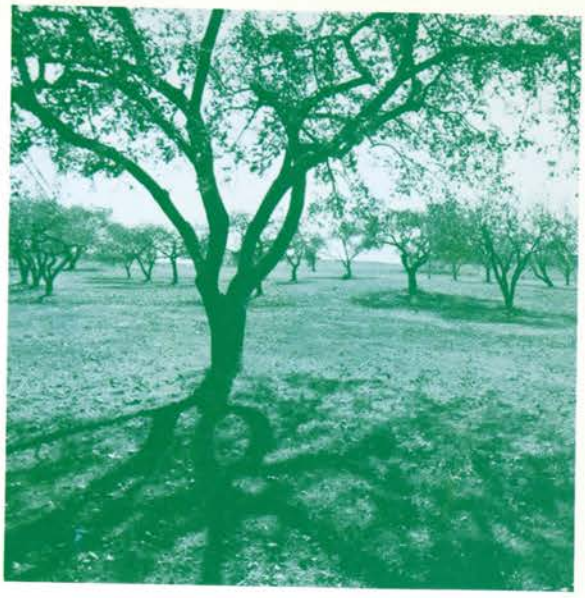
Humber College of Applied Arts and Technology

Humber Lakeshore 1 Campus Master Plan Report



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Humber Lakeshore 1 Campus Master Plan Report

August 1975

Moffat Moffat & Kinoshita
Architects and Planners

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Introduction

ROLE OF COMMUNITY COLLEGES

Soon it will be a decade since the founding of Ontario Colleges of Applied Arts and Technology. During this period these institutions have experienced dramatic growth, moving from a concept to twenty-two dynamic Colleges providing educational services which only a few years ago would never have been thought of as functions of formal educational institutions. This growth and redefinition of roles clearly underlines new trends in education not only in Ontario but in the rest of Canada.

From Victoria to St. John's, Community Colleges have developed as a new dimension of education. Without the impediment of tradition they have responded to the one constant in our society: Change. Traditional educational institutions have been slow to adapt to the new economic and social forces in our society, often clinging solely to what they saw as a primary assignment of providing a liberal education to young men and women recently graduated from Secondary Schools. However, across Canada two distinct forces have created a whole new range of educational priorities: the rate of socio-technological change and the increase in leisure time.

References to the number of careers a person might follow within one lifetime are now so common that we often overlook the reality of this process around us. Not only has this affected the type of educational content given to regular day students, but it has caused a remarkably increased participation in part-time programmes for those seeking to change or update their employment skills.

Lacking the massive influx of skilled immigrants common in the 1950's and early '60's, Canadian employers are now taking a new interest in the upgrading of present employees to meet new skill demands.

This process has not been limited to the purely vocational skills area. As society in general becomes more complex, the need for an increase in human interactional skills has increased with a corresponding growth in programmes serving this broad range of requirements.

As a direct result of this trend in Canada, Colleges now see a growing number of adult students, assisted by industry, registering in a very broad range of programmes.

The second major national trend has been the general response in society to the increase in leisure time. The demand for access to part-time learning has grown at such a rate that most Colleges in Canada now have more part-time students than regular day students. And this demand has not been confined to the traditional leisure interests of sculpture, painting, yoga and macrame. Adults with interests in Machine Shop and Electronics as hobbies have come back to school in great numbers.

The consequence of these and other forces has been to change the societal concept of education from an activity of youth to a continuous life long process, and in Canada, the Community Colleges are rapidly becoming the physical and philosophical embodiment of this trend. As the birth rate levels off and social and economic forces combine to bring more mature adults back to school, Colleges will change more and more from day time schools, with some day and evening part-time students, to part-time schools.

The Commission of Post-Secondary Education Report is quite explicit on this subject.

> "Institutions of post-secondary education should make every effort to provide part-time students with a range and quality of educational opportunities equal to those available to full-time students."

"If adult education is to realize the new promises of continuing education, it can no longer be treated as a peripheral activity."

In order to meet the changing requirements of society, the Community College must constantly amend its organizational format to increase the ability of people to study at their own convenience. As a result, not only is the type of student changing but so is the whole process by which the College undertakes the provision of the learning experiences.

In many cases Community Colleges across Canada have consciously attempted to project an image of openness and flexibility and hence have been the prime beneficiaries of these changes.

It would be wrong to ignore another significant force which, in Ontario at least, has had a major affect on Colleges of Applied Arts and Technology. Whereas in many other provinces Community Colleges are transfer institutions for Universities, and hence at least to a certain degree are seen as junior universities, such is not the case in Ontario. The Colleges of Applied Arts and Technology were established as a clear alternative to the liberal arts orientation of the University and thus were forced to build a very clear identity and reputation. During the late 60's many young people were increasingly unwilling to commit three years to a University programme that in their view held little prospect of employment upon graduation. The Colleges of Applied Arts and Technology offered an obvious alternative and their job placement success reassured young people. A further result of the need for a distinct identity was an extremely high interaction level with the community. This has resulted in some Colleges of Applied Arts and Technology developing and maintaining very strong links in the community as opposed to the traditional, although often mythical, "Town vs Gown" psychologies surrounding older post-secondary institutions.

The Colleges of Applied Arts and Technology in Ontario have responded both to national trends and to forces within the province and are now, by almost any measure, highly successful academic institutions. The time has now come for each College to determine its future direction.

Humber College has chosen to recognize the growing and changing needs of the community and to direct energy and resources to these new directions as a continuous statement of their commitments.

EDUCATIONAL PHILOSOPHY AND OBJECTIVES

As indicated in their present multi-year plan, Humber College has adopted two 1972/78 major objectives. The first, which to some extent is underway, is the integration of full and part-time studies. The second, and perhaps most critical over the next few years, is the development of a meaningful presence in the southern part of the Borough of Etobicoke.

It is the College's intention to develop in the Lakeshore area a multi-divisional campus combining programmes from all divisions of the College, which will house approximately 4,000 full-time day students. The College's traditional commitment to part-time learners will be in evidence at this campus.

The major planning objectives of the College at this time are to:

- Identify appropriate programmes with the Lakeshore community.

- Identify and develop programmes consistent with a college campus which has access to water, such as:
  - Marine Biology
  - Marine Engineers
  - Underwater Technology
  - Pleasure Craft Design and Construction

The College sees continued growth of part-time students in the evening and especially in the day. This consideration will be a major criteria in the organization and educational design of the College in the Lakeshore area.

The College believes in an "open-door" admissions policy -- one that is diagnostic rather than restrictive. In this way, everyone in the community can enroll at Humber College and work towards any programme of the College.

The Lakeshore Campus will be developed from the beginning on the basis of recognizing the needs and backgrounds of the adult learner. The Lakeshore community of students will experience "open-door" admissions, unparalleled flexibility of timetabling, varieties of teaching modes and the equal availability of academic services.

Functioning as an effective member of the College community prepares the student for his or her larger responsibility to society. To do this the College must not only provide the relevant programmes of study, but as well, provide students with adequate time for informal exchange with other students. This is supported by the provision of courses open to all College students on an elective basis. Through this technique a more integrated College community within the Lakeshore area will be created. Courses of study will be normally limited to a maximum of 24 classroom hours and provision will be made for a wide ranging curriculum.

While Humber's programmes of study are vocationally relevant and respond to specific economic needs of society, the philosophy at Humber remains one that recognizes that "the good of the individual student is our primary responsibility." It is a policy of the College that students be given the opportunity, through exposure to such aesthetic experiences as art, music, film, drama, and the physical sciences, to think in terms of the quality as well as the quantity of one's life. The Lakeshore Campus will reflect this College Philosophy.

It is crucial that the College provides an environment and learning process that encourages a desire to learn. Humber has experimented continuously for the last four years with new modes of learning. The Lakeshore Campus will embody Humber's learnings to date in the provision of educational experiences in a variety of possible delivery styles including, where appropriate, self-paced learning.

In summary, Humber constitutes a community of people working together to provide learning and growth opportunities for people with many different and individual needs. The College is quite proud of its achievements in the past, and is seriously concerned about its future ability to provide responsive and relevant education to people of Etobicoke and York. The Lakeshore Campus, both as a location and as a new model of operation, is an expression of this commitment and concern, and of the openness that society expects of the Colleges.

HISTORY OF THE COLLEGE

The Board of Governors of Humber College was appointed on October 3, 1966 and classes started in September 1967 at the James S. Bell School, 3495 Lakeshore Boulevard West, in Toronto. This facility remained in operation until 1971 when the students were finally transferred to the North Campus.

In April 1968 the College took over the Manpower Centre on Queen Elizabeth Boulevard. It added the Retraining and Apprenticeship division to the Manpower programmes and the Queensway Campus was begun. The addition of the Queensway Public School and Queensland Public School increased the capacity of this campus. These facilities are all leased and will eventually be replaced by facilities at the Lakeshore Campus.

In September 1968 the North Campus opened, and has been the main campus for post-secondary programmes. It houses the Applied Arts, Business, Creative Arts, Health Sciences, Human Studies and Technology divisions. Construction continued until 1974, and they now have over 600,000 square feet of space at the North Campus.

In September 1970 the Keelesdale Campus in the Borough of York was opened at 88 Industry Street. This has operated as a retraining centre for approximately 400 students.

1973 saw the takeover by the College of the Osler School of Nursing and the Quo Vadis School of Nursing, and both of these facilities are still operating at their own sites. The Osler Campus is a permanent part of Humber College facilities, while Quo Vadis is leased and is expected to be phased out as a separate campus in September 1976.

The Lakeshore Campus was acquired in 1975 and, with the former Lakeshore Teachers' College building and the expected construction of new facilities, will become the permanent southern campus of Humber College. It is expected that at some time in the future all leased facilities will be vacated and Humber will only operate the North Campus, Keelesdale Campus, Osler Campus and Lakeshore Campus.

ACQUISITION OF THE LAKESHORE CAMPUS SITE

In order to service more effectively the needs of the population of Etobicoke and York who reside south of Bloor Street, the College has concluded that a major campus must be developed somewhere on the Lakeshore. The need for such a campus has been borne out and mentioned in a number of studies, most notably in 1968 through their CAAT 1 study; in 1970 through studies in the Etobicoke Planning Office; and most recently through a study commissioned by Humber College in 1973.

This need was recognized by the Ministry of Colleges and Universities, and by Humber having to lease several facilities near the Queensway. With the transfer of Lakeshore Teachers' College to York University, Humber College requested that the Lakeshore Teachers' College facility be transferred to them. This was approved in principle and became the beginning of acquiring adjacent land.

The Ministry of Health had 28.5 acres of land immediately east of the Lakeshore Teachers' College site. Investigation over the years resulted in the trading of land between the Ministry of Health and Humber College.

Humber College transferred 31.542 acres of land at the North Campus to the Ministry of Government Services, and received in return 37.7 acres at the Lakeshore Campus which included the 9.254 acres of the Lakeshore Teachers' College and the 28.5 acres from the Ministry of Health.

This was officially approved in 1974, with acquisition of the Lakeshore Campus effective July 1, 1975.

Scope of the Report

In October 1974, Humber College engaged the firm of Moffat Moffat & Kinoshita, Architects and Planners, to develop a Master Plan for the Lakeshore Campus, which will form the basis for construction as and when funds become available.

The terms of reference were:

. To assist the College in the preparation of a Master Space Programme for the next 5 years.

. To prepare a Master Plan Report which would identify and recommend the physical needs of the College based upon the Master Space Programme.

The intention of the Report is to outline, analyze and summarize the planning developments that led to the recommendations. The Report includes analyses of existing facilities, site, programme, and various physical systems. It describes the design philosophy and approach that was used to arrive at a recommended physical development plan, and includes recommendations for implementation.

Master Plan Philosophy

The general philosophy of the Master Plan is the translation of the educational philosophy and objectives of Humber Lakeshore College into a logical and economical physical development plan which recognizes the unique features of the site and creates an effective environment for learning.

A team effort was required to achieve this, utilizing the expertise and views of staff members and the Board of Governors at Humber College, various consultants, provincial and local authorities, and the public.

The consultants involved included experts in Landscaping, Site Services, Traffic, Mechanical, Electrical, and Structural Engineering, and Cost.

The various authorities concerned included the Ministry of Colleges and Universities, Ministry of Government Services, Ministry of Health, Metropolitan Toronto and Region Conservation Authority, Borough of Etobicoke, Metropolitan Toronto Department of Works, Metropolitan Toronto Department of Roads and Traffic, and the Toronto Transit Commission.

Public meetings were held to obtain the views of residents in the area of Humber Lakeshore, and visits were conducted to other Community Colleges in Ontario. These included Fanshawe College in London, Sheridan College in Oakville, and Centennial College in Scarborough.

Analysis

Apple Orchard: View West

Figure 1. Existing Campuses

1 North Campus
Humber College Blvd.

2 Osler Campus
5 Queenslea Ave.

3 Keelesdale Campus
88 Industry St.

4 Queensland Campus
88 Culnan Ave.

5 Quo Vadis Campus
160 Sherway Dr.

6 Humber Lakeshore 2
56 Queen Elizabeth Blvd.

7 Humber Lakeshore 3
829 Queensway

8 Humber Lakeshore 1
3199 Lakeshore Blvd. W.

Facilities Analysis

AREA SERVED BY HUMBER COLLEGE AND ENROLLMENT PROJECTIONS

The area served by Humber College includes the Boroughs of York and Etobicoke, as well as Metropolitan Toronto and other outlying communities. (See Figure 1)

Initially, at the inception of the Ontario College system it was anticipated that each College would develop an exclusive community orientation; which they have done. However, the Market Share Analysis reports recently published have shown that Colleges are attracting considerable numbers of students from outside their original regional boundaries, including a large immigrant population.

The large number of students attracted to Humber from the Metropolitan Toronto area (exclusive of Etobicoke and York) are indicative of the quality of Humber's programmes and the local transportation network. Humber's 1973/74 Metropolitan Toronto student intake, excluding its immediate region, accounted for 31.3% of the student body.

The College's efforts to promote awareness within York and Etobicoke in the post-secondary area have been highly successful. The results of the 1973/74 Market Share Analysis show an improvement over those of the previous year. By comparison with a 1972/73 increase of 4.5% of student intake from Humber's region of the Boroughs of York and Etobicoke, the 1973/74 analysis displays a current figure of 24.5% of the student body.

METROPOLITAN TORONTO

Metropolitan Toronto, over the last five years, experienced a growth rate of 14.8% or 338,145 persons. As a result of recent limitations placed upon high density residential development within the Metro Toronto boundary this trend will slow considerably but nevertheless continue.

The Ontario Ministry for Treasury, Economics and Intergovernmental Affairs is forecasting a Provincial population growth rate of 6.5% over the next 5 years and of 14% over the next decade. Needless to say, Metropolitan Toronto will continue to absorb much of this increase.

THE BOROUGH OF YORK

Generally speaking York is bounded on the west by the Humber River, on the south by Bloor Street, on the east by Bathurst Street, and has its most northerly extremity at Cardelle Street.

Census 1971 data reveals a current population within the Borough of 147,305, and Borough planning officials forecast an optimal populace level of 172,000 persons, or approximately 13.5% growth.

THE BOROUGH OF ETOBICOKE

Utilizing Census Data gathered in 1971 by Statistics Canada, the Borough of Etobicoke currently supports a total population of 282,690. The planning team for the Borough has assumed a position whereby the optimal level of population assimilation within future years will be 394,000 persons, or an additional 111,310 persons over the current populace. Etobicoke has three planning districts as established by the Metropolitan Toronto Planning Board.

District 7: This is the southern-most district of the three, incorporating the area bounded by Lake Ontario to the south, the Etobicoke Creek to the west, the Queen Elizabeth Way to the north and the Humber River to the east. The existing population within the district is 59,880 as of the 1971 Census, with a forecasted optimum level of 72,000 persons, or a 20% increase. This district is directly within the realm of the Lakeshore Campus. This district displays an ethnic population (other than French and English heritage) of 12,755 persons, or approximately 20% of the total populace. The above is evidence

of the need for a multi-programme, multi-divisional campus to serve the area's needs.

District 8: The intermediate district of the Borough incorporates the area bounded by the Queen Elizabeth Way to the south, the Etobicoke Creek to the west, the Humber River to the east and Highway #401 to the north. This district presently supports a populace of 163,135 with a forecasted figure of 222,000 persons, or a maximum of approximately 30% increase.

District 9: This district extends from the southern boundary of Highway #401 to Steeles Avenue to the north. The eastern and western boundaries are the Humber River and Indian Line respectively. This district supports a current population of 59,670 persons, and has forecasted for its optimum level a figure of 100,000 persons, or a 40% increase.

Despite increasing population trends, The Boards of Education for Etobicoke and York are forecasting a status quo grade 12 and 13 enrollment pattern commencing in 1976/77 with a steady, yet slight decrease to the year 1984.

Humber has projected a fairly conservative post-secondary enrollment picture for the next 5 years, but has anticipated a stable enrollment situation for long range planning. This is a result of the Provincial forecasts of a flattening within the next 4 years in the area of secondary level enrollment.

Estimates of 10% growth each year to 1977-78 in the full-time post-secondary area are anticipated by Humber College. Because of the uncertainty facing the College in respect to funding arrangements for part-time Career Oriented, and General Interest programmes, enrollment projections have been even more conservative by forecasting a 5% per annum increase.

These projections indicate that Humber must concentrate on future efforts in the realm of adult education (Centre for Continuous Learning) and retraining, while maintaining the high academic level of existing post-secondary full-time programmes. Cooperative programmes such as employee day-release studies and in-house training, i.e., contract education, should be explored with business, industry, and service institutions.

EXISTING FACILITIES

A few years ago Humber College was just an idea -- this year it will be an educational and cultural centre for approximately 55,000 registered students. Humber offers some 120 career-oriented programmes and more than 1,100 part-time courses to 4,600 post-secondary students, 5,500 retraining students and 45,000 adults in part-time day and evening studies. In addition, several thousand area residents participate in a broad range of community events.

The existing facilities of Humber College total over 900,000 square feet of space located at eight major campuses. These campuses are either owned or leased, and it is expected that the leased locations will eventually be replaced by permanent owned facilities. Presently Humber is experiencing a shortage of space in excess of 200,000 square feet.

The owned campus sites are: North Campus, Keelesdale Campus, Osler Campus, and the Humber Lakeshore I Campus. (See Figure 1)

NORTH CAMPUS

The North Campus was the first permanent campus of the College and now totals over 600,000 sq.ft. of space constructed on a site of 186 acres. It houses programmes from Applied Arts, Business, Creative Arts, Health Sciences, Human Studies, Technology and Upgrading Divisions of the College. It has over 5,000 full-time day students and operates an extensive Continuous Learning programme.

KEELESDALE CAMPUS

The Keelesdale Campus is located in the Borough of York and has over 20,000 sq.ft. of space. It houses programmes from the Retraining Division of the College. It has over 400 full-time day students, and operates a Continuous Learning programme for the community in the Borough of York.

OSLER CAMPUS

The Osler Campus was acquired in 1973 when the Nursing programmes were transferred to the Colleges. This campus has over 60,000 sq.ft. of space and a residence for 300 students. It offers the Nursing programmes and accommodates over 300 full-time day students.

HUMBER LAKESHORE 1 CAMPUS

This campus is just beginning and will eventually replace the leased facilities now operated by Humber College.

The leased campus sites are: Humber Lakeshore 2 Campus, Humber Lakeshore 3 Campus, Queensland Campus and Quo Vadis Campus.

HUMBER LAKESHORE 2 CAMPUS
(FORMER QUEENSWAY 1 CAMPUS)

This campus is leased from private sources and contains over 80,000 sq.ft. of space. It operates programmes in the Technical Retraining and Technology divisions of the College, and has over 800 students. It is presently leased until 1979.

HUMBER LAKESHORE 3 CAMPUS
(FORMER QUEENSWAY 2 CAMPUS)

The Humber Lakeshore 3 Campus is leased from the Borough of Etobicoke and contains over 28,000 sq.ft. of space. It offers programmes in the Upgrading division of the College and has over 250 full-time day students. It is leased on a year to year basis.

QUEENSLAND CAMPUS

The Queensland Campus is leased from the Borough of Etobicoke and contains over 15,000 sq.ft. of space. It offers programmes in the Upgrading division and is used by the Centre for Women. It has over 100 full-time day students. It is leased for a three year period ending in August 1978.

QUO VADIS CAMPUS

The Quo Vadis Campus is leased from Queenway General Hospital and contains over 18,000 sq.ft. of space. It offers a Nursing programme only and has over 100 full-time students. This facility is expected to be vacated in August 1976.

OPERATIONAL RELATIONSHIPS AMONG CAMPUSES

Humber College envisages an ultimate structure of three distinct units:

1. North Campus
2. Lakeshore Campus
3. Keelesdale Campus

The Osler Campus will remain a satellite of the North Campus, and the Keelesdale Campus will maintain a relatively satellite relationship to one of the two major campuses.

The College is especially conscious of the relationships between the number of students located at one campus and the efficiency and effectiveness of operation. Whereas Humber College enrollment projections indicate a figure of up to 10,000 full-time day students, it would be more logical to accommodate these students on two smaller campuses rather than one large campus. There appears to be evidence that the internal relationships of a college begin to suffer in terms of administration and flexibility, once the number of students becomes excessive at one campus.

Within this framework of size versus responsiveness, other factors must be considered. Decisions affecting the College should be made as closely to the issue in question as possible. This is especially true in services which directly impact upon students and staff. Another factor is that the Lakeshore Campus has a distinctly different community from the North Campus, and because of its location has a variety of unique possibilities for addressing the particular needs of the community. The problem of operational relationships then, must recognize the imperatives for autonomy.

A high degree of centralization is seen as a restriction on initiative and an impediment to individual and campus growth. However, certain services and equipment must be centralized for economy. As well, in some service areas Humber's community is not restricted to Etobicoke and York, but includes all of Ontario and Canada. It would be inappropriate for the College to have two major campuses competing with different marketing plans in these areas. Centralization is again required here.

In the overall academic area, coordination between the two campuses will be achieved through a series of standing committees which will review new programmes or major shifts in objectives.

It is the intention of Humber College that each campus will identify spheres of operation that complement each other rather than compete. Each campus will be relatively self-autonomous within an overall College policy.

UNIQUE AND DISTINGUISHING FEATURES OF THE COLLEGE

Humber College has many unique and distinguishing features in the areas of teaching methodolgy, vocational programmes, and community services. Following are only some of the unique features of the College.

CENTRE FOR ENVIRONMENTAL STUDIES

Humber's Centre for Environmental Studies was created to assist local industry, government and public agencies in identifying positive approaches to problems of pollution.

CENTRE FOR WOMEN

A programme to assist women in fully utilizing the resources of the College, recognizing the special needs of those women who have come dissassociated with both the community and the business world because of family commitments.

STOREFRONT HUMBER

Now under the directorship of the local community in liaison with Humber, this project works to identify and develop informal and "on-the-spot" educational needs peculiar to the Lakeshore area community.

SENIOR CITIZENS' CENTRE

Full and part-time College staff are providing and developing pilot programmes and projects for senior citizens, as well as providing advice and assistance with their special problems.

TRAINING IN BUSINESS AND INDUSTRY DIVISION

The College provides a major focus on management studies through its Training in Business and Industry Division.

CONTINUOUS LEARNING DIVISION

The College's Continuous Learning Division also offers an extensive array of Business Management and Skills programmes for part-time study.

Another unique aspect of Humber College is the long-term commitment to providing educational services to the community on a seven days a week, 8:00 a.m. to 10:00 p.m. daily basis.

THE PEEL-HUMBER DEVELOPMENT CENTRE

The Peel-Humber Development Centre provides a unique opportunity for handicapped children to reach the fullest potential of their limited capabilities. Under the guidance of a full-time director, young children from families in Peel County and Etobicoke are given detailed diagnostic testing. The emotional and mental handicaps for these children are then assessed and a programme designed to develop the best skills is planned so that each student can reach the fullest possible potential.

RETRAINING AND APPRENTICESHIP DEPARTMENT

The College's attempts to meet the special needs of the economy is evident in the efforts of the Retraining and Apprenticeship Department of Humber Lakeshore. In addition, the Departments have introduced a broad series of Individual Learning programmes. Essentially this programming allows individual students to enroll at any time for a programme of individual objective learning, and to complete these studies on a personal timetable of almost any duration. The flexibility of the Individual Learning programme has pioneered the commitment to "plug-in - plug-out" educational services to the community.

Many new and unique programmes will be developed for Humber Lakeshore which will provide students with choices related to academic programmes, mode of learning, and style of operation.

Regional Site Analysis

DEVELOPMENT PATTERN

The most distinctive characteristic of the Borough of Etobicoke is the extensive network of industrial areas, which in turn defines the extent of residential communities. The regional recreation and open space systems, which relate mainly to the lake and river valleys, are also prominent. (See Figure 2) Another feature which dominates this area and influences its development pattern is Toronto International Airport at Malton, just beyond Etobicoke's western boundary.

The Borough is nearly 85% developed at present. About half of the developed land is in residential use, 15% industrial use, and 20% devoted to open space or recreational uses. In the south (District 7) there is a much higher proportion of industry (24%) and an extremely low proportion of open space (5%). At its present rate of growth, Etobicoke should be substantially developed in the next 5 to 10 years, though complete development of all the available residential and industrial land may take up to 20 to 25 years. If present policy continues, industrial park land utilization will take place on all land yet undeveloped. Consequently, considerable opportunities will present themselves in the future with respect to Training in Business and Industry programmes for the College.

EMPLOYMENT PATTERN

With a labour force participation ratio of about 40%, the number of jobs is roughly equal to the number of employed persons living in the Borough. In this respect Etobicoke represents a relatively balanced situation and does not represent a typical suburban dormitory community. Employment growth is expected to increase by 80% - 100% by 1995, and therefore self-sufficiency in employment is anticipated.

Industrial employment accounts for 60% of the jobs in the Borough. In District 7 which is heavily industrialized, industry accounts for 70% of the jobs. This fact is a definite influence in regard to the types of programmes that Humber Lakeshore will provide.

HOUSING

Etobicoke is predominantly a low density housing community. There are presently 85,000 dwelling units in Etobicoke comprised of 34% multiple housing (29% apartments, 5% medium density units) and 66% low density housing.

Of projected new housing stock, apartments are expected to constitute over 70% of the new housing, medium density dwellings an additional 14%, and low density houses amounting to 13%. In District 7, apartments are expected to form the bulk of new housing, although none will be located in the vicinity of the campus. On complete development, multiple dwellings will comprise 50% of the Borough's total housing stock.

This reflects the need for increased social and recreational services and facilities in the community.

TRANSPORTATION

As shown in the Vehicular Transportation Network (See Figure 3), major vehicular movement is generally in an east-west direction, via Highway #401 to the north and the Queen Elizabeth Highway to the south. North-south movement has been mainly secondary in nature, serving mostly the internal needs of the Borough. The main north-south roads are Highway #427 to the west, Kipling Avenue, Islington Avenue and Royal York Road. The Borough is planning to improve internal north-south facilities for both roads and public transit, particularly the upgrading of Kipling and Islington, and the extension of Islington south, towards Lakeshore Boulevard to Birmingham. The campus, in the south end of the Borough, therefore appears to be fairly accessible by car.

Figure 2. Regional Development Pattern

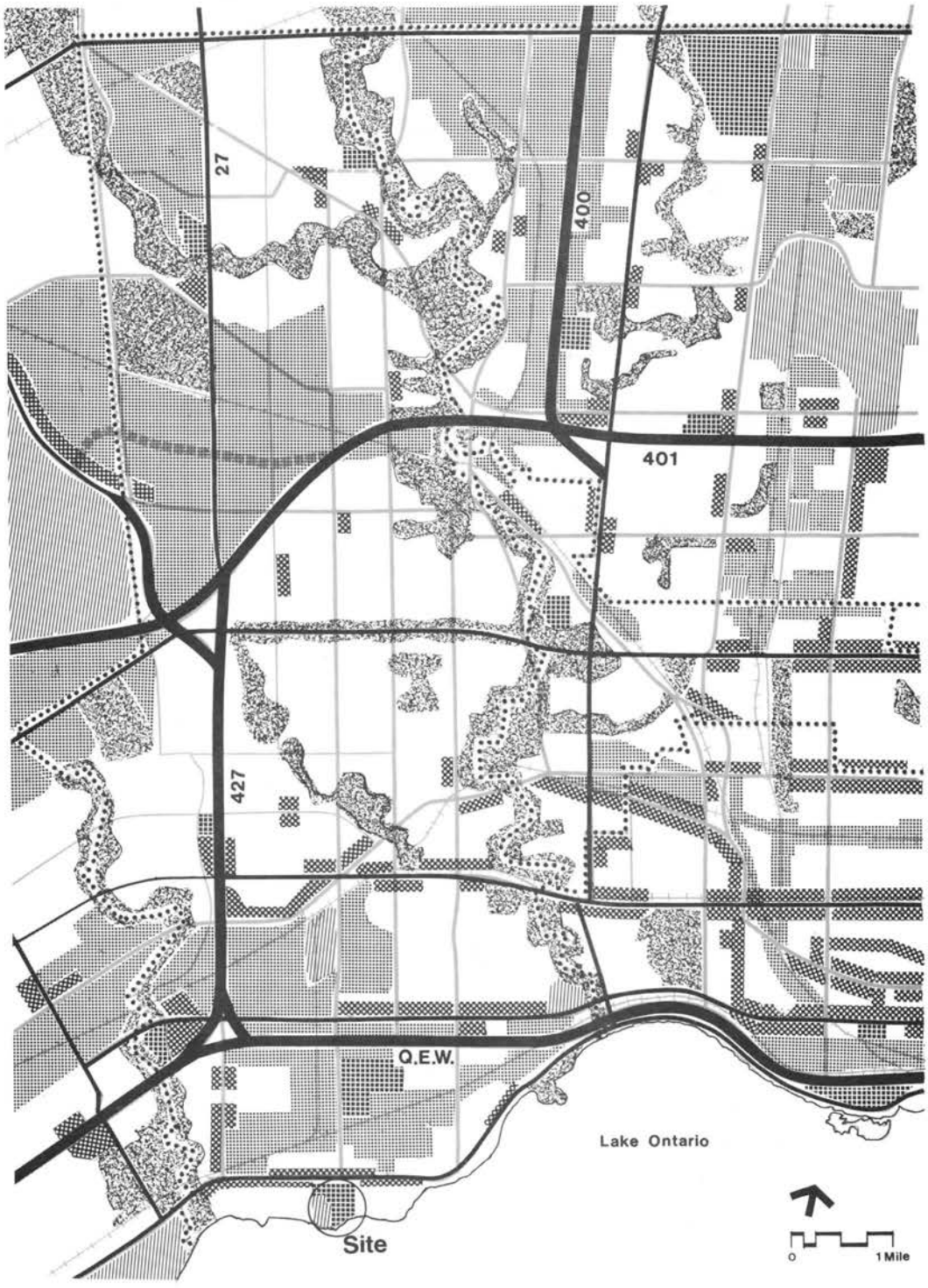


Figure 3. Vehicular Transportation Network

At the present time car ownership is relatively high in the Borough and public transit usage is fairly low. However, in view of rising costs in maintenance and gasoline, greater use of transit facilities is anticipated, especially if existing services are improved and extended.

As mentioned in the Metropolitan Toronto Transportation Plan Review of January 1975, there are several recommendations that would have a beneficial influence on the new campus. (See Figure 4)

Firstly, an intermediate capacity transit system is strongly recommended along the Eglinton Avenue corridor. This line would tie together other elements of the transit system that emanate from central Toronto, and would constitute a major link ensuring extensive transit coverage within the Metropolitan area.

Secondly, the extension of the Bloor-Danforth subway line westward from Islington to Kipling has been approved by Metro Council and is anticipated to be completed by 1978. Much needed parking facilities will also be provided in conjunction with the Kipling Station. The station is also appropriately located for convenient passenger transfers to new commuter rail service on the CP line to Streetsville to the west.

Thirdly, the present GO Transit commuter rail line along the Lakeshore operates between Oakville to the west and Pickering to the east of Toronto, and can accommodate about 20,000 passengers per day. Increases in capacity are recommended by increasing service and use of bi-level cars.

Two GO stations exist in the vicinity of the campus site. The Long Branch Station to the west is 1.4 miles from the site, and the Mimico Station to the east is 2.2 miles away. The Long Branch Station also serves as a terminus for Mississauga Transit and Gray Coach buses.

The Long Branch streetcar passes directly in front of the campus site and connects with the Long Branch GO Station to the west and the Humber Loop to the east.

Present bus service from subway stations down to the south of Etobicoke is very good. The Kipling South bus leads directly from the Islington Station down to the campus site.

As described then, the existing and proposed public transportation network is extremely good in southern Etobicoke and especially in regard to accessibility to the campus site from the outlying region.

COMMUNITY FACILITIES

There is a generally aging population in the south end of the Borough, and in the immediate vicinity of the site there are a substantial number of elderly persons.

Facilities for senior citizens in this area have been requested by the Etobicoke Parks Department as well as by the citizens themselves in the public meetings that were held, and in a local survey conducted by Humber in 1973. There is also a lack of services and facilities for older teenagers and for single mothers who do not work.

A strong need for community facilities and recreation space is therefore indicated for the neighbourhood.

Figure 4. Public Transit Network

PARKS AND THE WATERFRONT

There are about 1,430 acres of existing parkland in the Borough's jurisdiction, ammounting to an average ratio of 5 acres per 1,000 persons. While the provision of parklands may be considered as generally adequate on an overall basis, the local and community parks are not well distributed geographically. The most serious deficiency is in District 7, which contains only 1.4 acres per 1,000 persons. There is also a lack of specialized open space facilities for walking, cycling, etc., in this area.

One of the most critical needs in the south end of the Borough is the adoption of plans and policies with respect to the waterfront. Except for four small Borough parks, and the Metropolitan Toronto and Region Conservation Authority facilities at Marie Curtis Park, the 5-1/2 miles of waterfront are devoid of any meaningful public access. Objectives of the long range waterfront plan are to:

- Promote greater public access to the waterfront.
- Provision of water-oriented recreational facilities.
- Retention wherever possible of long-standing private rights to the waterfront.

Some of these objectives are being met through schemes now under contemplation by the M.T.R.C.A. and it is hoped that these will help to relieve some of the park deficiency in the south end. The first of these, in the Humber Bay area, is currently being implemented with land fill operations at the base of Mimico Creek.

The second consideration is for facilities adjoining and south of the Humber Lakeshore campus site. This location offers the unique possibility of joint planning and usage of both the park and the campus to meet the needs of the community.

Adjacent Site Influences

COMMERCIAL AND INDUSTRIAL

As previously mentioned, there is a high proportion of the Borough's industries in the south end of Etobicoke. In the vicinity of the site, these industries are concentrated to the northeast. Two and three storey strip commercial development is concentrated along Lakeshore Boulevard, part of which borders on the north end of the site. The Borough would like to up-grade and rehabilitate unsightly sections of this commercial strip. (See Figure 5)

RESIDENTIAL

Low density residential areas occur to the north, east and west of the campus site. Existing residences which have been adversely affected by proximity to the surrounding industry to the north are recommended by the Borough to be redeveloped for industrial purposes. No new residential development is anticipated in the surrounding area of the site.

The main residential influence on the new campus lies to the west, where the environment of the quiet, stable neighbourhood must be preserved. Residents have expressed concern about the possible influx of traffic and parking within their area once the campus develops. (See Figure 5)

METROPOLITAN TORONTO AND REGION CONSERVATION AUTHORITY

As part of a programme to promote greater public access to the waterfront and to provide water-oriented recreational facilities in southern Etobicoke, the M.T.R.C.A. is planning the development of the waterfront area adjacent to the new campus site. The Ministry of Natural Resources would also be directly involved in the planning of this area. This development is called the Westerly Filtration Plant. It is in the conceptual stage at present but has not been officially approved. (See Figure 6)

Envisaged are an artificial swimming lake, a seasonal boat mooring area for 500 boats, a dry sailing area, a day mooring area, and picnic and observation areas. The total space required for this facility will be about 25 acres, most of which will be comprised of land fill in Lake Ontario. The artificial swimming lake is contemplated within existing waterfront land, since the water depth and cold temperature of Lake Ontario would not make it feasible to use the lake itself.

Landfilling would be only that required for the creation of adequate protected water for boating purposes. (50,000 cu.yd. of fill is equivalent to 1 acre of fill in water.) Because of the current and high wave action in this locale, about 20% of the fill to be imported would have to be rubble, to stabilize normal fill.

It is anticipated that the M.T.R.C.A. could not proceed with development of any kind at this site until 1977, and no external landfill operations until 1980. This time would be required to complete an environmental impact study as required by the Environmental Assessment Act of 1975, and to transfer M.T.R.C.A. operations from the Mimico Creek Development. Fill generated until 1980 from new campus development or other nearby construction such as construction of the subway extension to Kipling, could be temporarily stockpiled at the south end of the College site until required by the M.T.R.C.A. This would ease the amount of imported fill necessary once the park development is to start.

Authority staff are now in the process of preparing the second 5-Year Waterfront Plan (1977-81), and the final concept and timing for the Westerly Filtration Plant will be formulated in late 1975.

Figure 5. Existing Land Uses

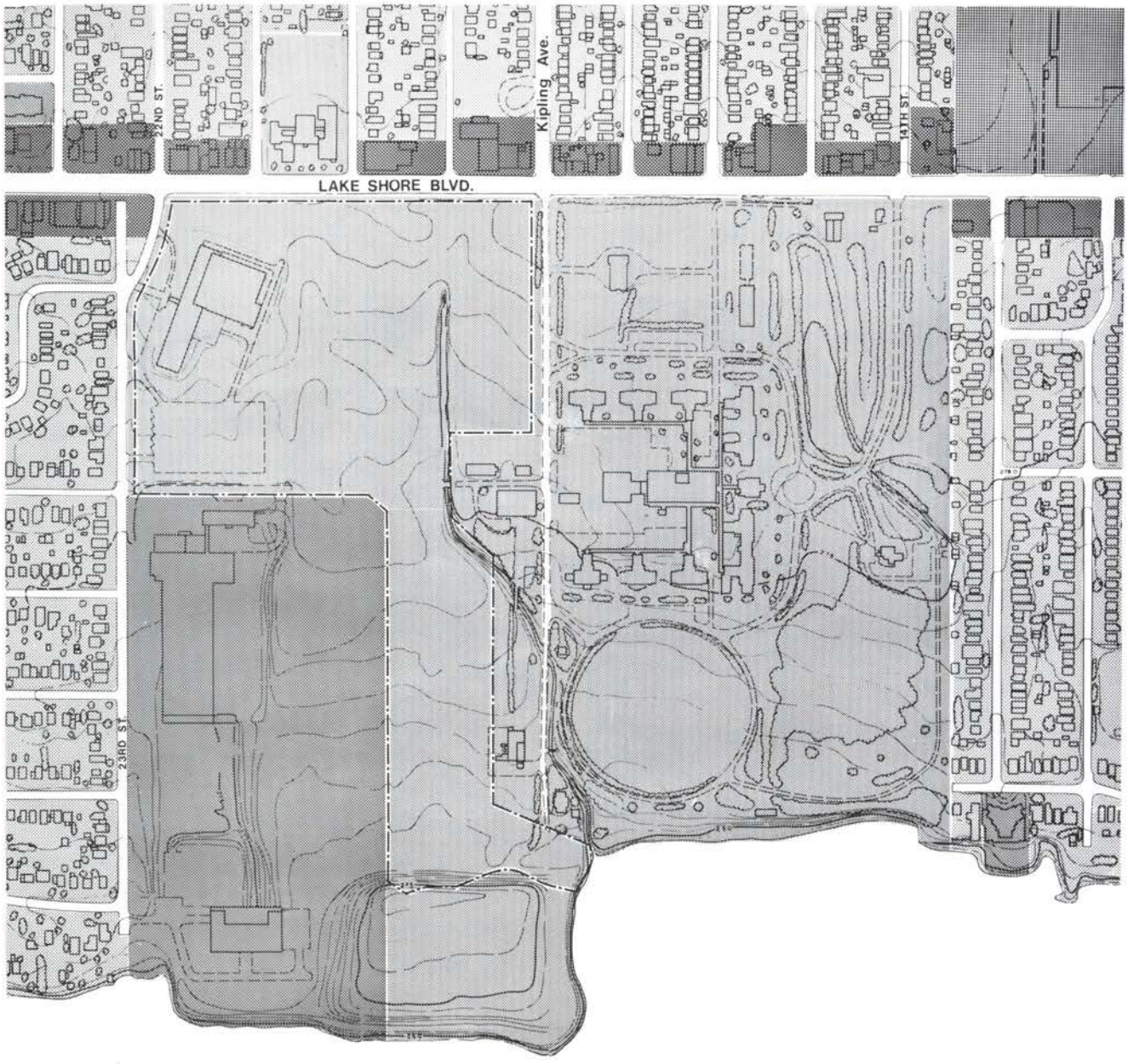
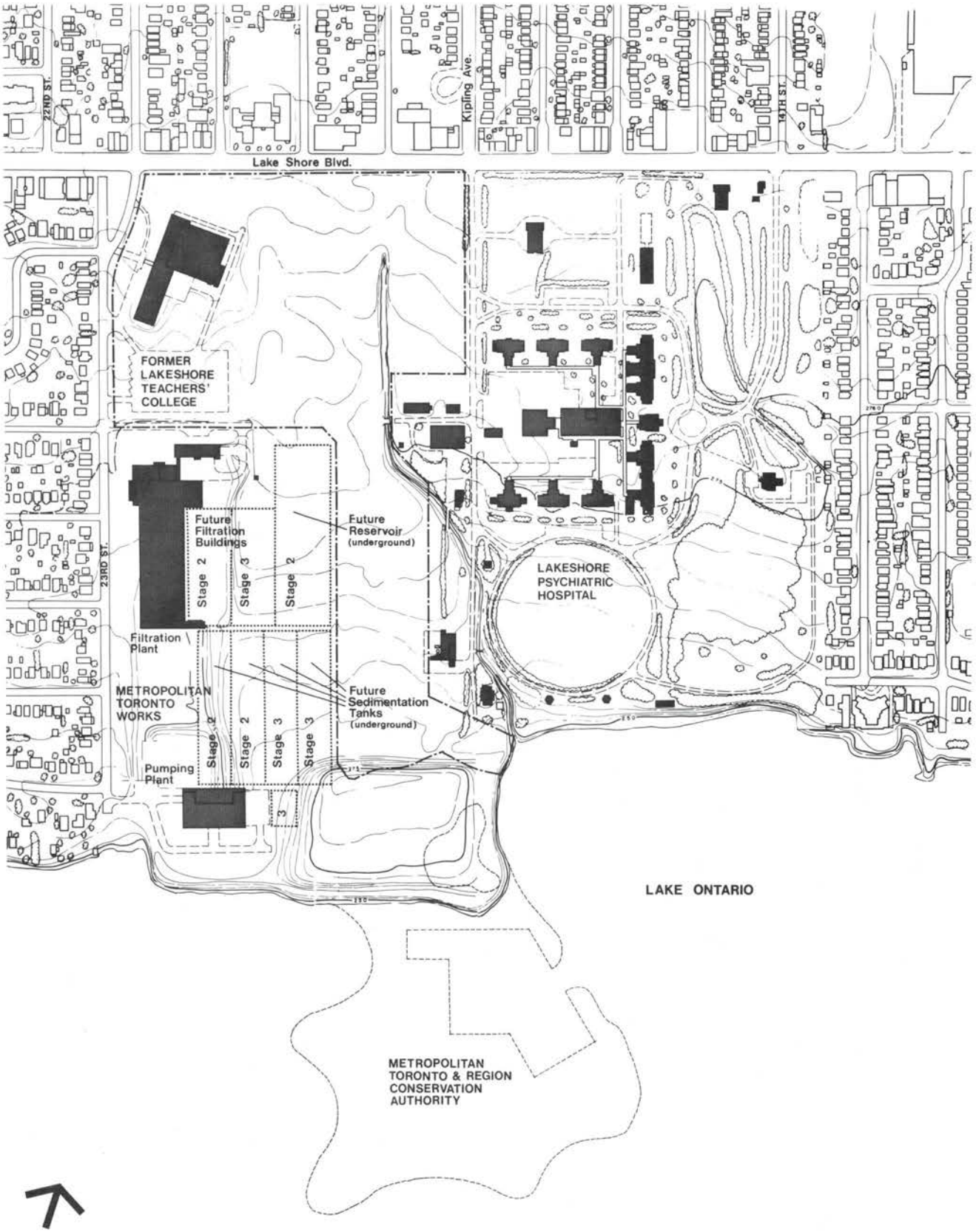


Figure 6. Future Adjacent Development



The educational facility proposed by Humber College is entirely compatible with the M.T.R.C.A. waterfront proposal and vice versa. In this regard, discussions have taken place from the outset of this study to determine the programmes, facilities, and problems of mutual concern. The M.T.R.C.A. development presents exciting possibilities of developing the new campus as an extension of the park, creating much needed recreational space for the community.

Humber Lakeshore will be providing water-related programmes, and the M.T.R.C.A. has agreed to provide space within the park to accommodate these along with associated facilities. The College has also agreed to share the use of their parking areas with the M.T.R.C.A. to accommodate the public on week-ends, when the campus would not be heavily occupied by students. In turn, the College could utilize M.T.R.C.A. parking facilities during the week days if required. This would maximize the use of parking areas and less land would be eroded for parking provision.

Of extreme concern to both Humber and the M.T.R.C.A., along with the residents to the west, the Lakeshore Psychiatric Hospital under the Ministry of Health to the east, and to the Borough, is the resolution of an access road down to the proposed park during construction and for eventual public access. This will be discussed in more detail in other sections of the Report, but in summary, it appears that the extension of Kipling Avenue southward along the present L.P.H. service road is the most logical route. However, Humber has agreed to the possibility of a temporary access road for the M.T.R.C.A. through their property, if the resolution of the Kipling Avenue extension becomes a long term issue with the Ministry of Health. The possibility of this should be recognized in the planning of the campus.

LAKESHORE PSYCHIATRIC HOSPITAL

The existing Lakeshore Psychiatric Hospital property is adjacent to and east of the campus site in a beautifully landscaped and park-like setting, between Lakeshore Boulevard to the north and Lake Ontario to the south, with a magnificent view to the lake. Another interesting feature of the property is an abandoned watercourse which extends from the Humber College site across the southwest corner of the property and down to the lake. (See Figures 6 & 11)

A service road on the west side of the site is aligned with the termination of Kipling Avenue, and extends from north to south dividing the property into 2 sections. The western portion of the property projects deeply into the midpoint of the campus site to the west. The main entry road off Lakeshore Boulevard occurs east of the service road.

The majority of existing buildings east of the service road are very old two and three storey red brick structures of interesting character and charm, beautifully complemented with mature trees. The 3 service buildings (Paint Shop, Laundry Building, Root House) clustered west of the service road are in a dilapidated state. The Moore House immediately south of the service buildings is a relatively new building which acts as a retreat facility for patients and visitors. Further south is a handsome old brick boiler plant which still serves the Hospital.

The long term use of this facility as a psychiatri hospital has not been decided as yet by the Ministry of Health. A report on the future of the Hospital site will be completed in 1976. However, it is unlikely that the Hospital will remain in its present use, and there is a possibility that the Ministry of Health will eventually vacate the site some time in the future. At that time, Humber College would

certainly like to obtain the property as space for future campus development or to convert the existing buildings into student residences.

At the present time Humber College is negotiating with the Ministry of Health in regard to obtaining access to the campus via the extension of Kipling Avenue along the north section of the Hospital service road, away from existing buildings. As mentioned, this appears to be the most logical and only route as far as the Borough of Etobicoke is concerned, for Humber's access. The Ministry of Health appears agreeable to allowing use of the north portion of the road but has rejected use of the road further south while the Hospital is still in its present use, because of potential disruption to patients and hospital functions.

Humber will be providing Health programmes, some of which could be complementary to existing Hospital programmes. The College might also provide functions and facilities to serve the Hospital patients so that the College could in effect become an extension of the Hospital.

COORDINATION OF PROVINCIAL GOVERNMENT AGENCIES

Presently, the Borough of Etobicoke Planning Department is attempting to coordinate the land use activities of Provincial Government Agencies that would be involved in this area. These would include:

- Ministry of Colleges and Universities for the Humber College site.
- Ministry of Health for the Lakeshore Psychiatric Hospital site.
- Ministry of Natural Resources for the M.T.R.C.A. waterfront park.

The proximity of each of these developments will necessitate cooperation from each of these Agencies on the basis of any respective long and short range plans which can be defined. The developments in question are essential for the benefit of the residents of the area in what is a unique opportunity to service the community.

METROPOLITAN TORONTO DEPARTMENT OF WORKS

The Metropolitan Toronto Department of Works occupies the adjacent property to the south and west of the campus site for their Westerly Water Purification Plant. Existing facilities include a one and two storey filtration building at the north end of the site, and a pumping plant to the south. A small sanitary sewer pumping station exists to the east of the filtration building. Underground structures include a clearwell adjacent to and east of the filtration building, and sedimentation tanks extending between the filtration building and the pumping plant.

An 8 acre section of land to the east of the filtration building and adjacent to the College property is a Metro Works easement on which surface rights have been granted to Humber, for roads, parking, or landscaping. However, any replacement costs related to excavation or access to Metro Works services would have to be borne by Humber. An additional 100 ft. wide Metro easement extends through the campus site southward from Lakeshore Boulevard. A paved right-of-way at the north edge of the property exists for Metro Works use, but could also be utilized by Humber College.

Future development plans, (See Figure 6) shown as Stage 2 between 1978-80 include: a 20 million gallon underground reservoir at the north end of the easement, expansion eastward of the filtration building, and additional sedimentation tanks east of the existing ones. Expansion shown as Stage 3 has no established date and this stage may never occur, depending upon future development of water purification technology. A future service building is contemplated east of the present pumping plant.

The depth of the underground structures would be about 30 ft., with 2 to 3 ft. of topsoil over. The slabs (designed for $\pm$ 7 tons) would be strong enough to support car parking over, without additional reinforcing. The top elevation of these structures may be above natural grade in some areas, and above grade access points would also be required.

The amount of fill that could be generated from excavations would be useful for the M.T.R.C.A. landfill requirements, and Metro Works has agreed to allow the fill to be used for this purpose.

The College recognizes the potential possibilities in education related to water purification, and courses related to the filtration plant will be provided.

Because of the proximity of existing and future Metro Works buildings to the campus, the new College buildings should recognize the scale and appearance of these structures.

Programme Analysis

LAKESHORE COMMUNITY EDUCATIONAL PROFILE

From its inception, Humber College has recognized the value of studying the needs, expectations, and characteristics of residents that live within its designated territory.

In 1973, Humber conducted a local survey of Etobicoke south of Bloor Street, and parts of Peel County to the west -- this geographic entity is known as the Lakeshore. The purpose of the survey was to isolate and illuminate local educational needs, indicate potential desirability and useage, and suggest an optional mix of courses and related activities for the proposed campus.

A four page questionnaire was drawn up incorporating these ideas, and distributed in a random sampling of the area. The conclusions of this survey are summarized as follows:

. 90% of the survey respondents live within thirty minutes commuting distance of the proposed new campus.

. Colleges of Applied Arts and Technology are known and accepted as viable, useful institutions by a large proportion of study area residents.

. Courses such as self-expression, human relations, family problems, management and marketing, recreation and travel, and communications were preferred to those expressed for trades and technical training, secretarial, commercial and business machines, and industrial engineering. This probably has more implications for part-time programmes for the 24-44 age segment of the community than for full-time day programmes.

. Considerable favourable response was given to suggestions for weekend and evening courses, and to a lesser extent, instruction which blends at-home and in-college studies.

. Study area residents will have a shorter trip to the Lakeshore Campus than to the North Campus site. This tends to impact more on potential part-time enrollment, as experience indicates that the bulk of full-time enrollment will come from outside the study area.

. Few respondents foresee difficulties in travelling to the Lakeshore Campus site.

. Courses (eg., commercial, management, retraining, technical) are seen as the principal advantage and desired offering of a Community College in the Lakeshore area.

Other community needs expressed included:

. Community Services (eg., children's day care programme, family counselling, health services.)

. A Meeting Place (eg., activities for the at-home mother, teen programmes, a meeting place for community groups.)

. Facilities (eg., auditorium, bookstore, library.)

Note: [Detailed analysis and statistics related to the Lakeshore community, educational profile, and South Campus Survey (1973) can be found in the "Lakeshore Campus Academic Master Plan", prepared by Humber College.]

EDUCATIONAL FORMAT

Humber College has long recognized its obligations, not only to the traditional full-time student, but also to the housewife who can attend school only a few hours each day or evening, the engineer who can spare two or three hours a week for familiarization with new practices, the shift-worker who cannot anticipate exactly when she or he might be available for institutional learning, the office worker who wishes to learn other trades or hobbies, and the young adult who must

work part-time during the day to finance his or her education. These examples of students who don't fit the mould of "the regular student" represent a major segment of the Lakeshore Campus. Therefore, Humber Lakeshore cannot have traditional academic systems with which to accommodate these people.

The concept of vertical timetabling will be an integral part of all classroom type learning systems at Humber Lakeshore. Students may receive the week's instruction in one subject in one time block, rather than having to return to the College several days each week for hour long presentations. Whenever practical, evening time blocks repeating the content of the day blocks will be developed, thus giving students a much greater ability to schedule themselves around other activities. The College will be an on-going operation, open 7 days per week from 8:00 a.m. to 11:00 p.m.

In some cases, individualized learning programmes will be developed to allow students to vary their timetables frequently, or to start a programme at any time during the year. This creates a complex system from the management standpoint, but is a good system for the students. The College has extensive experience in all of these variations and will design these into the academic programming of Humber Lakeshore.

PHASED ACADEMIC PROGRAMME

The Humber Lakeshore Campus will be a major self-autonomous campus of Humber College. It will offer programmes on a multi-divisional basis, integrating full and part-time studies. Due to its proximity to the waterfront, special programmes and facilities will be introduced relating to the lakefront development. In addition, programmes and facilities reflecting the needs of the Lakeshore community will be provided.

Projected enrollment by 1980 is for approximately 4,000 full-time students and over 10,000 part-time students. Full-time teaching and support staff will number about 900. With the inclusion of part-time students, 6,000 full-time equivalent students are anticipated. The programmes and enrollment are for a 5-year plan, but are probably sufficient for up to 10 years.

The academic programme presently envisaged by 1980 is planned in the following three phases:

- Phase 1 (1977-78) : Technology Module
- Phase 2 (1978-79) : Applied Arts and Health Module
- Phase 3 (1979-80) : Business and Resources Module

However, it should be emphasized that the priority and phasing of each of these Modules is not fixed. For instance, the Applied Arts and Health Module or the Business Module could preceed the Technology Module.

The operation of the campus will begin with the occupancy of the former Lakeshore Teachers' College building in September 1975.

FORMER LAKESHORE TEACHERS' COLLEGE

The existing former Lakeshore Teachers' College building contains about 90,000 sq.ft. of space. It has 23 classrooms occupying 23,000 sq.ft., in addition to a small library, offices, cafeteria, auditorium, and gymnasium.

Commercial and academic programmes are envisaged here over the next 5 years to accommodate a projected enrollment of 800 full-time students, 800 part-time students, and a support staff of about 50 persons.

The following is a list of programmes to be located here:

- Applied Arts Programmes
- Commercial Programmes
- Accountancy Diploma
- General Business Diploma
- Marketing Diploma
- Business Administration Diploma
- Secretarial Studies
- E.A.S.L. (English as a Second Language)

Several user meetings with Humber staff were conducted to arrive at detailed accommodation requirements. These are listed in the Appendix.

As the campus develops and new facilities for the College have been completed, these programmes and common functions such as Administration, Learning Resources Centre, and Instructional Materials Centre will be transferred to the new buildings.

The Teachers' College building will probably then be used as a community and recreation centre to serve the Lakeshore community. Of course in the interim, the building will be open to the community at all times for part-time programmes and for use of facilities such as the gymnasium or auditorium.

COMMUNITY, RECREATION, AND WATER-RELATED PROGRAMMES

COMMUNITY PROGRAMMES

In keeping with Humber's philosophy of inviting and including the community to participate, special community programmes and facilities will be provided. In recognition of the needs of the Lakeshore community, programmes will be included for: children's day care, family counselling, single mothers, teens, and senior citizens, along with the usual part-time programmes. The College will become the community "meeting place".

RECREATIONAL PROGRAMMES

A whole series of recreational programmes are envisioned for the College, oriented towards the community. Outdoor facilities will include: a soccer field, running track, tennis courts, and a "Vita Parcours" running and exercise system as established in the Scandanavian countries and as provided by the Metro Parks Department in the Don Valley parks system. Provision should also be made for a certain amount of unorganized open space. Indoor programmes related to the existing Teachers' College gymnasium will also be provided.

Because the campus is related to Lake Ontario and the proposed Metropolitan Toronto and Region Conservation Authority waterfront development at the south end of the site, recreational programmes related to swimming, rowing, and sailing will be a definite possibility in future.

WATER-RELATED PROGRAMMES

Again, because of the campus having access to water and the M.T.R.C.A. facilities, as well as being adjacent to the Metro Works water filtration plant site to the west, numerous water-related technology programmes could offer unique and exciting opportunities for Humber Lakeshore students.

Possible programmes could include: marine biology, marine engineering, underwater technology pleasure craft design and construction, sewage treatment, water filtration, and water pollution.

TECHNOLOGY MODULE

The following is a list of programmes envisaged for the Technology Module:

MECHANICAL PROGRAMMES

- Manufacturing Engineering Technician
- Mechanical Technician - Design
- Mechanical Technician - Numerical Control
- Tool and Die Design Technician

- Tool and Die Making Technician
- Mechanical Engineering Technician
- Electro Mechanical Technician
- Industrial Maintenance Technician
- Welding Technician
- Machinist
- Automatic Screw Machine
- Welding
- Small Engines
- Environmental Control Technician
- Water Filtration Treatment Technician
- Waste Treatment Technician
- Solar Energy

ELECTRICAL PROGRAMMES

- Electrical Apprentice
- Electrical Power Systems Technician
- Electrical Control Technician
- Instrumentation Mechanic
- Instrumentation Technician
- Precision Instrument Technician
- Hydro Programmes

This "Module" or division is comprised of 3 general and interrelated areas: Mechanical, Electrical, Common Area. The Common Area is foreseen as a large open interaction space accommodating centralized learning activities that will be used by all Technology courses, with Mechanical and Electrical labs on the periphery. Workshops, common tool crib, central supplies, or other common student functions could be in this area. (See Figure 9) This "resources" area will form the link with the remainder of the campus, merging into the main Resources complex.

Mechanical and Electrical courses do not necessarily have to be separated, and there does not have to be a room for each activity. Most of the instruction will take place in the shops, with theory being taught in the classrooms.

Few classrooms are anticipated. Labs may be used as classrooms initially, or classrooms in a future Module could be shared until funds for Technology classrooms become available. However, this would not be an ideal situation because of the remoteness of classrooms from the Technology Module. Faculty offices do not necessarily have to be adjacent to or overseeing workshop areas.

Vertical organization might also be possible for this Module, having light Technology courses at the top, Common Area in the middle, and heavy Technology courses at the bottom.

MECHANICAL DESIGN REQUIREMENTS

The following are specific design considerations for the Mechanical programmes:

- Large open space for workshops
- Centralized services (gas, electricity, compressed air, etc.), tool crib, and supplies
- Ease of accessibility to all services.
- High ceiling (minimum 12 ft. - 15 ft.) with exposed structure
- Mezzanine type storage system to maximize space use
- High supplies requirement with direct ground floor access for truck servicing
- Ground floor location for programmes involving heavy machinery or high vibration
- Good ventilation system
- Special exhaust requirements for Welding and Small Engines programmes

ELECTRICAL DESIGN REQUIREMENTS

Electrical programme design requirements are basically the same as for Mechanical, but with special regard for a dust-free environment, especially for the Precision Instruments programme.

SPACE AND ENROLLMENT

Space and enrollment requirements are summarized in Figure 7. Part-time students can be accommodated within all of these programmes without an increase in area.

WELDING RESEARCH UNIT

A federally sponsored programme for Welding Research is also anticipated in future as part of and in addition to the Technology Module. This will ultimately require 20,000 sq.ft. of space, and should be designed as a "plug-in" unit to the Mechanical areas. About 4,000-5,000 sq.ft. of space may be included in the initial phase, depending upon funds available.

HEATING PLANT

Although a central heating plant may not ultimately be recommended for this campus, an allowance of 4,500 sq. ft. is to be included for heating plant space.

APPLIED ARTS AND HEALTH MODULE

The following is a list of programmes for this Module:

APPLIED ARTS PROGRAMMES

- Law Enforcement
- Landscape Technician
- Travel and Tourism
- Furniture Design
- Interior Design
- Floor and Wall Covering
- Recreation Leadership
- Family and Consumer Studies
- General Arts and Science
- Public Relations
- Metal Arts
- College Preparatory

Spaces for these programmes will consist basically of classrooms and labs, and will be similar to the Business Module.

HEALTH SCIENCES PROGRAMMES

- Nursing
- R.N.A. (Registered Nursing Assistant)

Psychiatric, training and rehabilitation programmes for patients, or other health care programmes related to the Lakeshore Psychiatric Hospital are other possibilities, depending upon the future of the Hospital.

The Health Sciences area will be organized similar to the Technology Module and is comprised mainly of labs, with Paramedical programmes in one area and Nursing programmes in another.

SPACE AND ENROLLMENT

Space and enrollment requirements are summarized in Figure 7.

BUSINESS AND RESOURCES MODULE

BUSINESS PROGRAMMES

- Business Administration - 3 Year Diploma
  With specialization in one of the following:
  - Accounting
  - Marketing
  - Personnel Management

- General Business - 2 Year Diploma

- Secretarial - 2 Year Diploma
  With specialization in one of the following:
  - Medical
  - Legal
  - Executive
  - Engineering

. Certificate - 1 Year
  With specialization in one of the following:
  - Business Administration
  - General Business
  - Business Management
  - Marketing
  - Accounting
  - Personnel Management
  - Secretarial

Classrooms for these programmes should accommodate between 40-60 students, with provision for room divisibility. Three open office areas are required.

RESOURCES

The Resources area will be composed essentially of:

. Library
. Cafeteria
. Administration

Most centralized College functions will be located in this Module. Common functions initially housed at the former Lakeshore Teachers' College will eventually be transferred to the Resources Module.

SPACE AND ENROLLMENT

Space and enrollment requirements are summarized in Figure 7.

EDUCATIONAL CONCEPT

The philosophy of Humber Lakeshore is to create an environment that stimulates a desire to learn, as well as providing opportunities for informal exchange between students.

The Educational Concept is based on this philosophy. In this concept, the Resources Module is seen as tying together and merging with the common areas or "sub-resources" of the other Modules, forming a Resources nucleus, with more specific division functions around it. (See Figure 10) This area will form the campus activity centre, generating the potential for students and staff of the various divisions to intermingle.

RESIDENCES

No student residences are anticipated for the campus but if the Lakeshore Psychiatric Hospital eventually becomes part of Humber College, the existing buildings could be considered for residences.

Although the Borough does not anticipate construction of apartment buildings in the campus vicinity, there is a stock of boarding houses in the area for student accommodation.

SPACE PROGRAMME

The following space breakdown has been assumed for each Module based upon existing Humber facilities:

. Net/Gross = 70%
. Building Services = 30%
. Educational Resources = 10%
. Offices (as per Programme) = $\pm$ 10%
. Teaching Space (remaining space) = $\pm$ 40%

The following standards have been assumed for teaching spaces based upon existing Humber facilities and comparison with other community colleges:

. 20 students/lab @ 60 sq.ft./student
  = 1,200 sq.ft./lab

. 35-40 students/classroom @ 25 sq.ft./student
  = 900-1,000 sq.ft./classroom

. 40-60 students/business lab @ 25 sq.ft./student
  = 1,000-1,500 sq.ft./lab

A summary of space requirements is shown in Figure 8, based upon the Academic Programme and the above standards.

Figure 7. Space and Enrollment

	Gross Area (sq. ft.)	No. Of Full-Time Students	No. Of Teaching Staff
TECHNOLOGY MODULE			
Mechanical	50,000	333	35
Electrical	50,000	333	18
Common Area	50,000	333	
Heating Plant	4,500		
	154,500	1,000	53
APPLIED ARTS AND HEALTH MODULE			
Applied Arts	75,000	750	60
Health Sciences	75,000	500	20
	150,000	1,250	80
BUSINESS AND RESOURCES MODULE			
Business	75,000	750	36
Library	25,000		
Cafeteria	25,000		
Administration	25,000		25
	150,000	750	61
TOTAL	454,500	3,000	194

Figure 8. Space Programme

	Teaching	Office	Educational Resources	College Services	Net Area	Building Services	Gross Area (sq.ft.)
TECHNOLOGY MODULE							
Mechanical	20,500	3,500	5,000	6,000	35,000	15,000	50,000
Electrical	22,200	1,800	5,000	6,000	35,000	15,000	50,000
Common Area	24,000		5,000	6,000	35,000	15,000	50,000
Heating Plant							4,500
	66,700	5,300	15,000	18,000	105,000	45,000	154,500
APPLIED ARTS AND HEALTH MODULE							
Applied Arts	30,000	6,000	7,500	9,000	52,500	22,500	75,000
Health	34,000	2,000	7,500	9,000	52,500	22,500	75,000
	64,000	8,000	15,000	18,000	105,000	45,000	150,000
BUSINESS AND RESOURCES MODULE							
Business	31,000	5,000	7,500	9,000	52,500	22,500	75,000
Resources		17,500	17,500	17,500	52,500	22,500	75,000
	31,000	22,500	25,000	26,500	105,000	45,000	150,000
TOTAL	161,700	35,800	55,000	62,500	315,000	135,000	454,500

Figure 9. Programme Relationships

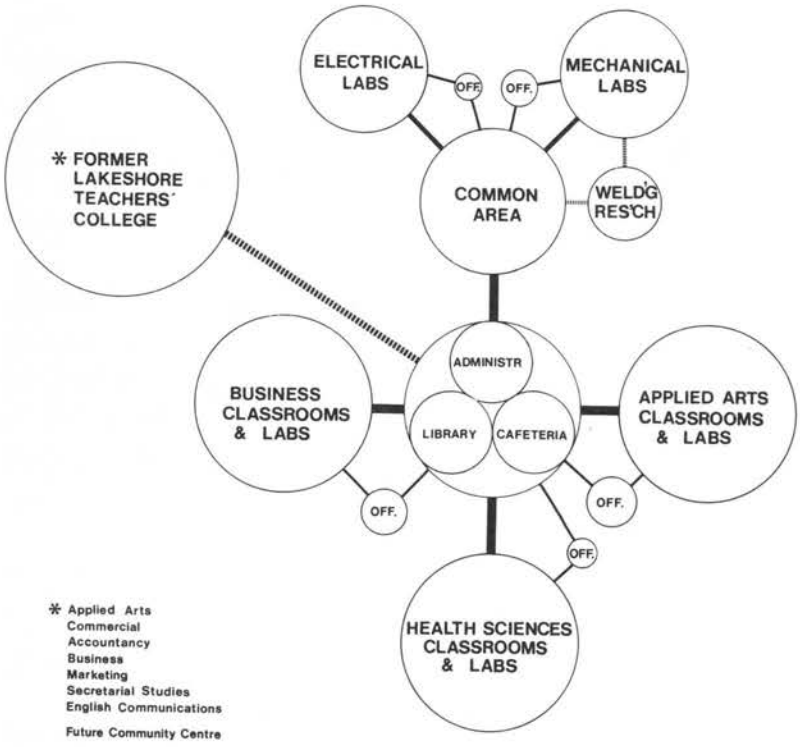
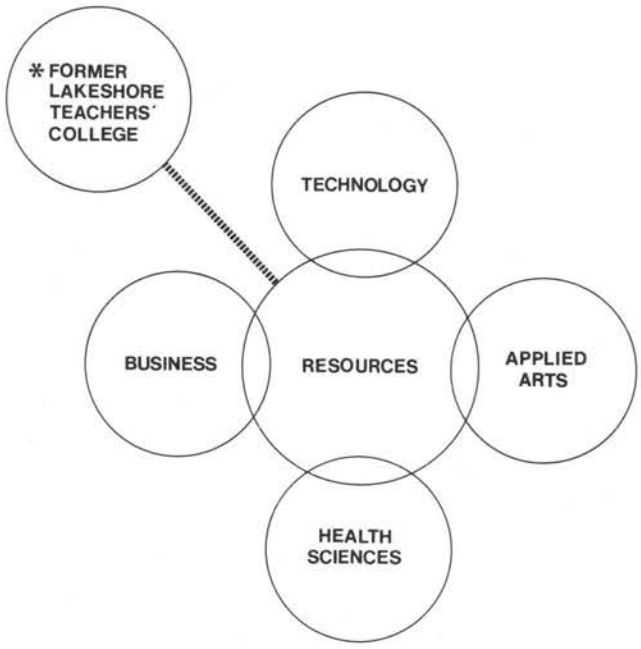


Figure 10. Educational Concept



Site Analysis in Detail

LOCATION

The site is located in a park-like setting at the southwest corner of Lakeshore Boulevard West and Kipling Avenue South. It is bounded on the west by 23rd Street and the Metropolitan Toronto Works property, the Lakeshore Psychiatric Hospital property to the east, Lakeshore Boulevard to the north, and a portion of property fronting on Lake Ontario to the south under the jurisdiction of the Ministry of Natural Resources. (See Figure 11)

ZONING

The property is presently zoned "Institutional" but not for college type use. However, the zoning will be amended to accommodate Humber College, and this is presently underway. Setback requirements are: a front yard of 20 ft., a side yard of 1/2 the lesser of the height or width of the building, and a 25 ft. rear yard. There is no maximum coverage requirement, but the Borough suggests that building coverage should not exceed 50% of the site.

SIZE

The area of the site is 37.7 acres, and measures about 2,600 ft. from Lakeshore Boulevard down to Lake Ontario. The middle section of the site is restricted in dimension to about 200 ft. across, where the Hospital property to the east projects into it.

EASEMENTS AND SITE SERVICES

The site is divided into two sections at the north end, where a 100 ft. wide Metro easement containing existing site services (6 in. sanitary sewer, 36 in. water main, 90 in. water main, 27.6 KV cable duct) runs in a north/south direction. An additional 90 in. water main is contemplated in future, probably around 1990. Adjacent to this and extending the entire length of the site is a 50 ft. wide Etobicoke easement containing a 102 in. storm sewer. (See Figure 11)

These easements comprise an area of 5.6 acres and decrease the area of the site that can be built upon. Only roads, parking or landscaping are permissable over these easements, and surface access to buried services must be maintained. Building structures across the easements would be possible, but these would have to be of limited width (eg., link or bridge), and have a 15 ft. clearance below them to allow for passage of cranes or service equipment. The authorities would consider the extension of building footings down into the easements if they do not interfere with existing services.

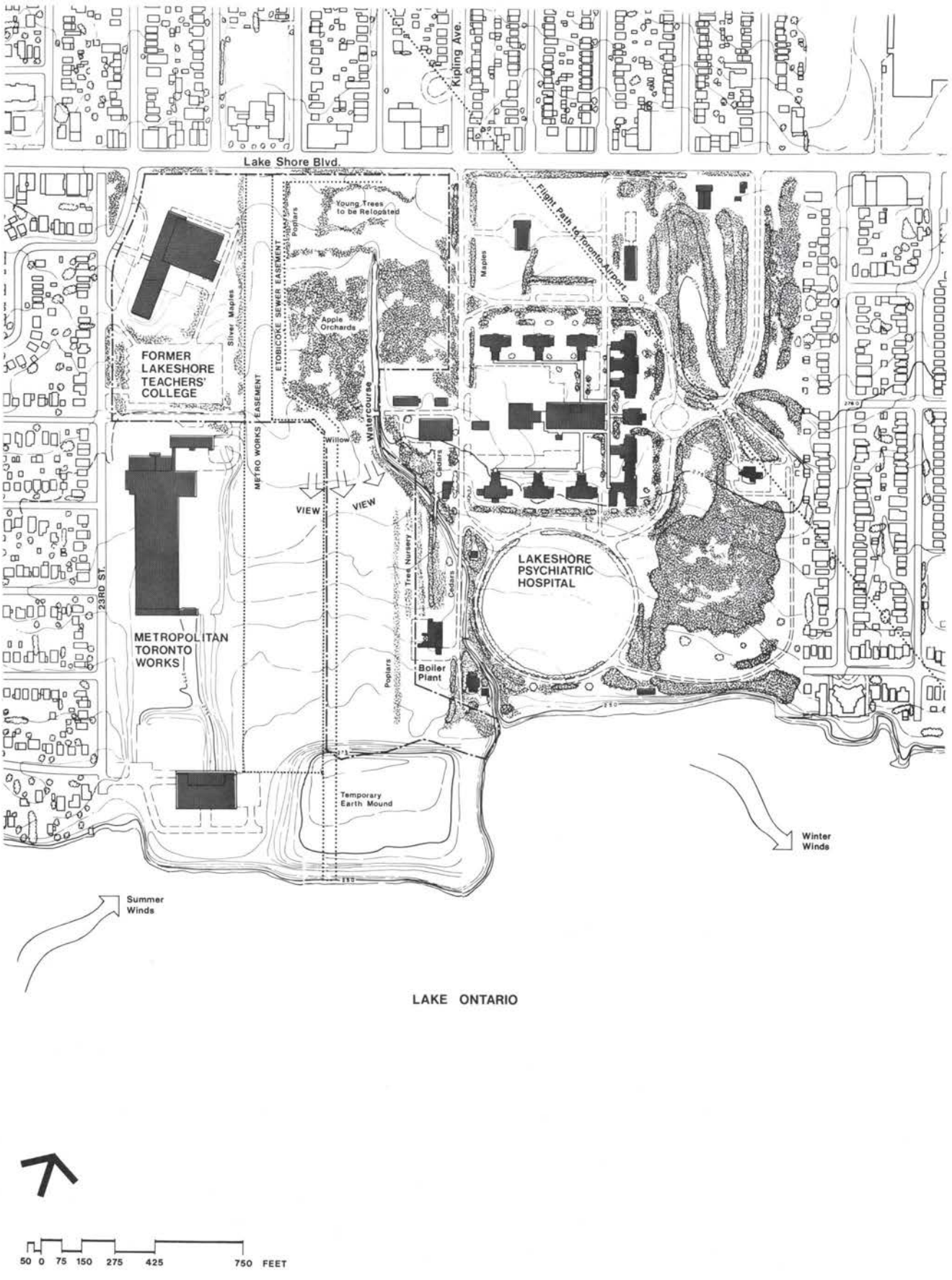
As previously mentioned, Humber College has acquired surface rights to the Metro Works easement of 8 acres to the west of the site. The College would have to pay for all costs related to road repair, parking, etc., if access to buried services are required, and if these facilities are placed over the easements.

FORMER LAKESHORE TEACHERS COLLEGE

As indicated earlier, the former Lakeshore Teachers' College building has recently been acquired by Humber College. It is to be open for use in September 1975, and is to be included as part of the total campus development.

The building is an isolated L-shaped "monument" in the northwest corner of the site. It is a basementless, two storey concrete and steel structure with buff-coloured brick cladding, built in 1958. It contains about 90,000 sq. ft. of rigidly organized space comprised essentially of classrooms, complemented by a gymnasium, cafeteria, kitchen, library, auditorium, and offices. There is a beautiful little courtyard at the southeast corner of the building, and a parking lot accommodating about 300 cars south of it. The main entrance, on the west side of the building, is fronted by a formal driveway off 23rd Street.

Figure 11. Existing Site Conditions



The building has no air conditioning and an inadequate electrical system. Present conditions do not meet with safety and fire requirements, and renovations to comply with today's standards are necessary. Existing wood window frames are rotting due to condensation, and some roof repairs are required.

The general atmosphere inside is very dull and sterile due to the use of hard materials on walls and floors, and lack of colour. The exterior appearance of the building is uninviting and "institutional-looking", typical of a school building of the 1950's.

Aside from the necessity to upgrade the building for functional reasons, the main challenge lies in converting a rather inflexible facility into one that is conducive to Humber's philosophy of having an open, flexible, and informal environment for learning. An additional concern is in relating the building to the proposed new campus buildings, and in reflecting the proper image of the College to the community.

PHYSICAL FEATURES

The topography of the site is relatively flat, gently sloping about 30 ft. down to the lake at an average fall of only 1.5%. There is a mound of earth temporarily stockpiled at the south end of the site, comprising about 3.5 acres and 20 ft. higher than the natural grade to the north. (See Figure 11)

A well defined drainage channel exists in the northeastern part of the site, in a northwest to southeast direction. The banks of the channel are generally steep, from 4 ft. to 10 ft. high with some evidence of bank erosion. The channel is well treed, mainly with willows.

A strong landscape feature of the site is provided by an apple orchard which comprises nearly 5 acres at the north end of the site. The trees, which are in excellent condition and are 20 ft. to 25 ft. high, could continue to be significant landscape elements for several years.

A group of small trees exists in an area about 200 ft. wide at the northeast corner of the site. The trees, most of which are about 2 in. caliper, could readily be transplanted. Species include Austrian Pine, Schwedler, Norway and Silver Maple, Black Locust and Honey Locust.

A nursery plot is situated just northwest of the Hospital boiler plant, and includes many trees which could be transplanted for use in landscaping the campus. Species include Ash, Honey Locust, Linden, Maples (various), Chinese Elm (which would not likely be transplanted), and Austrian Pine.

Other trees on the site include two rows of poplars, 6 in. caliper, one west of the boiler plant, the other in the north central part of the site; a row of 6 in. caliper Silver Maples along the east boundary of the former Lakeshore Teachers' College site; and various plantings around the Teachers' College building. A 30 in. willow (Salix alba tristis) is situated centrally at the point where the site is constricted, in line with the north wall of the Metro Works filtration plant.

VIEW

The most dominant elements seen from the site are the adjacent lands rather than the site itself -- the Lakeshore Boulevard commercial strip, the Metro Works structures, the buildings and large trees of the Hospital property, and Lake Ontario. (See Figure 11)

Major views are to the lake and to the beautiful grounds of the Hospital site. The lake, which provides a dominate influence on the site character, is blanked from view by the earth mound to the south. However, this will be removed once the

M.T.R.C.A. park development commences. The campus fronting on the lake presents a very unique situation, and water-related programmes in conjunction with the M.T.R.C.A. facility would be a tremendous asset to the College and the community.

WEATHER

In this location, summer winds come from the southwest, and winter winds from the northwest. The lake causes a tempering effect on the climate of the area, and temperatures are generally cooler throughout the year.

PUBLIC TRANSIT ACCESS

Public transportation in the immediate locality is extremely good. The site is accessible via T.T.C. vehicles from the nearby GO stations at Long Branch and Mimico, and from the Islington (and future Kipling) subway station. In addition, Humber's own buses will provide a service between these stations and the site. (See Figure 12)

The Long Branch streetcar route along Lakeshore Boulevard, offers high capacity and short intervals between vehicles, and terminates at the Long Branch GO station to the west. This line has transit stops at the northwest and northeast corners of the site.

The Kipling South bus operates between the Islington subway station and a bus loop immediately north of Lakeshore Boulevard. The T.T.C. is favourable towards an extension of this route into the campus in future, and a possible further extension southward to serve the M.T.R.C.A. park when that facility is completed.

All transit systems described are interconnecting, and the T.T.C. will increase service related to demand for all routes.

VEHICULAR ACCESS

As indicated earlier, vehicular access to the site is fairly good, by way of Lakeshore Boulevard and Kipling Avenue. Kipling and other north/south arterial streets connect directly with the Q.E.W. highway.

Presently vehicular and service access to the campus is available only from 23rd Street, feeding directly into the existing parking lot south of the former Lakeshore Teachers' College building. However, due to resident opposition, which is supported by the Borough, this route may be used only temporarily until new campus development commences. At that time, another means of vehicular access into the campus must be found.

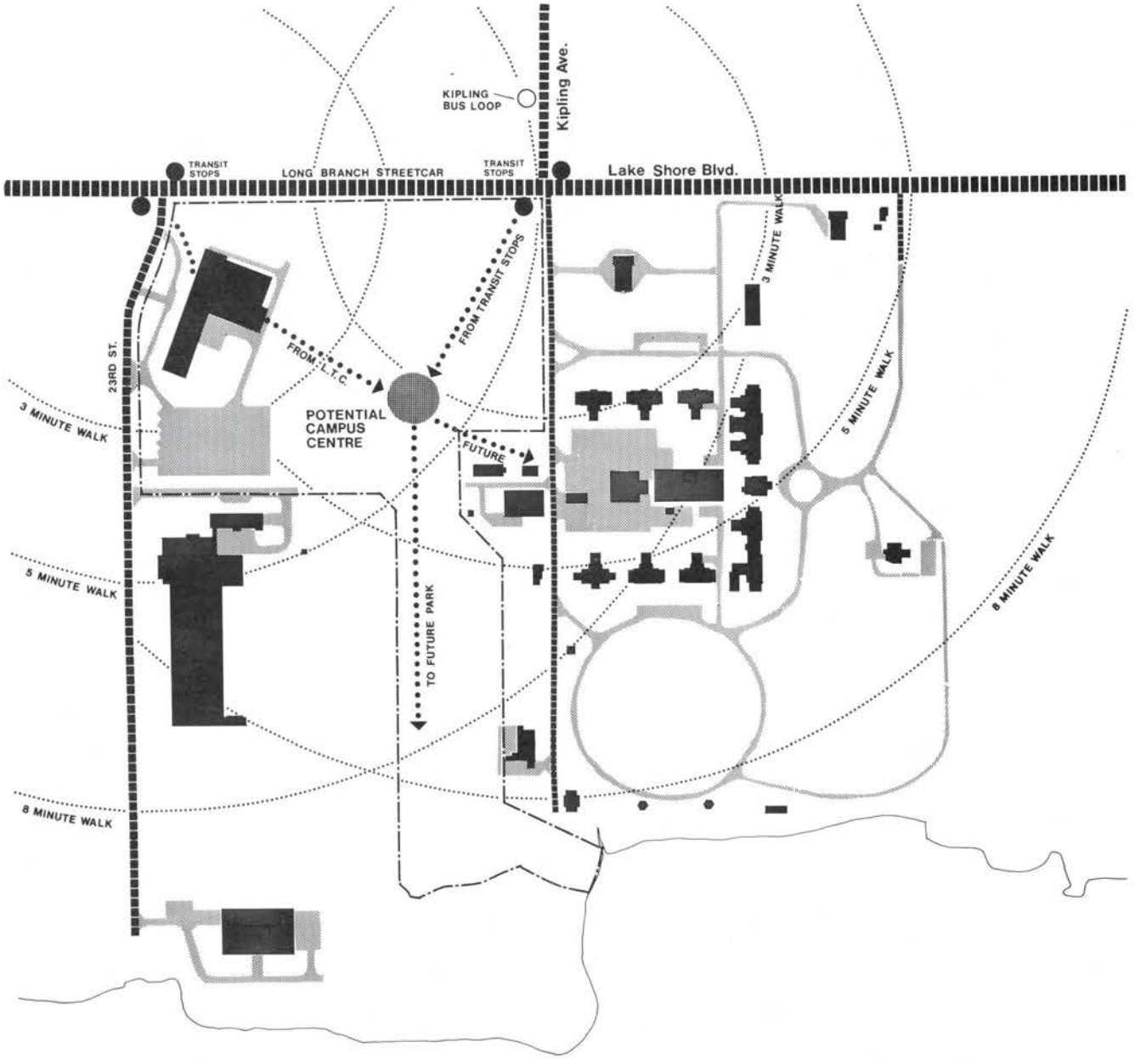
The only other means of vehicular access into the site would be from Lakeshore Boulevard or the Hospital service road forming the continuation of Kipling Avenue. (See Figure 12) These alternatives will be discussed in more detail in the Traffic and Parking Analysis Section of the Report.

In addition, access for construction and eventual public access down to the future M.T.R.C.A. park must be taken into consideration, as well as future access to the Hospital property and the extension of the Kipling South bus route.

PARKING

There presently exists space for about 300 cars in the lot south of the Teachers' College building. Additional parking to be provided will take into consideration the excellent public transit access to the site, and less car parking will be required than for a suburban campus such as Sheridan or Humber's North Campus. As well, the possibility of shared parking facilities with the M.T.R.C.A. will decrease the normal parking requirements.

Figure 12. Vehicular and Pedestrian Access



PEDESTRIAN ACCESS

The main pedestrian access points into the site would be from the Kipling Avenue/Lakeshore Boulevard intersection, and the 23rd Street/Lakeshore Boulevard intersection. Transit stops along the Long Branch streetcar line occur at these corners, as well as the Kipling South bus loop just north of Lakeshore Boulevard. These intersections are within an 8 minute walking radius to the southern extremity of the site. (See Figure 12)

Very little local pedestrian movement presently occurs along Lakeshore Boulevard or 23rd Street, and minor movement from the Hospital grounds.

With the inclusion of the former Lakeshore Teachers' College as part of the campus, a very strong flow of people can be expected between it and the new campus buildings. A north/south movement through the site is anticipated with the development of the M.T.R.C.A. park facility. The possibility of the L.P.H. property changing to Humber's use in the future would create another pedestrian pattern.

These pedestrian systems suggest the potential of a campus centre where the paths converge. The movement patterns should be recognized in the planning of the campus, but accessibility into the site from the surrounding community should be allowable from all sides.

NOISE

Present vehicular noise interference to the campus is generated by traffic along Lakeshore Boulevard. At the northern face of the existing L.T.C. building, noise levels are estimated at 60-65 dBA and internal levels at 50-55 dBA, which is considered to be satisfactory. Potential noise interference from Conservation Authority trucks will be discussed in the Traffic and Parking Analysis section of the Report.

The campus site is just outside the centre line of the flight approach path to the Toronto International Airport (See Figure 11), and beyond the effect of any significant aircraft noise, according to composite noise rating contours prepared by the Ministry of Transport. Internal noise levels at the existing building are estimated to be 51-56 dBA. For rooms sensitive to noise interference (eg., recording studio, music room), sound proofing should be investigated.

Planning System Analysis

PLANNING MODULE

From the Programme Analysis, Planning Modules or blocks were derived to determine the amount of space required for each phase, and how these spaces would be interrelated on the site.

A one storey development was not considered, since it would be impractical economically, and would take up too much space on the site.

Based on the space estimates and relationship of the programmes, a two or three storey development appeared to be logical. In addition, this would be in scale with the predominantly low-rise neighbourhood.

An area of 150,000 sq. ft. for each phase, comprised of 2 levels of 75,000 sq. ft. each, was established as the Planning Module. (See Figure 13)

GROWTH AND PHASING

Two types of physical growth systems were investigated -- radial and linear. Radial growth appeared to be the most logical system sympathetic with the Educational Concept for Humber Lakeshore. (See Figure 14) However, its main disadvantage was that radial growth from the nucleus would be limited as future Modules were added.

In consideration of the space limitation and narrowness of the site, a linear growth system was considered. Additionally, an open-ended linear system would allow for unlimited growth along the main circulation route. (See Figure 14) The disadvantage of this system was that the Resources Module would have difficulty in forming the desired educational nucleus.

By combining the two systems into an open-ended radial and linear system, the disadvantages of each were eliminated. (See Figure 14)

Vertical growth systems were not investigated because of the desire to keep buildings at low height and scale. As well, the initial low-rise structure would have to be designed to accept unknown functions which may never occur. This would add unnecessary cost to each phase.

Phasing studies utilizing the Planning Modules and the Combined Growth System were then conducted to analyze alternate schemes of phased development related to the site. The various schemes were studied in regard to the following considerations:

- Phasing logic - related to Academic Programme.
- Capability for future expansion.
- Pedestrian access and circulation.
- Vehicular access and parking.
- Orientation and view.
- Retention of natural setting.
- Relationship to community.
- Relationship to former L.T.C. building.
- Relationship to Hospital site.
- Relationship to M.T.R.C.A. waterfront development.
- Mechanical and Electrical Services.
- Site Services.
- Cost

The diagrammatic relationship of Planning Modules as shown in Figure 14 was concluded to meet the aforementioned considerations, and formed the basis for building space requirements in the development of the Land Use Plan.

Figure 13. Planning Module

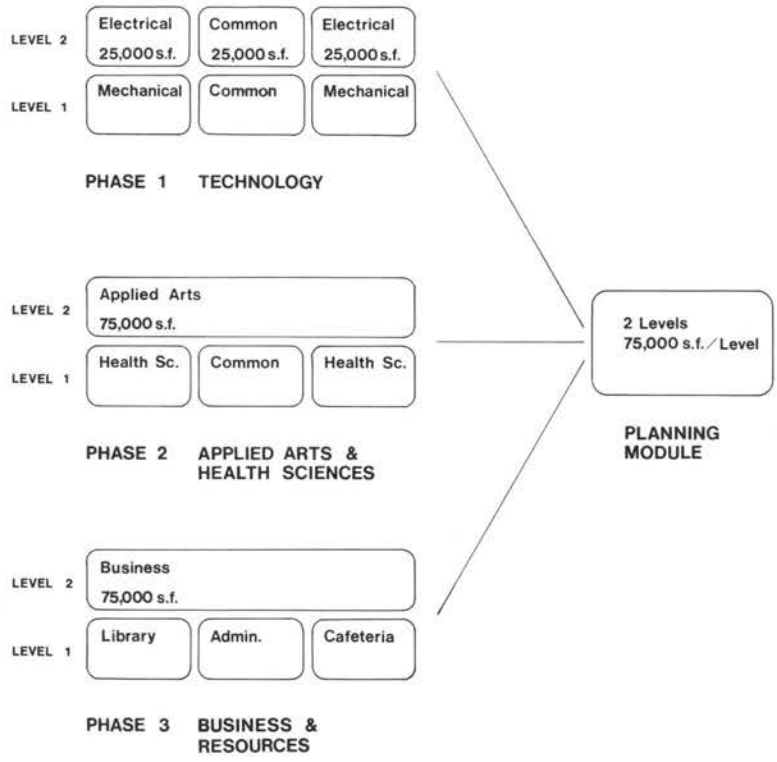
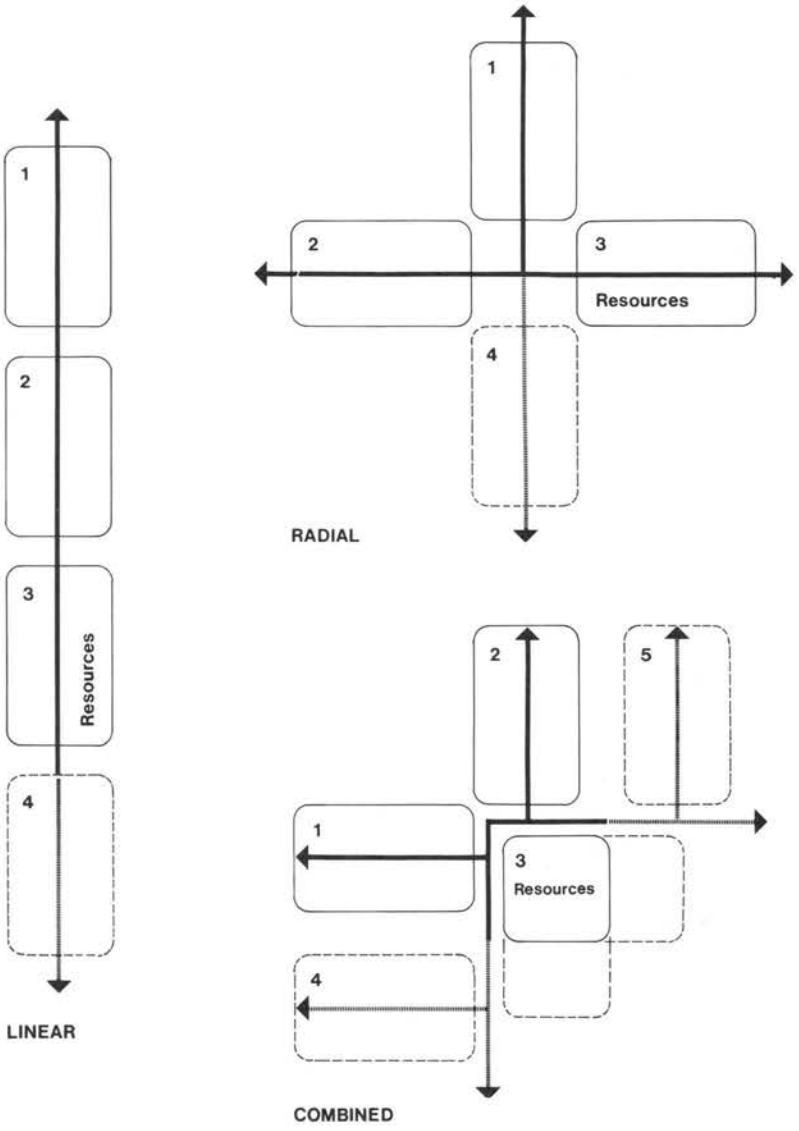


Figure 14. Growth Systems



Traffic and Parking Analysis

SCOPE OF STUDY

To make recommendations for the following aspects for each phase of campus development:

- Campus parking requirements.
- Traffic generated by the College on an all-day peak period basis.
- Public transit requirements.
- Internal road system and its connection to the existing transportation network.
- Service facilities for the campus.
- Impacts on the College of the development of the Conservation Authority park.
- The possible long-term transfer of the Lakeshore Psychiatric Hospital site to Humber College.

EXISTING CONDITIONS

REGIONAL AND LOCAL TRANSPORTATION NETWORK

The vehicular and public transit transportation networks have been discussed in previous sections of the Report under Regional Site Analysis and Site Analysis In Detail.

VEHICULAR ACCESS AND PARKING

As previously mentioned in the Site Analysis In Detail section of the Report, present vehicular access to the campus is via 23rd Street, serving the Lakeshore Teachers' College parking lot. This parking lot accommodates approximately 300 cars, but its layout is confining for proper vehicular circulation. In addition, vehicles must pass through the parking lot to service the L.T.C. building.

TRAFFIC VOLUME

Most vehicular traffic approaching the site would be by way of Kipling Avenue from the north, and Lakeshore Boulevard from the east and west. (See Figure 12) Therefore the Lakeshore Boulevard/Kipling Avenue intersection will be greatly affected by traffic generated by the College. This intersection, along with the Lakeshore Boulevard/23rd Street intersection, is presently controlled by automatic traffic signals.

The data available for peak hour traffic flows at the Lakeshore Boulevard/Kipling Avenue intersection was established during 1972, and obtained from the Metropolitan Toronto Roads and Traffic Department. The morning and evening peak hour flows (7:30-8:30 a.m. and 4:15-5:15 p.m.) of the number of vehicles per hour are shown in Figure 19.

PUBLIC TRANSIT CAPACITY

The two public transit routes in the immediate vicinity of the site are the T.T.C. Kipling South bus route and the Long Branch streetcar route along Lakeshore Boulevard. (See Figure 12) The Kipling South bus connects with the subway to the north, and the Long Branch streetcar connects with the GO Transit rail station to the west. Both routes operate seven days per week, from 6:00 a.m. to 1:00 a.m., and provide high capacity with frequency of service.

The Kipling South bus route provides 5-3/4 minute intervals at daily peak periods, and 30 minute intervals off-peak. The Long Branch streetcar route operates at 6-1/2 minute intervals at daily peak hours and 10 minute intervals off-peak. The T.T.C. has indicated that they would monitor and increase frequency of service for both routes to meet probable demand generated by the campus.

Two estimates of transit capacity for each route were developed as a basis of comparison with predicted transit usage generated by the College. The first reflected normal conditions of 65 passengers per bus and 95 per streetcar. The second considered maximum capacity conditions of 95 per bus and 135 per streetcar. Both peak period and off-peak transit capacities were calculated, the former being used for the daytime peak traffic and the latter for evening traffic movements. This data is included in Figure 15.

DESIGN PHILOSOPHY

The site is one of few suburban campus sites with such excellent public transit access available. The campus should therefore be transit oriented rather than car oriented.

Parking should be considered as residual space, leaving prime usable space for buildings and landscaping. Parking areas should be landscaped internally and externally to shield the mass of cars from view.

In view of the accessibility via public transit, less parking space should be provided initially than demand calculations would suggest. This situation should be evaluated, and will provide a basis for adjustment of predicted parking demand for future phases based on actual use.

The transportation plan should be based on the assessment of a balance between car travel and public transit usage in consideration of existing and future conditions. Close cooperation will be necessary between the College and other agencies, particularly the T.T.C., to ensure that transit services can accommodate the demand.

Vehicular access that is logical for each phase should be provided, and each phase should function satisfactorily as the ultimate development.

Consideration should be given to the impact of vehicular traffic on the neighbourhood and on the Lakeshore Psychiatric Hospital in its present and possible future use.

Access to the waterfront park during its construction and for the public when the park is complete should also be considered, in conjunction with access to the campus.

Possible cost sharing schemes should be discussed with the Conservation Authority for all shared parking and road facilities.

PARKING ANALYSIS

At Humber College's North Campus, 2,500 car parking spaces are provided based on a ratio of 1 space for every 2 full-time students (5,000 students). In view of the accessibility by public transit and the limited amount of land available at Humber Lakeshore, the same ratio should not be provided.

The process of estimating the number of car parking spaces is related to transit capacities available presently and in the future. However, for the sake of simplicity each aspect has been treated separately, and parking demand is based upon estimates of campus population.

The following ratios have been utilized:

- 1 parking space/3 full-time students or support staff members
- 1 parking space/2-1/2 part-time students
- 0.9 parking space/1 academic staff member
- 1 visitor's parking space/5 academic staff members

Figure 15. Existing Transit Capacity

Normal Capacity								Maximum Capacity							
Peak Hour				Off-Peak				Peak Hour				Off-Peak			
T	K	LW	LE	T	K	LW	LE	T	K	LW	LE	T	K	LW	LE
2300	600	880	880	1270	130	570	570	3380	880	1250	1250	1810	190	810	810

T = Total Passengers

K = Kipling Route Passengers

LW = Lakeshore West Route Passengers

LE = Lakeshore East Route Passengers

Figure 16. Parking Space Requirements

Phase	No. of Students	No. of Academic Staff	No. of Support Staff	No. of Parking Spaces	No. of Visitors' Parking
Existing	800	40	140	370	8
1	1000	50	170	470	10
2	750	60	110	370	12
3	1250	80	200	600	16
	3800	230	620	1810	46

In addition, a "turnover" allowance of 10% is added to the parking space requirements of part-time students. Part-time students are estimated at 20% of the total daytime student population.

The projected number of support staff is based upon the same ratio as at the North Campus. The estimated phased parking space requirement for this campus is shown in Figure 16.

In view of the uncertainties regarding the number of support staff members, these figures should be re-evaluated and adjusted to suit the actual numbers when known.

The surface space requirement for 1,800 cars is substantial on this site. Therefore, the use of parking structures was investigated as an alternative to normal surface parking. However, these proved to be too costly, and it is understood that the Ministry of Colleges and Universities has never provided funds for these structures in the past.

Since the campus will be more transit oriented than many other campuses, special provisions may be necessary to ensure that academic staff, visitors, or part-time students use separate parking areas or are assured of a parking space at all times.

During use of the former Lakeshore Teachers' College building, physical separation of staff and student cars will be difficult, but special pavement markings could be used. In the later phases, separate parking spaces can be defined within the larger parking areas by strategic placement of landscaping. The possibility of staggered teaching hours introduces the need to allocate parking spaces on an equitable system other than "first come first served".

Any system must consider the following parameters:

- Distance to be covered by student or staff member.
- Time of travel to and from College.
- Public transit availability.
- The potential for car pools.
- Other factors such as the priority to disabled persons or academic staff members.

During the initial phases of campus development it will be a relatively simple task to assess the merits of each parking space allocation by inspection. In the later stages of development this will become more complicated. It is suggested that a computer programme could be developed which would efficiently allocate parking spaces.

Another consideration that should be investigated by the College is to subsidize the use of public transportation with revenues derived from possible parking charges.

PUBLIC TRANSIT USAGE

Public transit usage is basically the unfulfilled parking demand. To derive estimates of transit usage for each phase, the number of persons served by car is subtracted from the total campus population.

Two different assumptions have been made of the numbers of persons who are auto passengers. This is reflected in car occupancy ratios of 1.3 or 1.5 persons per automobile in order to assess the impact of each on the existing transit system. The detailed calculations of transit usage are given in Figures 17 and 18, based on the alternative car occupancy ratios, along with forecasts regarding the basic routes in which students and staff are expected to travel.

Figure 17. DailyTransit Usage

Phase	Cumulative Number of Support Staff and Students	Cumulative Number of Car Parking Spaces Including Academic Staff Visitors and Turnover Allowance	Cumulative Number Served by Car at Occupancy Figure Of 1.3	Cumulative Number Served by Car at Occupancy Figure Of 1.5	Cumulative T.T.C. Passengers at Occupancy Figure Of 1.3	Cumulative T.T.C. Passengers at Occupancy Figure Of 1.5
Existing	940	278	361	417	579	523
1	2110	540	702	810	1408	1300
2	2970	880	1144	1320	1826	1650
3	4420	1143	1486	1714	2934	2706

Figure 18. Peak Hour Transit Usage by Transit Route and Car Occupancy Factor

Phase	1.3 Car Occupancy				1.5 Car Occupancy			
	T	K	LW	LE	T	K	LW	LE
Existing	350	170	70	100	310	160	60	90
1	840	420	170	250	780	390	160	230
2	1100	550	220	330	990	490	200	300
3	1760	880	350	530	1620	810	320	490

These forecasts are based on the capacity and frequency of the existing transit service in each route, and the development of the area served by the transit service. Basically it is estimated that of students and staff travelling to the College:

- 50% will use the Kipling South bus route - linking to the subway.
- 30% will use the Lakeshore Boulevard streetcar route east of the College.
- 20% will use the Lakeshore Boulevard streetcar route west of the College.

Furthermore, it is necessary to consider the peak hour movements. To do this it is considered that 60% of the traffic will travel in the peak hour. These calculations, along with the effects of the car occupancy factors previously established, are given in Figure 18.

These peak hour predictions of transit flow must then be compared with the existing transit capacity in Figure 15.

Comparisons of the predicted flows and the transit capacities reveal that there is adequate capacity (using a car occupancy of 1.3 persons per car and 60% for the peak hour traffic factor) to serve the daytime peak flows. The predictions suggest that on occasions, demands will be above the normally accepted capacities for the transit system but well within maximum capacity. It is suggested that this point should be discussed with the Toronto Transit Commission to improve service when the demands grow to the projected levels.

Evening attendance at the College is expected to be approximately 1/3 of the daytime peak level, and the campus will probably be much more car oriented than during the day. The parking provision suggested is adequate for the maximum evening demand but there is nevertheless good public transit service available for people who require it.

The College campus represents a substantial 'captive' clientele for the T.T.C. It is suggested that a close liaison should be established between the College and the transit authority in order that the transit requirements of staff and students can be reflected in the service provided.

TRAFFIC GENERATED BY THE COLLEGE

The impact of vehicular traffic generated by the College was considered to ensure that the campus development would not put undue strain on the existing street system, especially the Lakeshore Boulevard/Kipling Avenue intersection.

There are two aspects which must be considered before the impact of the College on this intersection can be established. The first is the assessment of the growth of traffic in the time between the 1972 observations and 1980, without the impact of College traffic. The second is the distribution of the traffic generated by the ultimately developed campus.

Traffic has grown at approximately 3% per year in the immediate vicinity of the intersection, and this figure was used to determine traffic flows by 1980. Traffic flows at the intersection predicted for the morning and evening peak hours in 1980 without the inclusion of campus traffic are shown in Figure 20.

Based on conditions at Humber's North Campus, peak hour traffic flows occur when students and staff are entering the College between 8:30-9:30 a.m. In this hour it is estimated that 60% of the total vehicles and 80% of the student/staff population enter the campus. Assuming similar proportions will apply to the Lakeshore Campus,

Figure 19. Existing Peak Hour Traffic Flows

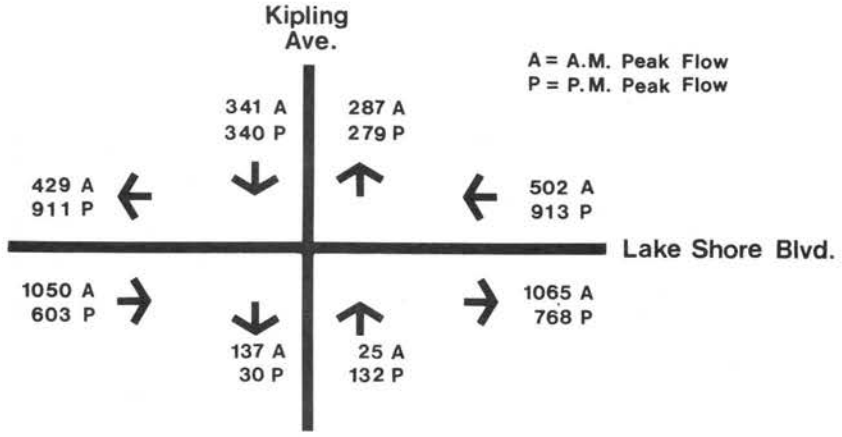


Figure 20. 1980 Peak Hour Traffic Flows Without Campus Traffic

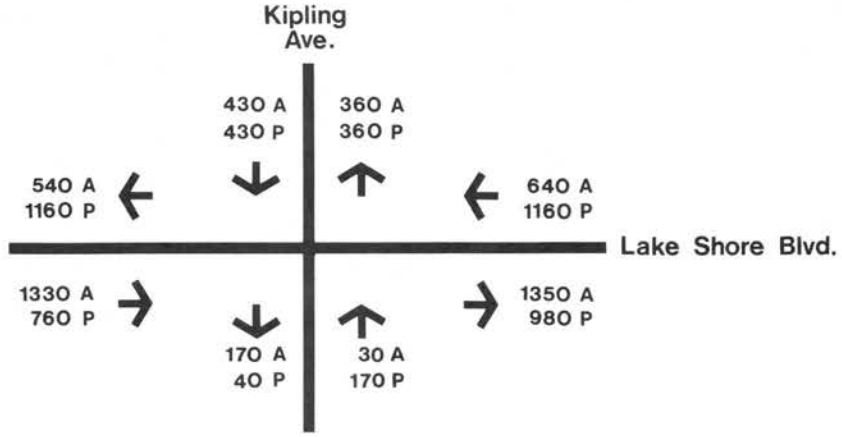
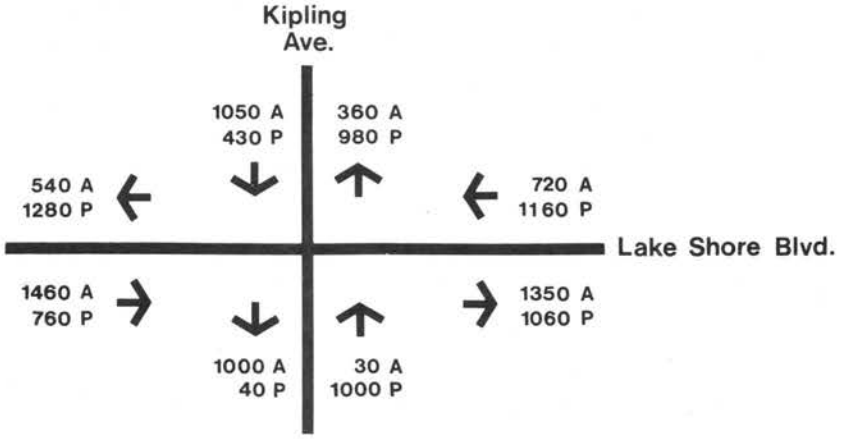


Figure 21. 1980 Peak Hour Traffic Flows Including Campus Traffic



the peak hour flows for campus traffic are as follows:

Peak Hour Flow (vehicles per hour)

Phase	Design Parking Spaces	Recommended Parking Spaces
Existing	220	190
1	500	380
2	720	620
3	1090	830

The 830 College vehicles are assumed to be distributed in the following manner:

. Kipling Avenue
: 75% (620 vehicles)

. Lakeshore Boulevard west of Kipling
: 15% (130 vehicles)

. Lakeshore Boulevard east of Kipling
: 10% (80 vehicles)

These proportions were derived from consideration of the existing and future population densities and road network. It was concluded that the bulk of traffic would use the Kipling Avenue route to gain access to the Queen Elizabeth Way. Thus, the 1980 peak hour predictions at the intersection including College generated traffic are shown in Figure 21.

From the calculations, it appears that the intersection will be heavily loaded during both peak hours, but not above its capacity. However, if the Kipling Avenue extension is recommended to be used for access to the campus, the portion of the road near the signalized intersection should be constructed to a 4-lane standard. In addition, it is suggested that staggered teaching hours be considered to spread the peak flows uniformly rather than compound congestion at the intersection.

It is evident from present day traffic flow estimates and the predicted traffic generation by the campus, that if present growth trends continue at 3% per year increased congestion will develop, with or without development of the College.

The issue is complicated by unknown factors such as:

. Effects of variable work hours.

. Measures to restrain traffic in the urban core of Toronto.

. Measures to improve public transportation and usage.

. Future energy policies.

. New developments or redevelopments in the area.

. Adjustment of routes by drivers as a result of congestion or new roads.

The effects of such changes could modify previous calculations, and should be monitored by the College to assess their impact on development of the campus. The foregoing also reinforces the philosophy that the campus should become more transit oriented, particularly in its later stages.

VEHICULAR ACCESS ALTERNATIVES

The following three vehicular access alternatives to the site will be discussed (See Figures 6, 11, 12):

. 23rd Street
. Lakeshore Boulevard
. Extension of Kipling Avenue

23RD STREET

This access route will only be available to the College temporarily until new campus development commences. The Borough of Etobicoke has indicated that this route will be prohibited for campus access at that time, to protect the residential areas to the west from the influx of external traffic. This route has also been previously rejected for Conservation Authority or public vehicular access to the waterfront.

LAKESHORE BOULEVARD

Because of the proximity (1200 ft.) between the two signalized intersections at 23rd Street and Kipling Avenue, any vehicular access point between these intersections would not be permitted by the Borough or by Metro Roads, to minimize the number of turns off Lakeshore Boulevard. The minimum distance allowable between signalized intersections is 1,000 ft.

However, temporary access off Lakeshore Boulevard opposite 20th Street would be granted for construction vehicles serving the site or for Conservation Authority trucks, but only until the first phase of campus development is ready for occupancy.

According to the present timing of the M.T.R.C.A. park facility (start in 1980), this access would not be available to the Conservation Authority. In addition, this access route, with M.T.R.C.A. trucks going down the easement, would cause an obvious disruption to the College.

Therefore, both 23rd Street and Lakeshore Boulevard will not be available for vehicular access to the campus.

EXTENSION OF KIPLING AVENUE

To maintain satisfactory conditions along Lakeshore Boulevard it is essential that the main vehicular access to the campus is via the extension of Kipling Avenue south of Lakeshore Boulevard.

This is the only route left available to the College, and the Borough has indicated that the Development Control Agreement and re-zoning of the site could be made contingent upon Humber acquiring this access. In other words, campus development could not proceed until this issue is resolved.

However, at the present time Kipling Avenue south of Lakeshore Boulevard is a service road belonging to the Lakeshore Psychiatric Hospital, which is under the Ministry of Health. Discussions have taken place with the Ministry in this regard, and Humber has formally requested this access for the College along with access for the Conservation Authority. The Ministry was not in favour of this route because of possible disruption to patients and Hospital activities while the Hospital remained in its present use.

The College has re-approached the Ministry to obtain access strictly for campus traffic, along the north portion of the road where interference with Hospital functions would be minimal. In addition, the Borough has written to the various Provincial Ministries and Authorities that would be involved in this area, to try and resolve this matter.

At the time of writing this Report, a meeting was held with representatives from Humber College, the Ministry of Colleges and Universities, the Ministry of Government Services, the Ministry of Health, the Ministry of Natural Resources, the M.T.R.C.A., and the Etobicoke Planning Department.

Given the existing parameters at the present time, the representatives of the Ministry of Health could not recommend to their Minister the opening of the Kipling Avenue extension in its entirety as a Borough or Metro road. In addition, the decision as to whether access could be granted for the Conservation Authority development cannot be resolved until the summer of 1976, when the future of the Hospital site will be determined.

However, the representatives of the Ministry of Health would consider recommending that the north portion of the Kipling Avenue extension be opened as a Borough road, providing the following conditions are met.

- There would be no cost to the Ministry of Health.
- The extension south of Lakeshore Boulevard would not be further than the existing first road east off the present service road.
- The extension would be designed to physically prevent through traffic southward.

Note: [Although use of the north portion of the Kipling Avenue extension was assumed for planning purposes in this Report, the foregoing conditions were not known prior to development of plans. These conditions have therefore not been included in the plans, which should be amended if official approval for use of the road is granted by the Ministry.]

This route should be constructed to Metro Roads standards in the event that Metro assumes responsibility of the road in future. The Borough requires a minimum distance of 150 ft. from the Kipling Avenue/Lakeshore Boulevard intersection to the campus entry road.

Access to the campus via the extension of Kipling Avenue is the most logical route and is supported by the Borough, Metro Roads, M.T.R.C.A., T.T.C., Humber College, and the Consultant Team for the following reasons.

- Ratepayer opposition to use of 23rd Street.
- Permanent access off Lakeshore Boulevard between Kipling Avenue and 23rd Street not permissable.
- Kipling Avenue is a major road which will be upgraded for increased vehicular usage.
- Traffic signals are existing at Kipling/Lakeshore intersection.
- T.T.C. favourable to extension of Kipling South bus route across Lakeshore Boulevard to serve campus and future M.T.R.C.A. park, but only if route is fairly direct.
- Vehicular access to waterfront park is required by the public in future.
- M.T.R.C.A. trucks would require access to the lake for filling operations and this access would not interfere directly with the campus.

In summary, 23rd Street may be used for College vehicular access until Phase 1 completion, but subsequently campus access must be via the Kipling Avenue extension.

CAMPUS ACCESS

There are two basic alternatives for providing access to the fully developed campus from the extension of Kipling Avenue. The first alternative is based on a single means of entry and exit into the campus, towards the north end of the Kipling Avenue extension. Based on estimated traffic volume, this alternative would require the north portion of the extension to be 4-lanes in width, as well as the entry road into the campus.

The second alternative is based on 2 campus entry and exit points, one at the north and the other to the south. This again would require the northern section of the Kipling Avenue extension to be 4-lanes in width down to the point where the northern campus entry road branches off. The northern campus entry road, the southern part of the Kipling extension, and the southern campus entry road would be 2-lanes in width.

The second alternative is favoured but, in the long term, relies on the College obtaining eventual use of the entire length of the Kipling Avenue extension.

SERVICE VEHICLE ACCESS

Service vehicle access will be required at several points within the campus and the majority of service vehicles will probably be in the form of small trucks. In order to reduce the impact, it has been assumed that these vehicles will use the internal campus road system. For this reason consideration should be given to limiting service movement to periods outside of peak traffic demand. The College should also have a policy to prevent students from parking on service or access roads.

BICYCLE ROUTES

The general conditions surrounding the College site are such that high traffic flows and a possible higher than average proportion of trucks will probably discourage the use of bicycles as a significant mode of transport to and from the College.

No specific paths will be initially provided for bicycle riders, but this aspect could assume increased importance in later years. It is suggested that a strip of land adjacent to proposed pedestrian walkways be preserved for future bicycle paths, free from large trees and other major obstructions.

Some students living within 2 miles of the campus, and most likely to the south of Lakeshore Boulevard, may use bicycles. This would especially apply to the residential neighbourhood to the immediate west of 23rd Street. Some provision should therefore be made for bicycle parking adjacent to buildings, with access from 23rd Street.

NOISE

The most significant impact within the campus (other than the heavy machinery of Technology workshops) will be the noise generated by the trucks destined for the M.T.R.C.A. waterfront park, if it is assumed that off-site materials will be used. It has been estimated that the average truck traffic flow will be approximately 60 per hour in each direction. These vehicles alone will generate the following noise levels (exceeded for 10% of the time) assuming 25 m.p.h. travel speed:

Distance From Road	Noise Level Exceeded 10% of the Time dBA
25'	66
50'	62
100'	57
200'	53
400'	48

The College buildings will be air-conditioned, and therefore a noise attenuation figure of 15 dBA is assumed for the wall/window system.

Considering the worst case, if the trucks pass between the campus and the Lakeshore Psychiatric Hospital, the maximum external noise level is estimated at 71 dBA due to the noise from both the trucks and Lakeshore Boulevard traffic at the northeast corner of the site. This reduces to 56 dBA inside the buildings and is therefore considered to be satisfactory, if buildings are sited in this location.

Noise levels within the College buildings will generally be lower, except where noise levels generated internally are close to or above the level of 56 dBA.

COSTS

The costs of roads and parking areas will be estimated on the assumption that there are no serious problems with either the ground bearing strength or with drainage of the site. Costs for road construction will include curbs, gutters, and surface water drainage. The car parking costs include paving, painting of lines, signs, and drainage. Estimates of temporary parking areas will include only site clearance and a gravel bed.

Mechanical Systems Analysis

SCOPE OF STUDY

The terms of reference used to carry out this study were to:

- Evaluate energy sources, distribution and conservation techniques.
- Evaluate alternate building system approaches and identify methods of comparison.
- Identify a mechanical service solution, including phasing and costs.

Of necessity, the study is general in its conclusions. The intention is to provide a rational design process that will permit the Engineers to incorporate new technologies when implementing the final design.

PHILOSOPHY

World events have focussed attention on the increasing gap between growth rates of energy consumption and traditional natural energy supplies.

Oil and natural gas in Canada are expected to fall short of demands by 1980. Ontario imports 80% of its energy from outside the province. Shortages will place it in a particularly vulnerable position both from supply and cost viewpoints.

To extend energy supplies and reduce costs should be the aim of every user. This requires effective conservation management; in other words, analysis of existing energy sources for more efficient use, together with innovative technology to accommodate new energy sources and new utilization methods.

Engineers can no longer afford to review energy consuming systems on the basis of capital cost alone. To conserve effectively, the energy used by individual systems must be compared.

It would seem at this time that the Government has to establish judgement criteria to achieve energy conservation. This section of the Master Plan Report has attempted to provide methods of selection by which this can be achieved. Additionally, particular systems have been identified as worthy of further consideration during the implementation stage.

Technology will advance during the inception of the Master Plan. It is hoped that any new developments will be incorporated consistent with the philosophy of effective energy conservation.

ENERGY SOURCES

Heating, and sometimes cooling, is required in occupied College spaces to maintain conditions conducive to teaching and administration.

COOLING

Cooling can be achieved by a chiller using steam for turbine drive or absorption; or by electric motor drive.

Despite efficient on-site generation of steam, electricity is a more effective method of providing this cooling. Consider the amount of energy required to produce one ton of cooling. For electricity, 3,000 BTU's are required at the drive and 12,000 BTU's are required at the fossil fuel generating plant. For steam, 12,000 BTU's are required at the drive and 18,000 BTU's are required at the boiler.

With the advent of more nuclear powered generating stations, and the scarcity and increased costs of fossil fuels, on-site steam generation would seem less attractive than electricity. Also, technology exists today to permit the use of electrical energy at the lowest rate without being penalized by demand charges. This is described in the Utilization section of this study.

CONDENSER WATER

Using condenser water from Lake Ontario could save further energy. However, the anticipated location of campus development towards the north end of the site precludes its use at this time, in view of piping and pumping costs and the pumping energy requirements.

HEAT RECLAIM

Heating is obviously required whenever there is a loss from the occupied space to outside. During those periods when College buildings are occupied, three sources of heat energy readily exist: the heat of lights, the heat of teaching equipment, and the heat of the occupants. By suitable selection of the building envelope, these three sources can offset or make a significant contribution towards the heating load.

Reclaim of this heat can either be direct at the perimeter, or indirect, using a heat pump. Currently, a heat pump can produce heating energy at a cost 42% less than the lowest fossil fuel. Using techniques to reduce electrical demand costs, this margin can be increased further. With such readily avaiable sources of energy, any other need for heating should be considered on an assist basis.

SOLAR ENERGY

Solar energy is free and should be the first assist source considered. South solar gain into buildings is maximum during the heating season, whereas east and west solar gain is maximum during the cooling season. Solar collection through exterior glazing should therefore be devoted to the south face only. External shade will be necessary during warm months to avoid imposing excessive solar gains and consequent energy consumption by cooling equipment. Shading can take the form of overhangs at exterior glazing, or deciduous trees which bear leaves from June to September.

Solar heating using collectors is unproven in this province. This method of heating has been proven in the southern United States where it has been incorporated in several projects.

However, in view of the stated aim of this province to reduce energy consumption, serious consideration should be given to solar collection at this campus. A small collector (minimum 400 sq.ft.) incorporated into the initial development phase could, on a pilot basis, test the reliability of this form of heating. It would also be a useful teaching tool for the technicians who will be required to operate such equipment in the future, or be included as part of the Technology programmes.

WASTE INCINERATION HEAT

Since we are a generation of waste makers, reclaimed heat from waste incineration should be considered as the second form of assist energy. "Starved air" incineration has made this feasible. The high temperatures of incineration and after-burning produce smokeless and odourless products of combustion well within current air pollution standards.

Using waste from the North Campus in conjunction with projected waste from the first two new phases of this campus, a reasonable pay-off can be shown for the incineration equipment.

LAKESHORE PSYCHIATRIC HOSPITAL STEAM

A third form of assist heating energy is available in the form of existing steam from the Lakeshore Psychiatric Hospital. At the time of writing this Report, it is not known if the Ministry of Health will permit its use. Assuming the College has to pay the cost of any new steam distribution services, this form of assist is not economic.

IMPORTED ENERGY

Finally, supplemental energy can be imported onto the campus in the form of oil, gas or electricity. Except with the use of a heat pump when reclaimed heat is available, electricity is not an economic form of heating. Obviously this requires explanation in view of the previous comments for cooling. Again, 3,000 BTU's of electric heating requires an energy input at the generating station of 12,000 BTU's. With fossil fuel, 3,000 BTU's of heating requires an energy input at the boiler of 4,300 BTU's. Thus, on-site fossil fuel for heating will save energy when reclaimed heat is not available.

Of gas and oil, gas is lower in initial cost and there are existing distribution lines in Lakeshore Boulevard. Gas is the obvious selection for final assist energy, but should be the last form of heat plugged into the buildings if the concept of energy conservation is to be maintained.

ENERGY UTILIZATION

In March 1975, the Minister of Energy for Ontario stated that measures would be incorporated in the proposed Uniform Building Code to control the thermal response of buildings.

With that in mind, we might try to emulate the builders of the pyramids. For centuries these structures have maintained their inner vaults at almost constant temperature and humidity, without any form of mechanical assistance.

This is due to the immense mass of the structure. Similar in principle to a flywheel, it stores energy and distributes it when required. During the day, the interior remains cool, while the mass is storing up heat. During the cool nights, this heat is emitted to the interior.

In Ontario we do not have the consistent swings in temperature that occur in the desert, nor is labour so economic to build such structures. It is possible, however, to simulate a thermal flywheel in other ways.

STRUCTURAL THERMAL STORAGE

A well insulated building structure with double glazing and a wall mass of 100 pounds per square foot has a thermal response time of approximately seven hours. That is, it takes seven hours for outside conditions to materially affect inside conditions.

This achieves three things.

Firstly, heat gains into the building are deployed across the day, reducing the peak instantaneous requirements for cooling. Secondly, external heat gains are stored until night periods, to offset heat losses when temperatures are cool. Thirdly, daytime gains within the building itself are stored to assist in offsetting losses.

All of this presupposes that the majority of the wall mass is contained within the insulation. However, this can also be partly achieved by using trees, walls and other vegetation to shelter the buildings from the effects of wind and sun at the appropriate times of the year.

WATER THERMAL STORAGE

Continuation of the flywheel principle to distribute energy beyond seven hours requires additional thermal storage. An economic and effective way of achieving this is with a water storage tank.

The validity for such a tank is best shown by considering the heat fluctuation during occupied and unoccupied periods in a typical 140 ft. square Building Module on this campus. (The rationale for the size of the Building Module is discussed in the Building Module System section of this Report.)

Figure 22 shows the hourly gain or loss of the ventilation air and building fabric, as a function of the outside air temperature.

Figure 23 shows the average hourly gain during occupied periods.

Figure 24 is a combination of Figures 22 and 23, and shows that above 34°F the heat of lights, people and equipment alone is sufficient to offset the building fabric and air ventilation losses. It also shows that a surplus of heat exists above this temperature during the occupied periods. If the average effect of the sun is added, the above comments are also true for all temperatures above 26°F.

Figure 25 is similar to Figure 24 and shows the combination of hourly losses and instantaneous gains during unoccupied periods. It is obvious that if the surplus daytime heat is stored for nighttime use, energy savings can be achieved.

This is one use of a water storage tank, and the amount of energy saved is illustrated in Figure 26.

A second use of water storage is for the storage of cooling. Electrical energy is billed monthly as a combination of demand and energy costs. If the demand of electrical energy is reduced, there can be considerable saving in costs by using off-peak periods to run the chiller.

When the off-peak period is at night, further benefits are realized. Lower air temperatures permit the chiller to operate more efficiently, using less energy.

Obviously, there are various combinations of chiller and storage usage that can be applied to show demand savings. Water thermal storage for energy saving has often been discounted because of the problems of temperature blending and water transfer. Pumps and baffles are now available that minimize or eliminate these problems.

For this campus, four 10 ft. deep insulated tanks comprising a total area of 4,000 sq.ft. and a total capacity of 250,000 U.S. gallons would be required. The tanks may be located on, above, or below grade; but will probably be below grade for this campus. These tanks could be used in conjunction with a water system incorporating waterfalls or fountains as decorative features.

The Metro Works clearwells or reservoir adjacent to the campus would be ideal thermal storage tanks; but unfortunately, the Metro Works Department would not permit their use.

The provision of water thermal storage will also satisfy the requirement of a storing medium for solar energy in future, if solar collection proves feasible for the campus.

Having the means to utilize the energy is not in itself sufficient. Evaluation is required. This can be undertaken in two distinct and yet complimentary ways.

ENERGY BUDGETS

Firstly, an energy budget can be established. In other words, all the energy used by the systems in one year can be equated to each square foot of the building area. Usually this is defined in kilowatt hours per square foot, and established using either manual or computer simulation of the systems. This process provides a direct comparison of energy.

LIFE CYCLE COSTS

Secondly, life cycle costs of the various systems can be established. These allow the comparison of capital costs and ongoing energy and maintenance costs. Examples of an energy budget and life cycle costs are included in the Mechanical Appendix.

Figure 22. Ventilation and Building Fabric Loss/Gain Diagram for Occupied Periods

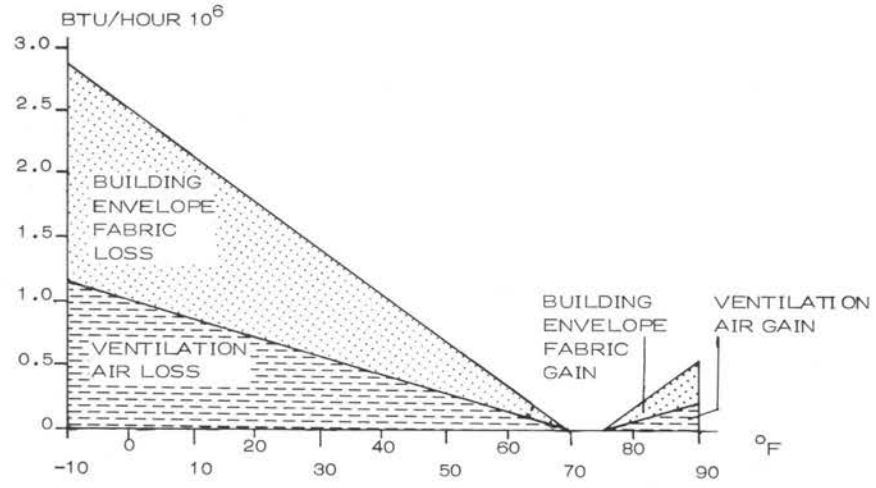


Figure 23. Average Space Gain Diagram for Occupied Periods

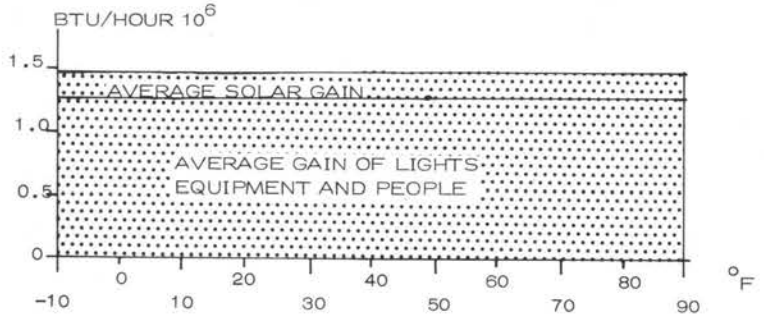


Figure 24. Combined Loss/Gain Diagram for Occupied Periods

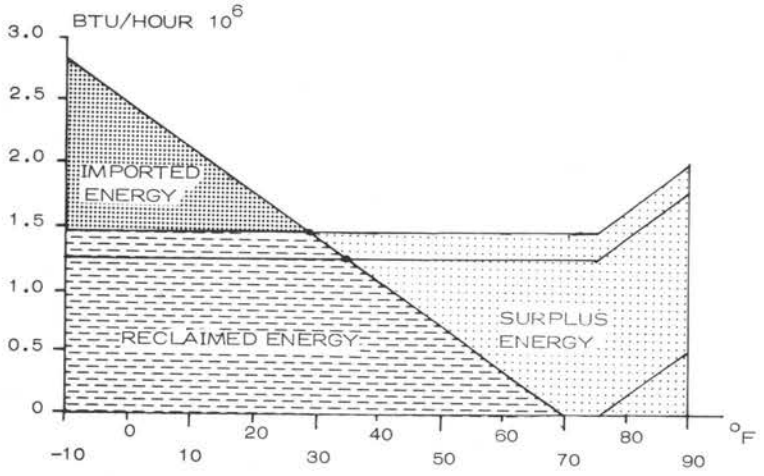


Figure 25. Loss/Gain Diagram for Unoccupied Periods

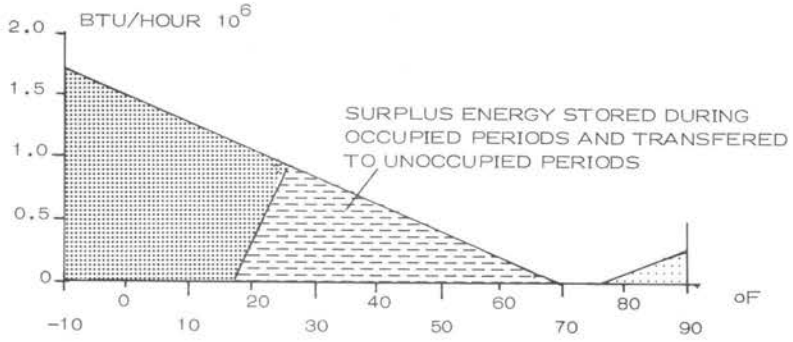
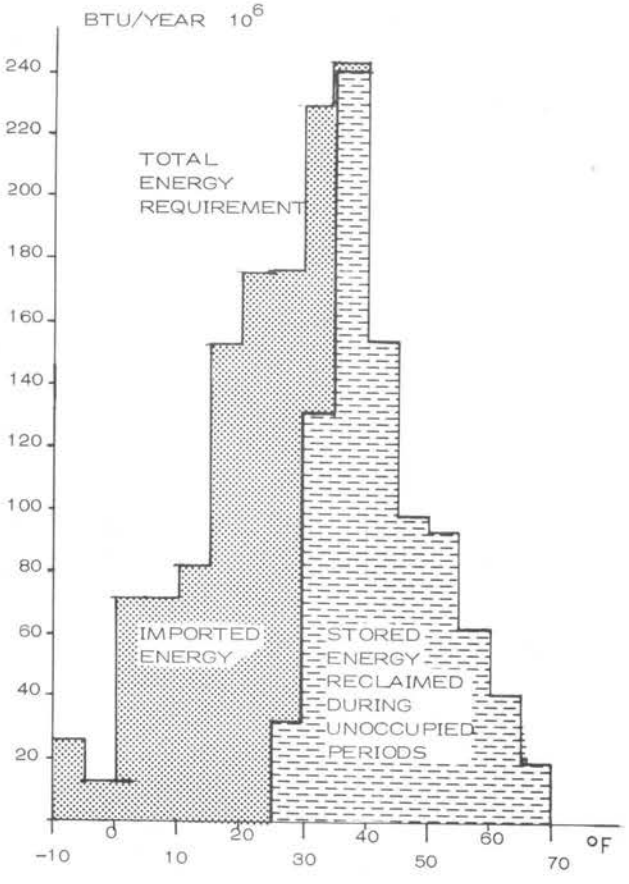


Figure 26. Yearly Energy Requirements for Unoccupied Periods



$\sum$ RECLAIMED ENERGY = 877×10^6 BTU/YEAR
UNOCCUPIED PERIODS

Compromise may be necessary when systems are selected. The lowest energy budget may not coincide with the lowest life cycle cost. It is at this time that the College and Government have to rationalize between costs on one hand and energy conservation on the other.

ENERGY DISTRIBUTION

CENTRAL PLANT

It has been conventional on college campuses to distribute energy for heating and cooling from a central source. The rationale for this approach has been that savings in equipment and energy costs are realized due to the diversity of building loads. However, operational experiences have not substantiated this.

Unless the exact nature of the campus is known from the very inception, central plant equipment size is guesswork at best. With guesswork, the allowance for diversity is impossible. In any case, campus diversity exists generally as a function of the time of day, or day of the week, rather than on a building basis. Equipment size is not affected by this type of diversity.

Additionally, considerable initial investment in equipment and distribution is required for buildings which may be years away from construction. This leads to oversize equipment, which is very inefficient and energy wasteful at low loads.

Finally, central plant is limited to a degree by the size of distribution pipe sizes, and other plants may eventually be required.

DIVERSE EQUIPMENT

A more reasonable approach to the problem of energy distribution would seem to be a chain which permits endless addition of links and yet, at any time, is complete. A suggested method of achieving this chain or loop concept is shown in Figure 27. Heating and cooling equipment is provided for each building at the time of construction. Pipework for primary distribution of both heating and cooling water is sized for that phase of construction. Future buildings are served in a similar fashion and primary pipework is interconnected. By pumping in series, the equipment in one building can be used to assist in a building where units have failed. Thus, the chain has achieved small sized distribution pipework which is infinitely extendable because of series pumping.

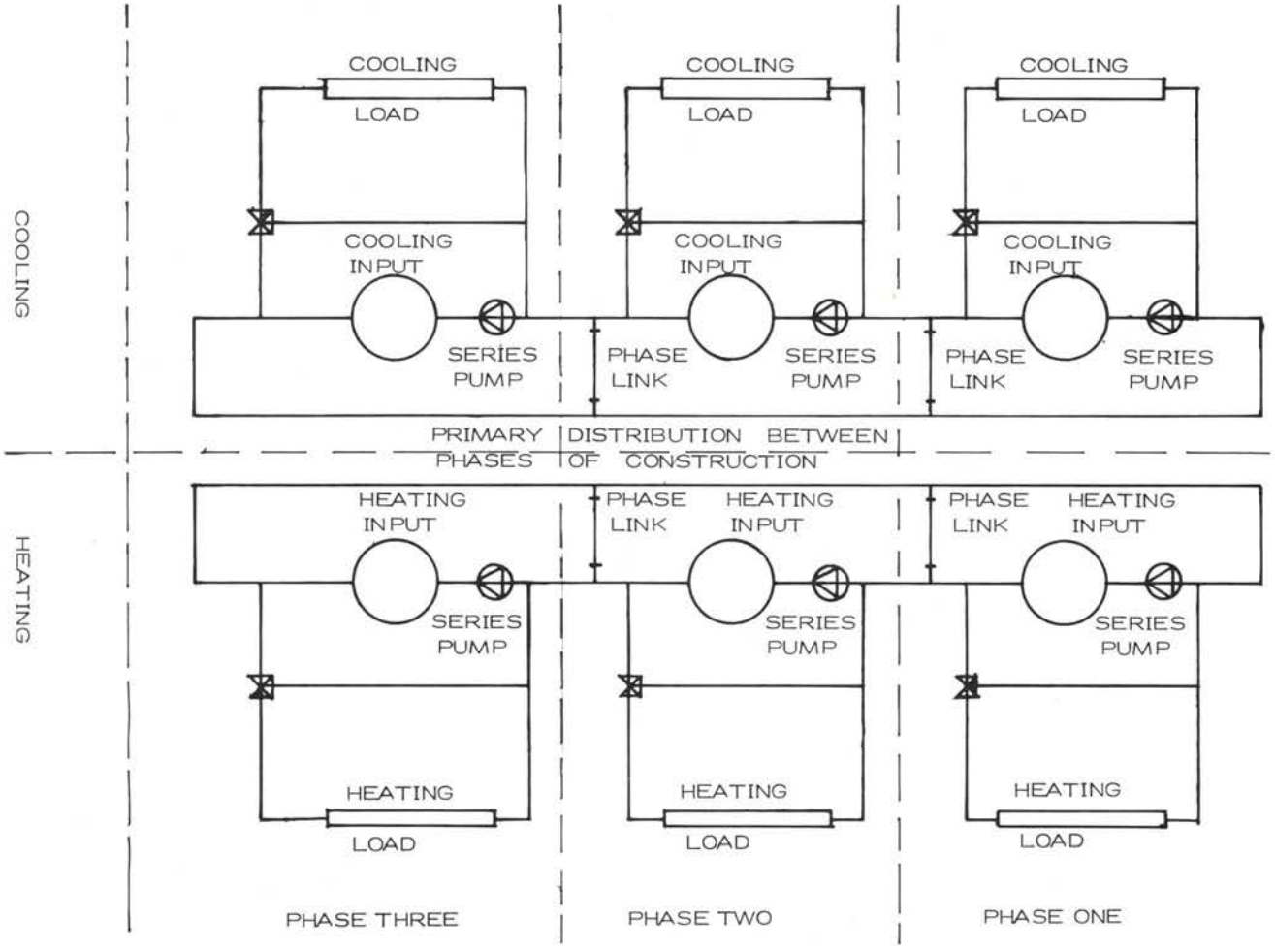
Also, low initial expenditure is involved in each phase using equipment sized for a specific building only, and selected to operate at the most efficient level.

It might be argued that this chain approach with diverse equipment is not as easy to maintain as central equipment. If all equipment were central this might be true, but maintenance is required in every building for air handling systems. Partial centralization, therefore, achieves little.

CENTRAL CONTROL

Central control, however, does provide a management point for all campus equipment. With a computer, central control can remove the tedious tasks of starting and stopping equipment, keeping a record of its operating hours, and monitoring its operating conditions. Probably more important is the fact that it can optimize system operation. This is particularly useful when reclaiming daytime heat for nighttime use. Time sharing of the North Campus central control system with the Lakeshore Campus would appear worthwhile.

Figure 27. Service Distribution



DESIGN CONDITIONS

ROOM TEMPERATURES

Conditions required within buildings on the campus will depend upon the type of occupancy, the function and activity rate, and the degree of clothing worn. Typically, in Ontario, classrooms and offices are heated and cooled. Workshops and similar spaces are only heated.

The American Society of Heating, Refrigerating and Air Conditioning Engineers has published suggested design temperatures for campus spaces. Allowing the room temperature to rise two degrees at the time of peak heat gain can reduce the air handling and cooling equipment size by approximately one equivalent ton for every 2,000 sq.ft. served. This principle can be applied to both perimeter and internal spaces.

OUTSIDE TEMPERATURES

In keeping with the thermal storage principle, design conditions for cooling may be based on 2-1/2% ambient temperatures. That is, design conditions will be below outside ambient temperatures for 2-1/2% of the time period from June to September. For heating, one per cent ambient temperatures should be used, since these low outside conditions have been experienced for periods in excess of twelve hours.

BUILDING UTILIZATION

By far the most important criteria of design is the profile of students and classroom use. Not only does this control the size of air handling equipment for cooling, it is also necessary to establish the amount and form of heating required. In the Mechanical Appendix, probable usage profiles have been developed from North Campus data.

HEATING AND COOLING SYSTEMS

For air-conditioning, that is heating and cooling, four categories are available, based on the terminal cooling medium. These are air-water, all-air, all-water and multiple unit or unitary.

In view of the ventilation requirements for the large occupancies involved on a campus, only the first two categories are worthy of consideration.

AIR-WATER SYSTEMS

In air-water systems, both media are supplied to the occupied space to provide cooling. Heating is achieved by changing the air or water temperatures.

Air-water systems are normally used where a considerable number of temperature control zones requiring heating or cooling are to be served in a limited space, such as in a hotel. For reasons of economy, the air quantities used are small and normally amount to 10 cubic feet of air per minute per foot of glazed external wall. In most teaching spaces this quantity of air will be insufficient for ventilation. Additionally, some energy penalties are involved with these systems, as shown in Figure 28. This is because of the so-called overlap temperatures of air and water necessary to obtain control.

ALL-AIR SYSTEMS

All-air systems provide complete sensible and latent cooling from the air supplied to the occupied space. Heating can be accomplished by water, steam and electric equipment, or by the air.

All-air systems are used generally where high ventilation rates are required and where conditions almost always require cooling, such as in a hospital, a classroom and the inner areas of a building. Where it is necessary to vary the temperature of the air supplied to the occupied space to obtain control, all-air systems in the past have been extremely inefficient energy

Figure 28. Combined Loss/Gain Diagram for Air Water Systems

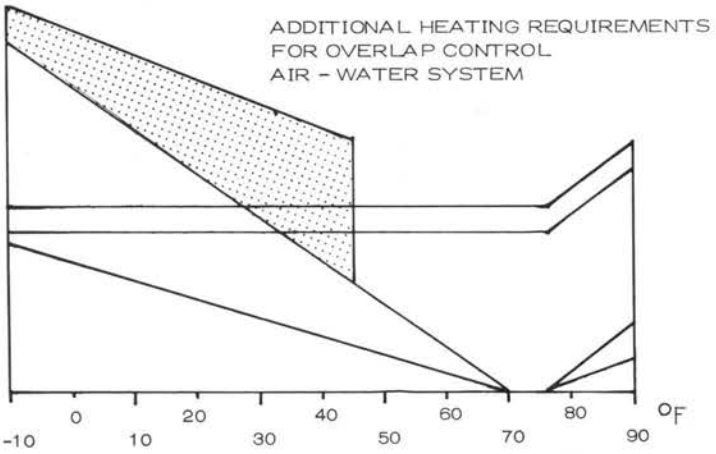
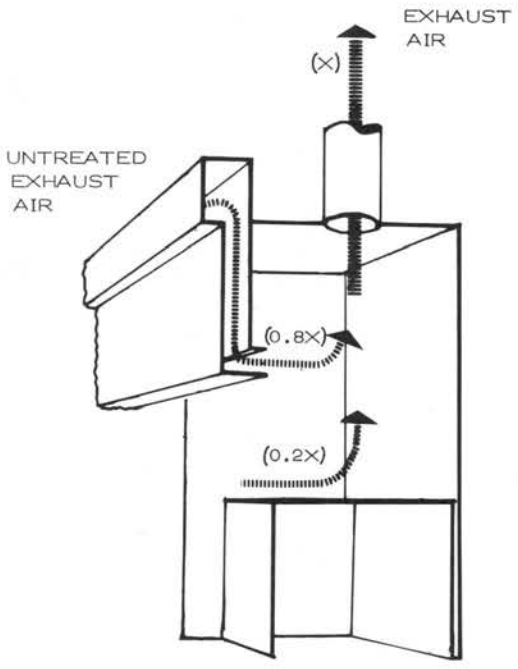


Figure 29. Equipment Exhaust Booth



users. The variable air volume concept of all-air systems has overcome this problem by varying the amount of air rather than the temperature. The variable air volume system saves heating, cooling and fan energy, in addition to some ductwork space.

At the present time, the variable air volume systems approach seems most appropriate for this campus. However, to truly determine the systems to use, energy budgets should be established.

RADIATION

Where heating is required with this system, finned radiation can be used. It is compatible with low temperature heat reclaim, previously discussed, and is relatively low in initial cost.

HEATING AND VENTILATION SYSTEMS

For Technology workshops that only require heating, two problems exist. Firstly, air is required for dilution of the activities in the workshop. Secondly, heat may be required to overcome these high ventilation rates. Depending upon the activity, the usual practice has been to clean and recirculate air used for ventilation purposes, to reduce the energy requirement. Where objectionable odour or contamination was present, the air was normally thrown away and, if possible, its heat reclaimed.

A further solution to this problem is shown in Figure 29. By introducing unheated, untreated air into a canopy at the point of exhaust ventilation, it may be possible to save both energy and capital equipment costs. A prototype of this assembly is presently being tested by the College to determine its limitations.

CONCLUSIONS OF ANALYSIS

In summary, if energy is to be effectively conserved, energy budgets of individual systems are required for comparison in conjunction with life cycle costs.

The energy of lights, equipment, people, the sun, and incinerated waste should be used before any fossil fuel is imported. Where excess energy is present, thermal storage provides the means to distribute its use to more appropriate times. This can be achieved using the building structure and a water storage tank.

Distribution of the energy using diversely located equipment, rather than a central plant can avoid excessive capital expenditures at the initial development phases, and may result in energy savings. Although justification during the final design process is required, variable air volume systems may be used for heating and cooling. For ventilation, direct supply of unheated air to workshop exhaust systems can save energy and capital costs.

Electrical Systems Analysis

SCOPE OF STUDY

To investigate and recommend optimum designs for the underlisted systems, considering the various phases of campus development and the relation of electrical systems to other engineering disciplines; and to provide a cost estimate:

- Primary and Secondary Power Distribution
- Emergency Power and Lighting
- Interior and Exterior Lighting
- Protection and Communication

EXISTING CONDITIONS

- POWER SUPPLY - available from Etobicoke Hydro's 27.6 KV lines on north side of Lakeshore Boulevard.

- TELEPHONE SERVICE - available from Bell Canada's main cables on south side of Lakeshore Boulevard.

- LAKESHORE TEACHERS' COLLEGE - existing 300 KVA substation is the largest permitted on Etobicoke Hydro's 4.16 KV system, but is inadequate for planned building usage.

DESIGN PHILOSOPHY

In designing the following systems, emphasis will be placed on flexibility, reliability, energy conservation, and economy.

PRIMARY POWER DISTRIBUTION

From the underground 27.6 KV feeder line, a main 4000 KVA, liquid-cooled transformer should step-down the power to 4.16 KV. A second (back-up) transformer is considered desirable, if the budget will allow, to provide continuity of power if a failure should occur in one unit. Distribution at 4.16 KV between buildings is recommended, rather than at 27.6 KV or 600 V, in the interests of economy and space conservation. A loop system should be employed, where practical, to provide continuity of power upon possible failure of any one section of underground feeder.

The rating of electrical service equipment, while still allowing for future growth, will be reduced somewhat by application of the mechanical thermal storage concept, and cost savings thereby achieved.

Consideration may also be given to supplementing the heat in the storage tanks with in-line electric resistance heaters supplied from a windmill-driven generator if this technology proves feasible in future. Such a power source should be entirely separate from and not connected to the normal Hydro supply. This feature could be added at any future date, but would be dependent upon equipment capital costs, Hydro rates in effect at the time, and architectural considerations.

SECONDARY POWER DISTRIBUTION

Secondary power distribution within buildings is recommended at 347/600 volts, with 600 V being used for large motors and distribution feeders, and 347 V for fluorescent lighting. Dry type transformers, stepping down to 120/208 V, should be provided where required for incandescent lighting, receptacles and miscellaneous small loads.

EMERGENCY POWER AND LIGHTING

A small diesel generator set is recommended for each building, to provide power for emergency and exit lighting, crucial systems such as fire alarm and communications, and certain motors necessary only for heat circulation.

INTERIOR LIGHTING

Interior lighting should generally be fluorescent, comprised of task lighting where practical, rather than general overhead illumination, in the interests of energy conservation.

However, classroom type spaces would require general illumination because of their varied uses. A reduction in overall lighting levels is recommended, except for task lighting, but should not be less than 80 ft. candles for classrooms. Fixture rows adjacent to windows should be circuited to permit their being switched off when not required, such as on bright days. Local switching should be provided in teaching areas to enable lecturers and cleaning staff to control lighting as required.

A limited amount of incandescent lighting is recommended, for non-academic areas such as lounges, lobbies and Cafeteria, to provide a more relaxed and intimate atmosphere.

EXTERIOR LIGHTING

Exterior lighting for parking lots, roads, walkways, landscaped areas, and building security should generally be efficient, high intensity discharge type with long life lamps to minimize maintenance. Control by timer rather than by photo-electric means is recommended, to limit "ON" time.

Selection of fixtures should be based upon compatibility with building and landscape design, standardization between buildings, and the prevention of throwing objectionable light towards residential areas.

PROTECTION

A supervised fire alarm system should be provided, conforming with the requirements of authorities having jurisdiction. Provision should be made for installation of a surveillance system, which can protect exterior doors and large open areas, such as the Cafeteria and Resources Centre. Intrusion alarm signals may be transmitted to a remote central station, if desired.

COMMUNICATION

An empty conduit and outlet box system should be provided, to permit installation by Bell Canada of a system comprising outside line and inside line (intercom) telephones.

Separate sound systems may be provided for certain areas such as the Cafeteria and student lounges. If necessary, a P.A. system can be included to provide coverage of corridors and main circulation areas.

Closed circuit TV systems should also be provided where required.

CENTRAL CONTROL

The desirability of central control for such systems as closed circuit TV or power utilization should be investigated in conjunction with the mechanical system controls.

Structural Analysis

SCOPE OF STUDY

To outline the main structural factors to be considered in planning new College buildings at this site.

EXISTING CONDITIONS

The existing Lakeshore Teachers' College building is a sturdy two storey concrete and steel structure, built in 1958. There are no existing buildings on the remainder of the site.

An abandonned 72 in. diameter storm sewer is an item which will locally affect foundation and floor slab construction, but the costs involved in lowering a few footings are not great, and need not influence the basic planning considerations for the project.

Foundation conditions are good, as revealed in a soils report prepared in 1957 for the Lakeshore Teachers' College, and a report on preliminary investigations which were carried out in 1974 at the proposed new building site.

Topsoil and fill varies in depth from a few inches to 2.8 ft. Beneath this material, very dense till, with excellent bearing capacity extends for a depth varying from 7 ft. to 10 ft. Beneath the till there is shale bedrock.

Excavations through the overburden, and to a shallow penetration into the underlying shale bedrock can be made by conventional, robust backhoe equipment.

Excavation costs for basements more than 10 ft. deep would begin to become substantial, and such deep basements over any large area should be avoided if possible.

Some minor seepages of groundwater were encountered during test borings, and in the Lakeshore Teachers' College building, groundwater rises in some places higher than the floor of the crawl space. Attention must be given to this factor but no great difficulty or expense is foreseen.

The 100 ft. wide Metro easement containing buried mechanical and electrical services, and the 50 ft. wide Etobicoke easement containing a 102 in. storm sewer, would impose certain structural restrictions if a building or link is planned across them. Metro Works has indicated that foundations could possibly be extended into the easement if they do not interfere with services. A vertical clearance of 15 ft. minimum must be maintained across the easements.

DESIGN PHILOSOPHY

The design philosophy is based on phased construction to produce a coherent ultimate set of buildings.

Planning requirements will certainly be modified over the span of total construction time, and the basic decisions should not be so detailed or rigid as to inhibit future adaptability.

The architectural planning appears to suggest that a grid or module of 35 ft. x 35 ft. may be appropriate. Where convenient, in one direction, the 35 ft. might be subdivided into two or even three bays. Where such additional columns are acceptable, some cost reductions may be realized.

A total building height of about 40 ft. maximum is contemplated, including at the most 3 floor levels.

Fire separation requirements will depend on the configuration of occupancies, but the structure will certainly need to have a fire rating. The maximum requirement will probably be a two hour rating.

Mechanical and electrical services will likely be quite extensive. Accessibility will be important, and pipe ducts and equipment should preferably not be buried inside fire rated assemblies.

The Technology Module will need some spaces with a clear height of 15 ft. or more, and consideration should be given to floor loadings and vibration isolation for machinery. Overhead lifting equipment may be suspended from the structure.

It is proposed to incorporate large water storage tanks in the lowest levels of the buildings to serve as heat energy reservoirs. They will introduce a premium in the structural cost but will be offset by mechanical efficiencies. Some very preliminary design has been done on these tanks, but detailed design will depend on selected configurations and depths, which will be affected by building arrangement and rock elevations.

The possibility of mounting solar energy collection panels on the walls or roofs has been discussed. Roof mounted panels would introduce some structural cost premiums, due to their own weight and to the snow piling which they might be expected to cause, but this problem may be minimized by coordinated design of architectural, mechanical, and structural elements. These will be investigated in more detail, if solar collection proves feasible in future for this campus.

Some discussions regarding possible parking structures have been held. Underground parking should be avoided because of the rock and water conditions to be expected. The choice between surface parking and multi-level parking structures depends upon planning parameters, and cost. These items are discussed in the Traffic and Parking Analysis section of the Report.

Site Services Analysis

SCOPE OF STUDY

- To investigate alternate methods of site servicing.
- To evaluate these methods with regard to their implications for phased development and costs.
- To make recommendations regarding site drainage, sanitary sewage disposal, and water supply.

EXISTING CONDITIONS

The surface run-off on the site is totally generated within the property limits, except for a minor exterior drainage area which is a portion of the adjacent Metro Works water filtration plant at the lower end of the site. Run-off from the site is now collected by surface swales and ditches, to a minor swale over the 102 in. diameter Borough of Etobicoke storm sewer recently installed along the western limit of the site, and the existing drainage course in the eastern portion of the site.

This drainage course was the outfall ditch for an existing 72 in. diameter Borough storm sewer, abandoned after the 102 in. diameter storm sewer was installed. The larger sewer was apparently not designed to accommodate run-off from the site, and as a result, can only be connected to if it can be shown that the possible hydraulic gradient elevation of the sewer will be below any building floor elevation.

There is a 12 in. diameter sanitary sewer and a 36 in. diameter sanitary trunk sewer in Lakeshore Boulevard. The invert elevations of both of these sewers are generally too high to allow gravity sewage disposal from the buildings. The Lakeshore Psychiatric Hospital is serviced through a 12 in. diameter sewer which intersects the site in the extension of the Metro Works right-of-way, which is south of the Lakeshore Teachers' College parking lot. The proposed site development will not affect this sewer. The Hospital sewer discharges into a pump station, owned and operated by the Metro Works Department from where it is discharged through a 6 in. diameter forcemain into the 36 in. diameter trunk sewer on Lakeshore Boulevard. When the Hospital did their own laundry, this station occasionally used to overflow. With the laundry now being sent out, the station has some spare capacity.

A Municipal watermain is located in Lakeshore Boulevard. The Hospital is supplied with water from this main at the intersection with 19th Street, the first street west of Kipling Avenue, through an 8 in. main which intersects the site at the northeast corner. This connection will have to be relocated during site development.

DESIGN PHILOSOPHY

The Site Servicing System will be so designed that it will:

- Minimize the disturbance of existing topography and vegetation during the development of each phase.
- Allow for servicing each phase with a minimum of capital investment.
- Allow for a capacity of 6,000 people on the campus at any one time.
- Generally allow for an extension of site services during each phase of development without a disruption of service to already completed phases.

In view of the compactness of the proposed development and the existing flat site grades, a positive underground storm sewer system will have to be provided in the portion of the site to be developed.

Synthesis

Adjacent Site: View North

General Design Philosophy

PROGRAMME

The design philosophy related to the Academic Programme is to create an active and stimulating environment for learning and teaching. In recognition of the Educational Concept, the Resources Module is to act as a central area in which students and staff of the various divisions could intermingle.

To accommodate the variety of Humber's teaching styles and methods and the multi-use nature of teaching spaces, classrooms and labs should be designed with the provision for openness and flexibility.

The former Lakeshore Teachers' College is to be retained and integrated as part of the campus in its present use as a teaching facility, and as a community centre operated by Humber in future to meet the needs of the community.

ADJACENT USES

Humber's philosophy of providing community oriented programmes and inviting the community to participate should be reflected in the physical design of the campus, in terms of its size, use of materials and character.

The College's philosophy related to adjacent institutions such as the Metropolitan Toronto Regional Conservation Authority, Lakeshore Psychiatric Hospital, and Metro Works, is one of cooperation and coexistence. An attempt should be made to integrate their needs and activities with those of Humber Lakeshore. The programmes related to these institutions that Humber envisages could be beneficial to all concerned.

It would be of mutual benefit to have the M.T.R.C.A. waterfront park built, as an extension of the campus, and to consider the campus as an extension of the park in this unique setting.

The campus could be developed as a community park, and recreation and activity centre in conjunction with the M.T.R.C.A. proposal to meet the need in the south end of the Borough for this kind of facility.

Similarly, the Metro Works site and the L.P.H. site should be considered as a continuation of the campus and vice versa, so that no physical barriers exist between these properties.

The planning of the campus should therefore take into consideration the short term and long term effects that it would have on these adjoining institutions, and how their plans would affect the College.

SITE DEVELOPMENT

The design philosophy related to the site includes consideration of the climate, orientation and view, landscaping, pedestrian movement, vehicular access and parking.

In consideration of the climate in Toronto, and the site being near Lake Ontario which would accentuate the effects of wind and cold, linked buildings or spaces seem logical.

The buildings should be oriented to take advantage of the view to the lake and to the beautifully landscaped Hospital property to the east.

Landscaping should be employed to retain and reinforce the park-like atmosphere of the site, and buildings should be located to harmonize with the natural setting; in the words of Tom Norton, the Principal of Humber Lakeshore, "a park-like setting with a college that just happens to be there".

Both active and passive landscaped spaces should be provided, and landscaping should be integrated into the building system. Existing trees should be preserved wherever possible, and smaller trees relocated. New planting on the campus

should be used to provide shade, buffering from winds, to screen and control views, and to soften and complement the buildings. Parking areas should be screened from view by use of berms and planting. The location and selection of tree groups should blend with the landscape of adjacent lands, particularly with the character of the Hospital site.

Possible major pedestrian movement systems within the site should be identified and reinforced in the site development plan.

The design philosophy related to vehicular access and parking has been discussed in the Traffic and Parking Analysis section of the Report.

BUILDING DEVELOPMENT

The design philosophy for building development includes consideration of image and scale, flexibility and expansion, phasing, energy conservation, building services and cost.

The buildings will form the main image creator for the College, and therefore the character of the buildings must appropriately reflect the philosophy of Humber Lakeshore. Being a commuter oriented campus, a sense of place should be created, and places where students can congregate should be provided. The campus design should reflect the needs of a variety of people attending the College: teenagers, housewives, working men and women, senior citizens, and part-time students.

The scale of buildings should be low profile, two to three storeys in height, in keeping with the character of the surrounding area and sympathetic with the landscaping philosophy. Especially important will be the creation of a human and intimate scale to offset the possible imposing quality of continuous interconnected buildings.

Consideration will also be given to access for the physically handicapped, by the inclusion of ramps into and within buildings, and the provision of elevators where required.

Flexibility of internal spaces should be provided to allow for changes in programmes and teaching methods. Provision should also be made for expansion of facilities to accommodate campus growth.

The building system must be adaptable to changes that may occur in the phasing of development as a result of financial or programme requirements. For instance, it may be that the total building requirement for each phase cannot be built at the same time, and therefore the building system should allow for incremental development over a period of years. Construction of the various phases cannot disrupt existing College operations, and physical facilities and landscaping should appear to be complete at any one phase of development.

In view of the economic situation today and potential energy shortages, energy conservation measures must be considered in all aspects of design; in terms of mechanical and electrical systems, use of materials, and relationship of spaces.

Mechanical and electrical services should be properly coordinated with the building system for economy, and ease of access and maintenance.

Building design should consider not only the functional and aesthetic aspects of the campus, but also the costs involved to keep development as economic as possible.

A cost plan will be devised so that once approval to proceed with the project has been granted, it will provide assistance for programme and design decision making. It will also provide a base or framework for future cost control and cost reporting for the project through to completion.

Land Use Plan

The basic concept of the Land Use Plan is to have the campus centre at the north end of the site, with development gradually reducing in density and scale towards the south to landscaped open space. (See Figure 30)

BUILDING LOCATION

Several factors and constraints influenced the location of buildings to the north end of the site.

- Existing former L.T.C. building to be integrated as part of the new campus, and philosophy of having interconnected buildings.
- Largest area of site available to accommodate the concept of a centralized campus, the southern portion of the site being too narrow for proper planning.
- Shorter length for site services to new buildings because of proximity to existing services under Lakeshore Boulevard.
- Campus is more directly related to existing commercial and industrial community.
- Proximity to existing public transit.
- Economy in length of roads and walks from community to campus.
- Preservation of southern end of site for recreation and landscaped open space related to the proposed M.T.R.C.A. park and Lake Ontario.
- Future campus expansion for recreational and water-related programmes could develop towards the south.

As previously discussed, the interrelationship of buildings are in recognition of phasing and of having the Resources Module forming the nucleus. Again, the phasing of buildings shown in Figure 30 is interchangeable.

LANDSCAPING AND PEDESTRIAN MOVEMENT

As mentioned previously, the landscaping philosophy is to retain and reinforce the natural setting of the site. Although the location of buildings at the north end of the site will not permit the preservation of all of the existing orchard trees and younger trees to the north, the buildings will be placed to retain as many as possible. Those that conflict with the buildings will be relocated.

A landscaped strip will be left between the buildings and Lakeshore Boulevard. This will serve as an introduction to the natural setting of the campus, and act as a visual and acoustical buffer to traffic along Lakeshore Boulevard. A pedestrian walkway from the intersection of Kipling Avenue and Lakeshore Boulevard should extend through this landscaped zone into the building complex.

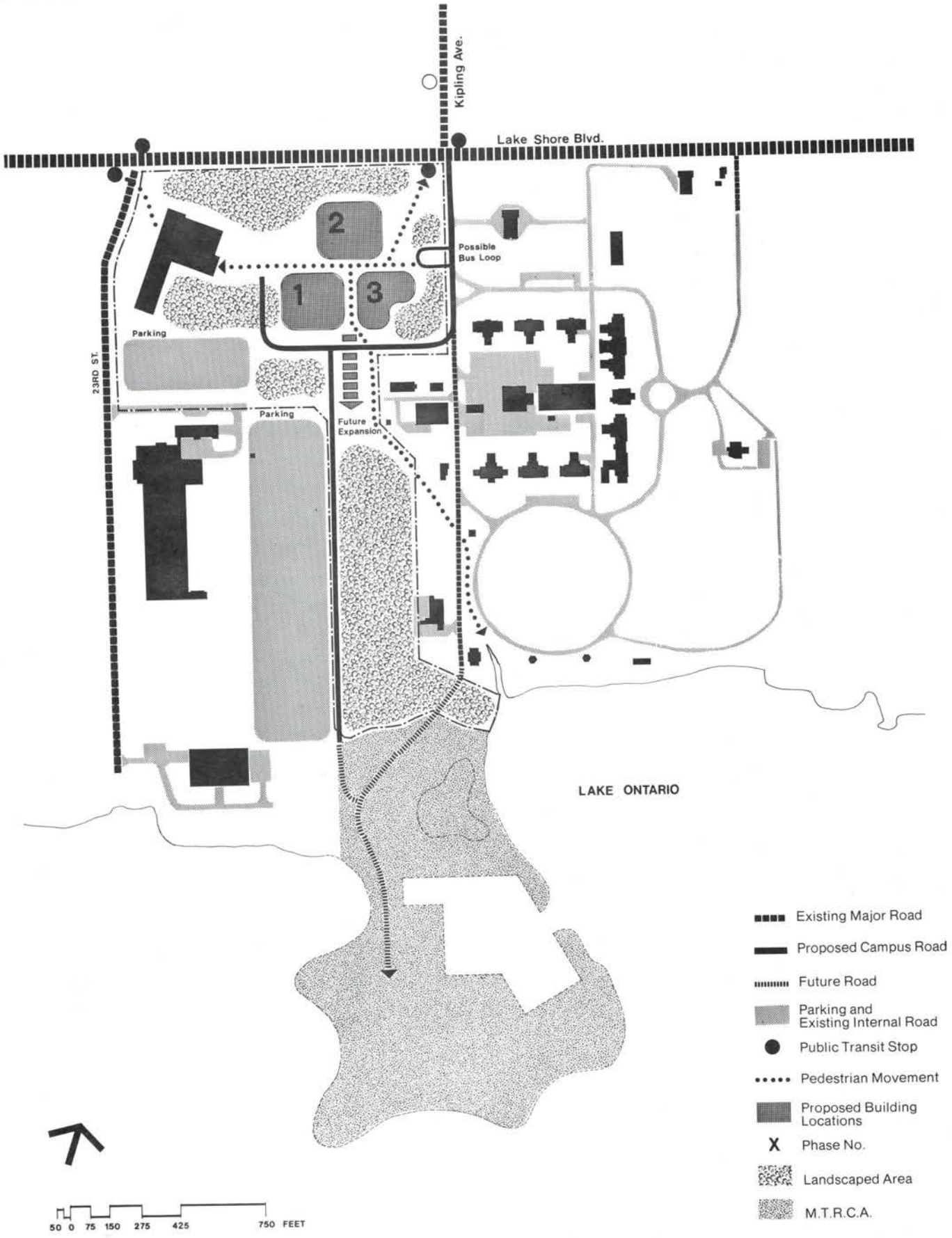
The southeast courtyard adjacent to the Teachers' College building will be retained and developed as part of a landscaped pedestrian zone extending into the new campus complex.

A major landscaped space will be developed adjacent to the Resources Module.

One of the unique features of the site is the existing watercourse extending from the north down to the lake. This watercourse will form the basis of a major landscaped feature. Walkways in and adjacent to it will serve as a pedestrian system between the buildings and outdoor recreatio areas to the south.

The bulk of landscaped open space will be in the southern portion of the site. The running track and soccer field could be included here, related to the waterfront recreational activities. Part of this area could also accommodate future campus expansion, but should not be used for car parking areas.

Figure 30. Proposed Land Use Plan



ROADS AND PARKING

As discussed previously, the most logical and only means of access to the campus is via the Kipling Avenue extension. This is also the desirable route for the Kipling South bus extension into the campus and for public access down to the M.T.R.C.A. park, once use of the road has been resolved with the Ministry of Health.

Two entrances into the campus are recommended to alleviate possible traffic congestion caused by a single means of entry and exit. A major entry towards the north end of the site is suggested serving the majority of the campus, and a minor one at the south which could also serve as access to the M.T.R.C.A. park. (See Figure 30)

The northern entry into the campus is recommended immediately north of the narrowest portion of the site, where the present L.P.H. property projects into Humbers' property. The possible T.T.C. bus loop is recommended just north of this intersection. The reasons for this access point are:

- Any access further north would interfere with campus building development.
- It occurs at a location where the site is naturally bisected because of its shape.
- Access south of this point would not be permitted while the L.P.H. exists in its present use.
- If use of the Kipling Avenue extension down to the lake is not resolved, it would allow access to the M.T.R.C.A. park with the least interference to the campus.

Note: [As previously mentioned in the Traffic and Parking Analysis section of the Report, this access point may have to be revised to a location further north, in view of conditions set forth by the Ministry of Health at the time of writing this Report.]

Since Humber has obtained surface rights over the Metro Works easements to the east of the Filtration Plant, it is suggested that most of the parking be placed here, preserving the land to the east for landscaped space and future campus growth. Additionally, this location would permit sharing of parking facilities with the M.T.R.C.A. park. This area will accommodate approximately 1,100 cars, but the construction will have to be phased with the proposed reservoir and sedimentation tanks. The existing parking lot south of L.T.C. is to be retained and enlarged for about 350 cars.

Since use of 23rd Street will be prohibited once the new campus develops, access to parking areas will be via an internal road running north/south over the Etobicoke sewer easement. This will also serve as the main service road to L.T.C. and the new buildings. At the south end of the site this road will connect with the proposed Kipling Avenue extension serving the M.T.R.C.A. park. This will provide a southern egress route from the campus and a connection with the park for sharing of parking areas with the College.

Building Module System

Having established the Planning Module and the probable or possible phasing of buildings in the Land Use Plan, the next step was to develop a Building System consistent with Programme requirements and the general design philosophy.

PROGRAMME SPACE REQUIREMENTS

The overall composition of the types of spaces to be provided are summarized in the Space Programme, in the Programme Analysis section of the Report.

Four types of teaching space are required from the Programme:

- 20 student lab @ 1,200 sq.ft.
- 35-40 student classroom @ 900-1,000 sq.ft.
- 40-60 student business lab @ 1,000-1,500 sq.ft.
- large open space for Technology programmes

Offices are generally to be accommodated within open office landscaping, rather than individually enclosed. The Library and Cafeteria are to be large open areas.

STRUCTURAL GRID

Based upon space requirements, a 35 ft. x 35 ft. bay, or grid, was adopted as being suitable for the teaching areas comprising most of the space. These dimensions provide classroom sizes of 875 and 1,050 sq.ft. and lab sizes of 1,050, 1,225, and 1,575 sq.ft. (See Figure 31)

SPACE DISTRIBUTION

It was decided that each component or "Building Module" in the Building System should contain spaces in the same proportion as in the total Programme. This would provide for all Programmes generally, and would allow for interchangeability of Programmes within each Module. The Modules could be modified to suit more detailed requirements when known in future.

Teaching areas, most of which do not require a view to the outside, are located centrally in the Building Module. This also enables greater flexibility of expanding or contracting teaching space as required. (See Figure 31)

Support facilities of Offices, Educational Resources, and College Services are located around the perimeter with views to the outside. For the Technology Programmes, Library, and Cafeteria, the Building Module could essentially become one large open space.

MODULE SIZE

The building code requirement of 100 ft. maximum horizontal distance to an exit from any point on a floor, established the size of the Building Module at 4 bays square, or 140 ft. x 140 ft. = ± 20,000 sq.ft., with exits located at opposite corners of the Module. (See Figure 31)

NODES

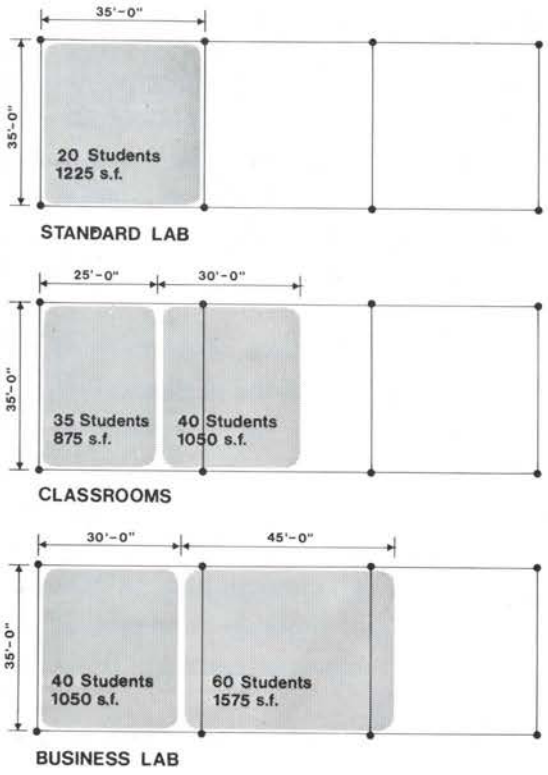
The location of exits combined with stairs, possible elevators, mechanical and electrical rooms, duct shafts, and washrooms form a vertical circulation/service core or "Node" at two corners of the Module.

Associated with these Nodes could be small lounges or other kinds of activities where students and staff could gather. These spaces should have a view to the outside for orientation and to provide visual relief from interior spaces.

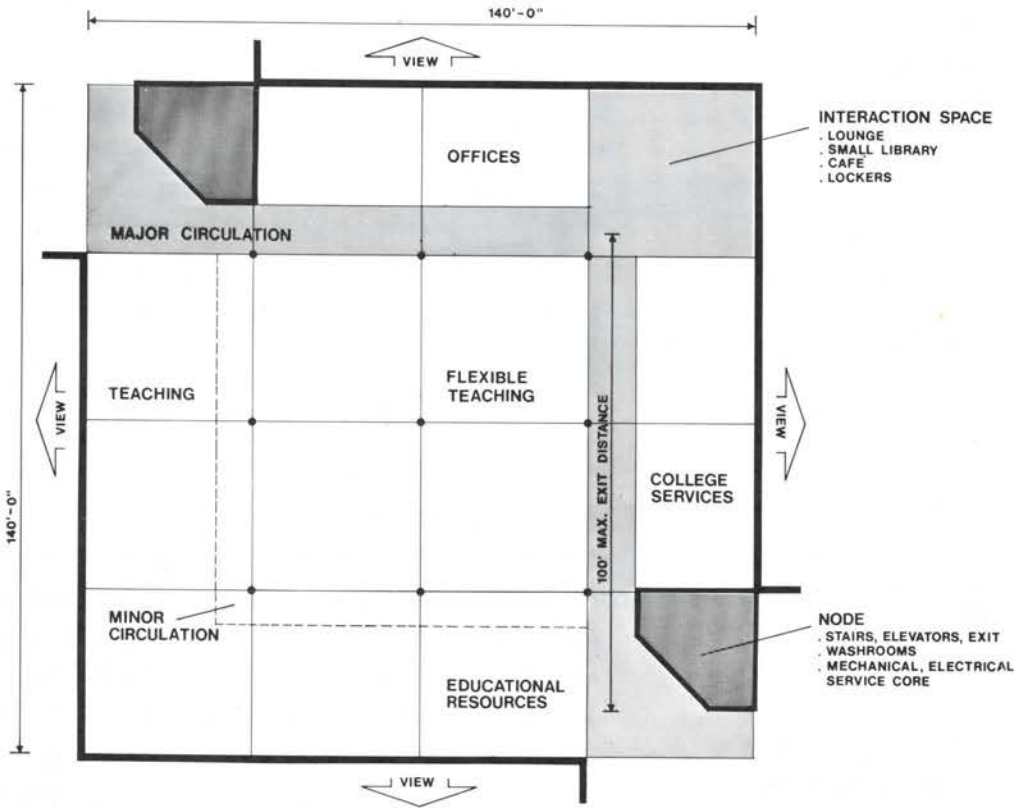
CIRCULATION SYSTEM

The major circulation route connecting the Nodes permits one large internal space for flexible classrooms and labs, with support functions at the perimeter opening onto the main "street". A minor circulation route could follow a similar pattern on the other side of the Module, if required within the teaching areas. (See Figure 31)

Figure 31. Space Requirements and Building Module



TEACHING SPACE REQUIREMENTS



BUILDING MODULE

To reinforce the College's philosophy of creating an active environment, an "interaction space" is located at the corner of the Module where a change in direction occurs in the circulation route. Common functions such as a lounge, small library, cafe, or lockers could be accommodated here. Again, this space should have generous views to the landscape and serve as a means of orientation.

BUILDING SYSTEM

The Building System is formed by interconnecting the Modules at the corners, with Node points or interaction spaces overlapping to form a common connection. (See Figure 32)

This system allows for incremental development in the event that the total space requirement for each phase is not built at the same time. For example, if funds available would only allow for construction of say 60,000 sq.ft. of the required 150,000 sq.ft. for a particular phase, one Building Module comprised of three floors at 20,000 sq.ft. each could be built initially. The remaining space requirement could be formed at a later date by additional Building Modules connecting onto the initial Module.

Interconnecting at the corners minimizes the interference and amount of surface interfacing required when future Modules are added. The appearance of buildings being complete at any particular phase would also be more readily achieved.

Finally, views from all sides of the Modules are retained and the definition of landscaped spaces adjacent to buildings can be maintained. Landscaped courts or a service yard can occur in the spaces between the Modules.

This system, combined with the overall growth pattern and Land Use Plan, formed the basis for the Physical Development Plan.

MECHANICAL AND ELECTRICAL SYSTEMS

The amount of space required for a traditional mechanical penthouse would be about 6% of the gross building area. With the Building Module and Building System established, localized penthouses with small mechanical rooms on each floor are proposed for each building phase.

The penthouse would take up about 1% of the gross floor area, and the mechanical room, accommodating the air handling unit, on each floor would require a space of 15 ft. x 15 ft. The penthouse and mechanical rooms will be vertically stacked at a building Node. The water storage tanks should also be located at one of the Nodes, probably underground, providing a vertically integrated system.

The main supply air distribution ducts and other mechanical services will follow the main circulation system, feeding into perimeter and interior spaces. (See Figure 33) This would permit ease of maintenance access without disrupting occupied areas.

The Electrical System will be similar to the Mechanical System in the location of electrical rooms and the distribution of services. Transformer and telephone rooms will be located at the building Nodes, and power, communication, and protection cables will follow the main circulation routes.

STRUCTURAL SYSTEM

Based upon the 35 ft. x 35 ft. structural grid established and the Structural Analysis, a structural steel framework is foreseen as being probably the most appropriate. Steel is generally more convenient than concrete for accommodating future additions and alterations, and the fairly large spans preferred are efficient in structural steel. However, detailed comparisons of various alternative structural systems should be carried out before firm decisions are made, and as architectural design develops.

Preliminary indications of possible steel framing schemes using joists, beams, or trusses were developed as a guide to architectural planning.

Figure 32. Building Module System

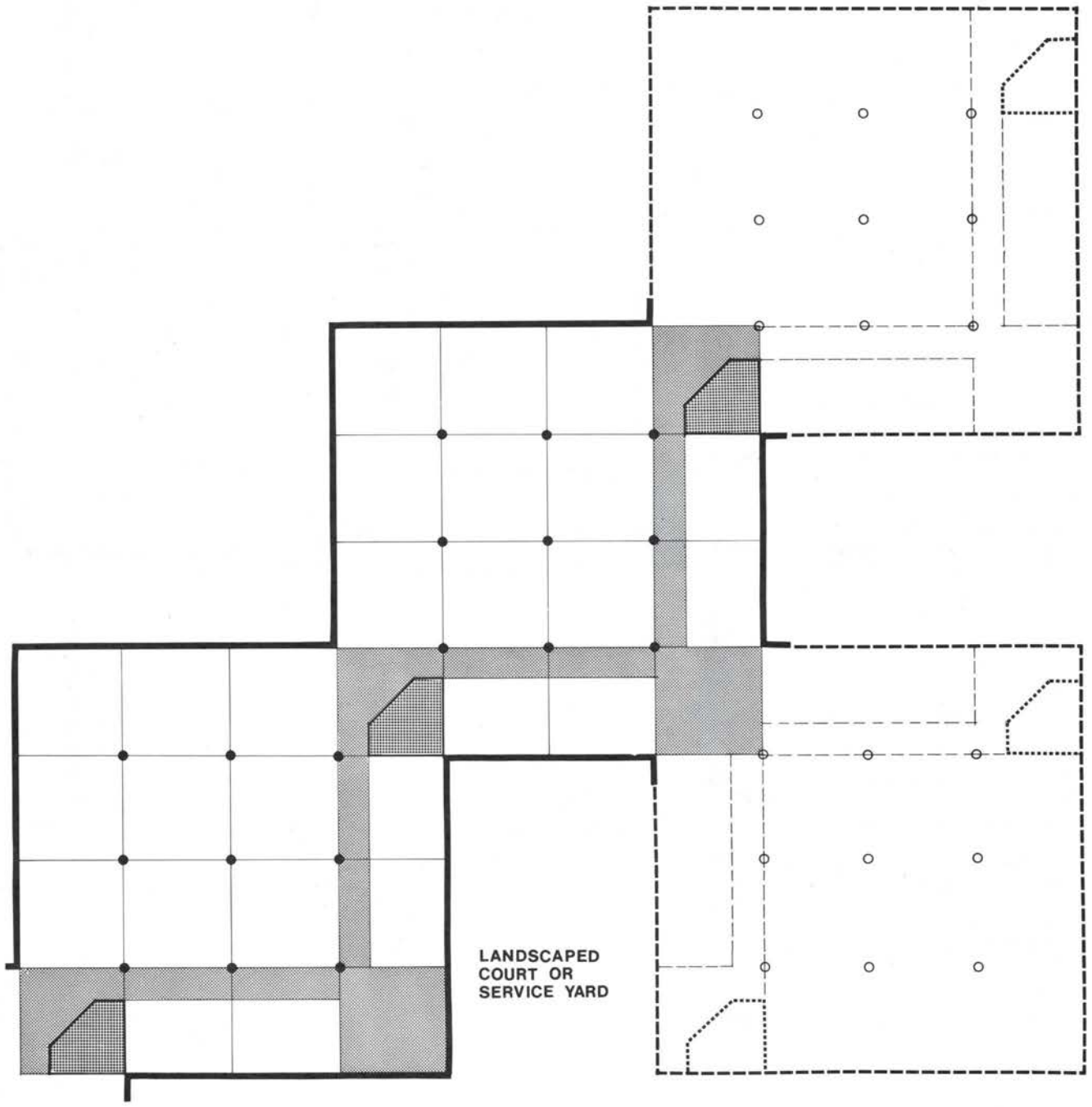
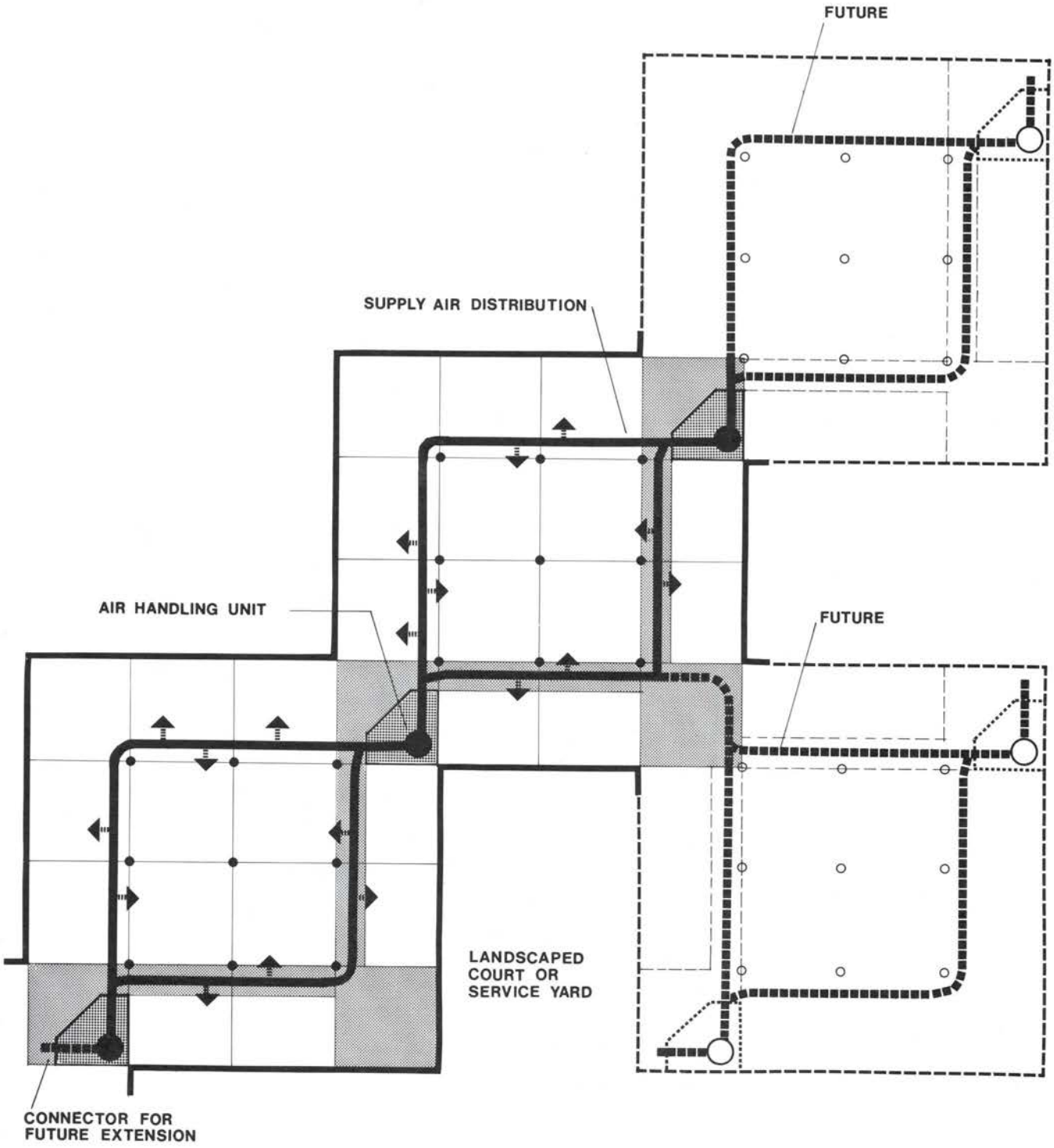


Figure 33. Mechanical System



Physical Development Plan

EXISTING CONDITIONS (See Figure 34)

BUILDINGS

The former Lakeshore Teachers' College building is presently being used to accommodate temporary Programmes, without major modifications to the original layout. Minor renovations are now being done to the interior to comply with safety and fire requirements. No exterior renovations are contemplated at the present time.

Several recommendations and plans were prepared to accommodate the new functions, and these renovations will be done over the years in stages as funds become available. The bulk of major renovations will probably not occur until all new campus development has been completed.

The angled orientation of the building on the site, its existing appearance, and the restriction of not being able to build on the easement to the east, will create a challenge in relating the L.T.C. building to future campus development.

ROADS AND PARKING

Existing vehicular access from 23rd Street will be maintained until new campus buildings are ready for occupancy. Turning prohibitions may be required to prevent use of residential streets at peak periods. The existing parking lot of 300 cars will be retained and should suffice for 80% of the projected enrollment at L.T.C.

Service vehicle access from the parking lot to the southeastern part of the building will be maintained. The existing driveway on the west side of the building will remain until Phase 1.

LANDSCAPING AND PEDESTRIAN SYSTEMS

The main pedestrian access is from the 23rd Street/Lakeshore Boulevard intersection. The main entry on the west side will remain temporarily until Phase 1, as well as the existing landscaping.

GENERAL

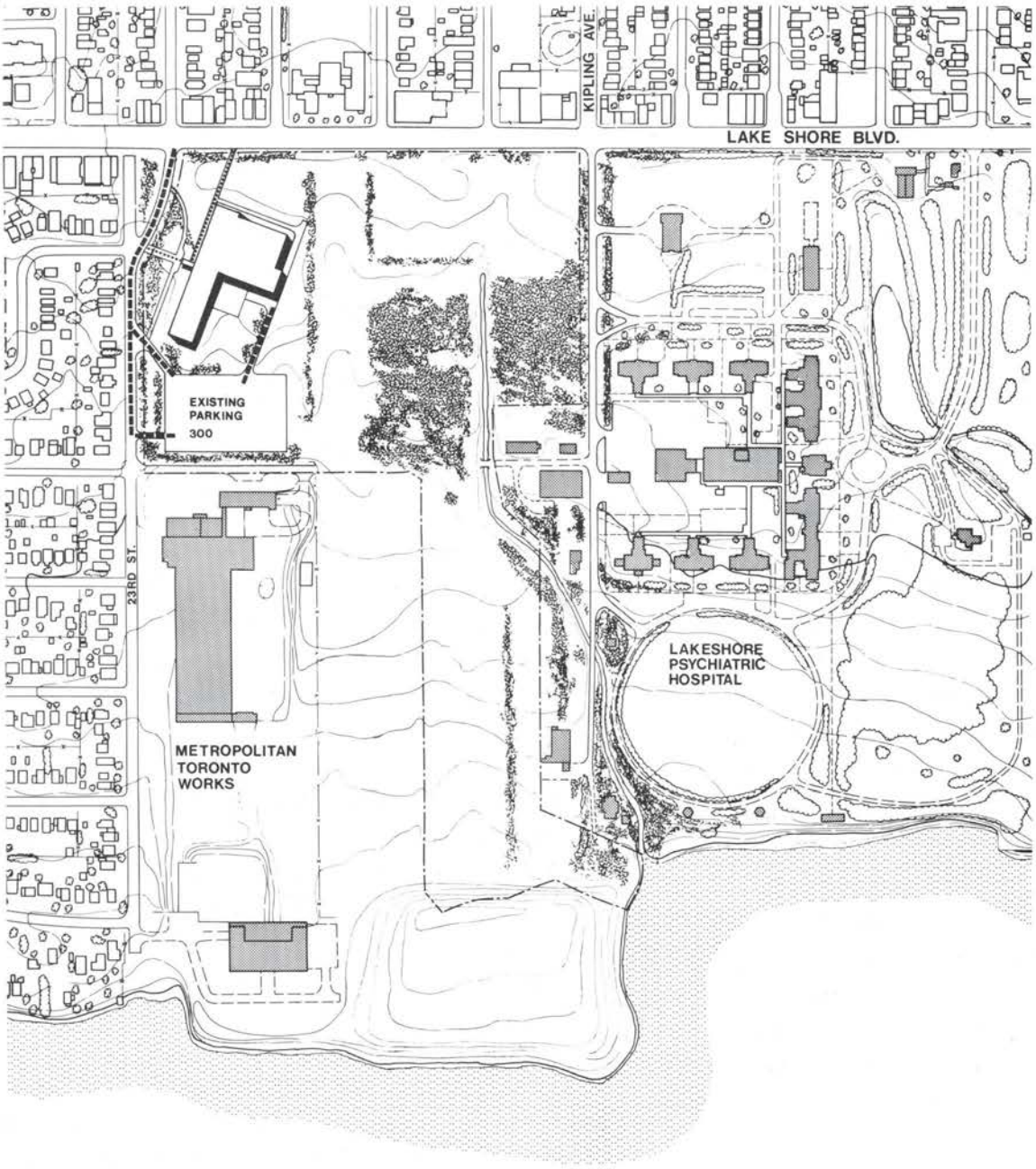
Each of the following phases of campus development will be described in terms of building development, roads, parking, landscaping, and pedestrian movement. Mechanical and electrical systems and site services development will be summarized in separate sections.

Building development for each phase will show groups of Building Modules combined to meet the required Programme areas. The shape and configuration of buildings as shown is not fixed. They merely show the recommended building development pattern using the Building Module System established. The final building shape and design will be subject to further detailed analysis of individual building Programmes. Detailed design requirements, such as ramps for the physically handicapped, service entrances, etc., should also be considered at that time.

It should again be emphasized that the following phases of building development related to Programme accommodation are flexible, and are strictly a demonstration of how phasing could occur. The Technology Module shown as Phase 1 may not necessarily occur in the first phase, and subsequent Programmes may not be accommodated in the phases designated. In fact, the Programmes of future phases could be incorporated into an earlier phase until such time as the complete campus is developed. However, it is recommended that the ultimate location of Programmes should be as shown on the plans, in recognition of the desired relationship of functions and the massing of buildings.

In addition, the phased development pattern depicts the ideal situation where all buildings for each phase are constructed within a two year period. However, if funds are not available to do so, building development would have to occur over a longer period of time. In this case, only partial development of each phase would be realized. The Building System established allows for this possibility.

Figure 34. Existing Conditions



For all phases, it should be assumed that 40% of the building envelope will admit natural light by means of glass or skylights, with perimeter glazing accounting for 33%.

For vehicular access, it is assumed that the use of the Kipling Avenue extension at the north end of the site has been resolved with the Ministry of Health, and that this route can be used for campus access. Service vehicles and bicycles will be accommodated within the internal campus road system. The need for temporary construction roads should be evaluated at the time of construction for each particular phase.

Note: [The additional conditions stipulated by the Ministry of Health for use of the Kipling Avenue extension were not known prior to development of plans.]

PHASE 1: 1977-78 (See Figure 35)

BUILDINGS

The main entrance at Lakeshore Teachers' College is to be relocated northward in recognition of the revised internal circulation, and an additional entrance is to be added off the existing courtyard. The main entrance canopy is to be removed.

New buildings east of L.T.C., and on the eastern limit of the easement, will form 150,000 sq.ft. of the Technology Module. Building Modules containing 2 floors, each of 15 ft. to 20 ft. height, are formed around an open courtyard. Each Module is comprised of open central spaces and mezzanines. The half Module projecting eastward contains the common or "sub-resources" functions and main entrance, in anticipation of future development eastward and pedestrian access from the Kipling Avenue/Lakeshore Boulevard intersection. Minor entrances occur at the corner building Nodes. Provision should be made at the northwest corner of the complex for the Welding Research facility which will initially require about 5,000 sq.ft. of space.

A second storey building link to Lakeshore Teachers' College is suggested in keeping with the philosophy of interconnected buildings and the anticipated heavy flow between the two facilities. This link will physically integrate L.T.C. with the new campus buildings, since buildings themselves cannot be placed on the 150 ft. wide easement. It will provide a protected passage for people, as well as for mechanical and electrical services feeding L.T.C. from the new campus buildings. Overhead services would facilitate access to them, and not interfere with existing Metro and Etobicoke services buried in the easement.

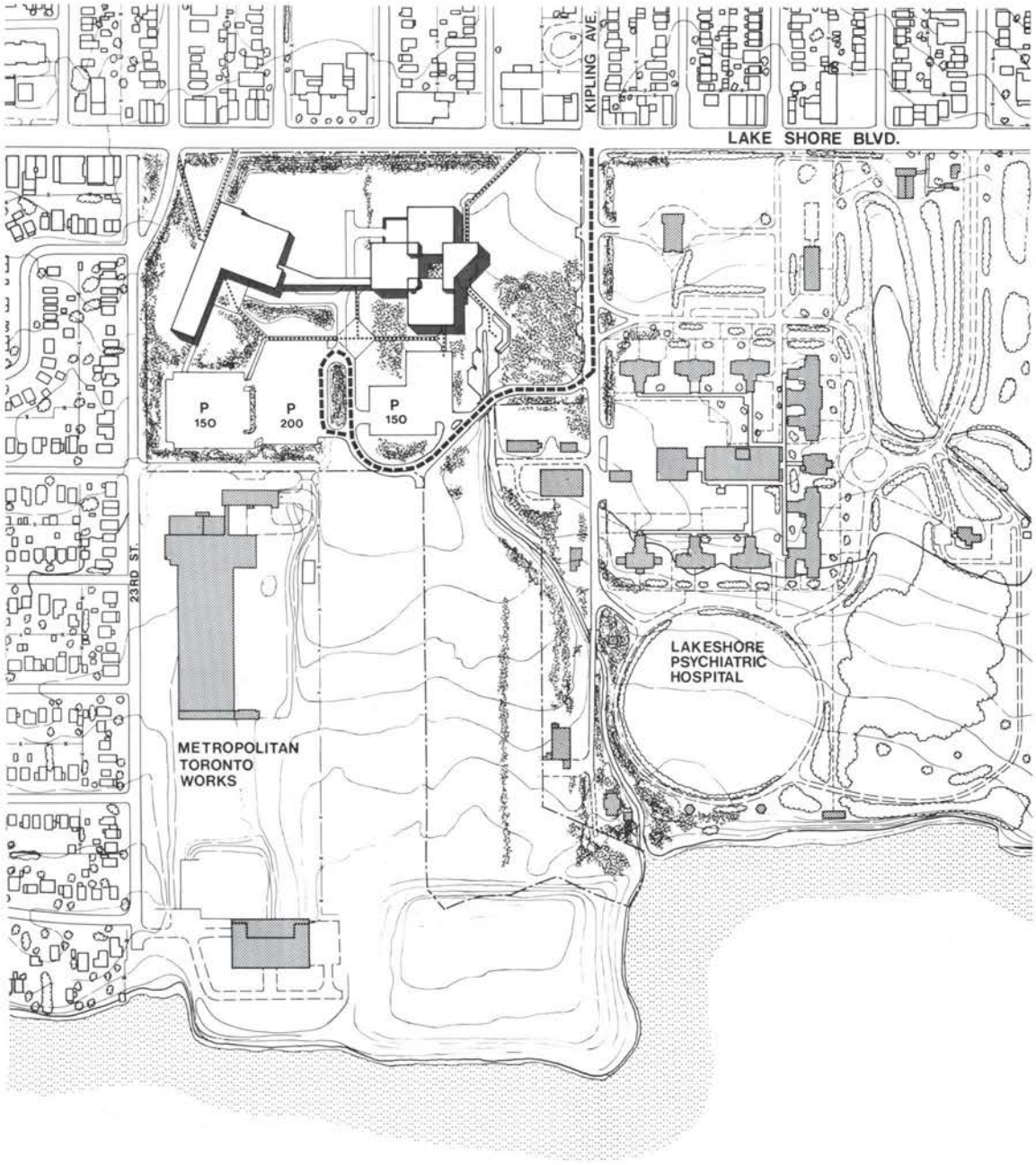
Other functions such as study carrels, shops, or offices could also be accommodated in the link, so that it would not merely be a conveyor of people and services. Although the distance between buildings is about 250 ft. across, the maximum structural span across the easement would be about 50 ft. since footings may be allowed to extend into the easement. This would substanially decrease structural costs. A clearance of 15 ft. under the link for cranes or service vehicles must be maintained for access to existing buried services.

ROADS

Campus access from 23rd Street will be closed. The entry drive on the west side of L.T.C. is to be removed, along with the service road from the existing parking lot. Emergency vehicle access into and out of the campus from 23rd Street is available via the Metro Works right-of-way south of the parking lot.

Access for campus traffic must be via the Kipling Avenue extension. It is imperative that this issue be resolved at this time in order for College development to commence. In the interim, temporary access for construction vehicles would be possible off Lakeshore Boulevard, and down the easement.

Figure 35. Phase 1: 1977-78



50 0 75 150 275 425 750 FEET

---- Vehicular Access

..... Pedestrian Access

The approach to the signalized intersection at Lakeshore Boulevard should be improved to a 4-lane standard. However, the existing L.P.H. service road is lined on both sides by mature trees, which are too close together to allow road widening between them. The western line of trees adjacent to the campus is less mature and complete than the eastern side. It is suggested therefore that the western line of trees be removed and the eastern line be left intact.

The intersection traffic calculations suggest that the need may arise in future for a right turn lane for traffic leaving the campus from the Kipling Avenue extension, and a right turn lane for traffic entering from Lakeshore Boulevard.

As an alternative, an overhead traffic signal system could be developed to regulate traffic flows at peak periods.

A 2-lane entry road westward into the campus is suggested immediately north of the Hospital property abutting the campus, and then northward along the easement to a car turn around loop east of the existing parking lot. This entry road should be constructed in a false cutting to hide part of the vehicles from view, and would also have to bridge across the existing watercourse.

Campus traffic will not be permitted beyond the car loop, and provision should be made for a drop-off area at this point. North of the loop the internal road will become a service road serving the L.T.C. building and Technology shops.

Access points for future road development off the west side of the Kipling Avenue extension and south off the internal road should be constructed at this phase.

PARKING

The existing L.T.C. car park is to be expanded eastward, creating two sections for 200 and 150 cars, separated by landscaping. Since the existing lot is very tightly planned, the layout should be revised for improved traffic flow at the expense of losing some parking spaces. Provision should be made for staff and visitors' parking in designated areas. Two access points to the parking lot are provided, coinciding with the turn-around route.

Additional temporary parking is provided for 150 cars in a location and shape to coincide with future Phase 3 buildings.

The additional 200 cars provided satisfies 43% of demand for this phase and 60% cumulatively. Additional space is available if the parking provided is inadequate, but would require temporary sites if the immediate campus area is to be preserved. The open space north of L.T.C. should remain as landscaped space to act as a foreground to campus buildings along Lakeshore Boulevard. This space should only be used for parking in the future, as a last resort.

LANDSCAPING AND PEDESTRIAN SYSTEMS

The existing walk leading from 23rd Street to the old main entry at L.T.C. is to be removed. A new walkway from the 23rd Street/Lakeshore Boulevard intersection to the relocated entry is to be provided. Landscaping will be added to the west side of L.T.C. and the existing parking lot, by rooting, pruning, and transplanting existing trees from around the building.

Two additional walkways from the parking lot will lead into the courtyard space. A major landscaped pedestrian route will connect the courtyard with the new buildings to the east, and a walkway northward from the car drop-off area will connect with the building link.

A major north/south landscaped walkway system leading from the Kipling Avenue/Lakeshore Boulevard intersection will be developed as an extension of the existing watercourse. The watercourse will serve as a major landscaped feature with walkways in and adjacent to it, complemented by trees and waterfalls. (These waterfalls or decorative fountains could be designed in combination with the water storage tanks recommended for the mechanical system.) It will lead into and through the building as a continuation of the landscape. It is suggested that the area adjacent to the watercourse south of the entry road be graded and prepared at this time for Phase 2 landscaped development.

Berms and landscaping should be added adjacent to Lakeshore Boulevard to shield the campus from traffic noise. Landscaping should also be added to shield from view, parking areas, the service road to L.T.C., and the Technology Module service yard. Existing trees should be relocated as required. Provision should be made for bicycles adjacent to building entry points.

CONSTRUCTION SITE

It is suggested that temporary construction site facilities be located immediately south of the car loop to serve this and future phases.

PHASE 2: 1978-79 (See Figure 36)

BUILDINGS

Included in this phase is 150,000 sq.ft. of space for the Applied Arts and Health Module. It is comprised of 3 Building Modules, with the Module attached to Phase 1 being 3 floors in height, at 12 ft. per floor. The other 2 Modules to the east are scaled down to 2 floors in height. Health Sciences Programmes are on the lower floor with Applied Arts Programmes above. As previously mentioned, Programmes other than Health Sciences or Applied Arts could occur at this phase.

An entrance court is formed by an upper level link spanning across to Phase 1 buildings. A service yard occurs to the east off the Kipling Avenue extension, which will serve as the main shipping/receiving area for the campus. Common function spaces occur to the southwest, related to the future main Resources area. A bus shelter will be incorporated into the building on the south side, related to the proposed bus loop for this phase. The cost of the shelter will be paid for jointly by the Province and the Borough. The Borough will decide its final location and design. Again, minor entrances and exits occur at the building corners.

ROADS

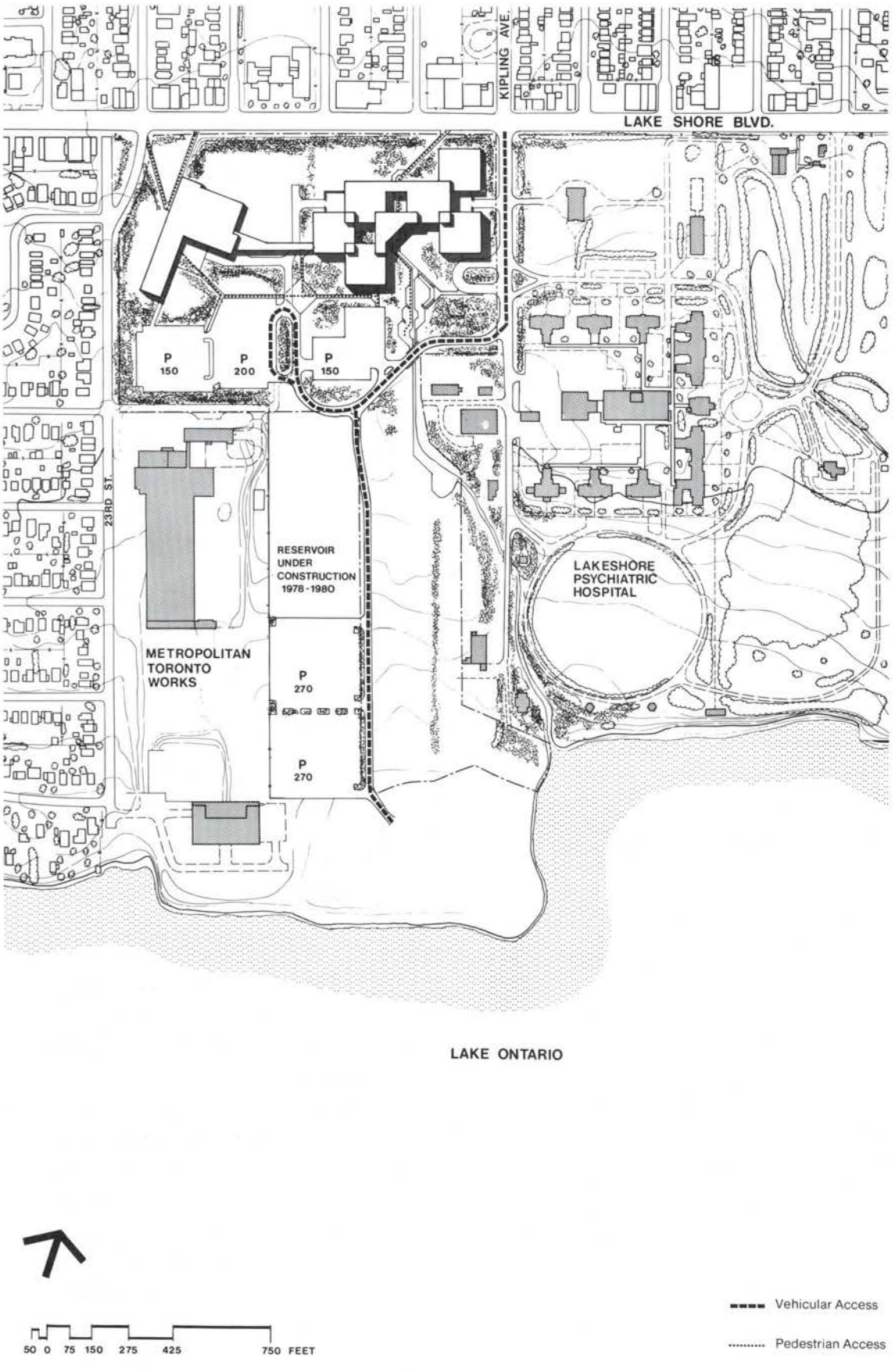
A service road to new buildings and a bus loop, both off the Kipling Avenue extension, will be introduced. The bus loop is suggested just north of the campus entry road to avoid traffic congestion at the intersection. This loop will accommodate the proposed extension of the Kipling South bus route and will also serve for Humber's own buses. It should be constructed to T.T.C. standards, and space for 2 loading positions should be provided. It is suggested that the College should obtain approval in principle from the T.T.C. prior to finalizing conceptual plans for this phase.

The internal campus road will be extended southward, down the Etobicoke sewer easement to serve the new parking lots. Cost sharing of this road and parking lot with the Conservation Authority should be investigated if they would require use of it for construction purposes, and since they will be using the College's parking areas in future.

PARKING

Since the Metro Works reservoir construction is anticipated at this phase, additional parking is recommended on the south portion of the Metro Works easement. A total of 540 cars in two

Figure 36. Phase 2: 1978-79



separately landscaped areas can be accommodated. This satisfies 146% of the required parking for this phase, and 86% cumulatively.

Although this location is remote from campus buildings, the southernmost point of the parking lot is within 10 minutes walking time to the campus centre. A location further north could only occur to the east of the reservoir, but would erode prime space for landscaping.

LANDSCAPING AND PEDESTRIAN SYSTEMS

The northern portion of the watercourse pedestrian system should be further developed with walkways, a natural amphitheatre, a concrete pond, fountains, and circulation pumps. This will serve as the main pedestrian system from transit stops, parking areas, and future recreation areas to the south.

The watercourse system to the south of the entry road should be prepared for future development, by cleaning it out and grading for a pond.

Existing trees to be removed should be replanted, and new trees and landscaping added around buildings, the service yard, and parking lot.

PHASE 3: 1979-80 (See Figure 37)

BUILDINGS

The Business and Resources Module at 150,000 sq.ft. completes the Programme requirement for new building space. The central Resources area ties together the common or "sub-resources" areas of previous phases. It is basically a large enclosed interior space comprised of 2 levels open vertically to each level, and covered with skylights. This area will form the main activity centre for the campus, containing the Cafeteria and Library on the ground floor with Administration above. The main space will be visually open to the landscaped exterior, and landscaping will flow into and form an integral part of the interior. The main pedestrian routes from the west, north and south will converge into this complex. In addition, this major space would be advantageous from a mechanical standpoint since the space would probably only have to be ventilated, with little heating required.

The Business Module attaches to the southwest corner of the Resources centre, over the Phase 1 temporary parking lot. It is comprised of 2 floors, scaling down to 1 floor to the south. Possible future building development will tie into this Module.

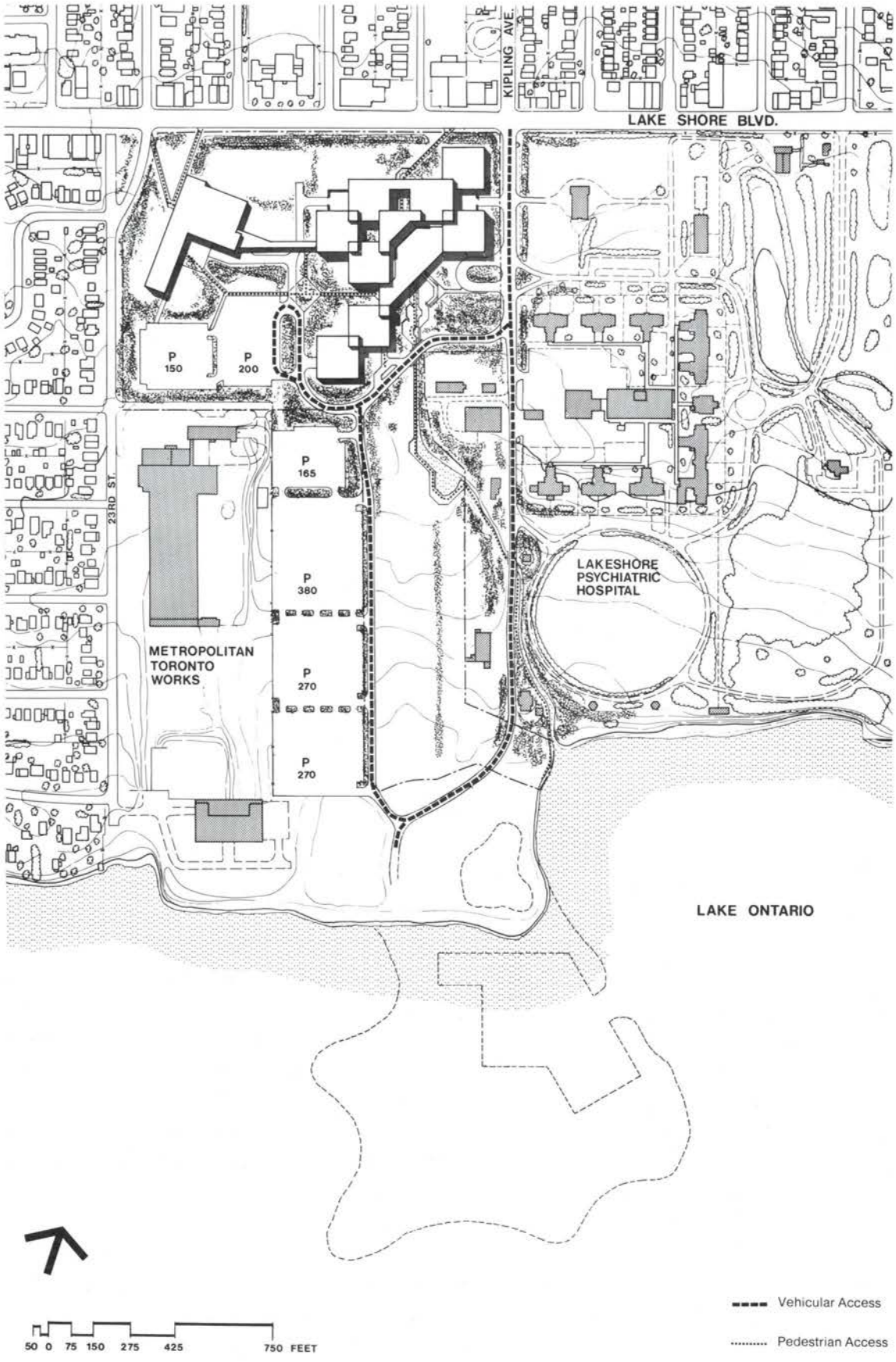
Because of site limitations and the need to maintain landscaped open space adjacent to buildings, significant expansion of this and previous building phases has not been shown. Expansion of campus facilities is recommended south of the Business Module.

ROADS

A second entry and exit road to the campus is recommended at this phase to relieve the north entry road. It is hoped that use of the southern part of the Kipling Avenue extension will serve this purpose, with an internal road connecting to the Phase 2 north/south road. It is assumed that this matter will have been resolved with the Ministry of Health or that the Hospital has changed to other use by this time. It is also assumed that the Conservation Authority would use this route for their access, and for eventual public access to the park.

This section of the Kipling Avenue extension is required to be a 2-lane road serving campus and M.T.R.C.A. park traffic. The existing road is not of adequate width, but is a beautifully treed and pleasant route. Any road works should respect this, even if it requires lowering of design standards. The road could be constructed to 20 ft. or 22 ft. width without shoulders,

Figure 37. Phase 3: 1979-80



without serious loss of capacity. Again, cost sharing with the M.T.R.C.A. should be investigated for all joint road use.

If use of this part of the Kipling Avenue extension is not permitted, the northern entry road into the campus may have to be widened to 4-lanes if traffic warrants it. In addition, M.T.R.C.A. access may have to be temporarily accommodated within the internal campus road, but hopefully this will not be necessary.

An additional car drop-off area is provided southeast of the Business Module, coinciding with the former entry to the deleted temporary parking lot. The west entry to the former temporary lot from the car turn-around, forms the service access road to the Business Module.

Some improvements to the Kipling Avenue/Lakeshore Boulevard intersection may also be necessary at this phase.

PARKING

The temporary parking lot provided at Phase 1 is deleted with the construction of the Business Module.

Once construction of the reservoir is completed, 545 cars can be accommodated over this area, with 165 cars designated for visitors and staff use, and 380 for students. The layout of the visitors' lot should take into account the existing Metro Works pump station. The total parking now provided for the campus is 1,435 cars, meeting 80% of demand calculations.

If the timing of the Metro Works reservoir is delayed substantially, a temporary car park to the east may have to be provided. Although the bearing strength of the reservoir structure is sufficient to accept the parking of cars on top of it, any cost premiums associated with parking on the reservoir would have to be borne by the College.

LANDSCAPING AND PEDESTRIAN SYSTEMS

Berms and landscaping are to be added around parking lots to shield them from view. Trees and landscaping should be added generally around buildings.

The watercourse system south of the north entry road into the campus should be developed with walkways, a pond, and landscaping.

PHASE 4: 1980- (See Figure 38)

This shows the possible final development plan for the campus based on the following assumptions.

- The Hospital property has been given over to other use and the portion of land west of the Kipling Avenue extension has been acquired by Humber, along with the boiler plant.

- The M.T.R.C.A. park and related facilities have been completed.

- Public access to the park will be via the Kipling Avenue extension.

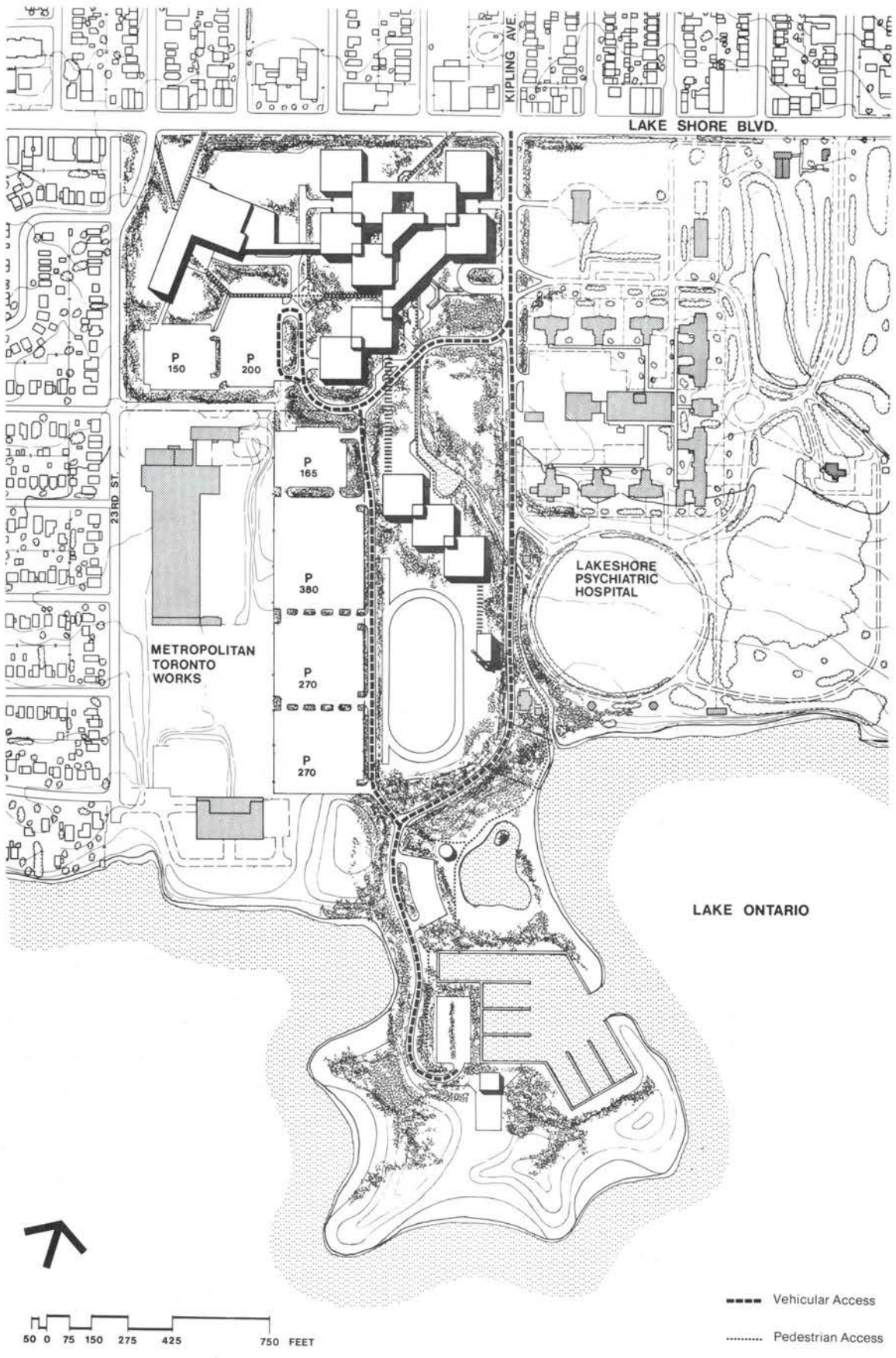
BUILDINGS

At the Lakeshore Teachers' College building, major renovations such as replacement of exterior glazing, new air-conditioning and electrical systems, revisions to internal layouts, and exterior embellishments will have been completed.

A service and maintenance building is recommended adjacent to the east wing of L.T.C. to accommodate 2 trucks, a tractor, lawn mowers, miscellaneous equipment, and storage. No provision will be made for Humber bus storage which will be at the North Campus.

One Building Module or 20,000 sq.ft. is to be added to the northwest corner of the Technology buildings to accommodate the Welding Research programmes.

Figure 38. Phase 4: 1980-



If incineration proves feasible as a means of energy for the campus, a central and screened location must be provided for the incinerator, along with provision for truck access.

Three Building Modules are shown south of the main College complex, as possible locations for future campus growth following the path of the watercourse. Possible linkages are shown to the north, and south to the former Hospital boiler plant. These linkages could take the form of covered pedestrian walkways rather than actual building connections. These facilities in conjunction with the renovated boiler plant could form the campus recreation and student centre.

M.T.R.C.A. PARK

It is hoped that construction of the Conservation Authority park facility will start in 1980, and be completed by 1985. As previously mentioned, facilities include an artificial swimming lake, boat mooring facilities, a sailing area, and picnic and observation areas. Change rooms related to the swimming lake, a small clubhouse, and some parking areas are envisaged. The shape and facilities indicated are preliminary and only conceptual in form.

ROADS AND PARKING

Access for M.T.R.C.A. trucks during construction and eventual public access to the park will be via the Kipling Avenue extension. It is hoped that the T.T.C. will extend bus service down to the park facility.

No additional parking is shown in the hope that the parking provided in previous phases will suffice and that there will be increased usage of public transit. This, of course, will have to be monitored and evaluated. It is suggested that the College and M.T.R.C.A. parking areas be shared for joint usage. The Conservation Authority should be approached to contribute to costs for all joint use roads and parking areas.

LANDSCAPING

The Hospital property, assumed to be acquired by Humber, is to be landscaped in relation to the watercourse and possible future buildings. This area could also be developed for recreational uses such as tennis. (Tennis courts for previous phases would occur within paved parking lots.)

The running track and soccer field should be placed west of the Hospital boiler plant. Trees and landscaping should be added adjacent to the internal north/south road and around new buildings. A tree farm related to the existing nursery plot west of the boiler plant could be developed as part of Humber's Landscape Technician programme. Open landscaped spaces throughout the site could serve as outdoor "rooms" for classes, sitting areas, or the Vita Parcours system.

A more detailed plan of the building development pattern in Figure 39 shows internal and external circulation routes, landscaped treatment, and vehicular and service access.

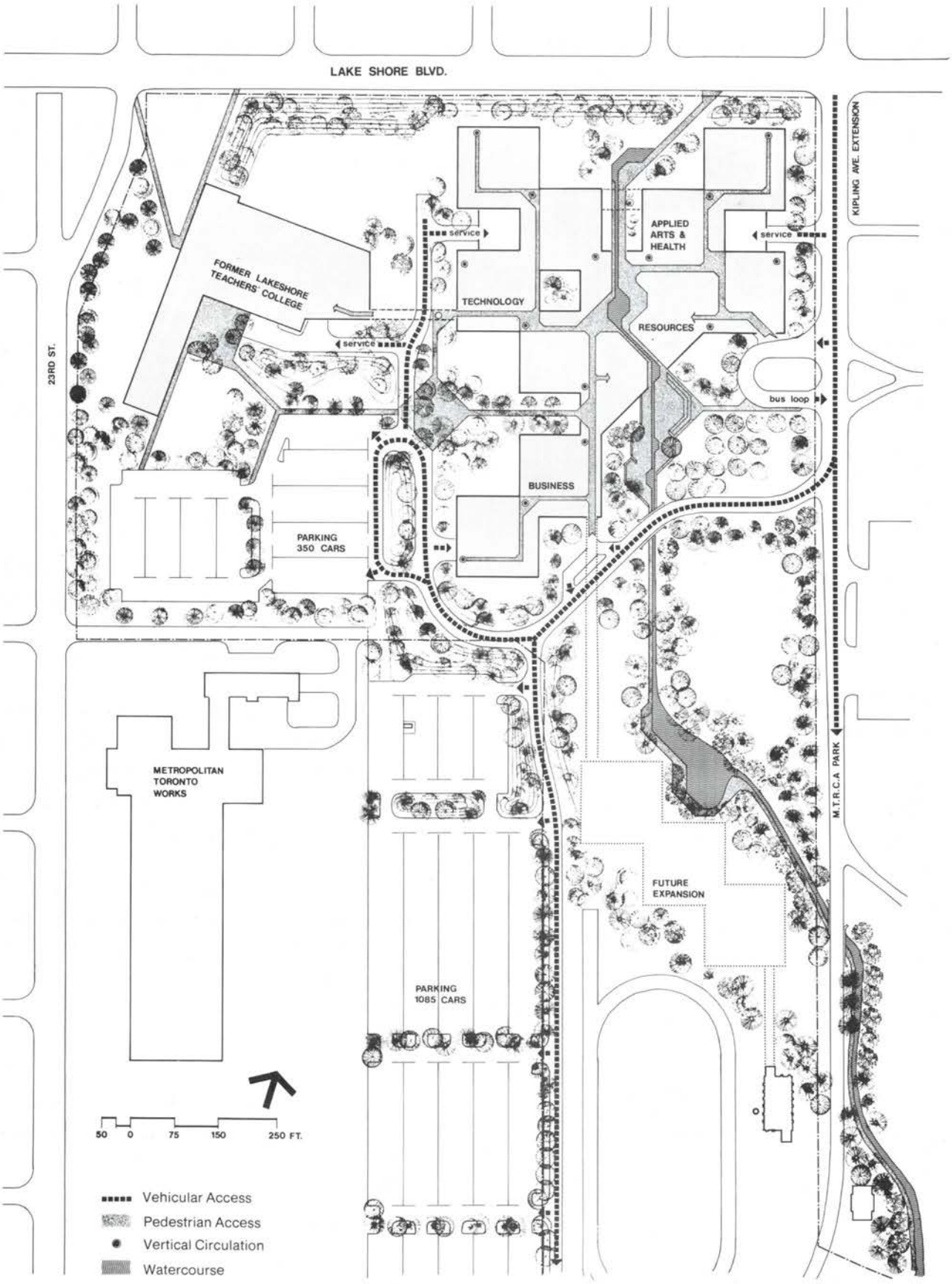
LANDSCAPING DEVELOPMENT

It is recommended that all major site grading be carried out for the ultimate development in Phase 1, and as much basic tree planting as possible be carried out over all areas.

While the use of caliper sized trees is recommended for areas to be developed for early use, it would be possible to plant more inexpensive and smaller trees in areas slated for later development. Mature deciduous trees should be strategically located on the east, west, and south sides of buildings to complement the Mechanical Systems approach as outlined in the Mechanical Systems Analysis section of the Report, by admitting or screening solar rays.

Immediate attention should be given to root pruning existing trees to be relocated, especially the apple orchard trees.

Figure 39. Detailed Development Plan



MECHANICAL SYSTEMS PLAN

The following is seen as the most effective way of incorporating the Mechanical Systems with phased building development to achieve maximum energy conservation. (See Figure 40)

PHASE 1

. Provide a heat pump to serve as the chiller for the Lakeshore Teachers' College building and new Phase 1 construction. Extend chilled water line across building link to L.T.C. Reclaimed heat to serve new construction only.

. Provide underground water storage tanks at a Building Node. It would be more economical to have all the storage tanks installed at the same time, rather than in separate phases. This would also avoid the disruption that could be caused by adding tanks in future. Serve cooling and heating systems from storage tanks during the day and regenerate tanks during the night.

. Provide pilot solar collector to test reliability of solar heating.

PHASE 2

. Provide heat pumps sized to suite Phase 2. First heat pump to be normal operation; second heat pump to act as stand-by.

. Connect storage tanks to Phase 2 systems and disconnect from Phase 1 systems. This is because more cooling appears to be necessary in Phase 2, and hence more savings in energy and operating costs are achieved.

. Use heat pump to serve Phase 1 and Lakeshore Teachers' College during the day. Use storage tanks to serve Phase 2 during the day. Use heat pump to regenerate storage tanks during the night.

. Provide heat reclaim from possible waste incineration and connect to storage tanks.

PHASE 3

. Connect second heat pump from Phase 2 to serve Phase 3 construction.

. Add solar heating if justified by Phase 1 pilot project.

COST

Costs for each phase are included in the Cost Appendix, and a detailed cost analysis is included in the Mechanical Appendix.

ELECTRICAL SYSTEMS PLAN

The schematic Electrical Systems plan shows the recommended staging. (See Figure 41) This is summarized as follows:

PHASE 1

. Install 27.6 KV and 4.16 KV substations, and 27.6 KV feeder from existing line in Lakeshore Boulevard. Provide space in substation for future 4.16 KV switching cubicles.

. Add 750 KVA transformer in Lakeshore Teachers' College building to replace existing transformer. Provide 4.16 KV line, and communication and protection cables from new substation to L.T.C., across building link.

. Provide empty underground duct banks for Phase 2 and Phase 3 power and communication cables. Terminate immediately outside building.

PHASE 2

. Add 4.16 KV substation.

. Extend duct banks from Phase 1, and install 4.16 KV line, and communication and protection cables.

. Provide empty underground duct banks for Phase 3.

Figure 40. Mechanical System

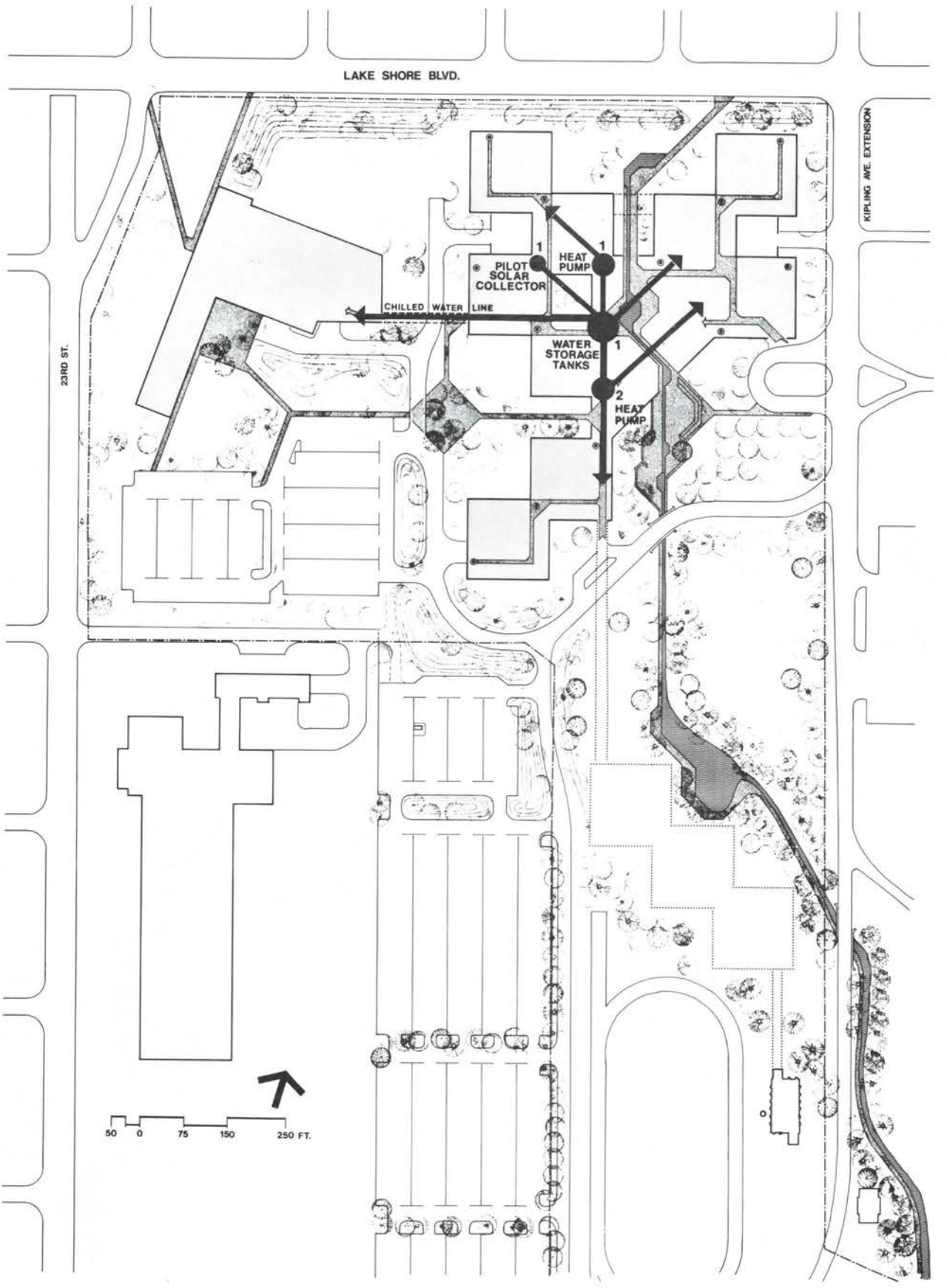
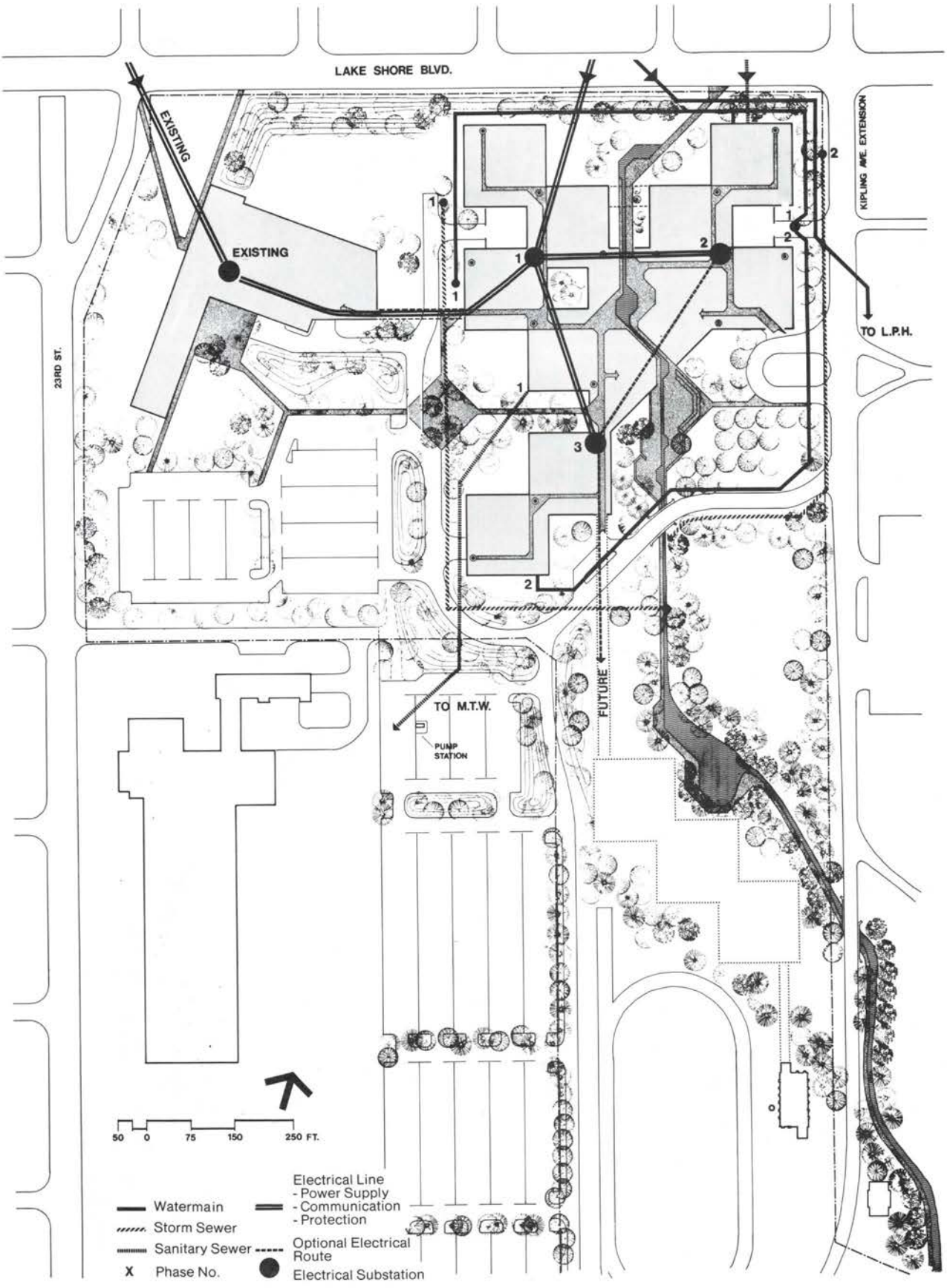


Figure 41. Site Services and Electrical Systems



PHASE 3

. Add 4.16 KV substation.

. Add 27.6 KV (stand-by) transformer and 4.16 KV line from Phase 2, thus closing the underground cable loop. This provides the system with flexibility, and protection against possible failure in the line elsewhere. (Recommended but not essential.)

. Provide empty underground duct banks for possible future campus development southward.

COST

Estimates of costs for each phase are included in the Cost Appendix.

SITE SERVICES PLAN

The schematic Site Services plan shows the recommended staging (See Figure 41), summarized as follows:

SITE DRAINAGE

Ideally Phase 1 storm run-off should be discharged to the 102 in. diameter Borough of Etobicoke storm sewer outfall. In order to obtain permission for this, it will be necessary to submit detailed storm run-off calculations to the Borough. In the event this method will not be approved, a storm sewer has to be constructed to discharge into the existing drainage course. In that instance the storm sewer should be designed to serve Phase 3 as well.

To service both Phase 2 and surface water run-off along the eastern site boundary, a storm sewer will be required discharging into the existing drainage course at the proposed road crossing.

Storm water run-off often has a high sediment load and can contain considerable concentration of "B.O.D.", suspended solids and other pollutants which are being discharged in the receiving waterbody, in this instance, Lake Ontario. It is thought by many that the next step in the pollution abatement process will be the clean-up or treatment of storm run-off waters. The discharge of water run-off from the site to the existing drainage course will make such treatment possible if required in the future, by incorporating a sediment pond in the water course. Such a pond could be made into a landscape feature for the Phase 4 development.

SANITARY SEWAGE DISPOSAL

Subject to final floor elevations, sanitary sewage from Phase 2 could be connected with a short gravity sewer to the existing trunk sewer in Lakeshore Boulevard. Phases 1, 3, and 4 will require the use of a pumping station. The existing Metro owned sewage pumping station is almost ideally located to service both Phases 1 and 3 by gravity. It has adequate capacity to handle the anticipated flow from Phase 1, and may only require a change in pump impellers and/or change in pump motors to accommodate Phase 3 and the future possible Phase 4.

It should be less costly in overall costs for the College, and advantageous to the Metro Works Department, if the spare capacity in this station is utilized. It is therefore recommended that the basis of cost sharing, maintenance and operation be negotiated with the Metro Works Department.

WATER SUPPLY

As the water supply to the Hospital is now metered on the Humber College site and its connection crosses the proposed Phase 2 building location, both the meter and connection will have to be relocated. The Borough of Etobicoke will either allow a meter at the property line to meter all flow, or smaller meters in the building(s) which would measure all flow, except fire flow. The first system is more suitable and allows for more flexibility, if site irrigation is considered in the future. Although this system is slightly more expensive during the initial development (by ± $10,000) than the system using meters in buildings, it is recommended that the first alternative be used.

COST

Estimates of costs for each phase are included in the Cost Appendix.

Implementation

Adjacent Site: View to Lake Ontario

Detailed Design Considerations

The design of buildings, roads, landscaping, and the the many accessories such as interior and exterior materials and furnishings, lighting, graphics, and visible services, are all aspects of equal concern. Individual solutions for each of these must be integral with the overall design philosophy and campus development.

MATERIALS

While maintaining the fundamental consistency of character desirable for the campus, the building materials should weather well over long periods of time. It is felt that reddish-brown textured brick should be the major exterior material, to provide the desired character for buildings and to relate to the residential area to the west as well as the existing Hospital buildings. This should be complemented with use of glass to create a feeling of openness and to allow views to the outside.

Low maintenance, permanent materials such as bronze, stainless steel, and aluminum are to be preferred over materials requiring regular repainting, for fittings in exterior and heavy traffic interior applications. Use of these materials will save costs over the life of the buildings.

Hardware for buildings and grounds should be consistent in design, materials, and finish. The criteria should be functional adaptation, simplicity of operation, ease of maintenance, a record of good performance elsewhere, durability, and visual design of a high order consistent with the whole campus.

In many ways the most important surface but the most neglected one, is the surface underfoot -- the paving. Brick, stone, and concrete are natural choices that will relate to retaining walls and the vertical surfaces of buildings. Variations of texture, size, and pattern should be considered to give scale to different locations and to signal the nature of the area -- walking, sitting, or major gathering space. Paving should be chosen to discourage vehicles where they are not wanted and to define pedestrian walkways. Again, consistent and sensitive design responsive to the nature of the campus should be implemented.

EXTERIOR FURNISHINGS

Of equal importance is the attention that should be given to the exterior furnishings of the campus. The exterior spaces of the campus are outdoor "rooms". Their contents must be designed with the same sensitivity as for the interior spaces. These items would include, but not be restricted to: benches, waste receptacles, telephone booths, noticeboards, handrails, and lighting.

Lights will be required for pathways, roads, parking areas, courtyards, landscaping, and the exterior lighting of buildings. These lights will require different methods of support -- bases, standards of varying heights, wall mountings for high and low levels, or enclosures for recessing in curbs or retaining walls. Many hundreds of such fixtures will eventually be used. They should be simple and unobtrusive, though of attractive appearance. Their materials should be that which require little attention over the years, and they should be ruggedly constructed.

GRAPHICS

The first priority of a graphics system is ease of communication -- it must convey information. It should comfortably include all of the visual details which it may be required to handle in the College, from stationery to the identification of vehicles.

It may be necessary to consider two inter-related graphics systems, one designed as a medium for information, the other as a decorative device.

In a complex project such as a college campus, the graphics system should contain the means or vocabulary necessary for an ongoing coding system. Directed to the stranger, visitor, or part-time student, this system should identify in a logical pattern the disparate parts of the campus, by location and possibly by function. Assuming a room as being the smallest unit, the coding system should identify units from the general to the specific by means of symbols, directories, or number or letter sequences.

The coding system would be required to:

- Give directions to the campus from main roads and footpaths.
- Identify the College at its entrances.
- Give direction to people and vehicles within the campus.
- Identify parking areas.
- Identify groups of buildings.
- Identify individual buildings.
- List occupants of buildings.
- Name and number rooms.
- Give special traffic instructions.

Visually, the graphics system should respect and complement the architectural design for both interior and exterior spaces. To reinforce the natural setting of the site, a landscape or natural theme may be appropriate for decorative purposes.

The system should be designed to be continuous, both with respect to concept and the mechanical means of implementing the concept. The visual concept would govern the choices of type-face, symbols, materials, colours, and presentation. The means to implement the concept should consider the availability of materials, inventory and stocking problems, maintenance and vandalism, and ease of replacement and adjustment.

The details and layout of the system should be contained in a simple manual of use which would provide guidance to the College for the ongoing implementation of the system, without constant reference to the Consultant. It is implicit in this approach that the system be one which lends itself to continuation.

METRIC CONVERSION

If the development of the campus is expected to proceed during the period of Metric Conversion in Canada, the design of all physical facilities must be evaluated in terms of the degree to which this conversion should be implemented. This aspect should be considered by the College and the Design Team in the light of Government policies in existence at the time.

Campus Development

Basic to the Master Plan is the recommendation that each projected phase of development be re-examined on a regular review schedule, every 2 or 3 years. Possible new circumstances or revisions should be studied in the interests of the continuity of campus development.

From its initial occupancy, the form and character of the College should be established, and development should be so planned that ongoing construction does not intrude upon or conflict with occupied parts of the campus.

The development should readily accept and adapt to inevitable changes in the Academic Programme or advances in technology. For example, the shape and profile of buildings should be investigated in regard to solar collection, if this proves feasible for the campus.

The ultimately developed campus should be consistent with its initial statement. The College's growth should be an evolution, encompassing unexpected variations but in harmony with the original statement.

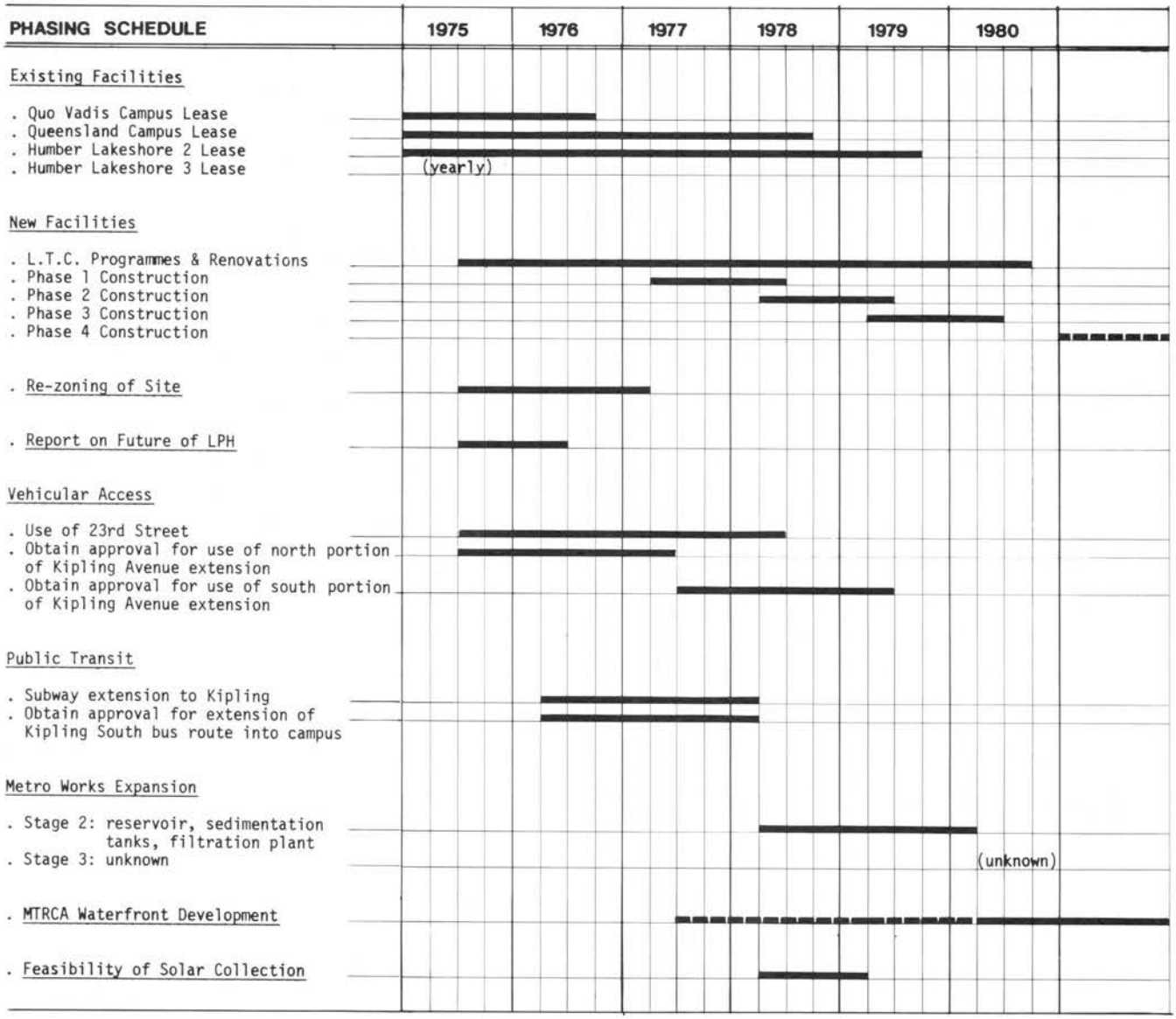
Phasing Summary

In view of the numerous influences and constraints which will affect the development of this campus, it may be useful to summarize these conditions in a time framework or Phasing Schedule. (See Figure 42)

A change in the timing of any one of these factors could affect the schedule of others. Therefore, whenever a change is made in any one of the schedules, all factors must be considered with regard to their ultimate effect on campus development.

This Phasing Schedule will also be useful in conjunction with the projected Cash Flow for the College, since a change in one will have a definite effect on the other.

Figure 42. Phasing Schedule



Costs

SCOPE OF STUDY

- To carry out and report on various cost studies of possible alternate design solutions.
- To coordinate cost input provided by other Consultants.
- To prepare a comprehensive Preliminary Budget along with Preliminary Cash Flow projections for the proposed project.

OBJECTIVES

The primary objective of the Preliminary Budget is to provide an initial expression of the probable Project Costs as has been outlined in the foregoing sections of the Report. Once approval to proceed with the project has been granted, it will provide assistance for Programme and design decision making. It will also provide a base or framework for future Cost Control and Cost Reporting for the project from commencement through to completion of all phases.

METHOD

Preliminary estimates were prepared based on broad parametric quantities measured from the architectural block schematics (See Cost Appendix). For certain elements not measurable at this stage, ratios and allowances were developed from statistics obtained from analysis of various other community college and university buildings. Mechanical and Electrical costs were prepared by the respective Consultants on the basis of their design parameters and recommended systems. Site development costs were provided by the Traffic, Landscaping, and Site Services Consultants in accordance with their recommendations.

As the block schematics do not represent a final design solution or the actual final phasing of development, the original gross area requirements were costed at the square foot rates arrived at in the Space Programme summary.

All estimates were based on March 1975 tender costs assuming a construction period of approximately 16 months, and then escalated to the projected tender dates of each phase of the project.

The Preliminary Budget thus computed forms what is considered by the Master Plan Project Team to be a reasonable and attainable cost target for each assumed phase of the project, provided market conditions remain competitive and escalation proves to be within the range predicted herein. (See Figure 43)

ESCALATION

Recent trends in escalation have made it somewhat difficult to forecast future construction costs with any certainty. Between 1968 and 1972, the three major price indexes used for construction purposes showed average cost increases as follow:

- Consumer Price Index (Statistics Canada) 4.2% p.a.
- Non-Residential Building Construction Price Index (Statistics Canada) 7.9% p.a.
- Southam Construction Index 7.1% p.a.

From 1972 to the present, the following rates have been tabulated:

. Consumer Price Index	1973	9.1%
	1974	12.4%
	1975	10.1%
. Non-Residential Construction Index	1973	9.8%
	1974	15.8%
	1975	9.3%
. Southam Construction Index	1973	13.5%
	1974	17.6%
	1975	10.3%

In consideration of current wage negotiations and settlements in the Metropolitan Toronto area, it is assumed that escalation for the remainder of 1975 will be approximately 12%, with the following years levelling out at approximately 10% per year. These rates have been assumed in this Preliminary Budget.

EXCLUSIONS

The following items are not included in this Preliminary Estimate:

- Land Costs
- Financing Charges
- Owner's Administrative Costs, etc.

CASH FLOW

The Preliminary Cash Flow Projection covers the total project cost. (See Figure 44) It has been assumed that each phase will be tendered in March of the designated year, with construction commencing in April and completion scheduled for 16 months following, except for Phase 4 renovations to Lakeshore Teachers' College, which is assumed to be completed within 5 months of the start of construction.

Figure 43. Preliminary Budget

Project: HUMBER LAKESHORE MASTER PLAN TORONTO, ONTARIO			Date: June 26, 1975	Sheet No:	
PRELIMINARY BUDGET					
	PHASE I (incl. Heating Plant)	PHASE II	PHASE III	PHASE IV (L.T.C. Renovations)	TOTAL
* Gross Floor Area	154,500 GSF	150,000 GSF	150,000 GSF	90,000 GSF	544,500 GSF
* Cost/GSF (March 1975)	36.00	33.50	36.20	Allowance	-
Net Building Cost	5,560,000	5,025,000	5,430,000	1,500,000	17,515,000
Link to L.T.C.	250,000	-	-	-	250,000
Site Development	540,000	610,000	455,000	-	1,605,000
Total Construction Cost	6,350,000	5,635,000	5,885,000	1,500,000	19,370,000
Professional Fees 7.5%	475,000	420,000	440,000	115,000	1,450,000
Post Contract Contingency 3%	190,000	170,000	175,000	45,000	580,000
Furnishings & Equipment $7/SF	1,080,000	1,050,000	1,050,000	630,000	3,810,000
Project Cost (March 1975)	8,095,000	7,272,000	7,550,000	2,290,000	25,210,000
Escalation Allowance	2,145,000	2,855,000	4,000,000	1,565,000	10,565,000
Master Plan Fees	100,000	-	-	-	100,000
TOTAL PROJECT COST	$10,340,000	$10,130,000	$11,550,000	$3,855,000	$35,875,000

* Program Area

** Cost Build-up - See Appendix (Average Cost/GSF New Construction = $35.24/GSF - March 1975)

Figure 44. Preliminary Cash Flow Projection

Project: HUMBER LAKESHORE TORONTO, ONTARIO	MASTER PLAN			Date: June 26, 1975		Sheet No:
PRELIMINARY CASH FLOW PROJECTION						
Scope of Work	TOTAL AMOUNT	Fiscal Year				
		1975/76	1976/77	1977/78	1978/79	1979/80	1980/81
Master Plan Fees	100,000	100,000					
Phase I (Net Building Cost) (Incl. Link)	5,810,000			3,485,000	2,325,000		
Phase II (Net Building Cost)	5,025,000				3,015,000	2,010,000	
Phase III (Net Building Cost)	5,430,000					3,260,000	2,170,000
Phase IV (Net Building Cost)	1,500,000						1,500,000
Site Development	1,605,000			280,000	555,000	565,000	205,000
Professional Fees (Estimate)	1,450,000		210,000	310,000	430,000	300,000	200,000
Post-Contract Contingency	580,000			65,000	160,000	165,000	190,000
Furnishings & Equipment	3,810,000				1,080,000	1,050,000	1,680,000
Escalation Allowance	10,565,000		50,000	1,020,000	2,500,000	3,430,000	3,565,000
TOTAL PROJECT	35,875,000	100,000	260,000	5,160,000	10,065,000	10,780,000	9,510,000

Summary

EDUCATIONAL PHILOSOPHY AND OBJECTIVES

. Humber College has adopted two major objectives: the integration of full and part-time studies, and the development of a meaningful presence in the southern part of the Borough of Etobicoke.

. The major planning objectives of the College are to: identify appropriate Programmes with the Lakeshore community, and to develop Programmes consistent with a college campus which has access to water.

. The Lakeshore Campus will be developed from the beginning on the basis of recognizing the needs and backgrounds of the adult learner.

. The College must not only provide the relevant Programmes of study, but as well, provide students with adequate time for informal exchange with other students.

. The College must provide an environment and learning process that encourages a desire to learn.

ENROLLMENT AND FACILITIES

. Humber has projected a fairly conservative post-secondary enrollment situation for longe range planning.

. Estimates of 10% growth each year to 1977-78 in the full-time post-secondary area are anticipated by the College.

. Humber College envisages an ultimate structure of three distinct units:

1. North Campus
2. Lakeshore Campus
3. Keelesdale Campus

. It is the intention of the College that each campus will identify spheres of operation that complement each other rather than compete. Each campus will be relatively self-autonomous within an overall College policy.

ADJACENT SITE INFLUENCES

METROPOLITAN TORONTO AND REGION CONSERVATION AUTHORITY

. As part of a programme to promote greater public access to the waterfront and to provide water-oriented recreational facilities in southern Etobicoke, the M.T.R.C.A. is planning the development of the waterfront area adjacent to the new campus site.

. It is anticipated that the M.T.R.C.A. could not proceed with development of any kind at this site until 1977, and no external landfill operations until 1980.

LAKESHORE PSYCHIATRIC HOSPITAL

. The long term use of this facility as a psychiatric hospital has not been decided as yet by the Ministry of Health, until a report on the future of the Hospital site has been completed in 1976.

. It is unlikely that the Hospital will remain in its present use, and there is a possibility that the Ministry of Health will eventually vacate the site some time in the future.

. At the present time Humber College is negotiating with the Ministry of Health in regard to obtaining access to the campus via the extension of Kipling Avenue.

METROPOLITAN TORONTO DEPARTMENT OF WORKS

. Surface rights have been granted to Humber over the Metro Works easements for roads, parking, or landscaping. However, any replacement costs related to excavation or access to Metro Works services would have to be borne by the College.

- Future development plans between 1978-80 include: an underground reservoir at the north end of the easement, expansion eastward of the filtration building, and additional sedimentation tanks.

- Because of the proximity of existing and future Metro Works buildings to the campus, the new College buildings should recognize the scale and appearance of these structures.

PROGRAMME

- The Humber Lakeshore Campus will be a major self-autonomous campus of Humber College. It will offer Programmes on a multi-divisional basis, integrating full and part-time studies.

- Due to its proximity to Lake Ontario, special Programmes and facilities will be introduced relating to the lakefront development. In addition, Programmes and facilities reflecting the needs of the Lakeshore community will be provided.

- Projected enrollment by 1980 is for approximately 4,000 full-time students and over 10,000 part-time students.

- The Academic Programme envisaged by 1980 is planned in the following three phases, although the priority and phasing of Programmes is not fixed:

  Phase 1 (1977-78) : Technology Module
  Phase 2 (1978-79) : Applied Arts and Health Module
  Phase 3 (1979-80) : Business and Resources Module

- The operation of the campus will begin with the occupancy of the former Lakeshore Teachers' College building in September 1975.

- Commercial and Academic Programmes are envisaged at the former Lakeshore Teachers' College over the next 5 years to accommodate a projected enrollment of 800 full-time students and 800 part-time students.

- As the campus develops and new facilities for the College have been completed, these Programmes and common functions will be transferred to the new buildings. The Teachers' College building will probably then be used as a community and recreation centre to serve the Lakeshore community.

- The Educational Concept is based on the College philosophy of creating an environment that stimulates a desire to learn, as well as providing opportunities for informal exchange between students. In this concept, the Resources Module is seen as forming a Resources nucleus, with more specific division functions around it. This area will form the centre of campus activity.

CAMPUS AND BUILDING DEVELOPMENT

- Humber's philosophy of providing community oriented Programmes and inviting the community to participate should be reflected in the physical design of the campus, in terms of its size, use of materials and character.

- The campus should be developed as a community park, and recreation and activity centre in conjunction with the Conservation Authority waterfront proposal.

- The Metro Works site and the Hospital site should be considered as a continuation of the campus.

- Energy conservation measures should be considered in all aspects of design.

- Development should be so planned that ongoing construction does not conflict with occupied parts of the campus.

- The development should readily accept and adapt to inevitable changes in the priority of phasing, the Academic Programme, advances in technology, or the availability of funds.

- Campus development should appear to be complete at any one phase of development.

- A sense of place should be created, and places where students can congregate should be provided.

- The character of the buildings must appropriately reflect the philosophy of Humber Lakeshore.

- The scale of buildings should be low profile, two to three storeys in height, in keeping with the character of the surrounding area.

- The buildings should be oriented to take advantage of the view to the lake and to the beautifully landscaped Hospital property to the east.

- In consideration of the climate in Toronto, and the site being near Lake Ontario, linked buildings or spaces are recommended.

- Especially important will be the creation of a human and intimate scale to offset the possible imposing quality of continuous interconnected buildings.

- Flexibility of internal spaces should be provided to allow for changes in programmes and teaching methods.

- The basic concept of campus development is to have the campus centre at the north end of the site, with development gradually reducing in density and scale towards the south, to landscaped open space.

- Building coverage should not exceed 50% of the site area.

- Buildings should be placed to retain as many existing trees as possible.

- The building system should allow for incremental development in the event that the total space requirement for each phase is not built at the same time.

- The Building Module System recommended should contain spaces in the same proportion as in the total Programme.

- Teaching areas are recommended to be located centrally in the Building Module, for greater flexibility to expand or contract space.

- The circulation system should allow views to the outside, and incorporate various College activities.

- Mechanical and electrical services should be properly coordinated with the Building System for economy and ease of access.

- Consideration should be given to access for the physically handicapped, by the inclusion of ramps into and within buildings, and the provision of elevators where required.

- In recognition of the Educational Concept, the Resources Module should serve as the campus activity centre, merging with and incorporating the exterior landscape treatment.

- The former Teachers' College building is to be included as part of the total campus development, and renovations to comply with present safety and fire standards are necessary.

- A second storey building link to Lakeshore Teachers' College is suggested from new campus buildings in keeping with the philosophy of interconnected buildings.

- A service and maintenance building is recommended adjacent to the east wing of the Teachers' College building, upon completion of academic building requirements.

- Provision should be made to accommodate the Welding Research facility at the northwest corner of Technology buildings.

- If incineration proves feasible as a means of energy for the campus, a central and screened location must be provided for the incinerator.

- Because of site limitations and the need to maintain landscaped open space adjacent to buildings, expansion of campus facilities is recommended southward, following the path of the watercourse.

- The design of buildings, roads, landscaping, and accessories such as interior and exterior materials and furnishings, lighting, and graphics must be integral with the overall design philosophy and campus development.

- Each projected phase of development should be re-examined on a regular review schedule, every 2 or 3 years.

- The design of all physical facilities should be evaluated in terms of the degree to which Metric Conversion should be implemented.

- It is suggested that temporary construction site facilities be located immediately south of the proposed car loop to serve all phases.

LANDSCAPING DEVELOPMENT

- Landscaping should be employed to retain and reinforce the park-like atmosphere of the site.

- Both active and passive landscaped spaces should be provided, and landscaping should be integrated into the building system.

- Existing trees should be preserved wherever possible, and smaller trees relocated.

- New planting on the campus should be used to provide shade, buffering from winds, to screen and control views, and to soften and complement the buildings.

- Parking areas and service yards should be screened from view by use of berms and planting.

- The location and selection of tree groups should blend with the landscape of the Hospital site.

- A pedestrian walkway from the intersection of Kipling Avenue and Lakeshore Boulevard should extend into the proposed building complex.

- The southeast courtyard adjacent to L.T.C. should be retained and developed as part of a landscaped pedestrian zone extending into the new campus.

- The existing watercourse will serve as a major landscaped feature with walkways in and adjacent to it, complemented by trees, ponds, and waterfalls. It will lead into and through the buildings as a continuation of the landscape.

- Accessibility into the site from the surrounding community should be available from all sides.

- A strip of land adjacent to proposed pedestrian walkways should be preserved for future bicycle paths, and provision should be made for bicycle parking adjacent to buildings, with access from 23rd Street.

- A new walkway from the 23rd Street/Lakeshore Boulevard intersection to the relocated entry at L.T.C. should be provided. Landscaping should be added to the west side of L.T.C. and the existing parking lot.

- The open space north of L.T.C. should remain as landscaped space to act as a foreground to campus buildings along Lakeshore Boulevard.

- A major landscaped space should be developed adjacent to the Resources Module.

- The bulk of landscaped open space should be in the southern portion of the site. The running track and soccer field should be included here, related to the waterfront recreational activities. Part of this area could also accommodate future campus expansion, but should not be used for car parking areas.

- The L.P.H. property assumed to be acquired by Humber should be landscaped in relation to the watercourse and possible future buildings.

- All major site grading should be carried out for the ultimate development in Phase 1, and as much basic tree planting as possible should be carried out over all areas.

- While the use of caliper sized trees is recommended for areas to be developed for early use, it would be possible to plant more inexpensive and smaller trees in areas slated for later development.

- Mature deciduous trees should be strategically located on the east, west, and south sides of buildings, to complement the Mechanical Systems approach.

- Immediate attention should be given to root pruning existing trees to be relocated, especially the apple orchard trees.

TRAFFIC AND PARKING

- The site is one of few suburban campus sites with such excellent public transit access available. The campus should therefore be transit oriented rather than car oriented.

- Comparisons of the predicted flows and the transit capacities reveal that there is adequate capacity in the existing public transit system to serve the daytime and evening peak flows.

- A close liaison should be established between the College and the T.T.C. to ensure that transit services can accommodate demand.

- Vehicular access that is logical for each phase should be provided, and each phase should function satisfactorily as the ultimate development.

- 23rd Street may be used for College vehicular access until Phase 1 completion, but subsequentl campus access must be via the Kipling Avenue extension. This is also the desirable route for the proposed Kipling South bus extension into the campus, and for construction and public access down to the M.T.R.C.A. park.

- The College should obtain approval in principle for the extension of the Kipling South bus route and the proposed bus loop into the campus, prior to finalizing plans.

- Use of the Kipling Avenue extension at the north end of the site must be resolved with the Ministry of Health immediately.

- In the long term, the College must obtain eventual use of the entire length of the Kipling Avenue extension.

- The existing Hospital service road is not of adequate width, but is a beautifully treed and pleasant route. Any road works should respect this.

- The portion of the Kipling Avenue extension near the intersection with Lakeshore Boulevard should be constructed to a 4-lane Metro Roads standard.

- Staggered teaching hours should be considered to spread the peak flows uniformly, rather than compound congestion at the intersection.

- Two entrances into the campus are recommended off the Kipling Avenue extension. A major entry towards the north end of the site is suggested serving most of the campus, and a minor one at the south which could also serve as access to the M.T.R.C.A. park. This will also provide a connection with the park facility for sharing of parking areas with the College.

- Access to parking areas should be via an internal road along the path of the Etobicoke sewer easement. This will also serve as the main service road to L.T.C. and the new buildings.

- Consideration should be given to limiting service vehicle movement to periods outside of peak traffic demand, and to prevent students from parking on roads.

- Emergency vehicle access into and out of the campus from 23rd Street is available via the Metro Works right-of-way south of the existing parking lot.

- The need for temporary construction roads should be evaluated at the time of construction for each particular phase.

- In view of the accessibility via public transit, less parking space should be provided initially than demand calculations would suggest.

- Parking should be considered as residual space, leaving prime usable space for buildings and landscaping.

- Most of the parking should be placed over the Metro Works easement, preserving the land to the east for landscaped space and future campus growth.

- Construction of parking areas will have to be phased with the proposed reservoir and sedimentation tanks.

- The layout of the visitors parking lot should take into account the existing Metro Works pump station.

- The existing L.T.C. car park is to be retained and expanded eastward, creating two sections, separated by landscaping.

- Special provisions may be necessary to ensure that academic staff, visitors, or part-time students use separate parking areas or are assured of a parking space at all times, by means of special pavement markings or by placement of landscaping.

- Consideration should be given to subsidize the use of public transportation with revenues derived from possible parking charges.

- Possible cost sharing schemes should be discussed with the Conservation Authority for all shared parking and road facilities.

- Assure that noise from the Conservation Authority, trucks and Lakeshore Boulevard traffic will not cause significant interference within buildings.

- For rooms sensitive to noise interference, sound-proofing should be investigated to keep out potential aircraft noise.

MECHANICAL SYSTEMS

- If energy is to be effectively conserved, energy budgets of individual systems are required for comparison in conjunction with life cycle costs.

- The energy from lights, equipment, people, the sun, and incinerated waste should be used before any fossil fuel is considered.

- Where excess energy is present, thermal storage provides the means to distribute its use to more appropriate times. This can be achieved using the building structure and a water storage tank.

- A pilot solar collector should be included in the first phase of development.

- Distribution of the energy using diversely located equipment, rather than a central plant can avoid excessive capital expenditures at the initial development phases, and may result in energy savings.

- Variable air volume systems may be used for heating and cooling.

- For ventilation, direct supply of unheated air to workshop exhaust systems can save energy and capital costs.

- Localized penthouses with small mechanical rooms on each floor are proposed for each building phase.

- The penthouse and mechanical rooms should be vertically stacked at a building Node. The water storage tanks should also be located at one of the Nodes, probably underground, providing a vertically integrated system.

- The main supply air distribution ducts and other mechanical services should follow the main circulation system for ease of maintenance access.

ELECTRICAL SYSTEMS

- From the underground 27.6 KV feeder line, a 4000 KVA, liquid-cooled transformer should step-down the power to 4.16 KV. A second (back-up) transformer is considered desirable.

- Primary power distribution is recommended at 4.16 KV between buildings.

- A loop system should be employed to provide continuity of power upon possible failure of any one section of underground feeder.

- Secondary power distribution within buildings is recommended at 347/600 V, and should follow the main circulation system.

- Dry type transformers should be provided where required for incandescent lighting, receptacles and miscellaneous small loads.

- A small diesel generator set is recommended for each building, to provide power for emergency and exit lighting and for fire alarm and communication systems.

- Interior lighting should generally be fluorescent, comprised of task lighting where practical, rather than general overhead illumination, in the interests of energy conservation.

- A reduction in overall lighting levels is recommended, except for task lighting, but should not be less than 80 ft. candles for classrooms.

- Fixture rows adjacent to windows should be circuited to permit their being switched off when not required.

- Local switching should be provided in teaching areas.

- A limited amount of incandescent lighting is recommended to provide a more relaxed and intimate atmosphere.

- Exterior lighting for parking lots, roads, walkways, landscaped areas, and building security should generally be efficient, high intensity discharge type with long life lamps.

- Selection of fixtures should be based upon compatibility with building and landscape design, and the prevention of throwing objectionable light towards residential areas.

- A supervised fire alarm system should be provided.

- The desirability of central control for such systems as closed circuit T.V. or power utilization should be investigated.

STRUCTURAL SYSTEMS

- A grid or module of 35 ft. x 35 ft. is recommended.

- A structural steel framework is foreseen as being the most appropriate system.

- The structure should have a fire rating with a probable maximum two hour rating.

- Mechanical and electrical services should not be buried inside fire rated assemblies.

- In the Technology Module consideration should be given to floor loadings and vibration isolation for machinery.

- The mounting of solar collection panels on walls or roofs should be investigated in more detail, if solar collection proves feasible in future for this campus.

SITE SERVICES

- The site servicing system should allow for a capacity of 6,000 people on the campus at any one time.

- A positive underground storm sewer system should be provided in the portion of the site to be developed.

- Ideally Phase 1 storm run-off should be discharged to the 102 in. diameter Borough of Etobicoke storm sewer outfall. In the event this method will not be approved, a storm sewer should be constructed to discharge into the existing drainage course.

- Sanitary sewage from Phase 2 could be connected with a short gravity sewer to the existing trunk sewer in Lakeshore Boulevard. Phases 1, 3, and 4 will require the use of a pumping station.

- It is recommended that the basis of cost sharing, maintenance and operation of the pumping station be negotiated with the Metro Works Department.

- As the water supply to the Hospital is now metered on the Humber College site, both the meter and connection will have to be relocated.

Acknowledgements

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. Mr. G. Wragg, President, Humber College

. Mr. T. Norton, Principal, Humber Lakeshore Campus

. Mr. H. Edmunds, Director of Physical Resources, Humber College

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