13

THE IMPACT OF RISING FUEL PRICES ON HOUSEHOLD BEHAVIOUR IN SYDNEY

A.J. Holsman
Senior Lecturer
Economic Geography
University of New South Wales

N.G. Lonergan
Senior Tutor in Geography
School of Geography
University of New South Wales

Abstract:

A survey of 224 households in Sydney provides evidence of the behavioural effects of recent fuel price rises and of the effects anticipated by households if the price of petrol rises to 60 cents a litre by the end of 1981.

Results show that to date over half of the households surveyed believe they have been unaffected by rises in the price of fuel. For those affected, discretionary trips have been reduced and less milage is driven. Larger households have been particularly vulnerable. If the price of fuel rises to the level projected, effects will be much more widespread both in their nature and their geographical extent.

FUEL PRICE RISE EFFECTS

INTRODUCTION

In the past two years the price of petrol to the Sydney motorist has doubled and the outlook for the coming decade is equally bleak with a general agreement that petrol prices will continue to rise faster than real incomes. There is much less agreement on the size of future rises and when the dwindling supply situation will make its most notable effect. More recently, the petrol price discussion appears to have been concentrated on the political issue of import parity pricing and the role of parity pricing in encouraging the search for new oil and the development of alternative energy fuels. Whilst accepting the need for this discussion and recognising the political implications of oil pricing, it seems unfortunate to us that very scant regard has been paid in policy formulation to the effects that the price rises alluded to above have had on household behaviour. Furthermore, the income and spatial distributional effects of such price rises can be only poorly appreciated until detailed evidence is presented. These gaps in our knowledge prompted the present paper which represents information gathered on the effects of fuel price rises on households in Sydney. This work is still very much at the pilot stage and results shown here should be seen as indicative rather than truly representative.

The response of researchers to the growing energy problem in Australia has been very recent. This is understandable given Australia's healthy oil supply and price situation for most of the seventies, a decade during which most western industrialised countries suffered significant economic and social impacts because of rapidly rising oil prices. However, in the last couple of years, a body of researchers have begun investigating some of the implications of radical changes in fuel supply and fuel prices in Australia and their response represents a realisation by a growing, but by no means universal sector of the community that Australia will inevitably have to 'bite the bullet' on oil supply and price in the eighties. Indeed, the nature of independent research into the implications of energy shortages are well illustrated by work reported in the 1979 A.T.R.F. Proceedings. Popular conceptions of the energy situation in Australia are questioned by Peterson, and Huxtable and Cox, whilst Schou evaluates alternative energy conservation measures. Bannister goes further into the analysis of fuel price rises' effects by considering the relationship of rising journey to work costs and urban spatial structure. A similar interest in the planning implications of rising energy prices is demonstrated by Sharpe (1980) whilst Roseth (1978) paints an interesting picture of a Sydney with less and more expensive oil. All these studies evidence the lively and

healthy debate on the impact of fuel price rises which now exists in Australia. However, they also evidence the absence of hard data, and too frequently their conjectures are based on shrewd observation or macro level information. To our knowledge, no work is available in Australia on the spatial variation of the effects of fuel price rises in Australia.

METHODOLOGY

The basic aim of this study is to establish aggregate attitudes to recent fuel price rises and their effects on household behaviour in Sydney and how these attitudes and effects vary across Sydney. A second part of the study is to ascertain how attitudes may change in the near future if a value of 60 cents per litre is assumed by the end of 1981 (this represents a percentage rise on present New South Wales fuel prices of approximately the same magnitude as has occurred since the beginning of 1979). To investigate these effects a questionnaire was constructed and administered to 224 households in Sydney. Fifteen households were surveyed in fifteen suburbs of Sydney in April-May 1980. The distribution of areas surveyed is shown in Figure 1. The distribution is not a totally random one in that surveys were undertaken with the assistance of students in the Geography Department at the University of New South Wales. The surveys were administered in the residential neighbourhood of these students. Nevertheless, a reasonable cross section of households were surveyed. Head of households were interviewed wherever possible. The selection of households for interview within the areas concerned was entirely random. The questionnaire sought household characteristics which could be cross tabulated with actual and perceived effects. Changes in household residence, car model, work trips, shopping trips and recreation trips were sought as well as the reasons for such changes (if any). Households were then offered possible responses to a fuel price of 60 cents a litre by the end of 1981 and asked to state the likelihood of making such a response.[1] Simple descriptive statistics have been used to analyse the data.

RESULTS

1. Impact of Fuel Prices in the Last Twelve Months.

1.1 Change of Residence

Of the total sample of 224 households, only 27 had changed their residence in the past year. The price of fuel was not mentioned by any of those changing residences as the prime reason for moving to a new residence.

---

1. A copy of the questionnaire is available on request from the authors.

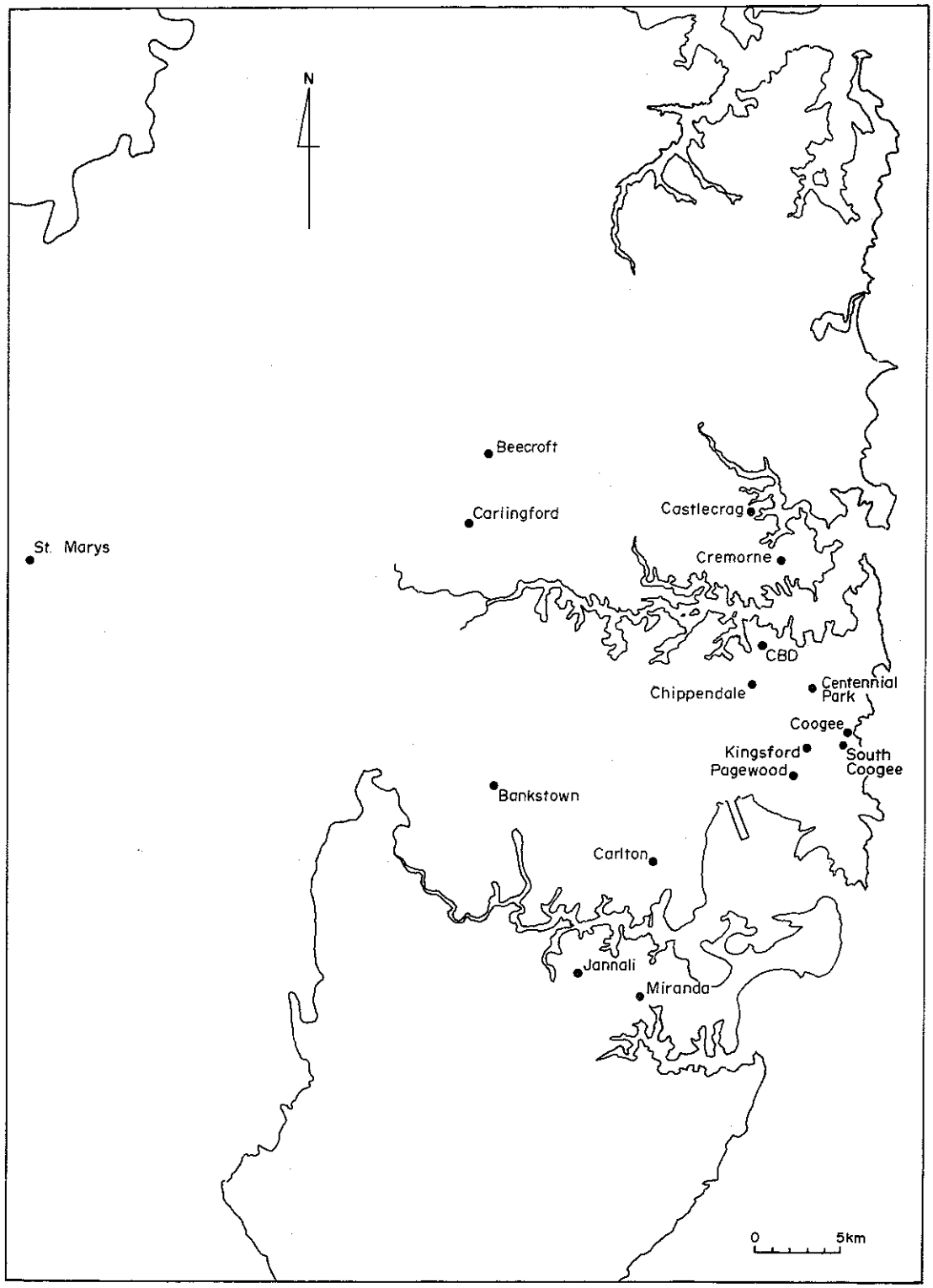

FIG. I. AREAS SAMPLED IN STUDY

1.2 Change of Car

The sample surveyed is better provided with cars per household than Sydney residents as a whole with only 8 households (3.6%) having no car, and 60% having more than one car. Company cars make up a substantial element of these percentages If they are extracted, 10% of families have no privately owned car and 46% of households have more than 2 privately owned cars. The latter figure suggests the sample is not truly representative of all households in Sydney and, therefore, it begs caution in the interpretation of the results reported here. 38 of the households with privately owned cars had changed such a car, or the number of such cars, in the past twelve months. 12 of these 38 purchased a similar sized new car to that owned before, 10 moved down from a large car to a small one whilst 8 moved from a small car to a larger one. The total sample gained four cars over the previous year, thus giving an impression of rising car ownership levels per household. Of the reasons given for changing the privately owned car, the importance of fuel price is less significant than the age of the car or changed family structure. Indeed, only 4 households gave the price of fuel as the major reason for changing the family car.

A similar trend existed for those households where a company car was changed. Only 3 out of 20 company cars changed during the past year represented a change from larger to smaller cars. More often, new company cars were larger than those previously held. Fuel price was given as the prime reason for changing the company car in just two cases.

1.3 Employment and the Journey to Work Trip.

Seven percent of household heads had changed their employment in the past year. None of the reasons given for such a change related to the price of getting to the previous place of work. 71% of the sample travelled to work in their own (or company) car and 19% used public transport. 9% of the sample had changed their means of getting to work in the past year with half of those changing using more public transport than before, and less than a quarter moving the other way and using their own car rather than public transport. Again the role of fuel price in changing the mode of travel is not very significant with only four respondents giving fuel price as their reason. Occupation or job location change rank more highly in accounting for modal shift.

1.4 Shopping Trips.

A higher percentage of the sample (16%) recorded changed shopping behaviour for the year under review. Of those registering a change in shopping behaviour, 49% were shopping closer to home and 31% were shopping less frequently. It might be anticipated that the price of petrol would be important in accounting for such changed behaviour but again the results are disappointing with just 5 households giving fuel price as the major reason for change. Of more importance was the existence of new planned shopping centres with better parking facilities.

1.5 Recreation and Social Trips.

26% of the total sample recorded a change in recreation and social trips, with 51% of such respondents stating they make less frequent trips than a year ago. In this case petrol price rises do make their mark with 47% of those changing their number of recreation trips giving fuel price rises as the major reason for change. It would appear therefore, that to date discretionary trips are the trips that have suffered because of rising fuel prices. What is unfortunate at this level of analysis is that it is impossible to state what sort of recreation and social trips have been curtailed. Observations of other researchers of the School of Geography suggest it is the day recreation trip that has suffered most. For example, visits to Sydney's National Parks in early 1980 appeared to be well down on figures for the corresponding period last year.

1.6 Total Effects of Fuel Price Rises.

As a check to responses in the individual trip making categories and as an indicator of the general effects of the fuel price rises that households have noted, an open-question was asked, requesting the two major effects of fuel price rises on the household. Table 1 shows the first response to this question and Table 2 gives the second effect (if given).

Table 1: Effects of Fuel Price Rises - Major Responses.

	% Response
No effect	57.2
Spent more money on car(s)	21.6
Less frequent use of car(s)	15.4
Bought smaller car or converted to L.P.G.	2.9
Greater use of public transport	1.0
Car pool for children's journeys	0.5
Car pool for work trips	1.0
Change to bicycle	0.5
	100.0

Table 2: Effect of Fuel Price Rises - Second Response.

	Relative Frequency (Percentage)
No effect	6.3
Less frequent use of car(s)	5.3
Spent more money on car(s)	2.7
Smaller car on L.P.G.	2.2
Greater use of public transport	0.9
Car pool for children's journeys	0.4
Car pool for work trips	0.4
No second effect given	81.7
	100.0

Some interesting points emerge from Tables 1 and 2. The major comment must be that despite a significant rise in fuel prices in the past year, one half of the sample recorded no effect on the household. This reaction is consistent with the observations of many economists who suggest a very low price elasticity for fuel. In other words the great majority of middle Australia represented by the sample felt price rises so far have been such as to be insignificant to them. It may also say something about the Australian's perception and adherence to the motor car. For many the car represents one of the, if not the, fundamentals of life. It is often considered to rank highly in family budgeting strategy. However, only approximately one quarter of the sample recognise the extra expenditure involved in running a motor car over the past year. Thus extra money to operate a car is not noticed, or if it is, such extra expense does not register as a

major or significant imposition. An alternative viewpoint is that the perception of car operating costs are viewed usually inaccurately and, hence, the car appears relatively cheaper than it is. Conversely, public transport appears relatively more expensive than it is. The nature of responses received would suggest that such households are using their car to the same level as before, and simply paying out the extra costs involved. This may or may not have caused some budgetary adjustments within the household.

About 30% of the sample had definitely reacted to fuel rises in one way or another. By far the most significant reaction (21%) had been to drive less distance or to use the car less frequently. This implies that such households committed a certain proportion of their budget to the car, and increases in operating costs of the car could only be met by using the car less. The size of this effect is larger than that inferred from the analysis of trip types which may suggest that it is easier for general responses to be made to the price rise effect. Most of the other responses to the fuel price rises were only noted by a small percentage of the households. For example, just under 5% had changed to a smaller car or converted their car to L.P.G. While this percentage is similar to that reported earlier, the impact of higher fuel prices is given greater significance here. A greater use of public transport was noted by just 2% of households. Thus, so far, modal shift has been minor and the lower costs of using public transport have yet to outweigh the advantages of private transport. Car pooling appears to have been given a minor boost by higher fuel prices.

1.7 Relationships between Household Characteristics, Geographical Location and Fuel Price Effects.

Although considerable information was collected on household characteristics the focus here will be to comment only on those household characteristics that relate, or appear to relate to changed trip behaviour or noted fuel effects. A SPSS Cross Tabulation Programme was used to analyse the data. Cell entries are too few in most circumstances to speak of statistically significant relationships. The larger the household size the more likely it is that the household has been affected by fuel price rises. For example, four person households made up 26% of the sample but only 23% recorded no effect from fuel price rises. Yet two person households which comprise 19% of the sample contribute 24% of the respondents stating no effect of fuel prices. These findings are as one would expect. Larger family

size usually infers more budgetary constraints than in a two person household where there may be two wage earners. Similarly, households with four or five members have been most affected by fuel price rises in their recreational and social trip movements. Both four and five person households also register above expected percentage responses to the nature of fuel effects question. This point applies most notably to the response level for 'extra money spent on car' and especially 'less frequent use of the car'. More larger families had appeared to react to the fuel price rises by driving less distance or using the car less frequently than by spending a greater percentage of their budget on car operating costs. It is also worth noting that larger households contributed more secondary effects than would be expected by their component of the sample.

Another notion that was investigated was the relationship between the household head's occupation and effects of fuel price rises. It would be expected that occupation status, being a surrogate for income, would have an inverse relationship with fuel price effects, that is, the higher the occupational status of the head of household, the less the effects of the fuel price rises. The data provided in Table 3 would tend to support this notion. Professional people appear to have noticed fewer effects than tradesmen. It would also be expected that certain occupational groups had to spend more money operating their car and that they would have noticed the effects of fuel price rises. Table 3 appears to confirm this viewpoint.

1.8 Effects Noted by Locality.

Table 4 shows the number of households that have been affected by fuel price rises so far. The only areas where more than half of the sample stated they had been affected were Pagewood, Carlingford, Miranda, St. Marys, and Carlton. These areas differ both in socio-economic status and in their distance from the city centre. The only two areas that could be classed as similar are Carlingford and Miranda where there are many families with young children. The need to run a car in such areas poorly served by public transport is very real, and as in the case of St. Marys, a lower status area, rising fuel costs cause a shudder to tightly constrained budgets. For the most part, very mixed results occur and no simple relationship between price effects and locality appear to exist. That no well founded relationships are evident is consistent with the other work on trip making that the author has undertaken in Sydney (Holsman and Adrian, 1974). Sydney is such

a multi-faceted city that simple distance or locality based relationships do not conform with those noted in other cities, particularly American cities.

2. FUTURE PRICE RISES AND THEIR EFFECTS.

No one knows (even the Arabs one suspects) what the price of petrol will be in Australia by the end of 1981. Given recent price rises and the percentage increases involved, a figure of 60 cents per litre appeared a reasonable figure to use to see if household reactions might change. Table 5 shows the first responses to the question 'Assume that the price of petrol is 60 cents per litre at the end of 1981. What would be the effect on your household?'

Table 5: Effects of Future Fuel Price Rises - First Response.

Response	Absolute Frequency	Relative Frequency
No effect	99	44.2
Less frequent use of car	61	27.3
Spend more money on car	22	9.8
Sell car	17	7.6
Buy smaller car or convert to L.P.G.	12	5.4
Greatest use of public transport	4	1.8
Car pool for kids	2	0.9
Car pool for work	3	1.3
Change to cycle	4	1.8

The percentage of the sample who believe they will be unaffected by such a price rise is approximately 44%. In other words, 13% of those who stated they had been unaffected by price rises so far considered they would be affected if the price of fuel rises as projected. Over one quarter of the sample stated they would make less frequent use of their car and would drive less distance than at present. This suggests a considerable drop in the demand for fuel by the private motorist may occur, a point bolstered by the lower percentage whose major response to such a price hike would merely be to spend more money on their car. Other important differences occur between the results presented

Table 3 Effects of Fuel Price Rises by Occupation of Head of Household (First Response)

Occupation	No. in Sample[2]	No Effects[3]	Spent More Money on Car[3]	Drive Less Distance/ Less Frequent use of Car[3]
Professional	38 (22.4)	28 (73.7)	4 (10.5)	3 (7.9)
Clerical	22 (12.9)	14 (63.6)	4 (18.2)	3 (13.6)
Sales	11 (6.5)	6 (54.5)	2 (18.2)	3 (27.4)
Transport	11 (6.5)	6 (54.5)	3 (27.4)	1 (9.1)
Tradesman	44 (25.9)	22 (50.0)	14 (31 8)	4 (9.1)
Labourer	4 (2.4)	2 (50.0)	1 (25.0)	1 (25.0)
Service	6 (3.6)	1 (16.7)	2 (33 3)	3 (50.0)
Pensioner	15 (8.8)	6 (40.0)	3 (20.0)	5 (33.0)
Unemployed	10 (5.9)	8 (80.0)	0 (0 0)	1 (10.0)
Others	9 (5.3)	4 (45.0)	3 (33 3)	2 (22.0)
TOTAL	170	97 (57.0)	36 (21.2)	26 (15.3)

[1] = Not all respondents would give head of household's occupation. Total sample here is 170.

[2] = Figure in brackets represents percentage of sample.

[3] = Figure in brackets represents percentage of row totals.

Table 4 Effects Noted by Locality

Suburb	Area	Affected by Fuel Price Rise	Unaffected by Fuel Price Rise
Bankstown	Middle	3	12
Chippendale	Inner	1	14
Beecroft	Outer	3	12
Kingsford	Middle	3	12
Carlingford	Outer	15	0
Cremorne	Inner	6	9
S. Coogee	Middle	2	13
Jannali	Outer	3	12
Miranda	Outer	11	4
Centennial Park	Inner	5	10
Coogee	Middle	2	13
St. Marys	Outer	12	3
Pagewood	Middle	11	3
Castlecrag	Middle	4	11
Carlton	Middle	8	7

Table 6: Effects of Future Fuel Price Rises - First and Second Responses Combined.

Response	Absolute Frequency	Relative Frequency	Adjusted[1] Frequency
No effect	99	37.0	44.2
Less frequent use of car	78	29.0	25.9
Spend more money on car	29	10.9	9.6
Sell car	17	6.4	5.6
Buy smaller car or convert to L.P.G.	19	7.0	6.3
Greater use of public transport	12	4.4	3.9
Car pool for kids	3	1.1	1.0
Car pool for work	4	1.8	1.3
Change to cycle	6	2.4	2.0

1 Adjusted Frequency column maintains the same percentage of the sample that stated no effect to the price rises.

in Table 5 and Table 1. The number of householders who state they will buy a smaller car, convert their car to L.P.G. or worse still for the motor industry actually sell their car has risen considerably. If the 7.6% of the sample stated they would sell their car in the eventuality of a 60 cent per litre occurring in 1981 do behave as they respond now, then we will similarly see a major fall in demand for cars and an unprecedented glut of cars on the second-hand market. Certainly volatility in the car market and car industry will occur given suggested price rises.

If we combine first and second responses to the question posed above, public transport seems destined to benefit from increased use by 4% of households. In reality, the percentage is likely to be higher than this given the percentage of people who will sell their car or use their existing car less. In other words, respondents appear to recognise greater use of public transport as a direct effect of fuel price rises. More often, the relationship is an indirect one, that is, using public transport more follows from selling the car. Increased use of car pools for getting to work or for moving the kids around do not appear to be an immediate response to higher fuel prices.

Despite the growing percentage of households that

is likely to react to higher fuel prices, the most significant and common response is that no effects on household behaviour will occur. Even if we exclude those negative responses from households where a company or subsidised car is available, one-third of households still believe they will be unaffected by future price rises. However, no one in the sample anticipated buying a bigger car!

2.1 Relationships between Household Characteristics, Geographical Location and Future Fuel Price Effects.

It was shown earlier that effects of fuel price rises so far have been felt more by larger households, that is, by those households with more children. In general terms, the same relationship holds for future price rises. Whereas 54%, 60% and 56% of one, two and three person households believe future price rises will have no effect, only 33%, 37% and 37% of four, five and six person households believe they will emerge from future price rises unscathed. Therefore, in the recent past and in the future, it seems as if those households with more children are most vulnerable to the effects of fuel price rises. This represents a single income per household effect where the budgetary ramifications and restrictions that a single wate or salary earner entails are particularly susceptible to fuel price rises. Similarly, the four, five and six person households have higher than expected percentages among those who will be travelling less distance or making less frequent use of the car.

As in the situation of effects noted so far, there is a general gradation of the 'no effects' percentage by occupational status to the suggested fuel price rise (see Table 7). However, there is one notable exception - the tradesman. Although all occupational groups show a marked fall in the percentage likely to be unaffected in the future from those presently affected, the tradesman's response rises from 50% to 57%. This exception is hard to explain though one suggestion is that many tradesmen have now decided on the best means of dealing with extra vehicle operating costs, that is to pass such costs immediately on to the consumer. The higher status occupations all record a drop in the unaffected percentage of approximately 17%.

Table 8 shows the number of households recording future price rise effects by locality. In Bankstown, Chippendale, Kingsford, Coogee, Centennial Park and Castecrag, approximately 60% of households interviewed believe they will be unaffected by

Table 7 Effects of Fuel Price Rises by Occupation of Head of Household (First Response)

Occupation	No. in Sample	No Effects	Spent More Money on Car	Drive Less Distance/ Less Frequent use of Car
Professional	38 (22.4)	22 (57.8)	4 (10.5)	6 (15.7)
Clerical	22 (12.9)	10 (45.4)	1 (4.5)	9 (40.9)
Sales	11 (6.5)	4 (36.3)	3 (27.3)	3 (27.3)
Transport	11 (6.5)	5 (44.5)	2 (18.2)	3 (27.3)
Tradesman	44 (25.9)	25 (56.8)	6 (13.6)	9 (20.4)
Labourer	4 (2.4)	0 (0.0)	0 (0.0)	3 (75.0)
Service	6 (3.6)	2 (33.3)	0 (0 0)	3 (50.0)
Pensioner	15 (8.8)	5 (33.3)	3 (20.0)	7 (46.6)
Unemployed	10 (5.9)	8 (80.0)	0 (0.0)	2 (20.0)
Others	9 (5.3)	3 (33.3)	1 (11.1)	1 (22.2)
TOTAL	170	84 (49.4)	20 (12.0)	47 (27.6)

Table 8 Future Price Rise Effects by Locality

Suburb	Area	Affected by Future Price Rise	Major Effect of Price Rise
Bankstown	Middle	4	Less Frequent use of car
Chippendale	Inner	1	n.a.
Beecroft	Outer	9	Less Frequent use of car
Kingsford	Middle	6	Less Frequent use of car
Carlingford	Outer	15	Less Frequent use of car
Cremorne	Inner	9	Less Frequent use of car
S. Coogee	Middle	9	Less Frequent use of car
Jannali	Outer	10	Less Frequent use of car
Miranda	Outer	9	Smaller Car/or L.P.G.
Centennial Park	Inner	8	Less Frequent use of car
Coogee	Middle	6	Less Frequent use of car
St. Marys	Outer	14	Less Frequent use of car
Pagewood	Middle	13	More money spent on car
Castlecrag	Middle	3	Less Frequent use of car
Carlton	Middle	10	Less Frequent use of car

future fuel price rise effects. Again, this group of suburbs is a very mixed bunch without a discernible common thread which could easily account for their similar response. Again the implication is that future fuel price effects will not or cannot be explained simply by simple distance or income variables. Certainly, some outer suburbs appear likely to be highly affected but these suburbs vary considerably in their character. With two exceptions, the major manifestation of a 60 cents per litre price of fuel in 1981 in all areas will be a less frequent use of the car(s) or driving less mileage. It would seem, therefore, that demand for fuel should fall notably across Sydney as its price rises.

2.2 Likelihood of Making Certain Responses to Higher Fuel Prices.

Perhaps the most interesting aspect of this study is to record and comment on household responses to a range of posited effects of future higher fuel prices. These responses are shown in Table 9 The only effects which recorded more than 20% of the total responses in the 'yes certainly' category were (i) make more multi-purpose trips (40.5%), (ii) walk more often (23.7%), (iii) make children walk to school (23.3%), (iv) make greater use of public transport (21.8%). It appears we are likely to walk more (perhaps a boost for the Fitness Australia Campaign) especially our children. The latter effect on children may reduce those local morning and afternoon traffic snarl ups caused by parents flagrantly disobeying all road safety procedures. Of course if more children are made to walk to school, perhaps some recognition of the implications for road patrols should be given by the relevant authorities. Possibly of more interest to the transport planner is the high proportion of the smaple that intend to undertake more multi-purpose trips. This could necessitate a reappraisal of single purpose trip modelling procedures and the identification to a more sophisticated level of those trip destinations which are likely to be linked together. Finally, the future bodes well for public transport. Over one fifth of the sample will definitely be using the system more than in the past, and almost a further quarter of the sample will possibly be travelling public. It would appear that public transport can gain substantially though much inevitably depends on their own pricing strategies resulting from their own higher fuel costs.

Table 9 Likelihood of Response to 60¢ per litre Petrol in 1981

(in percentages)

	Yes Certainly	Yes Possibly	No Unlikely	No Definitely
1. Change to smaller car?	14.5%	22.4%	24.8%	38.3%
2. Move closer to work?	1.9%	4.7%	19.2%	74.3%
3. Make fewer social trips?	9.6%	27.1%	24.3%	39.0%
4. Rearrange the family budget to retain present use of car?	12.1%	28.8%	28.4%	37.7%
5. Make greater use of public transport?	21.8%	23.6%	19.4%	35.2%
6. Would you change your place of work?	0.9%	3.8%	15.6%	79.7%
7. Make greater use of flexitime?	2.8%	17.6%	14.2%	65.3%
8. Make children walk to school?	23.3%	13.7%	10.3%	52.7%
9. Walk more often?	23.7%	28.8%	14.0%	33.5%
10. Make increased use of phone for shopping?	7.8%	17.1%	20.7%	54.4%
11. Convert the family car for L.P.G. or diesel fuel use?	6.5%	13.0%	20.0%	60.5%
12. It will affect choice of annual holiday location?	12.1%	17.8%	15.9%	54.2%
13. Would use a car pool to get to and from work?	11.2%	22.8%	9.6%	56.3%
14. Would sell private vehicle?	5.6%	11.2%	13.5%	69.8%
15. Move residence closer to public transport?	2.3%	1.8%	10.1%	85.8%
16. Make fewer local shopping trips?	18.6%	22.8%	23.3%	35.3%
17. Would be less willing to transport children out of school activities?	12.4%	19.9%	15.5%	52.2%
18. Buy a bicycle or use one more often?	9.7%	13.9%	15.7%	60.6%
19. Make more multi-purpose trips?	40.5%	27.1%	14.8%	17.6%
20. Make fewer weekend/social/ recreation trips?	13.8%	18.0%	23.5%	44.7%
21. Change to a larger car?	2.7%	2.7%	7.3%	87.3%
22. Change to a motor cycle?	1.4%	3.2%	6.5%	88.9%
23. Will you make fewer day recreation trips?	12.1%	17.8%	25.2%	44.9%
24. Do you consider the above possible changes as a major change to your life style?	19.9%		80.1%	
25. Do you welcome such possible changes to your life style?	7.9%		92.1%	

If we combine the 'yes certainly' and 'yes possibly' categories then other significant responses can be recognised. For example, if a cut off of 30% is taken, then in addition to those effects given above the following responses should be noted: (i) change to a smaller car (37%), (ii) make fewer social trips (37%), (iii) re-arrange the family budget to retain present level of use of the car (41%), (iv) affect choice of annual holiday location (30%), (v) would use a car pool for journey to work (34%), (vi) make fewer local shopping trips (41%), (vii) would be less willing to transport children to out-of-school activities (32%), (viii) make fewer weekend/social recreational trips (31.8%), (ix) will make fewer day recreational trips (30%). Certain similarities of responses are indicated here. For example, social and recreational trips of varying duration will be curtailed. The implications for tourist resorts and weekender development are far reaching and need to be appreciated not only in terms of certain centres' relationship to Sydney but to other metropolitan centres. For example, northern New South Wales coastal resorts have traditionally benefitted from Victorian holidaymakers in the winter months. A survey of Victorian visitors to such towns in June 1980 suggested that there would be a move by such visitors to towns further south, so Port Stephens could benefit at Port Macquarie or Coff's Harbour's expense. Local trip making for shopping or to transport children to their activities also will be reduced. The small car market appears destined to boom and there is already statistical evidence that this is occurring. Significant budgetary adjustments within the household are also likely to occur to maintain the use of the car close to present levels. The last interesting development could be the expansion of car pooling arrangements for the journey to work. Certainly encouragement of car pooling by government authorities through the organisation of matching bureaus, by amending insurance regulations and possibly by the reduction of car registration charges for car poolers, might reap considerable rewards in the coming decade.

Just as these are many activities that the public might curtail because of significant rises in petrol prices there are also certain responses that are not favoured by the households under review. Less than 10% of households responded affirmatively to the following: (i) move closer to work (6.6%) (ii) would you change place of work (4.7%), (iii) move residence closer to public transport (4.1%) (iv) change to a motor cycle (4.6%)

v) change to a larger car (5 4%). The first three responses indicate the unlikelihood of the sample households making a major locational shift in employment or residence because of rising fuel prices. This is not surprising given the personal and family upheavals necessary in such shifts as well as the substantial costs involved. However, these responses should not be interpreted as indicating that fuel price rises will have only a minor role to play in residential locational decisions. For those who will buy a home for the first time or for those who are making a residential readjustment within the city, it is inevitable that the costs of personal transport will play a part in the decision making process. How important this part is in the total decision is as yet undetermined, but the excessive rise in inner city residential property prices in Sydney in the past twelve months would tend to indicate a renewed interest in accessibility by home buyers. It would seem therefore, that although high petrol prices are unlikely to force many people to make a residential readjustment, for those who decide to move or for new purchasers of homes in Sydney, petrol prices will loom large in their decision making process.

The final question in the survey attempted to ascertain whether the effects that a future price of 60 cents per litre would have on households were regarded by those households as representing a major and welcome change in their life style. Approximately one in five households believed the effects of future fuel price rises would have a major change in their lifestyles. For such households, there may be considerable social and economic adjustments to changed activity patterns and household behaviour. The sociological implications of such adjustment will need to be assessed. Eight percent of the sample considered such changes and effects on their household as welcome. It could be argued that for this group the car has been somewhat of a necessary evil and that their physical (and possibly social) well-being will benefit from economically enforced lesser use and reliance on the car.

CONCLUSION

It needs to be reiterated that this paper represents a pilot study and therefore, that the survey findings should be treated with caution. Nevertheless, results provided here can be regarded as instructive, informative and indica-

tive. Not only are more surveys required from Sydney, but there is an important need to widen the sample to other metropolitan centres, and also to rural Australia where we suspect effects of fuel price rises may be more far reaching. We would argue that studies at two scales are necessary. First we must isolate those effects most likely to eventuate from rising oil prices and those types of households most vulnerable to such prices. Having isolated the most likely consequences, research needs to be undertaken on the implications of such developments and appropriate policy formulated by the relevant government department. For example, car oriented tourism appears likely to suffer notably from higher fuel prices. The effects of such a decline on facility operators and more particularly on communities dependent on tourism must be appreciated and planned for. Similarly, the likely growth in public transport usage by area must be established and catered for by the Urban Transit Authority

The majority of households appear unaffected by fuel price rises so far. Discretionary trips have been most affected, particularly trips of a social and recreational nature. Large households have been more affected than smaller. No simple relationship exists with locality, but those areas showing most concern are Miranda, Carlingford and St. Mary's. The former two areas lie in somewhat marginal political electorates and the rises in fuel prices could well have political implications in such areas. If the price of fuel rises to the level projected in this paper, significantly greater numbers of households will be affected though over 40% of households believe they will remain untouched by such rises. Whilst larger households will again be hardest hit by such future rises, it should be stressed that the projected effects will be felt more widely across the metropolitan area. It appears that we will be driving less often and less far, making more multi-purpose trips, walking more (especially children),consuming public transport in far greater quantities, forming car pools and undertaking fewer social and recreational trips. These consequences of higher fuel prices will represent a major change in many households' lifestyle and well being. The implications of these consequences are so far reaching that a far better appreciation of their effects by government authorities must be forthcoming, and similarly much broader and more informative data bases must be made available than that provided here.

BIBLIOGRAPHY

Bannister, H. (1979). "The effect of rising petrol prices on residential and employment markets", Australian Transport Research Forum Proceedings, 5, 509-527.

Holsman, A J., and Adrian, C.J. (1974). "Residential trip frequency: a critical appraisal of the underlying factors." Occasional Paper No.7, School of Geography, University of New South Wales.

Huxtable, E. and Cox, R. (1979). "Energy and public transport - are popular beliefs a myth?" Australian Transport Research Forum Proceedings, 5, 493-508.

Peterson, S. (1979). "Energy myths." Australian Transport Research Forum Proceedings, 5, 458-474.

Roseth, J. (1978). "Sydney with less oil: two scenarios." Royal Australian Planning Institute Journal, 16, No.1, 28-31.

Schou, K. (1979). "Transport energy issues: evaluation of conservation measures." Australian Transport Research Forum Proceedings, 5, 475-493.

Sharpe, R. (1980). "Improving energy efficiency in community land-use-transportation systems." Environment and Planning A, Vol.12, 203-216.

ACKNOWLEDGEMENTS

The authors would like to express their thanks to the students in the School of Geography who assisted in this project.