller liberal arts colleges. The nature of academic programs taught at the institution and the way in which they are taught are important factors. Even within a program, different areas of specialization exist, expressed in the courses and experiences which are given the student. The specialized science and technology programs weigh heavily, graduate instruction is significant, and the quantity and charater of research varies widely. Medical school activities and facilities vary so greatly from institution to institution that they are normally excluded from all attempts at statistical comparison.

The controversies and confrontations in education of recent history have served to publicize the extent to which education should and does change with the rapidly changing world for which it prepares our young. Course content changes as new developments in the program field occur. Programs grow or diminish as their popularity or employment opportunities fluctuate. Methods change as new technology becomes available, new concepts are advanced, and as the character of the enrolled student changes.

Some activities and the spaces needed to house them appear to remain fairly constant, however, The traditional classroom has served for many years as the basis for most instruction at most institutions, and it remains the dominant university teaching facility. At the UMD upper campus, 73% of all reported regualr scheduled instruction (in weekly student hours, Fall Quarter 1973) was in classrooms. But appearances are deceiving. Even simple matters such as the distribution of class sizes can make some classrooms difficult to use and can increase the demand for others to the extent that they are often scheduled out of availability. The traditional classroom is designed and furnished to support the traditional presentation of professor lecturing to students. However, today's students and teaching methods are increasingly oriented to group discussion and use materials and technology in ways not

foreseen in conventional classroom design. Through such conditions, the need for and utilization rate of particular specimens of even the ubiquitous classroom can fluctuate.

The situation with instructional laboratories is obviously much more complex and the obsolescence rate for equipment and rooms much higher. This is important because, although classrooms represented 73% of UMD upper campus instruction, instructional lab and studio space totalled 86,006 assignable square feet (ASF) as compared to only 55,779 ASF in classroom space on the upper campus.

A number of other factors determine facility utilization in addition to the character of the existing facilities, the institution's programs, and its educational methods. These include the geographical location of the institution, its accessibility, and its relationship to and involvement with the local community. Policies determine programs and methods, but they also create scheduling procedures and other operational patterns. The availability and utilization of resources for one function can also be a constraint on other functions: lack of office space or budget for additional faculty can prevent increases in the number of class sections and thus the increase in hours of classroom use, while forcing increase in class section sizes. And enrollment size, both overall and in particular programs or courses, is critical for many specialized facilities.

Facility utilization is highly dependent upon the extent to which a particular facility is "specialized," limiting the number or range of persons it can serve out of the total instructional population. To support particular educational activities properly, classrooms are constructed of specific sizes and laboratories with specific equipment that limit their usability to only a percentage of the total instructional activities of the campus. A particular specialized laboratory may be necessary for adequate instruction and accreditation of a particular program, but if the only instructional activities that can use that lab are of that program, room utilization is dependent upon the enrollment in that program.

Such "specialization" or limitation of population served can occur in several ways. A classroom of the most needed size can have low utilization if located in a remote area few students can get to, or if assigned exclusively to one small group.

The number of hours per week a particular room or all rooms are available for use is another important factor determining utilization. Budgetary limitations, institutional policy, custom, or local conditions can constrain the basic instructional scheduling period.

Utilization criteria and facility standards are often discussed and comparisons made between institutions. However, as outlined above, the utilization that an institution can achieve is the product of interacting dynamic factors based upon facilities, academic programs, methods, and policies unique to the institution. Because the programs, policies, and conditions are constantly being modified, the utilization achievable at an institution similarly varies. These differences between institutions and the unique dynamics of the programs and activities within institutions make national or statewide utilization standards difficult to define and comparisons of statistics between institutions misleading.

The sensitivity of utilization to program variations can be further clarified by examining one hypothetical program under varying conditions. This program requires several large specialized laboratories for undergraduate work. Lower division laboratories are used by degree majors and for service instruction to majors in other programs of the campus. Their utilization is heavily dependent upon total campus enrollment, or more specifically on enrollment in several other degree programs which require or encourage some knowledge of our hypothetical field. Because of the larger numbers associated with enrollment in several programs or the total campus, those lower division labs will tend to be well utilized. Laboratories needed for upper division instruction are dependent upon majors only, and thus utilization is very volatile. If the department has many majors, it may have a high utilization rate for its upper division labs. However, it may also have several degree "options" or specialties which require their own highly specialized laboratories and serve a very small number of students, resulting in the lowest lab utilization rate of the three scenarios. It is important to note that a low utilization rate for those specialized laboratories is not something "wrong" and subject to either defensive or punitive actions. Rather it is part of the resource cost of the particular programs and should be so considered when decisions are made concerning the programs. The intent of a utilization study is to determine if those facilities have the capability to support additional load in the programs, or if problems exist. Add to these scenarios such variations as special areas of faculty expertise, past budgeting success in the continuing fight against equipment and program obsolescence, fluctuations in student interest, and faculty popularity -- and an administrator directed to oversee and plan for particular areas has the ingredients of a headache.

A great deal of effort has gone into the search for real methods and measures for evaluating the resource needs and sufficiencies of colleges in the past few years, spurred on by pressures for reduced budgets and increased productivity. The pressure on all resource elements, coupled with the growing realization of the interdependencies which can cause particular operating costs to increase if particular capital costs are cut, has encouraged a much more comprehensive approach to evaluation than was common in the past.

The new non-traditional colleges have particularly stimulated this as they explore new methods and approaches in education. Some schools have invested in independent study media resources when they could not increase their faculty (substitution of capital for operating budget). Others have used functioning factories for vocational programs instead of building their own specialized laboratories (substituting operating for capital budget).

Emphasis is increasingly placed on the continual assessment of all resource requirements, including both capital and operation costs, to alternative program or policy decisions. The full "cost" per graduate in particular programs is being assessed using mechanisms such as the Induced Course Load Matrix, which calculates the instructional impact of one student in each degree major on each other department. Much effort is being directed to calculating unit costs and assigning them through various procedures to educational "products," primarily graduates. The goal is improved management decision-making with full knowledge of costs and benefits of alternatives. Information regarding facility utilization supports space management efforts to improve efficiency and and effectiveness of capital resources, but it also contributes to an understanding of the capital cost of programs.

Utilization Measurement:

Facility utilization is measured statistically in units of hours per week that rooms are in use (Room Utilization, in Weekly Room Hours), that student seats or study places are in use (Station Utilization, in Weekly Station Hours), and in the percentage of stations that are occupied when the room is in use (Station Occupancy Rate). Such statistics will found in our discussions of facility utilization in individual divisions and departments in Chapter Five. Caution should be exercized in interpreting these statistics, and particularly in making comparisons.

It is easy to react to a utilization statistic as a "large" or "small" number or percentage, but the specific context of that figure must be the basis for judgment. The mechanics of scheduling and other factors prevent achievement of 40 hours of use in a classroom available 40 hours a week. "Set-up" and "clean-up" operations in a laboratory and the need for student study there outside of regular class activities further reduce achievable utilization in many specialized facilities. We have presented our findings and conclusions for individual departments and the overall campus in the following chapters with recognition of this and have focused our discussion on the facility needs, capabilities, and problems.

Institution-wide data is often developed for scheduled class uses only and most comparisons between institutions are on that basis, but the total use made of rooms is becoming more important as the role of informal instruction and study expands. The rooms used for such unscheduled uses are also increasing in quantity and are a significant capital investment. The terms and mechanics of utilization calculation are discussed with the procedures used in this study in the following chapter, "Methods of the Study."

The study also discusses ways of improving utilization, both by increasing utilization and by improving functional satisfaction. The conditions and constraints that determine present levels of utilization and capacity were examined, and ways of adjusting the limiting factors explored. In some cases, this requires reappraisal of basic operating policy decisions, either explicit or implicit. An example is scheduling procudures that result in unused blocks of time. These policies were set originally to achieve other desired ends, so their change is not necessarily appropriate. Our recommendations thus frequently require further review by the organizations concerned and indirectly may affect other facets of the University's operation.

CHAPTER 4 - METHODS OF THE STUDY

CHAPTER 4 - METHODS OF THE STUDY

This facility utilization study is based on statistical utilization data for instructional facilities that are interpreted through qualitative information derived from interviews with the users and inspection of the facilities. Non-instructional facilities are evaluated primarily on the basis of interview and inspection.

The methods used in the study thus emphasize extensive interviews, inspection of facilities, the collection of statistical data concerning the facilities and their uses, and quantitative and qualitative analysis of the information so developed. The findings and conclusions are presented in detail by organizational unit and in general overview. The findings and recommendations for the Medical School and the Social Sciences are addressed individually.

The units, procedures, terms and code designations used in the study and given on the data files conform as much as possible with existing usage both at UMD and the University of Minnesota in Minneapolis.

The consultant team was officially directed to initiate work on the 21st of September, 1973 by a letter of selection and intent from the University. An Advisory Committee was formed by the University to guide and coordinate the study , and was composed of representatives of the UMD campus and the University offices of Physical Planning and of Space Programming and Management. It was chaired by the head of Space Programming and Management, Dr. Milton Trapold. A series of meetings were held immediately with the Advisory Committee to define the tasks to be accomplished, the information that already existed to support the study, and the mechanisms of coordination. During this period, the consultants also interviewed the Vice Provosts and academic division chairmen to define further the concerns which the study must address.

Mr. Clifford Alexander of the UMD campus was designated as campus coordinator for the study, with funding by the study allowance. Mr. Alexander has been responsible for major extension and revision of the facility inventory data as well, and was of major assistance to this study. Dr. Arthur W. Hafner, Dr. Edwin W. Haller, and Dr. Richard J. Ziegler served as principal coordinators specifically for the Medical School. Their assistance and the fact that a functionally defined and quantified building program already existed for the new medical facility were major time saving factors.

The study team was provided with an office in the Performing Arts Center during the period of on-campus data collection in the Fall Quarter. The office and listed telephone were quite satisfactory for the purpose, although the classification of consultants in the Performing Arts occasioned some amusement. Members of our team were on campus roughly half the time from the start of the study through December.

Work was initiated 3 October 1973. The contract was signed 26 October and was based upon the understanding of necessary tasks reached at that time with the Advisory Committee and the University contracting office.

The first series of interviews with the executive management of UMD and with the division chairmen was intended to identify their general experience and concerns with campus facilities, and also the basic goals, objectives, policies, and assumptions of campus operations.

The next step was the collection of statistical data and an extended series of in-depth interviews with all department-level organizational units of the campus. This continued through October and November 1973. A review of data with these units was found necessary in January 1974.

The data was input to our computer system during December and January, with preliminary analysis in early January and final analysis in early February. A presentation of preliminary findings and recommendations was made on 17 January to the Advisory Committee. Further review of advanced findings and conclusions was made during preparation of the final draft report at our offices on 2 March by Dr. Heller, Dr. Trapold, Dr. Carter, and Clinton Hewitt. The final draft report was presented to the Advisory Committe and University on 12 March for review prior to printing the report document.

Meetings for review of progress and study guidance were held with the Advisory Committee at roughly two-week intervals throughout the study. The Associate Provost and the Vice Provost for Academic Administration were also kept informed of findings, and information regarding campus operations was frequently solicited. Findings and recommendations were discussed with both the Social Sciences and the Medical School.

Interviews and Facility Review:

The department level interviews were conducted with heads of all academic departments and also with representatives of administration, student services, plant and central services, and other elements of UMD. We also spoke with the Campus Goals and Facilities Committee, the subcommittee for Buildings and Grounds, and representatives of the Student Association. We wished to learn of their general facility experience, discuss their existing facility utilization, identify special conditions and constraints affecting that utilization, and identify facility problems. We also discussed their staff, programs and activities, teaching load, and program enrollment. Use of department spaces by activities other than scheduled courses was also discussed in preparation for a questionnaire that was sent to them later. Other topics of concern included the Library and media resources, offices, and department support spaces. Our interview guide is presented in the appendix with a covering letter Mr. Alexander sent to the departments.

A brief inspection was made of all rooms assigned to the departments in the process of the interviews. The adequacy of the space and any special conditions were reviewed, and further discussion was stimulated, leading to an improved understanding of facility use and experience.

The statistical analysis of instructional facility utilization is based on UMD facility inventory data and room use data.

Facility Inventory:

Work during the preceding year on a facility master plan for the UMD campus (currently in review by the University) had resulted in a major update of the UMD facility inventory. This was made available to us in tabular report form, along with tapes of the preceding official inventory from University central computer files. The master plan inventory did not provide a detailed room classification, but it was believed initially that the two sources together would provide a complete and accurate inventory for use in this study. Both sources listed only academic buildings plus the Administration Building, Kirby Student Center, and the Food Service building. Data concerning the other campus buildings, representing primarily housing and plant operations, provided only the net and gross building areas but this was sufficient for those facilities.

As data collection progressed during the interviews and facility reviews, correction of the facility inventory continued and a major extension of the inventory was made by Mr. Alexander. The result of all the review and

revision, however, is a very up-to-date facility inventory for the campus for use by the University. It includes categories of facilities that earlier inventories had excluded but which the Space Programming and Management Office now wishes to list, and also includes the three buildings under construction in the Fall Quarter that are expected to be occupied in the near future.

Comment should be made regarding the University room classification system. Our original intent was to make our inventory as compatible as possible with the Higher Education Facilities Inventory and Classification system developed for the U.S. Office of Education by the National Center for Higher Education Management Systems. This was accomplished in many ways, but the UM room classifications have many differences from the other, as well as some problems having to do with the structure of the system. We suggest the University consider some revisions of its classifications in the future. The revisions and their impact on the University inventories are not viewed as difficult; and an improvement in structure would result as well as increased ease in federal reporting and data comparison.

Use Inventory: The office of the Vice Provost for Academic Administration maintains up-to-date data on scheduled courses by section, including room assignment, actual time given, class hours, etc. Class enrollment and additional comments on the needs and problems of the courses were developed by questionnaires sent to departments.

Data on other uses of academic instructional and meeting rooms were also developed directly through questionnaires to the individual academic departments and others with instructional responsibilities. The rooms concerned include classrooms, class laboratories and studios, special and individual laboratories and studios, audiovisual studios, department multipurpose rooms, conference rooms, study rooms, and lounges. The information solicited included identification of the uses and of any course with which such uses were associated, the number of hours per week and time of day and week they occurred, the average number of people in the room during that time, and comments about the facility needs and problems of the uses.

The necessary questionnaire forms were prepared with Vice Provost Vose, who sent them to the departments. The departments had some questions and some delay was experienced, but on the whole a very good response was received.

Data Manipulation and Analysis:

The approach used for the collected data was to assign each reported use to its room, total the uses and calculate utilization for that room, and develop sums and averages for a wide variety of data aggregations -- by category of room, size, location, time of day rooms are in use, and so on.

The utilization statistics are very simple, a measure of hours of use and percentage of seats occupied. Evaluation is the significant and more difficult action.

The total hours per week a room is in use is reported as Room Utilization (RU) in Weekly Room Hours (WRH). The average percentage of student seats or "stations" that are occupied during those hours of use is reported as the Station Occupancy Rate (SOR). The number of hours per week that the average station in the room is occupied is reported as the Station Utilization (SU) in Weekly Station Hours (WSH).

Weekly room hours or weekly station hours experienced may also be calculated as a percentage of the total hours the room is available for scheduling and are then termed the Room Utilization Rates (RUR) and Station Utilization Rates (SUR). However, we have not used these figures because they tend to be interpreted as percentage of capacity utilized and thus can be very misleading. As discussed in Chapter Three, the particular conditions and context of specific rooms or room groups determine their capacity.

Ideally, a full academic year is analyzed as utilization varies between Fall, Winter, and Spring Quarters. Different courses are given, enrollment fluctuates, and the random factor is active. Time was not available for an extended statistical analysis in this study, however. Analysis of Fall Quarter statistics should be satisfactory for the intent of the study, if it is not assumed to be completely representative of a full year. Fall Quarter does tend to be the one with the largest enrollment. It also tends to have the heaviest demand on the general classrooms and laboratories (which are often the ones with the heaviest utilization anyway), although this does

not hold uniformly. We have specifically discussed in our interviews with departments and users those conditions that vary from one quarter to the next, in order to evaluate conditions in Winter and Spring Quarters.

Computer Analysis System:

A huge quantity of data is used in a statistical facility utilization analysis. The study for UMD handled 2,539 "room" items with a minimum of 8 data facts per item in the facility inventory, and 1,585 reported use items with 8 data facts per item in the use inventory. To handle this volume of data, ADL developed a computer file and analysis system designed for the specific needs of the study and the University. (We frequently find this necessary in our work with higher education facilities and management.)

Lengthy talks were first held with the analytical staff and Dr. Trapold of the University office of Space Programming and Management. Their procedures, terms, and existing systems were reviewed with the intent of making our system and statistical product as compatible as possible.

It was learned that the office is in the process of planning a complete new computer analysis system for facility review, using the facility inventory and course files maintained by other central offices.

The system criteria for our study were very similar to that planned by Space Programming and Management. We have, therefore, designed the computer system in a manner that should provide the basis for the new UM facility utilization analysis system. Some adjustment may be needed, but the nature of the system facilitates any necessary alterations. The University can easily add capabilities to meet their requirements but which are beyond the needs of this study.

We will provide the University office of Space Programming and Management with our system and can make ourselves available to assist the University in adding it to their systems to the extent necessary. (It should be noted that these services go beyond the scope of the present contract.) The data files developed for this study will also be provided to the University, and we urge their continuing maintenance and quarterly analysis.

The Mark IV computer language was used for the system at the request of the University. They have the complete Mark IV package and intend to use it for this category of analytical report on many areas. The language

provides great flexibility in data manipulation and report generation, very important capabilities for purposes such as this study and continuing University facility analysis. The data can essentially be ordered and analyzed by any set of defined input elements. The language system was designed originally for the specific purpose of simplifying the development of analytical reports and has a very direct command procedure and standard formatting. Its use should not only save time at Minneapolis but also facilitate use by UMD in the future. The simplication can also constrain use, but this was discussed by our computer staff with the analyst of the office of Space Programming and Management.

Review and Correction:

Delays were encountered in the progress of data input and analysis. We had originally expected to use the UM central file facility inventory, with revisions from the "master plan" inventory, but the extent or changes reversed the process. As noted above, many additional questions and resulting revisions by Mr. Alexander occurred during the interviews and the input process. Correction to both facility and use data continued to the end of the year. It had been intended to start and complete the analysis in December, but this was not possible. The input was in fact completed in early January, and the first comprehensive assignment of uses to rooms was made by the computer system at that time.

The results were disappointing. They indicated that major errors still existed in both room and use data. The particular problems encountered included the mismatch between uses and room classifications, assignment of uses to clearly inappropriate and wrong rooms, use assignments overlapping in time, and uses that had been discussed in interviews but not reported.

Preliminary findings and conclusions were presented to the Advisory Committee with the strong recommendation that additional work be authorized to verify and correct the data that existed. This detailed review and verification procedure had been included in our original list of tasks but deleted in the final contract with the expectation of the University that it would not be required.

This work was authorized and we conducted a review with each academic department head of the use and facility data for his department. The inventory and classification system was explained carefully and a large number

of changes made as a result. Uses made of rooms were also reviewed, individually and in sum for each room, and revisions made. The data base was thus corrected and the analytical reports rerun and reanalyzed. The impact of the corrections varied by room, with some showing increased utilization and others less. The general, overall utilization did not vary greatly, but the conclusions are now much less susceptible to challenge. The findings and conclusions of the final analysis are presented in this report.

Future reuses of this facility utilization study must expect a major review, verification, and correction effort as part of each run. This is necessitated both by lack of complete understanding on the part of the department reporting uses and reviewing the facility inventory and because many errors are not apparent until all the data is assembled room by room. The problems are greatest with the non-scheduled uses, but these uses are important and should be included.

The final step of the analysis was integration of utilization statistics with the information we had collected about the facilities and their uses through interview and inspection.

Statistics alone are of little value. Conditions and context must provide the basis for evaluation, and both qualitative and quantitative conclusions are necessary. In this report, we have tried to explain the reasons for the utilization experienced and to identify the needs and conditions of the user, the facility problems experienced, and the constraints that exist. We have drawn both quantitative and qualitative conclusions and made recommendations thereon for improvement of facility utilization, both in its efficiency and its effectiveness.

CHAPTER 5 - PRESENT FACILITY EXPERIENCE

LGA/ADL
March, 1974

INTRODUCTION

This chapter presents information gained on the current utilization of facilities on the Duluth campus. This information is drawn both from our interviews with the various units on campus and from the results of computer analyses of current space and its utilization.

The discussion of each unit will include reviews of the space currently assigned to or used by that unit, the present and near-future activities which must be housed (in terms of personnel, programs, methods, and relationships with other organizational units), and analysis where applicable of the statistics resulting from the computerized space utilization program.

The following units with instructional responsibilities are discussed in this chapter:

Division of Education and Psychology	2100
Elementary Education	2110
Secondary Education	2120
Home Economics	2130
Industrial Education	2140
Physical Education	2150
Psychology	2160
Special Education	2170
Speech Pathology & Audiology	2180
Division of Science and Mathematics	2200
Biology	2210
Chemistry	2220
Geology	2230
Mathematics	2240
Physics	2250
Planetarium and Observatory	2291
Division of Humanities	2300
Art	2310
English	2320
Language	2330
Music	2340
Philosophy	2350

Speech/Communications/Theater	2360
Tweed Museum of Art	2391
KUMD-FM Radio	2393
Division of Social Sciences	2400
Business Administration	2410
Economics	2420
Geography	2430
History	2440
Political Science	2450
Sociology/Anthropology	2460
American Indian Studies	2461
School of Social Development	2500
Medical School	2600
Dental Hygiene	2710
Aerospace Studies	2810
Special Programs	2900
Limnological Research Center	3100
Continuing Education & Extension	4100
Health Service	9110

The following academic support and administrative units are discussed in Chapter Six:

Library	(6 - 16)
Educational Media	(6 - 18)
Computer Center	(6 - 20)
Administration	(6 - 20)
Plant Services	(6 - 21)
Food Service	(6 - 21)
Kirby Student Center	(6 - 21)
Student Housing	(6 - 22)

The Division of Education and Psychology includes the Departments of Elementary Education, Secondary Education, Home Economics, Industrial Education, Physical Education, Psychology, Special Education, and Speech Pathology and Audiology.

Of these departments, Home Economics, Industrial Education, and Physical Education occupy their own buildings. Elementary Education, Secondary Education, Psychology, and Special Education have their departmental offices in Bohannon Hall (also known as the Education Building). The offices and specialized facilities of the Department of Speech Pathology and Audiology are in the Home Economics Building.

Historically, this division represents a direct link to UMD's origins as a teachers college. Not surprisingly, in view of the declining birthrate and the lessening demand for teachers at all levels, the total teaching load of the division has been declining in recent years. The decline has been from 60,245 credit hours taught in 1971 to 53,811 in 1972, to 53,662 in 1973. This represents an overall decline of about 11% in these years, but the very small decline from 1972 to 1973 suggests that enrollment may be stabilizing.

The number of majors graduated by this division has declined during the past three years:

	1971	1972	1973
B.A.	95	91	77
B.S.	300	227	220
	395	318	297

The facilities occupied by the various departments making up the Division of Education and Psychology vary widely in size and suitability. Home Economics has the most spacious accommodations. Psychology appears to be the most crowded and is severely restricted in the development of new programs by the inadequacy of the available space. Industrial Education is constrained in its use of space by insufficient faculty and support staff. When the new physical education facility is completed, Physical Education will be well-equipped with activity-oriented space, but the department believes it will still be short of classroom-type teaching space. Speech

Pathology and Audiology has recently moved into new quarters which, while disappointing in some details, appear quite adequate for its clinical and teaching programs for the foreseeable future. Elementary and Secondary Education are both restricted by the unsuitability of their present teaching spaces to instructional programs that are increasingly individualized and "performance-based," but which must now take place in rooms designed for lecture presentations.

The Division also operates its own Learning Resources Center (Bohannon Hall, Rm. 120, 120A) consisting of a 30-station room with adjunct office and storage areas, the main room being a remodelled classroom. The room is used most heavily by Elementary and Secondary Education students involved in performance-oriented studies. The Division allows students of other departments on campus to use the facility when it is not needed for its own students. The room is open only 40 hours per week, but even so its utilization and its effectiveness are low because of limitations of instructors, equipment, and staff budget. The Division is also assigned an 8-station videotape center and a computer room.

The television studio operated by the Education Media service is also located in Bohannon Hall, but Educational Media is administratively responsible to the Vice Provost for Academic Administration. Operationally as well as administratively, the situation is a curious one with consequences that do not best serve the interests of the campus as a whole. As is recommended elsewhere, a high order of priority should be given to reorganizing the entire learning media service, providing not only a more rational administrative structure but also the necessary space and staff to develop a central, coordinated learning resources center to serve the entire campus.

The Division is also served by the Children's Library and the Teaching Materials Library which, though administratively and physically a part of the Campus Library, primarily support activities of this Division.

The divisional offices include a 16-station conference room which, in addition to faculty meetings, is used 9 hours a week for a small group discussion section in Secondary Education. Office space appears to be adequate.

ELEMENTARY EDUCATION (2110)

Staff:

1 Professor
3 Associate Professors
7 Assistant Professors
1 Secretary
1 Clerk Typist

Activities:

This Department offers two B.S. courses, one leading to certification in elementary education and the other in kindergarten-primary. Graduate programs are intended primarily for already certified teachers and include a small M.S. program and a year-old M.Ed. program, which is still in the process of crystallization.

Both the number of majors and the credit hours taught have been declining in recent years in accord with the national trend. In 1971 there were 230 graduating majors (both elementary and kindergarten-primary programs); in 1972, 160; and in 1973, 124. The credit hours taught declined from 8,787 in 1971 to 7,384 in 1972 and to 5,727 in 1973. There are currently about 90 students in each of the two upper division years, and the entering class size will not be permitted to exceed 100.

The curriculum is organized in two different ways:

About two-thirds of the majors are involved in the innovative IMPACT program, which calls for coordinated studies on the campus and field work in the public schools.

The remaining students are enrolled in "Track C" -- the more traditional program. If another suitable class lab were available, Track C would be converted to IMPACT.

There is considerable reliance on films and the audiovisual resources in the Division's Learning Resources Center. Both IMPACT and Track C students take part in microteaching exercises in which their simulated teaching is played back from a videotape recorder.

Facilities and Utilization:

In addition to adequate departmental and faculty offices in Bohannon Hall (the Education Building), this department has four faculty offices assigned to it in the Home Economics Building.

Of particular importance to the IMPACT program is HE 209, which is the the only teaching space assigned to this department. It is a 30-station converted Home Furnishings room about 1,000 feet square and used five mornings a week for a modified team-teaching approach involving considerable observation and participation. It is set up for use by 25-30 students and is equipped with stacks for textbooks, science kits, and teaching devices. It is used in the afternoons by Musical Education (musical instruments are stored here), and it is also used as an informal practice area. The IMPACT room is used for instructional purposes 30 hours a week. When the room is in use, an average of 65% of the stations are occupied.

Much of Elementary Education's teaching takes place in space assigned to other units. Microteaching, requiring TV cameras, recording equipment, and monitors, takes place in a room assigned to Secondary Education. Other media-oriented activities take place in the divisional Learning Resources Center. Another heavily used room is L 812, which contains desks, tables, and materials to make bulletin board and other school-related exercises.

Generally speaking, Elementary Education does not seem to be suffering from any acute space difficulties. There would appear to be a good argument for providing another room like HE 209 to permit the conversion of the entire undergraduate program to IMPACT.

SECONDARY EDUCATION (2120)

Staff:

3 Professors
3 Associate Professors
6 Assistant Professors
1 Secretary

Activities:

Secondary Education remains at a substantial size in spite of the general decline in the demand for teachers and the consequent decline in teacher-training courses. Student credit hours taught declined from 8,151 in 1971 to 7,505 in 1972, and then rose to 8,377 in 1973.

The Department is uncertain as to the size of its future undergraduate programs. They have so far experienced little difficulty in placing graduates with secondary credentials. One possibility is that the enrollment will decline; another is that enrollment will level off at its present size; still another is that practicing teachers will return to the campus in increasing numbers, tending to balance out any decrease there may be in undergraduate enrollment.

Secondary Education administers two graduate programs. An M.A. program enrolls 17 students (9 in Education and 8 in Education Administration) and is under the University-wide Graduate School. A newly inaugurated M.Ed. program has been offered this year on the Duluth campus to practicing teachers and about 150 teachers are actively involved, though most of them are on a part-time basis.

In recent years, the programs offered by Secondary Education have been individualized, with the focus on the student's demonstrated competency. The program proceeds from Phase I (orientation for sophomores) to Phase IV (student teaching for seniors). Particularly at the advanced undergraduate levels, the student's work calls for one-to-one relations with faculty, much field work in the public schools, and work with individualized instruction packets.

There is a small amount of faculty research, mainly oriented toward improving the programs of the Department.

Facilities and Utilization:

Scattered until the past year, the facilities assigned to Secondary Education are now centralized in Bohannon Hall. In addition to the departmental and faculty offices, assigned specialized teaching spaces include a 30-station classroom (BohH 116), a microteaching lab, a reading clinic room and the "STEP Commons" (Secondary Teacher Education Program), in which students do individual work on an unscheduled basis as well as test-taking. The microteaching lab (BohH 113) is equipped with videotape recording equipment to record and play back student teaching exercises. Two other rooms (BohH 115 and Boh H 240), not assigned to the Department, are also used for microteaching, using portable equipment. The departmental workroom is equipped with a computer terminal.

The STEP Commons Room (24 stations, 840 ASF), which is the only class laboratory, has a reported use for teaching of only 3 hours a week, with 41% of the stations occupied during these hours. The microteaching lab (Rm. 113, 12 stations, 347 ASF) had no regular instruction reported by Secondary Education and 5 hours of unscheduled use per week reported by Elementary Education. We believe the reporting has been deficient in these instances.

The 30-station classroom assigned to Secondary Education is highly used -- 43 hours of teaching uses per week with 41% of the stations occupied when the room is in use. No non-teaching uses were reported.

HOME ECONOMICS (2130)

Staff:

3 Assistant Professors
3 Instructors
1 Secretary

Activities:

The Home Economics Department offers both B.A. and B.S. programs, mainly, of course, to young women. In the past three years it has had a total of 28 graduating majors in 1971, 17 in 1972, and 28 in 1973. The student credit hours in those years were, respectively, 2,865, 2,405, and 2,959. There are no graduate students.

The major area of current expansion appears to be in the field of family and child development. The faculty foresees the possibility of developing interdisciplinary majors with Elementary Education in such areas as early childhood studies.

The Department owns considerable instructional media of its own, including the most commonly used projectors and audio recording equipment. Videotapes are also used. There will probably be an increased use of instructional media in the future.

Facilities and Utilization:

The Home Economics Department is singularly well-endowed with regard to space. Faculty and departmental offices are spacious. There is also a workroom, a large conference room, and a small lounge. There is a variety of assigned teaching labs, including such equipment as sewing machines, kitchen units, and laundry equipment. It was noted that the labs are often locked for security reasons when classes are not in session, although students with permission may work in them after-hours.

Among the class laboratories, no regular utilization of the Quantity Kitchen (HE 107, 12 stations, 472 ASF) was reported, and there appears to be little likelihood of its use increasing. The associated room, a Living-Dining Area (1,287 ASF) is used now as a departmental multipurpose room, particularly for infrequent meetings. The kitchen is sometimes used to prepare food for special occasions. In many institutions the requirements for such labs are met through shared use of central food service facilities if there is no major enrollment for the program. The use of these rooms should be reexamined in the light of other campus needs.

The Homemaking Lab (HE 108, 10 stations), the Foods Lab (HE 151, 20 stations), and the Clothing Lab (HE 239, 22 stations) are each in use an average of 16 hours a week. When the rooms are in use, an average of 59% of the stations are occupied.

The conference room (HE 130, 14 stations) is reported to be in use 35 hours a week for all purposes, of which 2 hours are for teaching. When the room is in use, 57% of the stations are occupied, both for teaching and for other uses.

The Department has expressed concern that one lab must serve as both a household furnishings and general textile lab in addition to its use as a general classroom, creating very crowded conditions with little time for set-up and clean-up. Need was also expressed for a room devoted to re-upholstering and refinishing of furniture which would enable the Department to offer a course in antiques and fabrics. Storage space would be required for slides and samples. Another course the Department would like to offer is in the general area of equipment and would be consumer-oriented, directed at how to buy appliances such as kitchen equipment, air conditioners, etc. Such a course, it is felt, would enhance graduates' job opportunities with equipment and appliance manufacturers.

Home Economics appears to have no space problems that cannot be solved by better utilization and scheduling of the available space. It should be noted that faculty members remarked that if they had been consulted in planning the building, it could have been designed to respond to their needs more efficiently.

Staff:

2 Associate Professors
5 Assistant Professors
2 Instructors
1 Secretary

Activities:

The Department offers four undergraduate programs: a B.A. for students expecting to go into industry and three B.S. programs for students seeking certification in Industrial Arts teaching or in industrial-vocational teaching. The main areas of concentration are wood technology, power (automotive and other systems), technical and architectural drawing, graphic arts (printing), metal technology, construction, and electricity-electronics. There is no graduate program; and, although the Master of Education program can concentrate in Industrial Education, few students do. Continuing education and extension activities are minimal.

There were 40 graduating majors in 1971, 20 in 1972, and 39 in 1973. The credit hours taught in those years were 4,877; 4,069; and 4,730 respectively.

The Department wishes to develop new programs for students entering industry in the fields of electronics, manufacturing and construction. Industrial vocational education is one of the areas of greatest enrollment growth potential across the nation, both for day and evening students.

The instruction is heavily oriented to hands-on laboratory experience of technical subjects. Audiovisual aids are important to industrial education instruction and are used to the extent possible in the present situation. The Department is even considering setting up its own Learning Resources Center. A viewing room adjacent to the labs is desired to allow students to refresh their memory of particular techniques while they are in the process of the work.

The Department reports that their greatest problem at this time is insufficient faculty and that students are turned away and courses not offered because faculty are not available to teach them.

Facilities and Utilization:

The Department has all its offices, laboratories, and support spaces in the Industrial Education Building. One classroom of 65 stations exists in the

building with class uses assigned centrally rather than by the Department. The building is free-standing without connection to the internal corridor circulation system that links most other academic buildings of the campus. This could easily be accomplished, however, and would significantly improve access problems between the building and the rest of the academic departments and facilities.

Although audiovisual media use is important to this Department, the building was not designed to facilitate its use and many difficulties are experienced. No conduit exists to allow connection to the campus CCTV system.

The Department offices are adequate. Faculty offices are insufficient in number, with four of the faculty being obliged to share two offices appropriate for single occupancy. A small student lounge area of 129 ASF and 8 stations also exists, but no formal uses were formally reported.

The Department is assigned a large multipurpose room (IE 115, 15 stations, 688 ASF) used for conferences, faculty meetings, and instruction. It is reportedly used for teaching purposes 9 hours per week with 115% station occupancy, and for all uses 10 hours per week with 110% occupancy. The room also contains a collection of publications and instructional materials of the field and is used irregularly by faculty and students to prepare materials or to study.

Industrial Education has 12 class laboratories with a total of 291 stations and 1823 ASF. Their aggregated average utilization for the Fall Quarter 1973 was 8.25 room hours per week with 58% station occupancy for teaching uses and 24.25 room hours with 26% occupancy for all reported uses, including those by campus central service. Three laboratories (Photo, Print, Electronics) were not used for teaching in the Fall Quarter as the courses of their specialty are not offered in that quarter, but occur in the Winter and Spring Quarters. The Photo lab and Print Shop with their associated service room are both used on a full-time basis by the central campus Printing Unit and others for institutional support printing, graphics, and photography work. With the level of demand placed on those facilities by teaching uses, this appears to be an excellent use of space. No problems were reported although careful coordination is required and extra area is provided at work stations.

Service space in general appears adequate for the requirements of the laboratories, although the temporary storage of large pieces of equipment in the Power lab and other items in the Plastics, Welding, and Metals labs is a problem. The Department does have a 1,771 ASF of dead storage (not suitable for those laboratory needs) which it uses for other equipment and materials used irregularly or acquired from "surplus" for the future.

The primary constraint on increased utilization of these rooms is reported to be lack of faculty and support staff, as noted above. Even section sizes are limited by the number of students at particular activities who can be handled by the single instructor. Student use outside of class periods roughly doubles the room hours of teaching uses, but it is constrained by safety and security problems requiring trained staff to supervise use of equipment at all times.

Time scheduling units, set-up time, and student study requirements are the ultimate constraints on maximum possible utilization of these class laboratories. The Department estimates an aggregated average utilization of roughly 25 room hours per week as the practical maximum capacity, and this appears reasonable. It must be recognized, however, that individual labs support varying demands, depending upon program enrollment and degree of specialization of the labs. Rooms such as the Power lab and Drafting lab have reported the highest student utilization. With increased enrollment in the appropriate courses they and other labs could reach capacity.

Technical-vocational laboratories are expensive facilities, and education in these fields is expensive because of it. UMD has designed many of its individual laboratories with flexibility of function in mind -- most serve "families" of courses and fields -- to minimize this capital cost per student served. Faculty-staff budget and enrollment policies are now the main determinant of cost effectiveness of these existing program capital investments. Marginal capital and operating cost requirements relative to enrollment and benefit should also be carefully weighed when considering new programs.

PHYSICAL EDUCATION (2150)

Staff:

2 Professors
2 Associate Professors
4 Assistant Professors
6 Instructors (1 on leave)

Activities:

The Department offers a B.S. program for students who intend to become teachers. There is no graduate program.

Physical Education graduated 27 majors in 1971, 42 in 1972, and 41 in 1973. The credit hours taught declined considerably from 10,217 in 1971 to 7,930 in 1972. It appeared to have stabilized th next year with 7,931 hours taught in 1973. This was to some extent the result of making P.E. courses elective rather than compulsory for non-majors.

Instructional programs are divided into activity courses, theory courses, and supporting courses. The activity courses include individual and team sports, swimming, dancing, and self-testing activities. All of these require specialized facilities.

Most courses are offered coeducationally. A trend is evident in less emphasis on team sports and more on individual recreation. Class groupings also tend to be smaller. Outdoor recreation courses such as ski-ing have increased significantly in popularity.

Audiovisual aids are used, particularly with theory lectures scheduled during inclement weather in place of outdoor classes. Access to appropriate rooms on short notice has proved to be a problem. The Department owns much of the AV materials and equipment it uses.

Facilities and Utilization:

The Department offices are adequate, although no conference or multipurpose room facilities are available and reportedly are needed occasionally. All full-time faculty have individual offices. Two part-time faculty share an office.

Classroom facilities appear to be somewhat limited; e.g., classes sometimes meet on the pool deck or in balcony seats. There is presently a severe shortage of lockers, with two or three students sharing a locker.

The existing building contains one large, divisible gymnasium room of 18,898 ASF plus spectator seating, a large field sports exercise room, developed in the basement crawl space, a pool, a dance studio, one smaller gymnasium room, four classrooms, and all the support facilities including showers and locker rooms.

Heavy usage was reported for the activity spaces during the Fall Quarter, with the data supporting the Department's statement that the heaviest demand was for gymnasium floor space. Several activities are scheduled simultaneously into the larger spaces, frequently to excess. Winter weather conditions place great strain on indoor space, particularly when storms force inside those activities that are scheduled outside. The four classrooms located in the building are left relatively lightly scheduled to provide surge space for such activities as well as the periodic theory lectures of the other indoor activity classes. The classrooms are not satisfactory spaces, however, both in their ventilation and audiovisual capabilities.

A new Physical Education facility is now in the early stages of construction. When completed, this building will provide more activity areas, including one 38,000 ASF field room, but no additional support facilities. Support requirements are now strained, with students sharing lockers and with athletic events forcing shared team uses. Limited space for equipment storage is reported to limit the activities possible, because the necessary gear (parallel bars, skis, etc.) cannot be stored.

PSYCHOLOGY (2160)

Staff:

1 Professor
3 Associate Professors
6 Assistant Professors
2 Instructors
1 Secretary

Activities:

The Psychology Department offers an undergraduate program leading to the B.A. The Department also administers the graduate program in educational psychology (under the University-wide graduate school) for persons seeking certification as school counselors. In addition, the Department carries a heavy service load. (The Department estimates that in the course of a year it teaches a third of the student body.)

There were 53 graduating majors in 1971, 49 in 1972, and 38 in 1973. In the same years, the credit hours taught fell from 17,038 in 1971 to 15,958 in 1973, and then rose to 17,983 in 1973. Twenty-three graduate students are currently enrolled--the largest graduate program on campus apart from the School of Social Development.

As much as space limitations allow, Psychology attempts small-group teaching and plentiful use of audiovisual aids. It makes heavy use of the Learning Resources Center and believes that it uses CCTV more than any other department.

The service classes are among the largest on campus with 400 students currently enrolled in a general psychology course.

The graduate students in education counseling are for the most part practicing teachers who arrive on campus after 4:30. Extension programs continue until 9:00 or 10:00 in the evening.

Only one room is devoted to research. There is virtually no animal research. The one faculty member who "runs rats" must compete for space at the medical school building. Faculty members have expressed interests in developing programs in human development (birth to death), alcoholism, and other "people-oriented" fields if funds and space were available.

Facilities and Utilization:

Psychology occupies quarters on the third floor of Bohannan Hall. The assigned facilities include departmental and faculty offices (both crowded), a group dynamics room, a conference-library room, a child observation room, a test library, an experimental room, a statistics laboratory, interview rooms, and a graduate student and faculty lounge. Some rooms are equipped with one-way glass and with audio and video capabilities.

The Minnesota Mobile Career Guidance Service with a staff of two also occupies an office in the departmental area.

The perceived needs are for more specialized research space and more small classrooms with greater flexibility. The Department's needs for space are discussed in Chapter Seven in connection with the proposed housing for the Social Sciences.

Two class labs (group dynamics and a multipurpose room) with a total of 32 stations in 1,239 square feet are assigned to Psychology. They are in use for teaching an average of 12.5 hours each per week. When in use for teaching, however, the rooms are crowded--116% of the stations are occupied. Uses of these labs besides regular instruction raise the combined weekly room use significantly to 55.5 hours per week. This yields an average room utilization of 27.75 hours. The station occupancy rate for all uses is 92%.

Two special class labs (statistics and the child study lab)--513 square feet with 19 stations--have no regular teaching uses. They are used for other purposes 55.5 hours per week. The average room utilization is consequently 27.75 hours per week. The station occupancy rate is 42% when the rooms are in use.

Two study rooms (13 stations in 356 square feet) are in use for teaching 9.5 hours per week, for an average room utilization of 4.75 hours. When the rooms are in use, 103% of the stations are, on the average, occupied. Other uses of these rooms raise the combined room utilization to 38.75 hours a week. When the rooms are in use, an average of 46% of the stations are occupied.

A multipurpose room of 20 stations is not used for teaching but is in use for other purposes 26 hours a week. The station occupancy rate is 28% when the room is in use.

SPECIAL EDUCATION (2170)

Staff:

1 Professor
1 Associate Professor
1 Assistant Professor
1 Secretary

Activities:

Special Education is a small department offering courses preparing students for certification in the areas of learning disabilities and retardation. The programs may include 50-65 post-baccalaureate students (but not necessarily master's candidates) at any one time. The teaching load has been growing. In 1971, Special Education taught 809 credit hours, in 1972, 1,218; and in 1973, 1,266.

The programs involve about 60% classroom work and 40% field work, consisting of directed teaching in the public schools of northeastern Minnesota.

Research conducted by the Department is principally field oriented and directed at modifying and improving on-going programs.

Videotape recordings and audiotapes are used as supplementary materials. The Department maintains most of its own media materials and also uses the Divisional Learning Resources Center. Because of the rate of change of knowledge in this field, the library, which has proved to be adequate, is a primary resource.

The department's primary working relations are with Psychology and Sociology.

Facilities and Utilization:

With all teaching being carried on in general purpose classrooms or in the field, the Department's needs for space are modest. Departmental and faculty offices are adequate.

Ideally, the Department would like to have access to more small seminar and conference rooms, as well as a central repository for teaching materials for the regional special education community. Teaching materials should be held close to the Departmental offices and rooms used for instruction. Since Special Education is assigned only office space, no utilization statistics are in order.

SPEECH PATHOLOGY AND AUDIOLOGY (2180)

Staff:

1 Professor
3 Associate Professors
6 Teaching Assistants
1 Secretary

Activities:

The Department of Speech Pathology and Audiology offers a pre-professional B.A. program. There are 11 full-time graduate students in the M.A. program in Speech Pathology, and 2 part-time graduate students. (A rather curious situation exists in which the state of Minnesota will hire B.A.'s, while the professional association in the field does not recognize the B.A. for certification.)

Seventeen majors graduated in 1971, 30 in 1972, and 27 in 1973. Student credit hours taught in these years were 1,399; 2,029; and 2,076 respectively.

The undergraduate program is viewed as a basic foundation presented largely in traditional lectures supplemented by audiovisual aids. Audio and videotape recorders and other more sophisticated recording devices are heavily used both for demonstration, and by advanced undergraduates and graduate students, as essential tools in working with patients referred to the clinic operated by the Department. Patients are referred from a variety of sources, including local physicians and Public Health nurses. Diagnostic interviews are held three days a week by the faculty with one graduate student and two advanced undergraduates participating. The students then work out a diagnostic procedure under faculty supervision. The clinic serves a very necessary role in the curriculum. The undergraduate program calls for 90 hours of supervised clinical experience and the graduate program 275 hours.

Research interests are largely clinical in orientation, directed toward the field, and involve work in schools, hospitals, and rehabilitation institutes.

Facilities and Utilization:

The Department occupies new and highly specialized quarters in the first level of the Home Economics Building. Office space is quite adequate, including both the departmental office and five faculty offices. (The extra faculty office is currently used by the graduate students.)

Classroom teaching takes place largely in HE 30, a relatively large classroom with 75 student stations. There are currently plans to subdivide this room, providing a 30-station classroom, student study spaces, and a seminar room, largely for graduate students. This will free office space for additional faculty, as required.

The clinic spaces are adjoined by observation rooms with one-way glass windows and audio and videotape equipment.

On the whole, although the faculty perceives some unanticipated difficulties with their present quarters and some new needs to be met, Speech Pathology and Audiology appears to be well-served in their present facilities.

The space assigned to this Department is made up of offices and clinics. It is consequently not amenable to statistical utilization analysis.

Introduction:

The Division of Science and Mathematics is comprised of the Departments of Biology, Chemistry, Geology, Mathematics, and Physics. The Planetarium and Observatory also are under the aegis of this division.

With the imminent move of the Physics Department into the new Classroom-Laboratory Building, Chemistry will remodel and occupy the entire Science Building (now officially to be known as the Chemistry Building). Biology occupies the Life Sciences Building. Geology and Mathematics share the Science-Mathematics Building.

The total credits taught in this division have been rising in recent years: 42,899 credit hours in 1971, 46,386 in 1972, and 48,390 in 1973. The division also has principal responsibility for a variety of pre-professional and pre-technical programs offered on the UMD campus and carries a large service load in offering basic courses to majors in other divisions.

In the spring and summer of 1971, 109 majors were graduated from the departments of this division; in 1972, 109 also; and in 1973, 100. These totals include those who majored in General Science, which in the three years under consideration totalled 15, 17, and 11 respectively.

The Physics Department will be very adequately housed in the new Classroom-Laboratory Building. Chemistry will also benefit from the move as it will inherit the space formerly occupied by Physics and has sufficient funds available for remodelling this space. Relatively minor remodelling would appear to meet the stated needs of the Biology and Geology Departments. Mathematics reports that it is quite short of space, and that even its acquisition of the space vacated in the Computer Center's move to the Classroom Laboratory Building will provide insufficient relief.

The Planetarium and Observatory is also administered by this division. This facility is used both for teaching and for demonstrations for visiting civic groups and school children. The latter activity has been declining because of insufficient supporting staff.

Facilities:

Divisional Offices are located in the Science-Mathematics Building and consist of the division head's office, a general secretarial office, a division workroom, and a museum. Space in these areas appears adequate, totalling almost

1,500 square feet. No uses were reported beyond the expected administrative functions.

On a division-wide basis, the following needs were cited: funding for more teaching assistant positions in order to expand graduate programs; supporting laboratory technical personnel; new faculty positions; and storage and office space.

BIOLOGY (2210)

Staff:

5 Professors
3 Associate Professors
5 Assistant Professors
2 Instructors
6 Teaching Assistants
1 Secretary

Activities:

Biology offers undergraduate majors for both the B.A. and B.S. degrees. In 1971, 40 majors were graduated from this department; in 1972, 53; and in 1973, 40. During the same years, the credit hours taught dropped from 13,315 in 1971, to 11,144 in 1972, to 10,477 in 1973. The opening of the Medical School, however, has increased the number of undergraduates expressing an interest in Biology.

Masters' degree programs are offered in the fields of Botany, Zoology, and Biology. In the fall quarter of 1973, there were 12 master's candidates. Of these, 6 held teaching assistantships.

The Department's instructional methods recognize the trend toward individualized study, with a number of students following programs of independent work. (Sixteen students were in such programs in the fall quarter of 1973.) In general, however, the program is of the familiar classroom and laboratory pattern.

By comparison with many other departments, Biology is quite heavily oriented to research, with faculty members devoting substantial effort to such activities.

Facilities and Utilization:

Biology is assigned a variety of specialized spaces including teaching and research laboratories, specialized laboratory support spaces, greenhouses, exhibition areas, specimen storage in a range room and herbarium, and an aquarium.

Laboratory facilities both for research and for teaching appear to be no more than adequate. Some teaching laboratories, designed on a 24-station module, must currently accommodate classes of 26-29 students.

Of the 15 rooms assigned to Biology for teaching purposes, 12 are teaching

labs with a total of 272 stations in 9,635 assignable square feet. These class laboratories are in use for teaching for a total of 166 hours per week, yielding an average room usage of 13.83 hours per week. When these rooms are in use for teaching, 96% of the stations are occupied, indicating that on the average stations are filled almost to capacity during scheduled use.

Other uses of these class labs raise their average weekly utilization to 23.27 hours, with 73% of the stations occupied when the rooms are in use.

Utilization figures for these laboratories must be interpreted in the light of the necessity of providing adequate set-up and clean-up time between class sessions.

Capacity for increased utilization of these class labs does exist, if enrollments increase and more faculty positions are authorized so that labs can be taught in sections.

Factors limiting present use of these labs outside of regular classes include lack of staff time to supervise activities, resulting in the need to keep these rooms locked for security reasons.

In addition to these class labs, Biology is assigned a special class lab (an isotope lab), a conference room, and a lounge. No utilization figures are available for the isotope lab, which is used as required and has potential for increased usage. The 15-station conference room is reported to be used three hours a week for teaching. For all uses, the room use rises to 7 hours per week. Conference room station occupancy rate is 20% for teaching purposes and 52% for all uses.

The lounge (12 stations) is reported to be in use for all purposes one hour a week. During this time, the room enjoys a station occupancy rate of 166%. We expect that this room is used for other purposes such as informal use that was not reported in this survey.

Faculty research labs are now at capacity. There are no proper experimental animal quarters. A limited number of animals are used and these are now maintained by the Medical School, while a few other, cold-blooded animals are maintained in individual biology research laboratories.

Expressed needs of the Department include laboratory stations where students can set up projects for extended periods of time (days or even weeks) as part of their independent study work. Lab service rooms are presently used for this, but this in turn tends to limit their capacity as support spaces. As stated above, research areas are heavily used at present with little, if any, additional capacity. The Department also uses the Limnological Research Center in summer, and it has some space in the Federal Water Lab. Joint research is also conducted with the Medical School. Both the aquarium and the herbarium are used for research as well as teaching support. The greenhouse serves both functions as well, but it is too small and sunlight is now blocked by new construction. Laboratory preparation rooms appear adequate at present. Any expansion in faculty positions, however, will result in increased demands for both office and research spaces.

The Department makes considerable use of media and has its own audiovisual storage room for departmental materials and equipment which are in constant use for labs and classes. Significant usage is expected of CCTV in the near future.

Staff:

6 Professors (1 on leave)
4 Associate Professors
1 Research Fellow
3 Teaching Assistants
1 Secretary

(In addition, two associate professors and one assistant professor of the Medical School hold joint appointments in the Department.)

Activities:

Chemistry teaches a relatively small, although increasing, number of undergraduate majors. (Ten graduated in 1971, eight in 1972, and eighteen in 1973.) It was, however, the fourth-ranking department in 1972-73 in terms of student contact hours. In the past three years, the credit hours taught have risen substantially from 8,720 in 1971 to 10,619 in 1972 to 12,428 in 1973. The undergraduate programs are expected to continue their increase in size, due, in part, to the chemistry requirements in the growing premedical program. The Department offers several service courses in addition to five courses in general chemistry for lower division students. They also teach a course for nurses in a hospital diploma program.

Chemistry conducts what appears to be the strongest research and graduate student programs on the upper campus. Of the faculty, nine are qualified to direct doctoral programs. In 1973, a Ph.D. was awarded by the University-wide Graduate School to a graduate student of this department, the first doctorate to be earned on the Duluth campus. There are currently 13 graduate students, of whom three hold teaching assistantships.

The Department expects to continue its close relationship with the Medical School, particularly if the permanent Medical School Building is to be located adjacent or close to the Chemistry Building. In addition, Chemistry will be conducting analytical work connected with the Lake Superior Basin Studies program.

Chemistry maintains its own library, staffed by a librarian, thus providing service at times when the Campus Library is not open. This collection is actually a part of the main library's collection, cross-referenced with it, and bought through the Library. It is housed in the Chemistry Building as a convenience for the Department.

Facilities and Utilization:

In addition to the departmental office and faculty offices, Chemistry is served by many special-purpose rooms for teaching and research. These include faculty research labs and student teaching labs (general chemistry, analytical chemistry, biochemistry, organic chemistry, physical chemistry), and their support facilities.

The most pressing needs perceived by the Department have to do with providing more space for faculty and graduate student research and with adequate offices, many of the present ones being too small. The amount of research conducted by faculty and graduate students places heavy demands upon existing laboratory and supporting spaces. Undergraduates in the honors program are also required to do an individual research project and other students are encourage to do so. More teaching laboratories are not needed since larger numbers of undergraduates could be handled by scheduling rather than by building more labs. (The Department would be prepared to schedule Saturday labs and classes if the demand justified this step.)

An extended discussion of this department's allocated space is perhaps premature since Chemistry will move into the space vacated when the Physics Department occupies its new quarters in the Classroom-Laboratory Building. A sum in excess of $400,000 is on hand to finance the necessary remodelling. Most of the Department's current problems will presumably be remedied in the course of the remodelling work. This remodelling program will accomplish a number of the Department's objectives, among which are enlarged, explosion-proof storage areas for chemicals; a significantly enlarged biochemistry research facility; added research space and expanded office space; and study areas and a meeting room for the Department's teaching assistants. It should be noted that this is the last step in a phased remodelling plan for the department that has been designed to accommodate anticipated program expansion to 1985. Therefore, it should be expected that current capacity exceeds demand and present utilization should be viewed with this in mind.

Chemistry is presently assigned 8 class labs with a total of 180 stations and and 8,862 square feet. The labs are in use for regular teaching a total of 136 hours per week, resulting in an average weekly room use of 17.0 hours per lab. During scheduled teaching hours, 92% of the stations are occupied. These rooms are also used on an unscheduled basis during the day and

occasionally at night and on weekends by undergraduates, graduate students, postdoctoral fellows, technicians and faculty.

Scheduling of additional sections of laboratory classes would not only increase hours of use of these teaching labs, but is also desirable from the standpoint of allowing section enrollments to be limited to a size that is efficient both for teaching and for safety purposes. The Department feels that some sections are presently too crowded but cannot severely restrict enrollment without undue hardship on students due in part to the sequential nature of chemistry courses. A further factor is that sufficient faculty time is not available at present for additional sections of many courses.

Further limitations in room use are imposed by the number of lockers or drawers existing in a laboratory. When these are all in use by students in the various sections of a course, there exists no further capacity for additional enrollment.

As in all laboratory courses requiring very specialized equipment and space, enrollment fluctuations influence utilization in a given quarter. This does not obviate the need for such special spaces which are required as essential support of the program's integrity.

The Department is also assigned two multipurpose rooms, with a total of 24 stations and 1,119 square feet. These rooms are used for regular teaching 11 hours a week, for an average weekly room utilization of 5.5 hours per week. Additional uses raise the average weekly utilization to 13.25 hours each per week. The rooms are more than fully occupied when in use for teaching, with an occupancy rate of 108%. The occupancy rate for all uses rises to 116%.

GEOLOGY (2230)

Staff:

3 Professors
4 Associate Professors
1 Research Associate (Minnesota Geological Survey)
2 Secretaries

Activities:

The undergraduate B.A. program enrollment has varied from year to year, with 8 graduating majors in 1971, 7 in 1972, and 6 in 1973. The student credit hours in the same years have varied comparatively little: 6,075 (1971), 5,640 (1972), and 6,100 (1973). The Earth Science curriculum of the Department prepares for the B.S. degree. The program graduated 9 majors in 1971, 3 in 1972, and 3 in 1973. The current interest in environmental and energy problems suggests that the number of majors as well as the service load may increase during the coming years. There is an M.S. program with 7 students currently enrolled.

Geology uses the customary audiovisual projection equipment. Access to the map, rock, and mineral collections is important. Field work comprises an essential part of the instructional program.

Facilities and Utilization:

This Department controls a number of specialized rooms necessary for its function. These include such spaces as an x-ray laboratory, a paleontology room, a rock preparation room, a chemistry lab with fume hood, etc. Space is assigned to the Department in both the Science-Mathematics Building and in the Life Sciences Building. The x-ray lab is cramped at present and additional equipment is required for which no space is available. The paleontology room would enjoy more efficient utilization if furnished with wider tables for maps. It is now used for rock labelling and is not in use for regular classes. The sedimentation lab is not used for regular classes, but is used by faculty and students for project work. Specialized collections are also a valuable and necessary asset to the Department and require storage areas where they can be accessible for study. In addition, the Minnesota Geologic Survey is provided space in the Geology Department consisting of office and equipment storage space. Geology has a small library of recent journals housed in a room with student study stations. The main bulk of the Geology collection is housed in the Campus Library.

Teaching laboratories appear to be adequate for the number of students currently served, and have some capacity for additional enrollment. No

drastic changes in teaching methodology are foreseen that would substantially alter the ways in which teaching labs are used. Research areas are apparently limited to use by faculty, graduate students and undergraduates working on projects. Labs used for general course work are open even on weekends.

There are sufficient offices for the faculty, but not for the graduate students. However, the Department would like to add two more faculty to round out departmental programs and activities which would require more offices. (One geology office is temporarily on loan to the Mathematics Department.)

In addition to its assigned rooms, Geology conducts classes in the Science-Mathematics, and Life Sciences Buildings and in Bohannon Hall (Education Building). If the graduate program enrollment increases, as anticipated by the Department, space is not available to house graduate students near their research projects.

A technician and analyst is also needed to prepare displays and to help with laboratory preparation for course work, both of which functions are now performed by faculty.

According to the Department, there are no significant space problems which cannot be solved by the reallocation of functions within the current departmental space. The Department would like to move the x-ray lab to a larger room, adjust the furnishings of the paleontology room and move the rock preparation function and adjust several other rooms to improve functional use.

Geology is assigned four class labs with a total of 92 stations in 3,012 square feet. These rooms are in use for regularly scheduled teaching 56 hours per week, or an average of 14 hours each per week. Other uses of these labs raise the average weekly room hours to 15.25. Station occupancy is 64% when the rooms are in use for teaching purposes and 66% when in use for all purposes.

Geology is also assigned an 8-station study room. No regularly scheduled teaching goes on in this room. It is reported to be in use 40 hours a week for all purposes, with 46% of the stations occupied during these hours.

Staff:

3 Associate Professors
5 Assistant Professors
4 Instructors
1 Clerk

Activities:

Enrollment of undergraduate majors in Mathematics has remained quite stable in recent years: 25 in 1971, 15 in 1972, and 16 in 1973. The Department carries a substantial service load, providing math courses for majors in Business Administration, the School of Social Development, Sociology, and others. Student credit hours taught have been declining slightly from 11,595 in 1971, to 11,023 in 1972, to 10,217 in 1973. The Department reports that there is often a waiting list for its classes -- not because classrooms are too small but because faculty are reluctant to allow classes to grow larger than 30-40 students. There is no graduate program.

There appears to be a need to offer more courses in statistics and analytical techniques applicable to computerized data. The Mathematics Department would like to see such courses centered in this Department rather than developed independently by those other departments who may feel they are needed.

Audiovisual aids are used to some extent, and television and overhead projectors would be used more frequently if the logistics of using them were simplified. The most important teaching aids are electronic calculators, which are used individually with and without the assistance of a tutor.

Faculty research is of a nature that could be carried on in individual offices — if individual offices were available.

In addition to instruction and research, the Department's spaces also accommodate colloquia, Mathematics Club meetings, and meetings of the Department.

Facilities and Utilization:

The Department is assigned a departmental office and an insufficient number of faculty offices: 10 for 12 faculty members. Some of these offices are of insufficient size to serve adequately as faculty offices. Shared offices are inadequate for many functions, including research and tutoring.

The only specialized room currently assigned to Mathematics (SM 320) accommodates a large number of calculators, keypunch machines, and other equipment. In addition to other rooms in the Science-Mathematics Building, the Department conducts classes in the Life Sciences and the Home Economics Buildings. Accessibility to departmental space is something of a problem on weekends and special arrangements sometimes are required. The Department does make Room 320 available to students in the evenings. Students and faculty in Mathematics also have access to the computer facilities, as needed, although not usually on weekends.

The Department reports that it is currently severely cramped for space. There will be some relief when the Computer Center moves to the new Classroom-Laboratory Building and Mathematics takes over its present area. This newly available space will not meet all the Department's needs. In addition to more faculty offices, more rooms are needed where individual students and faculty may meet for individual study. There is presently no space available where students can meet with faculty for independent study or for seminars.

Mathematics is assigned one class lab (a calculating room) of 1,027 square feet. It contains 12 stations. It is in use for regularly scheduled teaching 18 hours a week, and, for all purposes, is used a total of 19.5 hours a week. When the room is in use for teaching, 125% of stations are occupied. The station occupancy rate for all uses is 118%, indicating rather crowded conditions when this room is in use.

PHYSICS (2250)

Staff:

3 Professors
3 Associate Professors
2 Assistant Professors
8 Teaching Assistants
1 Secretary

Activities:

The Physics Department offers an undergraduate major (B.A.) and a minor (B.A. or B.S.). In 1970 there were 7 physics majors; in 1971, 2; in 1972, 6; and in 1973, 6. Student credit hours taught have been increasing: 4,463 in 1971, 4,968 in 1972, and 5,192 in 1973.

Eight graduate students are currently registered. The graduate student enrollment is expected to increase when Physics moves into its new quarters in the Classroom Laboratory Building (see "Facilities" below). The service load includes between 50 and 90 engineering students as well as students in the premedical program. Most students enrolled in the Department's programs are professional and research oriented. No major changes in teaching methodology are anticipated that would have significant facilities implications.

Both graduate students and faculty engage in research, for which more than merely adequate facilities will be provided in the new Classroom-Laboratory Building, although existing facilities in the Science Building have been severely strained to serve research functions.

The Department currently maintains its own collection of monographs and journals. Specialized books and journals needed for research and quick reference are housed here, with the more general physics collection housed in the Campus Library. Space is allocated in the new building for an expanded collection.

Facilities and Utilization:

The Physics Department's teaching spaces are currently located in the Science (Chemistry) Building, with two classes being taught in the Science-Math Building. A number of rooms in the Science Building are dedicated to research and storage for this Department. Any extended discussion of these facilities is perhaps not entirely useful since Physics will shortly be moving into its new quarters. It should be noted that the shortcomings of the present space have been overcome in the new facilities, which were planned to accommodate

program expansion into the future. Many departmental facilities are highly specialized and expensive spaces which are not readily usable by other departments. The space which will be available in the new building appears to be quite adequate, both in quality and quantity, for some years to come, and will amply serve research functions and an expanded graduate program.

Physics is presently assigned four class laboratories, totalling 3,001 square feet and containing 72 stations. These labs are in use for regular teaching a total of 26 hours per week for an average room use of 6.50 hours per lab per week. Other uses, including research activities, raise the total utilization of the rooms to 105 hours for an average weekly room utilization of 26.25 hours per lab for all uses. When these rooms are in use for teaching purposes, 72% of the stations are occupied. When all uses are considered (teaching, research, and all unscheduled use) the station occupancy rate is 29%.

PLANETARIUM (2291)

Staff: 1 Director

Activities: The Marshall W. Alworth Planetarium is adjacent to the southwestern side of the new Classroom Laboratory Building. It is in limited use for teaching -- a single two-section course and one extension course (both in Astronomy) during the Fall Quarter. Programs for the public are also a part of the Planetarium's regular activities and it is visited by civic groups and schoolchildren.

Facilities and Utilization: Physically, the Planetarium building comprises a 64-seat auditorium with projection apparatus, an office for the director, and two workrooms as well as exhibition space in the lobby. It is markedly short of storage space. On the second story, the area above the dome represents apparently usable space which is presently unfinished and unused. It is hoped that this space can become a lab for an Engineering course in graphics. An observation deck is planned for the top of the Planetarium and a new observatory with a telescope for research purposes will be a part of the new Classroom-Laboratory Building. (Currently, portable instruments are set up on ground adjacent to the Planetarium - a less than adequate condition.)

The 64 station, 803 square foot auditorium is in use for scheduled instruction 6.00 hours per week (excluding the extension course). When in use for teaching purposes 89% of the stations are occupied. Other uses raise the weekly room utilization to 15 hours. When in use for all purposes, the station occupancy rate is 78%.

The Division of Humanities is comprised of the Departments of Art, English, Language, Music, Philosophy, and Speech/Communications/Theater Arts. In addition its administrative jurisdiction includes the Tween Museum of Art, the University Theater, and KUMD-FM Radio.

During the past three years, the credit hours taught by the departments of this division have declined from 63,111 in 1971 to 59,626 in 1972, and then increased to 63,035 in 1973. Graduating majors increased from 144 in 1971 to 145 in 1972 and then declined to 106 in 1973. The Division of Humanities has the heaviest service teaching load of any division on campus. Minors in Humanities and Journalism are also offered under the Division.

Most of the facilities assigned to Art, Music, English, and Language are located in the Humanities Building. Philosophy has its offices in A. B. Anderson Hall. The theater-related faculty of Speech/Communications/Theater Arts are housed in the new Performing Arts Building, and the remainder of the Department is in A. B. Anderson Hall. The Tweed Museum of Art and radio station KUMD-FM are located in the Humanities Building.

Of these departments, Art and Music appear to have the most pressing space problems, growing principally out of the need, in Music, for better large-group rehearsal and performance space, and in Art, for better studios. These needs are detailed under the appropriate departmental discussion.

The only space assigned to the Division is that for its Divisional Offices in the Humanities Building and one office in the Social Science Building. These appear adequate for the Division's administrative functions. An 8-station, 180 square foot conference room is also assigned to the Division and is principally used for divisional and departmental meetings. No regularly scheduled instructional use was reported for this room. The room use reported for all purposes was 8 hours per week, with an average of 75% of the stations occupied while the room was in use.

Staff:

3 Professors
2 Associate Professors
1 Assistant Professor
5 Instructors
8 Teaching Assistants
1 Secretary

Activities:

Programs are offered for both the B.A. and B.S. degrees. There is also an M.A. program, and there is serious interest in developing a Master of Fine Arts program, which is largely a "studio" program.

Student credit hours taught have fluctuated in recent years: 11,062 in 1971; 8,388 in 1972; and 10,760 in 1973. In 1971, 29 majors were graduated; in 1972, 28; and in 1973, 21. There are currently 9 graduate students.

Students whose primary interest is in creative activities rather than art history engage in a high degree of individual work. The faculty observation is that students are making increasingly greater use of rooms for independent work in an atmosphere of competition.

There appears to be comparatively little use of audiovisual aids. An exception is the large slide collection used in art history and the individual slide collections owned by instructors. The Department would like to make greater use of media such as films and video tapes, but this has been limited by budget restrictions. Some money has been made available through grants for hardware, but the Department needs funds to develop software, such as single concept films.

The size of the faculty apparently has not kept pace with the growth of enrollment, making it impossible to add many new courses that the Department would like to offer to round out the programs. "Concurrent" instruction is common in the studios with one person teaching several different courses in the same room at the same time. The Library has served the Department well, but if an M.F.A. program should be instituted, new demands will be generated.

The Art Department is responsible for the Tweed Museum of Art, the only art museum north of Minneapolis. Senior student shows are held here as well as exhibits of regional and sometimes national interest. In the past, the head

of the Art Department has also been the director of the Tweed Museum of Art, with offices in the Museum. Beginning in Winter Quarter 1974, these functions will be separated, requiring new departmental offices outside of the Museum.

Facilities and Utilization:

Departmental and faculty offices appear to be adequate, although more office space is needed for teaching assistants. Some of the Department's space is highly specialized, with such equipment as ceramics kilns, foundry and welding equipment, and photo-processing equipment. Other facilities include basic drawing and painting studios.

A number of studio spaces are badly designed for their purposes. Some are basement rooms converted to drawing studios and have no natural light. Classrooms have also been converted to studios and also suffer from light problems. Creative work by both faculty and graduate students is inhibited by the lack of sufficient individual studio space. Three faculty members have been using rooms in Old Main but expect to be asked to give them up before long. Deficiencies, both in quantity and quality of studio space, are viewed as serious restrictions upon the development of new course and program (such as the M.F.A.) offerings.

Classes meet not only in the Humanities Building but also in Social Sciences and Anderson Hall, where much of the specialized studio space and equipment is located (such as that needed for ceramics). Faculty office space is also located in all three buildings, and the Department feels it would benefit from a less dispersed physical arrangement of its facilities.

Art is assigned one 15-station class laboratory, a 700 square foot print studio. Regular teaching takes place for 12.00 hours a week; other uses give a total weekly use of 26.00 hours. When the room is in use for teaching purposes, an average of 106% of the stations are occupied. For all uses, an average of 63% of the stations are occupied when the room is in use.

Twelve class studios total 14,179 square feet in area. They contain a total of 216 stations. They are used for teaching a total of 171.0 hours weekly, yielding an average room use of 14.25 hours per lab per week. Additional uses raise the total weekly room utilization to 343.00 hours for an average weekly room use of 28.58 hours each. When these rooms are in use for

teaching, 96% of the stations are occupied; for all uses, 64% of the stations are occupied.

No regular teaching use is reported for a 240 square foot study room with 15 stations. For other uses, largely slide study purposes, the room is occupied 15 hours weekly. When the room is in use, an average of 33% of the stations are occupied.

Art is also assigned two classrooms with 123 stations in all, and a total area of 1,501 square feet. They are used a total of 36 hours weekly for teaching, yielding an average room use of 18.00 hours each per week. Other uses raise the total weekly room use to 43.00 hours, or an average of 21.50 hours each per week. When in use for teaching, 95% of the stations are occupied on the average; for all uses, the comparable figure is 88%.

A 16-station multipurpose room (349 square feet) is used three hours weekly for scheduled teaching, with an average of 27% of the stations occupied. When all uses are considered, the hours of room use rise to 28.00 per week with 27% of the stations occupied on the average.

Service rooms for the ceramics and design studios appear to function adequately; storage for other studios is inadequate. The photography studio presents some special problems. This room serves courses required of all majors in Art. Only one instructional section can be offered due to lack of both space and faculty. Photographic facilities presently inhibit the Department from moving into offerings in cinematography, as well.

Of its two assigned classrooms, Room 314 in the Humanities Building is the most heavily used. This is a large 98-station room with its own projection room and an adjacent stack room for slide and file storage. It is used principally for lectures in art history and art appreciation. A room of this size, or perhaps even larger, is desired to keep the number of sections of such courses to a minimum due to the limited faculty available. The other classroom assigned to the Department is Room 26 in the Social Sciences Building. This room has 25 stations and is used for teaching only 11.0 hours per week. Several reasons for this usage are apparent. It is a basement room with poor ventilation and poor configuration which results in a bad projection angle.

In summary, the Department's most obvious facility needs are for more studio

space of better quality and for consolidation, if possible, of its somewhat scattered present spaces. The Department hopes some of these needs might be alleviated through reassignment to it of any space which might be vacated by the Social Sciences departments if additional facilities are provided for the latter departments.

ENGLISH (2320)

Staff:

8 Professors
3 Associate Professors
5 Assistant Professors
4 Instructors
12 Teaching Assistants
1 Secretary
1 Clerk-Typist

Activities:

The English Department offers undergraduate majors for both the B.A. and the B.S. degrees and also has a large graduate program. The latter offers the M.A. degree under the University-wide Graduate School. The service load is also large.

In 1971 English graduated 51 majors; in 1972, 59; and in 1973, 32. The declining number of majors was not, however, matched by the student credit hours, which dropped from 25,783 in 1971 to 24,781 in 1972, and then rose to 25,535 in 1973. There were 17 graduate students in 1973, of whom 12 held teaching assistantships. The Department anticipates an increase in the number of graduate students if more funds can be made available for teaching assistants.

The most concentrated use of teaching media is in the writing laboratory (H 470), which is equipped with tape recorders and special tables. The Department anticipates some added use of closed circuit television and videotapes, but it foresees no drastic change in basic teaching methodology.

Faculty research appears to be adequately accommodated in faculty offices.

Facilities and Utilization:

Departmental and faculty offices are adequate, but there are insufficient offices for the teaching assistants. Several teaching assistants share offices and others are scattered throughout the Humanities Building, largely in basement offices. Office spaces for teaching assistants are generally inadequate for the research being pursued by these people. A room formerly used as a departmental seminar room is now used as office space for 4 teaching assistants.

The English Department has assigned to it for teaching purposes the writing

laboratory and two special purpose class laboratories. The writing laboratory (Room 470, Humanities Building) is designed for individualized student use to develop writing skills in particular areas. The other two class laboratories are also equipped with special tables and chairs and are devoted to writing skills. The departmental conference room has been designated as a "commons" room where students can come to read, talk, study, or for social interaction.

In addition the Department conducts its classes in a variety of other locations throughout the campus, using largely general purpose classrooms.

The three departmentally assigned class laboratories total 47 stations in an aggregate of 1,607 square feet. They are in use for scheduled teaching a total of 80 hours per week for an average weekly use of 26.66 hours per room. During this time, an average of 96% of the stations are occupied. No non-instructional or unscheduled uses are reported for these laboratories.

The departmental multipurpose or "commons" room has 12 stations in 524 square feet. No formally scheduled instructional use is reported. For informal purposes, it is reported in use an average of 15 hours per week with 25% of the stations occupied.

LANGUAGE (2330)

Staff:

2 Associate Professors
2 Assistant Professors
5 Instructors
1 Secretary

Activities:

The Language Department offers undergraduate majors and minors leading to the B.A. and B.S. in French, German, and Spanish. The main emphasis is on communications skills, with a relatively few courses being offered in the literatures. There are currently no graduate programs.

The number of graduating majors in the languages have been declining from 23 in 1971 to 16 in 1972 to 13 in 1973, probably reflecting the lessening demand for secondary-school language teachers. Credit hours taught also declined from 8,173 in 1971 to 7,405 in 1972 to 6,699 in 1973. Classes are tending to become smaller in the beginning courses, dropping from a former average of 50 to about 35.

Instruction is centered in classrooms and in the language laboratory, which is equipped with the appropriate audiovisual systems. Other audiovisual aids and maps are used in the classrooms. A computer terminal in the departmental seminar room is used for instruction in German.

"Round-robin" seating is frequently desired in classrooms to promote face-to-face interaction and discussion.

Facilities and Utilization:

The Language Department is assigned departmental office and faculty offices, all in the Humanities Building. Although there are a sufficient number of faculty offices so that all are private, they are all relatively small, averaging 125 square feet. The Department is also assigned a seminar room and the language laboratory, which has 49 student stations. Attached to the lab are a small room for equipment storage and a workroom, also very small. Space assigned to the Department is all located in close proximity, promoting departmental cohesiveness. With the exception of better audiovisual storage and workroom space, the Department does not appear to have any serious unmet space needs.

One class laboratory -- the language lab -- is assigned to the Department.

With 49 stations in 1,137 square feet, the lab is in use for regular, scheduled teaching 18.0 hours weekly, with 62% of the stations occupied during this time. Other uses, such as independent study, raise the total hours of room use to 39.0 hours per week with 32% of the stations occupied, on the average, when the room is in use.

A small multipurpose room of 177 square feet with 6 stations records no regularly scheduled teaching uses. Other uses (largely individual study) account for 32.00 hours a week, with an average of 21% of the stations occupied when the room is in use. It will be recalled that this room houses a terminal for computer assisted instruction in German. The room also serves as a repository for a small collection of departmental books and periodicals.

MUSIC (2340)

Staff:

3 Professors
3 Associate Professors
5 Assistant Professors
4 Instructors
2 Teaching Assistants
5 Music Specialists
1 Clerk-Typist

Activities:

The Department offers undergraduate programs leading to both the B.A. and B.S. degrees, with the majority enrolled in the latter program in preparation for teaching music in the public schools. There is no graduate program at present.

Graduating majors have been increasing, with 5 in 1971, 8 in 1972, and 13 in 1973. The total annual credit hours taught by the Department have been rising in recent years: 5,574 in 1971, 5,511 in 1972, and 6,847 in 1973.

Because of the nature of the discipline, there is much individual instruction and much individual practice. No significant change in teaching methods is expected in the future.

Audiovisual aids play an important role in music instruction and their use is expected to increase if such materials can be made more convenient and available. The Department uses audio tapes for music appreciation courses, student practice review techniques, and attempts to tape all student recitals. Video taping and playback for vocal instruction is also used.

The Department has expressed some concern about the possible late afternoon scheduling of classes and the impact this might have on some of their programs. Most of the music organizations on campus, such as bands, orchestra, and jazz groups, are composed of from 25-50% non-music majors. If these students were in class during late afternoon hours when most musical groups meet, it would seriously jeopardize these programs.

Facilities and Utilization:

The large amount of space assigned to the Music Department reflects the individualized teaching programs and the need for many small private spaces.

In addition, rooms for group instruction must be equipped with musical instruments, recording and reproducing equipment, and other specialized teaching aids. Faculty offices appear to be adequate in numbers and in size. They are, on the average, larger than those assigned to most departments for the reason that they must also house musical instruments, principally a piano. They are heavily used for individual student instruction as indicated by reported usage. They also serve as faculty practice rooms and cannot be shared offices without impairing these important functions.

The most pressing facility need of the Department is for adequate rehearsal and performance rooms. This need is currently met in a most makeshift fashion. The Department has used the larger lecture halls in the Home Economics Building and Bohannon Hall for choral group practice and classes and for some instrumental recitals. The acoustics of these rooms are adequate and their location on the concourse system is excellent for public accessibility. However, problems arise due to the heavy scheduling of these rooms for classes,which leaves little time available for such uses, and the difficulty of leaving a piano in the limited space of the lecture area. The new Performing Arts Building now under construction is not expected to relieve this situation significantly since its performance and stage areas will be heavily used by the Theater Department, making them available only for occasional scheduled concerts.

The Department is presently making use of a basement room (No. 18) in the new Administration Building for band rehearsals, and increasingly is being forced to use this space for other group performances as well. The room was designed for computer use and is wired and ventilated for this purpose. Acoustically it is entirely inadequate and is located some distance from the remainder of the Department's facilities. Access is also a problem since this building is locked at 5:00 p.m. and a key is required to gain admittance. Band instruments are stored in a hallway near this room, and though they are in locked cabinets, they are conceivably vulnerable to a determined thief.

The utilization of some specialized spaces (e.g., the Listening Lab and certain practice rooms) is low because of the lack of funds to hire monitors to oversee the use and security of expensive equipment. Many practice rooms, which should remain accessible at all hours, must remain locked with only key-access because of insufficient staff to maintain security.

The band room in the Administration Building is presently assigned to the Music Department and has 65 stations in 1,879 square feet. For regular instructional purposes, the Department reports that the room is in scheduled use for 25.0 hours per week, with an average of 42% of the stations occupied. For all uses (including teaching), this room is used a total of 59.0 hours per week and 26% of the stations are occupied, on the average, during these hours of use.

Music is assigned 26 individual studios with a total of 37 stations in 1,410 square feet of space. Each studio is used an average of only .75 hours a week for regular teaching. Practice and other unscheduled activities raise the average room utilization to 24.36 hours each per week. When these rooms are in use for teaching purposes, the station occupancy rate is 206%. When all hours of use are considered, an average of 74% of the stations are occupied when the rooms are in use.

The Music Listening Room, a 48-station, 866 square feet, study room is used for teaching 8 hours a week, with an average station occupancy rate of 50%. This room contains a good deal of expensive equipment and materials and utilization is limited because the Department budget is insufficient to allow the staffing required for security purposes.

A 20-station classroom (719 square feet) is also assigned to the Department and is used for teaching 28 hours a week, with an average station occupancy rate of 109%. (No other uses are reported for this room.)

In summary, the critical needs felt by this department are for adequately planned, acoustically designed and appropriately furnished rehearsal and recital facilities, and for sufficient staff or student help to monitor and thus assure the security of practice and other areas which should be accessible but are presently locked for safety reasons.

PHILOSOPHY (2350)

Staff:

1 Professor
1 Associate Professor
2 Assistant Professors
1 Clerk-Typist

Activities:

The Department offers a B.A. major. Enrollment of graduating majors during the past three years went from 9 each in 1971 and 1972 to 6 in 1973. The Department estimates 20 majors this year. About 400 students each quarter are enrolled in philosophy courses, fulfilling their liberal education requirement, which is reflected in the student credit hours taught: 4,408 in 1971, 4,098 in 1972, and 3,957 in 1973. Enrollments presently appear to be holding steady. In spite of the declining load, the Department believes that enrollment will increase in the future. There is no graduate program, and none is foreseen in the near future.

Teaching methods are traditional; that is, there is little occasion for sophisticated audiovisual aids, but small-group discussion is encouraged.

Facilities and Utilization:

Departmental and faculty offices are presently adequate. Classes are held in general classrooms in Anderson Hall and the Humanities and Home Economics Buildings. The principal perceived facilities need is for small rooms for small-group learning and discussion. Most of the classrooms used by this department are too large for the course enrollments and do not allow for the "give-and-take" discussions desired in philosphy. Smaller classrooms with movable furniture are much more desirable for this kind of exchange.

Offices are the only spaces assigned to the Philosophy Department. Statistical utilization analysis consequently does not apply. The Department expressed a perceived need for a "discussion-after-class" room to which students and faculty could adjourn, a room which is conducive to small-group discussion and interaction.

SPEECH, COMMUNICATION, AND THEATER ARTS (2360)

Staff:

2 Associate Professors
4 Assistant Professors
3 Instructors
1 Secretary

Activities:

The undergraduate programs include majors and minors leading to the B.A. and B.S. degrees. There are no graduate programs, nor are any planned at present.

Twenty-seven speech/communications/theater majors graduated in 1971. The figure fell to 25 in 1972, and dropped slightly to 21 in 1973. During the same years, the credit hours taught rose and then dropped from 8,147 (1971) to 9,443 (1972) to 9,237 (1973).

In general, the courses offered by the Department fall into the clearly demarked areas of (1) rhetoric and communications and (2) theater arts. Sponsored co-curricular activities include intercollegiate debating; KUMD-FM, a student-operated radio station; and the University Theater.

In addition to general classroom space, instructional activities are carried on in two communications laboratories (categorized as classrooms) in A. B. Anderson Hall. Large classes meet in the auditoria in Bohannon Hall and the Home Economics Building. The level of audiovisual usage is very high, and it includes audio and video taping with playback, CCTV, slides and films, and map boards.

Facilities and Utilization:

The Department is currently in a transitional stage with the faculty associated with the theater curriculum moving into offices in the new Performings Arts Building. Departmental offices are presently located in A. B. Anderson Hall, and they are small and crowded, with inadequate storage and no work space. All faculty have private offices, although most are small.

Speech and Communications' two communications laboratories have control and video taping rooms located between them and they are reasonably sophisticated in capability. Eight video tape monitors are located in a small adjacent room, but these should be in private carrels if space were available. Both laboratories are acoustically inadequate to the extent that playback of audio recordings is difficult.

Lower division service courses are too large to be accommodated in space assigned to the Department, and consequently they are held in large lecture halls which are suitably equipped with required audiovisual devices.

The departmental seminar room is used to house a collection of relevant publications and tapes, but space is insufficient to allow full use of these materials. The use of audiovisual media is important to this department's functions, and include the use of graphics, popular media, comparisons of TV commercials, etc. However, budgets do not permit sufficient staff and equipment to allow the Department to produce materials appropriate for its use. Color TV capacity is considered necessary as is a rehearsal room for student video taping and playback.

Other teaching methodology employed by the Department generates a need for facilities that allow shifting from large to small groups, individual student project work space, and capability for filming in the field; most of these needs are unmet at present.

The new Performing Arts Building will include the presently occupied offices, but when completed will also provide a general purpose classroom (60 stations), various performing areas (a university theater, a small experimental theater, a rehearsal theater, a dance studio, etc.) and appropriate work spaces, lounges, ticket offices, and other support facilities.

As a stop-gap measure until the new building can be occupied, the Department is currently assigned two offices and a 2,622 square foot theater-auditorium in Old Main on the lower campus. Although space has been adequate, generally, it is poorly located for easy accessibility for both students and the public. In spite of these drawbacks, the space assigned to the Department in Old Main has enjoyed good utilization considering both the quality and the location of these facilities. The Department has also made use of other spaces in Old Main for shops, storage, and rehearsal rooms.

The auditorium in Old Main is in use for teaching 11 hours per week with an average station occupancy rate of 35%. Additional uses raise the total weekly utilization to 35 hours, with 18% of the stations occupied (on the average) during all hours of use.

The two communications labs (95 stations in a total of 1,635 square feet)

are in use for teaching for a total of 36 hours per week, with the station occupancy rate at 50% during these hours of use. For all purposes, hours of of use rise to a total of 62 hours per week (or 31 hours per room), and 35% of the available stations are occupied during these hours.

For regualr teaching purposes, the 12-station speech seminar room is in use 5 hours a week. When in use, the station occupancy rate is 88%. When all uses are added, this room is used 16.0 hours per week with 46% of the stations occupied on the average.

In summary, the Department's principal needs lie in the areas of improved availability of audiovisual media use and more flexible classroom space. The new Performing Arts Building promises to provide an excellent theater facility, a great improvement over what the Department has had available for its use in the past.

THE TWEED MUSEUM OF ART (2391)

Staff:

1 Director
1 Receptionist
1 Secretary
1 Technician

Activities:

The Tweed Museum of Art, located in an extension of the Humanities Building, is an integral part of the Department of Art. It is open the year around, both for students and for the general public. In addition to the Museum's permanent collection, periodic exhibitions are hung of regional or national importance.

During their senior years, all art majors present an exhibition of student work in the Tweed Museum of Art. Examples of such student work may be left permanently on request.

Facilities and Utilization:

The spaces assigned to the Museum include galleries, a library, workrooms, and storage spaces. To our observation, the spaces are appropriately designed and well used. The Museum's location on a central concourse of the circulation system is excellent for public and student access.

The Tweed Museum of Art is not used for any regular instruction. Exhibitions and informal classes and study take place for approximately 50 hours a week. In addition, the Museum is widely visited by people from the community and by schoolchildren from a wide geographic area. Formal utilization statistics are neither available nor appropriate.

Staff: KUMD-FM is operated by student staff, primarily from the Department of Speech, Communication, and Theater Arts.

Activities: Broadcasting on an assigned frequency of 89.1 mc., this radio station operates on a philosophy of "alternative programming" to serve a variety of local interests including both the campus community and the general Duluth public. Financial support is derived from the campus community.

Facilities and Utilization: KUMD-FM occupies a suite of rooms on the first floor of the Humanities Building comprising the station's studios, offices, and work and storage areas. Since no formally scheduled instruction takes place in these facilities, utilization statistics are not in order. The space available appears to adequately serve present activity levels.

Included in the Social Sciences Division are the departments of Business Administration, Economics, Geography, History, Political Science, and Sociology-Anthropology. In addition, three programs can be mentioned here, two of which are conducted through the Division and one of which, while unique, is allied to the social sciences. The latter is the American Indian Studies Program which is described later on in this section. Of the other two, the longest-standing is Social Science (formerly Social Sciences and Social Studies), an individualized, inter-disciplinary program that offers a major in Social Science for the B. A. degree and one in Social Science Education for the B. S. degree. This program graduated 42 majors in 1971, 24 in 1972, and 13 in 1973.

The third program is Urban Studies, which is also an inter-disciplinary program and leads to the B. A. degree. In 1972 there were 6 majors, and in 1973 there were 11. In the winter of 1974, there were 18 senior majors, 11 juniors, and 9 sophomores . Core courses are offered in Economics, Geography, Political Science, Psychology, and Sociology, with departmental concentrations in the upper division.

A decision package has been prepared for an inter-disciplinary M. A. program in Community and Regional Studies. If approved, this program will call for three new faculty positions in Geography, Political Science, and Sociology.

In 1971, the Social Sciences division taught 63,723 student credit hours, in 1972 the figure rose to 66,080, . and in 1973 it continued to rise to 68,724. The numbers of majors graduating from the Social Science departments, however, declined during the same years from 450 in 1971 to 392 in 1972 to 274 in 1973.

Business Administration and Geography, as well as the divisional offices, are located in the Social Science Building. With the exception of the Center for Economic Education, the department of Economics has its offices in the Library. Most of the department of History is located in Anderson Hall. Political Science has its offices in the Home Economics Building. Sociology-Anthropology is located entirely in Anderson Hall. American Indian Studies also has its single office in Anderson Hall.

The inadequacy of existing space for several of the departments of this division and the building request for new Social Sciences facilities is discussed at some length elsewhere in this report. In brief, the reported deficiencies have to do with the inadequacy and inappropriateness of existing space to the

newer instructional technologies. Business Administration, Sociology-Anthropology, and Economics have been particularly hampered by these factors. Geography is also cramped, particularly in its specialized spaces. Political Science and History do not appear to be suffering currently from any major space inadequacies.

The divisional facilities are minimal, consisting of three offices and a conference room. The conference room (SS118), which has 14 stations in 404 square feet, is used for teaching purposes 10.00 hours per week. Other uses raise the total room use to 34.50 hours per week. When in use for teaching, 88% of the stations are occupied, on the average. For all uses, 64% are occupied. This room lacks such necessities as acoustical tile, floor coverings, CCTV hook-up, bulletin board space and comfortable furniture.

The facilities problems of the Social Sciences and its departments are discussed in greater detail in Chapter 7 of this report.

BUSINESS ADMINISTRATION (2410)

Staff:

3 Professors
3 Associate Professors
4 Assistant Professors
1 Instructor
2 Lecturers
2 Secretaries

Activities:

This department offers three baccalaureate programs: B.Acct., B.Bus.Ad., and B.S. in Bus.Ed. Although there is no master's degree program at present, the department is proposing a Master of Business Administration program to meet the expressed demand.

Business Administration has registered a modest net growth during the past three years on the basis of the student credit hours taught: 9,569 in 1971, 8,945 in 1972, and 9,742 in 1973.

Graduating majors in the same years were:

	1971	1972	1973
B.Acct.	33	40	20
B.Bus.Ad.	90	89	55
B.S. in Bus.Ed.	15	13	11
	138	142	86

Teaching is increasingly directed toward small groups and individualized instruction, with much use of tapes, business machines, and other instructional aids. The Department is currently under strong pressure to upgrade its programs to be more responsive to the needs of today's business world. As is noted in Chapter 7, the Department is in receipt of recent letters from state education officials in both Minnesota and Wisconsin, indicating that the certification of graduates of the B.S. in Bus.Ed. program may be in danger unless better equipment and facilities are provided as quickly as possible. These are described under "Facilities and Utilization", below.

The library meets the Department's needs adequately now, but a stronger collection would be required to support an M.B.A. program. The faculty is just beginning to use the computer center, but increased use is expected in the future with at least one computer-oriented faculty member joining the staff.

Facilities and Utilization:

The Department is currently short one faculty office, requiring the single part-time faculty member to share an office with a full-time person.

The Department conducts its classes both in assigned space (statistics, typewriting, and accounting labs and two business machine rooms), and in general classrooms, mostly in the Social Science Building.

The most pressing facility needs for the program in Business Education are spaces appropriate for audiovisual materials and other forms of individualized instruction, more adding and calculating machines, and electric typewriters, word-processing equipment, instructional equipment in reprographics, and facilities for model office simulation.

The Business Administration program's needs are for additional office and seminar space, and audiovisual and computer hook-ups.

The Accounting degree program is also constrained by the shortage of space for small-group and individualized instruction.

In all programs, case study rooms are required in which students can interact face-to-face. Adequate blackboards and projection equipment are also a necessity.

Business Administration is currently assigned 4 class labs with a total of 119 stations for statistics, accounting, business machines, and typewriting. These rooms are in use an average of 19.00 hours per week for teaching purposes. Other uses contribute to an average room use of 46.25 hours per week per lab for all purposes. The station occupancy rate is 1.02 for teaching, meaning that while the room is in use 102% of the available stations are occupied. When the rooms are in use for all purposes, an average of 60% of the stations are occupied.

One of these class labs, the typewriting room (SS224) must also accommodate shorthand, which is reported to create an unfavorable teaching environment. A journalistic writing class also meets in this space. It is believed that such deficiencies will become even more critical if an M.B.A. program is undertaken.

ECONOMICS (2420)

Staff:

1 Professor
3 Associate Professors
3 Assistant Professors
2 Instructors
1 Secretary

Activities:

The Economics Department offers majors and minors leading to both the B.A. and the B.S. degrees. There is no graduate program, nor is there a strong likelihood of its development in the future. The Department will, however, make a substantial contribution to graduate education if the proposed M.B.A. program is in fact developed.

Economics graduated 28 majors in 1971, 18 in 1972, and 14 and 1973. Credit hours taught, however, have increased even as the number of majors was decreasing: 7,488 credit hours were taught in 1971; 8,159 in 1972, and 9,148 in 1973.

The Economics Department has expressed an interest in moving away from standard classroom teaching and, instead, adopting a case-study approach. Opportunities for independent study, which have been limited, are expected to undergo some expansion. Recent enrollment expansion has been absorbed by increasing section sizes in lower-division courses. This increasing service load reflects the importance of Economics to other academic programs.

The faculty has reported that course content is currently affected undesirably by the deficiencies of the facilities available. Under present conditions, computer activities cannot be coordinated with statistics content. Seminar rooms, more accessible computer facilities, and case study rooms are desired. (The case study rooms would be designed with 15 to 20 stations at tables on curved tiers.)

Although faculty research is undertaken, appropriate facilities are virtually non-existent. A currently funded research program requires three or four persons to work together in a faculty office.

The Department's principal functional relations are with the Department of Business Administration and the Bureau of Business and Economic Research.

Facilities and Utilization:

The Economics Department is currently somewhat scattered, leading to the complaint that there is a lack of departmental identity. Faculty offices are found both in the Library and in the Social Science Building. One faculty member, who concurrently acts as director of the Bureau of Business and Economic Research, occupies the office in the Social Sciences Building assigned to that function, while three more faculty are accommodated in another Social Science Building office assigned to the Center for Economic Education, a departmental function. In all, there are seven offices for nine faculty members.

Classes are taught in a variety of locations, with the introductory classes meeting in large lecture halls in the Home Economics, Education, and Life Science Buildings. Other classes are held in Social Science and in A. B. Anderson Hall.

Economics is assigned no spaces for regular instruction. The Center for Economic Education is housed in a 493 square foot office with 8 stations. Total usage is reported as 17 hours a week. When in use, 48% of the stations are occupied.

GEOGRAPHY (2430)

Staff:

4 Professors
1 Assistant Professor
1 Instructor
1 Secretary

Activities:

The Geography Department has experienced a decline in graduating majors from 32 in 1971 to 26 in 1972 to 11 in 1973. There are currently 60 undergraduate majors, the majority of whom are in the B.A. rather than the B.S. program. The Department carries a large service load, with some 700 students enrolled each quarter in geography classes, many of them satisfying their liberal education requirements. The service load is reflected in the credit hours taught, which vary only slightly from year to year: 8,606 in 1971, 8,693 in 1972, and 8,487 in 1973. There are no graduate students. Lower division classes are generally large lectures, with upper division classes meeting in smaller groups. Slides and films are used. The department head indicated that serious limitations on the scope and methods of the teaching program were imposed by the absence of such special purpose rooms as those accommodating plotters and computers. If facilities were available, the Department would consider improved teaching methods such as individualized instruction with increased use of audiovisual materials, tutorial carrels, etc.

There does not appear to be a large amount of research carried on in this department.

Facilities and Utilization:

The Department is currently assigned a department office, 5 faculty offices, a classroom, a cartography lab, a map library, and a map and equipment storage room. As noted above, the bulk of its teaching activities are carried out in general purpose classrooms, both in Anderson Hall and in the Home Economics Building.

The cartography lab (SS 320) is severely overcrowded even for the 16 drafting tables it now accommodates in 738 ASF. Not only are more stations needed, but also more work room. Some pieces of equipment which should be in the cartography room are currently located in the map library, which in turn is too small to serve as an adequate campus map library. There is also some concern over the floor loading capacity of the map library.

The facility needs perceived by the Department include another faculty office (they are currently short one office), a larger and improved cartography lab, a larger map library, and more storage for maps and equipment. In addition, if the Department is to teach modern methods of geographic analysis, a machines room is needed as well as a map interpretation room and an audiovisual tutorial room. A storage room of 67 ASF is clearly inadequate.

The reported utilization of the cartography lab is relatively low because of its specialized nature and because cartography is not offered during the Fall Quarter. It is also, however, used for faculty research, faculty drafting, student research, student drafting, study, test grading, test review, tutoring, and other unscheduled activities.

The cartography lab is in use 3.00 hours a week for teaching during the Fall Quarter. Other uses raise the total utilization to 28.00 hours per week. When the room is in use for teaching, 156% of the stations are occupied, which is, of course, much too high. For all uses, 31% of the stations are occupied.

No teaching uses are reported for the 8-station study room (254 ASF) assigned to Geography. Other uses account for 41 hours of utilization per week. When in use, an average of 24% of the stations are occupied.

Geography's 30-station classroom (SS 324, 748 ASF) is used for teaching 17.00 hours a week. Additional uses raise the weekly utilization to 19.50 hours. When in use for teaching, 47% of the stations are occupied. For all uses, 46% are occupied.

The Department's assigned facilities are also used for meetings of the Geography Club and Honorary Geography Society, departmental meetings, unscheduled lab exercises, informal discussions, etc.

HISTORY (2440)

Staff:

3 Professors
2 Associate Professors
2 Assistant Professors
2 Instructors
3 Teaching Assistants
1 Secretary

Activities:

The Department offers two undergraduate majors with approximately equal numbers enrolled in the B.A. and B.S. programs. In 1971 there were 92 graduating majors; in 1972, 49; and in 1973, 34. During the same years, the student credit hours taught declined markedly -- from 15,050 in 1971 to 14,713 in 1972 to 11,886 in 1973. Neither the numbers of staff nor the undergraduate enrollments are expected to change appreciably in the near future.

The Department also offers a Master of Arts degree program in which five graduate students were registered in Fall Quarter 1973. In the long range, there is the possibility of expanding the master's degree program to 15 or 20 students.

At the present time, the use of instructional media is somewhat limited, a situation which is related to the logistic problems created by history classes being scattered throughout the campus. There would apparently be greater use if materials were more easily accessible.

History does not require research space outside of the faculty offices. The Department would like a room for documents of interest for people working in regional or local history.

Facilities and Utilization:

This department currently occupies a departmental office and 8 faculty offices on the second floor of Anderson Hall. These offices appear adequate. The teaching assistants occupy 2 offices on the first floor level of the Humanities Building. It would be desirable to find the teaching assistants rooms closer to the faculty.

The Department is currently assigned no specialized rooms, with its courses being held in general-purpose classrooms. These are in many different

locations: Life Sciences, Anderson Hall, Social Sciences, Humanities, R.O.T.C., and Chemistry.

The Department's assigned facilities are also used for departmental meetings and make-up examinations.

The department head does not find the present situation to be difficult but observed that it would be desirable to have a seminar room near the departmental and faculty offices (presumably in addition to ABAH 201, already assigned to History).

The History seminar room -- 12 stations and 213 square feet -- is used 9 hours a week for teaching. Other uses contribute to a total utilization of 15 hours a week. When the room is in use for teaching, 29% of the stations are occupied. The corresponding figure for all uses is 36%.

POLITICAL SCIENCE (2450)

Staff:

3 Professors
1 Associate Professor
3 Assistant Professors
1 Secretary

(One professor is also Assistant Dean of the Graduate School.)

Activities:

Political Science offers an undergraduate program leading to the B.A. degree. There were 37 graduating majors in 1971, 35 in 1972, and 22 in 1973. Student credit hours taught in these years were 8,325; 8,933; and 8,990. The head of the Department expects that the undergraduate enrollment in these courses will stabilize at the 1971 level.

There is currently no graduate program. As has been noted, however, the Social Studies division is planning an interdisciplinary master's program in Community and Regional Studies, which will require Political Science to acquire an additional faculty member. A proposed Canadian Studies program, if funded, would require further new faculty positions.

Teaching methods are currently traditional, consisting largely of lectures with a minimum of group discussion. Instructional media usage is increasing but is still not large by comparison with other departments.

The computer was used for the first time this year as a research tool, but the Department in not heavily oriented toward the mathematical analysis of political phenomena at present. Access to the Computer Center is, however, desirable.

Facilities and Utilization:

In the fall of 1972, the Department moved to the Home Economics Building where its departmental offices are now located. These offices appear adequate for the present staff. Storage, however, is extremely limited, and such space is needed, particularly for maps.

Political Science is assigned no classroom or seminar space. Classes are held in a variety of general-purpose classrooms throughout the campus and in a seminar room in the Social Sciences Building (SS 118).

SOCIOLOGY-ANTHROPOLOGY (2460)

Staff:

3 Professors
3 Associate Professors (1 on leave)
3 Instructors
1 Teaching Assistant
1 Secretary

Activities:

The Sociology-Anthropology Department offers a major for the B.A. degree and a minor for both the B.A. and B.S. degrees. There were 81 graduating B.A. majors in Sociology in 1971, 92 in 1972, and 83 in 1973. Student credit hours taught rose from 14,685 in 1971 to 16,405 in 1972, and then declined to 14,900 in 1973. This decline appears to be largely due to the shift of social work courses to the School of Social Development. There is no graduate program.

Of the Sociology majors, about one-third are in social service, another third in criminology, and the remaining third in the concentration areas of community and social organization, social psychology, social issues and change, and anthropology. The School of Social Development is currently teaching the social work courses that constitute the social services concentration in Sociology-Anthropology. The students in question still graduate with a Sociology major and will continue to do so through this year. Criminology will also be taught by the School of Social Development.

Teaching methods include both traditional lectures and the newer teaching styles, including small-group problem-solving work and some computer-assisted instruction. The Department believes that more individualized and media-assisted instruction would be carried on if the Department's facilities were more amenable to such teaching modes, and if the faculty had more time to develop such activities.

In order to take advantage of modern teaching technologies, the Department has stated that it will require specialized and small-group discussion rooms. The desired specialized space includes one-way observation rooms, space appropriate to social science simulations, and individualized instruction space used in conjunction with a multi-media center. In addition, a physical anthropology lab would permit restructuring of the Anthropology curriculum.

Faculty research is largely accommodated in the existing office space, although it must be observed that the faculty offices are exceedingly small, all being in the neighborhood of 100 ASF. Independent study and student research would be encouraged by appropriate facilities as noted above.

The Department has close teaching relationships with the School of Social Development and the Medical School, both of whose faculty take part in the teaching programs.

Facilities and Utilization:

The Department is assigned a departmental office and 10 faculty offices, including the department head's office, in A. B. Anderson Hall. Both administrative and faculty offices are substandard in size. The faculty offices are, in fact, much more suitable for teaching assistants.

Classes are held in classrooms in Anderson Hall and also in the Social Sciences and Humanities Buildings. The use of newer teaching technologies has been severely hampered by the inflexibility of the Anderson Hall classrooms. Furthermore, acoustics are bad.

Sociology-Anthropology is assigned a 12-station seminar room (ABAH 301, 213 ASF) and a learning center (ABAH 345, 30 stations, 970 ASF). The learning center, or commons room, is subdivided by partitions so that it may be used by several groups at a time. One area is furnished as a lounge, one as a seminar area, and one as a classroom. In addition, it is equipped with some mechanical calculators and typewriters and with research project files.

Formal teaching takes place in the seminar room (ABAH 301) and the learning center for a total of 20 hours a week. Other uses contribute to a total of 68 hours a week for the two rooms, resulting in an average use of 34.0 hours per room. When the rooms are in use for teaching, 54% of the stations are occupied on the average. For all uses, the figure is 38%.

AMERICAN INDIAN STUDIES (2461)

Staff:

1 Instructor
1 Secretary (part time)

Activities:

A program rather than a department, American Indian Studies was developed in cooperation with the local Indian community to promote the awareness of Indian culture and history both among Indians and other races. (There are about 80 full time Indian students on campus with perhaps another 12 enrolled in extension classes.) The studies, in addition, contribute to the training and resources of those teaching social services.

Two courses are currently offered, one in the Chippewa language and the other a survey course in 20th Century Indian life. 105 credit hours were taught in 1973.

The director foresees expansion of the staff by one faculty member and an administrative assistant.

Teaching methods include one-large class, a seminar, and individual study. Audiovisual and television media are used, and more usage is foreseen.

The program also promotes active relationships with community groups who meet on the campus. The largest of these is the "Indian Week" in the spring, which includes speakers, movies, and concerts drawing as many as 500 people from the community.

Facilities:

American Indian Studies currently occupies minimal quarters, the director and his part time secretary sharing an office. It is doubtful if the program will ever require a large amount of assigned space, but adequate provision should be made for the current and future staff. Classes are presently taught in the Social Science Building.

SCHOOL OF SOCIAL DEVELOPMENT (2500)

Staff:

2 Professors
3 Associate Professors
1 Visiting Associate Professor
1 Assistant Professor
4 Instructors
6 Teaching Assistants
1 Departmental Assistant
1 Secretary

Activities:

The School of Social Development (formerly the School of Social Work) accepted its first students in August of 1972. At the present time it is primarily a graduate institution, with 37 students currently enrolled in a 12-month master's degree program. The upper limit for the graduate program is 100 students -- 60 to 70 are expected to enroll in July of 1974. (Unlike the rest of the campus, the School's academic year begins in July and continues for 12 months.)

The School has also assumed this year the responsibility for instructing undergraduates in the concentration area of social service. (Currently these undergraduates are still considered as majoring in Sociology.) To make maximum use of available educational resources, instruction of undergraduates in the Corrections concentration will also be transferred to the School. By the Fall of 1974, the School expects to have under way a Bachelor of Social Development program, with an initial enrollment of approximately 50 students.

The graduate program calls for students to specialize in a social development sequence, including regional planning, community development and organization, research, and program coordination and management.

In place of the usual social work approach to problems on a case-by-case basis, the School emphasizes long-range, comprehensive solutions through social and economic development plans. Special attention is directed toward the American Indian communities in Northeastern Minnesota.

The faculty is expected to grow from the present 11 to 15 in 1974-75 and to 21 by 1979-80.

There is little standard classroom instruction in the graduate program. Team teaching, involving 2 to 5 faculty, is important. Workshops are held on

weekends. Audiovisual media, including videotape, are used frequently. Access to a computer is also important.

In the field project sequence, teams of 2 to 6 students work in community agencies, returning to the School for a 3-hour conference once a week.

Research, both on the faculty and student levels, has been restricted by the inadequacy of the campus library in this area. In addition, the campus library is closed during vacation weeks when the School of Social Development remains in session.

The School has close academic relationships with the departments of Economics, Political Science, and Sociology-Anthropology, and with the American Indian Studies Program.

Facilities and Utilization:

The School of Social Development currently occupies one of the residences and the carriage house on the Alworth property, about a mile from the upper campus. In spite of some remodelling, these facilities are inadequate in size and inappropriate in character for the School's program either now or in the future.

The Alworth House includes two classrooms, one of 18 stations and 264 square feet, and the other of 25 stations and 318 square feet. These rooms are in use for a total of 38 hours a week, for an average weekly room use of 19 hours each. When the classrooms are in use, 141% of the stations are occupied, indicating a condition of severe overcrowding.

Two conference rooms, one of 6 stations and one of 5 stations, are in use an average of 5 hours a week for non-scheduled uses. A 10-station study room is available, as is a lounge with 6 stations.

In the Fall Quarter of 1973, two faculty offices in Anderson Hall were assigned to the School. With one exception, faculty offices at the Alworth House are shared, with 3 or 4 faculty in a single room. (The decision to share offices was made in order to conserve rooms for other uses, such as small-group meetings.) The departmental offices are also crowded.

The School has identified the following principal facility needs for the future: small-group discussion rooms (up to eight people), classrooms to accommodate

classes usually of less than 50 students and rarely of 100 students, seminar rooms (up to 15 people), a conference room (30 stations), and access to a lecture hall of 100 stations.

Staff:

The School of Medicine currently employs a full-time equivalent faculty (FTE) approximating 25, with an additional number of largely volunteer faculty in the clinical science disciplines, including those local practitioners serving as preceptors for medical students. In addition, the School employs supportive staff consisting of laboratory technicians, secretarial and clerical staff, laboratory animal technicians, and animal caretakers. Departments within the Medical School are organized around the following disciplines: Behavioral Sciences, Biochemistry, Biomedical Anatomy, Clinical Sciences, Microbiology, Pathology, Pharmacology, Physiology, and Preventive Medicine. Faculty in some of these departments have joint responsibilities in other UMD instructional departments, notably Behavioral Sciences with Sociology-Anthropology; Biomedical Anatomy with Biology; Physiology with Biology; and Biochemistry with Chemistry. Faculty of the Pathology Department is composed of practising pathologists associated with the local hospitals who devote part of their time to teaching for the Medical School.

Activities:

The principal function of the School is to provide the first two years of medical education in the basic and clinical sciences. The School enrolled its first class of 24 medical students in the fall of 1972, with a second class of 24 entering in the fall of last year. Entering class size is scheduled to increase to 36 students in the fall of 1974. After successfully completing the two years of medical instruction at UMD, students are qualified for guaranteed transfer to the University of Minnesota Medical School in Minneapolis, or for competitive entry into the clinical phase of any U.S. medical school for completion of requirements for the M.D. degree.

The medical curriculum takes advantage of the small class size, emphasizing small group discussions and seminars, with instruction through participatory rather than didactic methods. Clinical sciences are introduced at an early stage and are integrated to the greatest extent possible with related material in the basic medical sciences. A further emphasis of the curriculum lies in encouraging the ultimate selection by its students of primary care or family practice specialties in rural and small town practice settings in response to regional needs.

Several graduate education programs in various Medical School and related disciplines are now under consideration. These include an M.S. degree program in "Medical Microbiology & Immunology and Experimental Pathobiology," estimated to attract from 3 to 12 students, and

the development of a clinical chemistry laboratory at UMD as a basis for a future M.S. program in clinical chemistry. The latter would be a joint activity of the Medical School's Biochemistry Department and the Department of Chemistry. In addition to these planned programs, several special students are currently taking instruction at the Medical School which includes individually arranged tutorial and research studies under the direction of specific faculty and/or attending lectures in the Medical School's regular curriculum.

An essential and rapidly growing activity of the School of Medicine is in the area of biomedical research. Medical schools have traditionally regarded the generation of new knowledge as a vital part of their obligation and responsibility. UMD is no exception and its faculty's orientation is perhaps more toward "applicable" research (e.g., such areas as cardiophysiology, neurophysiology, fresh water micro-organisms, and health care delivery) than the so-called "pure" research. Research activities play an important role in teaching and students are encouraged to participate at appropriate levels with faculty or in their own research.

A variety of relationships exists between the School of Medicine and other entities. Among other instructional departments at UMD, the closest ties are with Chemistry, Sociology-Anthropology, Psychology, Biology, and Dental Hygiene. These are expected to increase in the future. A close physical relationship exists between the Health Sciences Library and the campus Library with the former making its collection available to students, faculty, and others in related fields. "Off-campus" relationships are also significant. School of Medicine faculty give invited lectures to students of St. Scholastica College and the St. Luke's School of Nursing, for example. Medical students receive clinical instruction at all local hospitals and health care institutions, and through individual preceptorships with practicing physicians in their offices. Courses in pathology for medical students are taught principally at St. Mary's Hospital.

Facilities:

The School is presently housed on the lower campus in the Laboratory School Building. In addition, some functions and personnel of the School are accommodated in the adjacent "Old Main" Building. The Laboratory School Building was remodelled to serve as an initial home for the School

and enabled the program to get started earlier than would have been the case if the program had had to await completion of new construction of permanent facilities.

At the end of Fall Quarter 1973, the School had assigned to it a total of 21,393 net square feet. Of this total, 16,857 is located in the Laboratory School Building and 4,536 is located in Old Main. It should be noted that much of the space in Old Main assigned to the School is in need of some modification and/or renovation, and consequently not all is ready for occupancy at this time.

Space occupied on the upper campus by the Health Sciences Library is assigned to the campus Library. Offices and research laboratory facilities of the biochemistry faculty are located in and assigned to the Department of Chemistry by agreement between Chemistry and the School of Medicine. Clinical faculty and the Department of Pathology are housed principally at the local hospitals. St. Mary's Hospital has made available to the School a 24-station pathology teaching laboratory and all of the local hospitals make available their classrooms and auditoria for use by the School.

Facility needs of the School are discussed in detail in Chapter 8 of this report. It is important to note here that severe space shortages do exist now and will increase in the near future, particularly in the categories of research laboratories and office space needed to house new faculty members added to meet teaching responsibilities of an increased enrollment. All research laboratories now in existence are operating at full capacity and some space designed to support teaching and research functions has been taken over for laboratory investigation. There are a total of ten spaces which are classified as research laboratories in the Medical School. Four of these are areas that were originally planned either as part of teaching laboratories or as laboratory support areas. Almost all of these labs are shared by more than one faculty member. Additional animal space is badly needed and cadaver preparation and storage areas are totally lacking. Almost all of the larger faculty offices are already shared, which impairs their function due to noise and lack of privacy. Some faculty with joint appointments have offices only on the upper campus and are assigned no space in the Medical School.

Space devoted to instructional purposes consists of two classrooms of

705 sq. ft. each, a multipurpose teaching laboratory of approximately 1,100 sq. ft., and a gross anatomy dissection laboratory of 803 sq. ft. Each of the classrooms has thirty student stations. While the rooms are large enough to accommodate a few more stations, due to their design characteristics, the noise level resulting from more than thirty people would seriously hamper the function of these classrooms. The multipurpose laboratory has twenty-eight student stations and the gross anatomy lab accommodates twenty-four stations. There are no conference rooms, seminar rooms, or other areas suitable for small group meetings and discussions. Two additional rooms have been set aside for student use. These are the Resources Center, equipped with eight audiovisual carrels, and the Study Center with 24 study carrels and a small student lounge with seating for seven.

Utilization:

The utilization of instructional space in the Medical School is based on a fourteen-week period from September 4 through December 7, 1973. This equates roughly to Fall Quarter as observed by most academic programs at UMD, but includes a three-week period at the beginning when most of the rest of UMD was not in session. It is recognized that one quarter's experience is not an entirely adequate reflection of the use of space by the medical curriculum and that at least one full year's instruction of both first and second year classes should be considered. This is particularly important in the case of the Medical School due to the uniqueness of its curriculum structure which does not closely follow a "quarterly" organization. For example, some courses in the curriculum may last only a few weeks rather than an entire quarter and very often do not meet on the same schedule from week to week. Some courses also overlap more than one quarter. The result is that no two weeks in the year's curriculum are the same and the use of instructional facilities can vary widely depending on the subject matter under consideration at any one time.

During this fourteen-week period, the two classrooms (Room 200 and Room 217) were used for scheduled class instruction an average of 19.9 hours each per week. During those hours the average classroom station was in use 15.33 hours per week, yielding a station occupancy rate of 77%. For all uses (including regular instruction and other uses such as faculty meetings, student meetings, seminars by visiting speakers, meetings with

members of the community, independent study, etc.) these two classrooms were in use an average of 42.15 hours each per week. The average classroom station was in use for 24.94 hours per week for a 59% station occupancy rate for all uses.

The multipurpose teaching laboratory (Room 15) was used for scheduled course instruction an average of 7.4 hours per week with the average station in use for 4.25 hours per week. The station occupancy rate for scheduled course work was 57%. For all uses, the multipurpose lab was in use an average of 50.4 hours per week with a station utilization of 20.32 hours per week, giving a station occupancy rate of 40%. It will be noted that room use hours greatly increase when all uses are considered. Outside of regular class hours, this laboratory is used for student and faculty research, research by another campus department, film showings, organizational meetings and independent study. This usage is an accurate reflection of the emphasis on individual study of the Medical School curriculum. A factor influencing the station occupancy rate of this class laboratory is the simultaneous schedûling of the laboratory and a classroom for a significant portion of course work. In these instances students go back and forth between the laboratory and the classroom on an informal basis. Since both rooms are in use and unavailable during these hours for other purposes, the course enrollment (rather than the course hours) was divided between the two rooms. This has the net effect of keeping the room use hours as scheduled, but dropping the station utilization rate.

Several other factors affect the overall utilization of this laboratory. Originally planned and equipped as a teaching laboratory, it has since been subdivided and almost half of it is now used as a physiology research lab. One result has been that there are insufficient sinks and insufficient gas outlets for Bunsen burners in the portion left for teaching purposes. There are no nearby storage and washing facilities for pipettes and other glassware. A laboratory coordinator is needed to manage this facility.

Room 115B, the gross anatomy laboratory, was used for scheduled instruction an average of 6.1 hours per week during the period under consideration. This includes one hour per week use by the Physical Education Department for 16 students in a human biomechanics course. The Medical School's use of this lab varied widely from week to week during the quarter, from no instructional use when gross anatomy was not being taught to as high as

18 hours per week of scheduled instruction. During the 6.1 average hours per week of scheduled room use, the average station was occupied 5.98 hours, yielding an occupancy rate of 98%. When only Medical School coursework is considered, the station occupancy rate exceeds 100%, since the Medical School course enrollment was 25 students and the room has only 24 stations. When all uses (scheduled courses and independent study) of Room 115B are analyzed, average weekly room use hours rise to 16.1 with the average station occupied 8.48 hours and a station occupancy rate of 53%.

It should be stressed that although this room is appropriately categorized as a class laboratory, it serves only one very specialized function and cannot be used for other purposes. Access is very limited and highly controlled. There are a number of problems associated with this space, foremost of which is its size. It is presently very crowded with six cadaver tables accommodating four students each. When class enrollment goes to 36 entering freshmen next fall, a choice must be made between six students per cadaver or somehow crowding in three more tables to maintain the more desirable and effective student-cadaver ratio of 4:1. There is no place in the lab now for prosection and the small lab adjacent to 115B, which was formerly used for this purpose, has been turned into a research laboratory. No cadaver preparation areas or storage facilities exist apart from the room itself so that the gross anatomy laboratory may be said to be occupied 24 hours a day.

Utilization statistics for the Resources Center (Room 1) and the Study Center (Room 2) are computed for unscheduled, informal uses only since no formally scheduled regular instruction takes place in these areas. Usage has been based on student responses to a survey taken during Fall Quarter about their use of these rooms. Room 1, with eight stations, enjoys an estimated 45.0 hours of use per week, during which time the average station is occupied 22.50 hours yielding a station occupancy rate of 50%. Room 2, with thirty-one stations, is also used 45.0 hours per week, on the average, with the average station in use during 5.81 of those hours. This gives a station occupancy rate of 13%. The lounge area was created in this room toward the end of the quarter, and observation since that time seems to indicate greater usage of this room.

It is important to emphasize here that, strictly speaking, there are no

available space utilization standards which are applicable to medical schools. There are, of course, standards (or more accurately "rules of thumb") which are useful in assessing amounts of space and types of space required for medical education but these do not address the question of how to judge the effective use of space. The use of space is always a reflection of program objectives and curriculum. These vary widely from one school to another, making comparisons difficult and the derivation of standards almost impossible. The federal government has funded a study of space utilization in university medical centers by educational programs in the various health professions. The study was to be completed last October but has yet to be published, nor is it near enough to completion to have established standards which would be useful.

Recommendations on meeting the space needs of the Medical School, both in the immediate future and on a permanent long range basis, will be found in detail in Chapter 8 of this report.

DENTAL HYGIENE PROGRAM (2710)

Staff:

1 Director
1 Assistant Director
1 Clinic Supervisor
3 Instructors
1 Secretary

(This totals four full-time faculty plus one half-time and one two-thirds time positions in the program. In addition, five local dentists are participating at a level of 20% of their time.)

Activities:

Currently, Dental Hygiene accepts 16 students per class in a two-year program of instruction. Enrollment is now at 15. Qualified students can be accepted following high school graduation; however, most enter the program after one year of college. Most of these students are residents of the northern Minnesota region. The program is expected to expand its enrollment to 20 students, but may not go much beyond that size. Dental Hygiene programs in the state currently graduate about 200 students per year (including 100 at the University's Twin Cities Campus) and estimates are that about half of the practicing dentists will employ hygienists. A further factor is that under the new dental practice act and the expanded duties office training program funded by HEW, dental assistants are beginning to take over some tasks formerly performed by hygienists. There is some movement to expand the present curriculum to a four-year, baccalaureate program, which could be accomplished by adding two years of general college work and offering more elective courses in dental hygiene. Of the current class of 15 students, 13 have indicated an interest in such a four-year program. A perceived need also exists in the area of health education in dentistry for the public.

Instructional methods used in the program include lectures, laboratory work, and clinical experience. Clinics are operated from 9:00 a.m. to 5:30 p.m. on Tuesdays and Thursdays, and from 1:30 p.m. to 5:30 p.m. on Wednesdays and Fridays. About half of the Dental Hygiene program's students are active in the clinic at any given time during these hours. The clinical experience runs for four quarters through the curriculum. Students will also receive some clinical training in the dental clinic at Miller-Dwan Hospital.

Under the present organizational structure at UMD, Dental Hygiene is a "free-standing" program, reporting directly to the Provost's Office. The

proposed reorganization now being considered for UMD would place Dental Hygiene under the office of the Vice Provost for Academic Administration, as the first component of a grouping of faculties and curricula in Allied Health Programs.

Facilities and Utilization:

The program is presently housed in temporary quarters in Old Main on the lower campus. Located on the first floor are the clinic, a small dental x-ray facility, the program's administrative offices, a student locker room, and one classroom. A student laboratory is located on the third floor. In addition, the program uses lecture rooms in the Life Sciences, Social Sciences, and Physical Education Buildings. Shortly, the program will move into new quarters in the Classroom-Laboratory Building now being completed on the upper campus. The new building will provide for an expanded and improved clinic (enabling enrollment to grow to 20 students per class), conference rooms, sufficient office space, a classroom/laboratory, and audio-visual carrels. Additionally, the move to these new facilities will allow closer relationships to develop with Life Science and other programs on the upper campus.

Analysis of the actual utilization of these new facilities must, of course, await experience. However, in a prediction of demand on the capability of this new space, these facilities appear to be very adequate. Reuse of the space on the lower campus, vacated when Dental Hygiene moves, is anticipated by the Medical School.

During the fall quarter, while assigned to temporary accommodations in Old Main, the Dental Hygiene program used a class laboratory for teaching purposes 12 hours a week. During these hours, an average of 78% of the stations were occupied. For all uses, the class lab was utilized 36.00 hours per week, with an average of 34% of the stations occupied during these hours of use.

A 35-station classroom was in use 6.00 hours a week for regular teaching. (No other uses were reported.) When the room was in use, 47% of the stations were occupied on the average.

AEROSPACE STUDIES - AFROTC (2810)

Staff:

1 Professor
2 Assistant Professors
3 Clerical-Administrative

Activities:

The Department of Aerospace Studies offers both a General Military Course for freshmen and sophomores and a Professional Officer Course for juniors and seniors leading to a commission as a second lieutenant in the Air Force. Eighty-eight students are enrolled in the courses, including an entering class of 36 freshmen. Seven of the ROTC students, including five freshmen, are young women. Although no great expansion of the program is anticipated, the head of the Department believes that the enrollment may rise to 100 in 1975.

The credit hours taught have been declining recently: 690 in 1971, 621 in 1972, and 544 in 1973.

Teaching methodologies include standard lectures supplemented by films, slides, charts, and other teaching aids as well as short student presentations during the first two years of the program. In the last two years, small seminars are the principal instructional mode, involving 7 or 8 students and using televised student-taught seminars for self-criticism and evaluation. The curriculum is developed by the AFROTC unit along broad course goals laid out by the Air Force and approved by the University. The unit has its own library collection either provided directly by the Air Force or acquired from funds allocated for that purpose by the Air Force. The collection is now housed in the larger classroom and may be moved from this location as access to it is limited when this classroom is in use by other departments.

Facilities and Utilization:

Aerospace Studies occupies a prefabricated building of what appears to be military design (built in 1954). Unlike most other buildings on campus, it is free-standing, connected neither with the concourse system nor with another building. All ROTC classes take place in the ROTC Building except for Corps Training (formations and other military exercises), which is conducted in the nearby Physical Education Building.

The ROTC Building contains departmental and faculty offices, two classrooms (15 and 40 stations), a lounge, cadet headquarters, a small library, and storage and miscellaneous spaces.

The two classrooms in the ROTC Building are used on an as-available basis by other departments -- currently by History. Only the smaller of the two is assigned to AFROTC, the larger being under the office of the Vice Provost for Academic Administration.

The 15-station, 411 square foot, classroom assigned to AFROTC is used for teaching purposes 15.00 hours per week. Other uses raise the total utilization to 27.00 hours per week. When in use for teaching, 57% of the stations are occupied; for all uses, 46% of the stations are in use on the average.

SPECIAL PROGRAMS (2900)

Staff:

1 Director
1 Senior Clerk-typist

Activities:

The Special Programs office is responsible for coordinating a wide range of instructional and other activities. These include the Freshman Studies Program, the Honors Program, various inter-disciplinary programs, educational development (grant-writing), international exchanges of students and faculty, and the University College courses (UC 3075).

The Freshman Studies Program involves 35 randomly selected students who have elected the course. Faculty involvement includes five to eight faculty, three "counselors in residence", and eight to ten upperclass tutors. The major thrust of the program is problem-solving. No instructional space is assigned to the program, which meets in rooms in the Home Economics Building and in Bohannon Hall.

Both the Honors Program and the UC 3075 course call for individual study and have a minimum impact on facilities usage.

The only facility assigned to Special Programs is the director's office. It has been observed to be both small and crowded.

LIMNOLOGICAL RESEARCH CENTER (3100)

Staff: See Below.

Activities: The Limnological Research Center has been used in the past only during the summer as a base of operations for research in fresh water limnology, principally as applied to Lake Superior. At the time of this study, the Limnological Research Center was not in use. Located on the shore of Lake Superior, the Center has stood unused in winter because of the lack of money for heating and insulation. In March 1974, the Lake Superior Basin Studies Center (which now occupies an office in the Administration Building) intends to renovate the building and move in on a year-round operation. The program will involve cooperation with several of the UMD science departments and the Medical School. Graduate student programs will be developed and visiting professors will be invited to the Center.

Facilities: As noted above, the Center occupies a presently uninsulated building on the shore of the lake (6008 London Road). The building is of two stories and a basement and comprises office, laboratory, and storage space and also a small apartment.

CONTINUING EDUCATION AND EXTENSION, DULUTH CENTER (4100)

Staff:

2 Professional Staff
4 Secretaries and Clerk Typists

Activities:

Like the Graduate School, this office is an extension on the Duluth campus of a University-wide function. Virtually all classes offered under the aegis of Continuing Education and Extension, however, are taught by regular members of the UMD faculty. In addition to academic courses offered in the evening, many non-credit courses are offered to people from the community. In addition, non-credit program packages are put together for special interest groups, and conferences and seminars are organized both on and off the campus. The office is also responsible for the summer sessions, in which enrollments have been declining in recent years.

A member of the professional coordinating staff reports that the previously clearly marked distinction between day and evening classes appears to be breaking down, with 175 to 200 day students taking classes in the evening in the Fall Quarter. There has been some discussion of completely integrating day and evening credit courses.

The office tends to draw on Minneapolis rather than UMD for media materials. They would, however, be interested in producing audiovisual materials in Duluth if better production facilities were available.

Facilities and Utilization:

About 75% of all classes offered through this office, and up to 90% of the extension courses, are held on the campus. Little difficulty has been experienced in obtaining the assignment of appropriate rooms.

The only spaces assigned to Continuing Education and Extension are a staff office and a rather small general office in the Administration Building.

Staff:

The Health Service is staffed by three physicians, (2 full time and 1 part time), two nurses, one medical technologist and two secretaries. The services of a psychiatrist are available by appointment. In addition, the Health Service draws on local practicing physicians for consultative services.

Activities:

The Health Service is supported by student fees of $9.00 per quarter (an additional quarterly fee covers hospitalization insurance). Services available include care of illnesses and injuries, immunizations, laboratory tests, and physical examinations as requested. Certain laboratory tests can be done in the Health Service's own facilities, such as CBCs and hemoglobin, cultures, mononucleosis and venereal disease testing and some blood sugar studies. The Service presently has no x-ray capability and refers students to local hospitals for this service. In the future the Health Service would like to be able to do at least standard chest and simple diagnostic x-rays.

An estimated 55 to 60 patient visits are accommodated each day, five days per week. Present staff is adequate to handle this load, however, more staff will be needed (particularly another lab technician) if enrollment increases significantly. The staff noted that student demands for service seem to increase more than in direct relationship to enrollment, and theorized that good service tends to create more demand in that satisfied patients return and tend to use the service more often. More psychiatric and counseling services are also needed. The services of an ophthalmologist are requested frequently but present budget and facilities are insufficient to add this capability.

Commonest student complaints are colds, upper respiratory infections and mononucleosis. Nurses do not presently perform a triage or screening function and every student is seen by a physician. The Health Service sees about an equal number of dormitory students and town students.

Athletic medicine is a further responsibility of the Health Service physicians, who attend all games and athletic events, and also do sports physicals for team members. The Service is planning to develop programs in preventive medicine, health education, and health risk appraisal with the goal of teaching students about risk factors and health maintenance.

The Health Service serves faculty only in emergencies or for promotion physicals. They also provide the annual physicals for the University's

food service workers and pre-employment physicals for custodians, physical plant staff, etc.

Facilities:

The Service is now housed in a converted residence located on the hill above the dormitories at 1215 East University Circle. The building has two levels. The laboratory, an office, lunchroom which doubles as a conference room and contains a sterilizer, some storage areas, an exam room (also housing a photocopy machine) and the garage are located on the ground level. The upstairs level contains the waiting area, three exam rooms (one of which doubles as a minor surgery), a kitchen serving as a nursing station, and one office.

Facility needs identified by the staff include more exam rooms, a conference room capable of accommodating 25 to 30 people, a minor surgery with a recovery room, a small but quiet dictating room, nurses' office, waiting area with privacy, an expanded laboratory and space for simple routine x-ray capability. A cast room would also be desirable to avoid time lags in transferring patients to local hospitals.

In summary, from our observation of this facility, it is crowded and well utilized. Within the limitations imposed by the facility, it appears to function reasonably well. However, there are space deficiencies, such as a recovery area (there is no infirmary on campus) and more exam rooms and offices are needed even now. If student enrollment or even student demands for service increase, expanded facilities to accommodate a necessarily expanded staff will be essential. Preferably such facilities should all be on one level.

CHAPTER 6 - OVERALL CAMPUS UTILIZATION

LGA/ADL
March, 1974

CHAPTER 6 - OVERALL CAMPUS UTILIZATION

Introduction:

This study has examined such concerns as scheduling problems, needs of the Social Sciences for specialized facilities, and availability and use of instructional "supporting" spaces: departmental multipurpose rooms, conference rooms, study rooms, and workrooms. We will consider present utilization in broad analyses of general groups of facilities, discuss specific problems and constraints, state conclusions about facility capabilities, and make recommendations for improving utilization. A concise summary of such conclusions and recommendations was given in Chapter One, and the Specific problems of housing the Social Sciences and the Medical School will be discussed individually in Chapters Seven and Eight.

Review of Campus Buildings and Areas:

UMD buildings are listed in Table 6-I with their gross and net areas, and the locations of the upper campus buildings are shown on the map (Figure 6-1). The source for the physical data statistics was the UMD facility inventory prepared for the Master Plan and updated by UMD in accordance with Plant Service facility records. These statistics were again reviewed and revised in the process of this study by LGA/ADL, assisted by the campus representative. The detailed listing, made available to us and used in our computerized analysis, now contains 2,539 "room" entries. This is roughly 1,000 more than the listing held by the University Central Office because the three buildings under construction were added and, in addition, areas considered "unassignable" (such as corridors, toilets, etc.) were also added in order to have a complete record as maintained by UMD's Plant Service. This facility inventory will require continual updating and correcting by the University. Some changes occur daily, not only by remodelling but also through reassignment of rooms, changes in function, and even increase or decrease in the numbers of stations. Some problems remain even after careful review. We verified the formal inventory on an item by item basis only for the instructional spaces. Administration in particular is classified only under broad categories such as "office," which should subsequently be more accurately classified. We questioned other items, but we did not have time to check further on classification and area. None of these items, however, was significant for our study. Our facility listing in the technical appendix is annotated to identify the questioned items for UMD's further correction.

The distribution of assignable area to University of Minnesota space categories is shown in Table 6-2. Area by function categories is shown in

Table 6-3. The distribution appears reasonable to us for a campus such as UMD.

UMD has many characteristics of a 4-year college but with the demands of University status added. This results in an "in-between" position in the proportion of facilities given over to classrooms, laboratories, offices, etc. The distribution of UMD space in space category by function category is shown in Table 6-4 and is indicative of the varied functions possible to individual types of space.

The physical location of UMD building groups and their relationships to their surroundings constitute an important factor in their use. The upper campus is the center of educational and associated activity for UMD. The lower campus, consisting of the old State Teachers College buildings, is significantly separated from the upper campus and so are the Alworth buildings. The lower campus consists of Old Main and two dormitories, built in the first decade of this century and the Laboratory School Building, which was constructed in 1926. The Laboratory School Building was remodelled for interim use by the Medical School, and the other three structures are used primarily as overflow or "surge" facilities for new or peripheral functions. The Alworth residence and garages, which were given to the University, have been remodelled and house the School of Social Development. Both the lower campus and the Alworth facilities are constrained in their use by their design, construction, condition, and separation from the main campus.

Classroom Facilities:

A classroom is defined as a room used by classes that do not require special-purpose equipment for student use. Classrooms include lecture rooms, seminar rooms, and general purpose classrooms. A classroom may be equipped with tablet-arm chairs, tables and chairs, or similar types of seating; and it may be finished with special equipment appropriate to a specific area of study, provided equipment does not render the room unsuitable for use by classes in other areas of study.

UMD has 61 classrooms on its inventory, including three on the lower campus and two in the Alworth buildings. They provide a broad range of room sizes from a 400-seat lecture hall to 15- and 20-seat general-purpose classrooms. They are distributed in an irregular pattern around the campus with

several in each academic building. They contain a total of 4,410 student stations and 58,365 square feet of space. On the upper campus, 47 of the rooms are assigned by the Office of the Vice Provost for Academic Administration to individual class sections on an open basis, and nine are assigned to individual departments for full-time use.

Most of the rooms were found to be conventional classrooms in satisfactory condition. A few have problems of configuration, ventilation, or accessibility. Many of the rooms are wired to allow for CCTV use, and a few have built-in booths with equipment that give such rooms flexible studio capability.

During the Fall Quarter of 1973, the classrooms on the upper campus were used an average of 24.87 room hours per week for teaching with an average of 53% of the seats occupied when the classes were being taught. Additional uses, such as meetings and student study, increased this utilization to 29.73 hours per week but decreased the average number of seats occupied to 48%. (See Table 6-5.)

Teaching utilization of the five classrooms on the lower campus and at the Alworth buildings averaged 16.76 room hours with 94% occupancy, with significantly less resultant station utilization than the upper campus. Upper campus rooms assigned full-time to individual departments also receive a lower reported utilization, averaging 19.44 room hours per week with 50% occupancy for all uses. The 47 upper campus rooms assigned on an open basis by the Vice Provost for Academic Administration report a significantly better utilization, 25.91 room hours at 50% occupancy for teaching and 30.62 room hours at 46% occupancy for all uses.

Comparing the relative utilization reported for the two groups (assigned and open), the implication is that rooms limited either by exclusive assignment or by location (and an isolated location tends to result in the equivalent of exclusion assignment) achieve lower utilization. This does not mean there should be no such assignments, because the more flexible time scheduling capability that results from the practice may be very important for particular program needs. However, exclusive assignment does tend to penalize utilization.

It is also helpful to look at the statistics by room size. Frequently in a campus analysis, one will find certain sizes of rooms used for more hours or with greater station occupancy rates than other sizes, and one can infer that the supply of rooms of particular sizes either exceeds or is less than the instructional needs of the institution. As noted before, UMD has an excellent range of classroom sizes. This is shown graphically in Figure 6-2. The locations of these rooms in the various academic buildings of the campus can be seen in Figure 6-3.

Reported utilization of the rooms calculated by the size of the rooms is presented in Table 6-7. A superficial review of each size entry indicates a wide variation in usage. Particularly interesting is the lack of any strong pattern in the percentages of seats occupied. Grouping the rooms into ranges of size results in some interesting points, however.

The six large lecture halls have capacities from 194 to 400 seats, and they are located at both ends and in the center of the upper campus. Their utilization rates average 26.1 room hours per week with 46% station occupancy. The rooms are clearly well-used for teaching. Reported non-teaching uses reach only 14.5 hours for the six rooms, adding only an average 2.42 room hours to the rate.

The uses of each room (listed in the technical appendix) indicate a wide range of departments and of class sizes. The 400-station room was used by classes ranging from 107 to 294 enrollment, and the 391-station room from 58 to 408 enrollment. Such a range is common for large lecture halls as their design capacity is usually determined by the need to handle the upper extreme of group sizes instead of the more frequent averages. These rooms at UMD are also located in highly accessible locations and have extensive audiovisual capabilities. If demand by large classes increases in the future, due either to enrollment expansion or to change in teaching methodologies, the smaller class sections can easily be diverted to other, smaller rooms.

Some assignment of additional class hours may also be possible during the scheduled weekdays, but it must be remembered that many of the class presentations using these rooms require set-up of media aids or demonstration equipment that limits their availability more than the conventional classroom.

Music and choral course activities are significant uses in some of these rooms, and formal recitals and concerts are also held there, although the storage of a piano in these rooms is difficult. Their audiovisual capability holds potential for non-instructional student recreation as well. The location of these rooms, opening onto the main student circulation route, has had excellent impacts in the "exhibition" of interesting courses and events to passersby, attracting many to "sit in" and sample topics they would perhaps never have tried otherwise.

Three rooms on the upper campus are basically small lecture rooms, with capacities of 90, 98, and 110 stations. The new Classroom-Laboratory Building will add a 156-station room in the near future. Their average teaching utilization is 28.67 room hours, but the 90-station room (HE 206) is reportedly used 40 hours per week (although with a 36% station occupancy rate). The occupancy rate for the other two rooms, the Art audiovisual lecture room and Chemistry 150, is much higher: 79% and 71% respectively.

Large classroms, ranging from 56 to 80 stations, are irregularly distributed throughout the campus. They seem concentrated in particular buildings (such as Social Sciences, A. B. Anderson Hall, and Home Economics) but they are not far from any of the other buildings. The average utilization of these 20 upper campus rooms is 28.1 room hours of teaching with 52% occupancy. They are well-used as a group and individually, although only half the stations are occupied on the average.

Classrooms of 30 to 50 stations form the backbone of many institutions' teaching spaces, and they are represented at UMD with 22 rooms. Their average utilization is 23.45 room hours per week for teaching with 53% occupancy, increasing to 31.3 hours (with 51% occupancy) for all uses. Although well-used as a group, individual rooms vary from 4 hours to 43 hours per week for teaching and 11 to 45 hours for all uses.

These rooms, like the next larger group, are scattered irregularly around the campus in particular buildings but with no area being far from a nearby building with rooms of this size range. Five of the rooms are located in the Physical Education and ROTC Buildings, considered by many students and faculty with whom we spoke to be an area remote from campus activity. Although not actually far away physically, these two buildings are on a dead-end corridor away from the central circulation system of the campus.

These five classrooms have the lowest reported uses of the entire group. However, the four rooms in the Physical Education Building are needed to take outdoor Physical Education classes during foul weather and thus can be expected to have low use, but their image -- and that of the ROTC room -- as remote locations are also factors.

If these five rooms are eliminated from the statistics of the group, average teaching utilization increases to 28.88 room hours with 53% occupancy, very similar to that of the next larger group. Although there is still a significant variation between individual rooms, there does not appear to be a strong pattern by building if the Physical Education and ROTC facilities are excepted.

Small classrooms of under 30 stations number only five on the upper campus, and a number of complaints were reported concerning the lack of such rooms. Reported teaching utilization of the existing rooms is low, however, ranging from 11 to 22 hours and averaging 16 room hours per week. Station occupancy was high at an average of 88%. Other uses increased the average room hours to 25. One of the rooms was in the ROTC Building, but it had 15 teaching hours and 27 hours of total use reported. This room and a 20-station room were assigned full-time to academic departments and had good utilization relative to the others.

A number of other small rooms are also available for teaching and other uses, classified under the UM system not as classrooms but as either departmental multipurpose rooms or conference rooms. There are 16 rooms with between 6 and 20 stations plus two with 30 and 36 stations. However, reported uses for the academic departmental multipurpose rooms averaged 4.85 hours with 70% occupancy for teaching and 19.76 hours with 46% occupancy for all uses. For academic departmental/divisional conference rooms, reported use was an average of 6.38 hours and 118% for all uses.

In concluding this review of use by classroom size, the five small classrooms and the five medium-sized classrooms in the Physical Education and ROTC Buildings are seen as having lowest utilization. The centrally located medium and larger rooms are seen as well-used in room hours. However, the percentage of seats occupied when the rooms are in use remains at roughly half.

This low station occupancy rate could reflect a trend to decreased class sizes, but it more likely responds to the desire to schedule classes close to department offices. Many individuals stated to us that such proximity reduced problems of carrying materials and equipment from the offices for use in class. Several departments also commented that it was very desirable to hold classes in the vicinity of the department offices in order to contribute a feeling of place and territory to their students, particularly to their majors.

The occupancy rate for many rooms can be improved significantly if the fitting of class size to room size were emphasized more in room assignments and if proximity to department offices were de-emphasized. Other factors such as media capability are also important and we are not suggesting constraint there. Such scheduling to class size would tend to increase the utilization of the small and medium size rooms and would decrease the use of the larger rooms. However, as the available rooms now appear balanced to demand, we see no particular advantage to such an effort, unless increased or shifted demand were to force it.

Much campus concern was reported to us on the lack of rooms where students can spread papers on tables in a teaching "paper lab" environment and also for rooms where the tight grid of tablet-arm chairs could be broken and reorganized into a less formal, group-oriented discussion methodology. Both of these require increased area per student station, but such areas appear readily available by reducing the station count in a number of rooms with low station occupancy rates, by restructuring chair arrangements or by replacing tablet-arm chairs with tables.

Such pressures for additional standard classrooms as will develop may be expected to occur primarily for the lower range of classroom sizes, as seen above. The need for more rooms of specialized design may include larger rooms, however.

The comparison of these statistics with utilization standards or data from other institutions is frequently done -- but not without hazard. As discussed in Chapter Three, the utilization achieved is the product of many factors unique to each institution; and to use such comparisons as uncompensated controls can create distortions rather than effective planning. It can be helpful to look at such comparisons, but only to identify unusual effects that merit further examination.

With this in mind, it is interesting to note that UMD classroom utilization is similar to or slightly greater than the experience of seven relevant states' aggregated institutions reported in a 1970 University of the State of New York study[1] (21.9 to 24.2 room hours, 29 to 65.9% station occupancy rate). UMD did not reach the levels set by most state standards reported in the same study of 30 room hours and 60-67% station occupancy rate. The California State Colleges averaged 31.8 room hours and 76.6% station occupancy rate for daytime use in 1969, but under conditions of intensive pressure for maximum productivity. The University of California at the same time achieved 27.5 room hours with 60% station occupancy rate.[2] These statistics are all for teaching uses only and for weeks of 40-45 hours on a Monday through Friday schedule. The University of Minnesota's Twin Cities campus in Minneapolis is reported as achieving a daytime-use level of 31.9 room hours with 62.6% station occupancy rate in 1969, significantly higher than UMD; but this is to be expected because of the urban 24-hour character of that campus and city. The St. Paul campus of the University was reported as experiencing a level of 20.6 room hours with 47% station occupancy rate.[3]

UMD utilization does not appear aberrant or unusual in such comparisons. However, further examination is necessary to determine whether the utilization now achieved is suitable for the campus needs and whether it can be improved.

Classroom Schedule Analysis:

Utilization data for upper campus classrooms by day and time of day is shown in Table 6-7. The heaviest classroom use for teaching on the upper campus occurs on Monday and Wednesday, 9:30 to 2:30. During this period, 70-83% of the rooms and 40-57% of the total stations are occupied and

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1 Planning-Inventory-Utilization, a 27 State Survey, Bureau of Higher Education Facilities Comprehensive Planning, University of the State of New York, February, 1970.

2 Inventory and Utilization Study for Public Higher Education, Fall 1969, The California Coordinating Council for Higher Education, January, 1971.

3 The Office of Space Programming and Management, University of Minnesota.

even the 12:30-1:30 hour remains high. Utilization drops off rapidly after 2:30, with only 7% of the total stations occupied for the 3:30 class hour.

The same time period is the most intensively used on Tuesday, Thursday, and Friday, but the level of use is significantly less. During the hours 9:30-2:30, average room use is 30% less on Tuesday-Thursday than on Monday-Wednesday, and station use is 30% less. Friday use is similar, but only slightly more than Tuesday and Thursday. Use after 2:30 decreases as rapidly on Tuesday and Thursday as on Monday and Wednesday.

Apart from teaching, other uses for which specific hours were reported are scattered throughout the day and week but basically follow the pattern of teaching uses, being highest when teaching demands are highest, and making little use of the classrooms in the late afternoon. However, about 80% of the non-teaching uses reported as occurring before 5:30 did not have specific hours identified and could concentrate in the later hours but are not sufficient to make that period comparable to the morning.

This morning peak is typical of many institutions and results from several factors. Students and faculty often prefer such a schedule because they find it an efficient way to organize their personal day, getting them up and active early and allowing flexibility in the afternoon. Student employment is often scheduled in the afternoon, although no specific data at UMD could be found to prove this during the limited time available to the study. Some institutions also deliberately limit late afternoon classes to encourage non-instructional student activities. At Duluth, however, winter weather and an early nightfall are strong factors, particularly because of the considerable separation of the campus from off-campus student housing. Another important factor is scheduling policy such as the 4-unit course module the University currently uses. At Duluth this policy has resulted in some difficulty in distributing classes evenly throughout the week.

Classroom uses at night were found to be significant at UMD but in no way approaching the proportion of room use during the day. 141 hours of classroom use after 5:30, Monday to Friday, were reported for the upper campus -- 10% of the daytime use. This resulted in up to 11% of the rooms being in use at some night hours, but averaged 5% during 5:30 to 9:30, Monday through Thursday. The station occupancy rate was much lower than daytime use. Saturday uses reported were negligible.

Given the established attendance patterns at campuses comparable to Duluth, we believe major increases in night-time utilization will not be achieved until new categories of students are enrolled. These might be such adults or working minors who have major job obligations, which make daytime classes difficult or impossible. Such categories of potential students are receiving great attention across the nation today, and it is conceivable that UMD may actively encourage their attendance in the future as conventional enrollment in the state as a whole declines.

An opportunity for improved room utilization at UMD, without seriously interfering with the present use pattern, is to fill in the morning schedule for classrooms on Tuesday and Thursday. This may require increased flexibility in the schedule module, which should be re-examined. A survey of student employment could also be helpful in indicating the extent to which afternoon scheduling must be constrained in support of student needs. The survey should determine particularly the proportion of students who work at each hour of the day and whether the employment could be scheduled for times other than the late afternoon and be fitted into the student's class schedule as a variable.

Laboratory and Studio Facilities:

Class laboratory and class studio utilization by day and time of day is presented in Table 6-8. Teaching uses were found to be much more evenly distributed across the schedule week than classrooms, but the peak periods are 9:30-11:30 and 1:30-3:30 on Monday through Thursday. Tuesday and Thursday are slightly more heavily used than Monday and Wednesday, with 29% of the rooms and 20-21% of the total stations occupied, compared to 28-27% of the rooms and 26-25% of the stations on Monday and Wednesday. Friday use was roughly half that of the other days. Non-teaching uses such as student work outside of class add an additional 70% of daytime room hours, although only 26% of the station hours. Only 16% of those additional room hours were assigned to a particular hour. However, while assigned use was spread throughout the day, the heaviest use was again in the mornings. Night and weekend uses are reported as minimal, only 9% of total uses, primarily because the labs are closed at night due to lack of staff to maintain security.

Class laboratories and class studios are more of a problem because of the basically specialized nature of such facilities. A class laboratory is defined as a room with specialized equipment for experimentation, observation, or

practice in a particular field of study used by regularly scheduled classes. This, in practice, extends to include all rooms used for regularly scheduled classes except the conventional multipurpose classroom and lecture hall (both classified as classrooms). Rooms equipped with tables and chairs and used for work sessions with spread-out papers are frequently called laboratories, but in strict classification should not be so called unless also furnished with specialized equipment that limits the classes that can use them. Class studios are considered laboratories in many systems, but at the University of Minnesota are separately listed as rooms for creative expression or practice and are used by regularly scheduled classes in the Fine Arts.

A special class laboratory is defined as a room used by informally or irregularly scheduled classes that require specialized equipment. Note that it is differentiated from a class laboratory only by the nature of scheduling, not by the specialization of equipment or instruction. Individual laboratories and studios are similarly differentiated from the above because they are for individual use rather than group use.

The key characteristic affecting utilization of laboratories and studios is thus that they are a "specialized" facility suitable only for limited activities by the limited group of people concerned with such activities. As such, utilization is dependent upon enrollment in the program and courses for which the special facility is shaped. A large student enrollment on a campus or in a department is frequently taken as a guideline to good lab utilization. That may be true for a number of basic sciences labs but labs for use by majors may still have low utilization because, while the number of programs may proliferate, enrollments by individual programs and courses remain low.

In addition, some laboratory activities require a "set-up" period before a class when particular equipment is put together and materials laid out so student time will not be lost in the class itself, and in addition this generally means a similar clean-up period after class. Students are frequently required to return to the laboratories outside of the scheduled class time to perform tasks with equipment and materials, study that in other courses could be done in the library or dormitory. These points mean that for class laboratories and studios, maximum practical room utilization by formally scheduled classes is normally much lower than the maximum achievable in classrooms.

The 14 class studios were used an average of 14 room hours per week with 81% occupancy for teaching, and 29.85 room hours with 56% occupancy for all uses. Twelve of these studios are in the Art Department, one is in Music, and a dance studio is in the Physical Education. The statistics show very clearly the role of student work in the studios in addition to scheduled class time. The campus has 26 individual studios, all music practice rooms, with 24.36 room hours per week for all uses. (See Table 6-5.)

Reported Fall Quarter utilization of the 59 UMD class laboratories, excluding the two Medical School laboratories, was an average 13.59 room hours per week with 84% occupancy for teaching uses. Utilization increased dramatically to 23.88 room hours per week when student study and other uses (excluding set-up requirements) were included. The seven special laboratories were reportedly used an average of 0.85 room hours per week with 73% occupancy for teaching uses, but 18.07 hours with 40% occupancy for all uses. The one individual lab on the upper campus had an average of 17.00 room hours with 48% occupancy for all uses.

Thirty one of these laboratories were in the Division of Science and Mathematics and are primarily science laboratories. The remainder represent a variety of specialized facilities used as laboratories by departments in Education, the Humanities, the Social Sciences, Industrial Education, etc. The utilization and particular conditions and problems of each were discussed in the prededing chapter.

By the overall campus averages, it would appear that in general such laboratories have the capacity to support significantly increased demand. This would be clearly indicated if class laboratory utilization were compared with conventional utilization standards or with the experience of other institutions. Because of set-up and other requirements noted above, the rule of thumb frequently heard for maximum average teaching utilization is 20 hours of room use per week with 80% station occupancy when the room is in use. State standards reported in a study by the State University of New York[1] range from 20 to 25 room hours and 75 to 85% occupancy, but the actual usage experienced by seven states, as reported in that study, ranged from 9 to 17.5 room hours and 19 to 76% occupancy.

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[1] Planning-Inventory-Utilization, a 27 State Survey, Bureau of Higher Education Facilities Comprehensive Planning, University of the State of New York, February, 1970.

Use of standards and comparisons for laboratories can be very misleading, however. Classrooms are by definition usable for a wide variety of functions and users, and averaging principles work well to promote their high utilization. Laboratories are by definition specialized, limited in function and users, and thus dependent upon the peculiar circumstances that generate their origin. When using standards in the evaluation of laboratory capability, a real danger exists that the user will accept statistics for several existing laboratories as an indication that additional laboratories are not needed, assuming that all labs are alike. No additional labs may, in fact, be needed -- provided no change or addition in functional requirement has occurred.

However, the addition of a new program or changes in a particular field may have generated the need for a laboratory different from any existing one. Such a new lab may not only have low use itself, but it may also have the effect of reducing utilization of other labs as well if no increase in program or course enrollment results. The decision will have to be made, as a basic management policy decision of the campus, on the cost-benefit trade-offs of providing the needed resources for this new specialty and of continuing to provide the resources for the old specialties. Responsibility is clearly on the designer of such labs to make them as flexible and as multipurpose as possible when designing for fields of low enrollment if additional users can thus be incorporated.

Even the rules of thumb for maximum utilization are widely erroneous for many labs. Some very specialized labs require very little set-up time -- a highly automated language lab provides an example -- while others may be highly constrained by set-up requirements.

Many of the instructional labs and studios surveyed have additional capacity to absorb continued expansion of demand, particularly if staff were available to keep the rooms open at night for some of the students' extra work that now occurs primarily during the day. However, a number of rooms, especially in the Social Sciences, are reaching maximum capacity. Furthermore, changes in the nature of those fields, in the skills necessary for their graduates, and in the methodologies used in education for those fields and others on the campus have resulted in the development of new major specialized facility needs to be further discussed below.

Research laboratories at the campus were reviewed and discussed with the departments and appear well-utilized. Certain desired and authorized research efforts in the sciences are currently deferred for lack of space, but these are expected to be accommodated satisfactorily when occupancy of the new Classroom-Laboratory Building allows the sciences, specifically Chemistry and Physics, to expand. Specialized facilities are also needed in the Social Sciences to support research efforts in education, psychology, and other fields, as discussed in Chapter Seven.

It should be noted that availability of proper laboratory and studio service rooms for instructional or research facilities is often a significant factor in the adequacy or utilization capability of the basic labs or studios. Service rooms can free space in the lab for student stations and can free lab time by allowing conflicting operations (some class preparations or set-ups) to be conducted separately. Such spaces are often the first to be lost under conditions of crowding. Although minor problems were found on the upper campus (in Industrial Education and to a lesser extent in Art), this elimination of service rooms has occurred most noticeably in the Medical School and has resulted in serious deficiencies there.

Academic Department Office and Support Spaces:

The academic departments' spaces other than classrooms and laboratories constitute an important base of operations, more than simply a cluster of offices.

The department office itself serves as a coordination and secretarial center, requiring appropriate department-head and secretarial offices plus adequate secretarial workroom and storage space for materials. Our review found the facilities of the upper campus basically adequate. In the past the Art Department has used the Tweed Museum of Art office as its department office, increasing the demand on available office space in the academic building by that amount. A number of departments report inadequate workroom and storage space, particularly in A. B. Anderson Hall where office and service spaces are far too small. In other areas it appears to be partially a result of expanding collections of audiovisual materials and equipment in a fixed amount of space.

Considered department by department, an analysis of the distribution of faculty offices by department and size reveals a wide variation in their adequacy.

At present, excluding offices that will be available in the Classroom-Laboratory Building but including those in the Performing Arts Center office wing, there are 22 fewer offices campus-wide than there are faculty to be accommodated in them. When the offices in the Classroom-Laboratory Building are all ready for occupancy, the number of faculty offices will almost match the number of faculty -- 295 offices for 293 faculty.

This match is only apparent, however, as excesses of offices in one department are countered by deficiencies in another.

For historical reasons having to do with the design of the various buildings, the offices also vary widely in size. Many of the present offices would be considered inadequate at most 4-year colleges. Of the total of 271 offices currently occupied, 42 (or 15%) are less than 100 square feet in area. These should be considered as marginal and probably are more suitable for use by teaching assistants.

Large offices (more than 200 square feet) are found mainly in the Medical School and in the Music Department. Many of the larger offices in the Medical School are occupied by two faculty members. Music Department offices are large because they often serve as instructional space and frequently must accommodate a piano in addition to the usual office furniture. In assessing an adequate number of offices for the UMD faculty, one factor that must be considered is that campus policy as indicated to us is to provide each faculty member (including those with substantial part-time commitments) with a private office. This seems reasonable to us based on real conflicts that occur in shared offices for faculty preparation work and student counseling. The latter consideration is particularly important in view of the current trend to independent study. At the present time, there is at least one shared office in the majority of departments and three or four in some departments. In the School of Social Development, all offices are shared.

Many departments have also been concerned with locating their faculty in a spacially related group of offices. Most have achieved this, over a period of time, but any continued growth of faculty will tend to cause some fragmentation. The problem is the isolation of individual building elements from each other, so that a building floor has either too many offices for a particular department or else too few.

Department and faculty activities also require spaces in which to meet, to work in groups, to share ideas, and to conduct formal or informal seminars on a flexible basis. For small departments, the department office and faculty offices usually must suffice when a nearby classroom is not available. The larger departments often need more than this, however, and many have small rooms variously titled multipurpose, conference, seminar, or lounge room for these purposes. Usage varies with the department. The uses reported to our survey were very low for some but substantial for most, averaging 19.76 room hours per week for multipurpose rooms, 6.38 hours for conference rooms, and 22.68 for lounges. The rooms frequently complement available classrooms by serving as seminar rooms, and the lounge aspects are viewed as important department interaction mechanisms for students and faculty. The potential of such rooms is high, particularly with the trend to less formal methods of goup instruction, but the actual departmental need depends upon its attitude to and its use of the facilities.

A significant shortage was found to exist in the availability to faculty and students of rooms where individuals or groups could spread out project work papers for hours or days. Such workrooms are of major help in course preparation, departmental management, faculty research, and student independent study. The rooms are particularly needed where faculty offices are small or shared, as happens in 21% of those on the upper campus. The requirement of facilities for faculty research in the hard sciences is readily recognized, but the functions of other faculty are frequently assumed to be adequately met by basic office space. With the contemporary emphasis on quantification and hard analysis in a broad range of fields from Sociology and Business Administration to Education, office-type workrooms with files, tables, and calculating equipment are required in a variety of sizes but they are poorly provided for at present.

Study/Learning Resources Facilities and Media Use:

The U.S. Office of Education and the new Higher Education Facilities Inventory and Classification Manual define study facilities as rooms used by individuals to study books or audiovisual materials, to shelve those materials, to process (but not produce) them, and as auxiliary service spaces to support those rooms. This concept has been expanded from that of the traditional library in recognition of the expanding role of non-book materials in higher education. Duluth is no exception to this change, and its current facility problems in this classification are a result of the growth in non-book study on the campus.

The campus central library is an excellent facility with adequate space for its existing book collection plus space for minor expansion. The central collection of approximately 185,000 volumes and 2,478 periodical subscriptions is reported to be basically adequate for undergraduate education. The level of graduate study existing and presently contemplated was reported to be satisfactorily supported by limited collection expansion and an efficient loan service from the major UM graduate/research collections at Minneapolis. Ideally, the present collection would not grow significantly but would instead be maintained current by replacement and the rigorous discard of out-of-date or unneeded materials. This has the effect of maintaining the accessibility of the collection and minimizing capital investment, but it requires assignment of sufficient operating budget to maintain the weeding process. The Health Sciences collection of the Medical School is rapidly expanding at this time with the required facilities authorized and funded as an addition to the present building. This collection is also intended to stabilize at a given size and to concentrate on active services to students and faculty. Approximately 10,000 volumes are reported housed outside the Library Building in other departmental collections at this time.

The Library Building provides 1,000 stations in carrels, tables, lounge seating, tablet-arm chairs, and a limited number of microfilm and audio stations. This number of stations is roughly 18% of the student enrollment, significantly less than the 25% recommended for such institutions by the American Library Association. At our request, a survey was conducted by the Library of station utilization during the days immediately preceding and during the Fall Quarter finals. Although well-used, the existing stations were adequate to accommodate the demand and offer significant capacity for more. However, such demand is a function of the service posture of the Library and the teaching methodology of the faculty and could vary significantly over time.

Undergraduate libraries typically fill important functions on campus as study halls and social centers, particularly on a commuter campus such as Duluth. This function is reduced to some extent at UMD by the nature of the concourses providing circulation for the campus. One broad sunny corridor is lined with 167 tablet-arm chairs and heavily used for socializing and reading by the students. Late night study halls are available in the lower level of the Library, and several departments have provided study rooms in their areas.

The Division of Education and Psychology has the most extensive use of audiovisual media on the campus and has developed a divisional learning resources center in Bohannon Hall. Other departments have been accumulating media materials and equipment, primarily for classroom use, but several small student study centers are also being developed in department multipurpose rooms or other spaces. The Speech and Communications faculty have elaborate AV/CCTV set-ups in two classrooms constructed to support active media use for classes but they also make it possible for individual students to study and review class tapes outside of class. The Health Sciences Library is emphasizing a service/media approach to meeting the needs of the Medical School, and the Social Sciences report that media-based learning resource centers are a major need of their programs. A "media revolution" has not yet occurred throughout the campus, but the potential of media is increasingly recognized and put to use.

Limited production and studio functions are provided by the Educational Media Center, a small unit in the basement of Bohannon Hall. The studio and other facilities are constrained but appear to be adequate for current demand. Most of the principal classrooms and academic buildings are now wired for CCTV; and, with the use of portable monitors, programs can be transmitted from the Educational Media Center to particular classrooms. Portable camera and playback equipment is also available.

However, the growing demand for media and the growing collections of materials and equipment have paradoxically resulted in low utilization of the resources that now exist. The most immediate problem is coordination. The campus is currently inventorying departmental and individual faculty collections to provide a comprehensive bibliography of what is already available on campus to prospective users. Such coordination should minimize future duplication as well as make materials more available to all. Coordination is also important in equipment, both to avoid unnecessary duplication and to maintain uniformity in equipment for compatibility and ease of maintenance.

The departments that try to maintain small learning resource facilities have also found the operating cost as much of a problem as the capital. As a result, limited staffing effectively reduces the availability and usefulness of their existing resources.

Consolidation of some of the functions and resources would appear to offer major cost and service benefits for all concerned.

The Medical School intends to expand its learning resource center in conjunction with the authorized Health Sciences Library project, and has indicated a willingness to allow this to form the nucleus of an expanding facility serving the entire campus. They would permit the center to use expansion space within the new Health Sciences Library facility for a temporary period if sufficient space were available. This, with consolidation of existing resources, offers an important opportunity to the University. It is reinforced by the needs and potential funding of the Social Sciences as expressed in their building request.

However, a campus learning resources center should not be approached as a new, isolated facility. Such a center should be an integral part of the teaching/study activities of the campus. If the center and the production facility as well are staffed with people who will encourage and guide the faculty in new techniques, the center's role will continue to evolve in pace with its usefulness to faculty and students. It should be closely coordinated with book materials and facilities. Furthermore, facility plans should not be made piecemeal but carefully planned for current needs and should allow a flexible response to future developments. A comprehensive reassessment of library and media functions and facilities alternatives should be made to result in a comprehensive facility action plan.

Other Facilities:

The Theater-Auditorium facility in Old Main on the lower campus is the only large "assembly" facility available on the campus during the Fall Quarter. However, it was reviewed only briefly because the theater would be moved during Winter Quarter to the new Performing Arts Center, which was under construction on the upper campus. The space in Old Main is in very poor condition, constraining theater activities, and the exit system and building construction are hazardous in case of fire. The facility appears to offer little potential for new uses without extensive reconstruction, which would have little long term benefit. The relocation of the theater activities will also free large areas of the building (heretofore used by the Theater for offices, rehearsals, shops, and storage) for other uses, but the fire code will limit such uses. The new Performing Arts Center appears to be an excellent facility and should very soon be well-used by theater and associated functions.

The Physical Education facilities currently receive heavy use which will, to some extent, be relieved by a new facility presently under construction. The uses reported for Fall Quarter support the statements of the Physical Education Department indicating that the heaviest demand is for gym-floor space, particularly in winter. The pool and other physical activity areas were also heavily used during the day but are adequate for current needs.

The Tweed Museum of Art is an unusual and valuable facility for a campus such as Duluth and has an important role for the institution and the local area. The facility is reported as satisfactory for present programs and funding and appears well-used by students and faculty. The location on a primary circulation route is particularly fortunate and successful in encouraging visits. The academic departments have a number of other minor exhibitions areas having collections of minerals, displays of fauna, etc., as educational mechanisms.

The Computer Center in Fall Quarter was still inadequately housed in an area of the Science-Mathematics Building, which constrained acquisition of needed equipment and delivery of services. In the Winter Quarter the unit is moving to much larger spaces in the new Classroom-Laboratory Building. The Computer Center would appear to have a considerable allowance for expansion in the new facilities before it again becomes constrained. Some office and workroom space may be available for other uses for an interim period.

The Administration Building primarily houses the campus executive management and the administrative support departments. A statistical analysis was not attempted because the methods used for instructional facilities was not appropriate and, in addition, the details of the facility inventory classification were insufficient for manipulation. All spaces were inspected and discussions were held with organizational unit heads to review their uses and facility experiences. The facility is an excellent, new building with no significant office problems reported. The area is adequate for its present occupants and will allow for some staff and file expansion over time. The problems of the future will most probably be in reorganization of space -- shifting groups to compensate for irregular activity growth. At present, a basement area of the Administration Building has been assigned for music practice use, a temporary placement that should be alleviated as soon as may be possible to the benefit of both Administration and the Music Department.

Plant Services (which includes all phases of building maintenance and repair, custodial care, grounds, and auto maintenance) appears adequately equipped to cope with campus growth.

For instance, heating capacity is being doubled by boiler additions now under way. On the lower campus, too, the addition of new, more efficient package boilers is planned. These will occupy less room than those now existing, thus allowing increased future capacity to be built into the heating plant. Additionally, it is planned to convert the lower campus heating plant to low-pressure steam as a means of minimizing expensive supervision.

The major Plant Services need for operating efficiency is a system of satellite maintenance and supply rooms located in strategic campus locations in order to place the tools and maintenance supplies in more efficient proximity to building work areas. The pedestrian paths and stairs between campus buildings are not matched by equal vehicular access for, as an example, plumbers' pick-up trucks, which would be mobile equivalents of these much-needed satellite maintenance supply rooms.

We have been advised that the present food service areas are of a size that will be sufficient for campus development up to 8,000 students, assuming that approximately 1,300 of these will be served in the residence halls or contract area. Receiving, storage, and preparation areas are adequate to serve a student body of about 12,000. The construction of facilities substantially larger than are needed now was dictated by considerations of location and the desirability of constructing the full facility at the outset rather than having to provide for future additions underground. It is believed that the faculty club will serve its members adequately until the student population exceeds 6,500.

Other central services appear satisfactory. Mention should be made, however, of the University printing and graphics activities which occupy teaching labs in the Industrial Education Building. Teaching activities share the equipment and spaces on an informally coordinated basis, and the station areas are larger to support this arrangement.

The Kirby Student Center houses most student activity services, including the general office, student organization offices, meeting rooms lounges, recreation, and food service, etc. Such a center is an important facility

on a commuter campus, where it serves as a comfortable rest area between classes and as a social place encouraging student interaction and community feeling. It was generally well-used during the day, but night activity appeared minimal. The facility is adequate to support an increase in general activity, particularly in the use of its numerous meeting rooms. The separate student organization offices on the concourse function as group activity centers and are especially crowded. That corridor area is heavily used and frequently congested, but in a positive manner that contributes much to the spirit of the campus. Student Service activities such as the Supportive Services offices (remedial and compensatory training) and Student College offices are located there and benefit significantly from their proximity. Supportive Services is presently in crowded offices and has a constrained learning resource laboratory some distance away. A limited number of academic offices are nearby and offer some opportunity for student-activity expansion as necessary if additional academic offices are provided elsewhere.

Student housing has continued to be a serious problem for UMD. Suitable off-campus housing is available only at a great distance from the campus, and access to the campus by public transit remains limited. The University has made efforts to improve transit access but cannot hope to compensate for the basic separation. It has built as much on-campus housing as has been possible, 1,700 beds with recent completion of the Stadium Apartments, and has used the old dormitories on the lower campus as temporary overflow space. This on-campus housing has maintained maximum occupancy rates, reflecting student demand.

The Lower Campus:

Old Main and the two dormitories on the lower campus are not used for significant class functions now, but an engineering-architectural survey was made by subcontract as part of this study to assess the potential uses. The conclusions of the survey are given below, and copies of the survey report are provided as a technical appendix to this report. Both Old Main and the dormitories were found to have load-bearing masonry walls, inflexible layouts, utility systems in need of complete replacement, and serious fire and safety problems. All three were constructed in the first decade of this century.

The survey found that, in its present condition, only the basement and first story levels of Old Main would be suitable by code for educational office and/or classroom uses and non-educational office uses. Even on those floors,

the spaces do not meet the normal level of quality of contemporary office or classroom space, and improvement to the utilities systems, toilets and architectural details and finishes of the building are desirable.

All levels of the building could be used for educational classrooms and/or offices in conformance with the code provided that major reconstruction was accomplished on the exit system; that the present plaster on wood lath were replaced with more fire resistive material; and that no assembly activities were permitted. In addition, much of the utility systems within the building and their connections to mains should be replaced. The heating plant should also be replaced.

Toilets should be rebuilt, windows repaired and reglazed, the roof repaired, and other general maintenance repair done. This work would be necessary to bring the facility up to suitable standards for intensive educational use, but access for the handicapped would still be difficult. Laboratory uses could also be made possible by adding an extensive laboratory utilities system within the building and appropriate waste systems and connections to local mains.

Although this evaluation does not include an in-depth cost analysis, it was the architect's professional opinion that the extensive remodelling necessary to make the building conform to Fire and Safety Codes, Electrical and Plumbing Codes, and to accommodate the handicapped would be extremely high for the value received. This would be especially true of remodelling for laboratory use where plumbing and ventilation requirements are more sophisticated than for general classroom use.

Although the present high ceilings would make installation of new plumbing relatively easy, the cost of installing mechanical systems of this nature in an existing facility would be higher than installation in a new building.

Old Main is approximately 70 years old. It is possible that an additional 25-30 years could be added to the life expectancy with a complete reconditioning of the exterior and interior. However, the cost of such a program, in the architect's opinion, is not warranted in a long range educational facility plan.

In summary, the most practical use to which Old Main can be adapted appears to be general office and limited classroom activities on the first story and basement levels and such limited uses in the upper stories as can be justified to the appropriate authorities by minor fire prevention measures. Investment in the building should be limited.

The Medical School use of its present building and its possible use of Old Main are discussed in Chapter Eight.

The best use of Washburn and Torrance Halls, the two old dormitories, appears to remain as dormitories, with even such use limited to the basement and first stories. Alternatively, office or limited instructional activities that are appropriate to the small rooms available in these buildings could use these two levels. It should be noted that any intensive use would strain the present utilities, and that some repairs and improvements, including those to the toilets and the lighting and electrical system, would be required for even a minimal environment by contemporary standards.

In view of the nature of the building construction, the fixed small rooms, and the cost of bringing the buildings up to code standards to accommodate intensive office or instructional use, it was the architect's opinion that the final product would not warrant the expenditure. This would be especially true in the case of laboratory use (probably research labs due to the small size of the rooms) where the installation of duct work and plumbing through masonry walls and concrete floors would be possible but excessively high in cost. The cost of installing these services would, in his opinion, be much more than the cost of similar services in a new facility. The added cost would have to be balanced against the difference in cost-benefit between the remodelling of this old building and the cost of constructing a new one.

Conclusions:

The UMD campus is an active and well-used facility of the University. Demand pressures at the campus are most clearly on instructional rooms, both general purpose and specialized, with basic institutional support and student service activities being adequately housed. The problems of teaching and teaching support spaces appear to reflect the changes in program character and contemporary teaching methodology more than simple enrollment increases. Some capacity for general increase in enrollment at the campus remains, although particular individual deficiencies exist. However,

serious needs were found for new forms of facilities. This latter must be expected at any institution attempting to maintain itself current with the changes of our times.

Classroom and class laboratory and studio facilities appear by present data to be well-utilized during peak periods of the schedule week. Improvements may be possible by expanding these peak periods of use. A 10% increase in classroom use could be achieved by increasing Tuesday, Thursday, and Friday utilization to nearly the level now indicated for Monday and Wednesday.* Further improvement may be possible by adding additional classes to the afternoon hours. A major increase in class laboratory utilization is easily achieved, if enrollments in many of the present programs and courses increase, with appropriate faculty increases to permit both additional class sections and more supervision of laboratory work outside of scheduled classes.

We were directed to look at utilization in the context of a 1.5% per year enrollment increase for the immediate future. This increase would represent roughly 87 FTE students by the first year and cumulative increase of roughly 448 FTE students in five years' time, an 8% increase.

Therefore, it would appear superficially that the existing class facilities could support this increase in enrollment. The new Classroom-Laboratory Building and the Performing Arts Center, when occupied in 1974, will add 4 classrooms with 312 stations to the inventory, plus several laboratories. This is particularly important in the context of current enrollment trends and the projection of a net decrease by 1990 of the present categories of students in Minnesota and the nation.

New facilities should be carefully evaluated for need, with renovation of existing facilities being examined first. This is not to say that new facilities are not needed: two important projects are examined in the following chapters.

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* The increase of scheduling on Tuesday, Thursday, and Friday to the same level as that achieved on Monday and Wednesday would theoretically result in a 19% increase in weekly station hours; in actual practice, of course, an equal level probably could not be achieved.

Whether in renovation or in new construction, however, emphasis should be placed on the careful avoidance, wherever possible, of overly specialized, permanently fixed facilities. As has been indicated above, specialization tends to limit the utilization of facilities, as well as often to increase their cost. Where specialized facilities are needed, great effort should be made to keep them usable for the greatest number of students and curricula possible.

Open assignment on an individual course basis of both classroom and laboratory facilities should be used whenever an opportunity exists to increase utilization. To help this, new facilities should be so located that they do not become isolated and the domain of a small group of users.

Strong shifts in program enrollment are now being experienced by UMD, and these can be expected to continue in the future as competition between institutions grows and economic and social conditions fluctuate. The tendency always exists to add new programs without eliminating the old and this can be as inefficient in specialized facility utilization as it is for the operating budget. If the campus enrollment grows only slowly or remains static, the present level of utilization in specialized laboratories will not tend to change. Therefore, it is important to include an awareness of the facility impact of new programs and enrollment level of old programs whenever decisions concerning such programs are made.

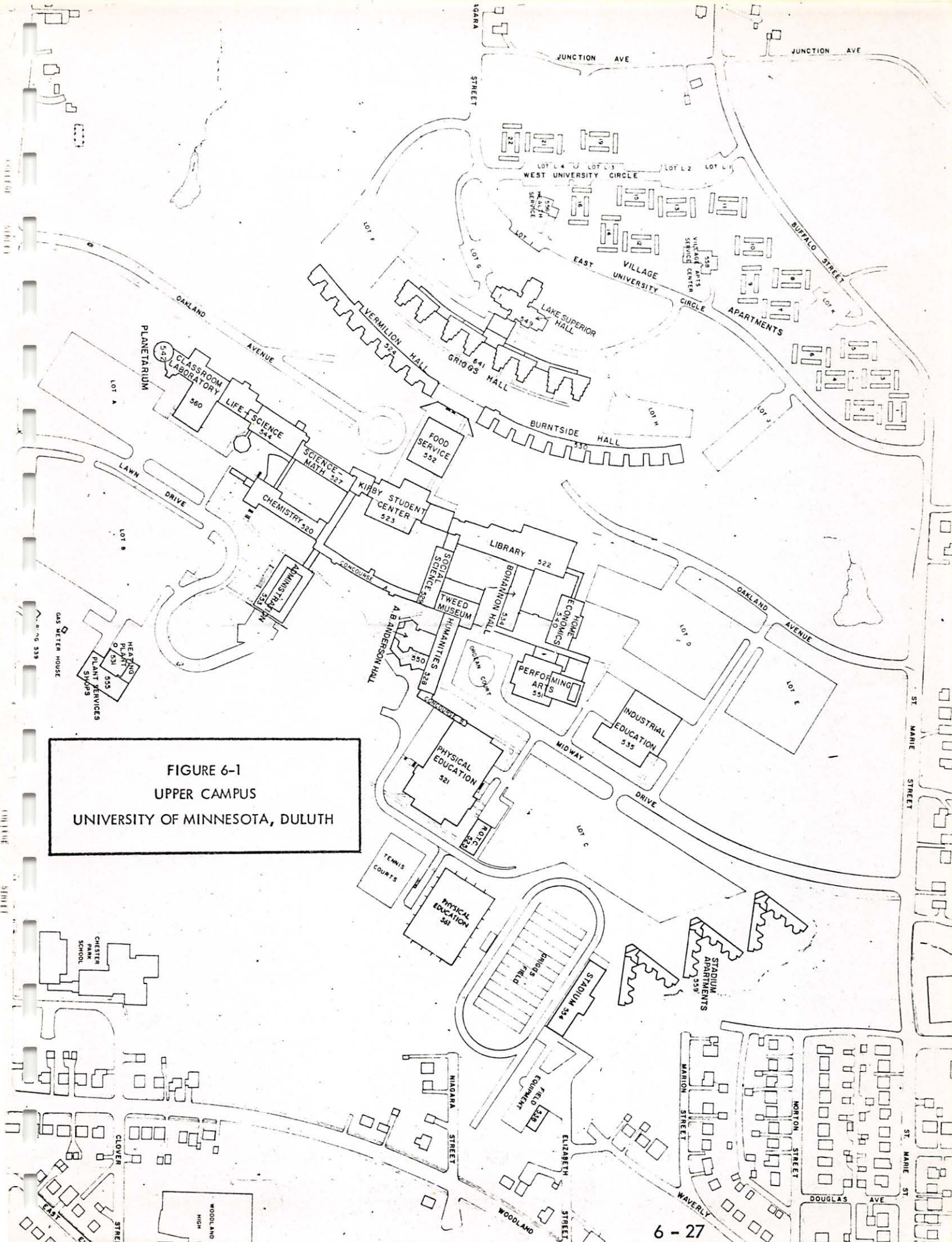
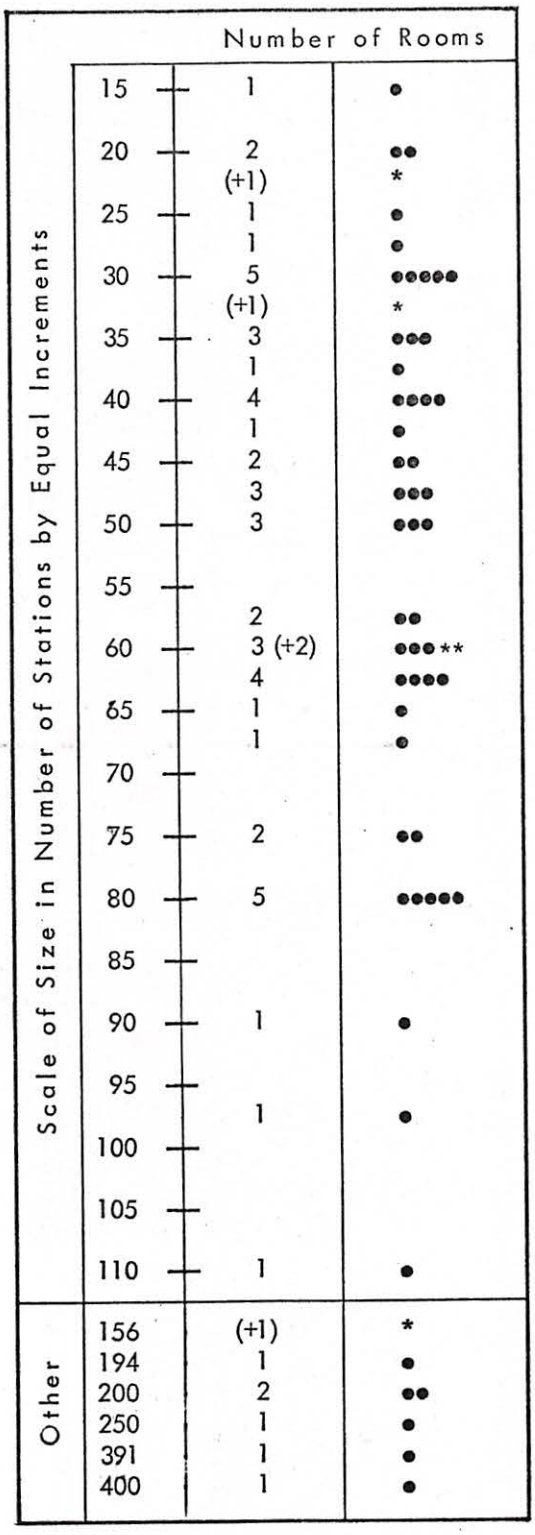


FIGURE 6-1
UPPER CAMPUS
UNIVERSITY OF MINNESOTA, DULUTH

FIGURE 6-2

UNIVERSITY OF MINNESOTA, DULUTH

DISTRIBUTION OF UPPER CAMPUS CLASSROOMS
BY ROOM SIZE BY INCREMENTS



* New classrooms to be provided in Buildings 551, 560, and 561, now under construction.

Source: UMD Facility Inventory

FIGURE 6-3

CLASSROOMS AND MEETING ROOMS

ACADEMIC BUILDINGS, UPPER CAMPUS

UNIVERSITY OF MINNESOTA, DULUTH

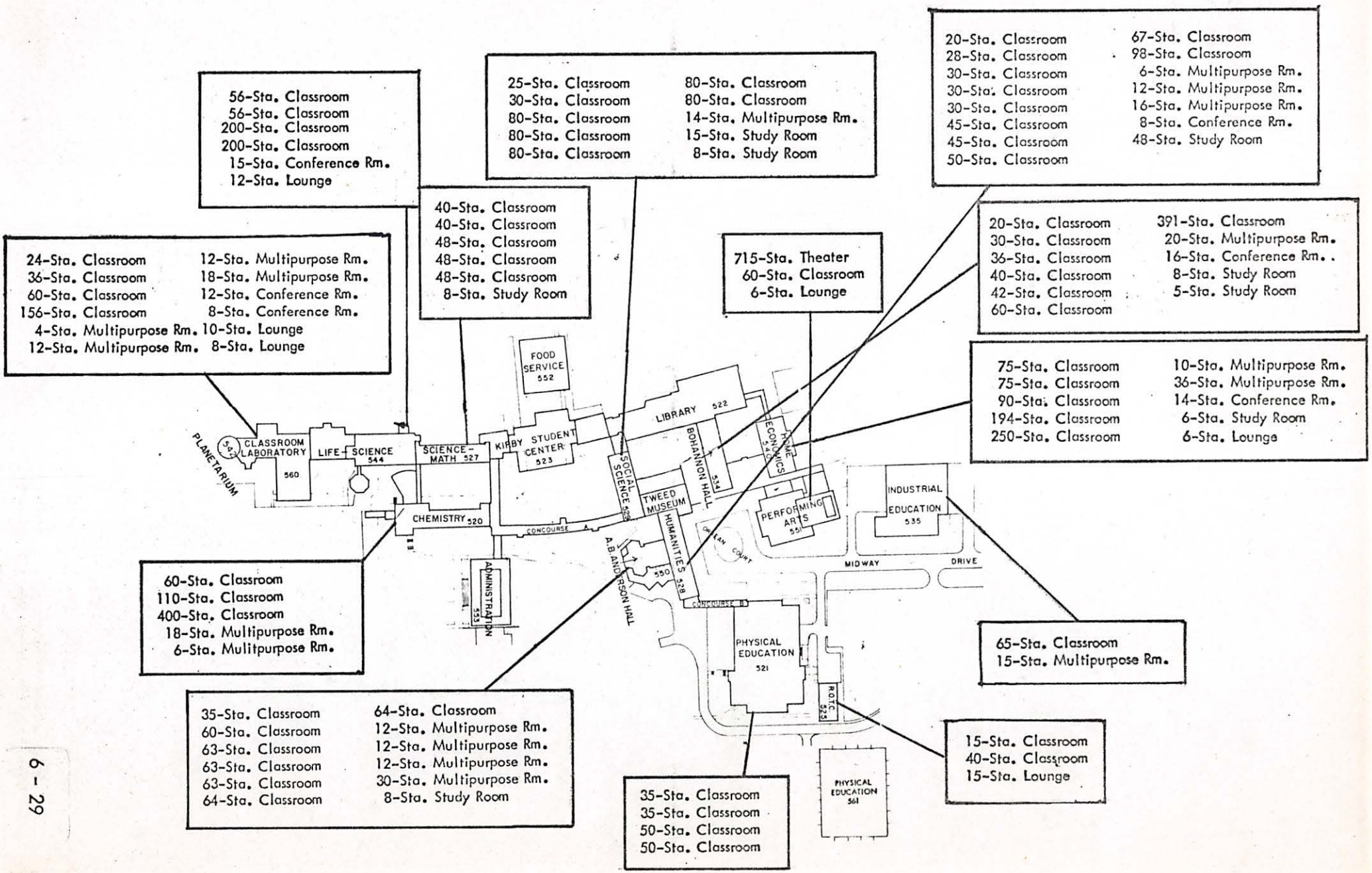


TABLE 6-1
UNIVERSITY OF MINNESOTA AT DULUTH
BUILDING LIST

Bldg. No.	Building Name	Bldg. Assignable Area (ASF)	Bldg. Gross Area (GSF)	Bldg. Efficiency (ASF ÷ GSF)	Location
501	Old Main	55,624	83,038	.66	Lower Campus
502	School of Med. (Lab. School Bldg.)	17,744	29,160	.60	L
503	Heating Plant (Lower Campus)	7,522	7,995	.94	L
504	Washburn Hall	14,305	18,240	.78	L
505	Torrance Hall	19,916	25,722	.77	L
510	Provost's Residence	7,023	12,510	.56	Off Campus
512	Alworth Toolhouse	242	480	.50	O
513	Alworth Garage, East	1,932	2,287	.84	O
514	Alworth Garage, West	3,319	4,176	.79	O
515	School of Social Development	4,893	9,518	.51	O
516	Alworth Apartments	6,599	9,037	.73	O
517	Limnological Research Center	6,609	8,192	.80	O
518	Cottage "A"				O
520	Chemistry (Science)	32,994	52,637	.62	Upper Campus
521	Physical Education	57,660	106,564	.54	U
522	Library	68,015	99,091	.68	U
523	Kirby Student Center	61,753	101,088	.61	U
524	Vermilion Hall	16,382	20,208	.81	U
525	Air Force ROTC	3,782	4,572	.82	U
527	Science-Mathematics	16,445	30,846	.53	U
528	Humanities	48,826	84,666	.57	U
529	Social Science	23,866	43,656	.54	U
530	Burntside Hall	18,717	22,866	.81	U
531	Heating Plant	13,166	14,804	.88	U
532	Ski Chalet	391	413	.94	Off Campus
533	Provost's Garage	1,011	2,239	.45	O
534	Bohannon Hall (Education Building)	27,404	53,463	.51	Upper Campus
535	Industrial Education	29,912	46,012	.65	U
536	Concourse A	12,640	14,480	.87	U
538	Automotive Equipment Shop	2,337	2,432	.96	U
539	Drug Information Center	2,561	3,051	.83	U
540	Home Economics	23,775	44,932	.52	U
541	Griggs Hall	70,149	84,067	.83	U
542	Marshall W. Alworth Planetarium	1,865	2,883	.64	U
543	Concourse B	4,446	5,156	.86	U
544	Life Science	36,383	60,435	.60	U
545	Gas Meter House	192	254	.75	U
547	Cottage "D"				O
548	Cottage "E"				O
549	Lake Superior Hall	81,008	95,863	.84	Upper Campus
550	A.B. Anderson Hall	21,964	35,586	.61	U
551	Marshall Performing Arts Center*	36,580	77,986	.46	U
552	Food Service Center	27,098	66,991	.40	U
553	Administration	38,400	74,136	.51	U
554	Stadium				U
555	Plant Services Shop	15,880	19,020	.83	U
556	Health Service	2,861	3,143	.91	U
557	The Village	53,504	58,140	.92	U
558	The Village Service Center	6,196	6,636	.93	U
559	Stadium Apartments	87,783	103,156	.85	U
560	Classroom Laboratory Building*	38,520	80,330	.47	U
561	New Physical Education Building*	38,169			U

Source: UMD Facility Inventory, as updated by UMD Representative in accordance with UMD Plant Services Data and by LGA/ADL Review with academic users, Fall Quarter, 1973.

* Under construction during Fall Quarter, 1973

TABLE 6-2
UNIVERSITY OF MINNESOTA AT DULUTH
CAMPUS BUILDING AREA BY SPACE CATEGORY

UM Space Categories	Upper Campus		Lower Campus		Off Campus		Total Existing UMD Buildings		Bldgs. in Const. #551, 560, 561	
	ASF	%	ASF	%	ASF	%	ASF	%	ASF	%
Laboratories and Studios										
1-Class Laboratory	60,723	11.16	2,770	3.77			63,493	9.99	7,928	6.99
2-Special Class Lab	2,727	.50					2,727	.42	4,736	4.18
3-Individual Lab	987	.18					987	.15		
4-Class Studio	18,388	3.38					18,388	2.89	1,196	1.05
5-Non-class Lab	9,373	1.72	5,991	8.16	6,609	35.92	21,973	3.45	959	.84
6-Non-class Studio									262	.23
7-Audio-visual Studio	1,771	.32					1,771	.27		
8-Individual Studio	1,410	.25					1,410	.22		
Offices										
10-Faculty Office	30,224	5.55	4,214	5.74	849	4.61	35,287	5.55	5,146	4.54
11-Staff Office	20,120	3.70	821	1.11	357	1.94	21,298	3.35	1,607	1.41
12-General Office	31,830	5.85	8,278	11.28	289	1.57	40,397	6.35	1,107	.97
13-Student Office	6,440	1.18	185	.25			6,625	1.04		
Workrooms										
21-Data-processing	1,652	.30					1,652	.25	3,511	3.09
23-Shop	33,505	6.16	1,207	1.64	242	1.31	34,954	5.49	5,183	4.57
24-Clinic	7,226	1.32	879	1.19			8,105	1.27	1,554	1.37
26-Study Room	14,168	2.60	1,444	1.96	278	1.51	15,890	2.50		
28-Merchandising	6,268	1.15					6,268	.98		
29-Workroom	7,478	1.37	390	.53	58	.31	7,926	1.24		
Assembly Rooms										
30-Classrooms	55,779	10.25	2,004	2.73	582	3.16	58,365	9.18	5,845	5.16
31-Assembly			7,205	9.82			7,205	1.13	7,146	6.30
32-Conference	5,060	.93			307	1.66	5,367	.84	616	.54
Accessory Service Rooms										
40-Laboratory	13,865	2.54	1,466	1.99			15,331	2.41	1,883	1.66
41-Clinical	312	.05	54	.07			366	.05	738	.65
42-Assembly	1,338	.24	6,325	8.62			7,663	1.20	16,433	14.50
43-Gymnasium	8,138	1.49					8,138	1.28	169	.14
44-Office	4,800	.88	522	.71	604	3.28	5,926	.93		
45-Library	6,295	1.15					6,295	.99		
46-Dept. Multi-Purpose	7,391	1.35					7,391	1.16	945	.83
47-Other	11,602	2.13	108	.14	423	2.29	12,133	1.90	898	.79
Recreation Rooms										
52-Lounge	8,090	1.48	871	1.18	165	.89	9,126	1.43	1,375	1.21
53-Activity	11,302	2.07			391	2.12	11,693	1.83		
55-Gymnasium	26,943	4.95	3,129	4.26			30,072	4.73	38,000	33.54
58-Spectator Seating	7,810	1.43					7,810	1.22		
Stacks and Storage										
60-Stack	44,994	8.27	173	.23			45,167	7.10	1,735	1.53
61-Storeroom	20,492	3.76	3,391	4.62	66	.35	23,949	3.76	1,765	1.55
63-Garage			950	1.29	1,011	5.49	1,961	.30		
Other Kinds of Rooms										
70-Access Area	5,301	.97	813	1.10			6,114	.96	1,024	.90
80-Animal Room	339	.06	2,681	3.65			3,020	.47		
81-Greenhouse	2,832	.52					2,832	.44		
82-Inactive	5,733	1.05	17,497	23.84	6,166	33.51	29,396	4.62	1,508	1.33
84-Exhibition Room	9,064	1.66					9,064	1.42		
86-Dining Room	32,011	5.88					32,011	5.03		
90-Field Building										
TOTAL	543,781	100%	73,368	100%	18,397	100%	635,546	100%	113,269	100%
85-Bedroom	333,739		34,221		13,622		381,582			
GRAND TOTAL	877,520		107,589		32,019		1,017,128		113,269	

Note: Table excludes all non-assignable area (Space Categories 71 - 74) including 1,242 sq. ft. that were assigned function categories. Table includes 1,553 sq. ft. that by error were not assigned function categories.

"Bedroom" includes all assignable area in all residence buildings including Village Service Center but excluding cottages.

Source: UMD Facility Inventory, as updated by UMD representative in accordance with UMD Plant Service data and by LGA/ADL review with academic users, Fall Quarter 1973.

TABLE 6-3
UNIVERSITY OF MINNESOTA AT DULUTH
CAMPUS BUILDING AREA BY FUNCTION CATEGORY

UM Function Categories	Upper Campus		Lower Campus		Off Campus		Total Existing UMD Buildings		Bldgs. in Const. (#551, 560, 561)	
	ASF	%	ASF	%	ASF	%	ASF	%	ASF	%
Instruction										
11-Teaching	136,361	25.07	6,781	9.28	582	3.17	143,724	22.63	18,537	16.36
13-Teaching Service	74,186	13.64	14,569	19.94	1,518	8.28	90,273	14.21	44,092	38.92
14-Admin. Service	22,761	4.18	1,100	1.50	1,818	9.91	25,679	4.04	419	.37
Research										
21-Organized Research	1,967	.36	5,557	7.60	6,609	36.05	14,133	2.22		
24-University Financed Research	7,047	1.29					7,047	1.11	959	.85
Public Service										
31-Services	15,116	2.77	14,380	19.68			29,496	4.65	1,991	1.76
Library Service										
39	63,337	11.64					63,337	9.97		
Student Service										
41	44,451	8.17	871	1.19	391	2.13	45,713	7.20	629	.56
Physical Education										
46	50,819	9.34					50,819	8.00	38,169	33.70
Administration										
49	18,897	3.47					18,897	2.97		
Plant Operation										
61	29,229	5.37	1,207	1.65	1,253	6.83	31,689	4.99	1,765	1.56
Institutional Service										
71-Central Service	19,637	3.61	950	1.30			20,587	3.24	5,200	4.59
74-Laboratory School Instruction										
75-Hospital Service										
76-Food Service	52,986	9.74					52,986	8.34		
Co.-Sponsored Activity										
79	1,307	.24	7,409	10.14			8,716	1.37		
Unused Space										
81	5,733	1.05	20,240	27.70	6,166	33.63	32,139	5.06	1,508	1.33
TOTAL	543,834	100%	73,064	100%	18,337	100%	635,235	100%	113,269	100%
77-Housing	333,739		34,221		13,622		381,582			
GRAND TOTAL	877,573		107,285		31,959		1,016,817		113,269	

Note: Table excludes 1,553 sq. ft. of assignable area that by error was not assigned function categories, but includes 1,242 sq. ft. of non-assignable area (Space Categories 71 - 74) that were assigned function categories.
"Housing" includes all assignable area in all residence building including Village Service Center, but excluding cottages.
"Plant Operation" excludes all non-assignable areas, including the Heating Plant building.

Source: UMD Facility Inventory, as updated by UMD representative in accordance with UMD Plant Service data and by LGA/ADL review with academic users, Fall Quarter, 1973.

TABLE 6-4

UNIVERSITY OF MINNESOTA, DULUTH
DISTRIBUTION OF NET BUILDING AREA BY FUNCTION AND SPACE CATEGORY
ALL UMD BUILDINGS INCLUDING NEW CONSTRUCTION

FUNCTION CATEGORIES		SPACE CATEGORIES							
		Labs, Studios, Workrms (01-00 + 21-29)	Assembly Rms (30-32)	Service Rms (40-47)	Offices (10-13)	Recreation Rms (52-50)	Stacks & Storage (60-63)	Other Rms	Total
Instruction	(11-14)	117,200	74,036	47,990	62,971	1,654	8,638	10,251	322,740
Research	(21-24)	20,880	-	1,187	-	-	-	72	22,139
Public Service	(31-33)	1,172	6,246	6,543	3,600	-	5,385	8,541	31,487
Library Service	(39)	12,037	-	6,340	3,422	591	40,920	27	63,337
Student Services	(41)	6,422	1,522	2,489	15,907	18,955	286	761	46,342
Physical Education	(46)	2,450	-	8,483	2,666	72,753	-	2,636	88,988
Administration	(49)	2,908	1,727	1,619	9,966	-	1,695	982	18,897
Plant Operations	(61)	21,427	282	708	2,573	137	6,457	859	32,443
Institutional Service	(71-77)	24,647	731	8,491	5,659	857	8,525	412,456	461,366
Others		1,730	-	459	4,703	3,129	2,671	31,208	43,900
Total		210,873	84,544	84,309	111,467	98,076	74,577	467,793	1,131,639

Note: Table includes all area in Table 6 - 2 plus 1,242 square feet in Space Categories 71 - 74 (non-assignable) that were assigned function categories.
Table includes all area in Table 6 - 3 plus 1,553 square feet of assignable area that by error was not assigned function categories.

Source: UMD Facility Inventory, as updated by UMD representatives in accordance with UMD Plant Services data and by LGA/ADL review with academic users. Fall Quarter 1973.

TABLE 6-5

UNIVERSITY OF MINNESOTA, DULUTH
INSTRUCTIONAL ROOM UTILIZATION BY SPACE CATEGORY
ACADEMIC UNITS ON THE UPPER CAMPUS
FALL QUARTER 1973

Space Categories				Teaching Use			All Uses		
Number	Title	No. of Rooms	No. of Stations	RU Hours	SU Hours	SOR %	RU Hours	SU Hours	SOR %
01	Class Laboratory	59	1,367	13.59	11.42	84	23.88	13.84	57
02	Special Class Laboratory	7	80	.85	.52	73	18.07	7.25	40
03	Individual Laboratory	1	8	.00	.00	00	17.00	8.25	48
04	Class Studio	14	321	14.00	11.42	81	29.85	16.87	56
08	Individual Studio	26	37	.75	1.55	206	24.36	18.14	74
26	Study Room	8	106	2.18	2.41	110	22.68	6.89	30
30	Classroom	56	4,272	24.87	13.07	53	29.73	14.29	48
32	Conference Room	4	53	1.25	.47	37	6.38	7.59	118
46	Departmental Multipurpose Room	14	219	4.85	3.44	70	19.76	9.28	46
52	Lounge	3	35	.00	.00	00	.33	.57	172

Source: Arthur D. Little, Inc.

TABLE 6-6
UNIVERSITY OF MINNESOTA AT DULUTH
CLASSROOM UTILIZATION BY ROOM SIZE
UPPER CAMPUS

No. Stations	No. of Rooms	Teaching Uses RU Hours	Teaching Uses SU Hours	Teaching Uses SOR %	All Uses RU Hours	All Uses SU Hours	All Uses SOR %
15	1	15.00	8.60	57	27.00	12.53	46
20	2	16.00	16.02	100	26.75	20.08	75
25	1	11.00	6.68	60	11.00	6.68	60
28	1	22.00	22.42	101	35.50	27.10	76
30	5	28.00	15.30	54	30.90	16.55	53
35	3	9.00	5.30	59	22.33	11.33	51
36	1	35.00	15.11	43	42.00	19.13	45
40	4	21.25	12.40	58	24.12	13.91	57
42	1	20.01	5.97	29	21.51	6.50	30
45	2	27.50	16.46	59	34.50	19.42	56
48	3	35.66	22.12	62	36.16	22.39	61
50	3	13.00	3.92	30	27.16	10.48	38
56	2	26.00	17.40	66	27.25	17.91	65
60	3	20.77	8.47	40	24.77	9.76	39
63	4	27.12	13.85	51	30.62	14.64	47
64	2	32.50	18.78	57	33.25	18.96	57
65	1	24.00	10.04	41	24.00	10.04	41
67	1	28.00	17.64	63	33.00	19.94	60
75	2	35.50	15.22	42	39.50	15.91	40
80	5	30.20	15.38	50	35.40	16.44	46
90	1	46.00	14.42	36	41.50	14.67	35
98	1	25.00	19.76	79	32.00	22.03	68
110	1	21.00	15.10	71	21.00	15.10	71
194	1	30.00	9.73	32	33.50	10.76	32
200	2	22.00	12.93	58	23.00	13.18	57
250	1	39.00	14.18	36	45.00	15.94	35
391	1	21.00	9.31	44	22.00	9.44	42
400	1	23.00	11.49	49	25.50	11.80	46

Source: Arthur D. Little, Inc.

T. 6-7

CLASSROOM USE BY DAY AND TIME
FOR TEACHING USES AND FOR ALL USES
UPPER CAMPUS

		Monday		Tuesday		Wednesday		Thursday		Friday		Average Day	
		Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %
8:30-9:30	%Rms.in Use	65	67	44	46	53	54	46	47	54	56	52	54
	%Sta.in Use	41	42	26	27	33	34	26	27	30	31	32	33
	Sta.Occ.Rate	53	53	50	51	56	57	49	50	50	51	52	53
9:30-10:30	%Rms.in Use	88	91	51	53	84	88	61	63	68	72	71	73
	%Sta.in Use	49	50	39	40	44	46	42	43	33	34	42	43
	Sta.Occ.Rate	50	50	53	53	50	50	49	49	46	47	50	50
10:30-11:30	%Rms.in Use	86	89	54	60	75	79	56	60	77	79	70	73
	%Sta.in Use	54	55	31	32	42	43	37	37	47	48	42	43
	Sta.Occ.Rate	57	57	47	46	60	59	51	50	54	54	54	54
11:30-12:30	%Rms.in Use	84	86	58	63	86	88	67	70	72	74	73	76
	%Sta.in Use	57	58	31	33	57	58	34	35	48	48	45	46
	Sta.Occ.Rate	61	61	54	53	60	60	51	51	61	61	58	58
12:30-1:30	%Rms.in Use	70	72	53	56	65	67	54	56	56	58	60	62
	%Sta.in Use	40	40	23	25	39	40	21	23	32	32	31	32
	Sta.Occ.Rate	59	59	49	49	62	62	45	47	60	59	59	56
1:30-2:30	%Rms.in Use	82	84	65	67	79	81	77	77	63	65	73	75
	%Sta.in Use	44	44	34	34	40	41	36	36	35	35	38	38
	Sta.Occ.Rate	49	49	49	48	52	51	45	45	50	49	49	48
2:30-3:30	%Rms.in Use	49	53	39	39	51	54	42	44	32	35	42	45
	%Sta.in Use	20	21	14	14	21	21	17	17	12	12	17	17
	Sta.Occ.Rate	45	44	49	49	45	44	53	53	55	52	49	48
3:30-4:30	%Rms.in Use	18	18	23	25	19	19	26	26	7	7	19	19
	%Sta.in Use	7	7	6	7	7	7	9	9	2	2	6	6
	Sta.Occ.Rate	27	27	24	26	27	27	29	29	15	15	26	26
4:30-5:30	%Rms.in Use	7	7	12	14	12	12	9	9			8	8
	%Sta.in Use	1	1	1	2	2	2	1	1			1	1
	Sta.Occ.Rate	12	12	6	9	17	17	4	4			9	10
Avg. Hour	%Rms.in Use	61	63	44	47	58	60	49	50	48	49		
	%sta.in Use	35	35	23	24	32	32	25	25	26	27		
	Sta.Occ.Rate	52	52	47	47	53	53	46	46	53	53		

Table represents 56 Classrooms with 4,272 student stations.

Teaching Uses reported to occur during the above periods but without specific hour assignment total 1.9% of total room hours with assignment and 0.1% of total station hours with assignment. All Uses without specific hour assignment total 12% of the total room hours and 3% of the total station hours with assignment.

Source: Arthur D. Little, Inc.

TABLE 6-8
CLASS LABORATORY/CLASS STUDIO USE BY DAY AND TIME
FOR TEACHING USES AND FOR ALL USES
UPPER CAMPUS

		Monday		Tuesday		Wednesday		Thursday		Friday		Average Day	
		Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %	Teaching %	All Uses %
8:30-9:30	%Rms.in Use	24	27	24	27	19	22	23	26	20	23	22	25
	%Sta.in Use	21	23	24	25	21	23	23	24	18	20	29	23
	Sta.Occ.Rate	91	86	89	84	93	88	87	82	88	83	89	85
9:30-10:30	%Rms. in Use	32	35	35	36	28	30	35	36	26	27	31	33
	%Sta.in Use	32	33	33	34	30	30	34	35	25	25	31	31
	Sta.Occ.Rate	92	90	88	87	97	95	88	86	95	92	92	90
10:30-11:30	%Rms. in Use	35	39	38	41	32	35	35	38	26	28	33	36
	%Sta.in Use	34	37	37	39	33	35	34	36	25	27	33	35
	Sta.Occ.Rate	104	98	96	93	107	102	98	94	108	101	102	97
11:30-12:30	%Rms.in Use	23	24	36	38	24	26	32	34	12	14	26	27
	%Sta.in Use	25	25	34	34	25	26	31	32	15	16	26	26
	Sta.Occ.Rate	107	104	81	80	105	102	89	88	135	126	97	94
12:30- 1:30	%Rms.in Use	18	19	23	24	16	18	26	26	14	18	19	21
	%Sta.in Use	21	23	24	24	18	20	27	27	17	19	21	23
	Sta.Occ.Rate	106	104	103	100	96	94	108	108	123	103	106	102
1:30 - 2:30	%Rms. in Use	30	30	30	31	31	31	27	30	18	23	27	29
	%Sta. in Use	31	31	30	32	34	34	26	29	25	26	29	31
	Sta.Occ.Rate	104	104	108	108	107	107	100	98	126	106	108	104
2:30 - 3:30	%Rms. in Use	34	35	34	34	34	35	35	36	14	19	30	32
	%Sta. in Use	28	29	31	31	28	29	30	30	13	15	26	27
	Sta.Occ.Rate	74	72	86	86	72	71	80	79	70	62	77	75
3:30 - 4:30	%Rms. in Use	26	26	27	27	22	22	27	28	11	16	22	24
	%Sta. in Use	23	23	24	24	21	21	23	24	10	12	20	21
	Sta.Occ.Rate	85	85	87	87	80	80	94	91	93	73	87	84
4:30 - 5:30	%Rms.in Use	22	23	20	20	12	14	18	19	05	11	15	17
	%Sta.in Use	17	17	15	15	11	11	14	15	03	05	12	13
	Sta.Occ.Rate	56	54	55	55	65	61	54	54	72	51	57	55
Avg.Hour	%Rms. in Use	27	29	29	31	24	26	29	30	16	20		
	%Sta. in Use	26	27	28	29	25	25	27	26	17	18		
	Sta.Occ.Rate	90	87	88	87	92	89	88	86	102	90		

Table represents 74 Class Labs and Studios with 1,748 student stations.
Teaching uses reported to occur during the above periods but without specific hour assignment total 3.6%. A total room hours with assignment and 1.7% of total station hours with assignment. All uses without specific hour assignment total 61% of total room hours and 19% of total station hours with assignment.

Source: Arthur D. Little, Inc.

TABLE 6-9

UMD FACULTY OFFICES (INCLUDING DEPARTMENT HEAD OFFICES)
DISTRIBUTION BY DEPARTMENT AND SIZE
(New offices in the Classroom-Laboratory Building are shown in parenthesis.)

DEPARTMENT	Number of Faculty	Number of Faculty Offices	AREA (nsf)				
			>200	150-200	125-149	100-124	<100
El. Ed.-2110	11	10		2	8		
Sec. Ed.-2120	12	12	1	1		10	
Home Ec.-2130	6	4		2	2		
Ind. Ed.-2140	9	7		2	3	1	1
Phy. Ed.-2150	14*	14		1	2	3	8
Psych.-2160	12	13	1	1	1	7	2
Spec. Ed.-2170	3	3			2	1	
Sp.Path & Aud.-2180	4	4		1			3
Biology-2210	15	16	1			15	
Chem.-2220	11*	13	3		2	1	7
Geol.-2230	7	7		1	6		
Math-2240	12	11		1	8		2
Physics-2250	8	8 (18)		(11)	3 (7)	2	5
Art-2310	11	10	1	4	3		2
English-2320	20	21	1	1	6	9	4
Language-2330	9	8			7	1	
Music-2340	15	15	13	1		1	
Philosophy-2350	4	4			1	3	
Sp./Comm./Th.-2360	9	17***	2	1	1	11	2
Bus. Adm.-2410	11	11		11			
Economics-2420	9	5	4	1			
Geog.-2430	6	6		6			
Hist.-2440	9	9			2	5	2
Pol. Sci.-2450	8	6		2	4		
Soc.-Anthro.-3370	9*	9				6	3
Sch.Soc.Dev.-2500	11**	6	2	2	1		1
Med. Sch.-2600	28	18	12	1	2	3	4
Dent. Hyg.-2710	5	(4)		(4)			
AFROTC-2810	3	3		3			
Comp. Ctr.-5300	1	(2)	(1)	(1)			
PL. & Obs.-2291	1	1		1			
TOTAL	293	271 (24)	41 (1)	46 (16)	65 (7)	77	42

*Includes one on leave
**Includes 1 visiting faculty
***Includes 2 offices in Old Main and 5 in ABAH.

Sources: UMD Facility Inventory and UMD Student-Staff Directory, 1973-1974

CHAPTER 7 - HOUSING THE SOCIAL SCIENCES

LGA/ADL
March, 1974

CHAPTER 7 - HOUSING THE SOCIAL SCIENCES

Introduction:

As we have already noted, two of the principal objects of this study have been to formulate recommendations for the most effective future housing for the School of Medicine and for the Social Sciences, including Psychology. This chapter will be devoted to the latter problem. The facilities needs of the School of Medicine will be discussed in Chapter Eight.

Planning for new physical facilities for the Social Sciences has been under way at UMD since 1968. As a result of the activities of the Social Sciences Building Committee, a three-phase building request was formulated for facilities that would eventually accommodate not only the departments of the Division of Social Sciences but also the new School of Social Development and the Department of Psychology. Recently, in recognition of changing enrollment trends, the responsible committee has been scaling down its projections of needed space. The analysis and recommendations presented in this chapter will, we hope, contribute to the development of a sound and realistic building program.

It should be noted that the phrases "Social Sciences Complex" and even "Social Sciences facilities" are misleading. The needs of the Social Sciences departments vary widely from a department such as Political Science, which has no substantial unmet space needs, to a department such as Business Administration, whose educational programs are in serious jeopardy because of deficiencies of equipment and space. In addition, two units which are closely associated with, but do not belong to, the Division of Social Sciences have been included in the planning. These units are the new School of Social Development and the Department of Psychology. With these reservations understood, we will continue to refer to the "Social Sciences facilities," but solely as a matter of convenience.

The Division of Social Sciences comprises the Departments of Business Administration, Economics, Geography, History, Political Science, and Sociology-Anthropology. As noted above, for facilities planning purposes "Social Sciences" include the Department of Psychology and the School of Social Development.

Important factors in projecting needed facilities are the current trends in teaching loads for the departments concerned, the present level of utilization of existing facilities, the remaining capacity for the campus as a whole, and the special needs and problems of the departments involved in the planning.

Teaching Loads:

The teaching load of the Division, measured in credit hours taught, shows an increase from 1970-71 to 1971-72 and then a decrease to 1972-73. There was a net increase of 1.7%.

All but one of the departments (History) showed net increases in credit hours taught during this period. The decline in History's teaching load was substantial (20.6%) and probably reflects the falling demand for secondary school history teachers.

As noted in Table 7-1, the greatest increase occurred in Economics (+21.7%). Political Science also showed a substantial increase (+10.0%). Increases in the remaining departments were less than 5%. If History were set aside, the remaining departments of the Division would register a cumulative increase of 8.1%. Psychology shows an overall increase of 7% during the same years. Credit hours taught have tended to increase in spite of declining numbers of majors because the Social Sciences have become increasingly important to majors in other fields. (Since the School of Social Development accepted its first students in August of 1972, comparable figures do not exist.)

We believe that the levels of student credit hours taught represent the soundest measure of the teaching loads of the departments. We must also note, however, that even as the credit hours taught have been increasing, there has been a substantial downward trend in the majors graduated by all but one of the departments (Sociology-Anthropology, which showed a modest net increase from 1971 to 1973).

In response to these trends, UMD programs in the career areas have been increased and restructured, with two current discussions suggesting a School of Business to advance these programs. Approval of a Master of Business Administration program has also been requested in response to an expressed demand. A request has also been made for a master's level program in Community and Regional Studies. In addition, a baccalaureate program in Urban Studies has grown rapidly (see page 7-7).

Present Utilization Levels:

A second important factor that bears on the magnitude and kind of facilities to be projected for future use is the level of utilization of existing instructional facilities. In Chapter Five we have discussed current utilization by

TABLE 7-1

STUDENT CREDIT HOURS TAUGHT, 1970 - 1973

Social Sciences	A 1970-71	B 1971-72	Change A to B	C 1972-73	Change B to C	Change A to C
Business Administration	8,723	8,074	- 7.5%	9,099	+12.7%	+ 4.3%
Economics	7,086	7,668	+ 8.2%	8,622	+12.4%	+21.7%
Geography	8,171	8,254	+ 1.0%	8,204	- 0.6%	+ 0.4%
History	14,511	14,252	- 1.8%	11,528	-19.1%	-20.6%
Political Science	7,803	8,553	+ 9.6%	8,584	+ 0.4%	+10.0%
Sociology-Anthropology	13,644	15,275	+11.7%	14,094	- 7.7%	+ 3.3%
American Indian Studies	-	-	-	844		
Division Total	59,938	62,076	+ 3.5%	60,975	- 1.7%	+ 1.7%
Psychology	15,598	14,699	- 5.7%	16,755	+13.9%	+ 7.4%
Grand Total:	75,536	76,775	+ 1.6%	77,730	+ 1.2%	+ 2.9%

(Based on figures from the office of the Vice Provost for Academic Administration. Summer Sessions not included.)

department. In the following paragraphs we will make some general observations on the utilization of existing space for the Social Sciences as a whole.

Relatively few classrooms and class laboratories are now assigned for full-time use to the departments that have taken part in the planning for the new Social Sciences facilities. One classroom is assigned to Geography and none to Sociology-Anthropology except for two multipurpose rooms -- one used as a learning center and the other listed as a seminar room. Four class labs are assigned to Business Administration, one to Geography, and two to Psychology. (The School of Social Development will be discussed separately.)

As previously reported, classroom facilities of the campus as a whole can accommodate some additional class scheduling if the campus can increase use of off-peak hours. We believe this can be expected to accommodate the standard general classroom needs of the Social Sciences Division for the short-term future until enrollment trends are further established. However, changing teaching methodologies and the increased use of technology in many social science fields have created special facility needs, different from the conventional classroom but which are essential to the student's preparation for many career areas.

In its present location in the Alworth House, The School of Social Development is constrained by facility limitations both for its current program and for its future planned expansion. Not the least of the constraints has been its remoteness from the upper campus. We understand that the School has asked the administration for a total of five faculty offices on the upper campus for 1974-75. In addition, the School has asked for classrooms on the upper campus to accommodate not only its undergraduate courses but also its graduate courses, leaving only its administrative offices in the Alworth House. We note that the sizes of the graduate classes cover a considerable range, from classes of 12 and 14 students to some with 25 and 37. In addition there are many informal meetings of small groups.

The School of Social Development is scheduled for major expansion in its teaching responsibilities. The provision on the upper campus of adequate space for its functions as it grows may pose some problems but should be pursued as a necessary condition to the planned development of this School.

Special Needs and Problems:

Of the departments being considered here, the most pressing needs appear to be experienced by the Department of Business Administration. The urgent needs of this department for physical improvements that will enable it to offer a high-level program geared to the needs of today's business world have been highlighted by recent letters received from education officials in Minnesota and Wisconsin who have visited the UMD campus. We have been informed by the head of the department that a real possibility exists that the state may withdraw certification from the graduates of the program in Business Education unless some serious deficiencies in facilities are corrected.

Jack W. Sullivan, Vocational Program Supervisor of the Minnesota Department of Education wrote, in a a letter dated February 5, 1974, of his extreme concern that the physical limitations of the department, particularly in the matter of equipment, made it impossible for UMD to offer a quality program. "I cannot, in good conscience, support the program that is presently being offered at the University...," Mr. Sullivan wrote. He identified the following principal areas that required upgrading:

1. Audiovisual and other materials for individualized instruction;
2. Facilities for model office simulation;
3. Approximately 15 more adding and calculating machines;
4. Word processing equipment that permits instruction in machine transcription and magnetic card typewriters;
5. Equipment for instruction in reprographics;
6. More electric typewriters and specialized typewriters.

On the same date, James A. Urness, Vocational Education Consultant of the Wisconsin Board of Vocational, Technical, and Adult Education wrote in much the same vein. Prefacing his remarks with the observation that "At the present time it does not appear that the University of Minnesota-Duluth is turning out qualified Business Education instructors," Mr. Urness went on to make many of the same observations as were made by Mr. Sullivan.

The Department's own perceptions of its deficiences parallel these visitors' comments. The Business Education program is severely constrained by the necessity of accommodating both typing and shorthand in its single 25'x30' room. Individualized learning materials can be used effectively only in

appropriately designed and equipped learning laboratories. A machine room designed for lecture demonstration is desired in addition to the room currently used primarily as a laboratory. Small-group study and seminar rooms are seen as further immediate needs.

The most pressing needs of the Business Administration degree program are seen to be an additional seminar and office space, audiovisual and computer hookups, and storage space.

As is true of the other programs also, the Accounting degree program is constrained by the lack of facilities and equipment for individual study using cassette tapes and other study materials. Seminar space is desired as is a library/study/commons room.

In the existing programs as well as in the proposed graduate MBA program, there will be an increasing need for case study rooms in which there are adequate blackboards and projection equipment and in which students can communicate face to face.

The future development of curricula in Sociology-Anthropology is reported to be severely limited by the inappropriateness of presently available space for modern educational technology. In addition to space suitable for the use of individualized instructional media, Sociology-Anthropology would undertake to change class formats if appropriate facilities were available. Such spaces would include classrooms designed so that large groups could break up into several smaller discussion groups. Other desired specialized space includes observation rooms with one-way glass and rooms designed for social science simulation. A physical anthropology lab would permit a strengthening of the curriculum in this field.

Currently the greatest deficiency in the Geography Department is in the inadequacies of its special laboratories. The Cartography Lab (SS 320) is too small to accommodate comfortably the 16 drafting tables, a light table, and a work table that it now contains. The map enlarger, which the Department would prefer to locate in this laboratory, is instead installed in the Map Library. A larger room would provide not only better conditions for student work and instruction, but also would make the room more suitable for shared uses. (It should be noted that utilization figures reported for this room are relatively low because, due to lack of staff, cartography is not taught during the Fall Quarter.)

Geography's other current space problem is the inadequacy of the Campus Map Library (SS 328), which falls within its jurisdiction. Not only is the room too small for its purpose but concern has also been expressed that the floor has been loaded to its safe maximum limit. In addition to maps, the Map Library contains a drafting table, a map enlarger, and a study table. Additional problems include, as in other departments, a shortage of general storage space.

Additional critical items reported by this department include the need for a machines room, space for map and air-photo interpretation, and an additional faculty office.

The Economics Department reports that its presently assigned spaces do not permit it to respond adequately to the increasing importance of quantification methods in its field. Access is needed to computer facilities closely linked to instructional facilities. Wang computers are desired for use in course work. It will be recalled that the Department of Business Administration reported similar needs; it is expected that, in the future, quantification will also become an important element for teaching and research in the Departments of Geography, Sociology, and Political Science, as it has at other institutions throughout the country.

Although the Department of Political Science is not currently experiencing any severe constraints of space, the Department has reported some difficulty in access to seminar rooms as well as a lack of storage space for maps and other instructional aids. There is no current shortage of office space, but some concern has been expressed that, if a proposed Canadian Studies Program should be mounted in 1974-75 or 1975-76, no office space would be available for the two proposed staff members and their secretary.

The Department of History appears to be adequately housed both for its present operation and its expected future mission. The department head has noted, however, that the Department does suffer from its classes being widely scattered, making it difficult to make effective use of audiovisual aids, since equipment must be moved from one room to another to serve successive sections of the same course.

The Department of Psychology reports a wide variety of problems growing out of the inadequacy or non-existence of rooms designed for its special

needs. Among these desired special-purpose rooms are a laboratory designed for child study to be used in early childhood programs. A statistics lab for about 20 students is also desired as well as a research room in which to meet students and discuss their research projects. Laboratory spaces for both human and animal research are requested. (It will be recalled that this department's current animal research is conducted in facilities belonging to the School of Medicine.) Psychology also reports a general inadequacy in the availability of AV-TV outlets and computer access. Seminar and small-group instructional space is also an endemic problem.

In addition to departmental programs, the Social Sciences Division is the locus for the Urban Studies Program, an interdisciplinary major that is reported to be the most rapidly growing program on the campus. In the winter of 1973-74, there were 41 declared majors in this program, which calls for freshman and sophomore prerequisites in Economics, Geography, Political Science, Psychology, and Sociology. The upper division work includes core courses in the same fields, with the exception of Psychology, and a departmental concentration in Business Administration, Economics, Political Science, Sociology, or Geography. An interdepartmental major may also be arranged.

The Urban Studies program does not generate any facilities needs of its own, own, but it partakes in the general needs of the Division for space suitable for small-group discussions and for advanced instructional technology.

Another interdepartmental major is in Social Science, leading to both the B.A. and B.S. degrees. The core subjects are offered in Economics, Geography, History, Political Science, and Sociology. In the winter of 1973-74 there were 5 senior majors, 6 juniors, 7 sophomores, and 3 freshmen. As is the case with Urban Studies, the program does not generate facilities needs of its own.

The School of Social Development has identified the following facilities as comprising their more urgent needs for instructional purposes: small-group discussion rooms (up to 8 persons), a seminar (or rooms) to accommodate 10-15 persons, access to classrooms seating from about 30 student to (rarely) 100 students, a multipurpose room seating up to 100, and access to a lecture hall.

Staff and administrative needs of the School include offices for faculty, teaching assistants, and administrative staff; faculty research facilities; a conference room; and space for extension education.

Finally, it should be noted that although our discussion has been focused on the Social Sciences, benefits will accrue to the Humanities Division through the freeing up of existing space and the construction of new spaces available on open assignment.

Conclusions and Guidelines:

Before making specific recommendations for the future housing of the Social Sciences, we shall offer some general observations on the needs of these departments. A common mismatch we have noted is between the size of the class and the size of the classroom or teaching laboratory. Frequently, the station occupancy rates of general classrooms are less than 50%, indicating that class sizes have tended to decrease in the Social Sciences as in other disciplines, while inflexibly designed classrooms have not, of course, accommodated themselves to these changes. We suggest that some classrooms with low occupancy rates can be changed in their configurations for use as class labs by removing the conventional tablet-arm chairs and substituting tables or other furniture conducive to laboratory-type use.

We have noted a general need for smaller rooms and for conference-center formats that combine an assembly room with small discussion rooms. We believe this need will have to be met by new construction. Noting the growing trend in other departments on campus for similar activity space, we believe that such spaces should be provided where they are as accessible to as many users as possible.

A response to the need of the Social Sciences for a learning resources center should be planned in the context of providing such facilities for the campus as a whole. Such integrated planning will provide both economy and greater functional efficiency. We note that many institutions have found that the productivity of their faculty has been expanded through encouraging independent study in learning centers instead of increasing class sizes.

In arriving at our recommendations we have been guided by some general considerations which we shall now discuss briefly.

First, it is extremely difficult at the present time to make reliable forecasts of enrollment trends for UMD. The trend for educational institutions in Minnesota as a whole clearly appears to be downward. As previously noted, however, this general trend has not been true for UMD.

The justification for new construction should be soundly based upon the needs of individual programs requiring specific facilities. We do not believe that new construction can be justified in general on the basis of projected increases in institutional enrollment.

Secondly, responses to immediate needs must be found as much as possible in remodelling. In addition to the economic advantages it provides urgently needed space much more quickly.

Both new and renovated facilities should be made available whenever possible for use on an open assignment basis to departments both within and outside the Social Sciences. We recognize, of course, that some special-purpose rooms for the use of individual departments are needed and justified.

Due consideration must be given both to long range needs and to urgent needs which bear upon the survival of a program. Urgent needs cannot generally be met by new construction, for the lead time before a new building can be occupied frequently amounts to as much as three years.

Finally, it should be noted that new construction does not necessarily mean a new building entity. Such a building entity may or may not be the best solution. New construction may possibly mean substantial additions to existing buildings.

Recommendations:

One

The needs of the Social Sciences for specialized instructional and research space should be met through a combination of renovation and new construction. The magnitude of the project in terms either of area or dollars cannot be estimated at the present time.

Two

Before any further time, effort, and money are devoted to developing new facilities for the Social Sciences, a comprehensive programming effort based on quantified functional analyses should be undertaken to define the needs that are to be met and lead to the development of a master plan for the satisfaction of these needs through renovation of existing facilities and/or new construction. Architectural work should be undertaken only after such a program has been completed.

Three

Measures should be taken immediately to relieve the deficiencies which seriously endanger the viability of instructional programs in the Department of Business Administration. This involves primarily the provision of appropriate class laboratories for the preparation of instructors in Business Education.

Four

Other departments whose current operations and future development are particularly constrained by their present quarters are Sociology-Anthropology, Geography, Psychology, and Economics. Pending the availability of newly constructed facilities, efforts should be made to alleviate the most severe constraints by the reassignment and/or renovation of existing space.

Five

The permanent home of the School of Social Development should be on the upper campus, allowing the School to develop the closest possible integration, in terms of both programs and facilities, with the Social Sciences departments.

Six

We urge that the UMD administration, giving due regard to the requirements of the other departments requiring more or renovated space, make every effort to provide adequate quarters on the upper campus for the entire School of Social Development as soon as this can be reasonably accomplished.

CHAPTER 8 - HOUSING THE MEDICAL SCHOOL

LGA/ADL
March, 1974

CHAPTER 8 - HOUSING THE MEDICAL SCHOOL

Introduction:

It will be recalled that the primary objective of this study as defined by the legislature was to facilitate "the fullest practical utilization of space for present programs, and inclusion of additional space for the basic sciences medical program by means of construction of additions to existing structures to accomplish this purpose." Contractually, the consultants undertook to "evaluate the degree to which existing space may accommodate future program needs, particularly those of the Medical School" and to recommend "the most effective housing for the Basic Medical Sciences."

These responsibilities have been interpreted to include an analysis of the current utilization and the shortcomings of the space presently allocated to the Medical School, the needs of the program in the immediate future and the potential ways of meeting them, and lastly the conclusions and recommendations on the permanent housing of the program on the upper campus, including the degree to which these needs can be met in existing structures. The above is the subject of this chapter.

The Present Situation:

The reader is referred back to the section in Chapter Five of this report which presents a brief overall description of the current facility experience of the School of Medicine and discusses the utilization rates and statistics for its existing instructional space. (See pages 5-71 through 5-77.)

As mentioned the School is now housed in the remodelled Laboratory School Building except for some functions accommodated in Old Main. The reader will recall that the remodelling of the Laboratory School Building was accomplished to permit an earlier start of the program. It should be noted that while this building will continue to serve as "adjunct" or "surge" space for certain functions of the School (for a period of no less than 20 years in response to the requirements of the federal government which partially funded the remodelling costs), it was not intended to be the exclusive long-term facility of the Medical School. Serious shortcomings have developed in two categories of space: research laboratory facilities and supportive services of various types.

A word is perhaps in order here with respect to the role of research in the medical school setting. As in most disciplines, teaching is only one facet of a university faculty member's responsibility. Research is another and is necessary to verify and to expand the body of knowledge being taught.

In the case of the biomedical sciences, faculty members are investigators both by inclination and by training. Research facilities to support investigative studies are also needed to attract and retain faculty. In addition, there is a student component in research. The modern practice of medicine is a combination of technical knowledge in problem solving and acquired professional skill, both solidly grounded in scientific investigation. The rapid expansion of the scientific body of knowledge precludes the medical student's mastery of the entire field and focuses the educational process on the methods of solving problems and the investigative process itself. It is less important that a student learn all the answers (which is no longer possible) than it is that he learn the process by which to find the answers he needs.

Research laboratory space is both limited and heavily used at present. As we noted in Chapter Five, the existing areas are operating at capacity now and most are shared by more than one faculty investigator. Some faculty members have no research facilities available for use now. Areas which were intended as supportive services have been turned into research labs, with the result that supporting functions have to be met in other ways. Several examples of this can be shown. Room 3 was originally planned as a glasswashing facility supporting both research and teaching uses. It is now a research facility and glasswashing is done in investigators' labs and in the janitor's closet. Room 115A was planned as a room for prosection in support of the gross anatomy dissection lab. It is now a research laboratory and prosection must take place elsewhere, if possible.

Another supportive service currently housed inadequately both in quantity and quality of space is the School's experimental animal facilities. Three rooms in the basement of the Laboratory School Building were originally planned as animal rooms and are used as such. In addition, two environmental chambers have been added at the ends of the second floor hallway to provide needed animal holding areas. These are both adjacent to classrooms which adds to the noise level and traffic problems of those rooms. The situation is further complicated by the fact that there is no elevator in the Laboratory School Building, which means that cages must be hand-carried up and down stairs for washing and that food and bedding supplies cannot be transported in bulk. In response to increased demand for animal holding areas, two rooms in the basement of Old Main are now in use for this purpose. Serious problems exist with animal space in Old Main due to the lack of any

ventilation system or of a plumbing and water supply for washing facilities. Areas currently in use for animals in Old Main are also inappropriate from the standpoint of size. The room housing the cat colony is too large and allows too much visual contact between animals. Exercise space is lacking and smaller rooms are needed to separate breeding animals, newborns, and adults. Smaller rooms are also needed to separate normal rats from hypertensive rats. No holding areas are available for dogs which limits their use to acute purposes only. Disposing of animal remains is an increasing problem and a crematorium is badly needed.

Other supporting services which are needed now and for which existing provisions are either inadequate or non-existent include an electronics shop, cadaver preparation and storage space, a sterile animal surgery, and additional computer equipment.

As observed in Chapter Five, existing office space is also heavily utilized, with larger offices already shared and with some personnel, principally part-time faculty, having no office space available to them in the Medical School facilities. The total lack of conference and seminar spaces in the Medical School also forces these functions into existing offices or classrooms.

For purposes of comparison, a conservative "rule of thumb" allocation of space in medical schools allows 1,000 square feet per full-time equivalent (FTE) faculty in the basic sciences. This allocation includes the faculty member's office, his research laboratory, and his share of his department's administrative space, laboratory support space, and animal facilities. This 1,000 foot allocation excludes all school-wide administrative space (such as the dean's office, student affairs office, admissions office, etc.) and all teaching space. It will be recalled that the School of Medicine at Duluth now has approximately 25 FTE faculty, which would generate in the neighborhood of 25,000 square feet for those functions named in the 1,000 foot allocation described above. For all activities of the School (including school-wide administration, all basic sciences departmental and research activities, offices for clinical faculty, and all instructional and student space), a total of 21,393 square feet is currently assigned to the School. Of this, more than 4,500 feet is in Old Main, much of which is not yet ready for use by the School.

While not ideal, teaching spaces in the Laboratory School Building are

adequate for the present enrollment level of 24 students each in the first and second year classes. The several special students now taking instruction at the Medical School can be accommodated in the classrooms and in instructors' research laboratories as appropriate. It is important to note that in addition to the teaching spaces at the Laboratory School Building, the School of Medicine also conducts classes for its students through the use of classroom and laboratory facilities in the local hospitals. Pathology laboratory classes are taught at St. Mary's Hospital, using a room which has been specially equipped for that purpose for 24 students. Lectures in physiology are also given to medical students in St. Luke's Hospital's auditorium. All local hospitals and health care institutions are used as settings for clinical experience by students. Some of this use is highly appropriate because of the need for students to be taught clinical medicine where patients are being cared for. However, non-clinical lecture and laboratory course work is at least partly given at the hospitals due to difficulties in scheduling and staff availability at the Medical School.

In summarizing the present space situation of the School of Medicine, it can be concluded that what space exists is very heavily utilized and that even for present activity levels it is, in many instances, inadequate both in quality and quantity.

The Immediate Future:

The deficiences of space will become considerably more acute in the very near future. This will be true in all space categories.

The entering class of the School will increase to 36 students in September of 1974 giving a total enrollment of 60 medical students. This will place an added strain on instructional facilities. Classroom and study areas will probably continue to be adequate but will be more crowded and much more noisy due to inherent design deficiencies.

To accommodate 36 students, the multipurpose laboratory will need to have restored to it that portion now partitioned off for use as a research laboratory. Even if this can be accomplished, the room will be less efficient than desired due to its long and rather narrow configuration, which makes addressing a class of that size difficult. A public address system might be able to overcome this problem. If the multipurpose teaching laboratory cannot be restored to its full size, a possible solution

might be to divide the class into smaller sections and schedule the use of the room at different times. It must be recognized that this method will require more faculty time and may in turn generate a need for more teaching personnel.

The gross anatomy dissection laboratory will present very serious problems for teaching 36 medical students next year. As previously noted, it is already crowded for 24 students and has no supporting facilities whatever. The choice apparently lies between assigning six students to each cadaver (a less than effective ratio for teaching anatomy) or severely overcrowding the laboratory by fitting in three more dissection tables. Dividing the class into sections for gross anatomy is not possible because there is no place to store cadavers when they are not in use. Further, there is no place where prosections and demonstrations can take place -- a need that must be met somehow. The Medical School will continue to make this laboratory available, as it presently does, to students in Physical Education's biomechanics courses, and in addition would like to present demonstrations of head and neck anatomy to students in the Dental Hygiene Program.

When the second year class reaches 36 students in the fall of 1975, some adjustments may have to be made in the present facilities for teaching pathology. The laboratory presently used for that purpose at St. Mary's Hospital will accommodate only 24 students. Alternatives might include use of the multipurpose lab at the Medical School instead of the St. Mary's facility. This has the following disadvantages: pathology faculty are based in the downtown hospitals, pathological specimens are readily available in the hospitals, and the hospital setting allows students to observe and to understand the service role of pathology in direct patient care. Another alternative would be to teach the class in sections using the existing lab at the hospital, but again this will require more teaching time and possibly more personnel.

The most acute needs for additional space in the near future will be for research laboratories and their supporting services, animal facilities and additional offices. Increased enrollment will require added faculty, which will serve to aggravate the existing shortages of these kinds of facilities. An estimated 6 to 10 more full-time basic sciences faculty will need to be housed in the Medical School in the near future. Appropriate space does not exist at present to accommodate these needs.

Some relief may be possible by converting certain spaces in the Laboratory School Building to research and teaching laboratory functions. For example, the two classrooms (Rooms 200 and 217), the Resource Center (Room 1), the Study Center (Room 2), and perhaps even Room 214 (currently occupied by the offices of ARCH) could conceivably be turned into laboratory spaces. Electrical and mechanical services are present and accessible in this building and whether they (and the existing sewer line) are sufficient to handle added loads should be investigated. Those functions presently housed in the above spaces would then have to be accommodated elsewhere.

Old Main represents the most potentially available overflow or "surge" space for the Medical School's immediate needs because of its adjacent location, the basement level connection between it and the Laboratory School Building, and the fact that some functions of the Medical School are already located there.

The use of space in Old Main for Medical School purposes is not without problems, however. In conjunction with this utilization study, the consultants commissioned an architectural survey of Old Main (and several other UMD buildings) to determine its potential for temporary use by the Medical School. The report of Damberg and Peck Architects, Inc., is appended. The use of space located above the first two levels (basement and first floor) for classroom purposes would not be in conformance with fire code regulations. One classroom does exist on the first floor which could be used and there are other spaces on this level which are of sufficient size to permit use as classrooms. However, most of the latter areas have been subdivided and are now in use as offices. These functions would have to be moved if the areas were to be reused as classrooms.

The further expansion of animal facilities in Old Main will probably be necessary but presents very special problems. Space does exist in the basement which could be used. For example, it has been suggested that the locker and shower rooms adjacent to the gymnasium could be turned into an animal surgery and a holding area for dogs, and that another suite of small rooms could be used for animal holding. Problems exist because the gymnasium is now used by a day care center and by residents of the nearby dormitory, and access to the gym is presently through the locker area. As stated earlier, ventilation in Old Main is inadequate for animal facilities and there have been problems in the past with the heating

system which have resulted in frozen hot water radiators and pipes. (See Damberg and Peck's report on the heating system.) Electrical wiring is also inadequate for sophisticated modern uses. These problems are more difficult and expensive to overcome.

The basement level connection to cage washing facilities in the Laboratory School Building would also require some modification in the form of a ramp or lift mechanism to overcome a short flight of stairs and to allow transport of cages, food, and bedding by cart rather than by hand. An incinerator is also required by the School to provide for disposal of animal and pathological remains and of drug specimens. Current disposal provisions for such items are totally inadequate.

Under certain conditions, largely required to meet fire codes, spaces above the first two levels of Old Main could be used for offices. It is also anticipated that the areas in Old Main vacated by the Dental Hygiene Program's move to new quarters will be reassigned to the Medical School for its use. These include the clinic (Room 101), a classroom (Room 103), and the suite of offices in Room 100.

We do not recommend the establishment of any "wet" laboratory facilities in Old Main. As noted in our architect-engineering consultant's survey of this building (see Appendix), "the extensive remodelling necessary to make the building conform to Fire and Safety Codes, Electrical and Plumbing Codes and to accommodate the handicapped would be extremely high for the value received. This would be especially pertinent to remodelling for laboratory use where plumbing and ventilation requirements are more sophisticated than for general classroom use." It should also be noted that funds used for remodelling in Old Main would have to come from private or state sources, since the federal government will not allow use of its funds for this purpose.

In analyzing the potential of Old Main space for overflow uses by the Medical School, we recognize that the separation of functions between the two buildings will create considerable inconvenience for both students and faculty. That inconvenience will be expensive in terms of time spent going back and forth between the two. For this, and for the other reasons cited above, we regard such use as a very temporary arrangement and recommend that funds expended for such purposes be held to a minimum. It cannot be

expected to relieve all of the space shortages and inadequacies faced by the Medical School and should be viewed only as an interim means to address immediate pressures.

The Permanent Housing of the Medical School:

The reader is reminded that both the Medical School's present utilization of existing space and the available means of overcoming deficiencies in the near future are only a part of the main purpose of this utilization study with respect to housing for the Medical School. A central issue to be resolved is the extent, if any, to which Medical School functions can be accommodated in existing space on the upper campus or by means of constructing additions to existing upper campus structures.

The reasons for moving the Medical School to an upper campus location are well known, but for those readers unfamiliar with the UMD program a brief reiteration would perhaps be useful. As we have mentioned, the remodelling of the Laboratory School Building was intended to provide an initial home that would enable the basic sciences program to get started quickly. It has served this purpose quite well and the Medical School is now an operating and excellent addition to the academic program offerings of UMD.

In the development of the Medical School, every effort has been made to integrate its activities to the greatest possible degree with existing programs in order to derive the mutual benefits available through close, supportive relationships. The success of these efforts can be seen in the faculty appointments that exist for Medical School faculty jointly with upper campus departments and in the teaching responsibilities of the Medical School faculty in other programs both at UMD and in the consortium (Lake Superior Association of Colleges and Universities). The development of the Health Sciences Library in the same physical facility as the Campus Library is another very significant example of this kind of cooperative relationship and so is the planning currently under way aimed at a closer integration of premedical and medical curricula at UMD and among the institutions in the corsortium.

It will require concerted effort to extend these interdepartmental relationships (and perhaps even to maintain them) as long as the Medical School continues to be located in its present setting, geographically isolated from

the rest of the UMD campus. The services of the Health Sciences Library are made available to Medical School faculty and students largely through the very excellent efforts of this library's staff and will be much more easily provided when the library's principal users are housed on the upper campus. The benefits of close collegial interaction between students and faculty of the Medical School and those of many upper campus departments are also essential reasons for a permanent upper campus location at the earliest possible date. The problem has not been whether the Medical School should be housed with other programs on the upper campus, but rather, when and how this might be most effectively accomplished.

In order to put this discussion into context in terms of the space required by the Medical School, we have estimated that something approaching 70,000 assignable square feet will be needed. This estimate is based on the University's advice that the entering class will be 48 students and that the program will continue as a two-year essentially basic sciences curriculum. This estimate is also based on our previous programming work for the Medical School at UMD and for comparable programs elsewhere in the country. It assumes that the educational research and resources center previously considered as an integral part of the Medical School's space can be located as a physical component of the Health Sciences Library. Consideration has also been given to the fact that since no other facilities for experimental animals exist at UMD, the Medical School's animal space should be sized with sufficient capacity to support the needs of other programs.

Our analysis of existing upper campus space which might conceivably have some application for use by the School of Medicine was undertaken with several factors or criteria in mind. We considered, first, the present owner department's utilization of its space to determine whether there was any capacity for additional use. This was done in consideration of the owner department's current and anticipated future utilization and program demands. Secondly, we considered the amount of space which might be made available either for shared use by the Medical School or for reassignment to the Medical School if the owner department could be adequately relocated. We also considered the physical adaptability of any such space to use by the Medical School in terms of the very specialized equipment and utility needs of the basic sciences program. A further and very important consideration was the location of such space. In order to avoid wide scattering or fragmentation of the Medical School's activities, we have operated on the premise

that small amounts of space in geographically separated locations would not have significant applicability to the Medical School's requirements.

We considered principally those facilities in the Science Building, Life Science and Science-Mathematics Buildings, and the Classroom-Laboratory Building as being appropriately located and having applicable utilities and services.

Taking the Science Building first, we estimate that approximately 5,000 assignable square feet will be vacated when Physics completes the move to its new quarters. While the Chemistry Department has not expressed a need for additional teaching laboratories, some renovation of these spaces is required. A pressing need exists for faculty and graduate student research space. This department conducts what are probably the most extensive graduate level and research programs on the upper campus, which are expected to continue. Undergraduate student credit hours and numbers of majors have increased, partly in response to an increased demand for premedical programs. This trend is expected to continue, particularly if more educational programs in health careers are developed at UMD. Chemistry has available funds and architectural plans to remodel the space vacated in this building to alleviate these shortages. This effectively rules out any allocation of this space to Medical School use, other than perhaps on a limited, shared basis for collaborative research efforts and continued facilities for Biochemistry faculty now housed there.

We also considered the implications of moving both Physics and Chemistry into the new Classroom-Laboratory Building and ruled out this possibility for two primary reasons. First, the labs and utility services in the new building are not wholly appropriate for Chemistry; but, more importantly, the space is insufficient to house both departments in the new building.

We also considered the consequences if Biology should move into the new Classroom-Laboratory Building and arrived at essentially the same conclusions as we did with moving Chemistry. Biology teaching labs, although crowded over normal occupancy, have some capacity to increase the number of classes (sections) scheduled per week, and have not yet reached the point where enrollment warrants additional sections of class laboratory sessions. When and if this happens, courses can conceivably

be taught in sections if more faculty can be added. Biology is expected to be influenced much like Chemistry by any addition of health careers programs. Here again, graduate level programs and faculty research are expected to grow and expansion should be anticipated.

The Science-Mathematics Building, while somewhat more remote, was also examined. Mathematics is somewhat tight for space, a condition which will be alleviated as the Computer Center moves to the new Classroom-Laboratory Building and Mathematics takes over this vacated space. The Geology Department, also located in the Science-Mathematics Building, appears to be in a stable enrollment situation and reasonably well-served by existing space. Our conclusion with respect to this building has been that there is no space which is applicable in sufficient size, location, or utility services to use by the Medical School.

We then considered the new Classroom-Laboratory Building which was designed to house an expanded Physics Department, a significantly enlarged Computer Center, and the Dental Hygiene Program.

In its present space in the Science Building, Physics is experiencing relatively low utilization for teaching in its class-laboratories (6.50 average hours per week per lab with 72% station occupancy for scheduled instructional use; 26.25 hours per week with 29% station occupancy for all uses). We conclude from this that these labs are now more heavily used for graduate student and faculty research than for scheduled course instruction. Since a considerable amount of specialized space is provided in the new building for such research functions, we do not anticipate any substantial rise in the utilization of class-laboratories. The Department's service teaching load is primarily for engineering and premedical students with the rise in student credit hours probably attributable to the latter. Undergraduate majors in the Department have remained stable and small in number. Graduate students presently number eight and the Department expects this enrollment to increase in the new facilities. While we anticipate a relatively low level of utilization of this new building by the Department (estimated by measuring demand against capacity), the lab facilities are highly specialized for Physics and not readily adaptable for use by other programs. Moreover, the lab areas which could be considered as potentially adaptable are located on the third and fourth floors and are not readily accessible.

In considering the potential of the new Classroom-Laboratory Building as a whole, we noted that it contains a total slightly in excess of 38,000 square feet which could be considered as net or assignable for functional use (excluding corridors, circulation, and mechanical and such other kinds of space not suitable for assignment).

In summary, the foregoing analysis has led us to the conclusion that sufficient space, appropriately located, adaptable, and available does not exist on the upper campus to serve the needs of the School of Medicine. New construction for this purpose will be required and should be planned as quickly as possible.

A major question remains as to where the Medical School's facilities should be located on the upper campus. Based on the findings of this study, we would urge that consideration be given to linking an addition for the Medical School to the science complex at two points: attached to both the Science Building and the new Classroom-Laboratory Building. This will complete a "quadrangle" in this area and enable the Medical School to strengthen and enhance already close relationships with Chemistry and Biology. Additional joint research and teaching efforts, entailing joint use of space, can be expected to result. By connecting with the new Classroom-Laboratory Building, access can be provided to its classrooms and auditorium for shared use if an appropriate mechanism to permit this can be achieved. This linkage is expected to generate some special security needs and the Medical School should not be designed in such a way that it becomes a major traffic artery for this part of the campus. Attention must also be given that any linkage at ground level with the Science Building respect the requirements of the explosion-proof chemical storage area due to be developed there as a part of Chemistry's upcoming remodelling program. Relocating the greenhouse would also be necessary.

The unique needs of the Medical School necessitate highly specialized space which, though it must be under the direct control of the School, can be made available to other programs for use on a space-available basis, as, in fact, it is at present. This may be particularly true of its class-labs, the use of which will fluctuate somewhat in response to curriculum demands.

Exactly how much space is needed, its cost, and its configuration, must

await further program and architectural definition. We would urge, however, that design characteristics consider both flexibility -- in order to adapt to changes in methodology and usage -- and expandability to allow for future needs which are difficult to judge with accuracy now. In this regard, the capacity for both horizontal and vertical expansion should be a part of the structural and mechanical design criteria of these facilities.

CHAPTER 9 - SPACE MANAGEMENT AND PLANNING

LGA/ADL
March, 1974

CHAPTER 9 - SPACE MANAGEMENT AND PLANNING

The purpose of space management and planning at UMD is to make the most effective and efficient use of facility resources possible to achieve the goals and objectives of the campus and University. The functions are to assess the capabilities of existing facilities and needs of campus activities, to assign those activities to facilities effectively and efficiently, and to act to re-equip, remodel or expand those facilities as necessary. To this end, those responsible must maintain adequate information concerning the facilities, the activities, and existing utilization. They must work within the guidance of campus comprehensive planning and they are major contributors to its continual revision and updating.

Space management and planning depends heavily upon the institution's inventory of existing facilities. The effective maintenance of a facilities inventory system requires a clearly designated office of record on each campus with responsibility and capability for executing the necessary tasks. The successful maintenance of the system requires careful coordination and cooperation among the offices charged with space management, physical plant maintenance and operation, and the units which occupy facilities.

At UMD, the Plant Services office is responsible for maintaining the formal records of building age, value, condition, etc., and the room files and plans identifying individual rooms and their areas. The Vice Provost for Academic Administration is responsible for maintaining the records of classification, furnishings and assignment of the rooms for all activities on the campus. Computerized files of this information are held at the central University offices in Minneapolis, and a list of all such data is forwarded each quarter to the UMD campus for review and updating. The campus does not have staff available for detailed examination of this mass of data at one time with the consequence that only a brief review is possible. Corrections focus on current assignment of academic spaces.

The UMD Facility Inventory recently received a detailed review and revision of particular physical data elements as part of the development of a campus physical master plan. The scope of that effort was further expanded by the UMD coordinator for this facility utilization study during the course of the study, and the study team specifically verified the data of all academic departments with each department. The current inventory as contained in the technical appendix of this report is thus a good representation of the actual situation on the campus during the Fall Quarter of 1973.

However, changes are made daily, particularly under the stimulus of good utilization information. This data must be maintained accurately and up-to-date to be of full value for analysis and management. To achieve highest efficiency, statistical utilization analysis should be conducted each quarter to guide adjustments during that quarter and larger shifts in the following quarter. The data used in that analysis should reflect the experience of that quarter, not of the preceding one, in order that open assignment facilities and the effect of recent adjustments to departmental assignments might be properly evaluated.

We recommend that UMD Plant Services update their records and forward to a campus coordinator and University of Minnesota central offices in Minneapolis a notice of data file change immediately after any change occurs to a facility in their area of responsibility. The quarterly inventory listing which the central office sends to the campus should be divided and distributed to appropriate individual departments for review. Every department-level unit of the campus, including administration, academic support and plant operations-central services units, should review the data for the spaces they occupy. Revisions they report should be reviewed and verified by the campus coordinator, and promptly forwarded to University central offices for file updating. A strong space management program which takes action on the basis of inventory and utilization data should assure departmental diligence. A comprehensive manual explaining the facilities inventory system, particularly the classifications and methods, is essential to assist the departments.* Lack of such guidance has inhibited campus efforts in the past.

Physical data is only half of a statistical utilization survey, however. Accurate data must be developed on the uses of the facilities. Many institutions depend solely on the scheduled course information already contained on their computerized files. Scheduled classes tend to indicate formal uses principally for the classrooms and class laboratory-studios, which represent only about 25% of the space on the UMD upper campus.

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* Appropriate sections of the "Higher Education Facilities Inventory and Classification Manual" recently issued by the National Center for Higher Education Management Systems at WICHE may be suitable, with annotation for particular University of Minnesota procedures.

With recent and continuing expansion of independent study and informally structured group instruction, scheduled uses miss significant activities in those classrooms and class laboratories-studios. They also miss almost completely the special and individual laboratories, studios, study rooms, meeting and multipurpose rooms, which constitute 11% of the upper campus and will continue to expand in response to important educational demands. Information on these informal uses is also important because it gives quantified information on the teaching methods and learning processes of the campus, which is valuable input to program planning and evaluation, and to resource planning.

We have collected use data for non-scheduled uses for this study and recommend that this be continued. It does, however, require significantly more effort than working with scheduled courses alone.

"Other" uses of instructional, meeting and study rooms should be collected by a system similar to that used in this study, involving survey forms filled out by facility "owners" and requiring review and adjustment in detail by a campus coordinator prior to analysis.

Even though scheduled course data is taken from corrected listings showing those courses actually given, actual room assignments, and second-week enrollments, errors will exist and the data must also be reviewed.

After proper review and verification by the staff member designated as responsible on the UMD campus, use data should also be forwarded under present conditions to the University central office for input to the central space management system. Both facility and use data should reflect the current quarter. Computer listings of this data should be returned promptly by the central office to the responsible person on the UMD campus where they will constitute the local record. Ultimately, revisions and new data should be coded and input to the University central computerized files from a UMD terminal to minimize processing delays, with appropriate reviews of the input by central staff as their time permits. Utilization analysis should be conducted at least quarterly, as noted above, to give maximum guidance to campus operations. Analyses originated by the University central office or requested by UMD should be promptly forwarded to UMD for use. Ultimately, UMD staff should be able to conduct such analyses as they find desirable at any time during the quarter using direct terminal hook-up with the Minneapolis central systems.

The computerized file and statistical analysis system we developed for this study was shaped to the needs and characteristics of present and planned University of Minnesota space management systems. It will be provided to the University for use and further development on the University's integrated management information system.

UMD campus facilities are now assigned to users by each Vice Provost for units under their responsibility. The office of the Vice Provost for Academic Administration maintains most general purpose classrooms on an open standing, assigning class sections each quarter to appropriate rooms of the campus. This is done manually on the basis of department requests and room suitability, and controlled by visual review of room assignment sheets. This assignment procedure appears to function quite adequately, and should be very responsive to the information available from this and ongoing facility utilization analyses. Manual assignment in this manner, and particularly the negotiations necessary between conflicting requests do require significant staff and management time, and an assistant to the Vice Provost should be provided in the future for this and other appropriate tasks if the present procedure is continued. All other academic, academic service and academic support units, excluding the professional schools, are assigned by the Vice Provost, full-time, to the organizational unit making primary use of the facility. Requests for additional space must be justified on the basis of functional and quantified need. The information contained in this and continuing utilization studies will substantially improve both justification and evaluation capability. Our recommendations for new specialized instructional and study spaces emphasize the need for open access. The establishment of a strong independent learning resources center could operate some of these specialized facilities as satellites located where appropriate for campus service. This provides an alternative to academic department assignment of new facilities intended to be used by several departments or the campus as a whole.

In conclusion, we view the functions necessary for sound space management an planning at the UMD campus as the following:

1. Facility inventory responsibility and coordination.

2. Use inventory responsibility and coordination.

3. Liaison with University of Minnesota central space management and planning offices.

4. Utilization analysis.

5. Space assignment and control.

6. Action for facility alteration or expansion.

7. Major input to facility master planning, building programming and design.

The campus now has basic capabilities only for space assignment and the requests for facility alteration and expansion, primarily because of the lack of appropriate trained staff. The other functions are handled by the University central offices in Minneapolis, but distance and communications problems constrain their effectiveness.

We believe that the needs of space management do require someone permanently located at the UMD campus who will be responsible for most of the task areas listed above. The on-campus demands of space management are substantial but budget allocated to this function can be expected to have significant return through increased facility utilization efficiency and effectiveness.

UMD also needs increased attention from a campus planner. However, the level of campus alteration and expansion expected by UMD and the University central offices is not believed sufficient to support a full time facility planning role on the campus. The position recommended for space management can and should give significant input and assistance to planners from the central offices, sufficient to meet campus needs.

It should be stressed that this individual should be expected to fulfill the space management role and responsibilities only. This is not the same function or the same position as that of an institutional researcher whose role is discussed is some detail in Chapter 3 of this report.

Wise and effective physical planning must be based on sound institutional and academic planning. The achievement of true efficiency and the adaptability required to respond to changing needs depends upon the definition of functional facility goals that support both the short-term needs of individual programs and the long-term needs of the campus as a whole.

We believe that this study will provide the first step in creating an ongoing management system which will substantially increase UMD's capability to arrive at sound long-term decisions as well as more efficient day-to-day operations.

In order to make such a system an effective tool for planning we recommend that UMD recruit to its administrative staff and assign to the Provost's Office an individual with experience in institutional research. We believe this is the most pressing UMD staff need and should be filled prior to that of a strictly facility oriented space management role. The need is not only to update continuously the data on which decisions are based, but also to analyze and interpret the impact of this data on all of the questions that are pertinent to arriving at the decisions that will, in the long run, advance the interests of the institution most effectively.

APPENDICES

LGA/ADL
March, 1974

ROOM CLASSIFICATION — UNIVERSITY OF MINNESOTA

Classification by Educational Function

INSTRUCTION

11 **Teaching**—instruction in formal courses and supervised study. This does not include physical education.

13 **Teaching service**—support of instruction including faculty offices, laboratory service rooms and storerooms for teaching materials.

14 **Administrative service**—departmental administrative activities.

RESEARCH

21 **Organized research**—research which is supported by sources outside the University.

24 **University-financed research**—research which is supported by sources within the University whether budgeted separately or not.

PUBLIC SERVICE

31 Instructional and research activities made available to the public or special groups including extension and cultural activities.

LIBRARY SERVICE

39 The collection, storage, circulation and use of reading, reference and other resource study materials. (So-called departmental libraries are included if under the administrative control of the University library.)

STUDENT SERVICE

41 Activities relating to students including health service, unions, recreation, vocational counseling, testing and placement.

PHYSICAL EDUCATION

46 Instruction in physical education as well as intramural sports and intercollegiate athletics.

ADMINISTRATION

49 Includes academic administration, business management, and general administration.

PLANT OPERATION

61 Custodial service and building and grounds maintenance.

INSTITUTIONAL SERVICE

71 **Central service**—service provided for and available to the entire campus, including storehouses, printing, truck service, laundry, bookstores, etc.

74 **Laboratory school instruction**—operation of laboratory schools.

75 **Hospital service**—operation of hospitals.

76 **Food service**—operation of food facilities.

77 **Housing**—operation of residence units.

CO-SPONSORED ACTIVITY

79 Professional organizations, government agencies, etc. which do not have a University budget, but whose work closely parallels and adds to the University's own programs.

UNUSED SPACE

81 Assignable areas undergoing remodeling or reassignment.

Classification by Kind of Room

LABORATORIES AND STUDIOS

01 **Class laboratory**—a room with specialized equipment for experimentation, observation or practice in a particular field of study used by regularly scheduled classes.

02 **Special class laboratory**—a room used by informally or irregularly scheduled classes which requires specialized equipment.

03 **Individual laboratory**—a room especially equipped and/or designed for individual student experimentation, observation, or practice in a particular field of study.

04 **Class studio**—a room for creative expression and practice, used by regularly scheduled classes in the fine arts.

05 **Non-class laboratory**—a room with specialized equipment used for laboratory applications and research.

06 **Non-class studio**—a room for creative expression in the fine arts.

07 **Audio-visual studio**—a room for production and distribution of instructional media.

08 **Individual studio**—a room for individual creative expression and practice by a student.

OFFICES

10 **Faculty office**—a room used by a professional person engaged primarily in teaching, research, or public service, except that of the chairman and his administrative or non-academic staff.

11 **Staff office**—a room used by administrative and professional staff whose teaching and research are not the primary activity, including the administrative offices of instructional departments and research organizations.

12 **General office**—a room used for secretarial and clerical work, operation of office machines, active working files, receptionists, etc.

13 **Student office**—a room used for student organizations and for teaching and research assistants and associates.

WORKROOMS

21 **Data-processing room**—a room for processing of data by machines or computers.

23 **Shop**—a room for the recurring production of a product or service such as printing and kitchens.

(OVER)

Classification by Kind of Room — (Continued)

24 **Clinic**—a room for the examination and treatment of patients, including surgery, therapy, X-ray, etc.

26 **Study room**—a room used for general study. Where it is an open-stack reading room a split should be estimated between study and stack area.

28 **Merchandising room**—a room used to sell products or services, such as bookstores, stadium stands, vending machines, etc.

29 **Workroom**—a room for work not classified elsewhere.

ASSEMBLY ROOMS

30 **Classroom**—a room where classes meet, such as for lectures or seminars.

31 **Assembly facility**—a room designed and equipped for dramatic, musical, devotional or livestock-judging activities.

32 **Conference room**—a room used primarily for meetings other than classes.

ACCESSORY SERVICE ROOMS

40 **Laboratory service room**—a room which directly serves a laboratory.

41 **Clinical service room**—a room which directly serves a clinic.

42 **Assembly facility service room**—a room which directly serves an auditorium, a theatre, etc.

43 **Gymnasium service room**—a room which directly serves a gymnasium.

44 **Office service room**—a room which directly serves an office.

45 **Library service room**—a room which directly serves the library.

46 **Departmental multi-purpose room**—a room used for miscellaneous activities, such as faculty meetings, book collections, special seminars, etc.

47 **Other service room**—a room which directly serves a primary room other than those listed above.

RECREATION ROOMS

52 **Lounge**—a room for rest and relaxation.

53 **Activity room**—a room designed for recreational activities other than athletic exercises, such as game rooms, bowling alleys, etc.

55 **Gymnasium**—a room for athletic activities, such as swimming pools, basketball courts, indoor fields, etc.

58 **Spectator seating**—the permanent seating area used to watch athletic events.

STACKS AND STORAGE

60 **Stack**—a room or portion of a room, used to provide shelving for books, audio-visual or other study materials.

61 **Storeroom**—a room used to store inactive departmental materials and for central storage. Active storage should be classified as office service, laboratory service, etc.

63 **Garage**—a room used to store vehicles.

OTHER KINDS OF ROOMS

70 **Access area**—areas such as internal corridors and lobbies.

80 **Animal room**—a room used for the housing and feeding of animals excluding field buildings.

81 **Greenhouse**—a glass room used for growing plants.

82 **Inactive**—a room in the process of remodelling, rehabilitation, or reassignment.

84 **Exhibition room**—a room used for the display of special collections, such as museums, art galleries, etc.

85 **Bedroom**—including hospital wards.

86 **Dining room**—any room set up for eating including bag lunch study, cafeteria, dining hall, etc.

90 **Field building**—animal shelters and other farm buildings where individual rooms are not classified.

Memorandum: October 19, 1973

To: Department Heads

From: C. Alexander

Re: Space Utilization Study

The State Legislature has requested that the University undertake a space utilization study "for the purpose of facilitating the fullest practical utilization of space..." The objectives of this study include an evaluation of the present level of space utilization on this campus; preparation of recommendations for increasing that utilization for present programs; and a determination of the extent to which present facilities can accommodate future programs.

The consulting firms of LESTER GORSLINE ASSOCIATES and ARTHUR D. LITTLE INC. have been contracted jointly to undertake this study. Representatives of both firms have been on campus the past several weeks establishing an office, opening lines of communication, and surveying sources of data on facilities and programs. In addition they have held preliminary conversations with members of the administration, with the faculty advisory committee, and with the Chairmen of the four Divisions. Beginning October 29 four members of the consulting firms will will be on campus for a series of interviews with the Heads of the individual Departments. I will be contacting each Department this week to determine the most convenient time for this important interview.

In the discussions of the programs and facilities in your department the consultants will be interested in a number of subjects including the following:

What has been your experience with the physical facilities utilized by your Department? Have they proved to be adequate? Are they utilized to a high degree? What particular conditions limit utilization of particular groups or categories of spaces? Are there any unique problems you have encountered?

What future changes in undergraduate and graduate programs do you anticipate? Do you forsee significant changes in teaching methodology for your department? What implications will such changes have on your requirements for space?

What particular space needs are generated by research activities of faculty or graduate students?

What use is made of rooms on an informal, ad hoc, irregular, or unscheduled basis? (Statistical support for such uses would be most helpful if available.)

What has been your experience with the Library in terms of satisfying the needs of undergraduates, graduates, and faculty?

To what extent do you use instructional media: films, tapes, closed-circuit T.V., etc.? Do you expect to increase your use of such media?

If you have any written descriptions of future plans or programs for your department; projections of future enrollments; statistics or other information that you feel would be useful to the consultants in enabling them to better understand the operation and plans of your department, they would be grateful for copies as appropriate. The importance of this study in terms of long-range planning and growth cannot be overemphasized. Your cooperation and assistance in facilitating the work of the consultants will be greatly appreciated.

Lester Gorsline Associates:

Kenneth Lamott
Bonnie J. Martz
Larry R. Aull
Jana B. Matthews

144 Performing Arts Building
726 7267

C. Alexander - Campus Coordinator
227 Industrial Education
726 7185

The following questions were used as a guide for the consultant team in their interviews of department members during the conduct of this study. The purpose of the interviews was to help provide the necessary qualitative information to assist the team in interpreting the statistical data generated during the study. This information, together with our personal observations of facilities, was used to identify constraints and other influencing factors that control how space is actually used at UMD.

1. General Facilities Experience

   1.1 Adequate? Suitable?
   1.2 Degree of utilization: high? low?
   1.3 Explain low utilization. Specialized facilities? Related to special programs?
   1.4 Any particular problems?
   1.5 Do classes fit rooms?
   1.6 Optimum class size?
   1.7 Identify groups of rooms for special utilization study.

2. Programs

   2.1 Program enrollment?
   2.2 Changes in undergraduate and graduate programs?
   2.3 Changes in teaching methodology?
   2.4 Changes in space requirements?

3. Research

   3.1 Space needed for faculty research?
   3.2 Space needed for graduate student research?
   3.3 Any independent undergraduate research?

4. Unscheduled Space Use

   4.1 How much?
   4.2 What sort? (Survey will pick up details.)

5. Library

   5.1 Adequate for undergraduates?
   5.2 Adequate for graduate students?
   5.3 Faculty usage?
   5.4 How is it used by your departmental personnel and students?

6. Instructional Media

   6.1 Present Use?
   6.2 Future Use?

7. Offices

   7.1 Faculty offices: Enough? Adequate?
   7.2 Departmental offices: Adequate?

8. Laboratory Support and Service

   8.1 Utilities?
   8.2 Equipment?
   8.3 Storage?
   8.4 Animals?

9. Station area in Rooms

   9.1 Crowded?
   9.2 Can more stations be added?

10. Accessibility

    10.1 How accessible are needed services?

Office of Vice Provost

UNIVERSITY OF MINNESOTA
DULUTH

Academic Administration
420 Administration Building
Duluth, Minnesota 55812

November 9, 1973

TO: Deans, Directors, Division Chairmen and Department Heads

FROM: D. A. Vose

SUBJECT: Space Utilization Study

As you know from Cliff Alexander's recent memorandum to you, the consultants who have been carrying out a space utilization study of our campus have entered on a phase of their study during which they will interview all academic officers as well as individuals responsible for non-academic activities on the campus. By the time you receive this memorandum they may very likely already have visited you.

As a supplement to the interviews, our consultants have prepared the enclosed forms which will require your prompt attention. These forms will provide us with needed information concerning facilities requirements to conduct the current program here at UMD and will therefore constitute a very important part of the overall facilities study. You will, I am sure, note that much of the information is information which already exists in the form of the UMD Class Schedule. Because some of the required information is not contained in the Class Schedule and because it will expedite this operation by collecting the information in a form which is readily adapted to computerized analysis, we are in fact duplicating some information which already exists. Ideally these forms would have been distributed before interviews were initiated but this was simply not possible under the present time constraint.

The first form entitled Scheduled Course Data will probably present few problems to you. Each course given by your department must be accounted for, section-by-section if there is more than one. For each course, or for each section of the course, a separate entry must be made for each room in which instruction takes place. If instruction takes place in an outdoors area (an athletic field, for example) or in a non-university building, a separate entry should also be made.

The first group of columns on the Scheduled Course Data form asks for the course identification utilizing the study field abbreviation and the four digit course number, the section number, if any (if only one section is offered, leave the column entitled Section Number blank), followed by the number of credit hours offered in the course and the current enrollment in the course.

The next group of columns entitled No. of hours scheduled in room by mode of instruction is provided to record both the building and room used and the particular mode of instruction corresponding to each scheduled hour of use. The choices concerning mode of instruction include lecture, lecture discussion (to include large group discussion), seminar (to include small group discussion), laboratory, independent study, and other (specify). For example, a three credit

course which, say, meets at 9:30 Monday, Wednesday and Friday, in which Monday and Wednesday are primarily devoted to a lecture presentation and Friday to a large group discussion, all in the same room, should be reported to indicate two hours of lecture and one hour of lecture discussion. Similarily, a course such as a statistics course which involves during the week one hour of a lecture type of presentation and two hours of laboratory type activities, again scheduled in the same classroom, should be indicated by one hour of lecture and two hours of laboratory.

The next column entitled Special Facility Requirements should indicate all of the special facility requirements such as closed circuit TV, audiovisual aids, or others, such as a laboratory demonstration bench. List under Special Facility Requirements only those special facilities that are currently available and currently being used in the particular course and room. Any deficiencies in the available special facilities or any other deficiencies or inadequacies in the space available should be recorded in the Remarks column. Similarily, you are encouraged to provide any helpful comment under the Remarks column.

The final column entitled Other facilities used for course in addition to regularly scheduled room should be used to record any additional use of campus facilities in conjunction with the particular course identified in the left-hand column. An exception to this is use of the UMD Library.

Each department or unit should report course offerings through Continuing Education and Extension which are offered on the UMD campus on a separate facility survey form clearly identifying the Extension offerings on that form. It is also urged that when completing the Scheduled Course Data form, each department or unit report on courses in the order in which they appear in the corrected Class Schedule for both regular day-time offerings and for Extension offerings to facilitate cross-referencing of the survey forms and the respective class schedules.

The second form entitled Other Uses of Instructional Rooms is to be used to report all irregular, unscheduled, or informal uses of instructional rooms or facilities on the campus. In other words, all instructional uses which are not captured on the survey of scheduled course data should be included. In addition, information reported on the Scheduled Course Data form in the right hand column entitled Other facilities used for course in addition to regularly scheduled room should be duplicated on the form entitled Other Uses of Instructional Rooms. Examples of other uses of instructional rooms include such items as meetings of departmental faculty and student representatives, utilization of instructional rooms by various clubs and organizations sponsored by the responding unit, and community interest type of activities sponsored by the responding unit. In other words, the basic purpose of the second form is to capture information concerning the nonscheduled or irregularly scheduled activities sponsored by the responding unit. The form to report other uses of instructional rooms is self-explanatory, but the rule to follow in completing the form is if in doubt please record and report the activity.

If you have any questions concerning the completion of either form, please refer them to this office for clarification. In addition, it is expected that questionable entries will be checked by the consultants to remove as much clutter as possible in the final data. There is urgency in the completion of this task so that the consultants can stay on schedule in completion of their overall task. I am therefore requesting that you complete these forms and return them to this office no later than Tuesday, November 20th.

DAV/mm/eb

UNIT:_____

CONTACT PERSON:_____

CAMPUS FACILITIES SURVEY SCHEDULED COURSE DATA FALL, 1973 - 74

COURSE (prefix and number)	Section Number	Number of credits	Enrollment	Room Number	Building	No. of hours scheduled in room by mode of instruction						Special Facility Requirements	REMARKS Use additional sheet if needed	Other facilities used for course in addition to regularly scheduled room (List room and use)
						Lecture	Lect.-discussion	Lab	Seminar	Indep. Study	Other - (Identify hours and type of instruction			

A-9

UNIT:_____

CONTACT PERSON:_____

CAMPUS FACILITIES SURVEY

OTHER USES OF INSTRUCTIONAL ROOMS
(IRREGULAR, UNSCHEDULED, INFORMAL)
FALL 1973-74

Bldg./Rm. No.	Type of Use	Course Name & No. If Any	No. Hrs. per Week in Use		Average No. of People Using Area at Any One Time	Category of User (Faculty, Grad., Undergrad., Technician, etc.)	Remarks (Use additional sheet if needed)
			Before 5:30 pm	After 5:30 pm			