TRAFFIC AUTHORITY OF NEW SOUTH WALES

LAND USE TRAFFIC GENERATION

DATA AND ANALYSIS 10

CAR ACCESSORIES TYRES

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CAR ACCESSORIES, TYRES —

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COMMISSION.

DATE: MARCH 1980

I.S.B.N. 0 7240 4781 6

Foreword

This report documents the data and analysis at one of a series of studies of traffic generation of particular land use types, conducted by the Traffic Authority of N.S.W. in association with the New South Wales Planning and Environment Commission.

The information contained herein is expected to be of value to developers, councils and interested authorities in assessing the traffic impacts of proposed developments. This report does not represent any policy or standards of either the Traffic Authority or the Planning and Environment Commission. The latter are contained in the Traffic Authority's "Policy and Standards for Traffic Generating Development".

C O N T E N T S

Summary.

The aim of this report is to quantify the traffic generation characteristics of certain types of automotive oriented developments. Car accessories and tyre sales centres were studied. Development of linear regression models was attempted, to enable predictions to be made for proposed new developments.

A complete set of models was not able to be developed. Where necessary, comparison of a proposed new development with a similar one surveyed in this report will give an appreciation of the probable traffic characteristics of the new development.

Where the models are used, their use should take into consideration their accuracy and the ranges for which they are applicable.

Table (i) lists the models developed. The accuracy of each equation is represented by the "fit" or R^2. (An R^2 of 0.90 means that 90% of the variation in the dependent variable - specific impact being predicted - is explained by the independent variable).

Table (i) *CAR ACCESSORIES, TYRES, MODEL*

SPECIFIC IMPACT	APPLICABILITY	INDEPENDENT VARIABLES USED FOR PREDICTION	EQUATION	R2	RANGE/OR INDEPENDENT VARIABLE
Average Vehicle Trips, AVT	Tyre sites	Road frontage, F (M)	AVT = 3+.28F	.86	10 - 42
Average Vehicle Trips, AVT	Tyre sites	Road frontage, F (M) Employees, E	AVT = 2+.23F +.43E	.98	F : 10 - 42 E : 4 - 13
Peak Parking accumulation PPA	All sites	Area of site, A_S (M^2)	PPA = .007A_S	.76 *	400 - 2330
Peak Parking Accumulation PPA	Tyre sites	Area of site, A_S (M^2)	PPA = 2+.006A_S	.89	750 - 2330

* Marginally significant

1. INTRODUCTION

The aim of this report is to quantify the traffic generation characteristics of motor vehicle tyres and accessories types of development. This report presents the results of the surveys conducted together with an analysis of the base data. The surveys gathered information on the following important factors:

- the peak vehicular flows generated by the developments and the time of day at which these peaks occur;
- the parking provision necessary if the parking demand is to be met without constraint.

This bulletin is one of a series of bulletins on individual land uses and is supplementary to the Traffic Authority publication titled "POLICY AND STANDARDS FOR TRAFFIC GENERATING DEVELOPMENT", which gives generalised advice on development policies, parking requirements and site access geometric standards. This report on the other hand provides a better numerical basis for the estimation of traffic generation than the above. An analysis has been attempted using multiple linear regression techniques. These results must be used with caution, taking due consideration of the stated accuracy of the models and the ranges over which each are applicable. In situations where a proposed development has very similar characteristics and location to one of the survey sites, a direct comparison of the developments might prove more accurate than an application of the analysis models. As the analysis turned out, this report can only generally be used by the latter approach, since adequate models were not able to be developed.

2. SURVEY METHODOLOGY

2.1 Selection of Survey Sites

Ten examples of developments were selected for study. A long list of possible sites was chosen first, from which a short list was produced by considering the following desirable characteristics:

1. On-site parking provision.
2. Fairly recent construction.
3. Ease in isolating the site from other developments, for survey purposes.
4. Availability of data and simplicity of collection.
5. Geographic spread.
6. Half tyre sales/service and half accessories/spares

2.2 Survey Procedure

The data has been collected in two ways. Firstly, from a site inspection and an interview with the site manager from which the number of employees, site descriptions, site layout plans, and site data about areas and dimensions, facilities, entrances and exits and parking availability were obtained. Areas and dimensions were measured up at the site inspection.

As well, counts of people and vehicles were taken on a busy day/ days.

Tyre Service Survey Technique

At each site the surveyors recorded the number of people and vehicles entering and leaving the site within every 15 minute period. People entering the site were divided into two categories; those who arrived in vehicles and those who arrived by other modes, such as public transport, walking, bicycles or of unknown mode. Also, for all vehicles parking on-site a record was kept of the number plate and the time of arrival and departure. By recording number plates and arrival and departure times for all vehicles related to the site, total vehicle generation, parking accumulation and average vehicle length of stay could be calculated. Cars parked on-site at the start and at the finish of the survey were also recorded.

Car Accessories Survey Technique

Two, four hour surveys were conducted on a Friday afternoon and on a Saturday morning at each of the sites.

As well, number plates and arrival and departure times for all vehicles parking on-site were recorded with the car radio sales outlet in Arncliffe being the exception due to the lack of on-site parking.

'Peak Utilisation' is calculated by dividing the Peak Accumulation by the number of parking spaces plus work bays.

'Average Vehicle Occupancy' at tyre sales sites is calculated by adding together total person trips in private vehicle in and out and dividing by total vehicle trips in and out for the period of the survey.

The average vehicle occupancy at car accessories and spares is calculated by dividing the number of people travelling by motor vehicle by the number of car drivers interviewed at the site.

'People travelling by Motor Vehicle' is calculated by dividing the number of people travelling by motor vehicle by the total number of people interviewed or counted.

'Vehicle Length of Stay' is derived from the number plate survey which records number plates and arrival and departure times. The results are grouped into seven time intervals.

'Average Length of Stay' is calculated by dividing the sum of the lengths of stay by the number of vehicles for which this data is available. Data for vehicles which have a 'negative' length of stay (i.e. leave and then return later) is excluded from all calculations dealing with vehicle length of stay.

Summary Table

Table 3.1 summarizes:-

- Site Data
- Trip Generation and Parking Accumulation Results

3. ANALYSIS

3.1 Background

The analysis of the data required the formulation of relationships or models which could be used to both explain observed behaviour and to predict likely reactions to alternative conditions.

Sites were selected to represent average situations. Depending on the demand/supply situation in a given area, other sites could potentially have considerably lower generation rates. The converse is also true. Nevertheless, there is confidence that the results are as applicable to practical situations as any that could have been expected.

In consideration of the relatively small number of sample points, the use of complex statistical methods is not considered appropriate, particularly in view of the intended general use of the results. The emphasis was thus on simpler manipulations based on multiple linear regressions.

The multiple linear regression equation is of the form -

$$Y = a(0) + a(1)x(1) + a(2)x(2) + \ldots + a(k)x(k)$$

where Y is the dependent variable - the particular parameter you wish to predict and x(1) to x(k) are the independent variables used for the prediction. As their name implies, independent variables should ideally have no relationships with each other. Examples of independent variables are site area and number of employees. It is an important point to remember that the equation is only valid within the ranges of values of the independent variables which were used to derive it. Thus although a(0) may be non-zero in a given equation it does not imply that the equation is valid when all the independent variables are zero.

The degree of accuracy of the regression equations is represented by the correlation coefficient, R^2, where

$$R^2 = \frac{A}{B}$$

where

A = variation in Y explained by the combined linear influence of the independent variables.

B = total variation in Y

Thus if the R^2 for an equation is 0.85, then it means that 85% of the variation in the dependent variable can be explained by the independent variables. An R^2 of 1.0 is a perfect fit. An "acceptable" R^2 should generally be greater than 0.80.

In addition to an acceptable R^2, the independent variables must not be highly intercorrelated. If this condition exists then there is no acceptable way of performing a regression analysis with the given set of independent variables.

The equations that are presented satisfy the above conditions, for use in the ranges of independent variables stated.

3.2 Data analysis

Table 3.1 represents a summary of the data at the ten sites. The initial analysis was attempted with all ten sites considered together. Separate analyses of two groups of five sites were also completed.

Independent Variables

- Area of site (M^2), A_S
- Area of building (M^2), A_B
- Main road frontage (M), F
- Employees, E
- Parking supply - on site, PS
- Number of service bays, B
- A.A.D.T. 1977 (on main road), AT

These are the independent variables used to predict the dependent variables. The correlation matrix, which illustrates the degree of relationship between these variables -R- is given below.

CORRELATION, R - 10 Sites.

	A_S	A_B	F	E	PS	B	AT
A_S	1.00						
A_B	.10	1.00					
F	.77	.11	1.00				
E	.09	.74	.29	1.00			
PS	.97	.03	.76	.06	1.00		
B	-.07	-.16	.04	-.38	-.14	1.00	
AT	-.30	-.09	.17	.08	-.25	-.22	1.00

The area of site, A_S, correlates fairly strongly with main road frontage, F, and parking supply, PS. There are also fairly high correlations between area of building, A_B with employees, E and parking supply, PS with main road frontage, F. These variables are thus not independent of each other and therefore cannot be used in the same regression equation.

Table 3.1.

ANALYSIS DATA.

ITEM \ LOCATION	SYMBOL	RYDE	LIVERPOOL	BELMORE	TAREN POINT	PENRITH	BROOKVALE	CHATSWOOD	BURWOOD	ARNCLIFFE	GREENACRE
Activity		Tyres	Tyres	Tyres	Tyres	Tyres	Accessories, spares	Access-ories, spares	Access-ories, spares	Car radios	Race and rally equipment
Area of Site (M^2)	A_S	1,110	1,300	750	1,080	2,330	690	770	480	400	1,050
Area of Building (M^2)	A_B	720	207	180	180	450	320	460	420	400	750
Main Road Frontage (M)	F	37	42	10	36	39	15	25	10	12	25
Employees	E	13	6	4	5	6	9	13	3	4	14
Parking Supply	PS	10	19	3	14	38	6	12	4	0	10
Number of Service Bays	B	5	5	4	3	3	0	0	0	11	0
A.A.D.T. 1977	AT	35,460	59,400	29,500	51,640	16,160	35,760	37,060	48,360	31,250	51,890
Peak Person Trips	PPT	31	42	15	23	27	50	58	30	18	12
Time of Peak Person Trips		11.00am -12.00	12.00-1.00pm	3.30-4.30pm	10.00-11.00am	11.00am -12.00	1.00-2.00pm	1.30-2.30pm	3.30-4.30pm	8.00-9.00am	1.30-2.30pm
Average Person Trips	APT	19	29	9	14	18	38	44	18	8	10
Peak Vehicle Trips	PVT	27	23	11	21	20	28	29	9	N/A	8
Time of Peak Vehicle Trips		12.00-1.00p.m	4.00-5.00pm	3.30-4.30pm	10.00-11.00am	11.00am -12.00	4.00-5.00pm	1.30-2.30pm	1.30-2.30pm	N/A	2.30-4.00pm 4.30-5.30pm
Average Vehicle Trips	AVT	16	15	6	12	13	15	15	4	N/A	5
Peak Parking Accumulation	PPA	7	10	6	10	15	7	9	2	N/A	6
Time of Peak Parking Accumulation		3.00p.m	2.00-4.00pm	5.00pm	10.00am	12.00noon	4.30pm	3.30pm	3.30pm	N/A	3.00pm
Average Length of Stay (minutes)	LS	27	46	13	33	47	12	13	14	N/A	14

Analyses were also made of the sites divided into two groups of five sites: tyre sales sites, other sites. The correlation matrices for each of these two data sets are as follows:-

CORRELATION, R - 5 TYRE SITES

	A_S	A_B	F	E	PS	B	AT
A_S	1.00						
A_B	.29	1.00					
F	.56	.34	1.00				
E	-.01	.92	.39	1.00			
PS	.99	.17	.63	-.09	1.00		
B	-.42	.31	.08	.56	-.44	1.00	
AT	-.49	-.43	.32	-.07	-.35	.39	1.00

There is a high correlation between area of site, A_S and parking supply, PS, illustrating the result of Council parking codes being tied to the area of the site. There is also a high correlation between area of building, A_B and employees, E, illustrating a functional relationship with this very specific land use.

CORRELATION, R - 5 OTHER SITES

	A_S	A_B	F	E	PS	AT
A_S	1.00					
A_B	.77	1.00				
F	.88	.67	1.00			
E	.93	.61	.97	1.00		
PS	.84	.50	.90	.90	1.00	
AT	.54	.72	.25	.24	.38	1.00

N.B. B = 0 for four of the five "other" sites.

There is a high correlation between many of the variables in this data set. In comparison with the tyres data set, the relationship between parking supply and site area is not as strong. Employees are better reflected by site area rather than building area.

Dependent Variables

(i) Peak Person Trips (IN & OUT), PPT

The peak number of person trips made in any hour of the survey.

Seven equations were tested, each with one of the seven "independent" variables. The accuracy of the equations, as represented by the "fit" - the correlation coefficient, R^2 - can be summarised:

10 SITES

PPT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.00	.02	.03	.09	.02	.14	.00

None of the independent variables correlates with PPT.

The data was separated into the two groups of five sites each, the first with the five tyre sales sites and the second with the five "other" sites and the analysis repeated with each of the independent variables.

5 TYRE SITES

PPT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.08	.05	.64	.14	.12	.33	.27

None of these variables is sufficiently accurate by itself as a predictor, nor were acceptable combinations of these variables able to be developed.

5 OTHER SITES

PPT	INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	AT
Fit: R^2	.00	.32	.03	.05	.18	.17

No adequate prediction resulted.

(ii) Time of Peak Person Trips

This varied widely throughout the survey period, from 8.00 a.m. - 9.00 a.m. to 3.30 - 4.30 p.m. Within the five tyre sites, it varied from 10.00 a.m. - 11.00 a.m. to 3.30 - 4.30 p.m. Similarly, no pattern was evident at the other five sites.

(iii) Average Person Trips (IN & OUT), APT

The average number of person trips per hour occurring over the six hour survey period.

As with peak person trips, no acceptable predictors were able to be found. For reference, the correlation tabulations are presented.

10 SITES

APT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.00	.01	.02	.15	.02	.22	.00

5 TYRE SITES

APT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.10	.02	.60	.08	.15	.29	.25

5 OTHER SITES

APT	INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	AT
Fit: R^2	.02	.20	.09	.14	.30	.11

(iv) Peak Vehicle Trips (IN & OUT), PVT

The peak number of vehicle trips made in any hour of the survey.

No acceptable predictors were able to be found for either five site groupings or for ten site grouping. For reference, the correlation tabulations are presented.

10 SITES

PVT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.11	.00	.30	.20	.16	.17	.00

5 TYRE SITES

PVT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.06	.40	.75	.59	.07	.15	.11

5 OTHER SITES

PVT	INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	AT
Fit: R^2	.10	.10	.16	.25	.41	.05

(v) Time of Peak Vehicle Trips

This varied from 10.00 - 11.00 a.m. to 4.30 - 5.30 p.m. Within the tyre sites it varied from 10.00 - 11.00 a.m. to 4.00 - 5.00 p.m. At the other sites it varied from 1.30 - 2.30 p.m. to 4.30 - 5.30 p.m.

(vi) Average Vehicle Trips (IN & OUT), AVT

The average number of vehicle trips per hour occurring over the six hour survey period.

No adequate prediction models were found for the aggregate ten sites. Individually tested, the independent variables gave the following relationships:

10 SITES

AVT		INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	B	AT
Fit:R^2	.22	.00	.46	.18	.26	.11	.00

For the five tyre sites, prediction models were developed:

5 TYRE SITES

AVT	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.14	.34	.86	.47	.16	.15	.09

Main road frontage, F enables AVT to be predicted, by the relationship:

$$AVT = 3 + 0.28\ F \qquad R^2 = 0.86$$

This is applicable for the Range of F of 10 to 42 metres.

Combined with number of employees, E, a better prediction model was developed:

$$AVT = 2 + 0.23\ F + 0.43\ E \qquad R^2 = 0.98$$

This is applicable for the ranges of variables of - F : 10 to 42 metres
E : 4 to 13

The calculation of average vehicle trips allows an appreciation to be gained of the average traffic generation of the development.

With the five other sites, no such relationships could be found. The following relationships were revealed:

5 OTHER SITES

AVT	INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	AT
Fit: R^2	.14	.07	.19	.31	.44	.04

(vii) Peak Parking Accumulation, PPA

The peak number of vehicles parked on site at any time during the survey.

Tested individually against each of the independent variables, the relationships found were:

10 SITES

PPA	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit: R^2	.76	.02	.60	.04	.80	.09	.03

Area of site provides an indication of peak parking accumulation, though it is only marginally acceptable. (A better relationship was found for the tyre sites, but not for the other sites). The relationship is:-

$PPA = 0.007\ A_S$ $\qquad R^2 = 0.76$

The range of A_S for which this is applicable is 400 to 2,330 M^2.

The relationship between peak parking accumulation and parking supply is obvious, indicating an on-site supply/demand relationship. Parking Supply should not be considered a good predictor of peak parking accumulation because of the causal relationship. Area of site in this case is the generator of parking. The parking supply, which has a high correlation with area of site - R = 0.97 - results from area of site through parking codes, and is not the factor responsible for total parking attraction, (i.e. on-site and on-street).

Breaking the sites down into the two groups of five produced a better prediction model for the tyre sites. Tested individually against each of the independent variables, the relationships found were:

5 TYRE SITES

PPA	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit:R^2	.89	.00	.36	.05	.96	.32	.08

$PPA = 2 + .006A_S$ $\qquad R = 0.89$

The range of A_S for which this is applicable is 750 - 2330 m?

At the five other sites, no acceptable relationships were found (Parking supply not considered an acceptable predictor).

5 OTHER SITES

PPA	INDEPENDENT VARIABLES					
	A_S	A_B	F	E	PS	AT
Fit:R^2	.52	.03	.60	.73	.83	.01

(viii) Time of Peak Parking Accumulation

Peak parking accumulation occurred at times ranging from 10.00 a.m. to 5.00 p.m. It generally occurred in the afternoon.

(ix) Average Length of Stay, LS.

The average time spent by vehicles parked on-site, including those being worked on in the service bays (minutes).

Tested individually against each of the independent variables, the relationships found were:

10 SITES

LS	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit:R^2	.73	.03	.77	.01	.73	.00	.01

No acceptable relationships were found.

Breaking the sites down into the two groups of five provides no better relationships. For reference, the relationships found when tested individually against each of the independent variables were:-

5 TYRE SITES

LS	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	B	AT
Fit:R^2	.61	.00	.76	.00	.74	.02	.03

5 OTHER SITES

LS	INDEPENDENT VARIABLES						
	A_S	A_B	F	E	PS	AT	
Fit:R^2	.38	.11	.18	.24	.55	.50	

3.3 Model

Adequate prediction models to cover all traffic aspects of car accessories and tyres developments were not able to be developed. The models which were able to be developed are presented in Table 3.2, together with the ranges of values for which the equations are valid. Note the applicability as determined by the data samples. Three of these - those with a single independent variable - are presented graphically in Graphs 3.1 - 3.3.

Note that the graphs are only valid for the range of independent variable observed. They cannot be extrapolated with confidence. Also shown is the 90% prediction interval, which illustrates the range of variation of the predicted dependent variable at a given value of independent variable. This means that for a given independent variable - for example, site area - the prediction of the dependent variable - for example, peak parking accumulation - will be inside the prediction interval limits in 90% of cases. (This prediction interval should not be confused with the confidence interval. The latter is based on mean values of the data. The confidence interval is always smaller than the prediction interval). For prediction purposes, the value as taken from the equation (or off the line of the equation on the graph), should be used, in the absence of any information indicating that a high or a low estimate would be more appropriate.

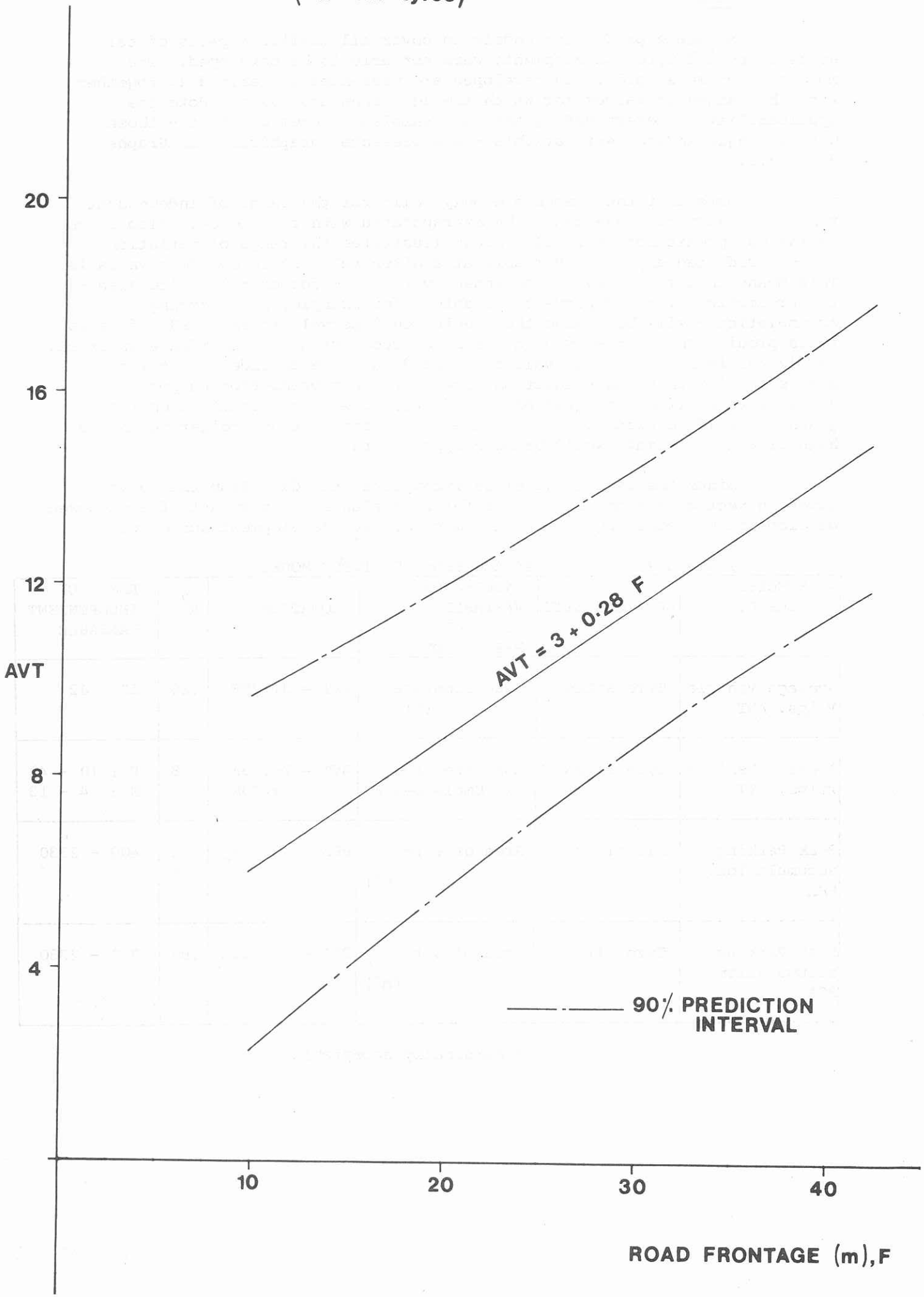
Since the overall model is incomplete, the data from the surveys given in Section 4 might be more useful in evaluating the impact of a proposed development by comparing it with the most similar development surveyed.

Table 3.2 CAR ACCESSORIES, TYRES MODEL

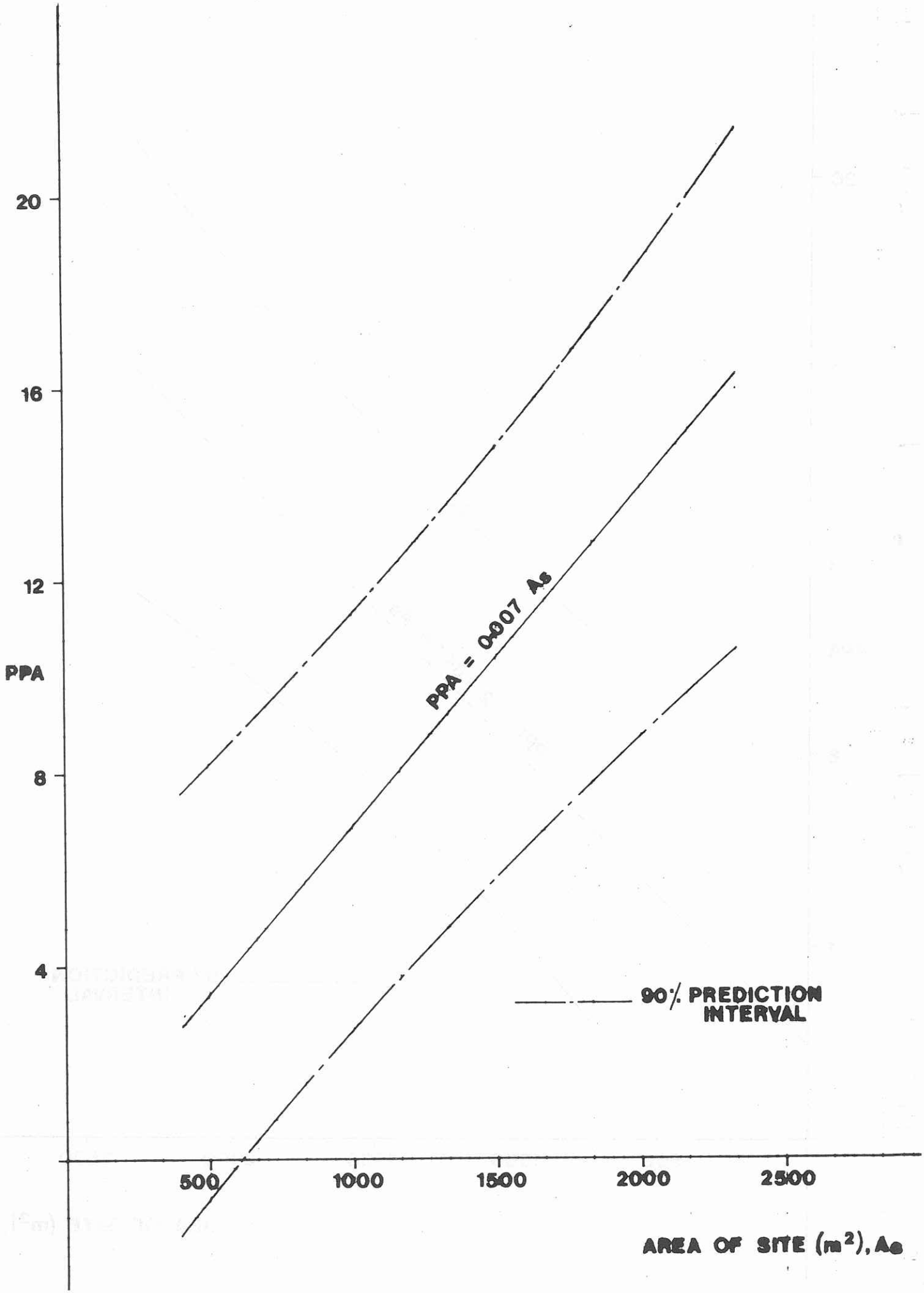
SPECIFIC IMPACT	APPLICABILITY	INDEPENDENT VARIABLES USED FOR PREDICTION	EQUATION	R^2	RANGE OF INDEPENDENT VARIABLE
Average Vehicle Trips, AVT	Tyre sites	Road frontage F (M)	AVT = 3+.28F	.86	10 - 42
Average Vehicle Trips, AVT	Tyre sites	Road frontage F (M) Employees E	AVT = 2+.23F +.43E	.98	F : 10 - 42 E : 4 - 13
Peak Parking accumulation, PPA	All sites	Area of site, A_S (M^2)	PPA = .007 A_S	.76 *	400 - 2330
Peak Parking accumulation PPA	Tyre sites	Area of site, A_S (M^2)	PPA = 2+.006A_S	.89	750 - 2330

* marginally acceptable.

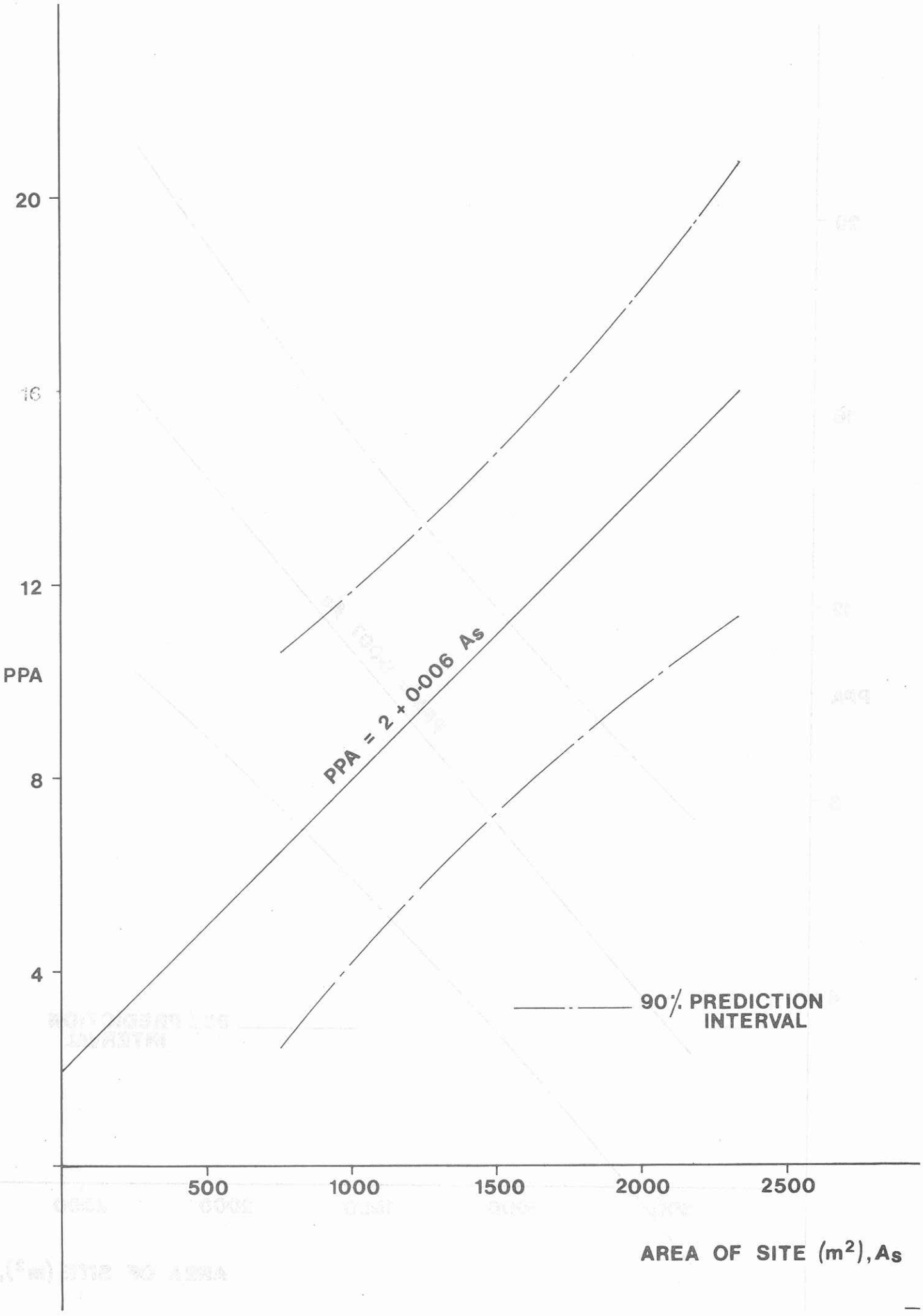
GRAPH 3·1 AVERAGE VEHICLE TRIPS, AVT
(for car tyres)



GRAPH 3·2 PEAK PARKING ACCUMULATION, PPA



GRAPH 3·3 PEAK PARKING ACCUMULATION, PPA
(for car tyres)



4. DATA RESULTS

4.1 Tyre Service - Ryde

General Site Description

The site is located on the southern side of Victoria Road, Ryde, near the intersection of Victoria Road and Lane Cove Road. Adjacent to the site there is a RSL Club and an auto electrician, opposite there is a service station and a church. In the immediate area there is a service station, vehicle spare parts and accessories outlet and another tyre service on the other side of the road. Underneath the building there is machinery for producing retreads which employees three people. There is no on-street parking due to parking restrictions which are in force during business hours.

Date of Survey: Thursday, 15th March, 1979.

Time of Survey: 11.00 a.m. - 5.00 p.m.

Site Data:

Nature of Business	:	Tyre sales & fitting, retread manufacturing
Area of Site	:	1,110m^2
Area of Building	:	720m^2
Frontage to Main Road	:	37m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	5
On-Site Parking Availability	:	10
Off-Site Parking Availability	:	Low
Number of Employees	:	13
AADT. 1977	:	35,460

TYRE SERVICE - RYDE

PERSON GENERATION

TIME	IN PRIVATE VEHICLES IN	IN PRIVATE VEHICLES OUT	OTHER MODES IN	OTHER MODES OUT	TOTAL IN	TOTAL OUT
11.00-11.30	10	12	0	0	10	12
11.30-12.00	3	4	1	1	4	5
12.00-12.30	6	5	0	0	6	5
12.30- 1.00	10	9	0	0	10	9
1.00 - 1.30	5	3	0	0	5	3
1.30 - 2.00	2	2	1	1	3	3
2.00 - 2.30	2	1	1	1	3	2
2.30 - 3.00	5	4	0	0	5	4
3.00 - 3.30	3	7	0	0	3	7
3.30 - 4.00	5	6	0	0	5	6
4.00 - 4.30	1	0	0	0	1	0
4.30 - 5.00	3	2	0	0	3	2
Total	55	55	3	3	58	58
Peak Hour	12.00am 1.00pm	11.00- 12.00am	1.30- 2.30pm	1.30- 2.30pm	12.00am- 1.00pm	11.00- 12.00am
Peak Number	16	16	2	2	16	17
Hourly Average	9	9	1	1	10	10

VEHICLE GENERATION

TIME	IN	OUT
11.00-11.30	8	9
11.30-12.00	3	4
12.00-12.30	5	5
12.30- 1.00	9	8
1.00 - 1.30	5	3
1.30 - 2.00	1	2
2.00 - 2.30	2	1
2.30 - 3.00	5	4
3.00 - 3.30	2	6
3.30 - 4.00	4	5
4.00 - 4.30	1	0
4.30 - 5.00	3	2
Total	48	49
Peak Hour	12.00am-1.00pm 12.30-1.30pm	12.00am-1.00pm
Peak Number	14	13
Hourly Average	8	8

TYRE SERVICE - RYDE

PARKING ACCUMULATION

TIME	VEHICLES
11.00	5
11.30	4
12.00	3
12.30	3
1.00	4
1.30	6
2.00	5
2.30	6
3.00	7
3.30	3
4.00	2
4.30	3
5.00	4
Peak Accumulation	7
Peak Hour	3.00 pm
Peak Utilisation	47%

LENGTH OF STAY

MINS	VEHICLES
0-4	15
5-9	7
10-19	6
20-29	4
30-59	4
60-129	5
120 and over	2
Total	43
Average Length of Stay	27 mins
Vehicle Occupancy	1.13 person/vehicle
Travelling by motor vehicle	95%

4.2 Tyre Service - Liverpool

General Site Description

The site is located on the Hume Highway at Liverpool, south of the main commercial area. The land use adjoining the site along the Highway is mainly commercial with a large component being motor vehicle oriented uses such as car yards, service stations and a motor registry. Behind the site is residential development.

Date of Survey: Wednesday, 7th March, 1979

Time of Survey: 12.00 noon - 6.00 p.m.

Site Data:

Nature of Business	:	Tyre & wheel sales & fitting. Suspension work & wheel alignment.
Area of Site	:	1,300m^2
Area of Building	:	207m^2
Frontage to Roads	:	Hume Highway: 42m Side Road : 31m
Number of Vehicle Entrances	:	1
Number of Fitting & Service Bays	:	5
On-Site Parking Availability	:	19 spaces
Off-Site Parking Availability	:	Medium
Peak Periods	:	Peak day fluctuates Busiest in the afternoon
Number of Employees	:	6
AADT. 1977	:	59,400

TYRE SERVICE - LIVERPOOL

PERSON GENERATION

TIME	IN PRIVATE VEHICLES IN	IN PRIVATE VEHICLES OUT	OTHER MODES IN	OTHER MODES OUT	TOTAL IN	TOTAL OUT
12.00-12.30	9	7	3	4	12	11
12.30- 1.00	6	8	2	3	8	11
1.00 - 1.30	2	3	1	2	3	5
1.30 - 2.00	11	3	1	1	12	4
2.00 - 2.30	0	7	4	4	4	11
2.30 - 3.00	1	1	1	1	2	2
3.00 - 3.30	10	3	2	1	12	4
3.30 - 4.00	8	7	3	1	11	8
4.00 - 4.30	4	9	1	0	5	9
4.30 - 5.00	8	6	3	1	11	7
5.00 - 5.30	2	4	0	1	2	5
5.30 - 6.00	3	7	1	2	4	9
Total	64	65	22	21	86	86
Peak Hour	3.00-4.00pm	3.30-4.30pm	12.00am-1.00pm	12.00am-1.00pm	3.00-4.00pm	12.00am-1.00pm
Peak Number	18	16	5	7	23	22
Hourly Average	11	11	4	4	14	14

VEHICLE GENERATION

TIME	IN	OUT
12.00-12.30	6	5
12.30- 1.00	2	3
1.00 - 1.30	1	2
1.30 - 2.00	7	2
2.00 - 2.30	0	4
2.30 - 3.00	1	1
3.00 - 3.30	6	3
3.30 - 4.00	6	5
4.00 - 4.30	3	7
4.30 - 5.00	7	6
5.00 - 5.30	2	3
5.30 - 6.00	3	6
Total	44	47
Peak Hour	3.00-4.00pm	4.00-5.00pm
Peak Number	12	13
Hourly Average	7	8

TYRE SERVICE - LIVERPOOL

PARKING ACCUMULATION

TIME	VEHICLES
12.00	6
12.30	7
1.00	6
1.30	5
2.00	10
2.30	6
3.00	6
3.30	9
4.00	10
4.30	6
5.00	7
5.30	6
6.00	3
Peak Accumulation	10
Peak Times	2.00pm, 4.00pm
Peak Utilisation	42%

VEHICLE LENGTH OF STAY

MINS	VEHICLES
0-4	10
5-9	6
10-19	5
20-29	1
30-59	5
60-119	0
120 and over	7
Total	34
Average Length of Stay	46 mins.
Vehicle Occupancy	1.42 persons/vehicle
People travelling by motor vehicle	75%

4.3 Tyre Service - Belmore

General Site Description

The site is located on Canterbury Road at Belmore. Adjacent to the site there is a car yard and a boat sales yard, opposite there is a service station. In the immediate area there is a church, three car sales yards and a group of small shops. The development along this section of Canterbury Road is a mixture of residential and motor orientated types of development. Access to the site is possible from the main road as well as from the side street.

Date of Survey: Thursday, 22nd March, 1979.

Time of Survey: 11.00 a.m. - 5.00 p.m.

Site Data:

Nature of Business	:	Tyre sales and fitting
Area of Site	:	$750m^2$
Area of Building	:	$180m^2$
Frontage to Main Road	:	10m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	4
On-Site Parking Availability	:	3 spaces
Off-Site Parking Availability	:	High
Peak Periods	:	9.00 - 11.00 a.m. and 3.00 - 5.00 p.m. Thursday and Friday
Number of Employees	:	4
AADT. 1977	:	29,500

TYRE SERVICE - BELMORE

PERSON GENERATION

TIME	IN PRIVATE VEHICLE IN	IN PRIVATE VEHICLE OUT	OTHER MODES IN	OTHER MODES OUT	TOTAL IN	TOTAL OUT
11.00-11.30	0	0	1	1	1	1
11.30-12.00	4	3	0	0	4	3
12.00-12.30	2	1	0	0	2	1
12.30- 1.00	0	1	0	0	0	1
1.00 - 1.30	3	2	2	0	5	2
1.30 - 2.00	2	2	0	2	2	4
2.00 - 2.30	0	1	0	0	0	1
2.30 - 3.00	2	1	0	0	2	1
3.00 - 3.30	2	1	2	1	4	2
3.30 - 4.00	3	2	0	0	3	2
4.00 - 4.30	3	6	0	1	3	7
4.30 - 5.00	2	0	0	0	2	0
Total	23	20	5	5	28	25
Peak Hour	11.30am-12.30pm 3.30-4.30pm	3.30-4.30pm	2.30 3.30pm	1.00-2.00pm	1.00-2.00pm 3.00-4.00pm	2.30 3.30pm
Peak Hour Number	6	8	2	2	7	9
Hourly Average	4	3	1	1	5	4

VEHICLE GENERATION

TIME	IN	OUT
11.00-11.30	0	0
11.30-12.00	3	3
12.00-12.30	2	1
12.30- 1.00	0	1
1.00 - 1.30	3	1
1.30 - 2.00	2	2
2.00 - 2.30	0	1
2.30 - 3.00	2	1
3.00 - 3.30	2	1
3.30 - 4.00	2	2
4.00 - 4.30	3	4
4.30 - 5.00	2	0
Total	21	17
Peak Hour	3.30-4.30pm	3.30-4.30pm
Peak Hour Number	5	6
Hourly Average	4	3

TYRE SERVICE - BELMORE

PARKING ACCUMULATION

TIME	VEHICLES
11.00	2
11.30	2
12.00	2
12.30	3
1.00	2
1.30	4
2.00	4
2.30	3
3.00	4
3.30	5
4.00	5
4.30	4
5.00	6
Peak Accumulation	6
Peak Time	5.00 pm
Peak Utilisation	86%

VEHICLE LENGTH OF STAY

TIME	VEHICLES
0-4	4
5-9	3
10-19	5
20-29	4
30-59	-
60-119	-
120 and over	-
Total	16
Average Length of Stay	13 mins.
Vehicle Occupancy	1.13 persons/vehicle
People travelling by motor vehicles	81%

4.4 Tyre Service - Taren Point

General Site Description

The site is located on Taren Point Road which leads to the Captain Cook Bridge. The land use along the main road is a mixture of industrial and motor vehicle oriented land uses. The surrounding area between Woolooware Bay and the residential area of Sylvania Waters has primarily an industrial character with some other land uses such as a drive-in theatre, a park and Taren Point Hotel. The site occupies a corner location with entrance to a side road only.

Date of Survey: Thursday, 8th March, 1979.

Time of Survey: 8.00 a.m. - 2.00 p.m.

Site Data:

Nature of Business	:	Car wheels & tyre sales & fitting. Suspension work & wheel alignment.
Area of Site	:	1,080m^2
Area of Buildings	:	180m^2
Frontage to Roads	:	Main Road : 36m Side Street : 30m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	3
On-Site Parking Availability	:	14 spaces
Off-Site Parking Availability	:	High
Peak Periods	:	7.30 a.m. - 12.30 p.m., Thursday, Friday or Saturday morning.
Number of Employees	:	5
AADT. 1977	:	51,640

TYRE SERVICE - TAREN POINT

PERSON GENERATION

TIME	IN PRIVATE VEHICLES IN	IN PRIVATE VEHICLES OUT	OTHER MODES IN	OTHER MODES OUT	TOTAL IN	TOTAL OUT
8.00 - 8.30	5	3	0	0	5	3
8.30 - 9.00	3	3	0	0	3	3
9.00 - 9.30	2	1	0	1	2	2
9.30 -10.00	5	2	0	0	5	2
10.00-10.30	5	9	0	0	5	9
10.30-11.00	5	4	0	0	5	4
11.00-11.30	2	3	0	0	2	3
11.30-12.00	0	0	0	0	0	0
12.00-12.30	4	4	0	0	4	4
12.30- 1.00	0	3	1	1	1	4
1.00 - 1.30	3	2	0	0	3	2
1.30 - 2.00	6	5	0	0	6	5
Total	40	39	1	2	41	41
Peak Hour	9.30-10.30am 10.00-11.00am	10.00-11.00am	12.00am-1.00pm	9.00-10.00am 12.00am-1.00pm	9.30-10.30am 10.00-11.00am	10.00-11.00am
Peak Hour Number	10	13	1	1	10	13
Average Hourly	7	7	0	0	7	7

VEHICLE GENERATION

TIME	IN	OUT
8.00 - 8.30	5	3
8.30 - 9.00	2	2
9.00 - 9.30	1	1
9.30 -10.00	5	2
10.00-10.30	5	7
10.30-11.00	5	4
11.00-11.30	1	3
11.30-12.00	0	0
12.00-12.30	4	4
12.30- 1.00	0	3
1.00 - 1.30	3	2
1.30 - 2.00	6	5
Total	37	36
Peak Hour	9.30-10.30am 10.00-11.00am	10.00-11.00am
Peak Hour Number	10	11
Average Hourly	6	6

TYRE SERVICE - TAREN POINT

PARKING ACCUMULATION

TIME	VEHICLES
8.00	5
8.30	7
9.00	7
9.30	7
10.00	10
10.30	8
11.00	9
11.30	7
12.00	7
12.30	7
1.00	4
1.30	5
2.00	6
Peak Accumulation	10
Peak Time	10.00 am
Peak Utilisation	59%

VEHICLE LENGTH OF STAY

MINS	VEHICLES
0-4	11
5-9	3
10-19	6
20-29	3
30-59	5
60-119	2
120 and over	3
Total	33
Average Length of Stay	33 mins.
Vehicle Occupancy	1.08 persons/vehicle
People travelling by motor vehicle	96%

4.5 Tyre Service - Penrith

General Site Description

The site is located at the western end of the Penrith commercial and retail area. A service station adjoins the site on the eastern side and next to the service station is the parking area associated with Penrith Plaza. Opposite the site is a car yard and a group of shops. A windscreen fitting business shares the site and is located at the rear but its influence is separated out in the survey.

Date of Survey: Monday, 19th March, 1979.

Time of Survey: 8.00 a.m. - 2.00 p.m.

Site Data:

Nature of Business	:	Tyre sales & fitting
Area of Site	:	2,330m^2
Area of Building	:	450m^2
Frontage to Main Road	:	39m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	3
On-Site Parking Availability	:	38 spaces
Off-Site Parking Availability	:	Low
Peak Periods	:	8.00 - 10.30 a.m. 12.00 noon - 2.00 p.m. 3.30 - 5.00 p.m. Monday and Friday
Number of Employees	:	6
AADT. 1977	:	16,160

TYRE SERVICE - PENRITH

PERSON GENERATION

TIME	IN PRIVATE VEHICLES IN	IN PRIVATE VEHICLES OUT	OTHER MODES IN	OTHER MODES OUT	TOTAL IN	TOTAL OUT
8.00 - 8.30	4	1	0	1	4	2
8.30 - 9.00	5	5	1	0	6	5
9.00 - 9.30	4	4	2	0	6	3
9.30 -10.00	4	2	0	1	4	3
10.00-10.30	4	3	0	1	4	4
10.30-11.00	3	4	0	0	3	6
11.00-11.30	6	5	3	1	9	5
11.30-12.00	7	5	0	1	7	6
12.00-12.30	5	5	1	1	6	6
12.30- 1.00	3	1	0	1	3	2
1.00 - 1.30	1	1	0	1	1	2
1.30 - 2.00	5	4	1	0	6	4
Total	51	40	8	8	59	48
Peak Hour	11.00-12.00am	11.30-12.30pm	8.30-9.30am 10.30-11.30pm	11.00-12.00am	11.00-12.00am	11.30-12.30am
Peak Hour Number	13	10	3	2	16	12
Average Hourly	9	7	1	1	10	8

VEHICLE GENERATION

TIME	IN	OUT
8.00 - 8.30	2	1
8.30 - 9.00	5	3
9.00 - 9.30	4	4
9.30 -10.00	4	2
10.00-10.30	4	3
10.30-11.00	1	2
11.00-11.30	5	5
11.30-12.00	7	3
12.00-12.30	2	5
12.30- 1.00	3	2
1.00 - 1.30	2	1
1.30 - 2.00	3	3
Total	42	34
Peak Hour	11.00-12.00am	11.00-12.00am
Peak Hour Number	12	8
Average Hourly	7	6

TYRE SERVICE - PENRITH

PARKING ACCUMULATION

TIME	VEHICLES
8.00	6
8.30	7
9.00	9
9.30	9
10.00	11
10.30	12
11.00	11
11.30	11
12.00	15
12.30	12
1.00	13
1.30	14
2.00	14
Peak Accumulation	15
Peak Time	12.00 am
Peak Utilisation	37%

VEHICLE LENGTH OF STAY

MINS	VEHICLES
0-4	0
5-9	8
10-19	6
20-29	2
30-59	5
60-119	3
120 and over	2
Total	26
Average Length of Stay	47 mins.
Vehicle Occupancy	1.20 persons/vehicle
People travelling by motor vehicles	85 %

4.6 Car Accessories and Spares - Brookvale

General Site Description

The site is located on the eastern side of Pittwater Road in Brookvale. The main land use in the vicinity of the store is motor orientated with five car sales yards nearby. There are a number of motor repairs close by as well. Opposite the site is a Leagues Club and a car radio sales outlet. The area in general is used for light industry with a small amount of commercial development along Pittwater Road. The store uses two utilities to make deliveries three times a day on average.

Dates of Survey: Friday, 9th March, 1979
Saturday, 10th March, 1979.

Times of Survey: 1.00 - 5.00 p.m.
8.00 a.m. - 12.00 noon

Site Data:

Nature of Business	:	Vehicle spares, accessories & tools
Area of Site	:	690m^2
Area of Building	:	320m^2
Frontage to Main Road	:	15m
Number of Vehicle Entrances	:	2
Number of Service & Fitting Bays	:	0
On-Site Parking Availability	:	6 spaces
Off-Site Parking Availability	:	Medium
Peak Periods	:	8.00 a.m. - 12.00 noon - Saturdays 9.30 - 11.00 a.m. and 1.00 - 3.00 p.m. - Weekdays.
Number of Employees	:	9
AADT. 1977	:	35,760

CAR SPARES AND ACCESSORIES - BROOKVALE

PERSON GENERATION

FRIDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
1.00 - 1.30	7	2	5	14
1.30 - 2.00	6	2	3	11
2.00 - 2.30	2	0	3	5
2.30 - 3.00	7	1	2	10
3.00 - 3.30	5	0	2	7
3.30 - 4.00	4	0	1	5
4.00 - 4.30	9	2	5	16
4.30 - 5.00	5	1	2	8
Total	45	8	23	76
Peak Hour	4.00-5.00pm	1.00-2.00pm	1.00-2.00	1.00-2.00pm
Peak Hour Number	14	4	8	25
Hourly Average	11	2	6	19

SATURDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.00 - 8.30	4	2	1	7
8.30 - 9.00	13	2	3	18
9.00 - 9.30	11	2	1	14
9.30 -10.00	9	2	2	13
10.00-10.30	9	3	9	21
10.30-11.00	9	2	1	12
11.00-11.30	9	4	1	14
11.30-12.00	3	0	1	4
Total	67	17	19	103
Peak Hour	8.30-9.30am	10.30-11.30am	9.30-10.30am	9.30-10.30am
Peak Hour Number	24	6	11	34
Hourly Average	17	4	5	26

CAR SPARES AND ACCESSORIES - BROOKVALE

ON-SITE VEHICLE GENERATION

TIME	FRIDAY IN	FRIDAY OUT	TIME	SATURDAY IN	SATURDAY OUT
1.00 - 1.30	7	5	8.00 - 8.30	4	1
1.30 - 2.00	8	7	8.30 - 9.00	15	11
2.00 - 2.30	2	5	9.00 - 9.30	10	12
2.30 - 3.00	7	4	9.30 -10.00	9	11
3.00 - 3.30	5	5	10.00-10.30	10	8
3.30 - 4.00	4	5	10.30-11.00	9	10
4.00 - 4.30	9	6	11.00-11.30	12	10
4.30 - 5.00	5	8	11.30-12.00	4	6
Total	47	45		73	69
Peak Hour	1.00-2.00pm	4.00-5.00pm		8.30-9.30am	8.30-9.30am
Peak Hour Number	15	14		25	23
Hourly Average	12	11		18	17

ON-SITE VEHICLE ACCUMULATION

TIME	FRIDAY	TIME	SATURDAY
1.00	2	8.00	0
1.30	4	8.30	3
2.00	5	9.00	7
2.30	2	9.30	5
3.00	5	10.00	3
3.30	5	10.30	5
4.00	4	11.00	4
4.30	7	11.30	6
5.00	4	12.00	4
Peak Hour	4.30pm		9.00am
Peak Accumulation	7		7
Peak Utilisation	117%		117%

CAR SPARES AND ACCESSORIES - BROOKVALE

ON-SITE VEHICLE LENGTH OF STAY

MINS	FRIDAY PM	SATURDAY AM
0 - 4	15	14
5 - 9	13	24
10-19	12	25
20-29	0	1
30-59	3	1
60-119	1	0
120 and over	1	0
Total	45	65
Average Vehicle Length of Stay	12 mins	11 mins
Vehicle Occupancy	1.18 persons/vehicle	1.25 persons/vehicl
People travelling by motor vehicle	70%	82%

4.7 Car Accessories and Spares - Chatswood

General Site Description

The site is located on the eastern side of the Pacific Highway in Chatswood. There is a sales and service centre for stereo equipment on one side of the site and on the other there are two single unit dwellings. Opposite there is a company which produces patterns for dress making. The surrounding development is a mixture of high rise flats, single unit dwellings and commercial type developments which include tyre sales, service stations, hardware stores and a veterinary surgeon.

Dates of Survey: Friday, 9th March, 1979
Saturday, 10th March, 1979.

Times of Survey: 1.00 - 5.00 p.m.
8.00 a.m. - 12.00 noon

Site Data:

Nature of Business	:	Vehicle spares, accessories & tools
Area of Site	:	770m^2
Area of Building	:	460m^2
Frontage to Road	:	25m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	0
On-Site Parking Availability	:	8 customer 4 staff
Off-Site Parking Availability	:	Medium
Number of Employees	:	13
Peak Period	:	8.00 a.m. - 12.00 noon - Saturdays 12.00 noon - 2.00 p.m. - Weekdays
AADT. 1977	:	37,060

CAR SPARES AND ACCESSORIES - CHATSWOOD

PERSON GENERATION

FRIDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
1.00 - 1.30	10	1	1	12
1.30 - 2.00	8	4	1	13
2.00 - 2.30	13	3	0	16
2.30 - 3.00	6	1	0	7
3.00 - 3.30	13	1	1	15
3.30 - 4.00	6	2	0	8
4.00 - 4.30	7	0	1	8
4.30 - 5.00	6	1	0	7
Total	69	13	4	86
Peak Hour	1.30-2.30pm	1.30-2.30pm	1.00-2.00pm	1.30-2.30pm
Peak Hour Number	21	7	2	29
Hourly Average	17	3	1	22

SATURDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.00 - 8.30	9	2	0	11
8.30 - 9.00	12	3	1	16
9.00 - 9.30	14	6	4	24
9.30 -10.00	20	8	3	31
10.00-10.30	23	6	3	32
10.30-11.00	18	4	1	23
11.00-11.30	23	7	2	32
11.30-12.00	20	6	1	27
Total	139	42	15	196
Peak Hour	9.30-10.30am 11.00-12.00am	9.00-10.00am 9.30-10.30am	9.00-10.00am	9.30-10.30am
Peak Hour Number	43	14	7	63
Hourly Average	35	11	4	49

CAR SPARES AND ACCESSORIES - CHATSWOOD

ON-SITE VEHICLE GENERATION

TIME	FRIDAY IN	FRIDAY OUT	TIME	SATURDAY IN	SATURDAY OUT
1.00 - 1.30	3	4	8.00 - 8.30	8	16
1.30 - 2.00	6	3	8.30 - 9.00	10	9
2.00 - 2.30	10	10	9.00 - 9.30	9	7
2.30 - 3.00	3	5	9.30 -10.00	14	11
3.00 - 3.30	9	6	10.00-10.30	10	16
3.30 - 4.00	3	6	10.30-11.00	13	9
4.00 - 4.30	4	4	11.00-11.30	14	15
4.30 - 5.00	6	9	11.30-12.00	17	19
Total	44	47		95	92
Peak Hour	1.30-2.30pm	2.00-3.00pm		11.00-12.00am	11.00-12.00am
Peak Hour Number	16	15		31	34
Hourly Average	11	11		24	23

ON-SITE VEHICLE ACCUMULATION

TIME	FRIDAY	TIME	SATURDAY
1.00	6	8.00	2
1.30	5	8.30	4
2.00	8	9.00	5
2.30	8	9.30	7
3.00	6	10.00	10
3.30	9	10.30	4
4.00	6	11.00	8
4.30	6	11.30	7
5.00	3	12.00	5
Peak Hour	3.30 pm		10.00am
Peak Accumulation	9		10
Peak Utilisation	75%		83%

CAR SPARES AND ACCESSORIES - CHATSWOOD

ON-SITE VEHICLE LENGTH OF STAY

MINS	FRIDAY PM	SATURDAY AM
0 - 4	6	17
5 - 9	16	36
10-19	9	14
20-29	1	1
30-59	0	0
60-119	0	0
120 and over	1	0
Total	33	68

Average Vehicle Length of Stay	13 mins	8 mins
Vehicle Occupancy	1.19 persons/vehicle	1.30 persons/vehicle
Persons travelling by motor vehicle	95%	92%

4.8 Car Accessories and Spares - Burwood

General Site Description

The site is on Parramatta Road near the intersection with Burwood Road, Burwood. The adjoining land use is dominated by car yards, smash repair and motor vehicle accessory businesses. Behind the strip of commercial land use, the land use consists of detached single unit residential dwellings. Parking on Parramatta Road is prohibited outside the site at all times during the day because of the proximity to the Burwood Road intersection.

Dates of Survey: Friday, 9th March, 1979
Saturday, 10th March, 1979

Times of Survey: 1.30 - 5.30 p.m.
8.00 a.m. - 12.00 noon

Site Data:

Nature of Business	:	Car accessory sales. No fitting of spares or accessories at this site.
Area of Site	:	480m^2
Area of Building	:	420m^2
Frontage to Road	:	Parramatta Road: 10m
Number of Vehicle Entrances	:	1 Frontage has mountable kerb
Number of Fitting & Service Bays	:	Nil
On-Site Parking Availability	:	4 spaces
Off-Site Parking Availability	:	Low
Peak Periods	:	9.30 a.m. - 2.30 p.m. - Saturday is the busiest day and the busiest times. During the week business is steady between 9.30 a.m. - 3.30 p.m.
Number of Employees	:	3
AADT. 1977	:	48,360

CAR SPARES AND ACCESSORIES - BURWOOD

PERSON GENERATION

FRIDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
1.30 - 2.00	2	0	1	3
2.00 - 2.30	2	0	0	2
2.30 - 3.00	5	1	0	6
3.00 - 3.30	5	2	1	8
3.30 - 4.00	2	2	0	4
4.00 - 4.30	8	3	0	11
4.30 - 5.00	0	0	0	0
5.00 - 5.30	0	0	0	0
Total	24	8	2	34
Peak Hour	3.30-4.30pm	3.30-4.30pm	2.30-3.30pm	3.30-4.30pm
Peak Number	10	5	1	15
Hourly Average	6	2	1	9

SATURDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.00 - 8.30	3	0	0	3
8.30 - 9.00	4	0	1	5
9.00 - 9.30	5	1	1	7
9.30 -10.00	8	1	0	9
10.00-10.30	14	1	1	16
10.30-11.00	5	2	2	9
11.00-11.30	7	5	2	14
11.30-12.00	4	3	1	8
12.00-12.30				
Total	50	13	8	71
Peak Hour	9.30-10.30am	11.00-12.00am	10.30-11.30am	10.00-11.00 am
Peak Hour Number	22	8	4	25
Hourly Average	11	3	2	16

CAR SPARES AND ACCESSORIES - BURWOOD

ON-SITE VEHICLE GENERATION

TIME	FRIDAY IN	FRIDAY OUT	TIME	SATURDAY IN	SATURDAY OUT
1.30 - 2.00	3	2	8.00 - 8.30	3	2
2.00 - 2.30	2	2	8.30 - 9.00	1	1
2.30 - 3.00	2	2	9.00 - 9.30	1	2
3.00 - 3.30	2	1	9.30 -10.00	4	3
3.30 - 4.00	2	3	10.00-10.30	6	6
4.00 - 4.30	0	1	10.30-11.00	3	3
4.30 - 5.00	0	0	11.00-11.30	1	2
5.00 - 5.30	0	0	11.30-12.00	2	0
Total	11	11		21	19
Peak Hour	1.30-2.30pm	3.00-4.00pm		9.00-10.00am	9.30-10.30am
Peak Hour Number	5	4		10	9
Hourly Average	3	3		5	5

ON-SITE VEHICLE ACCUMULATION

TIME	FRIDAY	TIME	SATURDAY
1.30	0	8.00	1
2.00	1	8.30	2
2.30	1	9.00	2
3.00	1	9.30	1
3.30	2	10.00	2
4.00	1	10.30	2
4.30	0	11.00	2
5.00	0	11.30	1
5.30	0	12.00	3
Peak Hour	3.30 pm		12.00 am
Peak Accumulation	2		3
Peak Utilisation	50%		75%

CAR SPARES AND ACCESSORIES - BURWOOD

ON-SITE VEHICLE LENGTH OF STAY

MINS	FRIDAY PM	SATURDAY AM
0 - 4	0	0
5 - 9	5	12
10-19	4	6
20-29	1	0
30-59	0	0
60-119	1	0
120 and over	0	0
Total	11	18
Average Vehicle Length of Stay	14 mins	7 mins
Vehicle Occupancy	1.33 persons/vehicle	1.26 persons/vehicle
People travelling by motor vehicle	94%	89%

4.9 Car Radio Service - Arncliffe

General Site Description

The site is located on the western side of the Princes Highway, Arncliffe; the surrounding land use is a mixture of commercial and industrial. Smash repair businesses, car sales yards and car accessory sites are represented along the Highway frontage along with small factories and warehouses. Back from the Princes Highway the land use is mainly residential.

Dates of Survey: Friday, 23rd April, 1979
Saturday, 31st April, 1979.

Times of Survey: 8.00 a.m. - 12.00 noon
8.00 a.m. - 12.00 noon

Site Data:

Nature of Business	:	Car radio sales, fitting & repair
Area of Site	:	$400m^2$
Area of Building	:	$400m^2$
Frontage to Main Road	:	12m
Vehicle Entrances	:	1
Number of Fitting & Service Bays	:	11
On-Site Parking Availability	:	Nil besides service bays
Off-Site Parking Availability	:	High
Number of Employees	:	4
AADT 1977	:	31,250

CAR RADIO SALES - ARNCLIFFE

PERSON GENERATION

FRIDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.00 - 8.30	2	0	0	2
8.30 - 9.00	6	1	0	7
9.00 - 9.30	1	0	0	1
9.30 -10.00	0	0	0	0
10.00-10.30	2	1	0	3
10.30-11.00	2	0	0	2
11.00-11.30	0	0	0	0
11.30-12.00	0	0	0	0
Total	13	2	0	15
Peak Hour	8.00-9.00am	8.00-9.00am	N/A	8.00-9.00am
Peak Hour Number	8	1	N/A	9
Hourly Average	3	1	0	4

SATURDAY

TIME	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.00 - 8.30	1	0	0	1
8.30 - 9.00	2	0	0	2
9.00 - 9.30	1	0	0	1
9.30 -10.00	1	0	2	3
10.00-10.30	1	0	0	1
10.30-11.00	1	0	0	1
11.00-11.30	2	0	0	2
11.30-12.00	1	0	0	1
Total	10	0	2	12
Peak Hour	8.30-9.30am	N/A	9.00-10.00am	9.00-10.00am
Peak Hour Number	3	-	2	4
Hourly Average	3	-	1	3

Vehicle Occupancy	Friday	1.15 persons/vehicle
	Saturday	1.00 " "
People travelling by motor vehicle	Friday	100%
	Saturday	83%

4.10 Car Race and Rally Equipment - Greenacre.

General Site Description

The site is situated on a minor road which runs off the Hume Highway at Greenacre near the intersection of the Highway with Rookwood Road. The surrounding land use consists of small industrial and motor vehicle related land uses such as smash repair and auto electrical businesses. The site consists of a two storey building with a warehouse and showroom on the ground floor with offices on the first floor.

Dates of Survey: Friday, 27th April, 1979.
Saturday, 28th April, 1979.

Times of Survey: 1.30 - 5.30 p.m.
8.30 a.m. - 12.30 p.m.

Site Data:

Nature of Business	:	Car Accessory Wholesales. No fitting of parts and spares
Area of Site	:	1,050m^2
Area of Building	:	750m^2
Frontage to Road	:	25m
Number of Vehicle Entrances	:	2
Number of Fitting & Service Bays	:	Nil
On-Site Parking Availability	:	10
Off-Site Parking Availability	:	Low
Number of Employees	:	14
AADT 1977	:	51,890

CAR RACE AND RALLY EQUIPMENT : GREENACRE

PERSON GENERATION

FRIDAY

	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
1.30 - 2.00	5	1	0	6
2.00 - 2.30	0	0	0	0
2.30 - 3.00	3	0	0	3
3.00 - 3.30	2	0	0	2
3.30 - 4.00	3	0	0	3
4.00 - 4.30	1	0	0	1
4.30 - 5.00	3	0	0	3
5.00 - 5.30	2	0	0	2
Total	19	1	0	20
Peak Hour	1.30 - 2.30 2.30 - 3.30 4.30 - 5.30	1.30 - 2.30	N/A	1.30 - 2.30
Peak Number	5	1	N/A	6
Hourly Average	5	0	N/A	5

SATURDAY

	CAR DRIVER	CAR PASSENGER	OTHER	TOTAL
8.30 - 9.00	3	0	0	3
9.00 - 9.30	3	2	0	5
9.30 - 10.00	1	0	0	1
10.00 - 10.30	0	0	0	0
10.30 - 11.00	5	3	0	8
11.00 - 11.30	0	0	0	0
11.30 - 12.00	2	1	0	3
12.00 - 12.30	0	0	0	0
Total	14	6	0	20
Peak Hour	8.30 - 9.30	10.00 - 11.00	N/A	10.00 - 11.00 8.30 - 9.30
Peak Number	6	3	N/A	8
Hourly Average	4	2	N/A	5

CAR RACE AND RALLY EQUIPMENT : GREENACRE

ON-SITE VEHICLE GENERATION

	FRIDAY			SATURDAY	
TIME	IN	OUT	TIME	IN	OUT
1.30 - 2.00	3	3			
2.00 - 2.30	0	1	8.30 - 9.00	3	0
2.30 - 3.00	2	0	9.00 - 9.30	1	1
3.00 - 3.30	2	4	9.30 - 10.00	0	1
3.30 - 4.00	1	1	10.00 - 10.30	0	0
4.00 - 4.30	1	1	10.30 - 11.00	5	4
4.30 - 5.00	2	2	11.00 - 11.30	0	2
5.00 - 5.30	2	2	11.30 - 12.00	0	0
Total	13	14		9	8
Peak Hour	2.30 - 3.30 4.30 - 5.30	3.00 - 4.00 3.00 - 4.00		10.30 - 11.30	10.30-11.30
Peak Number	4	5		5	6
Hourly Average	3	4		2	2

ON-SITE VEHICLE ACCUMULATION

	FRIDAY		SATURDAY
TIME		TIME	
1.30	5	8.30	0
2.00	5	9.00	3
2.30	4	9.30	3
3.00	6	10.00	2
3.30	4	10.30	2
4.00	4	11.00	3
4.30	4	11.30	1
5.00	4	12.00	1
5.30	4		
Peak Time	3.00 pm		9.00, 9.30, 11.00
Peak Accumulation	6		3
Peak Utilisation	60%		30%

CAR RACE AND RALLY EQUIPMENT: GREENACRE

ON-SITE VEHICLE LENGTH OF STAY

MINS	FRIDAY PM	SATURDAY AM
0 - 4	2	1
5 - 9	1	1
10 - 19	3	3
20 - 29	1	2
30 - 59	2	0
60 - 119	0	1
12 and over	0	0
Total	9	8
Average Vehicle Length of Stay	14 mins	26 mins
People Travelling by Motor Vehicle	100%	100%
Vehicle Occupancy	1.05	1.43

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