

## TRAVEL PATTERNS IN SYDNEY

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*ABSTRACT: Over the past decade research into urban travel patterns has increasingly emphasised two aspects: first, the relationship between travel and the accessibility of trip destinations, and second, the distinct travel patterns of people with different demographic characteristics and places of residence. The present paper analyses Sydney Area Transportation Study data in order to compare actual trip distances with the minimum distances necessary to accomplish each major trip purpose given the then urban layout. It also presents travel distance and travel time budgets for six population groups by four regions of residence. The six groups are household heads, wives and children each divided into those at work and those not at work.*

## TRAVEL PATTERNS IN SYDNEY

The purpose of this paper is to present data on travel behaviour in relation to accessibility, and on travel time budgets, for Sydney people ten years ago. Though this data is now history it should be useful in charting changes over time, and I hope that other workers will be able to process the 1981 transportation survey to yield comparative statistics.

### Accessibility and Trip Distance

Differences in the layout of suburbs can be summarised through the notion of accessibility, which attempts to measure the ease with which the residents of any suburb can reach the places they want to visit in the regular course of daily life. Accessibility in this sense is a compound of geographic distance (the closer the better) and speed of transport. Many different measures of accessibility have been proposed (Black 1976 Introduction) but that adopted here is one of the simplest: the average distance from the houses of a suburb to the nearest facility supplying the service in question. This measure covers only one side of the concept of accessibility - the side of distance. It makes no allowance for the effect of transport speed, even though distance is less significant for people with fast transport available. It therefore reflects the town planning rather than the transport planning side of accessibility.

Accessibility measures were developed for the several major trip purposes, and were compared with actual trip distance, as follows:

#### (a) Jobs

Given that in labour markets breadth of choice is important a simple measure of the distance to the nearest job is obviously inappropriate. The accessibility measure developed to assess the state of local labour markets was therefore the average distance to the nearest 50 000 jobs. This measure would be equal to the actual average length of the journey to work if people chose their jobs from among the nearest 50 000, no more and no less. To choose from among 50 000 jobs is not an unreasonable level of choice: the total number of jobs in Hobart is not much more than 60 000.

Had the citizens of Sydney so chosen in 1971 the average length of a journey to work would have been about 5 kilometres - about a third of the 16 kilometre average distance which would have been generated if all workers had worked in the city centre (Table 1). In actual fact the average distance travelled by workers in Sydney was midway between these two figures, which implies that workers chose their jobs from among more than the nearest 50 000, but from among less than the metropolitan total. In addition to the exercise of choice this travelling distance reflected the imbalance between numbers of jobs and local residents in many suburbs (Manning 1978 Ch. 4).

The accessibility of local jobs decreased rapidly with distance from the city centre, and at the fringe the average distance to the nearest 50 000 jobs was four times its inner suburban level. However the extra distance travelled by outer suburban workers was only twice the inner suburban level. The fact that average journey distance doubled while the constant-choice distance quadrupled implies that outer suburban workers not only travelled further; they sacrificed job choice as well. Among residents of the northern suburbs, however, the sacrifice in choice was less (many of them worked in the city centre) and the increase in distance was correspondingly greater.

(b) Schools

In 1970 the average distance from dwellings in Sydney to the nearest public primary school was approximately a kilometre, and to the nearest high school two kilometres. Neither distance varied very much across the metropolitan area, and it must be judged that the Education Department had succeeded in its policy of providing schools with equal geographic convenience across all suburbs. However the Catholic church with its school system, and the private entrepreneurs and voluntary agencies who ran kindergartens, failed to keep up with urban expansion and the distance to their facilities increased somewhat with distance from the city centre. Even so the average school trip did not vary much with suburb of residence, except that children living on the north shore (with a greater proportion of private school and tertiary students) tended to have longer than average journeys. These longer journeys by a small minority of students

were the chief reason why the actual average length of a journey to school was 2.5 kilometres greater than it would have been had all students attended the nearest appropriate school.

(c) Shopping

Four accessibility measures were calculated for retailing, on the assumption that a five-level hierarchy of shopping centres could be recognised. The city centre occupied the apex of the hierarchy, followed by the six major regional centres (the shopping malls extant in 1970 plus traditional shopping centres with eleven or more bank branches, including the city centre.) Twenty-one sub-regional centres were recognised, including the six regional centres and 15 others with more than six bank branches. The fourth level of the hierarchy was represented by IAB agencies, which the Board deliberately confined to centres with greater retailing strength than mere neighbourhood centres. Owing to the similarity of the policies pursued by the IAB and the licensing courts this measure could also be used to represent distances to clubs and pubs. Owing to the lack of a ready-made listing neighbourhood centres were omitted from the estimates.

The six major regional centres in Sydney in 1970 were well inside the urban boundary and were therefore relatively inaccessible from the outer suburbs. Similarly, due to the policies of the major retail developers, the average distance to a district centre (with IAB agency) increased with distance from the city centre, being at the fringe roughly double the distance usual in the inner suburbs. On the other hand, sub-regional centres with their catchments of around 100 000 people were fairly evenly distributed across the whole urban area.

The average length of shopping trips in Sydney was reported in the 1971 SATS survey as rather less than the average distance to the nearest sub-regional centre (how much less depends on the extent to which short-distance shopping excursions were underreported in the survey.) Once again the relative inaccessibility of facilities from the outer suburbs was reflected in longer journeys, such that the average shopping trip from the outer fringe was approximately twice the length of that usual in the inner suburbs.

Table 1 Accessibility and distance from the city centre, Sydney ca 1970

Service	Accessibility index		Actual travel		
	All Sydney Average	Increase in average for 1 km extra distance from city centre	All Sydney Average	Increase in average for 1 km extra distance from the city centre	
				Inner to West	Inner to North
	km	metres	km	metres	metres
City centre	16.8	1000			
Nearest 50 000 jobs	4.9	230			
WORK TRIPS			11.2	430	750
Hospitals	6.3	300			
Baby Health centres	1.8	40			
Kindergartens	2.9	70			
Public Primary Schools	1.0	0			
Catholic Primary Schools	1.4	35			
Public High Schools	2.0	0			
Catholic High Schools	2.9	50			
Technical colleges	4.7	70			
SCHOOL TRIPS			2.5	0	160
City centre	16.8	1000			
Regional centre	7.3	260			
Sub-regional centre	4.1	40			
TAB agency	1.6	40			
SHOPPING TRIPS			3.9	70	130
Libraries	2.3	50			
Public baths	3.6	0			
Beaches	14.9	0			
Nearest 5 ha of park	0.8	0			
Nearest 50 ha of park	1.9	15			
Golf links	2.9	0			
Bowling greens	1.4	40			
SOCIAL, RECREATIONAL AND OTHER TRIPS			6.5	90	200
General accessibility index	5.7	260			
ALL WEEKDAY TRIPS			7.0	130	460

Source: Accessibility indexes calculated by a process of geometrical probability, see Manning (1972). Actual travel from SATS tapes.

## (d) Social/recreational

Social/recreational travel is a residual category embracing a wide variety of trip purposes, for many of which (e.g. touring, or visiting relatives) minimum distance accessibility are irrelevant. However, accessibility indicators were calculated for libraries, public baths, beaches, parks, golf links and bowling greens. Among these only the distance to libraries and bowling greens increased significantly with distance from the city centre, and the latter increase will doubtless be rectified as the outer suburban population ages. Despite the equal accessibility of several kinds of recreational facility in the outer and inner suburbs, social/recreational trips were on average longer in the outer suburbs. This probably reflected a greater scatter of social destinations, and also the higher motorisation of the outer areas.

## (e) A General Accessibility Index

An attempt was made to summarise the accessibility measures by developing a combined index weighted according to overall population trip frequencies, in much the same way as a price index is weighted by overall population expenditures (Manning 1972 Ch. 10). The index so constructed underpredicted the average length of journeys reported in the SATS study, for two reasons. First, it was an index of the minimum distance required to visit the nearest of each of a given list of facilities, and people tended to travel further than the nearest facility in pursuit of choice. Second, the underreporting of trips in SATS was probably biased towards the shorter excursions.

Given that nearly 20 per cent of the total trip weights of the general accessibility index were for the distance from the city centre (as against 24 per cent for local employment and 21 per cent for schools), and given further that many of the other distance measures increased substantially with distance from the city centre, it is not surprising that the index should rate accessibility as decreasing strongly with distance from the city centre. Residence an extra kilometre from the city centre was worth an increase of about 250 metres in the average length of the trips comprising the regimen of the index.

However, this increase was not uniform over the whole metropolitan area. The concentration of local employment and retailing in Parramatta meant that in accessibility terms Parramatta was equivalent to an average suburb four kilometres closer to the city centre (Map 1). Bankstown was also a convenient suburb relative to its distance from the city centre. On the other hand much of Ku Ring Gai Municipality was the opposite of Parramatta: it had the levels of accessibility appropriate to places four kilometres further out. As might be expected the worst accessibility, given distance from the city centre, was in the various narrow peninsulas running out into the harbour, Port Hacking and Pittwater. However in these areas poor accessibility had its scenic compensations.

The fact that work, shopping and social/recreational trip distances increased with the distance from people's residence to the city centre, the increase being particularly strong for people living on the north shore, may thus be related to the layout of Sydney as summarised in the accessibility indices.

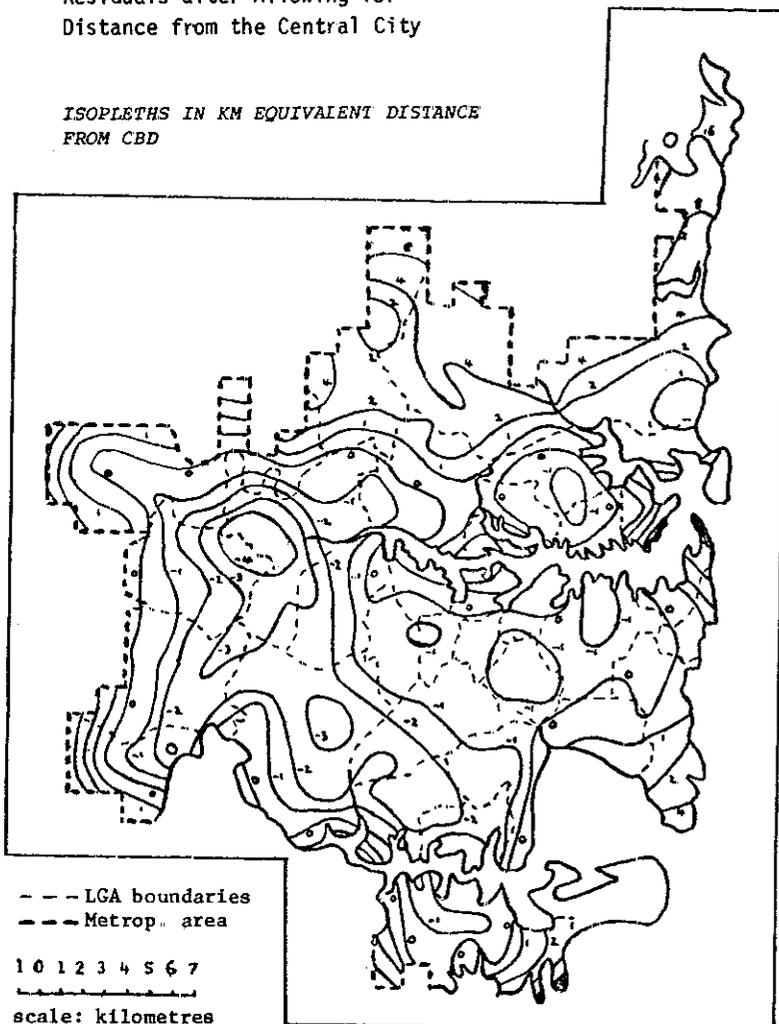
#### Travel Patterns by Region

To investigate the trip making behaviour of the residents of different parts of Sydney in more detail the metropolitan area was divided into four regions, shown on Map 2. Trips were allocated to the region of residence of the trip-maker, whether or not he ventured outside his home region. To simplify the calculations air-line distance was used throughout, as against the actual distance used in the accessibility indices.

Table 2 shows the regional pattern of journey lengths. The overall average distance for each region is as discussed in relation to the accessibility indices, but as a step towards discussing trip duration rather than distance the table breaks the journeys down by travel mode. Given that a majority of trips was made by car it is not surprising to find that car trip distances repeat the overall pattern faithfully. However public transport trips accentuated the differences between the regions: the average public transport journey in the inner region was but a kilometre longer than the average for all trips including walking, while the public transport figure for

GENERAL ACCESSIBILITY INDEX  
Residuals after Allowing for  
Distance from the Central City

ISOPLETHS IN KM EQUIVALENT DISTANCE  
FROM CBD



--- LGA boundaries  
--- Metrop. area

1 0 1 2 3 4 5 6 7

scale: kilometres

SYDNEY

FOUR  
REGIONS



NORTH

OUTER

MIDDLE  
WEST

INNER

WEST

TRAVEL PATTERNS IN SYDNEY

the outer west was 6 kilometres greater. This was due entirely to the greater length of train trips by outer area residents, and reflected the role of the railways in carrying people to and from the city centre. Bus trips in the middle and outer western regions were generally short, since the bus network in those areas (unlike that in the inner and northern suburbs) was useful only for local travel.

Table 2 Average Length of All Weekday Trips by Mode and Region  
Airline Kilometres, Sydney, 1971

Mode	Region				All Sydney
	Inner	Middle	Outer West	North	
Car	4.9	5.7	7.2	5.6	5.7
Public Transport	5.1	8.7	12.2	7.3	7.5
Train/ferry	7.8	13.9	21.9	11.3	12.8
Bus	3.9	2.8	2.9	4.7	3.7
All trips (includes allowance for walking)	4.3	5.6	6.8	5.5	5.4
Average distance from City Centre	7.3	19.0	31.6	13.5	14.6

Source: SAIS

It is worth remarking that the average public transport trip distance for the inner region, 5.1 air-line kilometres or approximately 6.5 actual kilometres, was roughly equal to the average public transport trip distance for Sydney as a whole in the 1930s - that is, in the era when the inner region approximated the metropolitan area as a whole (calculated from railway and tramway annual reports). It therefore seems likely that the pattern of public transport travel by residents of the inner region had changed little since it was established.

Turning from journey distance to duration (Table 3) much of the interregional pattern of variation disappears. Walk/cycle trips were of similar distance and duration in all regions, while the greater

Mode	Region				Sydney
	Inner	Middle	Outer West	North	
Car	21	21	21	20	21
Public Transport	41	46	51	44	44
Train/ferry	49	63	78	57	60
Bus	37	27	25	35	33
Walk/cycle	14	15	14	14	14
All trips (after allowance for walking)	26	26	26	24	25

Source: SATS

speed of motor travel on the less congested roads of the outer suburbs exactly compensated for the modestly increased average trip distance and there was no interregional variation in the duration of the average car ride. On the other hand the greater length of train rides by outer region residents was reflected in journey duration: half an hour longer for outer region residents compared to inner region people. Bus journey duration also varied with distance, though in this case the longer distance trips were made by residents of the inner and northern regions. Road congestion and slow bus speeds also contributed to the long average duration of bus journeys in the inner region. These longer bus journey times for the inner and northern regions partly balanced out against the relatively brief rail journeys by residents of these areas, so that the inter-regional variation in public transport times taken overall was less than for train and bus taken separately.

## TRAVEL PATTERNS IN SYDNEY

Given that average walking and car trip durations were similar in all regions, while public transport durations increased towards the fringe, it might be expected that journey duration overall would increase outwards from the city centre. However, in the regions where public transport journeys were of long duration the proportion of total trips made by public transport was less. Longer duration and smaller proportion made about the same contribution to the final average, with the result that the overall average trip duration was very similar in all regions. Outer suburban residents' trips were on average 60 per cent longer in distance than those of inner suburban residents, but they took the same time. Outer suburban people thus travelled further because they travelled faster, not because they devoted more time to each trip. And they travelled faster because they more often used the faster modes of transport, and because average speeds for each mode (particularly car and rail) were faster in the outer areas.

Now that we have ascertained the length and duration of an average weekday trip in each region, it is necessary to know only the average number of trips per person to calculate the total time spent in travel by a representative resident, and the total distance covered each day. This calculation is performed in Table 4. In Sydney on weekdays there was little regional variation in the tripmaking rate, though the residents of the prosperous northern suburbs reported that they travelled a little more often, so compensating for the slightly below average duration of their trips. Consequently there was very little regional variation in the average amount of time each citizen spent on travel. In all regions a typical resident spent an hour a day travelling. Interregional differences in average speed were reflected mainly in differences of trip distance but also, in the north, in trip frequency.

This is an unexpected result. So much has been said about the inconvenience of the outer suburbs that it is surprising to find the average resident of Sydney's western fringe spending no more time travelling than his inner suburban counterpart. On this evidence the inconvenience of the outer suburbs was overcome by fast transport, admittedly at a cost, for fast transport is not cheap.

Region	Single Trips		Trip Rate Trips per person	All Trips	
	Average Duration	Average Distance		Time Budget	Total Distances
	mins	km	per day	mins	km
Inner	26	4.3	2.2	56	9.4
Middle	26	5.6	2.3	60	13.2
Outer West	26	6.8	2.3	60	16.1
North	24	5.5	2.5	60	13.5
All Sydney	25	6.9	2.3	59	12.5

Source: SAIS

In discussing accessibility we saw that the variation in average trip distance between regions was dissimilar for different trip purposes. The same may be true for journey duration, despite the similarity of average duration for all purposes. According to tables 5 and 6 there was indeed a great deal of compensating variation hidden within the constant average. The work journeys of outer region residents were of longer duration than those of people living closer in, but in compensation their school, shopping and 'other' journeys took less time. Because of their faster speed they covered greater distances for all journey purposes except school travel, where both distance and duration were a little less than the metropolitan average. Another noteworthy case of compensating variation was the greater length, in both time and distance, of school trips by students living in the high-status north, offset by relatively brief shopping trips.

This compensating variation in trip duration was sufficient to bring about the similarity we have already observed of average duration for all trips across the four regions. However, here we meet a complicating factor. Because of differences in the demographic makeup of the population - more children in the outer region, fewer working wives in the high-status north - the proportion of work trips in the total number made by residents varied from 40 per cent in the inner region down to 24 per cent in the north,

while the proportion of school trips rose from 16 per cent in the inner region up to 28 per cent in the outer, with other variations for other trip purposes. The effect of this was to increase the overall average trip duration in the inner area slightly (because it had an above-average ratio of work trips) and depress it in the outer and northern regions, with their above-average proportions of school and social/recreational trips respectively. After allowance for this factor there was still very little variation in average trip duration between regions. However, this might turn out to be a meaningless result. Long work trips and short school trips can be cancelled out statistically to obtain similar averages, but they cannot be so cancelled in the lives of individual workers and children: time is not transferable from the one to the other. Accordingly it is desirable to probe behind the regional similarity of average journey duration and see if it hid differences between population groups.

Trip Purpose	Region				Sydney
	Inner	Middle	Outer	North	
Work	31	36	41	36	35
School	20	19	18	22	20
Shopping	19	18	17	15	17
Other	24	22	21	21	22
Overall Average	25.2	25.7	26.6	25.6	25.5
All Sydney Trip Mix Actual	25.8	25.9	25.9	24.0	25.5

Source: SAIS

TRAVEL PATIERNs IN SYDNEY

Table 6 Average Trip Distance by Purpose and Region  
Airline Kilometres, Sydney, Weekdays, 1971

Trip Purpose	Region				Sydney
	Inner	Middle	Outer	North	
Work	5.5	9.7	13.6	9.1	8.6
School	1.9	1.9	1.7	2.8	2.1
Shopping	2.4	2.9	3.7	3.1	3.0
Other	4.3	4.9	6.0	5.2	5.0
Total	4.3	5.6	6.8	5.5	5.4

Source: SATS

Population Groups

We have seen thus far that the constancy of average trip duration across the four regions of Sydney was due to compensating variation in typical trip times for the different journey purposes. In regions where work trips were time consuming shopping and 'other' trips were relatively brief. This may have averaged out overall, but how did it affect different groups of people?

To investigate this matter it was necessary first to define population groups. The possible definitions were limited by the statistical sources, which accounts for the absence of some perhaps relevant distinctions, such as high and low income. (Household income was available from the transportation study, but the definition was unsatisfactory). The selected population groups are listed in Table 7. The fundamental differentiation was between people with or without a paid job, each of these two groups being divided into heads of household, wives and children including adult children living at home. 'School-children' included students of all kinds living at home, even tertiary students, while children at work were children only in the sense that they were still living with their parents. At the other extreme, the non-employed heads of household were mostly elderly and retired.

People not fitting into the classification, such as sisters or parents of the head of the household, or young people in a group house, were omitted from the tables. For the record, the trip-making pattern of people left out of Table 7 was generally similar to working heads of household for people who had jobs, and to non-employed household heads for people outside the workforce.

There were obvious differences between the six groups in trip-making patterns. Three quarters of all weekday trips by schoolchildren were to and from school, and more than half total trips by workers were to and from work. Shopping and 'other' trips were relatively important only in the trip-making patterns of housewives and the elderly. Because their way of life did not involve compulsory daily travel to and from school or work these last two groups made fewer trips than the others - the elderly, indeed, averaged little more than a return trip every second day, whereas people in the workforce made a return trip daily with an extra one every few days.

The duration of an average trip varied by population group for two reasons (Table 7); first, the three employed groups had a high proportion of work trips (typically of long duration) and the others had none, and second, there was systematic variation in trip duration between population groups even after allowing for differences of trip purpose (Table 8). The typical work trip by a working child was several minutes longer than that of a head of household, which in turn took longer than that of a working wife. Again, elderly people and working children tended to take more time on their 'other' journeys than other people. The result was that the duration of a typical journey varied from under 20 minutes for schoolchildren and housewives to over half an hour for working children.

Having calculated the duration of an average trip and the number of trips per day it is simple to derive the average time spent travelling according to population group (Table 8). With the exception of the elderly, the groups with longer-duration journeys tended to make more trips, and this accentuated the differences between them. Working children and the working heads of household spent more than twice as much time travelling as the elderly or the housewives. School-

TRAVEL PATTERNS IN SYDNEY

children, with their regular pattern of short duration trips, had daily travel time budgets a little ahead of the housewives, while the socially uncertain position of working wives was reflected in their travel time - noticeably less than other workers, despite an attempt to keep up the numerous shopping trips typical of housewives.

These differences in time budgets reflected two factors: first, the extent to which people's station in life involved them in compulsory travel, and second, the relative urgency of other calls on their time. Comparing the three groups of employed people, it might be said that the working children had the least valuable time, since they squandered so much on work travel, and the working wives had the most valuable time, since they trimmed their travel time budgets to a minimum. This they did more by limiting the distance covered on their journey to work than by selecting fast transport. Sixty per cent of all trips by working wives (and also working children and elderly household heads) were made by car, as against 80 per cent of the trips of working heads of household and housewives, and 30 per cent of trips by schoolchildren.

Table 8 Average Trip Duration by Purpose and Population Group  
Minutes, Sydney, Typical Weekday, 1971

Population Group	Work	School	Shopping	Other	Average	Time Per Day
Working child	38	-	18	25	33	89
Working head	35	-	14	22	29	83
Working wife	29	-	15	20	25	68
Schoolchild	-	20	15	19	19	45
Housewife	-	18	18	20	19	37
Non working head	-	-	21	28	26	35
Overall	35	20	17	22	25	59

Source: SAIS

Population Group	Percentage of all trips				Total	Trips Per Day
	Work	School	Shopping	Other		
Working child	66	-	3	32	100	2.7
Working head	54	-	5	41	100	2.9
Working wife	57	-	9	34	100	2.7
Schoolchild	-	75	4	21	100	2.3
Housewife	-	3	33	64	100	1.9
Non working head	-	4	31	64	100	1.3
Overall	32	20	10	39	100	2.3

Source: SATS

Since the working heads of household had, presumably, the highest wages, their high rate of car usage was to be expected, and conversely the low rate for schoolchildren. But why should working wives make relatively less use of cars than housewives? It is possible that this observation was due to deficiencies in the data (housewives may have forgotten to report walked trips) but there are still two reasons why working wives should be expected to make less use of cars. First, housewives were often able to arrange their trip pattern to make use of the family car when it was available, but working wives had to travel at hours set by their job. Second, working wives tended to belong to families where the total income was insufficient for them to run a car of their own. Quite a few housewives belonged to high status groups which had enough income for a second car.

These systematic differences in travel time budgets combined with differences in trip duration by purpose to produce considerable inter-regional variation in travel time budgets between groups (Table 9).

This was most clearly seen in the case of working children, whose work journeys were very much more time consuming if they lived in the outer region than if they lived in the inner. Young people, particularly the daughters, often worked in the city centre even when they lived in the outer suburbs. Despite some sacrifice of travel time for other trip purposes, working children living in the outer areas spent 50 per cent more time travelling than their inner suburban counterparts. Such variation occurred in a milder way for employed heads of household - save that here the longest times were turned in by northern region residents. Despite the use of fast transport wherever money could buy it, the hectic life of a high-status consumer required extra time for 'other' travel. The pattern was different again for working wives, whose average travel time budgets were equal in the middle, outer and northern regions, but less in the inner. Work journeys were the cause of the extended travel time of middle and outer region working wives, while in the north the time devoted to 'other' travel was again high. The fact that working wives in the outer region travelled for no more time on average than those of the middle area is significant: it would indicate that city centre jobs were out of travelling range for most of them (unlike their daughters) and that if they could not get a local job they dropped out of the workforce (Manning, 1978, p. 90).

Housewives' travel time budgets did not vary by region, while those of the elderly ran if anything contrary to the rest, with particularly short time budgets in the outer area. (This figure is suspect, for the outer area had few elderly residents). Children in the outer region likewise spent less time travelling than those elsewhere. More of them were young and attended primary school, so their travel times could be expected to increase as they grew older. Northern region schoolchildren spent a relatively long time travelling due to their greater average age and their attendance at private schools.

For some population groups, notably those in employment, life in the outer region was thus associated with long travel times as well as high levels of spending on fast travel modes. However, the principle

## MANNING

of compensating variation applied to ensure the interregional constancy of average travel time budgets across all population groups, as shown in Table 4. The longer travel time budgets of employed people in the outer areas averaged out against the higher proportion of schoolchildren and housewives.

Population Group	Purpose	Region				Sydney
		Inner	Middle	Outer	North	
Working child	Work	54	70	87	63	66
	Other	18	23	20	28	22
	Total	72	93	107	91	89
Working head	Work	49	55	63	55	54
	Other	25	27	26	35	28
	Total	74	82	89	90	83
Working wife	Work	44	51	49	40	46
	Other	16	21	24	32	22
	Total	61	72	73	72	68
Schoolchild	School	35	33	32	36	34
	Other	9	11	7	13	10
	Total	44	44	39	49	45
Housewife	Shopping	11	11	12	11	11
	Other	26	25	25	25	26
	Total	37	36	37	36	37
Non-working head	Total	35	37	28	34	35
Overall		56	60	60	60	59

Source: SAIS

For each population group except the schoolchildren average speed was highest in the outer region, due to the consistent choice of the quicker transport modes and also the fact that average speed tends to be faster on longer journeys (a greater proportion of journey time is spent at speed in the train or on the main highway). The long travel time budgets of outer region residents were therefore rewarded by distances which were relatively even longer (Table 10).

TRAVEL PATTERNS IN SYDNEY

Even so, it remained a question whether this long-distance travel, bought at considerable monetary cost and for some groups with the additional cost of strained travel time budgets, was sufficient to compensate for the inconveniences of life in the outer suburbs. The outer suburbs were less well-provided with jobs and commercial and recreational facilities, and the greater geographic range of their residents' travel might not be sufficient to make up for this sparseness. It is perhaps significant that the only outer suburban residents who did not on average travel further or faster than their counterparts elsewhere in the city were the schoolchildren, a group whose major destination (schools) was provided with almost equal convenience in the outer suburbs as in the inner.

Table 10 Total Travel Distance by Population Group and Region  
Airline Kilometres, Sydney, Typical Weekday, 1971

Population Group	Region				Sydney
	Inner	Middle	Outer West	North	
Working child	13.9	23.5	32.8	22.1	21.7
Working head	14.1	22.4	30.0	24.3	21.1
Working wife	9.8	16.0	20.8	16.1	14.4
Schoolchild	4.8	5.4	5.1	7.6	5.8
Housewife	5.9	6.7	8.5	8.3	7.3
Non working head	4.8	6.3	6.7	6.5	5.7
Overall	9.4	13.2	16.1	13.5	12.5

Source: SAIS

Conclusion

A comparison of accessibility and journey patterns in different parts of Sydney proved useful in showing how people adjust their travel patterns to cope with outer suburban life. Schoolchildren make very little adjustment, but all adult groups adopt faster transport where possible, and in some cases (working heads of household, working children) both extent their travel times and reduce their range of destination choice,

while in others (working wives, housewives) the burden of adjustment tends to fall mainly on their range of activity. Indeed we may suspect, but from the available statistics cannot prove, that the lack of jobs in the outer areas persuaded many married women living there to drop out of the workforce.

Evidence from a range of other cities suggests that these responses to differences in accessibility are among the constants of human behaviour (Szalai 1972, Zahavi 1976). It is to be hoped that comparable estimates will very soon be available for more recent years so that we may sort out the constants from the changing trends in Sydney.

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TRAVEL PATTERNS IN SYDNEY

Note: The author regrets that owing to lack of space he has not been able to set the Sydney data in the context of that from other cities. However, the reader may do so by consulting:

- Gunn, H.F.: 'Travel Budgets: A review of Evidence and Modelling Implications'. University of Leeds, Institute of Transportation Studies, Working Paper No. 119, Leeds, 1979.
- Szalai, A. (ed): The Use of Time. Daily Activities of Urban and Suburban Population in Twelve Countries. The Hague, Mouton, 1972.
- Zahavi, Y.: Travel Characteristics in Cities of Developing and Developed Countries. World Bank staff paper No. 230, Washington DC, 1976.
- Zahavi, Y.; and Talvittie, A.: 'Regularities in Travel Time and Money Expenditures'. Transportation Research Record No. 750 pp 13-19.