SUBURBAN BUSINESS CENTRES IN FOUR AUSTRALIAN CITIES
This thesis incorporates original research carried out by the author during the tenure of a Commonwealth Research Scholarship in the Department of Geography, Research School of Pacific Studies of the Australian National University, Canberra, between August 1962 and April 1965.

C. D. Morley
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Finally, this thesis may be dedicated, in a very real sense, to Mrs Edna Everidge* of Humoresque Street, Moonee Ponds, Melbourne, and all those whom she represents. It is concerned with their world, and measures their activities within it.

* Created by Barry Humphries.
INTRODUCTION

The aim of this study is to examine the functional structure of nucleated clusters of central business types which are located within the suburban areas of metropolitan cities. In particular it is concerned with a classification of these suburban business districts, their functional interdependence, and their spatial relationships with regard to intra-metropolitan aggregate movement systems. Within these terms, four Australian metropolitan cities - Sydney, Melbourne, Brisbane and Adelaide - have been examined in Part I, with the aim of establishing a functional hierarchy of suburban business centres. Part II of the thesis is concerned with the detailed examination of the day-to-day operational levels of a series of centres, selected from each city, with the aim of testing the general classification and metropolitan patterns outlined in Part I.

In this instance the term 'suburb' refers to all metropolitan residential areas which support major business foci, other than the Central Business District. Hence, in accordance with normal Australian usage, an 'inner suburb' will be a section of the older, high density residential area immediately adjacent to, or included in, the central city. The 'central city' in this study refers to the Cities of Sydney, Melbourne and Adelaide; that is the local government area in which the metropolitan core is located. 1

---

1. Local Government Areas in Brisbane were amalgamated in 1925 into the City of Brisbane, which included the entire built-up area together with rural fringe districts.
All terms differ therefore, from North American usage which relates to Standard Metropolitan Statistical Areas, the largest city within this area being termed the Central City. Further, a 'suburb' is normally regarded as 'an urban place ... outside the corporate limits of a large city, but either adjacent thereto or near enough to be closely integrated into the economic life of the central city and within commuting distance of it'.

In this study a suburban business district is any commercial focus which operates as a separate and distinct central place, outside the limits of the Central Business District. Analysis of the latter does not form part of this work and, with certain noted exceptions, the boundary definitions for each city are taken to be coincident with those outlined by Scott.

The primary theoretical base comes from central place theory. Suburban business centres are studied as a particular form of central place. It is postulated that there exists a direct relationship between a business centre's functional structure, measured in terms of the provision of a range of central functions, and the centrality of that centre, measured by its trade area or sphere of influence. It is further suggested that suburban business centres fall into general class orders, each with a distinct functional role which may be related in a hierarchical

manner. In addition, concepts drawn from retail theory and market research, are utilised in the formulation of a model from which may be derived the outlines of internal market areas within metropolitan cities.

An examination of the internal form and structure of the mid-twentieth century metropolitan city presents a bewildering mosaic of apparently unique spatial patterns; a fact emphasised by the high residential densities and flexibility of intra-city movement. No one suburban segment can be exactly compared with any other; there are, therefore, exceptions to every generalisation, and valid objections to every typology relating to the internal structure of metropolitan cities. The student of urban areas may react in two ways to this situation. One is to acknowledge the complexity, and reduce the unit of study. In the present case this might mean the examination of an individual business centre, or perhaps the operation of one particular central function within a series of centres. This would allow detailed analysis, and the presentation of a precise and meaningful summary of the functional role and operation of that centre or business function. However, without the repetition of such depth studies in a wide variety of conditions, it would be impossible to utilise the information to answer questions regarding overall metropolitan problems.

The other response to the micro-complexity of the internal structure of the metropolitan city is to compromise, and to formulate general concepts relating to particular aspects of the city based on the comparison of as wide a selection of examples as possible, drawn
from as many cities as possible. Hence, the approach in this study; the drawing of a basic framework relating to four cities, and the detailed examination of a range of business centres as a means of illuminating that framework. The widening of the scope to include four cities, each with different forms and backgrounds, allows the analysis of a wider range of conditions, both at the metropolitan and local levels.

The application of identical techniques of study to four cities provides a sound basis for legitimate comparison. This approach is supported in a recent methodological work.

Urban geographers have been more concerned with individual cities than with a comparative treatment of two or more cities. Since different categories of phenomena have been applied at different degrees of generalisation, depending on the individuals making the study and the conditions in the urban areas studied, comparisons have been difficult. Yet the development of the broader concepts of city patterns and functions demand comparative analysis. The need is for the formulation of basic categories and procedures applied to many cities.4

Within a metropolitan environment virtually any enumeration may be criticised in terms of inconsistency of internal form. Ecological boundaries in urban areas are in certain instances related to zones of transition, but in other cases they are abrupt and complete. Most information is presented in terms of internal local government areas. Its use is therefore likely to conceal both forms of intra-urban boundary, and even smaller enumeration units are unlikely to distinguish

the form and significance of small, but important, nodal clusters—suburban business centres. As a result of this situation the primary source of data in this thesis relates to field observation.

The geographer . . . is becoming less and less content with statistics compiled for large enumeration areas, and is turning more and more to direct field observation for the precise location of enumeration items.

Basically the study is concerned with the conventional approach of the urban geographer to the nuclear clusters of central functions which develop within urban areas as a result of the competition for sites at nodal locations. However, its aims extend beyond an attempt to record and classify the morphology and functional form of suburban central places. More particularly it attempts to visualise such places as operating units and to distinguish between them in terms of the attitudes and use patterns of metropolitan residents. Such an approach has necessitated the application of a wide range of measuring devices ranging from land use surveys, to the structured observation of activity within business centres, and the interviewing of samples of customers engaged on shopping trips. In this way the study has extended into the fields of urban sociology and market research. In particular, the operation of suburban central places as foci of retail trading has resulted in the study concentrating, in many instances, on retailing activities. In this way the work has tended to fulfil many of the aims of marketing geography.

5. Ibid., p 243.
Marketing geography has in many senses come to be regarded as the practical application of the concepts of urban geography. On its face value, Applebaum's definition of marketing geography as being 'concerned with the delimitation and measurement of markets and with the channels of distribution through which goods move from producer to consumer',\(^6\) is a fair assessment of this study. However, the predominant emphasis in this expanding segment of the subject is on the consideration of problems which 'cannot be studied without the private information and facilities possessed by business';\(^7\) it follows that 'the marketing geographer should either work for business full time or should seek to conduct research for business on a part-time consultant basis',\(^8\) and aim at the presentation of 'specific recommendations for business action'.\(^9\)

Marketing geography therefore is in the full meaning of the term - applied geography. That is, not so much in Hartshorne's words that the 'geographer as a responsible member of society has an obligation to make his knowledge useful to society',\(^10\) which suggests the possibility of potential or chance significance, but rather that the limits of a study

---

6. Ibid., p 246.
10. R. Hartshorne, _Perspective on the Nature of Geography_, Chicago, p 166.
be defined exactly by the limits of the problem in hand. Further, that the problem be posed by decision-making laymen, who require prediction and recommendation regarding aspects of business or planning decisions. The conclusions drawn from such studies must, therefore, compromise with the variations and anomalies of reality in a manner surprisingly similar to that of the theoretical approach.

In this sense this study is not within the field of marketing geography. It is concerned with much of the material and many of the working concepts of the marketing geographer, but its motivation is general and academic. There is an attempt to formulate the theoretical base of suburban central place patterns, and the examination of the meaning and validity of that base constitutes the primary frame of the study. Further, while useful contacts have been made with business and planning communities, in no sense have 'private information and facilities' been sought or obtained. While such information is essential for the applied geographer, the restrictions put on its publication markedly reduce its value in the academic field. Examination of business operations have been carried out in this study by means of direct observation and comparison - the conclusions to be drawn from such methods are more important than the information derived.

Metropolitan Retailing Trends in Australia

Part I of this thesis has three aims: the formulation of a conceptual framework; the establishment of working principles and classifications; and the examination of the spatial patterns of business
centres within the four cities. Each of these aims must be examined in the light of important changes which are taking place in the form and distribution of retail sales within Australian metropolitan cities. This introductory outline to the changing patterns of internal functional form will concentrate on four features: retail decentralisation and the central business district; department and chain store expansion; changing merchandising methods; and the impact of these changes on existing suburban business centres. The facts relating to the decentralisation of retail trade in Australian metropolitan cities are not in dispute. The significance of the various factors responsible for this condition may be subjected to exhaustive examination, but in terms of future developments - the all important aspect to the business interests concerned - the chief question appears to be: is the CBD retail core 'changing rather than decaying'? 11

The evolution of the Central Business District, and its close relationship with the growth of mass public transport, has been discussed in many places. 12 The gradual fall in the accessibility of the CBD to an increasing proportion of the metropolitan population living in suburbs remote from it; its dependence on inadequate public transport links during a period of rising private car ownership; changing shopping habits

12. B.J.L. Berry & A. Pred, Central Place Studies, Regional Science Research Institute, 1961. A general bibliography, see Section VI. The Internal Business Structure of the City, pp 65-72.
which place a premium on speed rather than selection, and standardised products rather than personal style; together with the general congestion and functional obsolescence within the CBD itself, are similarly well documented and will not be enlarged upon here. Undeniably the result has been a decline in the use made of the CBD retail core, and an increase in the use made of retail outlets in the remainder of the metropolitan area. Such tendencies in metropolitan retail trade figures may relate to decentralisation of population, and therefore of purchasing power, termed 'locational decentralisation'; or to 'a real change in the mode of orientation of the marketing establishments or in consumer buying habits', termed 'institutional decentralisation'.

Data relating to the Retail Census of 1956-57 and 1961-62 allow a measure of the extent to which the different forms of decentralisation exist in the four cities under study. Table 1 summarises the significance of CBD retailing in terms of Inner City statistical areas. It points out the expected distinction related to overall population numbers; Sydney (1961 population 2,183,388), Melbourne (1,911,895), Brisbane (621,550), and Adelaide (587,957). The overall dominance of the Inner City areas in the smaller cities is confirmed by Table 2, but even here the decline, in real terms, of per capita expenditure, is a sign that central city sales are not keeping pace with population growth. Marked declines in Inner City per capita sales are recorded in

Sydney and Melbourne, with the suburban increase in Sydney contrasting with a surprising stagnation in Melbourne.

Table 1
Proportion of the Inner City Sales Made in the Inner City Areas of Sydney, Melbourne, Brisbane and Adelaide, 1956-7 & 1961-2

<table>
<thead>
<tr>
<th></th>
<th>Food</th>
<th>Clothing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956-7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>7.7%</td>
<td>59.0%</td>
<td>30.4%</td>
</tr>
<tr>
<td>Melbourne</td>
<td>5.6</td>
<td>57.8</td>
<td>29.5</td>
</tr>
<tr>
<td>Brisbane</td>
<td>17.8</td>
<td>87.0</td>
<td>48.4</td>
</tr>
<tr>
<td>Adelaide</td>
<td>16.9</td>
<td>81.3</td>
<td>49.5</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>6.4%</td>
<td>48.1%</td>
<td>24.2%</td>
</tr>
<tr>
<td>Melbourne</td>
<td>4.2</td>
<td>51.2</td>
<td>30.0</td>
</tr>
<tr>
<td>Brisbane</td>
<td>14.9</td>
<td>82.6</td>
<td>43.0</td>
</tr>
<tr>
<td>Adelaide</td>
<td>16.1</td>
<td>80.9</td>
<td>46.3</td>
</tr>
</tbody>
</table>

Source: Retail Census Volumes, 1956-7 and 1961-2.

Table 2
Inner City and Remainder of Metropolitan Sales Expressed as a Per Capita Figure Relating to Total Metropolitan Population

<table>
<thead>
<tr>
<th></th>
<th>1956-57</th>
<th>1961-62</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inner</td>
<td>Remaind.</td>
</tr>
<tr>
<td></td>
<td>(Per Capita Sales)*</td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>£79.7</td>
<td>£182.2</td>
</tr>
<tr>
<td>Melbourne</td>
<td>£77.3</td>
<td>£185.2</td>
</tr>
<tr>
<td>Brisbane</td>
<td>£109.7</td>
<td>£116.9</td>
</tr>
<tr>
<td>Adelaide</td>
<td>£120.3</td>
<td>£122.6</td>
</tr>
</tbody>
</table>

*1961-62 totals in terms of the 1956-57 £.
An additional measure of market trends during the inter-censal period may be obtained by calculating the proportion of the increase in metropolitan sales of comparison goods (essentially clothing and furnishings) which took place in business centres outside the CBD. As sales of such items make up between 60% and 70% of total CBD sales, the extent of institutional decentralisation may be obtained from this figure. In Sydney, 96.3% of the increase in metropolitan comparison sales were made outside the CBD; in Melbourne the proportion was 86.2%. In both cities therefore a high degree of institutional decentralisation had taken place during the period. By contrast Brisbane (51.4%), and particularly Adelaide (24.6%), showed fewer signs of significant changes in metropolitan market structure.

It would be incorrect to infer from this sales information that retailing activity has stagnated in Australian metropolitan CBDs. In Sydney, clearly the most affected, extensive office block development at the northern Sydney Cove end of the CBD, has injected into the area large numbers of 'captive' customers in the form of office employees. It has been noted that the greatest shopping activity in the Sydney CBD occurs between 12 and 2 p.m. and that the working population constitutes the 'chief buying force'. In response, the 'hard core' is located at the northern edge, of the retail sector, in the immediate vicinity of the City's major department store. The southern edge, centred on Railway Square, is showing marked evidence of decline, and it seems likely that

this section of the CBD accounts for a high proportion of the retail decline. Clearly a case exists for the future concentration of retailing in the central city hard core area.

In Melbourne the situation is different, with a more concentrated hard core section, dominated by one major department store. Since the retail census three department stores at the fringe of this area have closed down, to be replaced by arcades of small shops and office blocks; and one department store has opened. There has been therefore a tendency towards consolidation within the core area; however a decline in the numbers of stores in the Inner City area between 1956-7 and 1961-2 has been halted as a result of arcade development. It seems likely that the growth in the numbers of small scale comparison and specialist units is not merited in terms of the trends in retail sales in the metropolitan area.

The retail section of the Brisbane CBD is clearly divided into three sections, a central prestige department store section centred on Queen Street, a nearby western fringe section aligned to George Street, and an isolated fringe section, Fortitude Valley at the eastern limits of the CBD, containing a further two department stores. It seems probable that at present these sections, closely linked by frequent tram services, operate in close functional relationship. However, the possibility of fringe decline consequent upon incipient decentralisation cannot be discounted.

Finally, the Adelaide retail core continues to dominate the metropolitan area. This dominance is largely related to a cluster of five
department stores at the major shopping focus of Rundle Street. In con­
trast with a tendency for the cutting back of department store space in
the larger cities, and relative stagnation in Brisbane, two of the Rundle
Street stores have been opened since 1961, and the others have undertaken
major modifications and additions. There are also plans for the recon­
struction of a large Fruit and Vegetable Market and additions to an
adjacent department store located in the southern fringe of the CBD.15

At present, therefore, the major downtown department stores dominate
retailing patterns in all cities, but with varying degrees of buoyancy.
In Sydney, large scale suburban department store construction has marked­
ly reduced the proportionate significance of CBD sales in the traditional
central core merchandise, and a real decline in sales has taken place.
Melbourne is dominated by one major department store firm to the extent
that other CBD retailers have hesitated to open large suburban branches,
unless they are within a scheme instigated by the major firm. Suburban
department stores have been opened for some time in Brisbane and the
effects of these developments are discernible in the 1961-62 figures.
Department store expansion to the suburbs has only taken place in
Adelaide since 1961-62, but it appears probable that significant instit­
utional decentralisation will not develop in the metropolitan area for
some time to come.

Commenting on the background to decentralisation in the New York
area, Hoover and Vernon have pointed out that

the lines of retail activity which are tied closely to neighborhood populations - food stores, for instance and laundries - are already well scattered throughout the Region and can be expected to keep moving outwards as residences shift. At the other extreme, those which demand extensive comparative shopping and which rely on out-of-towners for a considerable portion of their sales will resist the continuing dispersion of populations and will cling much more tenaciously to the central shopping areas. In between these extremes are the department stores and other activities that can satisfy comparative shopping needs within clusters smaller than those of the central city.\textsuperscript{16}

There is no doubt that trends of this type have already become established in Australian metropolitan cities. Inevitably this will result in a changed functional status, the result of which will be to cut back marginal operations, and to consolidate within a viable economic area, many downtown facilities which are located 'in response to linkages which disappeared years ago'.\textsuperscript{17} The Central Business District will therefore have followed the North American pattern where, according to Vance, it 'has become the mass seller to the inner part of the metropolis, the speciality seller to the geographical city, and the office area for the region.'\textsuperscript{18}

It has frequently been emphasised that it is the impact of the movement of major department store operations to suburban business centres which instigates retail decentralisation. While chain variety stores have been located within major suburban centres for a considerable period,

\begin{itemize}
  \item \textsuperscript{16} E.M. Hoover & R. Vernon, \textit{Anatomy of a Metropolis}, New York, pp 118-19.
  \item \textsuperscript{18} Vance, \textit{op. cit.}, p 518.
\end{itemize}
the effect of the location of a major branch department store on the character of such a centre is of considerably greater significance. The location strategy applied by major chain store outlets has had a marked impact on the extent and form of decentralisation within the four cities.\footnote{19}

Chain store expansion in the suburbs has taken two forms. At the comparison level, department store development has attracted specialist chains to expand into the locality. This trend has involved both local and national chains retailing: clothing and shoes; furniture and furnishings; electrical and other household appliances. The development of planned shopping centres has also encouraged the expansion of chain comparison stores from the central city.

Concurrently with this growth in suburban comparison outlets, there has been a marked increase in the proportions of grocery sales made by chain stores. This trend dates from the expansion of the two major variety chain groups into the grocery field in the late 1950s. The increase in self-service trading, and the growth in the size of grocery outlets, inevitably favoured chain firms with the capital resources to build new outlets and acquire existing premises. In a series of takeovers of existing local grocery chains, the major national groups have extended their influence throughout most Australian metropolitan suburbs. Their power to dictate pricing policies, and the considerable rivalry between the two groups, has resulted in a marked increase in grocery

\footnote{19. T.E. Beed, "Location Strategies of Retail Firms in Sydney", paper read to 4th Meeting of Institute of Australian Geographers, February 1965. Also an unpublished Ph.D. thesis at the University of Sydney.}
price competition. This has acted against independent retailers who have answered by forming organised groups with the aim of sharing the advantages of bulk ordering and group advertising. Nevertheless there has been a high casualty rate among small independent retailers, particularly those unable to convert to self-service merchandising, that is below 1,500 square feet in sales area.\(^2\)

In addition to the extension of self-service, other changing merchandising methods have developed in importance during the study period. These relate to the gradual increase in the size of supermarket units (up to 20,000 square feet), and a consequent broadening in the range of merchandise offered. This is reflected in the trend towards departmentalised supermarket/variety units, particularly in planned centres. There is also evidence of an incipient development of discount trading, typically limited to the sale of household appliances at below list prices from arterial highway locations frequently outside established business centres. There has been some limited growth of American-style discount stores within new retail developments. Finally, consequent upon the growth in car ownership levels (1962 ratio one car to approx. 4 persons)\(^21\) there has been a steady increase in the development and size of planned shopping centres. Many of these are within the limits of existing business districts, but there is an increasing trend towards


\(^21\) Commonwealth Bureau of Census and Statistics, Census of Motor Vehicles 31st December 1962. At present only the State Preliminary Statements are available.
large 'regional' style centres located apart from existing retail facilities and serving areas with high population growth potentials. The predominant development of planned centres in Sydney.

The overall result of the trends, considered in this introduction to Australian metropolitan retailing, has been to introduce a high degree of competitive stress into the market structure. 'Independents worry about more competition from chain stores; city stores face competition from suburban centres; and chain and department stores risk capital to extend their outlets to compete with each other'.

It is claimed that the fierce price competition that has followed the virtual abandonment of retail price maintenance, consequent upon the introduction of 'specials' and 'trade-in' techniques, has resulted in basic changes in customer habit patterns.

The preference for the local dealer and service agent has gone along with the increasing emphasis on reliable, quick, well organised and widespread service facilities. Customers wander from shop to shop and from district to district because they are conditioned to searching for the "best" price and for "specials".

In a similar vein it has been asserted that

More effective and sophisticated promotion will develop . . . to control the trend towards "centre switching" by the fickle car/shopper. The modern woman shopper is not going to rely on established loyalties. She will shop where, when and how she wants to shop.


23. Ibid.

Any examination of the functional type and operational form of suburban business centres, within this retailing environment, will inevitably take note of the impact of these factors on existing metropolitan patterns.

The decentralisation of retailing from the central city has been paralleled by suburban centralisation. It has been suggested that the basic form of institutional decentralisation has followed a pattern relating to the opening of suburban branches of first variety, and then department, stores accompanied by attendant chain comparison outlets. Such units have inevitably gravitated to the larger existing business centres, thereby emphasising the structural framework of the metropolitan city 'built not around a single center but around several discrete nuclei [at the] ... points of greatest intra-city accessibility'.

In more recent work Ullman has pointed out that 'as urban transport improves cities not only can expand in area, but the range of location choice is widened, the more desirable sites within a city can be reached and developed according to their intrinsic advantages'. At such points centres will emerge which 'will develop on a regional or specialised basis, strengthening the multiple nuclei generalisation'. As early as 1925, Burgess recognised the same development in Chicago -


27. Ibid., pp 21-22.
XIX

sub-business centers have grown up in outlying zones
this was . . . not a revival of the neighborhood,
but rather a telescoping of several local communities
into a larger economic unit. Chicago was . . .
undergoing a process of reorganisation into a central­
ized decentralized system of local communities coales­
cing into sub-business areas.28

This is the stage reached by the larger metropolitan cities under study.

It was pointed out in 1948 that the existing network of business centres
in Sydney had

grown haphazardly from groups of local shops on street
and subdivision patterns not planned for the purpose.
In almost every case they have developed on heavy traffic
routes, resulting in ribbon rather than compact develop­
ment, bottlenecks, inconvenience and danger for drivers
and pedestrians.29

A basic aim of this planning scheme, and those relating to Melbourne and
Adelaide,30 has been 'to foster the conception of a commercial and social
focus for [a] . . . whole district'.31 This involves the selection of
existing business centres, and the planning of sites for new outer foci,
which are to operate as 'district' centres; that is major suburban foci
serving the needs of up to 250,000 people grouped within a distinct
segment of the metropolitan area. The aim is that such centres will

1925, p 52.

29. Cumberland County Council, The Planning Scheme for the County of

30. Melbourne and Metropolitan Board of Works, Melbourne Metropolitan
Planning Scheme 1954, Melbourne 1954.
South Australian Town Planning Committee, Report on the Metropol­

fulfil more than a purely local function, will require the support of not merely local neighbourhoods but large self-subsisting districts. The centres should provide State, departmental and local government offices, district courts, social and sporting organisations, health and cultural centres, secondary schools and other features of more than neighbourhood importance.  

It is admitted that the 'tasks of regaining physically identifiable urban units from the unplanned sprawl will be a major one.' The extent to which such centralisation has been achieved will constitute an important line of enquiry in this study.

Data utilised in this study has been drawn from a variety of Commonwealth and State statistical sources; from direct contacts with urban planners, development companies, retailers, and suburban centre customers; and from structured field observation.

Population and Retail Census data used throughout the thesis relate to the year 1961-62, and the inter-retail census period 1956-57 to 1961-62. This material therefore relates to the period immediately preceding the field study period, 1962-64. No detailed statistics are available between retail census dates, but population data has been brought up to date with reference to the estimated totals for mid-1964.

Each city was visited for a period of up to six weeks on two occasions, separated by a minimum period of ten months. The periods concerned are:


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32. Ibid., p 31.
33. Ibid., p 114.
Melbourne - October and December 1962, September/October 1963.


A general sample of suburban business centres was visited and information collected which forms the basis of the classification scheme (Chapter 2), and the overall analysis of metropolitan movement systems (Chapters 4 and 5). Further, a series of individual centres were selected for detailed study, the results of which are presented in Chapters 7 - 10 in Part II. The remaining chapters discuss the theoretical basis of the thesis (Chapter 1); the concepts of commercial and consumer behaviour applied in the study (Chapter 3); and the introductory chapter to Part II which discusses the field techniques used to analyse the operational patterns of the special study centres (Chapter 6). In addition, Chapter 11 summarises the results and concludes the study.
PART I

METROPOLITAN RETAIL PATTERNS
Chapter 1

CENTRAL PLACE THEORY AND THE INTERNAL STRUCTURE OF CITIES

This chapter presents an outline of the primary theoretical base of Part I. The development of the central place theory and its application to particular cases is discussed in the first section. This is followed by an examination of central place patterns within the city, and the extent to which existing classification studies have utilised central place theory in an attempt to understand the functional significance of such patterns.

The Development of Central Place Theory

The work of Walter Christaller was first presented in English in 1941 as 'a theoretical framework for study of the distribution of settlements'.¹ This came eight years after the first publication of his major work which introduced what has become known as Central Place Theory.² Since Ullman's general introduction, the theory has been utilised in a large number of theoretical and empirical studies examining the distinctions between settlement size and function; their numbers and distribution; and the symbiotic relationship between urban units and their hinterlands. In recent years, largely as a result of the work of Berry, central place theory has become

more generally applicable as a theory of retail and service business'.

It is the evolution of the theory in this direction that is of major interest in this chapter.

The theory examines the town as the basic centralised focus of community life - a central place. It states that central places vary in importance depending on the extent to which goods and services (central functions) are provided for a surrounding tributary area.

The extent of such areas varies according to the 'range' of the goods and services provided, that is the distance that the population of the tributary area is prepared to travel to the central place in order to make use of the central functions it contains. It is postulated

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5. That is the 'centrality', 'the relative importance of a place in regard to the region surrounding it, or ... the degree to which the town exercises central functions' - W. Christaller, op. cit., in C.W. Baskin, "A Critique and Translation of Walter Christaller's Die zentralen Orte in Suddeutschland, Univ. Microfilm, Ann Arbor, Michigan, p 124.

6. Baskin points out that the 'range' is a mean value, 'the lower limit of which includes an area which will economically support the offer of the good' while the upper limit outlines 'that distance beyond which the good will no longer be obtained at the place either because the transport costs prevent it or because the cost is less at another neighbouring place'. C.W. Baskin, op. cit., p 49.
that central places and their tributary areas fall into an ordered hierarchy, comprising of discrete groups with common relationship between functional structure and tributary area. Low order central places provide low order goods and services, marked by a high purchasing frequency and a low 'range'. High order central places provide both low order goods, and high order goods and services with a lower purchasing frequency and a high 'range'. Low order tributary or market areas 'nest' within those of high order central places. Using this marketing principle, Christaller postulated that with reference to a homogeneous plain, optimum market areas would be hexagonal in shape, on the basis that units of each order are ringed by six units of the order immediately below it on the hierarchical scale, each forming a corner of a hexagon. The number and spacing of each successive order was related to a constant $K$ factor. On the basis of Christaller's work in Southern Germany $K = 3$, in other words the market area of a 1st order centre is $1/3$ that of a 2nd order centre, which is $1/9$ that of a 3rd order . . . $1/27$, $1/81$ and so on. Similarly the distance between centres of each successive class will increase by $a\sqrt{K}$ - when $a$ equals the distance apart of the next lowest order unit.  


Since the original publication of Christaller's central place models, they have been both generalised and adapted to specific purposes. Losch\(^9\) broadened the theory to include areas of differing size, spatial patterns, and economic organisation. However, while subscribing to Christaller's hierarchical concept, Losch was unable to accept the methods by which the classification of central places had been reached.

He may have arrived at it by arranging a number of places according to their functions and then finding that most places in a group fell in a definite size class, which was thereupon regarded as typical for places with this function. But one can hardly speak of a clustering of the places about any representative central value within this size class.\(^10\)

In pointing out this lack of precision in the definition of class orders, Losch was foreseeing what has been a major point of criticism of central place theory during the past ten years;\(^11\) criticism which was highlighted with reference to the first major attempt at empirical study using the theory as a tool of comparative analysis.\(^12\) This study deals with the ranking of 234 central places in southwestern Wisconsin on the basis that 'the status of trade centers is determined by the

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10. Ibid., p 433.

11. Baskin makes the same point, regarding the determination of discernible size classes as 'a weak point in his whole scheme' - Baskin, op. cit., p 2.

functions they perform'. In a series of methodological steps, reconstructed by Vining, Brush divided the central places into three classes - hamlets, villages and towns. Vining described these divisions as arbitrary and asserted that there was 'no evidence ... that exactly three natural partitions may be observed in this array, [adding that the method] is not an independently derived basis for a classification of communities by type'.

Vining linked this criticism with rejection of the hierarchical concept, and denied that there is any basis for regarding 'Christaller's particular geometric pattern as corresponding to an observable pattern of distribution of population units'. As an alternative to the hierarchical system, Vining supports the rank-size rule as a means of describing the size distribution of population units. This is expressed as \( S_R = S_1/R \), where \( S_1 \) is the size of the largest city, \( R \) the rank in size of a given city, and \( S_R \) the size of a city having rank \( R \). In the same work he presents detailed empirical evidence of this size - rank continuum with reference to the United States. Zipf has attempted to relate this empirical evidence to an explanatory scheme linked with many facets of human behaviour.

13. Ibid., p 385.
15. Ibid., p 169.
16. Ibid., pp 164-65.
17. Ibid., p 148.
Generally speaking there has been little support for the complete rejection of a hierarchical class system. Stewart commented that 'there is no coincidence, even theoretically, between the rank-size rule for cities and the function-size class hierarchy'. However in the same paper he points out that the application of the rank-size rule does not relate to countries with dominant primate cities, the most marked example of such divergence being Australia. He goes on to suggest there is more typically an S-shaped log distribution of towns by size, such that 'K' and functional categories of towns are a more convenient, if arbitrary, means of examining the size and space relationships of urban areas.

Further discussion of the relationship between the Christaller hierarchical system and the unimodal distribution of the rank-size rule was put forward in a paper by Thomas. Here it is argued that the Christaller model was imperfect owing to its dependence on the calculation of 'typical' populations and distances between size classes which are based on the determination of the smallest size class. Thomas suggests that 'a model of spatial distribution of central places

22. Ibid., p 400.
must be developed that is not dependent on 'typical' size classes.23 particularly because 'by eliminating size classes we make our model more precise because we have excluded from it the generality imposed on each observation by the adoption of a classification'.24 However, in an attempt to establish an empirical base for such a model by testing the space relationships between a series of sample cities and their nearest neighbours of the same population size, Thomas found that 'the spacing of places is partly explained by their population sizes . . . in keeping with Christaller's initial formulation [but suggested that] . . . the spacing of central places . . . is the result of many complex interrelationships between many variables'.25

Other papers have attempted to formulate and test models relating to urban size and spacing,26 but work by Berry and Garrison27 brings the discussion more directly to the particular developments of central

23. Ibid., p 401.
24. Ibid., p 402.
25. Ibid., p 411.
place theory evolution pertinent to this study. In a detailed dis-
cussion of the work of different exponents of rank-size relationships
the authors found general comparisons between the work of Zipf and
Christaller, and particular contacts with reference to Christaller's
K3 network. By stating the arrangement in rank-size terms they
support the notion that 'the Christaller scheme is consistent with
Zipf's empirical observations'. Their final conclusion is that
schemes showing rank-size relationships present the average conditions
relating to the processes of urban development within the environment
of general economic growth. Beckmann has further shown that the basic
assumptions of central place theory normally lead to conditions per-
taining to the rank-size rule. Berry summarises the relationship
by stating that

Aggregative analyses, abstracting from spatial arrangements,
will almost certainly emphasize the importance of continuous
functional relationships. Elemental investigations on
which the spatial parameter is explicit will usually
identify the hierarchy as the dominant feature. Both con-
tinuous relationships and hierarchies, and blends thereof,
may be produced from the same data, and it therefore seems
foolhardy to continue the arguments as to which is valid.
Both exist.

28. Ibid., p 87.

29. M.J. Beckmann, "City Hierarchies and the Distribution of City
Size", Economic Devept. and Cultural Change, Vol. 6, 1958,

30. B.J.L. Berry, et al., "Retail Location and Consumer Behaviour",
Papers and Proceedings of the Regional Science Association,
Vol. 9, 1962, p 103.
Despite considerable misgivings therefore, no one has demonstrated decisively the invalidity of a hierarchical ordering of urban places; while it is equally true that there are proven theoretical weaknesses in such a system. These weaknesses particularly relate to complexities resulting from differences in the economic base of cities, and to the concept of hexagonal trade areas within a bounded surface where the competition generated by central places sited at the edges of the space unit will cause basic departures from the ideal scheme. Further strong criticism has centred around the arbitrary nature of selection of class orders in the hierarchical system. All of these weaknesses have been admitted by Berry, who has tended to re-formulate central place theory within more narrow bounds, and with reference to the particular purpose of explaining the patterns and usage of tertiary activities. He has further concentrated this framework around the recognition and definition of a hierarchical class system. It must, however, be accepted that such a system remains, as does the whole Christaller concept, the formulation of an intuitive notion. Central place theory, according to Ullman's original assessment, is basically 'an investigation hypothesis ... framed in the belief that ... there is some ordered principle governing the distribution'.


In a series of papers, published between 1958 and 1962, Berry in association with other authors has developed techniques and terminology relating to the recognition of functional classes of urban centres. All but the last of these publications have been concerned with data relating to small central places in Snohomish County, Washington, and analysis has been confined to the testing of the significance of a three-fold class division of such centres. The classification was based on the recognition of central functions, varying in type from retail units, to transport facilities and bulk distributors; and the arrangement of such functions into classes which had a common population:function ratio. No attempt was made, at this stage, to link such functional classes with hinterland usage patterns, or with the symbiotic relations between centres of different classes. Although suggestion that the impact of a 5th order metropolis, Seattle, and the subsequent imbalance of population:function ratios, owing to the presence of a commuting belt around the city, did lead to discussion of the centralisation of specialised functions resulting from improvements in transport networks.

A further development was the detailed definition and discussion of the theoretical significance of the range of a good, and the


minimum population numbers enclosed by the lower limit of the range - referred to as the 'threshold' population - or 'the minimum population size of an urban center for the support of an urban function'.

However, by relating the threshold size to the population of the central place and not the population of its market area; and further, by failing to examine the differing frequency of usage by custom within the trade areas of different orders of central place, the resulting totals can only indicate, in the broadest sense, a threshold figure that can be directly related to the reality of trading patterns. That the operation of a central place depends on support from its market area is axiomatic, and as Berry and Garrison point out 'an hierarchical pattern of central places and an hierarchical pattern of business implies an hierarchical pattern of consumer movement [they link this with provision of a transport network] ... the denser the distribution of purchasing power, the denser the transport network'. It follows that under such conditions the wider the possibility of choice on the part of the consumer, the greater will be the variability of his frequency of use of any particular central place within the network, and less meaning can be attached to a threshold figure based on population: function ratios. This situation applies to central places within a metropolitan area.


In a paper significantly titled 'Retail Location and Consumer Behaviour', Berry and his co-authors have drawn together the theoretical implications and analysis techniques of earlier papers into the field of retail location. The source material was gathered by a team working in southwestern Iowa, which examined the extent of trade areas, using interview and other techniques, as well as data referring to the numbers of establishments performing different central functions. This work moves away from earlier attempts at central place determination in terms of population:function ratios. The size and spatial distribution of central places is now viewed as a starting point for the examination of consumer travel behaviour in relation to retail activities, together with the interdependence of the trade areas of central places within different class systems.  

With regard to the present study, therefore, central place theory may be regarded as 'the theory pertaining to spatial aspects of retail and service business'.  

Links that remain with the original Christaller theoretic statement include the concepts of range and threshold, and the existence of uniform spacing within a network of central places (K systems), both of which have questionable significance within a metropolitan area; and the basic tenets of a hierarchical class-system of central places, based on the numbers

38. Ibid., p 106.
and complexity of central functions performed and the size of the
market area served.

It must be pointed out that there is a good deal of scepticism
regarding the value of central place theory, particularly in its
ability to reflect the operating principles of economic reality.
Doubt has been cast on the validity of the range and threshold concept
and the consequent hierarchical formulation, when the evolutionary
aspects of central place development are examined. With the changing
patterns of population and purchasing power distribution, there is a
strong possibility that original central places will be subject to
decline and possible extinction, while those remaining are not
necessarily located at the most efficient sites to serve their
present day tributary areas. The existing pattern is therefore
affected by the 'particular internal economic characteristics of the
types of retail and service businesses which have evolved in our
society, and the locational limitations imposed upon any such
businesses at a given point in time by the spatial patterns of
existing central places at that particular time in an area's history'.

This is particularly evident in the form of central place patterns
within metropolitan areas, where rates of commercial growth tend to
be rapid, and those of decline more gradual. Hence emerging and
decaying networks operate side by side, and any functional

hierarchy of central places will necessarily fail to relate directly to many of the basic demands of the static model. At best it will provide a framework from which to study the complexities of retail habit patterns and to formulate relationships between such patterns in contrasting areas.

The Internal Structure of Cities

It has long been recognised that groups of spatially associated business types exist within the built-up areas of cities. Groupings which occur as the result of direct contacts between customer and seller, that is agglomerations of retail and service business types, have been classified according to morphological structure, functional attributes, and the extent of market areas. Early studies of the nature of retail groupings within cities largely agreed upon a basic division into nucleated centres and business thoroughfares (string streets or ribbon developments). Such a division was based on the degree of concentration or dispersal of business units, and to a lesser extent on the types of goods and services offered, and the character of the tributary or market areas. In all cases the Central Business District was cited as the prime nucleated business centre of the city, supplying the entire metropolitan area with specialist

goods and services. There was also general agreement that other nucleated districts could be divided into two: major outlying business centres, which were 'focal points of intra-city transport and represented in miniature the same retail structure characterizing the CBD', and retail groups supplying frequently required goods (convenience goods) to purely local or neighbourhood areas. Further, isolated store clusters were distinguished - 'two or more complementary rather than competitive convenience goods stores'. In his more recent work Garrison proposed a four-fold division of nucleated agglomerations, based on differences in the numbers of establishments, business types represented, retail frontage, and spatial distribution.

While nucleated centres were regarded as serving the requirements of the surrounding locality, 'string streets' were adjudged to have developed along major traffic arteries with patronage derived from a small proportion of the passing inter-community traffic. However, the distinction between these two basic types is by no means clear, due to the extensions of nucleated centres along main arteries, particularly where the core of the nucleation is built around an intersection of two arteries. Proudfoot's map of Philadelphia shows frontages of such arterial extensions stretching up to 1½ miles from the main focus.

42. Ibid., p 427.
44. Proudfoot, op. cit., p 426.
Ratcliff, having defined a nucleation in relation to a 'pyramid of land values adjacent to an intersection and as the peak of development in a string street, [goes on] the boundary between the string street and the nucleation is a matter of arbitrary definition'.

The essential difference between the two is the lack of internal organisation in the case of the string street as compared with the more definite pattern in the arrangement of uses that characterizes the nucleation'. This distinction, relating to the significance of retail linkage or complementarity is, however, probably a dependent factor to the more important contrasts pointed out by Garrison. He states that string streets 'serve different demands than do nucleated centers . . . auto based . . . demands associated with people moving along urban arterials [which are] single purpose in character'.

Such a definition will therefore exclude from the string street category all groups of business types relying on the attraction of pedestrian customers from the immediate residential locality, despite their location along a traffic artery which is otherwise lined with car-orientated business types.

An extended discussion of these distinctions is necessary for a full appraisal of work by Berry from 1959 onwards. As co-author with

45. Ratcliff, op. cit., pp 394-95.
46. Ibid.
47. Garrison, et al., op. cit., p 58.
Garrison, 48 and in other papers, 49 Berry has attempted to classify all types of city business districts and string developments, and to tie-in this classification with a general theory of tertiary activity by reference to selected aspects of central place theory.

The basic empirical work on which the classification was based related to Spokane, Washington. Here 60 business types were identified, occurring in 296 business districts, defined as 'one or more business uses spatially separated from other business by alternate types of land use (residential, wholesale, manufacturing, industry etc)'. 50 Data relating to the numbers of establishments of each business type in each centre were examined using correlation matrices and linkage analysis. As a result 'four conformations of business were recognised, together with constituent groups of business types and the business districts or functional areas they create'. 51 The conformations of representative groups of business types relate to nucleated shopping centres, highway-orientated facilities, urban arterial districts and auto-row functional areas. Nucleated centres are further subdivided into neighbourhood, community and regional types.


In discussing this work it seems necessary first to point out a certain lack of precision in the definition of central business types or functions, and central places. A recent operational definition of a central function was 'a type of activity, such as drug store, church or veterinarian, regardless of size'. This presumably means that, if it is connected with the definition of a business district quoted above, any activity carried out in isolation fulfils definitional requirements. Christaller himself appears contradictory on this point. He uses the term 'dispersed goods' to refer to 'ubiquitous products', presumably referring to water, electricity, etc. Goods or services that do 'not have to be produced or sold in a central place' are referred to as 'indifferent goods and services'. However, Christaller later points out that 'we should understand central goods not only as economic goods and services but also non-economic, cultural and sanitary, etc. [because] . . . their acquisition causes burdens and costs and their offer makes the expenditure of money and labour necessary'. The confusion becomes complete when Christaller, having made this all-embracing definition, goes on to point out that 'there are two methods by which goods are brought to the consumer:

52. Berry & Garrison, (1958d), op. cit., p 68.
54. Baskin, op. cit., p 125.
56. Ibid., p 129.
one offers them at the central place to which the consumer must come, and one travels with the goods and offers them to the consumer at his residence. The former leads necessarily to the development of central places, market places; the latter one however does not need central places. 57

Rationalising from these quotations it is possible to make a more precise statement on which to base central place definitions. Central goods and services are offered and sold to the consumer within a central place, and involve travel to that place by the consumer. There is normally, therefore, direct contact between consumer and purveyor of central goods and services. Where such contact relating to non-economic functions (e.g. public library) takes place within a central place, then these functions may be regarded as being 'central' in character. Dispersed or indifferent goods and services are those which are normally distributed to customers outside the confines of a central place (e.g. public services), or those which, while operated within a central place, are offered to the consumer at his place of residence (e.g. telephone exchange).

These interpretations are recognised in further definitions of a central activity as 'the provisioning of goods directly to households and that such activities are the outgrowth of personal contact between the central service and its customers, thus leading to a

57. Ibid., pp 129-30.
close relationship between the residences of the consumers and the location of the service\textsuperscript{58}. If this is accepted, functions such as fire stations and telephone exchanges, frequently regarded as central functions, should be ignored. More accurately they are centralised public services serving a given area, frequently defined by arbitrary administrative boundaries, with no direct contact with consumers in the central place. It is unlikely that anyone has yet taken his fire to a central place in order to use the services of a fire station!

It would also seem difficult to justify the acceptance of isolated units as business districts, let alone central places. In a more recent publication Berry has modified his definition of a business district to refer to 'a group of spatially contiguous establishments less than 300 feet from each other, and either separated from other establishments by more than 300 feet at the periphery or, if in a continuous shoestring of business, falling into 'peaks' or 'ribbons' of land values'.\textsuperscript{59} This statement accepts that a 'group' of establishments are required to constitute a district; an isolated establishment is referred to as a 'single-establishment district'.\textsuperscript{60} It may be suggested, however, that such an occurrence - for example an isolated corner store - is non-central

\textsuperscript{58} L. Curry, "The Geography of Service Centers within Towns", \textit{Proc. of the IGU Symposium in Urban Geography 1960, op. cit.}, p 34.

\textsuperscript{59} Berry, et al., (1962), \textit{op. cit.}, p 68.

\textsuperscript{60} \textit{Ibid.}
or 'indifferent' in form and can have no reference to the study of a central place. This may be defined, with reference to the internal structure of cities, as an agglomeration of central business types—retail, service and professional—in complementary and competing association for the attraction of custom from a definable market area. The application of such a definition sets a lower limit to the recognition of business districts and central places within cities, which may be fixed by empirical study, but which from a theoretical viewpoint is satisfied by the existence of a market or trade area. This will be influenced not only by the size of a retail group, but by the potential purchasing power within the market area and by the influence of competing groups. Strictly this will make possible the inclusion of large isolated units, such as supermarkets and discount or department stores, assuming that their operations fulfil these conditions. Such a definition excludes string street commercial establishments which are non-central or dispersed business types sited in order to attract custom from passing motorists and gain nothing by grouping in complementary and competing association. However, examination of the business types grouped into Berry's 'Highway-orientated facilities and urban arterial districts', indicates that of the eighteen business types listed, six are commonly located within business districts, operating as central business

functions, the remainder being typical car-oriented types. This suggests that not only can business types operate as central functions in one location and dispersed functions in another, which is acceptable, but that under the conditions in Spokane their correlation with string street sites is sufficient for them to be listed under the 'arterial' conformation. It would seem that by giving equal emphasis in the correlation matrices to a single isolated business type and the same business type in a large, functionally complex business district, a strong bias in favour of the arterial conformation has occurred. Thus the analysis of two groups of business types, central and dispersed, with totally different locational requirements, within the same statistical scheme, results in groupings and conformations which illuminate the obvious: that arterial types are found along traffic routes and nucleated types within clusters.

A business district must function as a nucleated unit, its operations are carried out within a pedestrian scale of movement. The fact that an adjacent arterial road, lined with non-central car-orientated business types, lies within walking distance of the nearest section of the district, will be of little interest either to customers or retailers. These two forms of business location are neither competing nor complementary. It follows that, apart from isolated examples of the dispersed types located within the pedestrian-

62. Radio-TV sales and service, shoe repairs, furniture, gifts and novelty, florists. Ibid.
orientated business district, string streets devoted to car-orientated business should be excluded from a study of the business districts within cities. This is in fact accepted by Berry who, in a conclusion to work on ribbon developments, acknowledged that 'central place theory, at least in its present form, is not adequate to explain stretches of highway orientated or urban-arterial businesses'.

By far the most complete statement relating to the internal commercial structure of cities is found in two volumes containing the results of a study made under contract with the 'Community Renewal Program of the City of Chicago'. These present the results and data relating to a study of the 64 largest unplanned business centres in the City of Chicago, together with the 9 largest planned centres within the city limits and 12 competing suburban centres. The aim of the study is to outline the nature and extent of commercial blight, and is therefore confined to the central city section of the Chicago metropolitan area. In effect therefore it becomes a study of the commercial structure in that part of the city suffering retail stagnation and decline. In terms of the classification of business centres the study relies on an expansion of the framework


developed in relation to Spokane. There are, however, important refinements; Table 1-1 shows the outline of the classification. Within the hierarchy of centres there are three variants, these relate to distinctions between higher income sections of the city, lower income neighbourhoods, and planned centres. High income areas contain the full hierarchical class-system of 'Major Regional Business Center; 'Smaller Shopping Goods Center' (which serves the edges of the shopping goods areas if the major centres), with 'Community Business Centers' and 'Neighborhood Centers' providing two levels of convenience goods. Lower income neighbourhoods were found to have a simpler hierarchical system with 'Smaller Shopping Goods Centers' providing the highest order goods and services, and convenience

Table 1-1

The Structure of Business and Commerce

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<td><strong>Centres</strong> (Planned or Unplanned)</td>
<td><strong>Ribbons</strong></td>
<td><strong>Specialised Areas</strong></td>
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<tr>
<td>i. Isolated Convenience Stores</td>
<td>Shopping Street</td>
<td>Automobile Rows</td>
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<td>ii. Neighbourhood Business Centres</td>
<td>Urban Arterial</td>
<td>Printing Districts</td>
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<td>iii. Community Business Centres</td>
<td>Suburban Ribbon</td>
<td>Entertainment Districts</td>
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<td>iv. Regional Shopping Centres</td>
<td>Highway Orientated</td>
<td>Exotic Markets</td>
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<td>Medical Centres</td>
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66. Ibid., pp 19-104.
goods supplied by 'Neighborhood Centers'. It is asserted that this distinction results from differing levels of purchasing power in the contrasting districts. It seems a possibility that this contrast might be induced by the method of classification adopted. In lower income neighbourhoods, where string-street commercial development is more common, there will be a higher proportion of nucleated clusters of central functions which may take the place of the missing community-level centres, but which here are classified under ribbons owing to insufficient land value levels. Further, low income levels are possibly offset by higher population densities, resulting in large numbers of walk-in customers resident within the primary trade areas of business centres. These would not be recorded in the Chicago Area Transportation Study data used to enumerate shopping trips to each centre in the study. Again, there is a tendency in such low income, high density areas for a greater dependence on local facilities than in higher income areas. No indication is given of frequency or structure of shopping trips by the population resident within trade areas.

It is not intended to present a detailed discussion of the great variety and depth of detail presented in the Chicago study. In many

67. Ibid., pp 60-61.

68. Business centres within the Chicago area are defined with direct reference to commercial land values. The outer limits of centres are drawn at the point where there is a 'turnup point' along the 'ridge' of values extending along a string street. No premises valued at less than $750 per square foot were included in the centres, nor were neighbourhood groups failing to rise above that level tabulated.
ways techniques differ in the present work, and comparisons between the Chicago and Australian results will be developed at relevant sections.

Three other studies are worthy of mention with reference to the classification of central places within cities, particularly as they relate to conditions outside the United States. In the first, a section of Zurich was studied with the aim of 'a closer examination of the hierarchy of inner urban central services'. Here, a detailed case study method was used to examine functional structure and service areas of neighbourhood, regional and central business districts. Interview techniques and pedestrian counts were used to study the shopping habits associated with each rank. In this way Carol was able to demonstrate that a hierarchy of customer use patterns are related to the hierarchy of functional structure.

An attempt to classify 300 shopping centres in the Greater London area was based on the distribution and association of selected criteria: chain stores; variety and department stores; cinemas; banks and local government headquarters. Three ranks were recognised: regional; major suburban centres; minor suburban centres. However no attempt was made to relate these classes to market areas, nor to justify the selection of particular criteria by reference to the total functional structure of the centres concerned. The extent to which branches of


chain-store groups are an accurate measure of centrality is uncertain, and needs to be established precisely for the value of such classifications to be judged.

In a report submitted to the Royal Commission on Local Government in Greater London, Carruthers has developed a further classification method of central places within cities. In some ways similar to the Smailes study, this classification graded each centre according to the provision of banks, department and variety stores, and chain speciality stores. In an effort to gauge the extent and intensity of customer usage, additional information utilised was the rateable values of shop premises in the major centres, and bus services during shopping hours. The result is a four-order hierarchy, the top two functional classes being fulfilled by Central London, with the Third and Fourth order each subdivided to give six classes of service centre. The author states, however, that 'while the concept of a hierarchy provides a useful simplification, there is in fact a continuous range of centres, with no really marked breaks'. There are two points to be made with reference to this remark, first, it seems likely that by setting high minimum conditions ('a minimum of two banks and a Woolworth store')

73. Ibid., p 296.
the 98 centres studied by Carruthers do not give a complete picture of the full range of Greater London Service Centres. Secondly, it is probably not possible to dismiss the reality of a hierarchical class system without reference to wider background information.

In summary, recent studies, aimed at the classification of business districts within metropolitan cities, cover a wide range of approaches and methods. Berry has indicated that a hierarchy of central places exists on a city-wide scale, and that data relating to land values, customer trips, and retail sales support its existence. Further, he has recognised variants in the hierarchy related to the income levels of trade area population.

Carol has examined, by means of detailed case studies, the customer habit patterns associated with selected examples of business districts from different levels of the hierarchy. Smailes has attempted a classification on the basis of the presence of selected retail and service criteria, while Carruthers has added to this method analysis of the rateable values of shop premises and the nodality of centres as revealed by bus services.

It is submitted that none of these studies have examined the interaction between different levels of the hierarchy. While Berry has demonstrated that 'nesting' takes place, there has been no

74. Smailes and Hartley also make this point, stating that in relation to their classification, the lower truncation of Carruther's hierarchy is at an arbitrary point. Smailes & Hartley, op. cit., p 211.
detailed examination of its operation, either from a spatial viewpoint, or in terms of a reflection in customer habit patterns. There has been no evaluation of the general movement systems connected with the location and operation of central places within city areas, nor of the distinctions that exist between different areas within the city. The following discussion attempts to link this approach with the general theoretical background.

It has been argued that the centrality of a business district is related to its agglomerative form; that custom is attracted by the opportunity of fulfilling several complementary needs and by the choice offered by several competing units within the business district. From this it is possible to postulate the existence of hierarchical class orders, nesting trade areas, and other aspects of central place theory.

Customers are prepared to make varying expenditure on transport costs according to the character of the good they require to purchase. For rapidly consumed, frequently required convenience goods it may be expected that only a small transport cost will be acceptable, in which case such goods must be provided at regularly sited business centres. Because the average distance between such centres, providing low order goods, is small, it follows that the population resident within the spheres of influence of each centre will be insufficient to support establishments offering goods and services infrequently required. Such functions can only be performed by a business centre which is drawing custom from a trade area of sufficient extent to provide expenditure to support them at an economic level. It is at this stage that it becomes necessary to invoke the concepts of range and threshold.
It is argued that the threshold population or sales volume is that contained within the lower limit of the range, or market area, of a good; it is the minimum size of market necessary to support supply of the good. However the existence of a fixed threshold point relating to a particular good offered for sale at business centres within an urban area is somewhat difficult to envisage. If it is accepted that the market area of a business centre is formed by the amalgam of the market areas of its constituent establishments, with its outer limit that of the function requiring the highest threshold population, then it becomes difficult to explain the location of that particular highest order good in that particular centre. In fact, while there is a threshold size with reference to turnover, this does not relate to any particular market area size, either in terms of population total, or purchasing power. For the retail turnover of a particular establishment is related to the frequency with which residents of the trade area visit the centre, as well as the frequency with which they will require the goods offered by that establishment.

The threshold is, therefore, more accurately related to the general environment of the centre. A particular high order function can locate itself within a centre when the centre stands in such relationship with its market area that it can attract sufficient consumers with a frequency which enables the particular function to reach an economic turnover level. Thus there is a tendency for functions of like operational form to gather in business districts which stand in a common functional relationship with their market.
areas. This relationship is not merely a function of size, either in terms of numbers of establishments or numbers of central functions. Of equal importance will be the detailed business structure: the extent of competition among low order functions within the centre as well as the representation of higher order functions; the morphology of a centre and consequent distribution of pedestrians in relation to its retail frontage; the accessibility in terms of available public transport; the location and efficiency of lower order competitors within its trade area; the tastes and habit patterns of the trade area population; and finally the significance of the CBD retail core in those patterns.

The concept of a threshold point relating to each business type throughout the entire city appears difficult to accept when the complexity of intra-urban patterns are taken into account. However it seems possible to develop a theoretical scheme, more closely fitting the existing conditions, which is based on a division of the metropolitan city into areas of common movement systems. These would normally relate to the spheres of influence of the few highest order business centres, and within which the threshold factor operates with reference to a particular set of local spatial and functional distributions. Considerable variety in the form of the hierarchy within each area may be expected. The dominance of the highest order business district is a case in point. A weak high order centre will probably be related to strong centres lower in the hierarchy; in some instances the high order functions normally concentrated in one
centre may be spread over a series of lower order central places. In such areas retail patterns may be more closely orientated to the central business district, than in those dominated by a well-developed high order centre.

The definition of such segments of the city may be expected to be closely connected with barriers to movement, such as rivers, industrial belts, railway lines and parkland. This will be particularly the case when such barriers occur at the edges of the spheres of influence of the highest order centres. Where such barriers do not exist, the definition of areas with common movement systems will be more difficult; boundary lines will mark zones of dispersal.

Comparisons of the business centre structure of different segments of the same city will show, therefore, marked variance. Business centres fulfilling functions at one level of the hierarchy in one area, will not show exact parallels with a centre at the same level, operating in a different area. It may be expected, therefore, that hierarchical patterns, when averaged out with reference to the whole city, will show signs of blurring, with less marked distinctions than those occurring within the major commercial zones of the city. It is, however, unified by a common factor, the significance of the CBD in the total retailing patterns of the city. This will inevitably have a marked effect on the suburban threshold values, particularly with reference to the high order functions; at which level there is direct competition between high order suburban business districts and the central business district.
These, then, are the factors to be built into the model of retail and service relationships within a metropolitan city used in this study. The propositions will be tested in the succeeding chapters in relation to conditions in the four cities to be studied.
Chapter 2

THE CLASSIFICATION OF SUBURBAN BUSINESS CENTRES

Introduction

This chapter examines the functional structure of suburban business centres in Sydney, Melbourne, Adelaide and Brisbane. The analysis involves the selection of samples of business centres drawn from each city; the classification and evaluation of each, with the aim of outlining the total metropolitan patterns of retailing; and a comparison of results for the four cities.

The terminology used is based largely on the earlier theoretical discussion. The term business district is used to distinguish large agglomerations of business types, which include a full range of personal, professional and public services, from the normally smaller grouping of primarily retail establishments (a shopping centre). In the United States, where much of the terminology used in this field has its origin, there is a tendency to use the term 'shopping centre' to refer only to planned off-street retail groups. However, in this study of Australian cities, its use is extended to cover the ubiquitous street shopping focus.

It is necessary to enlarge on the definition of the business district as 'an agglomeration of complementary and competing central business types'. The definition of the actual physical limits of a

1. See Chapter 1, p 21.
centre will have considerable bearing on any analysis of its size and structure. In the present study the definition of such limits is based on two principles: that a business district operating as a central place is contained within the pedestrian scale of distance; and that its limits must relate to a definite break in retail frontage. To a certain extent the application of these principles can lead to conflicting estimates of the boundaries of a business centre. The measurement of pedestrian concentration within business centres normally indicates a marked fall in densities prior to the final break in retail frontage. However, pedestrian traffic which uses such low density fringe areas usually has its origin within the high density core sector. In most cases, therefore, the business district as an operating unit extends beyond the zone of high density, although in many instances the fringe area represents an excess retail provision.

The major problem of centre definition occurs with reference to string retail business frontages which stretch for several thousand yards along main traffic arteries (e.g., Prahran-Windsor in Melbourne or Leichhardt-Lewisham in Sydney). Earlier discussion suggested that such morphological types should be distinguished from commercial ribbon development composed of non-central business types (usually car-orientated), and should therefore be regarded as a particular form of central place development. However, under such conditions the entire length of retail frontage cannot normally be regarded as a single central place unit. Typically, there are a series of peak usage
sectors separated by stretches with low pedestrian densities. In this instance each sector should strictly be regarded as a separate business centre.

The physical definition of a business district is therefore related to the presence of a peak core, operating as a separate entity with reference to customer attraction. Fringe sections of the retail business frontage extending beyond the peak core are included if they do not operate as a separate viable business group, and are bounded on their outer side by non-central business types.² It is suggested that such a definition, based on pedestrian densities and the extent of central business types generating pedestrian traffic, provides a valid substitute for the use of land value data, which is not available in any standardised form in this instance. It has not been precisely indicated to what extent commercial land values either pre-date or post-date changes in retail turnover in the premises concerned, or that they are an accurate measure of centrality.³

² Mayer has fixed business centre limits in a similar way: 'boundaries of centres were designated at points where a nucleated, well defined intensive business development gives way to a more dispersed, less intensive ribbon development, to local neighborhood business use or to non-commercial land use such as railroads, institutions, industrial or residential areas, parks, or vacant land'. H.M. Mayer, "Patterns and Recent Trends of Chicago's Outlying Business Centres", Journal of Land and Public Utility Economics, Vol. 18, February 1942, p 8.

³ Mayer noted in the 1940's that Chicago business centres were normally defined by the $200 per front foot line, but 'this relationship is not invariable, however, because other factors such as the direction of new growth, the orientation with respect to transportation, and the relation to competing suburban centers, are not always fully reflected in the land values. Furthermore, land values do not immediately react to changes affecting the business areas; there is usually a lag of a year or two'. Ibid.
Sample Selection

The above rules have been applied in the definition of 228 separate business centres selected from the four cities under study.

The selection of a series of centres for detailed study was made necessary by the lack of precise and available data. The planning bodies in each city have carried out surveys of the distribution of retail facilities in their respective cities; however there are considerable variations in the dates at which such surveys have taken place, the basis on which data was collected, and the availability of that data. The comparative nature of this study demands close similarities in the timing of data collection, the classification of business types, and the areal definition of business centres. Further, there exists no complete street directory coverage for all cities. Where such directories are available the material does not relate to a common date - directories are revised over an extended period - and the classification of retail types is based primarily on an establishment's description of itself.

The aims of the sample selection methods were to provide a list of centres representing all size and functional types, with a distri-

4. Metropolitan Planning Authorities:
   - Sydney: Cumberland County Council - during period of field study, since replaced by The New South Wales State Planning Authority.
   - Melbourne: Melbourne and Metropolitan Board of Works.
   - Adelaide: South Australian Town Planning Committee.
   - Brisbane: Greater Brisbane Town Planning Committee.

5. Directory of Victoria and Directory of South Australia, are published annually by Sands and McDougall Pty. Ltd. Universal Business Directories (Aust.) Pty Ltd publish directories for all four cities, but in a form unrelated to locational distribution.
bution throughout the city in approximate proportion to the dispersal of all suburban business centres. Selection of examples of the different functional types was carried out on a quota basis, with a strong bias in favour of large functionally complex centres. As no complete, up-to-date lists of business centres of all types are available, it was first necessary to construct base maps, using selected criteria to locate business centres of differing functional structure. The criteria differed slightly from city to city, but basically consisted of banks, variety and department stores, chain specialist stores, post offices and local government offices. These enabled measure to be made of all but the smallest retail groups; however, as there is considerable homogeneity with regard to the size and business structure of such groups, this drawback was not of major importance. Sample centres were selected from the array of data provided by the base maps, with reference to location within the city area and functional range. In each instance the cities were divided into four concentric zones, of equal width, centred on the main central city G.P.O., and enclosing the entire metropolitan area. These zones were in turn divided into four segments by random diagonals crossing at the central point. Sample centres were chosen at random from each of the sixteen divisions according to fixed ratios. The ratios varied in relation to outline classes based on the number and type of criteria present. Generally four classes were recognised from which all examples in the highest class were selected; 1:2 of the secondary group; and from 1:3 to 1:5 of the
lower groups. It must be emphasised that the aim of the selection was to provide a full coverage of functionally complex centres, and a representative but smaller sample of centres with a more narrow functional base.

An apparent drawback to the success of these selections in providing a valid sample of centres from which city patterns may be outlined, is the under-representation of the smallest groupings and corner stores. At this local level considerable additional material would be necessary for a complete understanding of functional structure. However, it has been argued that the overall patterns of suburban retailing are based on the structure and location of the major business districts, with the distribution and form of smaller groups in a subordinate position, and playing a decreasing role in the shopping habit patterns of metropolitan cities.

The overall results for the four cities are not directly comparable. For Sydney and Melbourne there is a greater emphasis on the larger centres with low representation of the smaller groups; this results in a markedly higher average size of sample centres in these cities (see Table 2-1). However, comparative analysis of other cities based on centre size has no place in the use of this data, and the selections achieve their minimal aim of presenting a representative range of centres for detailed examination and functional classification (Figs 1-4).
MAPS 1 - 4

SAMPLE CENTRES

N.B. Centres numbered according to size order.

See Appendix II, Table 1 - Sydney
  "  2 - Melbourne
  "  3 - Adelaide
  "  4 - Brisbane
Melbourne
SAMPLE CENTRES

Sample Centres numbered according to size order - see Appendix II, Table 2.
3

Adelaide
SAMPLE CENTRES

5th Order Sample Centres
4th " " "
3rd " " "
2nd " " "
1st " " "

Non-Residential Land
Main Road Pattern
Approx. Limits Built-Up Area
Adelaide Hills Scarp

MILES
Brisbane

SAMPLE CENTRES

- 5th Order Sample Centres
- 4th " " "
- 3rd " " "
- 2nd " " "
- 1st " " "
- Planned Off-Street Centres

Central Business District
Non-Residential Land
Main Road Network
Limits of Built-Up Area

1 0 1 2 3 4 5
MILES
Table 2-1

Average Size of Sample Centres

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>Av. No. Retail Units</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>66</td>
<td>107.3</td>
</tr>
<tr>
<td>Melbourne</td>
<td>65</td>
<td>102.9</td>
</tr>
<tr>
<td>Adelaide</td>
<td>50</td>
<td>55.8</td>
</tr>
<tr>
<td>Brisbane</td>
<td>47</td>
<td>5.3</td>
</tr>
</tbody>
</table>

S.D. - Standard Deviation

Data Collection

Each of the 228 centres selected from the four cities was subjected to a detailed land use analysis in the field. This involved the recording of business types according to a common classification scheme, based on an assessment of the goods and services offered for sale in each establishment. In addition to land use data, information recorded included: the layout and extent of the central business frontage; the zone of highest pedestrian densities; off-street and kerbside parking facilities; the location within the centre of chain store branches and an estimation of the selling area of the centre's major retail units. Additional information relating to each sample centre included the enumeration of city public transport services passing through the centre, and the number of public transport services terminal to it, together with the numbers of incoming buses or trams during shopping hours. Where available, information relating to the traffic flow in the vicinity of the centres has been recorded.

6. See Appendix I for the classification of suburban business types used throughout the study, and a general discussion of its functional aims.
With this information a measure is possible of the two main facets of a centre's attractive force - functional structure and accessibility. By applying a scheme based on tenets of central place theory, an attempt has been made to classify the sample centres from each city on the basis of functional structure.

Classification of Sample Business Centres

The basic data used in this classification scheme relates to the numbers and characteristics of retail and business establishments contained within a centre. The validity of the classification of business centres therefore depends on the accuracy of the classification of business types. There are obvious disadvantages in the use of total establishments, subdivided according to business types, as a basis for individual centre classification. No two retail establishments are directly comparable, despite the fact that they offer for sale the same type of goods. Differences in store selling area may or may not affect turnover; differences in range and styling of goods within the same general type are considerable; the location of a site within a centre will profoundly affect sales levels; the attitude and ability of sales staff is never constant, and so on. There is no doubt that a classification in terms of retail sales turnover for each establishment would take into account a wide range of these distinguishing factors, and would enable accurate measure of the relative significance of particular types of business in a centre's operations. There is, however, no possibility of obtaining accurate data relating to the
sales of each unit in a large group of business centres. Possible alternatives present themselves: the enumeration of selling area or front-feet per business type, for example. However, it is clear that there is no direct relationship between an individual store's size and its sales levels; retail commodities of different types require selling areas of greatly differing extents. Other measures, such as the number of employees per business type are equally unreliable indicators of turnover within individual centres. Figures relating to total full-time employees will tend to be an underestimate of the workforce within suburban business centres, where a high proportion of casual and part-time family labour is used.  

While the use of numbers of business establishments as the basis for a classification of business centres is based primarily on expediency, it is possible to guard against the more obvious errors which arise from such a choice, and also even to justify it on grounds of other than expediency. By taking into account numbers of chain store groups, size of major units and of any other establishments of above average size, an important means of distinguishing between centres of similar size and structure is available. Further, it may be argued that if a distinctive class system can be formulated, which has meaning with reference to trading operations and consumer habit patterns, then the fact that its initial base was less than ideal is

7. The same problem has been faced, and the same solution accepted in most studies of this type. Garrison et al, Geographic Change, 1959, pp 70-1.
of little significance. It may be pointed out that, from the viewpoint of the customer using centres of different classes, the initial distinction is made with reference to the numbers and range of establishments selling particular types of goods and services.

Here, the primary aim is a classification of sample centres on the basis of numbers of retail and other business establishments; and in particular the relationship between total numbers of establishments in a centre, and the functional structure of business types represented.

The size of a business centre is by no means the only attribute to be considered in an examination of functional structure, but it is the most important. There is marked positive correlation between the size of sample centres and the number of business types represented. With the data available, it follows that size, in terms of the numbers of business establishments, will be the basic variable against which will be measured the distribution of each business type throughout the sample. If size was the only criterion it would be possible to hypothesise that a business type occurring in six centres would be found in the first six ranked according to size, and a business type

8. Data published in Berry's Chicago study does indicate a positive correlation between the number of establishments within business centres and the sales levels of these centres \( (r = .758) \). There are similarly close relationships between sales and total floor space \( (r = .762) \), front-feet \( (r = .756) \), and employment totals \( (r = .916) \). Berry et al., Commercial Structure, 1963, p 118.

9. Nos of Retail Units : Nos of Business Types (Simple Correlation Coefficients)

<table>
<thead>
<tr>
<th>City</th>
<th>( r )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>.88</td>
</tr>
<tr>
<td>Melbourne</td>
<td>.89</td>
</tr>
<tr>
<td>Adelaide</td>
<td>.94</td>
</tr>
<tr>
<td>Brisbane</td>
<td>.94</td>
</tr>
</tbody>
</table>

\( * \) = .1% level.
occurring in twenty centres would be found in centres ranked one to twenty. In this way there would be a continuum with a fixed rank-size:function relationship, and any hierarchical classification would have to be based on breaks in the rank-size continuum. However Figures 5 and 6 show that no such breaks occur in the four samples concerned. It is therefore necessary, in order to test the size-function hypothesis, to closely examine the distribution of each business type throughout the sample. According to central place theory it may be expected that this hypothesis will not be supported, and that in fact a stepped class system will emerge related to the threshold points of different groups of business types.

Classification

The examination and classification of the sample centres from each city involved three separate stages:

(i) The grouping of business types with tendencies to common distribution among sample centres.

(ii) The ranking of business centres on the basis of their possession of business types from the groups outlined above.

(iii) The testing of centre ranking with reference to the total structure of the centres within each rank.

Stage One

The first stage of this analysis produces results which, while not wholly convincing, do show a tendency towards the grouping of certain business types with common distributional patterns at distinct size levels. The distribution of each business type among
SIZE DISTRIBUTION OF SAMPLE CENTRES

(i) Sydney

(ii) Melbourne

Sample Centres (in size order - App.II, Tab.1)

Sample Centres (in size order - App.II, Tab.2)
SIZE DISTRIBUTION OF SAMPLE CENTRES

(i) Adelaide

(ii) Brisbane

Sample Centres

Units

Retail

Total

Sample Centres

Units

Retail

Total

(In size order - App.II, Tab.3)

(In size order - App.II, Tab.4)
the sample centres was measured by the calculation of the median size of centres in which it was represented. It was found that when different business types were distributed among similar numbers of centres within the sample, the median size of centres within these distributions was markedly similar. Further, there is a negative correlation between the number of centres and the median size of those centres. That is, the fewer the centres in which a business type is found, the higher will be the median size of that group of centres; therefore there is a marked tendency for business types found in only a few centres, to be located in the largest within the sample. For example, data from the Melbourne sample\(^\text{10}\) shows that variety and millinery stores are both present in 32 of the 65 centres, the median size of each group being 152.5 (see Table 2 Appendix II). The same table shows that 28 of the 32 centres with variety stores and 25 of those with milliners are found in the first 32 centres, ranked according to size. There is, then, a close resemblance between the distributional patterns of these business types, but no perfect relationship with centre size. Further confirmation that no complete size function continuum exists may be obtained by referring to the distribution of furnishing stores among the sample centres. In common with variety and millinery outlets this is found in 32 centres, but with a lower median figure - 130.0; 10 of the 32 centres are ranked

\(^{10}\) Detailed examples in this section will refer to diagrams and tables relating to the sample of business centres selected in Melbourne. Similar information may be obtained for each city from tables in Appendix II.
below the largest 32. In other words, the distribution is less closely related to size. Obviously there comes a point when the distribution may be regarded as having little or no relationship with the size of the centres in which it is located. A Melbourne example of this form of distribution relates to the location of builder's hardware establishments - located in 28 centres which have a median size of 95.0.

Measure of the extent of the deviation of this figure from an ideal size: function relationship may be obtained by comparing it with the median size of the largest 28 centres (i.e. those it would have been located in if the continuum was in operation), this figure is 160.0. The spread of builder's hardware units throughout the sample centres is therefore wide, with establishments in small centres not normally the recipients of specialised business types confined to a small number of centres (cf. opticians found in 29 centres with a median size of 157.5, 25 in centres ranked 1-29). Distributions not closely related to size are in some cases those of non-central business types, which are often located within business centres by chance - e.g. builder's hardware and car accessories. Others include public services (public library, baby health centres) and specialist outlets, such as antique stores. It seems likely that such business types operate outside normal central place relationships and have a fixed clientele which will not be affected by location in a centre of particular rank.
In order to measure the extent to which business types deviate from an ideal size:function relationship, and to examine evidence of the clustering of business types with like distribution among sample centres, scatter diagrams have been drawn for each city relating to the number of centres in which business types are represented and the median size of those centres (see Appendix II, Figures 1-2). The deviation may be assessed by comparing the median size of each business type, with the maximum possible median which would occur if a fixed rank-size:function ratio existed. It may be noted that the more common business types have medians close to this maximum figure, with an increasing deviation with falls in the number of centres represented. This is the result of greater variations in size among the larger centres and the effect of isolated occurrences of such business types in smaller, particularly planned, centres (e.g. Chadstone Shopping Centre in Melbourne).

The distribution of business types on the graphs indicates only a slight tendency to clustering. However, by dividing the array of business types on the basis of the most marked breaks in median:centre relationship it is possible to recognise, in each city, five groups with common distributional characteristics. There is no overlapping between these groups; which have low coefficients of variability for a series of attributes (see Appendix II, Tables 5-8). It must be emphasised that these groups merely indicate that in each city it is possible to distinguish five sets of business types with a tendency to common patterns of distribution throughout the sample.
centres. They vary from Group I business types, which are found in virtually all sample centres irrespective of size, to those in Group V which are found only in the largest centres. In order to establish the relevance of this characteristic it is necessary to examine the make-up of the different groups within the four cities. Inevitably there are wide differences in the numbers of centres represented and their median sizes, particularly between Sydney/Melbourne and Adelaide/Brisbane. However, there is a noticeable similarity in the constituent elements of the five groups, with the emergence of distinct functional patterns. In the first and second groups there is a clear emphasis on convenience business types, a balance between convenience, services and comparison outlets in the third group, with a dominance of professional services and comparison outlets in the fourth and fifth groups.

Detailed examination shows considerable variation between the cities. There are only eight business types located within the same group in each city, all in the first three groups, with seven types found in the fifth group in the two or three cities in which they are represented in suburban business centres. 11

11. Group I - grocer, fruit and vegt., butcher, chemist.
   Group 2 - draper, hardware, cleaner.
   Group 3 - toys/sports.
   Group 5 - dept store, confectionery, books, music/art, cameras, travel agent, insurance.
Stage Two

This stage in the classification of suburban business centre samples is concerned with the ranking of centres on the basis of their possession of business types according to the five groups outlined above. The assumption is that possession of a complete range of the business types in each group will indicate the highest ranking 5th order centres; possession of all but the fifth group will separate out 4th order centres, and so on.

The assignment of a rank to each centre was carried out by means of a tabulation abstracted from Tables 1-4 in Appendix II. This tabulation is summarised in Appendix II, Tables 9-12 which show the numbers of establishments present in each sample centre related to the five groups of business types already established. It will be noted that, in accord with central place theory, each centre of a particular rank fulfils the functions carried out by class orders below that rank. The major problem is the setting of the point at which insufficient 5th order business types are present for a centre to be ranked with 5th order status; number of 4th order business types for 4th order status and so on. There is no clear-cut hierarchy of discrete ranked orders; the considerable continuity within the data necessitates somewhat arbitrary lines of definition being drawn. Hence with reference to the Melbourne data a 5th order centre possesses 7 or more of the 10 5th order business types; a 4th order centre eight or more of the eleven 4th order types; a 3rd order centre seven or more of the eight 3rd order business types;
and a 2nd order centre at least ten of the fifteen 2nd order business types. However, close examination of the data reveals that such precise limits have been ignored in particular borderline cases. This may be seen more clearly with reference to the summary table relating to Melbourne (Appendix II, Table 10). The 3rd order centres of Balwyn, Middle Brighton and Ivanhoe have a frequency ratio of 4th order business types equal to several 4th order centres. Similarly the 2nd order centres of Blackburn, East Preston and Parkdale have high ratios of 3rd order types. The other cities show similar examples of this form of apparent overlap. In such cases a decision regarding the assignment of class orders has been based on an examination of business types present and comparison with average class order conditions. Hence in Melbourne, Ivanhoe has a frequency ratio of .8 for 4th order business types; however it has an average of less than 1 establishment per 4th order business type (4th order centres average 1.8), contains only one 5th order business type (4th order centres average 4.0), and 49 business types are represented in the centre (4th order average is 59). In these circumstances, on the basis of overall functional structure, Ivanhoe has been assigned 3rd order status. Using these methods, it is possible to divide the sample centres of each city into five ranked class orders (Appendix II, Tables 13-16).

Planned centres situated in locations apart from existing retail facilities stand outside the general hierarchical classification.
Detailed discussion of their form, structure, and functional role is found in Chapter 10. Here it is only necessary to point out that the chief distinguishing features are the large proportions of high order comparison retail outlets in relation to the total number of establishments and business types represented; a tendency for below average representation of convenience outlets, and personal and professional services; and few establishments per business type. Examples range in size from Chadstone (Melbourne) with 70 establishments, to the smaller Brisbane example of Mount Gravatt Drive-In with 26. Where shopping malls have been incorporated into existing centres, their impact on the total structure of the centres concerned has been insufficient to draw them from the normal hierarchical class system; Sydney examples are Eastwood, Dee Why, and Hornsby.

The significance and validity of the hierarchical classification must be related to the operation of the individual centres. Functional structure is not a complete measure of centrality, particularly within an urban area where a considerable array of additional distinguishing features are in operation. Further, it may be argued that within metropolitan areas the relative ease of movement and competition between adjacent centres will result in the complex overlapping of market areas. Under these circumstances it would be surprising to find a hierarchical ranking system which reflected exactly the requirements of a theory of central places evolved with reference to a low density rural area. The validity, in operational
terms, of the hierarchical classification presented here will be tested in Part II of this study with reference to the detailed examination of selected centres.

**Stage Three**

The third section of this outline of classification techniques is concerned with the examination of various attributes of the class orders distinguished from the sample data for each city.

It is open to some doubt whether the class systems devised by the method outlined above represents a statistically viable division. The central tendencies of each class order indicate distinctive characteristics, however the range of conditions about the mean blurs the outlines of each rank (Appendix II, Tables 13-16). Statistical measures of difference indicate that there is some basis for the acceptance of the ranked orders in terms of various functional attributes. Use has been made of Student's t test to calculate the standard error of the differences between the centres grouped in each class order according to total numbers of business types present (Table 2-2). The significance of the differences between each class order and its immediate neighbours was tested for each city. In only two of the sixteen cases have the differences failed to reach the 1.0% level of probability, each involving differences between 4th and 5th order classes. For the remainder it is clear that the grouping of sample centres in this way does result in statistically significant classes in terms of the range of business types, which is the basic variable with regard to functional structure.
Table 2-2

Standard Error of Difference (Student's t) Between Hierarchical Class Orders on the basis of Total Business Types

<table>
<thead>
<tr>
<th>Differences between Class Orders:</th>
<th>V/IV</th>
<th>IV/III</th>
<th>III/II</th>
<th>II/I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t = 7.0</td>
<td>4.5</td>
<td>5.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>signif. .1%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
</tr>
<tr>
<td>Melbourne</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t = 2.7</td>
<td>6.9</td>
<td>8.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>signif. 5.0%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
</tr>
<tr>
<td>Adelaide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t = 2.2</td>
<td>5.3</td>
<td>8.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>signif. 10.0%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
</tr>
<tr>
<td>Brisbane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t = 5.4</td>
<td>5.3</td>
<td>6.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>signif. .1%</td>
<td>1.0%</td>
<td>.1%</td>
<td>.1%</td>
<td>.1%</td>
</tr>
</tbody>
</table>

The differences between each class order in terms of internal functional structure have been examined by correlating total numbers of establishments with numbers of food and comparison units, and professional service establishments for each class order, and by plotting the regression of each correlation (Figures 7-12 and Table 2-3). Examination of this material suggests a variety of relationships. In general, while distinctions between the regression of each class order are present in most instances, these are engulfed by the application of confidence limits to the data.

However, certain basic differences may be noted. With regard to total food outlets there are close similarities between the two larger cities, and at a lower level, between the smaller cities (Figures 7 and 8). In each instance the proportionate significance
REGRESSION ANALYSIS - RETAIL UNITS: FOOD OUTLETS BY SAMPLE CENTRE CLASS ORDERS

(i) Sydney

V: \( b = 21a + 9 \) (\( r = +.85 \))
IV: \( b = 25a + 40 \) (\( r = +.86 \))
III: \( b = 29a + 44 \) (\( r = +.88 \))
II: \( b = 47a - 34 \) (\( r = +.96 \))
I: \( b = 42a - 3 \) (\( r = +.84 \))

(ii) Melbourne

V: \( b = 22a + 16 \) (\( r = +.87 \))
IV: \( b = 26a + 4.1 \) (\( r = +.95 \))
III: \( b = 32a + 4.5 \) (\( r = +.92 \))
II: \( b = 27a + 7.1 \) (\( r = +.96 \))
I: \( b = 46a + 1.3 \) (\( r = +.97 \))
REGRESSION ANALYSIS - RETAIL UNITS: COMPARISON OUTLETS BY SAMPLE CLASS ORDERS

(i) Sydney

\[ V: b = 0.4a - 4.6 \ (r = .87) \]
\[ IV: b = 0.37a - 3.3 \ (r = .93) \]
\[ III: b = 0.24a + 1.6 \ (r = .86) \]
II: not significant
I: “”

(ii) Melbourne

\[ V: b = 0.38a + 7.0 \ (r = .9) \]
\[ IV: b = 0.31a + 9.1 \ (r = .93) \]
\[ III: b = 0.32a + 2.6 \ (r = .83) \]
II: not significant
I: “”
REGRESSION ANALYSIS - RETAIL UNITS: COMPARISON OUTLETS BY SAMPLE CLASS ORDERS

(i) Adelaide

IV/V: \( b = 41a - 12.2 \) (\( r = .89 \))
III: \( b = 27a - 10 \) (\( r = .72 \))
II: \( b = 13a + 1.3 \) (\( r = .72 \))
I: \( b = 13a + 2 \) (\( r = .45 \))

(ii) Brisbane

IV/V: \( b = 26a + 4.9 \) (\( r = .71 \))
III: \( b = 12a + 3.4 \) (\( r = .83 \))
II: not significant
I: ""
REGRESSION ANALYSIS - ESTABLISHMENTS: PROFESSIONAL SERVICES BY CENTRE CLASS ORDERS

(i) Sydney

(ii) Melbourne

V: b + 1 Ma + 2.2 (r = .89)
IV: b + 12 a + 7.3 (r = .92)
III: b + 09 a + 4.4 (r = .49)
II: b = 1 a + 1.6 (r = .57)
I: b = 1.2 a (r = .54)

V: b + 04 a + 32.4 (r = .41)
IV: b + 17.6 (r = .54)
III: b + 7 a + 7.0 (r = .18)
II: b + 1 a + 4 (r = .7)
I: b = 06 a + 7 (r = .51)

x - not significant
REGRESSION ANALYSIS - ESTABLISHMENTS: PROFESSIONAL SERVICES

(i) Adelaide

(ii) Brisbane

V: $b = 15a - 4.0 \ (r = 0.7) x$
IV: $b = 0.7a + 5.7 \ (r = 0.86) x$
III: $b = 1.1a + 2.1 \ (r = 0.53) x$
II: $b = 2a + 3.6 \ (r = 0.75) x$

V: $b = 13a + 8.5 \ (r = 0.73) x$
IV: $b = 21a - 5.0 \ (r = 0.85) x$
III: $b = 12a + 1 \ (r = 0.62) x$
II: $b = 0.8a + 2.2 \ (r = 0.39) x$

x - not significant
Table 2-3
Correlation Coefficients and Regression Equations Relating Total Business Establishments to Total Numbers of Food, Comparison, and Professional Service Units.

<table>
<thead>
<tr>
<th>Total Retail Units:</th>
<th>Comparison Units</th>
<th>Total Establ.:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Food Units</td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>.85 b = .21a + .9</td>
<td>.87 b = .4a - 4.6</td>
</tr>
<tr>
<td>III</td>
<td>.86 b = .25a + 4.0</td>
<td>.93 b = .37a - 3.3</td>
</tr>
<tr>
<td>II</td>
<td>.88 b = .29a + 4.4</td>
<td>.86 b = .24a + 1.6</td>
</tr>
<tr>
<td>I</td>
<td>.96 b = .47a - 3.4</td>
<td>.17* b = .04a + 5.9</td>
</tr>
<tr>
<td>Melbourne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>.87 b = .22a + 1.6</td>
<td>.89 b = .38a + 7.0</td>
</tr>
<tr>
<td>IV</td>
<td>.95 b = .26a + 4.1</td>
<td>.93 b = .31a + 9.1</td>
</tr>
<tr>
<td>III</td>
<td>.92 b = .32a + 4.5</td>
<td>.83 b = .32a - 2.6</td>
</tr>
<tr>
<td>II</td>
<td>.96 b = .27a + 7.1</td>
<td>.81 b = .25a - 2.2</td>
</tr>
<tr>
<td>I</td>
<td>.97 b = .46a + 1.3</td>
<td>-3*</td>
</tr>
<tr>
<td>Adelaide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>.4* b = .4a - 19.9</td>
<td>.89 b = .41a - 12.2</td>
</tr>
<tr>
<td>IV</td>
<td>.6* b = .37a - 4.9</td>
<td>.72 b = .13a + 1.3</td>
</tr>
<tr>
<td>III</td>
<td>.82 b = .34a + 1.0</td>
<td>.72 b = .27a - 1.0</td>
</tr>
<tr>
<td>II</td>
<td>.75 b = .28a + 2.4</td>
<td>.49* b = .13a + 2.1</td>
</tr>
<tr>
<td>I</td>
<td>.64 b = .35a + 1.4</td>
<td>-</td>
</tr>
<tr>
<td>Brisbane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>.97 b = .2a + 6.3</td>
<td>.71 b = .26a + 4.9</td>
</tr>
<tr>
<td>IV</td>
<td>.89 b = .3a + 3.1</td>
<td>.83 b = .2a + 3.4</td>
</tr>
<tr>
<td>III</td>
<td>.81 b = .3a + 3.1</td>
<td>.19* -</td>
</tr>
<tr>
<td>II</td>
<td>.87 b = .54a - 1.7</td>
<td>-</td>
</tr>
<tr>
<td>I</td>
<td>.91 b = .82a - 2.0</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: All correlation coefficients relate to positive relationships, unless otherwise indicated.

* Denotes that 'r' fails to reach 5% probability level.

Regression Equations:  
a = Total Retail Units or Establishments  
b = Total Food, Comparison, and Professional Services Units.
of food outlets increases with ranks in rank. Further 5th, and to a lesser extent 4th, order centres stand apart from a virtual continuum relating to the lower three orders. This supports a later contention regarding the functional roles of the different class orders.

By contrast the significance of comparison stores decreases with the lowering of rank in Sydney and Melbourne, with 4th and 5th order best estimates regressions clearly distinguished from the lower ranks (Figure 9). In all cities there is a tendency for correlation coefficients to fall in this category with reference to 1st and 2nd orders (Table 2-3). At these levels the introduction of small numbers of comparison units is sufficient to cause this imbalance. In the smaller cities the 4th and 5th orders have been considered together; this results in a continuum relationship in Adelaide, and a clear distinction in Brisbane (Figure 10). In both instances, however, the small numbers of centres within the sample reduces the significance of the results.

The clearest distinction between class orders in the larger cities is obtained with reference to professional service establishments, although this is offset by the low coefficients for this attribute. In both Sydney and Melbourne there is clearly a higher rate of professional service representation in the higher orders (Figure 11). However, a continuum relationship is presented in the smaller cities (Figure 12). Here it is differences in the range and depth of merchandise at the convenience levels which distinguishes higher order
ranks, rather than the possession of a wide comparison or professional service content.

In summary, the results of this analysis bring no conclusive proof of the validity of the hierarchy in terms of functional form. However, it is evident that there is some statistical support for a classification of this type. A clear evaluation of its significance in terms of operational characteristics must await detailed examination later in the study.

The analysis of business structure is based on an examination of the business types represented in the different class orders, particularly the hard core of 'typical' business types with a frequency ratio of .75 or above within each ranked group of centres. It is first necessary, however, to note the extent to which a blurring of this 'typical' pattern occurs. Table 2-4 shows the total numbers of business types represented in all centres within each class order (column a), within at least three-quarters of the centres (column b) and within any one or more of the centres (column c). The lower the class order, the smaller the percentile significance of the basic elements in terms of column c. This is the result of the haphazard location within individual low order centres of single examples of higher order business functions. The sharp reduction in the numbers of 'typical' business types present in three-quarters of the centres in a class order (e.g. Sydney 1st order centres the number drops from 45 in column c to 9 in column b; 2nd order from 54 to 24)
Table 2-4

Numbers of Business Types Present in Sample Centres Grouped According to Class Orders.

<table>
<thead>
<tr>
<th>Class Orders</th>
<th>SYDNEY</th>
<th>MELBOURNE</th>
<th>ADELAIDE</th>
<th>BRISBANE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a</td>
<td>b</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>3</td>
<td>9</td>
<td>45</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>6.6</td>
<td>20.0</td>
<td>13.3</td>
<td>36.6</td>
</tr>
<tr>
<td>%</td>
<td>6.6</td>
<td>20.0</td>
<td>13.3</td>
<td>36.6</td>
</tr>
<tr>
<td>II</td>
<td>13</td>
<td>24</td>
<td>54</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>26.0</td>
<td>44.4</td>
<td>12.5</td>
<td>31.2</td>
</tr>
<tr>
<td>%</td>
<td>26.0</td>
<td>44.4</td>
<td>12.5</td>
<td>31.2</td>
</tr>
<tr>
<td>III</td>
<td>19</td>
<td>32</td>
<td>67</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>28.6</td>
<td>47.7</td>
<td>37.9</td>
<td>47.0</td>
</tr>
<tr>
<td>%</td>
<td>28.6</td>
<td>47.7</td>
<td>37.9</td>
<td>47.0</td>
</tr>
<tr>
<td>IV</td>
<td>30</td>
<td>43</td>
<td>67</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>44.7</td>
<td>64.2</td>
<td>43.6</td>
<td>64.8</td>
</tr>
<tr>
<td>%</td>
<td>44.7</td>
<td>64.2</td>
<td>43.6</td>
<td>64.8</td>
</tr>
<tr>
<td>V</td>
<td>44</td>
<td>61</td>
<td>71</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>62.0</td>
<td>85.9</td>
<td>66.2</td>
<td>84.5</td>
</tr>
<tr>
<td>%</td>
<td>62.0</td>
<td>85.9</td>
<td>66.2</td>
<td>84.5</td>
</tr>
</tbody>
</table>

Notes:  
a. Number of business types present in all centres within each class order.  
b. Number of business types with a frequency ratio of above .75 within the centres of each class order.  
c. Number of business types represented in any one or more centres within each class order.  
  
   %  Total of columns a and b as percentage of column c.
indicates the extent of this dispersal. The character of the business structure of any centre within a class order is determined firstly by the business types listed under column a, and secondly by those in column b. The additional types included in column c are not normally present in sufficient numbers to affect this character, unless this involves the location of a major high order establishment, such as a variety or department store, within a lower order centre (e.g. the department store in the 3rd order Sydney centre of Gordon).

In terms of total 'typical' business types present (column b), there are marked similarities between Sydney and Melbourne, and, at a slightly lower level, between the two larger cities and Adelaide. Brisbane, however, stands apart by reason of low representation at the level of the highest orders. Column c indicates that this is primarily due to poor development of the hierarchical system, for in terms of total business types represented, Brisbane is at only a slightly lower level than the other cities. It would appear, therefore, that higher order functions are spread more widely in Brisbane, with the resultant lack of clear definition of the 4th and 5th order centres.

Comparison between the centre rank at which each business type becomes a 'typical' class order constituent, and the ranking applied earlier to business types, based on median size clustering (cf. Tables 5-8 and 17-20 in Appendix II), shows considerable minor differences. This is particularly the case with reference to Melbourne and Brisbane. These distinctions are to be expected; the initial ranking
of a business type was made with reference only to its distribution among the sample centres ranked according to size. The ranking that emerges from the comparison of centres within the class orders takes into account the total functional structure of centres which have been grouped on the basis of the classification techniques discussed above. However, the differences between the two lists do not alter the basic functional pattern. That is, the significance of convenience units and personal services in the first and second orders, the addition of major units and comparison outlets in fourth and fifth orders, with the third order acting as an intermediate convenience/comparison type (see Table 2-5). The weak development of high order centres in Brisbane, discussed earlier, is further emphasised in Table 2-5. Thirteen business types in the 4/5 group are not 'typical' of Brisbane centres at that level; in addition three types are not 'typical' of sample centres either in Brisbane or Adelaide.

Detailed comparison of the four cities, order by order, indicates that 33 business types become 'typical' at the same class level in Sydney and Melbourne; 26 in Melbourne and Adelaide; and 22 in Sydney and Adelaide. Comparison with Brisbane indicates fewer similarities: 19 with Adelaide; 18 (Sydney); and 12 (Melbourne) - see Table 2-6. Patterns are therefore clearly related between Sydney and Melbourne, with the Adelaide distribution bearing some resemblance to the larger cities.

A final general inter-city comparison may be made with reference to the average numbers of establishments per business type present
Table 2-5

Business Types Grouped According to the Common Class at which they become 'Typical' Constituents in Each City.

<table>
<thead>
<tr>
<th>I &amp; II</th>
<th>III</th>
<th>IV &amp; V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocer</td>
<td>Shoes</td>
<td>Dept Store +</td>
</tr>
<tr>
<td>Milk Bar</td>
<td>Electrical</td>
<td>Variety &quot;</td>
</tr>
<tr>
<td>Fruit &amp; Veg.</td>
<td></td>
<td>Millinery *</td>
</tr>
<tr>
<td>Butcher</td>
<td></td>
<td>Furniture</td>
</tr>
<tr>
<td>Draper</td>
<td></td>
<td>Furnishings +</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td>Sewing Machine +</td>
</tr>
<tr>
<td>Chemist</td>
<td></td>
<td>Music/Art *</td>
</tr>
<tr>
<td>Wms Hairdr.</td>
<td></td>
<td>Leather</td>
</tr>
<tr>
<td>Mns Hairdr.</td>
<td></td>
<td>Cameras +</td>
</tr>
<tr>
<td>Post Office</td>
<td></td>
<td>Florist +</td>
</tr>
<tr>
<td>Bank</td>
<td></td>
<td>Gdn. Equip. +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Builder's Hardw. +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Hand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I &amp; II/III</th>
<th>III/IV &amp; V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cakes</td>
<td>Mns Clothing</td>
</tr>
<tr>
<td>Sea Foods</td>
<td>Chils. &quot;</td>
</tr>
<tr>
<td>Wms Clothing</td>
<td>Jewel/Gifts</td>
</tr>
<tr>
<td>Newsagent</td>
<td>Toys/Sports</td>
</tr>
<tr>
<td>Cleaner</td>
<td>Pets</td>
</tr>
<tr>
<td>Restaurant *</td>
<td>Hotel +</td>
</tr>
<tr>
<td>Garage</td>
<td>Solicitor *</td>
</tr>
<tr>
<td>Estate Agent</td>
<td></td>
</tr>
<tr>
<td>Doctor (not Melb.)</td>
<td></td>
</tr>
</tbody>
</table>

+ - not present as a 'typical' function in Brisbane
* - " " " " " " " " or Adelaide.

N.B. Delicatessen, Shoe Repairs, Cafe and Dentist are the only business types to cut across this pattern.

within the different class orders. Table 2-7 shows the average totals of 'typical' business types per class order, divided according to the main functional divisions. The validity of the term 'typical' is to
Table 2-6
Note - Table 2-6

Class order in brackets indicates incomplete inclusion in all higher orders. See Tables 19 and 20 in Appendix II.
### Table 2-6

<table>
<thead>
<tr>
<th>Class Order at which Business Types become 'Typical'</th>
<th>Sydney</th>
<th>Melbourne</th>
<th>Adelaide</th>
<th>Brisbane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept. Store</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>Variety Store</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Supermarket</td>
<td>-</td>
<td>-</td>
<td>(3)</td>
<td>-</td>
</tr>
<tr>
<td>Grocer</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Delicatessen</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Milk Bar</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cakes</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Confectionery</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fruit &amp; Veg.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Butcher</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sea Foods</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>General Store</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>(3)</td>
</tr>
<tr>
<td>Womens Clothing</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Millinery</td>
<td>5</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Draper</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>(2)</td>
</tr>
<tr>
<td>Mens Clothing</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
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### Table 2-7.

**Average Numbers of Establishments of 'Typical' Business Types**

Divided into Specified Groups in Sample Centres, Grouped According to Class Orders.

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<th>III</th>
<th>IV</th>
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<td>M</td>
<td>A</td>
<td>B</td>
<td>S</td>
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<td>Food</td>
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<td>7.8</td>
<td>4.8</td>
<td>3.5</td>
<td>18.8</td>
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<td>Other Convenience</td>
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<td>7</td>
<td>0.9</td>
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<td>9</td>
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<td>3.1</td>
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<td>Catering/Entertainment</td>
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<td>-</td>
<td>-</td>
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<td>Car Services</td>
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<td>1.5</td>
<td>-</td>
<td>-</td>
<td>1.7</td>
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<tr>
<td>Professional Services</td>
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<td>Public Services</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
<td>1.0</td>
</tr>
</tbody>
</table>

- **Average Totals (Typical)**: 12.8 14.9 6.4 6.1 49.3 43.6 26.2 20.8 93.7 99.9 49.5 40.2 170.3 227.9 110.3 76.7 289.3 293.4 171.7 123.1
- **% Comparison**: 8.0 - - - 6.3 7.6 4.2 4.8 19.7 23.3 16.2 7.9 28.5 29.0 20.1 20.5 28.5 32.7 25.2 25.7
- **Average Totals (All Estab.)**: 24.5 20.2 13.5 11.3 60.3 62.2 32.3 33.3 113.0 118.1 63.1 59.9 187.5 247.5 122.0 84.5 300.1 310.3 198.3 145.4
- **% Typical**: 52.2 73.8 47.4 54.0 81.8 70.0 81.1 62.5 82.9 84.6 78.4 67.1 90.8 92.1 90.4 90.8 96.4 94.6 86.6 84.7

*Notes: S. = Sydney; M. = Melbourne; A. = Adelaide; B. = Brisbane.*

- Post Office present in establishment listed under one of other business type headings.
a certain extent upheld by a comparison between the average totals of such establishments, and the average totals with reference to all establishments, 'typical' or not (i.e. including those with a frequency occurrence of below .75 within each class order). As might be expected, the higher the class order the greater the proportion of the total establishments included within the 'typical' list (e.g. Melbourne: 73.8% in the 1st order; 70.0% in the 2nd order; 84.6% in the 3rd; 90.4% in the 4th; and 94.6% in the 5th order). Generally percentages are sufficiently high to confirm the overall importance of the 'typical' functions. Examination of 'typical' business types and average numbers of establishments present in the different class orders, underlines the functional distinctions already suggested (Table 2-7, and Tables 17-20 in Appendix II).

First Order Centres

First order centres in all cities contain predominantly food and other convenience stores. From the viewpoint of size, the larger cities contain on average approximately twice the establishments in their first order centres than those in Adelaide and Brisbane. However, data relating to the lowest orders must be regarded with some suspicion owing to the low representation of small centres in the samples. Basically the food outlets at the 1st order level are the same for each city: grocer; fruit and vegetables; and butcher, with the addition of a milk bar in Melbourne and Adelaide, and delicatessen in Sydney. Normally there will be one or two units of each type, although a distinguishing feature of many 1st order centres is the lack of
competing units of the same business type. In addition to the food establishments, a chemist is the only other establishment to be found in all four cities at this primary level. The additional business types typically within these centres in Sydney and Melbourne may well be the result of inadequate sampling of the smallest groups; although the fact that bank branches are found in all centres studied in both cities, and drapers and women's hairdressers in all centres in Melbourne, does appear to indicate that 1st order groups within the largest cities provide a greater range of business types. In all cities, it may be expected that first order groups will provide essential requirements for a primary trade area defined by normal walking distances.

**Second Order Centres**

It has been suggested that the functional role of 2nd order centres differs little from that of the first order, and the interchange of functions entering at one or other levels has been noted. Table 2-7 shows that while business types typical in 2nd order centres are primarily within the convenience and service categories; there is a marked increase in the number of establishments representing those categories. Further, 15 additional business types become 'typical' in the 2nd order sample centres in Sydney, 9 in Melbourne, 8 in Brisbane and 6 in Adelaide (Tables 17-20 in Appendix II). There is considerable variety in the make-up of these types from city to city, but the general effect is to complete the full range of food outlets, add further convenience types, personal and professional services, and introduce either general draper and/or women's clothing to form
the first comparison units within the hierarchy. The result is the emergence of a centre with internal competition at the convenience level. Again, there is a marked contrast between the two sets of cities; the average Adelaide or Brisbane 2nd order centre is half the size of its counterpart in Sydney or Melbourne. However, there is a less marked distinction in terms of total business types represented, which indicates that at this level at least, the main difference is in terms of the average numbers of establishments per business types (e.g. Sydney's 2nd order centres average 4.0 butchers, Adelaide's 2.0).

While the size and structure of second order centres firmly distinguishes them from first order types, it seems likely that frequently the two class orders act as alternatives for the position of lowest ranked central place, rather than in a separate hierarchical relationship. It may be argued that 2nd order centres emerge where factors relating to the population density of primary trade areas, or lack of competing 1st order centres results in a sufficient demand for the support of additional convenience business types. However, in such conditions it may be expected that first order groups will develop towards the edge of the primary trade area of such a second order centre, limiting its sphere of influence to the provision of frequently required convenience goods and services.
Third Order Centres

The average third order centre in each city is approximately twice the size (both with reference to 'typical' and total establishments) of the second order average. However, the change in functional structure is more important than the mere increase in size. Significantly, increases in the average numbers of 'typical' food outlets are considerably less important in the make-up of the total increase, than the growth in numbers of comparison establishments; this is true in all cities but Brisbane (Sydney: increase from 3.1 comparison establishments in the second order to 18.5; Melbourne: 3.3 to 23.3 establishments; Adelaide: 1.1 to 9.0 establishments; while Brisbane 3rd order centres increase from 1.0 to an average of only 3.2 comparison establishments). The proportion of comparison outlets rises to around 20% of 'typical' units.

In Sydney and Melbourne the comparison units which become 'typical' at the third order level complete the full range of clothing outlets (men's clothing, shoes, children's clothing) and introduce other comparison types such as jewellers and gifts, electrical, and toys and sports outlets. The two smaller cities follow this pattern, but third order centres contain a narrower range of clothing types and average few establishments per business type. There is also a significant increase in the numbers of professional service establishments which become 'typical' at this level. These consist of banks, estate agents, and doctors and dentists, together with solicitors in the Melbourne
examples. Further, in Sydney and Melbourne third order centres contain catering service establishments; both cafes and restaurants.

Understanding of the functional role of third order centres can be more easily obtained by reference to additional information relating to their structure. Two elements emerge at this order which become dominant features in the larger cities; major retail units and comparison units representing chain store groups (see Tables 13-16 in Appendix II). The major retail units are most evident in Melbourne (12 out of the sample of 16 3rd order centres) where variety stores are the main type. Variety stores are also present in the 11 out of 20 3rd order centres in Sydney. The most common major unit present in Adelaide and Brisbane is the supermarket (6 out of 8; 4 out of 8 respectively). Of the 20 third order centres studied in Sydney, 11 contain chain group stores, in Melbourne 12 out of 16, Adelaide 5 out of 8, and Brisbane 1 out of 7. It will be submitted later that major units and comparison chain stores are the main customer generators within high order suburban business districts. The presence of these types within a proportion of the 3rd order centres of Melbourne, Adelaide and Sydney indicates the extent to which the functional role of this class level is intermediate in form. In the larger cities, and to a lesser extent in Adelaide and Brisbane, third order centres provide a full range of all but specialist goods and services, with considerable internal competition with reference to convenience goods and personal services. However, they are clearly distinguished from
4th and 5th order business districts by their lack of competition at the comparison level, narrower range of 'typical' business types and considerably smaller size and scale of operations. This distinctiveness from both lower and higher orders would appear to indicate that 3rd order centres perform a separate functional role within the hierarchy. This role will be examined more closely in the next two chapters, in terms of the spatial distribution of 3rd order centres within the four cities under study.

**Fourth Order Centres**

The functional structure of business districts ranked at the fourth order level of the hierarchy reflects a basic change in the relationship between such districts and their market areas. The change, highlighted by a marked increase in the average number of comparison establishments present, relates to a rise in the numbers of customers using the centre and the provision of specialist goods purchased at infrequent intervals. At this level, therefore, suburban business centres are competing with the Central Business District for trade area custom - convenience shopping trips alone cannot maintain them at economic levels of trading.

Examination of the business types which acquire the status of 'typical' functions at the fourth order level shows that the emphasis is on specialist goods and services. In all cities, with the exception of Adelaide, the variety store is found in all fourth order centres. Other additional business types complete the range of clothing outlets,
and add certain home furnishing types, together with professional services and various miscellaneous business types. In the larger cities there is considerable internal competition within the comparison types - an average of 10.4 women's clothing establishments in Sydney fourth order centres and 15.9 in Melbourne's. The depth and range of merchandise offered for sale in this category is markedly increased by the entry of numbers of chain store branches, particularly in the larger cities. In Sydney it is becoming increasingly common for large branch department stores to be opened in fourth order centres, (at present major department stores in 5 of the 18 4th order centres) which greatly increases the hold that such centres have over relatively wide areas and accentuates their dominance over lower order centres within that area.

By comparison, fourth order centres in Adelaide and Brisbane, while similar to the larger cities in terms of numbers and structure of 'typical' business types present, have a narrower range of establishments, fewer examples of chain store branches, and to a considerable extent are still dominated by convenience outlets. In terms of functional structure the regional significance of fourth order business centres in the smaller cities may be expected to be insignificant when compared with their counterparts in Sydney and Melbourne.

**Fifth Order Centres**

The highest rank in the hierarchy of suburban business districts may be distinguished by: the complete range of foods and services
provided; the variety of price and quality of merchandise offered; and particularly the dominance of major department stores and large branch stores of chain groups. It is again necessary to consider separately the conditions in the larger cities. Here the average number of establishments present reaches 300, over 90% of which are included in the list of 'typical' business types. Business types which become 'typical' at this level include department stores, a number of specialist retailers: music/art, cameras, books, records; specialist services: insurance branch offices, travel agents; and a series of miscellaneous types including certain public services. The average numbers of the basic comparison units within the 5th order rank of each city again increases (e.g. Sydney - 4th order centres average 10.4 women's clothing establishments, 5th order average 17.3; Melbourne a rise from 15.9 to 20.0), however the percentile significance of comparison stores rises only slightly from the fourth order level. More marked rises occur in relation to professional services and catering/entertainment establishments. It is noticeable in both cities that the average numbers of food stores in the 5th order types are very similar to the previous rank; there is actually a slight fall in Melbourne. The slightly lower rating of Sydney fifth order centres in relation to average numbers of comparison establishments is more than offset by the greater significance of major department stores. Five of the nine Sydney fifth order centres have large scale branch department stores, and
stores are planned for two others. In Melbourne only two of the six 5th order centres contain major department stores, the remainder contain smaller scale minor or junior department stores.

The dominance of the major fifth order business districts in Sydney or Melbourne may be measured by their complete range of business types, the depth of merchandise offered by competing establishments, and the overall significance of department and variety stores.

In Adelaide and Brisbane the relatively small numbers of fifth order centres, their narrower range of 'typical' business types and competing establishments, and particularly the lack of dominant major units, results in a different set of relationships. They are less clearly defined from fourth order types, this is particularly the case in Brisbane where there are equal numbers of 'typical' business types present in fourth and fifth order centres. The significance of the highest rank in Brisbane is further diminished as a result of the presence of major department stores in planned centres (i.e. Chermside and Coorparoo). In Adelaide two of the three highest ranked business districts are dominant groupings with considerable regional impact (i.e. Glenelg and Port Adelaide). Measure of the validity of a five-fold classification in the smaller cities must depend on an examination of the spatial patterns of customer usage.

Summary

This chapter has outlined the methods by which data relating to suburban business centres in Sydney, Melbourne, Adelaide and Brisbane
have been collected. Further, that part of the data relating to size and functional structure has been analysed with the aim of determining the validity of a division of suburban business centres into a hierarchical class system. Finally the constituent centres of such a system have been discussed with reference to their distinctive or 'typical' characteristics.

The resulting five-class hierarchical system relates to clear distinctions in the functional structure of the sample centres. However, the validity of these distinctions is by no means uniform; blurring occurs at the upper and lower ends of all classes for all cities, but particularly in the smaller cities. It has been suggested that the broader classification resulting from the amalgamation of 1st and 2nd orders and 4th and 5th orders will give a clearer indication of the different functional roles of suburban business centres. In this way the normal three-tier system emerges. Against this, an examination of Tables 13-16 in Appendix II suggests that marked differences occur between 4th and 5th order centres in terms of chain store representation and in the numbers of 1st floor establishments. Both these variables are representative of a greater intensity of business centre operation. Evidence will be examined in later chapters which further justifies this functional separation.

Under the present conditions of suburban retail expansion a wide range of business centres are likely to develop. This is the result of changes in the form and organisation of marketing, and
experimentation in different forms of off-street planned centres. What has been presented here is a scheme which attempts to establish distinct functional groupings from the complexities arising from this situation. The form of all business centres represents the results of a wide range of individual decisions, made by persons of conflicting interests - planners, developers, real estate agents, chain and independent retailers, and the consumer. A precise, sharply distinguished hierarchical system is not present, neither should it be expected.
Previous chapters have outlined the theoretical base of this study, together with an analysis technique which allows recognition of a suburban central place classification in terms of a functional hierarchy. The aim of the present chapter is to relate both theory and resultant hierarchical class system to the complex reality of market area structure, and to discuss techniques which will enable the broad outlines of metropolitan market area networks to be drawn.

The changing patterns of retail structure and consumer demand within Australian metropolitan cities have already been considered in the introduction. It is this dynamism, relating to the form and operation of suburban retailing, that most clearly distinguishes the suburban central place network from the theoretical formulation. The complexity which results from suburban retail expansion concerned with population growth, and the process of trade decentralisation; as opposed to retail decline which results from falls in retail trade area population and increased trade area competition; allows no stable consolidation of market area structure. Further, the reactions of metropolitan residents to these changes are complicated by increased personal mobility, and the consequent widening of the range of possible means of satisfying shopping needs. Functional complexity is therefore to be expected, with a tendency towards the
breaking down of traditional local patterns, and the formulation of large scale metropolitan networks based on the highest order suburban central places.

Equilibrium of Location

The concept of locational equilibrium, which aims at establishing the components of the general market structure, is useful as a means of examining the changing conditions at present experienced in Australian cities. The equilibrium of location, according to Losch, is that resulting from individual motivations which seek 'to achieve the highest profit as a producer, or the cheapest market as a consumer'. In fact, the equilibrium occurs as a balance between these forces; that is a balance taking into account the major components of commercial structure on one hand, and existing demands for goods and services on the other. Losch has set out precise conditions of equilibrium which may be used as a summary of market tendencies towards the equilibrium position. The five conditions are:

1. The location for an individual must be as advantageous as possible.
2. The locations must be so numerous that the entire space is occupied.
3. Abnormal profits must disappear.
4. The areas of supply, production, and sales must be as small as possible.
5. At the boundaries of economic areas it must be a matter of indifference to which of two neighbouring locations they belong.

1. A. Losch, The Economics of Location, p 94.
2. Ibid., pp 94-7.
Vance has pointed out that these conditions closely fit the situation which has arisen in North American cities following suburban expansion and consequent retail developments.\(^3\) Similarly it will be demonstrated that despite the complexities and uncertainty of suburban retail trade in Australian metropolitan cities, there is a clear tendency for these requirements to be fulfilled. However, as Losch goes on to point out, the fulfilment of these conditions does not necessarily mean that location will be equally advantageous for production or consumption - 'the best location for producers is not necessarily the best for consumers'.\(^4\)

It is normal, however, to regard the retail function as a consumer orientated operation. That is, it aims at the 'sale of a maximum quantity of goods within a specific trading area [with] retail transactions ... the result of individual action based on [consumer] preferences of one type or another'.\(^5\) The buying habits of potential customers are a prime determinant of retail location; it is the consumer, with his basic requirement that a series of shopping needs should be satisfied in one shopping trip, who imposes the necessity for the competitive bidding for sites within nucleated


shopping centres. 'Any supplier as well as being limited in his choice of location by the necessary market size . . . must take cognizance of the shopping lists'. The retailer located within a centre offering a wide range of goods is likely to obtain a larger proportion of the market than one in an isolated situation which gives him access to a wide market area, but imposes inconvenience by enforcing a special trip for a single purchase. It must be pointed out, however, that if the retail outlet located in an isolated site is of sufficient size to stock a wide range of goods (e.g. supermarket or department store), such that a series of shopping needs can be satisfied at one time, then such an operation may well prove successful. Nevertheless the overall effect of customer requirements has resulted in a strong tendency for commercial structure to develop in the form of centralised nodes. The form and functional structure of these central places has been established in Chapter 2, and in accordance with central place theory it has been suggested that each fulfils a functional role which may be ranked in terms of a hierarchical class system. In conjunction with this formulation it is possible to view each central place in terms of its tendency to balance supply and demand within the limits of its market area; this in turn forms part of a wider segment, and finally part of the metropolitan market equilibrium. The extent to

which such states of balance have been attained depends on the degree of adjustment to changes in both system and environment at local, suburban, and metropolitan levels.

Equilibrium is therefore envisaged as a state of balance between two sets of market factors: the form and operation of customer demand; and the commercial structure which evolves to satisfy that demand. Generally speaking the factors which make up the environment of customer demand relate to overall population characteristics - total, residential form and density, demographic and socio-economic composition, and growth potentials; and to consumer travel behaviour and resulting shopping habit patterns. The basic outlines of commercial structure relate to the location and functional form of business centres, the physical environment, including the provision of parking facilities, and the merchandise and sales policies of the constituent traders. The entire relationship between supply and demand exists within the context of the general accessibility patterns of the market area: the road networks, existing traffic conditions and resultant time: distance ratios, the completeness of public transport facilities, and the existence of barriers to movement. Clearly the operation of these market system components cannot be regarded as a static condition, nor in any sense can locational equilibrium be permanently fulfilled. Rather the equilibrium position may be regarded as a state at which the market aims, but fails to reach, owing to the extreme fluidity of the forces controlling business patterns. The relationship has
been described as a 'moving equilibrium'\(^7\) which must constantly be adjusted to take account of changes in both system and environment. The form of this adjustment is closely related to the extent of the impact of change; distinction being made between short- and long-term affects. Short-term changes are those concerned with the patterns of consumer demand, but which are absorbed within the existing market structure; long-term changes result from developments within the system of commercial structure, and result in a readjustment of the network of business districts as well as the movement systems related to them. In fact, short-term changes operate within the context of long-term changes, and a wide variety of examples will be introduced in later chapters to illustrate both conditions. An example of the distinction between such changes has been considered with regard to 'locational' (short-term) and 'institutional' (long-term) decentralisation of trade in metropolitan areas. At the suburban level it is noticeable that short-term changes result in long-term solutions. For example, the local adjustment of retail structure to an increased trade area population may result in the expansion of an existing centre by means of a planned retail addition, with off-street parking and a department store and/or supermarket unit. In this case developments arise in the scale and form of suburban retailing, which represent long-term changes in the market system.

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The Market Area

The market or trade area is the primary unit of analysis in the study of retail patterns and relationships. The concept of the market area - 'an area of demand ... containing ... existing or potential buyers of goods or services within clearly defined geographical limits'\(^8\) - may be considered within the framework of central place theory. The relationship between the size and extent of market areas and the class ranking of a central place has been discussed earlier. The primary interest here is the examination of the internal and external patterns which influence the form of market areas in general, and to establish a means of distinguishing the market area networks of the four metropolitan cities under study.

A centre's market area is defined by the operation of existing retail competition, and within these terms is 'created entirely by the response and behaviour of individuals'.\(^9\) In this sense it might be expected that, within a metropolitan area, there would be a direct link between the market area of a retail centre, and the ecological concept of 'community areas' (also 'natural' or 'social' areas). Frequently a community area is defined in terms of its links with a local business focus - 'an area the resident population of which is

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interrelated and integrated with reference to its daily requirements'. 10

McKenzie was more specific:

the focal point of centralization in the modern community
is the retail shopping center . . . meeting point of
buyers and sellers . . . since economic contacts are more
abstract and impersonal than other kinds of contacts, the
trade center has more general attractive significance,
and therefore more community-making influence than the
school, the church, the theater, or any other type of
interest center. 11

Other ecological studies by Foley, Ross and others have suggested
that local community life does centre on local retail facilities. 12

However, work in Australian cities appears to indicate that local
loyalties, in terms of the use of shopping centres, are related more
to the size and structure of the shopping centre concerned, than to
the existence of community consciousness. This may exist in terms of
neighbouring, participation in informal organisations, and in the
recognition by inhabitants of named areas; but changing patterns of
suburban retailing are apparently reducing the part played by the local

10. A.H. Hawley, A Theory of Community Structure, New York, 1950,
pp 257-8.

Soc. Sociology, Vol. 10, 1926, also in Studies in Human Ecology,

12. D.L. Foley, "The Use of Local Facilities in a Metropolis",
Rev., Vol. 27, 1962, pp 75-84.
Scott Greer, "Urbanism Reconsidered: A Comparative Study of
Local Areas in a Metropolis", Am. Soc. Rev., Vol. 21, 1956,
P. Hatt, "The Concept of Natural Area", Am. Soc. Rev., 11,
1946, pp 423-27.
shopping centre in these outward signs of community life. The de­
centralisation of retail trade from the CBD and the accompanying central­
isation process in the suburbs has been discussed earlier. The
decline in the operational levels of low order convenience centres,
which forms part of this process, may be related to changes in basic
living habits - 'daily requirements' as such, no longer exist; local
shopping centre loyalties remain in a vocal rather than active form,
the latter is in many cases limited to infrequent stop-gap purchases.

From observations in Australian cities it would appear that the
high order centre has more valid claims to community focus status.
This is demonstrated by customer loyalty; "I am a very proud resident"
... "it is as good as town", and variants were commonly used by
respondents to customer interviews which took place in various study
centres. However, whether this identification of customer loyalty to
a centre is related more to the wide range of cut-price grocery goods
available at such centres, than to any 'basic conditions of a common
life',¹³ is a debateable point. The extent to which economic motives
underlie the frequent use of particular centres, combined with the
greater opportunity of acting on such motives as a result of the use
of private transport, must seriously undermine the significance of
the suburban business district as a local community focus.

Shopping Habit Patterns

An assessment of the underlying motives which lie behind individual

decision-making inevitably results in over-simplification. The understanding of individual motives lies firmly within the field of sociology; however Brookfield has pointed out the necessity for the human geographer 'to comprehend the perception of environment among the inhabitants of the area in which he is working'.  

While individual attitudes and reactions are introduced with reference to particular business centre trade areas later in this study, at this stage only the broad outlines of customer motivation are considered. Shopping habit patterns reflect personal attitudes and values which are measured against socially determined standards. Within any community there is 'a particular pattern of social behaviour regarding shopping trips', the significance of which is enhanced by uniformity - there is 'no wish to be atypical'. This tendency increases the validity of generalisations made regarding habit patterns within areas of established retail facilities. Here, patterns of usage have 'grown up over a long period of years and ... are closely related to the geographic, social and economic characteristics of the region', and a network of 'traditional

circulation patterns'\textsuperscript{19} will have evolved. Within recently developed sections of an urban area, where no established pattern has emerged, or in suburbs with declining populations where traditional patterns are being shaken, the validity of the generalisation diminishes. In such areas of growth or decline it is necessary to establish probable movement systems by reference to factors other than established sociological norms. The present state of flux in all Australian metropolitan cities emphasises the importance of the correct assessment of those factors in this study. Further, in this instance it is the consumer's spatial behaviour which is of primary importance. The dominant factors influencing such behaviour have been listed as: merchandise offerings, travel costs, product types, consumer income and city size.\textsuperscript{20}

The degree of probability that satisfaction will result from a shopping trip made to a given business centre is an important corollary to these factors. This is Nelson's 'suction force'\textsuperscript{21} in operation, the strength of which is directly proportional to the number and range of opportunities for retail comparison which present themselves in a particular centre. It is this factor which strengthens the hold that a large, high order centre has over its trade area, and weakens the impact of a low order centre. A customer's decision to shop at a

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particular centre is 'made under conditions of uncertainty whether the
center will fulfill the need or not'. However, previous shopping visits
give the consumer 'prior knowledge of the probability of satisfaction'.

It is this experience regarding the probability of satisfaction for
various types of shopping trips (in terms of the purchases to be made)
at suburban centres of different ranks, which determines the shopping
habit pattern of an individual. Shopping trips may be classified
according to the goods and services which are required on a particular
visit. These will include trips for one convenience item, for a range
of convenience goods and services, for specialised comparison goods, or
one highly specialised item. Such trips may further be distinguished
by the frequency with which they are made, and the length of the
journey that a person is prepared to make to satisfy his particular
needs. The frequency of types of shopping trips will relate directly
to the rates of consumption of particular goods and the levels of stocks
held at home. It is these distinctions in shopping trip types that
are the key to the functional ranking of centres - 'functions at any
one level are "linked" into nucleation by consumer's desires to visit
several of them on a single trip'.


The 'friction' of distance has long been recognised as a major cost factor in the economic organisation of cities.\(^{25}\) The effect of time: distance factors in the form of shopping patterns is, however, complex. It is patently untrue that consumers will necessarily shop at the centre nearest to their place of residence. In Huff's words, the use of a centre is 'inversely related to the effort and expense involved in getting from the consumer's point of origin to a given shopping center,'\(^{26}\) as measured by travel time. Huff further points out that 'the anticipated costs of transport, the time and effort involved in preparing for, as well as making the trip, and other opportunities that must be foregone, tend to bring about a contraction in travel distances'.\(^{27}\) This 'resistance force' to a customer's use of a centre is, in the same manner as the 'suction force', modified by the range of goods sought in a particular shopping trip. Hence when travel is necessary in order to obtain a high order good at a distant high order centre, the attractive force of such a centre will induce the customer to ignore intervening lower order centres. In other words 'distance does not by itself determine shopping satisfaction ... it may cease to be an important deterrent if the desire for the article sought is strong enough.'\(^{28}\) People are prepared to pay an inconvenience cost to get


\(^{26}\) Huff (1963), op. cit., p 86.


\(^{28}\) C.T. Jonassen, The Shopping Center Versus Downtown, Columbus, 1955, pp 60-62.
what is available nowhere else. The latter point is operative particularly in relation to usage of the Central Business District. The impact of distance on shopping habits, can be summarised in the tendency to use the nearest centre which can provide comparative shopping within the range of business types to be visited on a particular trip. It will be pointed out later that the means of overcoming distance, and the frequency of visits are important variables with regard to this factor.

Two subsidiary factors may be noted to conclude this general discussion of shopping habits. These concern the age and income characteristics of the resident population. The age structure of a population will be an important variable distinguishing both spatial and temporal shopping patterns. Jonassen's study of habit patterns, in relation to downtown and suburban shopping, showed that the older age groups were more orientated to downtown than the younger. Further, it may be expected that the structure of shopping trips will differ according to age group, the willingness to travel long distances, and degree of adaptability to new conditions. Jonassen found that while length of residence did correspond to local loyalty, the significance of sentimentality or loyalty in conditioning the structure of retail trips was slight. 29

Income levels, too, may be expected to markedly influence shopping habits. Car ownership, expenditure on comparison goods and insistence on style and quality will all change according to income levels. The

29. Ibid., pp 80-81.
study quoted above found that upper income groups tended to be more orientated to downtown, while lower income groups were more closely orientated to suburban facilities. Huff supports this proposition - 'consumers of higher economic status will travel further for shopping purposes than consumers of lower economic levels'.

In conclusion it is interesting to note that the advantages of suburban shopping centres, as opposed to the CBD retail core, put forward by respondents in the Jonassen study were, ranked in order of importance:

1. Close to home.
2. Parking easy.
3. More convenient hours.
4. Less crowded.
5. Do not have to dress up.
6. Friendly and courteous assistants.
7. Less noise and confusion.
8. Clean and modern stores.

This emphasis on accessibility and convenience, with no mention of the range of goods, or price levels (both in fact listed as disadvantages) may well have been modified since the survey took place in 1955. Since that date there has been large scale development of regional planned centres in the suburbs of American cities. However, there is no doubt that the convenience factor remains at the core of customer decision-making with regard to a high proportion of suburban shopping trips.

Retail Price Levels

An additional factor influencing the shopping habits of trade area residents relates to the retail price of goods offered for sale. Price structure is an important variable distinguishing between stores with identical product lines and selling areas. The significance of the price factor is, however, reduced by both customer and seller ignorance which 'blunts the edge of price as a competitive force'. 32 It is difficult for the buyer to distinguish between price differences of less than 5%, while sellers are not normally well informed regarding their rivals' price structure.

The form of a store's price structure is influenced by its size and organisational form, the level of competition, and the type of commodity sold. From the point of view of price, commodities may be divided into four groups; in order of increasing variability these are: price-fixed goods; non-competitive goods; price latitude goods (i.e. those with varying style and quality); and highly competitive types (i.e. those with the lowest profit margins). 33 A broad distinction may be made between comparison and convenience goods. Comparison goods tend to have a low complementarity, linked with the importance of style and quality, which reduces the significance of the price factor, particularly in suburban retailing where there is a relatively low upper price limit. Convenience goods have a tendency to high


33. Ibid., pp 89-90.
complementarity, and price levels are a more important variable. The level of buyer ignorance has been reduced with the growth of large scale cut-price grocery advertising (around 15% of the Wednesday editions of Australian metropolitan evening newspapers) and the general price structure has become more highly competitive. Work in the United States has shown that during an eight week study of a series of supermarkets there was an average saving of 20% on items listed as 'specials', and that the latter could account for up to a quarter of grocery shopping. The conclusion was that the market structure had become 'more competitive, despite diminishing numbers of food outlets'.

There is a strong tendency for chain stores, with the advantages of scale economies, to maintain the lowest price levels. The clustering of such chain store grocery units in high order suburban centres, tends to result in lower grocery price levels operating in such centres. However, different price policies in different localities, depending on competition and socio-economic levels within the market area, together with the effects of independent retailer group organisations will tend to blur this distinction in certain cases.

The form of retailing competition is not strictly oligopolistic. The market is not controlled by a small number of firms, there are not normally price agreements, nor conditions of limited entry. There is,


however, a marked interdependence in price decision-making; a 'monopolistically competitive' condition.\textsuperscript{36}

\section*{The Definition of Market Areas}

It has been seen that the concept of the trade area is essentially an attempt to define the sphere of influence of business centres within the context of local shopping habit patterns, viewed in terms of the functional hierarchy already established. While the trade area may be defined generally with regard to the 'probable' or 'potential' custom which a centre will draw from a particular area, no exact means has been designed by which this segment of the population of a series of metropolitan suburbs may be distinguished. The criteria which may be used for this purpose relate to: the proportion of a total population that can be expected to use a centre; the volume of sales per capita spent within a centre; the total resident population contained within varying distance zones; the numbers of household units needed to support a particular centre; and definition by reference to the location of competitive groupings. In all these techniques, primarily designed by market researchers, the problem has been to make a valid estimate of the amount of 'escape' spending from within different segments of a trade area. That is, to measure the proportion of total expenditure that is spent in centres other than that under study. This figure will vary markedly according to the rank of the centre concerned, and the location of its competitors. In particular, the sales per capita of

\textsuperscript{36} Holdren, \textit{op. cit.}, p 5.
comparison goods in suburban centres will depend to a large extent on the influence of CBD retail core on the habit patterns of the city.

In Losch's terms the boundaries of market areas merely mark the zones of 'indifference'. The reality of the situation is presented by Nelson:

A resident of a block ... equidistant between a shopping center and the downtown area is open to attraction from both, as well as, perhaps, from other retail districts in the community. Because a woman's residence lies in the effective trading area of all these centres, her decision on where she will shop, for what, will ultimately be based on the factors of attraction and resistance operating upon her as an acting individual and not simply as a resident of a particular place. Next door neighbors may follow entirely different shopping patterns.37

In these terms the concept of a 'break-point' between two centres can, at best, be used to indicate the point at which the fall in sales per capita, which occurs with increasing distance from both centres, becomes accelerated. However, more distinct separation occurs where physical barriers or zones of non-residential land delimit more precisely the outlines of market areas. It may also be pointed out that the customer who relies on public transport as a means of travelling to a suburban business centre has markedly reduced possibilities of choice with regard to shopping decisions. In such cases the outlines drawn with reference to the outer termini of public transport networks which focus upon a centre will define the boundaries of a trade area with considerable precision. The rigidity imposed by

public transport routes is, however, a declining force, although the movement systems so created may be said to continue to operate at present as the 'traditional movement patterns'.

The Internal Structure of Market Areas

Implicit in the concept of the market area is the understanding that customer use patterns will vary within different sections of the spheres of influence of particular centres. An internal differentiation of trade areas may be made on the basis of a variety of criteria. These include: the varying proportions of resident population who will make use of the centre concerned; the frequency of shopping visits made by customers; per capita sales figures; and the structure of shopping purchases. While it may be expected that the operation of these criteria will vary primarily according to distance from the business district, factors relating to the residential form of different sections of a trade area, and the socio-economic levels of its inhabitants, may be expected to cut across the straightforward distance factor.

However, whichever criterion is used it may be assumed that, in accord with central place theory, the extent of a centre's active influence on habit patterns will depend on its functional ranking. All central places, whatever their class order, will possess a primary trade area. That is, the area providing the highest density of shopping trips per capita, and according to Applebaum, accounting for between 45% and 75% of total customers using the centre.  

the lower the functional ranking of a centre the greater will be the proportionate significance of this primary area, and the greater the proportion of convenience purchases made by its residents. The primary trade area is therefore synonymous with the entire trade area of a low order centre, and may be defined fairly rigidly in terms of accessibility. It will be that area which is closer with regard to time-distance, than to any other centre of equal status. Only when a low order centre contains a large scale supermarket will this pattern be changed.

The boundaries of primary trade areas for centres of all classes will be defined by competition at the convenience level -

distance from a competing center of the same type is an important factor in estimating the percentage of total purchases a given center will attract ... a regional center will attract heavily from its immediate surroundings and from other areas easily accessible which have no shopping facilities, but very little from the neighborhood of another center with a similar group of stores.39

The important point of this last phrase is that, while the range of convenience stores possessed by a high order centre is virtually the same as that present in a 3rd order centre, its range of comparison functions is vastly superior. Therefore, while the 3rd order centre can, to a certain degree, compete at the convenience level and therefore contain the extent of the primary trade area of an adjacent high order centre, the latter's trade area will continue beyond the 3rd

order centre, forming its secondary trade area. Again using Applebaum's estimates, this will contain between 20% and 30% of a centre's customers, with per capita sales figures half that of the primary trade area. 40 The existence of this secondary zone is a measure of the high order functions possessed by the centre. A larger proportion of comparison goods sales will be made to residents of this section of the trade area; these may be expected to make fewer shopping visits to the centre than primary trade area customers, and to make considerable use of low order centres located within the secondary trade area of the centre with the higher functional status.

These customer-business district relationships become more marked in the outer or fringe trade area, which in Applebaum's terms contains between 5% and 15% of a centre's customers, with per capita sales less than one sixth of the primary trade area. Such fringe sections are related primarily to the range of a centre's high order functions. 'Low threshold high frequency functions are found in lower level nucleations ("convenience goods centers"), whereas high threshold, low frequency functions are found in higher level nucleations serving larger trade areas ("shopping goods centers").' 41 Similarly, 'the variety of goods and services provided by regional centers is a function of the size of the trade areas of such centers, but conversely,

the size of their trade areas is similarly a function of the threshold requirements of the most specialised business types which are performed.\textsuperscript{42} It is therefore possible to visualise a centre's market area as being made up of the amalgam of the individual market areas of all its constituent stores. The outer limits of the area being delimited by the outer limits of the sphere of influence of the store with the highest threshold figure (e.g. department or variety store), decreasing in size to the primary trade area, served by the convenience stores. In fact, customers from the secondary and fringe trade areas, although normally drawn to such a business centre by its high order functions, are likely to make purchases from stores of all functional groups. Few suburban shopping trips are entirely comparison orientated. It is therefore impossible to distinguish between different store trade areas; they fuse to form that of the centre as a whole. Further, while a major department store may, in certain instances, operate as the sole attraction to a large number of customers using a business centre, this is not the usual pattern. While a major customer generating unit, such as a department store, is the basic attractive force, it cannot be completely separated from the remainder of the retail establishments within the business district. They form part of the total attractive force of the centre, even to customers from the fringe trade area. In particular, they provide internal competition and a wider range of merchandise and variety of commodity types.

\textsuperscript{42} Ibid., pp 115-116.
In summary, the trade area concept postulates that centers display spatial patterns that conform to the geographic distribution of customers. Each is located centrally with respect to the maximum number of customers it can serve, although the size of its trade area is maintained in the course of competition at about the minimum size necessary to support its most specialised function.43

The limits of the trade area may be defined by competition, with a resultant overlap of fringe trade areas, or by physical barriers. Its shape will largely conform with time-distance zones, but may be distorted by competition, or the form of public transport networks. The primary trade areas of low order centres may be expected to 'nest' within the secondary or fringe trade areas of higher order centres.

The Definition of Market Areas and Shopping Habit Patterns

Attempts to define in empirical terms the limits of market areas and the customer movement systems which they contain, may be broadly divided into two approaches: those using microanalytic interview techniques, and those using some form of operational gravity models.

Interview techniques normally depend on the probabilistic sampling of trade area populations in order to define the spheres of influence of existing or projected shopping centres, and to establish the use patterns and potential custom of resident populations. The advantage of this method is that it may be designed to take account of particular problems relating to the trade area of an individual centre.

Normally the technique involves the subdivision of a trading area on

the basis of residential blocks, census tracts, or randomly determined segments. A random selection of these units is made and residents within each selected unit are interviewed regarding shopping travel habits and expenditures. The data obtained in this way is applied to all segments, blocks, etc., in like relationship with the centre. The resulting generalised information will indicate per capita expenditure, frequency of shopping visits and other information which will allow the trade area to be drawn. A major disadvantage of this method lies in the fact that any sampling error will be magnified by the generalisation; the resulting information therefore has the air of accuracy and completeness, without the fulfilment of these qualities.44

The development of the gravity model concept is based on the use of the 'Interactance Hypothesis'.45 This 'predicts the number of interactions of any one specific kind, among people when observed in groups, from their basic dimensions of time, space, population, and per capita activity'.46 Essentially the aim is to make predictions

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44. Examples and discussion of various interview techniques are contained in:
Nelson, Retail Locations, 1958, chapter 12.
Jonassen, Shopping Center Versus Downtown, 1955.


46. Ibid., p 245.
regarding the levels of interaction between two places within a given time span. The validity of such a concept can be tested by calculating the correlation between observed and predicted conditions. However, a gravity model can only be successfully constructed on the basis of empirical data which will enable the use of meaningful constants and indices. Further, it will tell 'nothing about the nature of interaction or why it occurs. It only states how much interacting is to be expected'.

The most commonly quoted operational model used in this field is that developed from work by Reilly in the 1920s. Using information regarding lines of merchandise carried, charge accounts and circulation of local newspapers in towns in Texas, Reilly's conclusion was that 'under normal conditions two cities draw retail trade from a smaller intermediate city or town in direct proportion to some power of the population of these two larger cities and in an inverse proportion to some power of the distance of each of the cities from the smaller intermediate city'. On this basis retail gravitation may be expressed by:

\[ R.G. = \frac{P_1 \cdot P_2}{D^2} \]

47. Ibid., p 256.


49. Ibid., p 16.
Where $P_1$ and $P_2$ are the populations of the two cities, and $D$ is the distance between them. By substituting selling area of business centres for population, and travel-time for distance, this model has been used to determine the breaking points between the trade areas of suburban business districts. It is generally accepted however, that this is an oversimplification of the conditions. It fails to take into account the differences in range of merchandise, or parking facilities, and cannot be applied to customers travelling by public transport or on foot. In a recent study the application of Reilly's Law, with regard to the spatial distribution of shoppers using a particular planned shopping centre, indicated that 'all theoretical values from areas which actually produced shoppers were considerably less than those actually generated, [and that the Law] ... does not adequately approach the actual conditions'.

It is further pointed out that 'the basic assumptions of the inverse proportionality of the distance squared and the direct proportionality of the product of the proportions of the populations are subjective assessments!'

Conclusion

A variety of the propositions and techniques discussed above are used in the following chapters with the aim of examining the detailed

50. S.F. Blount, "The Special Distribution of Shoppers Around The Valley Shopping Center, St. Charles, Ill.", Prof. Geog., Vol. 16, 1964, pp 8-17.

51. Ibid., p 10.
operational characteristics of selected business centres within the four cities under study. The general metropolitan market area networks within which detailed study centres are located, are examined in Chapters 4 and 5. The formulation of these networks is based on a series of standard principles and rules relating to the intra-suburban movement of business centre customers.

In an attempt to distinguish a more realistic market area unit, individual high order market areas are linked to form zones of common movement systems. The hypothesis being, that there exist within the metropolitan city, areas of internal focus, divided by boundaries across which there is little movement in relation to the use of retail and service facilities. Under normal conditions persons resident within each zone are unlikely to leave that zone, other than for a business trip to the central city. The form of these zones is based on the assumption that the motivation for most trips (other than journeys to work), during shopping hours, are likely to involve the use of business facilities. Further, that trips connected with neighbouring, participation in community organisation etc., are likely to take place within the zone. An exception to this pattern is likely to occur in relation to movements for recreational purposes, towards coastal areas. Considerable cross-traffic may be generated during the summer months towards coastal business centres with beach facilities (e.g. Manly in Sydney and Glenelg in Adelaide); such trips will cut across normal movement patterns.
It is suggested that journeys to work stand quite separately from the pattern of movement systems connected with the operation of suburban business districts. While place of work may be in the vicinity of place of residence, movements between these places are regarded separately from household trips made out of work hours, or in the case of most shopping trips, during work hours.

The definition of such zones of internal movement depends on the detailed application of a number of basic principles of customer-decision making:

(i) Shoppers will move towards, rather than away from, the Central Business District.

(ii) Shoppers will rarely pass through one business district in order to visit another of equal ranking; they will tend to patronise the closest centre of equal rank.

(iii) Shoppers will tend to follow the traditional intra-city circulation patterns, as measured by suburban public transport routes.

The application of these principles allows a broad understanding of high order spheres of influence. It is necessary, however, to apply a series of more precise rules in order to locate, with validity, the break-points between such spheres. In practice the actual definition of such break-points was based on the following rules:

1. The 'breaking point' in relation to car customers will come either at the point of equal time:distance from both centres or at a marked physical barrier.

2. The breaking point in relation to public transport customers will come at either the point of equal time:

distance between the centres when a bus service links the two, or at a point five minutes time; distance at average walking speeds beyond the outer terminus of a bus route, terminal at the centre concerned.

3. Where an overlap of bus services occurs, note will be taken of the frequency of service and the time:distance of the journey from the overlap area.

4. A 'breaking point' will be presumed to occur at any physical barrier or belt of non-residential land use when no public transport route, terminal to the centre, crosses the break.

5. Note is taken of the network of city public transport services, including suburban train services, and the relationship of that network to intra-suburban patterns.

The application of these conditions allows the formulation of a series of market area boundaries - in fact, as already discussed these will merely indicate the location of indifference zones. However, it is argued that such boundaries, based on the common application of criteria relating to available data, allow a straightforward and meaningful subdivision of a complex metropolitan area into its basic market area pattern. Within these major market areas will be contained a series of low order centres, competing at varying levels with each other and the major high order unit. There exists therefore, an intricate network of overlapping low order trade areas, definable in general terms only with reference to narrow primary walking zones.

The existence of major, self-sufficient segments within metropolitan cities, has been postulated both in the introduction, and further explained in terms of the central place model in Chapter 1. The degree of significance that can be applied to their operation depends largely
on the strength of the major high order business district. Hence in the smaller cities, dominated more completely by the CBD retail core, the degree of self-sufficiency will only operate at the low order convenience levels. The basic projection is, however, of market area definition in terms of the relationship between the site of a major high order centre and general intra-suburban accessibility patterns.
PLATES 1 - 12
1. Low order convenience shopping group - Watsonia, Melbourne.

2. Middle order convenience/comparison shopping centre - Balgowlah, Sydney.
3. Peak core of established high order comparison centre – Campsie, Sydney.

5. Self-service conversion of existing grocery unit - Brisbane.


8. The lure of grocery 'specials' – a claimed 30% reduction for the nine listed articles.
9. Major generating units at the peak focus of a high order core sector – Glenelg, Adelaide.

10. An attempt to fulfil the demand for free off-street parking in street centres – Mentone, Melbourne.
11. The linear nature of string business centres - absence of central business types at the rear of Chapel Street, Prahran.

12. The failure of retail units outside a primary shopping street - rear of Jetty Road, Glenelg.
Chapter 4

METROPOLITAN MARKET AREA NETWORKS, PART I - SYDNEY & MELBOURNE

1. SYDNEY

The Sydney Metropolitan Area, as a result of its site and the form of its growth, provides a good example of the development of a network of high order market areas, which are clearly defined and distinguished from each other. The effect of major natural barriers - Port Jackson, Botany Bay, the Georges River and Port Hacking - has been to isolate whole segments of the built-up area. This physical separation, with its attendant problems of accessibility, has been accentuated, particularly north of the Harbour, by the growth of Sydney along rail and road routes aligned at diverging angles. Distance is therefore added to physical separation in reducing movement between ribbons of development. As a result, internal business foci, within each segment, have developed a full range of goods and services, and well established internal movement systems have formed around such foci.

The Spatial Distribution of High Order Centres

Analysis of the spatial relationships between the three highest orders of central places\(^1\) indicates that their distribution throughout

---

1. An attempt has been made in Chapters 4 and 5 to add to the sample of business centres (Chapter 2) all remaining metropolitan centres of 3rd order status and above. In most instances these have been visited in the field and detailed functional surveys made; in others the assessment is based on an outline survey, or on the basis of the criteria used in the construction of the sample base map - see page 38.
the metropolitan area does relate, in an overall sense, to the hier­archical system developed in Chapter 2. Table 4-1 indicates differences between the areal distributions of centres of the three highest ranked orders within the Sydney metropolitan area. The fall in the average

Table 4-1

Sydney - Average Road Distance to Nearest Neighbour of Equal or Higher Status

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>Av. Distance* in yards</th>
<th>SD</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>9</td>
<td>9,966</td>
<td>2,950</td>
</tr>
<tr>
<td>IV</td>
<td>21</td>
<td>4,690</td>
<td>3,230</td>
</tr>
<tr>
<td>III</td>
<td>53</td>
<td>2,653</td>
<td>1,150</td>
</tr>
</tbody>
</table>

* Nearest road distance

distance between each successive rank, is in accord with the predictions of central place theory. There is, however, a wide dispersion around the mean; but this is to be expected in an urban area with wide variations in trade area population density. The importance of this factor is further indicated by comparison of the proximity of 4th and 5th order centres to their nearest neighbours of equal status, and their road distance from the CBD. Correlation analysis shows that the distance between high order centres increases with distance from the CBD.

2. Calculation of the standard error of difference shows that the distances between 4th and 5th, and 3rd and 4th orders are significantly different: 4/5th - t = 8.6, signif. at .1% level; 3/4th - t = 2.6, signif. at 5% level.
(r = +0.72 signif. at .1% level); a relationship which is clearly linked with falls in average population density with distance from the central city.

Within these limitations, therefore, it is possible to construct a simple theoretical central place network within Sydney, and to test this by comparison with actual conditions, using the hierarchical classification formulated above. The city has been divided into seven segments according to local government area boundaries based approximately on market area patterns (Figure 13).

**Table 4-2**

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>IV</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrop. Area</td>
<td>9</td>
<td>20</td>
<td>53</td>
</tr>
<tr>
<td>Total Centres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumed* Market Area Population</td>
<td>223,000</td>
<td>100,000</td>
<td>38,000</td>
</tr>
<tr>
<td>Total</td>
<td>69,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Figures are based on the Metropolitan Area (outside the City of Sydney) with a total population in 1961 of 2,011,000. The City of Sydney is discounted owing to the dominance of the CBD and adjacent string street business centres which, with the exception of Newtown, do not reach high order status. Market area populations are based on the assumption that each centre commands an equal share of the metropolitan population; further, that lower order centres 'nest' within the market areas of those of higher order. The overall city relationship of 5th, 4th and 3rd order centres is 1: 2.3 : 5.9.

Using the assumed market area populations (Table 4-2), the estimated number of centres in each class order is calculated in
Sydney

METROPOLITAN LOCAL GOVT. & THEORETICAL MARKET AREA SEGMENTS

[Map of Sydney with various local government areas shaded and labeled.]
relation to the 1961 population of each segment (Table 4-3). The actual
distribution of high order centres within the metropolitan area has been
correlated with total population of the segments, with the aim of com­
paring actual and assumed conditions. The results (see Figure 14) allow
measure to be made of the extent to which an overall city pattern exists,
and the accuracy with which a theoretical hierarchical formulation
predicts actual conditions.

Examination of Figure 14 indicates that for each class order, the
regression line, relating actual centres present to segment population,

Table 4-3

<table>
<thead>
<tr>
<th>Segment</th>
<th>V</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>IV/V</th>
<th>1961 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.7</td>
<td>1.0</td>
<td>1.6</td>
<td>2.0</td>
<td>4.1</td>
<td>7.0</td>
</tr>
<tr>
<td>B</td>
<td>1.1</td>
<td>2.0</td>
<td>2.4</td>
<td>1.0</td>
<td>6.2</td>
<td>7.0</td>
</tr>
<tr>
<td>C</td>
<td>.5</td>
<td>-</td>
<td>1.1</td>
<td>4.0</td>
<td>3.0</td>
<td>1.0</td>
</tr>
<tr>
<td>D</td>
<td>2.3</td>
<td>2.0</td>
<td>5.1</td>
<td>4.0</td>
<td>13.4</td>
<td>10.0</td>
</tr>
<tr>
<td>E</td>
<td>2.0</td>
<td>1.0</td>
<td>4.5</td>
<td>4.0</td>
<td>11.8</td>
<td>11.0</td>
</tr>
<tr>
<td>F</td>
<td>1.3</td>
<td>2.0</td>
<td>3.0</td>
<td>2.0</td>
<td>7.9</td>
<td>7.0</td>
</tr>
<tr>
<td>G</td>
<td>1.1</td>
<td>1.0</td>
<td>2.5</td>
<td>3.0</td>
<td>6.6</td>
<td>6.0</td>
</tr>
</tbody>
</table>

\[ r = .56 \quad r = .68 \quad r = .85 \quad r = .84 \]
Sydney

BUSINESS STRUCTURE OF ASSUMED MARKET ZONES

Regression Line - actual number centre zone popl totals.
--- Estimated number of centres based on popl totals
lies in a close relationship with the estimated line, which is based on an exact hypothetical correlation between centres and population. This is despite considerable individual variations and relatively low correlation coefficients for 4th and 5th orders. Statistically the best fit relates to 3rd order and combined 4/5 orders, where the correlation is significant at the 5% level. In each instance there is larger than estimated representation in segments with the lowest populations, and lower than estimated numbers in segments with the highest populations. This results from a tendency for higher representation in the clearly defined segments north of the Harbour, than in the more homogeneous areas to the south and west of the city. More detailed reference to the individual differences will be made later in the chapter.

In general, however, these results support the contention that a hierarchical classification, of the type presented in Chapter 2, does provide a partial explanation of the relationship between central place patterns and population distribution throughout the metropolitan area.

**Empirically Derived Market Area Systems**

The following section examines each of the basic factors underlying a division of the city into zones of common movement systems, these are: barriers to movement; city public transport routes; intra-suburban bus services; and car customer time:distance zones.

1. **Barriers to Movement** (Figure 15)

Natural and man-made barriers to movement within the Sydney Metropolitan area are predominant in outlining the general form of the high order market network. This is particularly the case north of the Harbour,
Sydney

BARRIERS TO MOVEMENT

5th Order Business Districts

4th... Numbered in size order - see Appendix II Table 1.

L Liverpool
M Marrickville
N Newtown

Belts of Non-Residential Land

Approx. Limits of Built-Up Area

Suburban Rail Routes
where Middle Harbour and the Lane Cove River continue inland as barriers. The east-west line of Port Jackson and the Parramatta River inevitably acts as the major divide of the metropolitan area. East of Parramatta only one bus route and one suburban railway cross this barrier, other than at the Harbour Bridge. South of the Harbour the more effective barriers are associated with continuous non-residential belts taken up by industry, railway marshalling yards, the airport, parkland and racecourses. These form particularly marked zones south from the Parramatta River, in Auburn, Concord and Strathfield; and north from Botany Bay in Marrickville, Botany, Randwick and the City of Sydney. Local breaks in accessibility are caused by railway lines, and streams flowing into Botany Bay, but nowhere impede movement towards high order centres.

The southern limits of the metropolitan area are clearly defined by the Georges River and Port Hacking which limit the extent of the spheres of influence of centres such as Bankstown, Hurstville, and Caringbah. Westwards there are no such immediate limits, and the market areas of fringe high order centres (e.g. Blacktown, Fairfield, and Liverpool) extend into adjacent rural/urban margins.

2. City Public Transport Routes (Figure 16).

There are three modes of public transport available for travel into the central city of the metropolitan area: bus, harbour ferry, and train. City bus services are primarily operated by the Department of Government Transport, and with the exception of two routes, the outer termini of such services are within 60 minutes time-distance of the central city. In fact, in many areas the limit is lower than this
(Figure 16). An estimated 884,000 or 40.5% of the total metropolitan area population in 1961, were served by direct city bus services during shopping hours. This population with the highest degree of access to the CBD, is resident in the older suburbs to the south and east of the City of Sydney, a smaller area immediately north of the city, and two areas beyond the 60 minute time-distance limit which have no rail routes (Palm Beach on the north coast and Lane Cove-North Ryde in the north western suburbs).

Northern Harbourside suburbs are linked by a series of ferry services with Circular Quay at the northern end of the CBD. These range from Manly in the east, to Hunter's Hill in the west. The extent of the influence of such services is increased in several cases by the focus of suburban bus routes at ferry wharfs (e.g. Manly, Balmoral, Mosman and Cremorne). Use of the 'City Circle' rail route from Circular Quay enables dispersal to any point of the CBD.

For persons resident beyond city bus service limits, the New South Wales Government Railways suburban electric services are the primary means of travel to the CBD. Figure 16 shows the network of lines, together with numbers of city-bound services operating during shopping hours (off-peak 'shopping tickets' are available during week days for journeys of more than six miles between the hours of 9.30 a.m. to 4.00 p.m.). However, apart from relatively small numbers, resident within walking distances of suburban railway stations, there is an inevitable dependence on intra-suburban bus services which focus on certain stations. The growth of shopping centres in streets adjacent
to such stations is a common feature in many metropolitan cities. Where these centres have developed into high order business districts, and are therefore the focus of a large number of bus routes, they are placed in an intercepting location with regard to shopping trips to the CBD core.

3. Intra-Suburban Bus Services

Within the metropolitan area 67 suburban railway stations are the terminal point of at least one suburban bus service; all are beyond the 30 minute city time-distance bus zone (Figure 16). Table 4-4 shows the relationship between these 67 station bus foci, the number of services operated, and the functional ranking of the adjoining business centre. The 44 business centres ranked at 3rd order status or above form 53% of the estimated totals of 3rd, 4th and 5th order centres within the Sydney metropolitan area. There is a significant relationship (analysis of variance shows that differences are significant at the 5% level) between the numbers of services terminal at each railway business centre. In other words, despite the fact that basically suburban bus services are aimed at enabling the residents of zones interstitial to railway routes to connect with city rail services, a large proportion of Sydney's high order suburban centres have grown up at these nodal points. That these centres have become dominant in their own right, is indicated by the number and extent of their terminal bus services (see Tables 4-4 and 4-6).
Table 4-4

<table>
<thead>
<tr>
<th>Sydney - Suburban Business Centres Adjoining Railway Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Metrop. Centres</td>
</tr>
<tr>
<td>V 9 6</td>
</tr>
<tr>
<td>IV 21 11</td>
</tr>
<tr>
<td>. III 53 27</td>
</tr>
<tr>
<td>I &amp; II - 23</td>
</tr>
</tbody>
</table>

High order centres that are located at sites outside the suburban railway network, tend to possess fewer terminal intra-suburban services (Table 4-5). This is probably related to the location of the majority of such centres within the 30 minute time-distance bus zone around the CBD, rather than the lack of an adjacent suburban railway station. Bondi Junction, for example, a 5th order centre with only two terminal services, is further served by two through-suburban services and seven city services. Fourth order centres, located at the core of inner area string streets (e.g. Leichhardt, Newtown), are similarly served by through-city services. North of the Harbour, the 4th order centres of Gladesville and Ryde, beyond the 30 minute zone, have terminal services (Table 4-6), as does the 3rd order centre of Lane Cove. However, Crows Nest and Spit Junction, with minimal terminal routes, are also on city-bound bus routes. Of the high order centres outside the areas served by suburban railways, only Manly has a substantial number of terminal services. This is a function of the distance of the Manly-Warringah...
Table 4-5

<table>
<thead>
<tr>
<th>Metrop. Centres</th>
<th>Non-Rlwy Centres</th>
<th>Term. Bus Routes</th>
<th>Av. No. Routes</th>
<th>Centres with:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Through-routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Direct Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CBD Links</td>
</tr>
<tr>
<td>(i)</td>
<td>(ii)</td>
<td>(iii)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V 9</td>
<td>3</td>
<td>3</td>
<td>6.6</td>
<td>-</td>
</tr>
<tr>
<td>IV 21</td>
<td>10</td>
<td>4</td>
<td>2.7</td>
<td>6</td>
</tr>
<tr>
<td>III 53</td>
<td>26</td>
<td>5</td>
<td>2.0</td>
<td>21</td>
</tr>
</tbody>
</table>

(i) Centres apart from railway network with terminal suburban bus services.
(ii) Relates to centres with intra-suburban bus services passing through retail area.
(iii) Relates to centres linked by direct bus routes to the CBD.

While the significance of the use of private motor vehicles by customers visiting suburban business centres is rising rapidly, over half of the shopping trips made from beyond the walking zone around each centre, involve the use of public transport facilities. Such customers are, therefore, to a considerable extent tied to a particular centre by reason of its position at the focus of a bus network. It has been pointed out that while inner suburban centres are served by city routes, for the majority of high order business districts in Sydney, the numbers of terminal routes and the distances travelled by such routes, provide a useful measure of the centrality of a centre.
Table 4-6
Sydney - Centrality of High Order Suburban Business Centres - Terminal Bus Services

<table>
<thead>
<tr>
<th>Terminal Routes</th>
<th>Total Weekday Shopping Services</th>
<th>Average Route Distance (yards)</th>
<th>Total Route Distance (miles)</th>
<th>Centrality Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parramatta</td>
<td>25</td>
<td>360</td>
<td>9,945</td>
<td>142.5</td>
</tr>
<tr>
<td>Hurstville</td>
<td>16</td>
<td>262</td>
<td>5,616</td>
<td>51.2</td>
</tr>
<tr>
<td>Manly</td>
<td>15</td>
<td>141</td>
<td>9,873</td>
<td>84.0</td>
</tr>
<tr>
<td>Burwood</td>
<td>6</td>
<td>31</td>
<td>8,500</td>
<td>28.8</td>
</tr>
<tr>
<td>Bondi Junct.</td>
<td>2</td>
<td>39</td>
<td>5,200</td>
<td>6.0</td>
</tr>
<tr>
<td>Crows Nest</td>
<td>3</td>
<td>24</td>
<td>5,300</td>
<td>9.0</td>
</tr>
<tr>
<td>Chatswood</td>
<td>12</td>
<td>170</td>
<td>10,700</td>
<td>73.2</td>
</tr>
<tr>
<td>Bankstown</td>
<td>21</td>
<td>319</td>
<td>7,672</td>
<td>92.4</td>
</tr>
<tr>
<td>Caringbah</td>
<td>4</td>
<td>31</td>
<td>3,775</td>
<td>8.4</td>
</tr>
</tbody>
</table>

4th Order

| Rockdale        | 9                               | 180                           | 5,743                        | 29.7            | 53.5            |
| Hornsby         | 6                               | 44                            | 6,000                        | 20.4            | 9.0             |
| Eastwood        | 8                               | 67                            | 7,240                        | 32.8            | 21.9            |
| Fairfield       | 7                               | 87                            | 7,617                        | 30.1            | 26.3            |
| Auburn          | 11                              | 155                           | 3,690                        | 23.1            | 35.8            |
| Campsie         | 2                               | 32                            | 5,000                        | 5.6             | 1.8             |
| Ashfield        | 3                               | 32                            | 5,467                        | 9.1             | 2.9             |
| Gladesville     | 5                               | 66                            | 5,350                        | 15.0            | 9.9             |
| Cronulla        | 5                               | 49                            | 3,367                        | 9.5             | 4.7             |
| Blacktown       | 13                              | 104                           | 5,254                        | 39.0            | 40.0            |
| West Ryde       | 3                               | 45                            | 7,766                        | 15.2            | 5.9             |
| Ryde            | 4                               | 50                            | 5,220                        | 12.0            | 6.0             |
| Liverpool       | 10                              | 83                            | 9,456                        | 54.0            | 44.8            |
| Double Bay      | 1                               | 8                             | 4,800                        | 2.7             | .2              |
| Spit Junction   | 1                               | 9                             | 2,100                        | 1.2             | .1              |

* - Centrality Index = \( \frac{d}{100} \times s \)

When \( d \) = Total Route Distance, and
When \( s \) = Total Weekday Shopping Services.
Table 4-6 shows the numbers of terminal services, and the average and total distances travelled by such services, for each 4th and 5th order centre possessing terminal routes. By relating total route distance and total weekday services, a centrality index has been calculated. This shows an enormous range between Parramatta (513.0), and Spit Junction (.1), but emphasises the predominance, in terms of public transport networks, of five 5th order business districts: Parramatta, Bankstown, Hurstville, Chatswood and Manly. Each of these centres is in a position to extend its trade area over a district of residential growth, beyond the zone of city bus routes. More particularly, they are in intercepting locations, between the CBD and areas of most rapid development (Figure 17).

4. Car Customers - Time:Distance Zones (Figure 18)

By applying an average customer-car speed, time:distance zones have been drawn around each high order centre. Areas have been defined which contain the population to whom a particular centre is closer, in terms of driving time:distance, than any other. This is, of course, not to suggest that such areas of maximum accessibility will in any sense define car customer trading areas; the presence of free parking

---

3. Average customer-car speed - 600 yards per minute, or 20.7 m.p.h. The figure was calculated by use of a method adapted from the 'floating car' technique used in E.M. Hall & S. George, "Travel Time - An Effective Measure of Congestion and Level of Service", Highway Research Board Proceedings, Vol. 38, 1959, pp 511-529. An attempt was made to balance the length of trip and the proportion of travel on major arterials. This figure does not take account of time taken to obtain a parking space within a business centre.
PUBLIC TRANSPORT ZONES - MAJOR INTERMEDIATE CENTRES

- Main Intermediate Centres
- Other 4/5th Order Centres
- Area served by bus services terminal at Bankstown
  - Chatswood
  - Hurstville
  - Manly
  - Parramatta

- Boundary of Built-Up Area
- Outer City Bus Termini
CAR ACCESSIBILITY ZONES

Sydney

- 4/5th Order Centres - see Appendix II, Table 1.
- Break-Points - in terms of driving time: distance.
- 5 minute time: distance zones - estimated using average car speed of 20-7 m.p.h.
- Approx limits of built-up area.
- Area dominated by C.B.D. and adjoining string streets.

Liverpool
space, or a major department store may be expected to draw custom from beyond such narrow limits. However, the network outlined in Figure 18 does allow comparison of the accessibility of each high order centre, and the extent of competition between such centres.

Estimates of the resident population within the areas of maximum accessibility (see Table 4-7) show that 1,791,000, or 82.0% of the 1961 population of the Sydney metropolitan area, are within 15 minutes average driving distance of their nearest high order suburban centre (Table 4-8). Most of the remainder are resident within the inner suburbs, and are served by string streets immediately adjacent to the CBD. Normally the break-point between a high order centre and its nearest high order neighbour comes before the 15 minutes distance zone is reached. Only five 4th order centres (Blacktown, Caringbah, Dee Why, Hornsby, Liverpool), all located close to the outer metropolitan fringe, are able to extend their areas of maximum accessibility beyond 15 minutes. Each high order centre is overlapped by the 15 minute driving limit of its nearest neighbour; the only exceptions are the outer centres of Hornsby and Blacktown. Ashfield is located within the 15 minute driving zone of four centres, and Ryde of three. The use of private vehicles for shopping trips, therefore, brings high order centres into direct competitive conflict. Any subdivision of the city into areas of internal movement must take this increased accessibility into account.
Table 4-7

Sydney Resident Population * Within Time: Distance Zones

<table>
<thead>
<tr>
<th>Time Zones (minutes driving time from centre)</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Order</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bankstown</td>
<td>56,000</td>
<td>70,000</td>
<td>22,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>148,000</td>
</tr>
<tr>
<td>Bondi Junct.</td>
<td>70,000</td>
<td>22,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92,000</td>
</tr>
<tr>
<td>Caringbah</td>
<td>32,000</td>
<td>24,000</td>
<td>24,000</td>
<td>6,000</td>
<td>2,000</td>
<td>2,000</td>
<td>-</td>
<td>90,000</td>
</tr>
<tr>
<td>Chatswood</td>
<td>30,000</td>
<td>54,000</td>
<td>8,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>92,000</td>
</tr>
<tr>
<td>Crows Nest</td>
<td>42,000</td>
<td>8,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Hurstville</td>
<td>48,000</td>
<td>64,000</td>
<td>6,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>118,000</td>
</tr>
<tr>
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<td>66,000</td>
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<td>-</td>
<td>-</td>
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* Estimates based on 1961 census.
Table 4-8

Sydney - Extent of Areas of Maximum Accessibility
(Within the Metropolitan Area)

<table>
<thead>
<tr>
<th>Time:Dist. Zones (mins)</th>
<th>Nos. of (i) Centres</th>
<th>Est. Popl. Served</th>
<th>Cumul. %</th>
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<tr>
<td>1 - 5</td>
<td>28</td>
<td>1,022,000</td>
<td>46.8</td>
</tr>
<tr>
<td>6 - 10</td>
<td>25</td>
<td>613,000</td>
<td>74.9</td>
</tr>
<tr>
<td>11 - 15</td>
<td>12</td>
<td>156,000</td>
<td>82.0</td>
</tr>
<tr>
<td>16 - 20</td>
<td>5</td>
<td>32,000</td>
<td>83.5</td>
</tr>
<tr>
<td>21 - 25</td>
<td>2</td>
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<td>84.2</td>
</tr>
<tr>
<td>26 - 30</td>
<td>2</td>
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<td>84.3 (ii)</td>
</tr>
</tbody>
</table>

(i) Numbers of 4th and 5th order centres extending areas of maximum accessibility to each time: distance zone.

(ii) The remaining 15.7% are resident within the inner metropolitan suburbs dominated by the CBD.

Examination of the estimates of total resident population within areas of greatest accessibility, according to the class of the high order centre, shows a marked distinction between 5th and 4th orders (Table 4-9). 4

There is, therefore, a clear tendency for 5th order centres to have developed at points of immediate accessibility to the greatest population numbers. Or, to put it differently, fewer 4th order

4. Standard error of difference - t = 7.4, significant at .1% level.
centres have developed in the immediate proximity of 5th order centres, than in relation to other 4th order types.

Table 4-9

Sydney - Average Resident Population Within Areas of Maximum Accessibility

<table>
<thead>
<tr>
<th></th>
<th>Av. Pop.</th>
<th>SD</th>
<th>V</th>
</tr>
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<td>V</td>
<td>95,556</td>
<td>32,400</td>
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<tr>
<td>IV</td>
<td>51,527</td>
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Market Area Network (Figure 19)

The working principles discussed earlier have been used to subdivide the Sydney metropolitan area into fifteen zones, each containing a system of market areas linked by a common movement system. The central place pattern of each zone is summarised in Table 4-10, together with data relating to the constituent local government areas, resident population (based on 1961 census figures), and retail sales data (based on 1961-62 Retail Census). It must be emphasised that zones constituted in this way do not show distinct market areas, but groups of market areas, which normally focus on one high order business district. As indicated in Figure 19 the boundaries defining such zones of common movement are of two types: those distinguished by barriers to movement; and those forming areas of contact or overlap. The latter may be closely related to the concept of indifference lines. The scheme will provide a basis, firstly for inter-city comparison, and secondly in

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5. See Chapter 3, pages 102-103.
Figure 19

Market Areas

1. City of Sydney and Inner Western Suburbs
2. Woollahra-Waverley-Randwick
3. North Sydney-Mosman
4. Burwood-Ashfield
5. Canterbury
6. Hurstville-Rockdale
7. Bankstown
8. Parramatta-Auburn
9. Ryde-Hunters Hill
10. North Shore Suburbs
11. Manly-Warringah
12. Sutherland
13. Liverpool
14. Fairfield
15. Blacktown
Sydney
MARKET AREA NETWORK

- 5th Order Centres
- 4th Order Centres
- 3rd Order Centres
- Planned Off-Street Centres

4/5th Orders numbered in size order
- see Appendix II, Table 1

- Market Area Boundaries - formed by barriers to movement
- Zones of Contact

ZONES OF CONTACT

MILES
Table 4-10
Sydney Metropolitan Area - Summary of Central Place Totals, Population and Retail Establishment Changes, and Per Capita Sales Figures relating to General Market Areas.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
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<td>+1,402</td>
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<td>-159,000</td>
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<td>+5,174</td>
<td>12,749</td>
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<td>+5,174</td>
<td>12,749</td>
<td>-194</td>
</tr>
<tr>
<td></td>
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<td>251,000</td>
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<td>+5,174</td>
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<td>+1,900</td>
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<td>+843</td>
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Metropolitan Area (apart from Inner City) +197,100 +2,147 - 22,638 10.3 £475,282
order that results from detailed centre analysis, in Part II of this study, may be evaluated in terms of a hypothetical framework.

At this stage it is proposed merely to comment on the primary network of suburban business centres, and to draw some basic intrametropolitan comparisons.

a. Central Core

The entire pattern has developed with direct reference to the radial transport routes which focus in zone 1 - the City of Sydney and Inner Western Suburbs. This area, immediately adjacent to the Central Business District, represents the typical inner suburban commercial pattern. High density residential development (ranging from high cost apartments, to low cost terraces), and mixed industrial and commercial enclaves, are bisected by the lines of radial routes (both road and rail). The roads are congested with city-bound traffic, accentuated in this case by heavy commercial traffic associated with the port of Sydney. Central business development is strung along these radial routes, in some cases in the form of direct off-shoots from the CBD (Oxford Street, William Street/Kings Cross, Broadway); in others forming distinct business districts separated from the CBD by commercial, transport, or other land uses. The latter string street business centres (Newtown, Enmore, Leichhardt - Petersham), were originally located in an intercepting position with regard to convenience trips to the CBD. They have long been by-passed by the growth of business centres in more recent suburban areas, and remain, anachronisms of the past, the
frontage broken into clusters of convenience stores, serving immediately adjacent residential areas. Core sectors remain in close proximity to chain variety stores, and form the basis of centres reaching 4th order status (e.g. Leichardt, Newtown).

A fall in the total resident population of these inner areas (1957-61 - the period between retail census - a fall of 10,328, or 5.7% in the City of Sydney, and 2,421 or 1.7% in the southwestern inner suburbs), and increasing traffic congestion, have led to falls in the numbers of retail establishments (194 fewer in 1961-62 than in 1956-57), this is considerably in excess of the figure estimated in terms of metropolitan trends. Further, these figures include establishments retailing motor vehicles; the considerable expansion of car-orientated business into retail premises (42% of the total sales in that part of the City of Sydney outside the CBD in 1961-62 related to motor vehicles, vehicle parts and petrol) conceals an even greater real decline in the numbers of retail units. The entire area is now primarily a zone of through-movement. With the exception of isolated bus services terminal at Marrickville and Newtown, there is no development of internal public transport foci.

b. Inner Suburbs

The core area of Sydney is surrounded, typically, by established moderate density residential suburbs with a lesser admixture of

6. Based on best estimates according to least square regression:

\[ a = 0.092b + 7.5 \quad (r = 0.91, \text{ signif. at } 0.1\%) \]

When a = changes in numbers of retail establishments, 1956-7 to 1961-2, and b = population change during the same period. Data calculated in terms of Local Government Areas. See Table 4-10.
industrial and other commercial land use (areas 2-5 in Figure 19). The extent of this development is contained by natural barriers to the north and east of the central core. Hence the Woollahra - Waverley - Randwick area, forming zone 2, is clearly defined from the inner area by a belt of industry and parkland extending north from Botany Bay, and limited to the east by the Pacific coastline. Further, the North Sydney - Mosman area (zone 3) is a relatively small sector which developed north of Port Jackson, and is defined by its inlets. To the west extends the largest segment, the Burwood - Ashfield zone (4), and the transitional Canterbury area (5). In the south the Rockdale district is strictly part of the same residential zone, but has strong links with the Hurstville area to the south, and has been included in zone 6.

The market structure characteristics shared by the four areas are based on well established retail patterns, with a tendency to apparent stagnation. All municipalities, with the exception of Randwick, are either declining in resident population numbers or showing slow growth rates (Table 4-10). Similarly, the numbers of retail establishments show little change in most instances; the marked rise in numbers in North Sydney seems likely to be related to the opening of retail units built in association with office development in the business centre, which has resulted from its direct proximity with the southern end of the CBD. However, in most instances the fall in the numbers of retail establishments is above that estimated in terms of the metropolitan population-change:retail-establishment regression (Table 4-10). Discounting Randwick, this series of market areas fell in population by
328 persons between 1961 and 1957, with a net loss of 9 retail establishments; the cumulative estimate for each local government area concerned was an increase of 85 establishments.

With the exception of the Canterbury area (5), to be discussed separately, each of the zones is dominated by a string street high order centre: Bondi Junction (2); Crows Nest (3); Burwood (4). Each shows a tendency for fringe decline, and depends markedly on a central focus for customer attraction. Further, each has a low public transport centrality index (Table 4-6); Bondi Junction and Crows Nest are dominated by through city-bound bus services. The 4th order centres of Randwick, Spit Junction and Ashfield, which act as subsidiary high order centres in areas 2 - 4 show similar tendencies.

The Canterbury zone (5) will be discussed in detail at a later stage. Here it may be pointed out that the area lies within the fringe trade areas of a series of high order centres (Figure 19), is closely linked to the CBD by both rail and bus routes, and is served by a series of lower order railway centres dominated by the 4th order centre of Campsie.

In summary, this inner group of metropolitan zones has market structures which show similarities to the central inner suburbs, but is differentiated by the presence of high order centres which are at the focus of intra-suburban public transport services. However, with individual exceptions, there has been little recent retail development.

7. See Chapter 8, pp 327-337.
within the centres, and only Bondi Junction possesses a major branch department store. It therefore seems likely that the close transport links with the central city maintain the dominance of the central retail core with regard to comparison sales.

The major exception to this generalised summary relates to the southern section of the municipality of Randwick. Here, in an area of more recent residential growth and continued population increase, a 4th order centre has emerged at Maroubra Junction. Since the 1961-62 retail census was taken considerable retail expansion has taken place, both at Maroubra Junction and in association with the development of a small planned centre at Hillsdale. More exactly this area should be included within the intermediate belt of market systems discussed below. However, in terms of local movement patterns it is orientated to the inner market area to the north.

c. **Intermediate Suburbs**

Market areas 6 - 11 have been grouped to form an intermediate zone of central place development (Figure 19). Essentially this belt, with marked internal distinctions in residential type and socio-economic levels, is dominated by the five major high order suburban business districts of the metropolitan area: Parramatta, Bankstown, Hurstville, Chatswood and Manly (Figure 17). Each area has experienced marked population growth in recent years, and in response, the numbers of retail establishments have grown; in many cases the increases have

8. See Chapter 10, and Appendix III.
been in excess of the metropolitan estimates (Table 4-10). Much of this expansion relates to low order centres developed in areas of residential growth; but marked extension is taking place in the high order centres, including the development of major department stores and planned off-street retail segments.

Distinction should be made between Parramatta, Bankstown and Hurstville, which are at the focus of a close radial network of bus services; and Chatswood and Manly, which are located at the inner edge of elongated market areas projecting from older suburbs to areas that are strictly within the outer suburban section. The former group, located well beyond the city bus service area, are located in approximately central sites in relation to their trade areas, which gives them marked advantages over competing 3rd and 4th order centres which are located in off-centre positions (e.g. Hurstville - Rockdale; Parramatta - Auburn, Guildford and Merrylands). On the other hand, zones 10 and 11 are both linear in form, their southern edges being within the city bus service area. As residential growth has spread northwards, away from the central city, so the 5th order centres of Manly and Chatswood have become increasingly vulnerable to the development of high order centres in intercepting locations. These are able to channel off the growing market of the newer areas. Hence Hornsby, a 4th order centre, has developed at the outer end of the North Shore area, and Gordon, a 3rd

9. Chatswood business district has been rejuvenated by the opening of a major branch department store in 1961.
order centre with a major department store, in a central North Shore site. While Dee Why and the planned centre of Warringah Mall are situated in similar locations in relation to Manly.

The **Ryde - Hunters Hill** area (9) is completely atypical. No major high order centre has developed in the area, which lacks a coherent movement system. The northern sector is served by a single city bus route, the western sector by a city rail route, the southeast by city bus routes, and the Hunters Hill area by Harbour ferry services. Further, the road pattern of the area has no dominant nodal point. The result has been the parallel growth of three 4th order centres (Ryde, West Ryde, and Eastwood), in addition to the older established 4th order centre of Gladesville in the southeast. Each of these centres has a series of terminal suburban services (Table 4-9), with the result that there is a marked overlapping of primary trade areas in the Ryde area (Figure 18). Unusually, each of the three more recent centres contains a branch department store and off-street parking space. Competition is therefore intense, and likely to inhibit the expansion of any one of the centres to dominant 5th order status.

d. **Outer Suburbs**

The market systems numbered 12 - 15 in Figure 19 make up the final zone of the metropolitan area. The **Sutherland** area (12) contains a

---

10. The term 'North Shore' suburbs refers to those residential suburbs served by the North Shore Railway, aligned in a southeast-northwest direction from North Sydney in the south to Hornsby in the north. Throughout, this area has a high social status ranking - see A.A. Congalton, "Status Ranking in Sydney Suburbs", *Studies in Sociology*, No. 1, (Duplicated at School of Sociology, Univ. of N.S.W., 1961).
resident population of over 100,000, and has an established market structure. This includes the 5th order centre of Caringbah, which has a surprisingly poor public transport centrality index (Table 4-6); the 4th order resort centre of Cronulla; and a recently opened planned off-street development adjacent to the 3rd order centre of Miranda. Internal competition within the area is therefore well established. This is in marked contrast with the stage of development reached in the remainder of the outer suburban zones.

Market areas 13 - 15, which focus on the 4th order centres of Liverpool, Fairfield, and Blacktown respectively, are distinctive within the metropolitan area. Each is located within a rapidly developing outer suburban area (1954-61 population increase of 80,000 or 86%), and each had a 1961 trade area population of under 75,000. However, in each instance the main business centre has reached 4th order status, and with the exception of Seven Hills planned centre in the Blacktown area, there is little effective internal competition at the comparison level. Each centre has a well developed terminal bus network (Table 4-6), with high centrality indices. All extend their trade areas into the surrounding rural section of the County of Cumberland, but are in turn within the fringe trade areas of Bankstown and Parramatta.

11. This increase has been maintained since 1961 - between 1961 and 1964, it is estimated that there was an increase of 52,000 in resident population in these areas - that is +33.5%.
2. **MELBOURNE**

In marked contrast with Sydney, the Melbourne metropolitan area has developed within the context of relative morphological uniformity. This is partly the result of the rigid gridiron road pattern, which, with varying degrees of significance, dominates the metropolitan area; partly the result of the lack of major internal barriers to movement; and partly the close network of tram and railway services, the one operating within the grid framework, the other cutting diagonally across this pattern. This situation allows more direct intra-urban and central city access than is possible in Sydney. This fluidity of movement has led to a metropolitan retail network which, despite locational decentralisation, has continued to be dominated by the Central Business District. The centrality of the core area, allied with the tram network (Figure 20), has maintained direct central city access to over half of the metropolitan population (51.3%). Further, the development of a full range of suburban business centres has, to a certain extent, been inhibited both by the ease of access to the CBD, and the lack of distinctive internal movement systems, within a homogeneous urban scene.

The suburban pattern which evolved within this framework is based on numbers of middle order convenience-dominated centres, located either in string fashion along tram routes or adjacent to suburban railway stations. Trade areas therefore tend to be linear in form, aligned to tram routes, and contained in other directions by adjacent and parallel tram routes. Major centres emerged at tram intersections (e.g. Prahran, Richmond, Malvern, Camberwell), or at intercepting
points to the north of the CBD (e.g. Collingwood, Brunswick – Figure 20).

The expansion of the built-up area has not been matched by extension of the tram routes. Therefore an increasing proportion of the metropolitan population, particularly those resident to the south and east of the central city, have been unable to make direct shopping trips to the central retail core. As in Sydney, the result has been the growth of a series of high order business districts adjacent to outer suburban railway stations (i.e. beyond the tram termini), which are at the focus of suburban bus routes. These vary from established centres, close to the edge of the tram zone (e.g. Box Hill, Oakleigh), to emerging centres at the outer fringe of the metropolitan area (e.g. Frankston, Dandenong – Figure 21).

Any attempt to formulate a functional typology of suburban centres throughout the metropolitan area is concerned with the grouping of decaying inner suburban, dominant intermediate suburban, and emergent outer suburban centres. Detailed morphological and operational differences between these types will be discussed in a later section; here their functional similarity is taken on its face value, and their hierarchical status accepted as a valid means of comparison.

The Spatial Distribution of High Order Centres

Analysis of the locational patterns of 3rd to 5th order suburban centres, in terms of road distance to nearest neighbour of similar status (Table 4-11), shows a wide range around a central mean. However, as in Sydney, there is a general conformation between rank and distance,
Melbourne
TRAM ZONE

City Tram Routes - number
weekday shopping period services.

Travel time in minutes from
C.B.D. Core.

4/5th Order Centres - circles
proportional to total stores.

B. Brunswick
C. Collingwood
Ca. Camberwell
Co. Coburg
M. Moonee Ponds
Ma. Malvern
N. Northcote
Pr. Prahran
P. Preston
R. Richmond
S. South Melbourne

1 0 1 2 3 4 MILES
that is apparently more than the mere result of differences in numbers within each rank \( (t = 3.0 \text{ - significant at 1\% level}) \). As in the case of Sydney, the variation in distances apart, can be partly explained in

Table 4-11

Melbourne - Average Road Distance to Nearest Neighbour of Equal or Higher Status

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>Av. Dist. (yards)</th>
<th>SD</th>
<th>( V )</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>6</td>
<td>13,717</td>
<td>5,990</td>
</tr>
<tr>
<td>IV</td>
<td>14</td>
<td>5,243</td>
<td>3,410</td>
</tr>
<tr>
<td>III</td>
<td>48</td>
<td>2,973</td>
<td>1,750</td>
</tr>
</tbody>
</table>

relation to distance from the CBD. There is a marked positive correlation between a high order centre's distance from the CBD and the proximity of its nearest high order neighbour \( (r = + 0.98 \text{ significant at 1\% level}) \). Figures obtained by using a regression line based on this data, indicate a best estimate of the variation in high order centres proximity, ranging from 1.1 miles at a distance of 2.0 miles from the CBD, to 11.4 miles at approximately 23.0 miles from the CBD.

In order to examine the relationships between the distribution of high order centres and metropolitan population, the metropolitan area has been divided into eight zones (Figure 21). Using the same technique that was applied in Sydney, comparison has been made between the estimated numbers of high order centres based on an assumed market area population (Table 4-12) and the actual numbers of centres located within each zone.
Melbourne

METROPOLITAN LOCAL GOVT. AREAS & THEORETICAL MARKET AREA SEGMENTS

Market Area Segments

A
B
C
D
E
F
G
H

F Fitzroy
C Collingwood
R Richmond

MILES
0 1 2 3 4 5 6 7 8 9
Table 4-12

Melbourne - Assumed Market Area Population

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>IV</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metrop. Area Total</td>
<td>6</td>
<td>14</td>
<td>48</td>
</tr>
<tr>
<td>Assumed Mkt. Area Popl.*</td>
<td>319,000</td>
<td>137,000</td>
<td>40,000</td>
</tr>
</tbody>
</table>

* Based on the total metropolitan population (1961 census) of 1,912,000.

The results of this analysis (Table 4-13 and Figure 22), again show that, while regression lines relating numbers of centres to population totals have close affinities with the estimated line which indicates a direct relationship with population, there are wide variations within the pattern. Statistically, the best fit is obtained by relating the joint total of 4th and 5th order centres to zonal population ($r = 0.94$ significant at the .1% level). This is due to the fact that large segments of the northern part of the Melbourne metropolitan area are without a 5th order centre. To a large extent, therefore, Melbourne 4th and 5th order centres are alternatives rather than separate hierarchical levels.

While the zones used in this technique are defined arbitrarily in terms of local government boundaries, their arrangement does, in a broad sense, relate to the metropolitan framework of market areas. As such, it is noticeable in Table 4-13 that certain zones (notably D and G),
Melbourne

BUSINESS STRUCTURE OF ASSUMED MARKET ZONES

Regression Line - actual number centres vs. zone popl totals
Regression Line - estimated number of centres based on popl totals
have a poorly developed high order representation; while others (B, C and E) have a well developed representation of high order centres. This tends to lend weight to an earlier assertion that Australian metropolitan cities have no overriding hierarchical pattern; rather they are divided into areas of internal focus, within which contrasting networks will have developed.

Table 4-13

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.96</td>
<td>1.0</td>
<td>2.2</td>
<td>2.0</td>
<td>7.6</td>
<td>13.0</td>
<td>3.2</td>
<td>3.0</td>
<td>305,000</td>
</tr>
<tr>
<td>B</td>
<td>1.0</td>
<td>2.0</td>
<td>2.4</td>
<td>2.0</td>
<td>8.3</td>
<td>11.0</td>
<td>3.4</td>
<td>4.0</td>
<td>333,000</td>
</tr>
<tr>
<td>C</td>
<td>1.3</td>
<td>2.0</td>
<td>3.0</td>
<td>3.0</td>
<td>10.4</td>
<td>8.0</td>
<td>4.3</td>
<td>5.0</td>
<td>415,000</td>
</tr>
<tr>
<td>D</td>
<td>.3</td>
<td></td>
<td>.7</td>
<td></td>
<td>2.5</td>
<td>4.0</td>
<td>1.0</td>
<td></td>
<td>99,000</td>
</tr>
<tr>
<td>E</td>
<td>.6</td>
<td></td>
<td>1.4</td>
<td>3.0</td>
<td>4.8</td>
<td>1.0</td>
<td>2.0</td>
<td>3.0</td>
<td>193,000</td>
</tr>
<tr>
<td>F</td>
<td>.6</td>
<td></td>
<td>1.4</td>
<td>2.0</td>
<td>4.8</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td>191,000</td>
</tr>
<tr>
<td>G</td>
<td>.52</td>
<td></td>
<td>1.2</td>
<td>1.0</td>
<td>4.1</td>
<td>5.0</td>
<td>1.7</td>
<td>1.0</td>
<td>165,000</td>
</tr>
<tr>
<td>H</td>
<td>.5</td>
<td>1.0</td>
<td>1.2</td>
<td>1.0</td>
<td>4.3</td>
<td>3.0</td>
<td>1.7</td>
<td>2.0</td>
<td>170,000</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
r &= .93 \\
r &= .63 \\
r &= .7 \\
r &= .94 \\
\sum 1,871,000
\end{align*}

Market Area Systems in the Melbourne Metropolitan Area

1. Barriers to Movement (Figure 23)

The primary divisions of the metropolitan area radiate from the site of the CBD, on the north bank of the Yarra, five miles from its
Melbourne

BARRIERS TO MOVEMENT

Central Business District
5th Order Business District
4th "numbered in size order, see App. I, Table 2.
C Croydon
K Kew
P Chadstone Planned Centre

Belts of Non-Residential Land

Approx Limits of Built-Up Area
mouth on Port Phillip Bay. The extent of the Bay forms the major division between areas east and west of the CBD. This division is continued by the Yarra and a wide belt of port and industrial land which lies immediately to the west of the CBD. The Maribyrnong River, with attendant industrial development and open space, is bridged with decreasing frequency to the north; while to the east, the River Yarra, once the frequently bridged section adjacent to the CBD and inner suburbs is part, similarly acts as a barrier to movement. The CBD and inner suburbs cause a marked break in intra-city movement, and the city is therefore divided into three segments: the western suburbs, west of the Maribyrnong River; the northern suburbs, between Maribyrnong and Yarra Rivers; and the southeastern suburbs accounting for the remainder of the area with 55% of the total metropolitan population.

Within these basic divisions further less effective barriers exist. In the western and northern divisions these are in the form of south-flowing streams which provide a purely local break, but may be crossed without extensive diversion. The significance of these minor barriers will be examined more closely with reference to public transport services and time-distance breaking-points. It may be pointed out that the extent of the built-up area from the central city in western and northern directions is particularly narrow for a city of two millions (the average extension is around 8.5 miles from the central city). In the outer northern suburbs the upper courses of small streams in places constitute a major barrier to movement. The southeastern area is unbroken by significant stream lines, and maximum
accessibility is attained by the juxtaposition of approximately N-S/E-W grid patterned streets and major diagonal radial highways. Here, it may be assumed, the indifference factor relating to any boundary lines will be at a maximum. An obvious exception to this condition relates to the three extensions of ribbon development to Croydon, Dandenong and Frankston, each separated by large enclaves of rural-urban fringe.

2. City Public Transport Services (Figure 24)

Public transport services linking the central city of Melbourne with the remainder of the metropolitan area, are in the form of a high density network of tram routes serving an inner ring of suburbs; supplementary bus services; and suburban train routes extending to the more recent outer suburbs.

Approximately half the metropolitan population is resident within the area served by direct city tram routes (Figure 20). These routes pass through all suburbs to points between 40 and 50 minutes from the city, at average tram speeds; exceptions are the western suburbs (Footscray, Sunshine, Williamstown) and the northwestern area within the City of Heidelberg. The twenty-seven main routes provide an average shopping period service of approximately one tram every nine minutes. This high frequency makes up for the relative slowness of the tram services, and results in the tram network remaining a dominant force in orientating city movement patterns.

The city bus network involves relatively few services, the aims of which are to supplement the tram network and to serve the one outer
Melbourne
TRANSPORT NETWORK

Suburban Rail Network - shopping period services to City
- High Order Centres within Tram Zone
- " " " outside " "
- Planned Centre
- Tram Zone
- Bus
Areas outside rail network served by City bus services.

---
Approx. Limits of Built-Up Area

MILES
suburban area which is not aligned to a suburban rail route. The major routes, in terms of shopping period services, are those linking the city with Footscray, Sunshine and beyond. Others are terminal at Port Melbourne, West Heidelberg, and the inner suburbs of Brighton and Caulfield. An extended route to the Doncaster/ Templestone area in the east, serves the area remote from suburban rail routes (Figure 24).

The lack of major natural barriers has allowed the development of a close network of rail routes throughout the metropolitan area. The result is that outer suburban areas are normally aligned along a rail route, with direct accessibility to suburban stations. An estimated 40% of the metropolitan population is resident in an area relying on rail routes for public transport travel to the central city. Within this area the growth of intra-suburban bus services, terminal at suburban stations, has resulted in the development of a pattern similar to that already discussed in relation to Sydney.

3. Intra-Suburban Bus Services

Examination of data relating to bus and tram services terminal at suburban business centres, and the city public transport services passing through them, suggest that contrasts occur both between different orders, and between centres with different city transport links. It is noticeable from Table 4-14 that while 5th order centres stand out clearly from the remainder, there is no significant distinction between 3rd and 4th orders. This can be related to differences between those suburban centres located within the tram network and those within the outer
suburban rail networks (Tables 4-15 and 4-16). From these tables two important points may be made. Firstly, there is a major distinction between the numbers of centres with terminal bus routes, and the average number of routes involved. Secondly, there is a basic difference between the representation of the three ranks in the two tables. Briefly, under half of the centres located within the tram network, possess terminal bus services. Of these, the largest representation is at the 4th order level: Further, the average numbers of bus routes, terminal at centres within the tram belt, are below the overall averages (Table 4-14).

Table 4-15

Melbourne - Suburban Centres Within the Tram Network

<table>
<thead>
<tr>
<th>Class</th>
<th>No. Centres</th>
<th>Bus Foci</th>
<th>Av. No. Routes</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>2</td>
<td>1</td>
<td>4.0</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>10</td>
<td>8</td>
<td>3.3</td>
<td>3.2</td>
</tr>
<tr>
<td>III</td>
<td>17</td>
<td>5</td>
<td>1.6</td>
<td>.25</td>
</tr>
</tbody>
</table>
Table 4-16

Melbourne - Railway Suburban Centres Beyond the Tram Network

<table>
<thead>
<tr>
<th>No. of Centres</th>
<th>Bus Foci</th>
<th>Av. No. Routes</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>V 4</td>
<td>4</td>
<td>12.8</td>
<td>3.5</td>
</tr>
<tr>
<td>IV 4</td>
<td>4</td>
<td>4.3</td>
<td>2.5</td>
</tr>
<tr>
<td>III 30</td>
<td>24</td>
<td>2.8</td>
<td>2.5</td>
</tr>
</tbody>
</table>

By comparison, terminal bus services focus on over four fifths of the high order suburban centres which are adjacent to railway stations beyond the tram termini. The numbers of terminal routes are slightly above average for each rank, particularly in the case of the 5th order centres. These results tend, therefore, to support an earlier contention that CBD dominance and market area patterns have tended to inhibit the growth of high order comparison centres within that part of Melbourne served by tram routes.

A centrality index based on numbers and length of routes, and frequency of services has been calculated for 4th and 5th order centres (Table 4-17). Dominant in this respect are the 5th order centres located beyond, or outside the tram network: Box Hill, Footscray, Frankston, Dandenong; together with the planned centre of Chadstone. Of the 4th order centres within the tram network only Moonee Ponds has a well developed pattern of terminal bus services.

The relative lack of 4th and 5th order centres with high centrality indices may be contrasted with the wide range of railway centres of third order status, or below, with one or two terminal services.
Table 4-17

Melbourne - The Centrality of High Order Business Centres in terms of Terminal Bus Services

<table>
<thead>
<tr>
<th>No. of Terminal Shopping Routes</th>
<th>Total Terminal Shopping Services (yds)</th>
<th>Av. Route Hour Distance (yds)</th>
<th>Total Route Distance (miles)</th>
<th>Centrality Index*</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th Order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footscray</td>
<td>11</td>
<td>237</td>
<td>6,690</td>
<td>41.8</td>
</tr>
<tr>
<td>Prahran</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Camberwell</td>
<td>4</td>
<td>80</td>
<td>6,975</td>
<td>15.9</td>
</tr>
<tr>
<td>Frankston</td>
<td>11</td>
<td>161</td>
<td>7,000</td>
<td>80.5</td>
</tr>
<tr>
<td>Dandenong</td>
<td>10</td>
<td>125</td>
<td>7,691</td>
<td>43.7</td>
</tr>
<tr>
<td>Box Hill</td>
<td>19</td>
<td>201</td>
<td>11,058</td>
<td>119.4</td>
</tr>
<tr>
<td>4th Order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malvern</td>
<td>1</td>
<td>21</td>
<td>11,100</td>
<td>6.3</td>
</tr>
<tr>
<td>Brunswick</td>
<td>4</td>
<td>75</td>
<td>2,633</td>
<td>6.0</td>
</tr>
<tr>
<td>Bentleigh</td>
<td>1</td>
<td>22</td>
<td>4,200</td>
<td>2.4</td>
</tr>
<tr>
<td>Moonee Ponds</td>
<td>11</td>
<td>201</td>
<td>9,010</td>
<td>56.3</td>
</tr>
<tr>
<td>Richmond</td>
<td>1</td>
<td>15</td>
<td>4,000</td>
<td>2.3</td>
</tr>
<tr>
<td>Collingwood</td>
<td>1</td>
<td>21</td>
<td>12,200</td>
<td>6.9</td>
</tr>
<tr>
<td>Oakleigh</td>
<td>5</td>
<td>67</td>
<td>8,116</td>
<td>23.1</td>
</tr>
<tr>
<td>Northcote</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Coburg</td>
<td>4</td>
<td>72</td>
<td>4,775</td>
<td>10.9</td>
</tr>
<tr>
<td>Preston</td>
<td>3</td>
<td>51</td>
<td>4,800</td>
<td>8.2</td>
</tr>
<tr>
<td>Sunshine</td>
<td>3</td>
<td>58</td>
<td>7,233</td>
<td>12.3</td>
</tr>
<tr>
<td>South Melbourne</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Kew</td>
<td>1</td>
<td>55</td>
<td>9,000</td>
<td>5.1</td>
</tr>
<tr>
<td>Croydon</td>
<td>8</td>
<td>57</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Chadstone</td>
<td>6</td>
<td>106</td>
<td>6,942</td>
<td>23.7</td>
</tr>
</tbody>
</table>

* - Centrality Index = \( \frac{d}{100} \times s \)

When \( d = \) Total route distance covered by bus services terminal at a centre.

and \( s = \) total services arriving at centre during weekday shopping hours.
Proportionally the total services terminal at minor centres, are as significant as services terminal at high order centres. As such they emphasise the importance of railway services to the central city, and the role of suburban bus routes as links in shopping trips to the central city, rather than a means of reaching a suburban business centre.

4. Car Customer Accessibility Zones (Figure 25)

Time-distance zones, drawn around the high order centres within the metropolitan area, and confined by the proximity of competing centres of equal status, are again used to define areas of maximum accessibility. Estimates of resident population within such zones, clearly indicates that competitive activity between high order centres increases with proximity to the central city (Table 4-18). There is a positive correlation ($r = 0.91$ significant at .1% level) between distance from the CBD and total resident population which is most accessible to a particular centre; that is, the greater the distance between the CBD and a business centre, the greater will be the population closer to it than to any other centre. In terms of time-distance based on an average car speed, there is a close relationship between the distribution of centres with areas of maximum accessibility limited to 10 minutes driving distance, and the tram zone. Beyond this inner belt of suburbs there is an immediate increase in the distance between high order centres, and a consequent extension of the time-distance zones within areas of maximum accessibility (Table 4-19). There is little
CAR ACCESSIBILITY ZONES

- 4/5th Order Centres
  - See Appendix II, Table 2.
- Break-Points between centres in terms of driving time-distances.
- 5 minute time-distance zones
- Outer Limits of City Tram Services
- Dominated by C.B.D.

C - Croydon
K - Kew
<table>
<thead>
<tr>
<th>5th Order</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>Box Hill</td>
<td>38,000</td>
<td>62,000</td>
<td>32,000</td>
<td>6,000</td>
<td>-</td>
<td>8,000</td>
<td>-</td>
<td>146,000</td>
</tr>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>98,000</td>
</tr>
<tr>
<td>Dandenong</td>
<td>18,000</td>
<td>16,000</td>
<td>26,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>60,000</td>
</tr>
<tr>
<td>Footscray</td>
<td>44,000</td>
<td>34,000</td>
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<td>6,000</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Frankston</td>
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<td>12,000</td>
<td>4,000</td>
<td>6,000</td>
<td>8,000</td>
<td>-</td>
<td>-</td>
<td>46,000</td>
</tr>
<tr>
<td>Prahran</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>126,000</td>
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<table>
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<tr>
<th>4th Order</th>
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<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentleigh</td>
<td>40,000</td>
<td>72,000</td>
<td>70,000</td>
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<td>-</td>
<td>-</td>
<td>86,000</td>
</tr>
<tr>
<td>Coburg</td>
<td>48,000</td>
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<td>22,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>126,000</td>
</tr>
<tr>
<td>Collingwood</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>34,000</td>
</tr>
<tr>
<td>Croydon</td>
<td>16,000</td>
<td>16,000</td>
<td>22,000</td>
<td>4,000</td>
<td>9,000</td>
<td>12,000</td>
<td>4,000</td>
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</tr>
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<td>Kew</td>
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<td>-</td>
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<td>-</td>
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</tr>
<tr>
<td>Malvern</td>
<td>50,000</td>
<td>16,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>66,000</td>
</tr>
<tr>
<td>Moonee Ponds</td>
<td>24,000</td>
<td>16,000</td>
<td>18,000</td>
<td>10,000</td>
<td>6,000</td>
<td>-</td>
<td>-</td>
<td>74,000</td>
</tr>
<tr>
<td>Northcote</td>
<td>58,000</td>
<td>24,000</td>
<td>4,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>86,000</td>
</tr>
<tr>
<td>Oakleigh</td>
<td>30,000</td>
<td>64,000</td>
<td>26,000</td>
<td>26,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>146,000</td>
</tr>
<tr>
<td>Preston</td>
<td>44,000</td>
<td>54,000</td>
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<td>14,000</td>
<td>14,000</td>
<td>-</td>
<td>-</td>
<td>142,000</td>
</tr>
<tr>
<td>Richmond</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30,000</td>
</tr>
<tr>
<td>South Melb.</td>
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<td>4,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>50,000</td>
</tr>
<tr>
<td>Sunshine</td>
<td>16,000</td>
<td>22,000</td>
<td>14,000</td>
<td>18,000</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>90,000</td>
</tr>
</tbody>
</table>

* - Estimates based on 1961 census.
### Table 4-19

**Melbourne - Extent of Areas of Maximum Accessibility**
*(Within the Metropolitan Area)*

<table>
<thead>
<tr>
<th>Time Dist. Zones (Mins.)</th>
<th>Nos of* Centres</th>
<th>Est. Popl. Served</th>
<th>Cumul. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>20</td>
<td>814,000</td>
<td>42.6</td>
</tr>
<tr>
<td>6 - 10</td>
<td>18</td>
<td>534,000</td>
<td>70.5</td>
</tr>
<tr>
<td>11 - 15</td>
<td>12</td>
<td>280,000</td>
<td>85.1</td>
</tr>
<tr>
<td>16 - 20</td>
<td>10</td>
<td>126,000</td>
<td>91.7</td>
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<tr>
<td>21 - 25</td>
<td>7</td>
<td>49,000</td>
<td>94.3</td>
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<td>26 - 30</td>
<td>2</td>
<td>20,000</td>
<td>95.3</td>
</tr>
<tr>
<td>31 - 35</td>
<td>1</td>
<td>4,000</td>
<td>95.5*</td>
</tr>
</tbody>
</table>

* Number of Centres Extending Areas of Maximum Accessibility to each Zone (4th and 5th Orders).

**The remaining 4.5% are resident in sites closer to the CBD than the nearest high order business centre.**

Significance in the differences between the population within the maximum accessibility zones of 4th and 5th order centres (Table 4-20). A point further supporting the suggestion that 4th and 5th order centres

### Table 4-20

**Melbourne - Average Resident Population Within Areas of Maximum Accessibility.**

<table>
<thead>
<tr>
<th>Av. Popl. with Max Access.</th>
<th>SD</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>98,700</td>
<td>35,400</td>
</tr>
<tr>
<td>IV</td>
<td>89,500</td>
<td>46,700</td>
</tr>
</tbody>
</table>
within the Melbourne metropolitan area act as alternatives for highest rank status within different market areas.

**Market Area Network (Figure 26 & Table 4-21)**

In Sydney, major high order centres have established their own distinct patterns of internal movement systems; however centres of similar rank in Melbourne operate within the overall metropolitan network aligned to the central city. This results in a series of linear zones which cut across the city's morphological patterns (Figures 26 & 27). This is particularly the case with reference to the western and northern areas (4 - 8), where city tram and bus routes continue to the outer suburban areas. It is less true in the southeastern segment of the city (9 to 11) where the termination of city tram services coincides closely with the edge of a zone of population decline or stagnation.

Examination will be made of city retail structure on the basis of population change and related commercial morphological patterns. This will be linked with the form of the market area network as defined by city movement systems.

There is a clear positive relationship between the change in population levels of local government areas during the intercensal period 1957-61; and the change in total retail establishments during the same period. Estimates of increases or decreases in numbers of retail establishments, based on a least square regression line relating to this data, have been compared with actual changes (Table 4-21). The resulting metropolitan pattern may be used, in conjunction with information relating to population change, as a basis for intra-city contrast.
Figure 26
Figure 26

Market Areas

1. Inner City
2. Fitzroy-Collingwood-Richmond
3. Prahran-St Kilda
4. Footscray-Sunshine
5. Essendon
6. Brunswick-Coburg-Broadmeadows
7. Northcote-Preston
8. Heidelberg
9a. Camberwell-Kew
9b. Box Hill
9c. Ringwood-Croydon
10a. Malvern-Caulfield
10b. Oakleigh-Waverley
10c. Dandenong
11a. Brighton-Moorabbin-Sandringham-Mordialloc
11b. Frankston-Chelsea
Melbourne MARKET AREA NETWORK

5th Order Business Centres
4th " " "
3rd " " "

4/5th order centres numbered according to size order - App. II, Table 2
C. - Croydon
K. - Kew

MILES
### Table 4-21

Melbourne Metropolitan Area — Survey of Central Place Retail, Population and Retail Establishment Changes, and Per Capita Sales Figures relative to General Market Areas.

<table>
<thead>
<tr>
<th>L.G.A.</th>
<th>Business Centres</th>
<th>1957—61 Business Popl.</th>
<th>Incr/Decr in Total Retail Estab, 1957—61</th>
<th>Total Retail Estab, 1961-2</th>
<th>'000 Total Sales per Retail</th>
<th>'000 Per Capita Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V</td>
<td>IV</td>
<td>III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner City</td>
<td>1,912,000</td>
<td>G.B.S.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Melbourne</td>
<td>122,000</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-13,590</td>
<td>-10 - 119</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+403</td>
<td>0</td>
<td>9</td>
<td>-17,292</td>
<td>-103 - 182</td>
</tr>
<tr>
<td>Port Melbourne</td>
<td>89,000</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>-101</td>
<td>-56 - 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+253</td>
<td>0</td>
<td>0</td>
<td>+65</td>
<td>0</td>
</tr>
<tr>
<td>Prahran</td>
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<td>1</td>
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<td></td>
<td>+774</td>
<td>-40 - 5</td>
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<td></td>
<td></td>
<td>+202</td>
<td>0</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td>Footscray</td>
<td>137,000</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>-365</td>
<td>9 - 7</td>
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<td></td>
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<tr>
<td>Elstern</td>
<td>89,000</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-213</td>
<td>4 - 3</td>
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<td>0</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunswick</td>
<td>191,000</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>+1,091</td>
<td>1 - 8</td>
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<tr>
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<td></td>
<td>+3,071</td>
<td>0</td>
<td>30</td>
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<td></td>
</tr>
<tr>
<td>Broadmeadows</td>
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<td>2</td>
<td>1</td>
<td>+1,766</td>
<td>10 - 15</td>
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<td></td>
<td>+2,646</td>
<td>0</td>
<td>96</td>
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</tr>
<tr>
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<td>4</td>
<td></td>
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<td>-109 - 16</td>
</tr>
<tr>
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<td>+1,485</td>
<td>0</td>
<td>22</td>
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</tr>
<tr>
<td>Camberwell</td>
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<td>1</td>
<td>4</td>
<td>-359</td>
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<td></td>
<td>+207</td>
<td>0</td>
<td>19</td>
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<tr>
<td>Box Hill</td>
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<td>1</td>
<td>2</td>
<td></td>
<td>+7,912</td>
<td>+111 - 76</td>
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<td></td>
<td>+2,641</td>
<td>0</td>
<td>43</td>
<td></td>
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<tr>
<td>Ringwood</td>
<td>89,000</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>+5,627</td>
<td>-76 - 53</td>
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<td></td>
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<td>-</td>
<td>10</td>
<td></td>
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<td>-201 - 125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+1,010</td>
<td>0</td>
<td>51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frankston</td>
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<td>-</td>
<td>1</td>
<td></td>
<td>+7,622</td>
<td>+67 - 72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+2,015</td>
<td>0</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan Area (apart from Inner City)</td>
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<td>98</td>
<td></td>
<td>20,068</td>
</tr>
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</table>

Notes:
(i) Metropolitan Local Government Areas.
(ii) Business Centres divided according to Class Orders.
(iii) Lillydale and Fern Tree Gully totals included in Croydon figure.
The inner city area (area 1 Figure 26) stands out clearly with relation to population change. Its constituent local government areas: the Cities of Melbourne, South Melbourne and Port Melbourne; define an area of maximum population decline (-17,292 between 1957 and 61, or -12.4%). However, the fall in the number of retail establishments (discounting the CBD) is less marked than estimated (-103 in comparison with -182 estimated). This apparent anomaly can probably be related, as in the case of Sydney, to the increase in motor vehicle sales and establishments in the area during the period between 1957 and 1961; in 1961 the Retail Census shows that 46.7% of total sales in the area were connected with motor vehicles.

In terms of morphological type the inner city area, overshadowed by the CBD, contains the remnants of string street centres which are being replaced by a wide variety of non-retail commercial premises. One such centre, South Melbourne, remains at the 4th order functional level, although its operational role has already declined to that of convenience/comparison centre for the high density resident population of its primary trade area.

Surrounding the inner city zone is a further group of local government areas showing declines in resident population, or population growth well below the metropolitan average. These are best exemplified by market zones 2 and 3; although the area, with its attendant falls in the numbers of retail establishments, extends beyond these zones to the southeast. The Fitzroy – Collingwood – Richmond area (2) and the
Prahran - St. Kilda area (3) have a common environment of mixed high density housing and commercial development. In contrast with the inner city area, the extended string street shopping development remains, with important core sectors of high order status (Collingwood and Richmond in area 2, and Prahran in area 3). While typically these inner areas are primarily zones of through city-movement, Collingwood and particularly Prahran have maintained a hold on both primary and secondary trade areas. However, despite this fact, there have been considerable falls in the numbers of retail establishments operating in these areas (1957-61 a fall of 200 units, or 7% of the 1957 total). This decline can be related to the large number of retail premises being taken over by other commercial and manufacturing uses, at the fringe of the major string street centres, and throughout the minor centres (e.g. East Richmond and St. Kilda). Falls in the numbers of retail establishments within areas 2 and 3 are considerably above those estimated by reference to total city data (estimated fall only 15).

There are few internal transport services terminal to centres in this zone. The tram system is dominant, and each of the major centres has through- and cross-tram routes, with core sectors in close relationship with the main intersection point (Figure 20).

The Cities of Brunswick and Footscray are strictly within the same zone in terms of population and retail census figures; but both are

12. See later detailed study of Prahran - Chapter 7, pp 243-266.
directly linked with dominant movement systems, which draw them into wider market areas, and will be considered separately.

Despite market area conditions of population decline, and contraction in the numbers of retail outlets, areas 1-3 are in excess of the metropolitan average in terms of sales per capita (see Figure 27b). This suggests that either there is a more complete use of local facilities made by the inhabitants of inner suburban areas, or considerable expenditure within inner string business centres by residents of suburbs located further from the central city.

Beyond the inner suburban area of tram-orientated string streets, a further zone of common retail patterns extends approximately to the outer tram termini. With the exception of the Camberwell-Kew-Hawthorn area (9a), this zone tends to be aligned to linear market areas - Essendon, Coburg and Preston (5-7) to the north, and Malvern-Caulfield (10a) to the southeast. In general this zone includes established residential areas with relatively stable population totals. In detail, there are wide variations in population density, the form of residential development and the socio-economic levels of its inhabitants. This is reflected in the comparison of variations of changes in retail establishment totals with estimated totals (Table 4-21). However, certain common market area systems emerge, despite the heterogeneous background. All major high order business centres are orientated to city tram routes, with the largest at the intersection of routes (e.g. Camberwell and Malvern). Despite this close relationship with
linear movement along tram routes, each of the centres has at least one
terminal suburban bus service, with Moonee Ponds, Coburg and Camberwell
acting as the focus for a network of services (Table 4-17). This is a
measure of the increase in the proportion of resident market area
population living at points beyond normal walking distance from the
nearest tram route, and of the firmer hold that centres in this zone
have over their secondary and fringe trade areas. In most instances,
the high order centres of this zone extend their fringe market areas
beyond the limits of the tram terminals. This is particularly the case
for the northern centres of Preston, Coburg and Moonee Ponds. As a
result of this extension of spheres of influence into areas of popula-
tion growth, high order centres of the outer tram zone show evidence
of commercial redevelopment within their core sectors, and in some cases
fringe expansion. They may therefore be distinguished from the core
sector stagnation, typical of the inner suburban string centres.

The suburban areas of maximum population increase during the last
intercensal period are located beyond the tram zone in both the south-
east and northern segments of the city. In the case of the northern
areas of this group, they also form the outer fringe of the metropolitan
area, are oriented within the linear north-south movement patterns, and
are without high order business centre development. The southeastern
areas are, however, backed by further outlying suburbs, and have
developed movement systems, centred on three high order business
districts: Box Hill, Oakleigh, and Bentleigh; together with the
planned centre of Chadstone. Three market area networks have developed around these centres (9b, 10b and 11a - Figure 26); the relevant information regarding these areas is summarised in Table 4-22.

Table 4-22

<table>
<thead>
<tr>
<th>Mkt. Area</th>
<th>Popl. Incr.</th>
<th>Est. (i)</th>
<th>Term-</th>
<th>Av. S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box Hill</td>
<td>+42.4%</td>
<td>+327</td>
<td>+358</td>
<td>7</td>
</tr>
<tr>
<td>Oakleigh</td>
<td>+65.5%</td>
<td>+310</td>
<td>+359</td>
<td>6</td>
</tr>
<tr>
<td>Bentleigh</td>
<td>+19.0%</td>
<td>+309</td>
<td>+154</td>
<td>14</td>
</tr>
</tbody>
</table>

Notes: (i) Estimates based on metropolitan regression - see Table 4-20
(ii) Dominant centre Box Hill - 19 routes
(iii) "" Chadstone 6 "
"  Oakleigh 5 "
(iv) Major high order centre -
"  Bentleigh 1 "

The growth rates indicated above are primarily related to the expansion of moderate density, middle income residential suburbs. Each market area network is grouped around one or more suburban railway routes, and in each case the main shopping centres are located at stations along these routes.

The high rate of population growth between 1957 and 61 was matched by a large increase in the numbers of retail units. This increase is in each case above the estimate based on overall metropolitan data; 51% of the total metropolitan increase in retail establishments took place in this zone.
The degrees of dominance of the major high order centre varies considerably from area to area. Box Hill (9b) is overwhelmingly dominant within the northern area; whilst the controlling position of Oakleigh has been markedly affected by the development of Chadstone Shopping Centre in the central area (10b). In the southern bayside group of suburbs (11a), a wide dispersal of bus foci and the relative insignificance, in terms of the centrality index, of the 4th order centre of Bentleigh, present a totally different picture. The off-centre location of Bentleigh, the elongated form of the area, and the presence of two railway lines, have led to a multiplicity of 3rd order centres. These are absorbing, equally, the increase in retail establishments, with six centres having developed well defined trade areas (i.e. Cheltenham, Hampton, Mentone, Mordialloc, Moorabbin and Sandringham), and fourteen centres possessing terminal bus routes.

The outer southeastern suburbs project beyond this intermediate zone, aligned in narrow ribbons, following main road and railway routes, (areas 9c, 10c and 11b on Figure 26). These outlying tentacles of the city possess distinctive market features. In each of the present cases under study the resident population in 1961 was well under 100,000 (i.e. under normal metropolitan conditions insufficient to support a 5th order centre - see areas 3, 4, 9a and b in Table 4-21). However, two of the areas possess 5th order centres (Frankston and Dandenong), and the other a rapidly growing 4th order centre (Croydon). The success

of such centres is made possible by the relative isolation from competing high order centres (e.g. Frankston - 12.5 miles; Dandenong 10.0 miles; and Croydon 9.0 miles), which results in a far lower rate of 'escape' spending than is normal within metropolitan areas. Further, such centres, at the very edge of the built-up area, are in an intercepting location in relation to shopping trips made by residents in adjacent rural areas. This is reflected in the high population-sales indices indicated in Figure 27b.

Dandenong and Frankston are the dominant bus terminal nodes of their market areas, while Croydon and the expanding 3rd order centre of Ringwood share importance in the northern area.

It is noticeable that in these areas with high population growth rates (+32%, 1957-61) and established high order centres, larger numbers of retail establishments opened between 1957 and 1961 (449) than estimated (342). This contrasts markedly with rapid growth suburbs in the northern and western edges of the metropolitan area - Altona, Keilor, Broadmeadows - with no established high order central place. Here actual increases in the numbers of retail establishments (319) were well below the estimated totals (480).

Two areas, both atypical, remain for examination. The Heidelberg area (zone 8 in Figure 26) will be the subject of a later detailed study and may be discussed briefly at this stage. 15 This isolated

15. See Chapter 9, pp 403-420.
segment of the metropolitan area extends from older residential sections at its inner western edge, in the Ivanhoe area, to recent outer fringe suburbs around Eltham. In 1961 resident population of 99,000 was served by four 3rd order centres and a large number of minor centres of purely local significance. The irregular and interrupted form of residential development, with no important through-route, has led to this lack of a high order business district. Rapid population growth, and the increase in the numbers of retail establishments well above the estimated total, has in this particular case led to a proliferation of minor groups; with some similarities with the bayside area, but in contrast with the rest of the city.

Finally, the western suburban segment of Footscray - Sunshine (4) presents a normal market area framework within a different pattern of transport systems. Separated from the CBD by 3 miles of dockland and industrial area, and from the linear orientation of the northern suburbs by the Maribyrnong River, the area has a physical separateness unusual within the Melbourne metropolitan area. Further, it is not within the city tram network, despite its close proximity to the CBD. This is replaced by city bus routes which extend to the western fringe suburb of Deer Park. The most complete network of terminal services (bus and tram)\textsuperscript{16} within Melbourne, focus on Footscray (Table 4-17). The resulting 5th order business district has a wide functional range of retail and business outlets, and until recently dominated the entire segment.

\textsuperscript{16} A series of tram routes link Footscray with its primary trade area; these are not connected with the city network of tram services.
However, the rapid increase in population within the outer area has promoted the expansion of Sunshine to 4th order status. With the Williamstown - Altona area to the south, lacking a high order centre, the entire segment provides an interesting microcosm of intra-metropolitan differences within Melbourne.
1. **ADELAIDE**

The Adelaide metropolitan district, at its present stage of development, is contained within a small, compact area, measuring some fifteen miles from east to west, and eleven miles from north to south. The median location of the central city; the grid-iron road pattern overlaid by major arterial diagonals; and the relative lack of traffic congestion on central city approach roads during shopping hours, result in virtually the entire metropolitan area lying within 30 minutes car time of the CBD. A complete network of city bus routes serves all but an insignificant proportion of the metropolitan population; with a maximum travel time of 45 minutes. This high degree of accessibility to the Central Business District has led to the overall domination of the retail structure of the metropolitan area by the central retail core (see Introduction).

In comparison with the larger cities of Sydney and Melbourne, the suburban retail structure of Adelaide is of minimal significance in establishing intra-city movement patterns. Its emphasis is on the provision of convenience goods and services to market areas of limited extent; penetration into wider areas is contained by the lack of intra-suburban public transport services. However, an analysis of the functional structure of a wide sample of Adelaide's suburban
business centres, presented in Chapter 2, did indicate an incipient
five-fold hierarchical classification. It will be shown in later
detailed studies (Part II) that this formal typology is being broken
down by the concentration of recent growth within certain lower order
centres, which results in their operation at a higher order level than
their functional structure would suggest. At this stage however, the
spatial distribution of centres, grouped according to the original
classification, will be examined; a market area system developed and
its validity discussed.

Examination of the distribution of higher order centres throughout
the metropolitan area (Figure 28), indicates a simple twofold division
into those located in areas immediately adjacent to the central city
core (Unley, Norwood, North Adelaide, Hindmarsh, Torrensville), and
those located at coastal sites at some distance from the CBD (Port
Adelaide, Glenelg). With the exception of Clovelly Park, 3rd order
centres tend to be located in relatively close proximity to their
nearest higher order neighbour. Calculation of mean road distance to
nearest neighbours, according to rank (Table 5-1), indicates that while
distances fall with rank, there are no significant distinctions. This
deficiency in the theoretical scheme, common in some degree to all
cities, is largely the result of an incomplete metropolitan distribu-
tion of any single high order rank. While such ranks may be clearly
distinguished in relation to functional structure and transport
centrality, it is rare to find all present within any high order market
Table 5-1

**Adelaide - Average Road Distance to Nearest Neighbour of Equal or Higher Status**

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>Av. Dist. Apart (yds)</th>
<th>SD</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>3</td>
<td>13,665</td>
<td>2,100</td>
</tr>
<tr>
<td>IV</td>
<td>4</td>
<td>4,075</td>
<td>650</td>
</tr>
<tr>
<td>III</td>
<td>8</td>
<td>3,712</td>
<td>1,780</td>
</tr>
<tr>
<td>II</td>
<td>20</td>
<td>2,695</td>
<td>1,600</td>
</tr>
<tr>
<td>IV + V</td>
<td>7</td>
<td>6,330</td>
<td></td>
</tr>
</tbody>
</table>

area. In terms of their operational role within a given market area network, centres of equal functional status are likely to vary considerably throughout a metropolitan city. This is particularly true of conditions within smaller cities, where population size has inhibited the growth of complete networks. Hence, by combining 4th and 5th order centres, a more realistic pattern of high order space relations is obtained.

The lack of a complete network is indicated by a comparison of the numbers in each order, estimated according to resident population, and those actually present. As in the cities examined in Chapter 4, the metropolitan area has been divided into segments (Figure 29) based on Local Government Area boundaries, and related approximately to the metropolitan market area network. Tables 5-2 and 5-3 indicate assumed market area populations, and the estimated and actual totals within the five segments. A comparison of the 1961 population totals of each segment with the assumed market area populations, shows that, ideally,
Adelaide

METROPOLITAN LOCAL GOVT. AREAS & THEORETICAL MARKET AREA SEGMENTS
Table 5-2

Adelaide - Assumed Market Area Population

<table>
<thead>
<tr>
<th></th>
<th>V</th>
<th>IV</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metropolitan Area Total</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Assumed Mkt Area Popl.</td>
<td>196,000</td>
<td>147,000</td>
<td>58,000</td>
</tr>
</tbody>
</table>

84,000

* Based on the total metropolitan population (1961 census) of 587,957.

Table 5-3

Adelaide - Estimated and Actual Centre Representation Within Metropolitan Area Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>V</th>
<th>IV</th>
<th>III</th>
<th>IV/V</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>.62</td>
<td>-</td>
<td>.83</td>
<td>1.0</td>
</tr>
<tr>
<td>B</td>
<td>.68</td>
<td>1.0</td>
<td>.92</td>
<td>1.0</td>
</tr>
<tr>
<td>C</td>
<td>.75</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>D</td>
<td>.44</td>
<td>1.0</td>
<td>.59</td>
<td>-</td>
</tr>
<tr>
<td>E</td>
<td>.49</td>
<td>-</td>
<td>.66</td>
<td>1.0</td>
</tr>
</tbody>
</table>

\[
r = .38 \quad r = .85
\]

* Estimated numbers of centres are calculated with reference to an ideal situation where each centre of a particular order commands an equal share of the resident population of the metropolitan area. Hence in segment A the estimated number of 5th order centres will equal \[
\frac{122,000}{196,000} \quad \text{or} \quad .62
\]
no segment will be able to support a 5th order centre, and only one segment a 4th order centre. Correlations between actual numbers of centres of each rank, and segment population totals, indicates low coefficients for all but combined 4th and 5th order centres.

Having indicated that, in spatial terms, the hierarchy of suburban business centres within the Adelaide metropolitan area is incomplete, it is necessary to examine the general movement systems within the city, in order to justify any market area network drawn around the high order centres. As in earlier examples, transport systems and their relationship with suburban business centres, together with accessibility in terms of the use of private motor vehicles, will be studied.

City Public Transport Routes (Figures 30-31)

Direct city bus routes serve 92% of the resident population of the Adelaide metropolitan area. Services operated by both the Municipal Transport Trust and independent bus operators provide a close network of routes from all suburbs with the exception of the isolated Blackwood area in the southeast (in fact served by a city-bound country service) and the northern and southern extensions of the built-up area (Figure 30). The direct accessibility of a large proportion of the inhabitants to the central city, is indicated in Table 5-4. This shows that 72% of the metropolitan population are within the 30 minute time-distance zone. All Transport Trust routes and most privately operated routes provide at least a 15 minute service, that is 28 buses to the central city during shopping hours on a normal weekday.
Adelaide City Bus Routes

4/5th Order Centres - see App II, Table 3.

- Bus Routes terminal at C.B.D.
- Limits of Built-Up Area
- Adelaide Hills Scarp
- Glenelg Tram Route

MILES
### Table 5-4

**Adelaide - Time:Distance Zones According to City Bus Services**

<table>
<thead>
<tr>
<th>Time:Dist. from City* (mins)</th>
<th>Estimated Popl. 1961</th>
<th>Cumul. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>10,000</td>
<td>1.7</td>
</tr>
<tr>
<td>11-15</td>
<td>80,000</td>
<td>15.3</td>
</tr>
<tr>
<td>16-20</td>
<td>122,000</td>
<td>36.1</td>
</tr>
<tr>
<td>21-25</td>
<td>110,000</td>
<td>54.8</td>
</tr>
<tr>
<td>26-30</td>
<td>102,000</td>
<td>72.1</td>
</tr>
<tr>
<td>31-35</td>
<td>53,000</td>
<td>81.1</td>
</tr>
<tr>
<td>36-40</td>
<td>45,000</td>
<td>88.7</td>
</tr>
<tr>
<td>41-45</td>
<td>14,000</td>
<td>91.1</td>
</tr>
<tr>
<td>46-50</td>
<td>6,000</td>
<td>92.2*</td>
</tr>
</tbody>
</table>

* Time: Distance from CBD in terms of average time-tabled bus speeds on city bus routes.

** Remaining 7.8% (45,000) are resident in areas beyond city transport termini. 

Suburban rail services operate on routes serving southern and north-western sections of the metropolitan area (Figure 31). Such routes provide direct city services for all but a fraction of those resident beyond the city bus terminals. However, by contrast with Sydney and Melbourne, only 5 of the 15 centres of 3rd order status and above, are located at sites adjacent to suburban stations, and only one of these possesses a terminal bus service.

The lack of intra-suburban transport services necessitates an examination of the relationship of city transport routes and high order suburban centres, many of which rely on the interception of custom using city routes (Figure 30 and Table 5-5). This shows that in no case is a high order centre located at the focus of a series of city
Adelaide

SUBURBAN RAIL SERVICES

4/5th Order Centres
3rd " "
Numbered according to size order - see App II, Table 3
Centres within rail net.

30 Lines proportional to numbers of rail services to Adelaide during weekday shopping hours
20
10

Built-Up Area
Adelaide Hills Scarp

MILES
Table 5-5

Adelaide - City Public Transport Services in relation to Suburban Business Centres.

<table>
<thead>
<tr>
<th>4/5th Order Business Centres</th>
<th>City Transport Weekday Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tram</td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Glenelg*</td>
<td>42</td>
</tr>
<tr>
<td>Port Adelaide*</td>
<td></td>
</tr>
<tr>
<td>Unley</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>Hindmarsh</td>
<td></td>
</tr>
<tr>
<td>North Adelaide</td>
<td></td>
</tr>
<tr>
<td>Norwood</td>
<td></td>
</tr>
<tr>
<td>Torrenssville</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Brighton</td>
<td></td>
</tr>
<tr>
<td>Clovelly Park</td>
<td></td>
</tr>
<tr>
<td>Enfield*</td>
<td></td>
</tr>
<tr>
<td>Goodwood</td>
<td>42</td>
</tr>
<tr>
<td>Prospect</td>
<td></td>
</tr>
<tr>
<td>Semaphore</td>
<td></td>
</tr>
<tr>
<td>Tusmore</td>
<td></td>
</tr>
<tr>
<td>Woodville</td>
<td></td>
</tr>
</tbody>
</table>

* Glenelg has 7 terminal intra-suburban bus routes
60 services per weekday shopping hours
53.7 miles is the total distance covered
Centrality Index 32.2

* Port Adelaide: 1 terminal route
9 weekday services
12.3 miles covered - C.I. 1.1.

* Enfield: 1 terminal route
5 weekday services
3.3 miles covered - C.I. .17.

bus routes. Even those centres located in the inner suburbs surrounding the central city, tend to be served by only one through-route. The chief reason for this is the lack of nodal sites within the framework of the metropolitan street pattern. In each segment of the city routes run
along parallel streets, amalgamating at points close to the ring of
parklands and the CBD, beyond the sites of the five inner suburban
high order centres. Further, each of the five inner suburban centres
lies within the 15 minute bus time:distance zone. Therefore, five out
of the seven 4th and 5th order centres are located in sites which, in
Sydney and Melbourne, are typified by retail decline.

Suburban Public Transport Routes

Such is the dominance and completeness of the city public transport
network in Adelaide, that only three of the fifteen centres of 3rd order
status and above, have terminal intra-suburban routes (Table 5-5). Of
these, the coastal 5th order centre of Glenelg is predominant; Port
Adelaide is the terminus for one of the Glenelg routes; while the 3rd
order centre of Enfield has one short terminal route with few services.

Car Customer Accessibility Zones (Figure 32)

Time:distance zones, related to average motor vehicle speeds during
shopping hours, have been drawn around each high order centre, with the
breaking-points defining areas of maximum accessibility. A simple
pattern emerges, showing such areas extending outwards to the metro-
opolitan boundary from the inner suburban centres, with Glenelg and
Port Adelaide blocking such extensions in the northwest and southwest.
To a large extent these areas are purely hypothetical constructs; new
retailing developments, which do not reach 4th order status, severely
limit the actual extensions of the relevant trade areas (e.g. effect
of Arndale planned centre on Hindmarsh, Enfield on North Adelaide,
CAR ACCESSIBILITY ZONES

4/5th Order Centres
- see Appendix II, Table 3

Break-Points between centres in terms of driving time: dist.
5 minute time-distance zones
Adelaide Hills Scarp
Mitcham on Unley). However, in line with work on Sydney and Melbourne, estimates of 1961 resident population within these zones have been made (Tables 5-6 and 5-7).

Table 5-6

<table>
<thead>
<tr>
<th>Adelaide - Resident Population* Within Time:Distance Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Minutes driving time from centre)</td>
</tr>
<tr>
<td>1-5  6-10  11-15  16-20  21-25  Total</td>
</tr>
</tbody>
</table>

5th Order

<table>
<thead>
<tr>
<th>Centre</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenelg</td>
<td>23,000</td>
<td>54,000</td>
<td>30,000</td>
<td>3,000</td>
<td>2,000</td>
<td>112,000</td>
</tr>
<tr>
<td>Port Adelaide</td>
<td>23,000</td>
<td>46,000</td>
<td>9,000</td>
<td>-</td>
<td>-</td>
<td>78,000</td>
</tr>
<tr>
<td>Unley</td>
<td>26,000</td>
<td>40,000</td>
<td>14,000</td>
<td>3,000</td>
<td>1,000</td>
<td>84,000</td>
</tr>
</tbody>
</table>

4th Order

<table>
<thead>
<tr>
<th>Centre</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindmarsh</td>
<td>32,000</td>
<td>34,000</td>
<td>7,000</td>
<td>-</td>
<td>-</td>
<td>73,000</td>
</tr>
<tr>
<td>North Adelaide</td>
<td>30,000</td>
<td>28,000</td>
<td>26,000</td>
<td>4,000</td>
<td>-</td>
<td>88,000</td>
</tr>
<tr>
<td>Norwood</td>
<td>41,000</td>
<td>44,000</td>
<td>20,000</td>
<td>3,000</td>
<td>-</td>
<td>108,000</td>
</tr>
<tr>
<td>Torrensvile</td>
<td>26,000</td>
<td>15,000</td>
<td>4,000</td>
<td>-</td>
<td>-</td>
<td>45,000</td>
</tr>
</tbody>
</table>

* Estimates based on 1961 census

Table 5-7

<table>
<thead>
<tr>
<th>Adelaide - Extent of Area of Maximum Accessibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Within the Metropolitan Area)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>7</td>
<td>201,000</td>
<td>34.1</td>
</tr>
<tr>
<td>6 - 10</td>
<td>7</td>
<td>261,000</td>
<td>78.5</td>
</tr>
<tr>
<td>11 - 15</td>
<td>6</td>
<td>110,000</td>
<td>97.2</td>
</tr>
<tr>
<td>16 - 20</td>
<td>4</td>
<td>13,000</td>
<td>99.4</td>
</tr>
<tr>
<td>21 - 25</td>
<td>2</td>
<td>3,000</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* Number of centres extending areas of maximum accessibility to each zone (4th and 5th orders).
Barriers to Movement

In a small scale metropolitan area, sited primarily on level land with no major natural features (other than the scarp of the Adelaide Hills, which forms the southeastern boundary to all but a small section of the built-up area), any feature referred to as a 'barrier' to internal movement cannot be taken too seriously. Such barriers that exist merely act as breaks in direct movement and rarely add more than a few moments to the driving time of a car customer. However, the effect of such barriers on public transport systems, and their overall effect on the local psychology of distance, is considerably greater than might be expected.

The main barriers to movement within the Adelaide metropolitan area (Figure 28) involve breaks in residential land use resulting from: waterways (especially Rivers Torrens and Sturt, and the Port River); market gardening areas within the metropolitan area (e.g. Fulham Gardens and Kidman Park); the airport; belts of land devoted to manufacturing and industry; and the Central Business District. In practice, the CBD with its surrounding parklands and by-pass routes, is much less of a real barrier than is the case in the larger cities, but it remains a major deterrent to cross-city shopping trips. Of the remaining barriers, only the Airport adds substantially to time-distance zones.

There is, nevertheless, minimal crossing of these barriers by public transport routes (cf. Figures 28 and 30), and internal movement systems within the city are inevitably channelled within the segments
of built-up area between such divisions. Further, break-points between segments (Figure 32) coincide closely with the barriers.

**Market Area Network** (Figure 33)

The network of market areas drawn on the basis of criteria discussed earlier, follows a predictable pattern. Predominantly it is one of inner high order centres, strung along the main outlets of the central city (except Norwood), with primary trade areas of stable or declining population, resident in high density older residential areas and primarily within lower income groups (except North Adelaide). These old established centres are experiencing varying degrees of fringe decay, ranging from Torrensville, which has degenerated to the level of local convenience centre (despite its overall 4th order functional status), to North Adelaide which has revived as a centre catering for the specialised taste of a high income primary trade area. With this latter exception, the 1957-61 inter-censal period was marked by greater than estimated falls in the numbers of retail establishments (Table 5-8). At present, therefore, Adelaide's high order centres are essentially first generation centres, which in the two larger cities have long been by-passed by later developments.

The hold that each inner high order centre has over the market area extending beyond it to the outer suburbs varies considerably. Hindmarsh (Area 1a) was until recently, the only high order centre within an area containing an estimated population of 96,000 and it seems likely that it operated as a convenience/comparison centre for at least the inner
Figure 33

Market Areas

1a. Hindmarsh
1b. Port Adelaide
2. North Adelaide
3. Norwood
4a. Unley
4b. Blackwood
5. Goodwood-Clovelly Park
6. Torrensville
7. Glenelg.
Adelaide MARKET AREA NETWORK

-Mitcham
-Enfield

Selected 2nd Order Centres numbered in size order - see Appendix II, Table 3.

Market Area Boundaries formed by barriers to mvt.
Zones of Contact
Adelaide Hills Scarp

4/5th Order Centres
3rd Order Centres
Selected 2nd Order

Formed by barriers to mvt.
Table 5-8
Notes - Table 5-8

(i) Business Centres according to Class Orders

(ii) Inner City - Statistical Retail Area 4000 - Census of Retail Establishments, 1961-62

(iii) North Adelaide is part of the City of Adelaide - population totals are based on collector's district data. On the basis of observation it has been assumed that the 1957-61 decline in population in the City of Adelaide took place in the Inner City Area.

(iv) Market Zone 5 (see Figure 33) cuts across local government area boundaries. Data relating to population and sales is therefore included within the two adjoining dominant zones - 4a and 7.
<table>
<thead>
<tr>
<th>Mkt. Zones</th>
<th>L.G.A.</th>
<th>1961</th>
<th>Business Centres</th>
<th>Popl.</th>
<th>Incr/Decr. in</th>
<th>Total</th>
<th>'000</th>
<th>Total Sales per Capita</th>
<th>Sales per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inner City(11)</td>
<td>587,957</td>
<td>C.B.D.</td>
<td>-4,349</td>
<td>8</td>
<td>-</td>
<td>1,107</td>
<td>-</td>
<td>£71,485</td>
</tr>
<tr>
<td></td>
<td>Hindmarsh</td>
<td>83,953</td>
<td>1 1</td>
<td>-466</td>
<td>-17</td>
<td>-4</td>
<td>677</td>
<td>8.1</td>
<td>£10,823</td>
</tr>
<tr>
<td></td>
<td>Woodville</td>
<td>+6,139</td>
<td>2</td>
<td>+18</td>
<td>+5,653</td>
<td>19</td>
<td>+34</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Port Adelaide (1ii)</td>
<td>38,923</td>
<td>1 1</td>
<td>+223</td>
<td>-11</td>
<td>-4</td>
<td>529</td>
<td>13.6</td>
<td>£9,491</td>
</tr>
<tr>
<td>2.</td>
<td>Norwood</td>
<td>106,128</td>
<td>1 2</td>
<td>-136</td>
<td>-7</td>
<td>-2</td>
<td>1,019</td>
<td>9.6</td>
<td>£16,491</td>
</tr>
<tr>
<td></td>
<td>Enfield</td>
<td>+10,727</td>
<td>+107</td>
<td>+60</td>
<td>+10,175</td>
<td>+113</td>
<td>+61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Kensington &amp; Norwood</td>
<td>97,344</td>
<td>1 1</td>
<td>-524</td>
<td>-3</td>
<td>-4</td>
<td>813</td>
<td>8.6</td>
<td>£12,418</td>
</tr>
<tr>
<td></td>
<td>St Peters</td>
<td>+27</td>
<td>-12</td>
<td>-1</td>
<td>+2,130</td>
<td>+12</td>
<td>+33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Payneham</td>
<td>+3,045</td>
<td>+50</td>
<td>+51</td>
<td>+2,766</td>
<td>+24</td>
<td>+37</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Campbells Town</td>
<td>+12,444</td>
<td>+71</td>
<td>+77</td>
<td>+12,022</td>
<td>+36</td>
<td>+31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Burwood</td>
<td>-420</td>
<td>-25</td>
<td>-4</td>
<td>+5,022</td>
<td>+36</td>
<td>+31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mitcham</td>
<td>-299</td>
<td>-3</td>
<td>-3</td>
<td>+724</td>
<td>+10</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Unley &amp; Col. Light Ovens</td>
<td>87,073</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5.</td>
<td>Unley (part)(iv)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6.</td>
<td>Thebarton &amp; West Torrens</td>
<td>65,245</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Henley &amp; Grange</td>
<td>+5,181</td>
<td>+51</td>
<td>+12</td>
<td>+5,618</td>
<td>+50</td>
<td>+51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+2,780</td>
<td>+28</td>
<td>+37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+7,745</td>
<td>+90</td>
<td>+47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Glenelg &amp; Brighton</td>
<td>93,293</td>
<td>1 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Marion</td>
<td>+433</td>
<td>+34</td>
<td>+27</td>
<td>+4,764</td>
<td>+54</td>
<td>+68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+19,093</td>
<td>+83</td>
<td>+120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metropolitan Area (apart from Inner City)</td>
<td>+50,359</td>
<td>+142</td>
<td>-</td>
<td>5,115</td>
<td>8.9</td>
<td>£82,592</td>
<td>£144.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
section of that area. However, the recent growth of chain supermarket units (Woodville, Flinders Park), and more significantly, the opening of a planned shopping centre at Kilkenny (Figure 28), containing a major department store, will have reduced its depth of trading area penetration in areas of population growth. North Adelaide (Area 2) is in a similar situation; for while it is apparently the major suburban centre for an area with a population of over 100,000 it is obviously unable to maintain its dominance, at convenience or comparison levels, over recently developed outer suburbs. The rapidly growing 3rd order centre of Enfield is located in a central site within this market area, and its growing range of chain comparison stores indicates a likely rise in functional ranking.

Unley (Area 4a) is similarly affected by competition from the emerging centre of Mitcham, which is at present still functionally of 2nd order status. It is noticeable in all the cases cited, that the developing competitor offers provision for off-street parking, and is sited in an intercepting location between the older high order centre and the area of most rapid residential growth.

The marked decline of the 4th order centre of Torrensville (6) may be related, not only to its inner location and elongated string form, but also to the lack of major customer generators and general

1. Both Enfield and Mitcham are the subject of special study in Chapter 9, pp 420-432.

2. The more important suburban retail developments in Adelaide, relating to these and other outer centres, have taken place since the 1961-62 Census of Retail Establishments. Data in Table 5-8 is therefore largely outdated.
run-down nature of retail premises which now operate mainly with regard to the high density primary trade area.

Norwood (3) provides a totally different picture. Its market area is confined by the Adelaide Hills, and socio-economic factors reduce its penetration to the south. But, to the northeast, the Campbelltown area which increased in resident population by 8,045 between 1957-61 (+72.4%), is served only by local primary convenience facilities. The trade attracted to Norwood from this area (there is a free bus service on peak trading days) has enabled the centre to maintain its high order status. However, it remains as vulnerable to the growth of a planned centre at an intercepting location as the other inner centres.

Only one market area segment of the type under discussion contains no inner high order centre (Area 5). Here low order groups have developed at frequent intervals along the two main north/south roads of the area (Goodwood Road and Main South Road). There is a 3rd order centre at the inner margin (Goodwood) and one at the outer margin (Clovelly Park), but neither acts as more than a local convenience centre.

Port Adelaide (1b) and Glenelg (7) are the only two high order centres whose functional role is equivalent to their ranked status. Port Adelaide, located in a site directly adjacent to the main docks of the metropolitan area, is an old established centre serving what was originally an isolated segment. It remains the high order centre

serving the north-western section of the city. This is an area of stable population totals; between 1957 and 1961 the decline in the numbers of retail establishments was greater than that estimated in terms of overall city figures (Table 5-8).

Glenelg, on the other hand, has maintained its position within an area of more general population growth. Again an old established centre, with a high density primary trade area, Glenelg has been able to maintain a firm hold on the district extending to the south. This area, which, within the Adelaide context, is distant from the CBD, has an infrequent bus service to the central city, involving a journey of over 35 minutes. It is served, however, by a close network of bus services terminal at Glenelg. The resulting functional and operational patterns within the centre, are better developed than in any other street shopping centre within the metropolitan area.

The extent to which the central city has maintained its dominance in the sale of comparison goods within the metropolitan area is clearly indicated in Table 5-9. In terms of sales made by department stores, clothiers and drapers in 1961-62 the total contribution of all suburban shopping centres was only £11.9 per capita, the Inner City - £73.4 per capita. Such sales make up under 10% of the total expenditure within all suburban market zones which focus on inner string centres (1a and 2 - 6). The market areas which are dominated by Port Adelaide and Glenelg clearly make a significantly higher proportion of their sales in this category, a similar distinction relates to sales per capita figures.
Table 5-9

Adelaide - Significance of Sales made by Department Stores, Clothiers, and Drapers within General Market Areas.

<table>
<thead>
<tr>
<th>Mkt. Zones</th>
<th>Dept. Store Sales-1961-62 (A£000)</th>
<th>%</th>
<th>Dept Store Sales per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner City (CBD)</td>
<td>£42,000</td>
<td>58.8</td>
<td>£73.4</td>
</tr>
<tr>
<td>1. (a) Hindmarsh, etc.</td>
<td>796</td>
<td>7.4</td>
<td>9.5</td>
</tr>
<tr>
<td>1. (b) Port Adelaide</td>
<td>1,483</td>
<td>15.6</td>
<td>38.1</td>
</tr>
<tr>
<td>2. North Adelaide, etc.</td>
<td>925</td>
<td>5.6</td>
<td>8.7</td>
</tr>
<tr>
<td>3. Norwood, etc.</td>
<td>775</td>
<td>3.2</td>
<td>8.0</td>
</tr>
<tr>
<td>4/5. Unley, etc.</td>
<td>753</td>
<td>6.5</td>
<td>8.7</td>
</tr>
<tr>
<td>6. Thebarton, etc.</td>
<td>558</td>
<td>6.7</td>
<td>8.6</td>
</tr>
<tr>
<td>7. Glenelg, etc.</td>
<td>1,546</td>
<td>11.6</td>
<td>16.6</td>
</tr>
<tr>
<td>Total Metropolitan Suburbs</td>
<td>£6,836</td>
<td>8.3</td>
<td>£11.9</td>
</tr>
</tbody>
</table>

It seems likely that the particularly high per capita figure associated with Port Adelaide is connected with purchases made by casual visitors linked with its port function.

2. BRISBANE

Within the City of Brisbane the internal retail network reflects the influence of two contrasting factors: the small size of the main built-up area; and the presence of a marked barrier crossing that area. Firstly, the compact form of the City's growth, prior to a recent rapid expansion of fringe suburbs, has led to well-established central core
dominance. Virtually the entire built-up sector of the metropolitan area remains in direct public transport contact with the CBD. City tram routes have been extended, in many cases, to the recently developed outer suburbs. However, the continued dominance of the central area is threatened by a reduction in its accessibility from outer suburbs, relating to three elements: the elongated north-south growth of the City (Figure 34); the broken nature of relief in several urban fringe areas; and the presence of effective barriers to movement. The impact of this factor on the form of suburban retail growth structure is likely to result in the evolution of distinctive intra-suburban movement systems. The most marked barrier to movement, the Brisbane River, has always exerted an important influence; the more advanced development of inner suburban business centres south of the river may be related to this factor.

At the present time, the suburban business structure of Brisbane fails to conform to any overall pattern. In Chapter 2, the analysis of functional attributes of the five-order hierarchy, suggested that lack of definition between the different ranks, and a wide distribution of high order functions among centres of all ranks, showed the inadequacy of the hierarchical system as an explanation of the functional relationship of suburban business districts in Brisbane. Examination of the spatial relationships between centres of different orders supports this view (Table 5-10). The existence of any direct relationship between the central place network and the predictions of
BARRIERS TO MOVEMENT

5th Order Centres
4th

Centres numbered according to size order - see Appendix II, Table 4.

Brisbane

Mt Coot-tha

Hill areas impinging on city margins

P Planned Centre
R Redcliffe

Built-Up Area
C.B.D. core and fringe.

Mt Coot-tha
Enoggera
Rifle Range

Kedron Brook
Enoggera Creek

Mt Coot-tha
Whites Hill

Petrie

Gravatt

Bulimba Creek
Osley Creek

MORETON BAY

R

1 2 3 4
MILES
Table 5-10

Brisbane - Average Road Distance to Nearest Neighbours of Equal or Higher Status

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>Av. Dist. (yds)</th>
<th>SD</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>6</td>
<td>6,909</td>
<td>1,270</td>
</tr>
<tr>
<td>IV</td>
<td>5</td>
<td>1,710</td>
<td>860</td>
</tr>
<tr>
<td>III</td>
<td>10</td>
<td>2,263</td>
<td>940</td>
</tr>
</tbody>
</table>

central place theory, is made impossible by the numerical distribution of business centres according to rank. There are more 5th order centres than 4th order; if this anomaly is removed by treating these as one high order group, then there are fewer 3rd than 4/5th order. Further, the average distance from a 2nd order centre to its nearest neighbour of equal or higher status is greater than that of 3rd order centres.

It is a fundamental requirement of the central place concept, that the interlocking market areas of low order central places are smaller than those of higher order places - the relative sizes depending on the K factor.

Application of the technique used to test the relationship of central place patterns with population distribution, using defined segments of the metropolitan area, gives further evidence of the distortions present in the Brisbane network. In the calculation of assumed market area populations (Table 5-11), 4th and 5th order centres have been linked to form a single high order group. The distribution
Table 5-11

Brisbane - Assumed Market Area Population

<table>
<thead>
<tr>
<th>Total Centres</th>
<th>V &amp; IV</th>
<th>III</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumed Mkt Area Popl.</td>
<td>51,000</td>
<td>56,000</td>
<td>19,000</td>
</tr>
</tbody>
</table>

of centres according to the eight segments, based on statistical area boundaries (Figure 35), shows no significant relationship with resident population totals (Table 5-12). Rather, it shows that within certain

Table 5-12

Brisbane – Estimated and Actual Centre Representation Within Metropolitan Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>IV/V</th>
<th>III</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.9</td>
<td>3.0</td>
<td>1.7</td>
</tr>
<tr>
<td>B</td>
<td>1.4</td>
<td>2.0</td>
<td>1.3</td>
</tr>
<tr>
<td>C</td>
<td>1.0</td>
<td>-</td>
<td>0.9</td>
</tr>
<tr>
<td>D</td>
<td>0.9</td>
<td>-</td>
<td>0.8</td>
</tr>
<tr>
<td>E</td>
<td>1.3</td>
<td>-</td>
<td>1.2</td>
</tr>
<tr>
<td>F</td>
<td>1.5</td>
<td>3.0</td>
<td>1.4</td>
</tr>
<tr>
<td>G</td>
<td>1.9</td>
<td>2.0</td>
<td>1.7</td>
</tr>
<tr>
<td>H</td>
<td>1.0</td>
<td>1.0</td>
<td>0.9</td>
</tr>
</tbody>
</table>

\[ r = 0.73 \]
segments, there is a dominance of high order centres (e.g. A and F), while others contain no centre higher than 3rd order (D) or 2nd order (C). It will be shown that these segments relate approximately to market area systems, and that Brisbane's central place network fails to provide a complete hierarchical system of interrelated ranked orders.

The anomalous third order centre distribution provides an example of this distortion. There is an apparent clustering of 3rd order centres within particular sections of the City (Figure 39). Seven of the ten 3rd order centres are located closer to the Central Business District than to their nearest high order suburban centre. There is, therefore, a common functional role which is performed by 3rd order centres throughout the metropolitan area; that of highest order centre within areas dominated by the CBD retail core. Within these terms, an incipient pattern of city trade areas can be drawn, using data relating to public transport services and accessibility zones.

**City Public Transport Routes (Figure 36)**

The dominance of the CBD is clearly underlined by an examination of public transport services operated in the metropolitan area. Department of Transport tram and bus routes, terminal within the central city retail area, serve approximately 70% of the metropolitan population in 1961; while privately operated country bus routes serve certain outlying areas. Suburban rail services are accessible to a high proportion of those resident beyond the tram/bus zone (Table 5-13). An examination of the relationship between high order suburban business centres and the framework of city services indicates a predominance of tram orientated
PUBLIC TRANSPORT ZONES

- 4/5th Order Centres - see Appendix II, Table 4.
- High Order Centres within rail network.
- City Tram Terminals
- Area served predominantly by City Tram Services.
- City Bus Terminals
- Area served predominantly by City Bus services.
- Built-Up Area beyond direct Bus and Tram services.
- Suburban Rail Routes.

MILES
Table 5-13

Brisbane - Estimated Population Served by City Public Transport Services According to Time:Distance Zones

<table>
<thead>
<tr>
<th>Time: (^1)</th>
<th>Distance from city (mins)</th>
<th>Tram: (^2)</th>
<th>(%) Total Metrop. Popl.*</th>
<th>(%) Total Metrop. Popl.*</th>
<th>(%) Total Metrop. Popl.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>12,000</td>
<td>1.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11 - 20</td>
<td>82,000</td>
<td>13.2</td>
<td>10,000</td>
<td>1.6</td>
<td>-</td>
</tr>
<tr>
<td>21 - 30</td>
<td>140,000</td>
<td>22.5</td>
<td>113,000</td>
<td>18.2</td>
<td>-</td>
</tr>
<tr>
<td>31 - 40</td>
<td>56,000</td>
<td>9.0</td>
<td>13,000</td>
<td>4.9</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>290,000</td>
<td>46.6</td>
<td>136,000*</td>
<td>22.7</td>
<td>132,000</td>
</tr>
</tbody>
</table>

\(^*\) Estimated population served 1961.

1 Time:distance zones relate to average speeds for each type of conveyance, applied to all city services. The actual location of the zones therefore differs according to the type of transport involved.

2 Population figures relate to total resident population with easy access to tram routes. In several instances bus services use the same routes; for the purpose of this table it has been assumed that the population is served primarily by tram, and they are included under this heading.

3 A further 25,000 people, the population of the bayside suburb of Wynnum, is served by a direct privately operated city bus service. However, because of the relative infrequency of the service, and the length of the journey, this total has been included in the population served by suburban rail services.

locations within the main built-up area. This is primarily the result of the alignment of tram routes to major arterials, and the later development of bus services to serve areas interstitial to such routes.

The extension of tram routes, in many instances, to serve rapid growth
fringe areas (e.g. Chermside, Carina, Mount Gravatt, Moorooka), and the consequent provision of approximately 80 city tram services during week-day shopping hours (i.e. approximately 1 every 5 minutes), has extended city dominance to the outer suburbs. Only with the more recent expansion of fringe residential areas beyond the tram termini, have outer suburban centres been in a position to exploit their intervening locations.

A relative lack of cross-city bus routes channels public transport movements into a series of well defined segments, radiating from the city centre. There is little public transport movement across such segment boundaries, which therefore become an important controlling factor in the definition of market area networks within the City. However, as in Adelaide, city bus routes drawing passengers from the trade areas of high order suburban centres, do not necessarily pass through these centres, thus weakening their hold over secondary and fringe areas.

Suburban rail services are similarly of minor significance in the definition of suburban trading patterns in Brisbane. In only one instance has a high order centre, within the main built-up area, developed at a site adjacent to a suburban railway station (Nundah). Separated from the main area, the bayside centres of Wynnum and Sandgate are at railway orientated locations. Rail travel becomes an important factor in the movement of shoppers to the CBD only in areas with no direct bus routes to the central city, that is in the suburbs of Graceville, Inala, Darra, Coppers Plains and in the outer bayside suburbs.
Intra-Suburban Public Transport

Intra-suburban bus routes in Brisbane act as subsidiary feeder services, linking residential areas beyond tram routes to the nearest tram terminal. Only two of the existing high order suburban centres are located at tram terminals - Chermside and Mount Gravatt. Other terminal points have, to date, no shopping group above 2nd order status. This emphasises the function of such feeder services as links in a continuous shopping trip to the CBD. However, this situation is in the process of change. The 2nd order tram terminal centres of Carina, West Ashgrove, and particularly Stafford, have expanded rapidly.4 With the increase of resident population beyond the tram termini, there is a greater likelihood of the emergence of high order centres at such terminal locations.

Car Customer Accessibility Zones (Figure 37)

The significance of the spatial relationships of Brisbane's high order centres, becomes apparent when their accessibility is viewed in terms of time-distance zones, based on average car speeds. South of the Brisbane River three centres, located within the inner suburbs, have maximum accessibility zones hemmed in by the outer centres of Mount Gravatt and Moorooka. North of the Brisbane River there are no inner suburban business centres reaching high order status. As a result, the typically small area which is nearer to the CBD than to any other suburban business district is extended, particularly to the

4. See Chapter 9, pp 420-432.
west, to contain 135,000 or 23% of the 1961 Brisbane resident population (Table 5-14). Beyond this city-dominated zone, three equidistant centres extend zones of maximum accessibility to the outer fringe of the main built-up area. Standing apart from this area the three isolated centres of Wynnum, Sandgate and Redcliffe serve their respective bayside suburbs.

Examination of the extent of areas of maximum accessibility in terms of time-distance, shows that only 70% of the 1961 metropolitan population were resident within 15 minutes driving distance of a high order centre (Table 5-15). This is a measure of the incomplete nature of the network of high order centres.

It must be re-emphasised at this point, that the concept of the area of maximum accessibility is based on the principle that shoppers will tend to use the closest centre of equal functional status. In fact this ignores several problems, particularly those connected with the impact of major customer generators, especially branch department stores. Branch department stores which have been developed at Chermside and the 3rd order centre of Coorparoo, exert a marked influence on customer habit patterns. These stores provide a range of goods, otherwise available only in the CBD retail core. It may be expected therefore, that these branch stores will break down established movement patterns which developed around existing high order centres.

Figure 38 gives some indication of the form that this impact might take, with reference to the car time-distance zones and break-points associated with the present department store sites in Brisbane.
Table 5-14

<table>
<thead>
<tr>
<th>Location</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>City/Valley</td>
<td></td>
<td>54,000</td>
<td>41,000</td>
<td>31,000</td>
<td>6,000</td>
<td>2,000</td>
<td>1,000</td>
<td>135,000</td>
</tr>
<tr>
<td><strong>5th Order</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woolloongabba</td>
<td>22,000</td>
<td>13,000</td>
<td>8,000</td>
<td>1,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>44,000</td>
</tr>
<tr>
<td>Nundah</td>
<td>23,000</td>
<td>12,000</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>37,000</td>
</tr>
<tr>
<td>Redcliffe</td>
<td>10,000</td>
<td>10,000</td>
<td>3,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>22,000</td>
</tr>
<tr>
<td>Sandgate</td>
<td>13,000</td>
<td>10,000</td>
<td>3,000</td>
<td>2,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>28,000</td>
</tr>
<tr>
<td>Stone's Corner</td>
<td>27,000</td>
<td>25,000</td>
<td>7,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>59,000</td>
</tr>
<tr>
<td>Wynnum</td>
<td>21,000</td>
<td>5,000</td>
<td>6,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>32,000</td>
</tr>
<tr>
<td><strong>4th Order</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annerley</td>
<td>20,000</td>
<td>1,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>21,000</td>
</tr>
<tr>
<td>Chermside</td>
<td>19,000</td>
<td>21,000</td>
<td>4,000</td>
<td>9,000</td>
<td>4,000</td>
<td>-</td>
<td>-</td>
<td>57,000</td>
</tr>
<tr>
<td>Lutwyche</td>
<td>30,000</td>
<td>8,000</td>
<td>11,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>49,000</td>
</tr>
<tr>
<td>Moorooka</td>
<td>17,000</td>
<td>14,000</td>
<td>23,000</td>
<td>18,000</td>
<td>6,000</td>
<td>-</td>
<td>-</td>
<td>78,000</td>
</tr>
<tr>
<td>Mount Gravatt</td>
<td>23,000</td>
<td>8,000</td>
<td>1,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>32,000</td>
</tr>
</tbody>
</table>

* Estimates based on 1961 census.
### Table 5-15

**Brisbane - Extent of Area of Maximum Accessibility**
*(within the Metropolitan Area)*

<table>
<thead>
<tr>
<th>Time-Dist. Zones (mins)</th>
<th>No. of Centres IV &amp; V</th>
<th>Popl. Served: Suburban</th>
<th>Cuml. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>11</td>
<td>225,000</td>
<td>37.6%</td>
</tr>
<tr>
<td>6 - 10</td>
<td>11*</td>
<td>125,000 (54,000)&lt;sup&gt;2&lt;/sup&gt;</td>
<td>58.5%</td>
</tr>
<tr>
<td>11 - 15</td>
<td>10*</td>
<td>68,000 (41,000)</td>
<td>69.9%</td>
</tr>
<tr>
<td>16 - 20</td>
<td>4*</td>
<td>30,000 (31,000)</td>
<td>75.0%</td>
</tr>
<tr>
<td>21 - 25</td>
<td>2*</td>
<td>10,000 (6,000)</td>
<td>76.7%</td>
</tr>
<tr>
<td>26 - 30</td>
<td>*</td>
<td>(2,000)</td>
<td>-</td>
</tr>
<tr>
<td>31 - 35</td>
<td>*</td>
<td>(1,000)</td>
<td>-</td>
</tr>
</tbody>
</table>

1 * Indicates extent of area closer in terms of time-distance to CBD, than to any high order suburban centre.

2 Total population within each time-distance zone which is closer to city than to suburban centres is shown in brackets.

3 Relates only to suburban centres.

Approximately 60% of the population of the metropolitan area is within 15 minutes driving distance of a department store. Of course, this figure by giving an equal rating to the CBD and suburban department stores, overlooks the basic functional differences involved. It does show, however, the possible effects of a department store's location on intra-suburban movement patterns, particularly when there is a corresponding increase in the use of cars for shopping purposes.
Market Area Network (Figure 39)

In a small metropolitan city, lacking well developed internal movement systems which focus on high order suburban centres, the market area network is orientated along the general lines of movement to the Central Business District (Figures 36 and 39). Suburban shopping centres tend to be located at intervals along tram routes which follow the main arterial road pattern. Boundaries separating the market areas of such centres are formed by: lines which approximate to bus service divides; driving-time break-points between high order centres; and barriers to movement.

The impact of the Brisbane River on the growth of business foci within the metropolitan area has been mentioned earlier. At the time of this study the river was bridged at only four points; three in the immediate vicinity of the CBD, and one 9 2/3 miles (4 2/3 miles by road) upstream at Indooroopilly. The meandering river, flowing towards the northeast across the metropolitan area, causes a marked break in accessibility. More particularly, its effectiveness as a barrier is most marked with reference to intra-suburban movement for shopping purposes. The CBD acts as a barrier to such movement taking place via the three city bridges; while the Indooroopilly Bridge (a toll bridge) links two areas of the City, marked by their lack of high order suburban centres, and is primarily used by city-bound traffic. A series of 'foot' ferries operate, but none in the vicinity of major suburban centres, and their use by large numbers of shoppers can be
Figure 39

Market Areas

1. City and North City
2. Western Suburbs
3. Southwestern Suburbs
   a. Graceville-Corinda
   b. Darra-Inala
4. Northeastern Riverside
5. Southeastern Riverside
6. South City
7. Southern Suburbs
8. Southeastern Suburbs
9. Northern Suburbs
10. Northeastern Suburbs
11. Wynnum
12. Sandgate
13. Redcliffe.
MARKET AREA NETWORK

4/5th Order Centres
3rd
2nd
Planned Off-Street Centres
4/5th Order Centres numbered in size order
- see Appendix II, Table 4.

Market Area Boundaries
Zones of Contact
Central Business District
Retail Nodes:
V Fortitude Valley
Q Queen Street
G George Street
discounted. The effect of the more direct CBD accessibility to northern Brisbane may be judged from Table 5-16. The ratio of high order centres to population in northern Brisbane is 1 : 94,000; in southern Brisbane 1 : 48,000; and in the bayside suburbs 1 : 25,000. However the overall ratio of all 2nd to 5th order centres evens out the differences to 1 : 11,750; 1 : 10,350; and 1 : 19,000 respectively. The bayside suburbs are dominated by their high order centres, while the northern and southern sections differ primarily in terms of the numbers of centres that have risen above 3rd order status.

Table 5-16

Brisbane - Major Metropolitan Central Place Contrasts

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>North of Brisbane River</td>
<td>281,775</td>
<td>3, 6, 15</td>
<td>8,970</td>
</tr>
<tr>
<td>South of Brisbane River</td>
<td>238,413</td>
<td>5, 4, 14</td>
<td>7,800</td>
</tr>
<tr>
<td>Bay Suburbs</td>
<td>76,443</td>
<td>3, - , 1</td>
<td>26,700</td>
</tr>
</tbody>
</table>

Other barriers to movement are of less significance; they are normally related to breaks in accessibility patterns caused by hill reserves, parkland, minor streams, and land devoted to transport and industrial purposes.

The extent of those areas, primarily north of the river, which have no high order suburban centres and are orientated for all comparison purchases to the CBD retail core (areas 1-5) are indicated in Figure 39.
Table 5-17
Notes - Table 5-17

(i) Data relating to total retail establishments and sales is not available for many of the City of Brisbane statistical areas. This table is therefore a shortened version of those relating to the other cities.

(ii) Estimated change in numbers of retail establishments between 1957 and 1961 derived from the regression equation:
\[ a = 0.0058b + 0.1 \]
When \( a \) = change in totals of retail establishments on a statistical area basis, and \( b \) = change in statistical area population 1957-61.

(iii) Inner City area, as designated in the Census of Retail Establishments is approximately coincident with the CBD core.

(iv) Relates to statistical areas of Enoggera, Mitchelton, Ashgrove, The Gap, Normanby, Ithaca, Fernberg, Toowong, Indooroopilly, St Lucia, Kenmore (Figure 35).

(v) Ascot, Hendra, Meeandah.
(vi) Balmoral, Morningside, Murarrie.
(vii) South City, East Brisbane.
(viii) Yeronga, Ekibin, Tarragindi, Moorooka, Coopers Plains.
(ix) Greenslopes, Holland Park, Mt Gravatt, Chatsworth, Camp Hill, Carina.
(x) Newmarket, Windsor, Kedron, Stafford, Chermside, Geebung, Aspley, Bald Hills.
(xi) Kalinga, Nundah, Banyo.
(xii) Sandgate, Boondall.
(xiii) Wynnum, Eastern Rural.
(xiv) Includes small totals relating to surrounding Rural Statistical Areas.

P Planned shopping centres - Inala Civic Centre (3b), Mt Gravatt Drive-In (7), Chermside Centre (9).
Table 5-17
Brisbane Metropolitan Area – Summary of Central Place Totals, and Population and Retail Establishment Totals relating to General Market Areas (i)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CBD</td>
<td>Inner City (iii)</td>
<td>621,550</td>
<td>- - 1</td>
<td>-3,823</td>
<td>+10</td>
<td>-59</td>
</tr>
<tr>
<td>1.</td>
<td>City/North City</td>
<td>35,122</td>
<td>- -</td>
<td>-59</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>Western Suburbs (iv)</td>
<td>102,008</td>
<td>- 5 7</td>
<td>+6,718</td>
<td>+40</td>
<td>+40</td>
</tr>
<tr>
<td>3a.</td>
<td>Graceville-Corinda</td>
<td>18,617</td>
<td>- - 4</td>
<td>+940</td>
<td>+13</td>
<td>+5</td>
</tr>
<tr>
<td>3b.</td>
<td>Darra-Inala</td>
<td>15,763</td>
<td>- P 2</td>
<td>+6,269</td>
<td>+25</td>
<td>+36</td>
</tr>
<tr>
<td>4.</td>
<td>Northeastern Riverside (v)</td>
<td>25,700</td>
<td>- 1 2</td>
<td>+288</td>
<td>-1</td>
<td>-3</td>
</tr>
<tr>
<td>5.</td>
<td>Southeastern Riverside (vi)</td>
<td>29,561</td>
<td>- 1 2</td>
<td>+2,143</td>
<td>+25</td>
<td>+13</td>
</tr>
<tr>
<td>6.</td>
<td>South City (vii)</td>
<td>38,168</td>
<td>1 - 2 1</td>
<td>+570</td>
<td>-16</td>
<td>+3</td>
</tr>
<tr>
<td>7.</td>
<td>Southern Suburbs (viii)</td>
<td>60,872</td>
<td>2 - 1</td>
<td>+7,200</td>
<td>+86</td>
<td>+43</td>
</tr>
<tr>
<td>8.</td>
<td>Southeastern Suburbs (ix)</td>
<td>75,432</td>
<td>1 1 1 4</td>
<td>+11,493</td>
<td>+70</td>
<td>+68</td>
</tr>
<tr>
<td>9.</td>
<td>Northern Suburbs (x)</td>
<td>88,991</td>
<td>P 1 - 5</td>
<td>+11,237</td>
<td>+41</td>
<td>+63</td>
</tr>
<tr>
<td>10.</td>
<td>Northeastern Suburbs (xi)</td>
<td>29,954</td>
<td>1 - 1</td>
<td>+1,262</td>
<td>-16</td>
<td>+7</td>
</tr>
<tr>
<td>11.</td>
<td>Redcliffe</td>
<td>21,674</td>
<td>1 -</td>
<td>+4,256</td>
<td>+40</td>
<td>+25</td>
</tr>
<tr>
<td>12.</td>
<td>Sandgate (xii)</td>
<td>23,056</td>
<td>1 -</td>
<td>+1,736</td>
<td>+20</td>
<td>+7</td>
</tr>
<tr>
<td>13.</td>
<td>Wynnum (xiii)</td>
<td>30,913</td>
<td>1 - 1</td>
<td>+1,469</td>
<td>+18</td>
<td>+9</td>
</tr>
</tbody>
</table>

Brisbane Metropolitan Area: +56,350 +404 (xiv)
This segment of the metropolitan area contains an estimated 224,000 residents, or 36% of the total 1961 population (Table 5-17).

The City and North City areas (1) form the inner city zone, immediately adjacent to the CBD. Typically, the area experienced marked falls in resident population (3,823 or 11%) between 1957 and 1961. In common with the other cities a decline in the numbers of retail establishments is masked by the expansion of outlets dealing in motor vehicles and accessories. Only one shopping group rises above 1st order status; New Farm in the most extensive high density residential area. The dominance of the CBD is made more complete by the threefold division of the retail core discussed in the Introduction. In particular the Fortitude Valley area, an isolated retail node located 2,000 yards to the east of the central core, offers a full range of convenience stores as well as department stores and specialist comparison outlets. It acts, therefore, more as a major high order suburban business centre in one sense, although it is most commonly used in conjunction with shopping trips to the 'hard core' area and is here regarded as a fringe segment of the CBD. The Valley's influence is most marked in those areas served by city transport routes terminal to it, or passing through it before reaching the central core - that is the major part of the eastern half of the City.

The entire area of the western suburbs (2), lying between the CBD and the hill area of Mount Coot-tha, with a resident population of over 100,000 contains no high order business centre. Further, none of the
eleven public transport routes linking the area with the central core, pass through a high order centre before reaching the CBD. An examination of car time-distance zones (Figure 37) shows that south of Enoggera the entire area is closer to the central retail district than to any high order suburban centre. This large sector of the metropolitan area is therefore orientated for all shopping needs, other than immediate necessities, to the CBD retail core, particularly the western George and Queen Street sections.

The limited extent of the built-up area at this point, together with the lack of a central nodal site are probably the main factors behind this situation. The area is split into a number of east-west sectors following city tram routes, and separated by streams, bridged at frequent intervals, but nevertheless reducing accessibility between the groups of tram-orientated low order centres (Figure 36). The lack of an important nodal point in the western suburbs probably results from the relative insignificance of the radial routes crossing it. Apart from Coronation Drive, which links Indooroopilly Bridge with the city via the north bank of the river, none of the radial routes is in any sense a trunk road; mostly they peter out in the hill country to the west of Brisbane.

The commercial pattern is therefore highly fragmented, with the trade area network characterised by small scale disjointed primary areas based on walking distances. This is to be expected in an area of residential suburbs ranging from older, high density areas close to the
city centre (Petrie Terrace, Red Hill and Paddington), to recently developed low density housing at The Gap. Taking the area as a whole, the increase in numbers of retail establishments between 1957 and 1961 exactly balanced the estimate based on overall city relationships (Table 5-17).

South of the Brisbane River the Southwestern suburbs (3) continue that segment of the metropolitan area which lacks high order suburban business centres. The area includes the middle class suburbs of Graceville and Corinda, (3a), immediately south of the Indooroopilly Bridge, and isolated by a sharp meander of the Brisbane River; and the outer working class suburbs of Darra and Inala (3b). The latter area is separated from the remainder of southern Brisbane by a mile wide belt of paddocks and industrial land located along the line of the Oxley Creek. This relative isolation is accentuated by the lack of direct bus services to the city. The main movements to the CBD are via Indooroopilly Bridge, and the suburban rail route which crosses the river at this point. The 19,000 residents of the Graceville-Corinda area are served by four 2nd order shopping groups located in close proximity to railway stations. The Darra-Inala section is dominated by a large Housing Commission residential suburb lying south of the main Ipswich Road. The planned population of Inala of 30,000 will be served by a planned off-street shopping centre (Civic Centre) which is at present being developed in a series of stages and will eventually rise to a level comparable to 4th order status.
During the period 1957-61 the numbers of retail establishments in the Graceville-Corinda area has increased at a rate in excess of the estimate based on population growth, primarily as a result of the fragmentation of shopping facilities. By contrast, increases in retail establishment numbers at Inala were well below the estimated figure. However, this data relates to the situation prior to the opening of the first stage of the planned centre.

The remaining market area divisions which lack high order business facilities are both strictly within the fringe trade areas of existing high order centres. The Northeastern Riverside suburbs (4) and the Southeastern Riverside suburbs (5) are orientated by public transport services directly to the CBD, particularly the Valley section. Again fragmented primary trade areas are the rule, with the 3rd order centre of Morningside in the southern area being the only shopping group to show signs of significant expansion.

In contrast with the western segment of the metropolitan area, the commercial structure of southern Brisbane (6-8) has developed in the form of a series of distinct 'generations' of high order business centres. The 5th order centre of Woolloongabba represents the first 'generation', located in an area separated from the city centre by the Brisbane River, and at the original horse-drawn tram terminal. Second 'generation' centres developed at Stones Corner and Anmerley Junction at nodal points in the tram network. Finally, the recent emergence of Moorooka and Mount Gravatt as 4th order centres at, or close to,
the existing outer tram termini, has resulted in a third high order 'generation' serving the rapid growth outer suburbs.  

The South City area (6) is made up of mixed commercial/high density residential development, with both older inner ring housing and more recent flat development at Highgate Hill and Kangaroo Point. The initial high order centre located at Woolloongabba, is strung along the southern side of Stanley Street for a distance of 1,300 yards to the west of the Junction. Typically it degenerates into neighbourhood facilities at the western edge. The core area retains the functional structure of a high order centre, but fringe decay is evident and may be related to the declining primary trade area population and general traffic congestion. The decrease in the numbers of retail establishments during the last inter-censal period is greater than that estimated in terms of the falls in population. The 'Gabba' remains at the focus of many of the city transport routes from the southern suburbs; but in common with all inner string street centres it suffers from the fact that such areas have become primarily zones of transit.

The remainder of southern Brisbane is divided into two large market area systems. The Southern Suburbs (7) is a clearly defined sector, aligned north-south along Annerley and Beaudesert Roads, and continuing in the form of outer suburban railway suburbs - Coopers Plains, Banoon, and Sunnybank. The 4th order centres of Annerley

Junction and Moorooka mark successive stages in the extension of the metropolitan area. At present Annerley Junction, its trade area contained by competing high order centres, acts as a major convenience centre for a clearly defined primary trade area, with certain extensions into the Yeronga area to the west. Its status, as with other older high order centres (e.g. Lutwyche and Stones Corner), is based on a chain variety store and competing self-service grocery units. Moorooka is an example of the rapidly developing 4th order centre located in a position to intercept trade from a series of growing outer suburbs (cf. Mount Gravatt and Chermside). However, at this stage, the range of business types at Moorooka is no wider than that at the older centre of Annerley Junction; its advantages, apart from location, relate to size of retail premises more able to take advantage of self-service distribution techniques, and the greater range of chain store establishments. It must be emphasised that neither centre provides more than a rudimentary range of comparison goods, with the result that 'escape' spending to the CBD is still of dominant importance.

In terms of 1957-61 population increases the additional numbers of retail establishments was twice that of the estimate (Table 5-17). This is a measure of the growth of primary convenience groups in new residential areas, as well as the expansion of the 4th order centre of Moorooka.
The **Southeastern Suburbs** (6) make up the largest market area segment of southern Brisbane, with a population in 1961 of over 75,000. The area has developed in a form similar to that of area 7, but with a more complex areal pattern. Tram routes radiate from the site of the older 5th order centre of Stones Corner to Carina in the east, and Mount Gravatt in the south. A series of shopping centres of 2nd order status and above have developed at approximately $1\frac{1}{4}$ mile intervals along these tram routes.

Retail structure has been complicated in this area by the opening of a small planned centre 800 yards south of the 4th order centre located at the Mount Gravatt tram terminus, and a major branch department store at the 3rd order centre of Coorparoo, on the eastern tram route. The impact of these developments on the trading patterns of the area will be examined in detail in a later section of this study. 6

The remaining areas north of the CBD contain three high order centres which have developed beyond the inner residential sections. The **Northern Suburbs** (9) are separated from the inner city by a belt of parkland and other community land uses, which extend to the east-west line of Breakfast Creek. From this line the area extends in a widening arc to the northern limits of the built-up area at Everton Park, Aspley, and Zillmere. It is primarily defined in terms of the orientation of city tram and bus routes to Gympie and Lutwyche Roads, while its outer limits relate to the fringe market areas of the two

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6. See Chapter 8, pp 300-315.
high order centres of Lutwyche and Chermside. The former, located in the south eastern corner of the area, serves the higher density older suburbs of Windsor, Wilston, Grange and Wooloowin, together with some extension of influence into the newer suburb of Stafford. However, its primary trade area is contained by a series of lower order centres located within 2,000 to 3,000 of its core.

This intensive competition contrasts markedly with the northern centre of Chermside. A tram terminal centre with feeder bus routes, serving a middle income area, Chermside has shown a rapid rise to its present dominant position in the northern suburbs. This dominance is based primarily on the location of an early example of a planned off-street shopping centre in a site adjacent to the tram terminal group. With a major branch department store and large areas of off-street parking, the significance of comparison sales and the importance of car customers, contrasts with other high order centres in Brisbane.\(^7\)

Low order centres occur only at the fringe of Chermside's trade area; however two of these centres, Stafford and Everton Park, have recently expanded in size and range of store types. Stafford, a tram terminal centre within a trade area which doubled in population between 1954 and 1961, appears likely to emerge as a 3rd order centre.\(^8\) At the time of the 1961-62 retail census with the exception of the Chermside statistical area, the increase in the numbers of retail establishments had failed to keep pace with the rapid population growth.

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7. See Chapter 10, p 470.
8. See Chapter 9, pp 420-432.
The market area system within the Northeastern Suburbs (10) is defined by the market area of the 5th order centre of Nundah. A zone of contact with the Chermside dominated area to the west is defined mainly in terms of the orientation of public transport services along Sandgate Road. Nundah is the only high order centre located beyond the tram route termini and adjacent to a railway station. The operation of suburban bus services, linking the tram terminus at Clayfield with Chermside, through Nundah, gives the centre advantages over those with through tram routes. In a similar manner to the Chermside situation, the development of lower order centres in the vicinity of Nundah has been inhibited. The only 2nd order centre within the market area is located 4,500 yards to the north, in the outer suburb of Banyo.

In an area of only moderate growth rates there was a fall in the numbers of retail establishments during the inter-censal period. Although chain store development since the 1961-62 retail census has probably reversed this trend.

Each of the separated suburban districts located on the Moreton Bay coast, Wynnum, Sandgate, Redcliffe (11, 12, 13), contains a dominant 5th order centre. Here, the amount of 'escape' spending is minimised, although rail links to the CBD have resulted in a large proportion of comparison spending taking place outside the market areas. However, recent chain store expansion has broadened the functional structure of the three centres. The relatively low population totals, under 30,000 in each area, are below those within the general market areas of high
order centres within the main built-up area. Increases in the numbers of retail establishments has in each case exceeded the estimate based on population change.
COMPARATIVE SUMMARY

The primary aim of chapters 4 and 5 has been to outline the internal patterns and relationships which make up the network of high order suburban market areas within four metropolitan cities. Here an attempt is made to use this as a basis for comparison and to support a generalised discussion of the basic form and internal organisation of these cities.

An initial examination will be made of the numbers and spatial patterns of suburban business districts in each city. Table 5-18 shows the distribution of all centres, according to the hierarchical ranking system developed in Chapter 2, together with the ratio of 3rd and 4th to 5th order centres. A marked distinction arises between the larger cities of Sydney and Melbourne, and the smaller cities of Adelaide and Brisbane.

Table 5-18

<table>
<thead>
<tr>
<th>Total Central Places and Ratio of 5th : 4th : 3rd Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
</tr>
<tr>
<td>Total Ratio</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>III</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>II</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Brackets indicate ratio of low order centres to 4th and 5th orders combined.

Brisbane. The entire comparative scheme dwells on this expected distinction, and provides a clear indication of the part played by total
population size in the internal commercial organisation of a city. Tables 5-18 and 19 present several interesting contrasts. Firstly,

**Table 5-19**

<table>
<thead>
<tr>
<th></th>
<th>Sydney</th>
<th>Melbourne</th>
<th>Adelaide</th>
<th>Brisbane</th>
</tr>
</thead>
<tbody>
<tr>
<td>V/IV</td>
<td>1 : 72,766</td>
<td>1 : 95,000</td>
<td>1 : 84,000</td>
<td>1 : 56,546</td>
</tr>
<tr>
<td>V/IV/III</td>
<td>1 : 26,302</td>
<td>1 : 28,117</td>
<td>1 : 39,200</td>
<td>1 : 29,620</td>
</tr>
<tr>
<td>Total Metr.Pop.</td>
<td>2,183,388</td>
<td>1,911,895</td>
<td>587,957</td>
<td>621,550</td>
</tr>
</tbody>
</table>

the distribution among the three highest orders in Sydney and Melbourne goes some way to supporting the hierarchical concept. However, when the numerical distribution is related to total metropolitan population, it becomes evident that Sydney has a more complete network of high order centres. The disparity is overcome at the 3rd order level, an indication that, in Melbourne, fewer centres have risen above the intermediate convenience-comparison functional form of the 3rd order level. There are eight such centres to every 5th order centre in Melbourne, only six in Sydney. This distinction is clearly related to the more advanced stage of retail decentralization in Sydney, which in turn may be attributed to the city's physical setting.

Adelaide, and particularly Brisbane, show a marked divergence from a normal (in the central place theory sense) distribution of centres according to rank. Comparison with population totals (Table 5-19)
indicates that groups below 3rd order status are likely to be of greater significance in Adelaide; there are excessively large population totals to each third order centre and above. Brisbane has the lowest ratio of population to high order centres; this helps to account for their relatively narrow functional base, particularly as a large area of the city is not served by high order suburban centres.

Comparison of the average road distance between centres and their nearest neighbours of equal or higher status, supports these contentions (Table 5-20). Superficially there is a close similarity between the

<table>
<thead>
<tr>
<th></th>
<th>Sydney Av. Dist.* V.</th>
<th>Melbourne Av. Dist.* V.</th>
<th>Adelaide Av. Dist. V.</th>
<th>Brisbane Av. Dist. V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>9,966 29.6</td>
<td>13,717 43.7</td>
<td>13,665 15.4</td>
<td>-</td>
</tr>
<tr>
<td>IV</td>
<td>4,690 68.9</td>
<td>5,243 65.0</td>
<td>4,075 16.0</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>2,653 43.3</td>
<td>2,973 58.9</td>
<td>3,712 48.0</td>
<td>1,710 50.2</td>
</tr>
<tr>
<td>II</td>
<td>-</td>
<td>-</td>
<td>2,695 59.4</td>
<td>2,263 41.5</td>
</tr>
<tr>
<td>IV/V</td>
<td>4,697 68.9</td>
<td>6,820 73.3</td>
<td>6,330</td>
<td>6,909 34.0</td>
</tr>
</tbody>
</table>

* Distance in yards.

V. Coefficient of Variability.

average distance between 4/5th order centres and their neighbours of equal status, in all cities apart from Sydney. Clearly the Sydney figure relates closely to the lower ratio of population to high order
centres, which supports the suggestion that the city has reached a more advanced stage of suburban retail development. However, reference to population ratios for Melbourne, Adelaide and Brisbane, indicates a considerable variation in the significance of the common 6,000 to 7,000 yard distance. Using the Sydney figure as one representative of a complete network of high order centres, it would appear that in the cases of both Melbourne and Adelaide it is the incomplete cover of the city by high order market areas, which raises the nearest neighbour distance, rather than any evidence of wider spheres of influence. In Brisbane the combination of low population ratio and high average nearest neighbour distance, result from the effect of the isolated bayside suburbs with small populations and high order centres. At the 3rd order level the Sydney and Melbourne nearest neighbour averages reflect the overall city distribution of intermediate order centres. By comparison, the clustered 3rd order centres in Brisbane are reflected in the low average distance; while 3rd order centres in Adelaide fulfil the role of highest ranking centre in rapid growth suburbs. This latter point is illustrated by an average nearest neighbour distance of over 3,700 yards.

A more accurate measure of the spatial distribution of high order centres in the four cities, can be obtained by estimating the distance of 4/5th order centres from their nearest neighbours in terms of their distance from the Central Business District. In each city there is a significant positive correlation between these two factors (Figure 40). At all distances from the CBD, high order business districts in Sydney
SPATIAL DISTRIBUTION OF HIGH ORDER CENTRES: DISTANCE FROM C.B.D.

Sydney: \( b = 24a + 7.9 \) (\( r = 0.72 \))
Melbourne: \( b = 48a + 5.5 \) (\( r = 0.83 \))
Brisbane: \( b = 52a + 9.0 \) (\( r = 0.87 \))
Adelaide: \( b = 55a + 28 \) (\( r = 0.83 \))
are substantially closer to centres of equal status, than those of the remaining cities. Largely as a result of gaps in the market systems within Melbourne, high order centres in the city are only fractionally closer to their nearest neighbours than those in Adelaide and Brisbane. However, in terms of the smaller areal extent of the latter cities, the distances to nearest neighbour are considerable, and reflect the incomplete network of suburban centres.

Further direct comparison can be made between the four cities in relation to the proportions of metropolitan population in direct public transport contact with the central city. That is, conversely, a measure of the numbers resident in areas from which it is necessary to change from one transport service to another, in order to make a shopping strip to the CBD retail core. It has been demonstrated that such break-points in journeys to the central city are a frequent location of high order business centres. Within the Sydney metropolitan area, only 40% of the 1961 population were in direct contact with the central city (Table 5-21). Comparison with the remaining cities allows a measure of the extent to which this factor can be related to the degree of central retail core dominance. There is a close resemblance between the proportion of the metropolitan population with direct access to the CBD, and the proportion of total metropolitan retail sales which are made in the Inner City Retail Statistical Area. Hence Sydney, with the lowest proportion of total population directly linked to the Retail Core, has the best developed suburban retail network. Melbourne, with over
Table 5-21

Proportion of Metropolitan Population Served by Direct Transport Services

<table>
<thead>
<tr>
<th>Time: Dist. (mins)</th>
<th>Sydney Cuml.%</th>
<th>Melbourne Cuml. %</th>
<th>Adelaide Cuml. %</th>
<th>Brisbane Cuml. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>2.1</td>
<td>2.4</td>
<td>1.7</td>
<td>1.9</td>
</tr>
<tr>
<td>11 - 20</td>
<td>12.6</td>
<td>14.0</td>
<td>36.1</td>
<td>16.7</td>
</tr>
<tr>
<td>21 - 30</td>
<td>27.7</td>
<td>31.9</td>
<td>72.1</td>
<td>57.4</td>
</tr>
<tr>
<td>31 - 40</td>
<td>36.5</td>
<td>46.0</td>
<td>88.7</td>
<td>68.5</td>
</tr>
<tr>
<td>41 - 50</td>
<td>39.3</td>
<td>50.6</td>
<td>92.2</td>
<td>-</td>
</tr>
<tr>
<td>Above 50</td>
<td>40.7</td>
<td>51.3</td>
<td>92.2</td>
<td>68.5</td>
</tr>
<tr>
<td>% Inner City Trade</td>
<td>24.2%</td>
<td>30.0%</td>
<td>46.3%</td>
<td>43.0%</td>
</tr>
</tbody>
</table>

half of the population able to make direct journeys to the central city, and a well developed tram network, has a high proportion of 3rd order centres. High order centres, with a marked transport centrality, have developed primarily at the edge of, or beyond, the tram zone. Brisbane has the least well developed transport system for its size, but in the absence of high order centres capable of satisfying comparison requirements, transport routes beyond the city terminals serve, at present, only as links in shopping trips to the city. Finally, Adelaide has virtually complete direct public transport accessibility to the CBD, and high order centres located only in inner suburban locations, or at established suburbs remote from the central city.

A distinction must be made between high order centres which provide a full range of convenience outlets, with considerable internal competition, and a wide selection of minor comparison units; and the major
5th order centre, with a wide impact on surrounding lower order market areas based on major retail units (particularly department stores) and chain comparison outlets. It is these business districts that are in direct competition with the CBD retail core. A centrality index based on the regional impact of high order centres, measured in terms of the numbers and length of terminal bus routes, provides a means of defining this highest rank of suburban centre. In the smaller cities only Glenelg (Adelaide) and Chermside (Brisbane), approach this class in terms of the centrality index. However, in the larger cities, particularly Sydney, several high order centres in the intermediate and outer suburbs, beyond the direct city transport zone, have achieved this regional dominance. A consideration of high order centres with centrality indices of over 10.0 (Table 5-22), shows that despite the fact that

Table 5-22

<table>
<thead>
<tr>
<th>High Order Centres Ranked According to Centrality Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>V Parramatta</td>
</tr>
<tr>
<td>V Bankstown</td>
</tr>
<tr>
<td>V Hurstville</td>
</tr>
<tr>
<td>V Chatswood</td>
</tr>
<tr>
<td>V Manly</td>
</tr>
<tr>
<td>IV Rockdale</td>
</tr>
<tr>
<td>IV Liverpool</td>
</tr>
<tr>
<td>IV Blacktown</td>
</tr>
<tr>
<td>IV Auburn</td>
</tr>
<tr>
<td>IV Fairfield</td>
</tr>
<tr>
<td>IV Eastwood</td>
</tr>
</tbody>
</table>

NB. P - Planned Shopping Centre
Sydney's 4th and 5th order centres are located in closer proximity to each other than is the case in Melbourne, the numbers of terminal routes and the area served by such routes, is greater. The hold that high order Sydney centres have over their trade areas is, therefore, likely to be considerably stronger than that of Melbourne's suburban business districts of equal status. The average terminal route distance of 5th order centres within the Sydney metropolitan area is 55.1 miles, in Melbourne it is 55.2 miles (average road distance to nearest neighbour of equal status in Sydney 5.6 miles, in Melbourne 7.8 miles). For 4th order centres the comparable figures are: Sydney - average total route distance 19.8 miles, nearest neighbour 2.7 miles; Melbourne - route distance 11.7 miles, nearest neighbour 3.0 miles.

A major reason for this weaker hold over trade areas among Melbourne high order centres, is concerned with the distribution of intra-suburban bus services among a larger number of terminal centres (Table 5-23). In Melbourne a higher proportion of 3rd order centres

Table 5-23

<table>
<thead>
<tr>
<th></th>
<th>Average Numbers of Bus Routes Terminal at Suburban Business Centres, According to Functional Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SYDNEY</td>
</tr>
<tr>
<td></td>
<td>Total Centres</td>
</tr>
<tr>
<td>V</td>
<td>9</td>
</tr>
<tr>
<td>IV</td>
<td>21</td>
</tr>
<tr>
<td>III</td>
<td>53</td>
</tr>
</tbody>
</table>
possess terminal bus services, and these tend to attract more routes than Sydney's 3rd order rank. There is, therefore, a tendency in Melbourne for the route patterns of intra-suburban public transport to channel a large number of passengers to 3rd order centres, particularly those resident in the fringe trade areas of high order centres. This can be related to the fact that Melbourne's 3rd order rank tends to be larger, and to contain higher proportions of comparison outlets (particularly variety stores) than their Sydney counterparts. However, it also indicates that the Melbourne suburban bus network connects the suburban population to its nearest railway station, rather than to its nearest high order business district.

A final means of comparing the suburban central place networks of the four cities under study, relates to the estimates made of resident population within maximum accessibility zones; that is those areas in which a particular high order centre is closer, in terms of time: distance, than to any other centre (Table 5-24). Two points are worthy of note with regard to this data: firstly the relationship between

Table 5-24

<table>
<thead>
<tr>
<th></th>
<th>SYDNEY</th>
<th>MELBOURNE</th>
<th>ADELAIDE</th>
<th>BRISBANE</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>95,556</td>
<td>33.4</td>
<td>98,700</td>
<td>35.9</td>
</tr>
<tr>
<td>IV</td>
<td>51,527</td>
<td>14.9</td>
<td>89,500</td>
<td>52.1</td>
</tr>
<tr>
<td>IV/V</td>
<td>65,670</td>
<td>50.2</td>
<td>92,250</td>
<td>47.0</td>
</tr>
</tbody>
</table>
population totals of 4th and 5th order centres; and secondly comparison of the joint 4/5th order totals. Only Sydney provides a marked distinction between the areal extent of the zones of 4th and 5th order centres. It has been pointed out that the incomplete nature of the networks in Adelaide and Brisbane reduces the value of these figures in real terms; however, in Brisbane, 4th order centres are located at points which result in higher population totals in their maximum accessibility zones than the more clustered inner 5th order types and dispersed bayside 5th order business districts. Further, the high population totals for Adelaide's 4th and 5th order centres can again be related to its lack of outer suburban business district development.

With regard to the joint 4/5th order figures, the higher the totals, the less complete is the city's suburban retail network. In these terms, the marked suburban development in Sydney, the gaps in the Melbourne network, the total lack of a high order cover in Adelaide, and the concentration of Brisbane's high order centres into localised areas, are all evident.