BCIT

Campus Land Use Study

February 1981

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BCIT CAMPUS LAND USE STUDY

Prepared for the Director, Physical Plant
British Columbia Institute of Technology

February 19, 1981

Consultant Team:

Dr. N. Gerald Rolfsen, APRA
Mr. Owen D. Pawson, APRA
Mr. Brian Wallace, Zolton Kuun Associates

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A. Introduction

TERMS OF REFERENCE

In October 1980 APRA was retained to carry out an analysis of land use on the BCIT campus in order to establish a land use plan which would offer solutions to current problems and suggestions on future land utilization. This campus plan had to be cognizant of the Development Plan 1979-1984 and establish recommendations and priorities concerning parking facilities, road access, pedestrian paths, bulk storage and related facilities, student residences, recreational facilities, and landscaping.

Specific tasks which were to be addressed in order to produce this Campus Land Use Study were:

- examination of the existing campus and adjacencies
- review of the Development Plan 1979-1984
- analysis of PVI's planning and its impact on BCIT
- evaluation of existing pedestrian and vehicular circulation, access, and egress with special emphasis on parking.

From these initial studies, recommendations concerning the following issues were to be developed:

- location of bulk storage warehouse and related facilities
- present and future parking facilities
- vehicular access/egress and circulation
- student residences locations
- recreation facilities
- pedestrian circulation
- landscaping.

PURPOSE

This document is intended to stimulate discussion of various issues confronting the overall planning of the BCIT Campus. It represents APRA's present understanding of BCIT's problems and some of their potential solutions.

The Campus Land Use Study employs a series of assumptions with attendant rationale, which are intended to initiate a discussion of the relative merits of the subsequent recommendations. This dialogue should continue as BCIT's plan for land use evolves over time.

STUDY PROCESS

This document was prepared through a sequence of three phases. The first, or "Needs Assessment" phase was conducted simultaneously with the second or "Traffic Analysis" phase.

The first phase of the study was carried out through discussions with planning and user groups on the BCIT campus. These included the students through the Student Association Executive and Advisor, Athletic Services personnel, the Manager of Housing, the Dean of Students, Warehouse planners, Physical Plant personnel, and Parking administrators. PVI planning personnel were also contacted in order to assess the impact of PVI's long-term planning on the BCIT campus. Burnaby's planning department offered advice of a general nature and also specifically with regard to parking and access.

During this initial phase of the study, the consulting engineering firm of Zoltan Kuun Associates conducted detailed traffic counts and parking utilization field checks.

The third phase resolved issues and developed recommendations concerning land utilization through discussions and working papers. An advisory committee of interested user and planning groups on campus reviewed the information and recommendations offering comments and suggestions for development of a land use plan.

Through additional discussions with specific user groups and a "Draft Campus Land Use Study," the Recommendations, Assumptions, and Guidelines were refined for inclusion in this document.

Further discussion of this Land Use Study will offer guidance to campus planners and a basis for further development of specific campus components: Warehouse and Related Facilities, Parking and Access, Recreation Facilities, Housing, Pedestrian Circulation, and Landscaping.

MAJOR ISSUES

BCIT is presently facing problems of dwindling land resources and land utilization within its designated boundaries. As the institution grows in the coming years, these problems will increase and the institution will face planning compromises and probable higher densities as it evidences the characteristics of an urban campus.

The Development Plan 1979-1984 suggests that future educational and support facilities will be concentrated within the present "Core Area." It also generally recommends the maximum densities and potential future uses of all BCIT land parcels. However, its purpose was to address facilities planning and generally confined its analysis to the building Core Area.

Parking demand is the most pressing issue facing BCIT in terms of both the present situation and future planning. The Development Plan 1979-1984 has addressed the problem of shortage of academic facilities. With the solutions to this problem being imminent, parking assumes priority in terms of campus planning.

It must be emphasized that evaluation of parking facilities through dollar value estimates should be tempered with the realization that the shrinking land reserve elevates the real cost of parking facilities beyond the typical paving/ landscaping costs.

Monies must be allocated more carefully and with consideration of factors which in the past have not been as crucial, particularly land availability and its impact on recreational facilities and student residences.

Issues which must be considered for planning of future parking facilities are the usual economic tenets of supply and demand. Because supply is fixed, the demand side of the equation must be addressed.

Several factors which affect BCIT's parking requirements are:

1. optimum Institute size,

2. Burnaby's stance concerning on-street parking, specifically on Willingdon,

3. the advent of rapid transit,

4. the impact of the continuing student housing shortage in the surrounding area,

5. the cost of operating a car both financially and temporally,

6. the system of parking control, and,

7. future needs for PVI parking on the BCIT campus.

The optimum size of BCIT will affect not only parking on campus but also student residences and recreational and facilities planning. Factors affecting this decision are currently being discussed in various committees within the Ministry of Education, who will give policy direction to BCIT in terms of the scope of education to be offered on campus.

In summary, BCIT requires a comprehensive plan of land utilization, given the constraints mentioned earlier, which will be cognizant of the Development Plan 1979-1984 and which will offer guidelines to the future development of BCIT land holdings.

B. Current Concepts and Assumptions

PLANNING CONCEPTS

The following planning concepts are either in place presently and must be emphasized in future planning or they are aspects which must be developed as the campus expands. They are concepts which offer overall guidance to campus planning and have been emphasized by previous reports and have met with consensus during discussions with campus planners.

1. Maintain the present pedestrian core.

2. A central focus to the campus should be established and enhanced with future buildings. The exterior "centre" now seems to occur at the crossroads of east-west and north-south pedestrian circulation between the SAC Building and the Library and 1976 Building. Plantings, plazas, and prime use facilities will emphasize this centre. An interior "centre" identified by the Development Plan 1979-1984 occurs at grade level in the 1976 Building.

3. A campus "entry" must be emphasized for new students, faculty and visitors. This "front door" should be located on Willingdon Avenue (see Development Plan 1979-1984) and new construction would provide potential for this emphasis.

4. Remove temporary structures and consolidate buildings as suggested in Development Plan 1979-1984.

5. There will be a functional connection between Discovery Park and BCIT/PVI which may include a grade-separated crossing of Willingdon Avenue. This crossing should provide emphasis to the "front door" of the campus.

6. Facilitate pedestrian circulation between BCIT and PVI. The policy of PVI seems to be

one of containment and self-sufficiency in terms of facilities and continued sharing of recreational and other support functions.

PLANNING ASSUMPTIONS

BCIT OPTIMUM SIZE IS 5600 FTE STUDENTS

The position of this document for the purposes of establishing constraints to potential planning options will be that BCIT will stabilize at an enrollment of approximately 5600 FTE students. This will require up to 830 faculty and 540 support and technical education staff.

Projections in the Development Plan 1979-1984 suggest that up to 5657 FTE students will be enrolled in programs in the 83/84 academic year with 828 faculty and 538 support and technical education staff. Long-range figures and maximum enrollment size of the Institute is harder to address but this estimate must be made in order to evaluate long-range planning scenarios.

Lack of land will limit BCIT's potential growth. As an urban campus, it must accept limitations of area and either become "vertically" oriented to maximize available resources (with correspondingly higher construction costs) or stabilize its population. The latter course seems to be preferable.

Various educational task forces and committees presently studying BCIT's role in the post secondary sphere may also have an impact on growth. This aspect is impossible to predict at this point in time, but for purposes of this document, it will be assumed that the present general policy of regional college emphasis and promotion of the video medium as an educational tool will slow BCIT's growth.

It may also become necessary to establish other sites to accommodate BCIT growth by consolidating specific technologies at these other locations. This would avoid overcrowding of the existing BCIT campus.

Implication

By stabilizing the institution's population, a period of catching up will enable the campus to solve deficiency problems in parking, student residences, and academic facilities.

Consolidation and improvement of recreational/ greenbelt facilities can also be made.

WILLINGDON PARKING

Burnaby will eventually eliminate street parking on Willingdon.

The municipality has been suggesting for some time that this will become a reality and though the timeframe is not fixed, it is a good bet that rapid transit will provide a good rationale for this to occur.

Implication

This means that another 300 cars must be accommodated on the BCIT campus. For pragmatic reasons, approximately 100 spaces on neighbouring streets should be anticipated.

RAPID TRANSIT

Rapid transit and the advent of additional student residences will balance the effect of the housing shortage with respect to parking.

The proposed LRT line with a rapid transit stop at Willingdon and Central Park and supporting "feeder" transit along Willingdon, should offset some of the negative impact of the housing shortage. With the proposed transit line extending into Surrey, students will be able to take advantage of the relatively inexpensive accommodation and yet still have convenient access to the campus. Additional student residences will also alleviate the parking problem.

Implication

Parking requirements will not be affected by these offsetting factors.

CARS/STUDENT RATIO

The ratio of cars/student will remain unchanged in the near and medium future at least.

The impact of rapid transit should eventually improve BCIT's parking problem as it becomes an accepted form of commuting.

Implication

Parking requirements for the projected BCIT population can be extrapolated from existing data except in the long-term. In the short term, the availability of resources for the student and the needed accessibility of the car would suggest a continuation of the status quo. Eventually, demand for parking should fall off as energy costs continue to rise and rapid transit becomes increasingly efficient in terms of scope and convenience.

STAFF PARKING

The current practice of "overbooking" staff parking lots will continue.

This existing overbooking is 45 percent for faculty and staff, resulting in occasional overcrowding. A more realistic factor would be approximately 33 percent.

Implication

Assuming that an additional 455 staff/faculty will have to be accommodated, an additional 385 stalls are required.

PVI STAFF PARKING

It is assumed that PVI will provide their own staff parking needs for the short through long range.

Implication

This implies that only the student parking requirements of PVI must be considered at least in BCIT's short- and medium-term planning. Long-term planning should anticipate accommodation of all PVI parking on PVI land.

PVI PARKING ON BCIT CAMPUS

PVI parking on BCIT campus will be managed by BCIT.

It is essential for control purposes that BCIT have charge of all parking on its campus. It is anticipated that in the long term, PVI will become self-sufficient in parking for faculty, staff, and students. However, at least for the

short and medium term, parking must be accommodated on BCIT campus and regulated by BCIT parking controls.

Implication

To enforce parking regulations, the most effective method would be containment of PVI parking to one particular area/zone.

PVI PARKING STRUCTURE

PVI parking, as predicted in the "PVI/Burnaby Campus - Site Planning and Development Study - March 1980", will include a multi-level parking structure only in a long-range scenario.

Implication

This implies that BCIT must continue to accommodate up to 830 PVI cars by 1985 on adjacent BCIT land. PVI's 5-year planning scenario suggests that by 1985 only 459 spaces would have to be accommodated in the multi-level parking structure. However, a more realistic approach is to anticipate that PVI will be able to supply enough space (on its own campus or elsewhere) for its student growth and that the absolute number of PVI students parking on the BCIT campus (830) will remain relatively static in the short and medium term.

Long-range planning should anticipate these additional parking spaces to eventually become part of the BCIT inventory.

C. Planning Recommendations

The Recommendations which follow require ongoing evaluation/discussion as the campus is further developed. In some cases, cost analysis may suggest alternatives to these concepts or variations in their implementation. Further discussions with users or special interest groups may also suggest variation in the method of effecting the concept. Included with each concept is a rationale for its inclusion in this document, which will serve as a basis for further dialogue.

WAREHOUSE AND RELATED FACILITIES

1 The Warehouse and related facilities should be located to the south of the Logger Sportsfield along Wayburne Avenue.

This area is presently unused and has good potential access from the Wayburne/Carey corner. This type of facility, if properly landscaped and designed, would relate well to the architectural style represented by the Testing Station and ICBC building. Overall zoning of the campus would suggest that the south end of the campus be left as a car storage area and that a substantial portion of the middle campus be left for recreational uses. Other areas are already utilized or designated for residential or academic facilities. This would imply that this corner of the campus could be used to advantage with the Warehouse and related facilities.

PARKING

2 The total additional parking requirement for BCIT campus, taking into consideration BCIT and PVI students (900) and staff/faculty (385), will be 1285 spaces.

This figure and the rationale behind it is described in Appendix I. Analysis of past information and field checks in the fall of 1980 provided the basis for the figure of 1285 parking stalls. The Development Plan 1979-1984 also established ratios and student enrollment figures defining parking requirements.

In addition to the existing satisfactory staff parking allocation system,

3 **An equitable method of parking allocation to ~~staff and~~ students must be applied to existing and future parking facilities.**

The present scramble method is an inappropriate solution to the parking problem both in terms of available resources and time for faculty, staff and students. By allocating specific areas for particular groups, users will be assured that a parking spot will be available, thus avoiding the necessity for early arrivals and the following "hunt" by most campus drivers. This system could also provide extra finances to help cover any additional manpower required to police the parking. Allocation of preferred areas does not necessarily have to be based on financial criteria - students may have to provide evidence of "need," in order to qualify for a (preferred) parking spot.

This requires action on 4. + 6

Students must also be convinced, probably by substantial visible improvements, before they would be willing to change from the present system. Allocation of PVI parking on the BCIT campus would also have to be evaluated before implementing this recommendation.

4 **The present union agreements with regard to parking should be changed to enable a preferred parking system to be properly established.**

In order to charge a reasonable rate for students as well as faculty/staff, the present agreements must be changed to reflect a more positive attitude towards BCIT's parking problem.

5 **Provide as much parking as possible close to the Core Area without compromising the ringroad/ pedestrian core relationship.**

This concept must be implemented in conjunction with a parking control/allocation method. Though land in these areas will be more costly in terms of parking accommodation, it must be emphasized that using up other available land may not be as inexpensive as the bottom line

suggests. Aesthetics, convenience, and safety are aspects which should also be entered in the equation before the final evaluation is made.

This parking would become part of the overall parking inventory and control and would likely provide space for staff and faculty. Underground parking in the Core Area would cost approximately $5,000-7,000 per stall to construct though some of this investment could be recovered by adequate monthly parking charges.

refer to 9.

6 A defined parking zone should be established for PVI parking on the BCIT campus when the preferred parking system is instituted.

This will enable effective control of PVI parking on the campus and may solve problems with issuance of parking permits to short term PVI students. This area should be defined in consultation with PVI planning staff.

7 As more parking is accommodated on campus, access and egress for vehicles must be improved.

In consultation with Burnaby, BCIT should develop an additional access/egress either on Moscrop and/or upgrade the present "right in, right out" Willingdon access to a full intersection at the Kyle extension. A potential option to the latter intersection would be a Goard Way/Willingdon improvement to include a traffic light. These improvements will create better egress from the campus south on Willingdon.

8 A single deck on the "pink" lot should be considered in medium-range planning.

Once the "scramble" system is replaced with more orderly parking arrangements, this deck, as a designated area, could reduce traffic into the campus as its major entry would be from Wayburne. Costs may suggest however that this lot become a medium-range reality as the south end reaches parking saturation.

9 Underground parking for new construction should be considered only for long-term planning purposes when the supply of on-grade parking has been exhausted.

The cost of underground parking is prohibitive for the short- and probably the medium-range planning scenario. However, in the long term, the decreasing supply of campus land may make underground parking more feasible. — See 5.

10 Parking lots must be aesthetically de-emphasized through landscaping and scale if possible but without compromising security.

The municipality of Burnaby is very concerned about the impact of BCIT upon its neighbours and specifically about the relationship of the campus to the encircling thoroughfares. Landscaping will effectively reduce the impact of parking on the passing traffic. It will also avoid the ambience of typical asphalt car storage areas. Effective planning of pedestrian pathways and jogging trails may help keep the size of the lots to a more human scale. Security should not be overlooked, particularly for those areas at the south end of the campus.

A program of landscape upgrading of present parking lots and strips should be instituted (especially along Wayburne Avenue). Future lots should remain small in scope if feasible (berming and/or landscaping) but with consideration of security/safety issues.

BCIT OPTIMUM SIZE

11 BCIT should address the issue of its optimum size for purposes of long-range planning. Criteria which must be assessed when making this decision are:

External Constraints

- Ministry of Education policies impacting on BCIT programs,
- economic and socio-economic conditions

affecting technological industry (i.e., demand from industry for graduates),
- trends toward technical and vocational training,
- demographic analysis (i.e., the supply side of the equation),
- competition from colleges/universities with respect to enrollment,
- convenience of rapid transit.

Internal Constraints

- what programs will be taught,
- amount of land remaining,
- potential/feasibility of highrise construction,
- potential for removal of various components (housing, parking, recreation) to off-site locations,
- priorities concerning compromises in support facilities (e.g., how important is it to have housing on campus).

Quality Constraints

- psychological impact of small versus large educational facilities
- desirability of highrise development
- style of teaching - student/teacher ratio.

RESIDENTIAL **12** **An additional five units or equivalent of student residences should be provided in a manner to encourage the "village atmosphere" inherent in the existing residences.**

By assuming a leveling-off of BCIT enrollment, land availability on campus should accommodate these additional units. Off-campus residences should be avoided due to the problems involved with BCIT's longer hour schedule and access to campus resources. The area suggested as expansion for the "residential village" would not be used for parking or recreational purposes and it is unlikely that given the 1979-1984 Development Plan, academic facilities will spread beyond the Core Area.

RECREATIONAL FACILITIES

13 **The present track is used only as a jogging track and should be removed and an adequate jogging trail provided.**

Substantial renovation is required in terms of edging and resurfacing of the existing track in order to return it to its original condition. As there is no present track and field club, and future interest being unlikely or at best uncertain, its present function could be better accommodated by a fitness/jogging trail elsewhere on campus.

14 **Incorporate two full-size fields turned 90° to the present track field's orientation.**

The utilization of these two fields would likely increase due to a better surface than that presently on the all-weather field. This combination would also allow for more flexibility in terms of field maintenance, i.e., if one field becomes over used and requires repair, athletic programs will be able to continue on the other.

15 **The all-weather field is underutilized and should be used for short- and medium-term parking and for longer-term recreational planning as future facilities are required.**

Poor present usage may be a result of the quality of surface and/or lack of student interest. In either case, a replacement for this field should be made available before it is taken from the recreational land area and used for another purpose.

Short-term gains in parking faclities would likely be worth the investment of constructing two playing fields in the track/field area. Longer term use of the site for recreational facilities (i.e., rink, pool) would still allow for a substantial parking area.

16 **The stream should be enhanced and landscaped in conjunction with playing fields and parking developments.**

The placement of two fields to the west and a parking lot on the east would require that some funds be appropriated for enhancing the stream's appearance. The jogging trail could also encourage use of the stream bank and any monies set aside for a fitness circuit could serve a dual purpose here.

PEDESTRIAN CIRCULATION

17 **Pedestrian pathways should continue to be upgraded in terms of safety and convenience.**

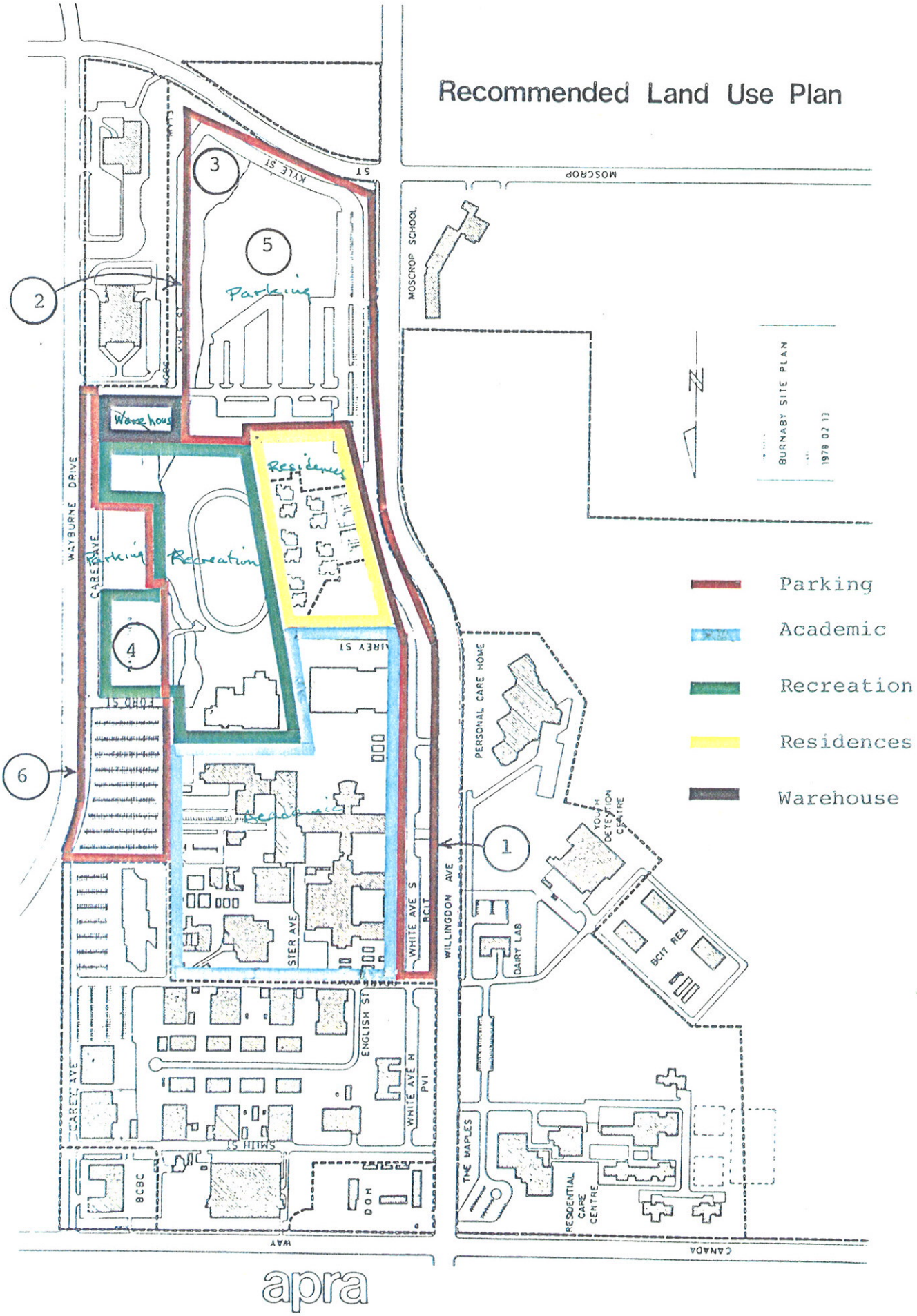
The circulation route to parking lots to the south, which was recently upgraded, still requires more work in order that users of the route perceive it as being "safe." Clear visual contact from the parking lot to the Core Area should be provided to enable the users to have their destination in sight. This will create a sense of security because an estimate can be made of the travel time and also a visual assessment can be made of potential "safe" areas if any trouble develops.

By widening the section of walkway through the wooded area and enhancing views to and from the campus core area, this parking area will improve its image. Also, by incorporating other parking areas, a jogging/fitness trail, and landscaping, the area will lose some of its "rural" character.

18 **The activity node established with the intersection of the central N.S. pedestrian circulation from/to the South end parking areas and the E.W. route between SAC and the Library should be emphasized by activity-intensive uses.**

The present student proposal to construct racquetball courts on the north wall of the gym should be considered only if other locations have been debated. The student planners should

work in conjunction with campus planners to evaluate other sites. The other more activity-related uses proposed presently as a second phase addition to these court facilities should be encouraged to locate at this node. Once other sites have been assessed and if this addition is the best option then this facility should be landscaped, bermed or placed below grade to soften its mass and opened up via glazing to provide glimpses to passersby of the activity within.


Recommended Land Use Plan
Parking
Academic
Recreation
Residences
Warehouse
BURNABY SITE PLAN
1978 02 13
MOSCROP SCHOOL
WAYBURNE DRIVE
KYLE ST
CAREY AVE
WHITE AVE S
WHITE AVE N
ENGLISH ST
WILLINGDON AVE
PERSONAL CARE HOME
YOUTH DETENTION CENTRE
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D. Land Use Plan

WAREHOUSE AND RELATED FACILITIES

Access to municipal streets, proximity to the campus core, and utilization of a relatively undesirable section of the campus are the criteria used to place these facilities at this location.

PARKING

BCIT should consolidate its parking in the areas shown in the accompanying site plan. Using the working paper by Zoltan Kuun and Associates (Appendix 1) as a guide, the following recommended parking areas (in order of sequential implementation) should be constructed as demand dictates:

	Net Stalls	Cost/ Stall	Approx. Cost
1. 90° parking on White Avenue	125	$ 800	$ 100,000
2. 90° parking along the east side of Kyle extension	45	$ 222	$ 10,000
3. Southeast corner of Kyle extension	100	$ 150	$ 15,000
4. All weather field*	250	$ 120*	$ 30,000*
5. South area parking**	400	$1400	$ 560,000
6. Deck on pink lot	400	$4500	$1,800,000
TOTAL (1980 dollars)	1320		$2,515,000

* The inexpensive cost of this parking is misleading. This area should be retained as a field until the present track/field area is converted to two full-size sodded fields. Approximate cost of $150,000 per field increases cost/stall to $1320.

** This parking area must be considered before Burnaby removes on-street parking along Willingdon, probably by 1985 (with the arrival of rapid transit).

Underground parking should be considered as the available parking areas are used up.

It should be emphasized that the above costs are exclusive of any landscaping expenses and that these should be considered as an essential cost when providing parking facilities.

ACADEMIC

Academic facilities should be concentrated in the present Core Area as per the Development Plan 1979-1984. The acquisition of the Teacher Training Centre and removal of temporary structures, should provide adequate infill opportunities to satisfy BCIT shortfall growth and even for expansion beyond optimum size.

RECREATION

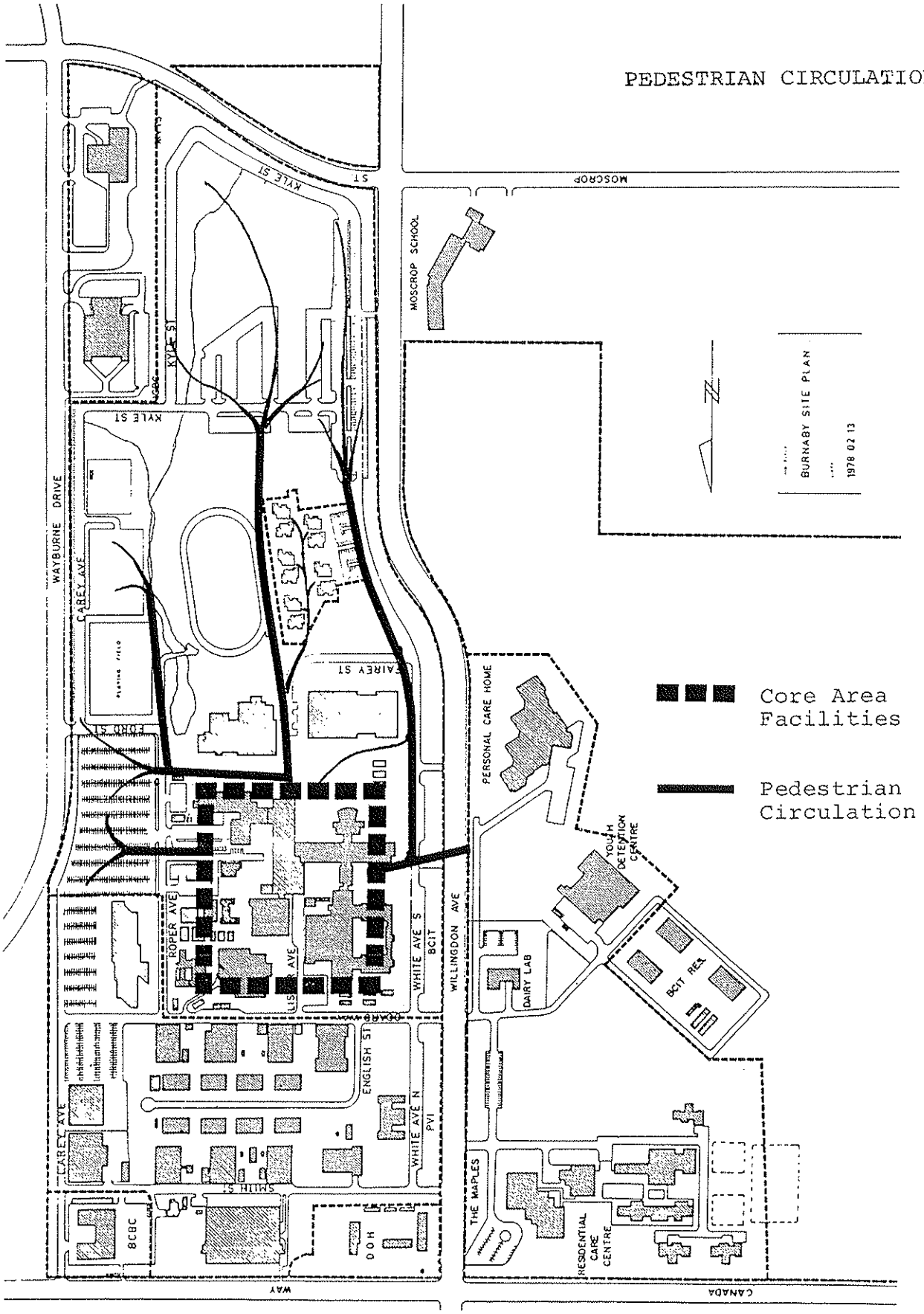
Recreational facilities will be grouped around the present facilities with the major change involving the track/playing field and the all-weather field. Future facilities, which may include a skating rink/pool complex, should be located on the all-weather field. In the interim, parking could be accommodated if two full size playing fields are provided on the present track/field facility. These improvements should include landscaping of the stream, provision of a jogging/fitness trail, and relocating the parking pathway if required. It is likely that even after provision of future recreational facilities on the present all-weather field, there will still remain a substantial parking area. Proposed facilities for racquetball courts would be best situated near the gymnasium support facilities and in an area not intensively used for pedestrian activities.

RESIDENCES

Future student residences should be contained within the area defined in the land use plan. By thus restraining the area available to this component, a higher density is implied for

future construction. The present "village atmosphere" should be retained, and it is anticipated that additional residences, even though in a more compact style, could reinforce this atmosphere.

PEDESTRIAN CIRCULATION



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E. Planning Guidelines

PEDESTRIAN CIRCULATION

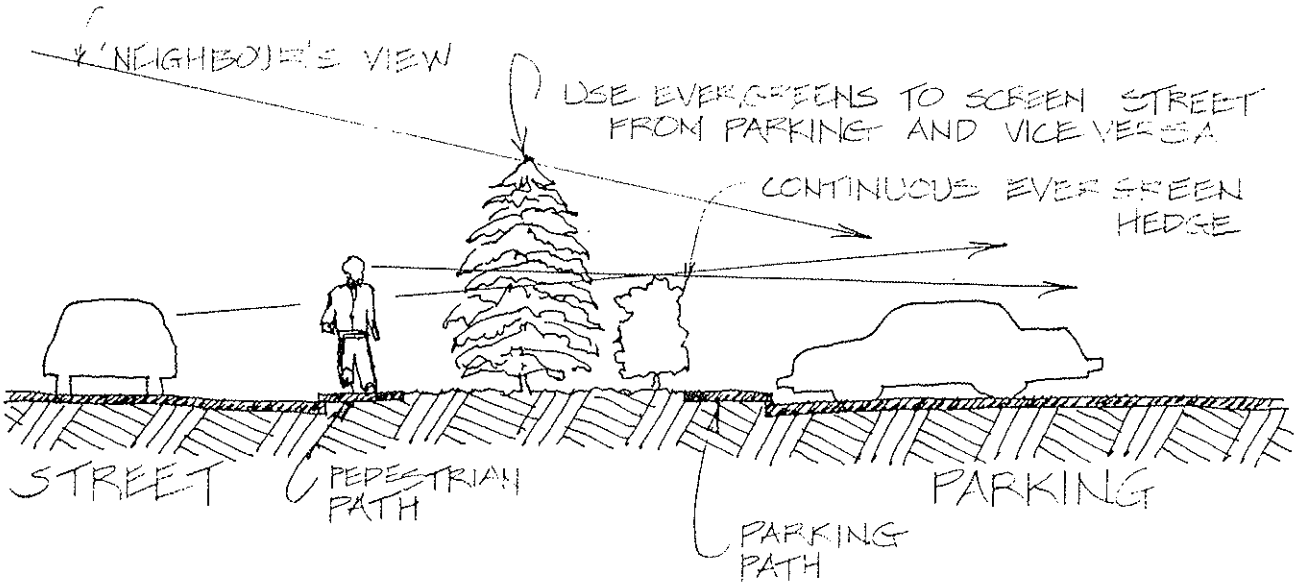
The pathway system depicted in the accompanying site plan shows the existing and probable future circulation from parking/transit areas to the Core Area facilities. Within the Core Area, it is anticipated that the system outlined in the Development Plan 1979-1984 will be followed and that a campus focus/activity node will be encouraged. Additional improvements to the major routes will alleviate the problem of the south end of the campus being undesirable for parking. Recommendations for the type of improvement have been made earlier in this document and it would be prudent to improve other paths to additional parking areas as they are developed.

LANDSCAPING

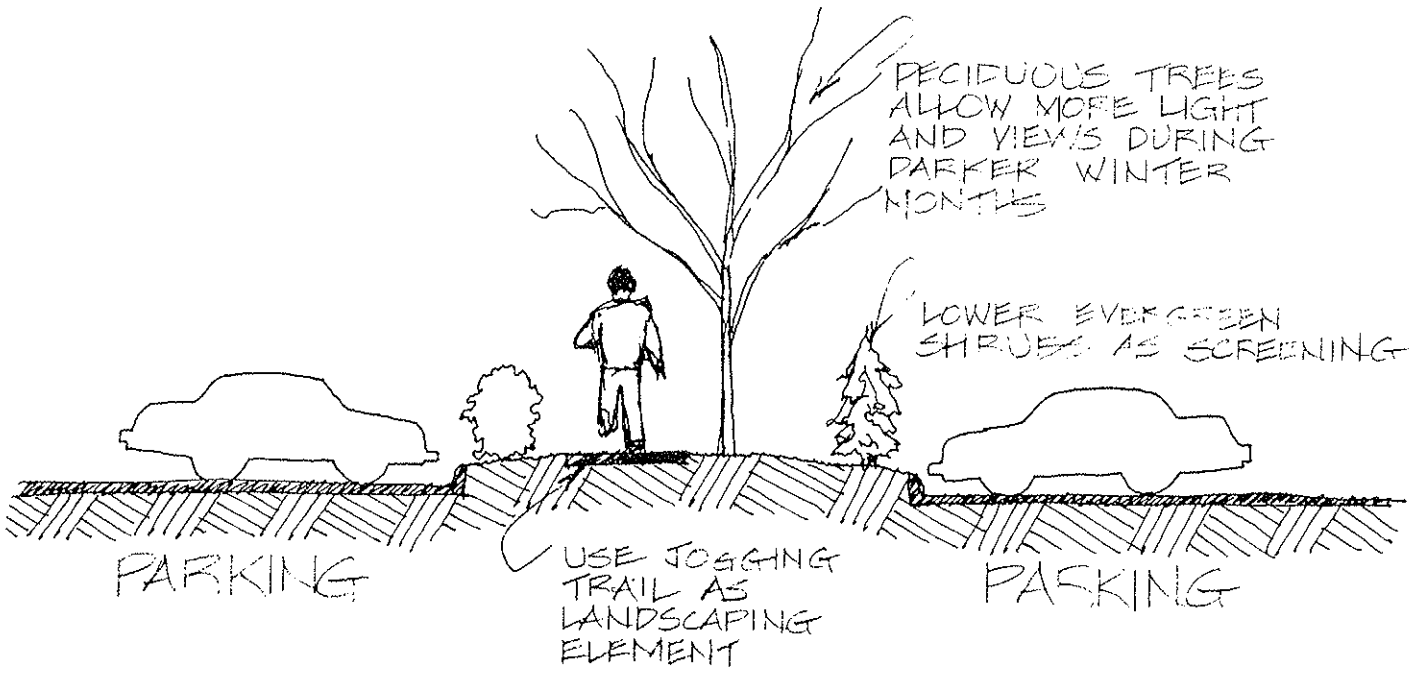
Landscaping, as shown in the accompanying site plan, should be undertaken as building and parking facilities are executed. Types of landscaping can be grouped according to the intended purpose:

1. Parking Screening

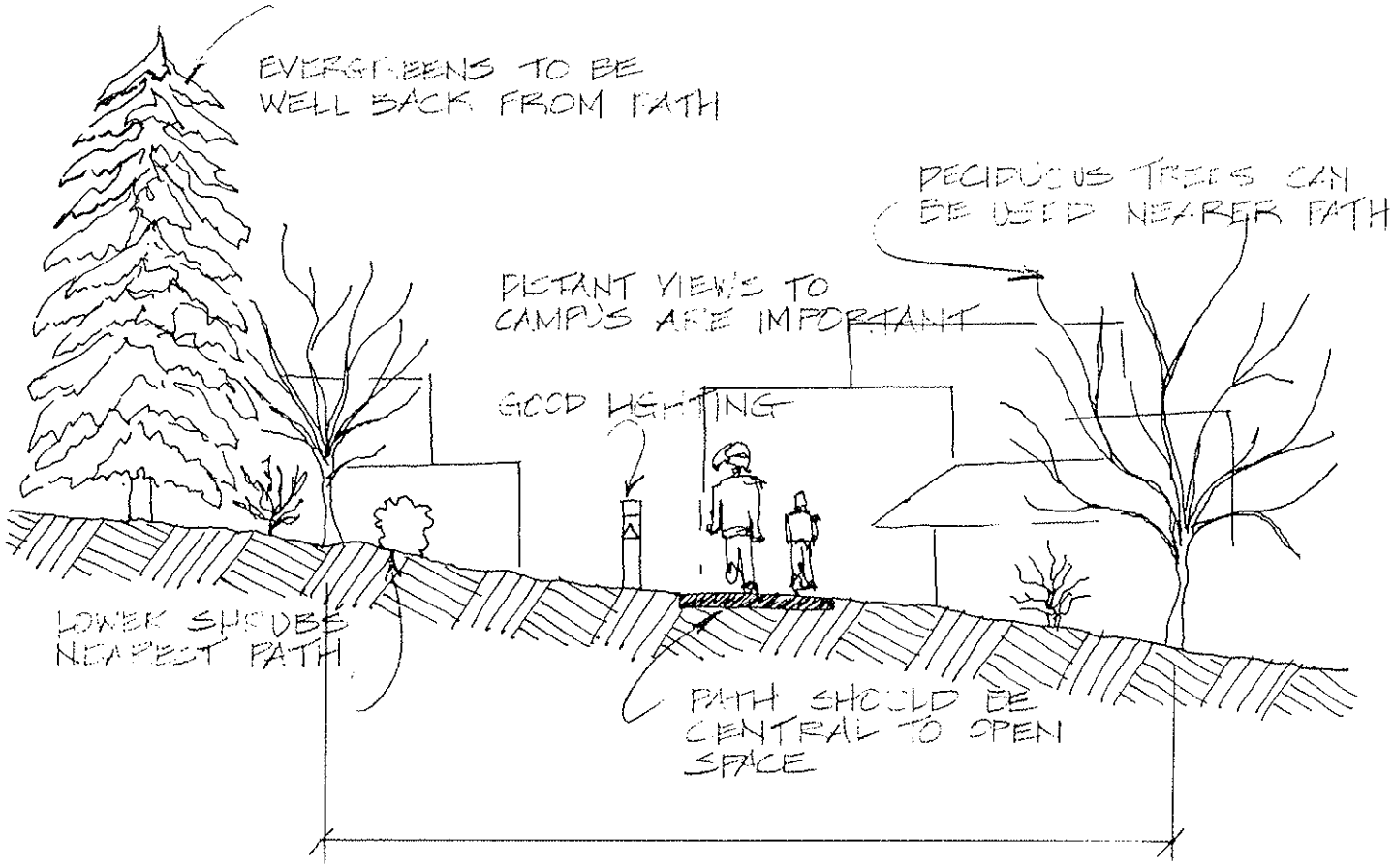
a) from municipal streets/other:



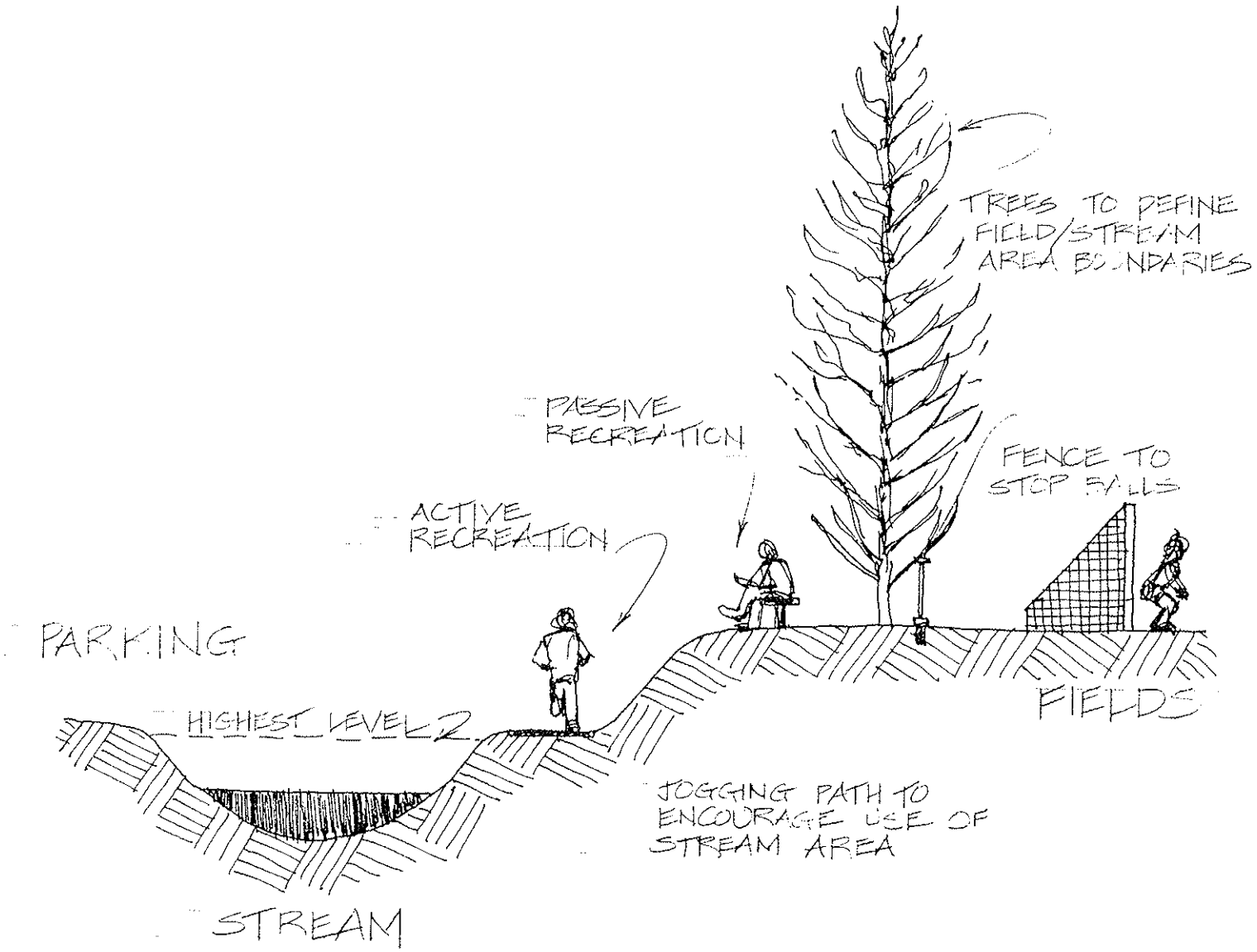
b) aesthetics:



2. Pathway Development

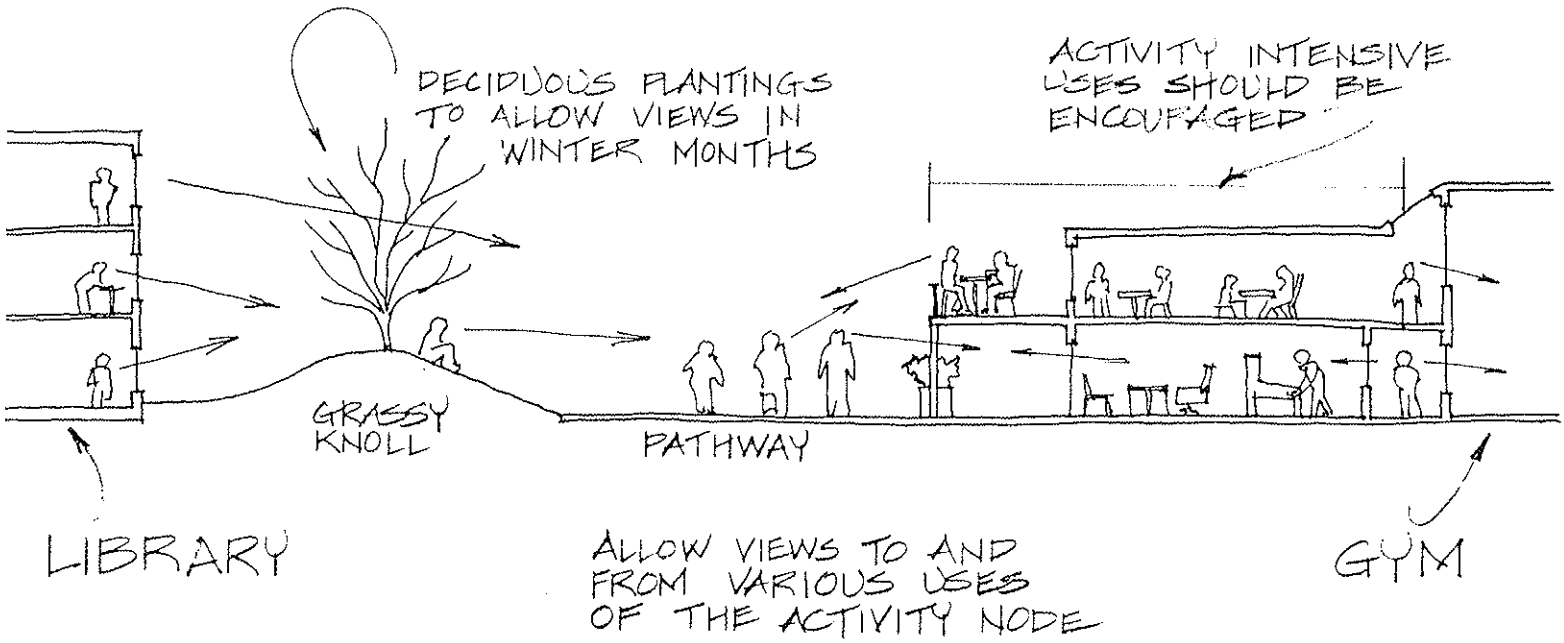


3. Environment Enhancement



ACTIVITY NODES

Development of a central activity node has been suggested by the Development Plan 1979-1984 for the area of the 1976 Building. This node, by virtue of its placement, will become the central focus for BCIT students. In terms of exterior circulation nodes, the area to the south of the 1976 Building, between the Gym and Library, should be enhanced as a circulation crossroads. This present pathway between the Library and SAC Buildings is well-landscaped and well-used by pedestrians. Future uses which could enhance this area are: cafeterial/lunch area, student pub, student leisure patios, games areas, and other activity generating uses.



Appendix 1

BCIT PARKING

This working paper outlines current parking conditions at BCIT, and discusses future parking demands for a variety of assumptions about on-street parking and transit usage.

A. Current Conditions

The parking situation at BCIT particularily relative to students is difficult to analyze because of the sharing of parking with PVI students. If there were clearly defined boundaries between PVI student parking and BCIT student parking understanding the parking problem would be significantly easier.

However, based on field checks in the fall of 1980 and other information in our files the following data has been developed:

1. Enrollment

BCIT	3850	(daytime)
PVI	1800	
TOTAL	5650	

2. Staff/Faculty, etc.

BCIT	915	

It is assumed that no PVI staff use BCIT parking facilities now and will not in the future i.e. PVI will handle their own staff parking needs.

3. Parking Availability

a) students

On-Site	2330	(BCIT proper plus areas east and north of the PVI Electrical Training Building)
Off-Site	400	

b) staff 735 (BCIT only)

Note:

One staff lot (475± stalls) is "overbooked" by approximately 45%

i.e. approximately 675 cars are assigned to this lot but are not there all at once because of varying schedules, etc.

4. Parking Usage

a) Students

On-site including areas east and north of the Electrical Training Building	2200	
Off-site, Willingdon and others	400	
Total Student Parking:	2600	(No. of cars parked)

b) Assumed Distribution of Cars Parked

	STUDENTS		
	BCIT	PVI	EMPTY
On-site	1470	830	130
Off-site	300	100	0

c) Staff

On-site	735

5. Parking Demand Ratio

Based on information obtained in earlier studies car drivers represent approximately 52% of the student enrollment and the daily attendance averages approximately 90% of enrollment. These two factors results in a parking demand ratio of 0.46 stalls per student enrolled.

B. Future Conditions

1. Student Enrollment

BCIT	5600
PVI	2400
TOTAL:	8000

2. Staff/Faculty

BCIT	1370

3. Transit Usage vs Car Usage

For the purposes of calculating future parking demands two conditions are examined:

a) no change in the current percentage of car drivers, and

b) a reduction in car drivers from 52% to 42% of enrollment.

The reduction in car usage could be attributed to any of the following:

i) higher costs for gas, etc. - the impact in price increases for operating a car would probably have little overall long term affect on car usage because the price increases are generally in small gradual increments - especially gas prices.

ii) parking charges on campus - implementation of parking charges on campus might have an immediate impact on current students if the charge was high enough ($15 - $25 per month?) but in subsequent years such a charge might not be a significant factor (unless it is reasonably high) because it would be viewed as just another part of the cost of going to school.

iii) introduction of allocated or preferred parking: this would probably be combined with a pricing system i.e. the closer parking is to the core the more expensive it is. Again, the cost of parking would be the major determinant on the parking demand.

iv) if parking was "unavailable" a forced reduction in the percentage of car drivers might occur but the results might be much student dissatisfaction, etc. Without available parking, reasonable transportation alternatives would be necessary. These alternatives could be car-pooling, transi or walking.

3. Transit Usage vs Car Usage, (cont'd)

Walking as a major mode of travel is unlikely, because of limited amount of student accomodation within walking distance.

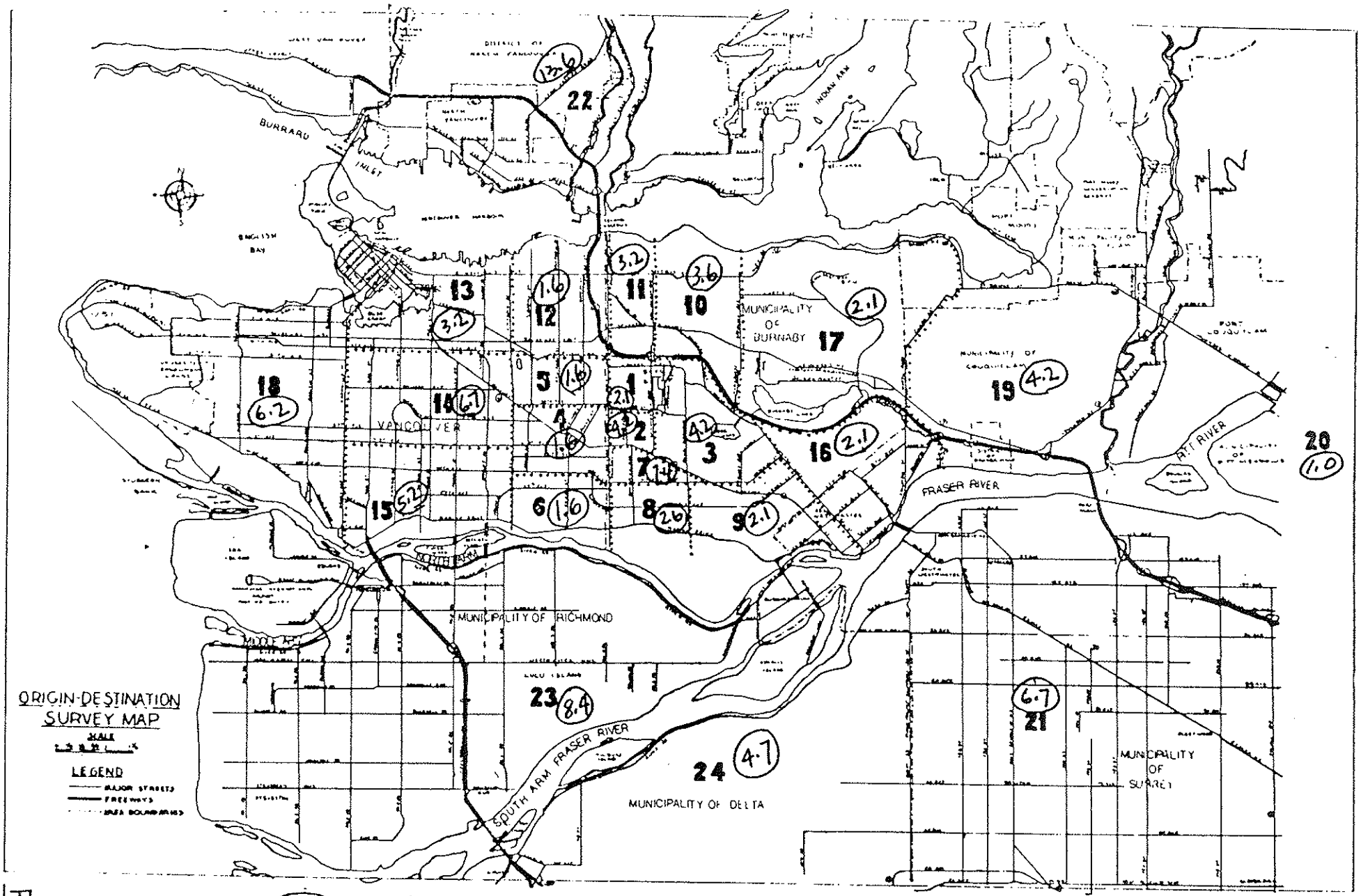
Car-pooling occurs to a small degree now but on a large scale is relatively unlikely because of the effort required to operate a car pool in such a situation - different class schedules, divergence of residential location,
etc.

Transit usage is related to the quality of transit services provided. Transit services varies throughout the region by virtue of the transit usage potentials. The route system is patterned to a large degree on the basis of the major demands - of which BCIT/PVI is not.

The introduction of LRT service in the Kingsway corridor will have some impact on transit usage to BCIT/PVI, however the LRT route will require a transfer. The transfer from LRT to bus detracts from the quality of service but the speed of the LRT service may allow students to live further from the campus without a major increase in travel time.

In reality, the vast majority of students will live some distance from the LRT route and use of it would then involve 2 transfers if the LRT route was the best choice of transit to use for the trip. Figure 1 illustrates the residential dispersion of the BCIT population in the spring of 1973. There are some indications that there is a shift to a greater percentage further from the campus because of the scarcity of accomodation.

Any increase in transit usage is more likely to be because of the 3 previously mentioned factors rather than because of improved transit services recoginzing that LRT will not be in



(0.0) % OF BCIT POPULATION LIVING IN ZONE (1973)

(Σ 99.9% because of round-off)

FIG. 1.

3. Transit Usage vs Car Usage, (cont'd)

service in 5 years.

C. Future Parking Needs

1. Students

For the given future student enrollment 8 "futures" re: the additional amount of parking required have been developed. The 3 variables used in calculating the future demand are:

a) percentage of car drivers

b) availability of on-street parking

C) PVI student use of parking

For each of the foregoing, 2 conditions have been assumed:

a) 52% car drivers; 42% car drivers

b) 400 off-site; 100 off-site

c) PVI students use about 30%(830) of the on-site spaces. The two conditions are that:

i) PVI students continue to use 30% of available parking

ii) PVI students only use 830 spaces and increasing PVI student parking demands are handled elsewhere.

Table 1 summarizes the results of this analysis.

	% CAR DRIVERS		AVAILABLE ON-STREET PARKING		PVI STUDENT USE		
	52	42	400	100	same absolute number	same % spaces	additional spaces needed*
FUTURE 1	X		X			X	950(285 PVI share)
FUTURE 2	X			X		X	1250(375 PVI share)
FUTURE 3	X		X		X		675
FUTURE 4	X			X	X		900
FUTURE 5		X	X		X		230
FUTURE 6		X		X	X		460
FUTURE 7		X		X		X	610(180 PVI share)
FUTURE 8		X	X			X	310(90 PVI share)

* Based on a full utilization of existing parking spaces

TABLE 1

2. Staff/Faculty, etc.

For the proposed increase of 455 staff/faculty, etc., the additional parking required would be 325 stalls assuming the same degree of "overbooking" as today. The amount of overbooking that works may vary as the Institute expands such that less overbooking is possible. On the basis that a 33% overbooking is the limit (existing 45%) the additional parking demand is 385 stalls.

Current travel modes (i.e. percent cardrivers) will probably not change over the 5 year planning period under consideration. Therefore, the parking demands calculated using present travel patterns should be adequate for planning the provision of more stalls.

3. Total Parking Requirement

Based on the foregoing, the additional on-site parking requirement is:

a) worst case 1250 + 385 = 1635 stalls
b) best case 230 + 325 = 555 stalls

For planning purposes the probable case is more likely to be; 900 (Future 4) + 385 = 1285 stalls - which represents the provision of approximately 260 stalls per year for 5 years. The 900 stalls includes 225 stalls required to meet the demand created if the Willingdon on-street parking is eliminated. Therefore, the initial on-site need is 1060 stalls.

D. Locations/Costs For Additional Parking

Figures 2,3, and 4 show the amount and approximate cost of parking at various locations on the campus.

Ballpark costs for various types of parking are as follows:

1. improving the edge of an uncurbed road for 90^{o} parking: $100 to $150 per stall
2. 90^{o} parking on a curbed road: $500 to $800 per stall
3. uncleared bush area: $1100 to $1400 per stall
4. simple structure: 2 to 3 levels $4500 to $5000 per stall
5. lower levels of buildings - design dependent - $5000 to $7000 per stall.

During the planning/design stages for new development consideration can be given to the provision of parking as part of the building. Each building site will present its own design constraints in terms of the amount of parking and the access to such parking. In general, this method will provide a small percentage of the required additional parking at a relatively high cost per stall.

E. Parking Management

The joint use of the parking facilities by both PVI and BCIT students makes implementation of a parking management system somewhat more complicated than if BCIT existed in isolation. Nevertheless, some system of parking changes and lot assignment should be implemented.

Parking charges could generate between $100,000 and $200,000 per year. Lot assignment (related to the parking charge) would rationalize traffic flows and routings to the campus somewhat, and would result in drivers proceeding directly to their assigned lot rather than converging on the parking areas closest to the campus centre.

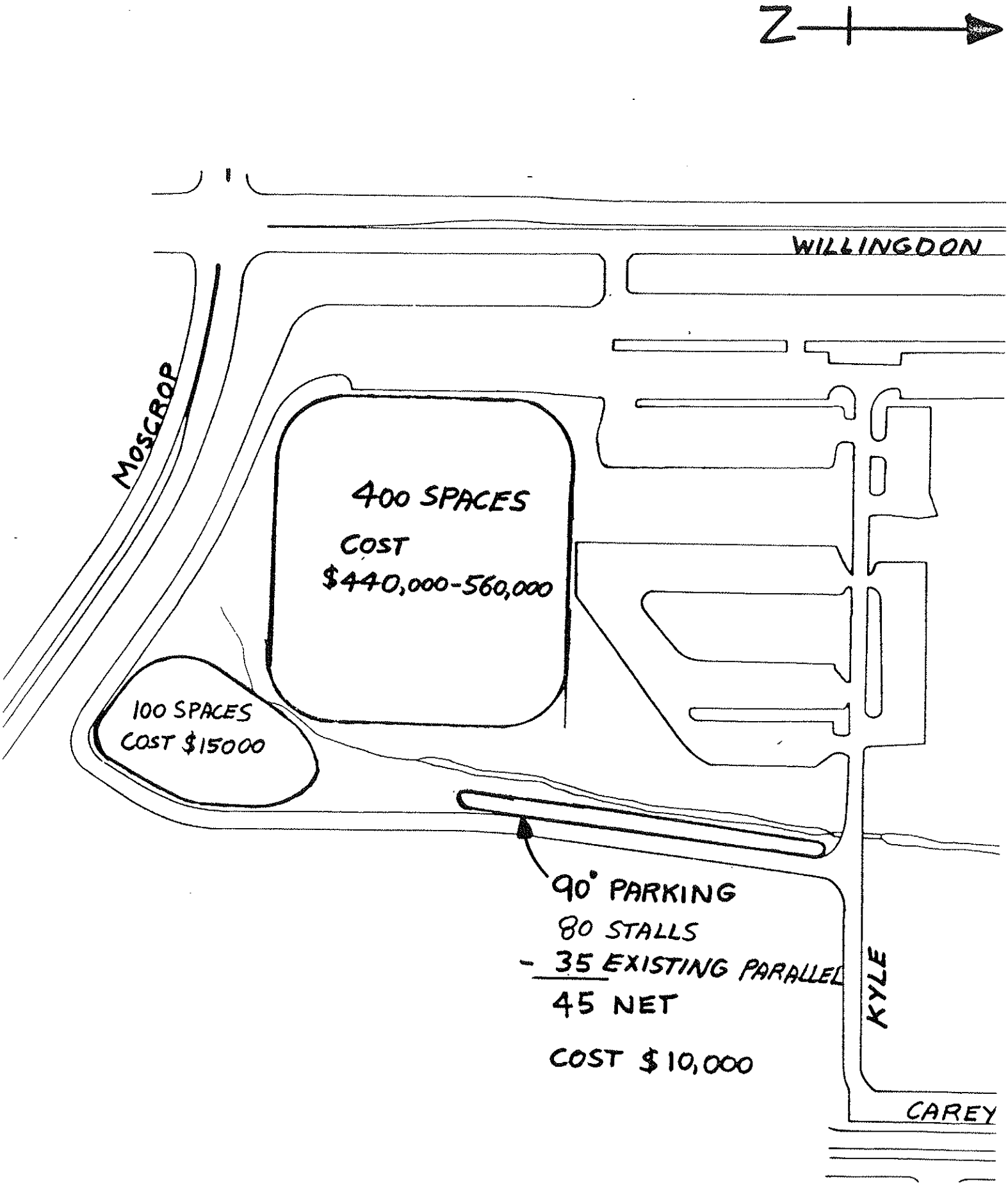

N
WILLINGDON
MOSCROP
400 SPACES
COST
$440,000-560,000
100 SPACES
COST $15000
90° PARKING
80 STALLS
- 35 EXISTING PARALLEL
45 NET
COST $10,000
KYLE
CAREY

FIG. 2

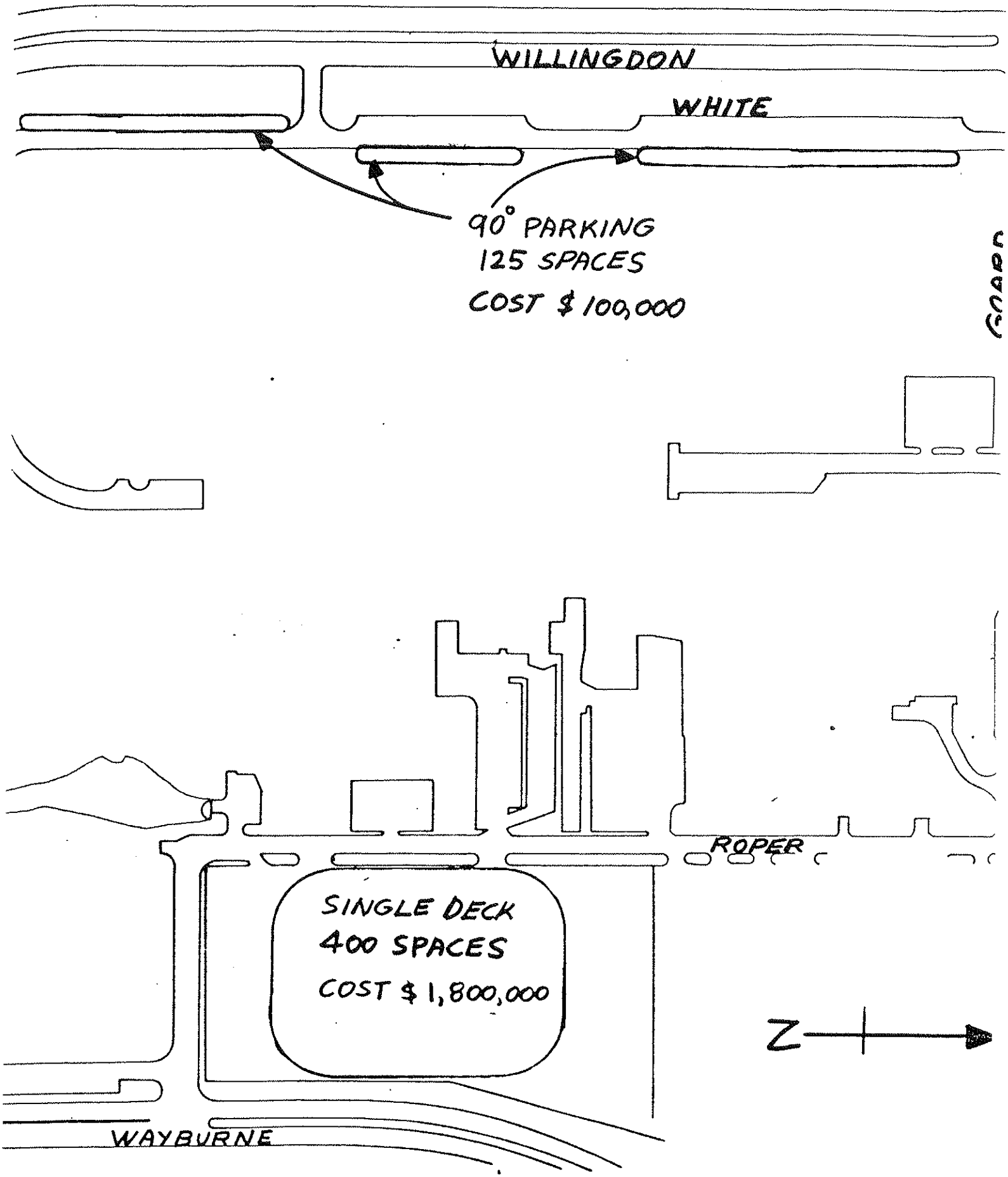

WILLINGDON
WHITE
90° PARKING
125 SPACES
COST $ 100,000
ROPER
SINGLE DECK
400 SPACES
COST $ 1,800,000
WAYBURNE

FIG 3

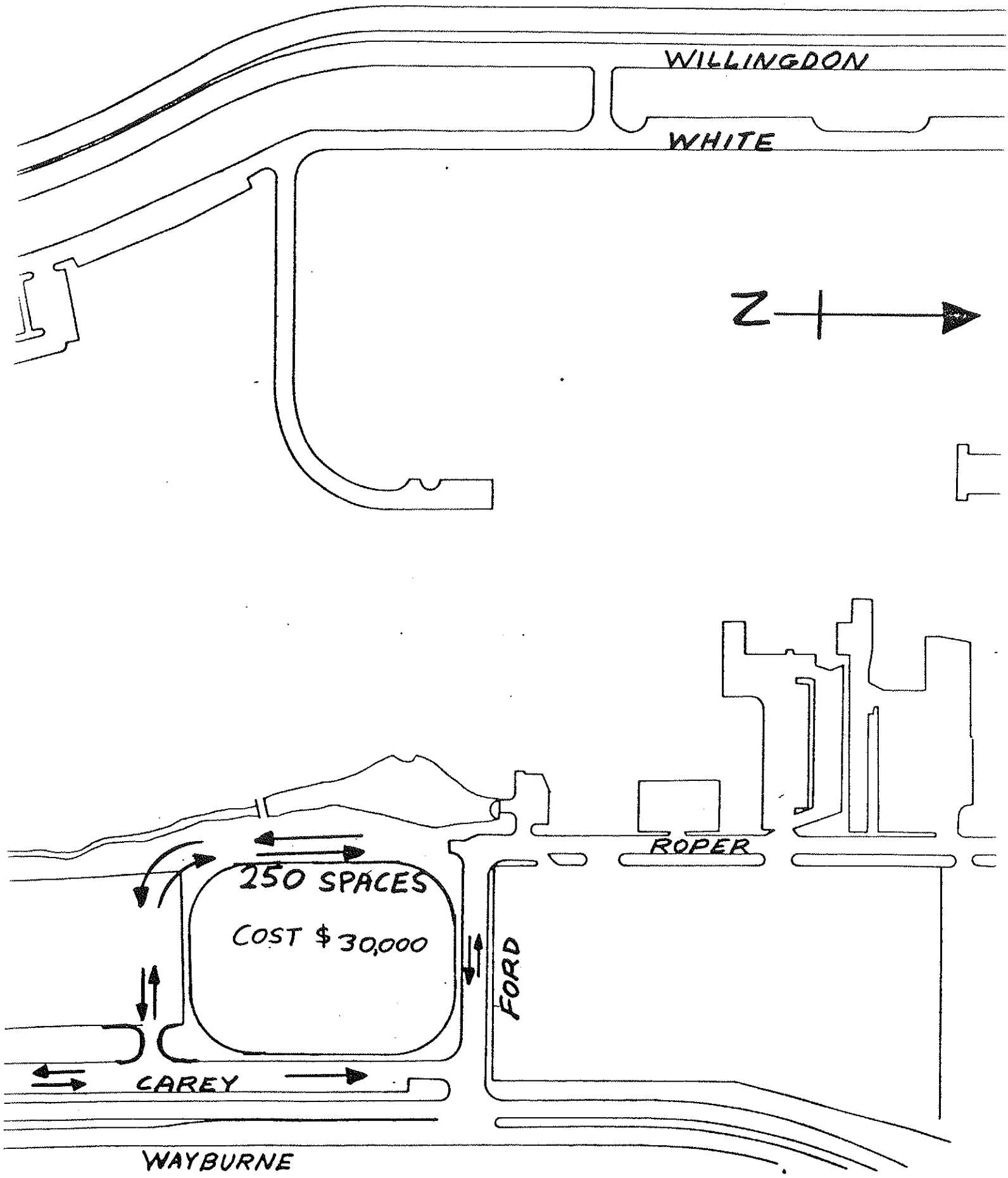

WILLINGDON
WHITE
N
ROPER
250 SPACES
COST $30,000
FORD
CAREY
WAYBURNE

FIG. 4

F. Summary

1. Additional parking space required:

385	staff/faculty
900	students
1285	Total

(As long as on-street parking is available on Willingdon, the additional requirement is 1060 spaces).

2. Location/cost of additional parking:

a) south end of campus: 550 stalls/$465,000-$585,000
b) White Avenue: 125 stalls/$100,000
c) all weather field: 250 stalls/$30,000
d) singledeck on "pink" lot: 400 stalls/$1,800,000

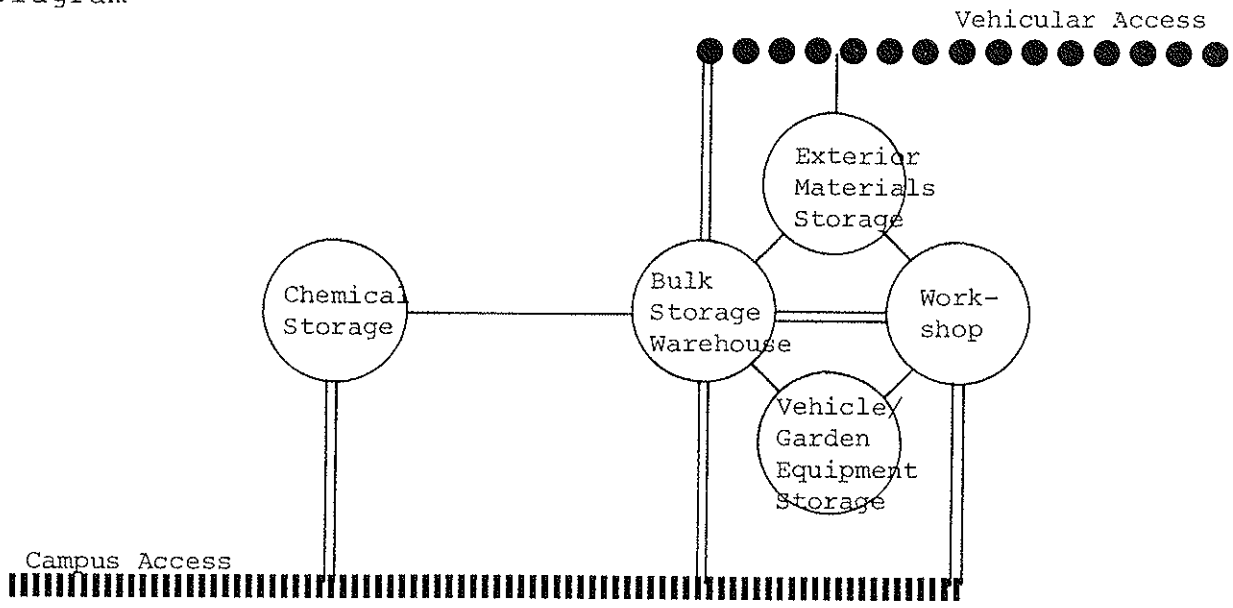
Appendix 2 - Warehouse Program

The Warehouse is intended to accommodate new furniture, items to be held in "ready use" inventory, laboratory equipment, and large items in transit from supplier to departments and will be controlled by the Operations and Maintenance Department.

The existing Chemical Storage should be relocated away from pedestrian circulation and buildings in general. The existing structure must be displaced in any case with the advent of the infill project which will extend between the Administration Building and the 1976 Building.

A Workshop/Yard area will provide facilities for maintenance and trades people involved in repairs or renovation to BCIT buildings. Storage of weather independent materials could be stored in an Exterior Storage area. Up to six vehicles and various gardening equipment will require storage in an area near the Workshops and Warehouse.

Relationship Diagram



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Space Summary

SPACE NAME	UNIT AREA (m^2)	ASSIGNABLE AREA (m^2)
Built Facilities:		
1. Chemical Storage	9@ 11.0	99.0
2. Bulk Storage Warehouse	1@1100.0	1100.0
3. Workshops	1@ 275.0	275.0
		1474.0
Compound Storage		
4. Vehicle/Garden Equipment Storage	1@ 370.0	370.0
5. Exterior Materials Storage	1@ 200.0	200.0

Chemical Storage (9 @ 11.0 m^2)

Could be near Bulk Storage Warehouse and be easily accessible by loading ramp and hand carts. Must be a separate building with appropriate fire safety precautions and with convenient access to Central Stores. Storage of gas cylinders, solvents, acids, bases, and other hazardous chemicals. Strict adherence to fire codes must be observed and proximity to pedestrian circulation should be avoided.

Bulk Storage Warehouse (1 @ 1100 m^2)

Storage of new furniture; items to be held in "ready-use" inventory, laboratory equipment, and large items in transit from supplier to departments. There may also be some storage of office and classroom furniture and dormant and semi-active files. The location must be easily accessed by trucks (semi-trailers occasionally). The Compound Storage should be adjacent as well as the Workshops which would benefit from proximity of supplies storage and shipping/receiving facilities.

The interior space will be flexible and of typical warehouse form, i.e., approximately square with a height appropriate for forklift handling

of materials. A forklift storage area with a recharging outlet must be provided in the building. Four loading bays must be provided, two on grade and two with loading docks of adjustable height. The bay system should be flexible both in terms of materials storage, handling, and expansion potential (an additional 1100 m^2 must be accommodated for planning purposes).

Workshops (1 @ 275 m^2)

This component will provide working areas for tradesmen/maintenance people and will include electrical, carpentry, mechanical, and plumbing shops with their attendent storage of everyday supplies. Larger items would be stored in the Compound Storage area or Bulk Storage Warehouse.

Vehicle/Garden Equipment Storage (1 @ 370 m^2):

Covered storage for up to six trucks and various pieces of gardening equipment (tractors and cutters). Should be near the Bulk Storage Warehouse and Exterior Materials Storage in a location optimizing access to the campus but minimizing views from municipal streets.

Exterior Materials Storage (1@ 200 m^2):

Storage of material which does not require sheltered/warm conditions (i.e., plastic conduit, concrete curbs, etc.). Should be near the Workshops but in a location without visual access to municipal streets.