

GOVERNMENT OF PAKISTAN
PLANNING COMMISSION
NATIONAL TRANSPORT RESEARCH CENTRE

+++

363-125

SWA

1990

07694

ISLAMABAD ROAD ACCIDENT ANALYSIS

NTRC-130

M. Sadiq Swati
Senior Chief

Shamim Ahmed Khan
Assistant Chief

January, 1990

C O N T E N T S

	<u>Page</u>
1. Summary	1
2. Introduction	2
3. Workshop	3
4. Analysis	3
4.1 Type of vehicles	3
4.2 General Conditions	3
4.2.1 Months-wise Observations	4
4.2.2 Day of Week	4
4.2.3 Hour of the day	5
4.2.4 Light Conditions	5
4.2.5 Collision Type	6
4.2.6 Junction Control	6
4.2.7 Accident Severity	6
4.3 Mechanical fault	6
4.3.1 Vehicle Lights	6
4.3.2 Break failure	7
4.3.3 Tyre burst	7
4.4 Negligence	8
4.4.1 Wrong turning	8
4.4.2 Signal/stop sign breaking	8
4.4.3 Over speeding	8
4.4.4 Over taking	9
4.5 Roads	9
4.5.1 Road Geometry	9
4.5.2 Surface Condition	9
4.5.3 Shoulder Characteristics	10
4.5.4 Junction Type	10
4.5.5 Road under-construction	11
5. Pedestrian	11
6. Accident Locations	11
7. Statements	12
8. Conclusion	13
9. Recommendations	13
9.1 Accident Location	13
9.2 General Location Sketch	14
9.3 Non-junction Accidents	15
9.4 At junction Accidents	16
9.5 Driver's Statements, Witnesses Statements and Reporting Officers, Account of Accident	16
Annexure-'A'	17

S u m m a r y

The primary objective of the study was to investigate the conditions under which most of the accidents occurred in and around Islamabad during the period of January 1986 to August 1987 and identify the black-spots using a micro computer. A total of 83 accidents were reported by the Police during the period in which 188 vehicles were involved in the 83 accidents i.e. 2.2 per accident. Out of these 106 (56%) were cars, 33 (18%) wagons, 17 (9%) trucks, 11 (6%) buses, 11 (6%) pickups, 7 (4%) motor cycles, 2 (1%) cycles, 1 (0.5%) tractor. The maximum of vehicles involved in one single accident was 3. Out of the total, 44 accidents i.e. 53% were fatal and 72 accidents i.e. 87% were in the day light. The peak month of the accidents was February in which 40 accidents i.e. 48% of the total occurred. As regard the day of week, Monday turned out to be the most hazardous in which 41 accidents i.e. 49% of the total occurred. The peak hour of the day was 2-3 PM in which 38 accidents i.e. 46% of the total occurred. 71% of the accidents were either side swipe (40%) and nose-to-tail (31%). Most of the accidents i.e. 54 (65%) occurred away from the junction. The analysis of the speed of the vehicle at the time of accident shows that 69 vehicles i.e. 36.70% of the total involved in the accident were exceeding the speed limit.

It is pointed out that all 83 accidents occurred due to the negligence of the road users as not a accident occurred due to mechanical fault or bad road condition. 66 (80%) were due to negligence of the drivers, 12 (14%) negligence of the Pedestrians and 5 (6%) due to some other road users. Out of 66 accidents which occurred due to negligence of the drivers, turning was the primary cause i.e. 57%. Other reasons include 5 over speeding (6%), 7 over taking (8%), 7 failing to stop at stop sign/signal (8%). Only 5 accidents occurred due to other reasons.

Of the 12 pedestrian accidents, 6 (50%) were fatal. All accidents occurred due to wrong road crossing by the pedestrian.

The black-spot could not be identified due to incomplete information regarding the exact location of the accidents. This objective can only be achieved if the reporting Officers clearly sketch the location map as per instructions issued with the accidents reporting booklet. Statements/reports of the drivers reporting officer etc. also need to be clearly written so that these could be easily read by the office staff.

2. Introduction

Over the past twenty years, the techniques of accident black-spot investigation have proved to be highly successful in countries such as the U.K., U.S. and Australia. As an example of how economically rewarding this approach can be, the "London Council Accident Black-spot Team", after well over 1000 schemes, has received an average first year rate of return 35%. Because of these highly cost effective results, the Overseas Unit of the Transport and Road Research Laboratory (TRRL), U.K. has put a high priority on testing the technique in developing countries. However, the technique depends upon a good standard of accident reporting and analysis and the Overseas Unit of TRRL over the past eight years has therefore put considerable effort into developing (a) an easy-to-use Police accident report booklet and (b) an easy-to-use micro computer accident analysis package specifically designed for accident on black-spot work. As a part of this programme and to collect the data of Road accidents the Overseas Unit of TRRL has developed a guideline of Road Accident report booklet intended for use in developing countries.

With a view to determine the viability of introducing the system in Pakistan the road accident report booklet was modified and translated in "Urdu" with the aim of reconciling two conflicting needs (i) to minimise the time and effort required by the reporting policeman to complete the booklet, and (ii) the need to maximise the recorded details of the accident for subsequent investigation and analysis. In particular, the booklet is designed so that the key details of the accident can be directly stored on Computer.

3. Workshop

In order to demonstrate and to test the booklet a workshop was held in the National Transport Research Centre from 8th December to 14 December, 1985. 17 Police Officers of the rank of D.S.P. to Sub-Inspector Traffic Police participated in the workshop. During the seminar the lectures were delivered by the Mr. M. Sadiq Swati, Senior Chief, National Transport Research Centre and Dr. Brain Hills, U.K. expert. The procedure for completion of booklet with the help of lectures and films were explained, in addition to practical demonstration of stage accidents.

After the successful desired results of the workshop the sufficient number of copies of the booklet were supplied to all Inspector General of Police with the request to report the all road accidents in the booklet in future and return to the NTRC for necessary analysis through Computer.

4. Analysis

A total of 83 booklets were received for the period of January 1986 to August 1987 from the Islamabad Traffic Police through D.S.P. (Traffic).

These booklets have been entered in the Computer as well as examined through the accident analysis package designed by the Overseas Unit of TRRL.

The emphasise has been given in the analysis on four main items viz. (1) general condition (2) mechanical fault (3) negligence and (4) roads condition. Therefore, the results of the analysis has been reported on the same lines.

The salient feature of the analysis are as under.

4.1 Type of vehicles

In all of 83 accidents a total of 188 vehicles were involved which means that 2.2 vehicles for accident. The type of vehicles included reported as under.

Cars	106
Wagons	33
Trucks	17
Buses	11
Pickup	11
Motor cycle	7
Cycles	2
Tractor	1
	<hr/>
	188
	<hr/>

It seems from the above that cars are to common vehicles which involved in total 188 vehicles i.e. 106 (56%) of the total.

4.2 General Conditions

The purpose of this analysis is to outline the conditions under which most of the accidents occurred. This analysis will help to identify impact of environmental condition on road accidents.

4.2.1 Months-wise Observations

The total reported accidents were for the period of 20 months

viz. from January 1986 to August, 1987. The months-wise accident details is

as under:

January	6
February	40
March	11
April	7
May	4
June	4
July	5
August	2
September	1
October	1
November	2
Total:	<u>83</u>

It can be seen from the above that most of the accidents i.e. 48% of the total were occurred during the month of February. It is pointed out that out of these 40 accidents 29 were recorded in 1986. Therefore, it may be assumed that the reporting Officers of traffic Police were quite active only during the initial period.

4.2.2 Day of Week

The accidents have been examined according to the days of week and the results found as under:

Saturday	-	4
Sunday	-	10
Monday	-	41
Tuesday	-	8
Wednesday	-	4
Thursday	-	12
Friday	-	4
Total:		<u>83</u>

4.2.3 Hour of the day

Similar to the analysis of day of week the accident records were examined according to the hour of the day as per details below:

<u>Hour</u>	<u>No. of Accidents</u>
00-01	3
02-03	1
04-05	1
06-07	8
08-09	5
10-11	5
12-13	4
14-15	38
16-17	8
18-19	2
20-21	7
22-23	1
Total:	<u>83</u>

As reported above, it seems that most the accidents i.e. 38 (46%) out of total 83 were occurred during peak time i.e. 14-15 hours.

4.2.4 Light Conditions

This analysis has been done to check the rate of accidents in different light conditions. The results derived from this analysis are reported below:

Day light	72
Night street light	7
Night street unlit	4
Total:	<u>83</u>

The general view is that most of the accident occurs during the night time due to the tiredness of drivers, vision problem etc.

But the results of the above analysis are shown that out of total 83 accidents 72 (87%) were occurred in the day light. Assuming that the accidents have not been recorded properly and the concentration have been given only on the day time's accidents, or, may be this is due to un-reported accidents.

4.2.5 Collision Type

This factor has also been examined and the results derived as reported below.

Side swipe	33
Nose-to-tail	26
Head on	9
Pedestrian	7
Over turned in road way	4
Others	4
Total:	<u>83</u>

As shown above, most of the accidents are side swipes and

Nose-to-tail i.e, 33 and 26 respectively.

4.2.6 Junction Control

This analysis is related with the type of Control, whether it was controlling by Police, signals, stop signs etc. The results of this analysis are reported below.

Not junction	54
Signals	6
Stop sign	5
Give way sign	3
Uncontrolled junction	15
Total:	<u>83</u>

4.2.7 Accident Severity

The severity of accidents have been examined and found that out of 83 accidents, 44 are fatal, 24 hospitalized 7 minors injuries and 8 are only damage of the vehicle.

4.3 Mechanical fault

This analysis has been proved the contribution of un-fit vehicles in the road accidents. Subsequently it will also help to prevent the defective vehicles on road. This analysis shows the contribution in the accidents of different type of defective vehicles.

4.3.1 Vehicle Lights

This analysis comes under the mechanical condition of the vehicle.

A total of 188 vehicles were involved in the 83 reported accidents out of 188 vehicles, 60 were with defective lights. The lights of the vehicles and the time of the accidents have been examined as per details below.

HOUR	Vehicle Lights		TOTAL
	OK	BAD	
00/01	5	0	5
02/03	0	3	3
04/05	2	0	2
06/07	13	0	13
08/09	8	0	8
10/11	7	0	7
12/13	5	3	8
14/15	56	51	107
16/17	15	3	18
18/19	4	0	4
20/21	11	0	11
22/23	2	0	2
Total:	128	60	188

4.3.2 Break failure

A total of 13 vehicles i.e., 16% were involved in the accidents due to break failure, but this was not a primary cause of a single accident.

4.3.3 Tyre burst

Next most important analysis is the tyre conditions of the vehicles. In this analysis an attempt has been made to check whether the accidents occurred due to tyre burst or not. The load condition of the vehicles at the time of accidents have also been examined. The results derived from the data available are as under:

VEHICLE LOAD	No Bst	TYRE BURST				Other	Total
		Frnt-R	Frnt-L	Rear R	Rear L		
Legal	119	1	2	1	0	37	160
Front	3	0	0	0	1	0	4
Rear	2	0	0	0	0	0	2
Side	2	0	0	0	0	0	2
Top	1	0	0	0	0	2	3
Inside	6	0	0	0	0	11	17
Total:	133	1	2	1	1	50	188

It seems from the above that the load condition of 119 vehicles out of total 188 was within the legal limit whereas 14 vehicles were over loaded as per details above.

As regard the tyre condition, at the time of accidents the tyre of 119 vehicles were O.K and no accident was occurred due to tyre burst.

4.4 Negligence

Under this analysis the results have been derived to determine the proportion of four main type of negligence viz. wrong turning, stop sign/signal breaking, over speeding and over taking. The details of the analysis are reported below.

4.4.1 Wrong turning

Out of total 83 accidents 47 i.e. 57% accidents occurred due to the wrong turning which mean that the 57% accidents occurred due to the negligence of the drivers.

4.4.2 Signal/stop sign breaking

It is found from the reported data that only 7 (8%) accidents were occurred due to failing to stop at stop sign/signal.

4.4.3 Over speeding

As this data is related to an urban area where the violation of speed limit is not easy due to curvatures, junctions, pedestrian crossings, speed breakers etc. Only 5 (6%) accidents were reported due to exceeding speed limit.

4.4.4 Over taking

Under the negligence of drivers the over taking is quite common and the analysis shows that the percentage of accidents due to over taking is 8% of the total accidents. A total of 7 accidents were recorded due to over taking. Brief results have been reported at Annexure-'A'.

4.5 Roads

This is one of the main reasons which influence the road accidents in different ways. The details analysis are as under:

4.5.1 Road Geometry

The road characteristics also influence the road accidents. The analysis the road geometry as well as road separation have been included. The results derived from the analysis are reported below:

<u>Median</u>	<u>Road Geometry</u>		<u>Gradient</u>	<u>Both</u>	<u>Total</u>
	<u>Straight flate</u>	<u>Curvature</u>			
Yes	125	8	0	0	133
No	42	10	0	3	55
Both	0	0	0	0	0
Total:	167	18	0	3	188

It may be seen from the above that out of 188 vehicles 125 were on straight, flate and median road. Whereas only 18 vehicles were on curved roads at the time of accidents. But that was not the Primary Cause of a accident.

4.5.2 Surface Condition

Road surface type and surface condition have also been examined.

The results are as follows:

Surf Condition	ROAD SURFACE TYPE			Total
	Paved	Grave	Kucha	
Dry	85	0	0	85
Wet	101	0	2	103
Other	0	0	0	0
Total:	186	0	2	188

4.5.3 Shoulder Characteristics

The shoulder width and shoulder type of the roads where a total of 83 accidents have been occurred were as under:

Type Shoulder	SHOULDER WIDTH										Total
	0	1	2	3	4	5	6	7	8	9	
Paved	0	99	12	0	0	0	0	0	0	0	111
Unpav	0	16	39	5	2	0	0	0	0	0	62
NoShr	15	0	0	0	0	0	0	0	0	0	15
Total:	15	115	51	5	2	0	0	0	0	0	188

4.5.4 Junction Type

The results of junction type analysis are as under:

Not junction	54
Cross junction	11
T junction	11
Y junction	1
Round about	1
Others	5
Total:	83

It may be seen from the above results that out of 83 accidents 54 (65%) were occurred on straight roads.

4.5.5 Road under-construction


Not a single accident was reported due this reason.


5. Pedestrian

This analysis is related with the pedestrian's accident severity. The results have been derived through the Computerized package and found that out of 83 accidents 12 pedestrians were effected out of these 6 were fatal and 5 were hospitalized. All the accidents occured due to wrong road crossing by the pedestrian.

6. Accident Locations

As mentioned earlier in the introduction chapter that the main idea behind this examination through Computerized package is to identify the blackspots and their causes. In order to sketch the accident location and accident map. The page numbers 12 and 13 of the booklet have been provided for this purpose. The specimen of pages are reproduced below:

ACCIDENT LOCATION			
61	LOCATION TYPE	City/town 1	Village/settlement 2
			Rural area 
62	CITY/TOWN/VILLAGE NAME		
63	WHERE KM POSTS EXIST	Nearst km post	64 Accident location is _____ m from km post Towards
	WHERE KM POSTS DO NOT EXIST	Distance to nearest feature such as police post, town etc _____ km	Direction towards _____

GENERAL LOCATION SKETCH - ALL ACCIDENTS	
SHOW WHERE POSSIBLE Names of roads Location of accident Location of nearest main road if accident on minor road Relation of accident site to significant buildings landmarks etc North direction	 North

NON-JUNCTION ACCIDENTS

Road A

Road B
Road C

Show direction, position and code letter of vehicles involved

ACCIDENT ROAD NAME A. _____
 Name of road B. _____
 Name of road C. _____
 Distance of accident from road B km/in* Distance of accident from road C km/in*

*CIRCLE INFORMATION TO BE RECORDED

AT JUNCTION ACCIDENTS

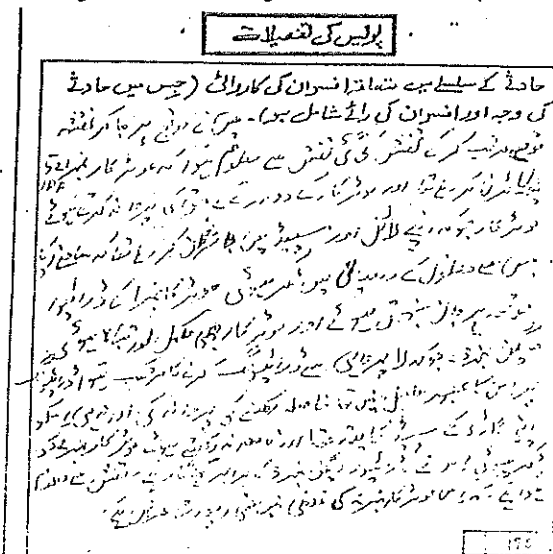
Complete diagram to show junction type Show names of roads on diagram

Show direction, position and code letter of vehicles involved

In order to identify the blackspots detailed maps for both rural and urban areas have been prepared and a copy of the same has also been provided to the D.S.P (Traffic), Islamabad. The instructions which was supplied with the booklets also contained the guideline for sketching the accident and location maps. But during the examination of the accident records it is found that the reporting officers have not reported the location and accident maps. Therefore, the accident locations could not be identified.

7. Statements

It is also mentioned here that in most of the cases the writing could not be understand. An example of such reports is reproduced below. In this respect the clear cut guidance was given to the reporting officers during the workshop,



8. Conclusion

It may be concluded from the analysis that out of total 83 accidents 53% are fatal. To outline the main causes of the accidents, three main reasons viz. mechanical fault, negligence and road conditions have been examined particularly. It is appeared from these analysis that most of the accidents occurred due to the negligence of the drivers. Out of 83 accidents 66 accidents i.e. 80% have been found due to the negligence of the drivers. The rest of i.e. 17 (20%) due to the wrong road crossing by the pedestrian and some other reasons. Assuming that this is due to lack of education and enforcement.

It is observed during the examination of the accidents records that the Reporting Officers have not recorded the details of accidents properly. They have also not sketched the location maps which is an important element to examine a accidents record. Therefore, the accident locations as well as black-spots could not be identified which was one of the main aims of this whole analysis. Difficulties have also been faced to read the statements reports recorded by the Reporting Officers. The best results can only be drawn if the Reporting Officers may records the accidents according to instructions issued as well as explained to them during the workshop.

9. Recommendations

In order to achieve the principle aims of this study it is suggested that during recording the road accidents the following guidelines may be followed.

9.1 Accident Location

This is one of the most important sections of the booklet, since the identification of accident black-spot is dependent upon the accuracy with which this is completed.

9.2

General Location Sketch

This should be filled in for ALL ACCIDENTS. This is NOT intended to be used for showing details of the collision; rather, it is intended to be an aid to the office staff in identifying on a map exactly where the accident occurred. Roads can be represented by single or narrow double lines, Landmarks or prominent buildings should also be marked, with approximate distances if possible, as these can greatly help pinpointing the accident location. The names of key streets should be marked. Examples are illustrated below.

GENERAL LOCATION SKETCH - ALL ACCIDENTS

<p>SHOW WHERE POSSIBLE</p> <p>Names of roads</p> <p>Location of accident</p> <p>Location of nearest main road if accident on minor road</p> <p>Relation of accident site to significant buildings landmarks etc</p> <p>North direction</p>	
---	--

GENERAL LOCATION SKETCH - ALL ACCIDENTS

<p>SHOW WHERE POSSIBLE</p> <p>Names of roads</p> <p>Location of accident</p> <p>Location of nearest main road if accident on minor road</p> <p>Relation of accident site to significant buildings landmarks etc</p> <p>North direction</p>	
---	--

9.3 Non-junction Accidents

An accident is considered to be a Non-junction Accident when it is further than 20 metres from the boundary lines of a junction. It will be noted that three road names are required to be given whenever this is possible, as in a town or city: the name of the road on which the accident actually occurred and the name of the roads at the junctions on either side of the accident location. This is required to make sure the correct section of the 'accident road' is pinpointed.

In sketching the collision, REMEMBER TO MARK THE CODE NUMBERS YOU HAVE ALLOCATED TO EACH VEHICLE (1, 2 etc.). Also give approximate distances, normally in metres, to the junctions on either side of the accident location.

An example is shown below:

NON-JUNCTION ACCIDENTS

Road A

① ② ③

K K K

Road BRoad C

Show direction, position and code letter
of vehicles involved

ACCIDENT
ROAD NAME A. Independence Avenue

Name of road B. Main Street

Name of road C. Main Street

Distance of accident from road B

100 m

 km(m)

Distance of accident from road C

150 m

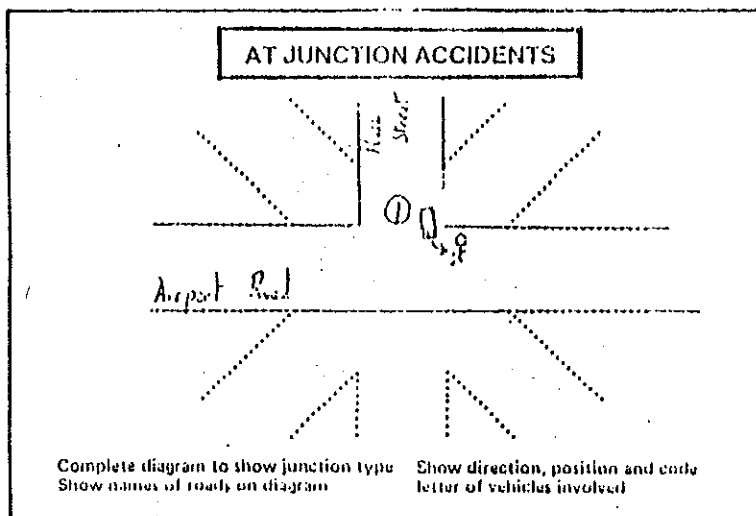
 km(m)

*CIRCLE INFORMATION TO BE RECORDED

9.4 At junction Accidents

An accident is considered to be At Junction if it is within the boundary lines of the junction or within 20 metres of the boundary lines. The dotted lines are intended to be an aid for drawing the junction - draw solid lines over those guidelines that are appropriate for the junction concerned, Remember to name all the roads at the junction and to mark the vehicles with the code numbers you have allocated to them.

An example is shown below:



9.5 Driver's Statements, Witnesses Statements and Reporting Officers, Account of Accident

The reporting officers should be careful when they write the reports and the statements should at least be readable for examiners/analysist. If insufficient space, clip additional sheets to the booklet.

A.	<u>Description</u>	<u>Condition</u>	<u>No. of accidents</u>	<u>Total No. of accidents</u>
	Month of the year	February	40	83
	Day of the week	Monday	41	83
	Hour of the day	14 - 15	38	83
	Severity	Fatal	44	83
	Collision type	Side swipe	33	83
	Junction type	Not junction	54	83
	Light condition	Day light	72	83

B. MAIN REASONSNegligence

i)	Wrong turning	47
ii)	Over taking	7
iii)	Over speeding	5
iv)	Stop sign/signal breaking	7
v)	Pedestrian's wrong road crossing	12
vi)	Others	5

Total (B) 83
