

ESTIMATING THE POTENTIAL FOR MARKETING
URBAN PUBLIC TRANSPORT

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ABSTRACT:

The paper describes a market research case study which assessed the potential of marketing to control the rate of growth of the Perth urban public transport operating subsidy. Emphasis is on philosophy and methodology. Subjects covered include the collection and use of attitudinal and factual information, market segmentation and possible financial implications. The identification of the work trip and shopping trip target markets is described in more detail. An assessment is made of the size and financial significance of these potential markets and one of the conclusions reached is that a public transport marketing campaign, incorporating substantial media advertising, would be an acceptable and feasible approach to increase passenger revenues.

THE "REAL" PROBLEM

Over the period 1972-3 to 1976-7 the net outlay, from the State Consolidated Revenue Fund, necessary to support the metropolitan Perth public transport (PT) rail, bus and ferry operations increased from \$15.6 million to \$20.2 million, in constant 1977 prices. Amongst others, the Minister for Transport, Treasury, the MTT and the Office of the Director General of Transport have begun to regard the growth rate and magnitude of the PT deficit with increasing concern.

Certainly the mounting deficit could be reduced, or retarded in growth, in the short term by a reduction in services, a reduction in annual capital investment, or an increase in fares. In contrast we believe that the adoption of a marketing orientation (1), in which advertising is only one tool, has the potential to attack the deficit problem in a more positive manner than the above alternative measures. Part of the problem is that an insufficient number of people are using the PT system to produce an acceptable financial result. The process of discovering why there are not enough passengers and then, if practicable, using this information to increase ridership is central to the marketing approach.

One of the major costs of a marketing campaign is that of promotion/advertising - an amount of \$320,000, or about 20% of a \$1.7 million marketing budget, being suggested for a successful PT operation of similar size to that in Perth (Seattle METRO, 1977). In contrast, expenditure to date on PT promotion/advertising in Perth has been relatively small. It was therefore felt that before embarking on a marketing campaign, and committing a relatively large sum, some estimate should be made of the likelihood that the funds so spent would at least be returned in additional PT revenue - that is, of the likelihood of self-liquidation. Of course an effective marketing campaign should yield a return very much greater than its cost. Our desire for self-liquidation is thus a minimum criterion.

Although there are several possible methods which may be used for the assessment of the likely self-liquidation of a marketing campaign only two are practicable (Mitchell, 1977; Longton). One is to relate the historical performance of promotion/advertising to product sales, and then apply this relationship to the proposed sale of a new, but similar, product. Such an approach has been used for some years by marketing people throughout the world, often with reliable

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- 1 Layton (1976) suggests that the three essential elements of a marketing orientation are:
- marketing goals must be specific, measureable, and have a definite time horizon,
 - the efforts of the total system must be directed towards the marketing goals,
 - identified customer needs must be the starting point for product planning.

results. Unfortunately neither the historical data, nor the relationship is readily available for our product (PT) either in Australia or overseas.

The second practicable approach is one where the potential market for the product is defined and analysed in depth. By the application of various criteria, segmented target markets are then identified and are tested for their likely response to marketing campaigns designed around the needs, attitudes, opinions, and demographics of their members. The last stage of this approach compares the estimates of response and marketing expenditure, thus establishing the likely degree of self-liquidation. It was decided that this second approach would be used to estimate the financial outcome of a marketing campaign designed to increase the ridership of public transport in Perth.

The Perth Urban Public Transport Market Research Study was thus undertaken, over the period April 1975 to November 1977, by the Office of the Director General of Transport and R.J. Donovan & Associates with the assistance of the Metropolitan (Perth) Passenger Transport Trust (MTT). This paper describes the methodologies used and some of the results obtained during the study (1).

THE RESEARCH

Three major target market segments were identified for:

- the work trip
- the shopping trip
- the leisure trip

Although all three of these have been studied, more attention was given to the work and shopping trip segments - primarily due to constraints of time and resources. Our quantitative research concerning the leisure trip is not covered in this paper.

However, we believe that this segment may have some potential for increased revenue, and that it should be studied in a similar manner to that of the work and shopping trip segment analysis in this paper.

Since the data which we were seeking was a mixture of qualitative and quantitative, as well as factual and attitudinal, we used a variety of research methodologies. Figure 1 below illustrates the overall structure of the research project as reported in this paper.

1 Full study details are given in Donovan R.J. & Associates (1976) and Wildermuth, H.K. & Bettison, G.E. (1977).

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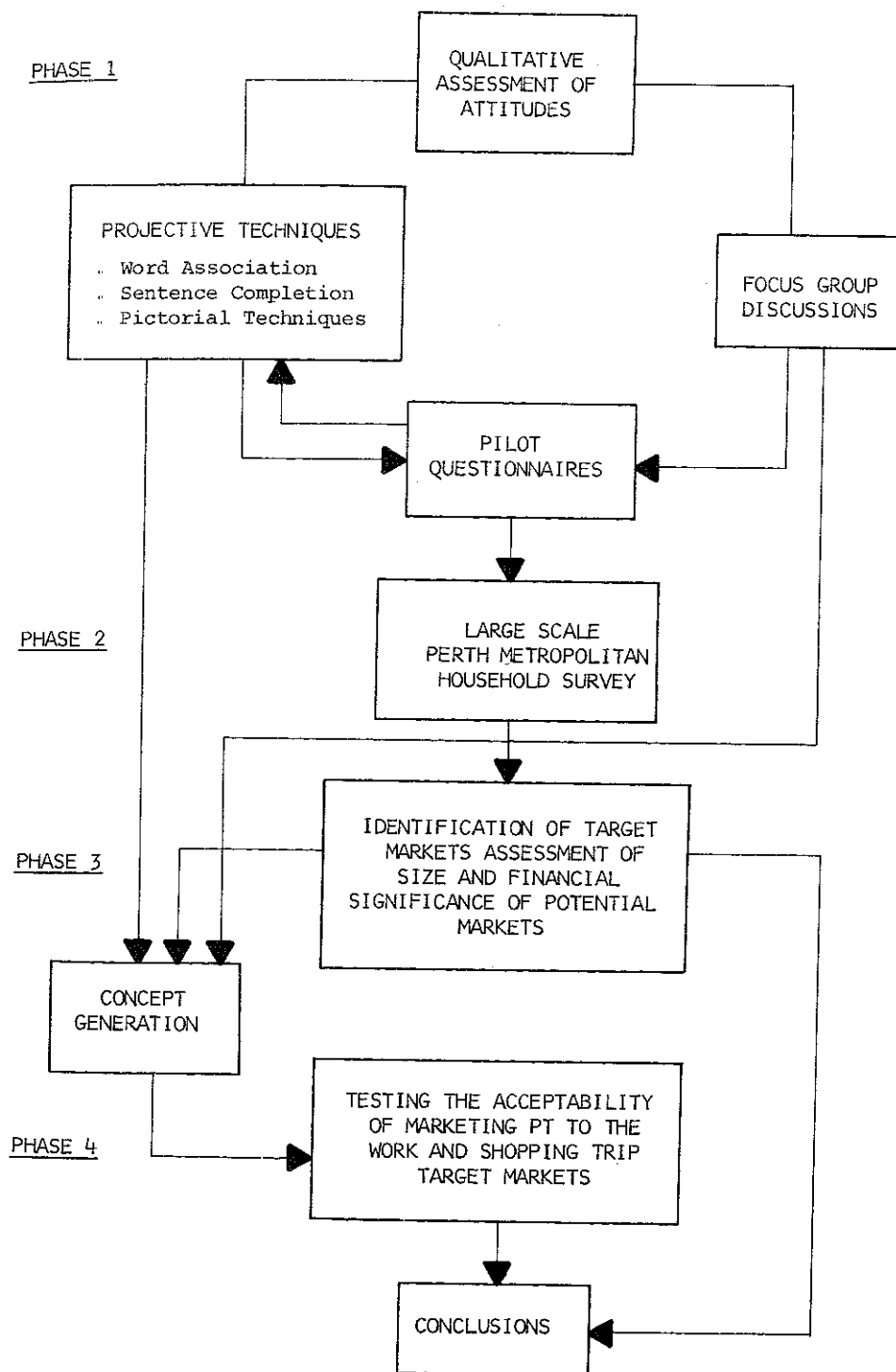


FIGURE 1: RESEARCH PHASES

There were four research phases:

Phase One Phase One consisted of a qualitative study of attitudes, images, opinions and ignorances of PT-users and Non-users about PT.

Phase Two This phase was a household survey of the Perth metropolitan area to provide:

- .. a quantitative estimate of the significance of some of the factors identified in Phase One;
- .. the necessary data for target market identification of persons likely to be attracted to use PT;
- .. sufficient data for an estimation of the size of these likely target markets, and
- .. a description of the demographics of PT-users and Non-users in Perth.

Phase Three This phase consisted of a comprehensive and detailed analysis of the household survey data to determine the size and characteristics of the target markets, and the possible financial self-liquidation of a marketing campaign to attract these target markets to use PT.

Phase Four Phase Four tested various advertising concepts (1) against the potential work trip market to assess:

- .. the acceptability of marketing PT in general to this group; and
- .. the acceptability to this group of several specific concepts promoting PT usage.

Each of these phases is discussed below with the emphasis, for Phases One, Two and Four especially, on the methodology used rather than the results.

QUALITATIVE RESEARCH

The first stage in the data gathering phase of this project was to provide information in its own right for input to the concept development and testing phase, and to provide the basis for construction of the household survey questionnaire.

- Two techniques were used:
- .. focus group discussions, and
 - .. projective techniques.

Projective Techniques

Projective techniques are procedures for *indirectly* measuring people's attitudes and opinions. They are mainly used to assess personality, the most well known test being the Rorschach Inkblot Test.

1 An advertising concept is the abstract idea, theme or promise of an advertisement. For example 'not having to worry about traffic problems' is a concept that could be directed to potential PT users.

The projective techniques used in this study were not complex and involved, as are the projective *personality* tests, but they are based on the same underlying assumption, which is that when people are faced with ambiguous stimuli (or situations), they respond in ways that reflect their personal interpretation, or association with, the stimuli. Thus when presented with a half sentence and asked to complete the sentence, people tend to respond with their own thoughts and feelings about the situation presented in the given half-sentence.

Similarly, they tend to impute their own motives, attitudes, feelings and values to "other people" as in the Thematic Apperception Test (TAT). This test involves presenting people with pictures of people in 'ambiguous' situations. The respondent is asked, "what is going on?" Projective techniques are particularly useful in encouraging freedom and spontaneity of expression, especially when respondents are hesitant to express their opinions directly. For example, in this study all members of all of the focus group discussions denied that public transport had a "lower class" image. However, using the sentence completion test described below, it was evident that a "lower class" image definitely exists in the wider population. That is, the projective technique detected an underlying attitude that people were hesitant to express directly. It was then necessary to develop a structured question that measured this attitude and took account of this hesitancy to respond.

There has been considerable discussion in Psychology as to the validity of projective techniques, especially in the area of personality measurement. However, they have enjoyed considerable 'empirical' success in the field of marketing and advertising (Haire, 1950; Smith, 1954; Robertson & Joselyn, 1974).

Projective Tests Used In this Study

Three projective techniques were used in this study: Word Association, Sentence Completion and Pictorial Techniques.

Word Association: a number of words are presented to the respondents, and they are asked to reply with the first word (thought) that comes into their head. Neutral words are presented along with words representing the attitudes being measured.

Sentence Completion: respondents are presented with a number of sentence beginnings, one by one, and are asked to complete the sentence. Sometimes the items are phrased in the first person, and sometimes in the third person.

Pictorial Techniques: respondents are presented with pictures of people in various situations and asked questions such as, "What is happening here, what are these people feeling, what has led up to this situation, what will happen next?" In this study, respondents were presented with three sketches. Sketch 1 simply presented a 'white collar' male about to enter a factory; Sketch 3 was more focussed and showed a 'white collar' male at a Bus Stop reading a Time Table. Sketches 1 and 2 served primarily as practice but were also designed to measure differential associations with transport for white and blue collar males. Sketch 3 was designed to measure specific associations with Public Transport.

The pictorial technique was particularly useful in describing the anxiety people feel in a bus stop situation and their uncertainty with respect to the reliability of the buses running on time. A common response was that the person was worried about being late, or was an executive of such a standing that he "didn't have to worry about being late".

Some typical responses were as follows:

"I'd say he is a manager of a big store ... he wouldn't be worried because he wouldn't be on a tight timetable."

"A clerical worker waiting for the bus ... he thinks it might be late. If he is late he will be in trouble."

"He is anxious and upset because he may be late for work."

The projective techniques were administered in small scale household surveys prior to and in conjunction with various pilots of the household questionnaire.

Focus Group Discussions

Focus group discussions are a widely used technique in marketing, advertising and consumer research. A focus group consists of 7 or 8 persons appropriate to the topic under discussion who are led in discussion by a group moderator.

Focus groups provide data in their own right but are commonly used as a preliminary to a follow-up quantitative stage.

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For example, a focus group discussion may be used to reveal the *types* of attitudes and opinions that exist, and hypotheses as to how these attitudes and opinions are formed. Appropriate field survey and/or experimental techniques may then be applied to test these hypotheses and determine to *what extent* the various attitudes and opinions exist in the population of interest.

Focus groups are particularly useful in learning the language of the consumer and other aspects of the mechanics of questionnaire development, and also in determining the areas of investigation that should be covered in a questionnaire.

In summary, focus groups provide three main types of data:

- (i) data for hypothesis testing or quantification in other and/or larger samples;
- (ii) data for clinical judgment interpretation of underlying motives and attitudes; and
- (iii) simply descriptive data relating to how people use and talk about the topic under discussion - in this case, PT.

In this research project, focus groups were mainly used to provide data types (a) and (c). They provided the basis for the questionnaire of the household survey, and in conjunction with findings from the projective techniques, they provided much of the basis for the marketing concepts generated for testing against the likely target market.

HOUSEHOLD SURVEY

The Questionnaire

On the basis of the focus group discussion and the projective test results, a questionnaire was constructed and piloted for administration in a household survey.

The questionnaire measured the factors shown in Table 1 below.

The Sample

The household sample was a geographically restricted probability sample of the Perth metropolitan region. The sampling frame was constructed with the assistance of the Australian Bureau of Statistics.

TABLE 1
FACTORS MEASURED IN HOUSEHOLD SURVEY

Trip Behaviour	Knowledge and Awareness of...
<ul style="list-style-type: none"> . Work trip mode choice . Duration of work trip . Variation in work trip mode . Parking at work location . Use of car during work hours . Frequency of shopping trip . Location of shopping . Mode choice for shopping . Variation in shopping mode . Use of PT for leisure trips . Frequency of leisure/personal business trip 	<ul style="list-style-type: none"> . New air-conditioned buses . Normal ticket options . Other ticket options . Information availability . Access to timetables . Resident participation in MTT planning . MTT deficit . Access to PT
Demographics	Attitudes and Opinions
<ul style="list-style-type: none"> . Age . Sex . Marital status . Employment status . Occupation . Place of employment . Normal working hours . Income . Driver's licence . Car access 	<ul style="list-style-type: none"> . Actual and potential advantages of PT for work, shopping, leisure . Reasons for not using PT (more) for work, shopping, leisure . Improvements that might attract increased PT usage . Importance of characteristics of work and shopping trips . Evaluation of car vs PT on work and shopping trip characteristics . Evaluation of MTT characteristics . Endorsement of various statements about PT in Perth

The sampling procedure specified 1232 households. Within each household, the required respondent was defined as the person aged 16 years and over whose birth date fell closest to the interview date. This procedure results in a random selection within each household and partly counters the potential bias of more frequent selection of those who spend more time at home, or are more likely to answer the door. At least three call-backs were made in an attempt to interview the specified individual.

Interviews were obtained at 802 households but for various reasons (incomplete, inconsistencies) 754 were subject to detailed analysis.

TARGET MARKET IDENTIFICATION & FINANCIAL SELF LIQUIDATION

Here we describe in more detail the analysis of the household survey data. Our aim is to identify and assess the size and characteristics of the likely target markets for increased PT usage for the work and shopping trips.

The Work Trip

Defining a Potential Work Trip Market - Keeping in mind the basic aims of our research, viz:

- . to obtain information with respect to the likely contribution of marketing to reducing the MTT deficit in the short-term;
 - . to obtain information indicating the broad areas (trip types), and extent of these areas, which exist for PT marketing; and
 - . to obtain a good indication of the initial promotion budget that can be justified,
- the 417 questionnaires completed by "employed persons" were analysed with the objective of defining a realistic potential PT user market for the work trip, on a region-wide basis.⁽¹⁾ A two-stage filtering process was carried out manually, thus digesting much valuable information which may be lost with a computerised process.

In the first filtering stage, apart from existing PT users, persons were eliminated from the potential market:

- . if their work place varies regularly (e.g. contractors) - In addition, such people generally carry tools etc. for which public transport in Perth presently is unsuitable.
- . if they travel to work as car passengers - These persons (in many cases the spouse of the driver) must, at present, be regarded as non-potential PT users. In Perth, in the absence of public transport priority measures of any significance (i.e. to car users), there is no incentive for car passengers to switch mode.
- . if their trip to work would take more than 30 minutes longer by PT - This excess travel time constraint was set on the basis of a recent attitude survey which indicated that a 20 to 25 minute travel time saving would be valued by commuters at approximately 40 cents (Wildermuth 1976). With an appropriate marketing campaign it should be possible, we feel, to balance such a "deficit", especially for those who presently pay for parking. The manual analysis of the questionnaires allowed us to interpret more readily whether the stated excess time was a true indication of the prevailing situation rather than a perception due to lack of awareness.

¹ Once the feasibility of marketing PT has been established, the usefulness of a region-wide analysis is possibly limited if the data collected suggests that extensive service alterations may be desirable. In that case, a more detailed market segmentation is called for, specifically with regard to locational characteristics.

- . if they have the use of a company car to travel to work - The availability of a company car generally includes a free "in-house" parking space and, more often than not, implies that the person concerned uses the car during working hours.
- . if they use their car during the day more than once a week for work or once a day or more for personal purposes - For salesmen, real estate agents, and others who need to travel as part of their job, public transport is no real alternative. Also, a number of respondents use their car frequently for personal purposes during the day, especially when their place of employment is located in areas where no shopping and other facilities are within walking distance.
- . if they could not use PT for any other valid reasons - e.g. if they either live or work in areas where no PT service is available, start or finish working hours when services do not operate, or cannot use public transport because of a physical handicap.

The first stage filtering process, according to the criteria described above, indicated 10% of the workforce as being potential PT users for the work trip.

In a second filtering stage the remaining respondents were divided into two groups, the so called short-term and long-term potential market. The allocation to either of the two groups was based on the firmness of the negative attitudes toward public transport as expressed during the interview and/or the degree of disbenefits that would have to be traded off against presently unperceived benefits as a result of a switch to public transport.

The short-term potential market includes those respondents who possibly could be reached with a marketing campaign over, say, 6 to 12 months. It is the characteristics and size of this market which would be of immediate concern to the MTT.

On the other hand, the long-term potential market may be tapped only after a persistent campaign over a longer period of time, say three years. This market would include respondents who indicated, mainly because of strong negative attitudes, that no improvements to public transport would make them use such services.⁽¹⁾

1 During the "conversion" time of possibly several years the relevant characteristics of the long-term market may change, perhaps markedly. We are therefore dealing with a somewhat unstable base and consequently should not attach too much weight to this potential market.

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The second stage filtering process suggested that 6% of the total workforce could fall into the short-term potential transit market, with the remaining 4% falling into the long-term potential market for the work trip.

Some Characteristics of the Potential Work Trip Market - In analysing the sex and age distribution of potential PT users, it is not surprising to find that a larger proportion of potential users are males since they represent almost two-thirds of the total workforce. In addition, a larger proportion of females than males are already using public transport at present. The majority of potential users appear to be in the younger age groups.

Two realizations emerge from a market segmentation by employment status and place of employment:

- (i) the limited role the public transport operation can presently play in moving tertiary students, and
- (ii) the limited potential for increased transit usage to work destinations outside the Perth Central Business District (CBD). With the educational institutions located outside the CBD, the two features are to some extent related though the student's non-use of public transport is also caused by fluctuating lecture times. (1)

For reasons outlined earlier, car passengers are not regarded as potential transit users. On the other hand, car pool participants are considered if they pay for parking. While driving, car poolers deny usage of the car to other family members. For those respondents with free access to a motor car and free parking, only well prepared and persuasive media advertising will have any chance of success.

For the calculation of likely revenues from the potential user market, consideration also has to be given to the fact that some of these potential public transport users will probably continue to use the car for some days of the week, and that some are already using public transport occasionally.

¹ Recent surveys showed that 5% only of tertiary students presently use public transport for the trip to "work". On the other hand, 39% of employed persons are reported to use public transport for their work trip to the CBD, and 9% use public transport if their work place is outside the Perth CBD.

The main reasons given for not using public transport at present are summarized in Table 2. For the short-term potential market, most of the reasons are attitudinal in nature (e.g. prefer to drive) or due to lack of awareness (e.g. infrequent during peak periods, cheaper by car, take too long because unaware of freeway services). Other reasons given, when analysed more closely, are not very convincing. For example, a "have to transfer" answer was given by a person who has to transfer at a suburban transfer station and board an express bus. However, when asked how public transport could be improved to increase his usage (see Table 3) the reply was not, as expected, related to direct routing but to seat availability.⁽¹⁾

Table 3 shows that almost half of the short-term potential users stated that in-vehicle travel time reductions (e.g. express buses) were necessary to make them use public transport more frequently. While such improvements may not be achievable in the short-term through marketing, the public needs to be educated that excess travel time has to be weighed against monetary cost savings and other advantages of using public transport, i.e. the travel mode decision should be based on a generalized cost concept and not on travel time advantages alone. Some 83% of the respondents who referred to travel time reductions pay a parking fee at present.

With regard to replies to the question of advantages of using public transport rather than the car for the work trip, an interesting observation is that it is likely that 'cheaper' is a stereotyped response with many people not really being sure that it is cheaper. Many responses were in fact like, 'cheaper (pause), I suppose'.

One of the difficulties transit operators face of competing on even terms with the motor car is the fact that perceived car operating costs are considerably less than actual costs while perceived transit costs are equal to actual costs, i.e. fares. Commuters need to be educated on this, and other points.

MTT Patronage and Revenues - In the financial year 1976/77, fare revenues from the MTT bus and ferry operation amounted to \$14.27 million from 55.9 million passenger boardings. (A journey where one transfer is involved would account for two passenger boardings). Included in these revenues is \$3.87 million reimbursement from Government for concessions given to scholars, pensioners, and the handicapped. The approximate annual patronage and revenues are given in Table 4.

1 Although it could be argued that transferring introduces added uncertainty with respect to getting a seat for the whole journey.

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TABLE 2
MAIN REASON FOR NOT USING PUBLIC TRANSPORT

Main Reason	Short-term Potential	Long-term Potential
Infrequent	20%	-
Take too long	12%	47%
Too long walk	12%	6%
Unreliable	4%	-
No seat available	4%	6%
Uncomfortable	4%	-
Cheaper by car	8%	12%
Use car after work	4%	6%
Car available if needed	-	6%
Have to transfer	4%	-
Prefer to drive	24%	18%
No reason given	4%	-
TOTAL	100%	100%

TABLE 3
HOW P.T. COULD BE IMPROVED TO INCREASE
PERSONAL USAGE FOR WORK TRIPS

Improvement	Short-term Potential	Long-term Potential
In-vehicle travel time reduction	48%	12%
Improved frequency	28%	6%
Improved reliability	8%	6%
More comfort/seats	12%	-
Direct route/better city circulation	-	12%
Radio/Music	-	6%
Cheaper fares	4%	-
Would not use anyway	-	59%
TOTAL	100%	100%

TABLE 4
ESTIMATED MTT BUS PATRONAGE AND REVENUES - 1976/77

Type	Journeys (million)	Boardings (million)	(%)	Revenues (\$ million)	(%)
Work (incl. tertiary students) by full fare paying adults	14.6	17.2	30.8	5.11	35.8
Shopping by full fare paying adults	8.2	8.6	15.4	1.91	13.4
Leisure by full fare paying adults	2.7	2.8	5.0	0.76	5.3
Pensioners, Handicapped	n/a	9.0	16.1	3.52	24.7
Children (not incl. school trips)	n/a	4.7	8.4	0.61	4.3
School trips	11.8	13.6	24.3	2.36	16.5
TOTAL	n/a	55.9	100.0	14.27	100.0

The above table highlights the different role of the MTT as compared with the traditional view held of public transport. In other cities stress is often placed upon public transport providing an alternative means of transport for those with access to a car, particularly for central city oriented work journeys. In Perth this is a minor and presently declining role. MTT's primary role is to provide a basic means of getting around for those without access to a car, especially the old and the young.

Potential Work Trip Revenue Increase -

The main purpose of the following calculations are to indicate the amount of resources which, when assigned to a marketing campaign, would at least be recoverable from the collection of additional revenues. The calculation includes the short-term potential market only since it is not expected that the long-term potential market can be tapped in the initial years of a campaign.

Of the 417 questionnaires representing the total metropolitan workforce, 55 respondents, or 13.2%, are current public transport users. While some of these PT users occasionally travel to or from work by other modes, some of the present non-PT users occasionally catch a bus or train to or from work. Therefore, it can be assumed that 13.2% of the workforce generated an estimated \$5.11 million in revenues in 1976/77.

The respondents constituting the short-term potential market represent 6.0% of the workforce. Thus, on first sight, that market could add \$2.32 million to MTT's revenues. However, a deduction has to be made for the fact that some of these potential users already travel occasionally by public transport and that some would continue to use the car occasionally if transport is required during the day. We calculated that this would decrease potential revenues to \$2.04 million.

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Given that a marketing campaign could persuade 10% of the potential market to switch to public transport, the maximum revenue increase that could be expected from additional work trips therefore is in the order of \$200,000 per annum or 3.9% of work trip revenues. Experiences elsewhere (1) suggest that this is a practically possible increase in sales following a campaign.

We then proceeded to calculate a minimum potential revenue increase. For this calculation we included those respondents only who travel alone in a car, pay for parking, and would have a convenient public transport service available which would add little to their total journey time. Again adopting the 10% success rate of a marketing campaign, the minimum revenue increase that should be achieved is in the order of \$50,000.

The most likely revenue increase from additional public transport work trips, assuming this is midway between the minimum and the maximum potential increase, could amount to approximately \$125,000 per annum with current fares. (This represents an increase in patronage of less than three per cent). Not included in this estimate are the revenues collected from those PT users who in the course of time might have changed to car travel but, because of marketing, could be persuaded to remain as public transport patrons.

Possible Deficit Implications of Additional Peak Period Patronage - Our study suggests that a marketing campaign directed towards daily commuters could increase peak period public transport usage in Perth by approximately three per cent (i.e. by some 400,000 journeys per annum). The possible deficit implications are twofold.

Firstly, the cost structure of public transport in Perth appears to be such that additional peak patronage might aggravate the operating deficit. A new passenger gained through a marketing campaign could result in the loss of a present passenger if, for example, the new passenger prevents the present passenger from obtaining a seat (2). To avoid this situation, the operator

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- 1 An investigation of the response actually achieved by a variety of recent campaigns for other goods and services (including new homes, finance, and leisure products, with media expenditures from \$120,000 to \$200,000) indicated sales increases ranging from 6% to 30%.
 - 2 Several recent consumer preference surveys have shown that the availability of a seat is of utmost importance to public transport users. For example, see Wildermuth (1976) (Chapter 9).

could introduce an additional peak service and may, due to increased frequency, gain some new passengers in addition to those gained through marketing. Although a recent analysis (1) suggested that present peak period operating costs in Perth might be covered by fare revenues, it is unlikely that this is the case at the margin. The main reason for this is the low off-peak patronage which tends to result in buses (and drivers) required during peak periods standing idle during the remaining hours.

Obviously the above problem does not occur if present peak period services operate below seating capacity. This appears to be the case in Perth. A patronage increase of three per cent could therefore be absorbed without inflicting a financial burden on the operator, especially if selective marketing techniques (handbills, local newspapers, local committee etc.) are employed to focus on under-utilised routes. Also, there seems to be a declining trend in peak period patronage. Had it been an increasing trend, marketing could again cause a deterioration in the profit and loss statement since new buses might be required earlier than would be needed otherwise.

Secondly, there could be a negative effect on off-peak patronage, at least in the short-term, if current car commuters are persuaded to use public transport. This potential problem is highlighted by some of the replies given in the survey to the question : "What are the advantages of using public transport rather than the car for the trip to work?". Several respondents answered to the effect that the non-employed members of the family would have access to a car during the day. While this would decrease family pressures to acquire a second car, it would also tend to decrease the use of public transport during the day time off-peak periods. On the other hand, the acquisition of a second car in the longer term, if the employed family member continues to commute by car, may result in even greater losses to the PT operation.

Some Considerations regarding the Work Trip Segment -
During our analysis with regard to potential public transport usage for the journey to work, a number of salient points emerged.

1 Wildermuth (1976) (Chapter 5).

Firstly, the travel mode decision is not necessarily made, as is implicit in most conventional modal choice models, in a rational economic manner by selecting, for every trip, among all available alternatives on the basis of perceived generalized costs. Rather, we found some merit in the "modal pool" concept developed by Lovelock (1975). Lovelock's model postulates that the travel mode is selected from among the modes in the modal pool and that this pool does not necessarily contain all available alternatives. Our analysis of the journey to work would suggest that the attitude towards public transport and the awareness of available services are important factors affecting a person's modal pool content.

Relating the above to public transport marketing, the suggestion made by Godfrey and Affleck (1977) in connection with the modal pool concept is, if valid, of cardinal importance:

"...actions to improve service features may have little effect in attracting people who do not include public transport in their modal pool. Information about such improvements will simply be filtered out in the same way that a non-smoker filters out cigarette advertising."

The implications are that if service improvements are to attract car users at all, a marketing campaign is imperative and that this campaign must initially be designed to change people's attitudes rather than to promote such improvements (though the two may go hand in hand). This, of course, implies that a marketing campaign can be successful in introducing public transport into people's modal pool.

Secondly, the analysis has again highlighted the limited role public transport in Perth can play for the journey to work under the prevailing land use and transport policies. The difficulties of competing on even terms with the motor car are magnified by factors such as the extremely low population density coupled with a well developed road network, the provision of free parking in the CBD for a large section of the CBD workforce, the provision of adequate and by any standard cheap parking for the remainder of the CBD workforce, the lack of bus priority measures of any significance (i.e. to car users), and the disadvantage of the present public transport fare structure as compared with perceived car operating costs.

A further point to realise is the fact that, unlike smoking, there is virtually no potential to increase the frequency of journeys to work, i.e. to increase the number of work journeys per employee. Nevertheless, we feel that a well designed marketing campaign could increase, by conversion of existing car users, peak patronage and revenues sufficiently in the short term to cover at least the cost of a promotion programme while the gradual change of attitudes towards and awareness of public transport should return far greater benefits in the longer term.

At present, the potential for increased public transport work trip usage is clearly limited to central city oriented journeys. Males constitute a larger target market than females though the latter are generally more favourably inclined to public transport.

The Shopping Trip

An individual was defined as a shopper if he or she made a shopping trip to the City Centre or to a suburban centre at a frequency of one a month or more. Shoppers were then classified as PT users if they *mainly* used PT for any of their *regular* shopping trips. As defined, a "PT-user shopper" could be a person who uses PT for city shopping trips but travels exclusively by car, perhaps more frequently, to suburban shopping centres. Thus the definition may include some "PT-users" who through subsequent analysis, may be found to have potential to use PT for a regular shopping trip which they now make by another mode. Whilst the definition thus permits these anomalies it does facilitate the comparison of the mode preferences of a shopper for whom PT is satisfactory for at least one shopping location.

The following four shopping trip market segments were analysed in detail : city and suburban weekday trips, city and suburban Saturday trips - using survey data collated by a standard statistical computer package as well as from examination of original questionnaires. The shopping trip analysis described below follows the sequence shown in Figure 2.

Our starting point was the assertion that "market segments whose main reason for non-use is attitudinal, can be defined as advertising target groups" (Donovan 1976). Given this, a good indication of the size of increase in PT use, which may result from a marketing campaign directed at each of the market segments, may be obtained by eliminating, from the potential PT shopper market, those shoppers for whom there appears to be physical reasons mitigating against increased PT use, at least in the short/medium term. Each of the four market segments were thus subjected to a filtering process, the residues of which being smaller segments consisting only of shoppers whose apparent reasons for not using PT more, or at all, were only negative attitudes.

The filters which were used to eliminate those shoppers who were unlikely to become PT users were as follows:

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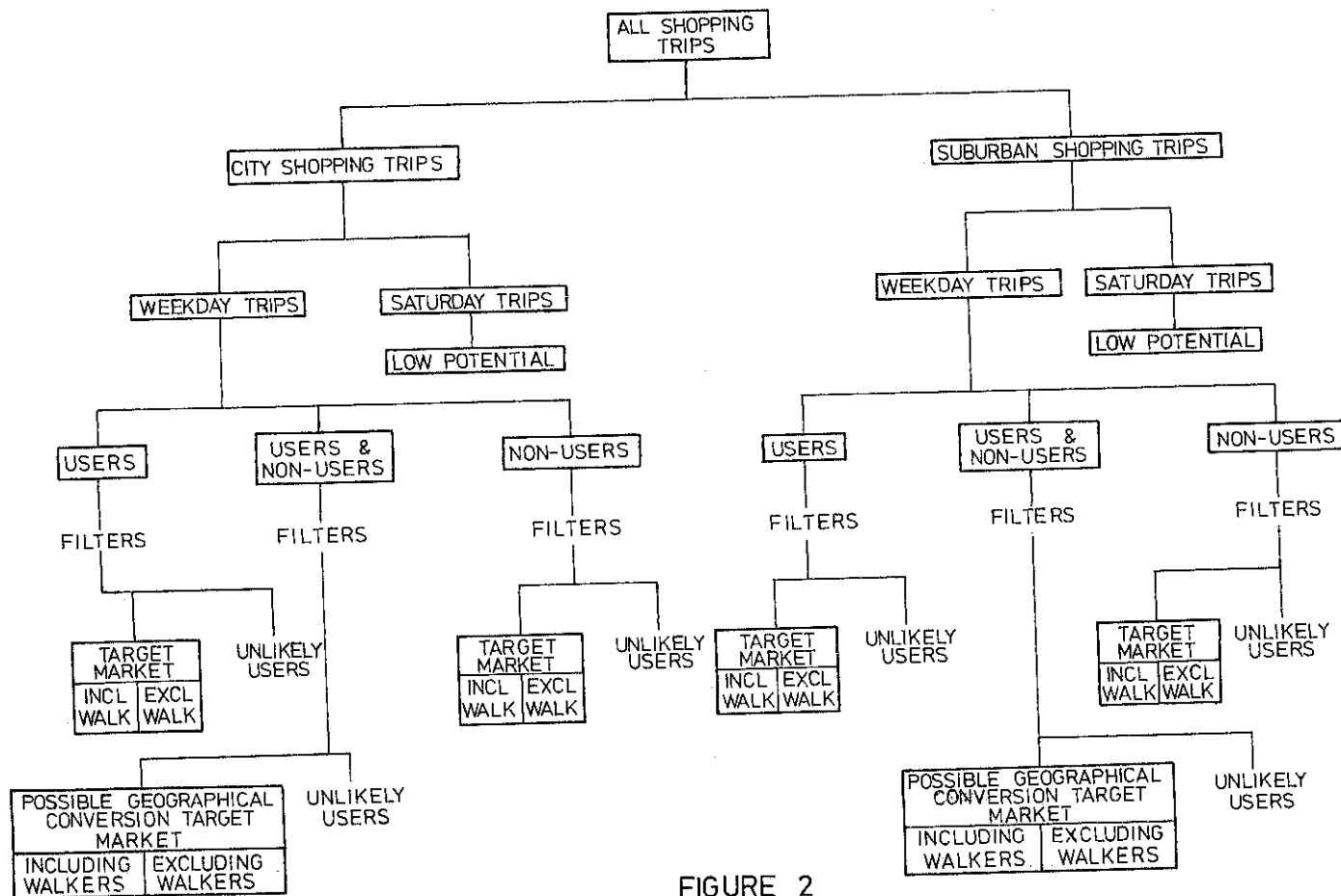


FIGURE 2
SCHEMATIC OF SHOPPING TRIP ANALYSIS

- had a driver's licence and unlimited car access. Whilst unrestricted car use is not a physical barrier to increased PT use, this filter probably represents a very real physical reason for many shoppers not increasing their PT use. If a particularly persuasive marketing campaign were launched, this filter could become less of a physical obstacle and the target markets identified through its use would thus become conservative estimates.
 - where buses did not go to the required suburban centre, or that there were no buses nearby.
 - said that they could not be enticed onto PT, or to use PT more, by physical improvements.
- Although some of the responses to this question may be expressions of very strong, deep down, negative attitudes towards PT it is likely that this filter still represents physical barriers to increased PT use in the short/medium term. Of course exposure to dynamic marketing over a period of years could change some of these attitudes in favour of PT.

The filtering process also provides information about existing shopping travel behaviour, in that it shows the extent to which the factors embraced by the three filters collectively influence the size of the PT market. A deeper analysis could have been conducted applying one filter at a time. However, such an analysis risks implying a greater degree of precision than the study is capable of yielding. Figure 3 below illustrates the overall reductions, in the number of shoppers, which the filtering process produces.

Both the suburban and city examples show that a much greater proportion of Non-users, than PT-users, have non-attitudinal reasons for not using PT more for shopping trips. Further, whilst the proportionate reduction in the suburban and city Non-user segments, due to filtering, was similar, the reduction in suburban PT-users was 1.36 times that for city PT-users. It is quite likely that this result may be attributable to shoppers' perceptions that buses do not go to the required suburban centres.

Table 5 suggests that the Saturday morning shopping trips currently contribute only 8.3% of PT shopping trip revenue - a fact which is recognised by the MTT through the lower frequency of Saturday morning services compared to weekday services. It is also likely that the existing lower Saturday morning service frequencies reinforce the mode preferences of Saturday morning shoppers. Increased PT operating costs and the substantial increase in car availability, which both occur on Saturday mornings, also tend to make the Saturday shopping trip an unlikely area from which additional PT net revenue may be derived in the short/medium term. The Saturday shopping segment thus appears to have little potential as a PT shopper market. On this basis no further analysis of the Saturday segments was conducted.

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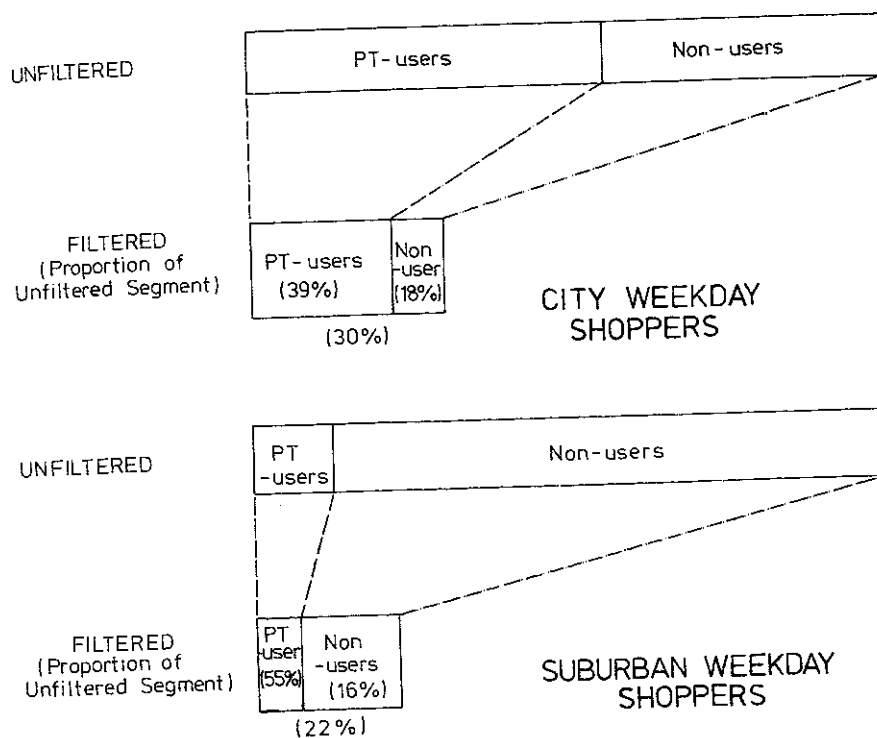


FIGURE 3
REDUCTION IN MARKET SEGMENT SIZE DUE TO FILTERING

TABLE 5
SIGNIFICANCE OF MARKET SEGMENTS

Market Segment	City		Suburban		All Segments
	Weekday	Saturday	Weekday	Saturday	
Proportion of all PT shopping trips made in each market segment	44.6%	3.1%	47.1%	5.2%	100%

The remaining two basic shopping trip market segments which have potential as target markets are the city weekday and suburban weekday segments - each of which has the sub-market segments of PT-users and Non-users. These are discussed below.

City Weekday Segment: Existing Non-users - After taking shoppers' non-attitudinal reasons for not increasing their PT use into account through a filtering process, as described above, the likely increase in weekday shopping trips was calculated by the following ratio:

*Likely response to a marketing campaign,
of shoppers who visit the city on weekdays
at a frequency of once/month or greater.
Existing city weekday shopping trip
patronage.*

That is, assuming a 10% response from the target market, increased patronage = $\frac{10\% \text{ of } 21}{185} = 1.1\% \text{ increase.}$

Since in our case shoppers with non-attitudinal factors inhibiting increased usage have been excluded through filtering, 1.1% may be a conservative estimate (1).

The 1.1% increase in patronage is equivalent to a revenue increase of : (1.1% of 44.6% of \$1.91 mill) p.a.
(Table 5) (Table 4)

... that is, about \$9,000 p.a.

If walking city weekday shoppers are eliminated from the Non-user sub-segment, the increases in city weekday shopping trips estimated above reduce to 0.9% or \$7,000 p.a. (2)

City Weekday Segment: Existing Users - It seems likely that, in the short/medium term, a PT marketing campaign would generate additional shopping trips per se. More realistically, a PT marketing effort does have the potential to increase PT trips at the expense of other modes. Thus the two sub-groups of city PT users from whom additional city shopping patronage may be gained are :

- . PT-users who, although they mainly use PT for suburban shopping trips, use other modes for city trips. Since 95% of existing PT-users travel to the city by PT only a small, if any, number of PT converts could be derived from this sub-group.
- . those PT-users who make most of their city shopping trips by PT, but some city shopping trips by other modes. The survey data does not allow quantification of this sub-group. However,

- 1 This would be particularly so if a marketing campaign was able to entice those shoppers on board whose survey response was that "no improvements would persuade me to use PT more".
- 2 Although not detailed in this paper, we also estimated the significance of walking shoppers in the suburban weekday and geographical conversion market segments.

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the heavy commitment of city PT-users above tends to indicate that their reasons for using other than PT on some occasions may be quite strong.

The marketing potential of both the above sub-groups is too small to yield any reliable estimate of increased PT trips or revenue.

Suburban Weekday Segment Table 5 above shows that the current significance to PT revenue of the suburban weekday segment is about the same as that of the city weekday segment.

Suburban Weekday Segment: Existing Non-users - Application of the same estimating technique used for the city shopping segments suggests that the filtered suburban weekday segment may yield a 7.5% increase in segment PT trips - being an additional \$68,000 p.a. revenue.

Suburban Weekday Segment: Existing Users - If it is assumed that in the short/medium term a PT marketing programme would not generate additional shopping trips per se, additional PT shopping trips may be derived by the mode conversion of:

- those PT-users who make most of their suburban shopping trips by PT, but make some by other modes.
- PT-users who, although they mainly use PT for city shopping, use other modes for suburban shopping.

A similar estimating method to that applied above was used to establish the likely response of each of these sub-markets to an effective marketing campaign.

Geographical Conversion In the above we have described the potential for deriving increased PT revenue from those shoppers travelling to the city and those travelling to suburban centres respectively - without considering any geographical change in shopping trips. In contrast, here we examine the potential for achieving, by marketing, a net increase in PT patronage by persuading some shoppers, who currently do most of their shopping at, say, suburban centres to do more shopping in the city and to do less at suburban centres - or vice versa. Whilst it might be ideally desirable to geographically convert only Non-users, the nature of most marketing methods would make it very difficult to focus this marketing objective only on other suburban shoppers in general. This marketing objective may be termed geographical conversion. Geographical conversion necessarily requires the pursuit of a secondary marketing objective - that of promoting either the city or suburban shopping venues - since, in this case, satisfaction of the increased PT revenue objective requires a change in both mode and shopping preferences.

Clearly, then, geographical conversion can only be applied in one direction - towards either the city, or the suburban centres.

For simplicity, the following estimates of the likely result of the execution of a geographical conversion marketing campaign initially assume that :

- . any effort to increase PT use within the confines of a particular location would not be affected by the geographical conversion campaign. The validity of this assumption depends, in part, upon the natures of the marketing methods used within the confines of a particular location and those used for geographical conversion.
- . the modal preference of geographically converted shoppers, once at their new shopping venue, would be the same as that of all shoppers already using that venue.

Table 6 below summarises the geographical estimates which are calculated in a similar manner to those described earlier. The subjectively derived 10% response to a marketing campaign used in the earlier estimates of mode conversion was taken in this case as the response to the marketing objective of geographical conversion - independent of mode of travel.

TABLE 6
ESTIMATED GEOGRAPHICAL CONVERSION OF SHOPPERS

Conversion Direction	Shopper Market	Increased Patronage %	Increased Revenue \$ p.a.
Suburban-City	Filtered Shoppers	2.8	24,000
City-Suburban	Filtered Shoppers	1.7	15,000

Table 6 indicates that, taken in isolation from other sub-markets, the geographical conversion of the suburban shopper to a city shopper is likely to yield the highest potential revenue increase. However, factors in addition to this potential revenue increase which must be considered before adopting this sub-market as a target market are:

- . marketable properties of city shopping compared to those of the suburban centres.
- . the degree of support for geographical conversion given by interest groups.
- . the comparative risks, for each location, that geographical conversion would be achieved without any mode conversion, or even to the detriment of PT.
- . the likely impact, of a geographical conversion marketing campaign, on the potential for achieving increased PT revenue within the suburban market segment.

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Table 6 suggests that suburban to city geographical conversion may yield up to \$24,000 p.a. In contrast, the suburban segment has the potential to yield an increased revenue of between \$120,000 and \$169,000 p.a. Thus, a geographical conversion campaign should only be proceeded with if:

- the 10% of shoppers assumed to be "captured" by the marketing campaign was likely to be a different 10% to that "captured" by a mode conversion campaign within the suburban segment. It is quite likely that this condition could be met since there are about 73% more suburban shoppers than city shoppers, and PT's present market share of suburban travel is very low (12%); or
- further investigation indicates that the existing PT system (or a low cost revision of it) is not capable of meeting the needs of the suburban segment to the extent necessary to tap this segment's additional revenue potential.

The Target Markets

Financial Self Liquidation: Those market segments which, on the basis of the analysis described above, seem likely to have the potential to respond to a set of special purpose marketing campaigns may be termed the Target Markets, and are summarised in Table 7 below.

TABLE 7
SUMMARY OF ESTIMATED RESPONSE OF SHOPPERS TO MARKETING

SHOPPER MARKET SEGMENT	Range of Likely Response to Marketing Campaign(a)		
	Increased Patronage % (col. not additive)	Market Share Improvement % (Existing Share)	Revenue Increase
CITY			7,000 to 9,000
Non-user	0.9 to 1.1	0.4 to 0.5 (51)	
SUBURBAN			47,000 to 68,000
Non-users	5.2 to 7.5	1.8 to 2.4 (12)	
PT-users	8.1 to 11		73,000 to 101,000
TOTAL : CITY & SUBURBAN	4.0 to 5.6	1.2 to 1.7 (29)	127,000 to 178,000
SUBURBAN to CITY Geographical Conversion			17,000 to 24,000
All shoppers	2.0 to 2.8	0.9 to 1.2	
ALL SEGMENTS	5.4 to 7.6	1.6 to 2.3 (29)	144,000 to 202,000

- (a) The lower limits being the effect which may result from walking shoppers not being attracted onto PT.

Table 7 indicates that if the shopping trip sub-market segments listed were adopted as target markets, an increase of annual PT revenue of between \$144,000 and \$202,000 or between \$127,000 and \$178,000 could result - with and without geographical conversion respectively. Thus, a significant increase in shopping trip revenue could be achieved by marketing.

A likely improvement in PT's market share of city and suburban weekday shopping trips of between 1.2% and 1.7% (without geographical conversion) is indicated by Table 7 - or from 1.6% to 2.3% if geographical conversion is included. In comparison to the experience of a variety of other industries, selling goods and services in a stable market, these gains in PT's market share of around 2% seem to be reasonable estimates (1).

CONCEPT DEVELOPMENT AND TESTING

Phase 3 had as its objective, the assessment of whether an advertising approach to various potential market segments would be effective. It was decided to test several general concepts against the work-force potential market. This was not a test of actual advertisements that would be used in a marketing campaign, but a test of :

- .. whether it was acceptable to the potential target market for PT to be advertised as part of a modern marketing strategy; and
- .. whether the concepts expressed in mock advertisements were acceptable concepts to the target market.

The logical next step, which was outside the domain of this research, would be to test various *executions* of the concepts and to design the most effective actual advertising copy.

For purposes of clarification, a *concept* is an abstract idea, theme or promise (e.g. PT offers freedom from traffic worries). The *execution* of a concept is advertisement, along with whatever visual and auditory communications constitute the advertisement. For example the following are two different simple verbal executions of the 'freedom from traffic worries' concept :

1 In a recent study of 600 major businesses in the US looking at their performance over the years 1970-72, it was noteworthy that only 20% were able to achieve gains in market share of 2% or more. (Layton, 1976).

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- " When you relax in air-conditioned comfort, why should you suffer the heat and hassles of rush hour driving, and
- " Why not leave the car at home weekdays, relax and let the MTT bus driver worry about the traffic."

Method

On the basis of data derived from the previous three phases of the project, an advertising agency was asked to develop several concepts that might be used to attract the work trip potential target market.

The concepts were initially tested against target market persons (essentially Non-users whose reasons for non-use of PT were attitudinal only) in focus group discussion to allow intensive probing of why certain concepts were not acceptable, and why others were acceptable.

On the basis of these focus group discussions, several concept executions were modified and several further concepts were developed.

Using a semi-structured questionnaire, these new and modified concepts were tested against a household sample of 150 target market persons.

Phase Four clearly showed that an advertising approach would be acceptable to the target market - not one person in Phase Four thought it absurd, unbelievable or inappropriate to promote Public Transport.

Generally the concept executions found to be most acceptable were those relating to the opportunity to relax, freedom from parking problems and freedom from the hassles of peak hour driving. These form a general concept of freedom from the various stresses and strains of driving.

Concepts relating to low cost, reliability, and time saving were generally unacceptable because they were perceived to be not credible.

CONCLUSIONS

The basic conclusions reached are:

- " A marketing campaign incorporating substantial media advertising of selected concepts could attract increased PT usage amongst the target market groups;

- . It is likely that a significant and carefully designed marketing campaign aimed at reducing, or minimising increases in, the Perth public transport deficit would self liquidate.
- . It is likely that marketing campaigns specially designed for target markets within each of the work trip and shopping trip segments would yield increased revenues of :
 - Work Trip - between \$50,000 and \$200,000 p.a.
 - Shopping Trip - between \$144,000 and \$202,000 p.a.
- ... totalling between \$194,000 and \$402,000 p.a.
- . a "minimum" marketing campaign focused on the target markets in the work and shopping trip segments, with a budget of \$194,000 would be very likely to self-liquidate.

A larger campaign, with a maximum expenditure of \$402,000 p.a. may also self-liquidate - although with less reliability of doing so than the "minimum" campaign. This \$194,000 to \$402,000 annual expenditure range, primarily for promotion and advertising, is of a similar order to that budgeted for by METRO in Seattle(1) - it is certainly much less than METRO's total 1977 marketing budget of \$1.69 million (Seattle METRO, 1977).

As with most forecasts, particularly those made for the first time, the accuracy of the additional revenue estimates may only be assessed after the target market campaigns are implemented. A careful monitoring of the response to these campaigns would provide basic data which may be used to improve the reliability of the response which may be expected from subsequent proposed marketing efforts.

Advertising, the nature and quality of the PT service, and pricing, are all essential facets of a marketing campaign. Thus, in order that the effectiveness of the campaigns be maximised, all facets must be tailored to the needs and characteristics of the target markets. Further, Aerni and Surti (1974) point out that "there is no reason why transit service that will be used primarily by shoppers needs to be identical to service catering primarily to home-to-work commuters".

1 The Seattle METRO is a bus operation with 645 vehicles and in 1975-6 earned a fare revenue of U.S. \$12 million, with an operating cost of U.S. \$46 million through the carriage of 41.5 million passengers. In contrast, in 1975-6 the Perth MTT operated 814 buses, earned a fare revenue of A\$13 million, cost A\$35 million to operate and carried 59.0 million passengers. (Knox, J.E. 1976; MTT, 1976).

The total cost of a full marketing campaign must include :

- .. advertising development and execution,
- .. PT route and frequency alterations(1), and provision of additional facilities - if necessary to meet the needs of the target markets.

For the purposes of this study, however, we assumed that the most significant cost of a marketing campaign was that for developing and executing the necessary advertising. Of course, whilst acknowledging the existence of the potential non-advertising costs, an effective set of campaigns could be maintained in the short term by selecting only those aspects of the existing PT system which, as shown by identified segment characteristics, already meet the needs of the target markets.

During our study we identified one particular aspect of predictive market research upon which there is a need for more methodological development. As described earlier, it was necessary to conservatively assume that the target market response to a campaign would be 10%. We therefore believe that the response, by identified target markets, to all marketing campaigns which may be implemented by Australian urban public transport operators should be closely monitored and analysed for use in designing subsequent campaigns.

1 If identified needs of Non-users suggested that route and/or frequency alterations may attract Non-users onto PT, care would need to be exercised so as not to lose existing passengers.

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