WORK TRIP LENGTHS WITHIN THE GREATER VANCOUVER REGION

by

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ABSTRACT

The study examines the "Living Close to Work" policy within the Greater Vancouver Region. Specifically it investigates the effects this policy would have on work trip lengths within the region.

A review of relevant literature and empirical research reveals factors which could influence work trip lengths within the Greater Vancouver Region. Among these factors are city size, location of residences and workplaces, and income.

Data for the study were taken from the Vancouver Area Travel Study and the 1971 Canada Census. Data on work trip lengths were obtained from the Vancouver Area Travel Study files and data on labour force:job ratios and average household incomes from the 1971 Census. Regression analysis was used to investigate the relationship between work trip lengths and labour force:job ratios and work trip lengths and average household incomes. A descriptive analysis of work trip length characteristics for downtown and non-downtown employment centers was used to study how travel and job location are related.

The investigation establishes that:

a) people who live in high income subareas of the Lower Mainland travel no less and no more than the population as a whole in going to and from work;

b) mean and median travel times to the suburban centers are shorter than the corresponding figures to the downtown workplaces;

c) between 1965 and 1972 mean work trip distances to non-downtown locations increased faster than the mean work trip distance to the

downtown;

d) areas with high labour force:job ratios tend to have long work trip lengths;

e) average work trip length in Greater Vancouver and the trip length frequency distribution for Greater Vancouver appear quite typical of those for moderate and large cities.

The implications of these conclusions for the "Living Close to Work" policy for the region are worked out.

The study suggests that this policy will not result in a substantial reduction in work trip travel distance. However, there are indications that it will result in worthwhile work trip travel time savings as well as other benefits. An area for further research is suggested and observations made on data requirements for such a study.

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CHAPTER 1

INTRODUCTION AND APPROACH TO THE STUDY

INTRODUCTION

Of all the trip purposes within North American metropolii, work trips tend to be the most significant in terms of volume, length, time spent travelling and obligation. In the Vancouver Region for example, the journey to work is the most significant of all trip purposes. Data in the Vancouver Area Travel Study (VATS) show that this was 30.3% of all trips by purpose (VATS: Preliminary Report, 1974: 37, 38)[1] and was the third largest category of trips following "to home" and recreation trips. Journeys to and from work tend to be long, concentrated in time and concentrated in space. Hence any attempt to tackle the traffic problems in Vancouver must necessarily deal with work trips.

This argument becomes even more evident when the characteristics of work trips are examined in detail. Out of the 3,354 VATS sample total of work trips generated within the region, 2,605 or 77% were home based and out of these home based trips, about 90% took place during the peak hours, that is 7-9 a.m. and 4-6 p.m. A further examination of the peak hour trip characteristics indicates that out of the total sample trips within these periods, 80% were work trips.

Since traffic congestion in cities, including Vancouver, is most severe in peak hour travel conditions, one can easily infer that a reduction in the volume of work trips during the peak hours will also mean a partial solution to the congestion problem. So far, efforts which have been made in trying to solve the problem include: increasing vehicle occupancy rates by car pooling; staggered work hours; flexible

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[1] This figure is made up of both "home to work," "work to home" trips and "on the job" work trips.

work hours, and the diversion or relocation of jobs to the suburbs.

Job relocation to the suburbs is an effort to create a balance between the number of workers and number of jobs in the various local areas of the region. It is hoped that this will lead to less travel.

If these work trip lengths can be reduced then certain advantages will accrue to society. These will be in the form of savings in energy consumption because of shorter trips and less use of congested facilities. Another benefit will be the effect the policy would have on minimizing the expenditures required to provide additional capacity for regional transportation facilities for peak hour use.

The Regional Town Centers Programme and the deflection of jobs to suburban centers will, it is hoped, enable workers to live close to where they work with major advantages to the region as described above. The programme will also give the workers the opportunity to live close to their work, even if they do not use the opportunity.

APPROACH AND METHODOLOGY

In order to examine the "Living Close to Work" policy for Vancouver, this study uses the VATS data and the 1971 Census. VATS included a variety of information, including the location of both trip ends (from which the total work trip lengths could be calculated) and the total travel times. These two variables were correlated in the analysis with average household incomes and labour force:job ratios for groups of census tracts obtained from the 1971 Census of Canada.

Although VATS has several other categories of information it was not well suited to this analysis. This is because the VATS is an

origin-destination survey conducted at one point in time in the Greater Vancouver Region with a one per cent sample. VATS' shortcomings include the fact that it gives a cross-sectional picture of the situation at one point in time and strictly speaking it cannot be used in analyzing the dynamic aspects of policy issues that the thesis attempts to address. This makes it less than ideal for the purposes of this study.

VATS was the second comprehensive transportation survey of the region. The first was conducted during the early fifties and prior to VATS it was the only data base for transportation planning within the region. Accordingly, VATS is the best data available, describing for the 26,700 sample total of all trips within the region, the trip maker and his travel characteristics. These include origin and destination of the trip, trip purpose, total travel time and mode of travel as well as socio-economic characteristics of the traveller.

The study attempts to overcome the difficulties associated with relying on VATS by analyzing the relevant literature and the VATS data base together to address the question instead of just depending on the VATS data alone.

ORGANIZATION OF THE STUDY

A brief and general overview of past relevant theory and empirical research is the subject of Chapter 2. This is an overview of the factors which influence work trip length. It also attempts to relate the relevant factors to the Vancouver Region. This will help identify the factors which could influence work trip lengths within the Vancouver Region.

Chapter 3 is divided into two sections. The first section analyzes

the general trip length distributions for various geographical areas within the Vancouver Region. This information will help establish the general trip making patterns within the region. The second section investigates the relationship between work trip length and the labour force:job ratios for small areas within the region. This will indicate whether or not any relationship exists between work trip length and the labour force:job ratios.

Chapter 4 is also divided into two sections. The first section summarizes the findings of the study. The second section combines the findings of Chapter 3 with the literature and empirical research reviewed in Chapter 2 to assess the effects the "Living Close to Work" policy will have on work trip lengths within the Vancouver Region.

CHAPTER 2

REVIEW OF LITERATURE AND EMPIRICAL RESEARCH

INTRODUCTION

The literature review indicates that there are several factors which could be significantly related to work trip length. These factors include city size, place of residence in relation to place of work and job status or income. The literature offers helpful insights for the Vancouver situation.

However, most of the studies are not conclusive so far as Vancouver is concerned because they relate to large cities. This section of the study will review relevant literature and assess the significance of conclusions drawn from this body of work for the Greater Vancouver Region.

1. CITY SIZE

City size often appears in the literature as a factor that may influence work trip length. It would seem reasonable to expect people in small cities to live closer to work and have shorter work trips than people living in big cities. If this is the case, then it is plausible to analyze data on work trip length vis-a-vis city size in order to determine whether this is in fact true.

Available literature on work trip length in relation to city size presents conflicting views. In 1951, a marked correlation was found between the size of a city and work trip length (A.S.P.O., Information Report #26, 1951). The conclusion of this study was that big cities have longer work trip lengths. However, in 1968, after the areal expansion and development of many cities, Lawton (1968: 22-40) claimed that there were no significant differences in the average work trip lengths for four types of settlements, namely: conurbations, large boroughs, small

towns and rural areas. All four had an average work trip length of 35 minutes duration. Surprisingly, an analysis and comparison of cities of different sizes confirm Lawton's claim. This is true when one uses distance in the measurement of work trip lengths. For example, if one uses distance in the comparison of work trip lengths for Chicago and Vancouver, there is no great difference between the work trip length frequency distributions (see Table 1). Chicago had an average work trip length of 6.72 miles to the downtown area and 5.23 miles to the job centers outside downtown (Taaffe, et al.; 1963: 16). The corresponding figures for Vancouver from the VATS data were 6.11 and 5.8 miles respectively.

Table 2 is the average work trip length data for ten selected Standard Metropolitan Statistical Areas (SMSAs). Figure 1 shows the relationship between the sizes of these SMSAs and their average work trip lengths. The summary statistics and the plot indicate that there is virtually no linear relationship between average work trip length and city size. This supports Lawton's claim that there is no consistent pattern connecting average work trip length and town or city size.

Vancouver's work trip length distribution and average work trip length fall within the range that is typical for cities of substantial population.

This analysis of work trip length and city size has indicated that there is quite a wide spread in the average work trip lengths but this is not clearly related to city size. The newer western cities seem to have longer trips than older, eastern cities and in general they are also less compact.

TABLE 1: COMPARISON OF WORK TRIP LENGTH DISTRIBUTIONS FOR VANCOUVER AND CHICAGO

Trip Length in Miles	Vancouver[1] (1972)	Chicago[2] (1958)
0 - 2	28	26.7
2 - 4	21	20.2
4 - 6	16	15.3
6 - 8	10	14.7
8 - 10	8	7.7
10 - 12	5	5.6
12 - 14	2	3.8
14 - 16	2	2.5
16 - 18	2	0.5
18 - 20	2	1.3
20 and longer	4	1.7
TOTAL	100%	100.0%

1. Source: VATS (1972) - Data Tapes

2. Goodman, W.I. and E.C. Freund, Principles and Practice of Urban Planning. International City Managers' Association, Washington, 1968, p. 142.

3. They are all straight distance measures.

TABLE 2: AVERAGE WORK TRIP LENGTH DATA
SELECTED SMSAs

1970 Pop. Rank	SMSA	Miles	Year of Study
2	Los Angeles (includes Orange and Venture Counties)	8.89	N/A
3	Chicago	6.62	N/A
4	Philadelphia	4.40	1960
6	San Francisco (Nine-county Area)	15.80	1965
7	Washington	7.20	1968
16	Dallas	6.20	1964
17	Seattle	8.55	1970-71
19	Milwaukee	5.11	1963
24	Buffalo	3.70	1962
26	Kansas City	8.07	1970

Source: American Institute of Planners. Motor Vehicle Manufacturers Association of the U.S., Inc., Urban Transportation Factbook Part 1, Where People Live, Where People Work, How People Travel. March, 1974, p. I-19.

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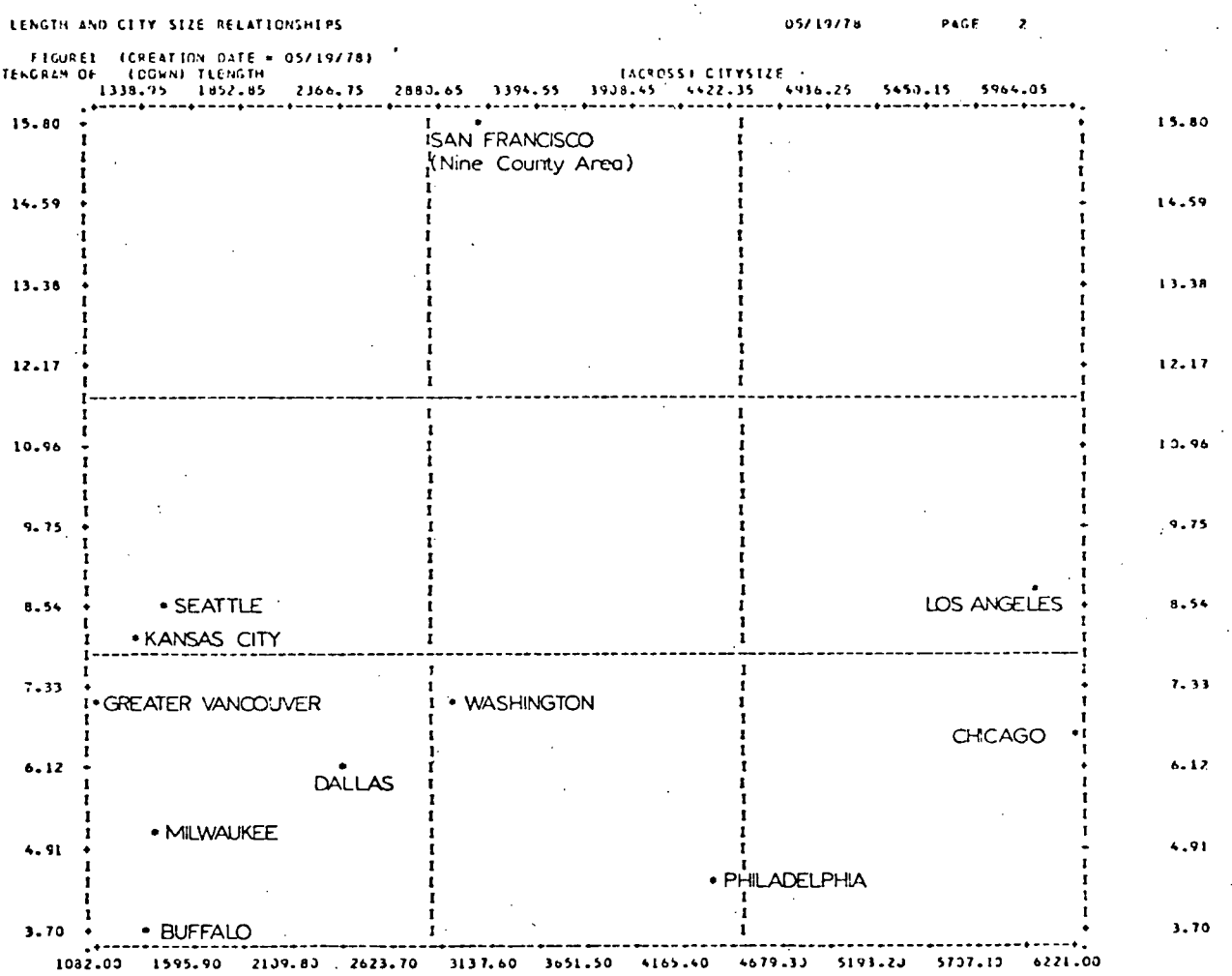
FIGURE 1: SCATTERGRAM OF AVERAGE WORK TRIP LENGTH AND CITY SIZE



TRIP LENGTH AND CITY SIZE RELATIONSHIPS 05/19/78 PAGE 3

STATISTICS..

CORRELATION (R)-	0.11627	R SQUARED	-	0.01352	SIGNIFICANCE	-	0.36676
STD ERR OF EST -	3.38741	INTERCEPT (A)	-	6.65009	SLOPE (B)	-	0.00020

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2. PLACE OF RESIDENCE

The importance of work trip length in residential location of households has been studied over and over again in various metropolii of the world. This literature includes works of Virirakis (1968), Kain (1961), Alonso (1971) and Richardson (1971).

Alonso (1971) argued that residential locations can be explained in terms of the relative value placed on space by the household and the cost of the journey to work at the CBD. Virirakis (1968) explained home location in a slightly different manner. After a study of the Athens Basin he concluded that there was a marked relationship between workplace and residence. He explained this in terms of an equilibrium between the tendency to search for a more advantageous place of residence in terms of cost, amenity and environment, and the cost of the journey to work. Kain (1961) on the other hand explained the residential location for each worker solely in terms of the worker's ability to meet the cost of travel.

Richardson (1971) dismissed the extreme travel cost minimization hypotheses (i.e. the trade-off model) as advanced by Alonso and Virirakis. He stressed the importance of environmental preferences in home location choice. He argued that if the pure rent/travel cost trade-off idea is valid then the rich who can outbid lower income groups for any site would like to live near the city center, close to their place of work and undertake short work trips. However, this is inconsistent with empirical observation and therefore there must be other factors accounting for this phenomenon.

In the Greater Vancouver Region, the trade-off between travel and

location costs may be a factor in location decisions of households, but there is evidence that the primary explanation is to be found more in terms of house price, amenity and local environmental factors. The importance of these factors is highlighted by the VATS data (Preliminary Report, 1974: 18) which indicate that for 16% of the sampled households that changed residence, house size was an important factor and for another 10% quality of dwelling was important.

Other less important factors in terms of the number of residents giving these as reasons for moving from one home to another included lower prices, good views and nearness to certain uses like shops, schools and parks. Only 9% cited the fact that they wanted to be nearer their place of work as an important reason for moving. Work trip length was the fourth most significant factor of consideration in household residential location decisions.

If work trip lengths are important in the locational decisions of households then one would expect a marked positive relationship between work trip lengths and the ratio of workers to jobs available in the sub-areas. This relationship is examined later on in Chapter 3 of the thesis to see if there is further confirmation of these indications that reducing journey to work is a fairly low personal priority.

3. JOB STATUS OR INCOME

Job status or income is another factor which may influence work trip length. The basis of this argument is the fact that one's income will determine one's ability to overcome distance. A high job status is usually associated with a high income and therefore the likelihood of such

a worker having a wider choice in the location of his residence. In addition to this choice, such people normally have shorter working hours and therefore they can afford a longer driving time to work (Hoover and Vernon, 1962: 155).

Much of the work done in this respect has been related to large cities. (Hoover and Vernon, 1962; Daniels, 1973). For example, in a study carried out in South West Chicago (Daniels, 1973: 167-88) the high income occupation groups behaved as expected in that they had longer work trip lengths than low income occupation groups. Reasons for this included the fact that high income workers could afford two cars and were thus better able to live in sections of the city far from centers of activity, employment and public transportation facilities (Hoover and Vernon, 1962: 155). The high income groups are little concerned with transport cost as compared to the low income/status workers.

The long work trip lengths of the high income groups can also be explained by their preference for spacious living which is usually to be found in new suburbs with a lot of space per house.

In a study carried out by Hoover and Vernon (1962: 159) in New York it was found that commuting time to Manhattan tended to increase with higher income level, though not at all sharply. There was only seven or eight minutes difference in commuting time between the highest-income fifth and the lowest-income fifth of the workforce.

So far as Vancouver is concerned these studies are inconclusive because they relate to very large cities. In Vancouver, there may not be such a clearly discernible relationship between job status or income and work trip lengths. This is primarily because there are substantial high

income neighbourhoods close to the CBD and at moderate and long distances from the CBD. High income workers live in West Vancouver, Shaughnessy or South West Marine Drive areas. Likewise, low income workers who live in the West End, Downtown Eastside, Riley Park, Fairview or Cedar Cottage live at a range of distances from the dominant downtown Vancouver employment center. Thus, income or status may not be significantly related to work trip lengths in the Vancouver Region. Using the 1970 income distribution figures and work trip lengths from VATS, this is analyzed in Chapter 3 of the thesis.

SUMMARY

This overview has discussed the factors which influence work trip length in metropolitan areas insofar as these can help in determining whether the "Living Close to Work" policy proposed for Vancouver will produce major benefits.

From the published material it appears that city size, job status and income are <u>not</u> likely to be factors influencing work trip length in Greater Vancouver: the location of residence and jobs may be a significant factor.

Of these factors, those for which data are available for Greater Vancouver from VATS and the Census are: income or job status in relation to the work trip length; the relationship between work trip lengths for trips with the home end in a sub-area and the labour force (place of residence):job (place of work) ratios in that sub-area. If there is a marked positive correlation between work trip length and the number of jobs in relation to the resident workers in the local area, then it means

that more workers in relation to jobs you have in an area, the longer the work trip lengths tend to be.

The relationship between such a result and the issues being addressed is also simple. If such a relationship is found to hold in the Vancouver Region, then it supports the conclusion that the location of jobs within the suburbs will in fact reduce work trip lengths, assuming other factors remain the same. Associated with this will be the social benefits which will accrue to society as a whole in the form of alleviation of downtown traffic congestion during the peak hours.

CHAPTER 3

ANALYSIS OF VATS AND THE CENSUS DATA

INTRODUCTION

This chapter examines the importance of the various factors discussed in Chapter 2 and how they may influence work trip lengths within the region. This is done by relating an analysis of work trip lengths from the VATS files to income, labour force and job ratios derived from the 1970 Census.

The analysis starts with a discussion of the methodology used. This is followed by a discussion of work trip lengths within the region. The relationship between the factors is next discussed. The chapter ends with a summary of the analysis and the most significant findings.

METHODOLOGY

(i) Basis of Statistical Analysis

The Vancouver Region was divided into a number of sub-areas that are manageable in terms of data collection. The subdivision was necessary because, for example, the correlation between work trip length and labour force:job ratio depends on a reasonable geographical distribution to give the spatial patterns needed. Figure 2 is an index map showing the sub-areas which were used for the statistical analysis.

(ii) Method of Analysis

Work trip lengths were calculated from VATS for all the home based work trips from these sub-areas. The average household income and the various labour force:job ratios for each of these areas were calculated from the 1971 Census data. A visual analysis supported by a regression analysis was then performed on the two sets of variables; work trip length

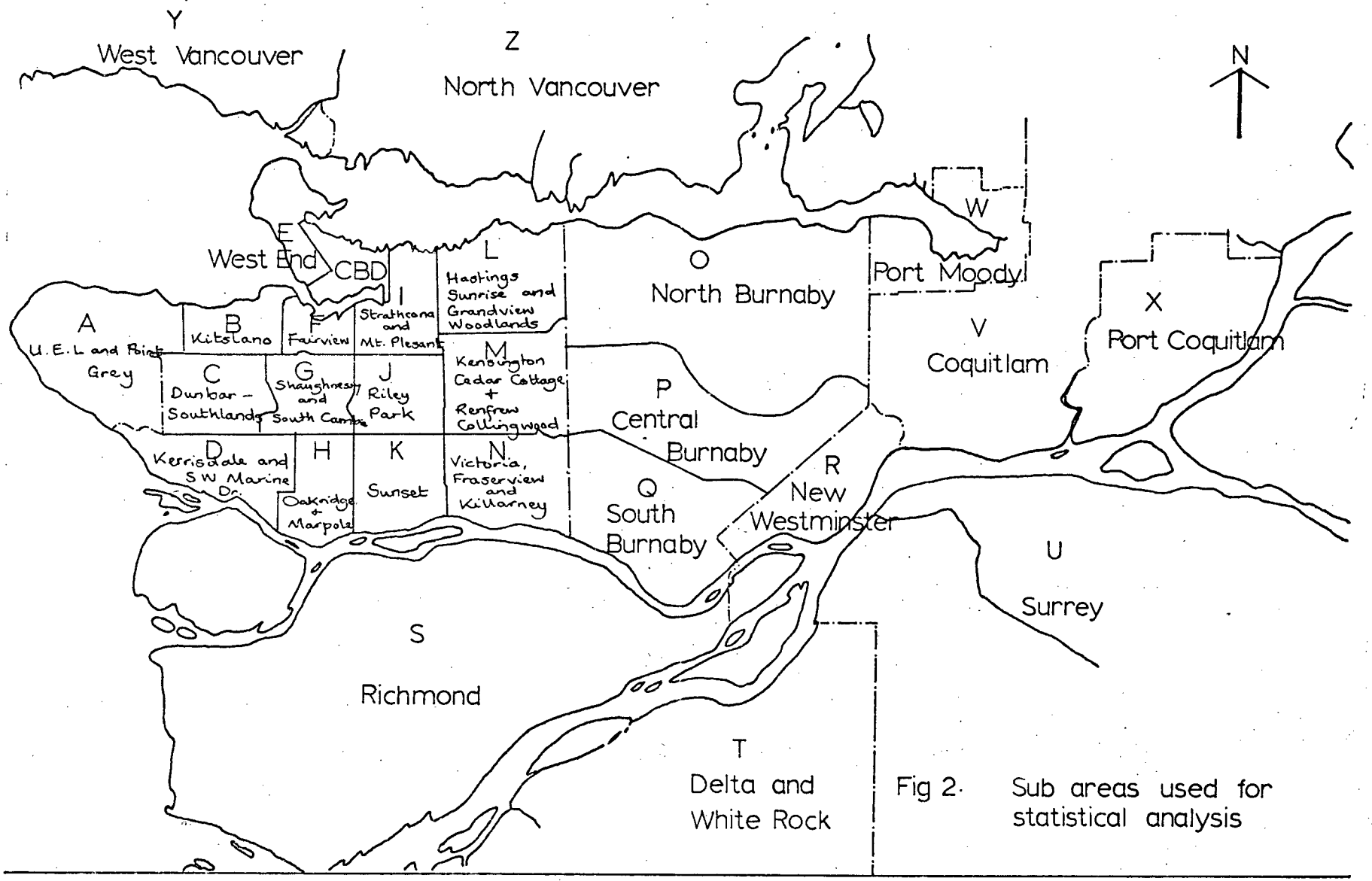


Fig 2. Sub areas used for statistical analysis

and income, work trip length and labour force:job ratios.

The 1971 Census data had to be used in conjunction with the VATS data because it was not possible to cross-match pieces of data on different VATS files.

(iii) Measuring Work Trip Length

The literature indicated that time and distance are the two most useful measures of work trip length when the matter of concern is full trip cost. They are relatively easy indices to collect and are together sufficient to allow comparison of relative costs. In view of the fact that some earlier studies used 'as the crow flies' distance as a unit of measurement, it would be interesting to compare the results of these studies and the present study. Thus, in addition to time and rectangular route distance the study also used the direct distance measure.

Reported work trip travel time is an item on the VATS file and was therefore read off from the file. Distance is, however, not an actual item on the file and had to be computed from the co-ordinates of the origin and destination of the work trips surveyed by VATS. As mentioned above, the measurement of distance was done both in terms of a rectangular distance or a direct distance measure. The rectangular distance measure tends to be a good estimate of actual trip distance for short work trips but the direct distance measure is better for longer distances.

Time and distance are used at different points in the study because travel time is sensitive to congestion and distance may better reflect other costs of travel.

SECTION A - WORK TRIP LENGTHS WITHIN THE GVRD

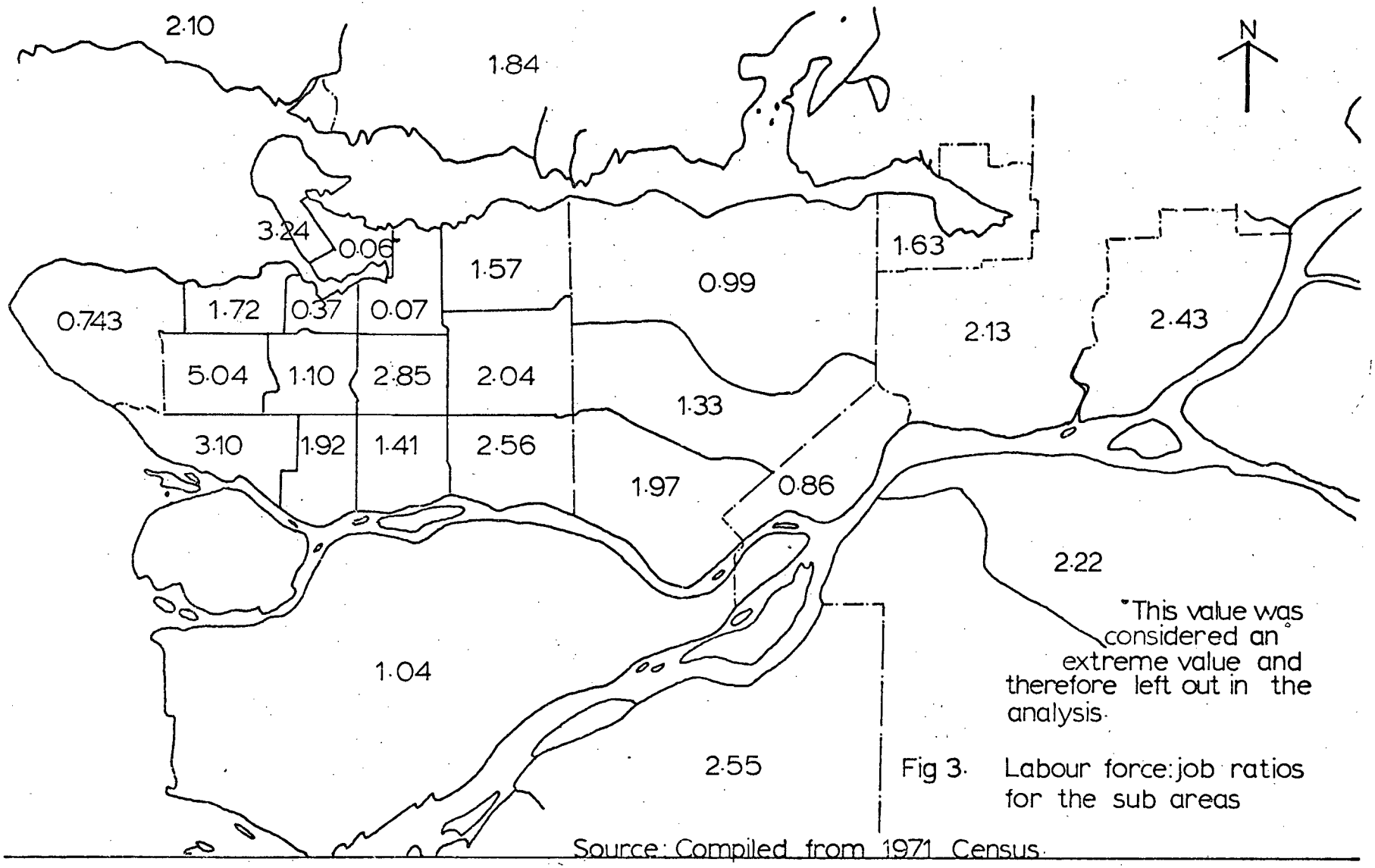
(i) Work Trip Lengths within the Sub-areas

Out of the 3,354 sample work trips generated, 77.7% of these trips started at home. The remaining 22.3% were on the job or business trips.

Appendix 1 is a place of residence (labour force) - place of work (jobs) matrix. It gives the origins and destinations of the sample work trips. In terms of work trip origins, North Vancouver, Surrey, Richmond, Sunset and the Hastings-Grandview Woodlands are the most significant. In terms of work trip destinations or concentrations of jobs, Surrey, Richmond, the downtown and North Vancouver are the most significant areas (see column totals in Appendix 1). This job distribution reflects the population size of some areas, which markedly influences residential population serving employment, and industrial concentrations in the region.

Figure 3 shows the labour force:job ratios for various areas of the region. Areas with large ratios include Coquitlam, Port Coquitlam, Surrey, Delta and White Rock and West Vancouver, all bedroom suburbs.

Figure 4 shows the mean work trip lengths for the sub-areas of the region. These vary between 21.63 minutes (3.15 miles) for the West End and 33.2 minutes (12.96 miles) for Delta and White Rock. A cursory look at Figures 3 and 4 indicates that work trip lengths are longer for areas with larger labour force:job ratios. The examples of Delta and White Rock, Surrey and Coquitlam illustrate this. In these areas most workers have to travel to work outside their various places of residence and thus, the high mean work trip lengths (see Appendix 2 for a statistical summary of work trip length characteristics).



*This value was considered an extreme value and therefore left out in the analysis.

Fig 3. Labour force:job ratios for the sub areas

Source: Compiled from 1971 Census.

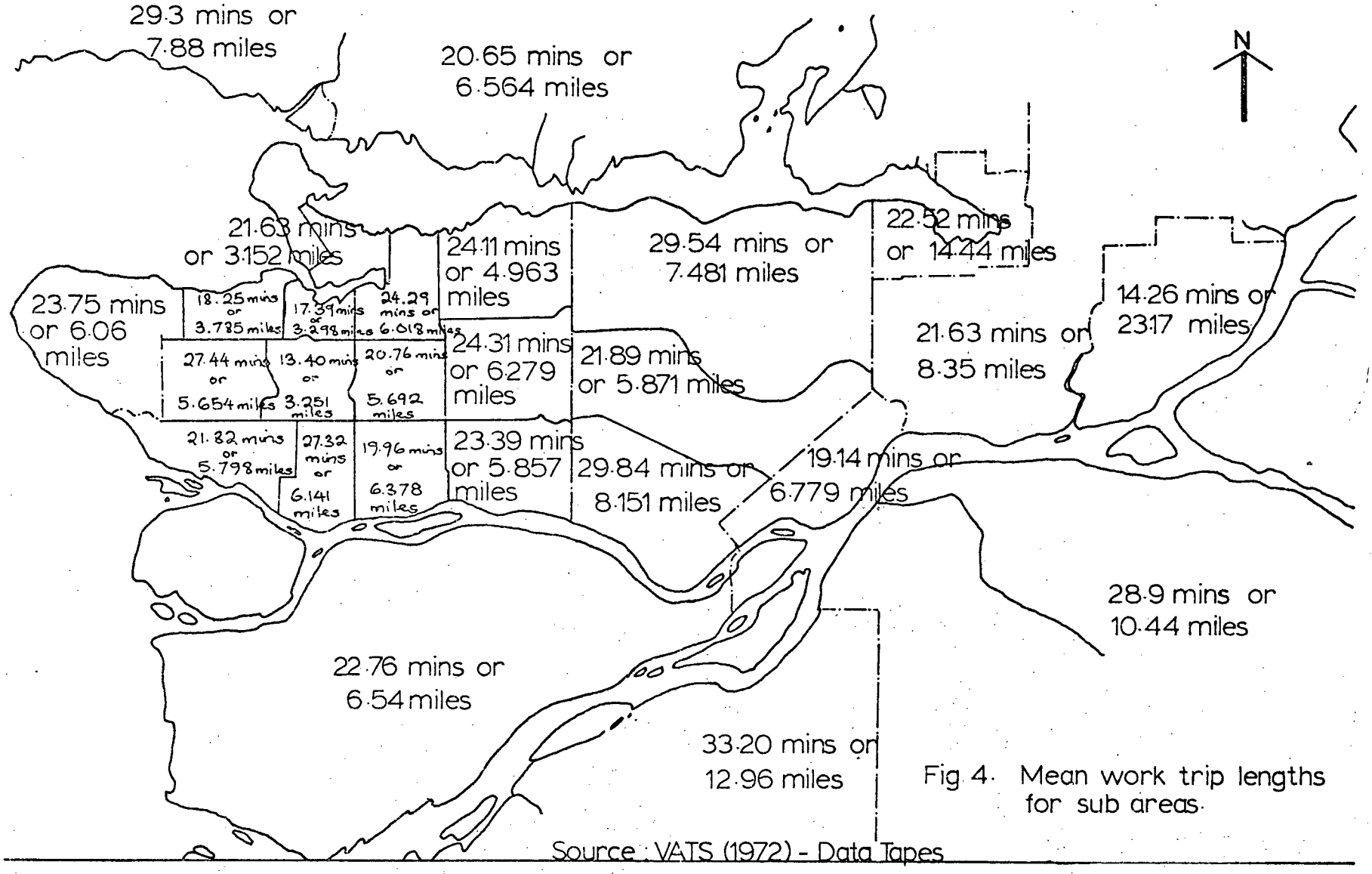


Fig 4. Mean work trip lengths for sub areas.

Source : VATS (1972) - Data Tapes

If areas with large labour force:job ratios tend to have long work trip lengths, then in crude terms it appears that a reduction in the ratio by say increasing the number of jobs in the various areas should have the effect of reducing work trip lengths.

For the same work trip lengths, there tends to be a decline in travel time as the distance of the home and from the CBD increases. For example, the short work trip length of 3.152 miles for West End workers was travelled in 21.63 minutes on average. On the other hand the mean work trip length of 3.251 miles for Shaughnessy and South Cambie residents was travelled in 13.4 minutes. This could reflect the different levels of accessibility by the alternative modes of travel in different parts of the city.

(ii) Work Trip Lengths Within the Whole Region

The work trip lengths within the region were broken down into home based and non-home based. Table 3 is a summary of the various types of trips and how they vary with distance. Home based work trips comprise about 77.7% of the total work trips and the non-home based work trips make up the remaining 22.3% of the trips. Home based work trips vary between the recorded range of one minute (0.1 mile) and 420 minutes (48.9 miles). About 60% of the labour force lived within 24 minutes of their places of work. This together with the median trip length of 4.285 miles goes to substantiate what the GVRD estimated to be the average work trip length within the region. "... Today, most people in the region live within 4 or 5 miles of their work ..." (GVRD, 1975: 15).

The mean work trip length of 24 minutes or 6.81 miles for the whole

TABLE 3: A COMPARISON OF HOME BASED AND NON-HOME BASED WORK TRIP LENGTHS

Trip Length In Miles	All Work Trips	Home Based Work Trips	Non-Home Based Work Trips
2	27%	24%	62%
2 - 4	21	21	12
4 - 6	16	17	11
6 - 8	10	11	6
8 - 10	8	8	2
10 - 12	3	4	2
12 - 14	3	3	1
14 - 16	2	3	1
16 - 18	2	1	1
18 - 20	1	2	1
20 - 22	1	0	0
22 - 24	0	1	1
24 - 26	0	0	-
26 - 28	1	1	-
28 - 30	1	0	-
30 - 32	1	1	-
32 - 34	1	1	-
34 - 36	0	1	-
36 - 38	1	0	-
38 - 40	0	0	-
40	1	1	-
Total	100%	100%	100%

Source: VATS (1972) - Data Tapes

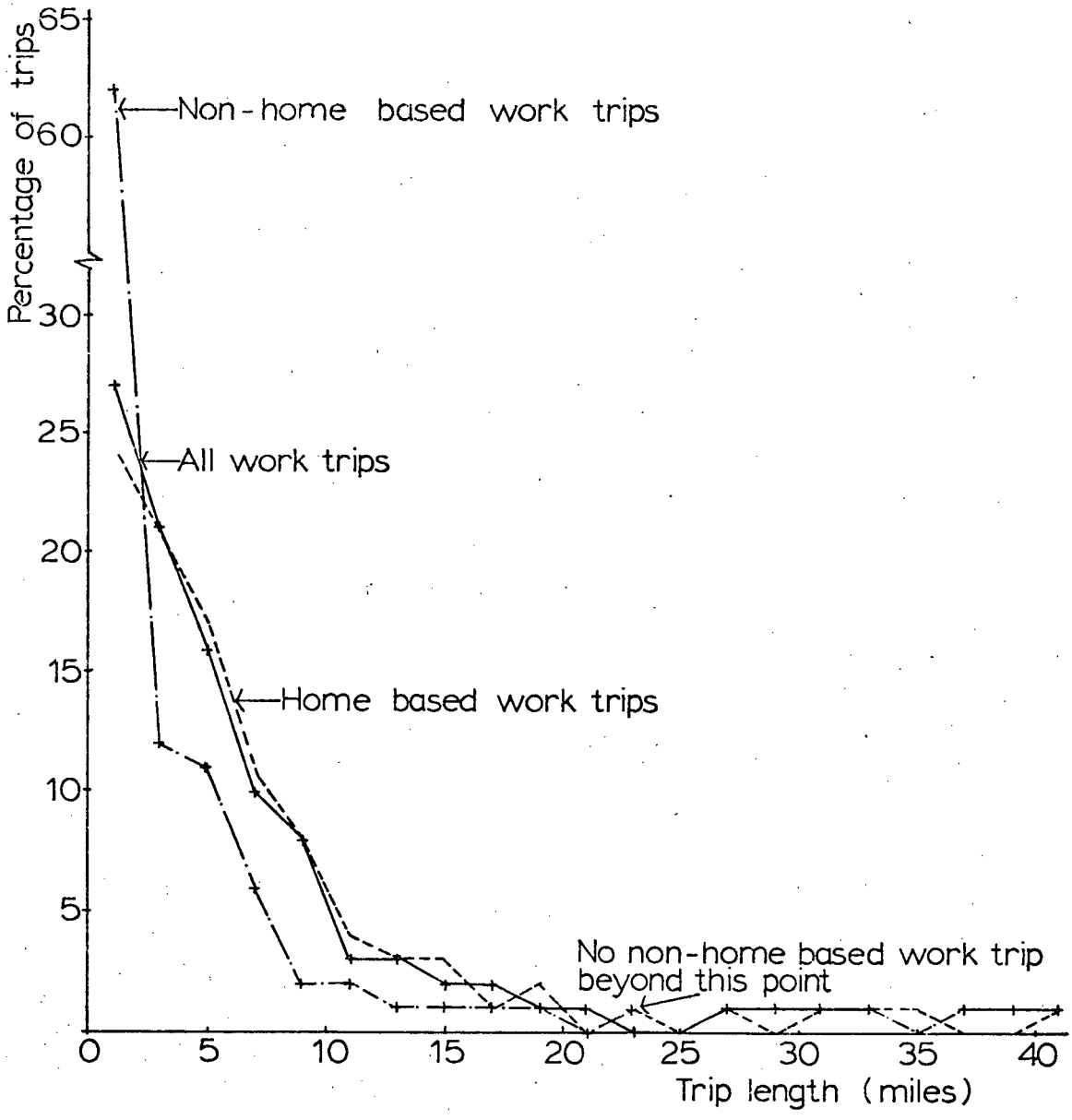
region in 1972 is slightly higher than the mean work trip lengths for Philadelphia, Dallas, Milwaukee and Buffalo (see Table 2 in Chapter 2). Even though Vancouver cannot be compared to most of these cities in terms of size, there is no significant difference between the mean work trip lengths. Figure 1 in Chapter 2 illustrates that there is at best a very weak relationship between city size and mean work trip length. It also fits in with Lawton's finding that there is no significant difference between work trip lengths in different types of cities and towns.

Figure 5 shows the work trip length distribution for both home based and non-home based work trips. The "all work trips" distribution follows the same pattern as the home based work trips but these two are different from the hon-home based work trips. Non-home based work trips are generally less than two miles, with a smaller number of trips beyond 24 miles. On the other hand home based work trips tend to be longer than non-home based work trips. In particular the home based work trip length distribution has a long tail. Table 4 is a summary of the various statistical measures of the three distributions.

Figure 6 shows the work trip travel time profile. Figure 7 is the cumulative frequency distribution curve for these trips. Forty-six per cent of the workers lived within 15 minutes of their workplaces. Eighty-two per cent of these workers undertook work trips of less than 30 minutes and in fact 60% of these home based work trips had a travel time of less than 25 minutes. Only 7% of the work force spent more than 45 minutes in travelling to work.

Figure 8 is the time profile for male and female workers. There are few differences between the two distributions. There are relatively more

Fig 5. Work trip distance profiles for the GVRD.



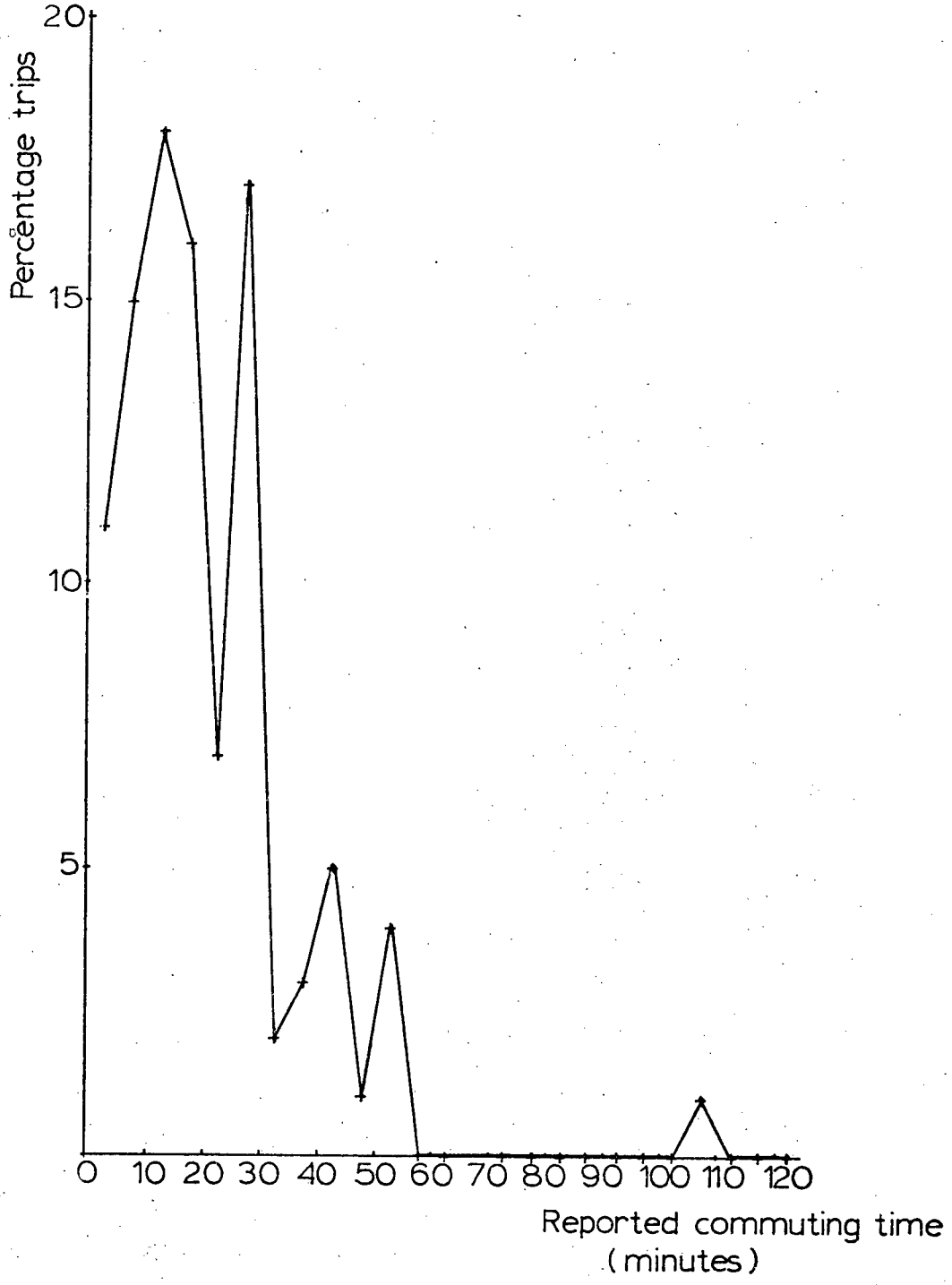
Source: VATS (1972) - Data Tapes

TABLE 4: A SUMMARY OF STATISTICAL MEASURES FOR THE VARIOUS WORK TRIPS

Statistical Measure	All Work Trips	Home Based Work Trips	Non-home Based Work Trips
Mean	6.81	7.06	3.23
Median	4.29	4.67	1.80
Standard Deviation	8.15	7.87	4.15

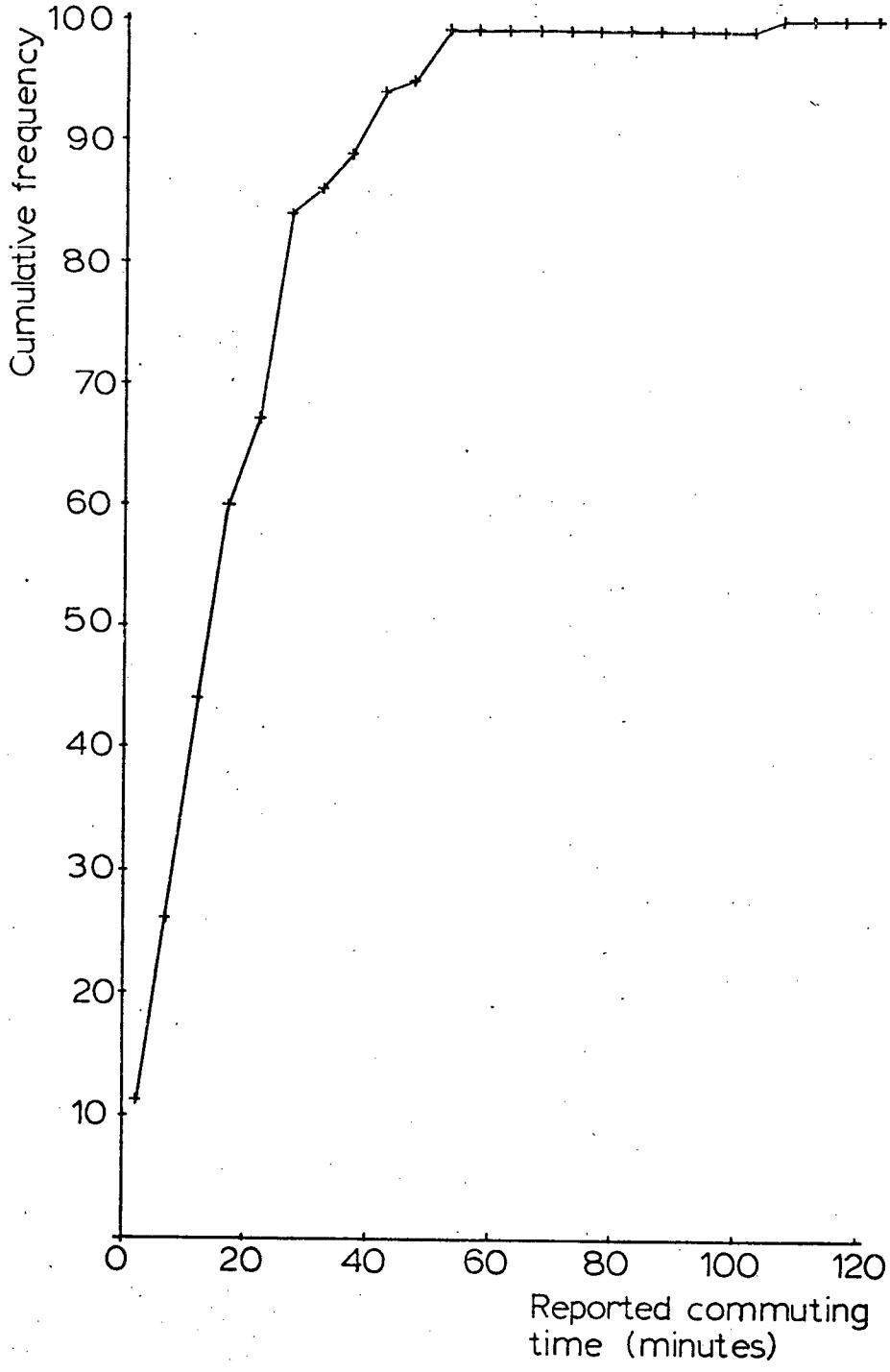
Source: VATS (1972) - Data Tapes

Fig 6. Work trip travel time profile.



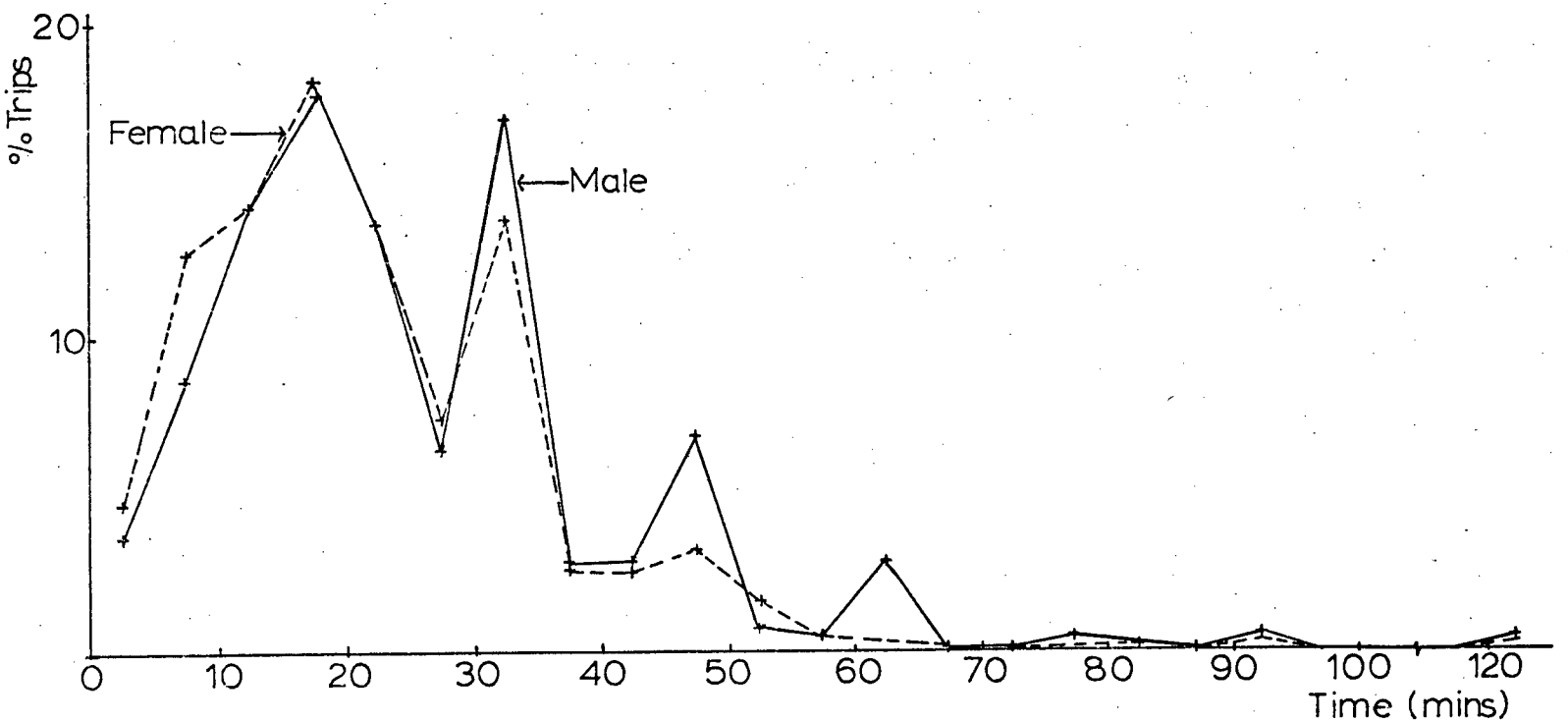
Source: VATS (1972) - Data Tapes

Fig 7. A cumulative frequency plot for home based work trip travel time.



Source: VATS (1972) - Data Tapes

Fig 8. Time profile for male and female workers



Source: VATS (1972) - Data Tapes

women than men who spent less than 17 minutes in travelling to work and the men generally spent slightly longer times in travelling than women.

Figures 9 and 10 illustrate the modes of travel to work and a breakdown of the modal choice characteristics by sex. The salient features are the importance of the automobile as a mode of travel to work, and the significant proportion of females who use bus transit, walked or travelled to work as auto passengers as compared to male workers.

This description of travel times and mode indicates that most work trips are quite short and that there is not much difference in travel time between men and women. There were also ties in travel time as reported and hence the "zig zag" in the profile as people tend to report quarter hour intervals.

The use of transit as a mode of travel to work invariably means waiting time and hence it is hard to reduce these trips to 15 minutes or less. Thus, it is not going to be easy to substantially reduce the travel time for the bulk of workers who use transit.

(iii) Differences Associated with Work Trip Lengths to the CBD and Other Employment Centers

The downtown is the center of all commercial and administrative functions within the region and therefore employs a substantial number of people from all over the region. In 1971 the downtown employed 73,000 people[1] or 35% of the region's labour force. Out of this, 62% lived within the City boundaries, the other 38% commuted from the other municipalities. In comparison with this the suburban areas including the

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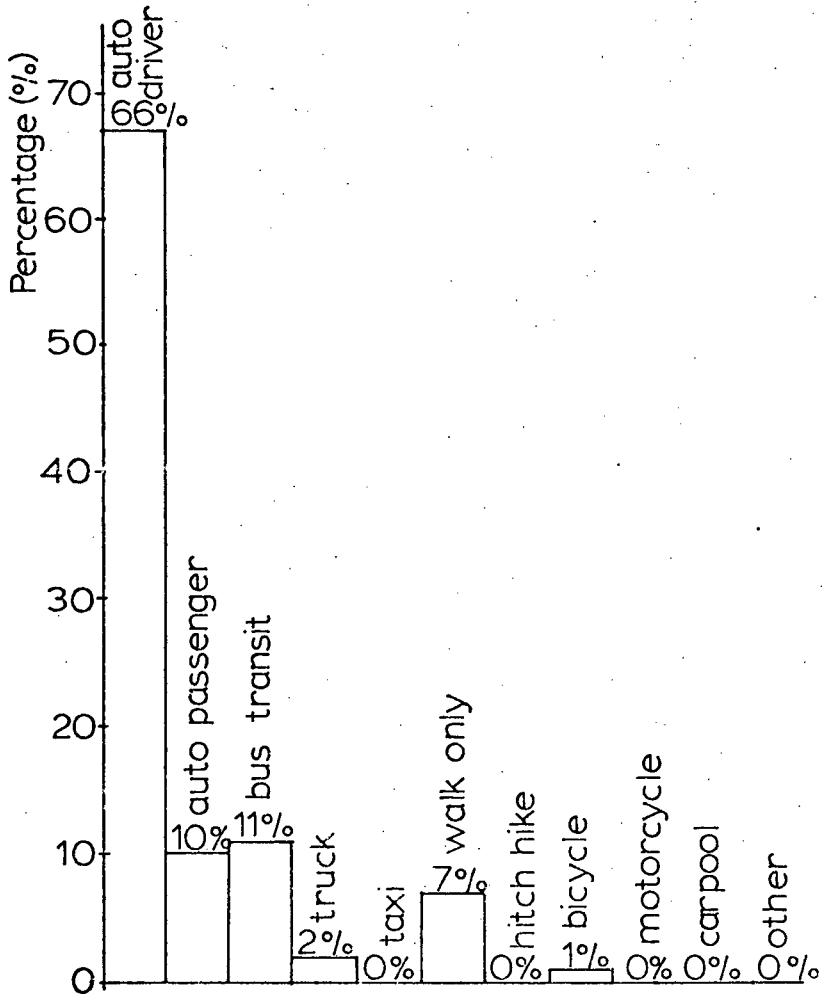
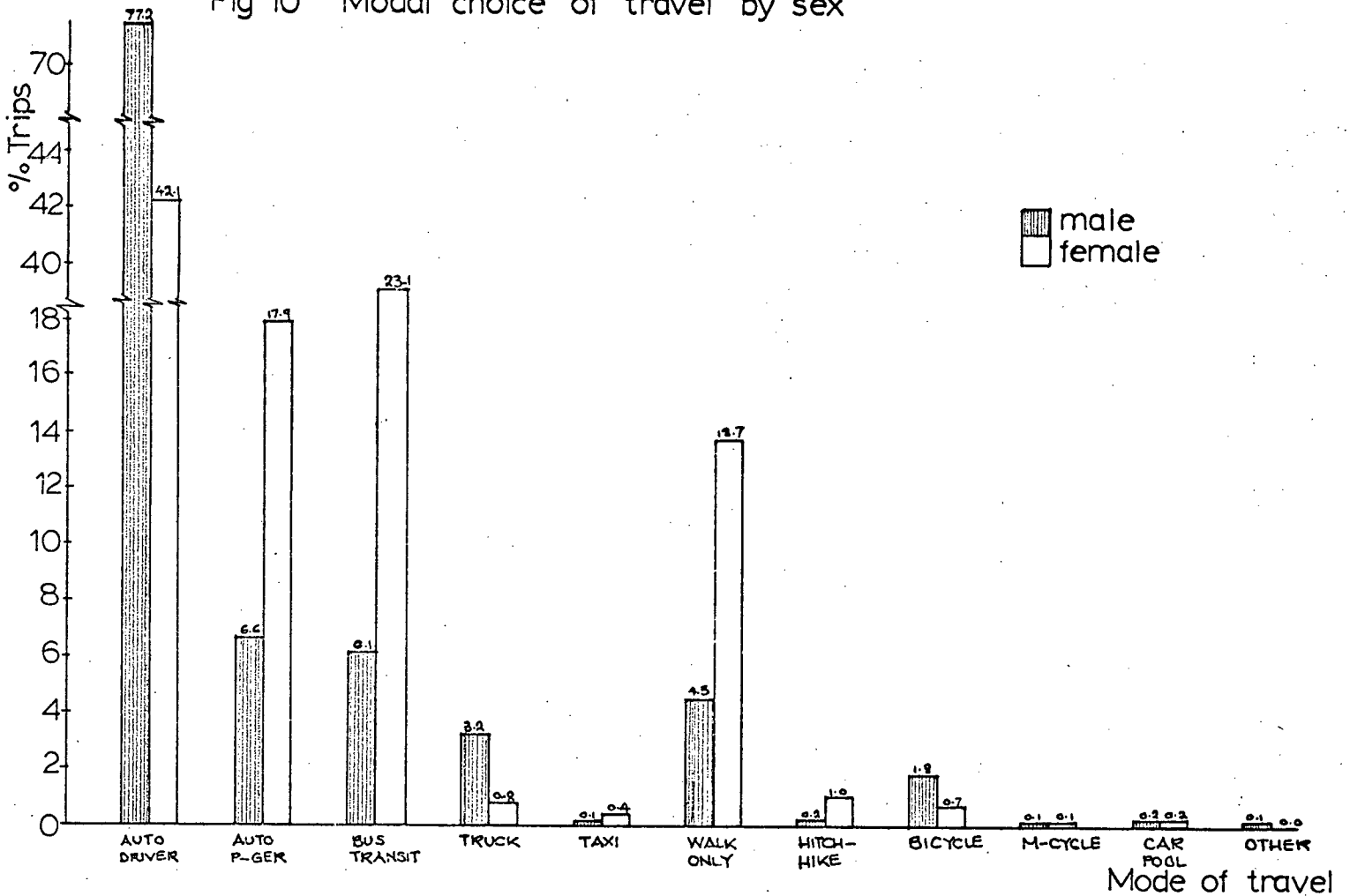
[1] Extracted from a Special Computer Cross Tabulation Run commissioned by the GVRD Planning Department using the 1971 Population Census.

Fig 9. Mode of travel for all home based work trips.



Source: VATS (1972) - Data Tapes

Fig 10 Modal choice of travel by sex



Source: VATS - Data Tapes

North Shore employed 135,660 people[2] or 65% of the region's labour force.

Figure 11 is the work trip length distribution for "downtown," "all suburban" and "major suburban employment centers". The mean work trip length for the downtown workers was 6.11 miles and the distribution had a median of 5.16 miles. The frequency distribution curve shows that about 18% of the workers lived within two miles of the downtown area which is essentially the area bordering the downtown and including the very densely populated West End.

The mean travel time to all employment centers outside the downtown was 23.2 minutes (8.1 miles) and the distribution had a median of 19.67 minutes (4.86 miles).[3] However the mean and median travel times to the major suburban employment centers in Burnaby, New Westminster, Surrey, Coquitlam and Port Coquitlam were 20.9 minutes (5.8 miles) and 16.68 minutes (4.96 miles) respectively. Figure 12 is the work trip travel time profile for the three distributions.

The above seems to indicate that either workers in the suburban centers lived closer to their workplaces than the downtown workers or travel is quicker outside the congested CBD. The latter is the predominant reason suggested by an examination of the mode of travel. This reveals the relative importance of auto travel to the suburban centers and transit to the downtown area (see Table 5). Auto is generally faster than transit and therefore travel to the suburban centers is likely to be faster than to the downtown.

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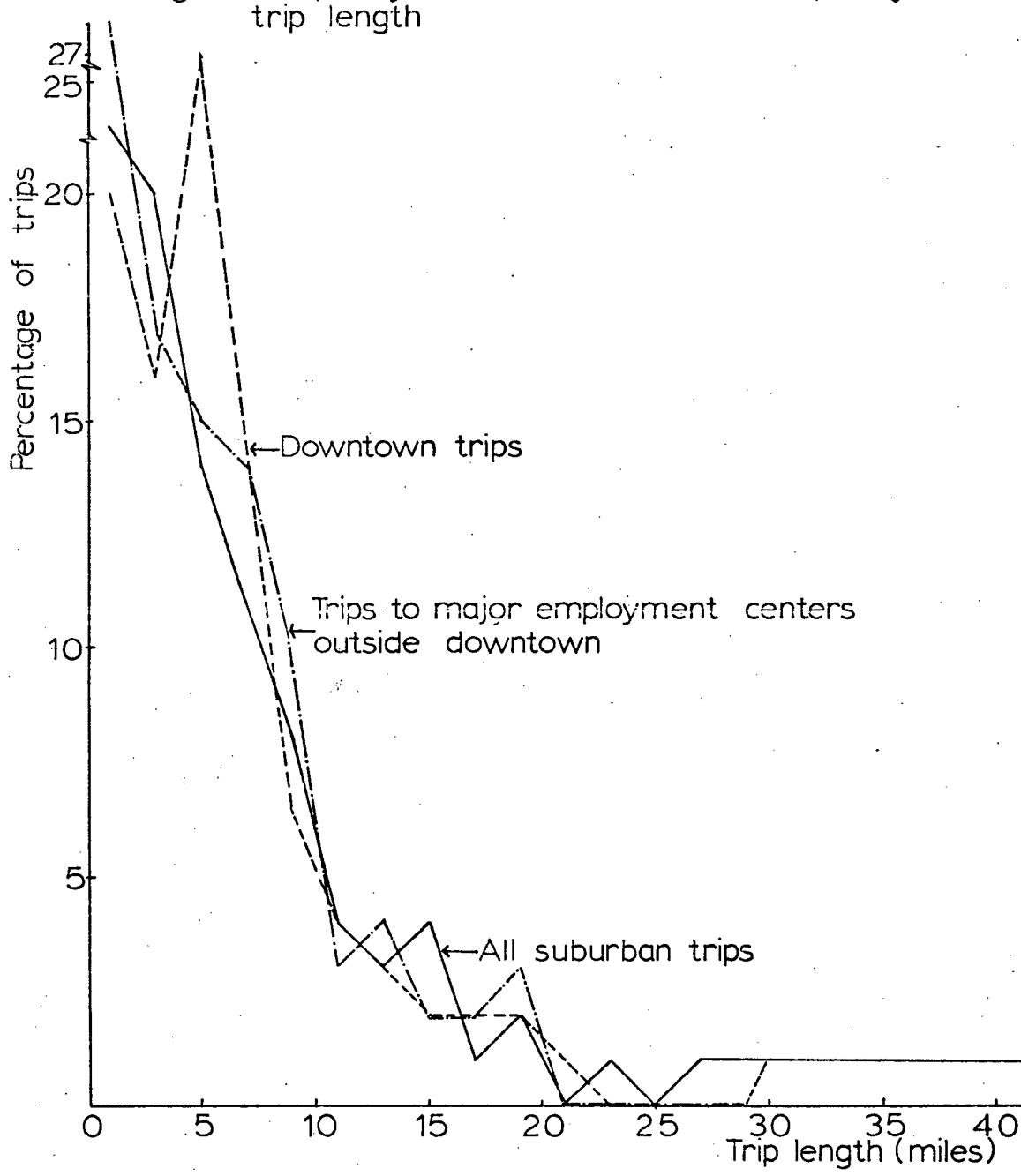
[2] Extracted from a Special Computer Cross Tabulation Run commissioned by the GVRD Planning Department using the 1971 Population Census.

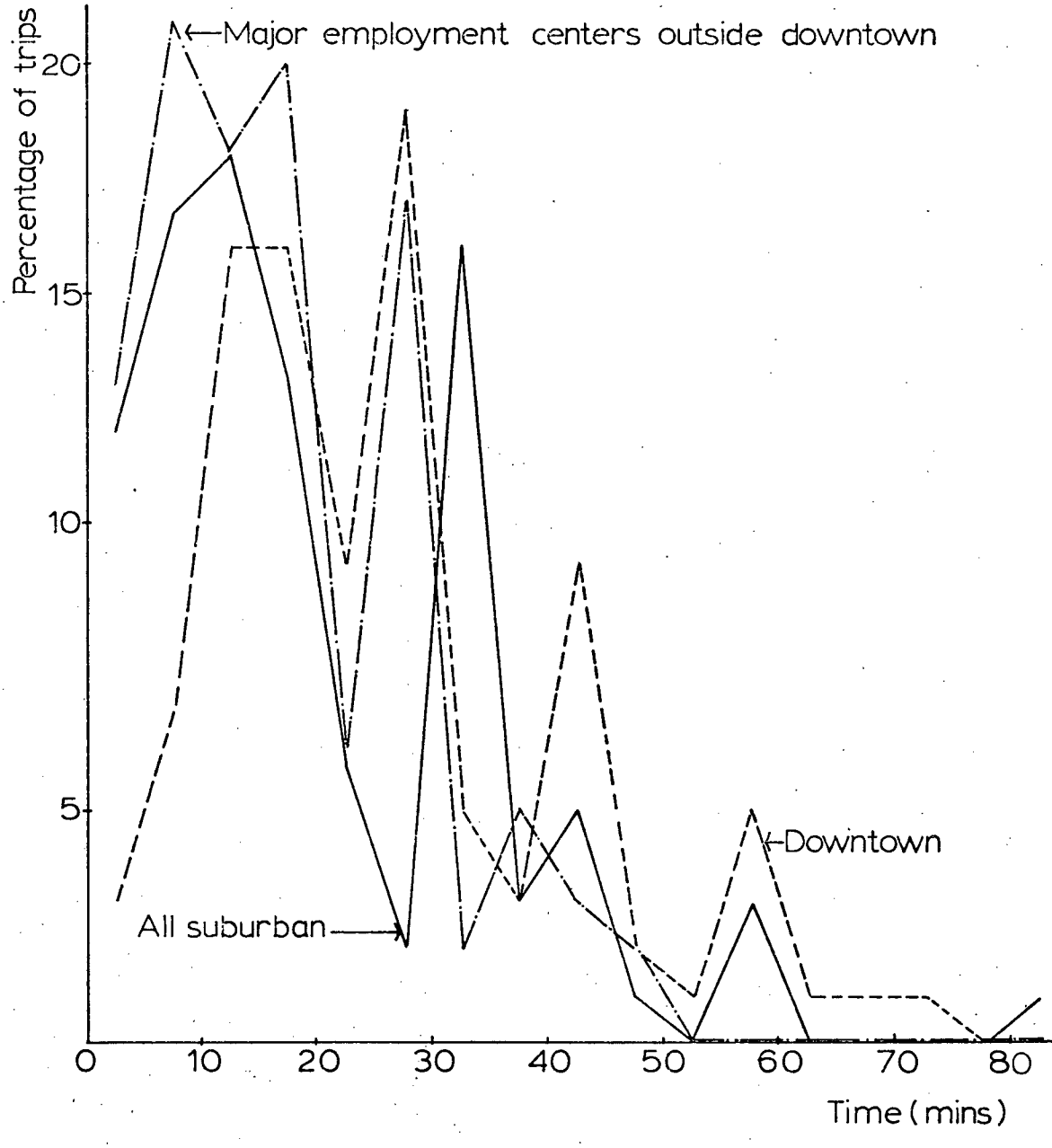
[3] See Appendices 3 and 4 for work trip length frequency distribution to the various employment centers.

Fig 11 Frequency distributions of work trips by trip length



Source: VATS (1972) - Data Tapes

Fig 12 Frequency distributions of work trip travel times.



Source: VATS (1972) - Data Tapes

TABLE 5: MODE OF TRAVEL TO EMPLOYMENT CENTERS

Employment Center	Mode %	1	2	3	4	5	6	7	8	9	10	11	12
Downtown Vancouver		48.6	10.5	27.5	0.4	0.4	-	11.0	0.6	-	-	0.4	-
Outside Downtown		72.8	9.5	4.8	3.5	0.1	-	6.0	0.4	1.7	0.1	0.3	0.1

Modes:
1 Auto Driver
2 Auto Passenger
3 Bus Transit
4 Truck
5 Taxi
6 School Bus
7 Walk Only
8 Hitchhike
9 Bicycle
10 Motorcycle
11 Car Pool
12 Other

Note: Percentage totals do not add up to exactly 100% because of rounding-off.

Source: VATS (1972) - Data Tapes

Both the downtown and the other employment centers have catchment areas extending all over the region (see Figures 13-17). The downtown work trips have origins in virtually all the geographical areas. Work trips to the suburban centers on the other hand did not have origins from all over the region. This can be attributed to the smaller sample sizes to the major employment centers as compared to the sample of trips to the downtown area.[4]

(iv) Comparison with Other Studies

Table 6 is a summary and comparison of the various work trip lengths within the region as presented by Wolforth (1965), Hickman (1968) and the VATS data (1972). While Hickman's study endorses Wolforth's study, the analysis using the VATS data suggests trips are longer and more time consuming than is indicated in these earlier studies. Mean work trip lengths for downtown workers have increased less than work trip lengths for employment areas outside the downtown area. This trend could be explained in terms of the pattern of job location and the areal growth of the region. Between 1965 and 1972 there was a lot of peripheral suburban residential development in areas like Surrey and Delta whose populations grew by 3.75% per annum and 17.28% per annum respectively.[5]

The higher rate of increase in the suburban work trip lengths may be explained by the faster population growth in relation to the increase in the number of jobs within the suburban areas. It can also be inferred from this that if work trip lengths within the sub-areas are to be reduced, then

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[4] See Appendix 3 for the various sample sizes.

[5] Computed from the Census figures of 1966 and 1971 for Surrey and Delta.

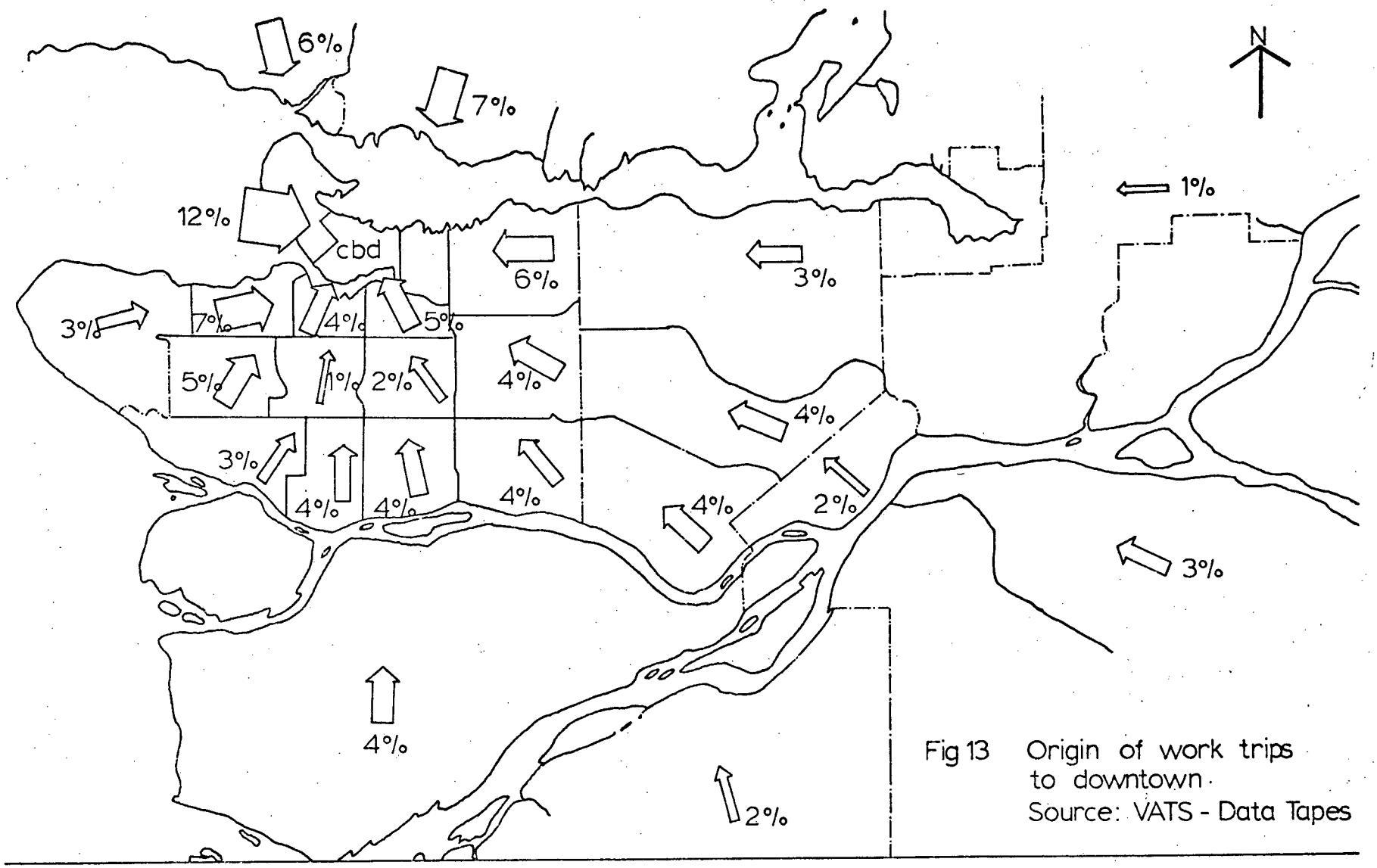

Fig 13 Origin of work trips to downtown.
Source: VATS - Data Tapes

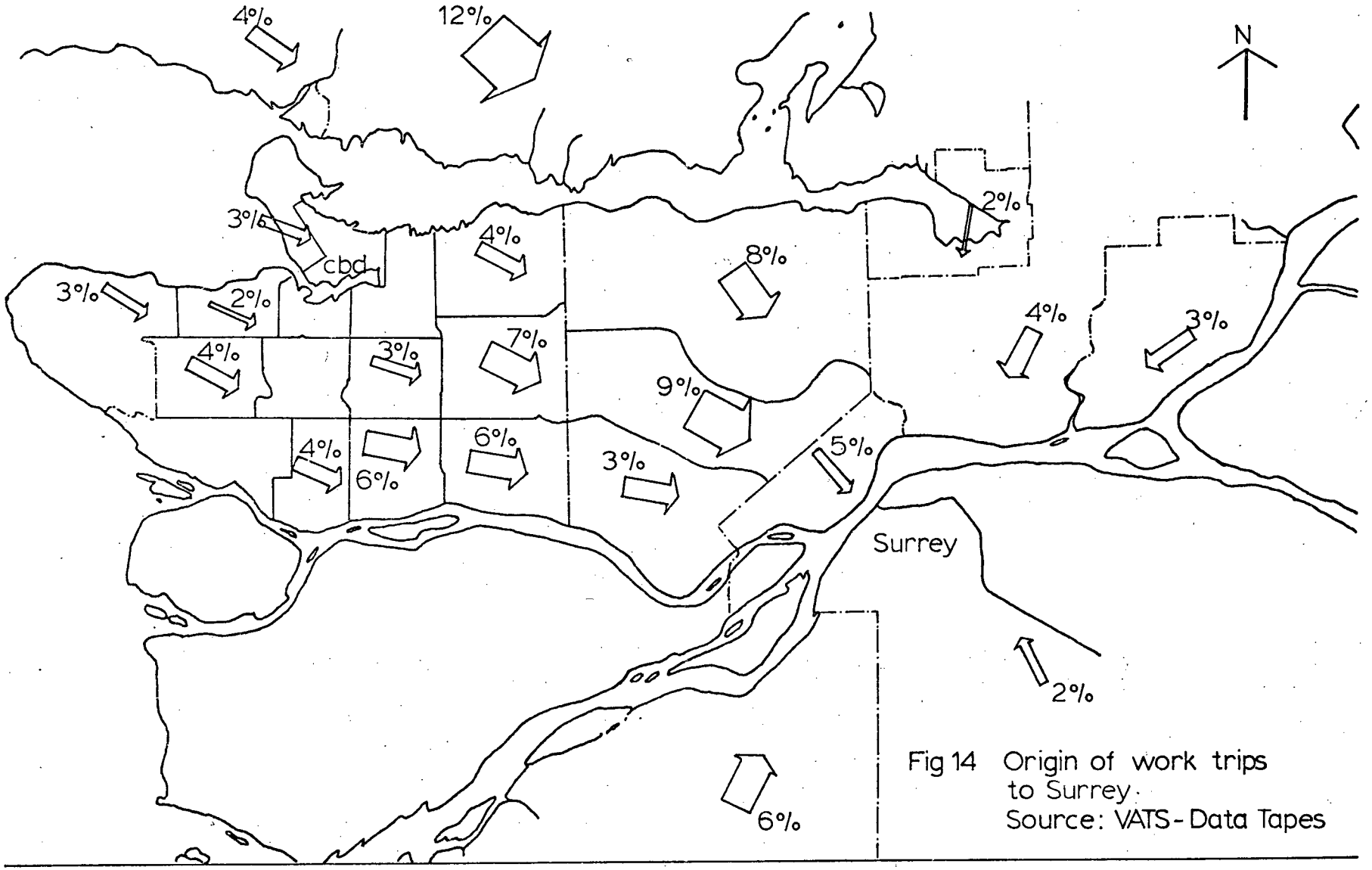

Fig 14 Origin of work trips to Surrey.
Source: VATS - Data Tapes

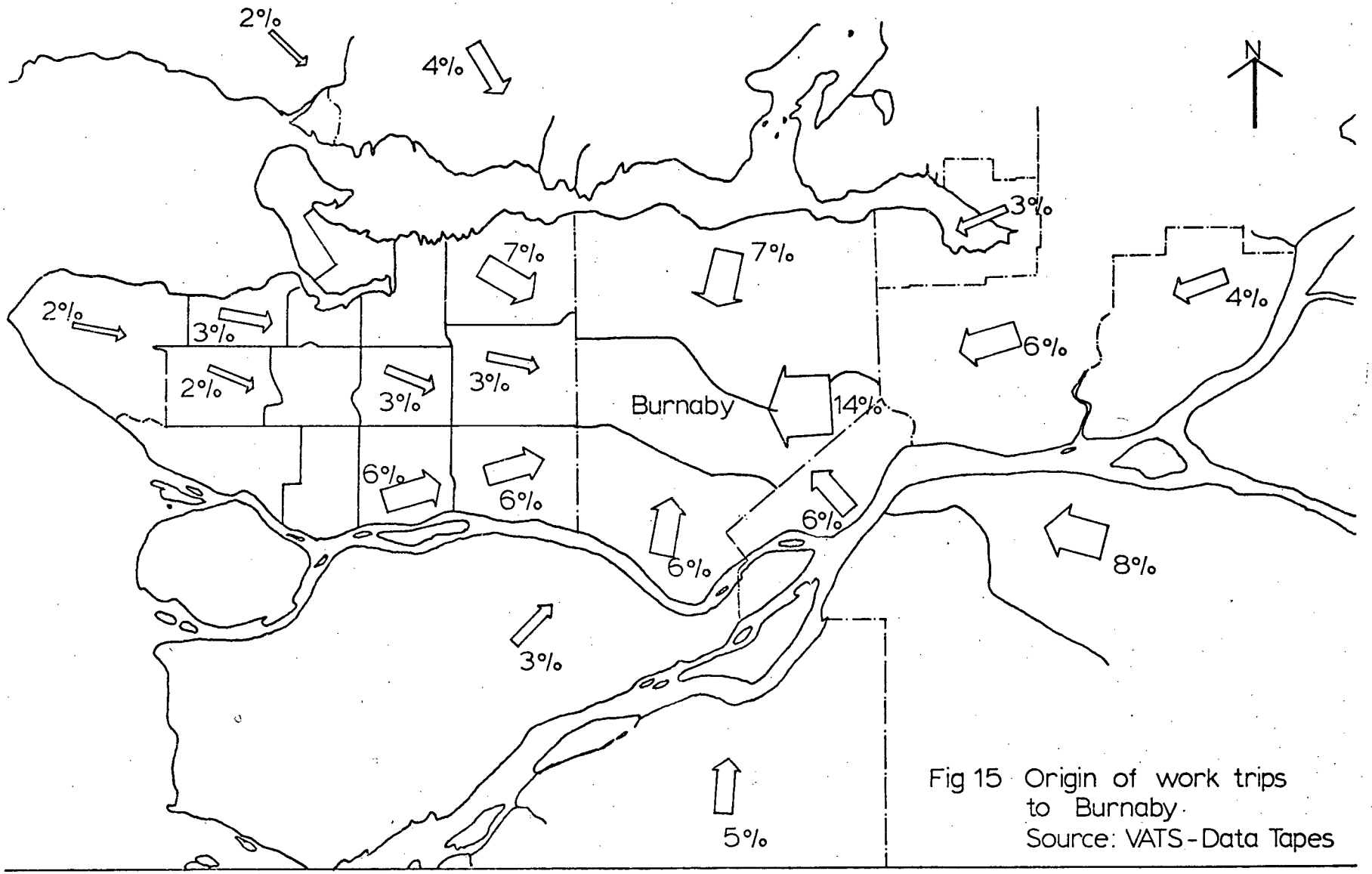

Fig 15 Origin of work trips to Burnaby.
Source: VATS - Data Tapes

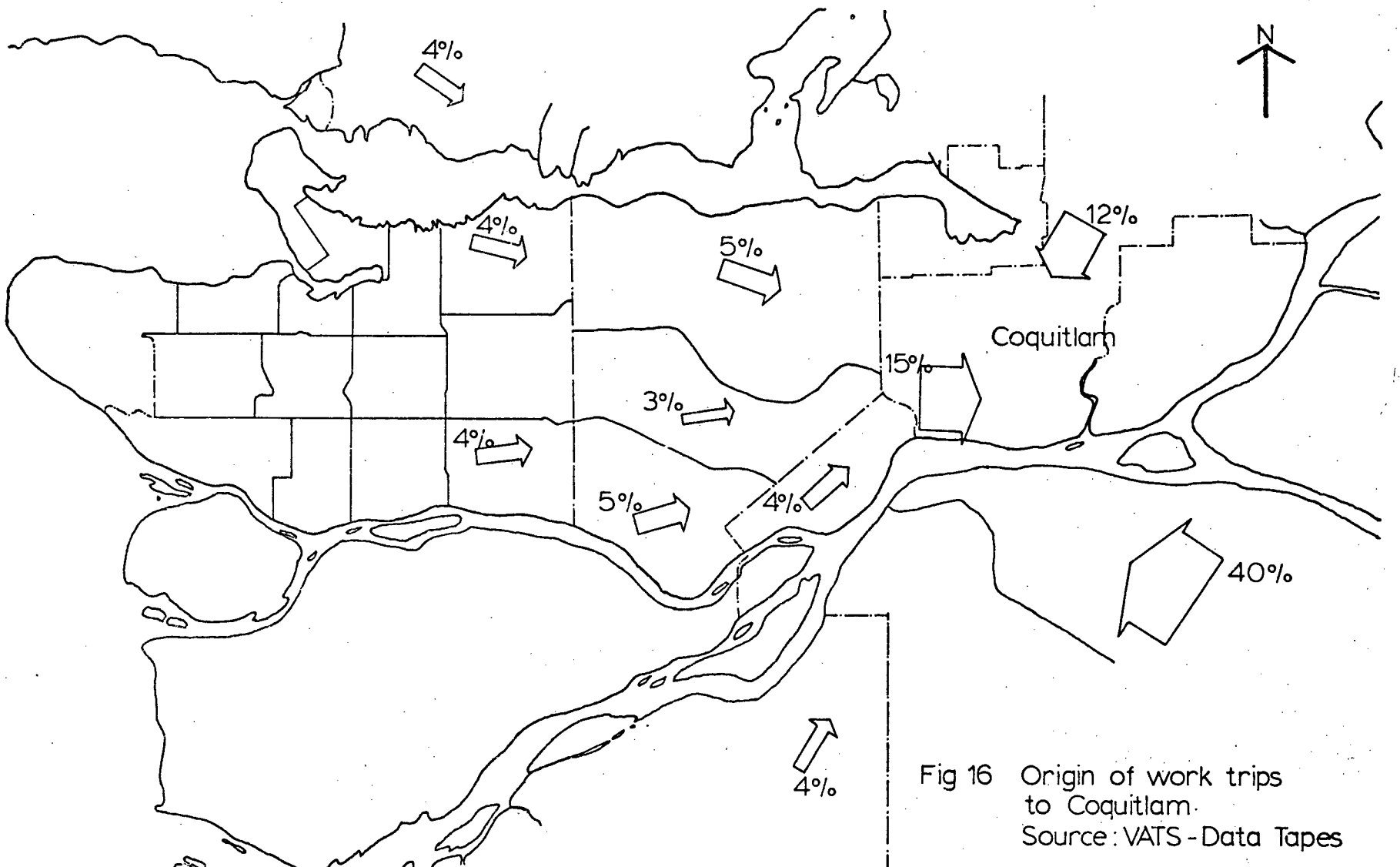

Fig 16 Origin of work trips to Coquitlam.
Source: VATS - Data Tapes

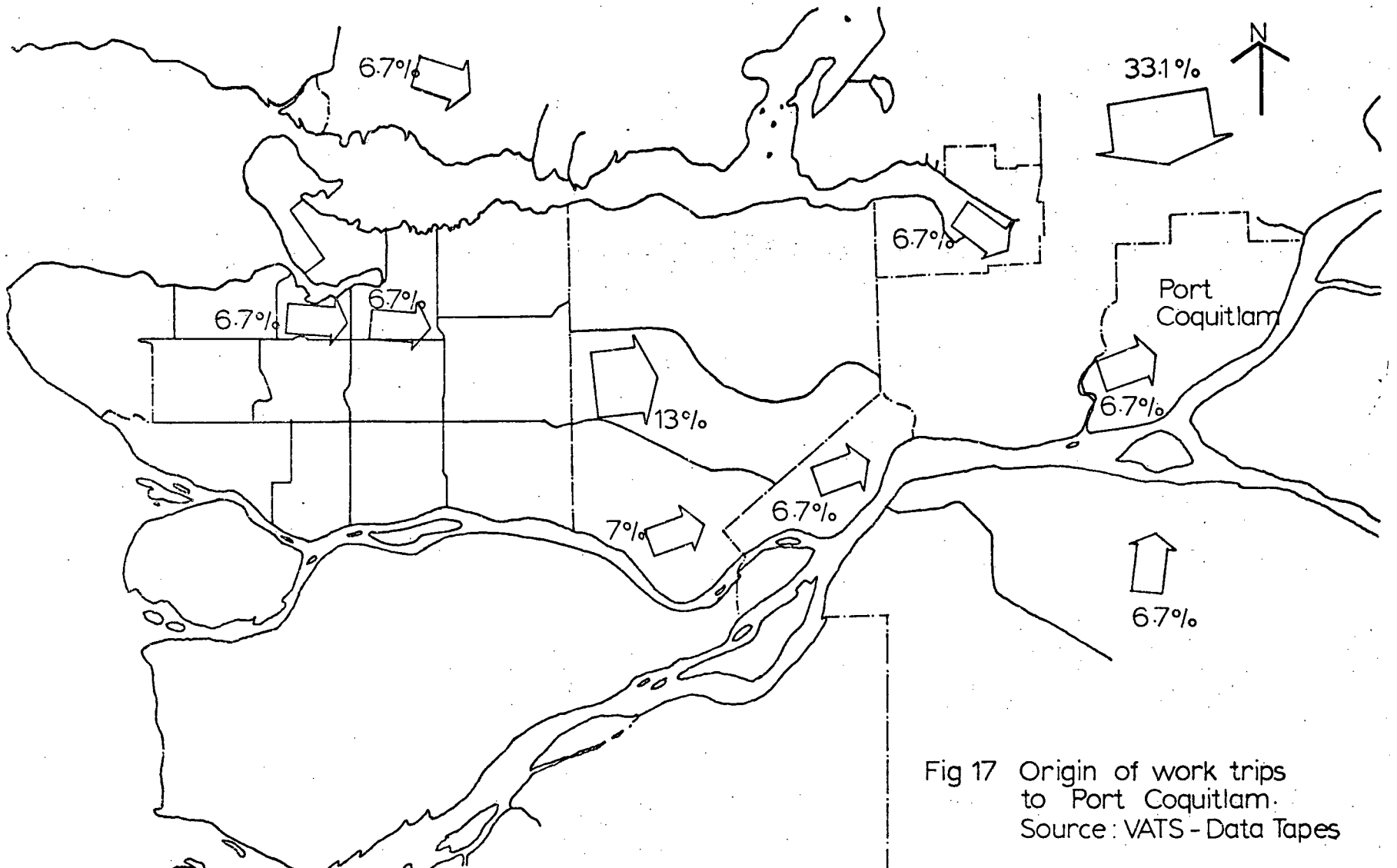

Fig 17 Origin of work trips to Port Coquitlam.
Source: VATS - Data Tapes

TABLE 6: A COMPARISON OF AVERAGE WORK TRIP LENGTHS FOR THE VANCOUVER REGION FROM THREE STUDIES[6]

Place of Employment	Wolforth's Study[7]	Hickman's Study[8]	VATS Data[9]
Employed in Downtown	4.0 miles	4.1 miles	4.74 (6.11) miles
Employed Outside Downtown	3.4 miles	3.6 miles	6.20 (8.1) miles[10]
Sample Size	825	709	2,605

Notes:

[6] Figures in parentheses indicate rectangular measures, all other distances are straight airline distances.

[7] Wolforth's study was conducted in 1965. He used the 1963 Vancouver City Director as the source of data.

[8] Hickman's study was conducted later on in 1968 and he used the same source as Wolforth.

[9] The VATS data base was collected in the spring of 1972.

[10] The average work trip length to the major employment centers is, however, 5.8 miles. (rectangular distance)

the rate of growth in the labour force should be matched with the rate of growth in the number of jobs.

Another possible explanation for this difference could be because of the differences in sample size and the sources of data. The two other studies used the 1963 City Directory which covered only Vancouver, Burnaby, North and West Vancouver and contains information gathered from voluntary respondents. Wolforth, for example, took 0.78% of the resident labour force of these areas and examined the attributes of the workers and their workplaces. Unlike these studies the VATS took a 1% sample of all the resident population within the Greater Vancouver Region in 1972 (3,562 households) and examined the attributes of the trip makers, their households, modal choice characteristics and trip record. It therefore forms a much wider and less biased data source than the Directory.

SECTION B - RELATIONSHIP BETWEEN FACTORS

(i) Work Trip Length and Labour Force:Job Ratios

Figure 3 shows the 1971 labour force:job ratios for sub-areas of the region. This ratio indicates the number of workers in relation to the number of jobs available in the various areas. A ratio of 1.0 implies that there are equal number of workers and jobs within an area. If all the jobs within such an area match the labour force skills then all the workers can work within that area and hence work trip lengths may be short. However, since the jobs in an area rarely fully match labour force skills this ratio is only a crude measure of local job opportunities for an area's workers. Whether or not it is possible to conclude that within the Vancouver Region the higher the ratio, the longer the work trip lengths

is an important question because a major regional planning policy, balancing the number of jobs and workers in sub-areas, is based in large measure on the belief that it is .

This hypothesis is tested for the Vancouver Region by performing a regression analysis on both the mean and median work trip lengths and the labour force:job ratios for the geographical sub-areas of the region identified in Figure 2. Figures 18 and 19 are plots of these ratios in relation to length as measure by the "mean times and distances".

From the various statistical measures it appears as if travel time is more related to the labour force:job ratio than travel distance. This relationship has the highest coefficient of correlation (0.3098)[11], which is a measure of the extent or degree to which these two variables are related. It also has the highest coefficient of determination (0.09598) which is the variation in mean work trip lengths accounted for by the variations in the labour force:job ratio. Only 9.6% of the variations in mean work trip lengths is accounted for by variations in the labour force: job ratios. This clearly indicates the importance of factors other than the labour force:job ratios in determining work trip lengths. These factors may include skills of the labour force in relation to the jobs available, the time the jobs are available on the market and the preference of the labour force for the jobs available.

Distance is not much related to the labour force:job ratios. This is exhibited by the wide scatter of data points and the low correlation

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[11] This is highest only in terms of the relationships between the variables.

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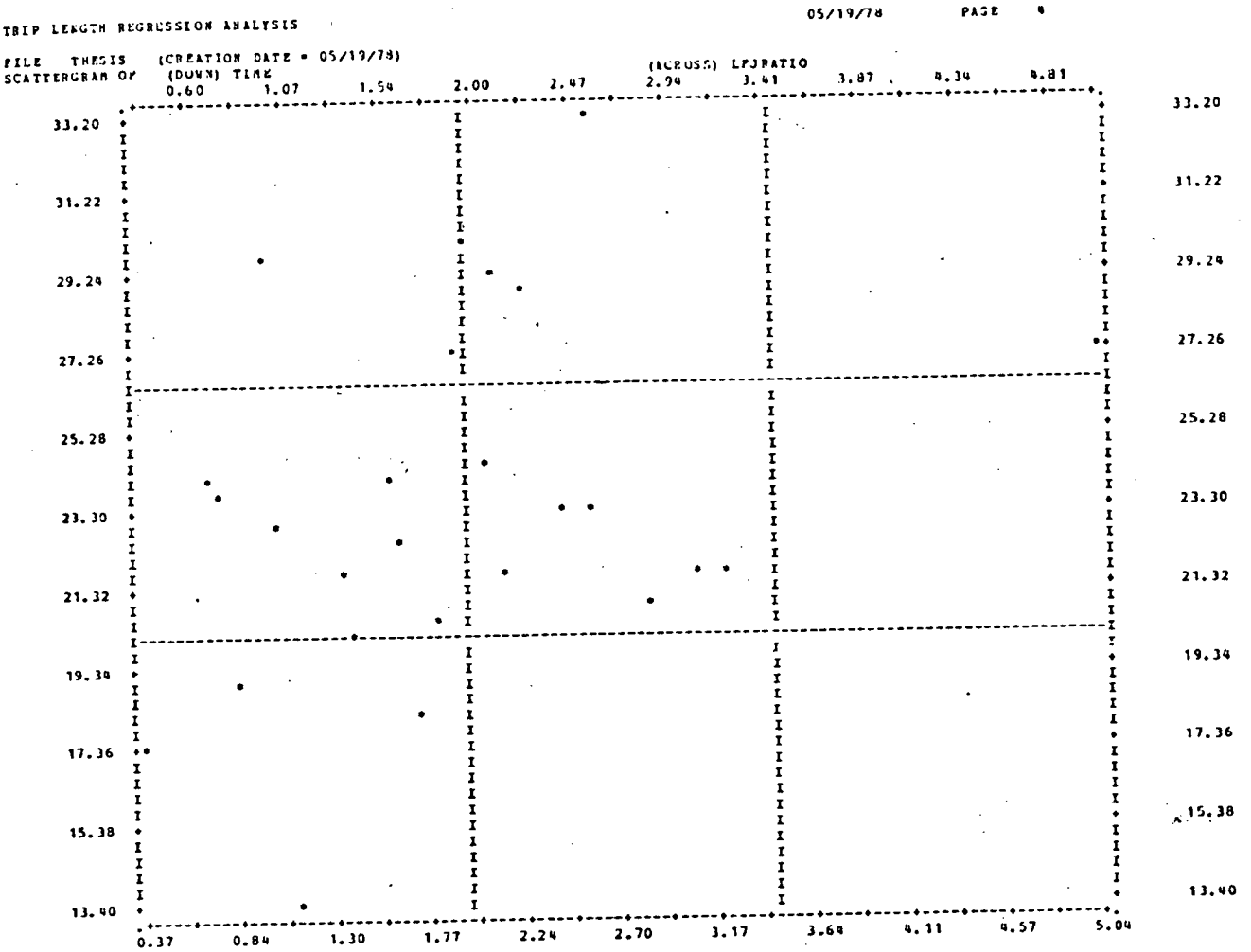
FIGURE 18: A SCATTERGRAM OF TRAVEL TIME AND THE LABOUR FORCE:JOB RATIOS



TRIP LENGTH REGRESSION ANALYSIS 05/19/78 PAGE 5

STATISTICS..

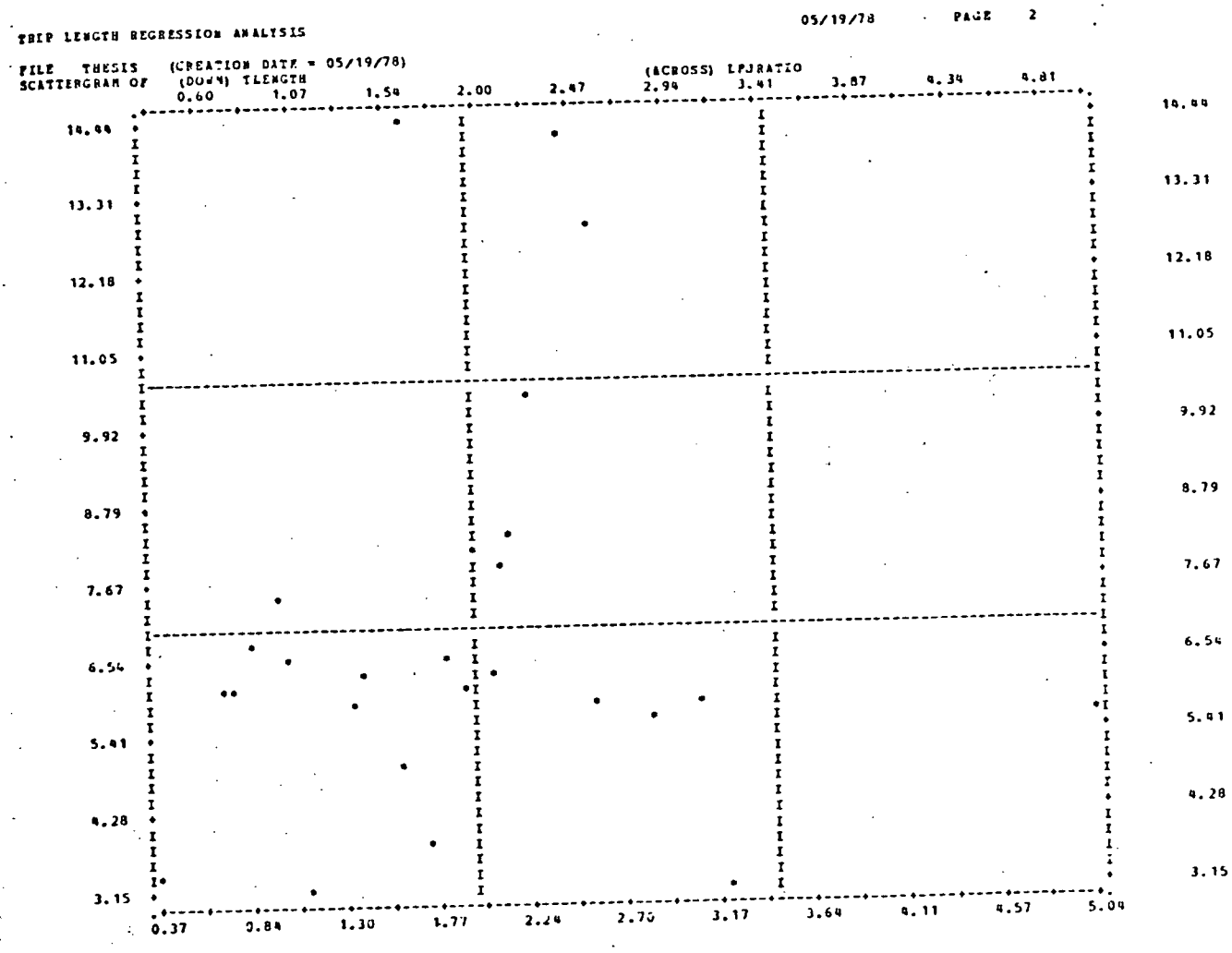
CORRELATION (R) -	0.30980	R SQUARED -	0.09598	SIGNIFICANCE -	0.06176
STD ERR OF EST -	4.31147	INTERCEPT (A) -	20.83388	SLOPE (B) -	1.38914

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 21.34785 ON THE LEFT MARGIN
A VALUE OF 27.81513 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES-	0	MISSING VALUES -	0

********** IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FIGURE 19: SCATTERGRAM OF TRAVEL DISTANCE AND THE LABOUR FORCE:JOB RATIOS



TRIP LENGTH REGRESSION ANALYSIS 05/19/78 PAGE 3

STATISTICS..

CORRELATION (R) -	0.10293	R SQUARED -	0.01057	SIGNIFICANCE -	0.30950
STD ERR OF EST -	3.06604	INTERCEPT (A) -	6.40670	SLOPE (B) -	0.31303

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 6.52266 ON THE LEFT MARGIN
A VALUE OF 7.98637 ON THE RIGHT MARGIN

PLOTTED VALUES - 26 EXCLUDED VALUES- 0 MISSING VALUES - 0

********** IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

coefficient (0.10283) and the extremely low coefficient of determination (0.015057).

Thus, time seems to be more correlated with the labour force:job ratio than travel distance. It mildly supports the claim that the higher the ratio the longer the mean work trip length for work trips leaving a particular area. It gives slight support to the contention that one way of reducing mean work trip lengths is to achieve a balance between the labour force and jobs within sub-areas of the region.

(ii) Work Trip Length and Income

The literature review in Chapter 2 presented the view that income influences work trip length. It appears that the well to do have longer work trip lengths than the other workers in most cities, at least in the United States, and that the low income workers have the shortest work trip lengths. Is this the case in the Greater Vancouver Region?

This question was investigated by analyzing work trip lengths from VATS of 1972 and average household incomes from the 1971 Census. Figure 20 indicates the average household incomes for the various sub-areas of the region. A regression analysis was done using these data on income and data on mean work trip lengths for home to work trips for each sub-area. Figures 21 and 22 are the plots of income with time and distance.

The analysis reveals that income is not significantly related to work trip length in terms of either time or distance. This is indicated by the R^2's of 4.0×10^{-5} for the relationship between distance and income, and 2.13×10^{-3} for that between time and income. Their coefficients of correlation are also extremely low: 6.63×10^{-3} and 4.616×10^{-2}

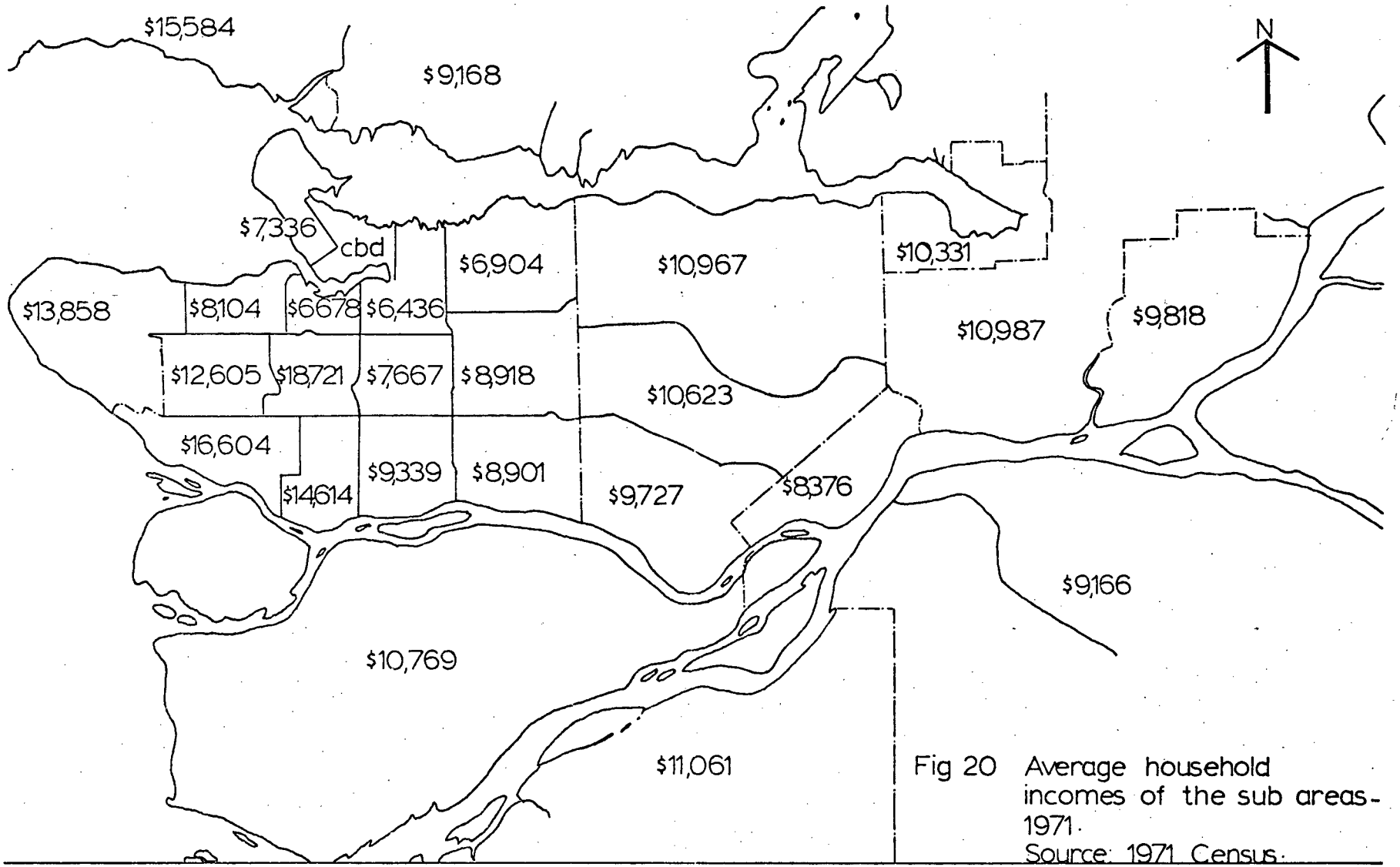


Fig 20 Average household incomes of the sub areas - 1971.
Source: 1971 Census.

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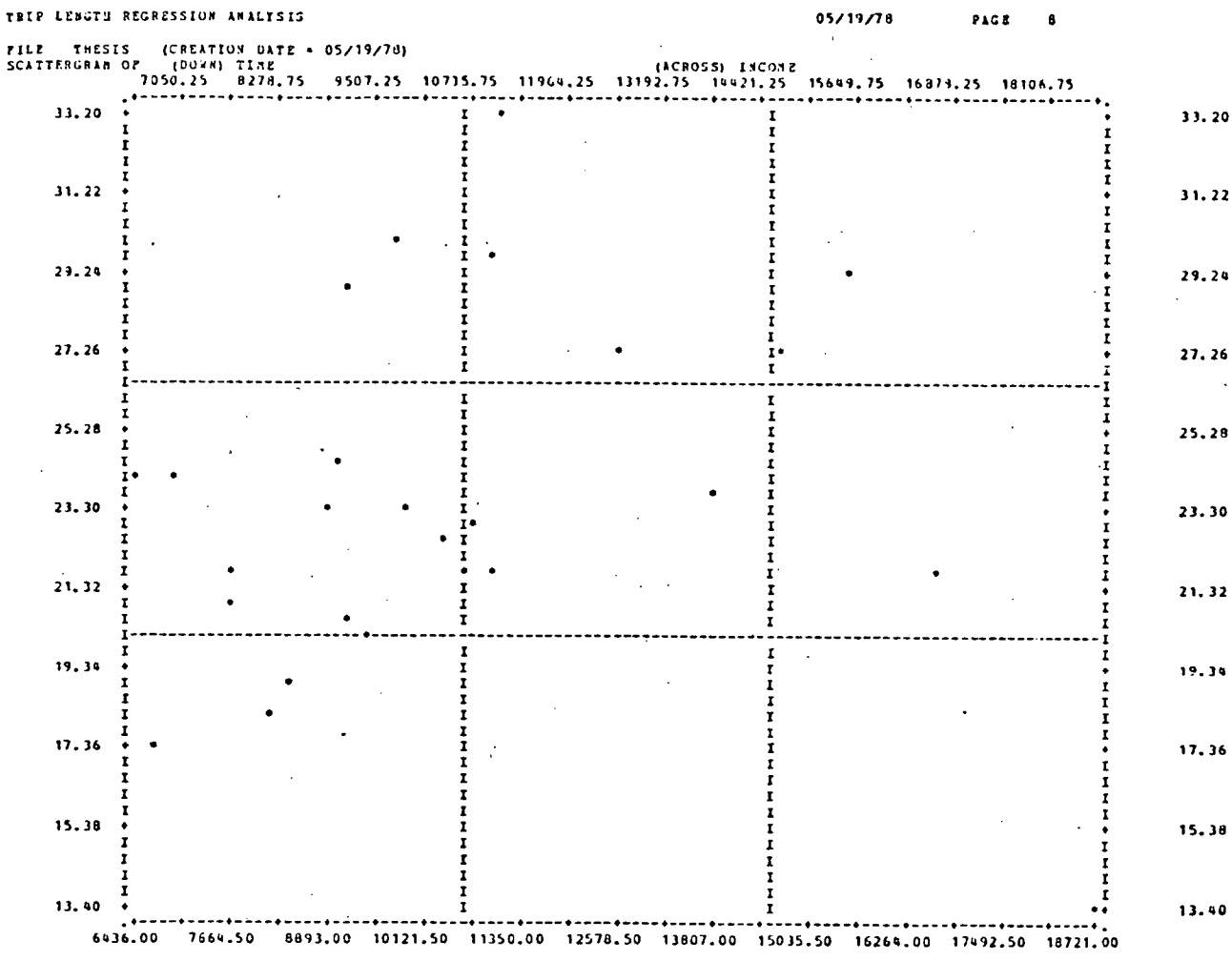
FIGURE 21: SCATTERGRAM OF MEAN TRAVEL DISTANCE WITH MEAN HOUSEHOLD INCOME



TRIP LENGTH REGRESSION ANALYSIS 05/19/78 PAGE 9

STATISTICS..

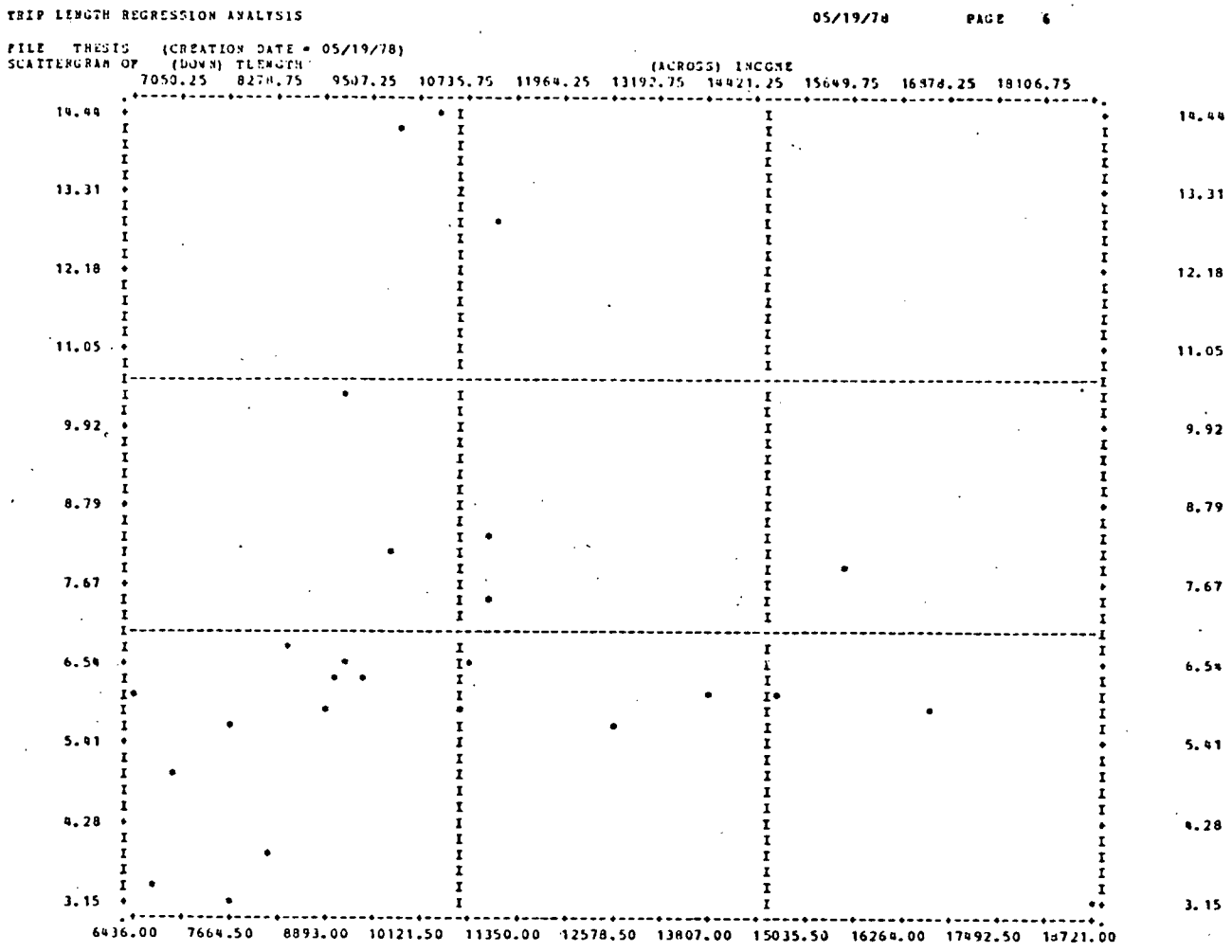
CORRELATION (R) -	0.04616	R SQUARED -	0.00213	SIGNIFICANCE -	0.41140
STD ERR OF EST -	4.52973	INTERCEPT (A) -	22.78658	SLOPE (B) -	0.00007

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 23.20779 ON THE LEFT MARGIN
A VALUE OF 24.01183 ON THE RIGHT MARGIN

PLOTTED VALUES - 26 EXCLUDED VALUES- 0 MISSING VALUES - 0

********* IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FIGURE 22: A SCATTERGRAM OF MEAN TRAVEL TIME WITH AVERAGE HOUSEHOLD INCOME



TRIP LENGTH REGRESSION ANALYSIS 05/19/78 PAGE 7

STATISTICS..

CORRELATION (R) -	0.00663	R SQUARED -	0.00004	SIGNIFICANCE -	0.48717
STD ERR OF EST -	3.08231	INTERCEPT (A) -	6.93593	SLOPE (B) -	0.639152-05

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A VALUE OF 7.05508 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES-	0	MISSING VALUES -	0

'*********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

respectively. However, a visual analysis of the plots indicates that the low income workers generally undertake short work trip lengths. On the other hand the middle income workers undertake the highest work trip lengths and the high income workers undertake modest work trip lengths.

As a conclusion, it can be said that even though certain studies indicate that as income increases work trip lengths increase, this does not appear to be the case in the Greater Vancouver Region.

CHAPTER 4

SUMMARY OF FINDINGS AND CONCLUSIONS

INTRODUCTION

This chapter is in two parts. The first states the findings of this study and the second discusses these findings and relates them to the "Living Close to Work" policy to indicate the benefits to be expected from such a policy. The specific aspects of the policy being discussed are:

1. whether a balance between the labour force and jobs on a local area basis will have the effect of reducing work trip lengths, and
2. whether the above strategy will lead to an easing of downtown traffic congestion.

SECTION A - SUMMARY OF FINDINGS

The major findings of the study could be summarized as follows:

1. Mean and median work trip distances to all the suburban centers together are somewhat shorter than the corresponding figures to the downtown employment center. This seems to suggest that in general terms if employment centers are located outside the downtown work trip distances will be shorter than those to the downtown area. This supports the proposition that one way of reducing work trip lengths will be to decentralize jobs from the downtown area to suburban centers.
2. Mean and median work trip travel times to the suburban centers are substantially shorter than the corresponding travel times to the downtown employment center.

One implication of this to the study is the fact that even though a job location outside the downtown might not lead to a substantial reduction in travel distances, there may be significant time savings.

3. Areas with high labour force:job ratios tend to have the longest work trip lengths. This is the case with Delta and White Rock, Surrey and Port Coquitlam. However, a balance of labour force and jobs in a particular area (i.e. a ratio of 1.0) does not necessarily imply short work trip lengths. The case of North Burnaby illustrates this. (This area has a ratio of 0.99 and a mean work trip length of 29.54 minutes or 7.481 miles.)

   This suggests that a balance between labour force and jobs in an area may not necessarily lead to short work trip lengths in comparison with other areas. The fact that the labour force balances the number of jobs may have little influence on work trip lengths because many other conditions are required if the jobs are to be filled by candidates who live locally. The right man must be available from the local area when a job is vacant, must want the job, and must be preferred over all others applying for it.

4. Between 1965 and 1972 mean work trip lengths to all the employment centers outside the downtown increased faster than the mean work trip length to the downtown[12] (see Table 6). This may be attributed in part to the increase in residential development on the periphery of the region.

   One implication of this is that as the population of the areas outside the downtown increases, the mean work trip length also

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[12] This conclusion was arrived at by comparing work trip lengths derived by Wolforth (1965), Hickman (1968) and VATS (1972). However, the VATS surveys were carried out in a different way from the two other studies. See page 46 for a discussion of the survey methodology used in each study.

increases. Thus, to reduce the mean work trip length outside the downtown, jobs can be located in such areas.

5. The comparison of travel modes to the suburban centers and the downtown revealed the importance of transit to the downtown and auto to the non-downtown employment centers. Women were also found to be heavily dependent on transit as compared to men.

   This suggests that if jobs are deflected from the downtown and located in the suburban areas, there may be a change in the mode of travel to work. Most workers will shift to the use of auto because of its advantages and higher quality of travel as compared to the bus transit.

6. The analysis of work trip lengths in relation to the average household incomes of the various geographical areas of the region revealed that people who live in high income sub-areas of the Lower Mainland travel no less and no more than the population as a whole to and from work. This is at variance with the general conclusion from empirical and theoretical studies that the rich do make longer journeys than the population as a whole.

   The study attributes this to the fact that high income workers can find high quality residential areas of substantial size adjacent to the CBD, in the inner suburbs and in the outer suburbs. Low income workers live in low-cost residential areas and there is a preponderance of these in the inner city and the journey to work from these areas is relatively short. Middle income sub-areas produce the longest work trips overall and this appears to reflect the development of new, mid-priced single family subdivisions on the urban fringe.

7. The comparison and analysis of the various populations and mean work trip lengths for ten SMSA's and Greater Vancouver show that average work trip length in Vancouver and the trip length frequency distribution for Vancouver appear to be quite typical of those for moderate and large cities.
8. The study was able to confirm the findings of some earlier studies that mean work trip lengths to suburban employment centers are shorter than the mean work trip to the downtown. However, it did not show that suburban employment centers draw their labour from a smaller catchment area as compared to the CBD. This was because there was no clear pattern in the origin of work trips to these two centers. They all seemed to have had origins over the whole region.

   In general the trip length frequency distribution for suburban centers has a very similar profile to that for trips to the CBD. The key differences are that more trips to suburban centers start close to these centers and the distribution is more compact for short and medium length trips.

SECTION B - CONCLUSION

One conclusion from the analysis was the fact that between 1965 and 1972, the increase in work trip lengths to employment centers outside the CBD was primarily the result of a greater increase in residential development on the region's periphery. The analysis also established the fact that mean and median work trip lengths to suburban centers were shorter than the corresponding figures to the downtown.

The above conclusions seem to suggest that there are two ways of

reducing work trip lengths:

(i) maintaining a balance between the population (labour force) and jobs for both downtown and non-downtown employment centers;

(ii) deflecting jobs to non-downtown locations.

These seem to be the legitimate bases of the GVRD's "Living Close to Work" policy which seeks to deflect jobs from the CBD to the suburbs and also seeks to maintain a balance between the labour force and jobs on a local area basis.

The comparison of work trip lengths from the three studies between 1965 and 1972 also suggests that one way of reducing work trip lengths is to maintain a balance between sub-area labour force and sub-area jobs. However, the analysis of the VATS and the 1970 Census data indicated that there was no significant correlation between work trip length and the ratio of sub-area labour force and sub-area jobs. A long work trip length was not necessarily the result of an imbalance between the sub-area labour force and sub-area jobs. Apart from this ratio, other factors related to employee skills, availability of jobs and preference of the workers in an area will determine whether people will travel less to work.

There was a very slight correlation between work trip time and the ratio of sub-area labour force to sub-area jobs. This in relation to the shorter travel times to the suburban centers as compared to corresponding figures to the downtown has an important implication for the study. Even though the matching of jobs to the labour force in the sub-areas might not lead to significant reductions in work trip distances, there will still be substantial time savings.

The VATS data on work trip travel mode indicated the overall

importance of transit and auto to the downtown and suburban centers respectively. The "Living Close to Work" policy by deflecting jobs from the downtown to the suburban centers may lead to a change in the workers' mode usage. There will be a significant and for the individual traveller a beneficial shift to the use of the auto because of its advantages and the higher quality of travel as compared to the bus transit.

One other benefit the policy has is the advantage it will have in diverting traffic from the CBD oriented peak hour flows. The policy can therefore lead to an easing of the traffic congestion within the downtown area and the city as a whole.

To some degree these conclusions must be regarded as tentative because of limitations of available data. As and when data on, say, decentralized firms and offices from the downtown become available, the issue should be further examined because it would be valuable to ascertain the effects of the policy in terms of the reaction of firms to moves over time. Such a study will not only be an indicator of the effectiveness of the policy but it will also indicate its effect on work trip lengths.

Finally, since it is clear that home selection depends to a high degree on the suitability of the dwelling in terms of size and neighbourhood amenities, research on exactly how important these factors are in Vancouver is called for. This research should be coupled with policy recommendations that will encourage the creation of housing and amenities that fit the desires of local area employees and is within their price range.

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APPENDICES

APPENDIX 1

PLACE OF RESIDENCE/PLACE OF WORK CROSSTABULATIONS

Meaning of Codes Used in Appendix 1

Code	Meaning
0	Blank Records
1	UEL and Point Grey
2	Kitsilano
3	Dunbar-Southlands
4	Kerrisdale and S.W. Marine
5	West End
6	Fairview
7	Shaughnessy and South Cambie
8	Oakridge and Marpole
9	Strathcona and Mt. Pleasant
10	Riley Park
11	Sunset
12	Hastings, Sunrise and Grandview Woodlands
13	Kensington, Cedar Cottage and Renfrew Collingwood
14	Victoria - Fraserview and Killarney
15	North Burnaby
16	Central Burnaby
17	South Burnaby
18	New Westminster
19	Richmond
20	Delta and White Rock
21	Surrey
22	Coquitlam
23	Port Moody
24	Port Coquitlam
25	West Vancouver
26	North Vancouver
27	Downtown
250	Subdivision 'A' (Census Met. Area Rural Fringe)
610	Unofficial Census Tract (Rural Fringe)

FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
PAGE 1 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK -0.	1.	2.	3.	5.	6.	7.	8.	9.	10.	ROW TOTAL
1.	COUNT	3	15	2	1	1	6	0	0	6	0	52
	ROW PCT	5.8	28.8	3.8	1.9	1.9	11.5	0.0	0.0	11.5	0.0	2.0
	COL PCT	2.1	22.4	3.2	5.0	1.8	3.3	0.0	0.0	2.6	0.0	
	TOT PCT	0.1	0.6	0.1	0.0	0.0	0.2	0.0	0.0	0.2	0.0	
2.	COUNT	1	7	18	2	3	11	4	1	6	2	106
	ROW PCT	0.9	6.6	17.0	1.9	2.8	10.4	3.8	0.9	5.7	1.9	4.1
	COL PCT	0.7	10.4	29.0	10.0	5.3	6.1	8.5	2.7	2.6	4.2	
	TOT PCT	0.0	0.3	0.7	0.1	0.1	0.4	0.2	0.0	0.2	0.1	
3.	COUNT	4	9	11	3	3	13	3	3	3	3	90
	ROW PCT	4.4	10.0	12.2	3.3	3.3	14.4	3.3	3.3	3.3	3.3	3.5
	COL PCT	2.8	13.4	17.7	15.0	5.3	7.2	6.4	8.1	1.3	6.3	
	TOT PCT	0.2	0.3	0.4	0.1	0.1	0.5	0.1	0.1	0.1	0.1	
5.	COUNT	4	3	3	1	13	7	2	3	14	3	115
	ROW PCT	3.5	2.6	2.6	0.9	11.3	6.1	1.7	2.6	12.2	2.6	4.4
	COL PCT	2.8	4.5	4.8	5.0	22.8	3.9	4.3	8.1	6.1	6.3	
	TOT PCT	0.2	0.1	0.1	0.0	0.5	0.3	0.1	0.1	0.5	0.1	
6.	COUNT	2	3	3	0	1	26	2	0	3	2	79
	ROW PCT	2.5	3.8	3.8	0.0	1.3	32.9	2.5	0.0	3.8	2.5	3.0
	COL PCT	1.4	4.5	4.8	0.0	1.8	14.4	4.3	0.0	1.3	4.2	
	TOT PCT	0.1	0.1	0.1	0.0	0.0	1.0	0.1	0.0	0.1	0.1	
7.	COUNT	0	3	0	5	0	9	6	1	3	2	43
	ROW PCT	0.0	7.0	0.0	11.6	0.0	20.9	14.0	2.3	7.0	4.7	1.7
	COL PCT	0.0	4.5	0.0	25.0	0.0	5.0	12.8	2.7	1.3	4.2	
	TOT PCT	0.0	0.1	0.0	0.2	0.0	0.3	0.2	0.0	0.1	0.1	
8.	COUNT	6	5	4	1	3	7	4	12	7	4	113
	ROW PCT	5.3	4.4	3.5	0.9	2.7	6.2	3.5	10.6	6.2	3.5	4.3
	COL PCT	4.1	7.5	6.5	5.0	5.3	3.9	8.5	32.4	3.0	8.3	
	TOT PCT	0.2	0.2	0.2	0.0	0.1	0.3	0.2	0.5	0.3	0.2	
COLUMN TOTAL		145	67	62	20	57	181	47	37	230	48	2605
		5.6	2.6	2.4	0.8	2.2	6.9	1.8	1.4	8.8	1.8	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 2 OF 12

PLWORK: COUNT / ROW PCT / COL PCT / TOT PCT

PLRESID		11.	13.	14.	15.	16.	17.	18.	19.	20.	21.	ROW TOTAL
1.	COUNT	2	2	1	3	1	0	0	0	0	0	52
	ROW PCT	3.8	3.8	1.9	5.8	1.9	0.0	0.0	0.0	0.0	0.0	2.0
	COL PCT	3.0	4.3	4.8	2.4	0.8	0.0	0.0	0.0	0.0	0.0	
	TOT PCT	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
2.	COUNT	4	1	0	4	2	0	0	3	0	1	106
	ROW PCT	3.8	0.9	0.0	3.8	1.9	0.0	0.0	2.8	0.0	0.9	4.1
	COL PCT	6.0	2.1	0.0	3.2	1.6	0.0	0.0	1.7	0.0	0.7	
	TOT PCT	0.2	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	
3.	COUNT	0	5	2	2	0	1	0	2	0	1	90
	ROW PCT	0.0	5.6	2.2	2.2	0.0	1.1	0.0	2.2	0.0	1.1	3.5
	COL PCT	0.0	10.6	9.5	1.6	0.0	2.9	0.0	1.1	0.0	0.7	
	TOT PCT	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	
5.	COUNT	1	1	1	0	5	0	0	7	0	0	115
	ROW PCT	0.9	0.9	0.9	0.0	4.3	0.0	0.0	6.1	0.0	0.0	4.4
	COL PCT	1.5	2.1	4.8	0.0	3.9	0.0	0.0	3.9	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0	
6.	COUNT	2	0	0	0	0	0	1	4	0	1	79
	ROW PCT	2.5	0.0	0.0	0.0	0.0	0.0	1.3	5.1	0.0	1.3	3.0
	COL PCT	3.0	0.0	0.0	0.0	0.0	0.0	0.8	2.2	0.0	0.7	
	TOT PCT	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	
7.	COUNT	0	0	1	0	0	0	0	1	0	2	43
	ROW PCT	0.0	0.0	2.3	0.0	0.0	0.0	0.0	2.3	0.0	4.7	1.7
	COL PCT	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.6	0.0	1.4	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
8.	COUNT	5	1	0	2	3	0	2	10	1	0	113
	ROW PCT	4.4	0.9	0.0	1.8	2.7	0.0	1.8	8.8	0.9	0.0	4.3
	COL PCT	7.5	2.1	0.0	1.6	2.4	0.0	1.6	5.5	1.9	0.0	
	TOT PCT	0.2	0.0	0.0	0.1	0.1	0.0	0.1	0.4	0.0	0.0	
COLUMN TOTAL		67	47	21	125	127	34	123	181	52	139	2605
		2.6	1.8	0.8	4.8	4.9	1.3	4.7	6.9	2.0	5.3	100.0

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FILE APPENDIX (CREATION DATE = 05/19/78)

* CROSSTABULATION OF *
PLRESID BY PLWORK
* PAGE 3 OF 12

PLRESID	PLWORK	22.	23.	24.	25.	26.	27.	71.	250.	610.	ROW TOTAL
1.	COUNT	0	0	0	1	0	8	0	0	0	52
	ROW PCT	0.0	0.0	0.0	1.9	0.0	15.4	0.0	0.0	0.0	2.0
	COL PCT	0.0	0.0	0.0	2.2	0.0	1.6	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	
2.	COUNT	2	1	0	0	2	31	0	0	0	106
	ROW PCT	1.9	0.9	0.0	0.0	1.9	29.2	0.0	0.0	0.0	4.1
	COL PCT	3.5	4.8	0.0	0.0	1.5	6.0	0.0	0.0	0.0	
	TOT PCT	0.1	0.0	0.0	0.0	0.1	1.2	0.0	0.0	0.0	
3.	COUNT	0	0	0	0	2	20	0	0	0	90
	ROW PCT	0.0	0.0	0.0	0.0	2.2	22.2	0.0	0.0	0.0	3.5
	COL PCT	0.0	0.0	0.0	0.0	1.5	3.9	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.0	0.0	
5.	COUNT	0	0	0	0	1	46	0	0	0	115
	ROW PCT	0.0	0.0	0.0	0.0	0.9	40.0	0.0	0.0	0.0	4.4
	COL PCT	0.0	0.0	0.0	0.0	0.8	9.0	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	
6.	COUNT	2	0	0	2	0	25	0	0	0	79
	ROW PCT	2.5	0.0	0.0	2.5	0.0	31.6	0.0	0.0	0.0	3.0
	COL PCT	3.5	0.0	0.0	4.3	0.0	4.9	0.0	0.0	0.0	
	TOT PCT	0.1	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.0	
7.	COUNT	0	0	0	1	1	8	0	0	0	43
	ROW PCT	0.0	0.0	0.0	2.3	2.3	18.6	0.0	0.0	0.0	1.7
	COL PCT	0.0	0.0	0.0	2.2	0.8	1.6	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	
8.	COUNT	0	0	0	1	1	34	0	0	0	113
	ROW PCT	0.0	0.0	0.0	0.9	0.9	30.1	0.0	0.0	0.0	4.3
	COL PCT	0.0	0.0	0.0	2.2	0.8	6.6	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	
COLUMN TOTAL		57	21	22	46	133	513	1	1	1	2605
		2.2	0.8	0.8	1.8	5.1	19.7	0.0	0.0	0.0	100.0

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FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * * CROSSTABULATION OF * * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 4 OF 12

PLRESID / PLWORK: COUNT / ROW PCT / COL PCT / TOT PCT	-0.	1.	2.	3.	5.	6.	7.	8.	9.	10.	ROW TOTAL
9.	12	2	2	0	4	18	1	0	52	3	206
	5.8	1.0	1.0	0.0	1.9	8.7	0.5	0.0	25.2	1.5	7.9
	8.3	3.0	3.2	0.0	7.0	9.9	2.1	0.0	22.6	6.3	
	0.5	0.1	0.1	0.0	0.2	0.7	0.0	0.0	2.0	0.1	
10.	7	0	3	0	3	8	6	2	10	8	77
	9.1	0.0	3.9	0.0	3.9	10.4	7.8	2.6	13.0	10.4	3.0
	4.8	0.0	4.8	0.0	5.3	4.4	12.8	5.4	4.3	16.7	
	0.3	0.0	0.1	0.0	0.1	0.3	0.2	0.1	0.4	0.3	
11.	5	4	3	0	2	9	1	1	5	4	87
	5.7	4.6	3.4	0.0	2.3	10.3	1.1	1.1	5.7	4.6	3.3
	3.4	6.0	4.8	0.0	3.5	5.0	2.1	2.7	2.2	8.3	
	0.2	0.2	0.1	0.0	0.1	0.3	0.0	0.0	0.2	0.2	
13.	3	1	4	1	2	10	5	2	24	4	113
	2.7	0.9	3.5	0.9	1.8	8.8	4.4	1.8	21.2	3.5	4.3
	2.1	1.5	6.5	5.0	3.5	5.5	10.6	5.4	10.4	8.3	
	0.1	0.0	0.2	0.0	0.1	0.4	0.2	0.1	0.9	0.2	
14.	2	1	3	1	1	11	3	0	8	5	78
	2.6	1.3	3.8	1.3	1.3	14.1	3.8	0.0	10.3	6.4	3.0
	1.4	1.5	4.8	5.0	1.8	6.1	6.4	0.0	3.5	10.4	
	0.1	0.0	0.1	0.0	0.0	0.4	0.1	0.0	0.3	0.2	
15.	5	2	0	0	2	4	0	2	14	0	96
	5.2	2.1	0.0	0.0	2.1	4.2	0.0	2.1	14.6	0.0	3.7
	3.4	3.0	0.0	0.0	3.5	2.2	0.0	5.4	6.1	0.0	
	0.2	0.1	0.0	0.0	0.1	0.2	0.0	0.1	0.5	0.0	
16.	1	2	1	0	1	9	1	1	6	1	118
	0.8	1.7	0.8	0.0	0.8	7.6	0.8	0.8	5.1	0.8	4.5
	0.7	3.0	1.6	0.0	1.8	5.0	2.1	2.7	2.6	2.1	
	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	
COLUMN TOTAL	145	67	62	20	57	181	47	37	230	48	2605
	5.6	2.6	2.4	0.8	2.2	6.9	1.8	1.4	8.8	1.8	100.0

(CONTINUED)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 5 OF 12

PLRESID	PLWORK: COUNT / ROW PCT / COL PCT / TOT PCT	11.	13.	14.	15.	16.	17.	18.	19.	20.	21.	ROW TOTAL
9.	COUNT	6	9	2	7	6	1	3	13	0	2	206
	ROW PCT	2.9	4.4	1.0	3.4	2.9	0.5	1.5	6.3	0.0	1.0	7.9
	COL PCT	9.0	19.1	9.5	5.6	4.7	2.9	2.4	7.2	0.0	1.4	
	TOT PCT	0.2	0.3	0.1	0.3	0.2	0.0	0.1	0.5	0.0	0.1	
10.	COUNT	4	2	1	1	4	0	1	3	0	0	77
	ROW PCT	5.2	2.6	1.3	1.3	5.2	0.0	1.3	3.9	0.0	0.0	3.0
	COL PCT	6.0	4.3	4.8	0.8	3.1	0.0	0.8	1.7	0.0	0.0	
	TOT PCT	0.2	0.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	
11.	COUNT	11	3	0	3	4	4	0	2	1	3	87
	ROW PCT	12.6	3.4	0.0	3.4	4.6	4.6	0.0	2.3	1.1	3.4	3.3
	COL PCT	16.4	6.4	0.0	2.4	3.1	11.8	0.0	1.1	1.9	2.2	
	TOT PCT	0.4	0.1	0.0	0.1	0.2	0.2	0.0	0.1	0.0	0.1	
13.	COUNT	6	7	4	5	4	0	1	3	3	2	113
	ROW PCT	5.3	6.2	3.5	4.4	3.5	0.0	0.9	2.7	2.7	1.8	4.3
	COL PCT	9.0	14.9	19.0	4.0	3.1	0.0	0.8	1.7	5.8	1.4	
	TOT PCT	0.2	0.3	0.2	0.2	0.2	0.0	0.0	0.1	0.1	0.1	
14.	COUNT	4	4	3	5	1	4	0	4	0	2	78
	ROW PCT	5.1	5.1	3.8	6.4	1.3	5.1	0.0	5.1	0.0	2.6	3.0
	COL PCT	6.0	8.5	14.3	4.0	0.8	11.8	0.0	2.2	0.0	1.4	
	TOT PCT	0.2	0.2	0.1	0.2	0.0	0.2	0.0	0.2	0.0	0.1	
15.	COUNT	4	1	0	22	8	1	5	2	0	2	96
	ROW PCT	4.2	1.0	0.0	22.9	8.3	1.0	5.2	2.1	0.0	2.1	3.7
	COL PCT	6.0	2.1	0.0	17.6	6.3	2.9	4.1	1.1	0.0	1.4	
	TOT PCT	0.2	0.0	0.0	0.8	0.3	0.0	0.2	0.1	0.0	0.1	
16.	COUNT	3	2	0	9	32	3	11	3	0	3	118
	ROW PCT	2.5	1.7	0.0	7.6	27.1	2.5	9.3	2.5	0.0	2.5	4.5
	COL PCT	4.5	4.3	0.0	7.2	25.2	8.8	8.9	1.7	0.0	2.2	
	TOT PCT	0.1	0.1	0.0	0.3	1.2	0.1	0.4	0.1	0.0	0.1	
COLUMN TOTAL		67	47	21	125	127	34	123	181	52	139	2605
		2.6	1.8	0.8	4.8	4.9	1.3	4.7	6.9	2.0	5.3	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * * CROSSTABULATION OF PLRESID BY PLWORK * * * * * * * * * * * * * * * * * * * PAGE 6 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK 22.	23.	24.	25.	26.	27.	71.	250.	610.	ROW TOTAL
9.		1	3	0	4	8	47	0	0	0	206
		0.5	1.5	0.0	1.9	3.9	22.8	0.0	0.0	0.0	7.9
		1.8	14.3	0.0	8.7	6.0	9.2	0.0	0.0	0.0	
		0.0	0.1	0.0	0.2	0.3	1.8	0.0	0.0	0.0	
10.		0	0	0	0	1	13	0	0	0	77
		0.0	0.0	0.0	0.0	1.3	16.9	0.0	0.0	0.0	3.0
		0.0	0.0	0.0	0.0	0.8	2.5	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	
11.		0	0	0	1	1	19	1	0	0	87
		0.0	0.0	0.0	1.1	1.1	21.8	1.1	0.0	0.0	3.3
		0.0	0.0	0.0	2.2	0.8	3.7	100.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	
13.		0	0	0	0	3	19	0	0	0	113
		0.0	0.0	0.0	0.0	2.7	16.8	0.0	0.0	0.0	4.3
		0.0	0.0	0.0	0.0	2.3	3.7	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.0	0.0	
14.		0	0	0	1	1	14	0	0	0	78
		0.0	0.0	0.0	1.3	1.3	17.9	0.0	0.0	0.0	3.0
		0.0	0.0	0.0	2.2	0.8	2.7	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	
15.		0	0	1	0	1	20	0	0	0	96
		0.0	0.0	1.0	0.0	1.0	20.8	0.0	0.0	0.0	3.7
		0.0	0.0	4.5	0.0	0.8	3.9	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	
16.		5	0	1	1	5	17	0	0	0	118
		4.2	0.0	0.8	0.8	4.2	14.4	0.0	0.0	0.0	4.5
		8.8	0.0	4.5	2.2	3.8	3.3	0.0	0.0	0.0	
		0.2	0.0	0.0	0.0	0.2	0.7	0.0	0.0	0.0	
COLUMN TOTAL		57	21	22	46	133	513	1	1	1	2605
		2.2	0.8	0.8	1.8	5.1	19.7	0.0	0.0	0.0	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 7 OF 12

PLRESID	PLWORK: COUNT / ROW PCT / COL PCT / TOT PCT	-0.	1.	2.	3.	5.	6.	7.	8.	9.	10.	ROW TOTAL
17.	COUNT	5	0	0	0	3	3	0	0	6	0	68
	ROW PCT	7.4	0.0	0.0	0.0	4.4	4.4	0.0	0.0	8.8	0.0	2.6
	COL PCT	3.4	0.0	0.0	0.0	5.3	1.7	0.0	0.0	2.6	0.0	
	TOT PCT	0.2	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.0	
18.	COUNT	5	0	0	0	0	3	0	1	2	0	82
	ROW PCT	6.1	0.0	0.0	0.0	0.0	3.7	0.0	1.2	2.4	0.0	3.1
	COL PCT	3.4	0.0	0.0	0.0	0.0	1.7	0.0	2.7	0.9	0.0	
	TOT PCT	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	
19.	COUNT	16	3	1	2	7	3	2	3	8	1	177
	ROW PCT	9.0	1.7	0.6	1.1	4.0	1.7	1.1	1.7	4.5	0.6	6.8
	COL PCT	11.0	4.5	1.6	10.0	12.3	1.7	4.3	8.1	3.5	2.1	
	TOT PCT	0.6	0.1	0.0	0.1	0.3	0.1	0.1	0.1	0.3	0.0	
20.	COUNT	14	1	0	1	0	4	1	0	11	1	125
	ROW PCT	11.2	0.8	0.0	0.8	0.0	3.2	0.8	0.0	8.8	0.8	4.8
	COL PCT	9.7	1.5	0.0	5.0	0.0	2.2	2.1	0.0	4.8	2.1	
	TOT PCT	0.5	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.0	
21.	COUNT	13	0	0	0	2	5	2	1	5	0	232
	ROW PCT	5.6	0.0	0.0	0.0	0.9	2.2	0.9	0.4	2.2	0.0	8.9
	COL PCT	9.0	0.0	0.0	0.0	3.5	2.8	4.3	2.7	2.2	0.0	
	TOT PCT	0.5	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.2	0.0	
22.	COUNT	4	0	0	0	0	0	2	0	4	1	86
	ROW PCT	4.7	0.0	0.0	0.0	0.0	0.0	2.3	0.0	4.7	1.2	3.3
	COL PCT	2.8	0.0	0.0	0.0	0.0	0.0	4.3	0.0	1.7	2.1	
	TOT PCT	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0	
23.	COUNT	7	0	0	0	0	0	0	0	2	0	32
	ROW PCT	21.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	1.2
	COL PCT	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	
	TOT PCT	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	
COLUMN TOTAL		145	67	62	20	57	181	47	37	230	48	2605
		5.6	2.6	2.4	0.8	2.2	6.9	1.8	1.4	8.8	1.8	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* C R O S S T A B U L A T I O N O F *
PLRESID BY PLWORK
* PAGE 8 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK 11.	13.	14.	15.	16.	17.	18.	19.	20.	21.	ROW TOTAL
17.	COUNT	1	1	1	10	13	5	5	2	1	3	68
	ROW PCT	1.5	1.5	1.5	14.7	19.1	7.4	7.4	2.9	1.5	4.4	2.6
	COL PCT	1.5	2.1	4.8	8.0	10.2	14.7	4.1	1.1	1.9	2.2	
	TOT PCT	0.0	0.0	0.0	0.4	0.5	0.2	0.2	0.1	0.0	0.1	
18.	COUNT	3	1	0	5	6	3	34	1	2	3	82
	ROW PCT	3.7	1.2	0.0	6.1	7.3	3.7	41.5	1.2	2.4	3.7	3.1
	COL PCT	4.5	2.1	0.0	4.0	4.7	8.8	27.6	0.6	3.8	2.2	
	TOT PCT	0.1	0.0	0.0	0.2	0.2	0.1	1.3	0.0	0.1	0.1	
19.	COUNT	4	1	1	1	2	2	1	91	1	1	177
	ROW PCT	2.3	0.6	0.6	0.6	1.1	1.1	0.6	51.4	0.6	0.6	6.8
	COL PCT	6.0	2.1	4.8	0.8	1.6	5.9	0.8	50.3	1.9	0.7	
	TOT PCT	0.2	0.0	0.0	0.0	0.1	0.1	0.0	3.5	0.0	0.0	
20.	COUNT	1	2	0	5	3	2	9	11	27	13	125
	ROW PCT	0.8	1.6	0.0	4.0	2.4	1.6	7.2	8.8	21.6	10.4	4.8
	COL PCT	1.5	4.3	0.0	4.0	2.4	5.9	7.3	6.1	51.9	9.4	
	TOT PCT	0.0	0.1	0.0	0.2	0.1	0.1	0.3	0.4	1.0	0.5	
21.	COUNT	4	1	2	7	12	3	23	14	13	94	232
	ROW PCT	1.7	0.4	0.9	3.0	5.2	1.3	9.9	6.0	5.6	40.5	8.9
	COL PCT	6.0	2.1	9.5	5.6	9.4	8.8	18.7	7.7	25.0	67.6	
	TOT PCT	0.2	0.0	0.1	0.3	0.5	0.1	0.9	0.5	0.5	3.6	
22.	COUNT	2	0	0	6	10	3	16	3	0	1	86
	ROW PCT	2.3	0.0	0.0	7.0	11.6	3.5	18.6	3.5	0.0	1.2	3.3
	COL PCT	3.0	0.0	0.0	4.8	7.9	8.8	13.0	1.7	0.0	0.7	
	TOT PCT	0.1	0.0	0.0	0.2	0.4	0.1	0.6	0.1	0.0	0.0	
23.	COUNT	0	1	0	3	2	0	1	0	1	0	32
	ROW PCT	0.0	3.1	0.0	9.4	6.3	0.0	3.1	0.0	3.1	0.0	1.2
	COL PCT	0.0	2.1	0.0	2.4	1.6	0.0	0.8	0.0	1.9	0.0	
	TOT PCT	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL		67	47	21	125	127	34	123	181	52	139	2605
		2.6	1.8	0.8	4.8	4.9	1.3	4.7	6.9	2.0	5.3	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * * CROSSTABULATION OF PLRESID BY PLWORK *

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK 22.	23.	24.	25.	26.	27.	71.	250.	610.	ROW TOTAL
17.		0	0	1	0	2	6	0	0	0	68
		0.0	0.0	1.5	0.0	2.9	8.8	0.0	0.0	0.0	2.6
		0.0	0.0	4.5	0.0	1.5	1.2	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	
18.		4	1	0	0	0	8	0	0	0	82
		4.9	1.2	0.0	0.0	0.0	9.8	0.0	0.0	0.0	3.1
		7.0	4.8	0.0	0.0	0.0	1.6	0.0	0.0	0.0	
		0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	
19.		0	0	0	2	2	22	0	0	0	177
		0.0	0.0	0.0	1.1	1.1	12.4	0.0	0.0	0.0	6.8
		0.0	0.0	0.0	4.3	1.5	4.3	0.0	0.0	0.0	
		0.0	0.0	0.0	0.1	0.1	0.8	0.0	0.0	0.0	
20.		0	0	1	1	0	16	0	0	1	125
		0.0	0.0	0.8	0.8	0.0	12.8	0.0	0.0	0.8	4.8
		0.0	0.0	4.5	2.2	0.0	3.1	0.0	0.0	100.0	
		0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	
21.		9	1	1	1	2	17	0	0	0	232
		3.9	0.4	0.4	0.4	0.9	7.3	0.0	0.0	0.0	8.9
		15.8	4.8	4.5	2.2	1.5	3.3	0.0	0.0	0.0	
		0.3	0.0	0.0	0.0	0.1	0.7	0.0	0.0	0.0	
22.		20	6	1	0	1	6	0	0	0	86
		23.3	7.0	1.2	0.0	1.2	7.0	0.0	0.0	0.0	3.3
		35.1	28.6	4.5	0.0	0.8	1.2	0.0	0.0	0.0	
		0.8	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	
23.		4	5	1	1	0	3	0	1	0	32
		12.5	15.6	3.1	3.1	0.0	9.4	0.0	3.1	0.0	1.2
		7.0	23.8	4.5	2.2	0.0	0.6	0.0	100.0	0.0	
		0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	
COLUMN TOTAL		57	21	22	46	133	513	1	1	1	2605
		2.2	0.8	0.8	1.6	5.1	19.7	0.0	0.0	0.0	100.0

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FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * * CROSSTABULATION OF * * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 10 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK -0.	1.	2.	3.	5.	6.	7.	8.	9.	10.	ROW TOTAL
24.		8	0	1	0	1	3	1	0	6	1	67
		11.9	0.0	1.5	0.0	1.5	4.5	1.5	0.0	9.0	1.5	2.6
		5.5	0.0	1.6	0.0	1.8	1.7	2.1	0.0	2.6	2.1	
		0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.0	
25.		6	3	1	0	0	0	0	1	4	1	82
		7.3	3.7	1.2	0.0	0.0	0.0	0.0	1.2	4.9	1.2	3.1
		4.1	4.5	1.6	0.0	0.0	0.0	0.0	2.7	1.7	2.1	
		0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	
26.		10	2	2	2	2	8	0	3	15	2	226
		4.4	0.9	0.9	0.9	0.9	3.5	0.0	1.3	6.6	0.9	8.7
		6.9	3.0	3.2	10.0	3.5	4.4	0.0	8.1	6.5	4.2	
		0.4	0.1	0.1	0.1	0.1	0.3	0.0	0.1	0.6	0.1	
27.		1	0	0	0	3	4	1	0	6	0	52
		1.9	0.0	0.0	0.0	5.8	7.7	1.9	0.0	11.5	0.0	2.0
		0.7	0.0	0.0	0.0	5.3	2.2	2.1	0.0	2.6	0.0	
		0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.2	0.0	
250.		1	1	0	0	0	0	0	0	0	0	3
		33.3	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL		145	67	62	20	57	181	47	37	230	48	2605
		5.6	2.6	2.4	0.8	2.2	6.9	1.8	1.4	8.8	1.8	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* C R O S S T A B U L A T I O N O F * * * * * * * * * * * * * * * * * * *
PLRESID BY PLWORK
* PAGE 11 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK 11.	13.	14.	15.	16.	17.	18.	19.	20.	21.	ROW TOTAL
24.	COUNT	0	0	0	13	1	0	4	0	1	2	67
	ROW PCT	0.0	0.0	0.0	19.4	1.5	0.0	6.0	0.0	1.5	3.0	2.6
	COL PCT	0.0	0.0	0.0	10.4	0.8	0.0	3.3	0.0	1.9	1.4	
	TOT PCT	0.0	0.0	0.0	0.5	0.0	0.0	0.2	0.0	0.0	0.1	
25.	COUNT	0	0	1	1	3	0	1	0	0	0	82
	ROW PCT	0.0	0.0	1.2	1.2	3.7	0.0	1.2	0.0	0.0	0.0	3.1
	COL PCT	0.0	0.0	4.8	0.8	2.4	0.0	0.8	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
26.	COUNT	0	2	1	10	4	2	4	2	1	3	226
	ROW PCT	0.0	0.9	0.4	4.4	1.8	0.9	1.8	0.9	0.4	1.3	8.7
	COL PCT	0.0	4.3	4.8	8.0	3.1	5.9	3.3	1.1	1.9	2.2	
	TOT PCT	0.0	0.1	0.0	0.4	0.2	0.1	0.2	0.1	0.0	0.1	
27.	COUNT	0	0	0	1	1	0	0	0	0	0	52
	ROW PCT	0.0	0.0	0.0	1.9	1.9	0.0	0.0	0.0	0.0	0.0	2.0
	COL PCT	0.0	0.0	0.0	0.8	0.8	0.0	0.0	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
250.	COUNT	0	0	0	0	0	0	1	0	0	0	3
	ROW PCT	0.0	0.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.1
	COL PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	
	TOT PCT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	COLUMN TOTAL	67	47	21	125	127	34	123	181	52	139	2605
		2.6	1.8	0.8	4.8	4.9	1.3	4.7	6.9	2.0	5.3	100.0

(CONTINUED)

FILE APPENDIX (CREATION DATE = 05/19/78)

* * * * * * * * * * * * * * * * * * * CROSSTABULATION OF PLRESID BY PLWORK * * * * * * * * * * * * * * * * * * * PAGE 12 OF 12

PLRESID	COUNT / ROW PCT / COL PCT / TOT PCT	PLWORK 22.	23.	24.	25.	26.	27.	71.	250.	610.	ROW TOTAL
24.		8	3	13	0	0	1	0	0	0	67
		11.9	4.5	19.4	0.0	0.0	1.5	0.0	0.0	0.0	2.6
		14.0	14.3	59.1	0.0	0.0	0.2	0.0	0.0	0.0	
		0.3	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
25.		0	0	0	23	11	26	0	0	0	82
		0.0	0.0	0.0	28.0	13.4	31.7	0.0	0.0	0.0	3.1
		0.0	0.0	0.0	50.0	8.3	5.1	0.0	0.0	0.0	
		0.0	0.0	0.0	0.9	0.4	1.0	0.0	0.0	0.0	
26.		2	1	2	5	86	55	0	0	0	226
		0.9	0.4	0.9	2.2	38.1	24.3	0.0	0.0	0.0	8.7
		3.5	4.8	9.1	10.9	64.7	10.7	0.0	0.0	0.0	
		0.1	0.0	0.1	0.2	3.3	2.1	0.0	0.0	0.0	
27.		0	0	0	1	2	32	0	0	0	52
		0.0	0.0	0.0	1.9	3.8	61.5	0.0	0.0	0.0	2.0
		0.0	0.0	0.0	2.2	1.5	6.2	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.1	1.2	0.0	0.0	0.0	
250.		0	0	0	0	0	0	0	0	0	3
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
COLUMN TOTAL		57	21	22	46	133	513	1	1	1	2605
		2.2	0.8	0.8	1.8	5.1	19.7	0.0	0.0	0.0	100.0

CHI SQUARE = 5338.37891 WITH 700 DEGREES OF FREEDOM SIGNIFICANCE = 0.0000

APPENDIX 2

SUMMARY OF WORK TRIP LENGTH MEASURES FOR THE SUB-AREAS

C*TRACT-TRIP LENGTH ANAL.

DISTA

MEAN	6.060	STD ERR	0.818	MEDIAN	4.298
MODE	0.258	STD DEV	5.895	RANGE	26.562
MINIMUM	0.258	MAXIMUM	26.820		
VALID CASES	52	MISSING CASES	2553		

TIMEA

MEAN	23.750	STD ERR	1.921	MEDIAN	20.500
MODE	20.000	STD DEV	13.309	RANGE	55.000
MINIMUM	5.000	MAXIMUM	60.000		
VALID CASES	48	MISSING CASES	2557		

DISTB

MEAN	3.785	STD ERR	0.356	MEDIAN	2.942
MODE	2.930	STD DEV	3.280	RANGE	18.803
MINIMUM	0.290	MAXIMUM	19.093		
VALID CASES	85	MISSING CASES	2520		

TIMEB

MEAN	18.250	STD ERR	1.129	MEDIAN	15.684
MODE	15.000	STD DEV	10.350	RANGE	40.000
MINIMUM	5.000	MAXIMUM	45.000		
VALID CASES	84	MISSING CASES	2521		

DISTC

MEAN	5.654	STD ERR	0.581	MEDIAN	4.556
MODE	4.411	STD DEV	5.516	RANGE	27.786
MINIMUM	0.258	MAXIMUM	28.044		
VALID CASES	90	MISSING CASES	2515		

C'TRACT-TRIP LENGTH ANAL.

TIMEC

MEAN	27.443	STD ERR	3.357	MEDIAN	19.900
MODE	15.000	STD DEV	31.490	RANGE	219.000
MINIMUM	1.000	MAXIMUM	220.000		
VALID CASES	88	MISSING CASES	2517		

DISTD

MEAN	5.798	STD ERR	0.751	MEDIAN	5.135
MODE	0.902	STD DEV	5.622	RANGE	26.723
MINIMUM	0.064	MAXIMUM	26.788		
VALID CASES	56	MISSING CASES	2549		

TIMED

MEAN	21.818	STD ERR	2.282	MEDIAN	18.250
MODE	15.000	STD DEV	16.925	RANGE	85.000
MINIMUM	5.000	MAXIMUM	90.000		
VALID CASES	55	MISSING CASES	2550		

DISTE

MEAN	3.152	STD ERR	0.472	MEDIAN	1.513
MODE	1.159	STD DEV	4.142	RANGE	30.362
MINIMUM	0.193	MAXIMUM	30.555		
VALID CASES	77	MISSING CASES	2528		

TIMEE

MEAN	21.628	STD ERR	2.600	MEDIAN	15.500
MODE	15.000	STD DEV	22.966	RANGE	193.000
MINIMUM	2.000	MAXIMUM	195.000		
VALID CASES	78	MISSING CASES	2527		

C'TRACT-TRIP LENGTH ANAL.

DISTF

MEAN	3.298	STD ERR	0.596	MEDIAN	1.985
MODE	0.129	STD DEV	5.300	RANGE	29.589
MINIMUM	0.097	MAXIMUM	29.686		
VALID CASES	79	MISSING CASES	2526		

TIMEF

MEAN	17.392	STD ERR	1.330	MEDIAN	14.950
MODE	5.000	STD DEV	11.817	RANGE	53.000
MINIMUM	2.000	MAXIMUM	55.000		
VALID CASES	79	MISSING CASES	2526		

DISTG

MEAN	3.251	STD ERR	0.563	MEDIAN	2.061
MODE	0.419	STD DEV	3.691	RANGE	16.581
MINIMUM	0.419	MAXIMUM	17.000		
VALID CASES	43	MISSING CASES	2562		

TIMEG

MEAN	13.395	STD ERR	1.614	MEDIAN	14.545
MODE	15.000	STD DEV	10.586	RANGE	44.000
MINIMUM	1.000	MAXIMUM	45.000		
VALID CASES	43	MISSING CASES	2562		

DISTH

MEAN	6.141	STD ERR	0.747	MEDIAN	4.765
MODE	3.574	STD DEV	5.641	RANGE	27.335
MINIMUM	0.161	MAXIMUM	27.496		
VALID CASES	57	MISSING CASES	2548		

C'TRACT-TRIP LENGTH ANAL.

TIMEH

MEAN	27.321	STD ERR	3.538	MEDIAN	20.357
MODE	20.000	STD DEV	26.474	RANGE	175.000
MINIMUM	5.000	MAXIMUM	180.000		
VALID CASES	56	MISSING CASES	2549		

DISTI

MEAN	6.018	STD ERR	1.126	MEDIAN	2.334
MODE	0.258	STD DEV	9.012	RANGE	32.905
MINIMUM	0.032	MAXIMUM	32.938		
VALID CASES	64	MISSING CASES	2541		

TIMEI

MEAN	24.286	STD ERR	1.939	MEDIAN	18.000
MODE	15.000	STD DEV	15.394	RANGE	85.000
MINIMUM	5.000	MAXIMUM	90.000		
VALID CASES	63	MISSING CASES	2542		

DISTJ

MEAN	5.692	STD ERR	0.911	MEDIAN	3.437
MODE	0.773	STD DEV	7.993	RANGE	30.458
MINIMUM	0.708	MAXIMUM	31.167		
VALID CASES	77	MISSING CASES	2528		

TIMEJ

MEAN	20.761	STD ERR	2.771	MEDIAN	15.389
MODE	15.000	STD DEV	23.347	RANGE	185.000
MINIMUM	5.000	MAXIMUM	190.000		
VALID CASES	71	MISSING CASES	2534		

C'TRACT-TRIP LENGTH ANAL.

DISTK

MEAN	6.378	STD ERR	0.918	MEDIAN	4.830
MODE	6.085	STD DEV	6.559	RANGE	29.428
MINIMUM	0.419	MAXIMUM	29.847		
VALID CASES	51	MISSING CASES	2554		

TIMEK

MEAN	19.957	STD ERR	1.376	MEDIAN	19.714
MODE	20.000	STD DEV	9.336	RANGE	40.000
MINIMUM	5.000	MAXIMUM	45.000		
VALID CASES	46	MISSING CASES	2559		

DISTL

MEAN	4.965	STD ERR	0.533	MEDIAN	3.131
MODE	0.161	STD DEV	6.349	RANGE	34.258
MINIMUM	0.161	MAXIMUM	34.419		
VALID CASES	142	MISSING CASES	2463		

TIMEL

MEAN	24.113	STD ERR	2.098	MEDIAN	19.717
MODE	15.000	STD DEV	25.001	RANGE	252.000
MINIMUM	3.000	MAXIMUM	255.000		
VALID CASES	142	MISSING CASES	2463		

DISTM

MEAN	6.279	STD ERR	0.596	MEDIAN	4.991
MODE	5.023	STD DEV	6.331	RANGE	33.742
MINIMUM	0.129	MAXIMUM	33.871		
VALID CASES	113	MISSING CASES	2492		

C'TRACT-TRIP LENGTH ANAL.

TIMEM

MEAN	24.309	STD ERR	1.792	MEDIAN	15.867
MODE	15.000	STD DEV	18.796	RANGE	115.000
MINIMUM	5.000	MAXIMUM	120.000		
VALID CASES	110	MISSING CASES	2495		

DISTN

MEAN	5.857	STD ERR	0.538	MEDIAN	5.377
MODE	0.676	STD DEV	4.749	RANGE	29.814
MINIMUM	0.322	MAXIMUM	30.136		
VALID CASES	78	MISSING CASES	2527		

TIMEN

MEAN	23.385	STD ERR	1.486	MEDIAN	20.000
MODE	15.000	STD DEV	13.124	RANGE	56.000
MINIMUM	4.000	MAXIMUM	60.000		
VALID CASES	78	MISSING CASES	2527		

DISTO

MEAN	7.481	STD ERR	0.730	MEDIAN	6.488
MODE	1.288	STD DEV	7.149	RANGE	39.151
MINIMUM	0.064	MAXIMUM	39.216		
VALID CASES	96	MISSING CASES	2509		

TIMEO

MEAN	29.538	STD ERR	1.551	MEDIAN	29.516
MODE	30.000	STD DEV	14.960	RANGE	78.000
MINIMUM	2.000	MAXIMUM	80.000		
VALID CASES	93	MISSING CASES	2512		

C'TRACT-TRIP LENGTH ANAL.

DISTP

MEAN	5.877	STD ERR	0.414	MEDIAN	5.892
MODE	1.771	STD DEV	4.441	RANGE	33.002
MINIMUM	0.161	MAXIMUM	33.163		
VALID CASES	115	MISSING CASES	2490		

TIMEP

MEAN	21.886	STD ERR	1.344	MEDIAN	19.783
MODE	20.000	STD DEV	14.350	RANGE	88.000
MINIMUM	2.000	MAXIMUM	90.000		
VALID CASES	114	MISSING CASES	2491		

DISTQ

MEAN	8.151	STD ERR	0.970	MEDIAN	6.214
MODE	1.964	STD DEV	7.998	RANGE	34.805
MINIMUM	0.419	MAXIMUM	35.223		
VALID CASES	68	MISSING CASES	2537		

TIMEQ

MEAN	29.844	STD ERR	2.965	MEDIAN	21.875
MODE	20.000	STD DEV	23.721	RANGE	115.000
MINIMUM	5.000	MAXIMUM	120.000		
VALID CASES	64	MISSING CASES	2541		

DISTR

MEAN	6.779	STD ERR	0.938	MEDIAN	3.300
MODE	0.676	STD DEV	8.495	RANGE	36.061
MINIMUM	0.129	MAXIMUM	36.189		
VALID CASES	82	MISSING CASES	2523		

C'TRACT-TRIP LENGTH ANAL.

TIMER

MEAN	19.139	STD ERR	1.322	MEDIAN	16.200
MODE	20.000	STD DEV	11.748	RANGE	58.000
MINIMUM	2.000	MAXIMUM	60.000		
VALID CASES	79	MISSING CASES	2526		

DISTS

MEAN	6.545	STD ERR	0.426	MEDIAN	4.347
MODE	2.833	STD DEV	5.647	RANGE	22.023
MINIMUM	0.129	MAXIMUM	22.152		
VALID CASES	176	MISSING CASES	2429		

TIMES

MEAN	22.763	STD ERR	1.334	MEDIAN	15.870
MODE	5.000	STD DEV	17.545	RANGE	109.000
MINIMUM	1.000	MAXIMUM	110.000		
VALID CASES	173	MISSING CASES	2432		

DISTT

MEAN	12.963	STD ERR	0.751	MEDIAN	12.975
MODE	1.578	STD DEV	8.194	RANGE	33.710
MINIMUM	0.161	MAXIMUM	33.871		
VALID CASES	119	MISSING CASES	2486		

TIMET

MEAN	33.198	STD ERR	1.765	MEDIAN	30.179
MODE	30.000	STD DEV	19.419	RANGE	100.000
MINIMUM	5.000	MAXIMUM	105.000		
VALID CASES	121	MISSING CASES	2484		

C'TRACT-TRIP LENGTH ANAL.

DISTU

MEAN	10.440	STD ERR	0.612	MEDIAN	7.759
MODE	2.962	STD DEV	9.309	RANGE	39.763
MINIMUM	0.225	MAXIMUM	39.989		
VALID CASES	231	MISSING CASES	2374		

TIMEU

MEAN	28.900	STD ERR	1.901	MEDIAN	25.000
MODE	30.000	STD DEV	28.768	RANGE	358.000
MINIMUM	2.000	MAXIMUM	360.000		
VALID CASES	229	MISSING CASES	2376		

DISTV

MEAN	8.354	STD ERR	0.972	MEDIAN	6.069
MODE	0.451	STD DEV	9.013	RANGE	45.398
MINIMUM	0.451	MAXIMUM	45.848		
VALID CASES	86	MISSING CASES	2519		

TIMEV

MEAN	21.628	STD ERR	1.624	MEDIAN	17.237
MODE	15.000	STD DEV	15.058	RANGE	70.000
MINIMUM	5.000	MAXIMUM	75.000		
VALID CASES	86	MISSING CASES	2519		

DISTW

MEAN	14.433	STD ERR	2.803	MEDIAN	8.420
MODE	41.695	STD DEV	15.859	RANGE	43.691
MINIMUM	0.612	MAXIMUM	44.303		
VALID CASES	32	MISSING CASES	2573		

C'TRACT-TRIP LENGTH ANAL.

TIMEW

MEAN	22.517	STD ERR	2.532	MEDIAN	20.400
MODE	10.000	STD DEV	13.635	RANGE	57.000
MINIMUM	3.000	MAXIMUM	60.000		
VALID CASES	29	MISSING CASES	2576		

DISTX

MEAN	14.263	STD ERR	1.788	MEDIAN	10.255
MODE	1.320	STD DEV	14.523	RANGE	48.778
MINIMUM	0.193	MAXIMUM	48.972		
VALID CASES	66	MISSING CASES	2539		

TIMEX

MEAN	23.167	STD ERR	1.826	MEDIAN	21.000
MODE	30.000	STD DEV	14.835	RANGE	57.000
MINIMUM	3.000	MAXIMUM	60.000		
VALID CASES	66	MISSING CASES	2539		

DISTY

MEAN	7.880	STD ERR	0.907	MEDIAN	5.634
MODE	2.608	STD DEV	8.165	RANGE	33.195
MINIMUM	0.129	MAXIMUM	33.324		
VALID CASES	81	MISSING CASES	2524		

TIMEY

MEAN	29.300	STD ERR	5.258	MEDIAN	22.500
MODE	30.000	STD DEV	47.025	RANGE	416.000
MINIMUM	4.000	MAXIMUM	420.000		
VALID CASES	80	MISSING CASES	2525		

C'TRACT-TRIP LENGTH ANAL.

DISTZ

MEAN	6.564	STD ERR	0.715	MEDIAN	4.556
MODE	0.419	STD DEV	8.280	RANGE	39.634
MINIMUM	0.032	MAXIMUM	39.667		
VALID CASES	134	MISSING CASES	2471		

APPENDIX 3

TRAVEL DISTANCE FREQUENCY DISTRIBUTIONS FOR MAJOR EMPLOYMENT CENTERS

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TRIP CONCENTRATIONS IN STUDY AREA

DISTCBD
(Downtown)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.200	2	0	0	6.600	5	1	69	13.600	2	0	92
0.400	12	2	3	6.800	11	2	71	14.000	3	1	92
0.600	12	2	5	7.000	7	1	73	14.400	3	1	93
0.800	13	3	8	7.200	8	2	74	14.800	1	0	93
1.000	12	2	11	7.400	1	0	75	15.000	1	0	93
1.200	13	3	13	7.600	7	1	76	15.400	1	0	93
1.400	12	2	16	7.800	3	1	77	16.000	1	0	94
1.600	7	1	17	8.000	4	1	77	16.400	1	0	94
1.800	5	1	18	8.200	2	0	78	17.000	1	0	94
2.000	8	2	20	8.400	2	0	78	17.200	4	1	95
2.200	10	2	22	8.600	4	1	79	17.400	1	0	95
2.400	12	2	24	8.800	9	2	81	17.600	1	0	95
2.600	9	2	26	9.000	3	1	82	17.800	1	0	95
2.800	3	1	27	9.200	1	0	82	18.000	2	0	96
3.000	8	2	29	9.400	3	1	82	18.200	1	0	96
3.200	5	1	30	9.600	4	1	83	18.400	2	0	96
3.400	9	2	31	9.800	6	1	85	18.800	1	0	97
3.600	8	2	33	10.000	3	1	85	19.000	1	0	97
3.800	11	2	35	10.200	2	0	86	19.200	2	0	97
4.000	5	1	36	10.400	1	0	86	19.400	1	0	98
4.200	9	2	38	10.600	2	0	86	19.600	1	0	98
4.400	6	1	39	10.800	5	1	87	19.800	2	0	98
4.600	13	3	42	11.000	4	1	88	20.400	2	0	99
4.800	20	4	46	11.400	1	0	88	20.800	1	0	99
5.000	13	3	49	11.600	3	1	89	22.600	1	0	99
5.200	17	4	52	12.000	1	0	89	22.800	1	0	99
5.400	13	3	55	12.200	2	0	89	24.400	1	0	99
5.600	14	3	58	12.600	1	0	90	26.400	1	0	100
5.800	16	3	61	12.800	2	0	90	29.400	1	0	100
6.000	10	2	63	13.000	2	0	90	31.400	1	0	100
6.200	14	3	66	13.200	2	0	91				
6.400	8	2	68	13.400	1	0	91				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.0	2121				

TRIP CONCENTRATIONS IN STUDY AREA

MEAN	6.112	STD ERR	0.226	MEDIAN	5.159
MODE	4.800	STD DEV	4.964	RANGE	31.200
MINIMUM	0.200	MAXIMUM	31.400		
VALID CASES	484	MISSING CASES	2121		

TRIP CONCENTRATIONS IN STUDY AREA

DISTSUBR
(All Suburban Areas)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.200	24	2	2	8.800	15	1	72	17.800	2	0	89
0.400	28	2	3	9.000	19	1	73	18.000	3	0	89
0.600	46	3	6	9.200	14	1	74	18.400	3	0	89
0.800	35	2	9	9.400	5	0	75	18.600	2	0	89
1.000	47	3	12	9.600	7	0	75	18.800	2	0	89
1.200	35	2	14	9.800	13	1	76	19.000	6	0	90
1.400	30	2	16	10.000	14	1	77	19.200	4	0	90
1.600	37	2	19	10.200	7	0	77	19.400	2	0	90
1.800	40	3	21	10.400	5	0	78	19.600	1	0	90
2.000	43	3	24	10.600	9	1	78	19.800	2	0	90
2.200	29	2	26	10.800	5	0	79	20.000	5	0	91
2.400	24	2	27	11.000	7	0	79	20.600	1	0	91
2.600	23	2	29	11.200	5	0	79	20.800	1	0	91
2.800	30	2	31	11.400	8	1	80	21.000	1	0	91
3.000	39	3	34	11.600	6	0	80	21.200	1	0	91
3.200	35	2	36	11.800	5	0	81	21.600	1	0	91
3.400	35	2	38	12.000	9	1	81	21.800	1	0	91
3.600	30	2	40	12.200	3	1	82	22.000	1	0	91
3.800	30	2	42	12.400	2	0	82	22.200	4	0	91
4.000	31	2	44	12.600	7	0	82	22.400	2	0	92
4.200	21	1	46	12.800	6	0	83	23.200	1	0	92
4.400	27	2	47	13.000	3	0	83	24.000	1	0	92
4.600	20	1	49	13.200	3	0	83	24.200	2	0	92
4.800	26	2	50	13.400	8	1	84	25.000	1	0	92
5.000	17	1	51	13.600	5	0	84	25.600	1	0	92
5.200	21	1	53	13.800	1	0	84	26.000	4	0	92
5.400	27	2	55	14.000	5	0	84	26.200	2	0	92
5.600	16	1	56	14.200	3	0	85	26.600	2	0	92
5.800	20	1	57	14.400	8	1	85	26.800	2	0	93
6.000	17	1	58	14.600	7	0	86	27.000	3	0	93
6.200	18	1	59	14.800	6	0	86	27.600	1	0	93
6.400	15	1	60	15.000	1	0	86	27.800	2	0	93
6.600	16	1	61	15.200	2	0	86	28.200	3	0	93
6.800	21	1	63	15.400	6	0	87	28.400	1	0	93
7.000	19	1	64	15.600	4	0	87	28.800	1	0	93
7.200	12	1	65	15.800	8	1	87	29.200	1	0	93
7.400	16	1	66	16.000	3	0	88	29.600	1	0	93
7.600	18	1	67	16.200	1	0	88	29.800	2	0	94
7.800	8	1	67	16.600	3	0	88	30.000	6	0	94
8.000	19	1	69	16.800	2	0	88	30.200	2	0	94
8.200	12	1	70	17.000	2	0	88	30.400	1	0	94
8.400	12	1	70	17.200	4	0	88	30.600	2	0	94
8.600	14	1	71	17.600	2	0	89	30.800	1	0	94

TRIP CONCENTRATIONS IN STUDY AREA

DISTSUBR
(All Suburban Areas)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
31.000	1	0	94	35.200	3	0	97	40.000	1	0	99
31.200	1	0	94	35.400	2	0	97	40.400	1	0	99
31.400	2	0	95	35.600	5	0	97	41.600	1	0	99
31.600	2	0	95	36.000	4	0	97	41.800	2	0	99
31.800	2	0	95	36.200	1	0	98	42.000	2	0	99
32.000	1	0	95	36.400	2	0	98	43.000	1	0	99
32.200	1	0	95	36.600	3	0	98	43.600	1	0	99
32.600	3	0	95	36.800	1	0	98	44.200	2	0	99
32.800	1	0	95	37.000	1	0	98	44.400	2	0	99
33.000	5	0	96	37.600	2	0	98	45.200	1	0	100
33.200	6	0	96	37.800	2	0	98	45.800	1	0	100
33.400	5	0	96	38.000	1	0	98	46.000	1	0	100
34.000	2	0	96	38.600	1	0	98	47.000	1	0	100
34.200	1	0	97	39.400	2	0	99	47.800	2	0	100
34.600	1	0	97	39.800	1	0	99	49.000	2	0	100

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.0	1085				

MEAN	8.104	STD ERR	0.237	MEDIAN	4.862
MODE	1.000	STD DEV	9.253	RANGE	48.800
MINIMUM	0.200	MAXIMUM	49.000		
VALID CASES	1520	MISSING CASES	1085		

TRIP CONCENTRATIONS IN STUDY AREA

DISTSUR
(Surrey)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.400	4	3	3	4.800	5	4	49	9.800	2	2	83
0.600	3	2	5	5.200	3	2	52	10.000	1	1	84
0.800	2	2	7	5.400	4	3	55	10.200	1	1	85
1.000	7	5	12	5.800	4	3	58	10.600	1	1	85
1.200	2	2	14	6.200	3	2	60	11.600	1	1	86
1.400	2	2	15	6.400	2	2	62	11.800	1	1	87
1.600	1	1	16	6.800	3	2	64	12.200	1	1	88
1.800	5	4	20	7.000	3	2	66	12.600	1	1	88
2.000	5	4	24	7.400	1	1	67	12.800	3	2	91
2.200	2	2	25	7.600	3	2	69	13.000	1	1	92
2.400	3	2	28	7.800	2	2	71	13.800	1	1	92
2.800	4	3	31	8.000	3	2	73	14.000	2	2	94
3.000	2	2	32	8.200	2	2	75	14.600	1	1	95
3.200	2	2	34	8.400	1	1	75	16.600	1	1	95
3.600	1	1	35	8.600	1	1	76	19.600	1	1	96
3.800	5	4	38	9.000	2	2	78	19.800	1	1	97
4.000	3	2	41	9.200	2	2	79	21.800	1	1	98
4.400	1	1	42	9.400	2	2	81	33.400	2	2	99
4.600	5	4	45	9.600	1	1	82	35.400	1	1	100

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.0	2475				

MEAN	6.512	STD ERR	0.535	MEDIAN	5.167
MODE	1.000	STD DEV	6.104	RANGE	35.000
MINIMUM	0.400	MAXIMUM	35.400		
VALID CASES	130	MISSING CASES	2475		

TRIP CONCENTRATIONS IN STUDY AREA

DISTPCR
(Port Coquitlam)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.800	2	0.1	13.3	13.3
	1.000	1	0.0	6.7	20.0
	1.400	1	0.0	6.7	26.7
	2.800	1	0.0	6.7	33.3
	3.200	1	0.0	6.7	40.0
	4.000	1	0.0	6.7	46.7
	5.800	1	0.0	6.7	53.3
	6.600	1	0.0	6.7	60.0
	6.800	1	0.0	6.7	66.7
	7.600	1	0.0	6.7	73.3
	8.600	1	0.0	6.7	80.0
	13.400	1	0.0	6.7	86.7
	15.400	1	0.0	6.7	93.3
	18.800	1	0.0	6.7	100.0
	0.0	2590	99.4	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	6.467	STD ERR	1.442	MEDIAN	5.800
MODE	0.800	STD DEV	5.583	RANGE	18.000
MINIMUM	0.800	MAXIMUM	18.800		
VALID CASES	15	MISSING CASES	2590		

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TRIP CONCENTRATIONS IN STUDY AREA

DISTCOR
(Coquitlam)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.400	1	3	3	2.600	1	3	43	7.400	2	7	80
0.600	2	7	10	3.000	1	3	47	8.800	1	3	83
0.800	3	10	20	3.200	1	3	50	9.000	1	3	87
1.200	1	3	23	3.400	3	10	60	10.000	1	3	90
1.400	1	3	27	3.800	1	3	63	10.800	1	3	93
1.600	2	7	33	4.000	1	3	67	11.400	1	3	97
2.200	1	3	37	4.600	1	3	70	19.000	1	3	100
2.400	1	3	40	6.000	1	3	73				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.0	2575				

MEAN	4.520	STD ERR	0.783	MEDIAN	3.300
MODE	0.800	STD DEV	4.286	RANGE	18.600
MINIMUM	0.400	MAXIMUM	19.000		
VALID CASES	30	MISSING CASES	2575		

TRIP CONCENTRATIONS IN STUDY AREA

DISTNWR
(New Westminster)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	0.400	1	0.0	9.1	9.1
	0.800	1	0.0	9.1	18.2
	1.000	1	0.0	9.1	27.3
	1.200	1	0.0	9.1	36.4
	1.600	1	0.0	9.1	45.5
	5.400	1	0.0	9.1	54.5
	6.000	2	0.1	18.2	72.7
	10.000	1	0.0	9.1	81.8
	11.400	1	0.0	9.1	90.9
	19.000	1	0.0	9.1	100.0
	0.0	2594	99.6	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	5.709	STD ERR	1.757	MEDIAN	5.400
MODE	6.000	STD DEV	5.826	RANGE	18.600
MINIMUM	0.400	MAXIMUM	19.000		
VALID CASES	11	MISSING CASES	2594		

TRIP CONCENTRATIONS IN STUDY AREA

DISTBUR
(Burnaby)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.200	5	2	2	5.600	5	2	53	11.200	1	0	88
0.400	7	2	4	5.800	8	2	56	11.400	3	1	89
0.600	5	2	5	6.000	2	1	56	11.600	2	1	90
0.800	6	2	7	6.200	7	2	58	11.800	2	1	90
1.000	9	3	10	6.400	8	2	61	12.000	3	1	91
1.200	6	2	12	6.600	5	2	62	12.200	3	1	92
1.400	9	3	14	6.800	4	1	64	12.600	1	0	92
1.600	6	2	16	7.000	4	1	65	12.800	3	1	93
1.800	10	3	19	7.200	5	2	66	13.000	1	0	94
2.000	10	3	22	7.400	2	1	67	13.400	1	0	94
2.200	5	2	24	7.600	7	2	69	13.800	1	0	94
2.400	5	2	25	7.800	3	1	70	14.000	2	1	95
2.600	4	1	26	8.000	10	3	73	14.400	1	0	95
2.800	6	2	28	8.200	5	2	75	14.800	1	0	95
3.000	6	2	30	8.400	5	2	76	15.600	1	0	96
3.200	4	1	31	8.600	4	1	77	15.800	1	0	96
3.400	6	2	33	8.800	3	1	78	16.000	2	1	97
3.600	4	1	34	9.000	4	1	79	18.400	1	0	97
3.800	6	2	36	9.200	5	2	81	18.600	1	0	97
4.000	8	2	38	9.400	2	1	82	19.000	2	1	98
4.200	3	1	39	9.600	1	0	82	19.200	1	0	98
4.400	5	2	41	9.800	6	2	84	19.600	1	0	98
4.600	10	3	44	10.000	5	2	85	19.800	2	1	99
4.800	9	3	47	10.200	2	1	86	33.400	2	1	100
5.000	1	0	47	10.400	3	1	87	35.400	1	0	100
5.200	8	2	49	10.600	3	1	88				
5.400	8	2	52	11.000	1	0	88				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.0	2275				

MEAN	6.177	STD ERR	0.273	MEDIAN	5.350
MODE	1.800	STD DEV	4.965	RANGE	35.200
MINIMUM	0.200	MAXIMUM	35.400		
VALID CASES	330	MISSING CASES	2275		

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NCN HOME EASED WORK TRIP ANALYSIS

DISTNHBT
(Non-home Based Work Trips)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
0.200	14	2	2	11.200	6	1	20	19.800	6	1	89
0.600	1	0	2	11.400	14	2	22	20.000	3	0	90
1.400	1	0	2	11.600	9	1	23	20.200	2	0	90
1.800	1	0	2	11.800	20	3	26	20.400	3	0	90
2.000	4	1	3	12.000	14	2	28	20.600	3	0	91
2.400	2	0	3	12.200	17	2	30	20.800	3	0	91
2.600	2	0	3	12.400	15	2	32	21.000	5	1	92
2.800	1	0	3	12.600	20	3	34	21.200	4	1	92
3.000	2	0	4	12.800	10	1	36	21.400	1	0	93
3.200	1	0	4	13.000	6	1	37	21.600	3	0	93
3.400	1	0	4	13.200	16	2	39	21.800	1	0	93
4.200	1	0	4	13.400	12	2	40	22.400	3	0	93
4.400	1	0	4	13.600	24	3	44	22.600	4	1	94
5.000	1	0	4	13.800	26	3	47	22.800	4	1	95
5.400	1	0	5	14.000	31	4	51	23.000	2	0	95
5.600	1	0	5	14.200	35	5	56	23.400	1	0	95
5.800	3	0	5	14.400	34	5	60	24.200	1	0	95
6.000	1	0	5	14.600	16	2	62	24.400	1	0	95
6.200	2	0	5	14.800	10	1	64	24.600	1	0	95
6.400	2	0	6	15.000	11	1	65	24.800	1	0	95
6.600	1	0	6	15.200	16	2	67	25.200	1	0	96
6.800	7	1	7	15.400	11	1	69	26.000	2	0	96
7.000	2	0	7	15.600	9	1	70	26.200	1	0	96
7.200	3	0	7	15.800	12	2	72	28.000	2	0	96
7.400	1	0	8	16.000	10	1	73	29.000	1	0	96
7.600	3	0	8	16.200	8	1	74	30.000	1	0	97
7.800	4	1	9	16.400	4	1	75	30.200	1	0	97
8.000	4	1	9	16.600	10	1	76	30.400	2	0	97
8.200	4	1	10	16.800	5	1	77	31.200	4	1	97
8.400	5	1	10	17.000	8	1	78	31.600	3	0	98
8.600	4	1	11	17.200	11	1	79	31.800	1	0	98
8.800	1	0	11	17.400	4	1	80	32.200	1	0	98
9.000	2	0	11	17.600	8	1	81	33.000	2	0	98
9.200	7	1	12	17.800	12	2	82	33.800	1	0	99
9.400	4	1	13	18.000	14	2	84	34.600	1	0	99
9.600	4	1	13	18.200	6	1	85	34.800	1	0	99
9.800	1	0	13	18.400	4	1	86	35.200	1	0	99
10.000	7	1	14	18.600	3	0	86	35.600	1	0	99
10.200	4	1	15	18.800	3	0	86	35.800	1	0	99
10.400	5	1	15	19.000	2	0	87	37.000	1	0	99
10.600	15	2	17	19.200	7	1	88	38.200	4	1	100
10.800	7	1	18	19.400	5	1	88	39.400	1	0	100
11.000	5	1	19	19.600	2	0	89				

NON HOME BASED WORK TRIP ANALYSIS

MEAN	14.439	STD ERR	0.213	MEDIAN	14.045
MODE	14.200	STD DEV	5.823	RANGE	39.200
MINIMUM	C.200	MAXIMUM	39.40C		
VALID CASES	749	MISSING CASES	0		

APPENDIX 4

TRAVEL TIME FREQUENCY DISTRIBUTIONS FOR MAJOR EMPLOYMENT CENTERS

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TRAVEL TIME ANALYSIS

TIMEGVRD
(The Whole Region)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
1.	8	0	0	21.	1	0	58	65.	5	C	98
2.	17	1	1	22.	4	0	58	70.	6	0	98
3.	14	1	2	23.	2	0	58	75.	11	0	98
4.	4	0	2	24.	1	0	58	80.	8	0	99
5.	231	9	11	25.	173	7	65	85.	2	0	99
6.	2	0	11	28.	2	0	65	90.	14	1	99
7.	16	1	11	30.	412	16	82	105.	1	0	99
8.	11	0	12	32.	1	0	82	110.	1	C	99
10.	359	14	26	35.	69	3	84	120.	5	C	100
11.	2	0	26	38.	2	0	84	180.	2	0	100
12.	4	0	26	40.	73	3	87	190.	1	0	100
13.	3	0	26	45.	148	6	93	195.	1	0	100
15.	461	18	44	48.	1	0	93	220.	1	0	100
17.	1	0	44	50.	28	1	94	255.	1	0	100
18.	1	0	45	52.	1	0	94	360.	1	0	100
19.	1	0	45	55.	12	0	95	420.	1	C	100
20.	346	14	58	60.	75	3	98				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
-0.	58				

MEAN	24.026	STD ERR	0.418	MEDIAN	19.900
MODE	15.000	STD DEV	21.099	RANGE	419.000
MINIMUM	1.000	MAXIMUM	420.000		
VALID CASES	2547	MISSING CASES	58		

TRAVEL TIME ANALYSIS

TIMESUB
(Suburban Areas)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
1.	8	0	0	22.	3	0	61	65.	2	0	98
2.	17	1	1	23.	2	0	61	70.	5	0	98
3.	14	1	2	24.	1	0	61	75.	9	0	98
4.	4	0	2	25.	140	6	68	80.	7	0	99
5.	222	10	12	28.	2	0	68	85.	2	0	99
6.	2	0	12	30.	337	15	83	90.	14	1	99
7.	14	1	13	32.	1	0	83	105.	1	0	99
8.	11	1	13	35.	52	2	86	110.	1	0	99
10.	337	15	29	38.	1	0	86	120.	5	0	100
11.	1	0	29	40.	60	3	88	180.	2	0	100
12.	3	0	29	45.	110	5	93	190.	1	0	100
13.	2	0	29	48.	1	0	93	195.	1	0	100
15.	402	18	48	50.	21	1	94	220.	1	0	100
17.	1	0	48	52.	1	0	94	360.	1	0	100
19.	1	0	48	55.	9	0	95	420.	1	0	100
20.	286	13	61	60.	59	3	98				

MISSING DATA

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.	427				

MEAN	23.218	STD ERR	0.458	MEDIAN	19.675
MODE	15.000	STD DEV	21.383	RANGE	419.000
MINIMUM	1.000	MAXIMUM	420.000		
VALID CASES	2178	MISSING CASES	427		

TRAVEL TIME ANALYSIS

TIMEC8D
(Downtown)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
3.	2	0	0	21.	1	0	44	55.	6	1	93
5.	13	3	3	22.	1	0	44	60.	23	5	97
7.	2	0	3	25.	46	9	53	65.	4	1	98
10.	38	7	11	30.	95	19	72	70.	3	1	98
11.	1	0	11	35.	25	5	77	75.	5	1	99
12.	1	0	11	38.	1	0	77	80.	1	0	100
13.	1	0	11	40.	16	3	80	90.	1	0	100
15.	80	16	27	45.	46	9	89	255.	1	0	100
18.	1	0	27	50.	9	2	91				
20.	83	16	44	52.	1	0	91				

M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.	2098				

MEAN	28.653	STD ERR	0.817	MEDIAN	25.141
MODE	30.000	STD DEV	18.402	RANGE	252.000
MINIMUM	3.000	MAXIMUM	255.000		

VALID CASES 507 MISSING CASES 2098

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TRAVEL TIME ANALYSIS

TIMESURR
(Surrey)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	3.	2	0.1	1.5	1.5
	5.	12	0.5	8.8	10.3
	7.	1	0.0	0.7	11.0
	10.	39	1.5	28.7	39.7
	15.	21	0.8	15.4	55.1
	20.	11	0.4	8.1	63.2
	25.	10	0.4	7.4	70.6
	30.	25	1.0	18.4	89.0
	35.	1	0.0	0.7	89.7
	40.	7	0.3	5.1	94.9
	45.	3	0.1	2.2	97.1
	75.	1	0.0	0.7	97.8
	80.	2	0.1	1.5	99.3
	90.	1	0.0	0.7	100.0
	0.	2469	94.8	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	20.390	STD ERR	1.292	MEDIAN	15.333
MODE	10.000	STD DEV	15.062	RANGE	87.000
MINIMUM	3.000	MAXIMUM	90.000		

VALID CASES 136 MISSING CASES 2469

TRAVEL TIME ANALYSIS

TIMEPC
(Port Coquitlam)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	3.	2	0.1	9.5	9.5
	5.	2	0.1	9.5	19.0
	10.	6	0.2	28.6	47.6
	15.	3	0.1	14.3	61.9
	20.	1	0.0	4.8	66.7
	30.	5	0.2	23.8	90.5
	45.	1	0.0	4.8	95.2
	60.	1	0.0	4.8	100.0
	0.	2584	99.2	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	18.857	STD ERR	3.237	MEDIAN	14.333
MODE	10.000	STD DEV	14.833	RANGE	57.000
MINIMUM	3.000	MAXIMUM	60.000		
VALID CASES	21	MISSING CASES	2584		

TRAVEL TIME ANALYSIS

TIMECOQ

(Coquitlam)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	5.	10	0.4	17.5	17.5
	10.	11	0.4	19.3	36.8
	15.	7	0.3	12.3	49.1
	20.	9	0.3	15.8	64.9
	25.	2	0.1	3.5	68.4
	30.	7	0.3	12.3	80.7
	35.	3	0.1	5.3	86.0
	40.	4	0.2	7.0	93.0
	45.	1	0.0	1.8	94.7
	50.	1	0.0	1.8	96.5
	60.	2	0.1	3.5	100.0
	0.	2548	97.8	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	20.789	STD ERR	1.876	MEDIAN	17.778
MODE	10.000	STD DEV	14.167	RANGE	55.000
MINIMUM	5.000	MAXIMUM	60.000		
VALID CASES	57	MISSING CASES	2548		

TRAVEL TIME ANALYSIS

TIMENW
(New Westminster)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	2.	2	0.1	1.7	1.7
	5.	11	0.4	9.2	10.8
	10.	19	0.7	15.8	26.7
	11.	1	0.0	0.8	27.5
	15.	27	1.0	22.5	50.0
	20.	16	0.6	13.3	63.3
	25.	9	0.3	7.5	70.8
	30.	20	0.8	16.7	87.5
	35.	1	0.0	0.8	88.3
	40.	4	0.2	3.3	91.7
	45.	8	0.3	6.7	98.3
	50.	1	0.0	0.8	99.2
	75.	1	0.0	0.8	100.0
	0.	2485	95.4	MISSING	100.0
	TOTAL	2605	100.0	100.0	

MEAN	20.750	STD ERR	1.144	MEDIAN	15.500
MODE	15.000	STD DEV	12.531	RANGE	73.000
MINIMUM	2.000	MAXIMUM	75.000		
VALID CASES	120	MISSING CASES	2485		

TRAVEL TIME ANALYSIS

TIMEBURN
(Burnaby)

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
2.	3	1	1	25.	26	9	63	55.	2	1	96
5.	21	7	9	30.	58	21	84	60.	5	2	98
7.	1	0	9	35.	10	4	88	75.	1	0	98
10.	36	13	22	40.	6	2	90	80.	1	0	98
15.	47	17	38	45.	14	5	95	90.	4	1	100
20.	45	16	54	50.	1	0	95	120.	1	0	100

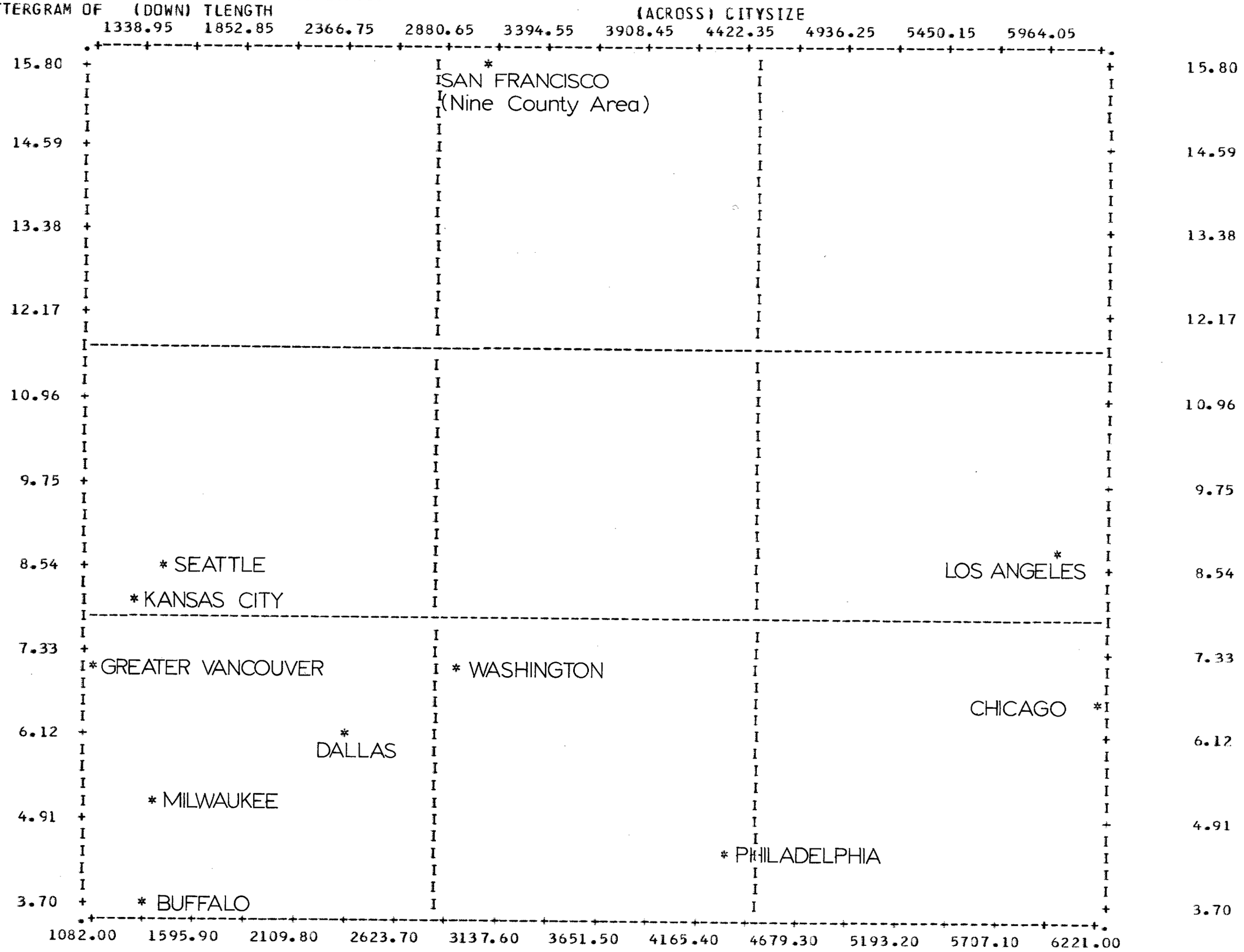
M I S S I N G D A T A

CODE	FREQ	CODE	FREQ	CODE	FREQ
0.	2323				

MEAN	24.071	STD ERR	0.962	MEDIAN	20.467
MODE	30.000	STD DEV	16.161	RANGE	118.000
MINIMUM	2.000	MAXIMUM	120.000		

VALID CASES 282 MISSING CASES 2323

FILE FIGURE1 (CREATION DATE = 05/19/78)
SCATTERGRAM OF (DOWN) TLENGTH (ACROSS) CITYSIZE



STATISTICS..

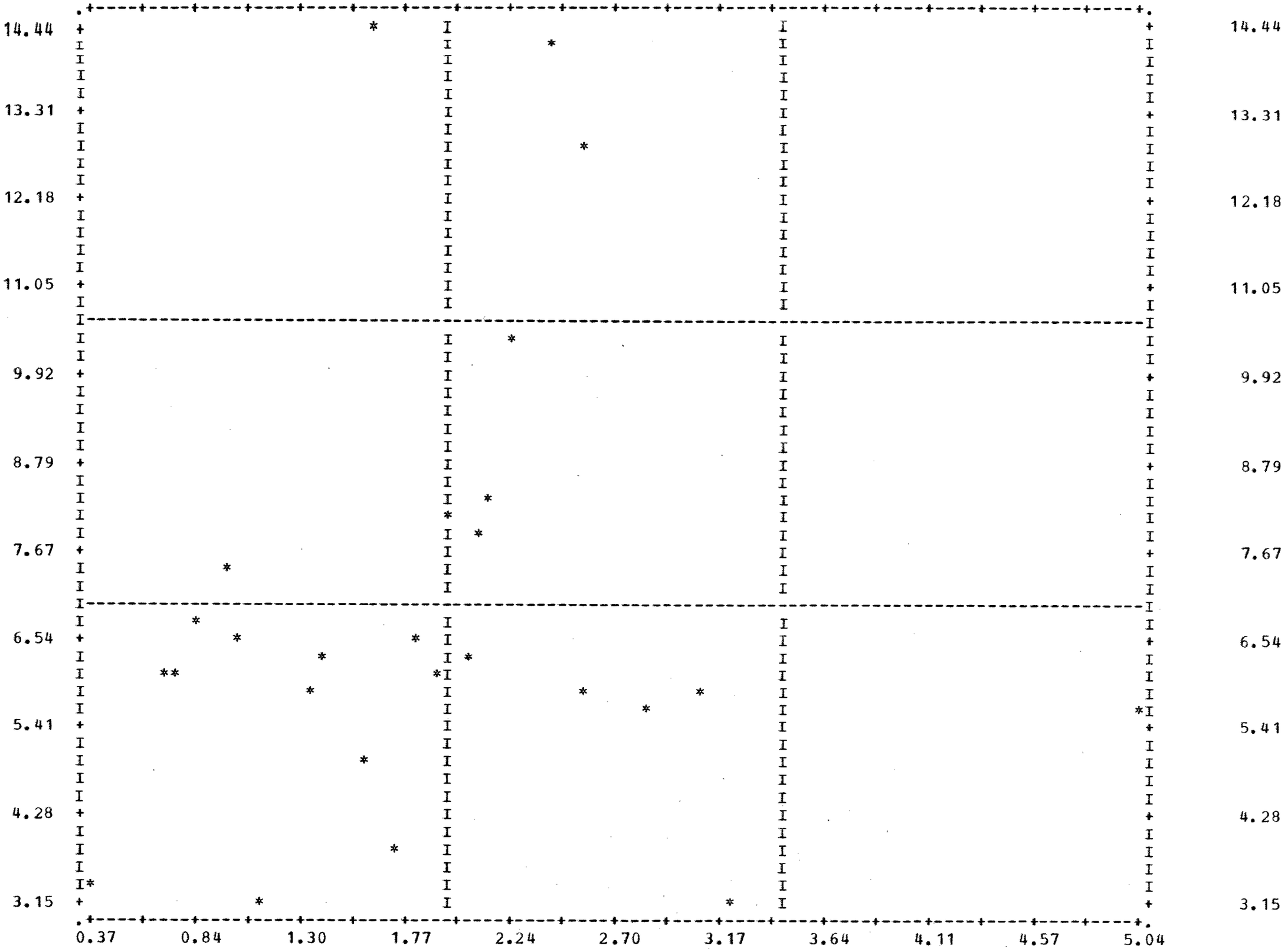
CORRELATION (R)-	0.11627	R SQUARED	-	0.01352	SIGNIFICANCE	-	0.36676
STD ERR OF EST -	3.38741	INTERCEPT (A)	-	6.85009	SLOPE (B)	-	0.00020

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 7.06450 ON THE LEFT MARGIN
A VALUE OF 8.08289 ON THE RIGHT MARGIN

PLOTTED VALUES -	11	EXCLUDED VALUES-		0	MISSING VALUES	-	0

'********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FILE THESIS (CREATION DATE = 05/19/78)
SCATTERGRAM OF (DOWN) TLENGTH (ACROSS) LFJRATIO



STATISTICS..

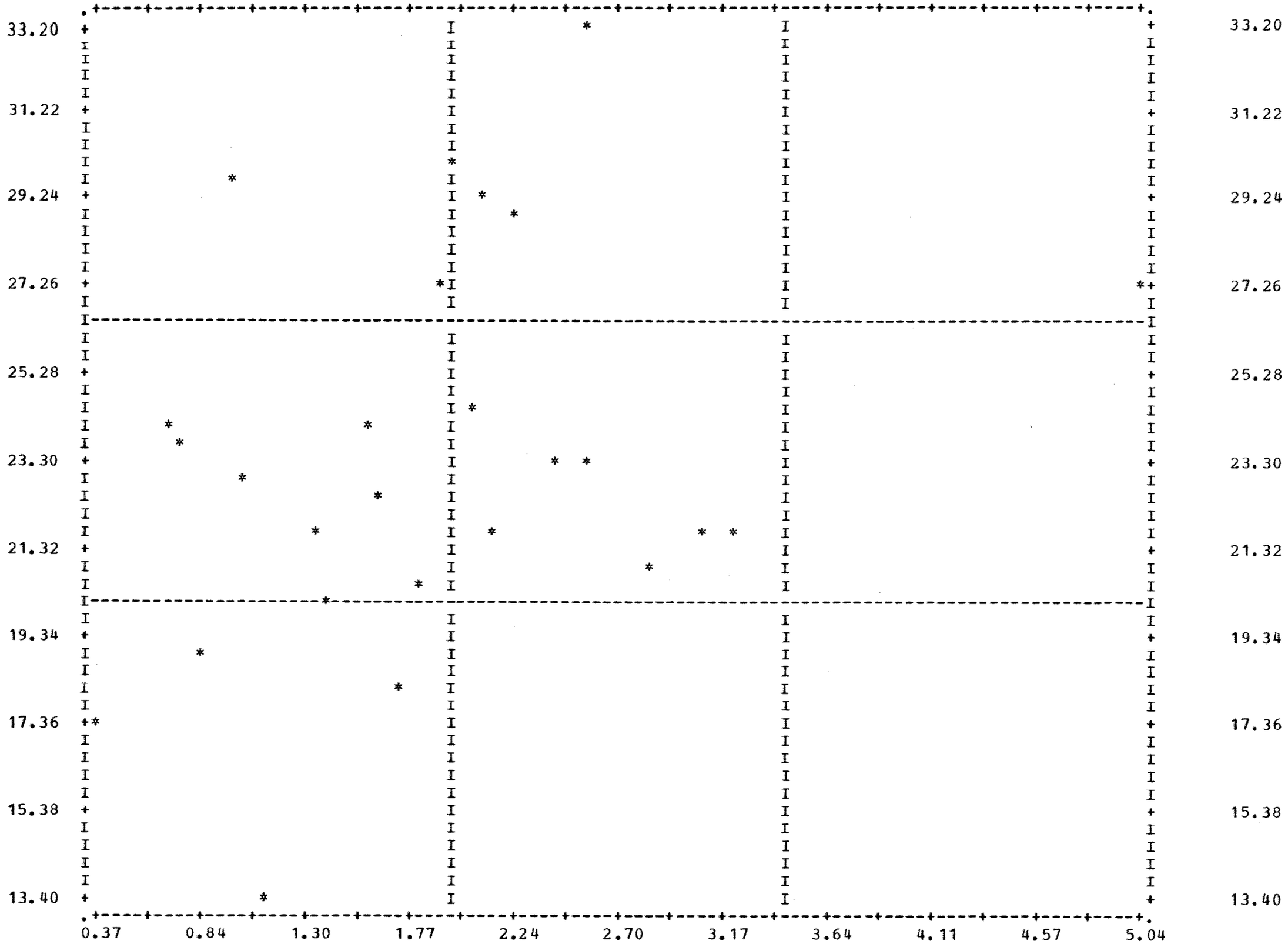
CORRELATION (R) -	0.10283	R SQUARED -	0.01057	SIGNIFICANCE -	0.30858
STD ERR OF EST -	3.06604	INTERCEPT (A) -	6.40670	SLOPE (B) -	0.31343

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 6.52266 ON THE LEFT MARGIN
A VALUE OF 7.98637 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES-	0	MISSING VALUES -	0

'*********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FILE THESIS (CREATION DATE = 05/19/78)
SCATTERGRAM OF (DOWN) TIME (ACROSS) LFJRATIO



STATISTICS..

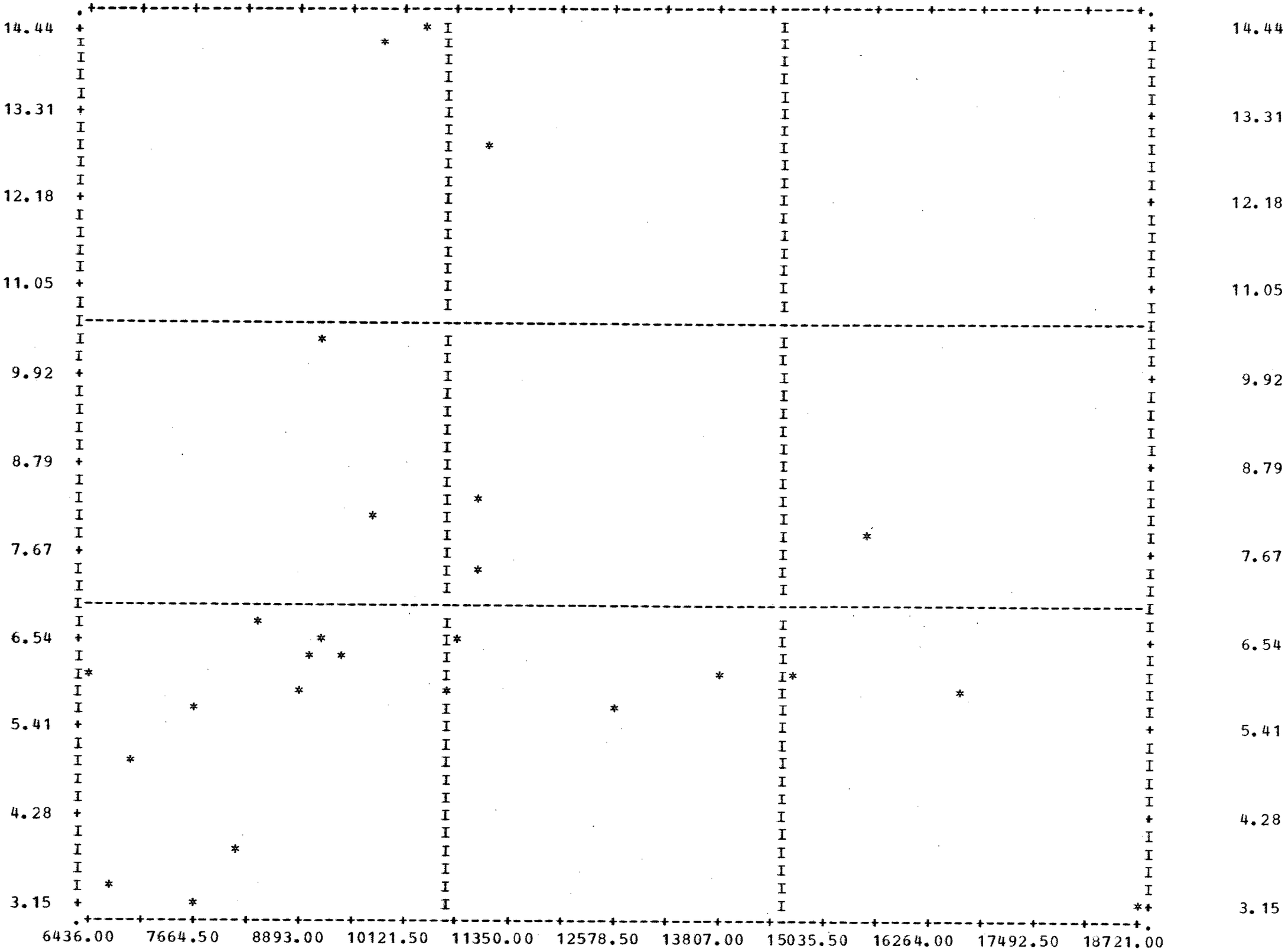
CORRELATION (R) -	0.30980	R SQUARED -	0.09598	SIGNIFICANCE -	0.06176
STD ERR OF EST -	4.31147	INTERCEPT (A) -	20.83388	SLOPE (B) -	1.38914

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 21.34785 ON THE LEFT MARGIN
A VALUE OF 27.83513 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES-	0	MISSING VALUES -	0

'********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FILE THESIS (CREATION DATE = 05/19/78)
SCATTERGRAM OF (DOWN) TLENGTH (ACROSS) INCOME



STATISTICS..

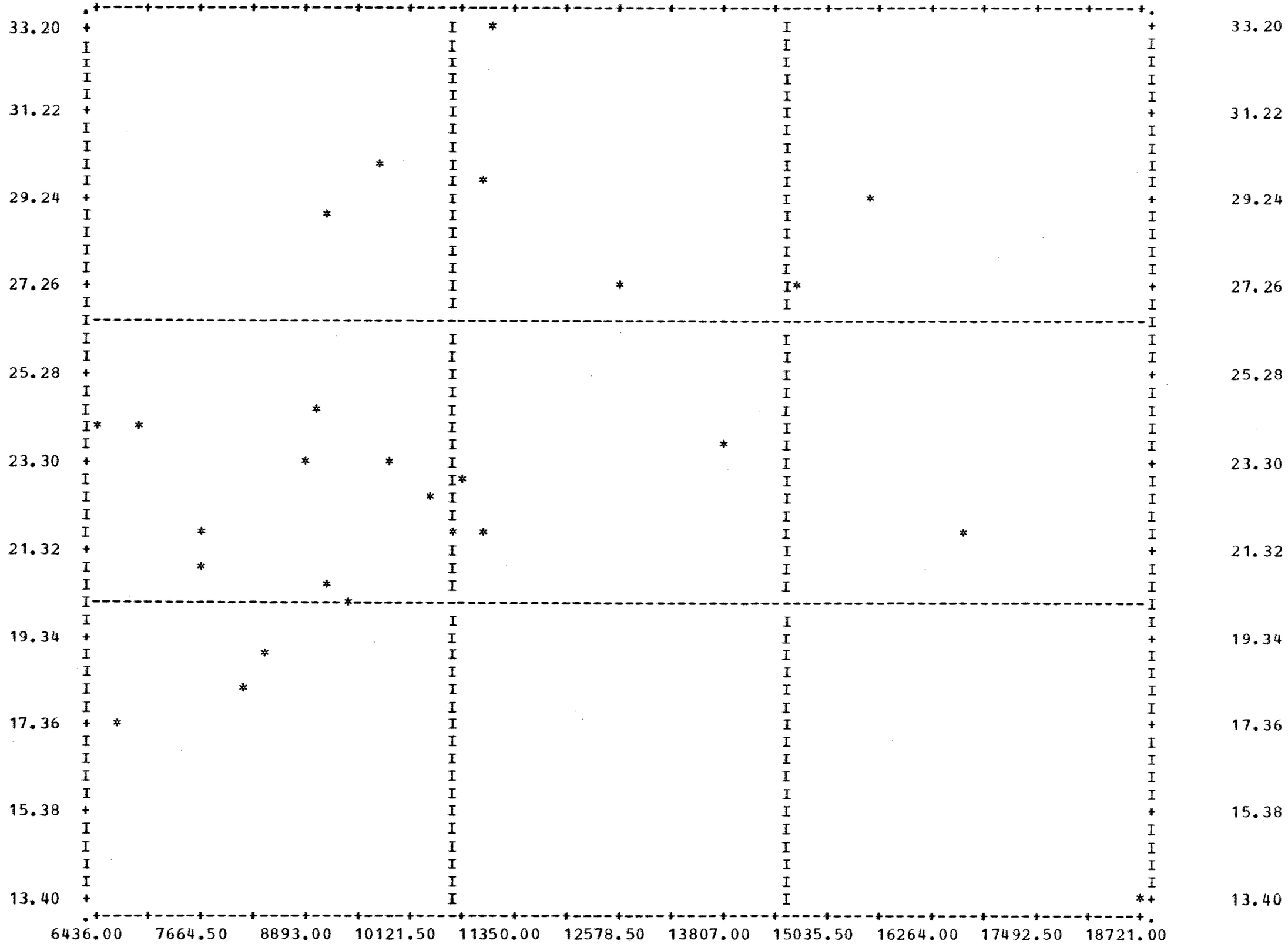
CORRELATION (R) -	0.00663	R SQUARED -	0.00004	SIGNIFICANCE -	0.48717
STD ERR OF EST -	3.08231	INTERCEPT (A) -	6.93543	SLOPE (B) -	0.63915E-05

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 6.97656 ON THE LEFT MARGIN
A VALUE OF 7.05508 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES-	0	MISSING VALUES -	0

'*********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.

FILE THESIS (CREATION DATE = 05/19/78)
SCATTERGRAM OF (DOWN) TIME (ACROSS) INCOME



STATISTICS..

CORRELATION (R) -	0.04616	R SQUARED -	0.00213	SIGNIFICANCE -	0.41140
STD ERR OF EST -	4.52973	INTERCEPT (A) -	22.78658	SLOPE (B) -	0.00007

THE REGRESSION LINE CUTS THE MARGINS OF THE PLOT AT
A VALUE OF 23.20779 ON THE LEFT MARGIN
A VALUE OF 24.01183 ON THE RIGHT MARGIN

PLOTTED VALUES -	26	EXCLUDED VALUES -	0	MISSING VALUES -	0

'********' IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED.