# TRANSPORTATION ASPECTS OF SOUTHERN AFRICAN UNIVERSITIES

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A thesis presented in partial fulfilment of the requirements for the degree of

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Thesis student K.C.WALL B.Sc(ENG).

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UNIVERSITY OF CAPE TOWN

DEPARTMENT OF URBAN AND REGIONAL PLANNING

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APPENDIX F, WHICH CONSISTS OF PLANS OF SELECTED CAMPUSES, IS BOUND AS A SEPARATE VOLUME.

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# L I S T  O F  T A B L E S

# A C K N O W L E D G E M E N T S

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(iii) the partners and particular staff of Ninham Shand and Partners, Cape Town; and

(iv) my Mother and Father

for help and encouragement.

# S U M M A R Y

This Thesis concerns a survey of transportation practices and administrative attitudes thereto at universities in Rhodesia and the Republic of South Africa. A six page questionnaire was posted to all thirteen major campuses – information requested included population figures in various student/staff and resident/commuter categories, parking demand and provision, modal split, public transport supply and use, and measures to cope with future increase in traffic. Responses were obtained from all thirteen; despite this satisfactory spirit of cooperation there remained great gaps in the data; the question on modal split, for instance, was hardly touched. Blame for this can be laid on the shortage of trained staff – the measurements necessary to plan scientifically for the future have never been made. The sole exception to this is the University of Cape Town, where the Planning Unit and consultants have between them recently made a comprehensive study of movement to, from and on the principal campus.

The study is primarily a descriptive one, but it includes much discussion of cause and effect relationships. Information was sought, where possible, in a quantitative form to permit the analysis of these relationships by simple statistical and graphical techniques. In spite of inaccuracy and incompleteness of much of the data, some distinct patterns were seen to emerge. For instance, the greater the proportion of resident students at any university, the smaller the car usage rate among students and thus the relative demand for parking space at peak time. Provision of space is, on the other hand, proportionately lowest where students are greatest

in number, thus the biggest campuses have, relatively speaking, the most acute shortages of parking space; similarly the campuses with the greatest residential component (often those in the smaller towns) are those on which tighter control of car ownership results in smaller relative space shortages. Some universities provide less than half the space they apparently need – the excess is forced to jam the surrounding streets. (These findings do not hold for the two temporary campuses or the Non-White universities and university colleges).

Parking on the campus is normally controlled by a simple disc system, with the most convenient spaces reserved for staff members. Small administrative fees are charged for these discs; however several universities are reported to be considering a more active pricing policy. The first large parking structure to be seen on a South African campus is now under construction.

Only two campuses described themselves as "adequately served" by public transport. Railways carry an insignificant proportion of commuting students and bus services take care of less than five percent.

The Author hopes that the findings will prove useful to university planning authorities and that these authorities will be encouraged to undertake transportation studies of their own campuses. A section of the Thesis is devoted to a brief description of the way to go about such a study. Areas where more intensive investigation may be warranted are also indicated; principally, these would need to include the effects of lecture timetable rationalization, the economics of campus parking garage and public transport operation, and more reliable knowledge of the rate at

which car ownership by students and staff is increasing.

Tables, graphs, extensive appendices, and plans of a number of campuses showing building and traffic layout, illustrate the text.

# K E Y N O T E S

1. ACCESS TO CAMPUS.

"The University Council ... looked forward with confidence to having at least the bulk of its new habitation (on the Groote Schuur Estate) ready for the centenary in October ... Meanwhile it engaged in long and disheartening negotiations with the City in the matter of direct roads of approach, a matter which yet awaits a satisfactory solution."

(Walker, writing on the University of Cape Town, 1929)(30)

2. PARKING ON CAMPUS.

"Parking is a bit like the common cold – no one knows an absolute cure but everyone has a different remedy that he swears by. The simple truth is that the cold will last just so long, no matter what you do, but you can relieve the symptoms.

"If parking need gets voracious enough I suppose it could become the tail that wags the dog and we could have drive-in lecture rooms."

(Martin, 1970)(15)

3. NEED FOR RESEARCH.

"Planning for the future must start with the present ... the planner must first have a thorough knowledge and clear understanding of his own particular problem ...

"The collection, therefore, of essential and pertinent information ... is an essential pre-requisite for planning."

(Morris, 1966)(17)

# I INTRODUCTION

## 1. CONTEXT

Unversity campuses and the cities they serve have many physical problems in common; it is without question that more efficient planning, being the allocation of existing facilities between competing present demands and the timely anticipation of future calls on resources, can considerably ease the difficulties of accommodation which they both presently face. Higher educational and research requirements, their greater availability because of a rising standard of living and wider use of schemes for the financial assistance of would-be students, and an increasing population, have throughout the world spurred large-scale expansion of enrolment at existing universities and the establishment of new universities.

White persons in the Republic of South Africa are privileged to have a proportion of their population attending full-time university second only to that of the United States (Table 1). In recent years, university enrolment has increased by something like 8% per annum, and the number of chartered universities for Whites from 9 to 11 (Table 2). Several universities have recognised the importance of planning to their own wellbeing by appointing specialists in this field to study and provide solutions to the problems of growth.

The physical effects needed to accommodate this burgeoning enrolment do not only comprise new lecture halls, offices, recreation facilities and residences; increasing concern is rightly being focussed on the means of travel to and from the campus by

Table 1

Relative proportions of university-going populations. 1966

| | Population | Full-time intramural university students | % |
|---|---|---|---|
| | million | thousand | |
| United States, all races | 198.0 | 4 583 | 2.31 |
| South Africa, Whites | 3.56 | 41.4 | 1.16 |
| Canada, all races | 20.01 | 219 | 1.08 |

(Data Sources 7, 8 & 10)

students, staff, visitors and deliveries. A large proportion of personnel and student time is spent in traffic jams, bus queues and searches for parking; constant frustration of this nature is a wastage of time and effort (and thus of money), while overseas authorities have declared that it is a contributory factor to student discontent and to difficulty in recruiting staff(3,4). Some articles in the local "student press" have reflected this concern(19,27).

The bulk of recent attention has been devoted to problems of accommodating the motor car – as in the United States, "... student reliance on the automobile has swept far beyond the predictions of pre-war campus planners ... (The most important reasons for this) are probably those relating to changing social and economic conditions. The automobile is no longer considered a luxury by many students, but a necessary means of transportation ... Staff sometimes look upon availability of convenient parking space as a fringe benefit in considering a job offer. Students object to parking fees but persist in driving to class .... Planners are disturbed over conversion of green lawns to parking lots as well as by the general clutter caused on campus roadways"(23).

Some of the universities generate considerable traffic which can quite seriously burden the streets and parking facilities in their immediate neighbourhood; while urban authorities in this country have in the past absolved the universities from responsibility in this regard, there is evidence(42) that this generous attitude has had its day.

Table 2

Universities and populations. 1970

| Name | Campuses | Full-time intramural students | Part-time or extra-mural students | Staff | Average annual increase in enrollment 1965-70 |
|---|---|---|---|---|---|
| | | | | | % |
| University of Cape Town | 1 large, 3 small | 5 590 | 1 935 | 1 860 | 5 |
| Universiteit van Stellenbosch | 1 only | 6 600 | 150 | 1 150 | 5 |
| University of Port Elizabeth | 1 only[4] | 700 | 400 | 310 | 16 |
| Rhodes University | 1 only | 1 725 | 190 | 700 | 4 |
| Die Universiteit van die Oranje-Vrystaat | 1 only | 3 000 | 1 225 | 760 | 8 |
| University of Natal | 1 large (Durban), 1 smaller (Pieter-maritzburg) | 4 605 | 1 655 | 1 875 | Dbn 11<br>Pmb 5 |
| Die Universiteit van Pretoria | 1 large, 4 small | 9 800 | 2 150 | 1 500 | 3 |
| Potchefstroomse Universiteit vir Christelike Hoër Onderwys | 1 only | 2 730 | 1 480 | 730 | 9 |
| Randse Afrikaanse Universiteit | 1 only[5] | 900 | 345 | 400 | 28 |
| University of the Witwatersrand | 1 large, | 6 800 | 2 375 | 1 885 | 6 |

contd...

Table 2 (contd.)

Universities and populations. 1970

| Name | Campuses | Full-time intramural students | Part-time or extra-mural students | Staff | Average annual increase in enrollment 1965-70 |
|---|---|---|---|---|---|
| University of the Western Cape[1] | 1 only | 795 | 140 | 190 | 18 |
| University of Rhodesia[2] | 1 only | 950 | 200 | 360 | 5 |
| University of South Africa[3] | 1 only[6] | Nil | 21 880 | 900 | 9 |

(Data Sources 2, 34 through 36, 39 through 50, & 54)

1. Coloured students
2. 46% Non-White students. In Salisbury, Rhodesia.
3. Correspondence institution. Multi-racial students.
4. Temporary campus established 1965; permanent campus in course of construction.
5. Temporary campus established 1968; permanent campus in course of construction.
6. Scattered premises in Pretoria; new consolidated campus in course of construction.

To sum up, the accessibility of universities is becoming a more important factor to their continued viability. With this in mind, it is clear that the establishment of new teaching facilities at existing universities (or the location of new universities) must be critically examined in the light of anticipated problems of transportation.

## 2. RESEARCH BY OTHERS.

In Southern African experience, "... the lack of research or published data concerning traffic and parking facilities for the campus" mentioned by Guyton and Reed(11) as a problem in the United States, is of major significance. A transportation study recently undertaken by consultants Ninham Shand and Partners on behalf of the University of Cape Town(30) is believed to be the first in any detail on the sub-continent. The two most recently established universities, Port Elizabeth and Rand Afrikaans, which are presently housed in temporary centre-city premises, have incorporated traffic consultants' recommendations in the planning of their new suburban campuses – here, however, American experience has been used as the source of data for prediction of traffic flows and parking space provision (vide van Niekerk, Kleyn and Edwards(56) and Bruinette Kruger Stoffberg and Hugo(16)). The same traffic consultants employed by the Rand Afrikaans University were retained by Pretoria University to prepare a case for permanent pedestrian access across a street dividing the campus; traffic surveys made in the course of that investigation were a useful additional

source of information to the present study(5). The University of Natal feels(40) that its Durban campus was adequately covered by a city-wide traffic study done by Holford and Kantorowich in 1968. It is however encouraging to learn(42,47) that both Stellenbosch and Witwatersrand Universities are considering instituting traffic studies of their own.

Thus it is to overseas publications, despite their limitations, that the intending planner is compelled to turn. Of greatest interest are the findings of four American studies which sought, like the present study, to investigate some of the current trends in transportation on a nation's campuses.

In 1969, the Highway Research Board published a comparison(14) by Louis Keefer and David Witheford of travel studies already undertaken representing, among other institutions, 38 universities and colleges. Emphasis was laid on trip generation characteristics, mode distribution and parking – "average" figures were obtained for factors of this nature against campus population size and percent resident students.

Pendakur(20) discussed in 1968 the results of a questionnaire returned two years previously by 51 United States and Canadian universities. He demonstrated the relationships existing between campus population, parking fees, parking availability and other facilities, and recommended parking standards and fees proportional to population for auto- and transit-oriented campuses.

"Parking programs for universities"(23) is a more dated (1961) questionnaire survey of 38 United States unversities' parking practices, incorporating a discussion of kerbside parking

and the selection of sites for and financing of offstreet parking.

In 1959 Wilbur Smith(24), following a study of ten major campuses and also aided by material abstracted from earlier surveys, recommended planning standards for university parking, comparing them with city zoning requirements where applicable.

The only similar British investigation known to the Author is contained in a Cambridge volume(6) — incorporating rather randomly related data on modal split and peaking factors obtained from four campus studies, it is nevertheless very interesting in containing the results of a prediction, projected into the indefinite future, of car ownership by category of university employment.

One other overseas reference which is sure to be of interest to an intending campus planner is a description published during the current year by Guyton and Reed(11) of the process preparatory to formulation of a long-range campus traffic circulation and parking plan. Incidentally, the present Author, in a yet-to-be-published discussion of the above, had cause to express his gratification in seeing how closely the methodology evolved quite independently for the Cape Town study with which he was associated(30), followed that chosen by the American writers referred to.

## 3. OBJECTIVES OF THIS RESEARCH.

The present Author argued that if there was so little published information on local campus conditions that traffic planners must draw on American data when planning new facilities, as related in the subsection above, a study which did no more than

collect and compare relevant facts would be welcomed by persons responsible for university planningand administration in this country. And so it proved – the encouragement received by the Author from his Correspondents at almost every university revealed that the authorities were fully aware of the importance of such information to themselves. While each university has a character of its own, many transportation problems are similar in nature, if not in degree, from campus to campus. There is evidence that the larger campuses have arrived at, or are about to arrive at, a crisis point at which they have to rethink their current policy of striving to provide free parking for nearly everyone who asks for it, or who becomes "entitled" to it by virtue of some sort of randomly established seniority qualification.

It was originally tentatively hoped that criteria could be developed which might directly relate, for example, parking spaces required on a given campus with, say, number of students and efficiency of transit operation, but considerations such as the unreliability of the data obtained and the small number of and great dissimilarity in nature between the campuses polled, as well as the simplistic level at which correlations were sought, rendered this impossible. The study therefore restricted itself to a survey and evaluation of all measures taken to accommodate the movement of persons to and from university campuses with special interest in such important factors as parking provision and degree of public transport use. Therefore, whatever its

shortcomings, it is hoped that the findings of this pioneering study into local conditions will prove useful to administrators concerned with the planning of new or expanded university facilities, or the rescheduling of campus activities. They should also prove useful in indicating areas where further study is warranted (see subsection IV D).

## II METHODOLOGY

### 1. DEFINITION OF STUDY UNITS.

From the start attention was almost exclusively focussed on those universities attended predominantly by persons of direct European descent (i.e. "Whites"). Very little social research can be done in South Africa in which the differences in income, educational standard etc. between the race groups is not an over-riding factor - the segregated Black ("Bantu") universities are all new, small and outside the urban areas, and so few students have cars that all three campuses were excluded from this study. The University of Durban-Westville, an institution for persons of Indian origin, had not yet at the time of the survey received its charter and was in any case in the process of moving house from temporary accommodation on Salisbury Island, Durban, to a new campus at Chiltern Hills, so it was similarly excluded. The University of South Africa, headquartered in Pretoria, is unique in being entirely a correspondence institution with no attending students - thus only data relevant to staff characteristics has been included in the present study. The only university with Non-White attending students in the Republic of South Africa included in the study (ignoring for these purposes the very small percentage of Non-Whites at Cape Town and Witwatersrand) is the University of the Western Cape, tuition at which is reserved for persons of mixed race ("Coloureds"). Outside the Republic, the present study includes only the University of Rhodesia, just under half of whose students are Non-White. The staff at all the above universities is multi-racial; however Non-Whites generally con-

stitute the lower orders of employment, and a distinction may be made between their transportation characteristics and those of their White colleagues. The universities polled are thus those named in Table 2 and shown in Figure 1.

It will be seen from this Table that some universities have more than one campus; with the single exception of the University of Natal, the sub-campuses are small in size, or contain no lecturing facilities, or are attended mostly by part-time or extramural students. For this reason and also because of a lack of traffic data concerning the secondary campuses, this present study is restricted to the major campus alone (again with the exception of the two Natal campuses). Part-time students, whose normal "after-hour" attendance causes few problems on these main campuses, have also been removed from further consideration, and the unit of measurement of student number is the "full-time intramural student" (see Glossary). Table 3 lists the population characteristics of each campus – a shorthand notation has been adopted to describe each campus in order to make perfectly clear to the Reader when a campus rather than the university as a whole or the town in which it is situated is being referred to – when a university has to be mentioned in the text its name is written in full. For example, "UCT" indicates the Groote Schuur Upper Campus of the University of Cape Town as defined in Appendix E, while "University of Cape Town" or some similar term indicates that the whole university is referred to. This refinement is necessary to avoid confusion. Background information on each university may be found in Appendix E.

## 2. QUESTIONNAIRE SURVEY.

In September 1970 a six-page questionnaire was sent to all the universities of Table 2. This questionnaire is reproduced in Appendix D with covering letters in the two official languages – to summarise, information requested included population figures in various student/staff and resident/commuter categories; parking demand, provision and regulation; modal split; public transport availability and use; and measures to cope with future increase in traffic. It was realised at the time that three fundamental differences lay between this survey and the four American surveys referred to in subsection I 2 above. Firstly, these studies (most notably Keefer and Witheford(14)) were primarily attempts to abstract information from universities at which detailed traffic studies had recently been made, and could therefore be filled in on a questionnaire with minimum effort and maximum confidence. Most of the universities polled employ trained planning staffs whose business it is to know the relevant figures. By contrast, only one South African university had done a traffic survey and only four boasted planning staff! Secondly, the American studies were content to analyse the replies they received from their questionnaires on first time of asking – there was no attempt to pursue those universities from whom no response had been obtained. In Pendakur's case(20), for example, a 62 per cent reply was cheerfully accepted, seeing as it represented no less than 51 universities.

In these circumstances it was perhaps surprising that the original twelve questionnaires had within three months elicited

Table 3

Campuses and populations. 1970

| Name of campus | Abbre-viation | Full-time intramural students | Staff[1] | | Total = campus population |
|---|---|---|---|---|---|
| | | | White | Non-White | |
| University of Cape Town, Groote Schuur Upper Campus | UCT | 4 740 | 590 | 510 | 5 840 |
| Universiteit van Stellenbosch | Stell | 6 600 | 700 | 450 | 7 750 |
| University of Port Elizabeth | UPE | 700 | 250 | 60 | 1 010 |
| Rhodes University | Rh(G) | 1 725 | 400 | 300 | 2 425 |
| Universiteit van die Oranje-Vrystaat | OVS | 3 000 | 400 | 360 | 3 760 |
| University of Natal | | | | | |
| (i) Durban campus | Dbn | 3 140 | 490 | 765 | 4 395 |
| (ii) Pietermaritz-burg campus | Pmb | 1 470 | 200 | 420 | 2 090 |
| Die Universiteit van Pretoria, Hill-crest campus | Pret | 8 520 | 1 165 | 335 | 10 020 |
| Potchefstroomse Universiteit vir Christelike Hoër Onderwys | PUCHO | 2 730 | 620 | 110 | 3 460 |
| Randse Afrikaanse Universiteit, Braam-fontein campus | RAU | 900 | 200 | 200 | 1 300 |
| University of the Witwatersrand, Jan Smuts Avenue | Wits | 5 800 | 1 050 | 600 | 7 450 |

contd...

Table 3 (contd.)

Campuses and populations. 1970

| Name of campus | Abbre-viation | Full-time intramural students | Staff[1] | | Total = campus population |
|---|---|---|---|---|---|
| | | | White | Non-White | |
| University of the Western Cape | W.Cape | 795 | 120 | 70 | 985 |
| University of Rhodesia | Rh(S) | 950 | 260 | 100 | 1 310 |

(Data Sources as Table 2)

1. Excludes staff working at residences off-campus.

as many as five responses, by which time the Author considered it necessary to send out reminders in the form of a covering letter (Appendix D) and a second copy of the questionnaire, as, with such a small universe size (only thirteen campuses) it was vitally necessary to obtain as large a sample size as could be managed without overstraining the good humour of the Correspondents at the various universities. By April 1971 partial replies had been received from all universities, but attempts to complete gaps in the data or to correct contradictions between one source of information and another continued to occupy the Author right to the time of writing; it is regretted, but in no way unexpected, that this Thesis has perforce gone to printing with quite a few queries to Correspondents still unanswered. Despite the reasonably satisfactory spirit of cooperation received therefore, there remain great holes in the data; the question on modal split, for instance, was hardly answered at all. Blame for this can, as mentioned above, be taken by the lack of suitable staff; the measurements so necessary to proper planning have simply never been made.

In any case, thirdly, the American researchers quoted had deliberately selected those universities which they considered most likely to give them replies, or from which they would receive the most homogeneous data; for example universities "... where 1960 enrollment exceeded 7 500 students"(23). The correlations produced under these favourable circumstances in much of the American work are not very convincing under close examination

only eleven members strong (traffic data for Pmb and PUCHO was very incomplete), with their ranging in relative size from one to ten thousand persons, two of them on temporary campuses (RAU and UPE), two of them with students of very different social character to the others (W.Cape and Rh.(S)) and between them possessing a wide selection of the possibilities open to student housing policy, availability of kerbside parking on public streets, etc.? In view of this pessimistic introduction, the Reader may be surprised to learn that some positive correlations were in fact obtained from the present investigation!

Identical questionnaires were sent out in December 1970 to about 50 universities in Canada, Australia and New Zealand (countries chosen for similarity of a variety of selected population characteristics, mostly to do with economic, educational and transportation matters, to those of White South Africans). About twenty replies yielding some very interesting information have been received to date — however this information will not be given here (other than to mention as an aside how far in advance the Canadians, for instance, are of us when it comes to traffic organization on the campus), but must await some maybe less formal distribution later.

## III ANALYSIS

### A. Correlations sought from the data.

At the heart of this study is the question of modal split - what method of transport does each person employ on his journey to the campus? Sir Geoffrey Crowther has stated(9) that "... one of the peculiarities of the motor car is that virtually everybody wants to have one" - admittedly this was said in a slightly different context, but it may justifiably be used as support for a contention that everyone who is physically capable of driving a motor car to the campus will do so, and will only be weaned away from its use for this journey if:-

(i) he cannot afford a motor car (evidence has already been quoted above to show that this is becoming less and less of a consideration);

(ii) he lives on the spot (in which case the university authorities are permanently faced with the problem of providing a space to store his vehicle);

(iii) he lives close enough to the campus to walk or cycle there under most conditions;

(iv) he finds it more convenient to take an arranged lift in another car, or to hitch; or

(v) he finds it more convenient to take public transport.

Some factors which may lead to a decision that it is "more convenient" to take an alternative mode to the private motor car are:-

(vi) congestion at entrances and exits, inducing intolerable delays to a car driver;

(vii) passive anti-car measures by university authorities such as the failure to provide sufficient convenient parking space;

(viii) active anti-car measures by the university authorities, such as fees for parking, or rationing of permission to bring cars on the campus; and

(ix) active pro-alternative mode measures, such as the provision of a cheap and handy campus bus service.

Although little direct information on modal split was available, the questionnaire was framed to gather knowledge about all of the factors listed above, and correlations were expected along these lines. No "trip generation" data as such was asked, nor was there information available, except in the case of UCT, on the important aspect of peak versus average loads.

Only simple statistical and graphical techniques were employed to discover apparent correlation or lack thereof between the variables considered. Many possible combinations of variables were tried and the more successful attempts plus only a selection of the most promising failures are reproduced in this volume (Figures 2 through 11).

## B. Presentation of data.

### 1. URBAN SETTING.

Table 4 shows each campus population as a proportion of the surrounding urban equivalent for the appropriate race group. It will be noticed that the campuses can be divided into two categories — those in "university towns" (Stellenbosch, Grahamstown and Potchefstroom) where the campus people are ten per cent or more of the town's Whites, and "non-university towns".

### 2. RESIDENTIAL COMPONENT.

Refer Table 5.

For the purposes of this study, no distinction is drawn between official university residences on the campus and those away from the campus, although some difference in travel characteristics is to be expected. This is not ideal, but lack of data forces the issue; it may be assumed that persons in "away-from-campus" official housing are the cause of rather less motor vehicles coming onto the campus than other commuting persons, because of above-average sharing; their need for parking space provision on the main campus is probably no more than that of campus residents. Many of them walk — distances involved are not that great; the Parktown and Pretoria men's residences are, at the furthest, one mile from the teaching area.

Table 4

Campuses and urban areas. 1970

| Campus | Definition of urban population | Urban population | Campus population as proportion of urban |
|---|---|---|---|
| | | thousands | % |
| UCT | Greater Cape Town[1], Whites | 378 | 1.54 |
| Stell | Stellenbosch, Whites | 25 | 26.4 |
| UPE | Port Elizabeth, Whites | 124 | 0.81 |
| Rh(G) | Albany Mag. Dist., Whites | 12 | 20.2 |
| OVS | Bloemfontein, Whites | 78 | 4.8 |
| Dbn | Durban and Pinetown, Whites | 260 | 1.69 |
| Pmb | Pietermaritzburg Whites | 47 | 4.45 |
| Pret | Pretoria, Whites | 326 | 3.1 |
| PUCHO | Potchefstroom, Whites | 35 | 9.9 |
| RAU )<br>Wits) | Sum of Witwatersrand Mag. Dists., Whites | 1 087 | 0.12<br>0.69 |
| W.Cape | Greater Cape Town[1], Coloureds | 599 | 0.16 |
| Rh(S) | Salisbury, all races | 422 | 0.31 |

(Data Sources 18 & 51)

1. Being Magisterial Districts of Cape Town, Wynberg, Simonstown and Bellville.

Table 5

Residential components. 1970

| Campus | Residential staff & students | | | Total as proportion of campus population |
|---|---|---|---|---|
| | on campus | other official university housing | total | |
| | | | | % |
| UCT | 480 | 740[2] | 1 220 | 21 |
| Stell | 5 010 | - | 5 010 | 65 |
| UPE | 200 | - | 200 | 20 |
| Rh(G) | 1 555 | - | 1 555 | 64 |
| OVS | 2 280 | - | 2 280 | 61 |
| Dbn | 1 255 | - | 1 255 | 29 |
| Pmb | 925 | - | 925 | 43 |
| Pret[1] | 1 185 | 1 675[3] | 2 860 | 14 |
| PUCHO[1] | 1 665 | - | 1 665 | 61 |
| RAU | 10 | - | 10 | 1 |
| Wits | 545 | 200[4] | 745 | 10 |
| W.Cape | 115 | - | 115 | 12 |
| Rh(S) | 710 | - | 710 | 53 |

(Data Sources as Table 2)

1. Student figures only – staff residents not known.
2. Ranging from ¼ mile to 2/3 mile distant from centre of main campu
3. Men's residences, 1 mile distant.
4. On Parktown campus, 1 mile from Jan Smuts Avenue.

3. MASS TRANSIT.

Tables 6 and 7 are an abstract of the answers received to section 3.3 of the questionnaire.

The adequacy or otherwise of train and bus services bear no apparent relationship to any of the expected indices such as urban population or distance from central business area. Only one campus (Pret) seems at all favourably located with respect to rail service, yet it is reported(39, translation) "... it is unlikely that any staff or students travel by train to the main campus".

Use of public buses is more common, but a frustrating lack of data is encountered. The three campuses best served are RAU, Pret and UPE — all of these admit significant proportions of student travel, but only UPE is prepared to "... venture an estimate of not more than 30% ... of students making use of the public bus system"(44), and this would appear to represent the highest percentage use among Southern African campuses.

Table 7 lists details obtained of services run directly onto the campus, as distinct from services running past the campus, even though serving it. The UCT subsidy system is worthy of special comment — the University guarantees the bus company a flat rate to run the service; fares collected are subtracted from this sum, and the University pays the difference to the company(60).

Sandrock(54) reveals that, in view of the anticipated shortage of parking space for staff cars on the new UNISA site at Muckleneuk, Pretoria (currently under development), "... the University has decided to do everything possible, from the outset,

Table 6

Public transport services. 1970

| Campus | Distance from CBD[1] | Passenger rail service nearby | Frequent public bus service nearby | Nearest bus stop |
|---|---|---|---|---|
| | miles | | | miles |
| UCT | 4 | no | yes | ½ |
| Stell | ½ | no | no | - |
| UPE | ½ | no | yes | 1/8 |
| Rh(G) | ¼ | no | no | - |
| OVS | 2 | no | no | - |
| Dbn | 3½ | no | yes | 1 |
| Pmb | 2 | no | yes | ¼ |
| Pret | 3 | yes | yes | 1/8 |
| PUCHO | 2 | no | yes | ½ |
| RAU | 1½ | no | yes | 60 yds. |
| Wits | 1½ | no | yes | ¼ |
| W.Cape | 2[2] | no | yes | ¼ |
| Rh(S) | 3 | no | no | - |

(Data Sources as Table 2)

1. CBD = Central business district.
2. From Bellville, not Cape Town.

Table 7

Direct bus services. 1970

| Campus | From[2] | Peak hour degree full | Fare Charged | Revenue[3] | Number of buses entering campus each day | Remarks |
|---|---|---|---|---|---|---|
| UCT | Railway Stn. | half | yes | S[4] | 7 | Account for 180 persons |
| OVS | CBD | full | yes | E | 23 | -[6] |
| Dbn | CBD | full | yes | E | 10 | -[6] |
| Pmb[1] | CBD | full | yes | E | 8 | -[6] |
| Wits | CBD | half | yes | S | 2 | -[6] |
| Rh(S) | CBD and Bantu townships | full | no | S[5] | 7 or 8 | For staff only; account for 150 persons |

(Data Sources as Table 2)

1. Also a subsidized service to Bantu townships.
2. CBD = Central business district.
3. S = Subsidized by university.
   E = Run on paying basis by the bus company.
4. See note in text.
5. Buses are owned by the university.
6. Number of patrons unknown.

to discourage staff from bringing cars to the site. They are going to provide a free bus service, in cooperation with the Municipality, from various points in residential areas with high staff densities, to the Campus and back. There will also be a free continuously operating mini-bus service between the Campus, other University sites and the City."

To sum, it is possible (excluding for the time being the UNISA proposals) to rank the campuses in order of adequacy of service as measured by the questionnaire replies. Such a ranking would be:-

| | | |
|---|---|---|
| best | - | UPE, PUCHO, OVS. |
| moderate | - | UCT, RAU, W.Cape, Pret, Pmb. |
| poor | - | Wits, Dbn, Rh(S). |
| no service at all | - | Rh(G), Stell. |

By and large, it seems the historical accident of choice of location that determines the efficiency of the transit services presently enjoyed - few universities have taken any positive steps to improve the services. In view of the practical difficulties involved, this is perhaps hardly surprising.

## 4. CAR OCCUPANCY.

The only local count of car occupancy was that made of all cars (i.e. including those not on university business) travelling in the thoroughfare separating the two portions of the University of Pretoria main campus - average number of persons in each car was 1.54(5). In the case of the recent Cape Town study(30) it was

deduced from a combination of traffic counts and questionnaire replies that 1.75 persons (driver included) occupied each car which parked on the campus and 1.05 persons rode each motorcycle or scooter. Each car which came onto the campus and drove off again immediately after stopping, dropped an average of 1.25 persons. "Guesstimated" figures from Durban(39) suggest car occupancy ratios of 1.25 to 1.5 for staff-driven cars and 2.0 to 2.5 for student cars. Casual observation at UCT has provided the Author with evidence of the widespread use of "car pools"; and hitchhiking among students. A questionnaire survey of students at the same campus in 1969(61) revealed that 9% of students used hitching at some stage of their journey to the campus, whereas no staff members admitted to the use of the same techniques.

An average loading factor of 1.25 persons per car for trips to American universities in the same size category has been counted(14, Table C-26).

## 5. CAR OWNERSHIP.

United States experience has reached the stage where "... every college administrator will tell you that sooner or later they have to succumb to student pressure to allow cars, if they're going to compete with other colleges for students"(3). The UCT study, although hampered by lack of comparable information for earlier years, represents nevertheless the only trend data available to the present Author. "On the basis of four individual counts, made in the years 1959, 1961 and two in

1964 (compared to the 1970 counts) it appears that the rate of growth between 1959 and 1970 of car traffic entering the campus has (averaged 4.5 per cent) per annum over and above the annual increase in student population ... Welgemoed(32) finds that White car ownership in the Republic is increasing at 6.6% per annum - when this is balanced against a population increase of 2%, it appears that the ownership of cars per White person is going up at 4.5% ... It would thus seem that the increase (of car ownership, at least at UCT) over the past decade of an annual percentage of about four-and-a-half is a reasonable one to take"(30) ((4.5 per cent represents doubling every 16 years).

Part of this increase is no doubt due to the general switch from two-wheel to four-wheel transport. "... The proportion of students using motorcycles (or scooters) has fallen from 15% of all traffic in the early 1960's to 4% at present"(30).

## 6. TRAFFIC CONGESTION AND INTRUSION.

Refer Table 8.

Traffic congestion appears on roads leading to all the campuses which are located in big cities (except W.Cape and Rh(S), which have very out-of-town locations). UCT in particular has long queues forming on the approach roads to the interchange and its northern entrance - delays of up to five minutes are imposed(30).

Three campuses have the problem of substantial traffic on public roads across their property - of these, omitting UPE which is shortly moving from its present cramped quarters, the other

Table 8

Traffic congestion and intrusion. 1970

| Campus | Peak hour congestion on roads | | Through traffic[2] |
|---|---|---|---|
| | to campus | within campus[1] | |
| UCT | severe | mild | no |
| Stell | no | no | ¼ |
| UPE | severe | severe | ¾ |
| Rh(G) | no | no | 1/8 |
| OVS | no | no | no |
| Dbn | severe | severe | ½ |
| Pmb | no | no | no |
| Pret | severe | severe | 2/3 |
| PUCHO | no | no | no |
| RAU | severe | no | no |
| Wits | severe | mild | no |
| W.Cape | no | no | no |
| Rh(S) | no | no | no |

(Data Sources as Table 2)

1. This includes public roads within campus.
2. i.e. Through traffic (that which does not stop on campus, even to drop someone off) as a proportion of traffic across the campus main avenue.

Table 9

Car arrivals. 1970

| Campus | Cars arriving | | Cars per campus person |
|---|---|---|---|
| | Student | Staff | |
| UCT | 1 565 | 445 | 0.342 |
| Stell | 1 370 | 600 | 0.254 |
| UPE | 160 | 80 | 0.238 |
| Rh(G) | 350 | 400 | 0.310 |
| OVS | 620 | 340 | 0.262 |
| Dbn | 1 100 | 400 | 0.385 |
| Pmb | 300 | 130 | 0.206 |
| Pret | 1 490 | 450 | 0.198 |
| PUCHO[1] | - | - | - |
| RAU | 400 | 295 | 0.535 |
| Wits | 2 100 | 900 | 0.402 |
| W.Cape | 60 | 100 | 0.162 |
| Rh(S) | 350 | 250 | 0.459 |

(Data Sources as Table 2)

1. No figures available.

two, faced with a permanent problem of intrusion, are taking steps to lessen the nuisance. King George V Avenue bisects the Dbn campus (refer Appendix F); as just half of its peak traffic has no business at the University, the authorities are "... negotiating with the Local Authority either for the deproclamation of portion of (this) road or, alternatively, for their approval for a scheme involving the development of a pedestrian deck above portions of the road, which would enable the central space to be double-banked in (a manner which will) minimise the (detrimental) effects of this road"(40). Pretoria University, faced with a similar problem in respect of Roper Street (refer Appendix F), employed consulting engineers to draw up a convincing proposal(5) for the alternative routing of through-traffic, constituting two-thirds of the peak volume, should Roper Street be closed. A decision in favour of this proposal had not at the time of writing been made by the City Fathers.

Only UCT (where weaving problems occur just inside one entrance) and Wits carry flows on internal roads sufficiently high to cause any concern.

## 7. PARKING DEMAND AND PROVISION.

As far as can be ascertained, Table 9 is a true reflection of the number of (a) student and (b) staff cars coming onto the campus during the course of the normal term day (only one visit by each car is counted, i.e. if it left the campus and later returned, it would not be counted again, and trips outside the day's

timetable, which usually ends at something like 5 p.m., are not counted either). The third column in the Table quotes what could be called the relative mobility of each campus - RAU appears to possess the highest number of cars per person.

At the peak time for parking demand on the campus (in the case of UCT this was 11 a.m.) actual demand for spaces runs at something between 80 and 95 per cent of the figures in Table 9. The revised figures may be seen in Table 10 which is compiled for the most part from the replies to 3.4.6 and 3.4.7 on the questionnaire reproduced in Appendix D.

Table 11, in its turn compiled from 3.4.6 and the parking plan 3.4.3, attempts to show how provision of spaces was made on or off campus to satisfy the demand quoted. The final two columns of this same Table quote the ratio of spaces provided to members of the campus population. The presence of "vacancies" in the midst of so much shortage may be explained as the combined result of:-

(i) the reservation of bays for staff members who are not making use of themat peak parking time; and

(ii) distant location of some official parking areas makes nearby "illegal" or "public street" parking more attractive.

"Illegal" parking is, in the words of the UCT traffic rules (63), parking "... in any area which is not marked out or otherwise indicated as a parking space". This technically includes strips of unbuilt land and sidewalks - action is however seldom taken against transgressors who are not actually constituting a traffic hazard or an obstacle to pedestrian movement.

Table 10

Parking demand. 1970

| Campus | Demand for spaces at peak parking time | |
|---|---|---|
| | Students | Staff |
| UCT | 1 840[1] | |
| Stell | 1 600[1] | |
| UPE | 140 | 72 |
| Rh(G) | 330 | 300 |
| OVS | 860[1] | |
| Dbn | 1 350[1] | |
| Pmb | 375[1] | |
| Pret | 1 665[1] | |
| PUCHO[2] | - | |
| RAU | 600[1] | |
| Wits | 2 750[1] | |
| W.Cape | 150[1] | |
| Rh(S) | 500[1] | |

(Data Sources as Table 2)

1. Combined student/staff figure only.

2. No figures available.

Incidentally, some of the campuses employ full-time traffic officers, with jurisdiction on university property only, and usually the ability to impose fines. UCT has 6 men, Pret 5, Wits 4 and Stell, Pmb and Dbn 1 each. In the larger universities, non-payment of a fine exposes the transgressor to a summons, appearance before a university "court" which could lead, in the extreme cases of repeated disobedience, to expulsion.

Some relationship between parking provision and campus area or land (real estate) price might be expected - Table 12 reflects the necessary data for subsequent discussion.

All present parking facilities, with minor exceptions, take the form of kerbside or off-street surface lots. Two universities have, in their latest structures, provided covered parking bays. Sandrock confirms(54) that the new UNISA administration building will have 175 spaces under cover. A more impressive project is that by Wits, whose R6½m Multipurpose Building will house 800 cars in the podium to a tower block(13). Several universities, among them UCT, Stell, Pmb and Dbn report that they are considering parking structures of their own.

## 8. CONTROL OF CARS ON CAMPUS.

Refer Table 13.

Most South African universities exercise some restriction on automobile usage for students or staff. Most commonly, discs entitling the holder to park in one of the areas allocated to persons of his university status are available free or at a small

Table 11

Parking provision and satisfaction. 1970

| Campus | Legal space provided on campus | Vacancies | Illegal on campus | On public streets | How demand is satisfied | Spaces provided per campus person |
|---|---|---|---|---|---|---|
| | (i) | (ii) | (iii) | (iv) | (i - ii + iii + iv) | (i.e. i/P) |
| UCT | 1735[1] | 200[5] | 305 | 0 | 1840 | 0.297 |
| Stell | 1160 | 50[4] | 40 | 450[7] | 1600 | 0.150 |
| UPE | 12 | 0 | 0 | 200[7] | 212 | 0.012 |
| Rh(G) | 40 | 0 | 0 | 590[7] | 630 | 0.017 |
| OVS | 860 | 50[4] | 50[4] | 0 | 860 | 0.229 |
| Dbn | 900 | 100[4] | 50[4] | 500[7] | 1350 | 0.205 |
| Pmb | - [2] | - [2] | - [2] | - [2] | 375 | - [2] |
| Pret | 580 | 215 | 260 | 1040[7] | 1665 | 0.059 |
| PUCHO | - [2] | - [2] | - [2] | - [2] | - [2] | - [2] |
| RAU | 200 | 0 | 70 | 330 | 600 | 0.154 |

contd...

Table 11 (contd.)

Parking provision and satisfaction. 1970

| Campus | Legal space provided on campus | Vacancies | Illegal on campus | On public streets | How demand is satisfied | Spaces provided per campus person |
|---|---|---|---|---|---|---|
| | (i) | (ii) | (iii) | (iv) | (i - ii + iii + iv) | (i.e. i/P) |
| Wits | 2650[3] | 200[6] | 100[4] | 200[4] | 2750 | 0.356[8] |
| W.Cape | 200[4] | 50[4] | 0 | 0 | 150 | 0.203 |
| Rh(S) | 700 | 200 | 0 | 0 | 500 | 0.535 |

(Data Sources as Table 2)

1. Including Northern parking area, 280 spaces.
2. No figures available.
3. Including space on both sides of the Motorway, available to students except if it is required by the Witwatersrand Agricultnal Society in connection with the use of the Showgrounds (Appendix F).
4. Author's estimate.
5. About 100 in Northern parking area; 100 (mostly reserved bays) elsewhere on campus.
6. About 100 on Agricultural Society's grounds and 100 elsewhere on campus.
7. Including public streets through campus.
8. 0.208 if Agricultural Society excluded.

administrative charge, usually 50c or R1,00 per annum (RAU disc-holders pay R3,00 for the privilege). Rules on student parking in the smaller towns are generally stricter – possibly the reason for this is that their students will, on average, live closer to the campus, whereas university authorities in the bigger urban areas realise the hardship imposed on a student living maybe 5 or 10 miles away if he is not allowed to use a car. For the same reasons, residents' car ownership is much more restricted, on the whole, than that of "oppidani" (commuters). Sometimes the restrictions attempt to prevent the use of a car in the town by the student (e.g. Rh(G) first years); at other universities the concern is more that he does not usurp a parking bay on university property, and what he does outside that area is his own business – there is nothing to prevent him buying a car and storing it on the public street (e.g. Pret first year residents). Most universities require students to state on the registration form whether they have a car or motorcycle; this information does not appear to be put to any practical use.

Every senior member of staff is normally entitled to a numbered bay earmarked for his particular use; although this system ensures that senior staff may waste no time in searching for a vacant bay handy to their destination on the campus, it does mean that this bay may (and frequently does – this is a major reason for the "vacant bays" of Table 11) remain empty for long periods, including peak parking demand time, when the staff in question are not required to be on the campus. UCT has 400 such bays. At Wits nearly a hundred covered bays are reserved,

Table 12

Real estate price and campus area. 1970

| Campus | Market price | Developable area |
|---|---|---|
| | Cents per sq. ft. | Acres |
| UCT | 200 | 102 |
| Stell | 23 | 360[2] |
| UPE | 500 | 10 |
| Rh(G) | 100 | 490 |
| OVS | 03½ | 97 |
| Dbn | 50 | 292[2] |
| Pmb | 50 | 230[2] |
| Pret | 150 | 104 |
| PUCHO | - [1] | 38 |
| RAU | 4 600 | 7 |
| Wits | 4 000 | 80 |
| W.Cape | 01½ | 260 |
| Rh(S) | 09 | 480 |

(Data Sources as Table 2)

1. No figures available.
2. Excluding very steep slopes

at a fee of R12 p.a., to staff of professor or associate professor or equivalent status. For the rest, staff at South African universities have usually their own parking areas to which admission may be gained on display of a windscreen disc of an appropriate colour – commonly many more of these discs are issued than there are spaces sufficient to accommodate the demand, and the excess have to compete with the student proletariat in their areas.

## 9. ANTICIPATED DEVELOPMENTS.

Table 14 abstracts the answers received in the questionnaire to "What can you tell me of the University Administration's plans to control traffic on the campus in the next few years?". Most universities intend to provide more parking in one form or another, but not all of them intend to impose fees or increase existing charges. There appears regrettably little enthusiasm for the idea of traffic studies – perhaps this attitude will change in time, and with it the resistance to suggestions of a more rational use of campus facilities by staggering the lecturing day and similar measures. The Planning Unit at the University of Cape Town is the local pioneer in suggesting economies of this nature to ease the peak load not only on traffic arteries and parking but on the use of teaching and recreation facilities too(35).

Four universities (five if UNISA is included – but their move to a new site is being made largely for reasons of concentrating at present scattered facilities) have made or are considering

Table 13

Campus parking controls. 1970

| Campus | Parking disc: Free | Parking disc: at 50c to R3 p.a. | Individually reserved bays for senior staff | Reserved parking areas for staff | Some category of student parking assigned to distant areas | Students not allowed to park cars ... : Students in residence: 1st year[8]: on the campus | Students in residence: 1st year[8]: in the town | Students in residence: 2nd year[8]: on the campus | Students in residence: 2nd year[8]: in the town | Students in residence: other undergrad[10]: on the campus | Oppidani i.e. commuters: 1st year[8]: on the campus | Oppidani i.e. commuters: 1st year[8]: in the town | Oppidani i.e. commuters: 2nd year[8]: on the campus | Oppidani i.e. commuters: 2nd year[8]: in the town | Oppidani i.e. commuters: other undergrad[10]: on the campus |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UCT | | x | x | x | x [6] | | | | | | | | | | |
| Stell | x | | | x | | x | x | x | x | | x | x | x | x | |
| UPE | x [1] | | x | x | | x | | x | | x | x | | x | | |
| Rh(G) | x [2] | | x | x | | x | x | | | | | | | | |
| OVS | x [3] | | | x | | x | | x | | x | | | | | |
| Dbn | x [3] | | | x | | | | | | | | | | | |
| Pmb | x | | | x | | | | | | | | | | | |
| Pret | x [4] | | | x | | x [9] | | | | | | | | | |
| PUCHO | x | | | x | | x | | x | | x | | | | | |
| RAU | | x | | x | | x | | | | | | | | | |
| Wits | x [5] | | x | x | x [7] | x | | | | | x | | | | |

contd

Table 13 (contd).

Campus parking controls. 1970

| Campus | Parking disc | | Individually reserved bays for senior staff | Reserved parking areas for staff | Some category of student parking assigned to distant areas | Students not allowed to park cars ... | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Students in residence | | | | | | Oppidani i.e. commuters | | | | | |
| | | | | | | 1st year[8] | | 2nd year[8] | | other undergrad[10] | | 1st year[8] | | 2nd year[8] | | other undergrad[10] | |
| | Free | at 50c to R3 p.a. | | | | on the campus | in the town | on the campus | in the town | on the campus | | on the campus | in the town | on the campus | in the town | on the campus | |
| W.Cape | x | | | | | | | | | | | | | | | | |
| Rh(S) | x | | | x | | | | | | | | | | | | | |

(Data Sources as Table 2)

1. Only 12 parking spaces in all on the campus.
2. Nearly all student parking takes place on public streets within the campus.
3. Resident students can hire a limited number of covered bays.
4. Staff only – students are not required to display discs. Very limited student parking is available on campus.
5. Senior staff pay fee for reserved bays. Limited number of student discs available are allocated by ballot among 2nd yrs. and upwards – others park off-campus proper.
6. First years ("social" year) to Northern parking area.
7. First years or ballot losers (see Note 5) must park in Agricultural Society grounds, or on public streets.
8. Academic, not social year.
9. Applies to men's residence only.
10. Unless over 21.

some decanting of activity to a new campus. At one of these, UCT, the matter is still under discussion and no decision has been made. Wits have decided in principle that a new first-year campus is to be established on their Frankenwald research farm 15 miles out of town on a turnoff from the Pretoria road(34) (see Appendix F). The other two are UPE and RAU, originally established on temporary city sites, which will be disposed of when the move to new suburban premises is made. Construction on the new campuses has, in both cases, commenced, and occupation of lecture facilities is envisaged for 1972 or 1973(16, 22, 41, 44 & 59).

The new Port Elizabeth campus is being established on a 2 000 acre site well outside the present urban area to which it will be linked by a freeway which will carry a frequent bus service. One of the cardinal principles of design has been that, within the campus core, only restricted vehicular movement can be allowed. "Both horizontal and vertical separation of pedestrian and vehicular traffic is envisaged. The motor car as a means of transport is to be accepted and efficiently catered for", and to this end there will be a ring road system feeding in to parking lots on the periphery. Space is to be reserved for "a more appropriate and faster personnel communication" system to assist pedestrians when the campus grows in size(25,26, 56). If 40% of the students are residents and one in three non-resident students (together with two in three staff) drive cars onto the campus(58), provision must be made at the university for parking at the rate of 0.35 spaces per unit of the campus population.

Table 14

Anticipated developments. 1970

| Campus | Major strategies | | | | Parking policy | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Restrict growth of present campus | Alter layout or entry arrangements | Revise timetable | University traffic study | Introduce or raise fees | Build more surface parking | Build parking structures | Employ more cops | Increase restrictions |
| UCT | - [1] | yes | yes | Done | yes | yes | yes | yes | - [1] |
| Stell | no | no | no | Near future | yes | yes | yes | yes | no |
| UPE | yes[2] | no | no | For new campus only | no | yes | no | no | no |
| Rh(G) | no | possibly | no | no | no | yes | no | no | yes[4] |
| OVS | no | no | no | no | no | yes | no | "possibly" | no |



contd...

Table 14 (contd.)

Anticipated developments. 1970

| Campus | Major strategies | | | | Parking policy | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Restrict growth of present campus | Alter layout or entry arrangements | Revise timetable | University traffic study | Introduce or raise fees | Build more surface parking | Build parking structures | Employ more cops | Increase restrictions |
| Dbn | no | yes | no | no | no | yes | yes | yes | Intend to withdraw permission to use cars from 1st and 2nd year students in residences |
| Pmb | no | yes | no | no | no | yes | yes | yes | Intend to withdraw permission to use cars from 1st and 2nd year students in residences |
| Pret | no | no | no | Done 1970[3] | yes | yes | no | no | From 1972 no 2nd year male residents or any year female residents may park cars on campus |
| PUCHO | no | yes | no | no | no | no | no | no | yes[4] |

contd...

Table 14 (contd.)

Anticipated developments. 1970

| Campus | Major strategies | | | | Parking policy | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Restrict growth of present campus | Alter layout or entry arrangements | Revise timetable | University traffic study | Introduce or raise fees | Build more surface parking | Build parking structures | Employ more cops | Increase restrictions |
| RAU | yes[2] | no | no | For new campus only | yes | no | no | no | no |
| Wits | yes | yes | no | "possibly" | yes | yes | yes | yes | no |
| W.Cape | no | no | no | no | no | no | no | no | no |
| Rh(S) | no | no | no | no | no | no | no | no | no |

(Data Sources as Table 2)

1. Matter at present being studied,
2. Temporary campus only.
3. Roper street only.
4. Proposed nature not revealed.

By contrast, the Auckland Park campus of Rand Afrikaans University is already entirely surrounded by housing, and is about 4 miles from the city centre, to which it will be connected by freeway, direct bus service and, by 1985 it is hoped, an underground railway(16). At the main entrance to the university, located so as to bridge the freeway, will be a "transport centre" to contain a bus terminus and parking garage intended to serve the university administration buildings during the day and the future opera house at night. Parking spaces will, by 1975, be provided in the ratio of 2 per 3 staff, 1 per 4 students (of whom a third will be part-time) and 1 per visitor(16) - this all works out at 0.41 spaces per full-time population unit. (It is to be hoped that this provision will be satisfactory in view of the fact that it appears, on the evidence of information available to the Author, to be inadequate for 1970 needs). They will be so dispersed that staff can find spaces within 5 minutes' and oppidani within 10 minutes' walk of their destinations. Initially this can all be provided by means of surface lots, with perimeter structures to come when the demand warrants it - students would be called upon to pay an economic rental for these(59). From the start, first year residents would be barred from keeping cars on the campus(41).

## 10. PEAKING.

The point has already been made in this Thesis that many facilities are under pressure for only short periods during the university day and are otherwise underutilized. For instance,

Figure 2 illustrates that while UCT parking space is at a premium between 9 a.m. and 1 p.m., at other times of the day and especially after 4 p.m. it is easy to find a convenient bay. Similarly, all "demand" figures quoted hitherto in this report refer to "peak" conditions on campuses.

This applies not only to parking but also to congestion at entry. To quote the example of UCT again(30), the majority of cars entering the campus do so for the first time between 8.00 and 9.00 a.m. (first lecture commences at 8.30), whereas the peak flows on De Waal Drive, the freeway off which access is obtained (refer Appendix F), have been recorded between 7.45 and 8.45 a.m. With this coincidence of heavy flows (over the peak quarter hour cars enter the university at the rate of 2 515 vehicles per hour, whereas the freeway rates at 3 740 vehicles per hour in the City-bound direction) it is no wonder that severe congestion is experienced at the entrances for a short while. Other universities, as mentioned in subsection III B 6 of this report, suffer from traffic troubles of the same nature, and will continue to do so as long as their first lectures start at roughly the same time as the business houses open. (Lectures commence at times ranging from 7.30 in the case of UPE and Pret to 8.30 at UCT). It is suggested that some measure of relief from entry congestion, if it exists, be sought in staggered starting times — in Figure 2 referred to above, 1 500 cars accumulate on the campus in the hour-and-a-half up to 9.30 a.m., whereas it takes from noon to 5.30 p.m. for the same nett accumulation to disperse.

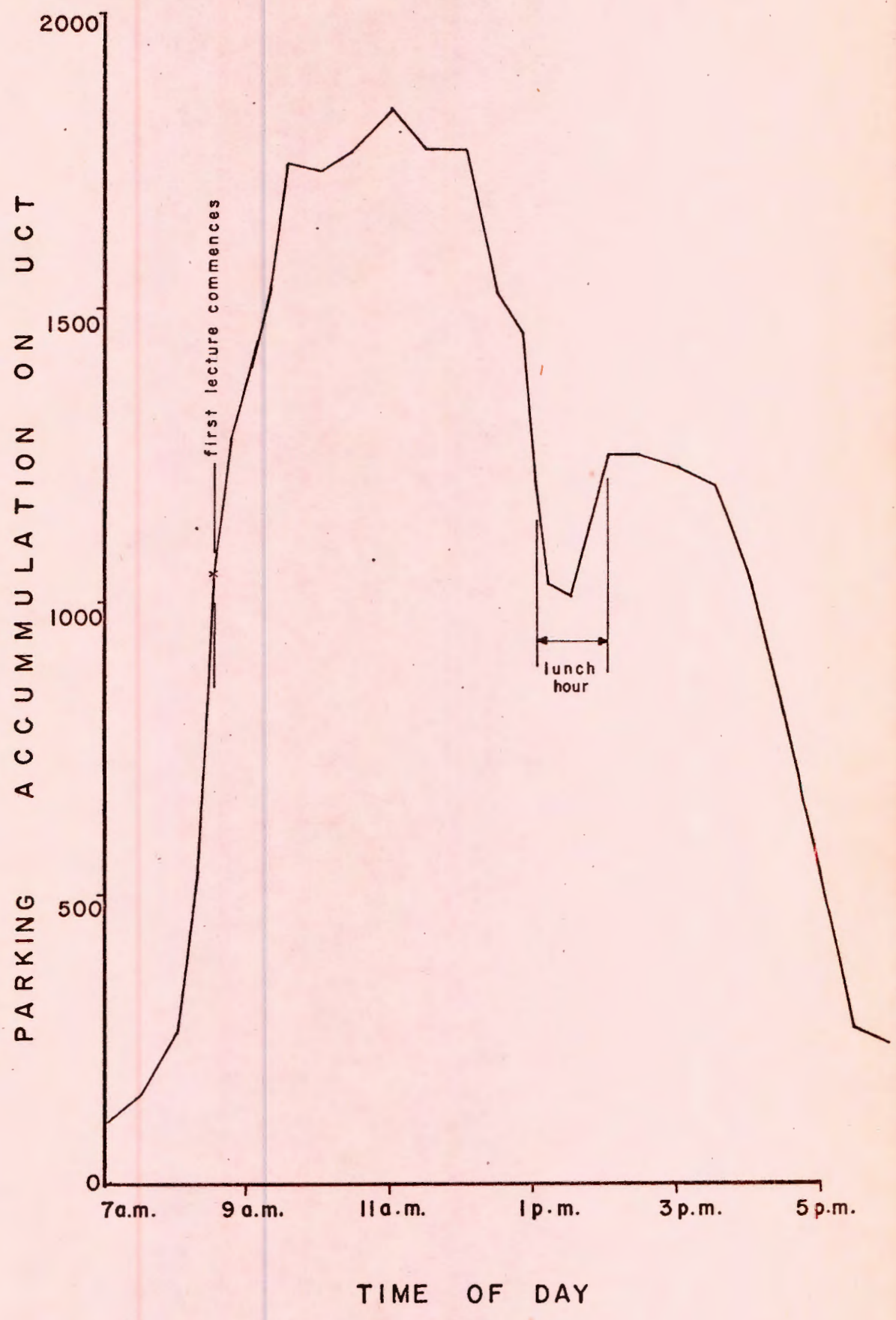


Figure 2

Parking accumulation with time, UCT upper campus

## C. Interpretation of data.

### 1. CORRELATIONS WITH UNIVERSITY POPULATION.

Analysis of the data collected by the questionnaire survey proceeded firstly along lines suggested by Keefer and Witheford(14). It is their opinion that a definite progression of the following indices can be discerned as the population of a campus rises:-

(i) the percentage of residents decreases;

(ii) the campus becomes more crowded in terms of students per unit of land area; and

(iii) the relative shortage of parking space on the campus increases, and that space which is available is further removed from the lecture areas.

The evidence of Figure 3 (derived from data in Table 5) on the score of (i) above is by no means conclusive. Even if UPE and RAU (the temporary campuses) and W.Cape (which is for Coloured students and frequently does not fit the pattern of the data provided by other campuses) are omitted (which leaves those encircled plots on Figure 3), the trend which can be seen as a downward progression across the sheet is disturbed by the extraordinarily high residential proportions of Stell and Pret. However, it may be said that, generally speaking, the percentage of residents does decrease with increasing campus population. The anticipated 1975 values for the same index on the new Rand Afrikaans and Port Elizabeth campuses are also shown on Figure 3.

If the two temporary campuses are once again disregarded, then Figure 4 seems to provide sufficient evidence of the local

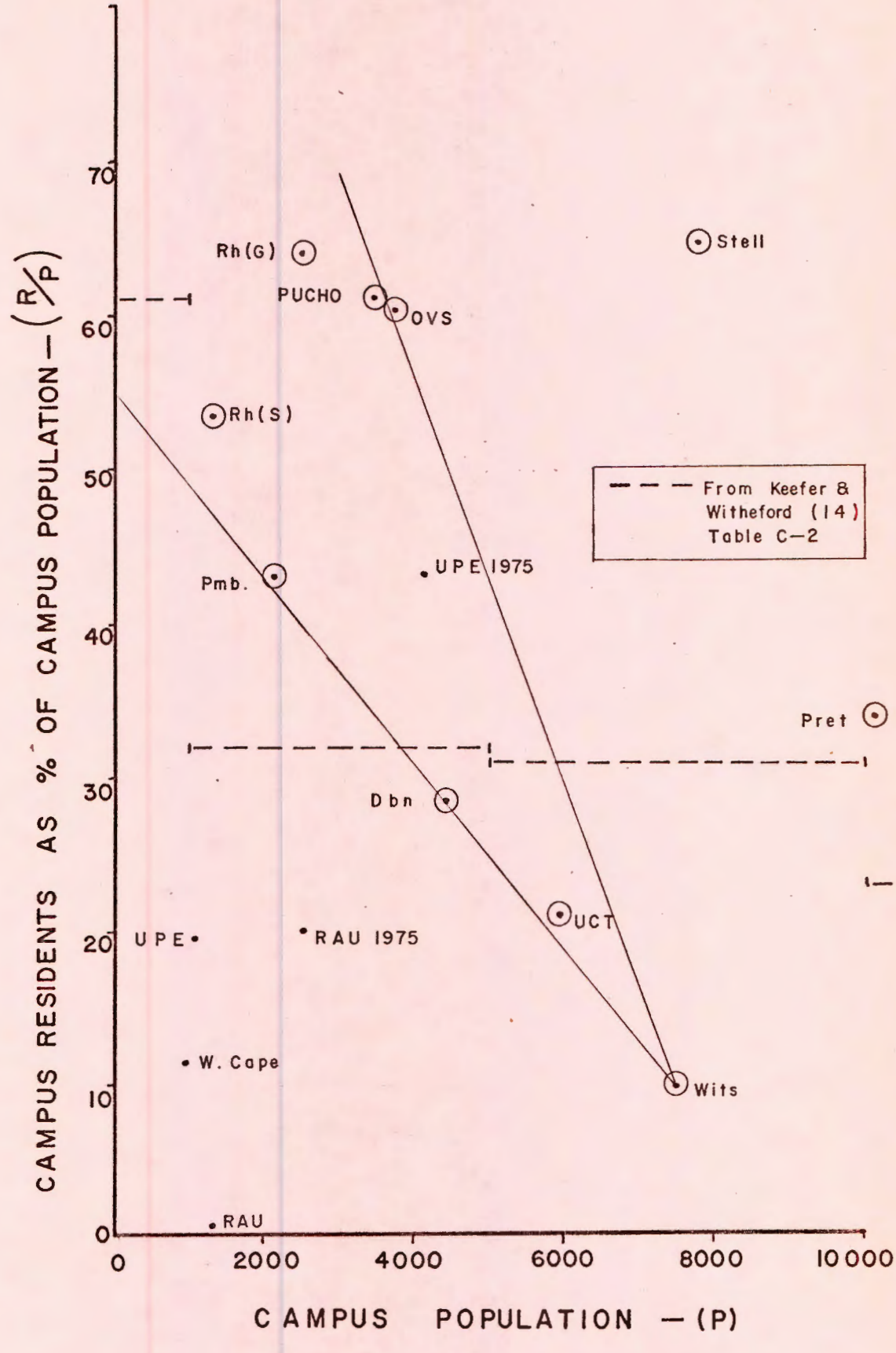


Figure 3

Residential proportion versus campus population

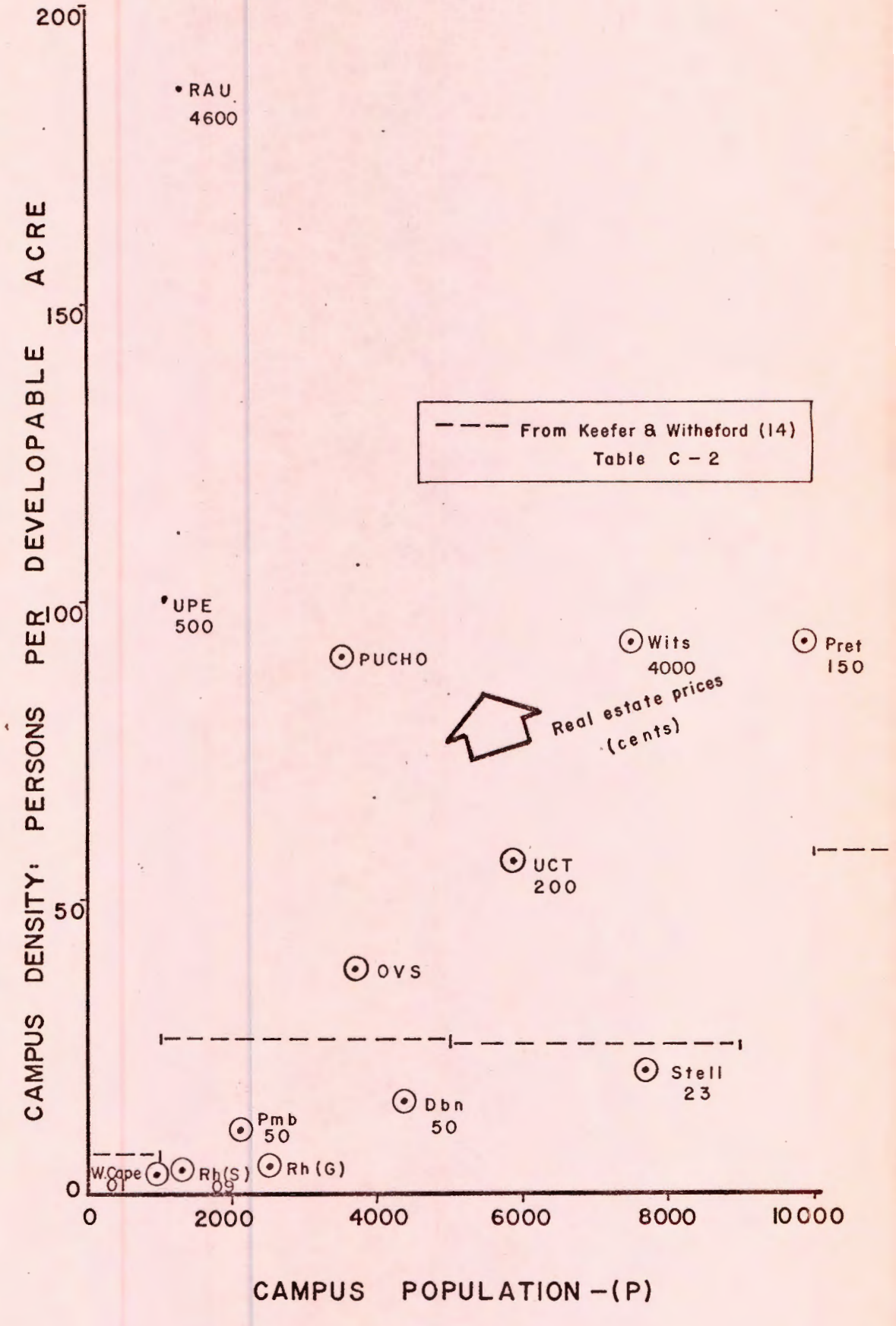


Figure 4

Campus population density versus campus population

applicability of (ii). Inspection of the real estate prices, recorded in cents on the same Figure, indicates an intuitively expected correlation with increasing campus density (here it is quite valid to include the temporary campuses). On both Figures are superimposed the equivalent group averages discovered by Keefer and Witheford in their United States survey.

On Figure 5 are plotted values of campus population versus on-campus parking provision (data Table 11) which are reassuringly found to lie within the envelope of values discovered in America by Pendakur(20, fig 1). The correlation of on-campus provision with population is confused by the several campuses which make extensive use of nearby public streets (in the cases of Dbn, Pret and especially Rh(G) a large proportion of the parking demand is met on municipal streets which could properly be described as internal to the university, there being no competing users for the space), but it clearly exists (see subsection III C 4). The shortage, measured as the sum of "illegal" and "public street" parking in Table 11 and reproduced in Table 15 in descending order of campus size can, if these three campuses are qualified by the extent of their internal public street assistance, be held on the evidence of the sample remaining after the two temporary campuses have, once again, been ignored, to substantiate the first part of progression (iii) above. It is not however true to say that this space is increasingly far from the lecture areas, as an inspection of the Campus Plans in Appendix F will show. In Stellenbosch, for example, one of the largest campuses in South Africa has a very even spread of parking areas. Local campuses have not yet reached the stage where most of the park-

Table 15

Parking shortage. 1970

| Campus (in descending order of size) | Shortage | Shortage after public streets internal to the campus are allowed as "campus parking" |
|---|---|---|
| Pret | 1 300 | 900 |
| Stell | 490 | 90 |
| Wits | 300[3] | 300 |
| UCT | 305 | 305 |
| Dbn | 550 | 200 |
| OVS | 50 | 50 |
| PUCHO[1] | - | - |
| Rh.(G) | 590 | 50 |
| Pmb[1] | - | - |
| Rh.(S) | 0 | 0 |
| RAU[2] | 400 | 400 |
| UPE[2] | 200 | 200 |
| W.Cape | 0 | 0 |

1. No figures available.
2. Temporary campuses.
3. 1 300 if Agricultural Society grounds not available.

ing is distributed over a periphery which is at a great distance from the lecture areas (bearing in mind an easy walking pace of 250 feet per minute, even the distance between the furthest boundary of the Agricultural Union parking and the Great Hall steps at Wits can be covered in 6½ minutes, which is not too much to expect of anyone, even a student hurrying to first lecture).

The Keefer and Witheford study also investigated trip generation characteristics as functions of university population, but data to relate this to South African conditions is not known to exist except in respect of the UCT study(61) - it was for various reasons not used in the report of the traffic consultants to that university(30), and no further mention will be made of it here.

## 2. CORRELATIONS WITH URBAN POPULATION.

The University Facilities Research Centre have theorised(23) that one of the most important factors related to travel habits and parking is the relationship between the size of the university and the population of the metropolitan area in which it is located. This may be true of the USA but, other than noting that the three universities where the student-plus-staff figure constitutes ten per cent or more of the appropriate urban population (i.e. PUCHO, Rh(G) and Stell - refer Table 4) are those to which the strictest on-campus traffic regulations apply, no further correlation could be found among local campuses. One other claim which is advanced in this publication is that a relation exists with "... the proportion of students who live in

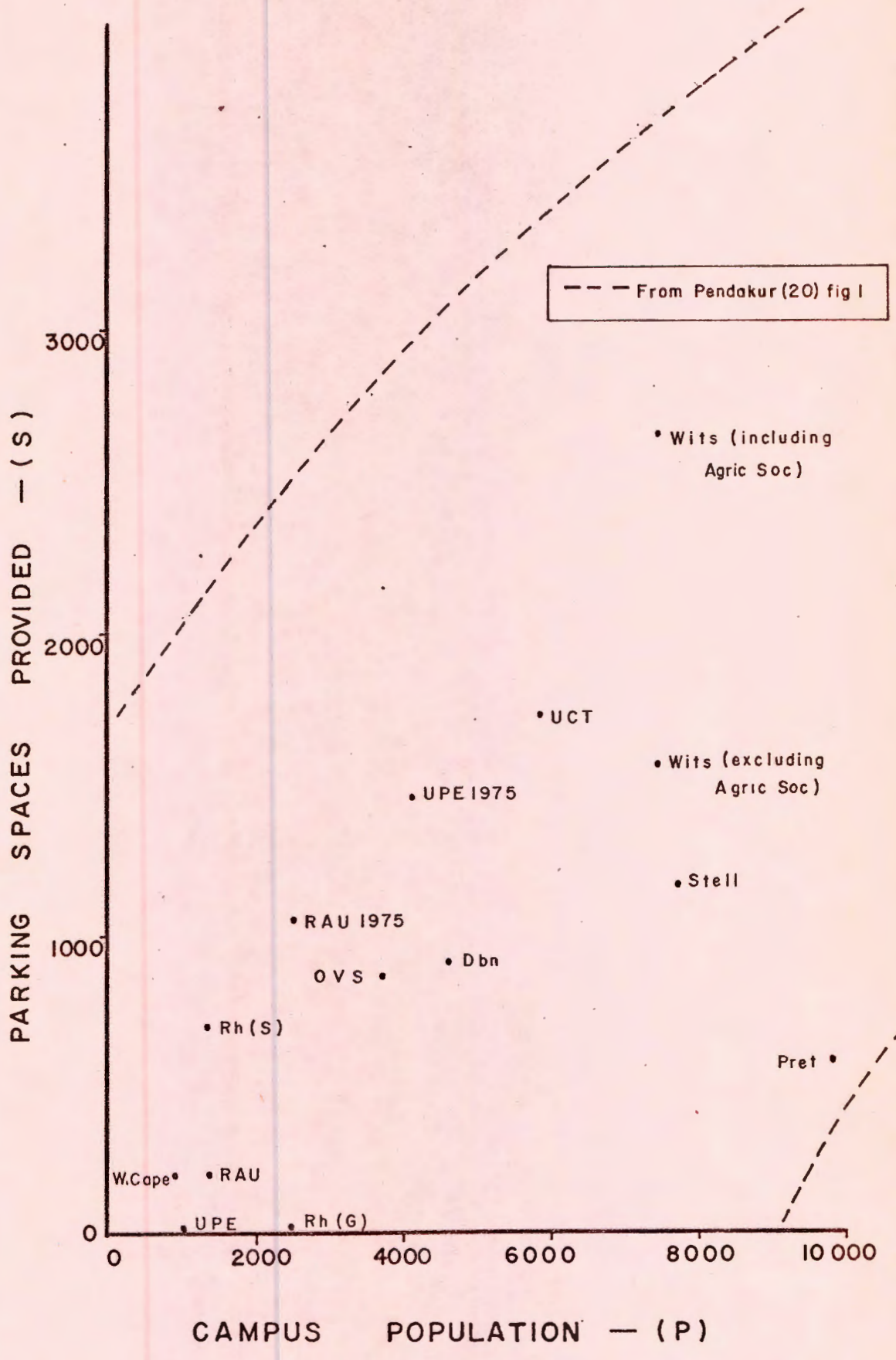


Figure 5

Parking spaces provided versus campus population

university housing". Although Figure 6 is not entirely convincing as an attempt to find this relation in South African conditions, it does illustrate the contention that some insight may be gained into university problems by the generalised separation of those universities "... into two distinct categories – those in urban universities resulting from large numbers of part-time and local resident students living some distance from the campus; and those in small-town universities where a great proportion of the enrollment lives within walking distance of (if not actually on) the campus. This is an over-simplification perhaps, but the distinction is readily discernable when evaluating present parking programs"(23). (This point has already been touched on in subsection III B 8). The three urban areas concerned above are the only ones which could conceivably be called "university towns" – as UFRC so correctly point out, "... it has been possible for these institutions, therefore, to adopt and enforce stringent regulations regarding student driving and parking ... Prohibition of student driving and parking on the campus is, of course, the easiest method of solving the traffic and parking dilemma now faced by many universities. Such action, however, could impose severe hardship on part-time and local resident students at big-city universities"(23).

3. CORRELATIONS WITH RESIDENTIAL COMPONENT.

Pendakur(20) lists as the principal determinants of parking demand:-

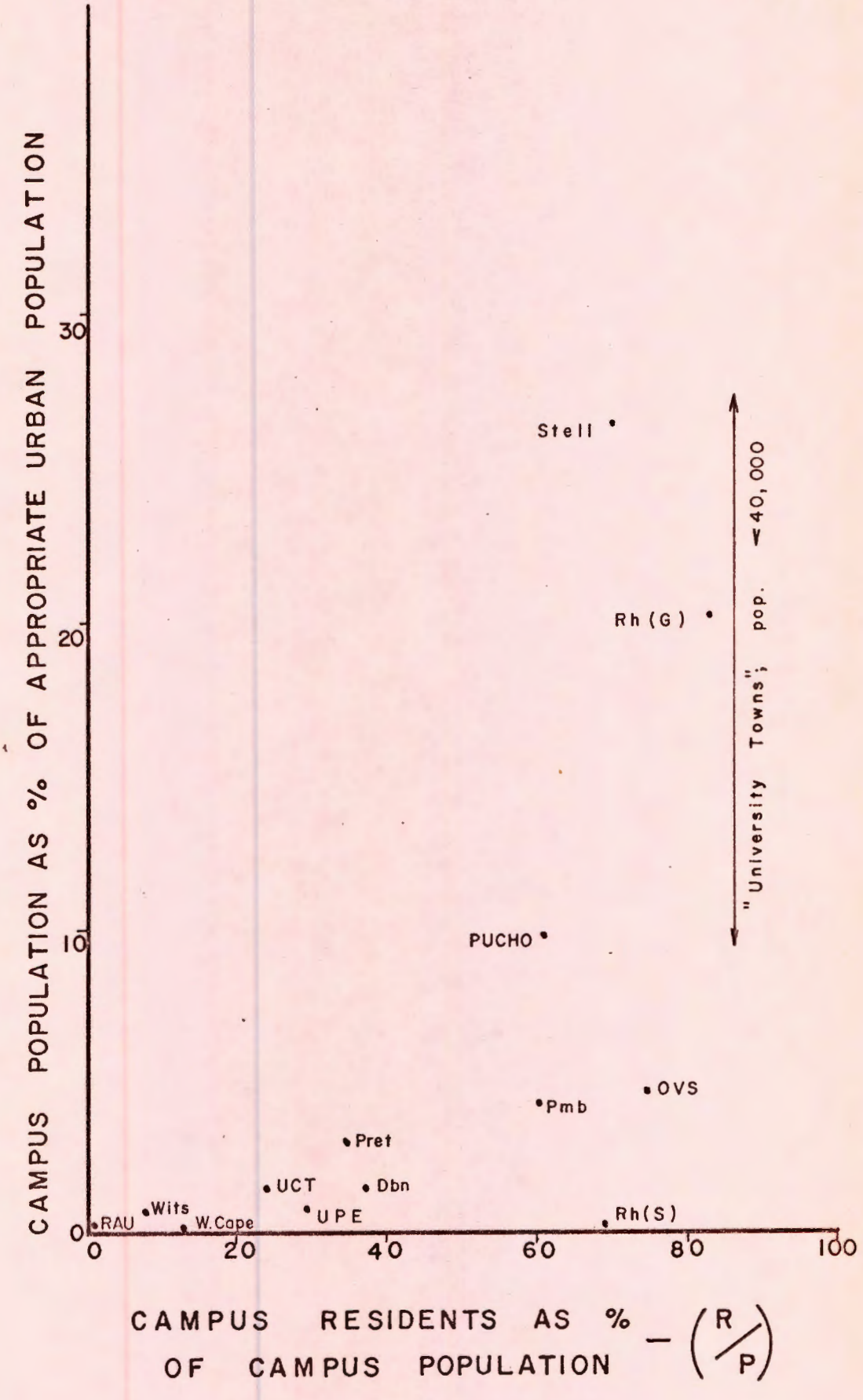


Figure 6

Campus population as % of urban population, versus campus residents as % of campus population

(i) Class schedules and office hours (this is self-evident).

(ii) The availability of parking itself, i.e. "a university providing abundant space for all segments of the population will experience a substantially higher demand for parking than one which imposes parking controls on all or some segments of the population". (A perusal of the final column of Table 9 suggests this might be true - three of those universities which severely restrict car ownership, viz., Rh.(G), OVS and Stell are well down in the order of parking demand per person (the figure for PUCHO is not known), where their companion (apart from a temporary campus and the Coloured university) is the big-city university with the poorest parking provision of all (i.e. Pret, see Table 15) acting as a disincentive to parking demand.)

(iii) "Availability and level of service of alternative transportation modes have a paramount influence on modal choice". (This seems intuitively correct, but South African experience of campuses with public transport is too limited to allow further comment - see III B 3).

(iv) "Parking fees". (Here there is no South African experience to go by).

(v) "... University housing policies. The number of students commuting daily to a university is a function of the percentage of total student population off campus".

Figure 7 (data drawn from Tables 5 and 9) illustrates (especially if the Reader ignores the one Coloured and two temporary campuses) the general applicability of this statement to South African conditions. Inspection of the Figure reveals a definite trend to increasing demand-for-space ratio (i.e. greater mobility) with decreasing residential percentage.

## 4. SUMMARY AND ANALYSIS OF FINDINGS.

The most important findings, for present purposes, so far revealed in this section C are:-

(i) The percentage of residents is inversely related to the campus population. (Refer Figure 3).

(ii) Provision of spaces is positively related to campus population, but at a diminishing rate of increase as the higher populations are reached. (Refer Figure 5).

(iii) Greater prohibition of student car ownership exists at those universities where campus population constitutes a relatively high percentage of the appropriate urban population, and these are among the campuses with greatest residential component. (Figure 6).

(iv) Parking demand per person is inversely proportional to the percentage of campus residents. (Figure 7).

No inconsistencies are implied in the above set of findings. The need for a car, greatest where the proportion of residents is small ((iv) above) is via (i) above deduced to be proportionately greatest where the campus population is at a maximum. Provision

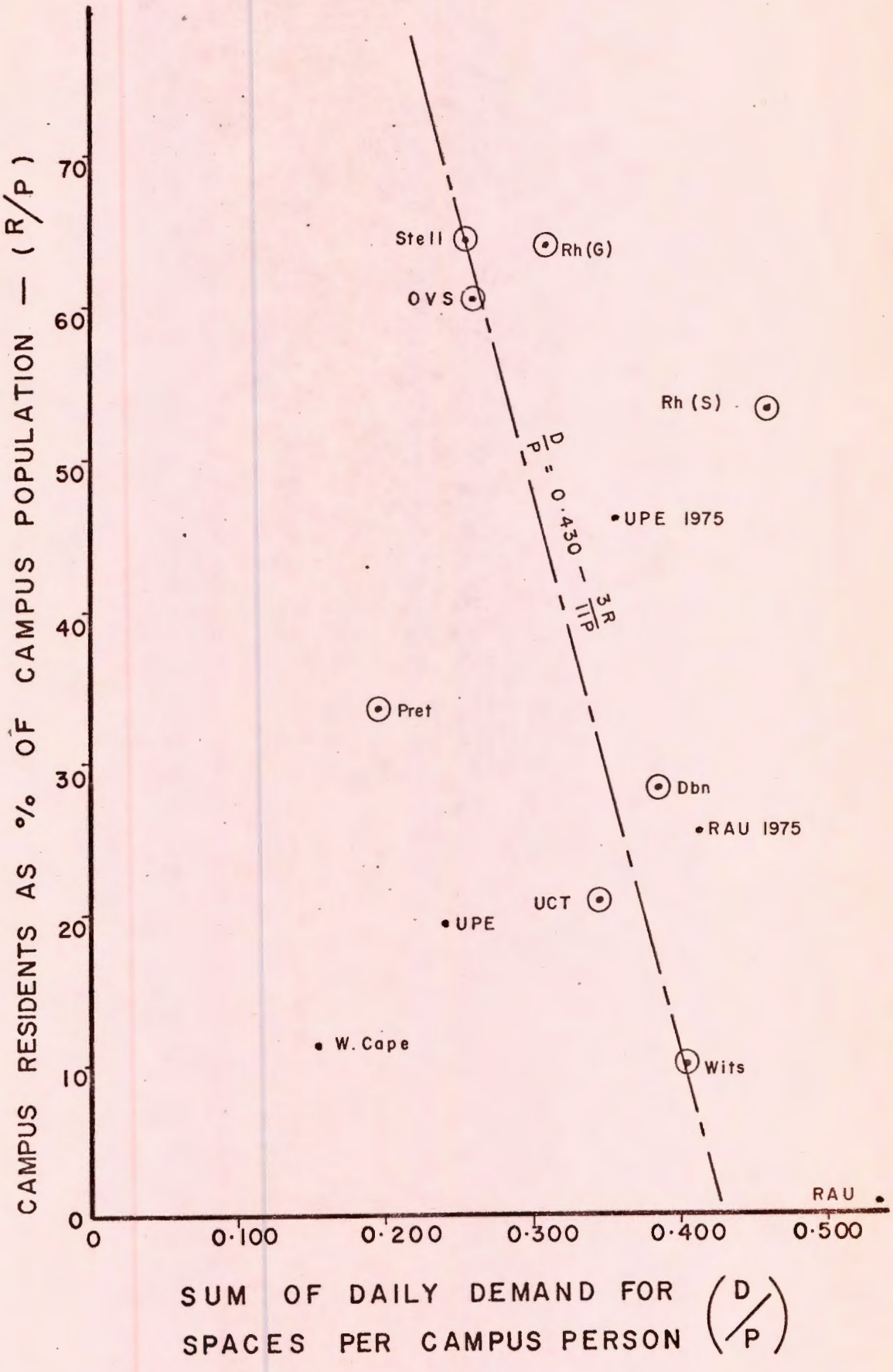


Figure 7

Campus residents as % of campus population versus demand for spaces per campus person

of spaces is, on the other hand, relatively lowest where populations are highest ((ii) above), thus the biggest campuses have the most acute shortages of parking space; similarly the campuses with the greater residential component (often those in the smaller towns) are those on which tighter control of car ownership results in smaller relative space shortages (the second part of (iii) above).

The first equation below expresses the mathematical relationship between the best fit line on the proportional residents versus proportional space demand graph (Figure 7).

$$\frac{D}{P} = 0.430 - \frac{3R}{11P} \quad \text{..... Equation 1.}$$

Careful definition of symbols is necessary:-

D = cumulative (i.e. not just peak) demand for parking space over the normal lecture day (i.e. not including after 5 p.m. work).

P = campus population (see Glossary).

R = number of students and staff housed in official university residences.

Figure 8 differs from Figure 5 in that one axis is expressed as "spaces provided per campus person" rather than simply the number of "spaces provided". In this form the diminution of the provision ratio with increasing campus population can be more clearly seen, and expressed as:-

$$\frac{S}{P} = 0.340 - 17P \times 10^{-6} \quad \text{..... Equation 2.}$$

where P is as before and

S = number of spaces provid̈d on the campus.

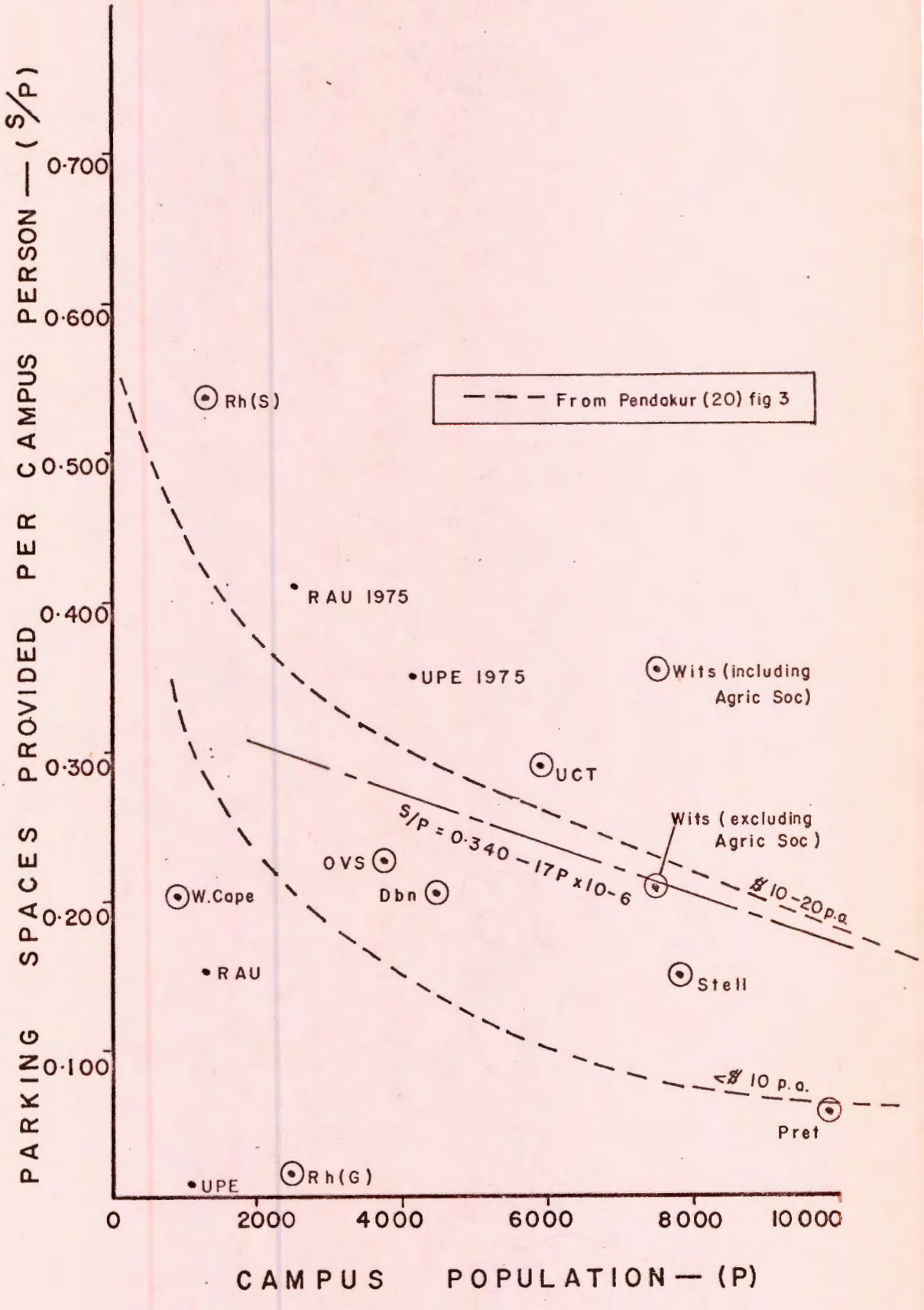


Figure 8

Parking spaces provided per campus person versus campus population

This relation is clearly nowhere near being valid for the temporary campuses and W.Cape, and predicts values above those actually measured for the four campuses with substantial parking available on internal public streets, viz. Rh(G), Dbn, Stell and Pret.

The Equation just derived is plotted onto Figure 5 (redrawn as Figure 9) so that the relation between the best fit line and parking spaces counted directly may more clearly be seen.

Superimposed on Figure 8 are two of Pendakur's equivalent curves for equal parking tariffs(20, fig 3). Thus, for similar parking availability, States-side campuses would charge something like 10 or 20 dollars per annum. The generalised South African campus provision is shown to lie between Pendakur's provision values for "public transport-" and "auto-oriented" campuses(20, fig 7); here we lack the sample size necessary to effect a comparison. Pendakur also found from his surveys that a campus population of 10 000 was roughly the point at which significant parking fees were often introduced and these affected parking supply as shown on the lines superimposed on Figure 8 – with local campus sizes approaching this figure, knowledge of this trend is of interest.

Other Pendakur correlations included provision versus land price, and versus land area. Local equivalents are plotted (Figures 10 and 11) as illustrations of the perversity of the data.

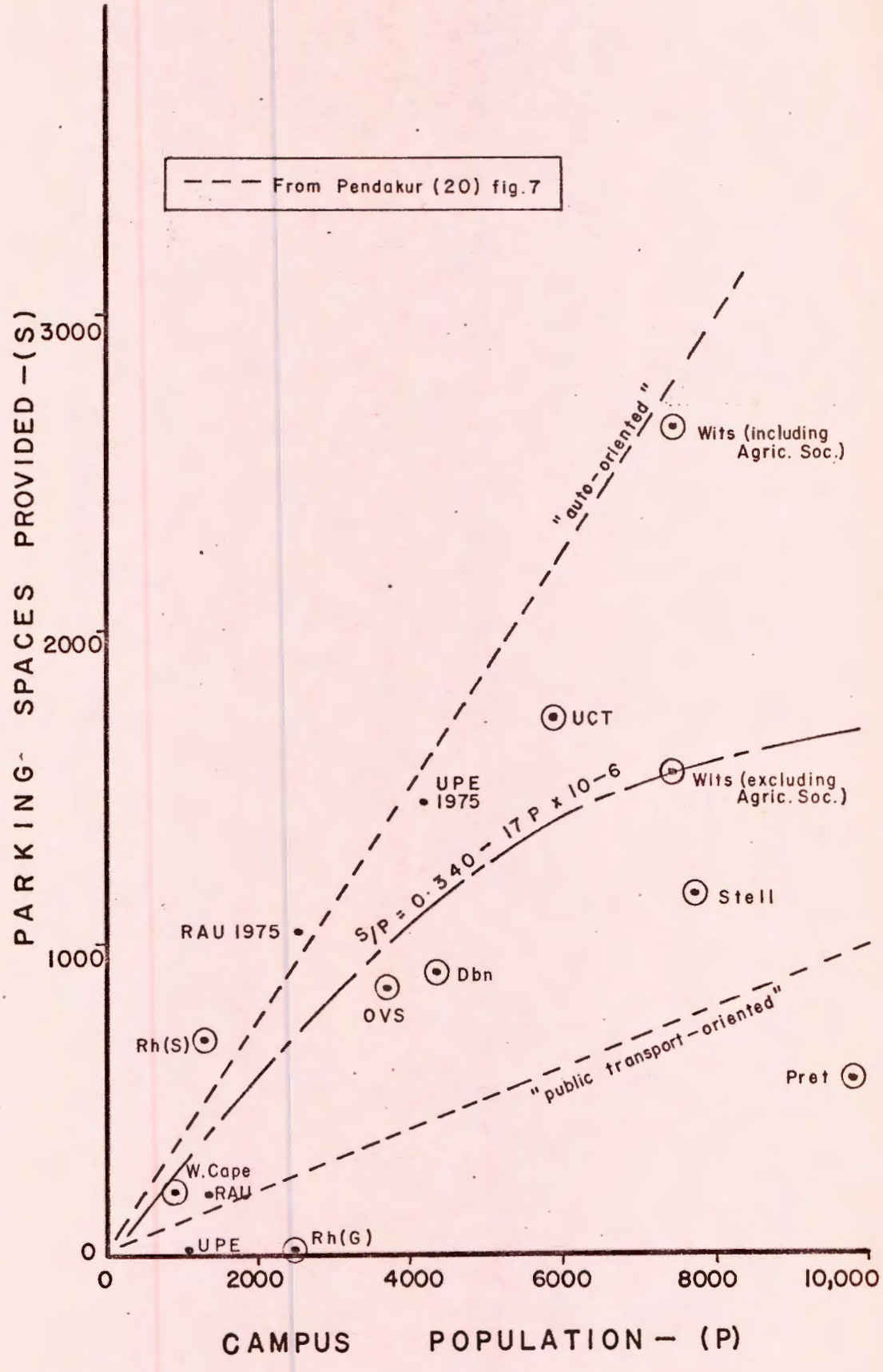


Figure 9

Parking spaces provided versus campus population

D. Problems of the future revealed by present trends.

Increase in automobile ownership among both students and staff, consistent with the general travel behaviour of an increasingly affluent population, must inevitably lead to a continuing shift from car-sharing or other modes of travel, and a consequent disproportionate increase in campus parking demands. Data available for UCT has already been noted (subsection III B 5) to illustrate the path of this particular trend through the decade past.

Also, under the prevailing conditions of decreasing proportions of campus housing, and the need by new or expanding institutions for suburban or outlying locations (e.g. Wits and UPE), the motor car must attract an increasingly dominant share of total tripmaking.

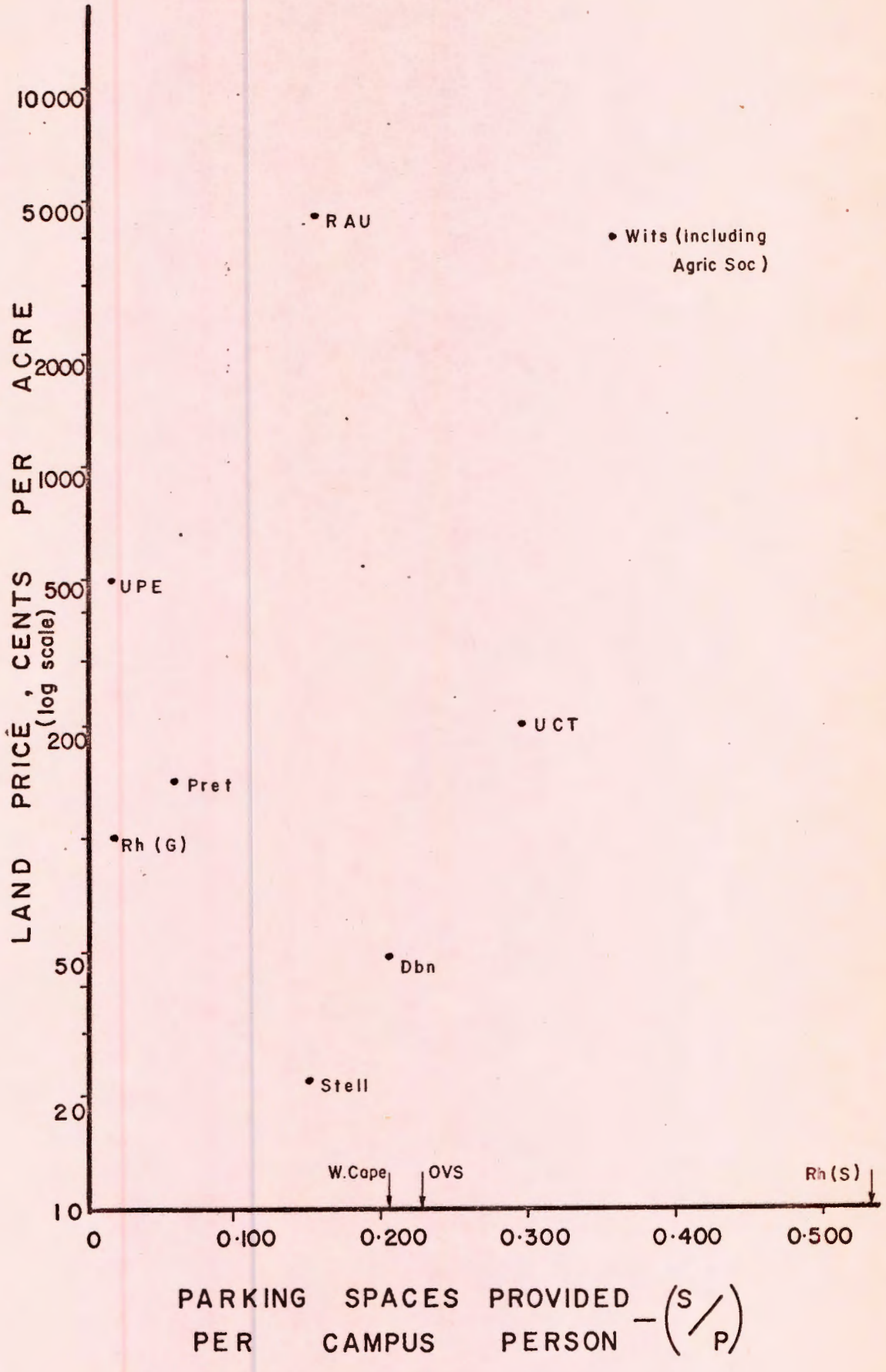


Figure 10

Land price versus parking spaces provided per campus person

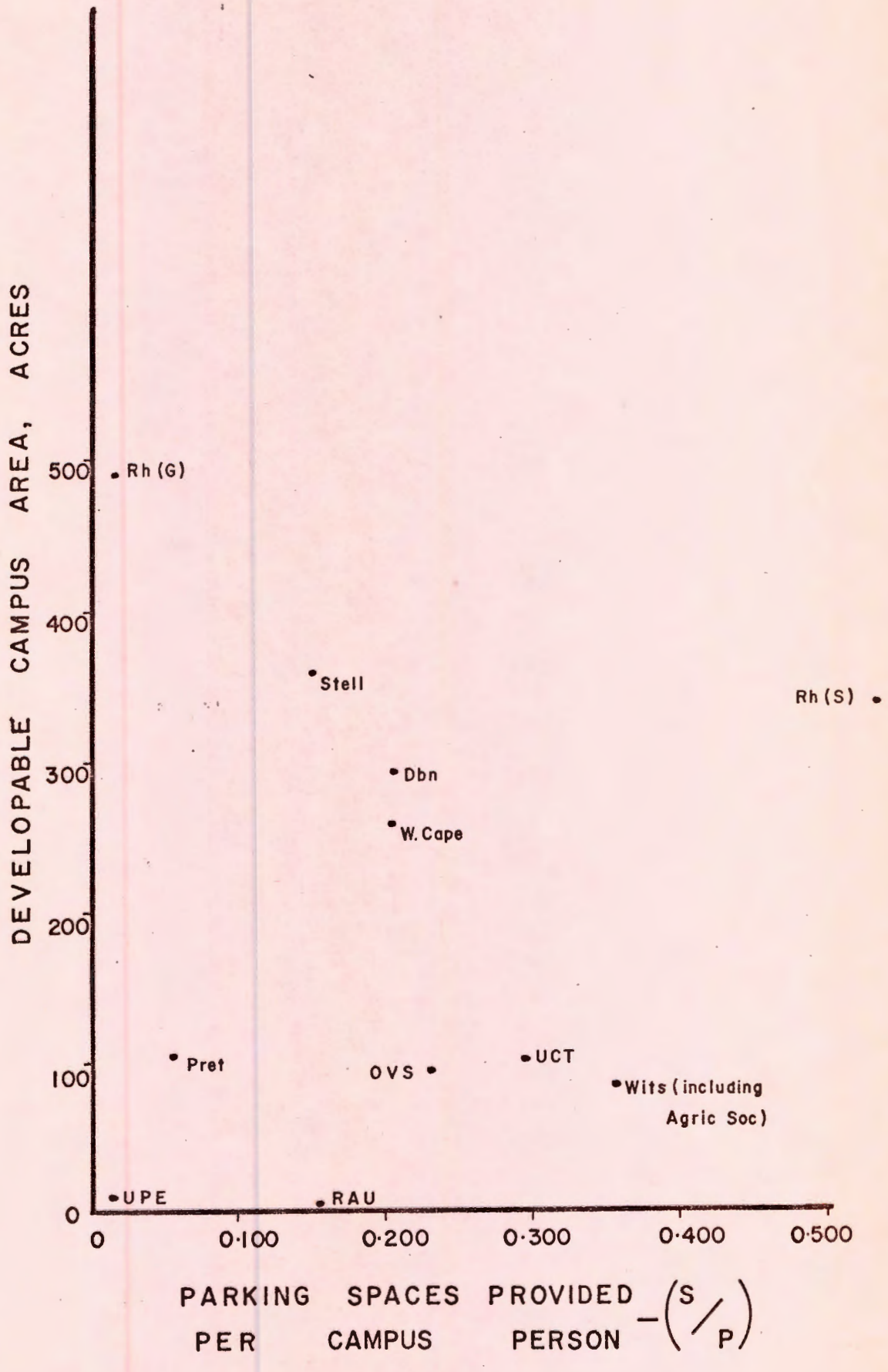


Figure 11

Developable area versus parking spaces provided per campus person

# IV C O N C L U S I O N S

## A. Proposals toward solutions.

### 1. INCREASE RESIDENTIAL COMPONENT.

This suggestion is made in the light of Equation 1 as a measure which will, from the university's private cost point of view, reduce on-campus parking requirement and congestion at peak entry times. To the student himself and to the public roaduser will accrue other apparent advantages.

Whereas the trend overseas might be towards less official housing (for reasons apparently connected to desires of removal from irksome supervision in residences), in the South African climate this is not noticeable. Certainly, some campuses (among them UCT and Pret) have ambitious plans for the construction of new residences.

### 2. ALLOW FOR THE STORAGE OF MORE CARS.

The problem with a policy of unrestricted accommodation of cars on the campus is not one of financing the construction of surface lots - provided the ground is level, a surface of, say, clinker, reasonably serviceable under most weather conditions, can be laid for as little as R16 per space(57). On nearly all campuses, the stage has been or soon will be reached where no more vacant land is available to develop in this manner. (There is the other valid objection that large areas of surface parking are ugly and depressing - UCT, for example, has gone to considerable expense

with terracing and planting in the effort to hide the Northern parking area from view).

Once the potential "easy" land is used up it is necessary for an entirely new approach to be employed. Parking must be provided in specialized structures at a cost of R3 000 per space, or sums of that order(57). Wits have been compelled by a City Council perturbed at the idea of student cars parking on the already "alarmingly" crowded streets of the busy commercial and industrial Braamfontein area to pioneer the inclusion of a large quantity of parking space in a structure on a South African campus (800 cars). Construction was started in recent months on the three-storey podium which will contain the cars, there being twelve floors of offices and student facilities in the tower above(13).

The suggestion has frequently been made that parking garages of this nature be financed partly from user charges (this would naturally discourage the use of a car in the first place, revealing another major tool of the campus planner; the small administrative fee for permission to park on most local campuses is not a significant disincentive to intending campus parkers). Martin(15) quotes several American campuses where realistic rates are not only covering the running expenses of garages but are contributing handsomely to the retirement of the debt incurred by their construction in the first place – daily rates range from 10 cents to $1.

Finally, it may be mentioned that identification and metering devices are available these days for the fully automatic con-

trol, if this is so desired, of all parking spaces on the campus.

3. ACHIEVE A MORE RATIONAL USE OF SPACE.

The system used on most campuses whereby senior members of staff are each allocated a parking bay for their exclusive use undoubtedly often results in that bay standing empty when at the same time there is an overall shortfall of available space. Yet, in view of the importance which is attached by these staff to having a personal unalienated bay, and the resistance and antagonism which any proposal to remove this privilege would arouse, it is questionable whether it is politic at the present time to suggest such a measure. At UCT, the campus for which the most authenticated figures are available, 500 of the 1 535 bays are numbered for the exclusive use of individual staff members or resident students - an estimated 80 of these stand empty at peak demand time, so full "democratization" of these would increase parking supply by no more than five per cent(30, 36). Pret is a different case in that many staff, rather than park on-campus in areas reserved for them, apparently prefer to put their cars under the shady trees bordering the streets around the campus; this policy adds the negligible walking time of the order of a minute to the commuter's journey. These rather unique circumstances (unique pricipally in having good parking available so close to the campus) result in 215 of the 580 staff spaces lying vacant at peak demand time(39).

Another argument against the removal of personal bays is that this method of allocation, despite its other shortcomings, is an efficient user of small tucked-away parking areas and of kerbside parking especially in sidestreets. A search in these areas would be postponed by the casual seeker of parking in favour of a first look at the bigger concentrated areas where his quest would be more likely to be successful. Thus, if it were not generally expected that a vacancy would be found there, a space tucked away in a sidestreet say, could optimally be allocated to a particular individual who would go direct to it upon his arrival at the campus. This works out quite well in practice – the small areas are generally close to the teaching facilities, and the allocation may be described by Guyton and Reed's "level of convenience" related to parking (11). This concept seeks to grade each parking area in terms of walking time to the campus centre – persons of a high status on the campus are permitted to park in "high convenience" spaces, i.e. those close to the buildings. Thus, unless there is to be some complete revision of parking allocation by conversion to say "ability to pay" rather than "status" as the criterion for the allocation of the more convenient parking, it seems that small areas as described above are best given to individual senior staff; the next size of area (say capacity ten or twenty cars upwards), which hopefully correlates with the medium level of convenience, to other staff and maybe senior students (disc identification would be necessary here to prove permission to use the area); with low convenience being the biggest areas normally

on the perimeter of the campus. The system roughly sketched out here is probably the fairest permissible given present attitudes relating parking privilege to university status rather than any other factor. It is moreover that generally employed on South African campuses.

Policies to obtain maximum use of parking space could more easily be effected if they are coupled with a re-ordering of the teaching timetable. As the UCT Planning Unit have demonstrated in the context of their own campus, low frequency of use and occupancy rates of teaching facilities prevail. To illustrate, "... the daily pattern of use shows that 80% of the use of general purpose facilities on the Upper Campus takes place before lunch and the remainder in the afternoons with practically no use on Saturday mornings"(29). Inevitably any shift of lectures to the afternoons or weekends in order to make use of the building stock during the dead time revealed by the Unit's survey will ease the peak parking demands on the campus. It is intuitively predicted by the present Author that economies of more than 25% could be achieved in parking provision if these policies were fully implemented. Relaxation of congestion at university entrances during the morning rush would also be observed, and further improvements to this would accrue from a staggered system of first lecture starting times (second or maybe third lectures could be arranged to phase together so as to minimise any inconvenience consequent upon the need for students to attend lectures in different departments during the course of the morning).

It is with the lecture timetable therefore, rather than with present systems of parking space allocation, that rationalization would bring the greatest results.

4. ENCOURAGE ALTERNATIVE MODES.

Very little of a positive nature has been done in this line in South Africa. Aside of UNISA's proposals already mentioned, there are only the token bus services of Table 7 which can be pointed to, and available data indicates that present trends, not only on local campuses but in the cities as well, are away from the use of mass transit. The experience of the UNISA experiment, limited as it is to be, will thus eagerly be observed for any indication that the present automobile fixation can be slowed.

5. RESTRICT VEHICLE USE.

There are two basic lines of approach open to a university should it attempt to reduce car entry to the campus. The "negative" approach (the "stick") would have that the authorities restrict car drivership to a selected portion of its population, or that they charge a substantial fee for the privilege of parking on the campus, or that they attempt to ignore the problem. A "positive" approach (the "carrot") would call for the university to provide a convenient and cheap alternative means of getting to the campus, or that they increase the stock of student housing, as discussed above in subsections 4 and 1 respectively.

The implications of the broad so-called "negative" policies follow.

(a) Restriction by edict.

An example of this method, beloved of a number of local campuses, is the withholding of permission to park cars on the campus from all students who have not yet successfully completed a year of study.

A measurement was made of the quantitative effect that a first-year and a first-year plus second-year (academic years) ban would have on parking demands at UCT(60). This revealed that the prohibition of first-year drivership could be expected to reduce parking needs by 19%, assuming that the removal of these cars from the road would not be an incentive to increased usership among students of other years. The equivalent figure for first and second years was 43%.

(b) Restriction by pricing.

This would entail the imposition of a parking charge on student or staff parkers or on both - at present parking permission is either free or may be purchased for a token sum. That the practical difficulties involved in deciding upon a tariff and then implementing this policy appear formidable, has already been noted in this Thesis.

(c) Restriction by congestion.

It was foreseen at UCT as long ago as 1961 that, if the university did not adopt some form of deliberate restriction, "... unregulated conditions (would) impose their own more severe restrictions" within a few years(62). Essentially, this requires

that the universities provide nothing more in the way of parking space, at the same time stepping up the level of enforcement of the parking regulations in order to combat an increased incentive to park illegally. Wits, for example, have reached an advanced form of this restriction, with many student cars forced to park on the Braamfontein streets.

The reaction of campus employees and the student body to any of these measures is difficult to predict, but it is certain that suggestions of pricing or edict will be met with resistance from those on whom they will be imposed. A "do-nothing" policy will not be acceptable either, and indeed it would seem that all these "negative" policies would only stand a chance of success if their introduction were accompanied by some positive alternatives.

## B. Zoning regulations for and financing of parking.

University capital expenditure is, in South Africa, very much the concern of the central government (36, 42, 52). Universities request the Secretary for National Education for loan authority to pay for the capital works they have in mind – some justification of the request must always be made, but in practice approval is usually a formality. The loan is then made on the open market and the State undertakes to repay usually 85% of the interest and redemption monies, leaving the remainder to the universities themselves. This percentage applies in respect of site works, internal roads, underground services, surface parking and buildings except residences. A lower percentage, viz. 50%, is repaid in the case of residences. (The present rate of interest is high, viz. 9½%, with redemption periods 20 to 40 years).

Until a test case had been attempted it was not apparent whether the large State subsidy would apply to structure parking as well. Then towards the end of 1969 the Johannesburg City Engineer's Department invoked town planning regulations to compel Wits to provide parking space in their new Multipurpose Building already described, in view of the congestion then existing in the area. Until then, local authorities in general had tended to turn a blind eye to the relevant requirement (in the case of Cape Town, roughly 1 bay per 8 persons) (55). The State department approved the expenditure, and construction is currently well advanced.

## C. Campus transportation studies.

### 1. NEED FOR STUDIES.

"... An adequate traffic and parking plan can be a valuable asset to a university .... Existing, future and proposed changes in traffic-related policy can be evaluated; and the use of available financial resources can be maximized"(11). This quotation neatly summarises the ultimate purpose of a campus transportation plan.

Only superficial attention has been paid to transportation at most local universities. Parking and access matters are widely, but not intensively, discussed; but their planning receives very low priority to judge by the general reluctance to study the problem in depth. Parking is provided on a hand-to-mouth basis, if at all; "restriction by edict", the favourite weapon, unfortunately does not dispose of the problem but merely sweeps it under the carpet for the local authority (which has to store the cars on its streets) and the individual student (who is often severely inconvenienced without his personalized transport) to deal with. Only half-hearted attempts have been made to provide alternatives to the motor car. And with only a very few exceptions, there is little coordination between the local authority, the public transport authority, and the university. Considering that some of the campuses generate as much traffic as the central business district of a fair-sized town, this lack of interest in a serious assessment of the problem is regrettable.

The present Author would suggest that the administrators responsible for at least the larger campuses (if not all campuses) commit themselves to prepare a transportation, traffic and parking plan of the university campus and environs. They would need to do this in conjunction with a comprehensive study of other physical university facilities, predicted student enrollment and a knowledge of the role envisaged for the university by those responsible for national educational planning, and in full cooperation with the local authority and mass transit bodies. This would need to be updated at regular intervals in the light of new developments. A basic prerequisite of such a plan would be the study, which could most properly be undertaken by specialist consultants or by staff temporarily employed by the university for the purpose. The term "plan" should incidentally not be understood in its most restricted meaning of a series of lines and shaded areas on a map – its most important constituent is the set of statements of aims and objectives to be adhered to in the implementation of the chosen policy.

## 2. PROCEEDING WITH A STUDY.

Guyton and Reed(11) have written the only paper known to the Author on the specialist subject of the technique of campus traffic planning. One criticism which could be levelled against it is that it stresses the needs of the motor car to the virtual exclusion of other modes. The Author was, as already mentioned, intimately involved in the UCT study, and the following brief

comments are offered for the guidance of any intending students of campus transportation. Studies short of the standard described would by all means be preferable to nothing, but it is suggested that anything less would be inadequate for the purposes of the larger campuses.

Information should be gathered in three ways as follows:-

(a) By questionnaire surveys

The 1966 Louisiana State University questionnaire form reproduced in Guyton and Reed(11, page 68) is, aside of the unfortunate exclusion of a question on times of entry to and exit from the campus, a model of its kind. Short and economically but courteously worded, it was distributed to every student and staff member, asking them for:-

(i) campus affiliation (i.e. staff type, or year of study in the case of students);
(ii) area of residence;
(iii) location of office or of initial class each day;
(iv) mode of travel to campus;
(v) parking place (if a driver);
(vi) number of car trips made in a day;
(vii) use of campus bus system;
(viii) vehicle ownership; and
(ix) opinion on various parking improvement proposals.

Information obtained from the last question might be very superficial but the presence of this question serves the most vital purpose, admittedly in a very small way, of asking the

person planned what he would like to see. This sympathetic attitude, carried throughout the study, will inevitably produce greater understanding of the planner's aims and the cooperation of the campus population when the time comes to implement the new policies. The planners must seek as much constructive publicity in the staff and student press as possible.

(b) By direct counts

A complete picture should be obtained of the following aspects:-

(i) number of persons arriving on campus by each mode, and number of vehicles represented;

(ii) parking spaces available in all significant categories, and which of these are occupied at peak times of the day; and

(iii) traffic flows at peak entry and exit times, and what this appears to represent in terms of level of congestion.

(c) By measurement and interview

Physical details should be available of road layout, widths, etc. – if not, they should be measured in the field. A comprehensive picture of access routes and public transit services to and around the campus shouldbe obtained. Every effort should be made to obtain data from the past, e.g. traffic counts or studies of bygone years, in order to extract, by comparison with the new figures, trend information. And finally, all persons capable of making decisions significantly affecting the campus,

e.g. the City Engineer, university policy-makers and public transit companies, should be kept in the picture and at the same time requested for any relevant information they could provide.

The questionnaire survey will be returned, answered, by probably not more than fifty per cent of the university population, so it must first be expanded to represent this known figure and checked against vehicle registration and the traffic and parking counts to ensure validity – inevitably certain adjustments will have to be made. This sort of work is considerably speeded with computer techniques (the Louisiana State questionnaire, for instance, is designed for numerical coding).

"Once summarised, data analysis will provide measures of existing use, will permit the determination of existing need, and will provide a basis for preparing estimates of future traffic and parking space demand.

"Prior to preparing any future solutions, present and future university policy related to traffic and parking must be defined or established for use in the study. As such, they may at times be tentative policies. The question of policy is one that must be fully appreciated because a university had (sic) the unusual distinction of being able to control traffic and parking needs to a significant degree by a policy decision (present Author's emphasis – although the traffic generated is potentially that of a large town, the university has far greater control than any local authority over the time of day peak loads occur, their magnitude relative to total daily demand, and also

their absolute size). Once university policy has been decided and following forecasts of future needs, (transportation) plans providing acceptable solutions can be prepared"(11). Plan implementation then follows, preferably under the continuing guidance of the professionals who were responsible for its preparation in the first place, and who will have to update it at frequent intervals. It is necessary that at every stage the transportation planning be fully coordinated with the university's land-use planning and with the intentions of the authorities providing access roads and mass transit links.

## D. Further research.

A wealth of data from overseas, the applicability of which to South African conditions still has to be tested, is available to the intending researcher into campus transportation trends, problems and solutions. A start has been made with this aspect by the present Author, and encouraging results have been obtained.

Very little information, theoretical or empirical, is available on what results would accrue from the imposition of a pricing policy or a change in the lecture timetable, or from the introduction of a transit service. Even when some form of "restriction by edict" has been imposed, no attempt has been made to analyse the "before" and "after" condition of the traffic. Car occupancy, and what determines it, is a most interesting field yet to be explored. Little attention has been paid to the effect that long range land use plans in the campus neighbourhood could have in reducing vehicular travel. At which level of demand (or be it real estate value) it becomes more economical to build parking structures than allow surface lots to proliferate, and what fees to charge for this space in view of original building costs and commuter resistance to paying, are subjects which have never been looked at in the context of South African university campuses. And above all, there is precious little trend data – for example the rate at which car ownership among students at each university is increasing is an area for fruitful investigation.

This Thesis has been severely handicapped by the lack of reliable research information. Hopefully in a few years' time when some of the universities have done the necessary groundwork, another researcher will do them a great service by collecting and comparing their findings with a greater certainty and more depth than the present Author has been able to achieve.

# V APPLICATION AND SELF-APPRAISAL

How far has this Thesis measured up to its original objectives (subsection I 3)? It suffers from incompleteness and unreliability of basic data to a considerable extent, as described in the preceeding sections. Apart from this, the small sample size means that the uniqueness of each campus has a disproportionate effect, and smooth correlation proves to be more difficult to discover. Nevertheless, the Author feels that a fair validity can be ascribed to the findings deduced from the data. Many gaps remain which can perhaps be filled in by future researchers.

The provision of design criteria such as recommended countrywide parking space ratio formulae or charts has purposely been avoided. University administrators may, at their discretion, make use in some manner of the best fit lines or "as is" formulae to determine, for instance, the amounts of parking required on their campus, but they have been amply warned of the dangers of uncertainty of data, distinction between "present situation" and design ideals, and inter-campus differences attendant on this practice. The present Author is in principle against transposing formulae from oversea or blanket recommendations which do not take into account the particular circumstances of each campus, especially its location with respect to place of residence of students, and the potential for a change of attitude to fees, alternative modes or student campus housing.

The purpose of this Thesis has been to aid administrators (who have clearly indicated their interest in this data) by

presenting for the first time a review of South African campus transport policies. Hopefully it has also highlighted, among other things, the need for more extensive study, the broad consequences of some actions such as building more residences and the reasons why the strict car discipline applied to students in say Rh(G) would cause a rumpus in Wits were it applied there. Among the things it does not say are what fees should be paid for parking, when parking garages should be built, or what the effects of mini-bus services would be.

The data collection phase of this Thesis took fourteen months – a brief analysis done after the event shows that this time could not have been reduced by very much. The critical path is clearly seen to be the sequence of letter-writing to the Correspondents that commenced with the original questionnaire and ended with the final request for clarification of some point or another. Even then, the Thesis had to go to printing before some final replies had been received, because handing-in deadlines were threatening.

The Author trusts that his Thesis will prove to be a significant contribution to university planning study in South Africa.

$ $ $ $

## APPENDIX A

### Terms of Reference

(Abstract of Department of Urban and Regional Planning instructions).

The objective of the thesis is an individual examination of some problem within the broad field of Urban and Regional Planning and its presentation as a contribution to knowledge within the field.

The subject should preferably be one in which (of several alternatives – Author) the candidate has a special interest or knowledge. It should include some original work, possibly in the collection of facts, but certainly in the interpretation of facts, whether new or old, and it should therefore add to the sum total of knowledge on the subject.

* * * *

The Author respectfully submits that this Thesis fulfils the above conditions.

## APPENDIX B

## List of References.


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(c) Personal communication, (dates between February 1970 and October 1971):-

At University of Cape Town.

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34. Beinart, Prof. Julian. Head of the Department of Urban and Regional Planning (and to July 1970, Director of University Planning Unit). And members of Department staff.

35. Elliott, Julian. Assistant Director of University Planning Unit (since July 1970, Director). And members of Unit staff.

36. Inskip, Prof. Donald. Deputy Principal. And members of Administrative Staff.

37. Robertson, D.C. Senior lecturer, Department of Civil Engineering.

At other Southern African universities.

38. Calderwood, Prof D.M. Head of Department of Building Science, Witwatersrand University.

39. Coetzer, J. Beplanningsbeampte, Die Universiteit van Pretoria.

40. Connell, Prof. P. Director of Physical Planning and Development, University of Natal, Durban.

41. De la Bat, R. Die Registrateur (Finansies en Bedryf), RandseAfrikaanse Universiteit , Johannesburg.

42. Forbes, C. Administrative officer, University of the Witwatersrand, Johannesburg.

43. Jordaan, L. Administrative Assistant, University of the Western Cape, Bellville.

44. Lap, A. Director of Works, University of Port Elizabeth.

45. Macquire, K. Registrar, University of Rhodesia.

46. Muirhead, F. Assistant Registrar, Rhodes University, Grahamstown.

47. Potgieter, J. Beplanningsadviseur, Universiteit van Stellenbosch.

48. Powell, H. Administrative Officer, University of the Witwatersrand, Johannesburg.

49. Schoeman, G. Registrateur (Akademies), Potchefstroomse Universiteit vir Christelike Hoër Onderwys.

50. Schwella, M. Assistente Registrateur, Die Universiteit van die Oranje-Vrystaat, Bloemfontein.

Non-university staff.

51. Brinsley, J. Director, Salisbury and District Publicity Association.

52. Erasmus, H. (Designation unknown), Department of National Education, Pretoria.

53. Richards, S. Acting Director, National Building Research Institute, Pretoria.

54. Sandrock, B. Architect to University of South Africa, Pretoria.

55. Speed, I. Engineer, City Engineer's Department, Cape Town.

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APPENDIX C

Glossary

In this Thesis, unless inconsistent with the context or clearly indicated to be otherwise,

"Campus population" means the total of full-time intramural students (see under) and full-time staff (see under) on the campus during an average term-time day.

"Correspondent" means the person at, or associated with, any of the universities mentioned in this Thesis, from whom the Author obtained information.

"Full-time intramural students" means students who spend the greater part of the period 8 a.m. to 1 p.m., five days a week during the normal term-time, attending lectures or practical periods on the campus. The relationship between the various categories of student can best be explained by the following table, based on definitions supplied by Pretoria University(39):-

| | Full-time | Part-time |
|---|---|---|
| Intramural | (1) Full-time student; lectures during day, 5 days a week. | (3) Less intensive version of (2), and writes examinations spreading degree course over longer period of time. |
| Extramural | (2) Full-time job during day; lectures during limited portion of day | (4) "Occasional" – usually students taking one or two |

| | |
|---|---|
| or in evening. Writes same exams as (1) | courses for interest's sake, without working towards a degree. Not including students of special short courses or summerschools etc. |

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"Modal split" means the allocation of trips to the alternative modes of transportation.

"Staff" means all persons in the employ of the university, White or Non-White, lecturing (the American term "faculty"), administrative, maintenance or any other category.

APPENDIX D

Questionnaire and covering letters

1. COVERING LETTER – ENGLISH VERSION.

P.O. Box 1347,

CAPE TOWN.

South Africa.

19th September, 1970.

The Registrar,
University of ...

Dear Sir,

In order to collect data for my Master's degree thesis on "Transportation aspects of South African Universities", a questionnaire, a copy of which is attached, has been compiled. I would be very grateful if you were to arrange for the completion of this questionnaire and its return to me at your convenience. It is realised that accurate measurements of some of the information requested may often not be available – in these cases the closest possible approximations would be appreciated.

If you have information in any form whatsoever (data sheets, reports, etc.) which could substitute for or supplement all or part of that sought by the questionnaire, I would be happy to pay the costs of reproduction, if necessary, in order to obtain it.

Should you wish, I would be pleased to make available to you findings of my study which may be of general interest. The Planning Unit at the University of Cape Town, with whom I am in close contact, has requested me to feed into their present planning programme all information I am able to glean.

Thanking you in anticipation,

Yours sincerely,

Kevin Wall.

2. COVERING LETTER – AFRIKAANS VERSION

Posbus 1347,

KAAPSTAD.

Suid-Afrika.

19 September 1970.

Die Registrateur,
Universiteit ...

Geagte Heer,

Ten einde inligting vir my magistertesis oor „Transportation aspects of South African Universities" te versamel, het ek 'n vraelys, 'n afskrif waarvan aangeheg word, opgestel. Ek sal dit hoog op prys stel as u my behulpsaam kan wees met die voltooing en terugsending van bogenoemde vraelys. Dit word besef dat akkurate gegewens van sommige van die inligting benodig dikwels nie beskikbaar mag wees nie. In hierdie geval sal die bes moontlike benaderings waardeer word.

As u beskik oor ander inligting van watter aard ook al (verslae, lyste van gegewens, ens.) wat dié in die vraelys verhang, geheel of gedeeltelik kan vervang of aanvul, sal ek graag die koste wil dra om afskrifte van sodanige inligting te bekom.

Indien u belangstel, sal ek u voorsien van enige bevindings in my studie wat van algemene nut mag wees.

Die Beplanningseenheid van die Universieit van Kaapstad, met wie ek in nou voeling is, het my versoek om alle gegewens wat ek versamel, in hulle huidige beplanningsprogram in te voer.

Ek vra verskoning vir die feit dat die vraelys nie in Afrikaans is nie – dit is slegs om administratiewe redes in Engels saamgestel.

By voorbaat dank,

Die uwe,

Kevin Wall.

## 3. THE QUESTIONNAIRE

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DEPARTMENT OF URBAN AND REGIONAL PLANNING

UNIVERSITY OF CAPE TOWN, SOUTH AFRICA.

Thesis Research Programme. Please complete and return to Mr. K.C. Wall, P.O. Box 1347, Cape Town, South Africa.

---

1.0 LOCATION.

1.1 Name of University: .....

1.2 Address: .....

1.3 Date: .....

1.4 How many campuses? (Ignore those contributing less than 5% of students): Please tick appropriate category.
One only .... One large, one small .... Two same size ....
Other (specify) .....
(If more than one campus, please write answers for each additional campus on separate sheets and tie them into the main questionnaire by the use of the key numbers.)

1.5 Year the University commenced occupation of the campus in question: .....

1.6 In what sort of area? (tick)
Commercial .... Industrial .... Residential ....
Undeveloped .... Other (specify) .....

1.7 Campus characteristic" (tick)
Compact .... Dispersed facilities ....

1.8 Distance of campus from city centre: Less than ½ mile .... 1 mile .... 2 miles .... 5 miles .... 10 miles ....
More than 10 miles ....
(If you have any brochure which, even incidentally, describes the University's location in more detail, please send me a copy.)

1.9 Could you give the approximate proportions of the campus land in the following categories? (State units morgen, acres or hectares):
Built .... Roads and sidewalks and maintenance areas ....
Sportsfields and gardens .... Undeveloped, but developable ....
Undeveloped and undevelopable .... TOTAL AREA .....

1.10 EITHER (a) What would the unit cost be at the present time of purchasing several acres of developable land adjoining

the campus? (assuming that some came up for sale) .....

OR (b) What is the average local government taxation valuation per acre of developed land in the vicinity of the campus? .....

2.0 POPULATION.

2.1 How is the University population made up? (Answers may be rounded off.) Note that "off-campus" residents will include some students in official University housing, if this is not all located on the main campus.

| | Campus residents | Living off-campus | Total |
|---|---|---|---|
| Full-time students | | | |
| Part-time students | | | |
| Academic and clerical staff | | | |
| Cleaners, messengers, etc. | | | |
| TOTAL | | | |
| F.T.E.'s | | | |

2.2 Approximate per cent postgraduate students: .....

2.3 Enrolment trends in past few years – average increase per cent per annum: .....

2.4 Approximate per cent of: male .... female .... students

3.0 TRANSPORT.

3.1 Opinion Survey.

3.1.1 How well would you say the campus was served in respect of:- (tick)

| | Over-provided | Adequate | Inadequate | Very Inadequate |
|---|---|---|---|---|
| Road network | | | | |
| Public transport | | | | |
| Parking facilities | | | | |

3.2 Modal Split.

3.2.1 What year was a modal split survey last done? .....
Was it for a peak time or for the whole day? (the latter would be more useful) .....
What were its results? (preferably express as number of persons):-

| Mode | Students | Staff | Total |
|---|---|---|---|
| Car | | | |
| Motorcycle | | | |
| Pedal cycle | | | |
| Bus | | | |
| Train | | | |
| Walk | | | |
| Resident on campus | | | |
| TOTAL | | | |

3.2.2 Of those recorded as coming by car, how many persons were

| | Students | Staff | Total |
|---|---|---|---|
| Car drivers | | | |
| Passengers in cars which parked on the campus | | | |
| Passengers in cars which didn't park on the campus | | | |
| TOTAL | | | |

3.2.3 How, if at all, do you think this split has altered since the above survey was carried out:- .....
.....

3.3 Public transport.

3.3.1 Is there a frequent railroad (surface or subway) service passing close to the campus and serving it: (tick)
Yes .... Infrequent .... None at all ....?

How far away is the nearest station from the centre of the campus: .... miles?

3.3.2 Is there a bus service directly onto the campus: (tick) Yes .... No ....? How many buses enter .... leave .... the campus every weekday? Where do the buses terminate: Central business district .... Railroad station .... Other (specify) .....? Do the buses during the peak time run: full .... ¾ full .... ½ full ....? Are fares charged: Yes .... No ....? Are they fully economic .... or subsidized....?

3.3.3 Is there a frequent bus service passing close to the campus and serving it: Yes .... Infrequent .... None at all ....? How far away from the centre of the campus is the nearest stop: ....?

3.4 Car transport.

3.4.1 Is there any through motor traffic across the campus (i.e. traffic which does not stop there, not even to drop someone off): Yes .... Negligible ....? What proportion is it of peak traffic: ¾ .... ½ .... ¼ .... 1/8 ....?

3.4.2 Are parking fees charged or discs issued to restrict the entry of or parking of cars belonging to any category of persons to or on the campus (state details, including charges)? Are there any other restrictions on car ownership or usage or parking availability (state). Please append copies of any traffic regulations applied to the campus population. .....
.....
.....
.....

3.4.3 Could you please attach some sort of map or aerial photograph of the campus showing roads, the major centres of student activity and kerbside and off-street parking areas with very approximate capacities. For off-street, distinguish between parking lots and parking structures (i.e. more than one level, roof top, basement – state which, and how many levels in all.)

3.4.4 Please mark on the above map any on-campus facilities used by large numbers of the general public (i.e. drawing more than 250 persons) at fairly frequent intervals (e.g. theatres, football stadia) and give an idea of the frequency, time of week and of academic year, and number of patrons.

(i) .....
(ii) .....
(iii) .....

3.4.5 Are there any other causes of substantial after 5 p.m. or weekend traffic onto the campus (state nature and magnitude)?
.....

3.4.6 Thus parking demand and supply at peak time, which is ..... a.m./p.m.:-

(Insert figures)

| | |
|---|---|
| Approx. No. spaces available | Students only |
| | Staff only |
| | Mixed |
| | Other |
| | Total |
| Less vacancies | Minus |
| Plus illegal parkers | Plus |
| Peak accumulation of cars on the campus | Equals |
| On public streets (estimate) | Plus |

3.4.7 How many cars are owned by: Students .... Staff ....? Do you have any comparable data for previous years (please append)?

3.5 Miscellaneous.

3.5.1 Would you say appreciable traffic congestion occurs on approaches to University: Yes .... No ....? State nature:
.....
.....
Within University: Yes .... No ....? State nature: .....
.....

3.5.2 How many traffic officers are permanently stationed on the campus: ....? Do they have the power to impose fines: Yes .... No ....?

3.5.3 Has deliberate staggering of starting times of lectures been resorted to yet (tick): Not at all .... On small scale .... On large scale ....? What is the starting time for first lecutre: .... a.m.?

3.5.4 Are there any other relevant transportation facts easily to hand? (Appendages to this questionnaire would be welcomed).

4.0 FUTURE.

What can you tell me of the University Administration's plans to control traffic on the campus in the next few years? Do they include any of the following possibilities:- (tick)

| | | Yes | No |
|---|---|---|---|
| 4.1 | Restriction of permission to use or own cars to a particular portion of the campus population (name them):- ..... ..... | | |
| 4.2 | Imposition of or increasing of parking fees | | |
| 4.3 | Construction of more parking lots | | |
| 4.4 | Provision of a single floor or part thereof of parking in new faculty buildings | | |
| 4.5 | Erection of multilevel parking structure(s) | | |
| 4.6 | Deliberate restriction of growth of academic activity on the campus | | |
| 4.7 | Appointment of more traffic officers | | |
| 4.8 | Alteration of road layout | | |
| 4.9 | Staggering starting times of lectures on a larger scale | | |
| 4.10 | Undertaking of traffic study in the near future | | |

4.11 Other (specify): .....

.....

5.0 OTHER REFERENCES.

Would you suggest that I could with benefit contact your consulting engineers or architects or any other authority for further information on or background to the above topics:
Yes .... No ....?
Please name the consultants/authority: .....

.....

4. FOLLOW-UP LETTER – ENGLISH VERSION

P.O. Box 1347,

CAPE TOWN.

9th November 1970.

The Registrar,

University of ...

Dear Sir,

Some while ago I sent you a questionnaire on University traffic matters. As I have received no reply, I fear it may have been lost in the post – accordingly I enclose herewith another copy.

Yours sincerely,

Kevin Wall.

5. FOLLOW-UP LETTER – AFRIKAANS VERSION

Posbus 1347,

KAAPSTAD.

9de November 1970.

Die Registrateur,

Universiteit ...

Geagte Heer,

'n Paar weke gelede het ek aan u 'n vraelys oor universiteitse verkeersprobleme gestuur. Omdat ek geen antwoord ontvang het, vrees ek dat hy miskien in die pos verloor is – gevolglik heg ek hieraan nog 'n afskrif.

Die uwe,

Kevin Wall.

APPENDIX E

Description of universities.

1. UNIVERSITY OF CAPE TOWN.

Postal Address: Private Bag,
Rondebosch,
Cape Town.

Principal correspondent: The Director of the Planning Unit, J. Elliott B.Arch.

Historical note: The University came into being in April, 1918, grown out of the South African College, an institution started as long ago as 1829. It was not until the centenary year however that the move was made from the old campus close to the central city to the magnificent new site on the slopes of Devil's Peak, formerly a part of Cecil Rhodes' estate. The University of 1918 had some 600 students. The original main buildings on the present site were planned for a student enrollment of between 2 000 and 3 000. Present enrollment exceeds 7 000, a very small percentage of whom are Non-Whites.

In 1969 the University authorities appointed a full-time Planning Unit to investigate guidelines for future development. Staff has averaged six in number during this time. Their report is scheduled to be published at the end of 1971, and it is anticipated that a smaller staff will be retained after this period for continuous review of the situation.

Location: The main campus of the University, known as the Groote Schuur campus, is split in two by the De Waal Drive freeway. In

this Thesis, attention has been focussed on the "Upper" portion of this, i.e. that above the freeway. Below the freeway, extending deep into the old-established residential suburb of Rondebosch, is a roughly equal area of land carrying sports facilities, residences and the administrative component.

About half a mile away, below the Groote Schuur Hospital, may be found the Medical School. The original S.A.C. city site, now expanded, houses Fine Art, Law and most of the part-time component. More sportsfields can be found at Pinelands, and the University has a half-share with Stellenbosch in the Nuclear Research Institute sixteen miles out of town.

Transport links: The lower portion of the Groote Schuur campus is well served by bus and rail, but students then face a climb 2/3 mile long and 300 feet in altitude to the upper campus. Only a token bus service runs up the hill.

The De Waal Drive freeway is one of the major routes into the city, and the campus can be reached from all parts of the urban area on high-standard freeways. Unfortunately, the Drive in the vicinity of the University is overloaded at peak-hour even out of term time, and jams are a regular feature.

University policy is to increase as fast as finances allow the presently small proportion of students in official housing.

A comprehensive transportation study was made in 1970.

Parking: Presently over-extended; practically every available open strip of unmade ground is occupied at peak parking demand time.

Conclusion: The Groote Schuur campus is nearing the time when the present almost unrestricted provision of parking space on surface lots must give way either to more intensive use of land, or to some deliberate limitation on the number of cars requiring parking.

2. UNIVERSITEIT VAN STELLENBOSCH.

(University of Stellenbosch)

Postal Address: University Office,

Stellenbosch.

Correspondent: The Planning Adviser, J.E. Potgieter M.Com., M.Sc.

Historical note: One of the first two universities in South Africa to receive their charters (Cape Town being the other) it grew out of the former Victoria College. The original buildings erected on the site to which the move was made in that year of foundation 1918 are still occupied, and adjacent street blocks have been acquired onto which the University has expanded.

With nearly 7 000 students the University is the fourth biggest in South Africa. Non-White students are not admitted.

The University employs a small specialized Planning Staff, led by a Planning Adviser.

Location: One-quarter of the White population of the Stellenbosch urban area is a student at or employee of the University, thus qualifying Stellenbosch as the closest local equivalent of the overseas "university town". It also has the highest residential component, higher even than Rhodes. Two-thirds of University personnel live on the campus, which occupies several large blocks close to the centre of this agricultural town. The Coetzenburg sports fields are nearby and extend to the outskirts of the urban area.

There is also a small Medical School in Bellville near the Karl Bremer Hospital (The School is shortly to move to the new Tiervlei Hospital). The University shares with Cape Town the Nuclear Research Institute on the Cape Flats.

Transport links: Public transport services are almost non-existent. For the majority of students, who live in Stellenbosch, this is not much of a problem, but there are substantial numbers of car-commuters from Greater Cape Town, 15 miles or more away.

The possibility of undertaking a traffic study is being considered.

Parking: Large off-street parking areas are set aside for University use, and parking is also permitted on the public streets crossing the campus, so the present shortage is not too grievous.

Strict rules on car ownership operate – no-one in first or second years may, except in special circumstances, own or operate a car anywhere in Stellenbosch (not merely within the confines of the campus). This represents unquestionably the most severe regulation exercised by any South African university on its population.

Conclusion: Stellenbosch University is able no doubt to impose such strict control because of the small size of the urban area and large residential proportion – hence students are not as inconvenienced as they would be at, say, Cape Town. Present information points towards a reinforcement of these rules, rather than relaxation.

3. UNIVERSITY OF PORT ELIZABETH.

Postal Address: P.O. Box 1600,
Port Elizabeth.

Correspondent: Director of Works, A. Lap Pr.Eng, B.Sc(Eng).

Historical note: The University was established in terms of an Act of Parliament in 1964 as the only parallel-medium attending university in the country. First lectures were held in 1965 to 300 students; this number presently exceeds 1 000.

Location: The University's teaching activities were initially conducted in the existing buildings of the Port Elizabeth division of Rhodes University, in a residential area about ½ mile from the centre of the city. With the purchase of adjoining property, including a private hotel for use as a residence, a campus of ten acres has been assembled – still the second smallest (after RAU) in the country.

This campus is to be sold when the move is made to the 2 000 acre Driftsands site, much of which is a gift from the Municipality. This is more than 4 miles from the present site, well beyond any existing urban development, and will accommodate anticipated growth for a far longer period than any other University has planned for.

Planning staff and consultants are presently busily at work on the form of the new campus. It will include a high proportion (nearly half) of residents.

Transport links: The present (Bird Street) campus is one of the select few in South Africa to have a good bus service nearby, and this is well patronised by students. The new campus is by contrast

pretty remote, but it is envisaged that a high standard freeway will eventually link it with the urban area.

Parking: On the present campus there are only 12 spaces, so nearly everyone parks on the public streets. Parking at the new campus will be on an adequate scale from the outset.

Conclusion: The Bird Street campus is a temporary one, and its disadvantages will not be borne for long. The new Driftsands campus, which will see its first classes in 1972, is being planned on a scale unprecedented in South Africa and it is to be hoped that measures proposed to cater for movement from the city to the campus, and within the campus, will prove themselves in practice.

4. RHODES UNIVERSITY.

Postal Address: P.O. Box 94,
Grahamstown.

Correspondent: Assistant Registrar (Estate and Buildings), F.G. Muirhead OBE, B.Sc(Econ).

Historical note: Rhodes University College, as it was then, was established on its present site in 1905 – university status followed only in 1949. Two thousand students are now registered.

There are no specialist planning staff at the University. Especially, "... the aspect of transportation is a subject which receives little attention at Rhodes"(46).

Location: Situated in the small historic city of Grahamstown, 80 miles east of Port Elizabeth. Maybe not quite in number, but certainly in atmosphere, this is the closest to the English "university town".

Rhodes is a small university and somewhat unique in that it is two-thirds residential. The buildings are all within a few minutes' walk of each other, and all students and most of the staff live within a radius of one mile from the Clock Tower. Only Stellenbosch has a higher proportion (very slightly) of residents.

Transport and parking: Motor vehicles, because of the compactness of Grahamstown, are not used to any great extent. Public streets traverse the campus roads, but traffic is light. There is no public bus service in Grahamstown. Strict regulations apply to discourage student car ownership.

Conclusion: "There are few universities in the world, and none in South Africa, where the university population is so concentrated. Little time or money is wated in getting from place to place"(46).

5. DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT.

(The University of the Orange Free State)

Postal Address: P.O. Box 339,

Bloemfontein.

Correspondent: The Assistant Registrar (Property, Equipment and Stock), M.C. Schwella B.Com.

Historical note: Grey University College was formed in 1907 as the higher portion of the division of Grey College into pre- and post-school, and in 1909 it moved to the present site. The name was changed in 1935 to The University College of the Orange Free State, and in 1949 this College was reconstituted as a University in its own right.

There are no Non-Whites among the more than four thousand students. The University does not employ specialized planning staff.

Location: Situated in Bloemfontein, the judicial capital of South Africa. The only campus is two miles out of town, next to the Tempe military area and a residential suburb.

Transport links: There is a good bus service to the campus, and the city itself is not so large that difficulty is experienced in gaining access to any part but the centre of it by car. The campus is not cut by public roads.

UOVS has, after Stellenbosch and Rhodes, the third highest proportion of residential to commuting students in the country.

No traffic studies have been undertaken.

Parking: This University manages, by a combination of high residential component, good public transport and restrictions on

ownership, to keep demand down to a fairly low level.

Conclusion: The campus is at the same level of development as Witwatersrand say twenty years ago, and it is thus to be expected that traffic problems will, within the foreseeable future, grow to parallel those of the larger University.

6. UNIVERSITY OF NATAL.

Postal Address: King George V Avenue,
Durban.

Correspondent: Director of Physical Planning and Development, Professor P.H. Connell B.Arch.

Historical note: Formerly the Natal University College, founded in Pietermaritzburg in 1910 with a branch established in Durban in 1932, an Act of Parliament of 1949 incorporated it as the University of Natal. Both the constituent campuses of the University are still centred on their original sites, but it is the newer Durban branch which has now grown to become more than twice the size of its Pietermaritzburg parent. Durban displays the fastest growth rate of the older South African Universities, viz. a steady 11% per annum for the last few years. Between them the two campuses now account for six-and-a-half thousand students.

A Director of Development and a small planning staff guide the overall growth of the campuses in their care.

Location: The Pietermaritzburg campus is in the well-established residential suburb of Scottsville, two miles from the city centre. The main buildings of the Durban campus are situated on a ridge overlooking the city from which the distinctive dome of Howard College is clearly visible, although 3 miles from the centre. The front portion of the campus is bordered by well-established White housing, while that portion of the campus behind the ridge extends through to undeveloped areas formerly in Non-White ownership.

Transport links: Both campuses are "inadequately" served by public transport. The nearest public buses are too far away to

be much use and the small number of buses running onto the campus do not account for many of the commuters.

Durban campus has the misfortune to be sited astride one of the main North-South collector roads, viz. King George V Avenue, and half of the peak traffic is said to have no business at the University. Pietermaritzburg does not have this particular problem.

The campuses are in the middle range with respect to proportion of students in residence.

Parking: Both universities are very short of formal parking space, and are considering relieving this by the imposition of restrictions against ownership (not at present operating) and the provision of more off-street areas. The streets in and around the Durban campus are especially heavily parked, but there is a big area behind the ridge currently being developed for parking.

Conclusion: Some arrangement must be reached with the City authorities to reduce the nuisance value to the campus of King George V Avenue. In all other respects, the two campuses suffer from the same sad story of traffic and parking problems found to a greater or lesser degree at all the urban universities in this country.

7. DIE UNIVERSITEIT VAN PRETORIA.

(The University of Pretoria)

Postal Address: Hillcrest,

Pretoria.

Correspondent: Planning Officer, J.C. Coetzer, B.A.

Historical note: Its predecessor, the Transvaal University College, was another of the Colleges incorporated within the University of South Africa in 1916, changing to its present status and name in 1930. It is now the largest of the South African universities at which attendance is required, with something like 12 000 students all told. However, in recent years it has been displaying a low growth rate relative to the other universities.

There is a small permanent Planning Department; it would not seem that it is composed of specialist planners as such.

Non-White students are not admitted.

Location: The main campus is composed partly of the original 1910 site and partly of portions of the residential suburb of Hillcrest acquired within the last few years. Rather more than a mile away to the east, the men's residential campus has been constructed on a portion of the experimental farm and sports area. In the central business district of Pretoria are a number of properties bought in 1963, to serve as the campus for part-time students. Finally, the Medical School may be found in the north of the city, next to the H.F. Verwoerd (Pretoria General) Hospital.

Transport links: One of the problems associated with the piecemeal acquisition of the main campus is the presence of several public streets, in particular Roper Street, separating the main

teaching facilities from the women's residences and parking area. A consultant has recently reported favourably on the possibility of closing these streets to through-traffic.

One boundary of the main campus is the already over-crowded major arterial Lynwood Road – road access from other parts of the city (at present rather indirect) and from the eastern suburbs will be improved when the full system of proposed freeways is in operation. A railway station is nearby, but few persons appear to make use of the services. Buses are frequent, convenient for some commuters, and are well patronised.

The University favours official student housing and a number of large attractive residences have been constructed in recent years.

Parking: Little campus parking space is provided, and the ownership of cars by junior residents is discouraged. At the main campus, most parking takes place on the ample verges of the surrounding public streets.

Conclusion: The main campus has its fair share of traffic and parking problems; it appears to be heading towards a policy of greater restriction of the use of cars, and this process would be hastened if the generous provision of verge parking were removed by proposed widenings of public streets.

8. POTCHEFSTROOMSE UNIVERSITEIT VIR CHRISTELIKE HOËR ONDERWYS.

(Potchefstroom University for Christian Higher Education)

Postal Address: Potchefstroom.

Correspondent: Registrar (Academic), G.P. Schoeman B.A., B.Com.

Historical note: This University grew out of the Gereformeerde Kerk Theological School, established in Potchefstroom in 1905. Its lecture scope broadened over the years and in 1921 it became another constituent college of UNISA, until in 1951 it was incorporated as a separate institution under its present title.

The University maintains a Department of Development with a Director and a small staff.

Location: In a residential suburb, two miles from the town centre. Nearly two-thirds of the University population reside on the campus.

Transport links: Well served by bus services near the campus. Although a railway line bounds University property on one side, there are no local passenger train services of any significance.

The town itself is not large enough for traffic congestion to cause concern, and vehicular access to the vicinity of the campus is not a problem.

Parking: Described in the questionnaire reply as "inadequate", but details of the nature of their difficulty are not known to the present Author.

Conclusion: Like Stellenbosch, a strict control over student car ownership (residents may not keep cars on the campus) combined with high residential proportion and small urban area size reduces the

amount and distance of commuter travel, and consequent traffic problems faced by the University authorities.

9. RANDSE AFRIKAANSE UNIVERSITEIT.

(Rand Afrikaans University)

Postal Address: P.O. Box 524,

Johannesburg.

Correspondent: The Registrar (Finance), R.S. de la Bat B.Sc., B.Com., MBA.

Historical note: This University wa founded in 1968 after widespread campaigning for an Afrikaans-medium university in the Johannesburg area finally gained official favour. As a temporary measure, the old brewery in Braamfontein not more than ¼ mile from Witwatersrand University was leased. Meantime the Country Club and some additional land at Auckland Park were taken over for the eventual permanent home of the University. Some residences on the future campus are already occupied, but the general move is not to take place until 1973. The growth rate of RAU is the highest in South Africa, viz. 28% per annum over the last two years. Eventual student enrollment at the new University is expected to be 15 - 20 000.

At present, a large planning staff, backed by consultants, is engaged in the detailed planning of the new campus.

Location: When the lease on the minute campus (seven acres, the smallest in South Africa) expires, the brewery owners plan a massive commercial development for the site to take advantage of the recent expansion of the city business district to include the Braamfontein suburb. The land is very valuable, being marketable at R2 million an acre.

Transport links: With such a prime location on a busy commercial street, the campus has the convenience of a frequent bus service.

Motor vehicle access is, as expected, difficult in the extreme.

Parking: On-campus parking is to all intents and purposes non-existent, and cars compete with office workers for kerbside space on public streets.

Conclusion: The present campus is a makeshift affair, and the congestion can be tolerated for the short remaining period of tenure. The planners claim to have made adequate provision for easy approach to and movement within the new campus.

10. UNIVERSITY OF THE WITWATERSRAND.

Postal Address: Jan Smuts Avenue,
Johannesburg.

Correspondent: Administrative Officer, C.P. Forbes B.A.

Historical note: In 1921 the University College, Johannesburg, was incorporated as the University of the Witwatersrand and moved to its present site in 1923. It now has a student enrollment of nine thousand, a very small proportion of whom are Non-Whites. Although not the largest university in South Africa, Wits has a greater number of part-time students than any other.

Planning is done by non-specialist staff within the administrative component of the University.

Location: The main campus is situated at Milner Park near to the Agricultural Showgrounds, from which it is separated by the North-South Motorway and a large parking area used by students when it is not needed for exhibitions.

The Medical School is situated on a site near the Johannesburg General Hospital (about 1½ miles from the main campus). The Graduate School of Business Administration and one of the halls of residence are also located off the main campus, in Parktown. The University maintains an experimental farm at Frankenwald off the Pretoria road just at the fringe of the urban area.

Transport links: Public transport links are described by the Correspondent as "very inadequate". However, road transport to the campus is well catered for by the Motorway and by Jan Smuts Avenue, although the latter experiences serious peak congestion. There is no occasion for traffic without any business there to

traverse the campus. No comprehensive traffic studies have been made.

The present small proportion of residential students is not likely to be increased.

Parking: Hopelessly inadequate, the situation has reached such critical proportions with competition between university and commercial parkers in the streets to the south, that the City Engineer has insisted on the provision of extensive parking in a building the construction of which has recently been commenced.

The imposition of substantial parking fees isalso under consideration.

Conclusion: This campus is probably that with the most severe parking problems of any in South Africa, and it is to their credit that they are employing the most sophisticated control methods yet seen locally.

11. UNIVERSITY OF THE WESTERN CAPE.

Postal Address: Private Bag,
Bellville.

Correspondent: Administrative Assistant, L. Jordaan B.A.Hons.

Historical note: The University College of the Western Cape was established in 1960 in order to improve the opportunities for Coloured (mixed racial descent) students to obtain higher education. In 1970, by which time there were nearly a thousand students, the institution became a full University and was empowered to conduct its degree examinations independent of UNISA. At present there are no medical or engineering faculties and Coloured students in these categories are usually allowed to attend Cape Town.

Planning is done by the administrative staff.

Location: During the first two years of its existence the College was housed in temporary premises, but during 1962 the move was made to the new buildings situated between Bellville and the Malan Airport. At present there is only a men's residence, but from 1972 the women are to be similarly catered for.

Transport links: Train and bus services are good, although rather too distant from the campus, and thus commuters try, where possible, to come by car.

Parking: Ample. Parking discs are freely handed out. This campus, and Rhodes, are the only ones where staff cars outnumber student.

Conclusion: Financial circumstances probably account for the small proportion of students who are car owners, and in turn for

the exceptionally low parking demand at a University whose public transport services are not that hot and which has a rather low ratio of campus residents.

12. UNIVERSITY OF RHODESIA.

Postal Address: P.O. Box MP.167,
Mount Pleasant,
Salisbury.

Correspondent: The Registrar, K.V. Macquire OBE, M.A.

Historical note: The University College of Rhodesia, which became the University of Rhodesia on 1st January 1971, was incorporated by Royal Charter in 1955 as the University College of Rhodesia and Nyasaland. The foundation stone of the first building on the new campus was laid in 1953 and by 1957 all faculties had vacated the original temporary premises in town. At that time there were only 70 students. In 1970, by which time full-time students numbered over 900, the formal associations with the Universities of London and Birmingham were terminated, and the University of Rhodesia prepared to award the first degrees in its own right. Nearly half the students are Non-Whites. The University employs no specialized planning staff, and no traffic studies have been undertaken.

Location: The main campus of the University is a block of 480 acres in the residential suburb of Mount Pleasant, Salisbury (pop. 400 000 all races, 110 000 of them being Whites).

In addition it possesses a research farm in the Mazoe Valley and a large slice of virgin country on the shores of Lake Kariba.

Transport links: There is no public transport of any kind to the city (centre 3½ miles away) or its surroundings. However, the University operates its own buses to cater for about 10% of the

campus workers and students. The campus is well situated with respect to Salisbury's arterial road system, but is not cut by any public roads and there is negligible through-traffic that has no business on the campus. No congestion is experienced on or near the entrances to or exits from the campus at any time.

University policy is to house a large a number of students as possible in residence. At present more persons (students and staff) live on the campus than need to commute to it.

Parking: With this enormous area of land and small number of students (so many of them in residence anyway and thus presumably having less incentive to own cars) it could be expected that there would be no parking problems. This is indeed the case – the Correspondent admits that parking facilities are "over-provided" (Rhodesia and Western Cape are the only Universities in the sub-continent in this fortunate category!)

Conclusion: Rhodesia has no difficulty in handling its traffic although it is rather isolated from public transport.

13. UNIVERSITY OF SOUTH AFRICA.

Postal Address: P.O. Box 392,
Pretoria.

Correspondent: The University Architect, Brian Sandrock B.Arch; (187 Esselen Street, Sunnyside, Pretoria).

Historical note: By an Act of 1916 the University of South Africa succeeded the University of the Cape of Good Hope as the principal supervising and examining body to a number of constituent University Colleges in the country. Since that date the original Colleges have all become Universities in their own right, and have been replaced by the five Non-White University Colleges, viz. Fort Hare (Alice), Western Cape (Bellville), Durban, Zululand (Empangeni) and North (near Pietersburg).

In 1946 the University commenced providing tuition to external students by correspondence. This has now become its main activity, with over 20 000 students enrolled. Present staff number about 900.

The University maintains a large Department of Development which is however more strongly staffed by persons with administrative qualifications than planners as such.

Location: The University has outgrown its scattered central Pretoria premises and is shortly to move to a new headquarters in the residential suburb of Muckleneuck.

Transport links: The new site is to have a frequent bus and mini-bus service knitting it in to the urban area. It is fairly well situated with respect to the arterial road system.

There are, as already implied, no attending students, and no housing of any consequence is provided for staff.

Parking: Present parking is grossly inadequate, but that provided on the new site is anticipated to be sufficient to start with – it is hoped that the bus services referred to will prevent the future situation getting out of hand.

Conclusion: While it must be admitted that UNISA, once it has moved to the new site, will not have problems of the same order of magnitude as other campuses, the measures being planned to cope with any difficulties of movement to the campus are imaginative.

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