THE UNIVERSITY OF WESTERN AUSTRALIA
CAMPUS PLANNING REVIEW 1990

Prepared by
R.J. Ferguson and Associates

December 1990

CONTENTS

ILLUSTRATIONS

INTRODUCTION

The objectives of this Campus Planning Review are to analyse the physical development of the Crawley campus with regard to planning, building design and landscape; to determine whether the principles established in the 1955 and 1959 plans and reinforced in the 1975 Report are still valid and to nominate development options for the campus considering issues such as the acquisition of the Nedlands campus of the Western Australian College of Advanced Education, the influence of the McGillivray and Shenton Park campuses and the possible expansion of the campus beyond its present boundaries.

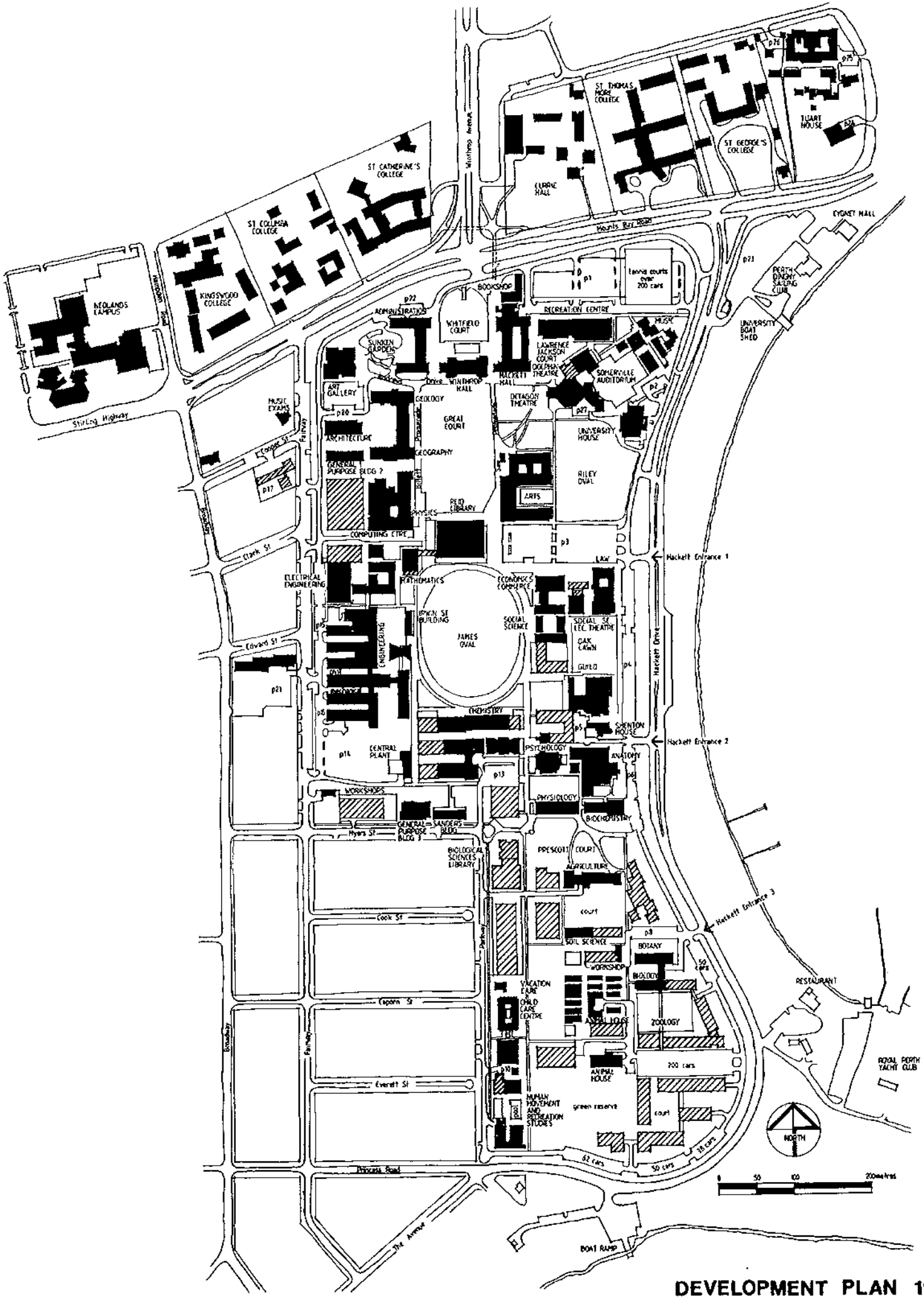
The Review makes no attempt to formulate a handbook which sets specific sites for all future buildings and building extensions on the campus nor to prescribe detail controlling building and landscape design. Such detail would inevitably prove to be inadequate and could constrain the progressive development of the campus. It is evident from earlier campus plans that particular buildings can change location several times before they are constructed. The size and nature of future buildings is impossible to predict and the best that can be achieved is to follow a simple planning structure which permits the greatest flexibility for the future. The day to day management of the campus plan and pursuit of correct design solutions is as important as the plan itself.

Immediately prior to and since the Report on Campus Planning dated July 1975 several in-depth studies have been undertaken to help resolve the problems of car parking and traffic movement. Many of the findings of these studies have considerable impact on the development of the campus and the studies have been remarkably consistent in their findings. The bulk of the recommendations on parking in the 1974 De Leuw Cather Report is repeated in the 1975 Bunbury Recommendations to the Senate on Parking and Traffic, the 1975 Bunbury Report on Campus Planning and the 1986 Feilman Planning Consultants Pty Ltd Traffic and Parking Strategy.

At the risk of being repetitious the recommendations of these studies are recorded in this Review as historical background and to emphasise the options available to the University.

The Review was prepared as a draft report and made available to the University community for comments in September 1990. Amendments in the form of an addendum were made to the Review in response to these comments and those of the Buildings Committee. The amended document was considered by Senate at meetings on the 26th and 27th of November 1990.

Senate resolved - "that The University of Western Australia Campus Planning Review 1990 be adopted as its campus planning guide, on the understanding that it does not commit the University to adopt every recommendation in the Report.".



DEVELOPMENT PLAN 1990

SUMMARY OF RECOMMENDATIONS

To this date the University has followed the basic structure of a campus plan Initiated by Professor Leslie Wilkinson in 1926-27 and developed by Professor Gordon Stephenson in 1954-55. The disposition of elements such as buildings, pedestrian precincts, roads and car parks and major green spaces has conformed to Stephenson[6]s 1959 planning principles. The management and control system put in place by the University has protected and enhanced the highly acclaimed qualities of the campus buildings and grounds.

In 1980 the Australian Heritage Commission entered the Gardens of The University of Western Australia in the Register of the National Estate and in 1986 the inaugural Western Australian Civic Design Award was presented to the Campus of The University of Western Australia for Excellence In Civic Design.

When the machine is operating efficiently, economically and achieving top performance do not try to fix it.

NEDLANDS CAMPUS

- Demolish the Gymnasium building and plant for an internal landscaped court to accommodate new development on its perimeter.

- New and existing "permanent" buildings should be made to achieve architectural qualities compatible with those on the Crawley campus.

- Construct a grade separated link between Kingswood College and a site on the western corner of the intersection of Stirling Highway and Fairway.

- Review the need for a grade separated link crossing Hampden Road between the Nedlands campus and Kingswood College after the Nedlands campus has been occupied and pedestrian movement patterns can be assessed.

SHENTON PARK RESEARCH CAMPUS

- Pursue the possibility of accommodating additional facilities on the Shenton Park campus from the Crawley campus to Increase development options on the Crawley campus.

- Consider the provision of a large car parking facility on the Shenton Park campus connected to the Crawley campus with a shuttle bus service.

FAIRWAY BROADWAY CORRIDOR

- Continue to acquire properties particularly in the Primary but also in the Secondary Study Area and do so, where possible, in groupings in order to achieve developments such as that at Edward Street and the Cooper Street car park. It is likely that an expanded site will be required for the construction of a pedestrian grade separated link serving the Nedlands and Crawley campuses between Broadway and Fairway on Stir1ng Highway.

ARCHITECTURE

- Continue and strengthen the established architectural direction of the campus buildings in the northern and southern campuses in order to achieve a unified single campus.

- Employ architects who understand and are sympathetic to the qualities of the campus, who have the skills to be creative within the contextual constraints of the established campus and who are prepared to be co-ordinated and controlled by a system which has the benefits of long term past experience and present and future problems and potential well in sight.

LANDSCAPE

- Maintain the Permanent Green Reserve system and create Reserves in the southern campus depending on the planning options adopted.

- Protect, where possible, important established stands and individual specimens of trees. In some instances this will require a decision between trees and development.

- Create landscaped entrances into the western campus at the location of Car Park 18, Edward Street and Myers Street.

- Protect the cross campus view from the Art Gallery across Great Court and Riley Oval to the River.

- Open a portion of Prescott Court to the River and maintain cross campus views from Myers Street to the River.

- Retain bituminous surfaces for roads and car parks and light grey precast concrete slabs for pedestrian surfaces. The size, thickness and texture of the slabs should reflect their location. Red brick paving can be used for patterning colonnades and other intimate spaces.

- Continue the internal and information signage system but impose further controls on tenancy and advertising signs so they do not diminish the image of the campus.

- Make adequate provisions in building designs for elements such as seating and bicycle racks.

- Concentrate adequate safety lighting in areas used at night such as car parks, libraries, theatres, underpasses, Guild facilities, and main pedestrian footways.

- Establish levels for the campus internal ring road and plant now for the long term future.

- Compatible with development in the south and south-east corner of the southern campus, identify and maintain river views from the southern campus green spaces.

- Maintain the basic landscape system of planting native species on the perimeter of the campus with exotic species confined to the Inner campus.

- Undertake a landscape study to accompany this Planning Review. The study should address issues such as plant types, landscape furniture, including bollards or their alternatives and the location of art works in the landscape.

AIRCONDITIONING OF BUILDINGS

- Maintain the Central Chilled Water Plant system with looped main serving the whole campus. A second Central Plant linked into the loop system may be considered in the southern campus Should building development intensify in this area.

PARKING AND TRAFFIC

- Discontinue the practice of constructing temporary car parking facilities on future building sites on campus and construct the identified permanent facilities compatible with the extent of future building development.

- Increase parking facilities off, but within walking distance of the campus.

- Widen Hackett Drive to retain existing on street parking and provide for an additional lane of traffic movement.

- Develop major parking areas external to the campus connected by a frequent shuttle bus service.

- Request the Parking Committee to investigate the possibility of incremental increases in parking fees to contribute to the additional funds required for car parking facilities on and off campus.

- Gain the acknowledgment of the Cities of Subiaco, Nedlands and Perth and the State Planning Commission of the fact that the University campus is a cultural and environmental asset to the community and must not be allowed to take on the appearance of a suburban shopping centre car park.

- Retain space on the perimeter of the campus to permit the construction of a continuous internal ring road except for the section adjacent to Parkway.

- Extend Parkway into the campus to serve Chemistry and whatever remains of Car Park 13 and cut the existing internal road connecting Car Park 13 and Fairway Entrance 4 so as to serve only the Central Plant and relocated Workshops.

- Open Parkway to Hackett Drive via the internal ring road, halfway between The Avenue intersection and the boat ramps entrance, at least to permit a left turn only exit on to Hackett Drive. This connection to Hackett Drive would not be required if the internal ring road was completed between Parkway and Hackett Entrance 4.

- Should additional parking facilities be constructed in the location of Car Park 1 or the Tennis Courts widen the ring road from the Winthrop Avenue entrance to just south of Music to accommodate additional traffic and move the access to Hackett Drive further south to avoid conflict with the queue at the Mounts Bay Road control lights.

- Confine all vehicles to the external boundaries of the campus and restrict University vehicles to only essential penetrations into the inner campus so as to help set a standard for others.

- Employ barriers in the form of bollards - removable if necessary for emergency or ceremonial vehicles - kerbs and planting to return the inner campus to the pedestrians.

- Arrange vehicular access points to be as close to buildings as is compatible with the environmental qualities of the campus and locate service lifts in the buildings to be as close to service docks as will suit the internal planning of the building.

- Encourage walking and carrying or trolleying of goods between buildings and service docks.

FUTURE DEVELOPMENT

General

Many of the highly acclaimed qualities of the campus have been achieved by the adherence to, what have become known as, the 1959 Stephenson planning principles described under Planning Background.

- Maintain the philosophy of the Stephenson planning principles:

1. Locate like departments and facilities in functional groups.

2. Provide for expansion of all buildings and groups of buildings.

3. Confine vehicular traffic and car parks to the perimeter of the campus.

4. Maintain the Inner campus for pedestrians only.

5. Arrange buildings to frame a variety of landscaped spaces and internal courts

Southern Campus

- Give consideration to the relocation or the diminishing of the Taxonomic Garden, experimental plots, glasshouses, animal holding and grazing in order to locate a green reserve of the scale of Riley Oval in the southern campus.

- Alternatively expand the Human Movement and Recreation Studies Outdoor Laboratory and Incorporate into a major green reserve.

- Explore the potential of the site in the south-east corner of the campus for a major building development to form a southern gateway to the southern campus to complement the prominence of the Hackett Memorial buildings.

- Maintain River views from buildings and internal green spaces in the south-east corner of the campus.

Workshop Accommodation

- Retain the present decentralised system of departmental workshops and create regional workshops in new development where location, proximity of departments, compatibility of operation and scale of activities support such facilities.

- Relocate the Property Services Maintenance Workshop, Plumbers' Workshop (now used by Geology) and Grounds Machine Building (Car Park 13) to Myers Street above a car parking facility.

- The options for locating the Agriculture, Botany and Zoology Workshop include the new Zoology building site, adjacent to the Taxanomic Garden electrical substation and a site north of Car Park 8.

- Locate a combined Geology/Geography Workshop on the site of Media Services and the Child Study Centre when this site can be redeveloped.

Commercial and Sporting Facilities

- Locate a Guild catering facility in or adjacent to the Biological Sciences Library extension at the south-west corner of Prescott Court. Provide for an additional facility in the southern campus when this area is totally developed.

- Provide a second staff facility in the southern campus or a relocated major staff facility closer to the centre of the whole campus.

- Locate additional commercial outlets at the Guild building in the centre of the campus adjacent to the service access at the rear of Shenton House.

- Maintain James Oval and Riley Oval for organised sporting activities. Should future demands for building expansion be so great as to require the use of Riley Oval, building development should only be considered if the green space and activities on Riley Oval can be relocated in the southern campus.

- Create a space in the southern campus with the identity of James Oval and the size of Riley Oval for informal if not organised sporting activities.

Expansion

- Avoid planning by simply infilling green spaces. The finite location of new buildings and building extensions and the redevelopment of groups of buildings should be undertaken in a manner which strengthens the civic design qualities of the campus.

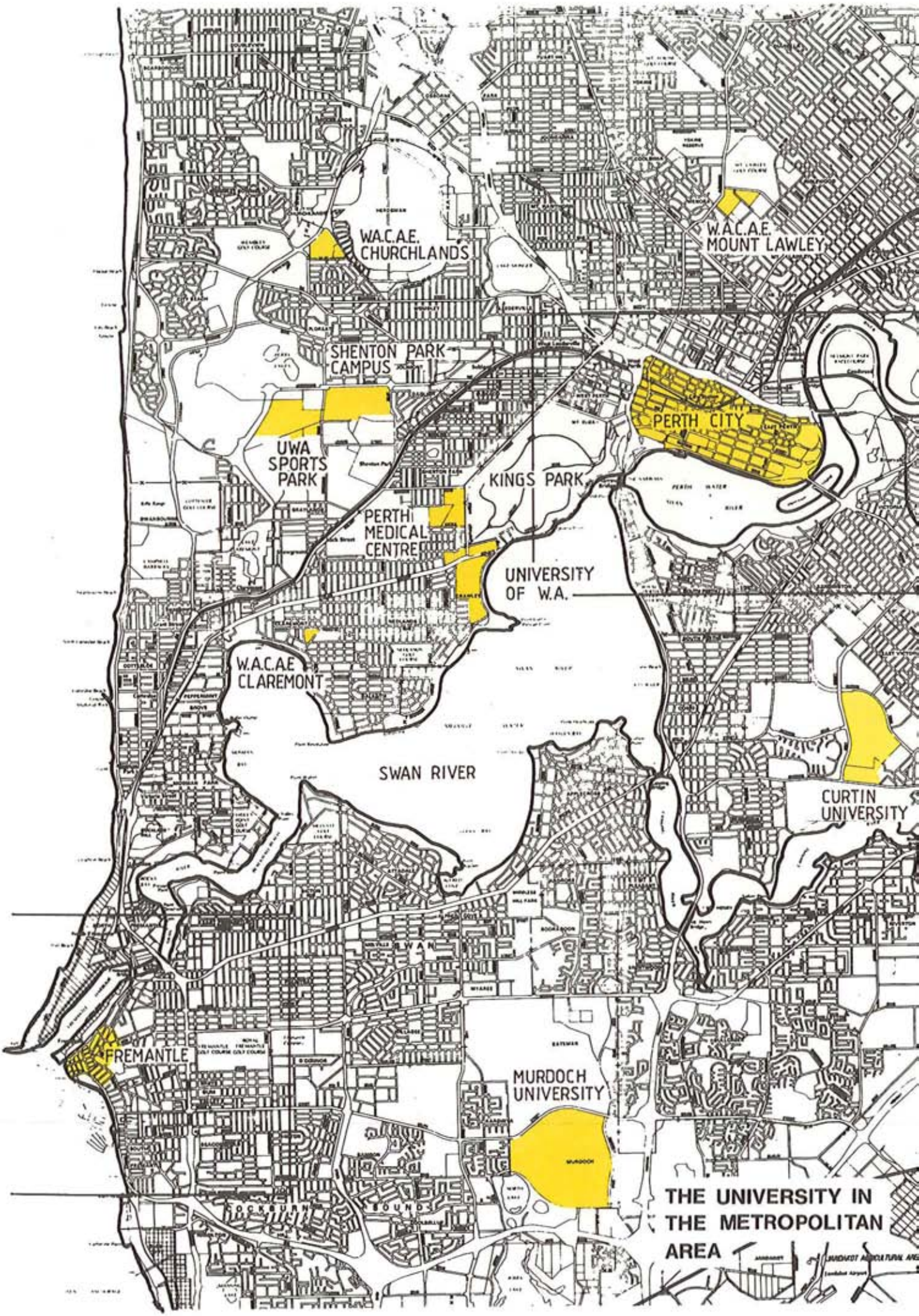
- Continue the use of the Shenton Park campus to supplement and where possible relocate facilities on the Crawley campus to free that campus for expansion.

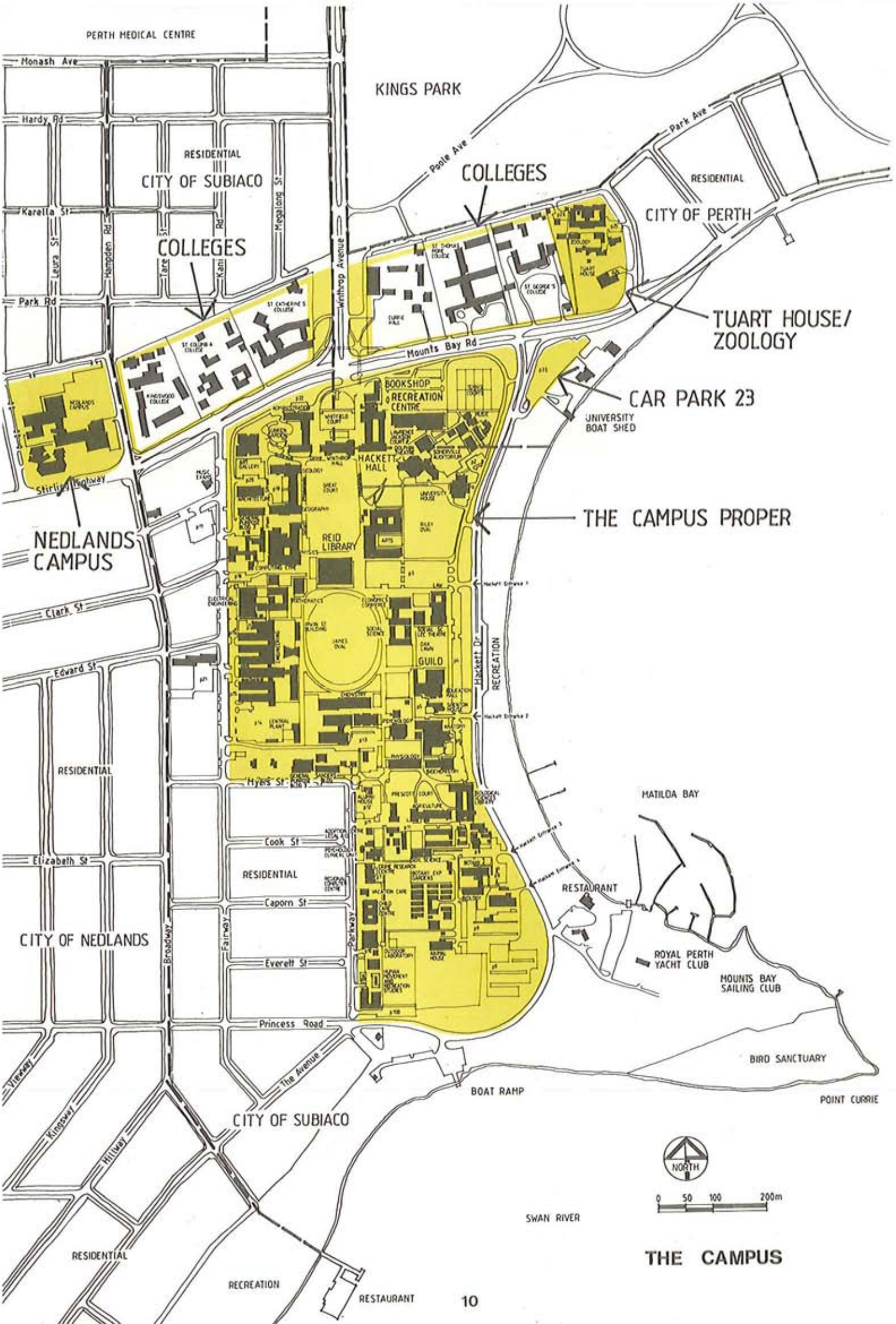
- Pursue the expansion of the campus beyond Fairway to Broadway at least between Stirling Highway and Myers Street and take no action that would jeopardise the expansion of the campus into the area between Parkway and Fairway between Myers Street and Princess Road.

Services

- Adopt the Service Corridor System illustrated. Some corridors may not be used in the short term but if kept open will provide long term flexibility.

- As opportunities permit re-lay existing services outside the system to be contained in the corridors.


W.A.C.A.E. CHURCHLANDS
W.A.C.A.E. MOUNT LAWLEY
SHENTON PARK CAMPUS
PERTH CITY
UWA SPORTS PARK
KINGS PARK
PERTH MEDICAL CENTRE
UNIVERSITY OF W.A.
W.A.C.A.E CLAREMONT
SWAN RIVER
CURTIN UNIVERSITY
FREMANTLE
MURDOCH UNIVERSITY
THE UNIVERSITY IN THE METROPOLITAN AREA


PERTH MEDICAL CENTRE
Monash Ave
Hardy Rd
Karella St
Park Rd
Stirling Highway
Clark St
Edward St
Hyde St
Cook St
Elizabeth St
Caporn St
Everett St
Princess Road
Viewway
Kingsway
Hillway
The Avenue
Broadway
Fairway
Parkway
Laura St
Hampden Rd
Tate St
Kent Rd
Megalong St
Winthrop Avenue
Poole Ave
Park Ave
Mounts Bay Rd
Hackett Dr
RESIDENTIAL
CITY OF SUBIACO
COLLEGES
KINGS PARK
CITY OF PERTH
TUART HOUSE/
ZOOLOGY
CAR PARK 23
UNIVERSITY
BOAT SHED
BOOKSHOP
RECREATION
CENTRE
HACKETT
HALL
THE CAMPUS PROPER
NEDLANDS
CAMPUS
REID
LIBRARY
GUILD
RECREATION
CITY OF NEDLANDS
MATILDA BAY
RESTAURANT
ROYAL PERTH
YACHT CLUB
MOUNTS BAY
SAILING CLUB
BIRD SANCTUARY
POINT CURRIE
BOAT RAMP
NORTH
0 50 100 200m
SWAN RIVER
THE CAMPUS

THE CAMPUS AND ITS NEIGHBOURS

The Crawley campus of The University of Western Australia, leased from the Crown for a period of 999 years from 3 March 1920, enjoys a location 5 km west of the Perth city centre on the main highway between Perth and Fremantle close to the centre of gravity of the Metropolitan Region on the banks of the Swan River.

The campus proper covers an area of 46.2 ha bounded by Mounts Bay Road, Hackett Drive, Parkway, Myers Street, Fairway and Stirling Highway. The extended campus includes an area of 0.72 ha in Car Park 23, an area of 12.75 ha to the north of Stirling Highway and Mounts Bay Road bisected by Winthrop Avenue which accommodates residential colleges, an additional total area of 0.96 ha in two lots flanking Winthrop Avenue adjacent to St Catherine's College and Currie Hall, a 2.29 ha site presently the home of Zoology and Tuart House and the recently acquired Nedlands campus of the WACAE on a 3.5 ha site west of Hampden Road.

The University owns properties off campus between Fairway, Parkway and Broadway, some of which are occupied by University related activities such as Administration, the Australian Music Examinations Board, the Tertiary Institutions Service Centre and the CSIRO Geomechanics Division.

The Queen Elizabeth II Medical Centre, constructed on 30 ha of University land, is located less than a kilometre north of the main campus on Winthrop Avenue and accommodates the major part of the School of Medicine, Sir Charles Gairdner Hospital, State Health Laboratories Services and State X-ray Laboratories. The Centre is partly within the City of Subiaco and partly within the City of Nedlands.

There is significant movement of students and staff between the Medical Centre site and the main campus involving the use of motor vehicles and bicycles.

University sporting fields are accommodated with the Superdrome and some service and storage facilities on the 50.7 ha UWA Sports Park at Shenton Park, approximately 3km from the main campus, between Stephenson Avenue and Brockway Road.

Immediately adjacent to the UWA Sports Park between Brockway Road and Selby Street is the 62 ha Shenton Park campus which has been recently considered for a Research Campus and accommodates support facilities for the main campus Departments of Agriculture, Botany, Engineering and Zoology.

The Dental School is located in the Perth Dental Hospital buildings in the Perth city centre adjacent to the Royal Perth Hospital.

The Claremont Community Health Centre owned by the University and located on Stirling Highway at Freshwater Parade provides University facilities for the Department of General Practice, the West Australian Centre for Remote Rural Medicine, Community Health Research and Training, teaching and student areas and facilities for community groups such as Community District Nurse, Child Health Nurse and Main Hall for general community functions.

Other tenants include general practitioners, speech therapist, physiotherapist, the Royal Australian College of General Practitioners, Family Medical Clinic, Family Medicine Programme and After Hours Family Medical Clinic.

More distant facilities include the Marine Biology Laboratory at Watermans Bay and the 180 ha Harry Waring Marsupial Research Station at Jandakot which provide facilities for Zoology. Also the 675 ha Allendale and Hope Valley Farms at Wundowie and Irrigated Summer Crops Research Centre at Waroona which provide facilities for the School of Agriculture.

The main campus is located mostly within the City of Subiaco with a small area in the north east corner within the City of Perth. The common boundary between the Cities of Subiaco and Nedlands is Broadway and Hampden Road placing the Nedlands campus within the City of Nedlands. Local Authority zoning controls are described in Appendix 1.

Immediately north of the Colleges' sites, east of Winthrop Avenue, is the 417 hectare Kings Park located on Mount Eliza controlled by the Kings Park Board and preserved primarily as natural bushland but with areas accommodating tennis courts, children's playgrounds, botanical gardens, an arboretum, memorials and a restaurant. Some areas are maintained as parkland and others as gardens.

The River foreshore between Mounts Bay Road and the Crawley boat ramps immediately south of the campus off Hackett Drive is a Class A Reserve vested in the National Parks and Nature Conservation Authority and controlled by the Department of Conservation and Land Management. Generally the area is used for public recreation purposes and facilities, some leased from CALM include the Perth Dingy Sailing Club, University Boat Club, Royal Perth Yacht Club, Matilda Bay Sailing Club, a kiosk and a restaurant. A nature conservation area is maintained as a bird sanctuary on Pt Currie with restricted access.

The University enjoys expansive views to the east and south across these foreshore areas and many of the public enjoying the River foreshore areas also access the campus for recreation purposes, using campus facilities, particularly car parks.

INTERACTION WITH THE COMMUNITY

The University interacts with the general community in a variety of ways ranging from casual use of its facilities such as garden courts for wedding photographs and lecture theatres for single events to Festival activities lasting for a period of three to four weeks regularly each year. Many activities bring concentrated numbers of extra people onto the campus at times in conflict with student and staff usage of campus facilities.

UNIVERSITY EXTENSION

University Extension is involved with community education programmes including the Summer School, lectures and courses relevant to more than one department or faculty. The programmes offered to the general community have become increasingly popular and because of the limited access to venues on campus Extension is looking to use off-campus venues.

The Summer School

Established by the Adult Education Board as a service to encourage the general community to participate in concentrated education programmes, the Summer School has developed into a programme operated annually for two weeks in January, each programme having a different theme. With increasing popularity the 1989 Summer School attracted approximately 2,500 persons to campus each day, 3,000 were enrolled in courses and approximately 1,000 each day attended the lecture series.

Community Education Courses

Extension offers a number of community education courses running throughout the year with lectures generally held during evenings. In 1989, 7,223 persons enrolled in these courses.

Continuing Education Courses

Various individual departments organise continuing education lectures for professionals, business people and others in the community, drawing 1,289 persons in 1989 mainly to venues on campus.

Lecture Series

Lectures by prominent persons on topical subjects are organised throughout the year and are available to the general public.

The University of the Third Age

Non-award courses in the form of monthly lectures held throughout the year are available to retired and other aged persons. In 1989, 1,600 persons participated in these courses.

THE FESTIVAL OF PERTH

The Festival was founded in 1953 as a means of providing evening entertainment for participants in the Summer School programme. Ties with the Summer School have been broken but the link with the University remains and attendances have grown from 42,000 at the first Festival to over 500,000 at recent Festivals when over 600 performances and events were staged.

The Film Festival runs from early December until late February and main Festival events for three to four weeks in February each year. The Festival does overlap with the commencement of the academic year but most events occur in the evening outside normal University hours.

The growth of the Festival has necessitated the more frequent use of off-campus venues but University facilities such as the Somerville Auditorium, Octagon, Dolphin and New Fortune Theatres and the Sunken Garden are in continual use throughout the Festival period and Winthrop Hall is also used on occasions. Simultaneous use of these facilities results in a potential audience of around 4,000 persons concentrated at the extreme northern end of the campus where car parking facilities are limited.

THE CONFERENCE OFFICE

Established in recognition of the increasing number of conferences using University facilities the Conference Office provides a consultancy and management service for conference planners whether the conference is based on or off campus. The extensive facilities available on campus are used in vacation times and can involve the Colleges which are available to accommodate conference delegates.

DEPARTMENT OF HUMAN MOVEMENT AND RECREATION STUDIES

Programmes provided by the Department involving the general public include 'Unigym' and 'Uniswim', a Corporate Health Programme and the sale of a number of sport related videos on subjects such as aerobics, sailing and badminton.

The Uniswim programme includes learning to swim classes for all ages, rehabilitation classes and the use of the swimming pools by the general public attracting approximately 1,000 persons a week onto the campus.

The Unigym programme is a remedial physical education programme for children aged four to twelve years. Approximately 100 children participate in the programme each week along with a number of community service workers and practice students from other institutions.

ADVANCED MANAGEMENT PROGRAMME

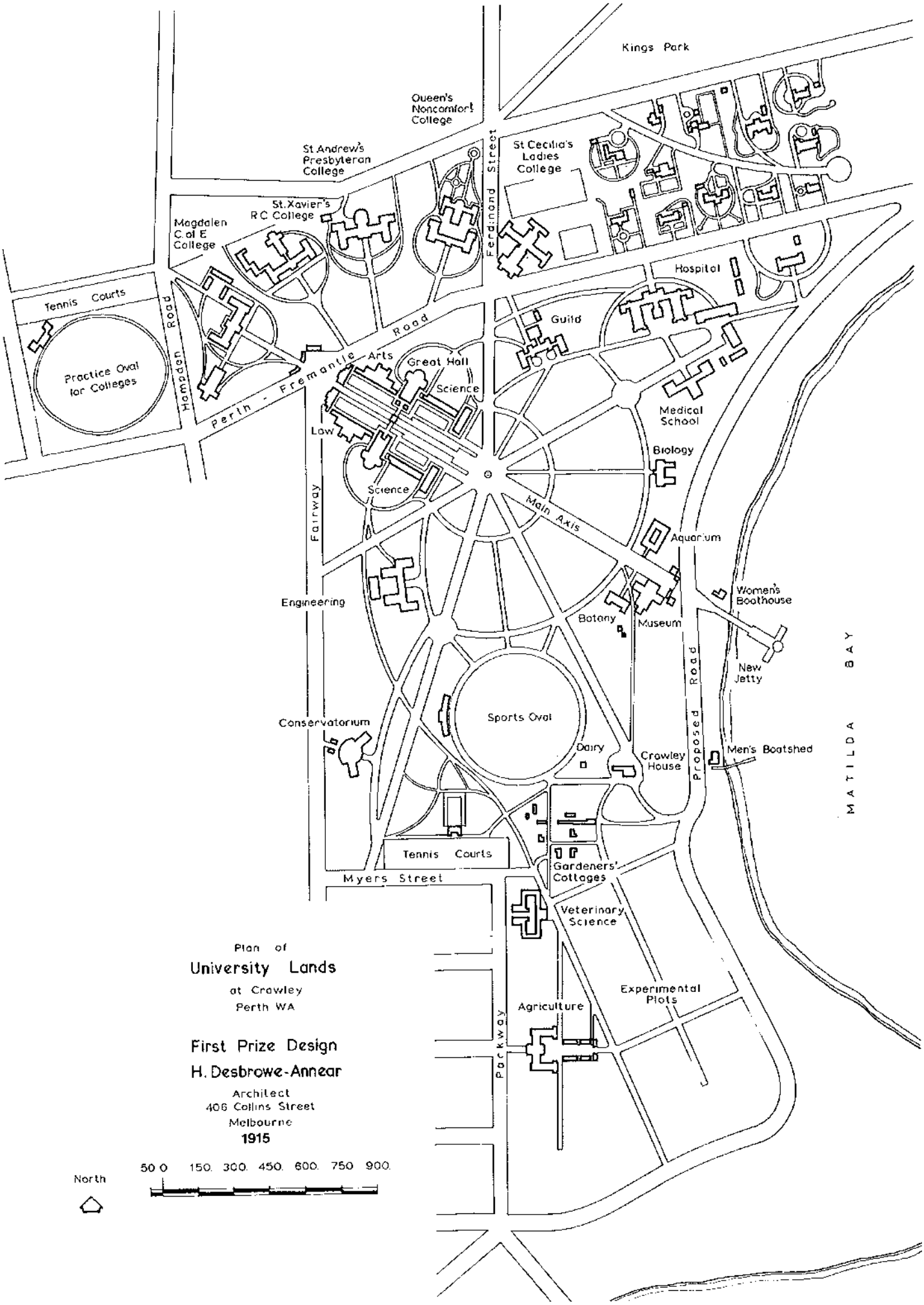
This programme aimed at mid-career managers involves a six week residential course which is broken into three two week periods. All these periods occur outside the academic year. The programme, involving approximately 35 persons in each two week module, is conducted at Kingswood College.

OTHER ACTIVITIES

The community enjoys a range of other services and activities provided on campus including various research centres such as the Centre for Urban Research, also facilities such as the Anthropology Museum, the Geology Museum, the Lawrence Wilson Art Gallery and the University libraries which are open to the general public although generally not for borrowing of material, the Music Examinations Board, the Western Australian Regional Computing Centre and the Department of Music which organises lunchtime and evening concerts.

The campus is a popular venue for conventions, some elements of which are, at times, accommodated in tent structures erected on ovals and courts.

As well as the numbers of the general public attracted to the campus to participate in University activities many others attend the campus as visiting and part time lecturers, all making a variety of demands on the campus from car parking to refreshment and toilet facilities.


Kings Park
Queen's Noncomformist College
St Andrew's Presbyteran College
St Cecilia's Ladies College
Ferdinand Street
St. Xavier's R.C. College
Magdalen C. of E. College
Tennis Courts
Hampden Road
Practice Oval for Colleges
Perth - Fremantle Road
Hospital
Guild
Great Hall
Arts
Science
Law
Medical School
Biology
Science
Fairway
Main Axis
Aquarium
Engineering
Botany
Museum
Women's Boathouse
New Jetty
Proposed Road
MATILDA BAY
Conservatorium
Sports Oval
Dairy
Crawley House
Men's Boatshed
Tennis Courts
Gardeners' Cottages
Myers Street
Veterinary Science
Experimental Plots
Agriculture
Parkway
Plan of
University Lands
at Crawley
Perth WA
First Prize Design
H. Desbrowe-Annear
Architect
406 Collins Street
Melbourne
1915
North
50 0 150 300 450 600 750 900

PLANNING BACKGROUND

To this date the University has followed the basic structure of a campus plan initiated by Professor Leslie Wilkinson in 1926-27 and developed by Professor Gordon Stephenson in 1954-55. The first campus plan prepared by Harold Desbrowe-Annear in 1915 had been found deficient and was almost totally reshaped by Wilkinson.

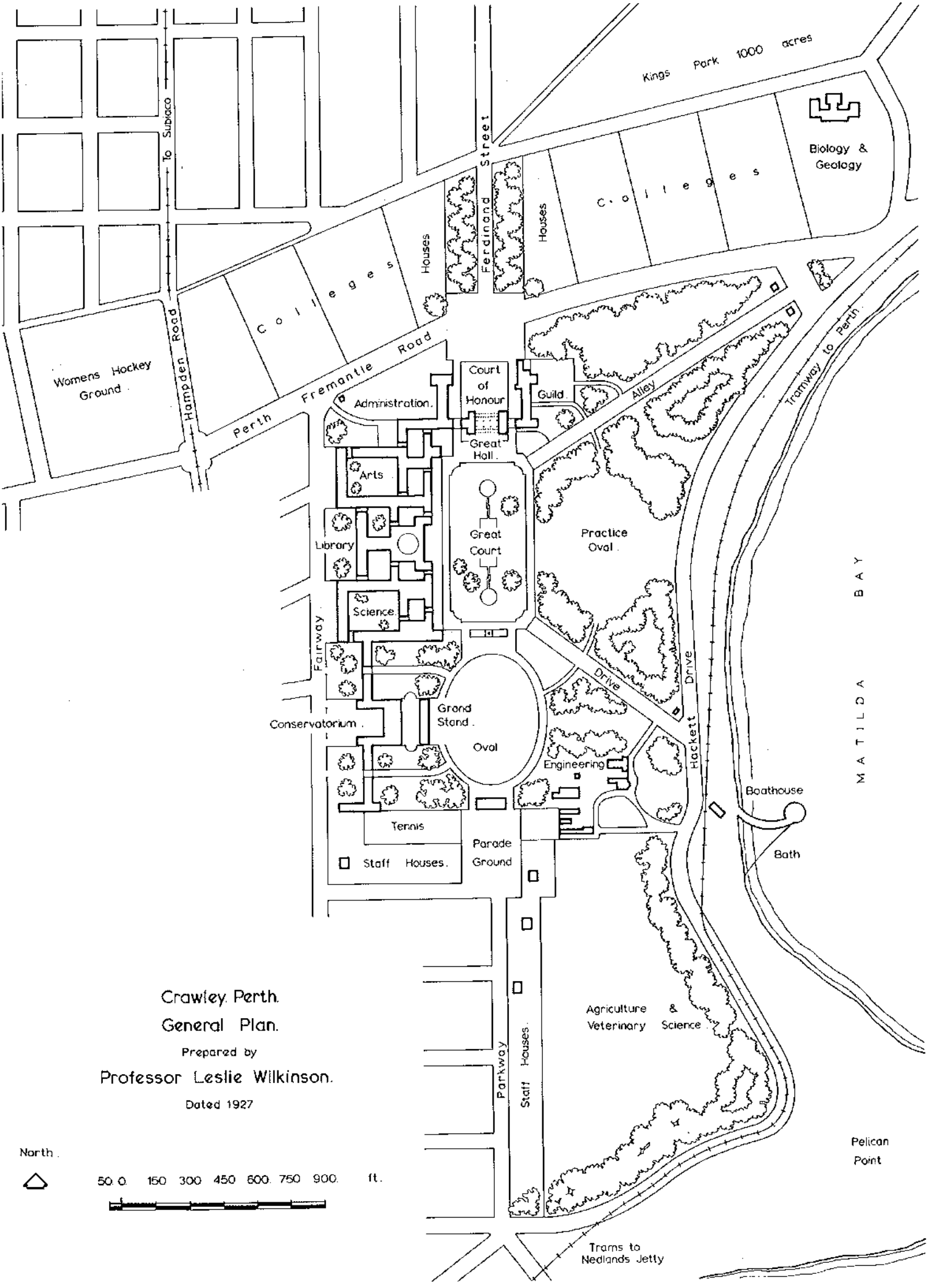
Wilkinson's plan established the spine of the campus with the three main green spaces, Great Hall and an element which became the Reid Library on a strong north-south axis but concentrated all building development west of this axis leaving the eastern flank of the campus to landscaped areas. The plan may have adequately served a modest population of around 2,000 to 3,000 for which it was designed but by 1952 the University found itself faced with a likely rapid expansion in population and in 1954 it was assumed that student numbers would reach 7,000 by 1984.

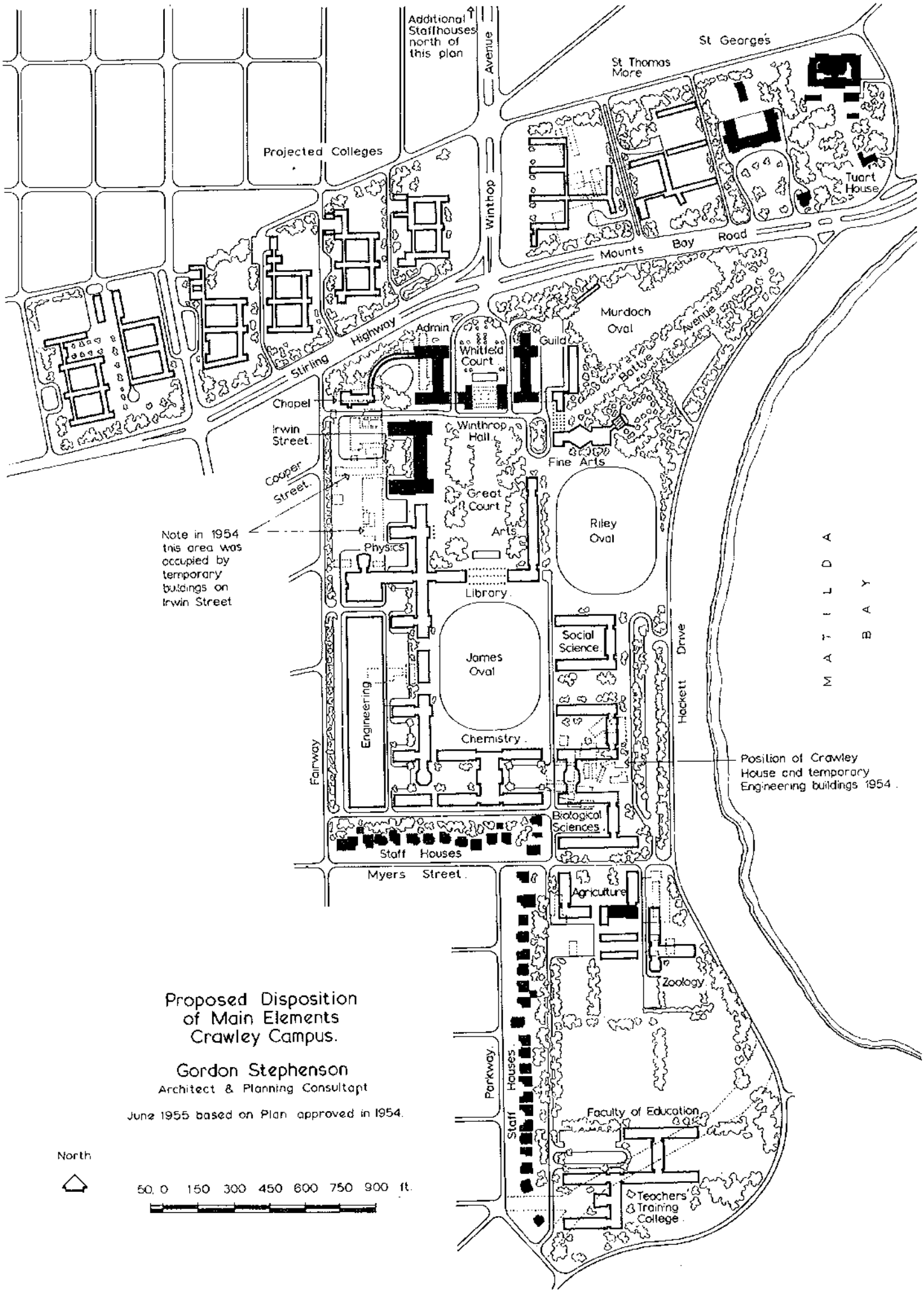
Stephenson's 1954 and 1955 plans were developed from estimates prepared by the Registrar Dr C. Sanders for an estimated student enrolment of 4,750 in 1973 and a required 116,000 square metres of building area for a population of 8,000 students by the late 1980's. The plan maintained Wilkinson's spine but dispersed building sites over the whole campus creating a simple, ordered and highly aesthetic arrangement of buildings and spaces.

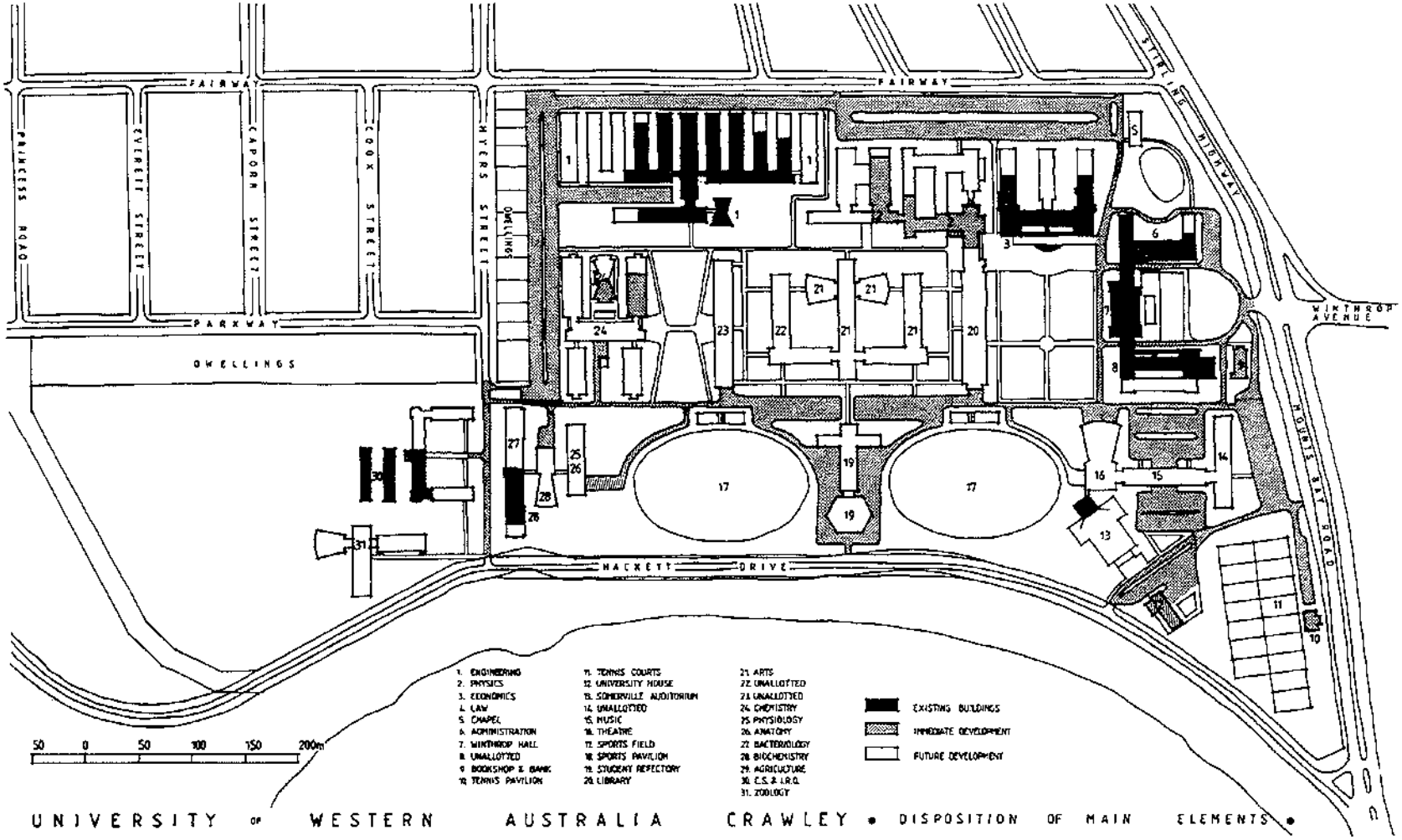
A paper which accompanied the 1955 plan noted that the planning problems to be resolved were: (1) the relationship between departments and faculties, (2) the areas required by each faculty or group of departments, (3) the layout system, (4) the shape of buildings in very general terms and (5) the inclusion of elements which should already be regarded as fixed. The paper also noted that although the development plan should be regarded as flexible in all its details the main disposition of the elements should not be altered without good reason.

The principles of the plan were that departments were located in functional groups; vehicles were excluded from the inner courts and greens and that provisions were made for ample courtyard and car parking space. The plan made provisions for the parking of 1,000 vehicles.

A noteworthy diversion from the structure plan occurred in 1958 when Marshall Clifton and A.E. Clare, Principal Architect Public Works Department, were invited to collaborate in the preparation and submission to the Senate of a comprehensive sketch plan of the new Chemistry, Physics, Library and Arts buildings. At the same time the Principal Architect was commissioned to proceed with the design and construction of the Physics and Chemistry buildings.


Kings Park 1000 acres
To Subiaco
Ferdinand Street
Houses
Colleges
Houses
Colleges
Biology & Geology
Womens Hockey Ground
Hampden Road
Perth Fremantle Road
Court of Honour
Guild
Alley
Tramway to Perth
Administration.
Great Hall.
Arts
Great Court
Practice Oval.
Library
Science.
Fairway
Drive
Drive
Hackett
Grand Stand.
Conservatorium.
Oval
Engineering
Boathouse
Bath
MATILDA BAY
Tennis
Parade Ground
Staff Houses.
Parkway
Staff Houses.
Agriculture & Veterinary Science.
Pelican Point
Trams to Nedlands Jetty
Crawley. Perth.
General Plan.
Prepared by
Professor Leslie Wilkinson.
Dated 1927
North.
50. 0. 150 300 450 600. 750 900. ft.


Additional Staffhouses north of this plan
Avenue
St Georges
St Thomas More
Tuart House
Projected Colleges
Winthrop
Mounts Bay Road
Murdoch Oval
Avenue
Admin
Whitfield Court
Guild
Batlye
Highway
Stirling
Chapel
Irwin Street
Winthrop Hall
Fine Arts
Cooper Street
Great Court
Arts
Riley Oval
Physics
Library
Social Science
James Oval
Engineering
Chemistry
Hackett Drive
Fairway
Biological Sciences
Staff Houses
Myers Street
Agriculture
Zoology
Parkway
Staff Houses
Faculty of Education
Teachers' Training College
MATILDA BAY
Note in 1954 this area was occupied by temporary buildings on Irwin Street
Position of Crawley House and temporary Engineering buildings 1954
Proposed Disposition of Main Elements Crawley Campus.
Gordon Stephenson
Architect & Planning Consultant
June 1955 based on Plan approved in 1954.
North
50. 0 150 300 450 600 750 900 ft.



UNIVERSITY OF WESTERN AUSTRALIA CRAWLEY • DISPOSITION OF MAIN ELEMENTS •

TAKEN FROM:

PUBLIC WORKS DEPARTMENT
WESTERN AUSTRALIA

A.E. CLARE
PRINCIPAL ARCHITECT

14th MAY 1959

In May 1959 Clifton and Clare presented to the Buildings Committee layout plans and models showing relationships of these buildings and also sketch plans for the Physics and Chemistry buildings.

By that time the estimated required building area had increased and Clifton and Clare advised that the building areas required for the Library and Arts buildings could not be met by the quadrilateral framing of the Great Court as depicted in the 1955 Stephenson plan. Their proposal was to relocate James Oval on Hackett Drive symmetrical with Riley Oval about a Student Refectory building on a strong east west axis with Arts, creating a second formal entrance to the campus off Hackett Drive. The Library building was moved to a central position in the Great Court and the Arts building was located in the present position of the Reid Library.

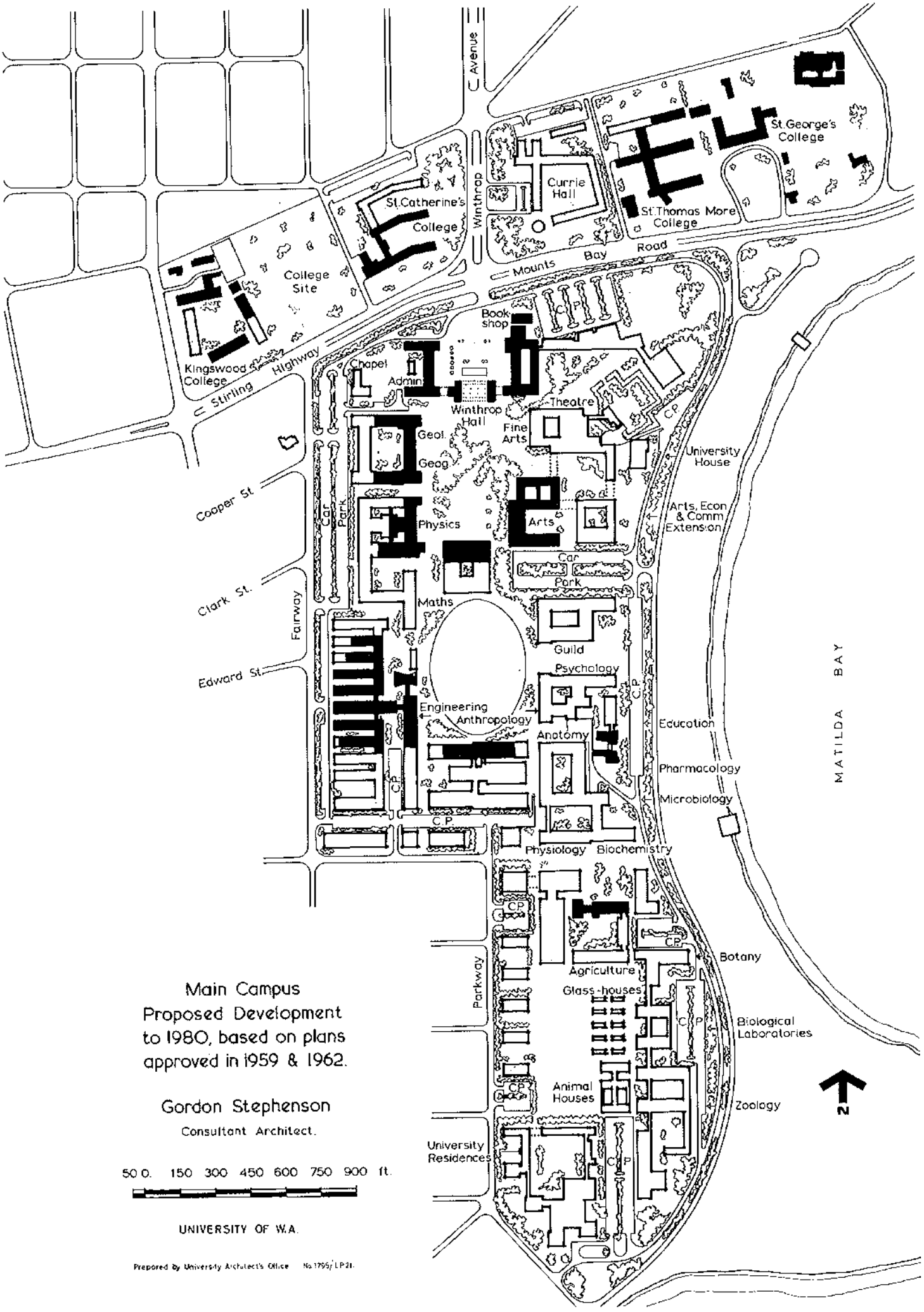
Apart from providing additional development space at the expense of the Great Court the justification for this major departure from the Wilkinson and Stephenson plans was to create identifiable architectural precincts - a 'romantic' group of buildings which included the Hackett buildings and the north face of the proposed Library building which was to copy the Winthrop Hall elevation, a 'scientific' group of cheaper construction and an 'academic' group of slightly more expensive construction. The buildings for Engineering had been committed and the sketches for Physics and Chemistry had been completed. Presumably these buildings fell in the 'scientific' group.

The philosophy seemed to be that containment of the 'romantic' group permitted the use of a so called contemporary idiom for the new buildings thus, by separation, avoiding any architectural disharmony.

It was also proposed that the Library, Arts and some unnamed buildings be six storeys in height to help provide 158,000 square metres of building floor area and that parking provision be made for 1,600 vehicles.

The second stage Engineering buildings, Chemistry and the six storey Physics buildings proceeded to completion but all other proposals of the layout plan were set aside by the Senate's October 1959 decision to invite Stephenson back from Toronto for consultation and for him to subsequently accept a permanent appointment as Consultant Architect.

Stephenson reviewed his plan in 1959 maintaining the framework of the 1955 plan but intensifying the site coverage of buildings almost to the exclusion of large landscaped spaces. The aim being to achieve the 148,000 square metres of building area estimated as required in a report prepared by a sub-committee of the Buildings Committee of which Dr R. L. Kirk was convener. The sub-committee predicted an increase in student numbers to 8,500 by 1967 with 720



Main Campus
Proposed Development
to 1980, based on plans
approved in 1959 & 1962.

Gordon Stephenson
Consultant Architect.

50 0. 150 300 450 600 750 900 ft.

UNIVERSITY OF W.A.

Prepared by University Architect's Office No.1799/LP21.

teaching staff and a requirement for parking facilities for 2 500 cars and 830 motor cycles and scooters when the student numbers reached 8,000.

When presenting the 1959 plan to the Senate and the Professorial Board Stephenson reiterated the basic planning principles of the 1955 plan and added that it was undesirable to make provision in buildings for undergraduate classes beyond the third floor but, if necessary, buildings housing offices for teaching and research staff and some research laboratories could go up to six and eight floors. Also that all buildings should be of true University character but that no attempt should be made to prescribe an architecture suitable for all buildings and all time.

Stephenson advised that "old buildings should not be hidden from the new and that two buildings totally different in design could still harmonise", however, cream bricks were promoted for use on the west flank of the Great Court for the reason that "old Chemistry and new Physics could not be seen in perspective from the side and could be foiled by trees from the frontal view.".

Time has simplified Stephenson's planning principles into four statements which were quoted and supported in the 1975 Report on Campus Planning and are still quoted as the current guiding principles:

(a) Buildings for all faculties and major departments should be so designed that they could be expanded when required.

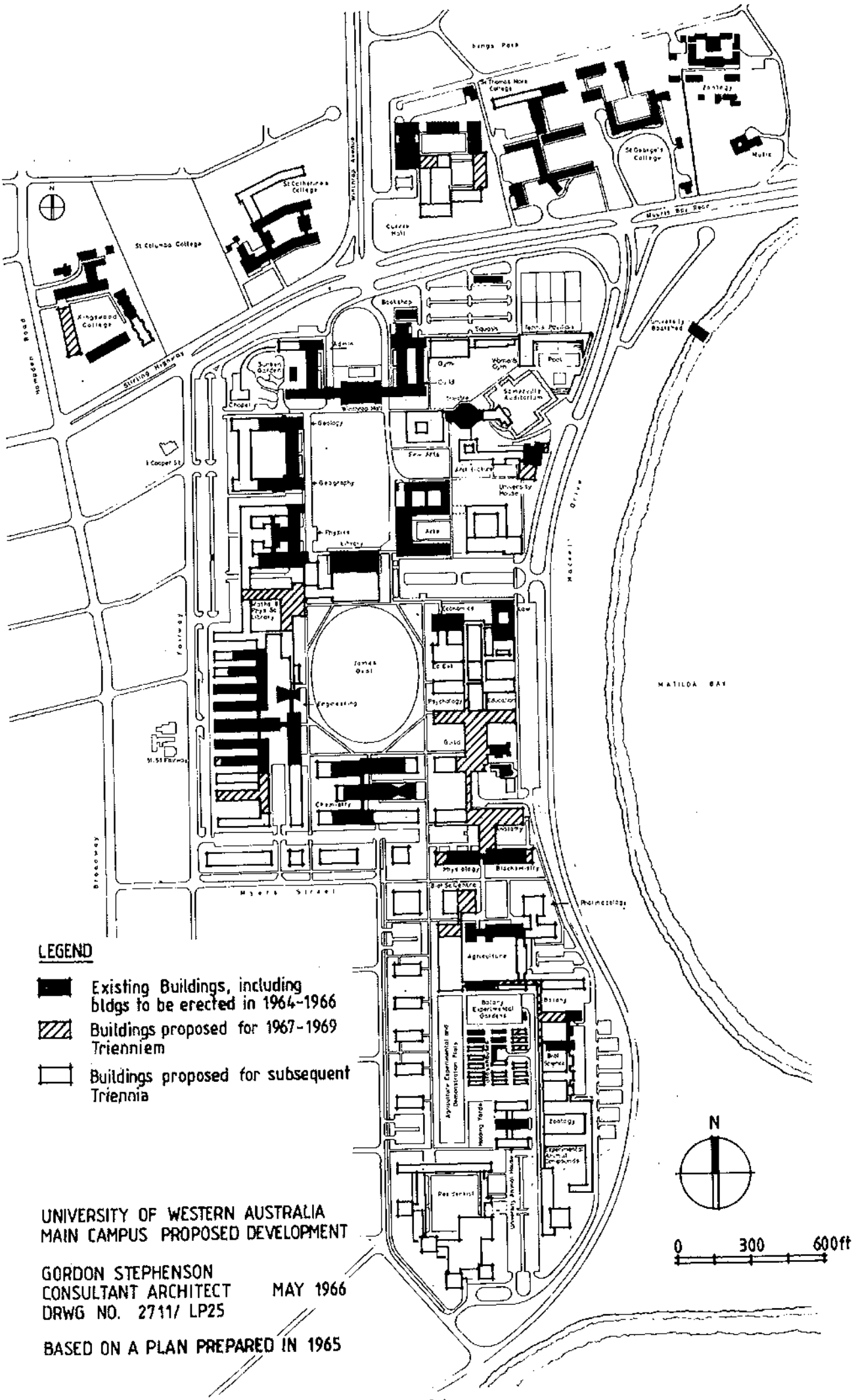
(b) Faculties and departments should be placed in the most convenient possible physical relationship.

(c) Buildings and departments should be arranged to face a series of quiet inner courtyards and spaces. Cars should have access to buildings only from the periphery of the campus.

(d) Cars should be confined to car parks and a ring road on the edge of the campus. Paths and promenades through the inner parts of the campus should be for pedestrians only.

In terms of the landscape elements the 1959 plan proposed the retention of Whitfeld and Great Courts, James Oval and Somerville Auditorium but nominated a reduction in size of Riley Oval. Stephenson emphasized a real need for landscaping on the western side of the campus and suggested the removal of car parking on the Fairway road verge.

The 1959 plan made provision for 1,800 parked vehicles but Stephenson stressed that the campus should not become possessed by cars and that sunken areas for car parking


LEGEND
Existing Buildings, including bldgs to be erected in 1964-1966
Buildings proposed for 1967-1969 Triennium
Buildings proposed for subsequent Triennia
N
0 300 600ft
UNIVERSITY OF WESTERN AUSTRALIA
MAIN CAMPUS PROPOSED DEVELOPMENT
GORDON STEPHENSON
CONSULTANT ARCHITECT MAY 1966
DRWG NO. 2711/ LP25
BASED ON A PLAN PREPARED IN 1965

should be created with landscaping to screen the vehicles from view.

The campus plan was redrawn in 1962 and 1965, the 1965 plan showing even more intense development of the campus than the 1959 and 1962 versions. The 1965 plan apparently was not endorsed by the Senate.

All the Stephenson plans supported the location of residential colleges north of Stirling Highway and Mounts Bay Road as established by the Desbrowe-Annear and Wilkinson Plans. The 1954 and 1955 plans depicted a residential college on what is now the WACAE Nedlands campus site and a Teachers Training College with the Faculty of Education in the extreme southern campus. The 1959, 1962 and 1965 plans showed University residences in that location.

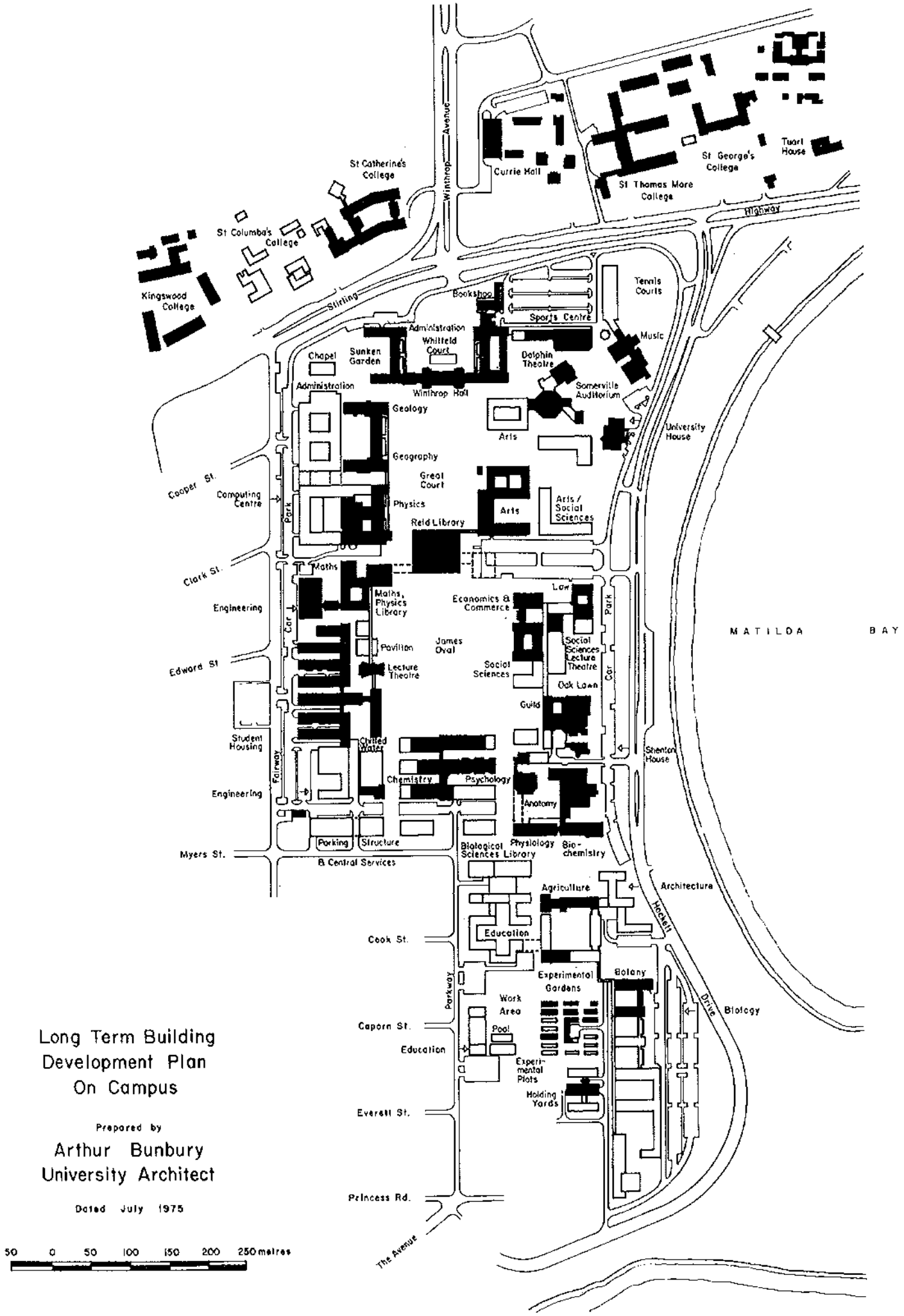
In the period between 1966 when Arthur Bunbury replaced Stephenson as University Architect and his retirement in 1985 the structure and principles of the 1959 Stephenson plan were maintained and in his Report on Campus Planning presented in 1975 Bunbury, as well as recording the variations in detail which had occurred to the campus plan, proposed that no major departures from the principles of the 1959 plan be contemplated in the future.

In August 1970 Professor A.R.H. Cole completed an Academic Plan No. 1 commissioned by the Professorial Board to assist in the development of the University over the period 1970-1980.

The Academic Plan made proposals for a broad range of administrative and academic structures and although not specific in physical requirements would have been valuable in the development of the campus plan. The Vice Chancellor's Review of the Academic Plan was not completed until November 1975 after the preparation of the 1975 Report on Campus Planning.

In the absence of a detailed brief for the long term physical planning of the campus and especially the southern campus, where most planning opportunities existed, the 1975 plan was based largely on assumptions and closely followed the pattern of the 1959 and 1962 plans.

None of the Stephenson plans nor the Bunbury plan made detailed recommendations for architectural or landscape control. Stephenson proposed that no attempt should be made to prescribe architectural controls and both Stephenson and Bunbury made broad brush recommendations for the future of the major green spaces but made no reference to intimate detail such as paving materials and signage.



Long Term Building Development Plan On Campus

Prepared by

Arthur Bunbury
University Architect

Dated July 1975

50 0 50 100 150 200 250 metres

Such issues were controlled in the day to day management of the plan and its principles, a system which requires the constant involvement of a highly skilled and sensitive architect planner to examine and guide proposals for campus development. The University has always jealously guarded the very high standard of architecture and landscape for which the campus is renowned. Architects and advisers have been cautiously selected and in-house administration has been painstakingly precise.

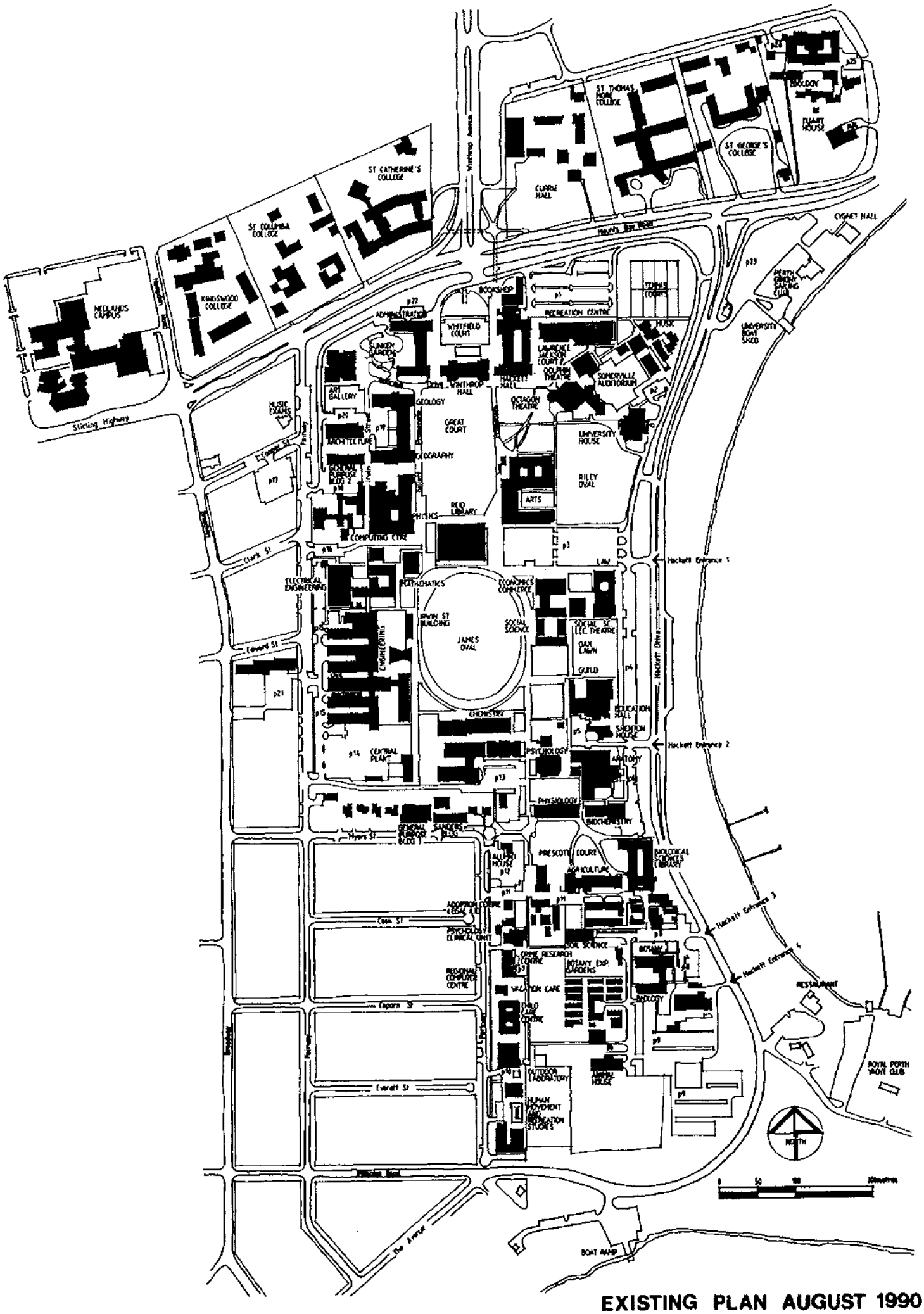
Stephenson worked in association with the new project architects brought on to the campus in place of the Public Works Department and in the role of associate project architect as well as University Architect was in an excellent position to avoid disasters and encourage the high standard of architecture which set a contextual background for others to follow. Landscape elements such as paving materials were not that well controlled and in later years have not achieved the integrity of the campus architecture.

Whitfeld Court, Great Court and James Oval had been classified by the Senate as Permanent Green Reserves prior to 1975. Stephenson had noted Somerville Auditorium as worthy of retention but had not recommended any action for the Sunken Garden and the 1965 plan eliminated the Oak Lawn completely. The 1975 plan recommended the classification of the Sunken Garden, Somerville Auditorium and the Oak Lawn although shown reduced in area from what it is at this time. It also recommended the creation of another major green space north of the Institute of Agriculture building, the space being landscaped in 1983 and named Prescott Court. This Court was later added to the list of Permanent Green Reserves.

The 1965 plan provided for permanent ground level parking for 2,000 vehicles which Stephenson recommended as the maximum acceptable to protect the visual amenity of the campus.

Later in 1975 Bunbury prepared a document, Recommendations to the Senate on Parking and Traffic, which proposed that the concept of a campus in which the pedestrian is dominant should be maintained and that vehicles should be confined to a ring road system following the perimeter of the campus. Also that, in view of the limitations imposed by the existing size of the campus, the area which can be allocated to vehicle parking cannot be sufficient to meet the demand and must be limited to protect the function and amenity of the campus.

The documents estimated a parking need of 4,000 spaces to meet the anticipated maximum campus population of 12,000 students and recommended that 2,000 of these spaces should be provided on campus or on adjoining University land and the remaining spaces in the immediate neighbourhood off campus. Any shortfall in the total provision on or off campus was to



EXISTING PLAN AUGUST 1990

be met by undercroft and multi-level parking structures and also by remote parking areas connected to the main campus by shuttle bus service.

Additional studies were initiated to resolve the growing car parking problem on and off campus and partly as a result of one of these studies, the Traffic and Parking Strategy completed in 1986 by Feilman Planning Consultants Pty Ltd, the potential for expanding the campus was explored in depth. Due to the pressure by the Subiaco City Council which was concerned by the number of University generated vehicles parking in the streets adjacent to the campus the consultants' study found that a number of these vehicles should be accommodated on University land and recommended that the majority should be accommodated on the western flank of the campus. The first undercroft car parks were completed in 1989 under the Human Movement Gymnasium and in 1990 under the Lawrence Wilson Art Gallery. The first decked car park was completed in 1990 off campus on Edward Street between Fairway and Broadway.

In order to gain Council support for the rezoning required for the Edward Street development to proceed a study of the area between Stirling Highway and Princess Road and Broadway and Fairway and Parkway was undertaken by the same consultants to determine future land use options. The Broadway Fairway Planning Study was completed in 1988.

A more recent influence on the development of the Crawley campus is the acquisition by the University of the 3.5 hectare Nedlands campus of the Western Australian College of Advanced Education which will permit at least temporary relocation of some departments from the Crawley campus after 1991 when the University takes possession of this site. The existing buildings provide approximately 10,000 square metres of net floor space as currently used by the College.

A preliminary planning study of the potential use of the Shenton Park campus for research and other purposes was completed in 1990 by Feilman Planning Consultants Pty Ltd. It is apparent that a more intensive use of that campus by departments on the Crawley campus could free areas for development especially in the southern campus.

The 1926 plan was developed for a student population of 2,000 to 3,000, the 1955 plan for 8,000 students by the late 1980's and the 1959 plan for 8,500 students by the late 1960's. The 1975 Report noted a planned maximum population of 12,000 students and the 1988-1990 triennium submission to Commonwealth Tertiary Education Commission nominated a target of 10,000 Equivalent Full Time Student Units by 1994. In 1989 the EFTSU's were 9,080 comprising 8,193 internal and 11 external full-time students and 2,187 internal and 32 external part-time students.

The student population including total full-time and part-time students rose from 7,120 in 1970 to 9,176 in 1975 dropping to 8,755 in 1985 because of the restrictions on growth at the Crawley campus to support growth of Murdoch University which commenced teaching in 1975. The total student population increased to 10,423 in 1989.

The Crawley campus could support a much larger population depending on the particular disciplines involved. For instance Agriculture, Botany, Human Movement and Engineering are relatively large ground space users compared to Arts and the Social Sciences which could be adequately accommodated in high-rise buildings.

It is relevant that during negotiations related to the UWA/Murdoch University merger, the relocation of the School of Agriculture to the Murdoch campus seemed acceptable. Should the School of Agriculture and or the glasshouses, garden plots and animal holding yards of Agriculture, Botany and Zoology be able to be relocated elsewhere, such as at the Shenton Park campus, more options become available for the development of the southern campus.

The constraints on population growth will involve limitations for vehicle parking facilities and a correct environmental balance between buildings and landscaped spaces.

NEDLANDS CAMPUS

As part of a major building works package financed jointly by the University and the Commonwealth Tertiary Education Commission negotiations commenced in 1987 for the University to purchase the 3.5 hectare Nedlands campus of the Western Australian College of Advanced Education. Nedlands College was constructed in 1967 on the site of the former University Women's Hockey Ground on the corner of Stirling Highway and Hampden Road.

It was noted during negotiations that the Nedlands campus buildings totalling 14,600 square metres in gross floor area would eventually require replacement but until then, in conjunction with facilities on the Crawley campus, would provide an expansion potential for some 1,500 students and relieve pressures on accommodation in existing buildings on the Crawley campus.

New facilities for the Nedlands College are being constructed at the Mount Lawley campus of the WACAE and are due for occupation in February 1991 making the Nedlands campus available to the University at the same time.

The site bounded by Stirling Highway, Hampden Road, Gordon Street and Clifton Street is within the City of Nedlands and zoned Public Purposes. Lots to the north and west are zoned Residential R25. Lots on the north side of Stirling Highway between Clifton and Williams Streets and on the south side of Stirling Highway between Bruce Street and the Broadway corner are zoned Office/Showroom and Service Station. The Nedlands City Council has a blanket maximum building height limit in the area of two storeys or 10 metres above natural ground level, a requirement which may be varied by Council subject to certain conditions. This height limit may effect future development on the Nedlands campus. The City Council will be interested in provisions for parking and traffic movement patterns.

Facilities on the Nedlands campus include a five level Administration/Teaching building with 3,550 square metres of usable floor area, a two level Teaching/Resource building with 1,770 square metres. The lowest level of this building is mostly below ground level but the structure of the building has been designed to carry a two level vertical extension. The Industrial Arts building provides 1,780 square metres and is integrated with the one, two and three level Gymnasium building which provides 1,280 square metres. A single level Music building provides 500 square metres, a Student Association building 230 square metres and Cafeteria 680 square metres. The 140 seat Lecture Theatre integrated with the Administration/Teaching building is accommodated in 200 square metres.

Because of the spread of buildings, tennis court, cricket practice nets and hockey field the campus is not endowed with the open landscaped court system of the Crawley campus. Car parking is mostly contained on the northern and western flanks of the campus and accommodates 350 vehicles. At times an additional 50 vehicles are parked on a grassed area to the north of the Industrial Arts building. Parallel parking in the road verge of Gordon Street on the northern boundary of the site provides 20 bays and right angle parking in the road verge of Clifton Street on the western boundary provides 46 bays. This parking is limited to 4 hours between 8:30 am and 6:00 pm.

A two level parking structure on the existing Hockey Field would provide an extra 370 spaces which, if not required for the Nedlands campus, could be well used to ease pressures on the Crawley campus.

The demolition of the Gymnasium building would allow the creation of an internal landscaped court around which new buildings could be located to achieve the planning qualities and environment enjoyed on the Crawley campus.

The college facilities at present service a total of 1,500 students comprising 900 to 1,000 EFTSU's with 80 staff members.

A separate study prepared by R. J. Ferguson & Associates in 1990 analysed the existing facilities and investigated various options for the use of those facilities. The purpose of the study was to determine which departments might be suitable tenants for the Nedlands campus, if only in the short term, and whose vacation of facilities on the Crawley campus would best benefit that campus.

Although adjacent to the Crawley campus, diagonally across the intersection of Stirling Highway, Hampden Road and Broadway, all departments consulted perceived the Nedlands campus as being remote from the Crawley campus because of the Stirling Highway barrier and the time required for students to move between the two campuses.

The marked difference in character between the two campuses caused some adverse reaction from some departments and the nature of the buildings, particularly the staff offices which are relatively few compared to the area of teaching spaces and small compared to those on the Crawley campus, created difficulties in exercises to relocate departments, most of which have particular space requirements. Many offices and some teaching spaces although air conditioned are without natural light.

New and existing buildings which are to be retained for some time should be made to achieve architectural qualities compatible with those on the Crawley campus.

GRADE SEPARATED LINK

A study to establish the need for a grade separated link between the two campuses and to examine options for such a link was undertaken in June 1989 by consultants Scott and Furphy Pty Ltd.

The study observed that existing pedestrian movement between the Crawley campus and St George's, St Thomas More and St Catherine's Colleges and Currie Hall at peak traffic time was facilitated by the subway system located at the junction of Winthrop Avenue and Stirling Highway and Mounts Bay Road. However residents of Kingswood and St Columba Colleges had no specific pedestrian route to the main campus and made indiscriminate crossings of Stirling Highway at grade. The existing level of pedestrian movements, even at peak periods, was not found to warrant grade separation, however the increase in pedestrian movements anticipated to be generated by the occupancy of the Nedlands campus by the University, and particularly should a car parking station be established on that campus, would warrant pedestrian grade separation.

A grade controlled pedestrian crossing (pedestrian phase at traffic signals) at the Broadway Stirling Highway intersection was found to be unacceptable to the Main Roads Department because of the interference with traffic flows in Stirling Highway especially when this intersection is upgraded to include continuous left turns at all junctions.

A bridge and subway were investigated to link the space between Kingswood and St Columba Colleges and the north-west corner of the main campus. Despite the greater cost the study found in favour of the subway on the basis that users prefer subways to bridges and that the subway would be less environomentally intrusive.

It was found that access ramps and stairs for a bridge would occupy more land than for a subway which is required to be only approximately 3 metres below road level where a bridge is required to be approximately 6 metres above road level.

The existing ground levels do not permit "see through" situations as available at the Winthrop Avenue subways and climbing down into and up out of the tunnel may not be as attractive to users out of peak pedestrian periods as a bridge where the users are exposed to view at all times.

The space at the north-west corner of the campus is too constrained by the new Art Gallery and its landscaping to comfortably accommodate subway or bridge ramps and steps.

The Study did not find a need for a grade separated crossing of Hampden Road but did recommend that this need be reviewed after the Nedlands campus has been occupied and pedestrian movement patterns can be assessed.

Ideally any grade separated link serving the northern side of Stirling Highway should be located to be easily accessible to the Nedlands campus, Kingswood and St Columba Colleges. The location of the link on the southern side of Stirling Highway can only be into the off-campus area between Broadway and Fairway and ideally at the corner of Stirling Highway and Fairway. This would require the demolition of one or two properties on that corner.

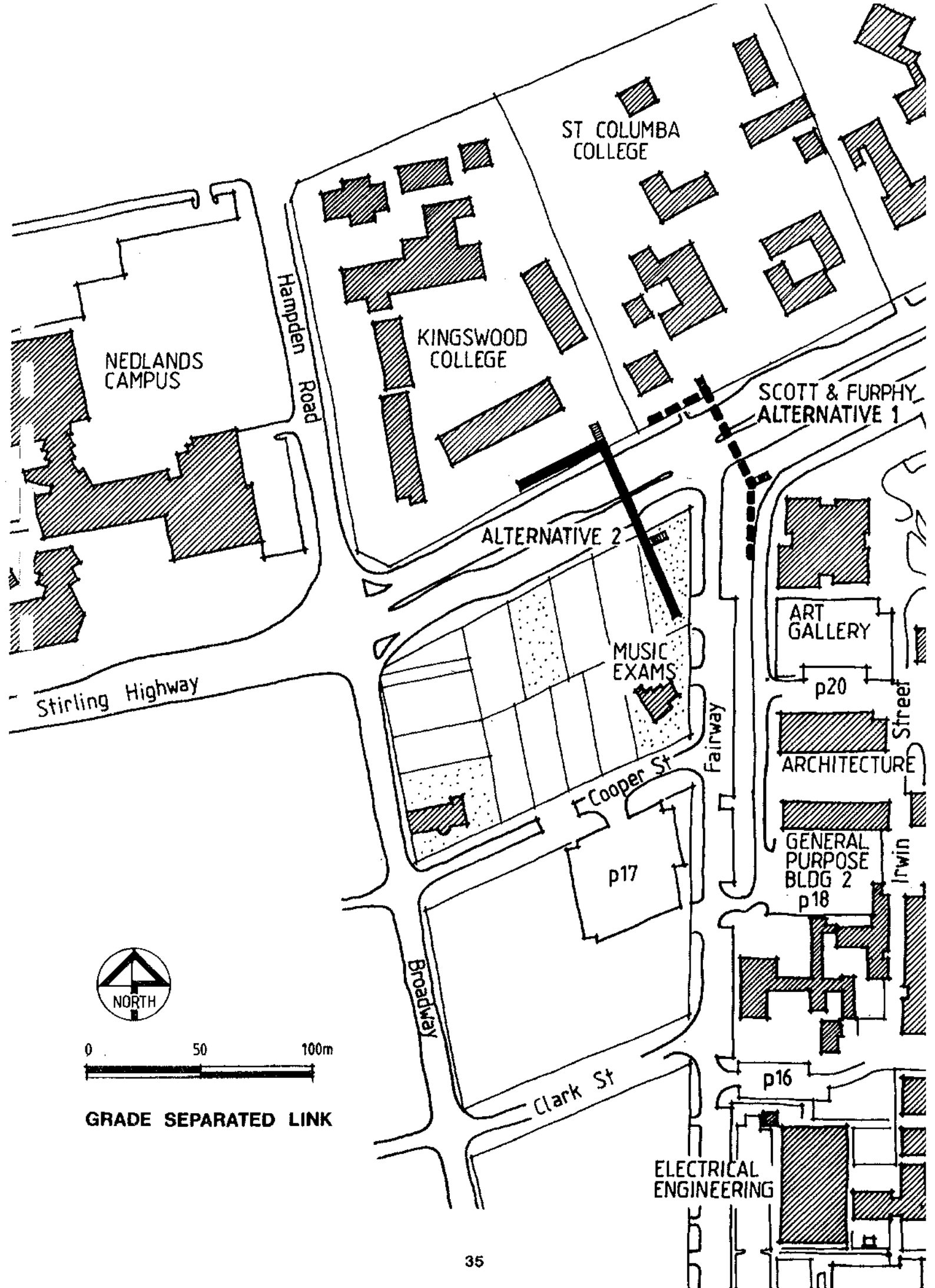
RECOMMENDATIONS

- Demolish the Gymnasium building and plant for an internal landscaped court. The existing Hockey Field should be replaced by a two level car parking structure.

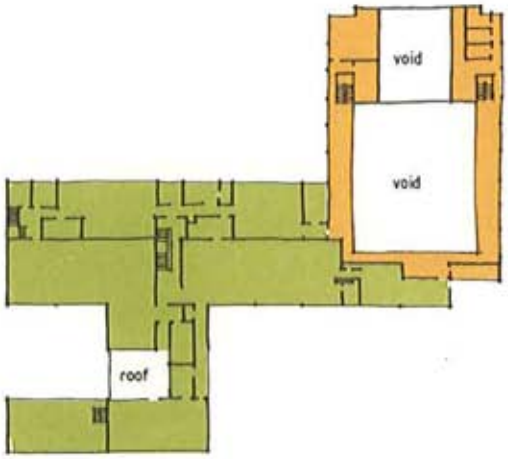
- Upgrade "permanent" existing buildings and design new buildings to achieve architectural qualities compatible with those on the Crawley campus.

- Construct a grade separated link between Kingswood College and a site on the western corner of the intersection of Stirling Highway and Fairway.

- Review the need for a grade separated link crossing Hampden Road between the Nedlands campus and Kingswood College after the Nedlands campus has been occupied and pedestrian movement patterns can be assessed.

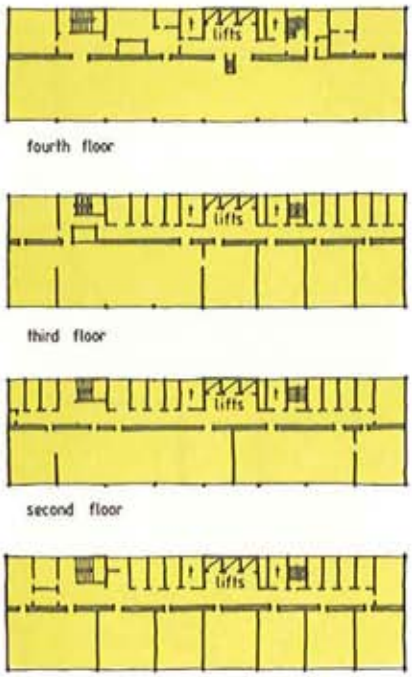

ST COLUMBA COLLEGE
KINGSWOOD COLLEGE
NEDLANDS CAMPUS
Hampden Road
SCOTT & FURPHY ALTERNATIVE 1
ALTERNATIVE 2
ART GALLERY
MUSIC EXAMS
p20
Street
Stirling Highway
Fairway
Cooper St
ARCHITECTURE
GENERAL PURPOSE BLDG 2
p18
Irwin
p17
Broadway
Clark St
p16
ELECTRICAL ENGINEERING
NORTH
0
50
100m
GRADE SEPARATED LINK

NEDLANDS CAMPUS PLAN EXISTING 1990



first floor

INDUSTRIAL ARTS / GYMNASIUM



fourth floor

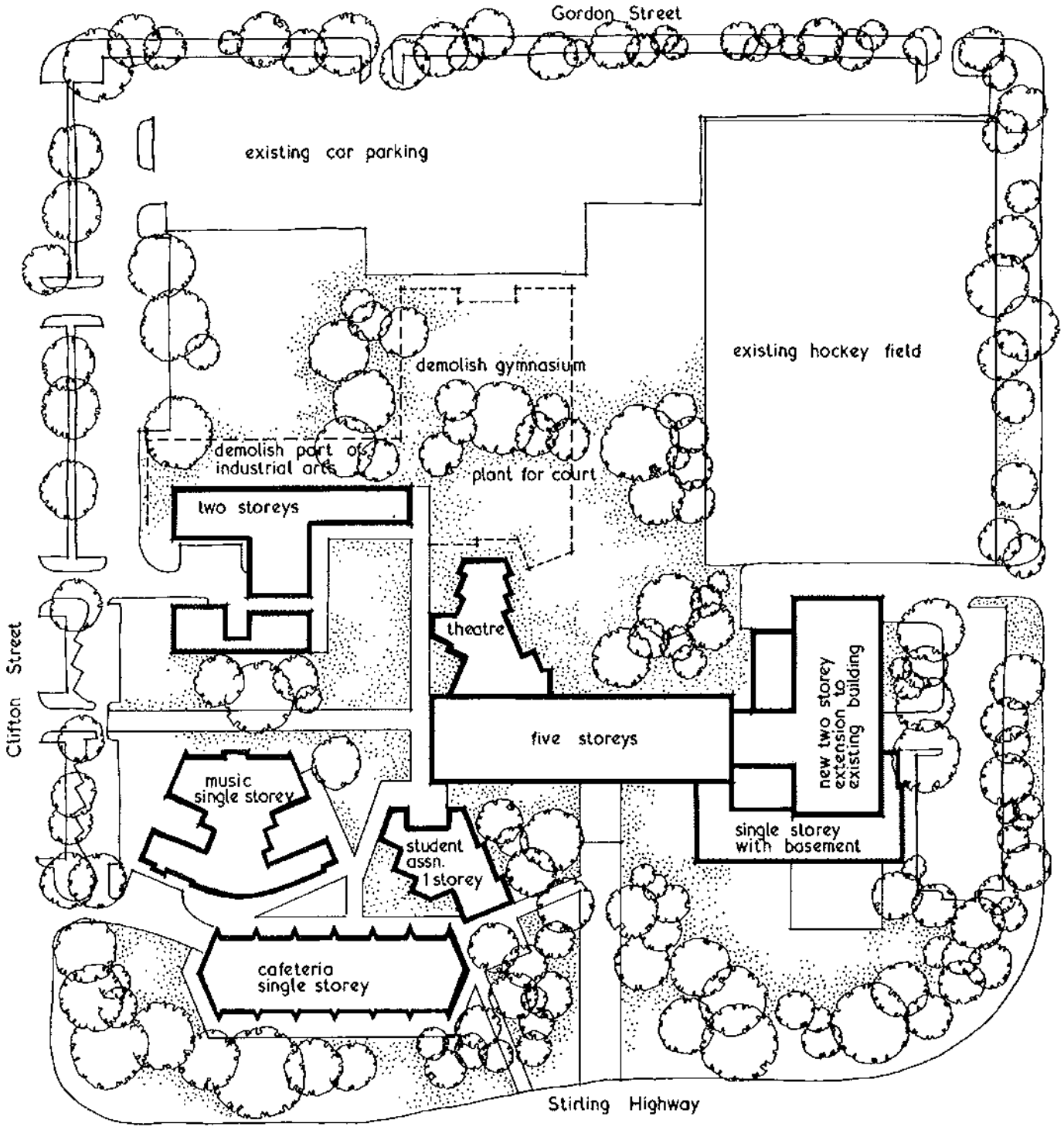
third floor

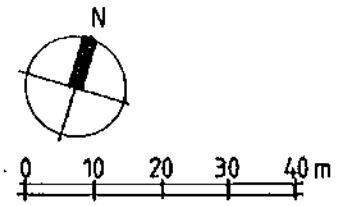
second floor

first floor

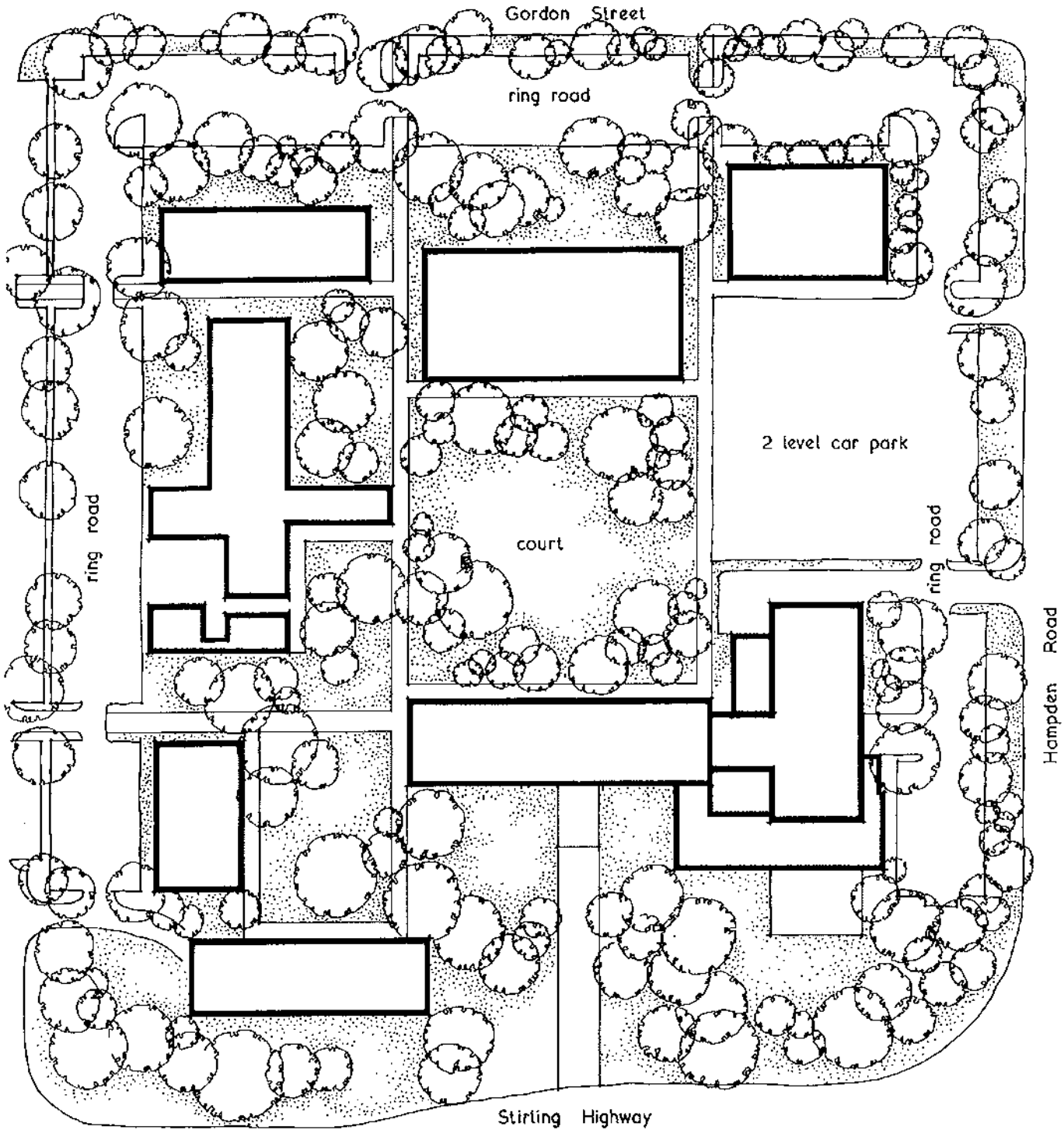
ADMINISTRATION / TEACHING

NEDLANDS CAMPUS PLAN EXISTING 1990





NEDLANDS CAMPUS PLAN INITIAL DEVELOPMENT



NEDLANDS CAMPUS PLAN TOTAL DEVELOPMENT

SHENTON PARK RESEARCH CAMPUS

The University initiated a study in 1987 to establish the development potential of its 62 hectare site south of Underwood Avenue between Brockway Road and Selby Street.

As a guide to the study it was envisaged that a research based campus of some 3,000 to 4,000 students and a "business park" allied to the academic facilities be considered for the site.

The site, 3 kilometres north of the Crawley Campus, is immediately east of the U.W.A. Sports Park including the Superdrome and McGillivray Ovals and a CSIRO laboratories facility. To the north-west of the site is the Perry Lakes Stadium, to the north and east residential development and to the north-east the headquarters of the Australian Institute of Management Western Australia. To the south are located the Water Authority Subiaco Sewage Treatment Works, the Water Authority Water Supply Depot, the Paraplegic-Quadraplegic Centre, a Tuberculosis Association Hostel and Royal Perth Hospital Shenton Park Annex.

At the time of the study 21 hectares at the western end of the site was used by the University's Institute of Agriculture as a research station, approximately 3.7 hectares were leased to the Water Authority and the Department of Marine and Harbours for use by these departments and the University for water research. The University's Department of Civil and Environmental Engineering occupied approximately 4 hectares of bushland, 3,500 square metres of which was developed, the Department of Botany occupied 4 hectares and the Department of Zoology, 5 hectares as research stations. Approximately 24 hectares of the site was undeveloped natural bushland.

The Perth Main Sewer cuts diagonally through the larger eastern section of the site from the Underwood Avenue Selby Street intersection to the Sewage Treatment works in the south-western corner. The Perry Lakes Main Sewer cuts through the western section of the site from Underwood Avenue to the Sewage Treatment Works. A major chlorine dousing facility is located immediately adjacent the southern boundary of the site in the north-eastern corner of the Sewage Treatment Works site and is considered a potential hazard due to possible gas leaks.

The Water Authority of Western Australia has been requested to commission a risk assessment analysis of the chlorine store and dousing facility.

The outcome of this analysis could result in modifications to the consultants' design proposals.

A "Preliminary Planning Assessment" was prepared in June 1987 by Feilman Planning Consultants Pty Ltd which proposed two development options. One located a research campus on the western section of the site with the greater eastern section subdivided into business research lots. The second option located the research campus to the east and the business research lots to the west.

One section in the centre of the site proposed business research lots in both options allowing immediate possession of these lots for private research institutions but keeping the major planning options open for the long term future. Both options proposed a large landscaped car park buffer strip between development and the Sewage Treatment Works.

More detailed Development Plans prepared in August 1989 and August 1990 identified five uses for the site in Administration, Teaching, Research, Business and Graduate Student Housing. The Plan proposed retaining the existing Agriculture and Engineering research areas on the western section of the site and commencing new development from a central location in the larger remaining eastern section of the site. Expansion of Administration, Teaching, Research and Business facilities was proposed to be radial from the centre of the site to its boundaries with Student Residential Accommodation developing in the south-eastern corner of the site.

A recommendation of the Plan was that the research campus should remain closely related to the main Crawley campus so that the Shenton Park campus did not become a secondary or inferior institution.

This more recent Plan also proposed the provision of a 2,500 space car park located as a buffer against the Sewage Treatment Works with a shuttle bus service connected to the Crawley campus to help ease the parking problems of the main campus.

Neither of the studies was required to assess the financial viability of the site for a research campus or business research park but the 1989 and 1990 Plans did observe that whilst there is little evidence that proximity to a university is a significant pull factor for businesses in locational terms, the Shenton Park site has substantial attractions as a business location in its own right, being located only 6 kilometres from the Perth Central Business District and surrounded by quality residential areas.

The 1990 Plan has been discussed with officers of the local authority and has been redrafted for endorsement by Senate prior to presentation to the Nedlands City Council and State Planning Commission.

The Plan represents a long term development strategy and presumably the existing users of the site will be able to justify their continued occupancy as part of the teaching and research elements of the campus.

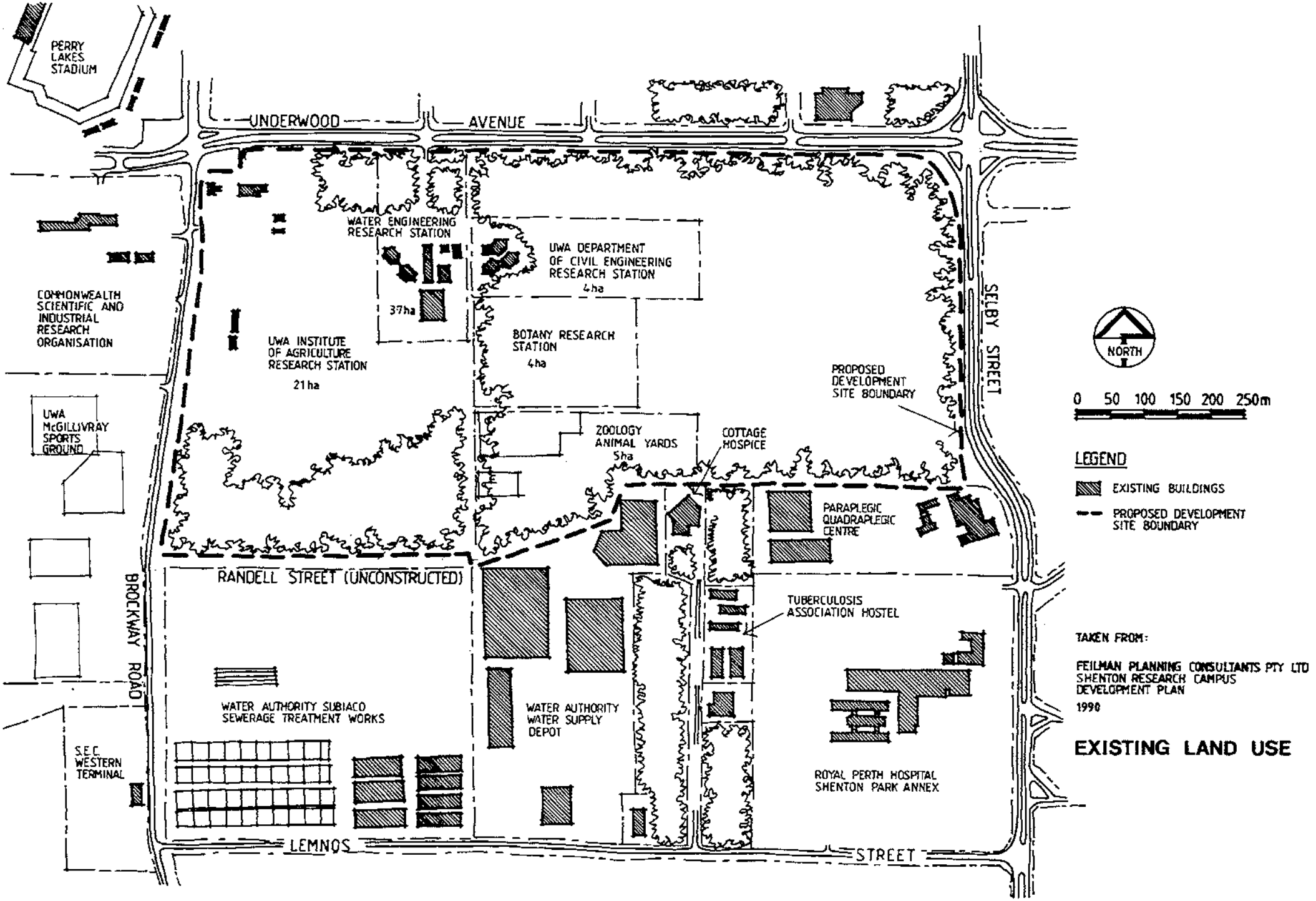
An immediate benefit to the Crawley campus of the Shenton Park site is in its potential to relieve the Crawley campus of some of its pressures such as in the area of field plots, glasshouses and animal holding for the Biological Sciences and experimental areas for Engineering. The problems of removing these facilities from close proximity to other undergraduate teaching facilities need to be addressed.

The relocation of whole departments from the Crawley campus to Shenton Park might be most unwelcome until adequate support facilities are established at Shenton Park.

RECOMMENDATIONS

- Pursue the possibility of accommodating additional facilities on the Shenton Park campus from the Crawley campus to increase development options on the Crawley campus.

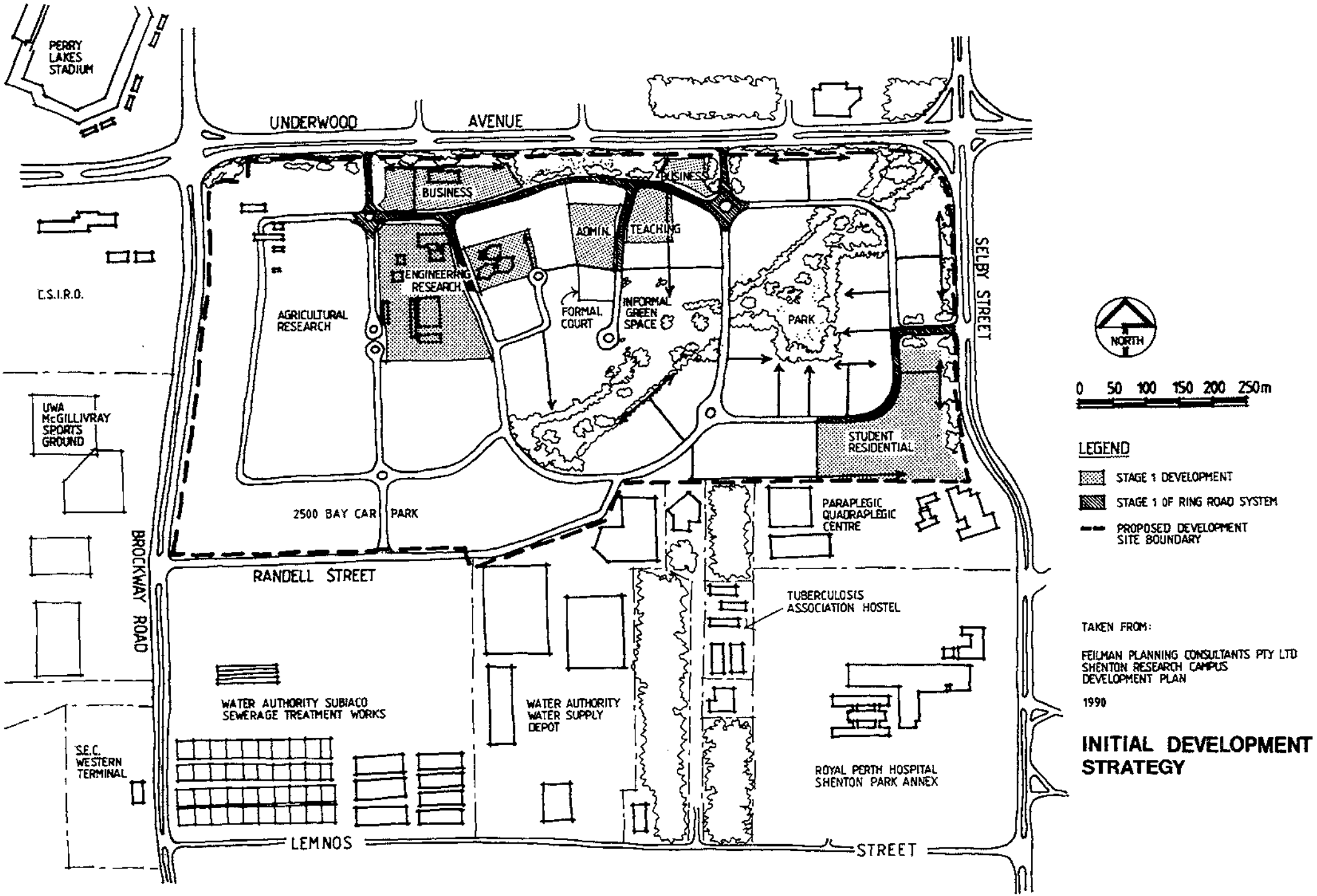
- Consider the provision of a large car parking facility on the Shenton Park campus connected to the Crawley campus with a shuttle bus service.



TAKEN FROM:

FEILMAN PLANNING CONSULTANTS PTY LTD
SHENTON RESEARCH CAMPUS
DEVELOPMENT PLAN
1990

EXISTING LAND USE

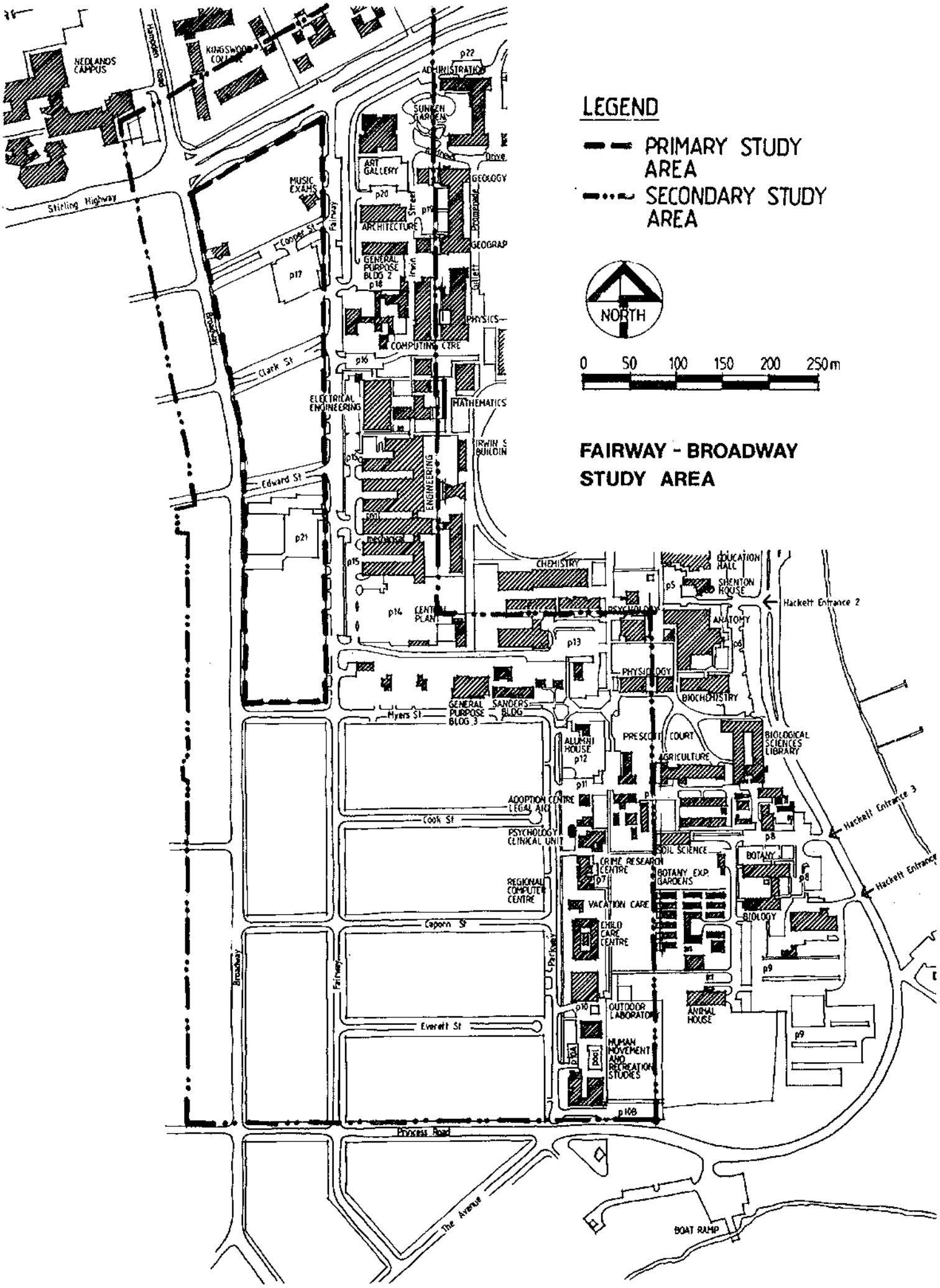


TAKEN FROM:

FEILMAN PLANNING CONSULTANTS PTY LTD
SHENTON RESEARCH CAMPUS
DEVELOPMENT PLAN

1990

INITIAL DEVELOPMENT STRATEGY


LEGEND
PRIMARY STUDY AREA
SECONDARY STUDY AREA
NORTH
0 50 100 150 200 250m
FAIRWAY - BROADWAY STUDY AREA
NEDLANDS CAMPUS
KINGSWOOD COLLEGE
ADMINISTRATION
SUNKEN GARDEN
ART GALLERY
MUSIC EXAHS
GEOLOGY
ARCHITECTURE
GEOGRAPHY
GENERAL PURPOSE BLDG 2
PHYSICS
COMPUTING CTRE
MATHEMATICS
ELECTRICAL ENGINEERING
ENGINEERING
CHEMISTRY
EDUCATION HALL
SHENTON HOUSE
PSYCHOLOGY
ANATOMY
PHYSIOLOGY
BIOCHEMISTRY
GENERAL PURPOSE BLDG 3
SANDERS BLDG
ALUMNI HOUSE
PRESCOTT COURT
AGRICULTURE
BIOLOGICAL SCIENCES LIBRARY
ADOPTION CENTRE
LEGAL AID
PSYCHOLOGY CLINICAL UNIT
REGIONAL COMPUTER CENTRE
CRIME RESEARCH CENTRE
SOIL SCIENCE
BOTANY
BOTANY EXP. GARDENS
VACATION CARE
CHILD CARE CENTRE
BIOLOGY
OUTDOOR LABORATORY
ANIMAL HOUSE
HUMAN MOVEMENT AND RECREATION STUDIES
BOAT RAMP
Stirling Highway
Clark St
Edward St
Myers St
Cook St
Caporn St
Everett St
Princess Road
The Avenue
Broadway
Fairway
Parkway
Hackett Entrance 2
Hackett Entrance 3
Hackett Entrance

FAIRWAY BROADWAY CORRIDOR

The "Traffic and Parking Strategy Stage 2 Report" commissioned by the University to review the traffic and parking situations on and in the vicinity of the Crawley campus and prepared by Feilman Planning Consultants Pty Ltd for the University in 1986, among other recommendations, found the western flank of the University to be deficient by some 300 parking spaces and recommended that this deficiency be met on sites between Fairway and Broadway.

At that time the University had already acquired approximately one third of the properties between Stirling Highway and Myers Street and Fairway and Broadway and approximately one third of the properties between Myers Street and Princess Road and Fairway and Parkway. This acquisition pattern was to give the University ownership of properties which were most affected by development on campus and to give some degree of control over development adjacent to the campus. The acquisition of properties also opens up the possibility of University related activities expanding into this corridor.

In 1987 the University sought the agreement of the City of Subiaco and the State Planning Commission to a Planning Scheme Amendment for a development of 6,900 square metres of land on the south side of Edward Street between Fairway and Broadway. The Amendment was to enable offices and laboratories to be constructed for the Geomechanics Division of C.S.I.R.O. which desired a close relationship with the University's Department of Civil Engineering. The University also proposed to provide parking additional to that required by C.S.I.R.O. and other tenants to reduce the parking deficit identified by the "Traffic and Parking Strategy".

The development which is now constructed comprises a two storey building on basement car parking adjacent a two level car park providing a total of 181 spaces. The site has only been partially developed and could accommodate a further 240 parking spaces in two and three levels.

As a condition of its support for the Edward Street development the Subiaco City Council requested that the University carry out a study of the area between Stirling Highway and Princess Road, Fairway and Parkway and Broadway to determine potential development options for the area.

The defined area is generally zoned residential, with low density between Myers Street and Princess Road and Fairway and Parkway and low, medium and higher densities between Stirling Highway, Princess Road and Fairway and Broadway. Some sites adjacent to the University have an Additional Use Permit to allow the construction of single unit flats and two sites, the Broadway Fair Shopping Centre and the strip

fronting Broadway between Stirling Highway and Cooper Street, are zoned for shops. A site on the corner of Cooper Street and Fairway owned by the University is used as a car park. Two other small sites fronting Broadway are used for commercial purposes.

The "Broadway-Fairway Planning Study" prepared by Feilman Planning Consultants Pty Ltd in 1988 was undertaken in consultation with both the Cities of Subiaco and Nedlands.

The Study established a Primary Study Area between Stirling Highway, Myers Street, Broadway and Fairway and a Secondary Study Area including the Primary Study Area and properties on the western side of Broadway and the area between Myers Street, Princess Road, Broadway and Parkway.

The Study identified six development opportunities:

1. Maximum Residential Capacity. Existing development is below the limit permissible under the Local Authority Scheme in the Primary Study Area but to capacity in the area bounded by Myers Street, Princess Road, Parkway and Fairway. Unless the University required student housing adjacent to the campus and could also achieve extra car parking faciliites the option does not have much commercial attraction.

2. Maximum Commercial Capacity. The office content of shops, offices and other commercial use might be of some interest to the University but such concentration in a "commercial hub" would compound the traffic movement and car parking problems.

3. Maximum University Expansion. This option involves the expansion of University related activities into both Primary and Secondary Study Areas making Broadway the western boundary of the campus, except for an area around Broadway Fair, in lieu of Fairway and Parkway.

   The benefits to the University include the opportunity to restructure the western elements of the campus ring road system, to upgrade the University's immediate and long term parking requirements and, of course, to free up planning for campus activities.

4. Composite and Mixed Development. This option includes University expansion on properties immediately west of Fairway between Stirling Highway and Myers Street and immediately south of Myers Street between Fairway and Parkway, with commercial and retail development flanking Broadway and residential or student accommodation elsewhere. Other variations and combinations of development could be investigated.

5. Do Nothing - Likely Future. It is anticipated that both Study Areas would continue to undergo progressive piecemeal changes to satisfy more economical uses of individual sites. It could be expected that residential land would be converted into office/commercial uses particularly abutting Broadway.

6. Special Zone for University Related Activities Including Research. This is a reduced version of Option 3 limiting University related activities to the Primary Study Area and the strip immediately south of Myers Street between Fairway and Parkway. The remaining properties would retain their existing zoning.

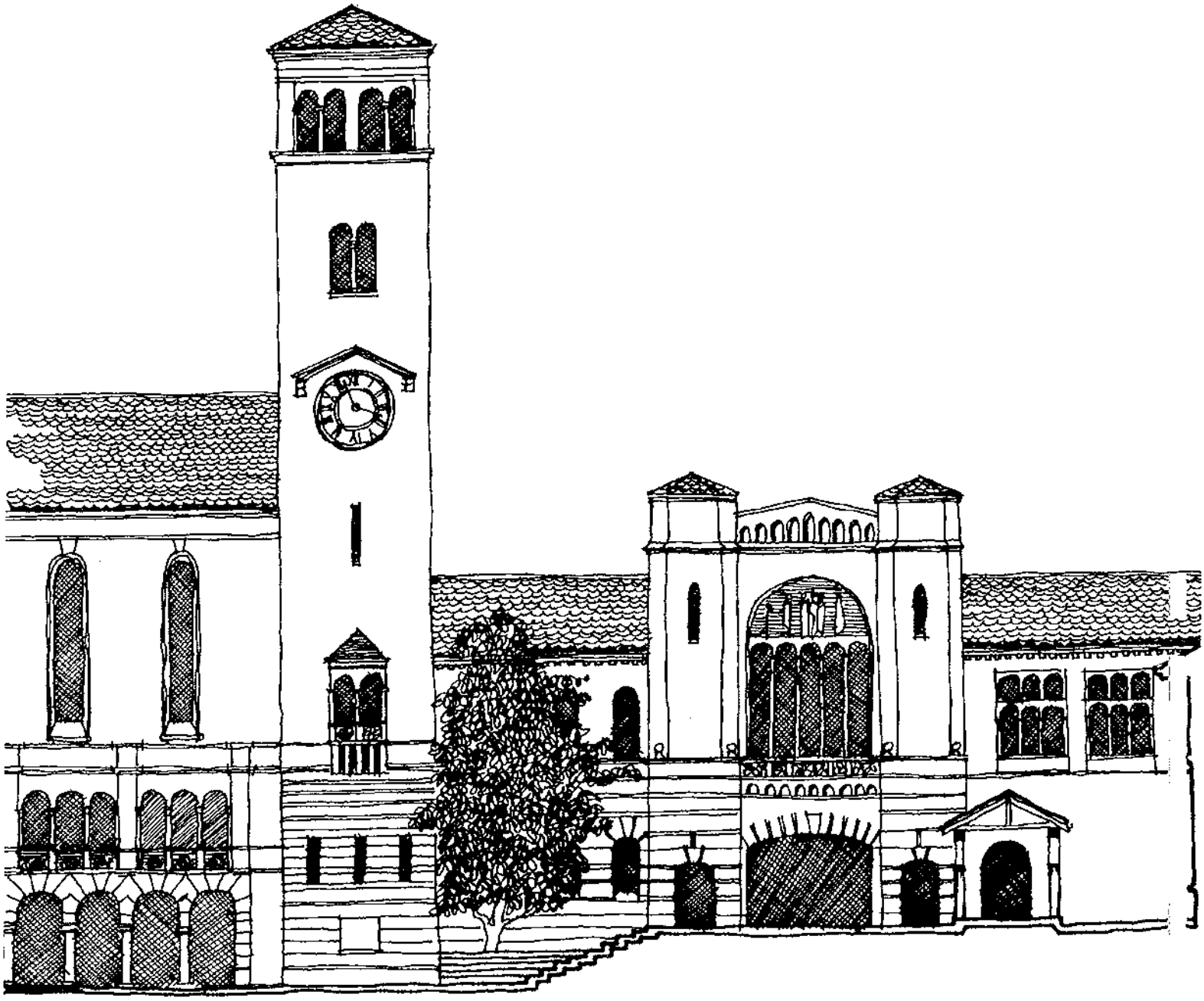
It seems inevitable that University activities will move into the Primary Study Area following the example of the Edward Street development and possibly in the long term into the Secondary Study Area. A move into the Primary Study Area may find more support from the Local Authority than would a move into the Secondary Study Area which is currently zoned as an important part of the Local Authority's low density residential stock. Development which is community orientated such as Anthropology Museums may be more acceptable to the Authority than would undergraduate teaching facilities.

Most of the properties in the Study Area are individually and privately owned, consequently the University is limited to acquiring additional properites when they become available. Several properties are strata titled with multiple owners which will make their acquisition difficult.

Due to these constraints and also because support from the Subiaco City Council and the State Planning Commission is required for the properties to be used for purposes other than those for which the properties are zoned, development will be piecemeal.

RECOMMENDATION

- Continue to acquire properties particularly in the Primary but also in the Secondary Study Area and do so, where possible, in groupings in order to achieve developments such as that at Edward Street and the Cooper Street car park. It is likely that an expanded site will be required for the construction of a pedestrian grade separated link serving the Nedlands and Crawley campuses between Broadway and Fairway on Stirling Highway.



ARCHITECTURE

The 1930 Hackett Memorial buildings comprising Winthrop Hall, Administration and Guild buildings although, even at that time, a little over romantic in some detailing responded well to the challenges set by the Wilkinson plan and endowed the campus with a generous palette of pitched terra cotta tiled roofs, limestone walls and a variety of colonnades, porches, towers and spaces. The grandeur of composition, richness of detail and colour of the buildings have set a formidable design standard for subsequent building development.

Apart from a few instances later development has displayed remarkable good manners in seeking to honour the qualities of the original buildings and in diverse ways has achieved a totality of design rare on campuses developed over a period of time under a variety of influences. The achievement is more notable because of the design constraints imposed by the established palette of materials and elements which is unforgiving of any major variation.

The architectural success of the campus has been achieved by various buildings, each successful architectural statements in their own right, being designed to be compatible with their neighbours and particularly the original group of buildings through scale, colour and texture without being constrained in terms of sculptural innovation or choice of materials.

This continuance of character and image is not apparent on most campuses with beginnings similar to that of the Crawley campus. Many support a philosophy of respecting the older buildings as part of the heritage of the campus but encouraging new buildings to explore the fickle fashions and styles of the particular times. Very few of these campuses enjoy architectural success.

An example of this approach on the Crawley campus is the stylistic expression of the Engineering library and lecture theatres building which was fashionable at a time when Brasilia was under construction and when bold mosaic tile patterns were applied to complete wall surfaces of buildings, following examples set by Mexico's University City. The buildings, whilst true to their times and in line with some of their city contemporaries, depart from the campus character and disrupt the totality of the architecture achieved elsewhere on campus. It should be noted that this approach had total support at the time as it was thought, correctly, that new buildings should not, and in fact economically could not, ape the Hackett buildings. However, instead of following a simple contextual design approach the buildings set out to establish an independent competing image of their own.

If this free ranging philosophy had been continued the campus would boast sheer walled buildings clad in mirrored glass, a style which was highly fashionable some years ago despite the moral and legal issues of reflecting one's solar glare and heat onto another's property, and, more recently, 'post modern' buildings reproducing thinly applied elements of the past as facadism.

It is notable and not accidental that the group of four buildings, Arts, Reid Library, Economics and Commerce and Law, constructed immediately after Stephenson's appointment as University Architect, each by a different architect employing different materials and achieving individual identity, form and architectural quality, are compatible with the original buildings and contribute to a continuance of character and image across campus.

Critics of the campus find deficiencies in the simplicity and consistent heights of buildings, the persistence of the terra cotta roof tiles and the hint of piecemeal development which is a product of relatively small buildings being sited in isolation from linked neighbours and their own immediate expansion. Others find that when the various buildings are assessed individually many do not meet the fashion criteria expected of their contemporaries elsewhere in the community. The lesson for the community and particularly for the city streetscapes is in the fact that the campus buildings which are free from passing fashions achieve individual merit by contributing to the success of the total campus.

A test of their correctness is whether the buildings are timeless in their architectural qualities and contribution to the campus.

To depart significantly from the established image of the campus and still maintain its architectural integrity may be impossible. The relatively minor departure from the limestone scaled wall texture of the Hackett buildings to that of the imperial sized clay brick, despite colours being compatible, is noticeable and has developed an independent image in the area of Physics, Mathematics and Electrical and Electronic Engineering.

The larger scale and various textures of the limestone wall elements find sympathy with a variety of materials including large concrete blocks, in situ off-form concrete and exposed aggregate precast concrete panels but not with small imperial size bricks or blocks which have a finite scale and texture of their own.

The painted timber walled, iron roofed, reconstructed Irwin Street Building and the stylistic Engineering and Chemistry buildings contribute to a group on the western flank which departs significantly from the campus image. Any expansion

of this group or repeat in the southern campus would more than test the strength of the established image. The one-off Irwin Street museum piece is acceptable and, in fact, refreshing but if every building chose its own separate direction the result would be chaos.

Despite the flat roof of Hackett Hall the same may result if flat roofs were pursued to any extent. The minor flat roofs of the studios and library elements of the Music School are tolerable being contained within the prominent pitched tiled roofs of the bulk of the building elements. The flat roofs of the Human Movement building represent a conscious departure from the system and are more in character with the Physics building than with the main campus building stock. Recent additions to Human Movement have pitched terra cotta tiled roofs and there are proposals, funds permitting, to pitch over existing flat roofs.

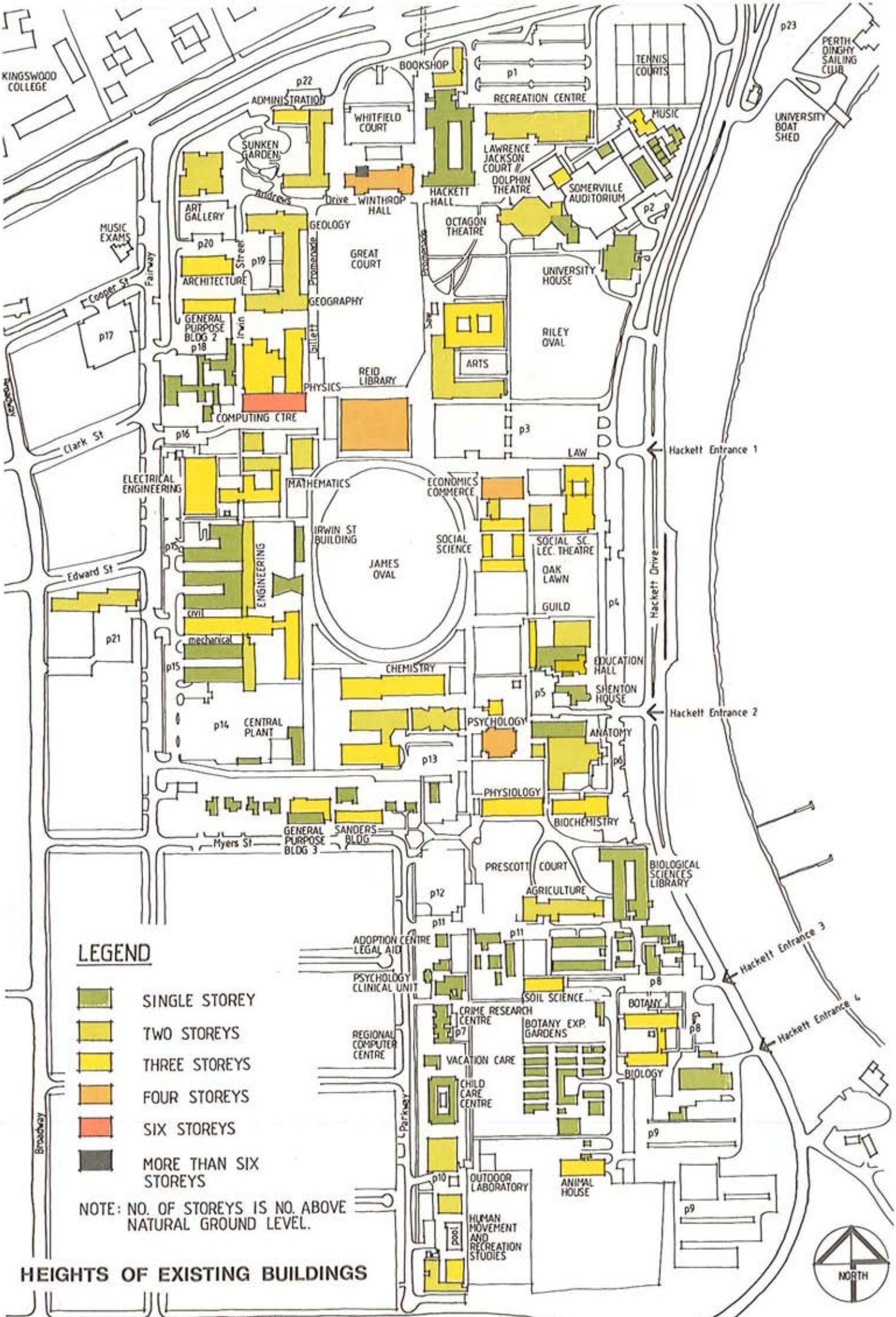
The use of the roof to accommodate solar collector panels could encourage a new building type where, for example, experimental glasshouses are accommodated on top of buildings to conserve ground space.

It is generally accepted that three storey buildings are a desirable maximum for student access. Beyond that height access would require to be supported by passenger lifts which are not the most efficient means of moving large numbers of people.

Whilst the height image of the campus may be that of three storeys most of the buildings are in fact single and two storeys. Many recent buildings are three storeys in whole or in part with only the Reid Library, Economics and Commerce and Psychology being four storeys, approximating the height of Winthrop Hall. The Physics Building is six storeys plus leaving the Winthrop Hall Tower as the highest element on the campus.

The illustration showing Heights of Existing Buildings is indicative only. For instance, Winthrop Hall has been shown as a four storey building but in fact is only two storeys over the bulk of the Hall; most large lecture theatres are basically single storey but because of their height have been shown as two storey buildings; the Computing Centre building has been shown as three storeys but is only two and a half storeys above ground level and the Lawrence Wilson Art Gallery has been shown as a two storey building despite its basement car park.

Because of the policy to install lifts in all buildings of two storeys and higher there is potential to explore buildings of greater height. The lifts are basically to facilitate access for disabled persons and to act as goods lifts for the movement of furniture and equipment but could



LEGEND

- SINGLE STOREY
- TWO STOREYS
- THREE STOREYS
- FOUR STOREYS
- SIX STOREYS
- MORE THAN SIX STOREYS

NOTE: NO. OF STOREYS IS NO. ABOVE NATURAL GROUND LEVEL.

HEIGHTS OF EXISTING BUILDINGS

be used to serve facilities such as staff offices and research laboratories on levels above three storeys.

High rise buildings - four to eight floors - permit a greater density of accommodation freeing areas for landscaping, car parking and future development but they do not necessarily enclose space which is one of the attributes of the campus.

Great Court once a single green space, now landscaped into two sections, is superbly contained below tree canopy by the Reid Library, Arts, Winthrop Hall, Geology-Geography and not so handsomely by Physics. Winthrop Hall, Reid Library, Physics and the Moreton Bay Fig are suitably scaled to the dimensions of the Court.

A second floor on Hackett Hall would complete and enhance the composition of Whitfeld Court.

The buildings around James Oval generally are too low and fragmented for its successful containment. Taller and more dense buildings on the western flank, taller buildings on the southern flank and some partial closure of the space between Social Sciences and the Guild would enhance the spatial quality of the Oval.

The slight elevation of the western Fairway side of the campus over the eastern side should encourage taller buildings to reinforce the land form and to gain views of the River. The particular location and orientation of high buildings must be sensitively controlled so as not to detract from the presence of the Winthrop Hall group nor to dominate or overshadow the landscape.

The functions required of particular buildings will greatly influence their height but in general terms high buildings cast long shadows and can create unpleasant wind patterns thus reducing the appeal of the ground space for passive and active use.

As well as facilitating protected access, the linking of various elements of groups of building reinforces the impression of totality and adds to the architectural experience of the campus. The most significant device is the free standing colonnade of Administration, Hackett Hall and Geology and Geography repeated in format, if not in style, alongside Physics and developed into the covered way of the Economics and Commerce, Social Sciences and Guild group giving protected access to separate buildings. It is developed further in Music to provide access to individual rooms.

The colonnade also addresses the act of entering the group, building or element serving as an interface between external open space and internal closed space. In some instances such

as Arts, Social Sciences and Law the colonnade has moved inside the buildings flanking internal courts and providing passage through the buildings as well as access to the various elements of the building.

The image of a cloistered campus is strongest in the earlier and adjacent groups of buildings and weakest where smaller single buildings sit isolated in the landscape.

The sensitive integration of buildings with the landscape through either cloisters or glazed spaces is a major contribution to the campus image. The one, two and three storey format of the bulk of the campus buildings is comfortably scaled to human activities and the heights of trees, is free of excessively long winter shadows and is relatively economical to construct and maintain.

However, the presence of trees adjacent low buildings causes major maintenance problems in terms of gutter cleaning especially if flat roofs and box gutters are used. There is little attraction in solutions such as eliminating gutters or trees or constructing all buildings to be higher than the tree canopy as these solutions present their own problems.

The relatively maintenance free materials employed on the external surfaces of buildings adds to the richness of the campus image. The clay tiled roof, fair face clay brick, concrete block, limestone and reinforced concrete frames and and panelled walls, copper gutters, aluminium window frames and limited use of rendered and painted surfaces externally contribute to the development of a responsible architecture.

There is no good reason to purposely depart from the established architectural direction of the campus even on the relatively undeveloped southern campus. This does not mean that the existing buildings should be imitated but they should serve as examples of an architectural language which is capable of fresh interpretation. The form of a building should be generated by its function and its character by its response to climate, freedom from maintenance and its contextual responsibilities. The qualities of a building will be determined by the skill with which its form and character are achieved.

It is not necessary that buildings have pitched terra cotta tiled roofs, limestone coloured masonry walls nor be only three storeys in height but in any search for a new architectural approach or simply a change for the sake of change the danger will be in a significant departure which could diminish the campus image.

RECOMMENDATIONS

- Continue and strengthen the established architectural direction of the campus buildings in the northern and southern campuses in order to achieve a unified single campus.

- Employ architects who understand and are sympathetic to the qualities of the campus, who have the skills to be creative within the contextual constraints of the established campus and who are prepared to be co-ordinated and controlled by a system which has the benefits of long term past experience and present and future problems and potential well in sight.

LANDSCAPE

The hierarchy and disposition of the major open spaces established in the Wilkinson plan have set the pattern for the progressive development of the campus plan and landscape system. The formality of the symmetrical and grand landscaping of Whitfeld Court respects its function as the prime approach to the University. The Great Court, being the centrepiece of the northern campus and well used for informal activities, is more loosely moulded with planting but still has a scale compatible with its size and importance. The playing fields of James and Riley Ovals, each comparable in size to Great Court, give the campus an opportunity to breathe and offer an open contrast to the increasing density of building development. Others have predicted the loss of Riley Oval to building development and this may be inevitable but the Whitfeld Court, Great Court, James Oval green heart to the campus should never be lost or even reduced in area.

Somerville's "Cathedral of Pines" located parallel and adjacent to one of Wilkinson's diagonals is unique, exotic and now sacred, adding to the diversity and richness of the campus landscape.

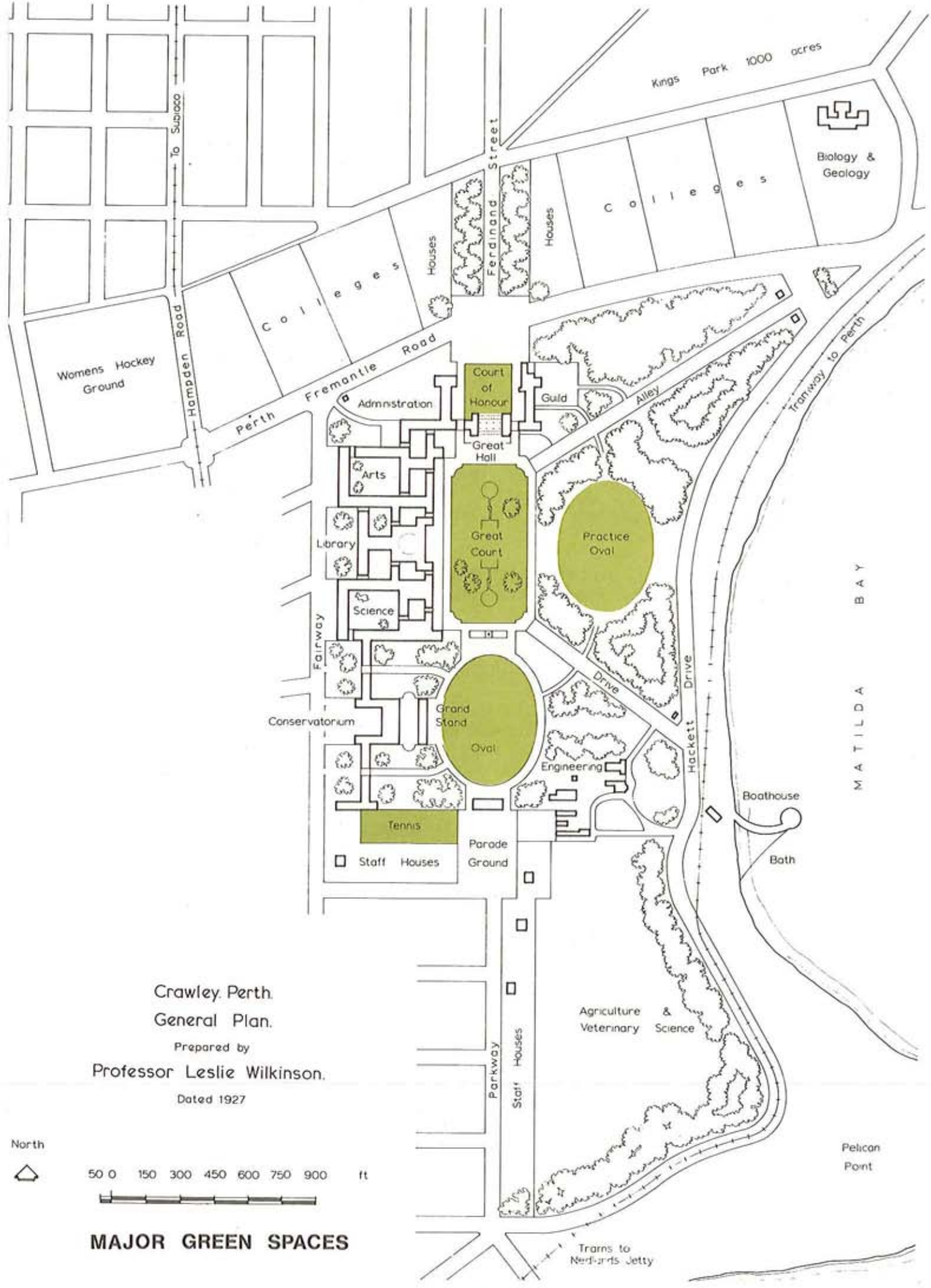
The Sunken Garden, originally a pit from which building sand was taken for the construction of the Hackett buildings, developed over a long period of time into another unique and exotic element in the landscape, not so much by its planting which is consistent with that of the main campus, but by some of its intimate detail and seclusion.

Oak Lawn, similar in size to Whitfeld Court and a development from the swampy area which was part of the original Shenton farm, links the campus spaces to the River foreshore with the simplicity of its horizontal lawn surface and collection of cork oaks remaining from an avenue serving Shenton House.

The southern campus can boast only two major open landscaped spaces in the Human Movement and Recreation Studies Outdoor Laboratory, which is comparable in treatment to James and Riley Ovals, and in Prescott Court which provides yet another form of space experience by the moulding of its ground form and the nature of its planting. Due to its extreme ground moulding the Court came close to being foreign to the campus.

With redevelopment around their boundaries both these spaces will take on new dimensions.

The spaces Whitfeld Court, Great Court, James Oval, Sunken Garden, Somerville Auditorium, Oak Lawn and Prescott Court have been protected by Senate resolutions as "Permanent Green Reserves". Whilst protecting the Reserves from building development the precise boundaries of the Reserves have not been determined.


Kings Park 1000 acres
Biology & Geology
Colleges
Houses
Ferdinand Street
To Subiaco
Hampden Road
Womens Hockey Ground
Perth Fremantle Road
Administration
Court of Honour
Guild
Alley
Tramway to Perth
Great Hall
Arts
Library
Great Court
Practice Oval
Science
Fairway
Conservatorium
Grand Stand
Oval
Drive
Hackett Drive
Engineering
MATILDA BAY
Boathouse
Bath
Tennis
Parade Ground
Staff Houses
Parkway
Agriculture & Veterinary Science
Pelican Point
Trams to Nedlands Jetty
Crawley. Perth.
General Plan.
Prepared by
Professor Leslie Wilkinson.
Dated 1927
North
50 0 150 300 450 600 750 900 ft
MAJOR GREEN SPACES

Provided the future planning of the campus is always sensitively controlled the intentions of Senate may be enough without constraining development potential on the fringes of the Reserve by prelocation of boundaries. Some Reserves such as Whitfeld Court would be simple to define, others such as Prescott Court which will have building development on its western, eastern and southern sides are difficult to define at this stage.

It should be possible to survey exact boundaries of Whitfeld Court, Great Court, James Oval, Sunken Garden, Somerville Auditorium and Oak Lawn allowing for known expansion potential for adjacent buildings.

The southern campus would gain some order and presence with the establishment of additional permanent green spaces such as the potential space between the Agriculture and Soil Science buildings. An additional space the size and nature of Riley Oval around the centre of the southern campus would strengthen the image of the whole campus but would require animals, glass houses and experimental gardens to be accommodated elsewhere.

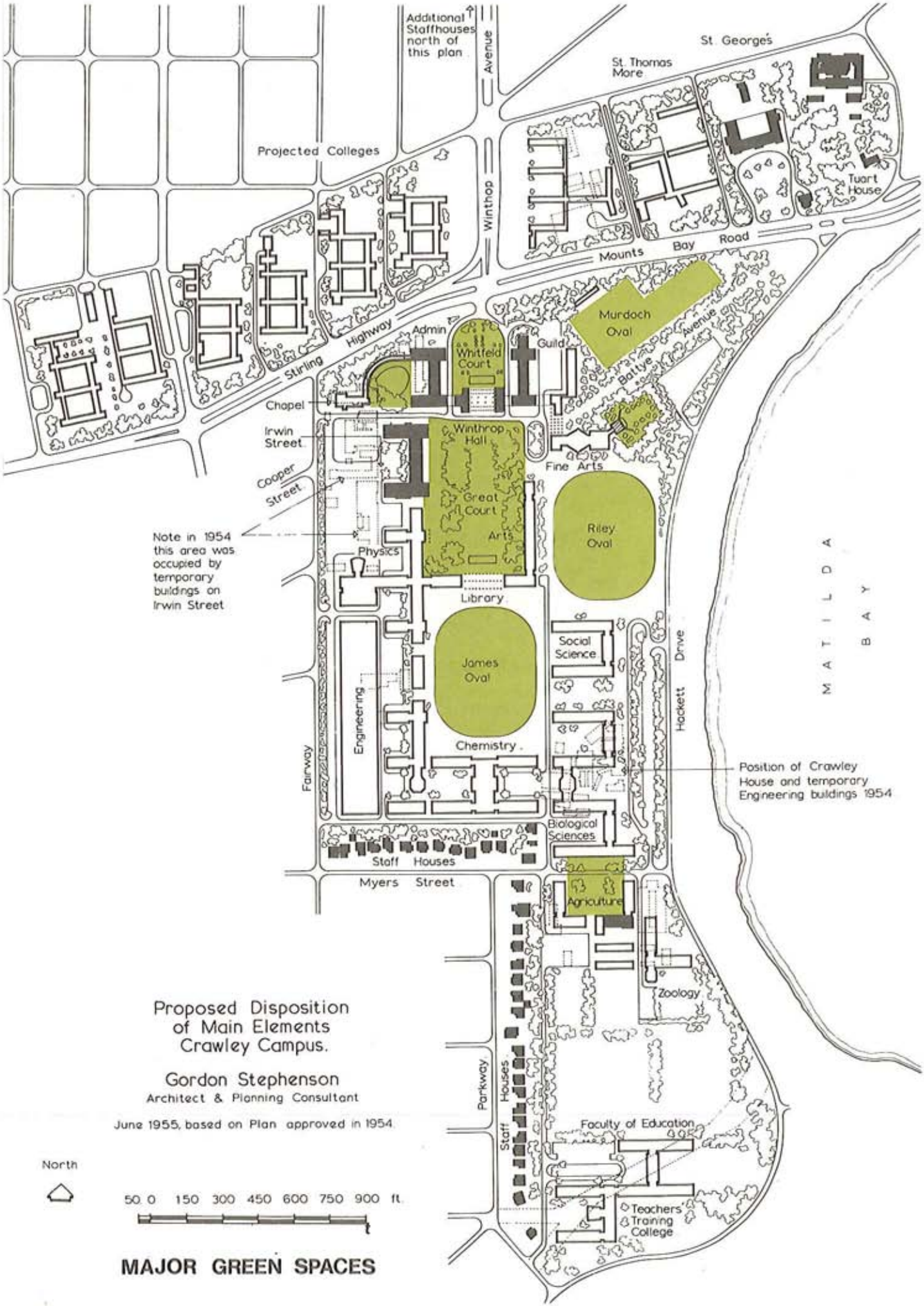
It is notable that the 1959, 1962, 1965 and 1975 plans did not include any formal major open spaces in the southern campus other than what has been named Prescott Court, the bulk of the open space being left to experimental gardens, glasshouses and animal holding yards.

The environment of the western flank of the campus at Fairway and Parkway would be greatly improved by formal green space penetrations similar to Oak Lawn. Opportunities exist at the site of the Child Study Centre, south of Electrical Engineering, north of Vacation Care or south of Unicare when these sites are redeveloped. At least one of these spaces should become another prominent campus entrance from the west.

The views into and out of the campus are major features of the civic design qualities of the campus and all plans have strived to protect the prominent views to and from the River.

Views and vistas will change as the campus develops with buildings and planting but views of Winthrop Hall and its Tower should be protected even if heavily framed by planting such as the view from Winthrop Avenue to Winthrop Hall.

Elements of the Recreation Centre were assembled to protect as much of the view of the Winthrop Hall rose window as possible from Mounts Bay Road. Much of this view is now filtered by planting and a second level on Hackett Hall would further reduce the view.


Additional Staffhouses north of this plan
Avenue
St. George's
St. Thomas More
Projected Colleges
Winthop
Tuart House
Mounts Bay Road
Murdoch Oval
Avenue
Admin
Whitfeld Court
Guild
Battye
Highway
Stirling
Chapel
Irwin Street
Winthrop Hall
Fine Arts
Cooper Street
Great Court
Arts
Riley Oval
Note in 1954 this area was occupied by temporary buildings on Irwin Street
Physics
Library
James Oval
Social Science
Hackett Drive
MATILDA BAY
Engineering
Fairway
Chemistry
Position of Crawley House and temporary Engineering buildings 1954
Biological Sciences
Staff Houses
Myers Street
Agriculture
Zoology
Parkway
Staff Houses
Faculty of Education
Teachers' Training College
Proposed Disposition of Main Elements Crawley Campus.
Gordon Stephenson
Architect & Planning Consultant
June 1955, based on Plan approved in 1954
North
50 0 150 300 450 600 750 900 ft
MAJOR GREEN SPACES

A fine cross campus view exists and should be maintained between the Art Gallery and the River across Great Court and Riley Oval. This alone does not prohibit construction of buildings or extensive planting on the northern and southern ends of Riley Oval.

Internal and external views and vistas are too numerous to identify. The location of future buildings, extensions, large pieces of sculpture and landscaping should be done with existing and possible new views and vistas in mind.

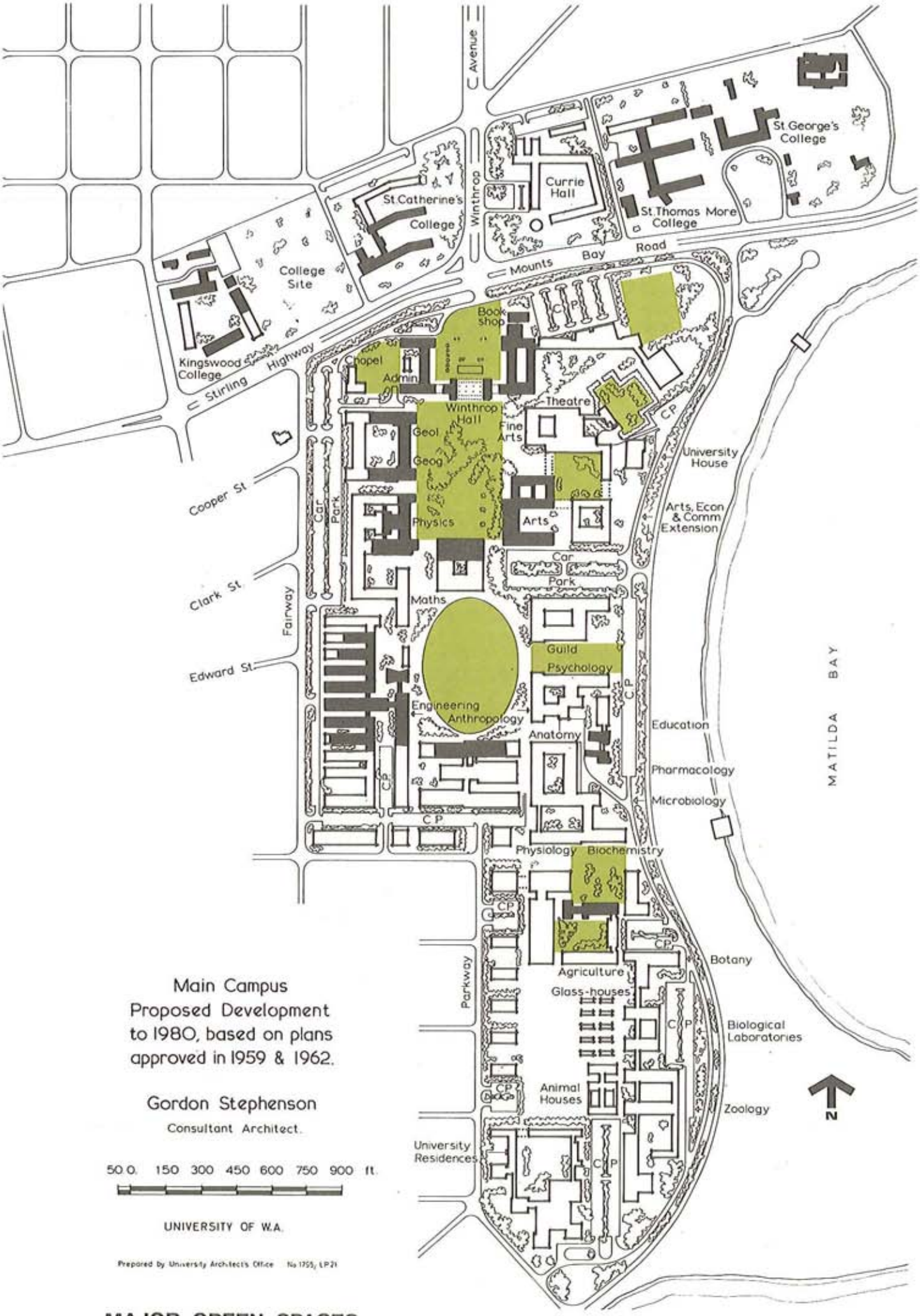
The campus is an integral part of a continuous landscape system comprised of Kings Park, the campus and River foreshores including Pt Currie. When viewed as part of this system the tree canopy is the dominant element on the campus penetrated only in a few places by towers and buildings. A contribution to the strength of the system is that in general local species were planted on the perimeter of the campus and exotic species kept to the interior spaces such as in Whitfeld Court. This system should be maintained.

The open grassed areas of the landscape are well used as casual sitting spaces and should be maintained. The shade from tree canopies is important to this function but when the trees are too dense or are not deciduous the grass fails and low maintenance ground cover and hard paving find their way into the passive areas.

Ground cover and low shrubs have been successfully used to direct pedestrian traffic across the soft landscape and to keep pedestrians away from windows which require privacy. The whole of the soft landscape palette must be employed for passive climate control to shade buildings and paving surfaces in summer and, with deciduous trees, allow winter sun to penetrate. It must also control direct and reflected glare and screen from view the increasing extent of car parks on campus. Correct location of individual species will facilitate closing and opening vistas and framing views into and out of the campus.

In August 1990 the University's Curator of Grounds prepared an analysis of established native planting worthy of preservation in the southern campus. In some cases the planting conflicts with the logical development of the campus and decisions will have to be made between planting and full development.

Plant types should be the subject of a separate study by others. The proportion of soft landscape to hard landscape and the relationship of landscape to buildings will determine the success of the campus in terms of its civic design qualities.



Main Campus
Proposed Development
to 1980, based on plans
approved in 1959 & 1962.

Gordon Stephenson
Consultant Architect.

50 0. 150 300 450 600 750 900 ft.

UNIVERSITY OF W.A.

Prepared by University Architect's Office No 1755/ LP 21

MAJOR GREEN SPACES

PAVING

A variety of hard landscape surfaces and the increasing car parking facilities are now competing with the soft landscape which has been a major characteristic of the campus image.

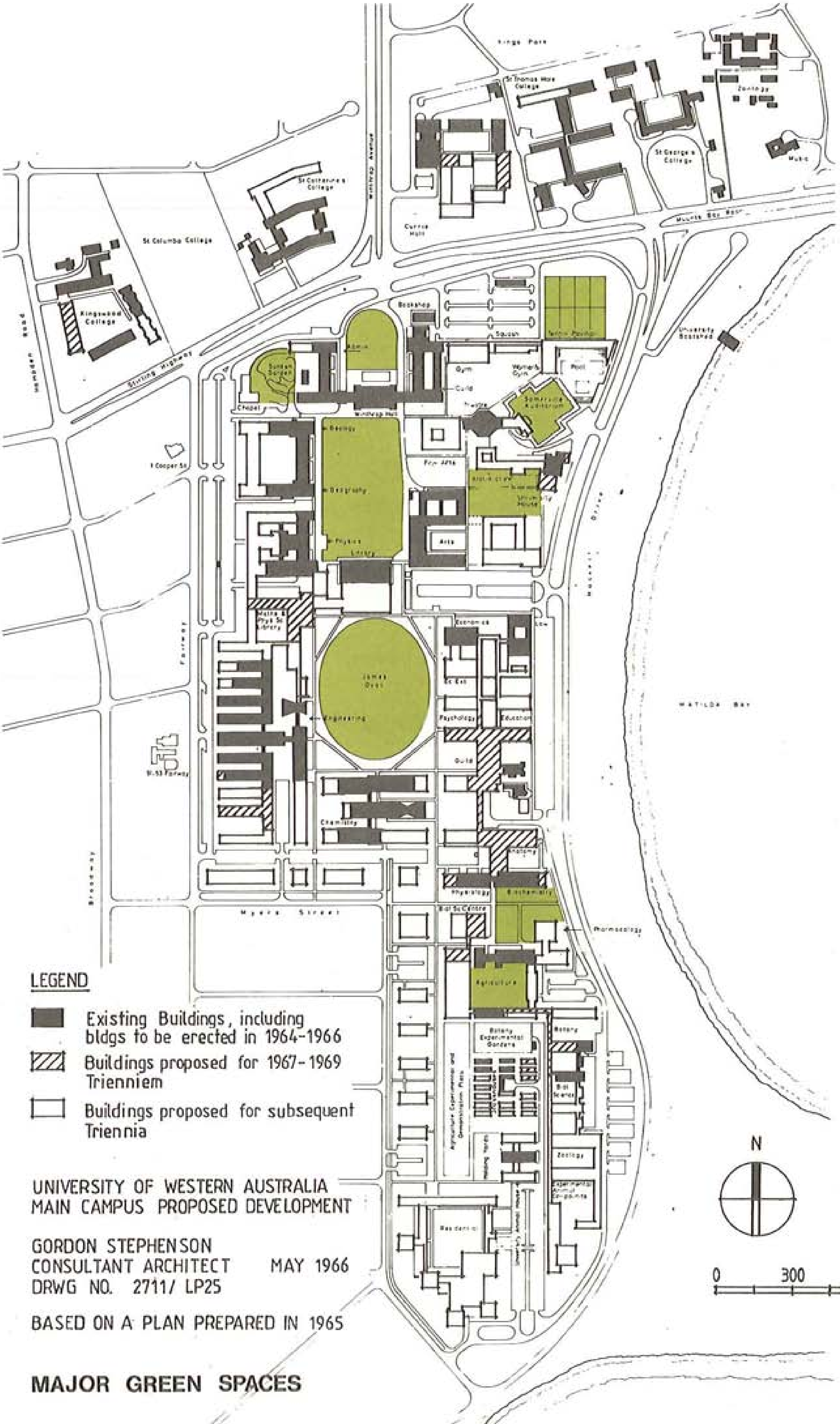
The system in the early development of the campus consisted generally of bituminous surfaces for all roads and carparks, some flush with the soft landscape surface and some with raised concrete kerbing and light grey precast concrete slabs for pedestrian surfaces. This restricted and economical palette of materials achieved a simple dignity and the receding colours blended well with those of the soft landscape.

The reasons for departing from the established paving materials were probably varied. The standard precast concrete slab is possibly seen as very ordinary and new slabs can be slippery when wet. Also the increase in vehicular traffic on pedestrian ways caused many of the thin 610mm x 610mm slabs to crack.

The major departures from the pedestrian surfaces began with Gillett Promenade where textured precast concrete slabs were used patterned with glazed brown terra cotta tiles and later with Saw Promenade which was constructed totally of red pressed clay bricks. Some of the 610 x 610 slabs of Gillett Promenade have cracked under heavy vehicular load as have many of the smaller terra cotta tiles. The pressed bricks of Saw Promenade being not very dense have not worn well and many have been replaced.

The variety of paving materials increased in various sections of the campus. The bituminous road surface around Whitfeld Court and south of Winthrop Hall was replaced with in situ cream concrete patterned with red clay tiles. This material is already being disturbed by tree roots and is expensive to replace when access to underground services is required. Some car parks have been surfaced with blue red 'high performance' clay bricks, cream sand lime interlocking units and cream tumbled concrete cobblestone pavers. Pedestrian ways have been surfaced with red clay tiles in mortar, blue red 'high performance' clay bricks dry jointed, cream interlocking sand lime units and cream tumbled concrete cobblestone pavers. The dry jointed bricks have been laid in various patterns including basketweave, diagonal, herringbone and stretcher bond.

More recent roads and car parks have returned to the bituminous surfaces and raised kerbing except where stormwater can safely run off into the soft landscape. This situation should be maintained so that pedestrians on the bituminous surface know that they are at greater risk from vehicles than when on pedestrian surfaces but particularly so that vehicles can be limited to bituminuous surfaces.



LEGEND

Existing Buildings, including bldgs to be erected in 1964-1966

Buildings proposed for 1967-1969 Trienniem

Buildings proposed for subsequent Triennia

UNIVERSITY OF WESTERN AUSTRALIA
MAIN CAMPUS PROPOSED DEVELOPMENT

GORDON STEPHENSON
CONSULTANT ARCHITECT MAY 1966
DRWG NO. 2711/ LP25

BASED ON A PLAN PREPARED IN 1965

MAJOR GREEN SPACES

The issue of pedestrian paving materials cannot be isolated from the issues of the penetration of vehicles into the once pedestrian only inner campus and whether underground services should be located under the soft landscape or paved surfaces. The landscape is damaged when access is required to the services in the underground system throughout the campus. If the services to be accessed are under soft landscaping trees and shrubs may be lost and grass and other ground cover takes time to regrow. If the services are under paving it is possible to reinstate the paving immediately after the works are completed with no obvious scarring. In many instances however correct compaction of the soil replaced in trenches has not been achieved and the paving material has subsided.

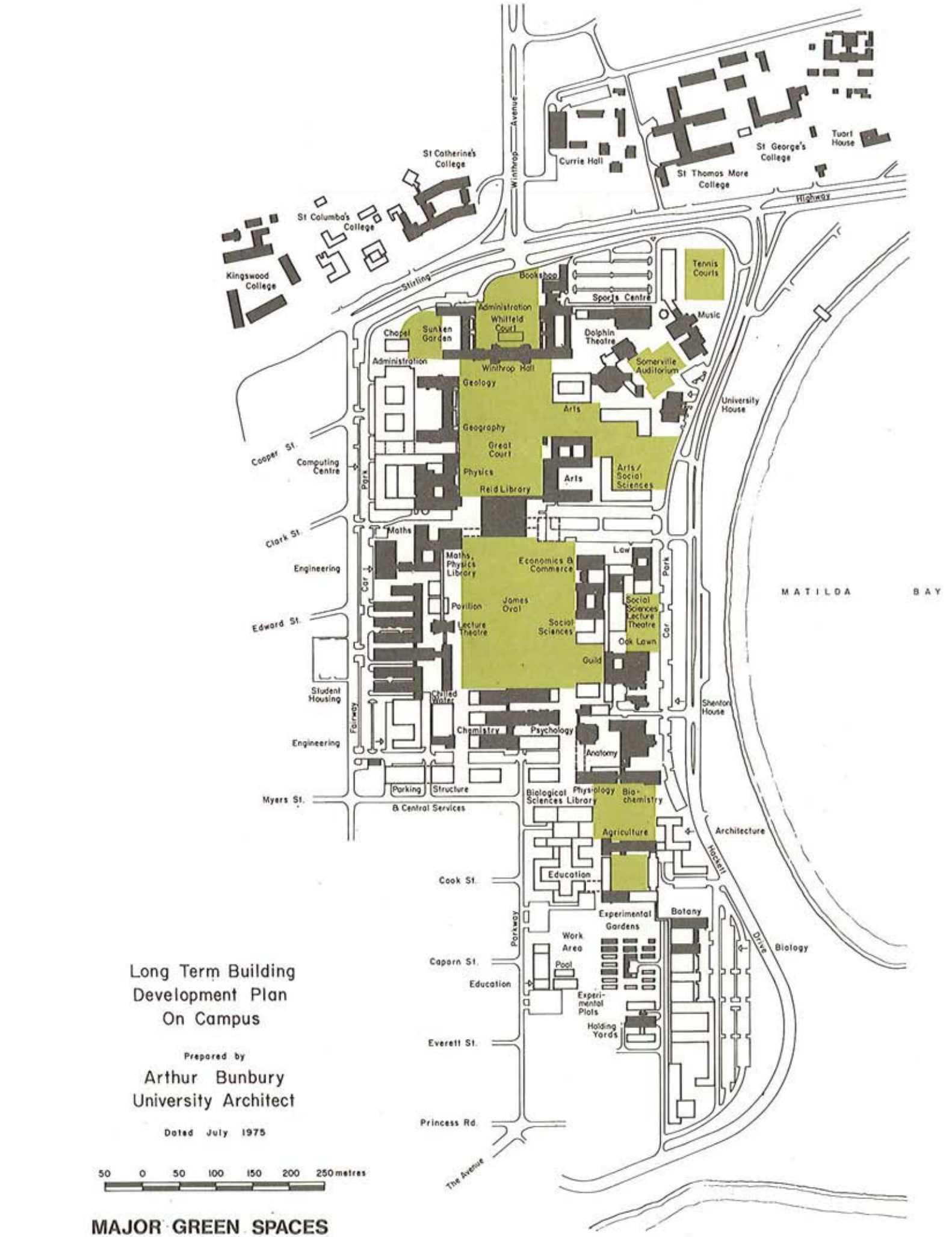
Several buildings have been successfully connected to the concrete paving slab system by using the precast concrete slabs patterned with red clay bricks. In some instances these have become the dominant element in colonnades and have been used exclusively in some internal courtyards. A complaint against the 610 x 610 concrete slab, apart from breaking under vehicle load when not properly laid, is the handling of the heavy and awkwardly sized slab when laying.

Exposed aggregate concrete slabs have been used recently in 600 x 300 precast format to maintain the established soft grey colour scheme via the exposed aggregate which also provides a non slip surface. The half size eases handling problems. Some of these slabs laid in Jackson Court were produced too thin, laid green and subjected to heavy vehicular load and, of course, some have cracked.

An exposed aggregate 400 x 400 precast slab has been successfully used in the hard landscape of the Third General Purpose building although the exposed diorite aggregate is too dark in colour.

The blue red "high performance" clay brick has been criticised because of its aggressive colour and problems with the heat and glare it reflects into windows of buildings. The sand lime and cobblestone concrete pavers are foreign to the campus materials both in scale and texture and due to their domestic size are limited in use.

Some spaces such as around Winthrop Hall and the new Art Gallery require monumental scaling in the landscape elements because of the function and scale of the buildings. Precast exposed granite aggregate concrete slabs measuring 900 mm x 600 mm have been used around the Art Gallery and this size would be suitable for surrounds of Winthrop Hall. Smaller and thicker slabs can be used in areas where heavy service vehicle access or where access to services is unavoidable. The flexibility of the precast slab in terms of manufacture, shape, size, texture and colour can not be matched by other materials. Elements such as brown red (as distinct from the



Long Term Building Development Plan On Campus

Prepared by

Arthur Bunbury
University Architect

Dated July 1975

50 0 50 100 150 200 250 metres

MAJOR GREEN SPACES

blue red) clay bricks can be introduced for patterning adjacent to buildings and used exclusively in small areas such as colonnades, porches and internal courtyards to suit particular situations. The red brick is suitable for narrow paths through the soft landscape but take on an aggressive texture and colour in large areas.

Except in a few instances vertical surfaces in the landscape such as retaining walls and in situ seat benches have been of limestone or limestone coloured materials. This simple but most important continuation of the architectural theme adds great aesthetic strength to the total image of the campus and should be maintained.

SIGNS

The campus has survived and enjoyed 60 years without a formal entrance name sign, probably because of its unmistakeable Winthrop Hall and Tower which could only be university buildings. Despite the presence now of two other universities in the Metropolitan Area, the possibility of the WACAE becoming a university and the formation of a private university in Fremantle, The University of Western Australia, because of its image, could survive without major boundary signage.

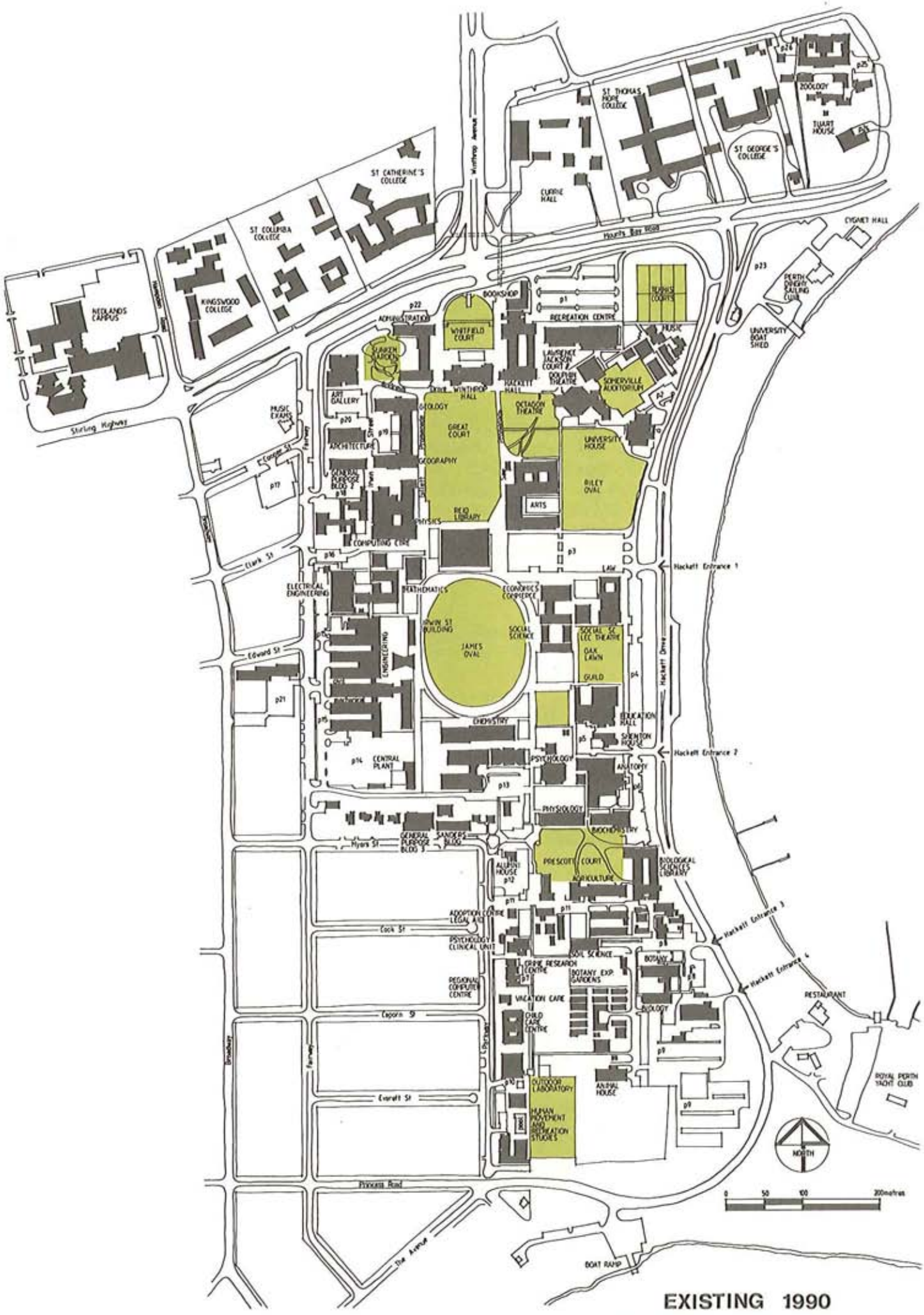
The issue of identification of the Nedlands campus of the University will need to be addressed when the University occupies that site.

Access to the campus is gained from Hackett Drive, Parkway, Myers Street and Fairway in greater numbers than via the main entrance opposite Winthrop Avenue. Major signs at all these entrances would be overdone and should the University choose to have a main campus name sign, it would be preferable to locate it at the main entrance leaving minor finger signs to direct access at the other boundaries.

Boundary entrance signs such as "Fairway Entrance 2" are accompanied by panels with strip signs identifying, with small lettering, the University, car parks and buildings accessible from the particular entrance along with information regarding speed limits, etc.

The University has a system in place which is working and the campus is well endowed with a variety of internal signage. The problem area seems to be in the control of advertising and topical information signs.

Direction signs to faculties and departments, courts and places, particular buildings and facilities, are covered by finger "street" signs with white lettering on crimson ground. Some, such as for disabled toilets, employ a different colour combination.



EXISTING 1990
MAJOR GREEN SPACES

Most maps depicting the campus layout are attached to buildings. Some are freestanding. All such maps would be better located against buildings and be under cover so as to not clutter the landscape. Buildings in strategic locations should be designed to provide this facility so the maps are prominent but have protection for the viewer.

Identification signs such as names of buildings, courts and places vary considerably. Most buildings are named with freestanding black metal letters attached to buildings and when fixed to relatively soft stonework are sometimes stolen. Some buildings have names recessed in concrete, some painted on metal plates and some are without names. Whitfeld Court and Lawrence Jackson Court have names carved into stone blocks, the Sunken Garden and Prescott Court cut into bronze plates. Others are not named.

Building names could be standardised but some flexibility should be allowed the design architect to provide an easily read sign compatible with the particular building design. Labels for places, courts, promenades and gardens will vary depending on the nature of the element and the information to be supplied but some uniformity could be achieved.

Car parks have freestanding signs with white letters on blue ground and are easily found. The signs contain control information.

Major traffic warning signs such as dips, humps, stop signs, etc. are identical to those used in similar situations off campus for easy identification and safety. Minor control signs such as no entry and no standing signs tend to vary in colour and size and could be more unified.

Control signs are remarkably absent on the campus it being open to all at all times. Temporary keep off and pedestrian detours due to grounds or building works are generally well handled with discreet painted signs.

Tree and plant species information signs are generally of white lettering on brown ground, small and discreet.

Topical information signs can become haphazard. Secure pinboards behind locked glass are fixed against buildings. Paste-up signs generally are restricted to freestanding concrete cylinders adjacent to major student use buildings and these should be limited in number. A few paste-up signs find their way on to buildings which can cause a major cleaning problem.

Generally advertising is not permitted on the campus but it does exist and sometimes spills onto the road verge at the Winthrop entrance to the campus and other prominent places.

Temporary signs advertising a one-off activity such as a conference or Festival activity are tolerated but require control. The temporary nature of the advertisement should be reflected in the material and design of the sign which should be easily removable and not conflict with permanent signs.

Tenancy and service facility signs such as for The University Bookshop and Guild Pharmacy are generally restricted to the building housing the facility but sandwich boards and other signs find their way into prominent path ways and entrances where they can become a hazard for pedestrians.

A separate study is being undertaken on the issue of all advertising signs on campus.

FURNITURE

Seating Seating remote from buildings is limited to standard teak benches and the occasional stone bench such as outside Winthrop Hall and inside the Sunken Garden. Most other seating is on steps or retaining walls in the landscape.

A variety of seating forms are designed into or are attached to buildings and generally become a sculptural extension of the building and reflect the quality of the building. Freestanding seating attached to table tops located in internal courtyards can be yet another quality and requires strict control.

Waste Bins Waste handling from buildings in general is a major problem. Bin recesses or even rooms usually become polluted with spilt rubbish or smells and it seems much more efficient to remove rubbish from buildings immediately and totally especially as most campus buildings are freestanding and do not have fronts and backs where rubbish enclosures can be concealed.

Freestanding bins which are numerous around student eating facilities seem to be as much ignored as used and lawns are littered with waste. The simple black painted cylindrical bins currently used may be difficult to improve on and more intricately designed bins can become a little self conscious and generally are vandalised.

Cycle Racks The triangulated galvanised pipe cycle racks whilst efficient in containing cycles are tending to pollute the surrounds of some buildings especially adjacent to entrances. Cyclists desire protection and security for their cycles and if provisions are not made the cycles will find their way into buildings, corridors and even rooms. Provisions for sheltered cycle racks with locking facilities for the whole bicycle should be made in building designs in preference to freestanding structures which can crowd the ever diminishing open landscape.

Bollards

In order to reduce maintenance, planting beds have been replaced with treated pine bollards to control vehicular access. Whilst undoubtedly more economical than the precast concrete bollards adjacent to Winthrop Hall pine bollards lack the visual substance of other campus landscape elements and could be better used as horizontal rails in areas such as the native bush area of the southern campus and replaced by limestone walled planting beds in areas such as the eastern end of Car Park 3.

Some type of collapsible or removable bollard is required to prevent casual vehicular traffic from penetrating pedestrian spaces but to permit access for emergency or ceremonial vehicles.

SCULPTURE

The precious green spaces on the campus can be greatly diminished in their landscaped qualities if subjected to excessive intrusion by external "works of art" especially if they are not campus compatible. The fact that a piece of sculpture might be recognised as a significant work of art or be created by a prominent sculptor should not automatically gain it a place on the campus. The University should be very selective about the acceptance and location of external art works especially if they were created for other environments.

LIGHTING

The campus lighting system is currently being reviewed and generally consists of post top standards to light car parks, roads and major pedestrian areas with lower bollards lighting minor pedestrian paths. Buildings generally incorporate external lighting for entrances and service areas.

Some areas of the campus used at night are underlit and are being identified in the lighting review.

RECOMMENDATIONS

- Maintain the Permanent Green Reserve system and create Reserves in the southern campus depending on the planning options adopted.

- Protect, where possible, important established stands and individual specimens of trees. In some instances this will require a decision between trees and development.

- Establish levels for the campus internal ring road and plant now for the long term future.

- Create landscaped entrances into the western campus at the location of Car Park 18, Edward Street, Myers Street and Parkway south of Unicare or north of Vacation Care.

- Protect the cross campus view from the Art Gallery across Great Court and Riley Oval to the River.

- Open a portion of Prescott Court to the River and maintain cross campus views from Myers Street to the River.

- Compatible with development in the south and south-east corner of the southern campus identify and maintain River views from the southern campus green spaces.

- Retain bituminous surfaces for roads and car parks and light grey precast concrete slabs for pedestrian surfaces. The size, thickness and texture of the slabs should reflect their location. Red brick paving can be used for patterning, colonnades and other intimate spaces.

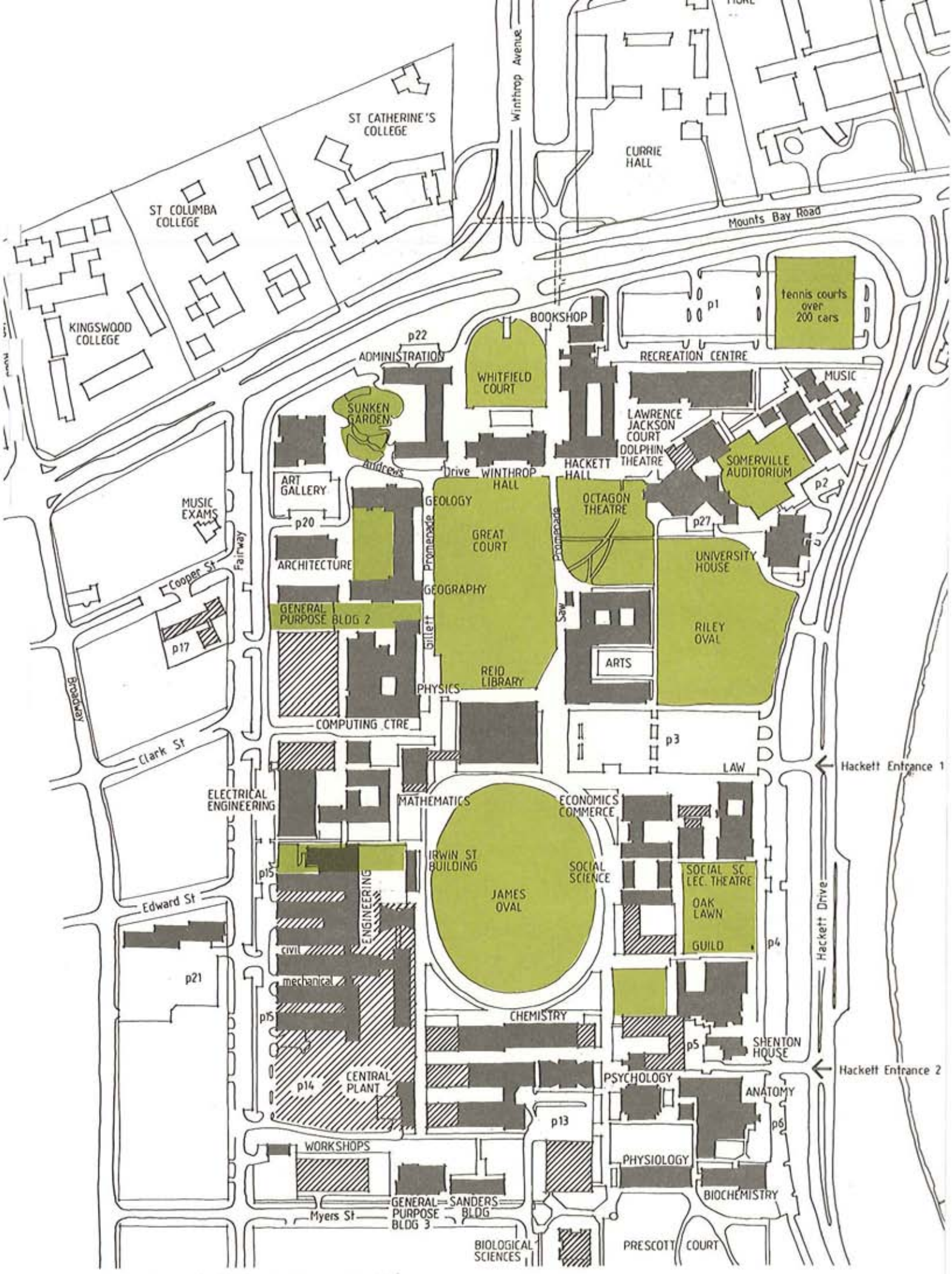
- Continue the internal and information signage system but impose further controls on tenancy and advertising signs so they do not diminish the image of the campus.

- Make adequate provisions in building designs for elements such as seating and bicycle racks.

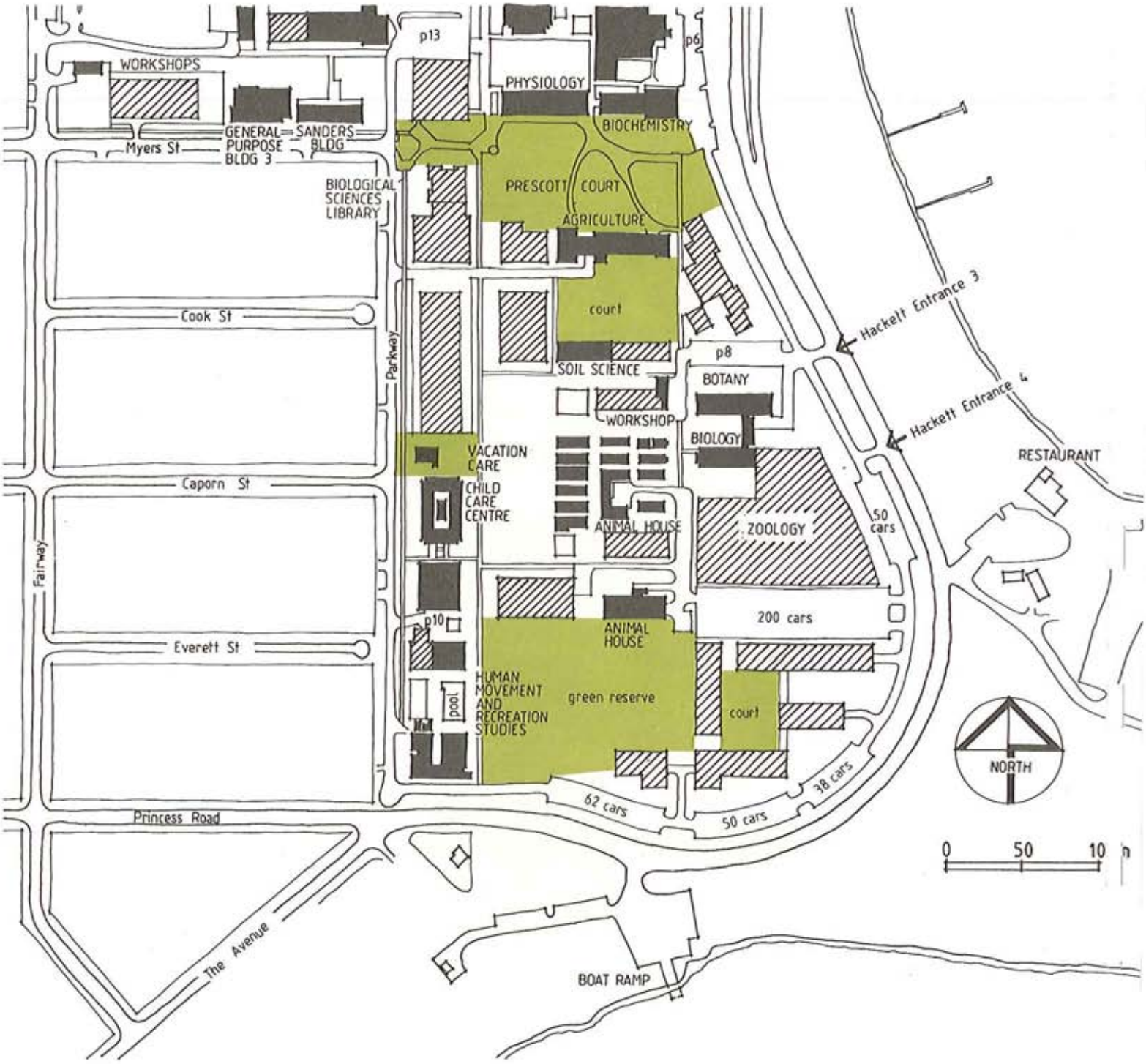
- Concentrate adequate safety lighting in areas used at night such as car parks, libraries, theatres, underpasses, Guild facilities, and main pedestrian footways.

- Maintain the basic landscape system of planting native species on the perimeter of the campus with exotic species confined to the inner campus.

- Undertake a landscape study to accompany this Planning Review. The study should address issues such as plant types, landscape furniture including bollards or their alternatives and the location of art works in the landscape.



NORTHERN CAMPUS – OPTION 1
MAJOR GREEN SPACES

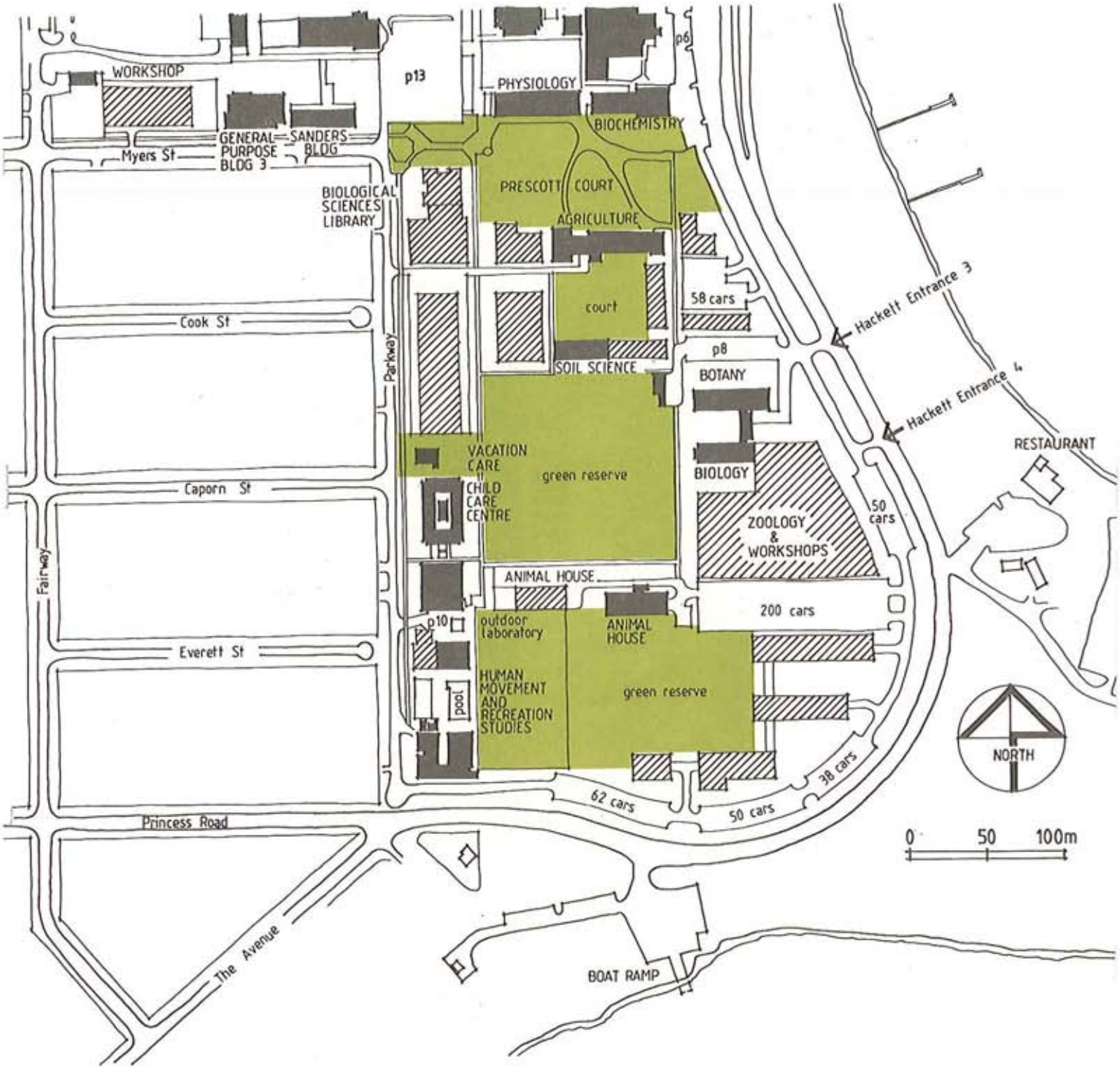


LEGEND

EXISTING BUILDINGS

FUTURE BUILDINGS AND DEVELOPMENT SITES

SOUTHERN CAMPUS – OPTION 1
MAJOR GREEN SPACES



LEGEND

EXISTING BUILDINGS

FUTURE BUILDINGS AND DEVELOPMENT SITES

SOUTHERN CAMPUS – OPTION 2
MAJOR GREEN SPACES

SOUTHERN CAMPUS • AUGUST 1990

AIR-CONDITIONING OF BUILDINGS

In 1986 the Accommodation Committee established a Working Party to undertake a review of the University's air-conditioning policy with a view to determining strategies for dealing with the funding of additional capacity for the Central Chilled Water Plant and the air-conditioning of large teaching venues and office areas which are subject to extreme heat during summer months.

Previous studies available to the Working Party included:

1978 Survey and Report on Air-Conditioning in The University of Western Australia prepared by the Staff Engineer;

1985 Report on a Proposal to Expand the Central Chilled Water Plant prepared by the Staff Engineer and

1986 Report on the Central Chilled Water Facility of The University of Western Australia prepared by Consulting Engineers Wright Mackay and Associates.

The University's practice in providing air-conditioning in new buildings or extending air-conditioning to existing accommodation has generally been consistent with the policy outlined in the Sixth Report of the Australian Universities Commission:

that priority should be given in the first instance to air conditioning libraries, large lecture theatres, computer rooms, animal houses and certain other specialised areas and;

that next in order of priority should be those areas of administration where work must of necessity be undertaken during the hottest part of summer.

Although some dedicated air-conditioning systems serving individual rooms or suites do exist on campus the main system for all buildings on campus is to produce chilled water at the Central Plant located in the southeast corner of Car Park 14 adjacent to Myers Street and pipe the chilled water underground to the various buildings which contain their own air handling plant and heating systems. The Central Plant has been extended to accommodate extra chillers for the increasing air-conditioning load on campus and is designed for further expansion.

As part of their 1986 Report the Consultants were asked to advise on the viability of extending the Central Plant system as opposed to the alternative of installing dedicated cooling plant in individual buildings.

The Consultants agreed with the opinion of the Staff Engineer that the Central Plant is the most cost effective way of serving the buildings on campus because of the efficiency in size and flexibility of the central system and the back up provided by the system compared to that provided by one system for each building. It was also found that maintenance of the central system could be carried out by fewer staff than would be required for a number of individual plants providing the same capacity.

The Working Party recommended that the existing centralised system be continued and extended as required and established a priority list for air-conditioned spaces:

1. Laboratories identified by the Ventilation Committee as needing an efficient air-conditioning system rather than just mechanical ventilation to extract noxious fumes.

2. Laboratories/workrooms housing expensive electronic equipment where equipment specifications and expert advice support the absolute need to provide environmental control.

3. Major teaching venues with seating capacities greater than 100 - with priorities in this category to be determined on the basis of the hours in which the venue is in use per week, the number of student places and comparative temperature and humidity readings.

4. Library areas where temperature and humidity readings and expert advice supports the need for environmental control to preserve book stocks.

5. Office areas and laboratories where human comfort is the main criterion with priorities within this category to be determined on the basis of temperature and humidity readings and an assessment of the period of occupancy.

6. Major teaching venues such as the Ross and Clews Lecture Theatres where the existing air-conditioning system needs to be upgraded.

7. Teaching venues with seating capacities greater than 50 and less than 100 - with priorities in this category to be determined on the basis of the hours in which the venue is in use per week, the number of student places and comparative temperature and humidity readings.

RECOMMENDATION

- Maintain the Central Chilled Water Plant system with looped main serving the whole campus. A second Central Plant linked into the loop system may be considered in the southern campus should building development intensify in this area.

PARKING AND TRAFFIC

BACKGROUND

The committee, convened by Dr. R. L. Kirk, set up by the Buildings Committee in 1959 to collect and collate all relevant information for use by Professor Gordon Stephenson in preparation of his campus plan, in a very detailed report, estimated that parking provision would need to be made on campus for 2,500 cars and 830 motor cycles and scooters when the student enrolment reached 8,000.

In a presentation of his 1959 campus plan Prof. Stephenson observed that "Parking space could be provided for a maximum of 1,800 cars although it was essential to prevent the campus from being possessed by cars.".

The 1959 plan was to accommodate a student population of 8,500 by the year 1967.

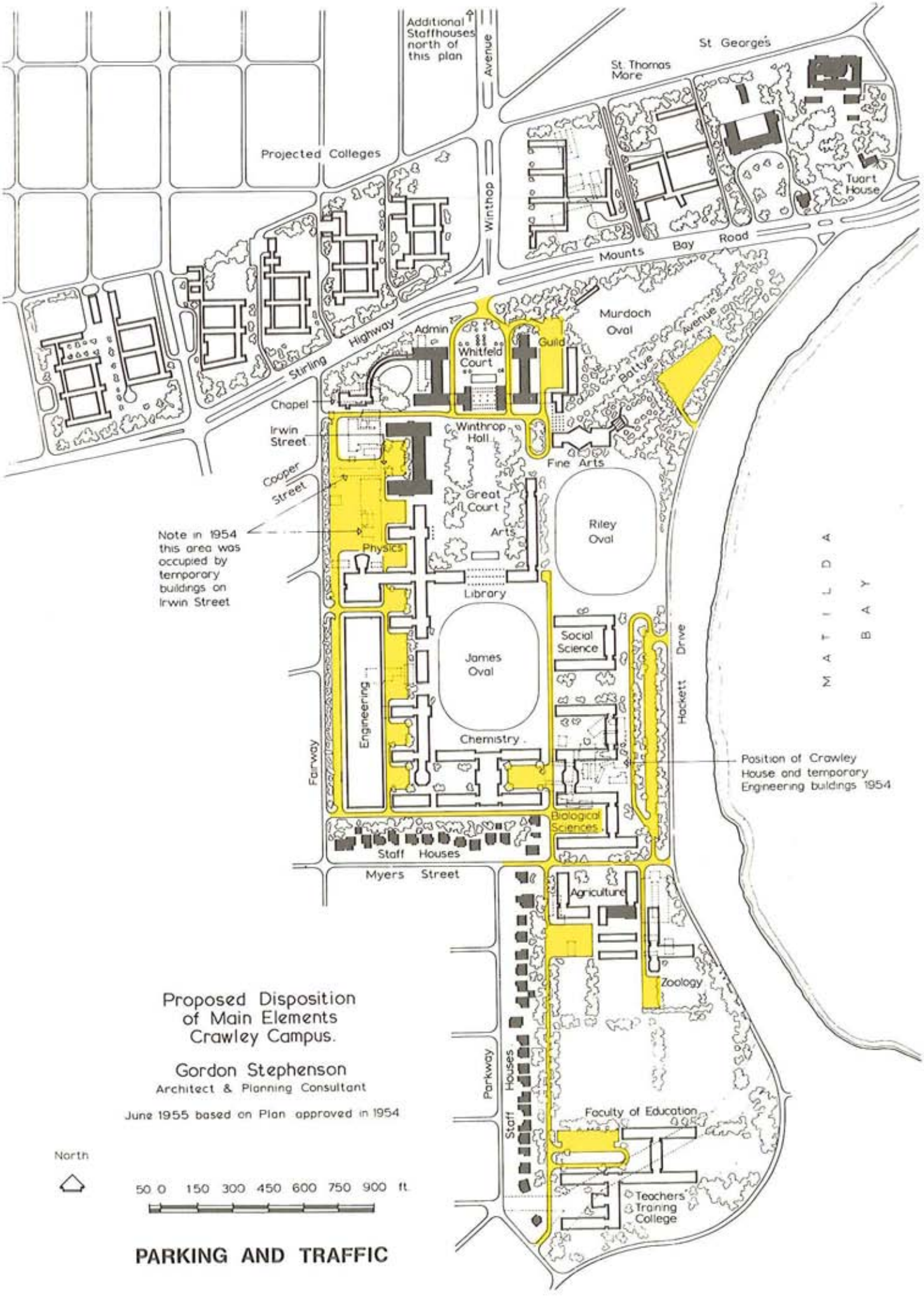
The 1962 and 1965 Stephenson campus plans provided for approximately 2,000 parking spaces flanking the ring road or in areas fed by the ring road. This extent of parking was considered to be the maximum acceptable without prejudicing the quality of the campus environment. Subsequent studies and reports on parking have supported the 2,000 spaces as an ideal maximum.

In protecting the environmental qualities for which the campus is renowned, these early and subsequent campus plans did not and could not provide parking facilities to meet the total demand on the campus proper. The early plans assumed that surplus vehicles would find parking spaces in neighbouring side streets or that students who could not park on campus would find other means of gaining access to the campus.

The extent of building development envisaged by the 1962 and 1965 plans is well in excess of actual development achieved in 1990 and would have generated an impossible vehicle parking problem with only 2,000 bays on campus and no specified alternatives.

In 1966 a working party consisting of Professors Webb, Savage and Stephenson prepared a report which was to form the basis of parking control.

In 1967 the Vice Chancellor arranged a conference of interested authorities to discuss and consider solutions to the parking problem.


Additional Staffhouses north of this plan
Avenue
St George's
St. Thomas More
Projected Colleges
Winthop
Tuart House
Mounts Bay Road
Murdoch Oval
Avenue
Battye
Admin
Whitfeld Court
Guild
Highway
Stirling
Chapel
Irwin Street
Cooper Street
Winthrop Hall
Fine Arts
Great Court
Arts
Riley Oval
Physics
Library
Social Science
James Oval
Engineering
Chemistry
Hackett Drive
Fairway
Biological Sciences
Staff Houses
Myers Street
Agriculture
Zoology
Parkway
Staff Houses
Faculty of Education
Teachers Traning College
MATILDA BAY
Note in 1954 this area was occupied by temporary buildings on Irwin Street
Position of Crawley House and temporary Engineering buildings 1954
Proposed Disposition of Main Elements Crawley Campus.
Gordon Stephenson
Architect & Planning Consultant
June 1955 based on Plan approved in 1954
North
50 0 150 300 450 600 750 900 ft
PARKING AND TRAFFIC

The conference agreed that it was desirable for the local authorities to advise the University well in advance of their proposals to restrict parking around the campus. The University would, in turn, advise the authorities of their intention to exclude further categories of staff or students from parking on the campus.

In 1970 Professor Cole's Academic Plan recommended that car parking structures be built and/or parking space be provided under new buildings rather than spoil the campus by overcrowding with cars and, if money was available, it be used to purchase neighbouring properties for the erection of multi-storey car parks.

In 1974 Consulting Engineers De Leuw Cather of Australia Pty Ltd were appointed to investigate and report on matters pertaining to traffic circulation and parking.

Also in 1974 a Parking and Traffic Project Committee was established to act as an advisory body and to express the views of staff and students.

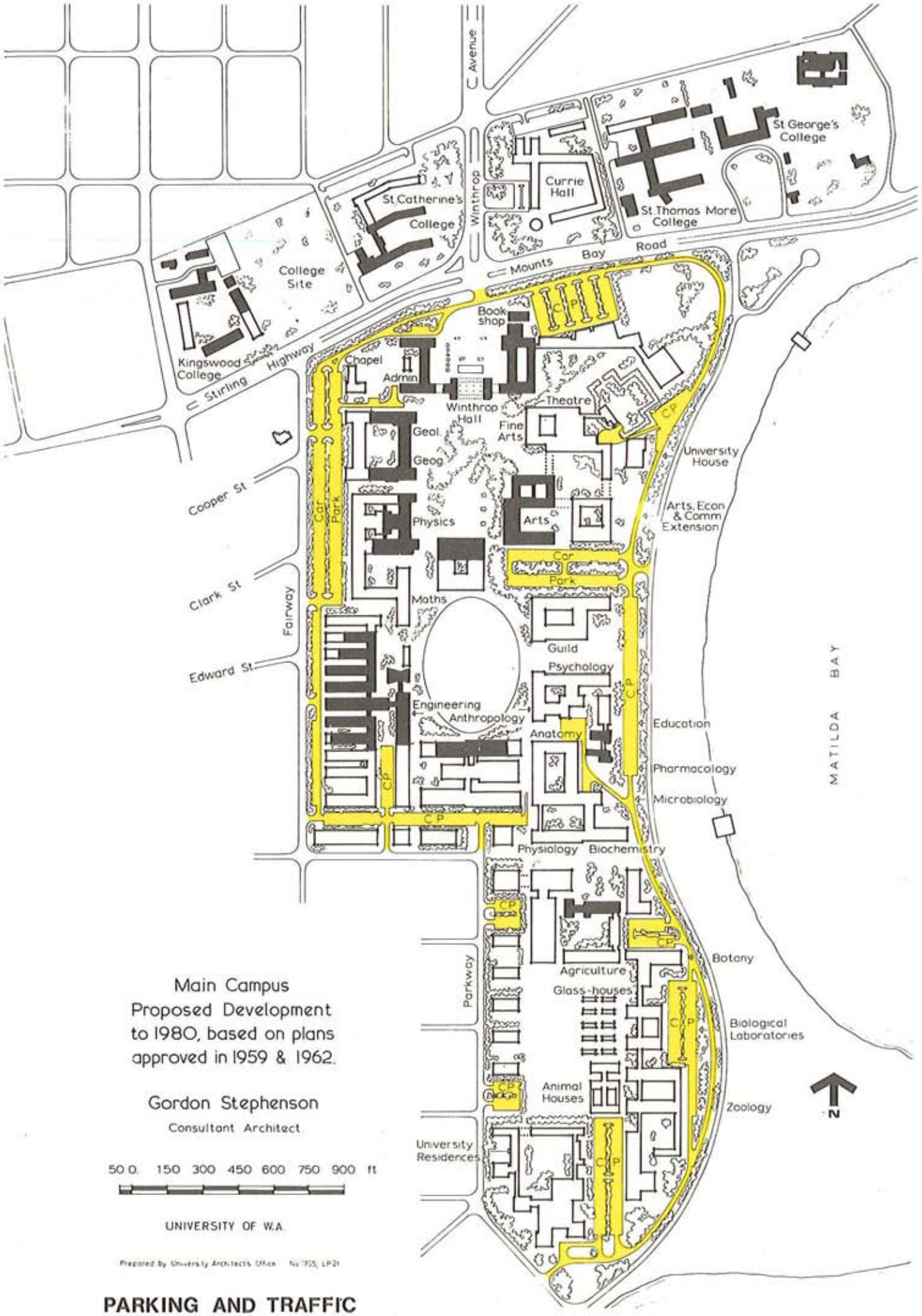
The De Leuw Cather Report was comprehensive and the findings and recommendations, with a change of some numbers, are as valid in 1990 as they were in 1974.

At the time of the study 1696 cars and 310 motor cycles were parked on campus, 1,000 of these cars were in designated permanent car parks.

It was estimated that an additional 1,400 cars were parked on adjacent streets during the times the University was in session.

The Report referred to a survey conducted in September - October 1965 which established that 68% of students and staff journeyed to and from the campus by private car (driver or passenger), that 9% journeyed by bus and 23% by other means (walk, motor cycles or bicycles). The report did not anticipate any change in travel arrangements in 1974 from those established in 1965.

It is significant that during the preparation of the report the construction of the Electrical and Electronic Engineering building caused the loss of 67 car spaces and 12 motor cycle spaces. In recent years this problem has compounded into the situation where the University has constructed extensive temporary parking areas on future building sites which require replacement elsewhere when the sites are developed with buildings, along with the additional parking spaces required for the additional population accommodated in the new building.



PARKING AND TRAFFIC

The Report noted that in the early stages of what became the Bunbury 1975 Report on Campus Planning general planning concepts approved by the Buildings Committee for future development included:

- The landscape quality of the campus should take priority over the needs of parking and traffic;
- The area used for ground level parking should not exceed more than 10 percent of the total land area available.

The Report assumed a particular configuration of the realigned Hackett Drive and the area of the campus was taken to be 47.5 hectares. 10% of this area was estimated to park a maximum of 2,100 cars at ground level but considering spaces lost to landscaping a more realistic figure was taken to be 1,500 cars.

As a guide to the Report it was estimated that the maximum campus population of 15,300 persons could be attained by 1978. Based on a study undertaken at that time for the University of Queensland the De Leuw Cather Report assessed a minimum need of 4,000 parking spaces and possibly up to 7,000 spaces.

In assessing options available to meet the parking problem the Report referred to studies undertaken in the United States which indicated that a substantial improvement in public transportation facilities would only attract a minor portion of car users on a regular basis. However it was suggested that this might not be the case should a pricing policy be introduced on campus and off-campus parking be restricted by the Local Authorities.

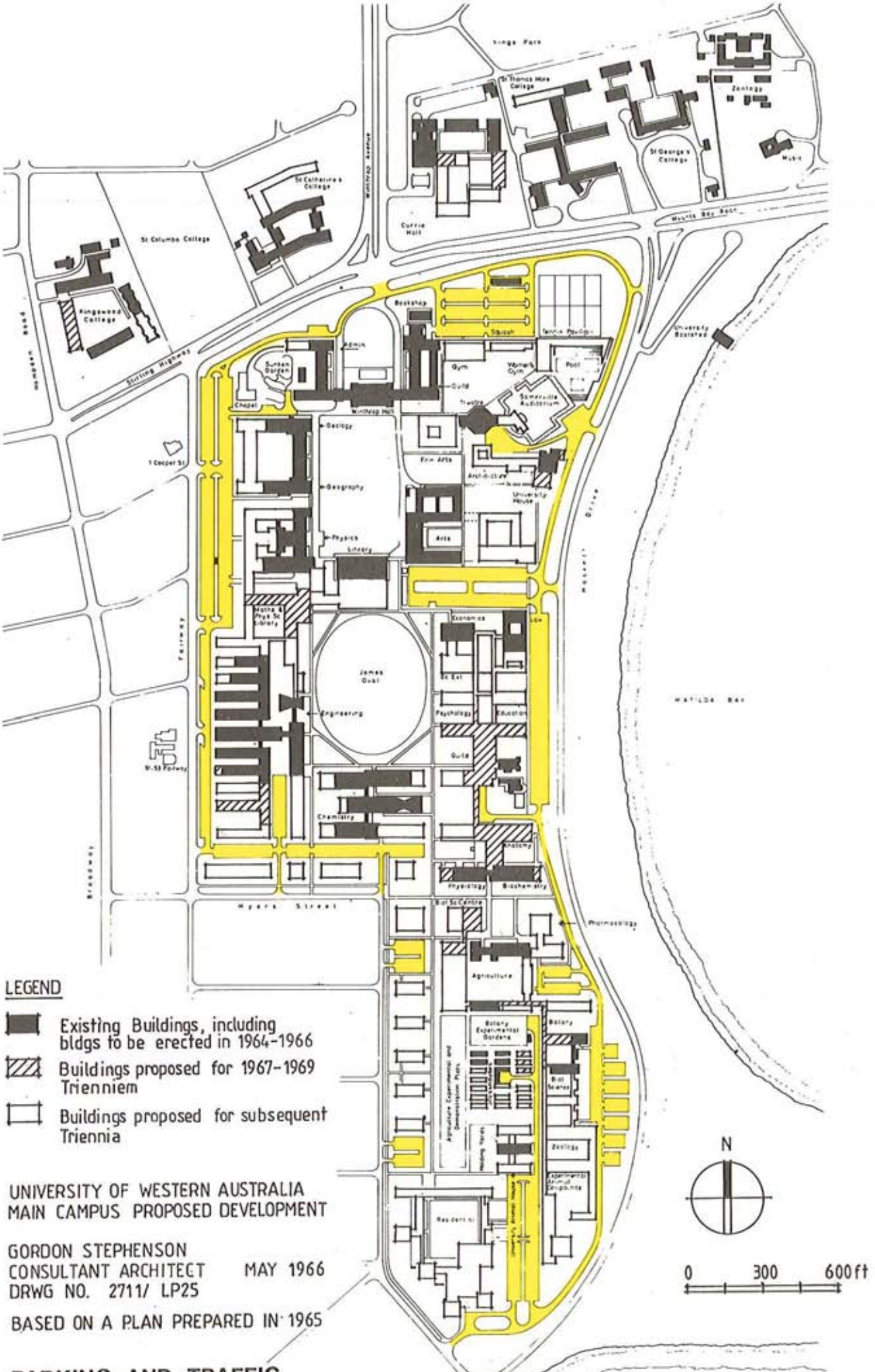
The options identified were:

1. The "Do nothing" approach, i.e. to ignore the parking problem and to provide only such parking space as is readily available within the Campus. This assumes that unlimited parking would remain available on the adjacent street system and that public transport would be used to a much greater extent than indicated by the 1965 survey.

2. Restrict further expansion of the University by limiting the student population. This would permit more space within the Campus to be utilised for parking instead of buildings.

3. Accommodate academic and non-academic parking demand within the Campus and:

   (a) construct multi-storey car parks to meet student demand either within the campus or acquire additional land off Campus for parking;



PARKING AND TRAFFIC

(b) develop major parking areas external to the Campus which could be served by shuttle bus service.

4. Dampen future demand by the introduction of a pricing system for parking.

5. Further restricting the issue of parking permits combined with a more strict control of parking both on and off campus.

6. Development of a student housing policy.

The Report indicated that to make a shuttle bus service between peripheral parking areas and the campus attractive to students it was imperative that satisfactory patronage be developed and that the travel and waiting time be kept as short as possible.

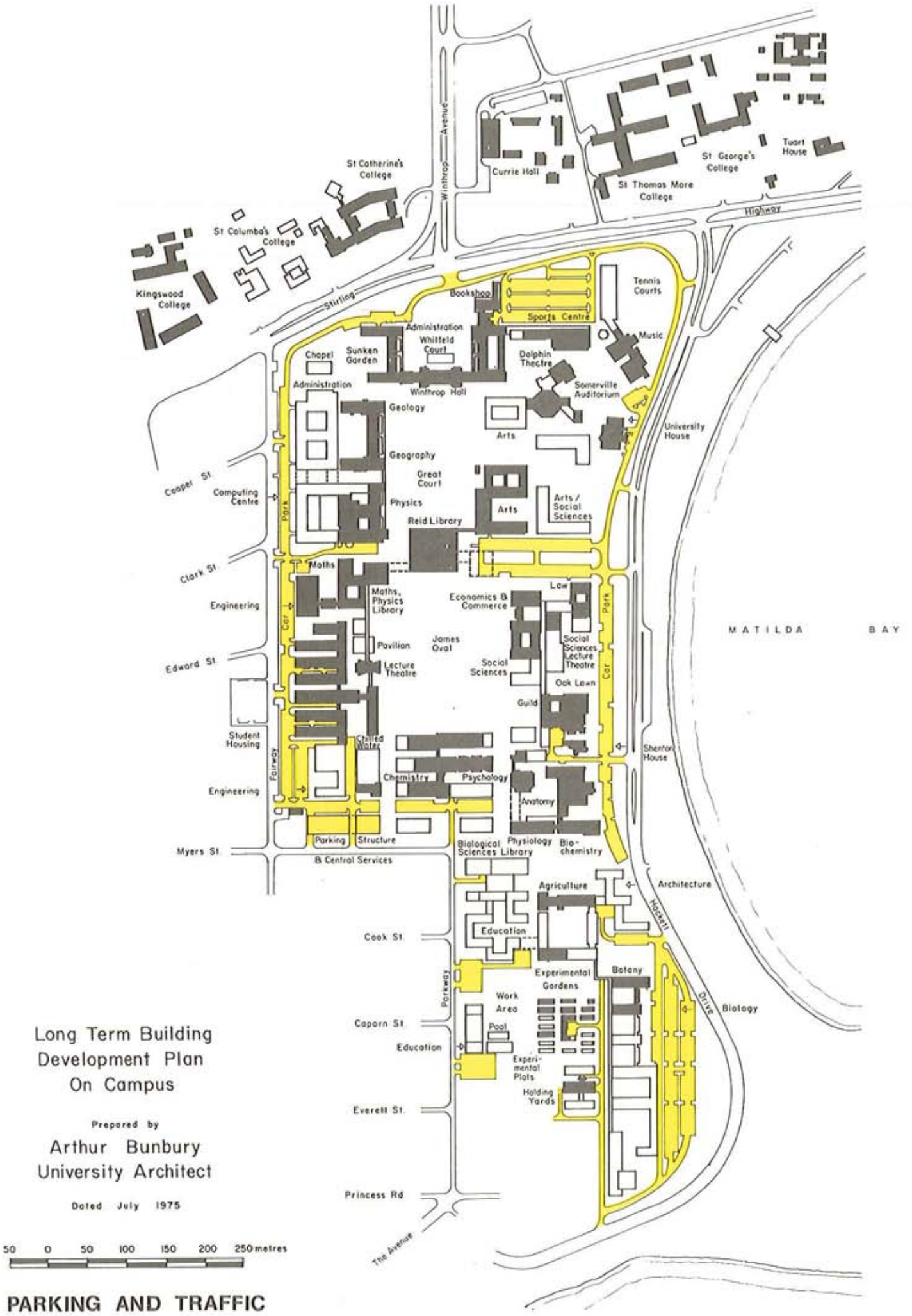
The recommendation was for a free service, at least initially, from a parking station of a minimum of 1,000 spaces, for viability, as close to campus as possible and serving all focal points on the campus. It was also recommended that should the parking station be in the vicinity of the Shenton Park campus the shuttle bus service could also serve the Shenton Park railway station and thereby attract a greater use of existing public transport.

In its investigations into traffic circulation the Report found that the University was well served by the existing regional road system, that adequate capacity existed on the adjacent streets and that the anticipated increase in campus population would not be critical in terms of traffic movement.

The Report also concluded that there was no real advantage in retaining the internal ring road concept illustrated in the Stephenson plans because of the value of the University land and that there was adequate capacity on the adjacent street system. It was recommended that the existing ring road be retained on the north side of the campus and on the east side only as far south as Hackett Entrance Number 1. Traffic circulation on all other sides of the campus was proposed to be via Fairway, Myers Street, Parkway and Hackett Drive which it was observed, may have to be widened to accommodate additional traffic.

The Report recommended that the Andrews Drive entrance should be relocated further south in Fairway to avoid congestion at the Fairway intersection with Stirling Highway. This relocation has occurred as part of the Architecture - Art Gallery redevelopment.

In November 1974 the University Architect's Office prepared a "Campus Planning - Traffic and Parking Preliminary Report" based on the De Leuw Cather Report. This Report was amended



Long Term Building Development Plan On Campus

Prepared by

Arthur Bunbury
University Architect

Dated July 1975

50 0 50 100 150 200 250 metres

PARKING AND TRAFFIC

twice in December 1974 and became the basis of the "Recommendations to the Senate on Parking and Traffic" dated October 1975.

These 1975 Recommendations modified the statistics related to the campus population in that the anticipated maximum was reduced from 15,300 persons in 1978 to 13,770 after a much longer period to a time defined as Year X. The Recommendations observed that the magnitude of the parking problem was somewhat lessened but that the principal conclusions and recommendations of the De Leuw Cather Report remained valid.

The 1975 Recommendations included:

- 4,000 car spaces should be regarded as a reasonable provision which should be available for use by the main campus community by the time the campus population reaches its currently predicted maximum size.

- Approximately 2,000 of these car spaces should be provided on the main campus or adjoining University land.

- As many as possible of the required number of off-campus spaces should be supported by a frequent bus service linking the facilities with points around the campus boundary. The costs of such shuttle services were investigated and quoted.

- Alternatives to ground level parking including structures above or below ground should be considered where they conceal or reduce the visual intrusion of parking in the landscape.

- Every opportunity should be taken to promote improvement of public transport facilities serving the University neighbourhood.

- The ability to park on the campus is to be regarded as a privilege and the cost of providing the necessary facilities should be borne by those availing themselves of the facility.

In 1980 the University sought to clarify its standing as a "public authority" within the meaning of the Metropolitan Region Scheme and whether it must apply for approval from the City of Subiaco before carrying out any development for the purposes of the University on land reserved for such purpose.

The Supreme Court judgement of 11 March 1980 accepted by the University required the University to obtain development approval from the then Metropolitan Region Planning Authority which became the State Planning Commission for any development on its land, whether reserved for University purposes under the Scheme or otherwise, by lodging the

necessary applications through the relevant local authorities in whose areas the developments are situated.

The result of this process is that the local authority may recommend to the Commission certain conditions for development approval. The main thrust of these conditions has been the inclusion of adequate provision of car parking facilities to support all new development.

In 1985 Feilman Planning Consultants Pty Ltd with Scott and Furphy Engineers Pty Ltd were appointed to prepare a Traffic and Parking Strategy to help resolve the University's parking problem which had increased since the 1974 Report and 1975 Recommendations. A Stage 1 Report was presented in July 1985 and a Stage 2 Report in July 1986.

The 1986 Strategy recognised the accumulated existing parking problems which had been predicted by the 1974 Report and 1975 Recommendations and concentrated on resolving the parking problems on and adjacent to the campus.

By application of population to parking space ratios used by other Australian universities the Strategy identified a 490 space "backlog" which was recommended to be accommodated as quickly as finance/opportunity arose on the eastern and western flanks of the campus and, in the longer term, an additional 360 spaces to replace those vehicles parked on Hackett Drive. In addition to clearing the "backlog of demand" the Strategy recommended that all new development include sufficient parking facilities and to this end a formula was promoted employing parking space ratios for students, academic staff, non-academic staff, visitors and an additional 10% factor to ensure that parking provisions exceeded actual demand. This formula was similar to that used in the De Leuw Cather Report to determine parking space requirements for the expanding University population.

In terms of traffic movement the Strategy recommended that the efficiency and safety of the Fairway and Broadway intersections with Stirling Highway be improved, that Fairway and Hackett Drive be accepted as part of the campus ring road system and also that a cross campus link between Myers Street and Hackett Drive be considered to provide more efficient egress of vehicles from the western flank of the campus via Hackett Drive.

The Strategy recommended that areas between Fairway and Broadway north of Myers Street be incorporated into the long term development plan for the campus. This area was seen to have potential as a mixed use zone of University, business and commercial activity and was strategically located to provide the opportunities for both "backlog" and future parking supply.

PRESENT SITUATION

The environmentally acceptable maximum of 2,000 ground level on campus parking spaces nominated by Stephenson and supported by Bunbury has already been exceeded.

At this date, August 1990, there are 2,519 cars parked on campus proper plus 269 cars on Car Park 23 at the intersection of Hackett Drive and Mounts Bay Road. 1,311 of these cars are parked in permanent car parks.

An additional 83 cars are parked in Car Park 17 and 181 are parked in Car Park 21 off campus between Fairway and Broadway. A total of 53 cars are parked off campus in the Zoology and Tuart House car parks, 164 are parked in verge parking in Fairway, 111 in Parkway, 350 vehicles are parked on Hackett Drive and 27 in Myers Street.

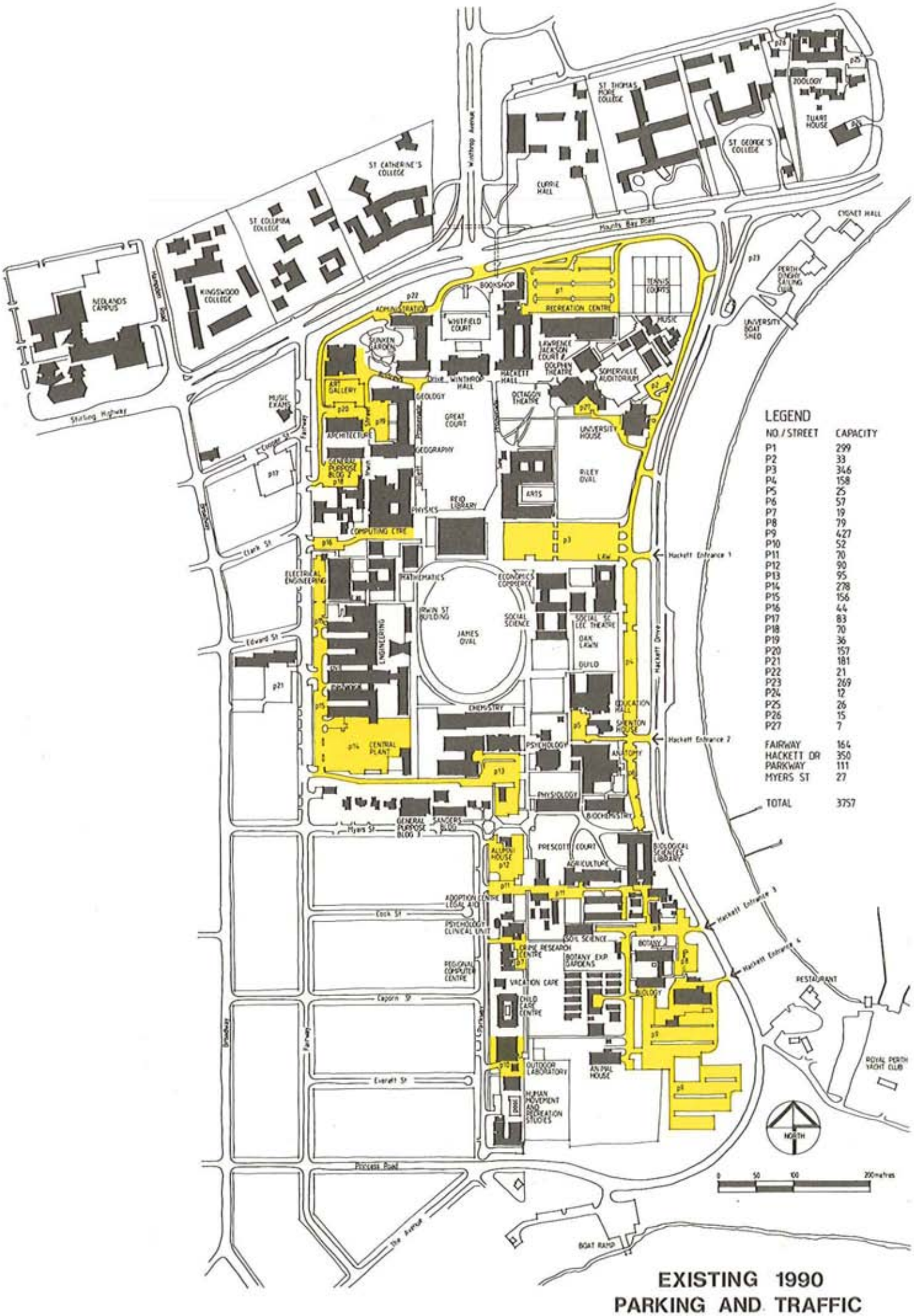
A total of 3,757 cars are parked on or immediately adjacent to the campus.

Further development, especially that planned in the southern campus, will eliminate some existing car parking and could require additional spaces because of the increase in population in that area. South of the line of Myers Street 737 spaces exist on campus, not including those in Hackett Drive or Parkway. Preliminary redevelopment plans for this area indicate that only approximately 852 spaces can be achieved, 200 of these flanking a ring road and 200 accommodated under buildings after total redevelopment. This number will change as detailed development occurs but the order of potential development shows that not much more than replacement parking facilities can be achieved.

North of Myers Street 1,782 spaces exist on campus not including Car Park 23 or those spaces in Fairway or Myers Street. It will be difficult to maintain these numbers with further development of the northern campus unless vehicles are accommodated in large numbers in parking structures and/or under buildings.

The desirable maximum limit of 2,000 parking spaces on campus established by earlier plans assumed that this number would be accommodated at ground level and unfortunately, but for obvious economical reasons, more than half of this number was located in temporary car parks on future building sites.

It is clear that if the University is to retain its environmental qualities it cannot continue to impose large car parks on the landscape. There are few opportunities on campus where the natural ground levels permit the construction of structures or under building car parks which are environmentally compatible with the established qualities of the campus. The success of Car Parks 3 and 4 is in them being below the floor levels of adjacent buildings and



EXISTING 1990
PARKING AND TRAFFIC

separated from pedestrian ways by stone retaining walls. Opportunities similar to that exploited at the Art Gallery site exist only in the extreme south-east corner of the campus, between Myers Street and Car Park 14 and in the area of Car Park 1 and the Tennis Courts.

If the celebrated aesthetic and amenity balance of buildings, services and landscaping established in the northern campus is to be achieved over the whole campus it is estimated that the desirable maximum number of parking spaces on and immediately adjacent to the campus is in the order of 4,400 at ground level, in structures and below buildings.

Even if an additional parking facility for say 1,000 vehicles was constructed on campus it is apparent that this facility would rapidly fill and other University generated vehicles would take up the spaces in the streets adjacent to the campus. The constant and very costly provision of car parking facilities on campus cannot solve the problem.

It is significant that the City of Perth has addressed its traffic and parking problem by imposing a maximum number of parking spaces related to the area of each site that can be achieved by development in the inner city. Other local authorities will follow this example as they find that their city centres also cannot cope with increasing traffic and parking demands. It is inevitable that these accumulating universal pressures will result in more efficient public transport systems but probably only in the long term.

Information on existing public transport facilities is contained in Appendix 2.

Internal Ring Road

The 1962 and 1965 Stephenson plans showed a continuous internal ring road around the campus except for the Parkway section where Parkway was to become the only external section of the ring road system. At that time Parkway was connected to Princess Road, The Avenue and Hackett Drive. This was also the case at the time of the preparation of the 1975 Campus Planning Report and Recommendations on Parking and Traffic. The Parkway connection to Princess Road was closed in 1977.

The 1974 De Leuw Cather Report and the 1986 Feilman Planning Strategy both proposed that the internal ring road be confined to the northern edge of the campus and the eastern edge as far south as Hackett Entrance 1 and that all other campus traffic communications be via the existing external road system. The 1975 Recommendations on Parking and Traffic supported these proposals but Bunbury advised that adequate space should be retained for the extension of the internal ring road should future circumstances require such extension.

The 1975 plan did show an almost continuous internal ring road system except for small sections adjacent to Myers Street, Hackett Drive and the full extent of Parkway.

The one way section of ring road on the northern edge of the campus causes traffic moving from say Law on the east to Architecture on the west to use Hackett Drive, Mounts Bay Road/Stirling Highway and Fairway for access.

The internal ring road is already complete on the Fairway flank except for a small section at the site of the Child Study Centre.

The south-eastern section of the campus has been penetrated by what amounts to an internal road system at the expense of paths for pedestrians only and formal internal green spaces partly because of the absence of an internal ring road system. If the external roads are to be used as the campus ring road system in whole or part it is likely that more vehicular traffic will be forced onto the pedestrian system. The curve of Hackett Drive between Hackett Entrance 4 and the entrance to the boat ramps is too dangerous to accommodate additional campus entrance points.

Vehicles in the Inner Campus

One of the several, often quoted and always supported basic planning principles promoted by Stephenson is that "Cars should be confined to car parks and a ring road on the edge of the campus. Paths and promenades through the inner parts of the campus should be for pedestrians only.".

Whilst the campus structure plan follows this principle the number of vehicles using the pedestrian path and colonnade system and in some cases grassed areas is competing with pedestrians in the inner campus.

Access has been made too easy in some areas by the elimination of a grade separation between vehicles and pedestrians and in other areas bad habits such as vehicles parking in pedestrian colonnades or on green spaces have developed unchecked promoting continued vehicular pollution of the inner campus. When students, staff and others witness University service vehicles penetrating the pedestrian spaces there is a tendency for some to follow suit especially to avoid walking from legitimate car parks or service points or to save time by crossing instead of circumnavigating the campus.

Emergency vehicles such as ambulances, firefighting units and cranes to lift out equipment or plant require occasional penetration to all strategic points on the campus without being barred by trees or other permanent physical barriers.

Service vehicles require frequent access to all buildings and some buildings have been located and or designed in such a manner as to make this impossible without vehicles encroaching on pedestrian ways. Such access is required for rubbish collection, general maintenance and delivery of mail, stationery, cleaners equipment, furniture refits, etc.

OPTIONS

The options alternative to swamping the campus with parking structures have been promoted by earlier studies and include:

1. Increase parking facilities off but within walking distance of the campus.

   The Fairway Broadway corridor has been identified for such purpose and two car parks have been constructed in this area. The designed extension to the Edward Street development would yield additional parking spaces.

   When the University takes possession of the Nedlands campus of the WACAE the hockey field would lend itself to a single or double level car park, however, depending on development of that campus it could generate its own parking problems. A grade separated link across Stirling Highway serving the two campuses would become imperative if Crawley campus vehicles were parked on the Nedlands campus.

   Additional parking facilities along the River foreshore could serve the University during the week and the general public on weekends.

   Widen Hackett Drive to retain existing on street parking and provide for an additional lane for traffic movement.

2. Develop major parking areas external to the campus connected by a frequent shuttle bus service.

   The De Leuw Cather Report recommended that a minimum of 1000 parking spaces would be required for such a system to be viable and that travel and waiting time should be as short as possible.

   The Feilman Planning Consultants Pty Ltd Shenton Park Research Campus Report identified a site on the Shenton Park campus which could accommodate up to 2,500 vehicles to serve both the Crawley and Shenton Park campuses.

   A parking structure at the Perth Medical Centre site has also been considered and such a facility is within walking distance of the main campus.

3. Increase parking fees on campus to provide additional funds for car parking facilities on and off campus, to dampen requirements for on campus parking and therefore to encourage other means of transport to the campus - walking, cycling, public transport and car pooling.

   Short term parking should be investigated so that parking spaces are turned over more frequently.

   Such moves would have to be coupled with the Cities of Subiaco, Nedlands and Perth imposing short term parking restrictions and heavy fines for offenders in the adjacent street system and also the encouragement and if necessary subsidisation of more efficient public transport systems. The community as a whole would benefit from this move.

4. Gain the acknowledgment of the Cities of Subiaco, Nedlands and Perth and the State Planning Commission to the fact that the University campus is a cultural and environmental asset to the community and must not be allowed to take on the appearance of a suburban shopping centre car park.

Maximum Parking on and Adjacent to Campus

Given the assumptions that must be made on the potential full development of the campus the following options for parking on and adjacent to the campus should be considered a maximum:

Car Park 1: Existing 299. Lower existing car park and cover part with a deck to provide an additional 200 spaces.

Any increase in the number of parked vehicles in this area would require reconstruction of the ring road to provide two way traffic and access to Hackett Drive further south.

Under Tennis Courts: Excavate a car park a half level into the ground and rebuild the courts a half level above ground to provide an additional 200 spaces.

Car Park 2: Retain existing 33 spaces.

Car Park 3: Retain existing 346 spaces.

Car Park 4: Retain existing 158 spaces.

Car Park 5: The existing 25 spaces could be lost when the Guild building achieves its ultimate expansion.

Car Park 6: Retain existing 57 spaces.

Car Park 7: The existing 19 spaces could be lost when the site between the Biological Sciences Library expansion site and Vacation Care is developed. There is potential to accommodate 150 vehicles on this site with or without buildings over.

Car Park 8: The existing 79 spaces could be reduced to 50 with the redevelopment of the Botany Biology building.

Car Park 9: The existing 427 ground level spaces could be replaced by 600 spaces when this south east corner is totally developed - 200 in a ground level park, 200 flanking a ring road extension and 200 under buildings.

Car Park 10: Retain existing 52 spaces.

Car Park 11: The existing 70 spaces will be lost when the Biological Sciences Library and Agriculture extensions are constructed.

Car Park 12: The existing 90 spaces will be lost when the Biological Sciences Library and its extension are constructed.

Car Park 13: The existing 95 spaces could be reduced to 30 when this site is eventually developed.

Alternatively, 120 spaces could be achieved if basement parking was provided under new building development.

Myers Street: The site between Myers Street, Fairway Entrance 4, the Third General Purpose building and the electrical substation will accommodate an additional 130 spaces at the Myers Street level with Workshop buildings over.

Car Park 14: The existing 278 spaces should be retained when the site is redeveloped for Engineering and the Central Services Plant is extended.

Car Park 15: Retain the existing 156 spaces.

Car Park 16: The existing 44 spaces will be lost when the Fourth General Purposes building is constructed.

Car Park 17: Off campus but retain existing 83 spaces with or without development over.

Child Study Centre	As part of the redevelopment of this site provide 100 spaces under buildings.
Media Services:	
Car Park 18:	The existing 70 spaces could be lost to green space and Child Study Centre site redevelopment.
Car Park 19:	The existing 36 spaces will be lost when this space is landscaped.
Car Park 20:	Retain existing 157 spaces.
Car Park 21:	Off campus but expand existing 181 spaces to 420 spaces.
Car Park 22:	Retain existing 21 spaces.
Car Park 23:	Off campus but retain existing 269 spaces.
Car Parks 24, 25 and 26:	The existing 53 spaces off campus could be lost should this site be redeveloped for other than University purposes.
Car Park 27:	The existing 7 spaces could be lost if this park is converted to a service only area.

It is proposed that a maximum total of 3,789 cars can be parked on and immediately adjacent to the campus plus 164 in Fairway, 27 in Myers Street, 111 in Parkway and 350 on Hackett Drive.
Totalling 4,441.

RECOMMENDATIONS

- Discontinue the practice of constructing temporary car parking facilities on future building sites on campus and construct the identified permanent facilities compatible with the extent of future building development.

- Increase parking facilities off, but within walking distance of the campus.

- Widen Hackett Drive to retain existing on street parking and provide for an additional lane of traffic movement.

- Develop major parking areas external to the campus connected by a frequent shuttle bus service.

- Request the Parking Committee to investigate the possibility of incremental increases in parking fees to contribute to the additional funds required for car parking facilities on and off campus.

- Gain the acknowledgment of the Cities of Subiaco, Nedlands and Perth and the State Planning Commission of the fact that the University campus is a cultural and environmental asset to the community and must not be allowed to take on the appearance of a suburban shopping centre car park.

- Retain space on the perimeter of the campus to permit the construction of a continuous internal ring road except for the section adjacent to Parkway.

- Extend Parkway into the campus to serve Chemistry and whatever remains of Car Park 13 and cut the existing internal road connecting Car Park 13 and Fairway Entrance 4 so as to serve only the Central Plant and relocated Workshops.

- Open Parkway to Hackett Drive via the internal ring road halfway between The Avenue intersection and the boat ramps entrance, at least to permit a left turn only exit on to Hackett Drive. This connection to Hackett Drive would not be required if the internal ring road was completed between Parkway and Hackett Entrance 4.

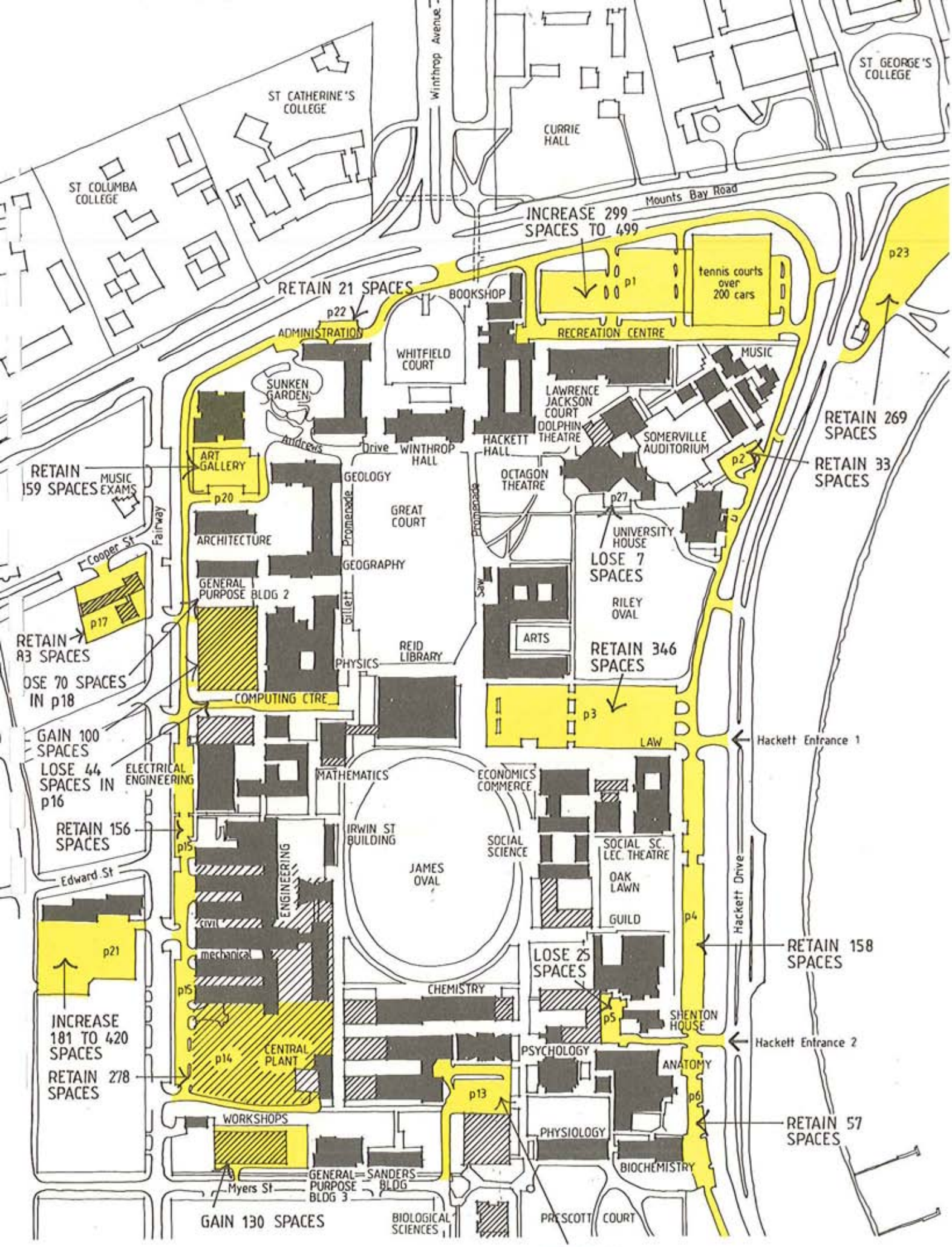
- Should additional parking facilities be constructed in the location of Car Park 1 or the Tennis Courts widen the ring road from the Winthrop Avenue entrance to just south of Music to accommodate additional traffic and move the access to Hackett Drive further south to avoid conflict with the queue at the Mounts Bay Road control lights.

- Confine all vehicles to the external boundaries of the campus and restrict University vehicles to only essential penetrations into the inner campus so as to help set a standard for others.

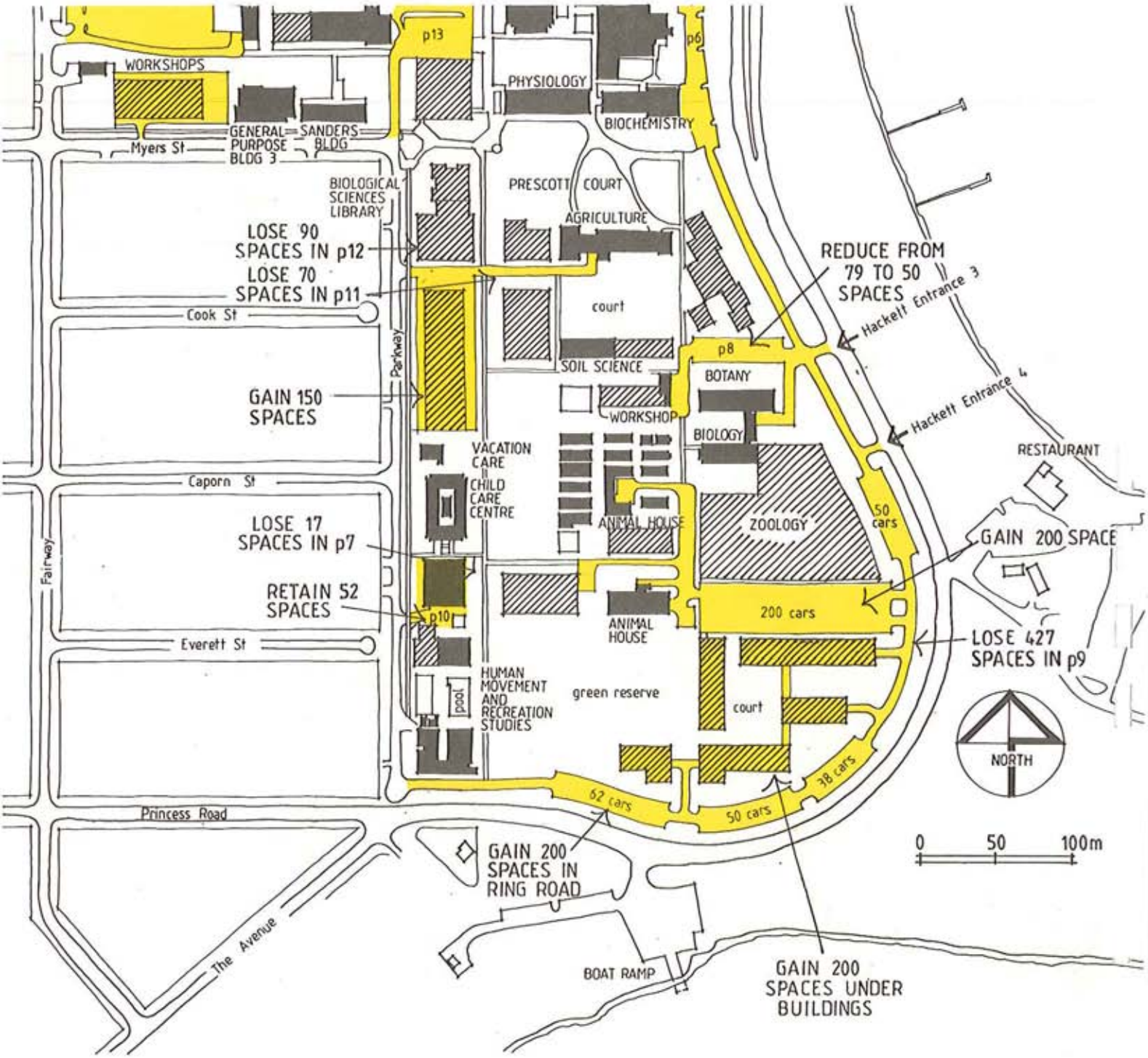
- Employ barriers in the form of bollards - removable if necessary for emergency or ceremonial vehicles - kerbs and planting to return the inner campus to the pedestrians.

- Arrange vehicular access points to be as close to buildings as is compatible with the environmental qualities of the campus and locate service lifts in the buildings to be as close to service docks as will suit the internal planning of the building.

- Encourage walking and carrying or trolleying of goods between buildings and service docks.



NORTHERN CAMPUS – OPTION 1
PARKING AND TRAFFIC



LEGEND

EXISTING BUILDINGS

FUTURE BUILDINGS AND DEVELOPMENT SITES

SOUTHERN CAMPUS – OPTION 1
PARKING AND TRAFFIC

FUTURE DEVELOPMENT

GENERAL

When assessing its physical structure the qualities attributed to the University are generally those of the northern campus - low-rise buildings unified in scale, colour and texture set in a continuous and consistent landscape open to its neighbours via the large perimeter courts which herald at least visual entry into the campus - all a product of the sensitive integration of planning, architecture and landscape.

The image diminishes in quality at the interface with suburbia on the western flank and southern campus. These areas are less distinctive because of the absence of large open landscaped spaces, the nature of the buildings, their disposition and the dominance of car parking both on and off campus.

Other and more significant qualities become apparent when the campus is viewed in precincts, the more imposing of which are those where groups of buildings, joined or otherwise, are located and shaped to contain a variety of spatial experiences.

The looseness and a certain loss of quality of some groups has resulted from open ended planning to allow expansion of all elements and the inclusion of new elements at various times in the future. The size and nature of the many spaces vary greatly and those which contribute most to the environmental qualities of the campus are unified with a common architectural and landscape theme. Several buildings are involved in more than one space which is a real test of their design sensitivity.

The original and extended buildings of the group comprising Hackett Hall, Winthrop Hall, Administration, Geology and Geography, allowing the modest gap between Administration and Geology, are continuous physically and in architectural style and frame a monumental composition of spaces.

The development of the General Purpose building 2, Architecture building and Art Gallery complete the containment of spaces in the north-west corner of the campus and will achieve total resolution of this precinct when the Geology Geography Court is landscaped and the deck linking Architecture and the Art Gallery is constructed.

The buildings of the Lawrence Jackson Court group comprising Hackett Hall, the Guild Recreation Centre and the Dolphin and Octagon Theatres are not physically linked but their sensitive containment of the Court and compatible architecture develop an imposing presence.

The buildings of the group comprising Law, Economics and Commerce, Social Sciences and Guild - not consistent but compatible in architectural style and not complete until Law and Economics and Commerce are joined, Social Sciences and the north-south covered way are expanded to the south and Guild to the west - are the result of long term planning for a composition of continuous structures supporting an organised hierarchy of spaces.

The successful modelling of the various groups of buildings is a product of locating like faculties and departments in functional groups and particularly the sensitive location and design of individual buildings with regard to their present and future neighbours and their own logical extensions.

The confinement of vehicular traffic and car parks to the perimeter ring road system in order to retain the inner parts of the campus for pedestrians has reinforced the success of some precincts and groups of buildings. The areas on campus which depart from the campus image are those where vehicles penetrate the inner campus and destroy the space structure and pedestrian sanctuaries of the precincts.

RECOMMENDATION

Many of the highly acclaimed qualities of the campus have been achieved by the adherence to, what have become known as, the 1959 Stephenson planning principles described under Planning Background.

- Maintain the philosophy of the Stephenson planning principles:

1. Locate like departments and facilities in functional groups.

2. Provide for expansion of all buildings and groups of buildings.

3. Confine vehicular traffic and car parks to the perimeter of the campus.

4. Maintain the inner campus for pedestrians only.

5. Arrange buildings to frame a variety of landscaped spaces and internal courts.

SOUTHERN CAMPUS

The development structure of the campus north of Myers Street is established. Zones, green spaces, new buildings, extensions, redevelopment sites, service roads and car parks are known within necessary tolerances to accommodate change.

The campus south of Myers Street has inherited some

development constraints in the form of buildings, facilities and service easements but, apart from Prescott Court, has not achieved a positive development structure compatible with that of the northern campus.

Should the Service Corridor System be adopted and provision be maintained for the ring road extension the basic structure of the southern campus would be established.

In 1977 a committee comprised of representatives of departments occupying the southern campus and the Department of Zoology, as a potential future occupant, agreed guidelines for space allocation in the southern campus from a plan prepared in 1975.

The guidelines made provision for Agriculture - building site, experimental plots, glasshouses, animal grazing, animal laboratories, workshop and yard; Physical Education (Human Movement and Recreation Studies) - building site, work area and cricket practice wickets; Non Departmental Facilities - squash courts and tennis courts; Botany/Biology - building site, taxonomic garden, experimental plots, glasshouse and workshop area; Zoology - building site and animal paddock; Car Parks and some Open and Unallocated Space. In agreeing the allocations the departments concerned required satisfactory assurance regarding the length of tenure they could expect for the areas allocated to them in the plan.

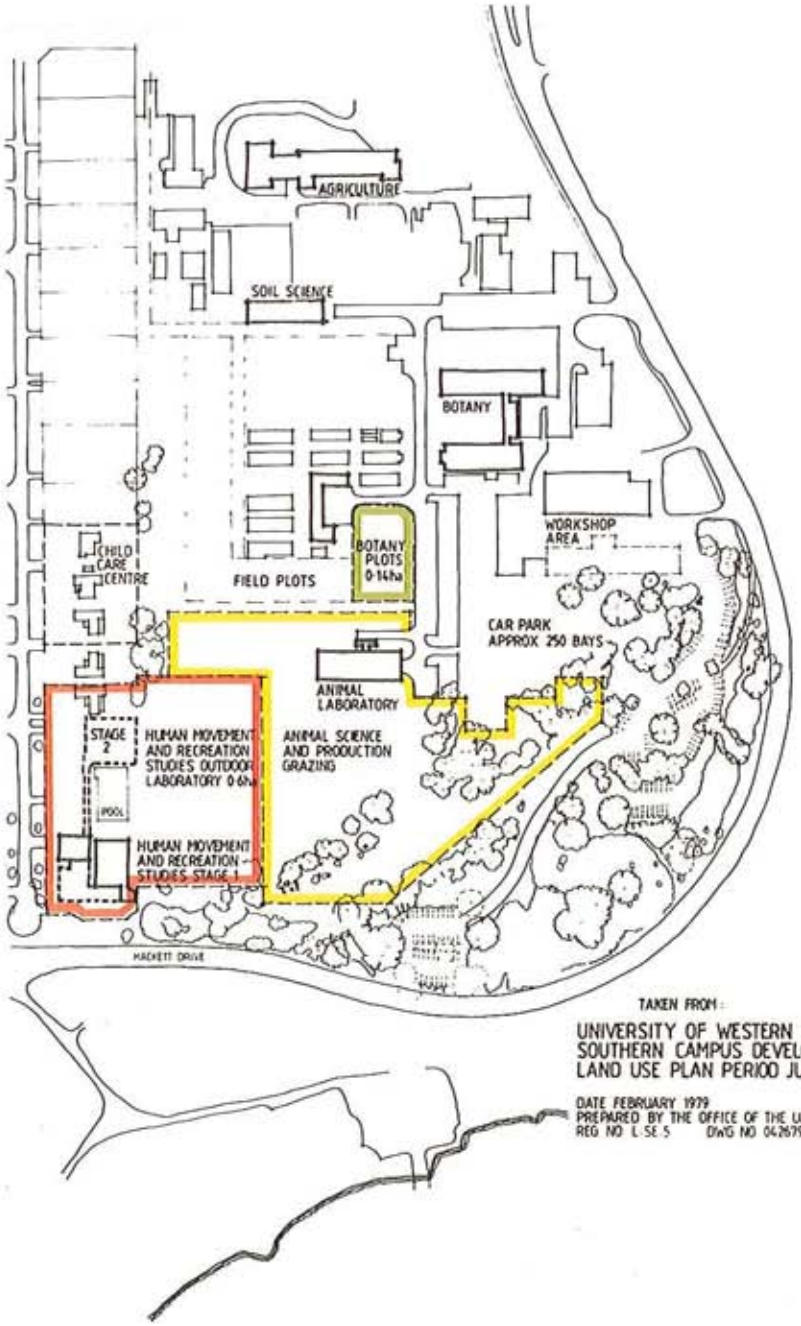
In 1978 the allocations were revised to accommodate the construction of Physical Education and its Outdoor Laboratory and an interim seven year plan was developed based on the revisions. It was agreed that two years notice would be given to the relevant departments before any significant changes were made to the interim plan.

It was acknowledged that the interim plan made no attempt to meet the longer term requirements of potential users of the southern campus and that further development could occur which would not prejudice the allocated uses but which could involve additional detailed planning within the framework adopted. The plan was approved by both the Buildings Committee and the Senate.

Development since 1978 includes:

- The realignment of Hackett Drive resulting in a loss of 0.9 ha of site area in the southern campus.

- A site was nominated in the 1975 Report on Campus Planning to the east of the Agriculture building for Architecture. The new Architecture building has since been constructed to the north of the Second General Purpose building.



TAKEN FROM:

UNIVERSITY OF WESTERN AUSTRALIA
SOUTHERN CAMPUS DEVELOPMENT
LAND USE PLAN PERIOD JULY 79-1986

DATE FEBRUARY 1979
PREPARED BY THE OFFICE OF THE UNIVERSITY ARCHITECT
REG NO L·SE·5 DWG NO 042679

- A site on Parkway to the west of the Agriculture building was nominated in the 1975 Report for an Education building. It is now proposed that Education be relocated on the Nedlands campus.

- The Department of Human Movement and Recreation Studies has been extended to provide an indoor exercise laboratory, a second swimming pool and additional offices.

- Parkway houses Nos. 22, 24 and 26 used for child care and another, No. 20 have been replaced by a new 100 place Child Care Centre (Unicare). No. 18 has been converted for use for Vacation Care purposes.

- Parkway houses Nos. 8, 10, 12, 14 and 16 have been converted for various uses and currently accommodate the Adoption Centre, Legal Aid, Psychology Clinical Centre, Crime Research Centre and Regional Computing Centre.

- Parkway house No. 4 has been demolished to permit the construction of Car Park No. 12.

- Parkway house No. 2 used as Alumni House has been demolished to permit the construction of the Biological Sciences Library building on this site.

- The space between Physiology and Biochemistry and Agriculture was landscaped and became Prescott Court.

- The Workshop South building was demolished and reconstructed at Allandale Farm.

- Car Park 9 was constructed south of the Property Services and old Plumbers' Workshops to accommodate 427 vehicles.

A part of the major building works package financed jointly by the University and the Commonwealth Tertiary Education Commission and involving the purchase of the Nedlands campus of the Western Australian College of Advanced Education is the construction of a Science Facilities building comprising a new Biological Sciences Library, extensions to Agriculture and Botany and the relocation of Zoology to the main campus.

All these facilities have been identified for location in the southern campus and a particular site has been approved for the Biological Sciences Library building.

The Guild of Undergraduates requires at least one additional catering facility in the southern campus and possibly two depending on development in the extreme south-east corner.

The Property Services Maintenance Workshop and Plumbers' Workshop (now used by Geology) should be demolished to make way for Zoology and possibly relocated on a basement car park off Myers Street adjacent to the Central Chilled Water Plant.

Agriculture, Botany and Zoology require a Combined Workshop adjacent to their extended and new facilities. Possible sites include the new Zoology building site, the garden plot, the glasshouse lot, adjacent to the electrical substation, (which would require relocation of the Taxonomic Garden) and a site immediately north of Car Park 8.

An additional Animal House will require location and the existing Animal House requires refurbishment.

Human Movement and Recreation Studies will inevitably make claim to additional facilities including a doubling of the Outdoor Laboratory.

It is more likely that the Child Care Centre will duplicate elsewhere than expand on the main campus because of the management problems of large centres and also to provide an alternative type of service.

It is understood that the departments concerned require some of their animal holding and grazing areas, experimental garden plots, glasshouses and service structures to be immediately adjacent to the main teaching and research buildings.

It does seem possible to relocate the Taxonomic Garden, even off campus, gaining approximately 3000 square metres in an area which is under pressure for additional uses.

Should it be found that animal areas, garden plots and glasshouses could be successfully relocated off campus additional development options become available.

The site in the extreme south-east corner of the campus has good views over the River and is elevated above the level of Hackett Drive and a possible future ring road. This site currently accommodates a large section of Car Park 9, animal grazing and an area of natural bush.

Due to its elevation, this site is ideal for basement car parking, as achieved at the Lawrence Wilson Art Gallery, and a large grouping of buildings of some prominence related to the riverscape. The sculptural solutions to this group of buildings could include elements in the form of high-rise towers to complement the tower of Winthrop Hall at the extreme northern edge of the campus. River views should be maintained from buildings and the internal green spaces of the southern campus.

The site west of Agriculture and north of Car Park 8 has the potential to accommodate a prominent building on the bend of Hackett Drive, related to the River foreshore. Because of the need to remain in scale with the two level Agriculture Building, open Prescott Court to the River, maintain the

Sunday and public holiday services are even less frequent. Route No. 103 runs every 40 minutes until 4:00 pm, then hourly until the last service around 8:00pm. Both No. 72 and No. 200 run every 90 minutes between 10:00am and 8:00pm.

These timetables suggest that the University is well serviced from Perth and the near northern and western suburbs but traffic congestion, especially during peak periods, causes the services to become erratic, often with two buses arriving together and long waits between buses.

Journeying to and from the outer suburbs often involves two or three connections sometimes at inconvenient times and generally involving a long journey time, hence the great number of students and staff who rely on private vehicles for transport.

APPENDIX 2

PUBLIC TRANSPORT

The University's location on the main Perth-Fremantle road link gives the University access to several Transperth bus routes servicing the two cities and the western suburbs. However, apart from a through service to Curtin University there is no direct service between the University and any other part of the metropolitan area. Nor is there a convenient rail service, the nearest rail stations being Shenton Park, 2.5 km from the campus with no public transport connection to the campus, Claremont, 3.4 km from the campus and Daglish, 3.2 km from the campus both with limited bus connections.

Bus Route No. 103, the main Perth-Fremantle link using Kings Park Road, Thomas Street, Hampden Road and Stirling Highway includes a stop at the corner of Hampden Road and Stirling Highway. This service provides buses every 10 minutes during peak periods, 7:30am - 9:30am and 4:00pm - 6:00pm, approximately every 15 minutes during the day and hourly in the evenings until between 11:15pm and 11:30pm.

Route Nos. 200, 202, 208 and 209 which run between Perth and Claremont follow the same route as 103 but deviate through Shenton Park and Subiaco between the University and Perth. These services provide buses every 15 minutes during peak periods, every 20 - 25 minutes during the day and every 2 hours in the evening until between 10:45pm and 11:45pm.

Route No. 201 between Perth and Claremont uses Mounts Bay Road and Hackett Drive running every 20 minutes during peak periods and approximately every 80 minutes during the day, the last service being around 5:00 pm.

Route Nos. 71, 72 and 73 offer a through service from Curtin University of Technology to The University of Western Australia via central Perth and on to Claremont and/or Cottesloe. This service uses Mounts Bay Road and Stirling Highway. It runs every 15 minutes during peak periods, half hourly during the day and hourly in the evening until around 11:00 pm.

Saturday services on all routes are less frequent. Route No. 103 runs every 20 minutes, No. 72 half hourly in the mornings, every 40 minutes in the afternoon with only 2 buses after 8:00pm. Route Nos 200, 202 and 208 run half hourly in the morning and every 90 minutes after 1:30pm until 11:00pm.

CITY OF PERTH PLANNING SCHEME 1985

The north-east corner of the campus abuts the "Crawley Precinct" contained by Mounts Bay Road, Crawley Avenue and Kings Park and zoned Residential R 60 with a number of special controls relating to density, car parking, heights of buildings and boundary set back dimensions, aiming to encourage a low population density and spacious high quality dwellings.

Because of the environmental aims of the Precinct, proposals for redevelopment of the adjacent University site accommodating Zoology and Tuart House would draw special attention from the City Council.

activities into the area bounded by Stirling Highway, Fairway, Broadway and Myers Street and possibly in the very long term the area bounded by Myers Street, Broadway, Princess Road and Parkway.

The area north of the Colleges between Hampden Road, Monash Avenue and Winthrop Avenue is zoned R30 with some single lots zoned R50. The area between Hampden Road, Park Road and Kanimbla Road is zoned R80. The lots located between Hardy Street and Park Road east of Hampden Road are included within a Shop Zone.

The foreshore to the south and east of the campus is designated Open Space MRS Reserved Land.

The Subiaco City Council is interested in campus parking solutions to remove University generated vehicles which are being parked in the side streets.

CITY OF NEDLANDS TOWN PLANNING SCHEME NO. 2

Properties between Clark Street and Princess Road on the west side of Broadway are zoned Residential R35; between Princess Road and Hillway, Residential R12.5. Some individual lots are zoned for Additional Use - Office. The north-west corner of Princess Road and Broadway is zoned Additional Use - Hospital.

Lots between Stirling Highway and Cooper Street on the west side of Broadway are zoned Service Station and Retail Shopping; between Cooper and Clark Streets, Office/Showroom; between Hillway and The Avenue, Retail Shopping and Service Station and south of The Avenue, Hotel.

The Nedlands campus is zoned Public Purposes and generally lots to the west and north of that campus, Residential R25. The lots on the north side of Stirling Highway between Williams and Clifton Streets and on the south side of Stirling Highway between Bruce Street and the service station on the corner of Broadway are zoned Office/Showroom.

Lots on the west side of Hampden Road between Park Road and Hardy Road are zoned Retail Shopping. The Nedlands City Council has a blanket maximum building height limit in the area of two storeys or 10 metres above natural ground level, a requirement which may be varied by Council subject to certain conditions. This height limit may effect new development on the Nedlands campus.

The Nedlands City Council will also be interested in provisions for parking and traffic movement patterns when the Nedlands campus is occupied.

APPENDIX 1

METROPOLITAN REGION SCHEME

In order to obtain Development Approval for building projects the University submits proposals to the State Planning Commission through the Local Authorities who make observations on the particular proposals and recommendations to the Commission. To date the City of Nedlands has not been involved in development and the Cities of Subiaco and Perth have been mainly interested in vehicle parking facilities.

Any development off campus is submitted direct to the Local Authority for a Building Licence.

Under the Metropolitan Region Scheme the sites of the main campus, the Colleges and the Nedlands campus are reserved for Public Purposes. The River foreshore to the south and east is reserved as Parks and Gardens whilst the remaining areas surrounding the campus are part of the Urban Zone which permits a range of land uses defined in the Local Authority Planning Schemes.

CITY OF SUBIACO TOWN PLANNING SCHEME NO. 3

The area bounded by Myers Street, Parkway, Princess Road and Fairway is zoned Residential R30 (Low to medium density). The area bounded by Stirling Highway, Fairway, Myers Street and Broadway is zoned Residential R80 (Medium to high density).

Some lots enjoy Restricted Use Permits and Additional Use Permits. The lots located between Stirling Highway and Cooper Street and the Broadway Fair Shopping Centre between Broadway and Fairway north of Caporn Street are included within a shop zone.

Properties on the west side of Fairway, between Myers Street and Princess Road adjacent to Broadway Fair Shopping Centre are zoned Residential R50 as is the area bounded by Princess Road, Fairway and The Avenue. The remaining properties south of Princess Road and east of Broadway are zoned Residential R80.

Should the University wish to pursue development off campus in this area rezoning would have to be achieved as was done for the Edward Street project between Fairway and Broadway, where offices and laboratories for the Geomechanical Division of CSIRO and others were constructed in conjunction with a two level car park providing 180 bays with expansion potential for a further 240 bays. The lots were rezoned Restricted Use Permit.

It would seem inevitable that the University will expand its

SERVICES

The 1927 and 1955 Plans set a campus planning structure which because of their ordered, rectangular grid of groups of buildings supported a simple underground service system. The planning structure has been maintained in subsequent plans and although not formalised the principle of the service system has been followed. This may not be apparent as some primary and many secondary services have found their own diagonal and economical routes between points.

Secondary services supporting elements of single buildings usually follow the perimeter of the buildings and others such as reticulation, of course, have to reach the lawns or gardens they service.

The Service Corridor System illustrated herein follows the campus structure plan and subdivides the campus into development lots. The corridors vary in width depending on the number and type of services accommodated but at this stage in the development of the campus have not been dimensioned because of the great number of services which are outside the corridors and which, when lots are developed, may have to be relocated within the System.

Some corridors have already been breached by buildings and this may happen in particular locations provided the long term consequences are known at the time. Generally the corridors should be free of building development to allow free access to the services at all times. However they can be penetrated by roads, car parks, pedestrian paths and landscaping.

Ideally each service should have its own place in terms of a standard cross-section of each corridor in order to group compatible services, separate non compatible services and to ease discovery and the recording of established services.

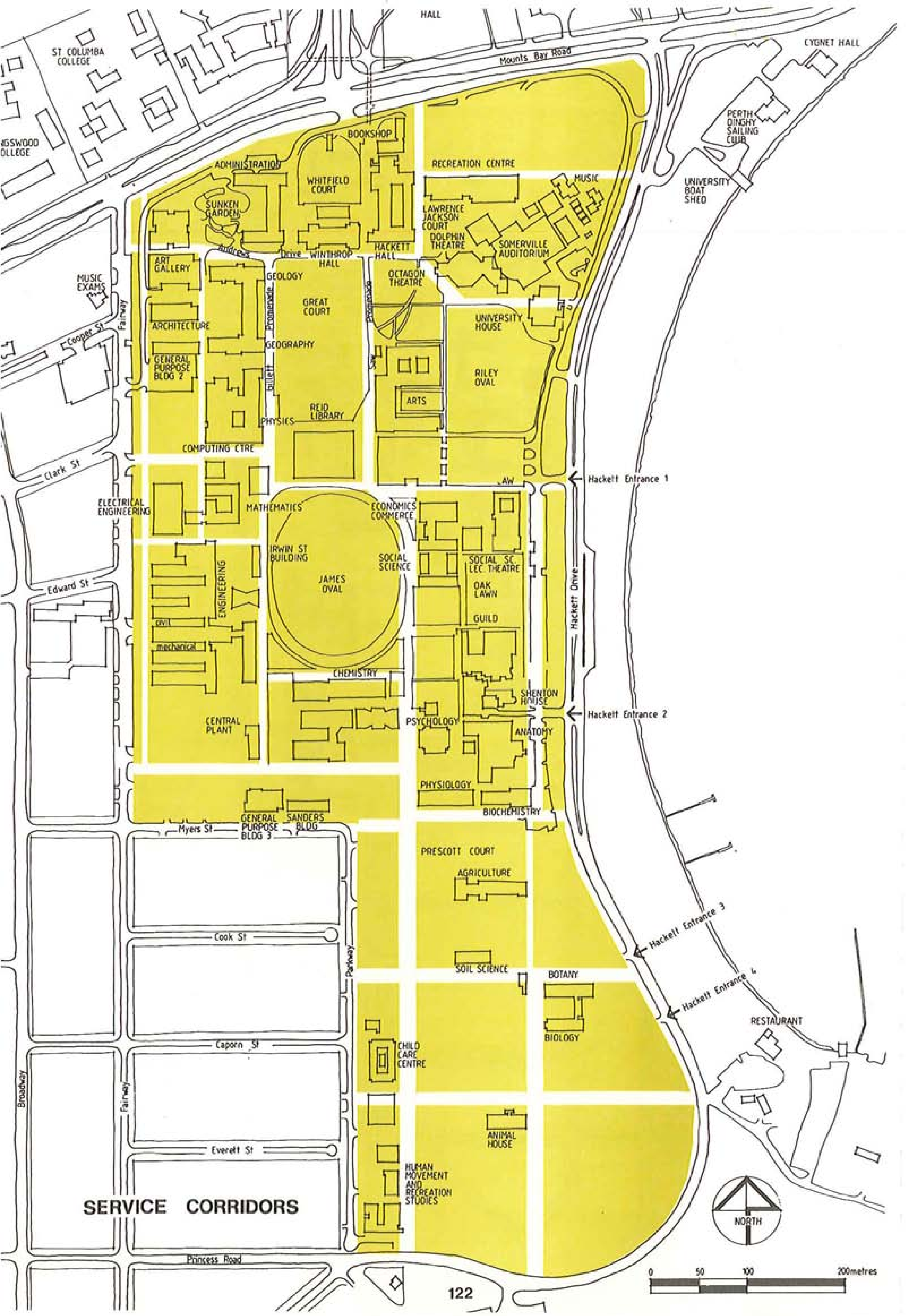
The Corridor System eases the looping of services such as electricity, chilled water, domestic and fire water and gas so that when a service is broken at one point on the campus facilities can be served from another part of the loop.

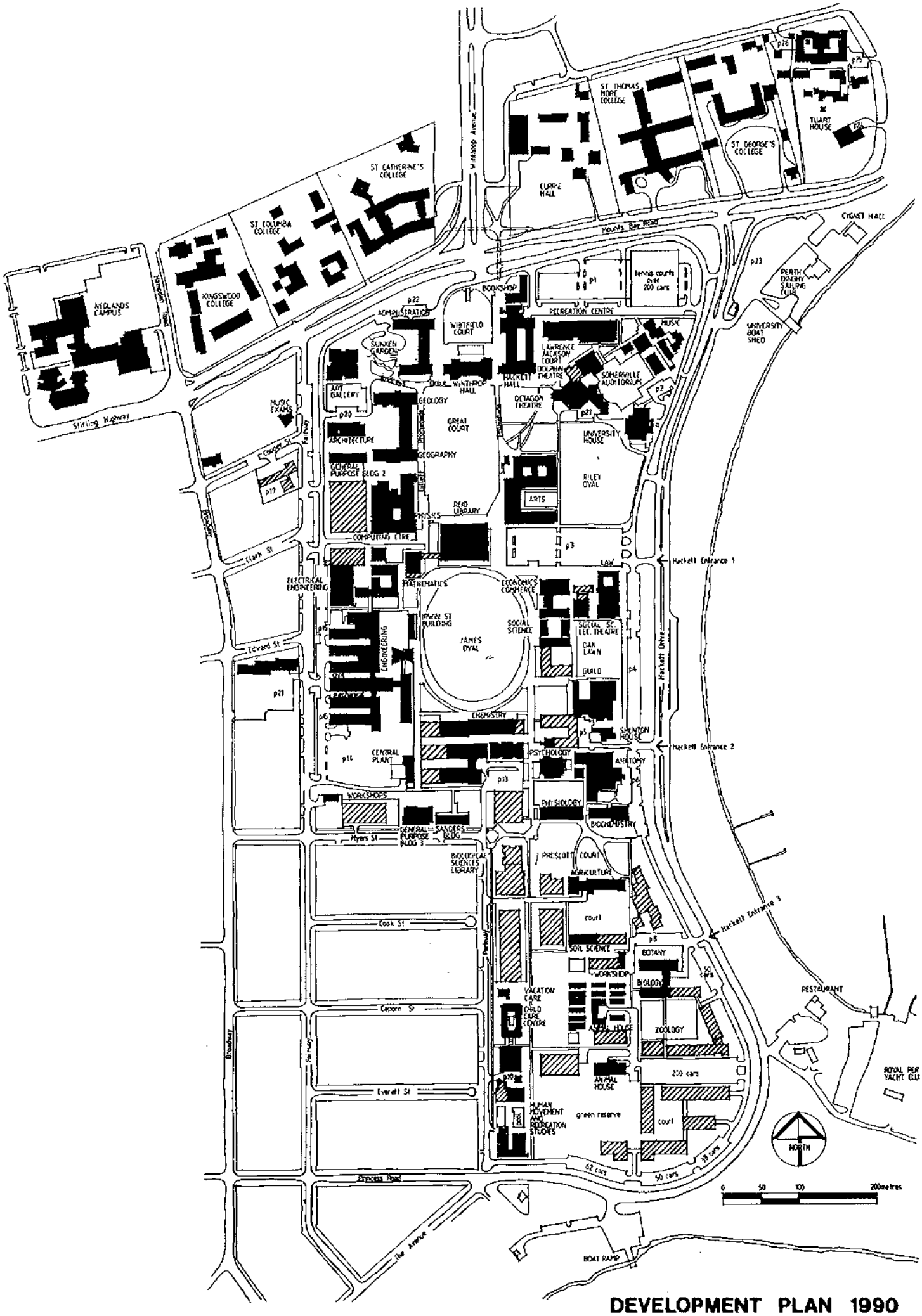
The need for additional electrical substations and even central chilled water plants will be decided as development progresses and requirements are intensified.

RECOMMENDATIONS

- Adopt the Service Corridor System illustrated. Some corridors may not be used in the short term but if kept open will provide long term flexibility.

- As opportunities permit re-lay existing services outside the system to be contained in the corridors.


HALL
ST COLUMBA COLLEGE
CYGNET HALL
Mounts Bay Road
PERTH DINGHY SAILING CLUB
UNIVERSITY BOAT SHED
BOOKSHOP
ADMINISTRATION
WHITFIELD COURT
RECREATION CENTRE
MUSIC
SUNKEN GARDEN
LAWRENCE JACKSON COURT
DOLPHIN THEATRE
SOMERVILLE AUDITORIUM
WINTHROP HALL
HACKETT HALL
ART GALLERY
GEOLOGY
OCTAGON THEATRE
MUSIC EXAMS
GREAT COURT
ARCHITECTURE
UNIVERSITY HOUSE
Cooper St
Fairway
GEOGRAPHY
GENERAL PURPOSE BLDG 2
RILEY OVAL
ARTS
REID LIBRARY
PHYSICS
COMPUTING CTRE
Clark St
Hackett Entrance 1
LAW
ELECTRICAL ENGINEERING
MATHEMATICS
ECONOMICS COMMERCE
IRWIN ST BUILDING
SOCIAL SCIENCE
SOCIAL SC. LEC. THEATRE
JAMES OVAL
OAK LAWN
Edward St
ENGINEERING
civil
mechanical
GUILD
Hackett Drive
CHEMISTRY
SHENTON HOUSE
Hackett Entrance 2
CENTRAL PLANT
PSYCHOLOGY
ANATOMY
PHYSIOLOGY
BIOCHEMISTRY
Myers St
GENERAL PURPOSE BLDG 3
SANDERS BLDG
PRESCOTT COURT
AGRICULTURE
Hackett Entrance 3
Cook St
Parkway
SOIL SCIENCE
BOTANY
Hackett Entrance 4
RESTAURANT
Caporn St
CHILD CARE CENTRE
BIOLOGY
Broadway
ANIMAL HOUSE
Everett St
HUMAN MOVEMENT AND RECREATION STUDIES
SERVICE CORRIDORS
NORTH
Princess Road
0 50 100 200metres



DEVELOPMENT PLAN 1990

southern campus of some planning constraints such as areas for animal grazing, experimental field plots and glasshouses and permit the southern campus to achieve the landscaped qualities of the northern campus.

The move of Zoology to the southern campus and relocation of users in Tuart House would free this site for other University related activities such as student housing or a conference centre.

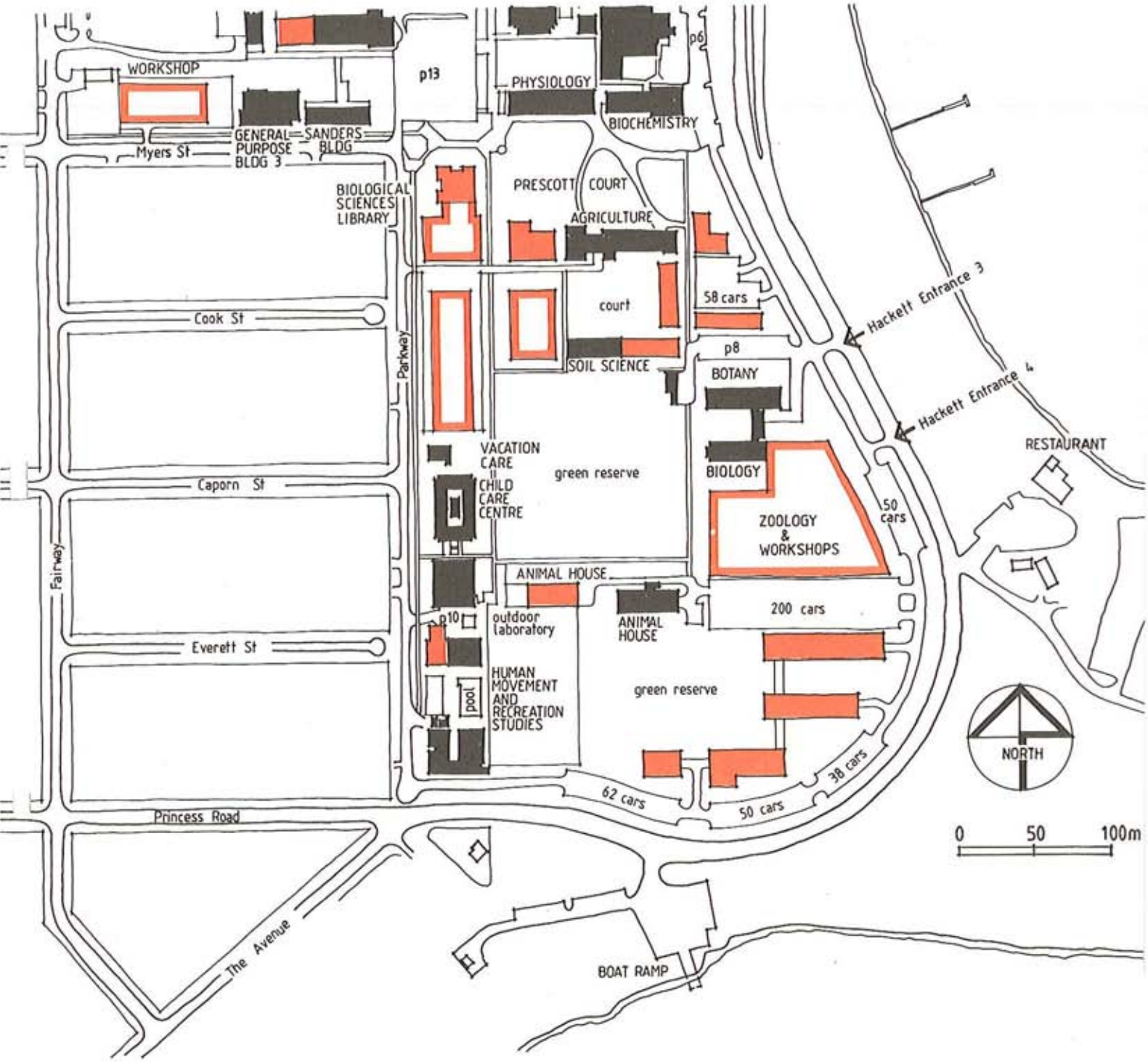
There is a need for car parking facilities off campus such as in the Fairway Broadway corridor and possibly at the Nedlands campus, Medical Centre and Shenton Park sites.

RECOMMENDATIONS

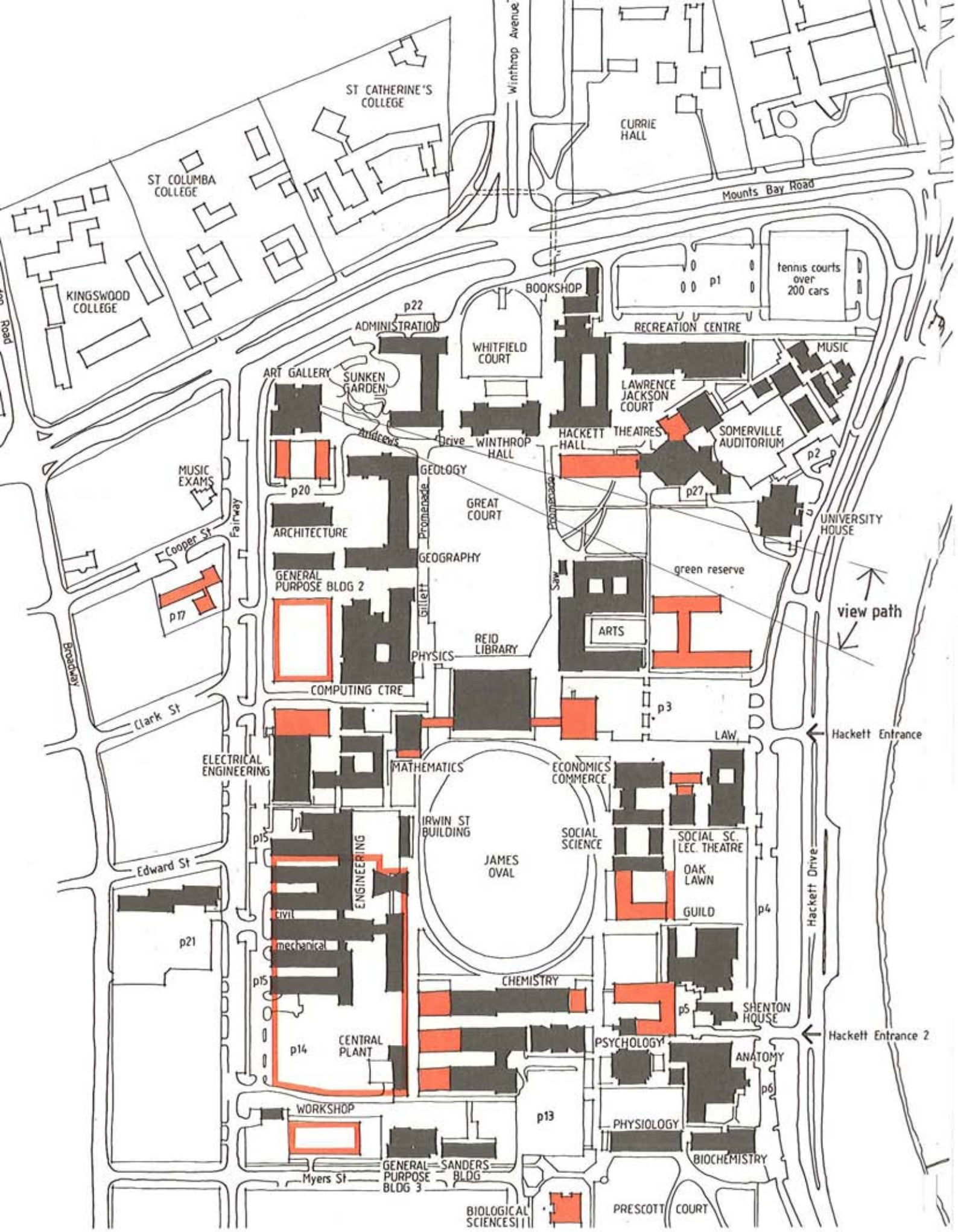
- Avoid planning by simply infilling green spaces. The finite location of new buildings and building extensions and the redevelopment of groups of buildings should be undertaken in a manner which strengthens the civic design qualities of the campus.

- Continue the use of the Shenton Park campus to supplement and where possible relocate facilities on the Crawley campus to free that campus for expansion.

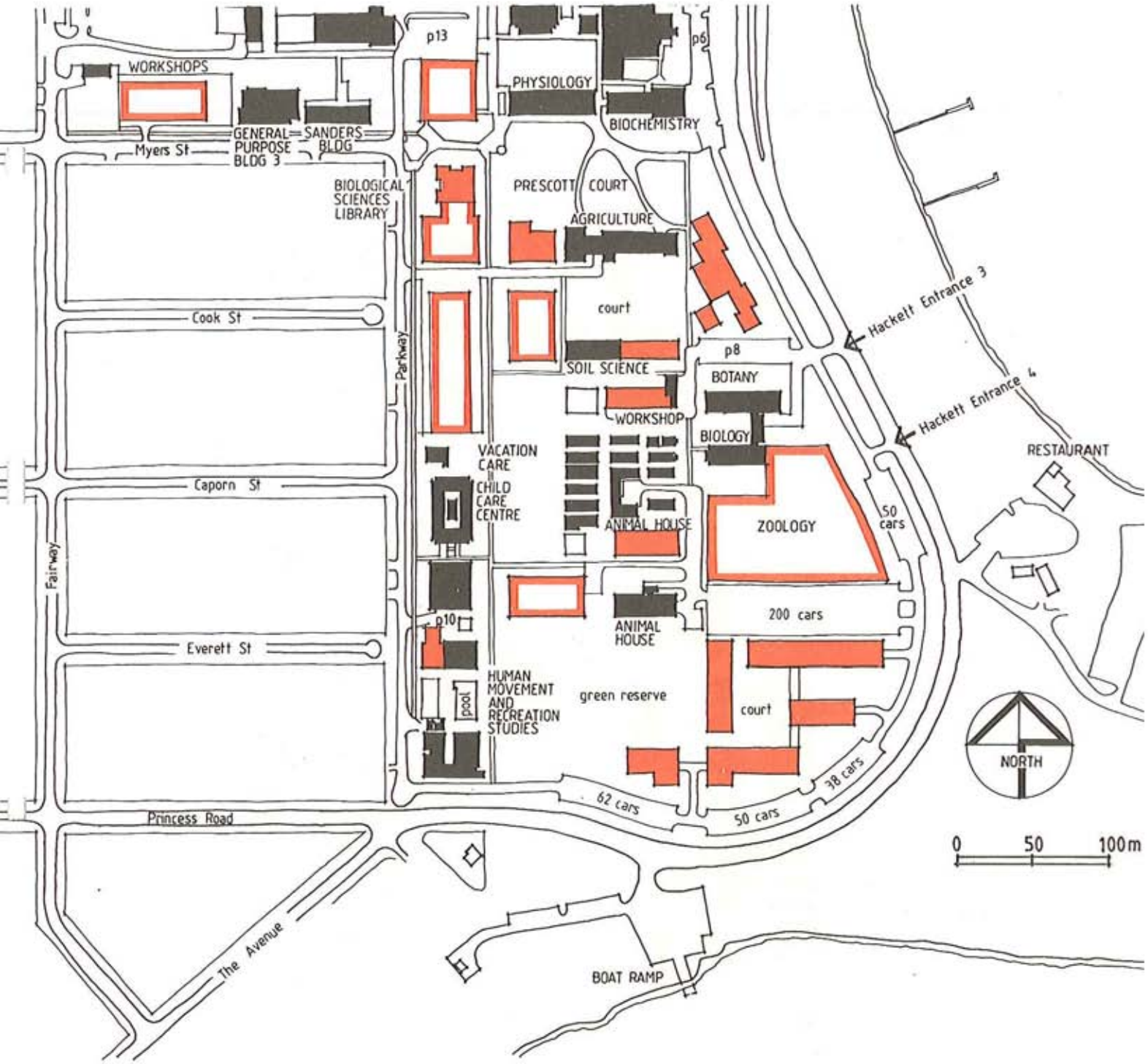
- Pursue the expansion of the campus beyond Fairway to Broadway at least between Stirling Highway and Myers Street and take no action that would jeopardise the expansion of the campus into the area between Parkway and Fairway between Myers Street and Princess Road.



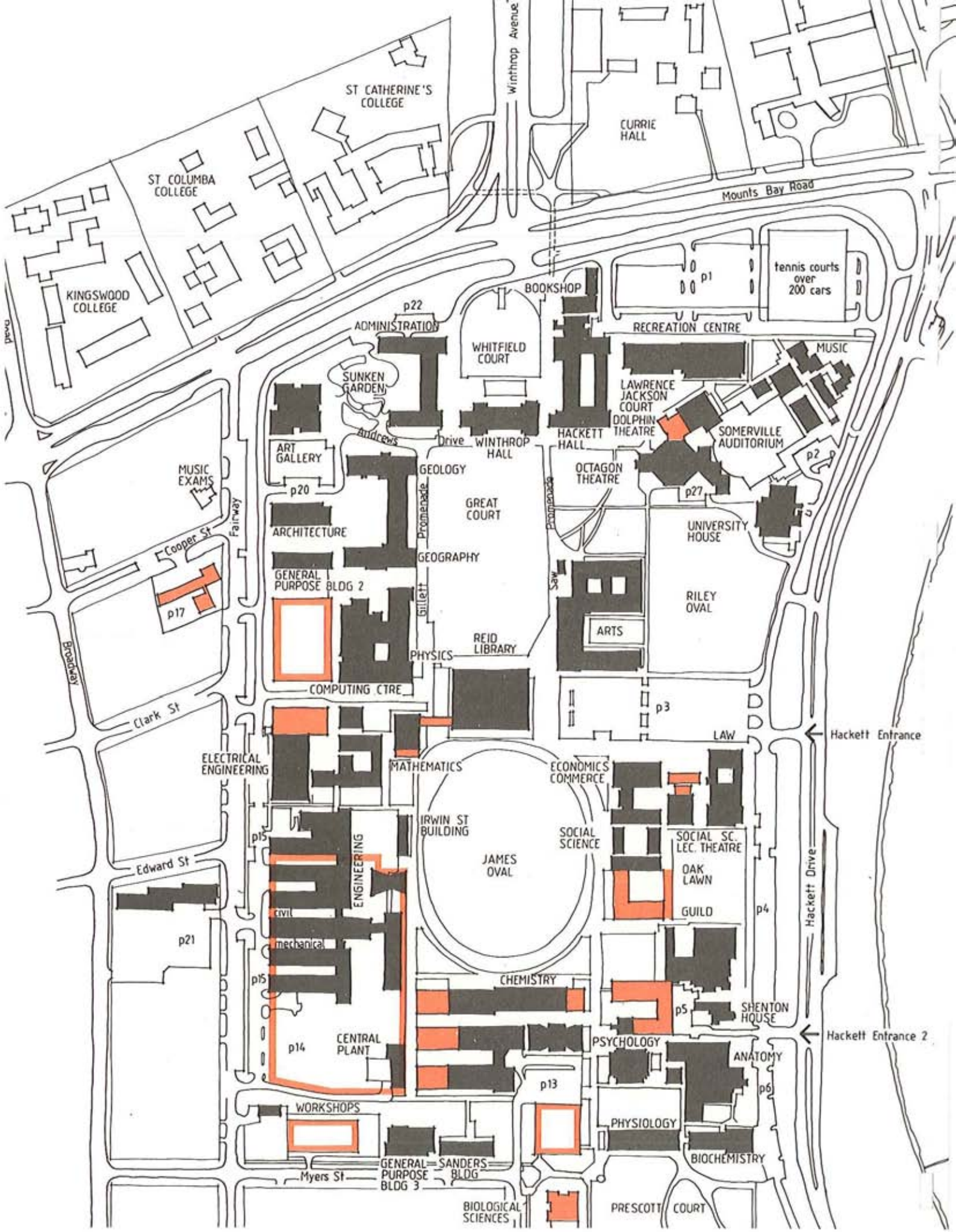
SOUTHERN CAMPUS – OPTION 2
BUILDING DEVELOPMENT



NORTHERN CAMPUS – OPTION 2
BUILDING DEVELOPMENT



SOUTHERN CAMPUS – OPTION 1
BUILDING DEVELOPMENT



NORTHERN CAMPUS – OPTION 1
BUILDING DEVELOPMENT

EXPANSION

It is not possible to confidently locate every new building and building extension which will be required in the foreseeable future. This can only be done at the time the needs of the particular additional accommodation and competing claims for space are known. For instance the new Architecture building was eventually constructed on a site west of Geology/Geography despite being shown on the 1966 Plan on the northern edge of Riley Oval and on the 1975 Plan at the south-eastern corner of Prescott Court.

It must be assumed that all buildings and groups of buildings will expand and provisions should be made for such expansion. At some time however expansion provisions will be fully utilised and options for relocating whole departments to provide expansion space for others will have to be considered. For instance should the Department of Anthropology and the Anthropology Museum be relocated, others in the Social Sciences building could expand into the vacated spaces.

Whilst some areas of the campus provide opportunities for immediate major new development and other areas, such as the sites of Engineering and Chemistry, will be redeveloped in the future the campus has reached a stage when new buildings and building extensions can easily destroy the integrity of the campus. There is a danger now of planning by infilling and extreme and possibly unpopular expansion solutions may have to be sought. The most economical and convenient solution may not be in the best long term interests of both the users and the campus as a whole.

At this stage in the development of the campus it is inevitable that new development will cause the loss of some established landscaping.

If the Service Corridor system is to work the corridors should be kept free of building development but can accommodate pedestrian paths, roads, car parks and landscaping provided underground services are always accessible. The corridors divide the campus into development lots and the Permanent Green Space system further restricts development in those lots. The sparsity of alternatives for the provision of car parking facilities contributes to the predictability of the development plan.

Expansion of facilities off campus is inevitable. Firstly to the Nedlands campus which can accommodate at least two major and several minor departments, also into the Fairway Broadway corridor where the Edward Street development has established a precedent and in the very long term into the Parkway, Fairway super block.

Increased use of the Shenton Park campus could free the

activities. The swimming pool facilities are used by the campus community and also the general public.

Indoor sporting activities such as squash, badminton, basketball, gymnasium, etc., are accommodated in the Guild Recreation Centre at the extreme northern edge of the campus.

The main University sporting activities are accommodated at UWA Sports Park at Shenton Park. It is unlikely that major additional facilities would be required on the Crawley campus.

RECOMMENDATIONS

- Locate a Guild catering facility in or adjacent to the Biological Sciences Library extension at the south-west corner of Prescott Court. Provide for an additional facility in the southern campus when this area is totally developed.

- Provide a second staff facility in the southern campus or a relocated major staff facility closer to the centre of the whole campus.

- Locate additional commercial outlets at the Guild building in the centre of the campus adjacent to the service access at the rear of Shenton House.

- Maintain James Oval and Riley Oval for organised sporting activities. Should future demands for building expansion be so great as to require the use of Riley Oval, building development should only be considered if the green space and activities on Riley Oval can be relocated in the southern campus.

- Create a space in the southern campus with the identity of James Oval and the size of Riley Oval for informal if not organised sporting activities.

COMMERCIAL AND SPORTING FACILITIES

Catering facilities exist in Hackett Hall on the northern edge of the campus, a coffee shop in the Reid Library at the centre of the northern campus, the main Guild refectory and function facility in the centre of the whole campus and a staff facility, University House, on the eastern flank of the northern campus. Additional facilities have been requested by the Guild in a location around the south-west corner of Prescott Court and, depending on development in the southern campus, a second facility south of the Agriculture building.

Many staff use the Guild catering facilities but consideration should be given to either a second staff facility in the southern campus or a relocated major staff facility closer to the centre of the whole campus.

The campus can support a limited range of commercial outlets. The existing facilities are concentrated at Hackett Hall and the Guild building.

The Broadway Fair Shopping Centre, only 300 metres from the boundary of the southern campus, provides a wide range of facilities including clothing, food, liquor, chemist, newsagents, lunch bars, restaurants, hairdressers, shoe repair, dry cleaner, bank, medical practice and many others.

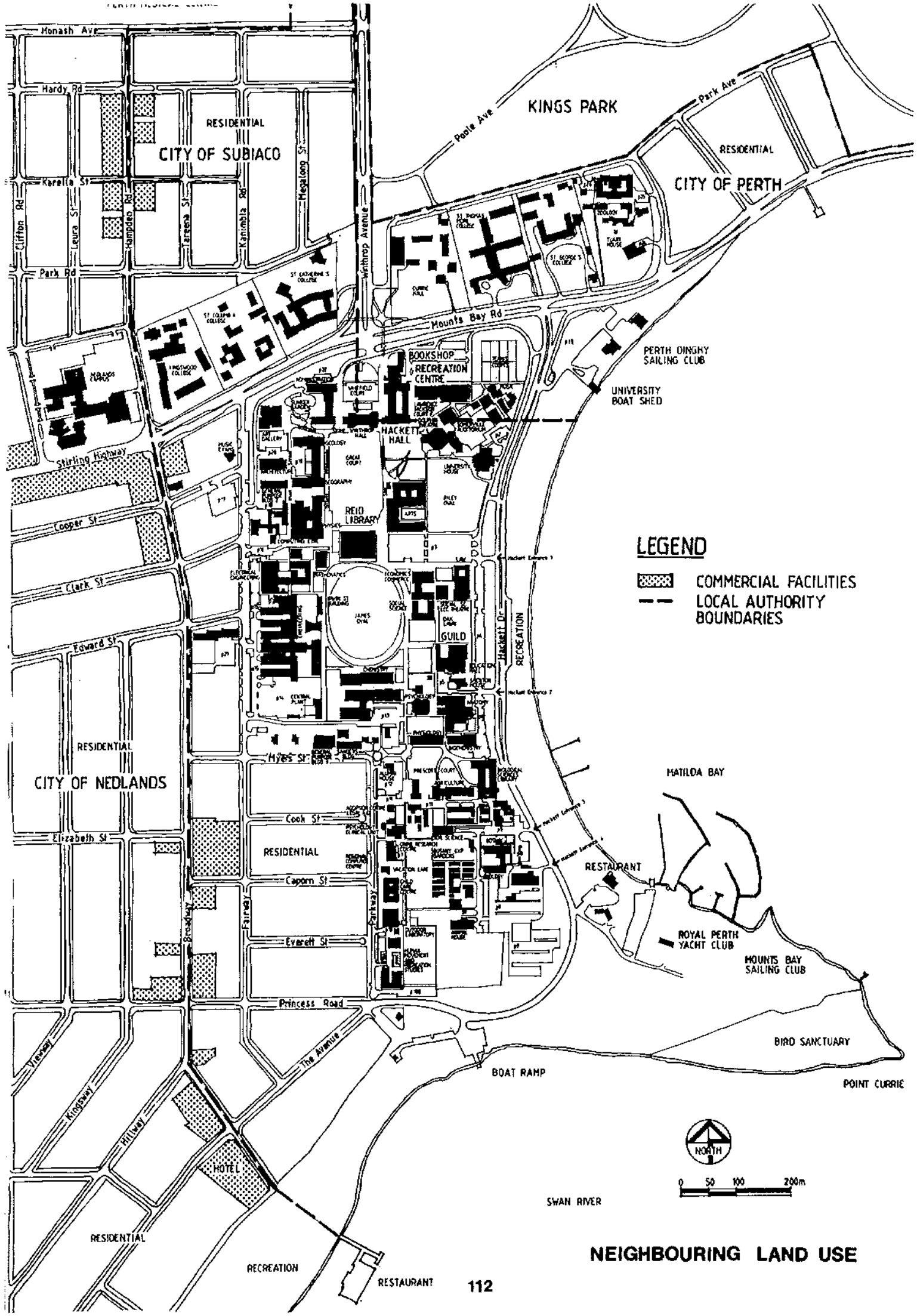
These facilities are supported by others in Broadway and Hampden Road, duplicating those in Broadway Fair, but providing additional facilities such as a hotel, a hospital, dentists and service stations.

All these facilities, many only 100 metres from the campus boundary, would compete with duplicate facilities provided on campus.

Sporting facilities on the main campus include James Oval which is now primarily used as a cricket ground but can support other activities such as soccer, hockey, kite flying, etc. Riley Oval primarily a rugby pitch is used for informal sporting activities and on special occasions a car park. Both Ovals are used for inter-faculty sporting competitions.

Eight tennis hard courts are accommodated in the north eastern corner of the campus and used by the Tennis Club for winter competitions. It would seem unnecessary to relocate or duplicate the existing tennis courts unless it is decided to locate some other facility on this site, in which case, consideration should be given to protecting views of Winthrop Hall from Mounts Bay Road.

The Human Movement and Recreation Studies Outdoor Laboratory at the extreme southern edge of the campus is used as a teaching and research facility for skill practice in all sports and is capable of supporting informal sporting



NEIGHBOURING LAND USE

The heavy duty activities accommodated in the old Plumbers Workshop should not be relocated in the Geology/Geography building. Such location would bring additional vehicles beyond Irwin Street into the inner campus.

When the Property Services Maintenance Workshop and Plumbers Workshop are demolished their activities should be relocated above the proposed Myers Street car park.

The Geology component will provide built in expansion for the Maintenance Workshop should the Geology and Geography Workshop be combined and eventually relocated in the Media Services/Child Study Centre site redevelopment where it could be well serviced from Fairway adjacent to the Geology/Geography buildings.

Agriculture, Botany and Zoology Combined Workshop

The Working Party came to the view that the Agriculture, Botany and Zoology workshops would benefit from an amalgamation similar to that of the Preclinical Services Workshop.

This view was based on the substandard qualities of the existing Zoology and Agriculture workshops, the Agriculture electronics workshop being separated from the main workshop and in a building which is due to be demolished, and the Zoology and Botany workshops being each staffed by only one technician and therefore denied the benefits from a larger pool of expertise.

The Working Party recommended that a combined facility be within the range of 300 to 400 square metres in area.

RECOMMENDATIONS

- Retain the present decentralised system of departmental workshops and create regional workshops in new development where location, proximity of departments, compatibility of operation and scale of activities support such facilities.

- Relocate the Property Services Maintenance Workshop, Plumbers Workshop (now used by Geology) and Grounds Machine Building (Car Park 13) to Myers Street above a car parking facility.

- Locate a combined Geology/Geography Workshop on the site of Media Services and the Child Study Centre when this site can be redeveloped.

- The options for locating the Agriculture, Botany and Zoology Workshop include the new Zoology building site, adjacent to the Taxanomic Garden electrical substation and a site north of Car Park 8.

workshop facilities was investigated and an example was found in the Preclinical Services Workshop which services the three preclinical departments - Anatomy and Human Biology, Biochemistry and Physiology. The success of this regional workshop relies on the three departments being in close proximity to each other and the workshop and the needs of the departments being similar. Physiology has established an electronics workshop independent of the main workshop. The regional workshop is not so large that workshop staff lose touch with the particular requirements of academic staff and the facility is administered by a users committee and not dominated by one department. The Working Party found that the scope for introducing this type of regional workshop facility was limited because of the geographic separation of most departments and the differences in needs and scale of operation.

The Working Party recommended:

- that the present decentralised system of departmental workshops be retained as the general basis for the continued operation of workshops on the University campus;

- that regional workshops be considered in any future building developments where proximity of departments, compatibility of workshop operation and scale of activities indicate that such a facility would be a viable operation and,

- that the concept of centralised workshop facility not be supported as an option for the long term development of workshop facilities on the University campus.

Relocation of Geology Workshop

At present the Department of Geology's workshop facilities are spread between the old Plumbers Workshop - interim heavy duty workshop, the General Purpose building No. 2 - electronics workshop and the Geology building - woodwork and instrument workshop. In addition the Department has a secure and partially covered vehicle compound at Shenton Park and a temporary field equipment store in the southern campus.

Several options were investigated for the relocation of the facility including the ground floor of the Geology building, assuming Geology remains in the building, a combined facility with other compatible departments such as Geography and Civil Engineering, as a first stage of a General Workshop facility in the vicinity of the Central Chilled Water Plant on Myers Street and the total relocation to existing workshop facilities on the Nedlands campus.

At the time of the Working Party's investigations Geology had not been identified as a possible tenant for the Nedlands campus.

WORKSHOP ACCOMMODATION

In 1986 a Working Party of the Accommodation Committee was established to advise on the long term development of workshop facilities on the University campus and particularly to investigate the proposed location of activities undertaken in the Geology workshop. Later the Working Party was requested to include an examination of the feasibility of replacing the existing Agriculture, Botany and Zoology workshops with a shared facility in close proximity to these departments. The examination was to determine the scale of the workshop facility needed to service the requirements of the three departments.

The Working Party investigated more than 70 separate facilities with a combined area in excess of 5,100 square metres and involving approximately 140 staff located on the Crawley and Shenton Park campuses under the administrative control of 20 different departments and varying in size from the Department of Geography workshop with an area of 55 square metres and 1 technical staff to the Department of Physics 8 separate workshops with a combined area of 815 square metres and 20 technical staff.

The Working Party found that the present decentralised system of workshops is operating satisfactorily and that the close working relationship that exists between academic and technical staff under the present arrangement is an important factor in the ability of departmental workshops to manufacture and maintain equipment used for teaching and research in a timely and efficient fashion. The Working Party doubted that these characteristics could be achieved in a centralised workshop or in large regional workshops but acknowledged that a problem with some one technician workshops is that the technician is not able to be an expert in all fields and suitable replacement staff are difficult to arrange when that one technician is sick or on leave.

The advantages in combining departmental workshops into one large centralised facility were explored and found to be in the potential savings achieved by avoiding duplication of equipment and staff, the economies of scale of a larger operation and a saving in space. The disadvantages were found to be the increased time spent by academic staff in preparing instructions for the workshop staff for the task to be performed and a likely slow down in the response time for urgent new projects and repairs to existing equipment. Also the close working relationship between academic and workshop staff would be lost with a possible reduction in the quality of service by the workshop. The initiative and knowledge gained by technical staff working closely over a period of time with a particular department would be difficult to replace in a centralised facility.

A compromise between the centralised and decentralised

Service Corridor System and maintain provision for the ring road extension, the triangular site will require a special building to achieve its potential.

An alternative use for the site is to construct more modest buildings with car parking facilities.

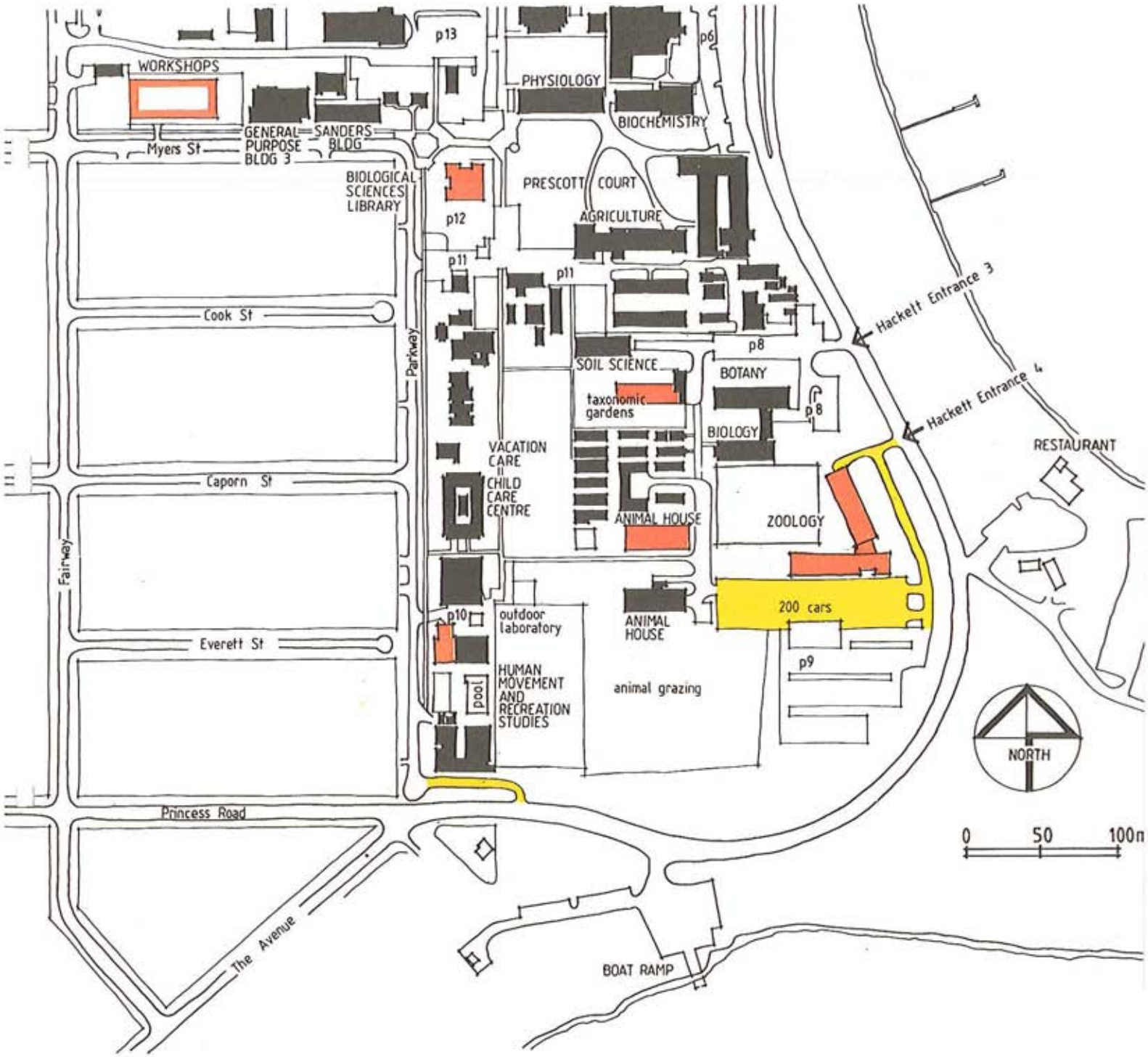
RECOMMENDATIONS

- Explore the potential of the site in the south-east corner of the campus for a major building development to form a southern gateway to the southern campus to complement the prominence of the Hackett Memorial buildings.

- Maintain River views from buildings and internal green spaces in the south-east corner of the campus.

- Give consideration to the relocation or the diminishing of the Taxonomic Garden, experimental plots, glasshouses, animal holding and grazing in order to locate a green reserve of the scale of Riley Oval in the southern campus.

- Alternatively, expand the Human Movement and Recreation Studies Outdoor Laboratory and incorporate into a major green reserve.



SOUTHERN CAMPUS –
STAGE 1 DEVELOPMENT