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Title and Subtitle

Appraisal of the existing traffic accident data collection and recording system - South Australia

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Abstract

Traffic accident data collection in South Australia has been appraised with the intention of answering two questions: What can reasonably be expected of the mass accident data system, and what improvements could be achieved by alterations to the system or to the demands made of it?

Dummy accident reports, compiled by a Survey Team attending accidents in metropolitan Adelaide, were compared with computer accident records prepared by the Australian Bureau of Statistics using police accident reports edited and coded by the South Australian Highways Department. Also, data from multiple reports for a sample of accidents not attended by police were checked for consistency. Results show that the mass data system has a very high error rate, with at least 60% of items analysed in both comparisons having error rates exceeding 5%.

Analysis of police activities at the scene shows that considerable time is spent on-site; on average 2 police man-hours at personal injury or property damage accidents and 9.5 police man-hours at fatal accidents. However, provided an accident data item is not required to be collected during the first 10 minutes, there appears to be sufficient time for police to accurately collect information.

Recommendations for changes to the system are included.

COMMONWEALTH DEPARTMENT OF TRANSPORT

APPRAISAL OF THE EXISTING TRAFFIC ACCIDENT DATA COLLECTION AND RECORDING SYSTEM - SOUTH AUSTRALIA

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The co-operation extended to the Survey Team by members of the South Australian Police Department is acknowledged; in particular to the Deputy Commissioner of Police, at that time, Mr. L.D. Draper, Assistant Commissioner, E.L. Calder, Inspector J.M. Whitbread, Officers in the Operations Room who notified the Survey Team of an accident and Senior Constable C. Sharpe who drove the police vehicle used by the Survey Team.

The assistance of Ms. Carol Boughton of the Road Safety Information Service, Commonwealth Department of Transport, in preparation of this report is acknowledged. The analysis of police activities was undertaken by Ms. Boughton, as well as the preparation of Chapters 3, 4, 8 and 9.

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1.0 INTRODUCTION

1.1 BACKGROUND

The prime source of mass data relating to road traffic accidents is currently the police accident report form.

The main function of the police is law enforcement. Road traffic accident statistics collected via the police are therefore 'administrative by-products' of the police activities.

When considering the likely accuracy or quality of these reports, it is important to realize that in South Australia, with a damage reporting criteria of $100, only about 20 per cent of all reported accidents are attended by police.

If statistics collected in this fashion are to be used for decision-making on a scientific basis, it is important that the limitations of the collecting and recording system are appreciated. Although it has been known that such limitations exist, the source and extent of the limitations have not previously been identified. Nor has any attempt been made to thoroughly assess the data collecting/processing/recording system to determine:-

- What can reasonably be expected of the system?
- What improvements could be achieved by alterations to the system or to the demands made of it?

1.2 STUDY DESIGN

P.G. Pak-Poy & Associates Pty. Ltd. was commissioned by the Commonwealth Department of Transport to undertake a two-part study design for an appraisal of the existing traffic accident data collection and recording system in South Australia.

Part One comprised describing the mass accident data collection and recording system in South Australia*, and defining the tasks for accurately determining the reliability of the mass data so collected. These tasks were as follows:-

- A field survey of accidents attended by police in metropolitan Adelaide.
- Comparison of multiple reports received for accidents not attended by police.
- Comparison of driver characteristics as recorded on accident reports with those held in the driver licence records for the same driver licence number.
- Comparison of vehicle characteristics as recorded on accident reports with those held in the vehicle registration records for the same vehicle registration number.

Part Two, described herein, involved the completion of these tasks.

The specific objectives of Part Two of the Study were as follows:-

- Assess the accident reporting task and how it is performed by police.
- Identify possible difficulties experienced by police at the accident site.
- Identify possible variations in accident reporting procedures for different types of accidents and at different locations.
- Identify possible difficulties associated with the accident report form itself.

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* See Appendix A for relevant excerpts of "Study Design for an Appraisal of the Existing Traffic Accident Data Collection and Recording System - South Australia", P.G. Pak-Poy & Associates Pty. Ltd.

- Compare accident data for polic attended and non-attended accidents.
- Assess the validity of using vehicle registration number and driver licence number to provide accurate data on the characteristics of vehicles and drivers involved in accidents.

The field survey and analysis methods used in the appraisal are outlined in this report. The report also presents the findings of the appraisal with regard to the aspects of the system mentioned above, and comments on methods of overcoming some of the problems identified.

1.3 THE EXISTING ACCIDENT REPORTING AND RECORDING SYSTEM

The sequence of activities in South Australia, from the time that an accident occurs to the recording of accident data on magnetic tape is summarised below with regard to activities by the Police, Highways Department and Australian Bureau of Statistics.

1.3.1 Reporting by Police

Accident report forms (see Appendix A, Figures 4 and 5) are prepared by police officers either at the scene of the accident or at a police station when a driver reports an accident.

From discussions with various police officers the following points have emerged:-

- Police generally attend accidents only when:-
  - personal injury is involved,
  - damaged vehicle(s) cause traffic hazard,
  - criminal offence suspected or
  - fire hazard
- All requests for police attendance at accidents in the metropolitan area are dealt with by the Police Operations Room. If it is considered that police attendance is necessary, the nearest avail-

able patrol car is despatched by radio. If the accident is severe, the accident investigation squad is also despatched. The police officers on this squad are experienced in the investigation of accidents, whereas the patrol policeman is mainly concerned with dealing with the immediate problems arising from the accident and reporting the accident.

- If an accident report form cannot be completed within 24 hours of the accident then a blue copy of the partially completed report is sent to the Police Accident Records Section. The original and a carbon copy of the final report (plus any statements) are sent to Police Accident Records as soon as possible thereafter.

In the case of an accident attended by the police, the scope for errors and omissions in the report is probably less than in the case of an accident reported to a police station. Nevertheless, because the completion of an accident report is only part of police duties at the accident site, it is inevitable that some errors and omissions could occur.

1.3.2 Police Accident Records Section

All accident reports are sent to the Police Accident Records Section as soon as possible. The preliminary report (blue) is matched with the final report when it arrives. The final report is rarely received more than two weeks after the accident. Where more than one report for an accident is expected, the first report is held until the subsequent report(s) have been received. Such reports are generally not held for more than 10 days.

The Accident Record Section function is mainly clerical processing and they make no alteration to the forms. Carbon copies are sent to the Highways Department as soon as "multiple reports" have been matched. Originals are sent to the Police Adjudication Section where a decision is made regarding the need for any legal action.

When any legal action has been completed the forms are returned to Accident Records where they are micro-filmed (including "multiple reports").

Reports are numbered by Police in date of occurrence order and logged in a book with following headings:-

Report No.
Date
Time
Surnames
Location
Injuries

A further log with micro-flim cassette and frame number against Report Number facilitates access to micro-film records via a rapid searching display device.

1.3.3 Highways Department

The Highways Department edits and manually codes the information contained on the carbon copy that is sent to them by the police. To resolve the situation where the police may have marked two or more boxes for a data item, and where only one answer can be accommodated on the magnetic tape format, the Highways Department has adopted an internal "hierarchy" for such items to decide which answer should be coded. Twice a week the processed forms are delivered to the Australian Bureau of Statistics for transfer of data to magnetic tape. Reports for accidents involving only property damage are not sent to the Australian Bureau of Statistics if the total cost of damage, as estimated by the reporting police or the driver(s) involved, is less than $100.

The Highways Department does not code onto a separate form but code, using red biro, directly onto their copy of the report form. In the majority of cases, there is more than one report for each accident (e.g., accident reported by both drivers at different police stations). In such cases there are frequent discrepancies between the reports, and the coders at the High-

ways Department must compile a "composite" report. The report which they consider "most likely" is coded and edited in red biro to represent the "composite" report.

The Highways Department has advised that it rarely finds it necessary to contact the police regarding errors, discrepancies, or omissions on the accident forms.

1.3.4 Australian Bureau of Statistics

The Adelaide office of the Australian Bureau of Statistics transcribes coded information, from the forms sent to them by the Highways Department, onto a "transcription form" and from this directly onto magnetic tape. Two tapes are prepared each quarter, one for the Bureau itself and another for the Highways Department. These tapes are of slightly different format, but both contain all of the coded accident data.

The Bureau runs a fairly comprehensive edit check on the tape data searching for logical inconsistencies or key data that is missing. Such errors and omissions are corrected wherever possible and a list of remaining omissions etc., is prepared.

Because the transfer to tape process is verified, the transcription process appears to be the most likely source of any data errors or omissions introduced by the Australain Bureau of Statistics.

1.4 CALCULATED ERROR RATES

At various points in this report, and in particular in Section 2.0 (Police Attended Accidents), the term "Error Rate" is used. The "Error Rate" for any item refers only to differences between:-

(a) The data (if any) recorded against that item by the Survey Team during observations at the site of the accident, and

(b) The data (if any) recorded against that item on the computer tape record for the same accident.

As a measure of the overall accuracy of the reporting and recording system (from the accident itself to the magnetic tape records of the accident) the "Error Rates" given in the report could be in error only to the extent that accident details were incorrectly recorded by the Survey Team at the accident. Every effort was made to prevent the introduction of errors by the Team and we are confident that a very high level of accuracy was achieved. In seeking to achieve this accuracy, the following procedures were adopted:-

- All Team members were issued with a set of instructions describing how the information for each accident should be recorded (see Section 2.2 and Appendix D). These instructions were developed from information provided by the Highways Department.
- The need for accuracy was emphasised and Team members were instructed to leave blank any data item which could not be recorded with a high degree of certainty
- The Team was drawn from a group of three experienced professional engineers and one draftsman, all of whom had previous experience in field data collection surveys.

Consideration was given to the use of alternative descriptors such as 'discrepancy' or 'disagreement' rate to remove the harsher connatations of the term 'error'. This is particularly relevant in respect of items where subjective judgement must be used (eg road grade, traffic volume) and differences between individuals would automatically be expected. Again, the need to choose a single factor for recording purposes in a situation where other factors are present might result in a difference of opinion rather than error.

Nevertheless, if the study is to have a positive effect on motivating reassessment and consideration of desirable changes to the data collection system, the harsher but more objectively meaningful descriptor of 'error' has been retained. The likely source of error is identified in the detailed analysis wherever possible.

2.0 POLICE ATTENDED ACCIDENTS

2.1 DATA COLLECTION

Field data were collected in accordance with the procedure outlined as *Method (C)* in the *Study Design* (see Appendix A). An unmarked police car and plain clothes officer were supplied to the Survey Team for the eight week survey period. Data was recorded on dummy accident report forms at 112 locations and police activity was recorded at 91 of these sites. The lower number of police activity reports resulted from police not being observed at 16 accidents the Team attended and another 5 accidents at which more than eight police attended, thus making recording of activity details not feasible.

On notification of an accident, the receiving police officer in the Operations Room at Police Headquarters types out the details provided and forwards the typed card to the work dispatcher. By radio this dispatcher directs an available police patrol car near the accident to proceed to the scene to render assistance. The Survey Team was generally notified immediately following this dispatch of a police car to the scene.

It is common in South Australia not to dispatch a police vehicle to the scene of a minor accident (no casualties) unless there are extenuating circumstances. In the case of a suspected fatal accident, a police vehicle from the Accident Investigation Unit is also requested to attend.

Times of notification of accident, dispatch of patrol cars and arrival at and departure from the accident site are recorded by the police. In addition all radio messages are recorded on tape, for play-back at a later time should this be necessary.

One of the two Survey Team members completed a dummy accident report (see Figure 2.1 and Appendix A, Section 3.4) while the other member observed and recorded police activity at the scene. The Team's police driver did not actively

ACCIDENT REPORT OBSERVER .....

Accident between .....

Time of day .....

Day of week .....

Date .....

Location: at .....(suburb)

on .....(road, street etc.)

distance & direction

.....(N,E,S,W)

from .....(road street etc.)

	UNIT 1	UNIT 2	UNIT 3
TYPE Car, utility, s/wagon, semi-trailer, truck, motor cycle, pedestrian, pole, bridge etc.			
YEAR OF MANUFACTURE			
MAKE			
REGISTRATION NO.			
COLOUR			
IF TOWING State what and reg. no.			
DRIVER OR PEDESTRIAN Sex			
BRIEF DAMAGE DESCRIPTION			

SEVERITY OF ACCIDENT? (Tick one)	property damage only ☐ injury ☐ fatal ☐
ATTENDED BY POLICE? (Tick one)	Yes ☐ No ☐
SPEED LIMIT	_____ km/h
WIDTH OF ROAD	_____ metres

Figure 2.1

SKETCH & COMMENTS

Indicate North with Arrow

(1) Letter 1 2 3 each vehicle and show direction of travel with arrow
(2) Show Pedestrians thus → O
(3) Use solid line to show path of vehicle before →
Use broken line after initial impact
(4) Show railway thus ——+——
(5) Show distance and direction to landmarks and give names

FEATURES OF LOCATION

TYPE OF LOCATION

INTERSECTION—ETC
1 Interchange
2 + Cross
3 Y Wye Junction
4 T Tee Junction
5 Multiple
6 Roundabout
7 Crossover
8 Railway Crossing

BETWEEN INTERSECTIONS
9 6 Lane Road
10 4 Lane Road
11 3 Lane Road
12 2 Lane Road
13 One Way Street
14 Freeway
15 Ramp—Off
16 —On
17

ROAD FEATURES
1 Straight Road
2 Curve or Bend—Slight
3 —Sharp
4 Top of Hill
5 Bridge or Culvert
6 Causeway or Dip
7

ROAD CONDITION
1 Sealed
2 Unsealed

1 Wet
2 Dry

1 Slippery

1 Obstruction, Roadworks etc.

ROAD GRADE
1 Level
2 Grade—Slight
3 —Steep

TRAFFIC CONTROLS

UPON ROAD
1 Med. Strip—Painted
2 —Raised
3 —Level
4 Islands
5 Barrier Line
6 Safety Bars
7
8 No Control

ERECTED (CROSS ONE ONLY)

FOR VEHICLES
1 Traffic signal—Stop/Go
2 —Flashing
3 —Flsy. Not Wkg
4 Rail. Xing—Boom
5 —Wigwag
6 —Flashing Signal
7 —No Control
8 Police
9 Stop Sign
10 Give Way Sign
11 Warning Sign *
12
13 No Control

FOR SCHOOLS
14 Flash Lights—Monitored
15 —Unmonitored
16 —Not Working
17 Safety Sails
18 Flags Out
19 School Signs Only
20

FOR PEDESTRIANS
21 Walk Lights—Mid-Section and Blk
22
23 Traffic Signal Stop/Go
24 Zebra Crossing
25 Pedestrian Refuge
26 Children Sign
27 Pedestrian Sign
28 Control Not Working
29
30 No Control

ACCIDENT DETAILS

TYPE OF ACCIDENT

COLLISION BTN. VEHICLES
1 Head On
2 Rear End
3 Side Swipe—Same direction
4 —Opp. direction
5 Approx. right angle

OTHER TYPE OF ACCIDENT
6 Hit Safety Fence
7 Hit Pole or Tree
8 Hit other Fixed Object
9 Hit Pedestrian
10 Hit Animal
11 Veh. O/Turned or Lvg. Road
12

VEHICLE MOVEMENT

1	2	
		1 Right Turn
		2 Left Turn
		3 "U" Turn
		4 Swerving
		5 Reversing
		6 Stopped on Carriageway
		7 Straight Ahead
		8 Entering Private d'way
		9 Leaving Private d'way
		10 Parked
		11 Parking—Angle
		12 —Parallel
		13 Unparking—Angle
		14 —Parallel
		15 Overtaking—On right
		16 —On left
		17

PEDESTRIAN MOVEMENT
1 Walking on Footpath
2 On Ped. Xing
3 Within 20 m. of Marked X Walk
4 Alighted from Parked Veh.
5 Walk out from Bet. Pkd. Veh.
6 Walk on Road—With Traffic
7 —Against Traffic
8 Pushing or Working on Veh.
9 Playing on Roadway
10 Crossing W/out Control
11

WEATHER ETC.

WEATHER
1 Raining
2 Not Raining

LIGHTING
1 Daylight
2 Dawn or Dusk
3 Night Street Lights Off
4 Street Lights—Orange
5 —White
6 —Blue

TRAFFIC CONDITIONS
1 Heavy
2 Medium
3 Light

SAFETY EQUIPMENT

CRASH HELMET—RIDER

1	2	
		1 Worn
		2 Not Worn

CRASH HELMET—PILN. PASS.

		1 Worn
		2 Not Worn

SAFETY BELT—DRIVER

		1 Not Fitted
		2 Fitted—Worn
		3 —Not Worn
		4 —Not Known if Worn

SAFETY BELT—IF FRONT PASS

		1 Not Fitted
		2 Fitted—Worn
		3 —Not Worn
		4 —Not Known if Worn

Figure 2.1 (cont.)

participate in the gathering of information. When necessary, the Team was able to obtain information such as the location of the accident vehicles from the driver's contact with on-site police. Requests for information directly from on-site police was avoided whenever possible (see Appendix A, Section 3.4).

The pattern of police attendance at accidents, by type of accident in 1975, is shown as Figure 2.2*. The figure shows that the police attended only 19 percent of all reported accidents. Proportionately more accidents are attended in the country. The pattern of police attendance is similar to that for 1971 (see Appendix A, Chapter 3), but police attended a smaller proportion of metropolitan non-casualty accidents in 1975 than in 1971.

2.2 DUMMY ACCIDENT REPORTS

The Team member completing the dummy accident report was instructed to fill in only those parts of the report which could be done with a high degree of certainty. No interviewing of persons concerned with the accident was to be undertaken. These stipulations eliminated the collection of much information on occupants of vehicles, their position in the vehicle prior to the accident, and whether seat belts were or were not worn (in cases where they were fitted to the vehicles).

Other time-related questions on the form, such as traffic conditions, weather, lighting, and vehicle movements, were often difficult to answer, due to the time delay between when the accident occurred and the time the Survey Team arrived at the scene. Where possible, vehicle movements were deduced from obvious evidence such as tyre marks, impact points, and location of damage on vehilce, but in many cases there was insufficient evidence to deduce movements with a reasonable degree of certainty. In such cases the relevant items were left un-answered on the dummy form.

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* Figure 2.2 was prepared from an analysis of accident records held on computer tape for 1975. For 10 percent of the Police-attended accidents that were attended by the Survey Team, computer tape records indicated that the Police did not attend, and so the proportion of reported accidents attended by Police may be slightly higher than indicated in Figure 2.2.

All Team members were issued with a set of instructions as to how the dummy accident report should be filled in (see Appendix D). These instructions were developed from information provided by the Highways Department, and in several areas seek to clarify issues that are not 'self-explanatory' on the accident forms. None of the police with whom we were involved during the survey were aware of any similar document having been issued to them to assist in completing accident report forms.

It should be noted that the police accident forms are completed from field notes on return to the office and not in the field as were the Team's dummy accident reports.

2.3 ANALYSIS OF DUMMY ACCIDENT REPORTS

A total of 112 accidents were attended by the Survey Team during the field survey, and dummy reports made out for them. Of this number, 98 accidents appeared on the Highways Department tape; 7 were not recorded by attending police and 7 were recorded by attending police but were not coded by the Highways Department. The 98 accidents that were checked against the Highways Department tape involved a total of 163 motor vehicles of all types, 4 bicycles, 7 pedestrians and 6 fixed objects such as trees and poles.

The consultant was advised that the accidents not recorded by police were excluded on the basis that they were minor accidents. The further 7 accidents were not coded by the Highways Department for the same reason. However, on the basis of the data collected by the survey team some of these accidents were sufficiently severe to have been included in the official records (see Table 2.1).

The discrepancy between the number of accidents that were attended (112) during the field survey, and those that appear on the Highways Department tape (98) give rise to an overall omission rate* of 0.12 with a 95 percent confidence band* of 0.06 - 0.19. A significant proportion of accidents reported to police, therefore, do not appear in official accident statistics.

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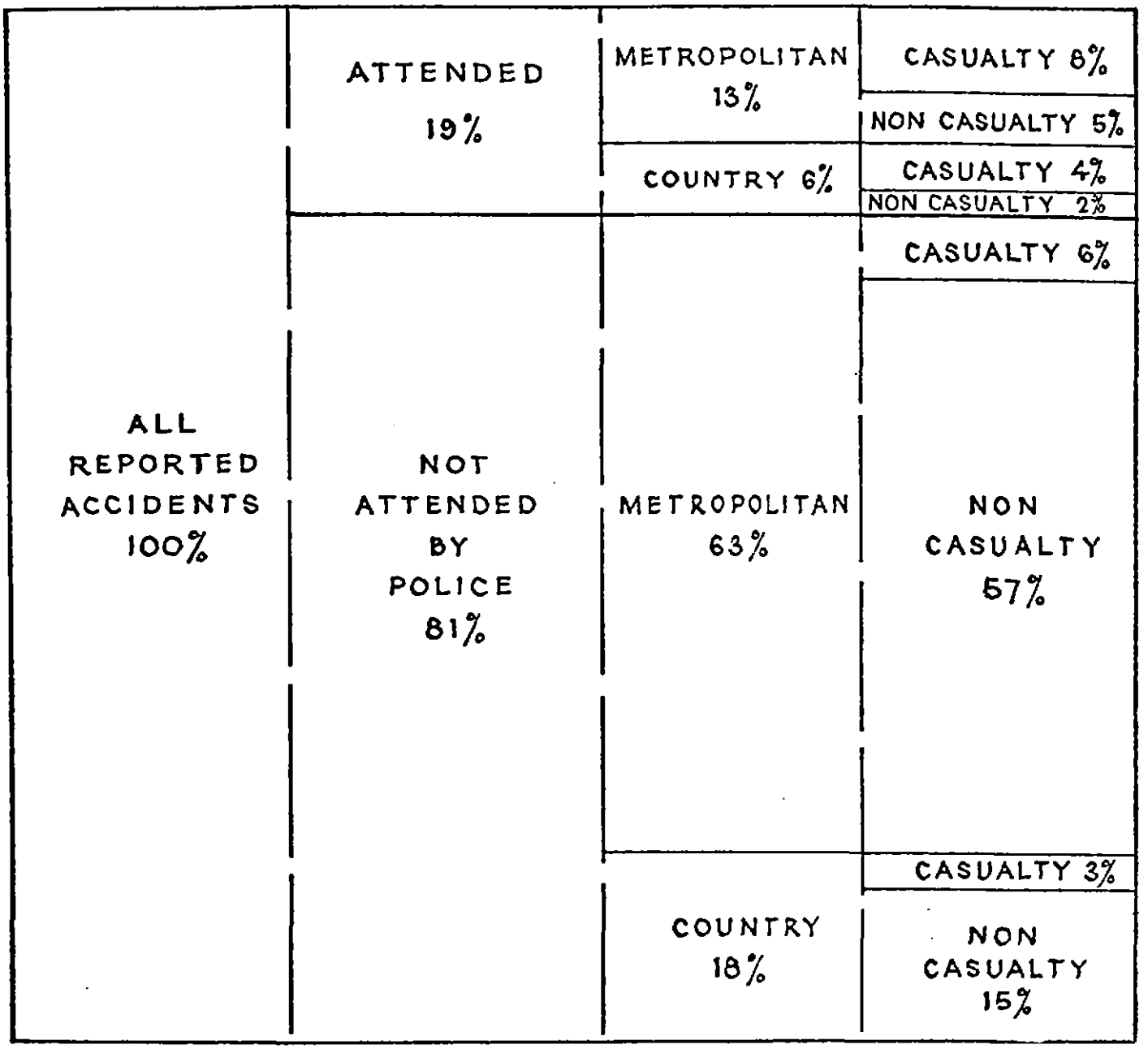
* See Appendix A, Chapter 4



See Footnote on Page 9

PERCENTAGE DISTRIBUTION OF REPORTED ACCIDENTS, SOUTH AUSTRALIA 1975

Figure 2.2

TABLE 2.1

POLICE REPORT MADE BUT NOT LOCATED
ON HIGHWAY DEPARTMENT'S FILE

Date	Description	Report by Police Found
16.10.76	3 cars; 1 did not stop/1 overturned	Yes
20.10.76	Minor damage to parked car/vehicle did not stop	No
22.10.76	Car/Pedestrian (believed injured)	No
22.10.76	Car/Pedestrian (from hotel); minor car damage only	Yes
26.10.76	Car/pole (severe)	No
26.10.76	2 cars (minor)	Yes
27.10.76	2 cars (minor)	Yes
29.10.76	Bus (minor)/car (severe)	Yes
2.11.76	Parked car (minor)	Yes
3.11.77	Taxi/car (minor)	Yes
4.11.77	Car (moderately severe) fence	No
9.11.76	Car (minor)/Pedestrian	No
11.11.77	4 car rear end collision/minor to moderate damage	No
13.11.77	Motor cycle only (minor)	No

The Survey Team's dummy reports were coded and punched onto cards, and correlations with the Highways Department accident records were sought, using the following parameters:-

- Registration number of the vehicle.
- Date and time of the accident (given a one-hour tolerance).

Matching was done against the relevant tape by Highways Department officers, who compared the parameters above and drew out the complete record for that particular accident. Comparison of the official file with the dummy report produced the results that follow in Section 2.4.

2.4 RESULTS OF DUMMY REPORT ANALYSIS

No comparisons with dummy reports can be made for the 14 data sets not coded by the Highways Department. Table 2.2 therefore does not include the effect of these uncoded accidents and compares only those recorded both on the dummy forms and the Highways Department's tape. In this way, the omissions in particular parameters on the Highways Department's tape on the otherwise complete reports, are not obscured by the 0.12 omission rate mentioned in Section 2.3 of this report.

The dummy report items are reviewed below:-

DATE

No discrepancies were recorded for this parameter, which was used as a secondary criterion for matching of the dummy reports with the Highways Department tape.

REGISTRATION NUMBER

The rate of error* (0.06) in recording registration numbers gives rise to some concern, especially if they are to be used as a key datum for determining other vehicle characteristics from registration records.

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* The error rate is defined as the number of times a specific item was recorded on the dummy report (C1) less the number of times the tape data gave the same answer as the dummy report (D1), divided by C1 (see Appendix A, P.A24).

TABLE 2.2

RESULTS OF DUMMY REPORT ANALYSIS

NO.	ITEM	CODED	OMISSION	OMISSION RATE	ERRORS *	ERROR RATE	95% BAND
1	DATE	98	0	0	0	0	0-0.04
2	REGN. NO.	163	0	0	9	0.06	0.04-0.11
3.	NO. OF UNITS	180	0	0	17	0.09	0.06-0.16
4.							
5.	UNIT TYPE	180	0	0	8	0.04	0.02-0.10
6.	UNIT MAKE	163	0	0	10	0.06	0.04-0.11
7.	UNIT COLOUR	145	0	0	12	0.08	0.05-0.15
8.							
9.							
10.	SEX OF DRIVER	90	0	0	3	0.03	0.01-0.04
11.	TIME OF DAY	97	0	0	3	0.03	0.01-0.08
12.	DAY OF WEEK	98	0	0	0	0	0-0.04
13.	SEVERITY	98	0	0	16	0.16	0.09-0.24
14.	POLICE ATTENDANCE	98	0	0	10	0.10	0.05-0.17
15.	SPEED LIMIT	90	8	0.08	2	0.02	0.01-0.04
16.	INTERSECTION TYPE	96	2	0.02	24	0.24	0.16-0.35
18.	ROAD FEATURES	92	0	0	7	0.08	0.04-0.16
19.	ROAD GRADE	92	0	0	15	0.17	0.10-0.27
20.	ROAD COND. SEAL/ UNSEAL	94	0	0	0	0	0-0.04
21.	ROAD COND. WET/DRY	92	0	0	7	0.08	0.04-0.16
24.	CONTROLS UPON ROAD	90	0	0	23	0.26	0.13-0.37
25.	CONTROLS ERECTED	89	0	0	14	0.16	0.06-0.26
26.	TYPE OF ACCIDENT	86	0	0	11	0.13	0.04-0.23
27.	VEH. MOVEMENT 1	63	0	0	10	0.16	0.06-0.26
28.	VEH. MOVEMENT 2	60	0	0	4	0.07	0.02-0.18
29.	PEDESTRIAN MOVEMENT	5	0	0	2	0.40	sample too small
30.	HELMET RIDER	5	0	0	0	0	sample too small
31.	HELMET PASSENGER	1	0	0	0	0	sample too small
32.	BELT DRIVER	156	0	0	0	0	0-0.04
33.	BELT PASSENGER	4	0	0	0	0	sample too small
34.	WEATHER	96	0	0	2	0.02	0.01-0.04
35.	LIGHTING	95	0	0	14	0.15	0.08-0.23
36.	TRAFFIC CONDITIONS	95	0	0	22	0.23	0.15-0.33

Note: In cases where the Survey Team was unsure of a particular item, no recording was made on the Dummy Report. This resulted in some of the above coded items to be less than the maximum. In the case of Sex of Driver, only 90 recordings were made out of a possible 163 vehicles, since in many cases the Survey Team was unsure of who was driving the vehicle.

Numbers that did not correspond between the Highways Department's record and the dummy reports were submitted to the Motor Registration Division, which extracted vehicle make, type, year, and colour from records for each number. These were then compared against the descriptions on the Highways Department's records and the dummy report to determine where the error lay. The verified registration number was then compared with the incorrect version to determine the nature of the error.

In only one of these nine cases, the error arose from the Highways Department coding incorrectly from the police forms. The remaining eight errors were due to incorrect police reporting. Examples of errors were substituting '3' for '5', 'U' for 'V', 'C' for 'L' and '6' for '0'. Only one error resulted from the transposition of consecutive characters.

NUMBER OF UNITS INVOLVED

The 0.09 error rate in this category related to the fact that the collection of dummy report data was commenced sometime after the accident and from visual evidence only. Hence, in many cases drivers of vehicles that were involved in only a minor way had already exchanged particulars and had left the scene before the Survey Team arrived. This could be considered a flaw in the survey methodology, but one which it would have been difficult or impossible to overcome. As a result, the discrepancies between the Highways Department data and the dummy reports in this regard cannot be taken as an indication of the accuracy of recording of this parameter in the official records.

UNIT TYPE

An error rate of 0.04 with a 95 percent confidence band of 0.02 - 0.10 indicates a reasonable degree of reliability in reporting vehicle type. Examination of discrepancies showed that the only significant variation was confusion between 'sedan' and 'station wagon'. This distinction is subjective in many cases; vehicles such as Renault 4 being registered as 'sedan', but having a five door station wagon type configuration and appearance. The only way to

overcome this source of error is to employ a comprehensive and up to date vehicle specification reference that is available to, and used by, police taking accident particulars.

UNIT MAKE

The error rate of 0.06 in this parameter indicates a fair degree of reliability in reporting unit make. The coding method for the parameter takes into account make and a weight classification in three categories, light, medium and heavy. Most discrepancies arise in the weight classification, between adjoining classes, e.g., light - medium, and medium - heavy. The guide specifications for classifications are incomplete, vague and have categories that are not mutually exclusive. For example, a Chrysler Galant can be correctly coded as Chrysler or Japanese. This situation forces many subjective judgements to be made which are complicated by vehicle ranges moving up in weight classification; for example, Torana included 1.3 litre four cylinder models in 1970 and 5 litre V8's in 1975.

Improvements in accuracy in reporting this parameter could readily be achieved by requiring more complete model description on the accident report form, together with a more rigorous coding classification sheet arranged by vehicle make and model, rather than by classification.

UNIT COLOUR

The error rate in the 95 per cent confidence band of 0.05 - 0.15 is based on the tolerance criteria outlined in Section 5.2 of this report. If this tolerance had not been allowed, the error band would have been 0.22 - 0.37, which illustrates the difficulty in specifying names of colours. Of those discrepancies classified as errors, most arose at night, particularly under sodium vapour lights. The most striking example was a car that appeared to be bright orange under the sodium lights, but was in fact dark green. Most errors related to similar colour tones such as grey-silver, cream-light yellow, fawn-bone, and silver-undefined blue.

Correct identification required the use of a torch at about 10 cm from the paint to overcome the chromatic influence of the sodium lights. This is mainly a field problem that could be overcome through adherence to a similar procedure by police.

The need to record this information could be questioned since it would be available from Motor Registration Division records. It also depends on whether a researcher wants to identify the vehicle by true colour or as perceived at the time of the accident.

One problem, although probably minor, is the fact that the vehicle colour as recorded by the Motor Registration Division may not be the actual colour of the vehicle due to it being resprayed. While the Division requires identification of vehicle colour change, this does not always happen and no checks are made of this aspect.

SEX OF DRIVER

A very small error rate of 0.03 was evident in this category. The 3 errors in this category are thought to have been made by the Survey Team rather than during reporting or coding. The errors could have occurred by the Survey Team arriving late at the scene of an accident and either being wrongly informed or incorrectly deducing that the driver was being interviewed by the police.

TIME OF DAY

A small error rate of 0.03 in Highways Department coding was mainly (2 of the 3 errors) the result of afternoon accident times being written in a twelve hour clock style by police, instead of a twenty four hour style. This gave rise to an error of twelve hours when they were coded without the facility for adding 'pm'. The other error was the result of the accident time being reported wrongly by police by more than one hour.

DAY OF WEEK

No errors were observed in this parameter.

SEVERITY

A high observed error rate of 0.16 in this parameter could be due to the dummy report being compiled from visual evidence, taken some time after the accident. In some cases injured parties had left the scene, or had ostensibly recovered from, or had treated, slight injuries. The accident was, therefore, marked as property damage only, for want of contrary information. This flaw in the methodology could not reasonably have been overcome.

The discrepancy was consistently that of the official report indicating injury and the dummy report stating property damage only. Even though police reports for some severe accidents were not located, it is unlikely that police records would be incorrect in this item as more detailed and complex procedures must be followed in the case of an accident resulting in an injury. It is recommended that the results in this case be disregarded.

POLICE ATTENDANCE

Police were observed on the scene at all accidents for which the dummy report indicated police in attendance. All discrepancies (10) related to the official Highways Department tape indicating that no police attended the accident.

SPEED LIMIT

Of the two parameters with omission, speed limit had the higher omission rate. It would appear that speed limit is often omitted from records of metropolitan accidents, presumably because it is implied from the accident location (metropolitan area). The error rate was low at an observed 0.02, which arose through incorrect selection by police of a zone speed on speed zoned main roads, e.g., 80 kph instead of 60 kph.

TYPE OF LOCATION

A very large error rate was recorded for this parameter. The observed rate was 0.24 with a 95 percent confidence band of 0.16 - 0.35. The main cause of these discrepancies was the difficulty of categorizing actual locations according to the choice provided on the police accident form. Examples of distinctions that must be made with a high degree of subjectivity are those between 4 and 6 lane roads where a parking lane is provided, and between T- and Y- junctions. Furthermore, the basic decision for the Policeman between 'at intersection' and 'between intersections' is often confused by knowledge of accident particulars. Many accidents that occur at or near an intersection arise through circumstances unconnected with that fact. The temptation, to overcome the apparent ambiguity in reporting such a case correctly as an "intersection accident" by reporting locational detail relevant to the accident, e.g., "2 lane road", is strong and apparently succumbed to sometimes.

It is known that the Police often cross two boxes under the "Type of Location" heading; one under the subheading "Intersection etc." and one under the subheading "Between Intersections". In such cases the Highways Department coders refer to the accident diagram and the "Distance and direction" recorded elsewhere on the form to resolve the matter.

It is apparent from the large degree of error and confusion in this item, that a review of the accident reporting form is warranted. Consideration should be given to whether an accident relating to an adjacent intersection should be so reported, rather than if it occurred within 10 m of the intersection.

ROAD FEATURES

The error rate observed, 0.08, is due to discrepancies arising where either of the two descriptions could reasonably be applied; for example, 'straight' or 'slight curve'. This condition arose either through marginal and subjectively

allotted differences in degree, or because the categories provided are not mutually exclusive. For example, 'slight curve' and 'bridge or culvert' can occur together and be of equal (including negligible) relevance to the accident. It is more likely that the police report is incorrect since an experienced engineer recorded the dummy reports.

Where the Police mark two or more boxes for this item, it is understood that the Highways Department coders resolve the matter by using an internal "hierarchy" in which, for example, "Curve or bend" takes preference over "Bridge or culvert".

ROAD GRADE

A high observed error rate, 0.17, in this parameter was almost entirely the result of difference of opinion between the Survey Team and police as to whether the road was 'level' or of 'slight grade'. Provided that the categories 'level' and 'slight grade' are combined for any analysis on this item, the abovementioned error rate would be of little consequence. As the number of cases where the road is absolutely level must be very small, it may be preferable to change the subjective categories to slight, medium, or steep grade, eliminating 'level' entirely.

ROAD CONDITIONS

The first choice under this category is between sealed and unsealed roads. No discrepancies were observed. The second choice is between wet and dry roads. An error rate of 0.08 was observed. The discrepancies arose on occassions with intermittent rain, with variations occurring between the Survey Team and police as to whether the road was 'wet' or 'dry'. The time of observation is critical in this case, as trafficked roads dry quickly after rain.

CONTROLS UPON ROAD

A high error rate of 0.26 was observed for this parameter. In all cases investigated, the discrepancy was due to different choice of control from several applying to the

accident location. It is understood that the Police sometimes mark two or more boxes for this item and that the Highways Department coders determine the appropriate category using an internal "hierarchy" of categories. The Survey Team was instructed to mark only one box and some of the errors may have arisen through the Survey Team being unfamiliar with this "hierarchy". Similarly, such errors could arise from reports by those Police who marked only one box. So far as the Police are concerned the choices are not mutually exclusive.

For example, an intersection could have a painted median strip with safety bars and only one of these can be coded. In these circumstances, variation between answers is inevitable. To overcome this situation, either the program should be changed to accept a full description of the controls, or they should be arranged on the form in an hierarchy, with printed instructions to fill in only the first applicable box in the category. This situation occurs in several categories on the form, and the general solutions mentioned above would be applicable to these other cases as well.

CONTROLS ERECTED

This category harbors the same difficulty as "Controls Upon Road". The lower error rate (0.16) is due to the reduced proportion of instances where more than one form of erected control is employed. Discrepancies arose through the fact that one type of control, for example, traffic lights, could refer to vehicles and pedestrians and could hence be legitimately recorded in two coding boxes. As in the case of "Controls upon road", the Highways Department coders use an internal "hierarchy" of categories to determine the appropriate category where the Police have coded two or more boxes. This error rate could be reduced by emphasising the requirement to mark only one box.

TYPE OF ACCIDENT

The error rate of 0.13 for type of accident proved to have resulted from different interpretations between the Survey Team and police of the actual situation. A good correlation between observations was shown by reference to the

plans of the Survey Team and police of the accidents, but the possibility of describing the collision type as more than one of the multiple choices provided on the form gave rise to discrepancies. An example of the subjective nature of this descriptive process is given by the case of a collision between a vehicle turning left on a large radius at an intersection colliding with a vehicle whilst trying the enter the conflicting traffic stream. This could reasonably be described as "approximately right angles" from consideration of the road layout, and as "side swipe - same direction" from examination of damage.

The problem of secondary or multiple impacts, which would logically give rise to multiple entries under type of accident, is dealt with during coding by selecting only the initial impact to categorize the type. In this way, a case where a car, after collision with another, leaves the road, hits a fixed object or objects and strikes a parked vehicle, is coded only by the type of the initial collision between vehicles. The fact that a secondary impact occurred can be deduced from other coded information (Unit Type) but a certain amount of information relating to the secondary impact could only be retrieved from the original accident report and not the coded tape. For example it would generally be necessary to refer back to the accident report to identify the vehicle(s) involved in the secondary impact.

One accident, involving a collision between two cars, with one of the cars then leaving the carriageway and colliding with a pole was coded as "hit pole or tree". This error may have arisen through failure of the police to mark the correct box with the error being undetected during editing by the Highway Department.

VEHICLE MOVEMENT

The error rate in this category varied between the two units on the accident form. For Unit 1 it was 0.16 and for Unit 2, 0.07. This category also presents to the Policeman a large range of multiple choices which are not mutually exlcusive, and between some of which the differences are

subjective. The most common example was whether the front vehicle was "stopped on carriageway" or "turning left" or "Turning right" or "straight ahead" in the case of a rear-end accident. Where the Police mark two or more boxes for this item the appropriate category is chosen by the Highways Department coders using an internal "hierarchy" of categories for this item. For example if Unit 1 is marked as "Turning right" and "Entering Private Driveway", the latter would be coded.

PEDESTRIAN MOVEMENT

The sample size of only 5 is not sufficient to obtain a statistically significant result in this category. However, it is obvious that the same degree of subjectivity in selection of description is present as in Vehicle Movement above, and the multiple choices are, once again, not mutually exclusive.

CRASH HELMET

The sample size is insufficient to obtain a statiscally significant result, but the fact that this category offers a simple yes-no choice reduces the probability of error i.e. discrepancy. It would be difficult in many cases for the police to determine with certainty whether a motor cyclist was wearing a crash helmet at the time of an accident.

SAFETY BELT

In general, only drivers' seat belts were reported on the dummy reports, as in most cases there was no indication as to whether a front passenger was carried or not. No discrepancies were noted, and this was probably assisted by the fact that the four choices given cover the whole range of possibilities and are mutually exclusive. Unless the police were actually at the scene of the accident when it occurred they reported (as did the Survey Team) "Fitted - not known if worn", or "Not Fitted". To simplify reporting, the accident form could delete whether they were fitted-worn/not worn since these boxes are rarely filled in.

WEATHER

A very small error rate of 0.02 indicates that the weather reported on accident forms is reliable within acceptable limits.

LIGHTING

This parameter gave rise to a high (0.15) error rate between the Survey Team and the computer tape records. The major cause of discrepancy appears to have been in subjective judgements between "daylight" and "dusk", and the not mutually exclusive categories of "dusk" and "street lights". Although some anomolies of this type are resolved during coding by the Highways Department using the time of the accident as a reference to differentiate between daylight and dusk, the remaining error rate (0.15) is high enough to indicate that the layout of this item on the form requires revision.

TRAFFIC CONDITIONS

A high error rate for this item (0.23) between the Survey Team and the computer tape records is due to differing opinions between the three subjective categories of "heavy", "medium" and "light", complicated to a minor degree in the case of intersection accidents by confusion as to which road is to be referred to in the report. Traffic flows on the two roads at an intersection are often substantially different from each other. The differences of opinion related only between two adjacent categories, e.g., "light" and "medium", and in no cases were errors made between "light" and "heavy".

Traffic condition data should be used with care, even if the user is aware that overlap into other categories often occurs. A definition of the terms "light", "medium" and "heavy" is required, especially since the form is applicable to both urban and country areas.

2.5 SUMMARY

Comparison of police accident reports stored on magnetic tape with dummy accident reports compiled at the scene

by the Survey Team revealed many differences. Just over 10 percent of the items* for which the Survey Team were able to collect information has an error rate exceeding 0.20; 31 percent had an error rate in the range 0.10-0.19; and 27 percent had an error rate in the range 0.05-0.09. Thus, 70 percent of the items had at least a 0.05 error rate.

The reasons given for high error rates can be summarised as follows:-

- The Survey Team observed insufficient evidence to answer correctly; e.g., accident severity (0.16) and number of units involved (0.10).
- The item was subjective; e.g., traffic conditions (0.23), road grade (0.17), lighting (0.15) and road conditions (0.08).
- Layout on the accident report form implies that single responses to multiple choice questions are required and in some cases the choices are not mutually exclusive; e.g., traffic controls erected (0.16), vehicle movement-unit 1 (0.08), and vehicle movement-unit 2 (0.07).
- An inadequate knowledge of definition of accident items; e.g., intersection type (0.23), type of accident (0.13), unit makes (0.06) and unit type (0.05).
- The conditions at the scene of the accident; e.g., unit colour (0.08).
- Inaccurate reporting by police; e.g., vehicle registration number (0.09).

The field survey of accidents proved to be a worthwhile exercise, in as much as it has cast doubt on the assumed validity of many aspects of reported accident data.

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* Items given as "sample size too small" have been excluded.

3.0 ANALYSIS OF POLICE ACTIVITY*

3.1 INTRODUCTION

As stated in Section 2.3, 112 accidents were attended by the Survey Team during the field survey. Six of these accidents (minor property damage) were not attended by police and at a further 10 accidents the police were not observed due to the Survey Team arriving after the police had left the site. In a further 5, more than eight police were in attendance and, as the activities of all could not be observed reliably, no activities sheets were completed for these accidents, (see Table 3.1). Activities sheets are therefore available for 91 accidents.

TABLE 3.1

SURVEY ACCIDENTS BY POLICE ATTENDANCE

No. of Police Observed in Attendance	No. of Accidents	% Attended
Not observed	16	-
1	1	1.0
2	69	72.0
3	10	10.4
4	10	10.4
5	1	1.0
8	5	5.2
Total	112	100.0

Table 3.2 is a listing of the activities observed during the field survey. Time spent on a particular activity was calculated from the times recorded by a stopwatch when the police changed activity. As many activities averaged less than one minute, the activities listed in Table 3.2 have been arranged into 10 activity groups.

* Chapter prepared by the Commonwealth Department of Transport.

TA

POLICE

Activity Group	
Interview	Tal
Inspection	Insp
Measure	Insp Take ne
Write notes	Writ no asso ia or M a:
Management	Talk t O F T
	Help a Attend Use ra Direct Drive Move v Clean
Off-site	Leave Off si Observ appare
Before-team	Time b accide tend a observ fore j ling-
After-team	Time l the s accid they
On-site	Inter Write Befor
Activity	Time site (Afte

After-team time arises because the Survey Team was permitted to leave the scene before the attending police, provided the police activity was, in all probability, the last activity, i.e. after notes had been written up and awaiting for driver to arrange for vehicle to be towed away. In such cases, any more time spent on-site would provide very little additional data and would tend to reduce the rate at which accidents could have been attended by the Survey Team.

Values of these 10 activity group variables were punched onto cards; one card per policeman in attendance at the accident. Copies of these (police) cards and an associated accident card (see para 4, Section 2.3) were forwarded by the consultant to the Commonwealth Department of Transport for analysis.

3.2 SAMPLE REPRESENTATIVENESS

Severity of Accident

Of all accidents occurring in the Adelaide metropolitan area that are reported to the police, approximately only one in five are attended by police, and of those attended 58 per cent are casualty accidents (see Fig. 3.1). Of the 96 accidents at which police were observed in attendance, 46 per cent were coded as casualty. When corrected for recording error (see Table 2.2), then 63 per cent of the accidents attended were casualty accidents. The accidents attended by the Survey Team were therefore representative, in terms of the proportion that were casualty, of those normally attended by police in Adelaide.

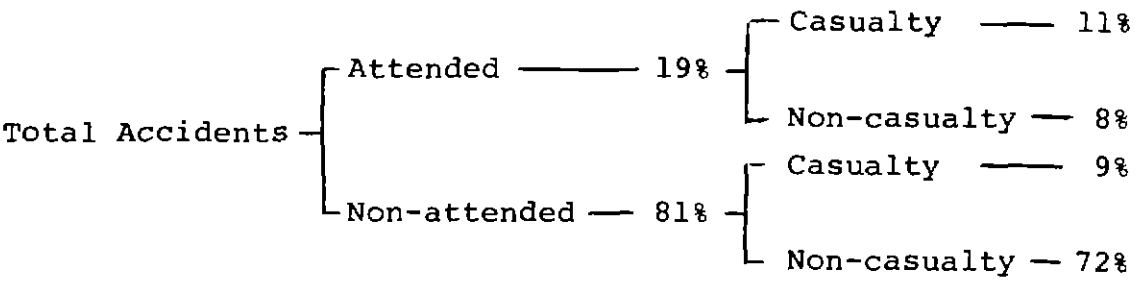

Fig. 3.1 - Reported Metropolitan Accidents, Adelaide

Type of Accident

Table 3.3 gives a comparison by type of accidents attended by the Survey Team with all reported accidents and casualty accidents in South Australia in 1976. The distribution of accidents attended by type reflects more the distribution of casualty accidents, as would be expected since 63 per cent of the accidents attended by the Survey Team were casualty accidents. Table 2.2 indicates an error rate of 0.13 for type of accident; no adjustment could be made for this. As the distribution by type of metropolitan accidents attended by police is not available, it cannot be said how representative by type are the accidents attended by the Survey Team.

TABLE 3.3

TYPE OF ACCIDENT, SOUTH AUSTRALIA, 1976

Accident Type	Reported Accidents %	Casualty Accidents %	Survey Team %
Multi-vehicle	84	64	73
Single vehicle struck fixed object	8	13	10
Overturning or leaving carriage	4	11	3
Struck Pedestrian	2	10	11
Other	2	2	3
All Accidents	100	100	100

Time of Day and Day of Week

The schedule which the Survey Team followed was designed to maximize the number of accidents attended, within the limits imposed by the project budget, i.e. working for long hours during periods when it is known that the accident rate is low were avoided. Unreasonable bias towards any particular period of the day or week was also to be avoided, although the schedule had to conform with police awards, pay periods, etc. The schedule followed by the Survey Team is given in Table 3.4.

TABLE 3.4

SURVEY TEAM SCHEDULE[1]

Week	Day						
	Thur	Fri	Sat	Sun	Mon	Tues	Wed
1	A	A	A	0	0	A	A
2	A	N	0	0	A	A	D
3	D	D	D	0	0	D	D
4	A	A	0	0	A	A	A
5	A	N	N				

(1) Shifts: D 7.00 a.m. - 3.00 p.m.
A 3.00 p.m. - 11.00 p.m.
N 6.00 p.m. - 2.00 a.m.
0 No data collected

Note: Police pay periods commence on a Thursday

A comparison of the distribution by day of week of casualty accidents reported to police in South Australia in 1976, and the accidents attended by the Survey Team is given in Table 3.5. There are two obvious discrepancies:-

(a) the Survey Team did not attend accidents on any Sunday; and

(b) there is a bias towards accidents which occurred on Thursdays.

A comparison by time of day, as in Table 3.6, indicates that the Survey Team attended a greater proportion of accidents at night. This was due to the afternoon shift not finishing until 11.00 p.m. and more afternoon shifts were worked since the team was able to attend both day and night accidents during this shift.

Keeping these differences in mind, the results of the police activity analysis are presented in Chapter 4.0. These results were obtained from applications of the Statistical Package for Social Sciences (SPSS) computer programs.

Detailed analyses by such items as type of accident and type of location have not been undertaken, in view of the high error rates described in Chapter 2.0 between the dummy accident reports and the official accident tape. The accident details used for the analysis were those recorded on the dummy reports.

TABLE 3.5

ACCIDENTS BY DAY OF WEEK, SOUTH AUSTRALIA

Day of Week	Casualty Accidents 1976 %	Survey Team %
Monday	12.1	7.7
Tuesday	12.5	9.9
Wednesday	13.1	17.6
Thursday	14.6	34.1
Friday	16.9	17.6
Saturday	17.5	13.2
Sunday	13.3	-

TABLE 3.6

ACCIDENTS BY TIME OF DAY, SOUTH AUSTRALIA

Time	Casualty Accidents 1976 %	Survey Team %
0601-1800	64	51
1801-0600	36	49

Different time periods were used in each of the Study Design tasks, since delays of three months would have occurred if the Consultant waited for details of multiple report, registration numbers and licence numbers to become available for the period in which the Survey Team was in the field.

4.0 RESULTS OF POLICE ACTIVITY ANALYSIS*

4.1 INTRODUCTION

Preliminary investigations of Police Operations Room records showed that, on average, police remain at an accident site for about 50 minutes.

On site activity beyond the 50 minutes is nearly always confined to obtaining statements from persons who were involved in, or who witnessed, the accident, writing up notes or awaiting the removal of a vehicle from the scene. Figure 4.1 shows the time spent on-site in 15 minute intervals by severity of accident, e.g. interval 3 is equivalent to 45-59 minutes.

For each fatal accident at least three hours was spent on site. From Table 2.2 up to 16 per cent of the injury accidents could have been miscoded as property damage accidents by the Survey Team; the effect of this is unknown. Figure 4.1 suggests that for the majority of property damage accidents the police are on site for less than 45 minutes, while for the majority of personal injury accidents they spend at least 1 hour on-site.

Average time police stayed on-site at the 91 accidents** recorded by the Survey Team was 56 minutes, with an associated standard deviation of 48 minutes. Table 4.1 gives the mean and standard deviation of on-site time by number of police in attendance. With the exception of those accidents with four police in attendance the average time on-site tends to decrease with increasing number of police in attendance.

Alternatively, the total police time spent on-site can be considered, i.e. the sum of the time spent on-site by each policeman. Figure 4.2 gives the distribution of on-site time by all policemen per accident while Table 4.2

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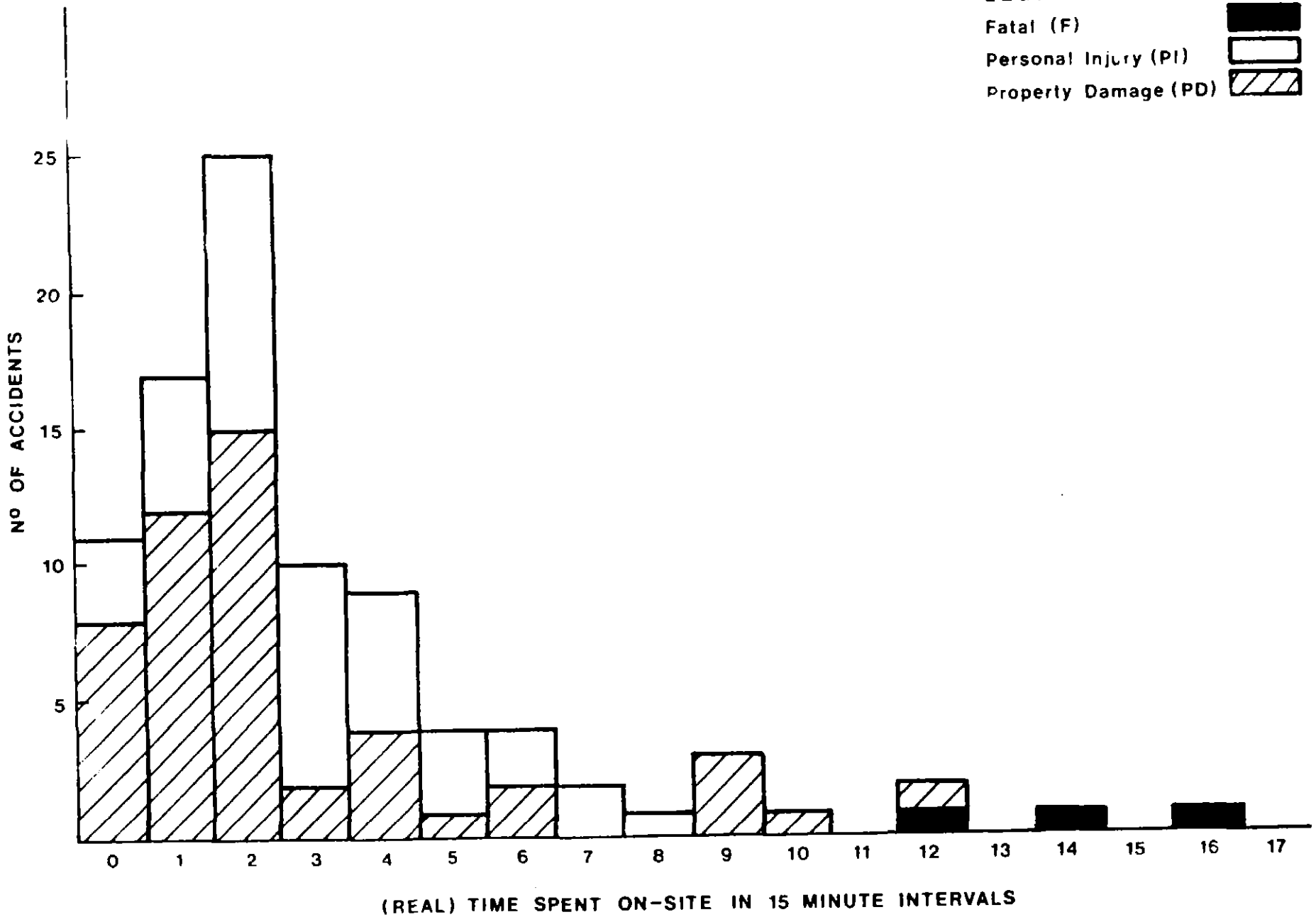
* Chapter prepared by the Commonwealth Department of Transport, excluding Section 4.4.

** 5 or less police in attendance.



NOTE : Error rate of 0·16 in accident severity, mainly PI's coded as PD's by survey team.

TIME SPENT ON-SITE BY POLICE

Figure 4·1

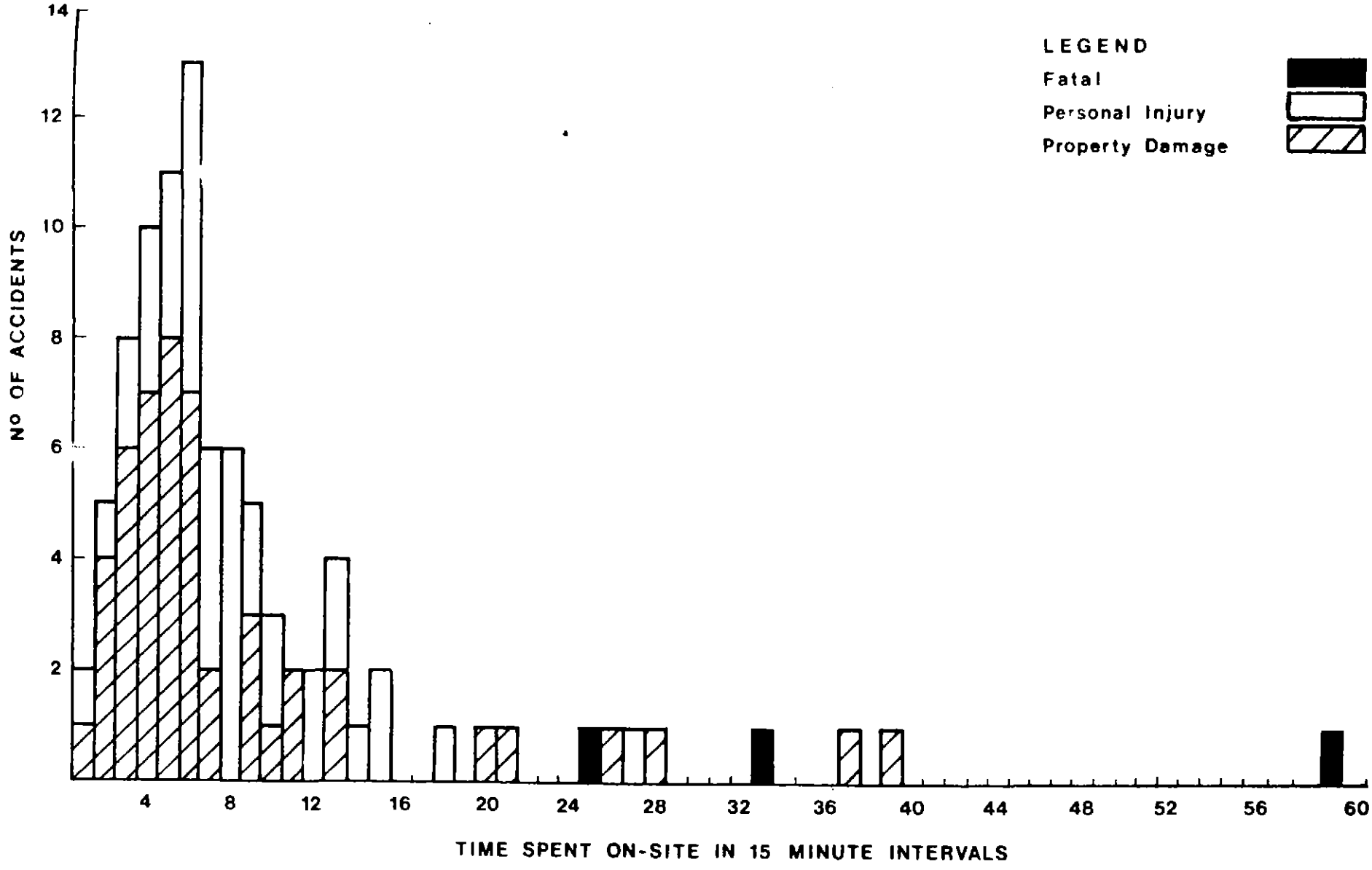


Figure 4.2

POLICE MANPOWER ON – SITE

gives the mean and associated standard deviation by accident severity. On average, approximately 2 on-site police man-hours are spent on personal injury and property damage accidents, compared with 9.5 on-site police man-hours for fatal accidents.

TABLE 4.1

MEAN AND STANDARD DEVIATION OF ON-SITE TIME BY NUMBER OF POLICE IN ATTENDANCE (MINUTES)

No. of Accidents	No. of Police	Time on-site	
		Mean[1]	Standard Deviation
1	1	85	-
69	2	55	45
10	3	35	22
10	4	81	70
1	5	13	-
91	-	56	48

(1) The mean and standard deviation have been used instead of the median, since this allows the reader to better appreciate the spread in recorded times. The median is generally a slightly lower value than the mean value.

TABLE 4.2

TOTAL ON-SITE TIME PER ACCIDENT BY SEVERITY OF ACCIDENT[1] (MINUTES)

Severity*	Mean	Standard Deviation
Fatal	579	267
Personal injury	118	74
Property damage	117	128
Total	134	139

* From Table 2.2 there is an error of 0.16 in Survey Team's recording of severity of accident; mainly personal injury accidents being incorrectly coded as property damage.

4.2 TIME ON-SITE BY ACTIVITY

Table 4.3 gives the number and proportion of accidents attended by police for which no time was engaged in each activity group. Important aspects relating to observed police actions are:-

- In 4 per cent of accidents attended no person was interviewed by police.
- In six out of every ten accidents attended, the police were not observed inspecting the vehicle(s) involved or taking measurements of the scene.
  - Note that in South Australia police are required to include on the accident report forms a brief description of total property damage and an estimate of the value of the damage.
- In 28 per cent of cases there was no off-site time.
- In four out of every five accidents the Survey Team left the scene before the police.
- In 14 per cent of cases there was no Before Team time so that for these cases the Survey Team were on site when the police arrived.

TABLE 4.3

NUMBER AND PER CENT OF ACCIDENTS ATTENDED FOR WHICH NO TIME WAS ASSIGNED TO AN ACTIVITY GROUP

Activity Group	No.	%
Interview	4	4
Inspection	51	56
Measure	55	60
Write notes	38	42
Management	7	8
Off-site	25	28
Before team	13	14
After team	19	21

Table 4.4 gives average total time (in minutes) for all police attending each activity group by number of police attending, while Table 4.5 gives the corresponding percentages.

It is immediately apparent that the Survey Team observed only a small proportion of the total time spent on-site by the police. However, the Survey Team did not leave the scene until the police activity was, in all probability, the last. When the Team left the scene, the police were usually engaged in activities such as interviewing, writing up notes and awaiting for vehicles to be either claimed or removed from the scene. Interviewing accounts for the greatest proportion of time on-site while management of the scene is the second major activity.

TABLE 4.4

AVERAGE TIME SPENT ENGAGED IN EACH ACTIVITY GROUP BY NUMBER OF POLICE IN ATTENDANCE (MINUTES)

Activity Group	No. of Police Attending									
	One		Two		Three		Four		Five	
	$\bar{X}$	S[1]	$\bar{X}$	S	$\bar{X}$	S	$\bar{X}$	S	$\bar{X}$	S
Interview	1.7	-	12.0	9.5	15.1	8.2	22.1	16.4	26.7	-
Inspection	-	-	1.1	1.8	0.6	0.8	0.7	1.4	-	-
Measure	-	-	1.2	1.9	0.7	1.3	1.5	2.4	-	-
Write-notes	-	-	2.1	3.3	2.3	2.3	1.3	2.5	2.2	-
Management	1.4	-	8.1	8.6	12.1	8.3	17.0	17.7	7.2	-
Off-site	3.4	-	2.7	3.5	4.6	4.0	4.5	4.3	13.0	-
Before-team	2.0	-	22.4	19.3	33.0	38.2	50.4	38.3	15.0	-
After-team	76.0	-	60.6	88.8	37.6	45.6	231.2	235.7	-	-
On-site[2]	84.6	-	110.2	90.9	105.8	66.6	328.6	281.5	64.0	-
Activity	6.6	-	27.2	15.5	35.2	15.7	47.0	36.4	49.0	-
Activity as per cent of On-site	8		25		33		14		77	
No. of accidents	1		69		10		10		1	

(1) $\bar{X}$ = mean, S = standard deviation

(2) Due to rounding errors some columns do not add to On-site

TABLE 4.5

AVERAGE TIME SPENT ENGAGED IN EACH ACTIVITY GROUP BY NUMBER OF POLICE IN ATTENDANCE AS PER CENT OF ON-SITE TIME

No. of Police Attending	1	2	3	4	5
No. of Accidents	1	69	10	10	1
Activity Group					
Interview	2.0	10.9	14.2	6.7	41.7
Inspection	-	1.0	0.6	0.2	-
Measure	-	1.1	0.7	0.5	-
Write notes	-	1.9	2.2	0.4	3.4
Management	1.7	7.4	11.4	5.2	11.2
Off-site	4.0	2.4	4.3	1.4	20.3
Before-team	2.4	20.3	31.3	15.3	23.4
After-team	89.9	55.0	35.5	70.3	-
On-site	100	100	100	100	100
Activity	7.7	24.7	33.4	14.3	76.6

As defined, 'Before-team' includes police travel time to scene. When more than one police car car attended, 'Before-team' is the same for all police in attendance and is calculated from the time the first car receives notification to attend. Average 'Before-team' (in minutes) by number of police in attendance is given in Table 4.6. On average just over 10 minutes elapsed between the police receiving notification to attend and the Survey Team commenced observing on-site.

TABLE 4.6

AVERAGE 'BEFORE-TEAM' BY NUMBER OF POLICE IN ATTENDANCE (MINUTES)

No. of Police	1	2	3	4	5
Before team	2.0	11.2	11.0	12.6	3.0

'After-team' is the same for all police still in attendance when the Survey Team left, even though some police may leave the scene before others or before the Survey Team.

4.3 INDIVIDUAL POLICE ON-SITE TIME ANALYSIS

For this analysis all police attending an accident were ranked in descending order of time engaged in Interview with the policeman who had the largest time for Interview per accident having rank 1. Table 4.7 gives the average time policeman of rank j spends engaged in each activity group.

TABLE 4.7

AVERAGE TIME POLICEMAN OF RANK j SPENDS ON ACTIVITY GROUP i (Minutes)

Activity Group (i)	Rank (j)				
	1	2	3	4	5
Interview	8.3	4.3	2.3	1.9	-
Inspection	0.4	0.5	0.3	*	-
Measure	0.2	0.8	-	0.2	-
Write notes	0.7	1.2	0.4	0.1	-
Management	3.6	4.5	4.4	4.2	-
Off-site	1.0	1.7	2.4	0.4	9.0
Before-team	12.7	11.9	11.4	11.7	3.0
After-team	31.6	30.3	33.7	52.5	-
On-site	58.6	54.8	53.7	71.2	12.0
Activity	14.3	12.6	9.9	6.9	9.0
No. of Policemen	91	90	21	11	1

* Less than 0.1 minutes.

In many instances a significant proportion of the policemen did not spend any time on a particular activity group. The per cent of police of rank j who had no time recorded for a particular activity group is given in Table 4.8.

If only those police who engaged in an activity group are considered; then, on average, police spent -

- 1.7 minutes inspecting vehicle(s);
- 2.8 minutes taking measurements;
- 2.1 minutes writing notes; and
- 3.2 minutes off site.

TABLE 4.8

PER CENT OF POLICE OF RANK j

WHO HAVE NO TIME RECORDED FOR ACTIVITY GROUP i

Activity Group (i)	Rank (j)				
	1	2	3	4	5
Interview	4	13	48	73	100
Inspection	76	70	81	91	100
Measure	88	73	100	71	100
Write notes	69	58	81	82	100
Management	10	11	10	9	100
Off-site	65	47	38	73	-
Before-team	13	12	10	9	-
After-team	20	24	24	18	100
No. of Police	91	90	21	11	1

4.4 OBSERVATIONS OF THE SURVEY TEAM

The Team found that while one policeman was generally fully involved throughout the on-site period*, the second (or more) policeman attending the accident appeared to have time to undertake additional minor tasks, e.g., measure tyre pressure. In most cases, only one policeman took statements, since it is understood that if two policemen were involved in this task, then both could be required to attend court in the case of prosecution. The off-site time included periods in which the policeman was apparently not actively engaged in any accident related action.

* (while Team present)

Other aspects of police operations noted during the field survey, include:-

- There is a noticeable difference in efficiency in the handling of accidents between the regular traffic police and sector patrols. The sector patrols appear to be a little unsure of what to do next and there was usually some "observing time" by one or other of the policemen.
- The sector patrols tended to carry out tasks together and one member appeared to do most of the work. On the other hand, traffic patrols worked more efficiently, with one policeman taking statements and the other making inspections and measurements.
- In many cases police vehicles were poorly located at the scene of an accident and were themselves a traffic hazard or an obstruction to traffic.
- Removal of vehicles after an accident was generally slow and vehicles were often left to block traffic unnecessarily. However, it was noted that during peak traffic periods, the damaged vehicles were removed faster.
- Improved police direction of traffic around an obstruction is required.

5.0 MULTIPLE REPORT COMPARISON

5.1 INTRODUCTION

As expected, only a small proportion of the accidents attended during the field survey were not attended by the police. 'Non-attended' accidents constitute approximately 80 per cent of all accidents and some indication of data quality in this area is highly desirable (Figure 2.2).

In a high proportion of 'non-attended' accidents, two or more reports are received for the same accident. Currently the South Australian Highways Department undertakes the task of resolving the disagreements between reports for the same accident. The magnitude of this task and the data items where discrepancies most frequently need be resolved, can be identified from analysis of a random sample of such accidents checked for consistency between reports.

The greater the need for resolution of discrepancies, the greater is the potential for the introduction of errors during the process. Of more importance, however, is the likelihood that a high 'error rate' (measure of the extent of disagreement between pairs of reports for the same accident and data item) for a particular data item is an indication that the item is generally inaccurately reported for reasons such as:-

- intentional distortion by public,
- unintentional distortion by public,
- misunderstanding by public or police,
- shortcoming of the form.

The analysis can not positively identify the reasons for inaccurate reporting but can identify data items that may be prone to inaccurate reporting.

The random sample of 'non-attended' accidents was selected manually by perusing the micro-film copies of accident reports held on cassettes by the Police Department, for the period 1st June 1976, to 31st October, 1976. A total of 127 accidents were analysed in this way; 97 non-casualty accidents and 30 casualty accidents*

* It was originally intended that 100 casualty and 100 non-casualty accidents should be analysed. The process of locating suitable accidents on the micro-film cassettes involved visual inspection of each report on the microfilm viewer because there was no way of accessing only those reports in which we were interested. When a suitable accident was located, the two reports (four sheets) had to be photocopied, rather than analysed direct from the micro-film viewer, to avoid excessive use of the micro-film machine to the exclusion of normal Police requirements. This was a particularly time consuming procedure and within the economic scope of the project it was only possible to extract data for 127 accidents.

TABLE 5.1

MULTIPLE REPORT COMPARISON FOR ACCIDENTS NOT ATTENDED BY POLICE

DATA ITEM	Number of Accidents in which data item should have appeared on both reports			Data item missing						Data item illegible or ambiguous						Data item given on both reports					
				One Report			Both Reports			One Report			Both Reports			Same			Different		
	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.
Time	127	30	97	1	1	0	0	0	0	1	0	1	0	0	0	121	29	92	4	0	4
Day	127	30	97	0	0	0	0	0	0	0	0	0	0	0	0	123	29	94	4	1	3
Date	127	30	97	0	0	0	0	0	0	0	0	0	0	0	0	122	30	92	5	0	5
Location	127	30	97	0	0	0	0	0	0	0	0	0	0	0	0	110	24	86	17	6	11
UNIT 1																					
Type	127	30	97	0	0	0	0	0	0	0	0	0	0	0	0	126	30	96	1	0	1
Year	127	30	97	96	22	74	7	2	5	0	0	0	0	0	0	15	5	10	9	1	8
Make	127	30	97	22	7	15	0	0	0	0	0	0	0	0	0	101	21	80	4	2	2
Reg. No.	126	29	97	26	8	18	0	0	0	1	0	1	0	0	0	88	17	71	11	4	7
Colour	127	30	97	14	5	9	0	0	0	0	0	0	0	0	0	83	17	66	30	8	22
Towing	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
UNIT 2																					
Type	127	30	97	2	0	2	0	0	0	0	0	0	0	0	0	124	30	94	1	0	1
Year	125	29	96	92	21	71	10	2	8	0	0	0	0	0	0	15	4	11	8	2	6
Make	125	29	96	23	5	18	2	2	0	0	0	0	0	0	0	92	21	71	8	1	7
Reg. No.	123	27	96	16	6	10	0	0	0	4	1	3	0	0	0	91	18	73	12	2	10
Colour	125	29	96	18	4	14	1	1	0	0	0	0	0	0	0	74	17	57	32	7	25
Towing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DRIVER OR PEDESTRIAN																					
UNIT 1																					
Sex	127	30	97	26	7	19	0	0	0	1	1	0	0	0	0	98	21	77	2	1	1
Age	127	30	97	119	27	92	0	0	0	0	0	0	0	0	0	7	3	4	1	0	1
Licence No.	126	29	97	108	23	85	14	5	9	0	0	0	0	0	0	4	1	3	0	0	0
Licence Type	126	29	97	109	25	84	10	3	7	0	0	0	0	0	0	7	1	6	0	0	0
Driving Experience	126	29	97	118	27	91	4	1	3	0	0	0	0	0	0	4	1	3	0	0	0

TABLE 5.1 (Cont'd.)

DATA ITEM	Number of Accidents in which data item should have appeared on both reports			Data item missing						Data item illegible or ambiguous						Data item given on both reports					
				One Report			Both Reports			One Report			Both Reports			Same			Different		
	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.
UNIT 2																					
Sex	126	30	96	18	6	12	0	0	0	0	0	0	0	0	0	108	24	84	0	0	0
Age	126	30	96	124	29	95	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1
Licence No.	123	27	96	115	25	90	7	1	6	0	0	0	0	0	0	1	1	0	0	0	0
Licence Type	123	27	96	113	25	88	9	1	8	0	0	0	0	0	0	1	1	0	0	0	0
Driving Experience	123	27	96	115	26	89	7	0	7	0	0	0	0	0	0	1	1	0	0	0	0
Damage Estimate	127	30	97	38	9	29	7	3	4	0	0	0	0	0	0	19	1	18	63	17	46
CASUALTIES																					
FIRST																					
Type of person	30	30	0	21	21	0	0	0	0	1	1	0	0	0	0	8	8	0	0	0	0
Unit No.	30	30	0	20	20	0	1	1	0	0	0	0	0	0	0	9	9	0	0	0	0
Sex	30	30	0	21	21	0	0	0	0	0	0	0	0	0	0	9	9	0	0	0	0
Age	30	30	0	28	28	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
Nature	30	30	0	20	20	0	0	0	0	0	0	0	0	0	0	6	6	0	4	4	0
Severity	30	30	0	21	21	0	0	0	0	1	1	0	0	0	0	6	6	0	2	2	0
Position in vehicle	20	20	0	17	17	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	0
SECOND																					
Type of person	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unit No.	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sex	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Age	3	3	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Nature	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Severity	3	3	0	1	1	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Position in vehicle	3	3	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Witnessed by police	127	30	97	4	0	4	0	0	0	0	0	0	0	0	0	122	30	92	1	0	1
Type of location	127	30	97	6	0	6	2	0	2	35	9	26	16	3	13	44	13	31	24	5	19
Road features	127	30	97	19	4	15	4	1	3	1	0	1	0	0	0	100	24	76	3	1	2
Grade	127	30	97	5	0	5	0	0	0	0	0	0	0	0	0	111	27	84	11	3	8
Road conditions	127	30	97	5	0	5	0	0	0	0	0	0	0	0	0	93	24	69	29	6	23

TABLE 5.1 (Cont'd.)

DATA ITEM	Number of Accidents in which data item should have appeared on both reports			Data item missing						Data item illegible or ambiguous						Data item given on both reports					
				One Report			Both Reports			One Report			Both Reports			Same			Different		
	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.	All	Cas.	Non Cas.
CONTROLS																					
Upon Road	127	30	97	30	5	25	2	0	2	11	0	11	0	0	0	49	14	35	35	11	24
Erected	127	30	97	34	8	26	9	0	9	10	2	8	3	1	2	60	17	43	11	2	9
Type of Accident	127	30	97	10	2	8	1	0	1	0	0	0	0	0	0	88	23	65	28	5	23
VEHICLE MOVEMENT																					
Unit 1	127	30	97	9	2	7	0	0	0	6	1	5	0	0	0	86	23	63	26	4	22
Unit 2	125	29	96	8	1	7	1	0	1	2	1	1	0	0	0	77	21	56	37	6	31
Pedestrian Movement	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPARENT ERRORS																					
Unit 1	127	30	97	40	10	30	3	0	3	13	1	12	0	0	0	45	12	33	26	7	19
Unit 2	126	30	96	38	9	29	6	2	4	9	2	7	2	2	0	42	11	31	29	4	25
Weather	127	30	97	8	2	6	0	0	0	0	0	0	0	0	0	113	26	87	6	2	4
Visibility	127	30	97	15	2	13	0	0	0	1	0	1	0	0	0	100	24	76	11	4	7
Lighting	127	30	97	8	2	6	1	0	1	2	0	2	0	0	0	93	26	67	23	2	21
Traffic Conditions	127	30	97	13	3	10	0	0	0	1	0	1	0	0	0	66	13	53	47	14	33
SAFETY EQUIPMENT																					
Motor Cycle Rider Helmet																					
Unit 1	7	4	3	3	2	1	0	0	0	0	0	0	0	0	0	4	2	2	0	0	0
Unit 2	5	3	2	4	2	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Driver Safety Belt																					
Unit 1	119	25	94	69	14	55	11	2	9	0	0	0	0	0	0	39	9	30	0	0	0
Unit 2	118	24	94	83	16	67	9	3	6	0	0	0	0	0	0	24	4	20	2	1	1

Description of the method used to compare multiple reports is included in Section 4.4.1, Appendix A.

The results of the manual comparison between two accident reports for the same 'non-attended' accident are shown in Table 5.1 for all accidents, non-casualty accidents and casualty accidents respectively. Each data item has been considered separately, with the comparison of the data between the two forms yielding one of the following classifications:-

- Data item should appear on both reports. (Note that certain data items may not be required, depending upon details of accident, e.g. Unit 2 registration number not required if Unit 2 is a pedestrian).
- Data item required on both reports but missing:-
  - from one report
  - from both reports

  (e.g. year of vehicle manufacture).
- Data item required on both reports but illegible or ambiguous:-
  - on one report
  - on both report

  (e.g. two crosses in a data field requiring only one cross).
- Data item required and given on both reports:-
  - answers the same
  - answers different

5.2 TOLERABILITY CRITERIA

Some tolerance was allowed with regard to certain data items, in deciding whether or not the answers were the same; these are listed below:-

Time of Accident

Accepted if times were within 1 hour of each other.

Location of Accident

Difference between distance measurements was ignored except where it located the accident either:-

- between different intersections/junctions
- at a junction/intersection on one report and between junctions/intersections on other report.

Vehicle Colour

The following 'equivalence' were assumed:-

White = Cream = Bone

Grey = Silver

Purple = Mauve

Maroon = Red

Fawn = Beige = Light Brown.

Damage Estimation

Where total property damage estimates were given on both reports, the estimates were listed as being different only if the differences between the estimates exceeded 20 per cent of the average value of the two estimates,

e.g. if two estimates of total damage are $500 and $800; 20 per cent of average estimate = $130. Since the difference between the estimates exceeds this, it is listed as "different".

or if two estimates of total damage are $500 and $600; 20 per cent of average estimate = $110. The difference between estimates is less than this and is therefore listed as "same".

Safety Belt

An initial inspection of reports showed that the question relating to the fitting and wearing of seat belts was almost invariably answered only in relation to the driver and not the front seat passenger. For this reason it was decided to analyse the reports only in relation to the driving position.

Where this question was answered on both reports, a difference was recorded only if:-

. One report recorded the belt as worn, and the other as not worn; or

. One report recorded the belt as fitted and the other as not fitted.

e.g. If one report recorded the belt as fitted and worn and the other as fitted but not known if worn, no difference was recorded.

SULTS

a comparison of contradicti
non-casualty accidents for
tes in excess of 5 per cent.
, statistical testing (Chi s
ample sizes given in Table 5
difference in error rate fo
non-casualty accidents. For
re generally discussed below
asualty accidents combined.

he item "Damage", which involv
the cost of damage to all units
e contradiction rates are very h
cent for casualty accidents and 7 p
y accidents. Although the diffe en
nificant at the 5 per cent level it
iate to draw any conclusions from t
high rates involved and the effect
teria mentioned previously.

een derived from Table 5.1 and lists
arly susceptible to omission from re
in a report or contradiction betwee
e the omission rate, ambiguity rate
exceeds 5 per cent. The method of
es is described in Table 5.3.

items listed in Table 5.2 is now d
reference to the implications of the
in Table 5.3

Accident

accident was recorded on all report
cent of accidents a contradiction
en reports for the same accident.
on type of difference here was in
measurement from the nearest inter
ion such that one report would lo-
dent at an intersection/junction

TABLE 5.2

CONTRADICTION RATES FOR ACCIDENTS

	All	Casualty	Non-casualty
Location	0.13	0.20	0.11
Year of manufacture	0.36	0.25	0.40
Make	0.06	0.07	0.06
Registration no.	0.11	0.15	0.11
Colour	0.28	0.31	0.28
Damage	0.77	0.94	0.72
Type of location	0.35	0.28	0.38
Grade	0.09	0.10	0.09
Road conditions	0.24	0.20	0.25
Controls upon road	0.42	0.44	0.41
Controls erected	0.15	0.11	0.17
Type of accident	0.24	0.18	0.26
Vehicle movement	0.28	0.19	0.31
Apparent errors	0.39	0.32	0.41
Weather	0.05	0.07	0.04
Visibility	0.10	0.14	0.08
Lighting	0.20	0.07	0.24
Traffic condition	0.42	0.52	0.38
Safety belts (driver)	0.03	0.07	0.02

(within 10 metres) but the other report would locate the accident between intersecting roads/ streets. There were two cases of locations being totally different and several others where an error had been made in locating the accident north, south, east or west of the nearest intersection/junction. Since intersection and mid block type accidents are major categories used by traffic engineers and researchers, accuracy in recording this aspect is required.

Whilst it may sometimes be possible to resolve contradictions of this type by references to the sketches on the accident report forms, the sketches are usually not dimensioned and it would be

TABLE 5.3

DATA ITEMS SUSCEPTIBLE TO ERRORS - NON-ATTENDED ACCIDENTS; MULTIPLE REPORT COMPARISON

DATA ITEM	Omission Rate[1]			Ambiguity Rate[2]			Contradiction Rate[3]	
	One Report Only	Both Reports	Sample Size[4]	One Report Only	Both Reports	Sample Size[4]	Rate	Sample Size[4]
Location	-	-	127	-	-	127	13%	127
Year of Manufacture	75%	7%	252	-	-	252	36%	47
Make	18%	-	252	-	-	252	6%	205
Registration Number	17%	-	249	2%	-	249	11%	202
Colour	13%	-	252	-	-	252	28%	219
Damage Estimate	30%	6%	127	-	-	127	77%	82
Type of Location	5%	2%	127	28%	13%	127	35%	68
Grade	4%	-	127	-	-	127	9%	122
Road Conditions	4%	-	127	-	-	127	23%	121
Controls, Upon Road	24%	2%	127	9%	-	127	42%	84
Controls, Erected	27%	7%	127	8%	2%	127	15%	71
Type of Accident	8%	1%	127	-	-	127	24%	116
Vehicle Movement	7%	-	252	3%	-	252	28%	226
Apparent Errors	31%	4%	253	9%	-	253	39%	142
Weather	6%	-	127	-	-	127	5%	127
Visibility	12%	-	127	1%	-	127	10%	111
Lighting	6%	1%	127	2%	-	127	20%	116
Traffic Conditions	10%	-	127	1%	-	127	42%	113
Safety Belt (Driver)	64%	8%	237	-	-	237	3%	65

(1) For each data item the omission rate was calculated from O/S; where O is the number of times the data item was omitted, and S is the sample size. This was done separately for cases where the data was missing from only one report and for cases where the data item was missing from both reports (see note 4 re sample size).

(2) For each data item the ambiguity rate was calculated from A/S; where A is the number of times the data item was recorded ambiguously (or illegibly), andS is the sample size. This was done separately for cases where the data item was ambiguous or illegible on only one report and for cases where the data item was illegible or ambiguous on both reports (see note 4 re sample size).

(3) For each data item the contradiction rate was calculated from E/S1, where E is the number of times the data item was recorded clearly on both reports but contradiction existed between the answers, and S1 is the relevant sample size (see note 4).

(4) Sample size(s) used for the purpose of calculating omission rate and ambiguity rate was generally 127; the total number of accidents. For data items relating to individual units involved in an accident (e.g., Registration Number, Colour, etc.), the sample size is the total number of relevant units, rather than the total number of accidents.

Sample size(S1) used for the purpose of calculating the contradiction rate was the total number of times the data item was recorded clearly on both reports.

difficult for the Highways Department coders to determine with any degree of certainty whether or not the accident occurred at an intersection/ juntion. The Highways coders generally have knowledge of the accident location and often subjective judgement is used.

- Year of Vehicle Manufacture

There is a natural tendency for this item to be missing from one of the reports for an accident because, to complete this item for the other vehicle involved in an accident, the reporting driver would normally have to question the other driver. In 75 per cent of cases this item is missing from only one of the reports. This is of no consequence, provided of course that it is recorded correctly on the other report. In 7 per cent of cases the item was missing from both reports.

The contradiction rate for this item was 36 per cent and has probably resulted from the reporting driver trying to estimate the year of manufacture of the other vehicle involved in the accident. Again this may be of little consequence, provided that the year of vehicle manufacture is taken from the report of the driver of the vehicle in question.

- Unit Make

The make of the vehicle was omitted from both reports for less than one per cent of the cases reported, although it was omitted from one report only in 18 per cent of the cases, illustrating that drivers generally know the make of his or her vehicle but not necessarily that of the other vehicle involved in the accident.

The contradiction rate for the two was 6 per cent which probably resulted from drivers guessing

as to the make of the other vehicle after leaving the accident scene.

- Registration Number

There were no instances of a registration number being omitted from both reports, but in 17 per cent of cases a number was missing from one report but given on the other.

The contradiction rate for this item was 11 per cent. Contradictions generally involved an error in only one character of the registration number or the transposition of two characters. This would probably be of little consequence, provided that the vehicle registration number is taken from the report of the driver of the vehicle in question, but the results of dummy report analysis show that a similar rate of error occurs on the summary tape.

- Vehicle Colour

There were no instances of vehicle colour being omitted from both reports, but in 13 per cent of cases colour was missing from one report but given on the other.

Even allowing some tolerance in the description of colours (as described previously), the contradiction rate for this item was 28 per cent. (In one case white versus black!). Again, it would be reasonable to assume that the vehicle colour recorded on the report by the driver of the vehicle concerned is correct.

- Damage Estimate

For 30 per cent of accidents an estimate of total damage was given on only one report and for 6 per cent of accidents on neither report. In all of the latter cases, however, an estimate of damage to one of the units appeared on the first report

and an estimate of damage to the other unit appeared on the second report and so it would be possible to derive an estimate of the total damage by addition.

Of more importance, however, is the fact that, using the tolerability criteria described previously, the contradiction rate for this item was 77 per cent. This highlights the wide variations in damage estimates by different persons and in fact casts serious doubt on the accuracy of any such estimates on accident reports, particularly for accidents not attended by police. Care should be exercised in using this item for research due to the magnitude of the contradiction rate.

Type of Location

Although this item was rarely omitted from reports, it was recorded ambiguously on one report for 28 per cent of accidents and ambiguously on both reports for 13 per cent of accidents. These ambiguities were invariably caused by the marking of two coding boxes; one in the "Intersection etc." category and another in the "Between Intersections" category.

The contradiction rate for this item was 35 per cent, the most common cause of contradiction being that one report showed the accident as having occurred at "Intersection etc." and the other report showed the accident as having occurred "Between Intersections".

The extent of ambiguities and contradictions with this data item is such that the general accuracy of data in this area must be suspect, particularly for accidents not attended by police.

The extent of ambiguities in the data item suggests that there may be some misunderstanding of

the requirements of the report form by police, because two coding boxes are being marked in a field where only one mark is required. This is encouraged by the fact that the choices are not mutually exclusive.

- Grade

  The contradiction rate for this item was 9 per cent. The available categories are subjective (Level, Slight or Steep) and for this reason it is logical to expect some different interpretations.

  A further point worth noting with regard to this item is that where the grade differs for each vehicle involved in the accident, the Highways Department, during final coding, code the grade for the "responsible unit". The data item "responsible unit" is marked "for office use only" on the accident report form and was not answered on any of the reports inspected because "responsibility" is assigned by the Highways Department. It would appear necessary to make provision on the accident form for the recording of a grade for each unit, to facilitate selection of the appropriate grade by the Highways Department.

- Road Condition

  The contradiction rate for this item was 23 per cent and was generally confined to cases where both reports indicated that the road was sealed and wet but one report indicated "slippery" and the other report did not.

- Controls; Upon Road

  For 24 per cent of accidents this item was omitted from one of the reports and in 2 per cent of accidents omitted from both reports. This was probably caused partly by the inability of the

reporting driver(s) to recall what traffic controls were on the road at the accident location and partly by failure of the police to mark the "No Control" box provided in the data field for this item. Discrepancies of this type could often be resolved during final coding by the Highways Department officers, either by reference to the other report, or through their knowledge of the road system.

In 9 per cent of accidents this item was recorded ambiguously on one of the reports, invariably caused by the marking of two or more of the boxes provided. Again, this could often be resolved as described above during final coding by the Highways Department.

The contradiction rate for this item was 42 per cent. Strictly speaking the discrepancies here were "differences" rather than "contradictions" because the answer categories provided are not mutually exclusive. For example, an intersection may have a painted median strip as well as safety bars. To overcome this problem it appears that either:-

- an hierarchy of such controls should be prepared and made known to the police, so that only the relevant control appearing highest on the list is marked, or
- allowance should be made for the marking of more than one of the boxes provided.

. Controls; Erected

For 27 per cent of accidents this item was omitted from one of the reports and in 7 per cent of accidents ommited from both reports. Again, this was probably caused partly by the inability of the reporting driver(s) to describe what controls

existed at the accident location and partly by failure of the police to mark one of the "no control" boxes provided in the data field for this item. Discrepancies of this type could often be resolved during final coding by the Highways Department officers, either by reference to the other report, or through their knowledge of the road system.

In 8 per cent of accidents this item was recorded ambiguously on both reports. This was invariably caused by the marking of two or more of the boxes provided. Again this could often be resolved during final coding by the Highways Department.

The contradiction rate for this item was 15 per cent and was almost always caused by one report indicating "no control" and the other report indicating some form of control, typically a give-way or stop sign.

As in the case of "Controls; Upon Road", it may be appropriate to either introduce an hierarchy of controls or alternatively allow the marking of more than one of the boxes provided.

Type of Accident

In 8 per cent of accidents this item was omitted from one of the reports. This problem can usually be resolved by reference to the other report because the item was missing from both reports in only 1 per cent of accidents.

The contradiction rate for this item was 24 per cent. The contradiction was generally caused by one report indicating "Approximate Right Angle" with the other report indicating "Side Swipe" either same direction or opposite direction. This item could often be resolved by reference

to the sketch and description of the accident provided that the Highways Department coders have some clear criteria by which to differentiate between accident types.

. Vehicle Movement

There were no instances of this item being omitted from both reports but in 7 per cent of cases the item was missing from one of the reports.

The contradiction rate for the item was 28 per cent. There were two principal ways in which contradictions arose:-

- In "rear-end" accidents the front vehicle was recorded as "stopped on carriageway" in one report and "straight ahead", "left turn" or "right turn" on the other report.
- In accidents involving a vehicle turning into or out of a private driveway, one report indicated category 8 or 9 (relating to driveway) and the other report indicated category 1 or 2 (turning).

Once again, selection of these categories is a subjective matter and in the first instance involves the question of whether the vehicle was in fact stationary.

. Apparent Errors

The report form requires that "apparent error" be recorded for each unit involved in an accident (excluding trees etc.).

For 31 per cent of units the item was given on only one of the reports and for 4 per cent of units was given on neither report. In 9 per cent of cases the item was recorded ambiguously on one of the reports, invariably caused by the marking of two or more boxes in the data field,

e.g. box 5 ... Fail to give way to right, and box 18 ... Inattention.

The contradiction rate for this item was 39 per cent. It is understandable that discrepancies are likely to occur with this data item because of its largely subjective nature. In particular, where the accident is not attended by police, the driver reporting the accident will tend to allocate error(s) to the other driver/pedestrian etc. rather than himself and the recording policeman is entirely dependent upon the driver's description of the accident.

The extent of discrepancies with this data item is such that the general accuracy of data in this area must be suspect.

- Weather

Weather was never omitted from both reports and was omitted from one of the reports in 6 per cent of the cases.

The contradiction rate was 5 per cent which generally resulted from accidents occurring at a time when the road was wet, and indecision by the driver when reporting as to whether it was actually raining at the time of the accident.

- Visibility

There were no instances of this item being omitted from both reports but for 12 per cent of accidents it was omitted from one report.

The contradiction rate for this item was 10 per cent, always caused by one report indicating "View Obscured" by fog or dazzle etc. and the other report indicating "View Unobscured". The view reported may well differ between the two reporting drivers, since space is provided on the form for only one view recording.

. Lighting

For 6 per cent of accidents this item was recorded on only one of the reports.

The contradiction rate for the item was 20 per cent, and the majority of the contradictions occurred in relation to late afternoon accidents and involved disagreement over which of the following categories applied:-

Box 1 ... Daylight

Box 2 ... Dawn or Dusk

Box 3 ... Night, Street Lights Off.

Because of the high contradiction rate it would probably be better during any analysis on this item, to consider also the date and time of day at which the accident occurred.

. Traffic Conditions

There were no instances of this item being omitted from both reports, but in 10 per cent of accidents it was omitted from one of the reports.

The contradiction rate for the item was 42 per cent. The available categories are subjective (Heavy, Medium and Light) and for this reason it is logical to expect different interpretations.

. Safety Belt (Driver)

There is a natural tendency for this item to be missing from one of the reports for an accident because, to complete this item for the other driver and vehicle in the accident, the reporting driver would have to inspect the other vehicle fairly closely. In 64 per cent of cases the item was missing from one of the reports and in 8 per cent of cases was missing from both reports.

The contradiction rate for this item was 3 per cent, using the tolerability criterion described earlier.

5.4 SUMMARY

A number of items have a high omission rate and/or contradiction rate due principally to the driver of one vehicle not obtaining details of the other vehicle(s) involved. Items such as registration number, unit colour, year of manufacture, damage estimates, and safety belt (driver) all fall into this category. Elimination of the majority of these errors is possible if the vehicle details as reported by the driver of that vehicle are assumed to be correct. For example, in 75 per cent of cases year of manufacture is given on only one form; a major transcription task with associated error is required.

In line with the summary results of Section 2.5, the reasons for high error rates were:-

- The item was subjective;

  e.g. traffic conditions (contradiction rate (CR) 0.42), apparent errors (omission rate (OR) 0.31, CR 0.39), lighting (CR 0.20) and road grade (CR 0.09).

- The layout on form required a single response to multiple choice questions for which the choices were not mutually exclusive;

  e.g. controls upon road (OR 0.24, CR 0.42), apparent errors (CR 0.39), vehicle movement (CR 0.28), lighting (CR 0.20) and controls erected (CR 0.08).

- The layout on forms inadequate;

  e.g. visibility (CR 0.10) and road condition (CR 0.23) can both differ for the two reporting drivers but space is provided on the form for only one recording.

- An inadequate knowledge of accident item definitions;

  e.g. type of location (CR 0.35) and type of accident (CR 0.24).

- Inaccurate reporting;

  e.g. registration number (CR 0.11) and year of vehicle manufacture (CR 0.36)

- Conditions at scene;

  e.g. unit colour (CR 0.28).

The above results show that many items are not recorded on both accident forms and for those items which are recorded on both forms, the contradiction rate is high. Since the majority of accidents (81 per cent) are not attended by police, the large contradiction rates for many items indicates that care is required in the selection of data items to be used for analysis in research studies. This is particularly true for such items as year of vehicle manufacture, vehicle colour, damage estimate, road condition, vehicle movement, apparent errors, lighting and traffic conditions. Some variations in reports would be due to the driver not wishing to incriminate himself, while at other times it would be due to a natural memory lapse between the accident and reporting time.

6.0 REPORTING ACCURACY OF REGISTRATION NUMBERS

6.1 INTRODUCTION

Vehicle registration numbers have been collected by police for many years in connection with the accident report form. Vehicle registration numbers have been recorded on magnetic tape accident records only since the beginning of 1975.

There is an increasing tendency in the analysis of accident data in relation to the properties of vehicles to use the vehicle registration number in conjunction with vehicle registration records to identify vehicle properties that reporting police cannot reasonably be expected to determine on site (e.g. weight, horsepower, etc.). Still further detail would be available if police recorded the manufacturer's Vehicle Identification Number from the design rule certification plate. As a result it may also be feasible to reduce the vehicle related data to be collected by police (vehicle type, make, year etc.).

For such systems to work it is essential that the collection and recording of the number(s) be done with a high degree of accuracy.

The following check upon the accuracy with which vehicle registration numbers are collected and recorded was undertaken.

From magnetic tape accident records for the year 1975, the Highways Department were asked to extract 1,000 vehicle registration numbers from a random sample of 1,000 accidents. Vehicle type, year, make and colour were extracted at the same time as well as the code which indicated whether or not police attended the accident. A special computer program was written and run by the Highways Department for this purpose. The effective sample size was reduced to 980 registration numbers because in 20 cases the vehicle registration number field was blank on the accident tape.

This list of registration numbers was given to the Motor Registration Division of the South Australian Department of Transport who endeavoured to extract type, make, year and colour of vehicle from their magnetic tape records for each of the registration numbers. The broad results from this process are shown in Table 6.1.

TABLE 6.1

BREAKDOWN OF SAMPLE REGISTRATION NUMBERS

	Cars, Trucks etc.	Motor Cycles	Total
. Total Numbers given to Registrar	942	38	980
. Numbers located on Registrar's file	889	36	925
. Numbers not located on Registrar's file			
- Apparently legitimate format	5	2	7
- Interstate	39	0	39
- Faulty format	9	0	9

To determine whether the sampled registration numbers appearing on the magnetic tape accident records were correct, vehicle type, make, year of manufacture and colour from each tape for each registration number were compared. (An important assumption here is that the registration records are correct).

It was necessary to exclude motor cycle registration numbers from this analysis because insufficient check data were available in the case of motor cycles, for the following reasons:-

. Make and colour of motor cycles is not included on the accident tape.

- Year of motor cycle manufacture is frequently omitted from the accident tape.
- Year of manufacture and colour of motor cycle were not included in registration records for any of the sampled motor cycles, although there is provision in the registration records system for this data to be included.

6.2 DISCUSSION OF RESULTS

As shown in Chapter 5 of this report, the data items 'year of vehicle manufacture' and 'colour', and to a lesser extent 'vehicle type', are susceptible to error on the accident reports. Thus the apparent "non-matching" of up to two items may result from mis-recording of the items themselves, rather than the registration numbers. In recognition of this, the criteria shown in Table 6.2 (also see Appendix C) were adopted to determine whether there was sufficient agreement between data items to say that the registration number appearing on the accident tape was correct. From Table 6.2 the following "Error rates" have been calculated.

For accidents attended by police,
"Error rate" = 15/(125 + 15) = 10.7%

For accidents not attended by police,
"Error rate" = 79/(649 + 79) = 10.9%

For all sample accidents,
"Error rate" = 94/(774 + 94) = 10.8%

These "Error rates" should be taken into account during the design and analysis of accident research studies based on the use of vehicle registration numbers extracted from accident reports.

The "Error rate" for accidents attended by police is statistically the same as for accidents not attended by police (see Appendix B). A larger "Error rate" for accidents attended by police might have been expected since the

conditions and environment at an accident site could be considered to be less favourable for the accurate recording of data than within the office environment at a police station, e.g. rain, poor lighting, illegible or damaged number plates etc. In addition vehicle owners can be expected to know their own registration number.

TABLE 6.2

COMPARISON OF VEHICLE REGISTRATION NUMBERS BETWEEN ACCIDENT TAPE AND VEHICLE REGISTRATION TAPE(1)

	Accidents Attended By Police	Accidents Not Attended By Police	Total
Total Sample	147	742	889
Numbers Recorded Correctly			
- All 4 items matching	44	341	385
- Any 3 items matching	60	248	308
- Only type and make matching	20	57	77
- Only make and year matching	1	3	4
	125	649	774
Insufficient Data For Matching			
- None of the above apply and there are two or more items missing from one or both lists	7	14	21
	7	14	21
Numbers Recorded Incorrectly			
- None of the above apply	15	79	94
	15	79	94

(1) Motor cycles have been excluded.

7.0 REPORTING ACCURACY OF DRIVER LICENCE NUMBERS

7.1 GENERAL

Driver licence numbers are recorded on the police accident report form, but are not recorded on magnetic tape. In the analysis of accident data it would be possible to use the driver licence number in conjunction with driver licence records (magnetic tape) to obtain more information than is recorded on the accident form about drivers involved in accidents. For example, driver licence records contain information relating to:-

- Class of licence (type of vehicle)
- Demerit points
- Disabilities
- Restrictions (need to wear glasses etc.)

For such a system to work it is essential that the collection and recording of licence numbers be done with a high degree of accuracy.

The following check upon the accuracy with which licence numbers are collected was undertaken.

A random sample of 1,012 driver licence numbers was extracted manually from the micro-film copies of accident reports held on cassettes by the Police Department for the period 1st June, 1976 to 31st October, 1976. For each number, the driver's sex, age and licence type was also extracted, as well as whether or not the accident was attended by the police. For reasons associated with confidentiality of police records, names were not extracted from micro-film records.

This list of numbers was given to the Motor Registration Division of the South Australian Department of Transport who endeavoured to extract name, sex, age and type of licence from their magnetic tape records for each of the licence numbers. All but seven of the numbers were located on their files.

The items sex and age were checked for agreement between the two lists to determine whether each licence number had been recorded correctly. A basic assumption here is that the Registrar's records are correct. It was originally intended to use "licence type" as an additional check item but there would have been little value in doing this because the only available categories are "full", "learner" or "unlicensed" and over 99 per cent of licenses are "full".

A tolerance of plus or minus one year was allowed in determining whether "age" from each list was in agreement.

Some caution was needed in checking for agreement with the item "sex". The reason for this is as follows: Driver's sex was not originally recorded on the Registrar's* files. Some years ago, however, "sex" was included in the records and had to be indicated on all new licence application forms. Those drivers then currently holding licences were asked to indicate their sex but many failed to do so. As a result, the Registrar's office subsequently "guessed" the sex of many licence holders based on the person's first name and it is known that errors occurred during this process. Several such errors were found in checking the list provided by the Registrar for this survey (e.g. Margaret = Male) and these were allowed for during the analysis.

7.2 DISCUSSION OF RESULTS

The results of the complete analysis are given in Table 7.1. Licence numbers were listed as correct only where both "sex" and "age" were matching; or where "age" was matching and "sex" did not match because of an error on the Registrar's list. If there was clear disagreement in either "sex" or "age" then the licence number was assumed to have been incorrectly recorded on the accident report. A total of 54 licence numbers were discarded from the sample because "sex" and/or "age" did not appear on one or both lists and there was insufficient data for matching to determine the likely validity of the licence number.

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* Registrar, Motor Registration Division, S.A. Department of Transport.

The "error rates" can be calculated from Table 7.1 as follows:-

For accidents attended by police,
"Error rate" = 14/(147 + 14) = 8.7%

For accidents not attended by police,
"Error rate" = 31/(766 + 31) = 3.9%

For all sample accidents,
"Error rate" = 45/(913 + 45) = 4.7%.

The total "error rate" is not sufficiently high to cause major concern when considering the use of licence numbers on accident reports to access information on driver licence records for the purpose of accident research.

The "error rate" in reporting driver licence numbers obtained at accidents attended by the police is significantly greater than for accidents not attended by police (see Appendix B). This could be attributable to the sometimes difficult conditions under which information must be collected at an accident site, when compared with the reporting of an accident by a driver over a desk at a police station. Factors at the accident site which could contribute towards this difficulty include:-

- rain;
- poor lighting at night time;
- pressure of other duties at accident site;
- interruptions.

TABLE 7.1

DRIVER LICENCE NUMBER
ACCURACY CHECK

		For Accidents Attended by Police	For Accidents Not Attended by Police	Total
Total Sample		181	831	1012
Numbers recorded correctly				
Sex	Age			
OK	OK	142	751	893
?	OK	5	15	20
		147	766	913
Insufficient data for matching				
Sex	Age			
OK	NA	19	27	46
NA	NA	0	1	1
		19	28	47
Number recorded incorrectly				
Sex	Age			
X	X	3	6	9
OK	X	7	17	24
X	OK	2	6	8
?	X	2	1	3
X	NA	0	1	1
		14	31	45
Numbers not located on Registrar's file		1	6	7

Legend: OK ... Data on each file matches.
NA ... Data missing from one or both files.
X ... Data does not match.
? ... "Sex" does not match but "sex" given on Registrar's list is incorrect (based on first name check).

8.0 CONCLUSIONS

There are basically three stages in the preparation of mass road traffic accident data for analysis:-

(a) Recording of the data on accident report forms by police.

(b) Editing and manual coding of the data (in South Australia by the Highways Department).

(c) Preparation of the data for computer analysis (in South Australia by the Adelaide office of the Australian Bureau of Statistics).

In the first stage, the accident reports are almost always compiled 'in the office', either from notes taken by police at the accident scene or from persons involved reporting at a police station. For South Australia, only about 20 per cent of all reported accidents are actually attended by police, although 60 per cent of casualty accidents are attended.

Apart from any difficulties associated with obtaining information at the accident scene, the transcription from notes to the accident report forms automatically introduces an error component.

Comparison of police accident reports stored on magnetic tape with dummy accident reports compiled at the scene by the Survey Team indicated that 70 percent of the items for which the Survey Team were able to collect information had at least a 5 percent error rate. If those items with an error rate attributable to the Survey Team not being able to observe adequate evidence are excluded (i.e., severity of accident and number of units involved) then 60 percent of the items had an error rate exceeding 0.05 and 13 percent of the items had an error rate exceeding 0.20. It should be noted that the Survey Team attended only metropolitan Adelaide accidents, whereas multiple report comparisons were made for accidents which occurred throughout South Australia.

From the multiple report comparison, for accidents not attended by police, just over 80 per cent of the same accident items as the Survey Team recorded for the dummy accident report comparison had an error rate* of at least 0.05 with 64 per cent having an error rate exceeding 0.20.

On the basis of these two comparisons mass accident data could not be said to be very reliable, although police attended accidents have considerably lower error rates.

In the second stage, editing and manual coding of the data, considerable time and effort is spent by the Highways Department coders in trying to produce cohesive and accurate accident records. For those non-attended accidents for which multiple reports are received a composite report is compiled. Anomalies in driver and vehicle characteristics can be reconciled by assuming that the details given on the report by the driver are correct. Differences in road characteristics and traffic controls are resolved by the coders knowledge of the accident locations and difference in accident location and accident type by reference to the sketch and accident description provided in the report.

In a similar way, accident reports for police attended accidents are checked for consistency between details provided in the sketch and accident description and coded items, such as accident type, type of location, traffic controls and vehicle/pedestrian movements.

Whether the interpretations made by the Highways Department coders eliminate errors in the report depends on the skill of the coders. However, the extent of this task does create another stage at which errors can be introduced.

A number of items, in both the multiple report comparison and the dummy accident report comparison, were associated with high error rates because of their subjective nature, e.g., traffic conditions (for attended accidents)

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* Error rates for the multiple report comparison cover omissions, ambiguous responses and contradictions.

0.23 error rate, for non-attended accidents 0.42 contradiction rate) and road grade (attended 0.17 error rate, non-attended 0.09 contradiction rate). Damage estimates (contradiction rate 0.77) and apparent error (contradiction rate 0.39), which were excluded from the dummy accident report comparison, also had high error rates and are very subjective.

If the intent of the accident report is to record factual data for scientific analysis then the retention of these items on the accident report form could not be justified in view of the high error/contradiction rates.

The items traffic control upon road (attended 0.26, non-attended 0.42), vehicle movements (attended 0.16, non-attended 0.28) and visibility (non-attended 0.10) were all associates with high error rates due mostly to their poor layout on the accident report form. The first two items are multiple choice questions for which the responses are not mutually exclusive but a single response is required. Either the Highways Department needs to alter its programs to allow multiple responses or else the responses need to be arranged on the accident report form in hierarchial order such that only the highest ranked response is coded. The third item, visibility, could apply differently to the units involved, but space is provided for only one recording.

Two other items which appear to cause considerable difficulties in recording are type of accident and type of location. These two items currently require considerable correction by the Highways Department coders on the basis of accident description, sketch and the coders' knowledge of the location. Definition of each accident type and type of location, particularly where traffic engineering, in the form of channelization, completely changes the intersection type, needs to be circulated to the police.

The use of vehicle registration numbers, to access record systems containing more information on vehicles than the police can reasonably be expected to determine

on-site, is limited. One in every ten vehicle registration numbers is recorded incorrectly; this error rate was evident in the dummy report comparison, the multiple report comparison and the check of a random sample of registration numbers from a random sample of accidents.

The driver licence number, when recorded by police attending the accident, has an error rate of nine per cent; thus, almost one in ten licence numbers are also incorrectly recorded. When the licence number is recorded at a police station there is an error rate of four per cent, yielding an overall error rate of five per cent.

Since police have a tendency to attend casualty accidents and the more severe property damage accidents causing traffic disruptions, driver characteristics, as determined by using driver licence numbers to access licensing records, have the greatest probability of being incorrect for that group of drivers for whom accurate details are more likely to be required.

The use of vehicle registration numbers and driver licence numbers to access registration and licensing records is, therefore, restricted at this stage. For the future, however, police access to an on-line system containing both registration and licensing records would enable driver's name with licence number and vehicle owner's name with registration number to be used to access files and record accurate licence and vehicle registration numbers on accident report forms.

Currently the police are expending considerable manpower investigating and reporting accidents. Apart from the 'in the office' time, for those accidents attended by police an average of two police man-hours are spent on-site for personal injury and property damage accidents and 9.5 police man-hours for fatal accidents. However, a proportion of the man-hours spent on-site appears to be non-productive in terms of accident management, or data collection and recording.

During the first ten minutes (approximately) at the scene generally all police in attendance are fully involved in management tasks. Provided the collection of an accident data item is not required during this phase then the item can reasonably be collected. Items such as location of vehicle damage, extent of vehicle damage, availability of occupant restraints, automatic/manual transmission, tyre pressures, vehicle identification number, road widths and length of skid marks could easily be recorded after the intense management phase.

The difference observed in efficiency in the handling of accidents between the regular traffic police and sector patrols highlights the need for training of all police in accident management and data collection. Development of a training program needs to be investigated.

The fact that police attending an accident do not record accident details on an accident report form automatically increases the probability of error. Since police have to interview a number of people and logically for efficiency distribute the workload, it is not surprising that the accident report form is not completed on-site. In addition, collection of information on particular items can be easily overlooked resulting in a not known response.

Consideration could be given to the development of a check list or lists which would reflect the order in which tasks are usually performed, e.g.,

Policeman 1	Policeman 2
for injured persons	for vehicles
. name	. registration number
. age	. type
. sex	. make
. movement/location in vehicle	. year of manufacture
	. colour
	. damage

Policeman 1

for drivers

- name
- age
- sex
- licence number
- vehicle registration number
- vehicle movement
- alcohol

witnesses

Policeman 2

road characteristics

- width
- conditions
- controls

weather

Details of the final stage of data preparation by the Australian Bureau of Statistics were canvassed as part of the preparation of the study; from the accident forms sent to the Bureau from the Highways Department, coded information is transcribed onto a 'transcription form' and from this directly onto magnetic tape. The transfer to tape process is verified but the transcription process is not. This is a likely source of error; no checks were made on this.

In view of this double transcription process (from two reports to one by the Highways Department and the above process by the Bureau) re-design of the form is required to allow punching of data direct from the accident report form.

9.0 RECOMMENDATIONS

The results of the series of tasks, undertaken by the Consultant in order to appraise the traffic accident data collection and recording system in South Australia, indicate that there is a need to improve the system if the data are to be used for decision making.

The following actions are recommended:-

(a) revision of the accident report form

- to improve the layout of the following items
  - traffic controls - both upon road and erected,
  - vehicle movements,
  - lighting,
  - visibility,
- to eliminate the need for the transcription of data by the Australian Bureau of Statistics,
- to change the possible responses for the following items
  - road grade,
  - road condition,
- to exclude those items which are subjective and consequently have high error rates;

(b) circulation of the definitions used by the Highways Department for particular items, particularly for type of accident and type of location;

(c) examination of the definition of an intersection accident with consideration being given to accidents occurring within 10 m of an intersection but not related to same being separately identified, e.g., accident occurred at intersection within 10 m of intersection or not at intersection; and

(d) development of a training program in accident management and data collection for police with particular emphasis on the logical assignment of tasks at the scene.

APPENDIX A

EXCERPTS (CHAPTERS 2 - 4) FROM "STUDY DESIGN FOR AN APPRAISAL OF THE EXISTING TRAFFIC ACCIDENT DATA COLLECTION & RECORDING SYSTEM IN S.A.", p.6.

P.G. PAK-POY & ASSOCIATES, FEBRUARY, 1976.

2.0 MASS ACCIDENT DATA COLLECTION AND RECORDING SYSTEM IN SOUTH AUSTRALIA

Before proceeding with study design it was necessary to describe, in general terms, the sequence of activities (in South Australia) from the time that an accident occurs, to the recording of accident data on magnetic tape by the Australian Bureau of Statistics. The activities involved are summarized in Figure 1 (overall system), Figure 2 (Police Accident Records) and Figure 3 (Highways Department).

This information has been obtained during preliminary discussions we have had with officers from the Police Department, Highways Department and Australian Bureau of Statistics. The following is a brief step-by-step description of the system with comments regarding potential error sources.

2.1 THE ACCIDENT

Section 43 of the South Australian Road Traffic Act describes the responsibilities of drivers who are involved in accidents. In this section an accident is defined as a "collision whether caused intentionally or otherwise". Accidents must be reported to police within 24 hours by the driver(s) concerned if:-

- any person or animal is injured or killed,
- any real or personal property (other than an animal) is destroyed or damaged.

A person charged with failing to report an accident can successfully defend the charge by proving that:-

- property damage only was involved and that a fair estimate of making good the damage was not more than $100, or
- damage to property owned by the defendant was the only damage or injury involved.

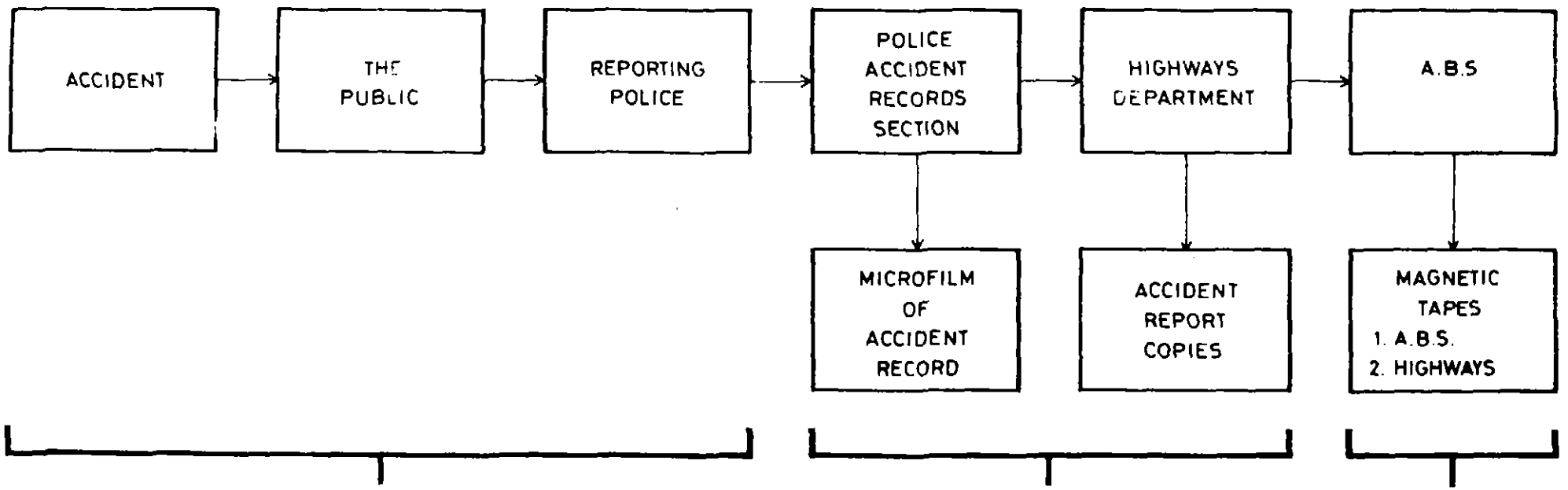
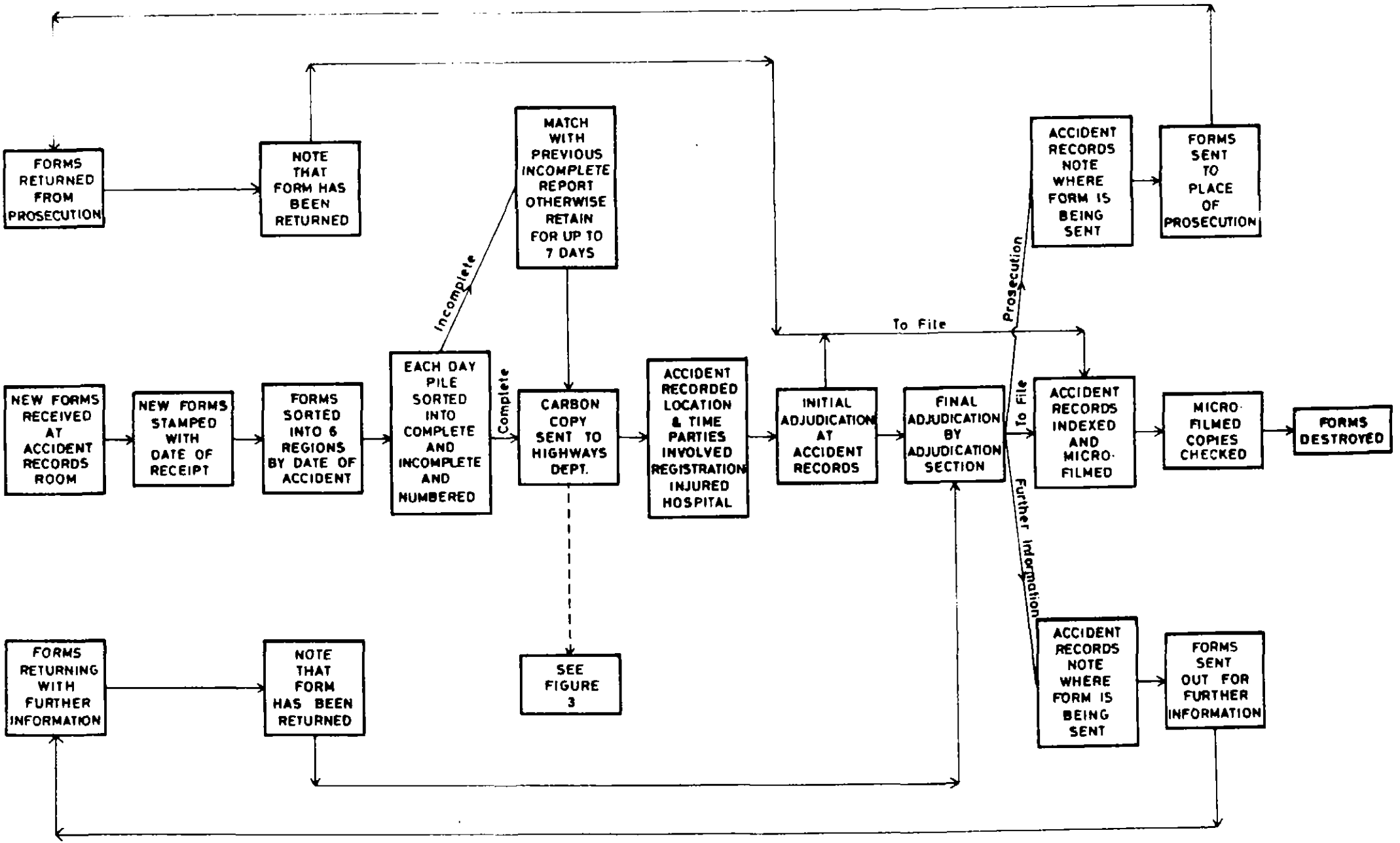
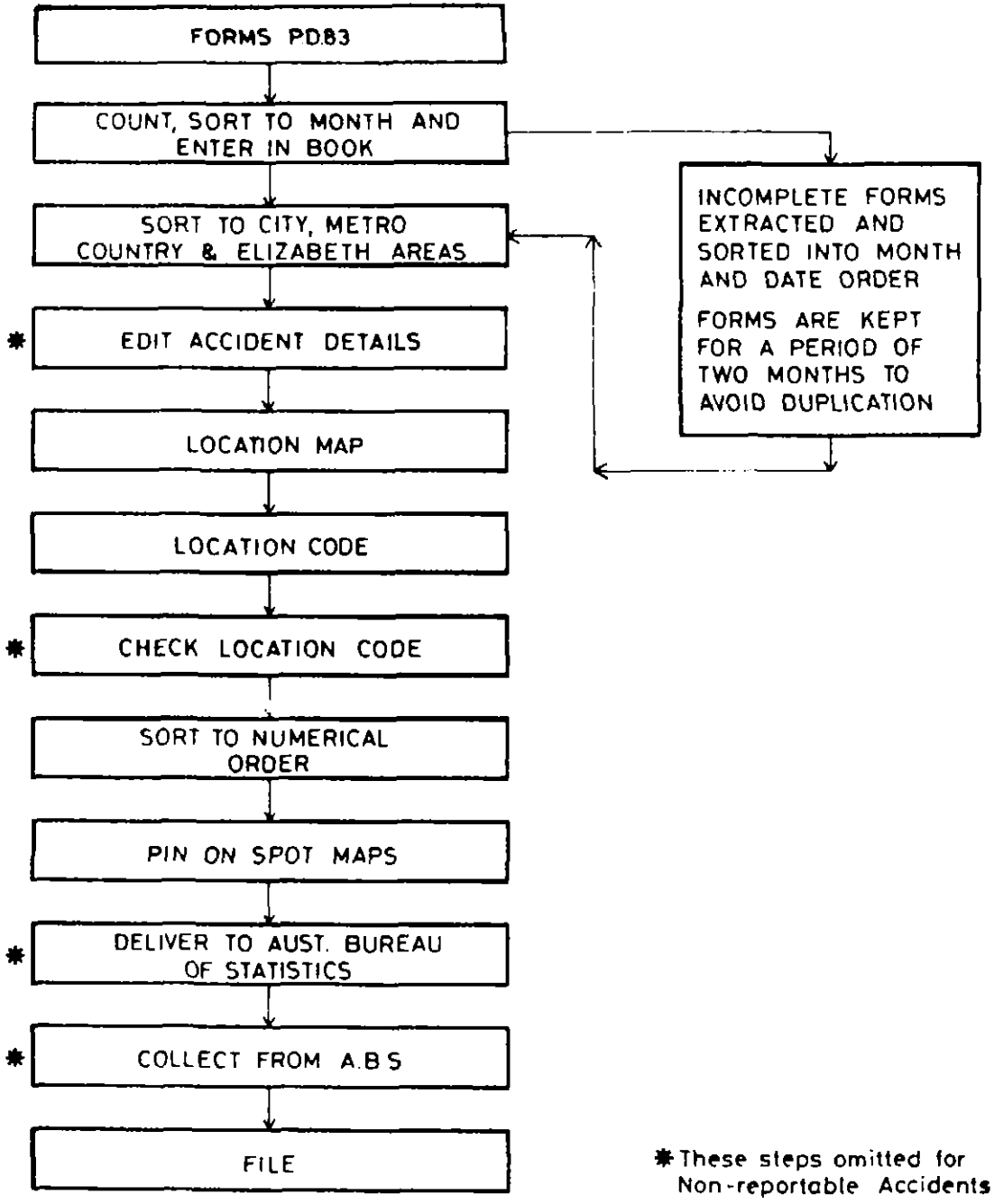


Figure 1

THE SYSTEM AND POSSIBLE ERROR SOURCES



POLICE ACCIDENT RECORDS SECTION INVOLVEMENT



*These steps omitted for Non-reportable Accidents

HIGHWAYS DEPARTMENT INVOLVEMENT

Figure 3

In this report a "reportable" accident is as defined above and excludes those for which a defence against a non-report charge exists.

2.2 THE DRIVER

Immediately following an accident a driver must generally decide whether or not he will report the accident to police. The decision is likely to be influenced not only by his understanding of his responsibilities (above), but also by such things as:-

- Whether or not he intends to make an insurance claim.
- The intentions of the other driver in this regard.
- Whether or not he is likely to be charged with an offence.

Not all reportable accidents are reported to the police and the extent of non-reporting is not known. In South Australia 163 drivers were prosecuted in 1974/75 for failing to report an accident, resulting in 135 convictions.

Regardless of whether an accident is reported to a policeman at the scene, or at a police station, the quality of many of the data items on the report form (see Figures 4 and 5) depends upon the accuracy of information provided by the driver or other persons with regard to such things as:-

- Age,
- Position in vehicle,
- Vehicle movement,
- Pedestrian movements, and
- Safety belt worn.

Drivers, or other persons, can provide incorrect information either intentionally (to avoid prosecution) or

unintentionally by subconscious "rationalization". Similarly, accident reports may be incomplete because of a person's failure to observe or recall events.

2.3 REPORTING BY POLICE

Accident report forms are prepared by police officers either at the scene of the accident or at a police station when a driver reports an accident.

From discussions with various police officers the following points have emerged:-

- Police generally attend accidents only when:-
  - personal injury is involved,
  - damaged vehicle(s) cause traffic hazard,
  - criminal offence suspected, or
  - fire hazard exists.
- All requests for police attendance at accidents in the metropolitan area are dealt with by the Police Operations Room. If it is considered that police attendance is necessary, the nearest available patrol car is despatched by radio. If the accident is severe, the accident investigation squad is also despatched. The police officers on this squad are experienced in the investigation of accidents, whereas the patrol policeman is mainly concerned with dealing with the immediate problems arising from the accident and reporting the accident.
- If an accident report form cannot be completed within 24 hours of the accident then a blue copy of the partially completed report is sent to the Police Accident Records Section. The original and a carbon copy of the final report (plus any statements) are sent to Police Accident Records as soon as possible thereafter.

In the case of an accident attended by the police, the scope for errors and omissions in the report is probably less than in the case of an accident reported to a police station. Nevertheless, because the completion of an accident report is only part of the policeman's duties at the accident site, it is inevitable that some errors and omissions could occur.

2.4 THE ACCIDENT REPORT FORM

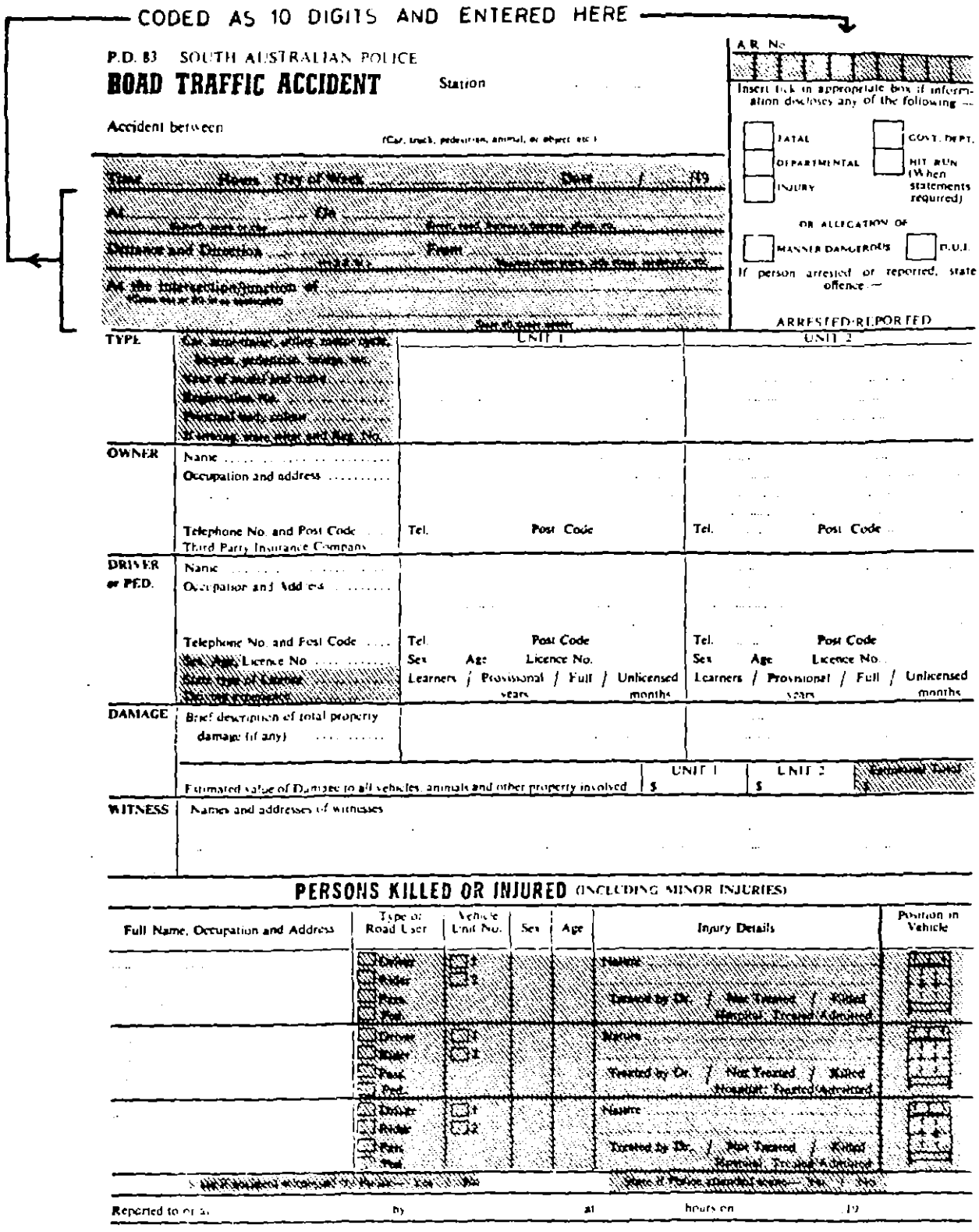
The accident report form (see Figures 4 and 5) is the result of a joint design effort some years ago by the Police Department, Road Traffic Board and the Bureau of Statistics. In discussions we have had so far with these authorities, little criticism has been levelled at the content or structure of the form.

Whilst it is not the purpose of the survey to redesign the accident report form, the output from the survey may indicate areas in which alterations to the form may be necessary. For example, if a data item is particularly susceptible to error, or often omitted, then the value of continuing to collect information on the data item should be questioned, unless the quality of the item can be improved by alteration of the system.

2.5 POLICE ACCIDENT RECORDS SECTION

All accident reports are sent to the Police Accident Records Section as soon as possible. The preliminary report (blue) is matched with the final report when it arrives. The final report is very rarely received more than two weeks after the accident. Where more than one report for an accident is expected, the first report is held until the subsequent report(s) have been received. Such reports are generally not held for more than 10 days.

The Accident Record Section function is mainly clerical processing and they make no alteration to the forms. Carbon copies are sent to the Highways Department as soon



BRIEF DESCRIPTION OF ACCIDENT—

LEGEND

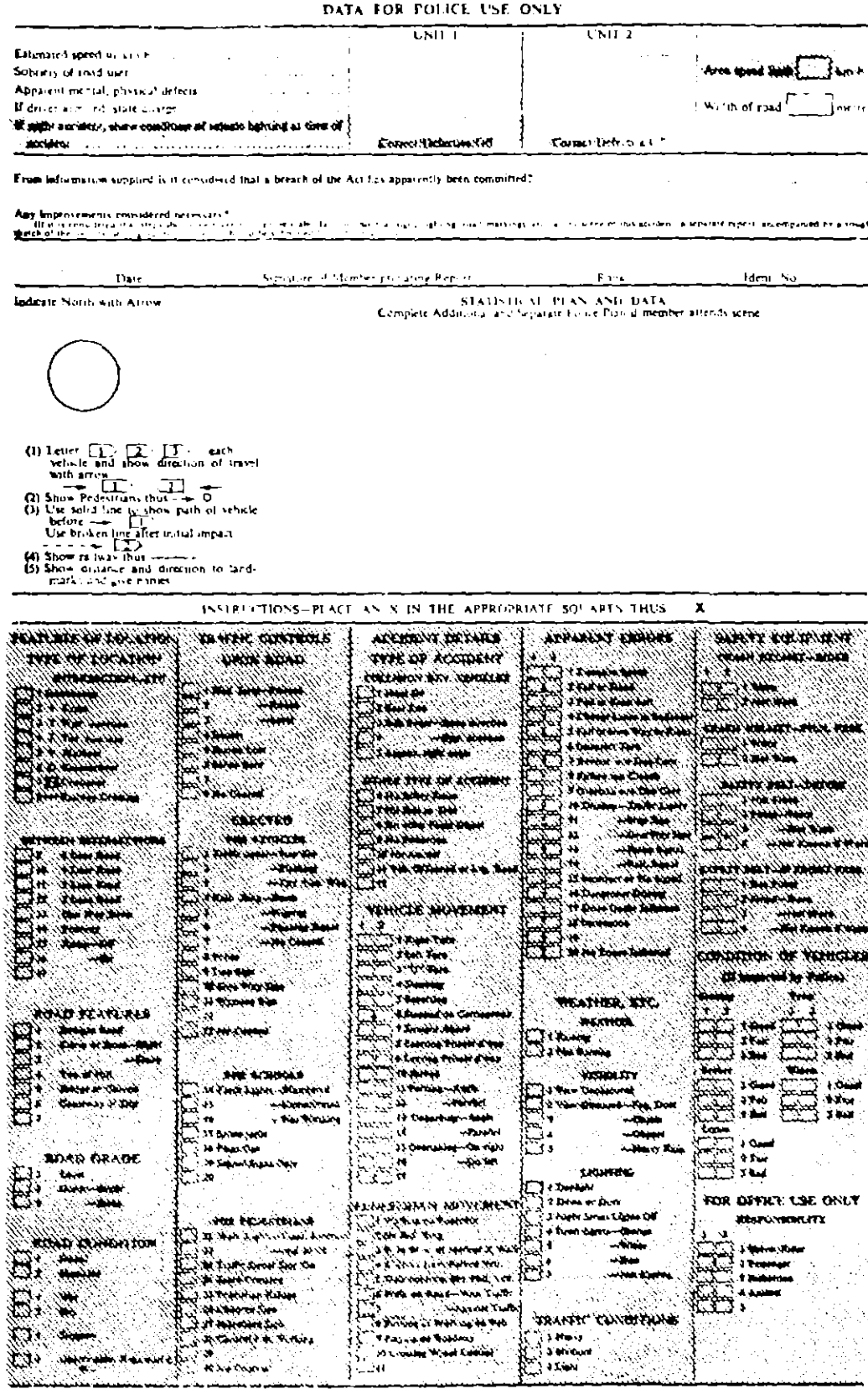
Items Coded and Stored on Magnetic Tape .....

NOTE: Some extra and/or derived data is also coded:-

City/Metropolitan/Rural
Public Holiday
Number of Units
Blood Alcohol Content
Thrown Out of Vehicle
Number of Casualties
Secondary Apparent Error

FRONT OF ACCIDENT REPORT FORM

Figure 4



DATA FOR POLICE USE ONLY

UNIT 1 | UNIT 2

Estimated speed at time of accident

Sobriety of road user

Apparent mental, physical defects

If driver was not state charge

If applicable, state condition of vehicle lighting at time of accident

Area speed limit km/h

Width of road metres

From information supplied is it considered that a breach of the Act has apparently been committed?

Any improvements considered necessary?

Date | Signature of Member preparing Report | Rank | Ident. No.

Indicate North with Arrow

STATISTICAL PLAN AND DATA

Complete Additional and Separate Police Plan if member attends scene

(1) Letter each vehicle and show direction of travel with arrow

(2) Show Pedestrians thus → O

(3) Use solid line to show path of vehicle before impact

Use broken line after initial impact

(4) Show railway thus

(5) Show distance and direction to landmarks and give names

INSTRUCTIONS—PLACE AN X IN THE APPROPRIATE SQUARES THUS X

FEATURES OF LOCATION

TYPE OF LOCATION

INTERSECTION, ETC.

BETWEEN INTERSECTIONS

ROAD FEATURES

ROAD GRADE

ROAD CONDITION

TRAFFIC CONTROLS

UPON ROAD

ERECTED

FOR VEHICLES

FOR SCHOOLS

FOR PEDESTRIANS

ACCIDENT DETAILS

TYPE OF ACCIDENT

COLLISION BETW. VEHICLES

OTHER TYPE OF ACCIDENT

VEHICLE MOVEMENT

PEDESTRIAN MOVEMENT

APPARENT ERRORS

WEATHER, ETC.

WEATHER

VISIBILITY

LIGHTING

TRAFFIC CONDITIONS

SAFETY EQUIPMENT

WORN KILLED—DRIVER

CRASH HELMET—PILLION RIDER

SAFETY BELT—DRIVER

SAFETY BELT—OF INJURED PERSON

CONDITION OF VEHICLES

(If inspected by Police)

FOR OFFICE USE ONLY

RESPONSIBILITY

LEGEND

Items Coded and Stored on Magnetic Tape.....

NOTE: Some extra and/or derived data is also coded:-

City/Metropolitan/Rural

Public Holiday

Number of Units

Blood Alcohol Content

Thrown Out of Vehicle

Number of Casualties

Secondary Apparent Error

BACK OF ACCID

REPORT FO

Fig

as "multiple reports" have been matched. Originals are sent to the Police Adjudication Section where a decision is made regarding the need for any legal action. When any legal action has been completed the forms are returned to Accident Records where they are micro-filmed (including "multiple reports").

Reports are numbered by Police in date of occurrence order and logged in a book with following headings:-

Report No.

Date.

Time.

Surnames.

Location.

Injuries.

A further log with micro-film cassette and frame number against Report Number facilitates access to micro-film records via a rapid searching display device.

2.6 HIGHWAYS DEPARTMENT

The Highways Department edits and manually codes the information contained on the carbon copy that is sent to them by the police. Twice a week the processed forms are delivered to the Australian Bureau of Statistics for transfer of data to magnetic tape. Reports for accidents involving only property damage are not sent to the Australian Bureau of Statistics if the total cost of damage, as estimated by the reporting police or the driver(s) involved, is less than $100.

The Highways Department does not code onto a separate form but code, using red biro, directly onto their copy of the report form. In the majority of cases, there is more than one report for each accident (e.g., accident reported by both drivers at different police stations). In such cases there are frequent discrepancies between the reports, and the coders at the Highways Department must compile a

"composite" report. The report which they consider "most likely" is coded and edited in red biro to represent the "composite" report.

The Highways Department has advised that it rarely finds it necessary to contact the police regarding errors, discrepancies, or omissions on the accident forms.

The "location code" for an accident is a ten digit number comprising 4 or 5 different parts and the scope for coding error is probably greatest in relation to this item. The majority of other data items are self coding. Editing errors are also possible, i.e., failure to detect or correctly resolve errors or omissions by others.

2.7 AUSTRALIAN BUREAU OF STATISTICS

The Adelaide office of the Australian Bureau of Statistics transcribes coded information, from the forms sent to them by the Highways Department, onto a "transcription form" and from this directly onto magnetic tape. Two tapes are prepared each quarter, one for the Bureau itself and another for the Highways Department. These tapes are of slightly different format, but both contain all of the coded accident data.

The Bureau runs a fairly comprehensive edit check on the tape data searching for logical inconsistencies or key data that is missing. Such errors and omissions are corrected wherever possible and a list of remaining omissions etc., is prepared.

Because the transfer to tape process is verified, the transcription process appears to be the most likely source of any data errors or omissions introduced by the Australian Bureau of Statistics.

3.0 PRE-DESIGN CONSIDERATIONS

3.1 METROPOLITAN/COUNTRY ACCIDENTS

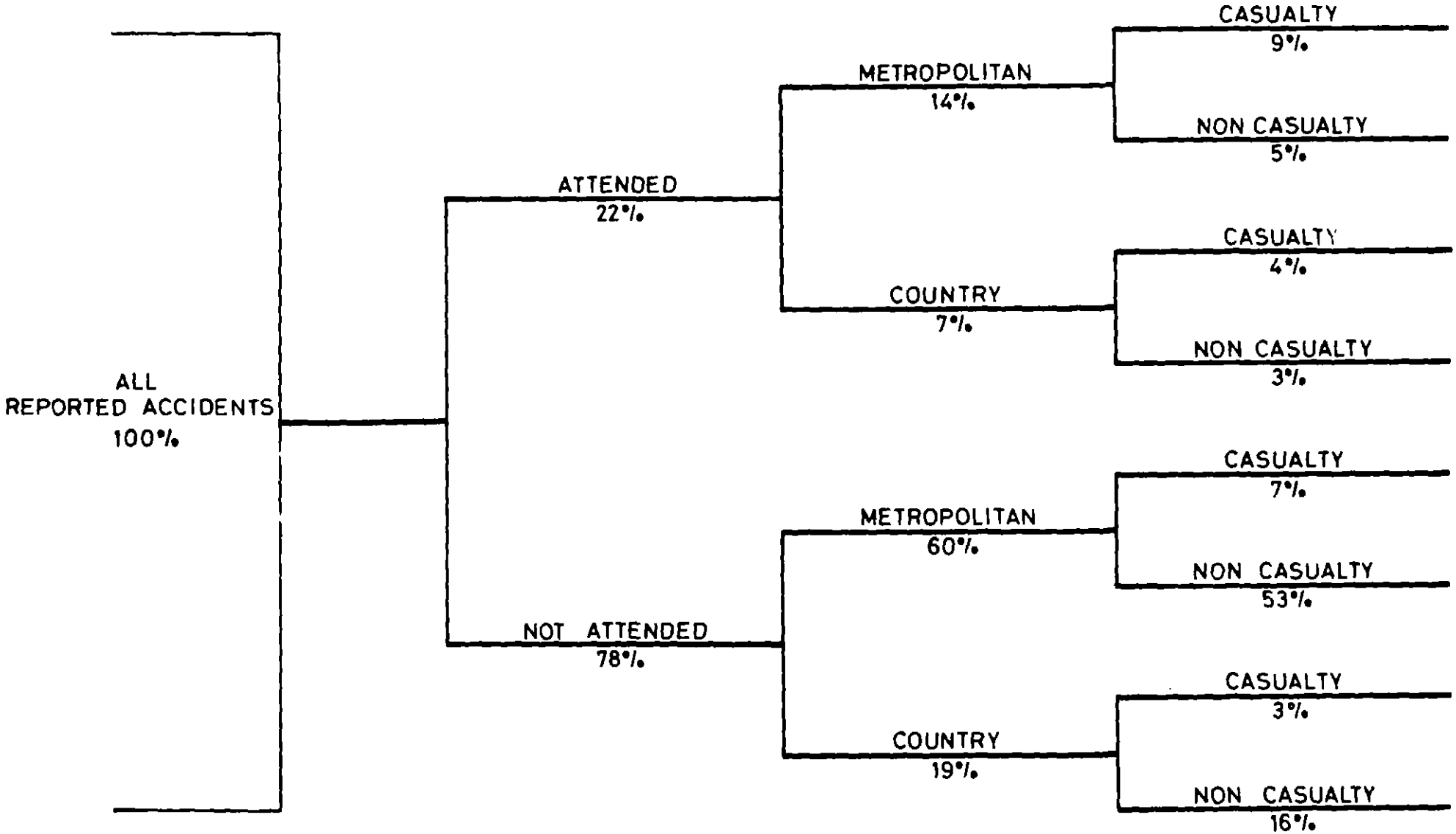
At a meeting with Dr. A.P. Vulcan of the Department of Transport on October 23, 1975, it was agreed that the Study should be designed to include only metropolitan area (Adelaide) accidents. Approximately 75 per cent of all accidents reported in S.A. occur in metropolitan Adelaide, see Figure 6. Experience gained through execution of the metropolitan part of the study will facilitate a subsequent design of an efficient survey for country areas.

The reason for deleting consideration of country accidents in the first instance is basically one of economics. It was recognised from the outset that a considerable proportion of the survey cost would be the cost of having persons waiting for and attending the scene of accidents as soon as possible after their occurrence. In order to maximise the number of accidents that could be attended (bearing in mind the relatively high cost of attending accidents in country areas and the overall budget ceiling for the survey) it was decided to concentrate on metropolitan area accidents.

3.2 RATE AT WHICH ACCIDENTS OCCUR

Table 1 has been prepared from information supplied by the Police and shows for 28 days in March 1975, the number of accidents attended by Police in metropolitan Adelaide based on an analysis of Radio Operations Room records. The overall average for March 1975 was 16 accidents attended per day.

The total number of reported accidents per day in South Australia currently averages about 100. Hence the percentage figures shown in Figure 6 (for 1971) can be considered to correspond roughly to the current average number of accidents per day in the State. In the metropolitan area, therefore the average is about 75 accidents per day with only 14 of these being attended by police.



Figure

PERCENTAGE DISTRIBUTION OF REPORTED ACCIDENTS (S.A. 1971)

Typical hourly and daily variations in the rate at which accidents occur in South Australia are shown in Figure 7 derived from A.B.S. data for 1973.

TABLE 1

ACCIDENTS ATTENDED - METROPOLITAN ADELAIDE

28 DAYS IN MARCH 1975

Time Period	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.	Total
7am - 3pm	19	12	22	12	23	25	18	132
3pm - 6pm	12	14	15	9	8	18	8	84
6pm - 11pm	13	13	20	19	28	27	16	136
11pm - 2am	4	9	5	11	21	28	2	80
2am - 7am	0	1	3	6	5	9	1	25
Total	48	49	65	58	85	107	45	457

3.3 METHOD OF ATTENDING ACCIDENTS

3.3.1 Description of Alternatives

Accidents will be attended during the survey for two reasons:-

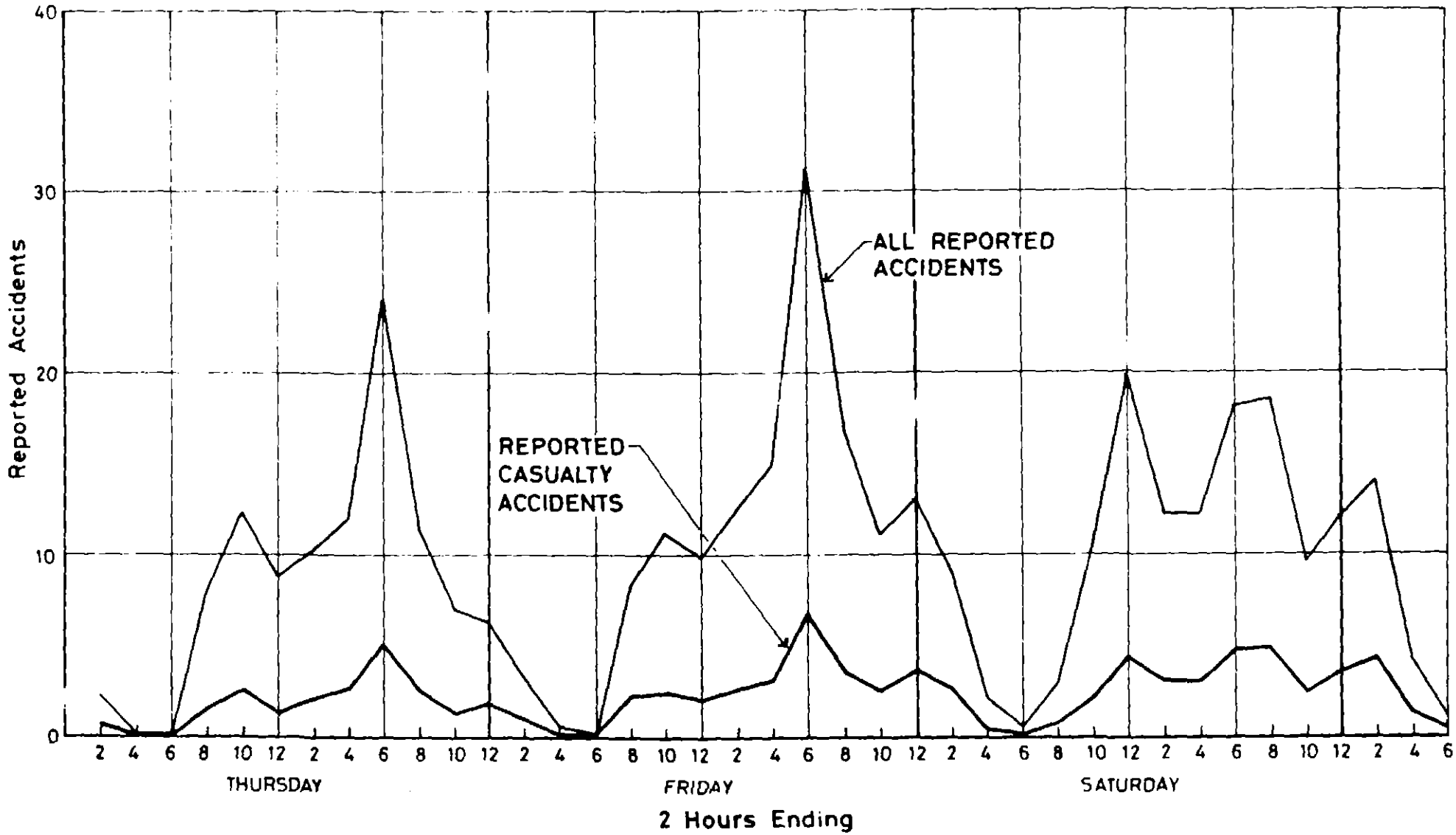
- To collect information about the accident, for later comparison with accident records.
- To observe and document the activities of police at the accident site.

Two persons will be required, one for each of the above tasks, with only one necessarily with professional training.

There are basically three methods by which the team could reach accident sites quickly:-

(a) Using a private or company vehicle equipped with a radio tuned to the police frequency.

(b) By accompanying police in a normal patrol car.


Reported Accidents
40
30
20
10
0
ALL REPORTED ACCIDENTS
REPORTED CASUALTY ACCIDENTS
2 4 6 8 10 12 2 4 6 8 10 12 2 4 6 8 10 12 2 4 6 8 10 12 2 4 6 8 10 12 2 4 6 8 10 12 2 4 6
THURSDAY
FRIDAY
SATURDAY
2 Hours Ending

(c) In a special unmarked and roving police car driven by a plain clothes policeman.

Method (a) is not favoured by the police for reasons associated with non-police use of the radio. The method suffers in comparison to the others because speed of travel to the site could not be as fast as in a police car. Problems may also arise for the survey team in explaining their presence to police on site.

Method (b) overcomes the above problems and has the advantage that the survey team would be able to observe police activity at the site from the time at which police first arrive. A major disadvantage of this method arises from the fact that patrol cars operate within sectors, of which there are 11 in the metropolitan area. Consequently the rate at which accidents could be attended would be very low. Only about 14 accidents are currently attended per day by police in the whole metropolitan area. There is also the possibility that the close contact between the survey team and reporting police may bias the results of the survey.

Method (c) overcomes most of the disadvantages of (a) and (b) and the police have indicated that they are willing to co-operate by providing the unmarked vehicle (with radio) and plain clothes police driver. The unit would normally respond only to traffic accident calls and the plain clothes policeman would generally avoid becoming involved in normal police activity on site. One of the patrol cars for the sector would normally arrive at the scene prior to the survey car. This means that the first few minutes on-site police activity would often not be observed by the survey team.

3.3.2 Trial Using Method (c)

With the co-operation of the police, method (c) (unmarked police car) was tried on Friday, October 31,

1975 between 4.00 p.m. and 12 midnight with observers from the firm present.

For the purpose of police radio communication, metropolitan Adelaide is divided into two parts; messages relating to the area north of the River Torrens are transmitted on radio channel 1 and messages relating to the area south of the River Torrens are transmitted on channel 2. Approximately 65 per cent of metropolitan area accidents occur in the channel 2 area which includes the central business district of Adelaide. This is the area in which the trial was conducted. From the table in Section 3.2 it would have been reasonable to expect about 9 police attended accidents in the metropolitan area during this period; i.e. 0.65 x 9 = 6 attended accidents in the channel 2 area.

In fact five accidents occurred in the channel 2 area during the period and it was possible to attend all five accidents despite the fact that four of them were bunched during the last 2½ hours of the period, as shown in Table 2. We were assisted in this regard by the fact that all five of the accidents occurred within an area of 30 sq. km. whereas the channel 2 total area is about 170 sq. km.

Other points to emerge from the trial were:

- Except for accident number 2, all accidents were injury accidents of the "rear-end" type.
- Except for accident number 2, the normal police patrol car, ambulance and tow truck arrived at the scene before the survey vehicle.
- Accident number 2 was the type not normally attended by the police. It was a rear-end accident involving three vehicles, no injuries and only minor vehicle damage. The operations room had been advised in advance

that we were interested in attending such accidents as observers only.

TABLE 2

Accident Number	Time Advised by Radio (PM)	Time Arrive at Site (PM)	Delay (mins.)
1	4.20	4.25	5
2	9.50	10.00	10
3	10.40	10.45	5
4	11.10	11.20	10
5	11.15*	11.35	20

*Advised of accident 5 while proceeding to accident 4.

. At each accident the observers completed a "dummy" accident report form as far as was possible without interviewing drivers or the reporting police, i.e. personal information, accident details, vehicle movement, pedestrian movement etc. were excluded. In every case it was possible to complete this task within 10 minutes of arrival at the accident scene.

. Police activities observed on site included:

- traffic control
- assist with moving vehicles to a safe position
- assist ambulance officers deal with injured persons
- interact with tow truck drivers
- make on site measurements
- interview drivers, etc.

This last mentioned activity was the most time consuming activity at each of the four accidents attended by a police patrol.

. In relation to the accident form (see Figures 4 and 5):-

- "year of model" is not shown on vehicle registration labels and can be difficult to determine on site without reference to driver.

- Sodium lighting is used on a substantial proportion of Adelaide arterial roads and correct identification of some vehicle colours can be extremely difficult under this light.

- During periods of intermittent rain and without interviewing drivers etc. it will not always be possible to answer with confidence the questions Road: Wet/Dry, Weather: Raining/Not Raining. For example the presence of water on the road when the observers arrive does not necessarily mean that it was raining or the road was wet when the accident occurred.

3.4 "DUMMY" ACCIDENT REPORT

As mentioned in Section 3.3.1, one of the reasons for the team attending accidents is to collect information about the accident for later comparison with accidents records; i.e. a "dummy" accident report will be prepared. To complete the report form fully would certainly require that drivers and possibly witnesses be interviewed. Some problems likely to arise here are described below:-

. It may impede (or influence) the police in questioning a person to have a third person (the observer) listening to and making notes during the interview.

. The person may object to the presence of the observer during questioning by police.

. Attempts by the observer to interview drivers etc. separately from the police may again

impede the police and/or be objected to by the persons concerned.

There would be little point of course in the observer copying data from the policeman's report. Dr. A.J. McLean has indicated that during the 1963/64 accident survey in Adelaide [1] drivers were often interviewed on site by the study team. They were assisted, however, by the fact that they could introduce themselves as doctors and could embark on a series of questions regarding injury.

In view of the difficulties described above it was decided that the survey team should not seek information from drivers or witnesses. Bearing this in mind, and in the light of experience gained in the Friday night trial, Table 3 shows a complete list of data items from the accident report form and indicates those items:-

- That are coded onto magnetic tape
- Which the team should be able to collect with a high degree of accuracy at nearly every accident attended. (Primary items)
- Which the team should be able to collect with a high degree of accuracy at only a proportion of the accidents attended. (Secondary items)

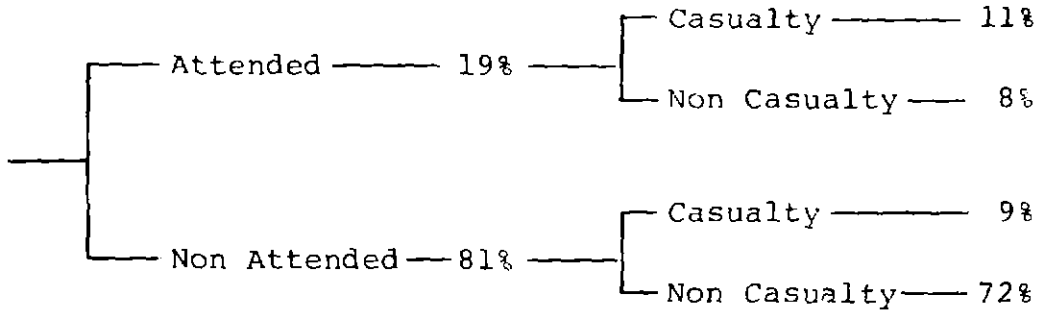
3.5 SAMPLING PROBLEMS

The population of accidents to be considered in the study consists of all accidents occurring in the Adelaide metropolitan area that are reported to the police. This population can be broken down approximately as follows:

---

(1) Traffic Accidents in Adelaide, South Australia. ARRB Special Report No. 1 - 1966.

REPORTED METROPOLITAN ACCIDENTS



It is clear that an accident attended by the police is far more likely to involve a casualty, than an accident chosen at random from all reported metropolitan accidents. Allowance for this must be made when interpreting the results of a survey based on attending accidents with police.

With the co-operation of the Police Operations Room, as occurred during the Friday night trial, it would sometimes be possible to attend accidents that would not normally be attended by the police. According to police, however, a very small proportion of accidents reported to the Operations Room are not attended. It is claimed that in recent years the public have become less inclined to request police attendance at accidents involving property damage only. Indeed, from the breakdown of accidents above, it would appear that police attendance is not requested at a high proportion of casualty accidents.

From the above it can be seen that a survey based on the attendance of an observer at accidents, in response to messages received at the Police Operations Room, will yield only a small proportion of data relating to accidents that are not normally attended by the police. The number of such accidents covered by the survey will be maximised by giving accidents of this type preference when there is a choice of accidents that could be attended (see page 24).

The "multi-report" comparison (Section 4.4.1) will also provide some indication of data quality for accidents of this type.

TABLE 3

LIST OF DATA ITEMS

Data Items on Accident Report Form	Coded*	Primary*	Secondary*	
Station				
Between		X		
Time of Day	X	X		
Day of Week	X	X		
Date	X	X		
Location	X	X		
Vehicle				
Type	X	X		
Year	X		X	
Make	X	X		
Reg. No.	X	X		
Colour	X	X		
Towing	X	X		
Owner				
Name				
Occupation				
Address				
Phone Number				
Post Code				
Third Party				
Driver or Pedestrian				
Name				
Occupation				
Address				
Phone Number				
Post Code				
Sex	X		X	
Age	X			
Licence Number				
Licence Type	X			
Driver Experience	X			
Damage				
Brief Description		X		
Value Estimate	X			
Witnesses				
Names				
Addresses				
Persons Killed or Injured				
Type of User	X)			
Unit Number	X)			
Sex	X)	Accidents will be classified as property damage only, injury or fatal		
Age	X)			
Nature of Injury	X)			
Severity	X)			
Position in Unit	X)			

*See section 3.4

TABLE 3
(cont'd).

Data Items on Accident Report Form	Coded*	Primary*	Secondary*
Witnessed by Police	X		
Attended by Police	X	X	
Reported			
To or At			
Hour of Day			
Date			
Brief Description of Accid.			
Estimates Speed (km/h)			
Sobriety of Road User			
Mental/Physical Defects			
Charge if Driver Arrested			
Condition of Vehicle Lighting			
Area Speed Limit (km/h)		X	
Width of Road (Metres)			X
Breach of Act			
Any Traffic Improvements			
Date Prepared			
Police Signature			
Rank			
Identification Number			
Sketch Plan			X
Type of Location	X	X	
Road Features	X	X	
Road Grade	X	X	
Road Conditions	X	X	
Traffic Controls			
Upon Road	X	X	
Erected	X	X	
Type of Accident	X	X	
Vehicle Movement	X		X
Pedestrian Movements	X		X
Apparent Errors	X		
Weather	X	X	
Visibility	X		
Road Lighting	X	X	
Traffic Conditions	X		X

*See section 3.4

TABLE 3

(cont'd)

Data Items on Accident Report Form	Coded*	Primary*	Secondary*
Crash Helmet			
Rider	X		X
Pillion	X		X
Safety Belt			
Driver	X		X
Front Passenger	X		X
Condition of Vehicles			
Steering	X		
Tyres	X		
Brakes	X		
Wipers	X		
Lights	X		
Responsibility			

* See Section 3.4

4.0 RECOMMENDED STUDY PROCEDURES

4.1 PRELIMINARY FIELD SURVEY

Prior to the main survey and with the co-operation of the police, one person shall accompany a normal metropolitan police patrol for a total of approximately 24 hours. This will involve 3 x 8 hour shifts, each with a different patrol. The actual shift times etc. shall be chosen in conjunction with the police and should provide as great a chance as practicable that the patrol will be required to attend at least one accident each shift. Although a patrol car normally operates only within a given sector, the possibility that the patrol will be called upon to attend an accident can be increased by arranging with the Operations Room to have the patrol also handle accidents in adjacent sectors whenever practicable.

The purpose of this preliminary survey is two-fold:-

- Experience gained here will enable the observer to recognise and more accurately describe the various police activities at an accident site. This will assist during the survey proper where police activity must be described without questioning the police involved.
- Through discussion with the police on patrol and through observation of police activity at accident sites and elsewhere, the observer can obtain some first hand experience of accident reporting as it fits into the policeman's overall duties.

4.2 MAIN FIELD SURVEY

A survey team of two persons shall attend as many accidents as practicable in an unmarked police car driven by a plain clothes policeman.

4.2.1 Schedule of Shifts

A schedule of 8 hour shifts spread over a period of five weeks has been developed and is shown below:-

TABLE 4

SURVEY TEAM SCHEDULE:

SHIFTS/EXPECTED ACCIDENTS*

Week	Day							Total Expected Accidents
	Mon.	Tues.	Wed.	Thu.	Fri.	Sat.	Sun.	
1	-	B/4	B/6	B/5	B/6	B/7	-	28
2	B/4	B/4	B/6	B/5	C/8	-	-	27
3	-	A/2	A/4	A/2	A/4	A/4	-	16
4	B/4	B/4	B/6	B/5	B/6	-	-	25
5	-	B/4	B/6	B/5	C/8	C/9	-	32
Total Expected Accidents	8	18	28	22	32	20		128

* Shifts: A. 7.00 a.m. to 3.00 p.m.
B. 3.00 p.m. to 11.00 p.m.
C. 6.00 p.m. to 2.00 a.m.

The expected number of accidents has been derived using the March 1975 data provided by the police (see Section 3.2) and assuming that only accidents in the Channel 2 area can be attended.

Liaison will be maintained with Dr. A.J. McLean to avoid so far as possible any interference between the two surveys.**

In preparing the above schedule it was necessary to take into account the following requirements:-

. The need to maximise the number of accidents attended, within the limits imposed by the budget, i.e., try to avoid working

** Dr. McLean is undertaking, for the Department of Transport, an in-depth investigation of a sample of 400 accidents to which an ambulance is summoned in metropolitan Adelaide.

for long hours during periods when it is known that the accident rate is low. Unreasonable bias towards any particular period of the day or week should be avoided.

- The desirability, for various reasons, of working eight hour shifts, e.g. coincides with police shifts; longer shifts would become tiring and very short shifts would be inefficient.

- The desirability of using only one two man study team to ensure uniformity of reporting procedure etc. For practical reasons (e.g. illness) it will be necessary to have 3 or 4 persons from whom the study team should be chosen on a rotating basis.

4.2.2 Preparation of Dummy Report

It will be the responsibility of one team member to fill out a dummy accident report for every accident that the team attends. As mentioned in Section 3.4, only data items that can be completed with a high degree of certainty will be completed. The observer will not normally seek to obtain information about the accident by questioning persons involved in the accident or by questioning the police attending the accident.

4.2.3 Description of Police Activity at Accident Site

It will be the responsibility of the other team member to observe and document the activities of the police at the accident site. The system of recording will be fairly simple for the following reasons:-

- There will frequently be two (and sometimes more) police on site and a complicated recording system would be liable to overload a single observer.

- Despite the experience gained during the preliminary field survey it will frequently be difficult to recognise and describe accurately every police activity. The police involved should not be questioned about their activities and the survey team should not become obtrustive; e.g. by obvious "eavesdropping".

In the light of experience gained during the first week of the survey it may be found necessary to modify the recording method, but in the first instance it is proposed that the form shown in Figure 8 be used.

Police Operations Room records show that, on average, police remain at an accident site for about 50 minutes. On site activity beyond this time is nearly always confined to interviewing or getting statements from the last of the persons who were involved in, or who witnessed, the accident. The team member who prepares the dummy report should return to the unmarked police car and listen to the two-way radio when he has completed the dummy report. If he hears of an accident he should immediately advise the other observer (recording police activity) so that a decision can be made, in conjunction with the plain clothes policemen, as to whether or not it will be possible to attend the second accident. The survey team should generally not leave a site unless it is clear that the current activity by the police is, in all probability, the last activity. In such cases any more time spent on site would yield very little additional data and would tend to reduce the rate at which accidents can be attended.

ACTIVITY REPORT

TIME MESSAGE R'CD..... DAY OF WEEK.....

TIME ARRIVE AT SCENE..... DATE.....

OBSERVER.....

SUBURB..... ROAD..... AT.....

BRIEF DESCRIPTION OF ACTIVITIES

SHOWING TIME AT CHANGE OF ACTIVITY

IN MINUTES

	1st POLICEMAN Time	2nd POLICEMAN Time	3rd POLICEMAN Time
1st ACTIVITY			
2nd ACTIVITY			
3rd ACTIVITY			
4th ACTIVITY			
5th ACTIVITY			
6th ACTIVITY			
7th ACTIVITY			

COMMENTS

Abbreviations

TD - Talk to Driver
TP - Talk to Passenger
TW - Talk to Witness
TT - Talk to Tow Truck Driver
TA - Talk to Ambulance-man
TU - Talk to Unknown Perso..
T1, T2 - Talk to other Policeman
TF - Talk to Fireman
WN - Write Notes
UR - Use Radio
IP - Attend Injured Person
HA - Help Ambulanceman
IV - Inspect Vehicle
MM - Make Measurements
MV - Move Vehicles
CT - Control Traffic

Figure 8

If at any time the study team has a choice of two or more accidents that could be attended, the order of preference should be:-

- Accident that police would not normally attend,
- Non injury accident
- Single vehicle accident, and
- Others.

This will tend to counter the bias that exists against the first two categories when attending only accidents reported to the Operation Room.

4.3 ANALYSIS OF FIELD SURVEY RESULTS

4.3.1 Dummy Report

From the field survey described in Section 4.2, a total of about 120 dummy accident reports will be completed. These dummy reports will only be completed for those data items that can be obtained at the accident site by the observer with a high degree of accuracy (see Section 3.4).

The dummy reports will be classified into four categories, firstly into casualty and non-casualty accidents, and further into accidents "normally attended by police" and "not normally attended by police". As mentioned previously only a small proportion of the dummy reports will be for accidents that would not normally be attended by police. Hence it is not likely that any statistically valid conclusions regarding data quality for accidents of this type will emerge from this part of the survey. It can be expected that the dummy reports will be divided approximately as follows:-

Accidents Normally Attended by Police	
Casualty	70
Non Casualty	52
Accidents Not Normally Attended by Police	
Casualty	)
Non Casualty	) 6

The quality of accident data stored on magnetic tape will be tested for accuracy by comparison with the data contained on the dummy reports; the steps involved in this process will be as follows:-

- Obtain from the Highways Department a copy of the magnetic tape(s) which should contain records for the dummy report accidents.
- Tabulate from this tape the accident data relating to those accidents for which dummy reports have been prepared. Reports will be matched on the basis of date, time (range), location and registration number. If any dummy reports cannot be matched on this basis, it will be necessary to check with the Highways Department to facilitate location of such reports on the magnetic tape. For example, a quick manual check of reports by location may reveal a simple date or time error that has prevented matching. Every effort will be made to locate on tape the matching report for each dummy report.
- Table 5 will then be prepared manually for each of the accident categories given above.
- The 95 per cent confidence intervals for error rate and omission rate will be calculated for each data item and each accident category included in the survey. The nature of the "accident population" does not lend itself to equalizing sample sizes in each category during a survey of this type. As a result, there may be fairly wide variations in the size of confidence intervals.

TABLE 5

ANALYSIS TABLE

FIELD SURVEY/MAGNETIC TAPE

Number of dummy reports.....

Number of 'matching' reports found on magnetic tape.....

	DATA ITEMS			
	ITEM 1	ITEM 2	ITEM 3	--- ETC
MAGNETIC TAPE REPORTS ONLY				
No. of times each data item should have been given in tape data	A_1	A_2	A_3	---
No. of times each data item actually given in tape data	B_1	B_2	B_3	---
Omission Rate	$\frac{A_1-B_1}{A_1}$	$\frac{A_2-B_2}{A_2}$	$\frac{A_3-B_3}{A_3}$	---
DUMMY REPORT/TAPE REPORT COMPARISON				
No. of times each data item recorded on dummy report	C_1	C_2	C_3	---
No. of times tape data gives the same answer as dummy report	D_1	D_2	D_3	---
Error Rate	$\frac{C_1-D_1}{C_1}$	$\frac{C_2-D_2}{C_2}$	$\frac{C_3-D_3}{C_3}$	---

For example, assume that our sample includes 100 casualty accidents, and that in 20 of these vehicle make is recorded incorrectly on the tape, i.e., the observed error rate is 0.20 for this item, in casualty accidents. Using Figure 9 we can be 95 per cent confident that the actual error rate lies between 0.12 and 0.29.

If our sample included only 50 non-casualty accidents, with vehicle make recorded incorrectly in 10 cases, then the observed error rate is the same as for casualty accidents, 0.2. In this case, however, using Figure 9, we have a different and larger 95 per cent confidence interval, viz., 0.10 to 0.34.

- Data items will be ranked into order of reporting accuracy by statistical testing wherever possible.

4.3.2 Police Activity

The format of data recording for this part of the survey will be similar to that shown in Figure 8. (As mentioned in Section 4.2.3 some variation may occur in the light of experience during the first week of the survey).

It should be possible, at the conclusion of the survey, to group these activities into some logical sets, e.g.,

- protecting life and property,
- obtaining data for accident report,
- obtaining statements, and
- general management of the situation.

For each of the accident categories involved, the average and standard deviation of time spent on each activity will be calculated.

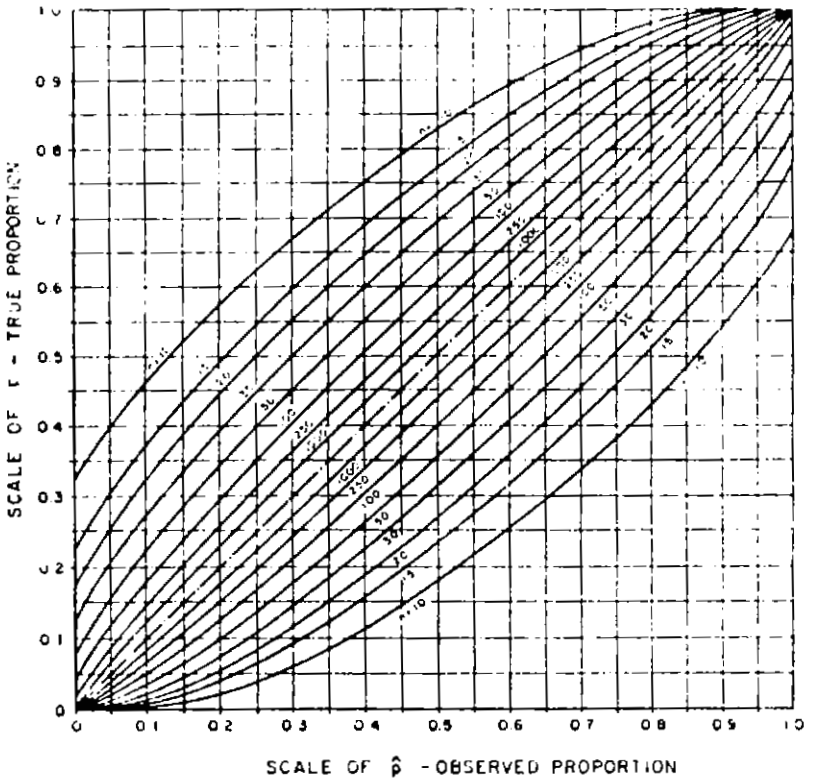
The time at which the police patrol arrives at and leaves each accident scene cannot be recorded during the survey (see Section 4.2.3), but will be obtained from the Operations Room records.

4.4 OTHER ANALYSES

4.4.1 Multiple Report Comparison

Only a small proportion of the field survey accidents will be of the type not normally attended by the police. Statistically significant results in this category are not likely but some indication of data quality in this area is highly desirable.

In a high proportion of these accidents, two or more reports are received for the same accident and it is proposed that a sample of such reports be checked



Confidence Belts for Proportions —
Confidence Coefficient 0.95.

for consistency between reports. This analysis must be done manually and it is proposed that a random sample of 100 casualty accidents and 100 non-casualty accidents (involving multi-reports) be selected from the most recent quarterly period for which police micro-film records are complete. The analysis procedure is summarized in Table 6. To simplify the analysis, in the case of three or more reports for one accident, only the first two reports on the micro-film will be considered. It is considered that the time consuming refinement of extending comparisons to the third, fourth, etc., reports for an accident is not likely to add greatly to the significance of results from this type of analysis.

The "error ratio" as calculated in Table 6 is not directly comparable with the error rates that will be calculated in relation to accidents attended by the police (see Section 4.3.1). The "error ratio" is simply a measure of the extent of disagreement between pairs of reports for the same accident and data item.

Disagreement between reports for the same accident should be resolved to a large extent by the Highways Department. The magnitude of their task in this regard and the data items where discrepancies most frequently need be resolved, will be identified by this analysis. The greater the need for resolution of discrepancies, the greater is the potential for the introduction of errors during the process.

Of more importance, however, is the likelihood that a high "error ratio" for a particular data item is an indication that the item is generally inaccurately reported for reasons such as:-

- intentional distortion by public,
- unintentional distortion by public,
- misunderstanding by public of police,
- shortcoming of the form,
- etc.

TABLE 6

ANALYSIS FORMAT

MULTIPLE REPORT COMPARISON

Number of Accidents.....

	DATA ITEMS			
	ITEM 1	ITEM 2	ITEM 3	--- ETC.
No. of times data item appears on <u>both</u> reports	A_1	A_2	A_3	---
No. of times data item is the same on each report	B_1	B_2	B_3	---
"Error Ratio"	$\frac{A_1-B_1}{A_1}$	$\frac{A_2-B_2}{A_2}$	$\frac{A_3-B_3}{A_3}$	---

(Separate Tables for casualty and non-casualty accidents).

The analysis will not identify the reasons for inaccurate reporting but will identify data items that may be prone to inaccurate reporting. The level at which error rates (or ratios) become "intolerable" depends upon the ways in which the data is going to be used.

4.4.2 Pattern of Police Attendance at Accidents

Figure 6 shows for the year 1971 the pattern of police attendance (and non-attendance) at accidents. It is proposed that an equivalent Table be prepared for the year 1975 by analysis of the magnetic tape accident records for that year.

4.4.3 Reporting Accuracy of Registration Numbers

Vehicle registration numbers and driver licence numbers have been collected by police for many years in connection with the accident report form. Driver licence numbers are not recorded on magnetic tape, but vehicle registration numbers have been recorded on magnetic tape since the beginning of 1975.

There is an increasing tendency in the analysis of accident data in relation to the properties of vehicles to use the vehicle registration number in conjunction with vehicle registration records to identify vehicle properties that reporting police cannot reasonably be expected to determine on site (e.g., weight, horsepower, etc.). Still further detail would be available if police recorded the manufacturers Vehicle Identification Number from the design rule certification plate. As a result it may also be feasible to reduce the vehicle related data to be collected by police (vehicle type, make, year, etc?).

For such systems to work it is essential that the collection and recording of the number(s) be done with a high degree of accuracy.

The following check, upon the accuracy with which vehicle registration numbers are collected and recorded, is proposed:-

- From magnetic tape accident records for the year 1975, extract 1,000 registration numbers from a random sample of 1,000 accidents. Vehicle type, make, year and colour will be extracted at the same time as well as the code which indicates whether or not police attended the accident.
- For each vehicle registration number so obtained, extract from the registration records tape the vehicle type, make, year and colour.
- If any three of the items (type, make, year, colour) are the same from each data source then it will be assumed that the registration number was recorded correctly in the accident tape.
- The remainder of the numbers will be assumed to have been recorded incorrectly on the accident tape unless the omission of one or more items from the accident tape (type, make, year or colour) might have precluded the matching of three items (e.g., vehicle, type and make are matched but year and colour are missing from accident tape). In such cases there is insufficient evidence to say whether or not the registration number was recorded correctly.
- The proportion of incorrectly recorded registration numbers (with 95 per cent confidence intervals) will be calculated separately for accidents that are attended by police and accidents not attended by police.

4.4.4 Reporting Accuracy of Driver Licence Numbers

Driver licence numbers are recorded on the police accident report form, but are not recorded on magnetic tape. In the analysis of accident data it would be possible to use the driver licence number in conjunction with driver licence records (magnetic tape) to obtain more information than is recorded on the accident form about drivers involved in accidents. For example, driver licence records contain information relating to:-

- Class of licence (type of vehicle)
- Demerit points
- Disabilities
- Restrictions (need to wear glasses etc.)

For such a system to work it is essential that the collection and recording of licence numbers be done with a high degree of accuracy.

The following check upon the accuracy with which licence numbers are collected is proposed:-

- From micro-film accident records for the year 1975, extract 1,000 licence numbers from a random sample of 1,000 accidents. Driver sex, age and type of licence will be extracted at the same time, as well as the code which indicates whether or not police attended the accident.
- For each licence number so obtained, extract from driver licence records the driver's sex, age and type of licence.
- If all three of the data items are the same from each source then it will be assumed that the licence number was recorded correctly on the accident form. A tolerance of plus or minus one year will be allowed in the case of age.
- The remainder of the licence numbers will be assumed to have been recorded incorrectly on the

accident form unless the omission of one or more items from the accident form (sex, age or type of licence) might have precluded the matching of the three items (e.g., sex and type of licence are matched but age is missing from the accident form). In such cases there is insufficient evidence to say whether or not the licence number was recorded correctly.

- The proportion of incorrectly recorded licence numbers (with 95 per cent confidence intervals) will be calculated separately for accidents that are attended by police and accidents that are <u>not</u> attended by police.

APPENDIX B

NOTES ON STATISTICAL SIGNIFICANCE OF ERROR RATE DIFFERENCES

Reference: "Facts from Figures" M.J. Moroney p. 254

A "Chi squared" test can be applied in the following cases to see if the error rate differences between "attended" and "not attended" accidents is statistically significant.

It turns out that for registration number the difference is not signficant, but is for licence number.

Registration Numbers

	Wrong	Correct	Percentage Wrong
Attended	15	125	10.7
Not attended	79	649	10.9
Total	94	774	10.8

Using Yates correction and the "Chi squared" formula given in Moroney, "Chi squared" = 0.83. With 1 degree of freedom (as here) 5 per cent level of "Chi squared" is 3.8 and so the observed difference may well have arisen by chance.

Licence Numbers

	Wrong	Correct	Percentage Wrong
Attended	14	147	8.7
Not attended	31	766	3.9
Total	45	913	4.7

Proceeding as above, "Chi squared" = 5.88 and the difference is almost certainly significant.

APPENDIX C

COMPARISON OF VEHICLE REGISTRATION NUMBERS (excluding motor cycles) BETWEEN ACCIDENT TAPE AND VEHICLE REGISTRATION TAPE

	TYPE	MAKE	YEAR	COLOUR	FOR ACCIDENTS ATTENDED BY BY POLICE	FOR ACCIDENTS NOT ATTENDED BY POLICE	TOTAL
TOTAL SAMPLE					147	742	889
Numbers Recorded Correctly							
- All 4 items matching	OK	OK	OK	OK	44	341	385
- Any 3 items matching	OK	X	OK	OK	3	16	19
	OK	NA	OK	OK	1	13	14
	OK	OK	X	OK	10	14	24
	OK	OK	NA	OK	30	96	126
	OK	OK	OK	X	5	17	22
	OK	OK	OK	NA	10	49	59
	X	OK	OK	OK	1	43	44
- Only type & make matching	OK	OK	X	X	10	28	38
	OK	OK	X	NA	6	19	25
	OK	OK	NA	X	1	7	8
	OK	OK	NA	NA	3	3	6
- Only make & year matching	X	OK	OK	NA	1	2	3
	X	OK	OK	X	-	1	1
					125	649	774
Insufficient Data for Matching							
- None of the above apply & 2 or more items missing from one or both reports	OK	NA	NA	OK	3	3	6
	OK	NA	OK	NA	3	3	6
	OK	NA	NA	X	1	1	2
	OK	NA	X	NA	-	1	1
	OK	NA	NA	NA	-	4	4
	X	NA	NA	X	-	2	2
					7	14	21

APPENDIX C
(Cont'd.)

	TYPE	MAKE	YEAR	COLOUR	FOR ACCIDENTS ATTENDED BY POLICE	FOR ACCIDENTS NOT ATTENDED BY POLICE	TOTAL
Number Recorded Incorrectly							
- None of the above apply	X	OK	X	OK	1	8	9
	OK	X	X	OK	1	6	7
	OK	X	NA	OK	1	-	1
	OK	NA	X	OK	1	4	5
	OK	X	X	NA	1	4	5
	OK	X	NA	X	2	1	3
	X	X	X	OK	2	-	2
	X	X	X	X	4	13	17
	X	X	X	NA	1	3	4
	X	NA	X	OK	-	1	1
	OK	NA	OK	X	-	3	3
	OK	X	OK	NA	-	2	2
	OK	X	OK	X	-	2	2
	OK	X	X	X	-	17	17
	OK	NA	X	X	-	1	1
	X	OK	X	X	-	2	2
	X	OK	X	NA	-	2	2
	X	OK	NA	X	-	1	1
	X	X	OK	NA	-	3	3
	X	X	NA	X	1	2	3
	X	NA	X	X	-	4	4
					15	79	94

OK ... Data on each file matches.
NA ... Data missing from one or both files.
X ... Data does not match.

APPENDIX D

INSTRUCTIONS FOR COMPLETING DUMMY REPORT

INSTRUCTIONS FOR COMPLETING DUMMY REPORT

General

Accuracy in completing the form is of great importance and you must mark the form clearly and unambiguously. Although you should endeavour to complete the form as fully as possible, only complete those items which you can do so with a high degree of certainty.

For example, under the heading "vehicle movement" it will generally not be obvious from the accident scene whether the front vehicle in a rear end accident was moving at the time of the collision. Don't guess, just leave this section blank if you are not sure.

You should not question the persons involved in the accident or the police patrol.

"Accident Between"

Describe simply as say "2 cars"
"car and pedestrian"
"car and pole", etc.

Time of Day

Best estimate of time at which accident occurred (24 hour time).

Day of Week and Date

Make sure you get this right for accidents between midnight and 2.00 a.m.

Location

For distance, an estimate of distance from nearest side road (metres) is adequate.

Unit Type

This can be pedestrian, pole, animal, etc. in which case subsequent vehicle related data for that unit does not apply.

Year of Manufacture

This is not shown on registration label, so do not complete this section unless you are familiar with the make and can be certain of the year of manufacture.

Make

Make and model are required, e.g., Ford Falcon, Ford Escort, Austin A30, Austin 1800 etc.

Registration No.

It is most important that these are recorded accurately and legibly. It is very easy to transpose numbers and/or letters, e.g., SAL236 = SAL263. Other common errors are D=0, G=C, L=I etc. For semi-trailers obtain the number from the prime mover (not trailer).

Colour

For two-tone cars use principal colour. Try to confine colours to the following list:-

White
Cream
Gold
Purple
Orange
Pink
Silver
Blue
Brown
Green
Grey
Yellow
Black
Red

Towing

Identify as trailer, caravan, compressor etc. and give registration number.

Note:- For semi-trailers record the number of the trailer here, because it is often a different number from the prime mover.

Driver or Pedestrian Sex

If you are able to identify on site, with a high degree of certainty, the driver of each vehicle then record their sex. The same applies to pedestrians involved.

Brief Damage Description

e.g.,
- Rear bumper bar damaged
- Extensive damage to front of car
- Both nearside doors caved in.

Severity

If any of the persons involved are treated on site for injuries by doctor, nurse, ambulance man etc., record as an injury accident. If no one appears to be injured, record as property damage only. Injured persons may die later in hospital but for the purpose of this study record 'fatal' only if person dies on site.

Attended by Police (Yes/No)

Do not count the plain clothes policeman that is accompanying us on the study.

Speed Limit (km/h)

Generally 60 km/h in metropolitan area, but variations in outer areas, e.g., Main South Road, Mt. Barker Road.

Width of Road (metres)

From kerb to kerb or from edge of seal to edge of seal, including median strips.

Sketch and Comments

See instructions on form.

Features of Location

- Type of Location

  An accident shall be coded as occurring at an intersection etc. only if it occurs within 10 metres of the intersection (measured from projection of nearest kerbline on side street). Otherwise the accident is "between intersections". If it is an intersection accident, do not record number of lanes etc.

  For an accident "between intersections" the number of lanes recorded must include both carriageways where a divided road exists. The number of lanes recorded shall be the number of lanes in which traffic normally travels during peak periods.

- Road Features

  Self explanatory.

- Road Grade

  If the grade of approach for each vehicle is different, show steepest grade.

- Road Condition

During periods of intermittent rain it may be difficult to say whether road was wet at the time of the accident. If you are uncertain, leave the wet/dry section blank. A wet road is practically always "slippery" but a dry road may also be slippery if there is loose gravel, sand etc. on the surface. You should look for this but don't be mislead by loose dirt, debris etc. that falls from vehicles upon impact. (Note that the location of this debris provides a good indication of the point of impact).

Traffic Controls

- Upon Road

Raised medians for an accident within 10 metres of an intersection or junction must be recorded as islands, but at a "crossover" record as median.

- Erected

Where hazard boards, flashing bollards etc. have been placed at roadworks, accidents etc., indicate by marking No. 12.

Where police are controlling traffic for any one of a number of circumstances where normally there may be some other form of control. "Police" No. 8 takes preference.

Should an accident occur on an uncontrolled arm of an otherwise controlled intersection or junction etc. show as "no control" No. 13.

In the event of "rear enders" etc. occurring within 30 feet (10 metres) of crossings, show as such, even though a pedestrian may not be involved. It should be remembered that school crossings outside of the prescribed school hours (and therefore not working) are NOT legal crossings but must nevertheless be edited to that control, not working.

Accident Details

- Type of Accident

The initial impact or event determines the type of accident.
e.g. Hit pedestrian on carriageway = No. 9
Side swipe (same direction) then hit pole = No. 3.
Important:- If the first event is the vehicle leaving carriageway and there is a subsequent collision, you must cross two boxes..
e.g. Leave carriageway then hit pedestrian; cross No. 11 and No. 9.

Note:- Leave carriageway and overturn without hitting anything ... write No. 23.

- Vehicle Movement

The movement of all vehicles should be recorded. In the case of rear end accidents it may be difficult to determine whether the front vehicle was moving at the time of the accident. If uncertain, leave blank.

"Stopped on carriageway" implies a temporary stop at traffic signals, in queue etc. and is not the same as "parked".

- Pedestrian Movement

Only applies when a pedestrian is involved. May be difficult to code without information from witnesses. If unable to decide, leave blank.

Note that if pedestrian is crossing with Traffic signal control, code 12.

Weather etc.

- Weather

May be difficult with intermittent rain. If unsure, leave blank.

- Lighting

During daylight hours, always code 1 or 2. During darkness, if there is provision for lighting but lights are off code 3. During darkness, if there is no provision for lighting (e.g., outer areas) write N.S.L. (no street lighting).

- Traffic Conditions

This is subjective of course and all that is required is your own judgement.

Safety Equipment

- Crash Helmet

If you can see crash helmet(s) on site, code as worn.

- Safety Belt

Examine the vehicle(s) to see if belts fitted. If belts are fitted you will generally have to code as "Fitted - not known if worn" unless there is clear evidence one way or the other, e.g., injured person still wearing seat belt when you arrive.