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Development of road crash report form for Punjab traffic police

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A B S T R A C T

The increase in motor vehicle population on urban roads of the province Punjab is coupled with increase in road crashes. It is badly affecting economy as large number of fatalities and property damages are involved in it. For improvement in road safety situation, the pre-requisite is the availability of comprehensive information related to road crashes and the victims, and this can be a valuable tool to diagnose safety problems and in devising countermeasures accordingly. The information is collected through the road crash report form. This research paper aims to evaluate current road crash report form that is being in used by Punjab Traffic Police, to identify its limitations and to develop the report form as per international practices. Current, form incorporates only 25 different variables and those are not adequate for in depth analysis. This study developed report form that includes76 different variables under seven different general categories. Those variables were selected as are easy to collect, concise and comprehensive. The implementation of the proposed road crash report form will be beneficial in generating the homogenous, accurate and uniform data source for all concerned road safety stakeholders for its better intervention in road safety studies and decision makings.

Introduction

Analysis of data published by Pakistan Statistics Bureau shows that number of road crashes consistently remained above 9000 each year in last decade. The World Bank produced report in collaboration to the Planning Commission of Pakistan in 2012, for 100,000 inhabitants the fatality rate for a country is 25.3 per cent due to road crashes in contrast to the developed world where, it varies between 5–10 fatalities per 100,000 inhabitants and the fatality rate for the rest of Asian region observed ranges from 12.6 to 18.3. It is substantial higher in comparison to the countries having low fatality rate like UK regardless of the fact that UK is six times more motorized than Pakistan as discussed by Batool *et al.* (2012).

Within Pakistan, this dilemma is found more acute in Punjab that is a most populous and developed province. In 2001, 5509 road crashes were occurred in the province that caused 10187 fatalities and 5162 crashes were occurred in 2010 that led 9231 fatalities in accordance with PDS (2011). A slight decline in the overall number of road crashes has observed over the years, however, the actual number is still alarming.

After the efforts of years, National Transportation Research Center (NTRC) under Ministry of Communication of Pakistan (MCP) with the assistance of JICA has prepared a Pakistan Transport Plan Study which comprises of three policies with the aim to obtain safe and sustainable transport system in a country by the year 2025 as mentioned in report by NTRC and JICA (2006). Moreover, provincial and local governments are trying at their own level to provide safer transport system to the citizens.

But none of the above clearly mentioned the establishment of road crash data bank that is essential for road safety research work. Hizal and Sharifah Allyana (2009) discussed that the collection of quality, accurate and reliable information related to road crash and its victims over a period of time is an essential tool to control and identify safety problems in transport, to identify priority action areas and to evaluate effectiveness of measures used to improve road safety.

Currently there is no centralized road crash databank at national level in Pakistan. National Road Safety Secretariat was aimed to establish centralized data base at national level, however, due to procedural requirements and limited resources it was wound up in 2008. Data is collected by various organizations within the purview of their own department requirements. Mainly, police is responsible to collect and maintain data within its jurisdiction and later data compiles at provincial headquarters for producing annual statistics. There is no standardized, uniform and comprehensive road crash report form is in practice.

A pre-requisite for developing reliable road crash data bank is the availability of comprehensive, uniform and standardized road crash report form which in its conventional form is a paper based questionnaire and in its advanced form is digitized questionnaire. Either data is collected manually or in e-form and the important is that road crash report form should be comprehensive enough that facilitates in performing in-depth investigation.

There are many different stakeholders that have interests in road crash data, for instance, traffic police, traffic engineers, road safety policy makers, policy makers in finance, transport, health and law department, researchers, automobile industry, insurance companies, public and politicians. (2003) discussed that data requirements varies among them however, the underlying objective is its better intervention in road safety management to prevent the happening of future crashes of similar nature. Keeping in view of the above discussion, this research paper involves an evaluation of existing road crash report form and to develop the comprehensive, uniform and standardized Road Crash Report Form (RCRF) for Punjab Traffic Police, in Pakistan, and can also be applicable to any other country.

Current Road Crash Report Form of Punjab police

There are two components of the Punjab traffic police in the current command and

control structure: (i) Punjab Traffic Warden Service which exists in the five big cities of the province namely Lahore, Faisalabad, Multan, Gujranwala and Rawalpindi. (ii) Traffic Police Punjab which is present in the remaining cities of the province. However, there is only difference of administrative hierarchy but the overall system is same.

Both components of the Punjab Traffic Police are using the same single page crash report form to collect the information about road crashes (copy enclosed at Appendix A). It is in Urdu language and all information is collected in description. It is mainly divided into three sections namely general information, vehicle details and road user's details. Overall, it facilitates in collecting information about 25 different variables. Table 1 summarizes the variables included in the current crash report form. However, scope of the form is limited and not as per international practices.

Following are some of its main limitations:

1. It is an un-coded form that makes it non-standardized and an inconvenient to be filled.
2. It has no proper structure or layout.
3. It is non-comprehensive.

a. There is no section about road characteristics and its geometry details (like carriageway type, functional class of road, number of lanes, existence of median or shoulder, width of median/lane/shoulder, type of shoulder, type of intersection, etc).
b. No section is available to record details about the traffic characteristics and traffic control/management devices e.g. traffic flow is one way or two ways, type of control at intersection, traffic signs.
c. A field is provided to note down the vehicle speed. However, it often remains blank because of non-availability of devices or non-technical staff.
d. Crash location is recorded in terms of street address in plain language which is very old and conventional method. It is not enough to pinpoint the exact location of crash on the network.
e. A simple location sketch is drawn and the nearby landmarks are recorded without any measurements. Thus, it is not useful in identifying the exact crash location.
f. There is no field about crash type which is useful in determining either the vehicle got collide with another vehicle or with any other object (e.g. car hit with tree).
g. A field for crash pattern is also missed in the crash Performa that describes the manner by which the vehicles initially came near to each other and got hit.
h. A field is given to note down the weather state in a plain language which may be misinterpreted as no values are assigned to it. Further, there is no field about the condition of light on crash spot which is one of the important variables that are useful in describing the prevailing environment condition of the location.
i. A section is given to record the vehicle detail but it is not comprehensive. It does not cover the aspects of vehicle information that are important for analysis. It does not facilitate in collecting the information about the mechanical condition of the vehicle. Moreover, no detail about vehicle insurance has been considered in the existing Performa.
j. A section is given to record the information about driver and road users who were involved in crash. But, this section is usually not filled, may be of shortage of time or non-awareness to the importance of this information.

k. There is no field about the number of persons killed or injured in an accident. However, this information is extracted from the First Information Report (FIR).
l. A field is given to note the cause of crash from the assigned three values i.e. road condition, vehicle condition and driver's negligence and these are not sufficient for the identification of the cause that led crash to be happened.
m. Crash report form does not provide any field for the identification of the crashes that involve only property damage.
n. No space is given for recording the statements of the witnesses and some general observations about crash.
o. No space is given to draw collision diagram of an accident.

Road Crash Report Form by other departments

In Punjab other than traffic police, Punjab Emergency Service (Rescue 1122) and District Regional Transport Authority collects this information within the purview of their own department's stakes. Rescue 1122 uses single page 'Emergency Response Form' for data collection related to first aid treatment and shifting of the victim to the nearby hospital. Thus, information about road crashes that are collected by Rescue 1122 is limited to the type of crash (fatal or injury), vehicles involved, driver's information (age, education, license) and use of safety devices (helmet or seat belt). A sample copy of an Emergency Response Form is enclosed at Appendix B.

The District Regional Transport Authority gathers this information for crashes that involve Public Service Vehicles only. Information is required for Claim Tribunal for compensation claims that are filed by the legal heirs of victims of road crashes. For this purpose, Motor Vehicle Crash Report form is used that facilitates in collecting relevant information mainly includes date, time and location of crash, vehicle details, status of route permit, fitness certificate, license, driver experience and numbers and details of persons killed or injured in crash.

Development of Road Crash Report Form

Identification of constraints and opportunities in the development of road crash report form

A very first option was considered to strengthen the current crash report form through the incorporation of necessary missing variables that can be identified by comparing the form with other world-wide good examples of road crash report form. The variables should be included in the developed new Road Crash Report Form as per Table 2 and 3. However, existing form is limited and non-comprehensive due to which it was too hard to compare it with other forms. So, the only option was to design completely new road crash report form as per international practices.

Further, there is limitation that no information can be derived from the other sources because of non-integration among organizations and all details have to be collected from the spot by the officer. Thus, to avoid the cumbersome data recording it is highly necessary to carefully trade off in the selection of variables for their integration in the design of new road crash report form to make it comprehensive enough but not to be extra ordinary lengthy. However, there is an opportunity to obtain road inventory data from the Lahore Urban Transport Master Plan project of the Transport Department which only requires updating.

Table.1 Variables included in existing Road Crash Report Form

VARIABLES INCLUDED IN CURRENT ROAD CRASH PERFORMA			
General Details	Date/time, location, classification of accident / severity, road type, road condition, weather condition, other details		
Vehicle Details	Registration number, vehicle type, age of vehicle, speed, vehicle's driver, other details		
Road User's Details (driver, passenger, pedestrian)	Age, gender, injury, alcohol/other drugs, license, safety measures, other details		
Causes of accident	Road Condition	Vehicle Condition	Driver's Negligence

Table.2 Variables included in developed Road Crash Report Form

Variables Included in Proposed Road Crash Report Form			
Road Crash Related Variables		**Road Variables**	
Crash Identifier	Hit and Run	Road Type	Central Reservation
FIR No.	No. of vehicles involved	Functional Class	Shoulder Type
Police Station No. /Name	No. of damaged vehicles	Surface Type	Lane / median / shoulder width
Crash Date	No. of drivers/	Road Condition	Horizontal Features
Crash Time	pedestrians / passenger	Number of Lanes	Vertical Features
Crash Day	No. of drivers/	Road Works	Intersection Type
Crash Severity	pedestrians / passenger	**Crash Location**	
Area Name	Crash Type	Crash at Intersection	X & Y Coordinates
Inside/Outside	Crash Pattern	Crash not at Intersectior	KM Post
Municipal Limit	Contributing Factors	Map Number	Landmark Features
Traffic Variables		**Environment Variables**	
Traffic Restriction	Speed Limit	Weather	Light
Intersection Control	Road Markings		
Vehicle Variables		**Person Variables**	
Registration Number	Tax Details	Name	Use of Drugs
Registration Year and Authority	Vehicle Type	Gender	Use of Safety Equipments (Seat Belts/Helmets)
Vehicle Make	Vehicle Defect	Age	
Vehicle Model	Tire Burst	License Type	Use of Mobile
Model Year	Vehicle Light	License Number	Driver's Error
Engine Number	Vehicle Maneuvre	Injury Severity	Passenger Position
Chasis Number	Loaded	Details of Deceased	Pedestrian Location
Fitness Certificate	Skid Length	Type of Injury	Passenger Action
Insurance No. / Company / Expiry Date	Vehicle Damage	Driver's Education	Pedestrian Action

Table.3 Developed Road Crash Report Form

Report No: *District:*

Traffic Police Crash Report Form	FIR.No:	Police Station No:	Area Name:		Crash Date	DD:
	Reporting Officer Name:	Beat No:	Inside Municipal Limit (1. Yes 2.No)	Hit & Run (1.Yes 2.No)		MM:
						YYYY:

Crash Day				Crash Time	Crash Severity		Vehicles			Drive	Passenger	Pedestrian
1.Sun	3.Tue	5.Thur	7.Sat	HH:	1.Fatal	2.Serious Injury	Involved		Killed			
2.Mon	4.Wed	6.Fri		MM:	3.Slight Injury	4.No Injury	Damaged		Injured			

Crash at Intersection

Intersection Name	
First Road Name	

Crash Not at Intersection

Road/Link Name		Distance.1 (m)	
Node.1 Name			
Node.2 Name		Distance.2 (m)	

XY MAP		Route.No		Map Number	
X		KM		Node.1/Cell No	
Y		M		Node.2	

Crash Location Sketch: Show site in relation to prominent landmarks such as bridges or km post and mark distance from landmarks. Always give street names.Mark the crash spot clearly with a cross .

North ↑

Road Type	Functional Class	Surface Type	Road Condition				No.of Lanes:		Centeral Reservation
1. Single Carriageway – One Way	1. Primary 4.Local	1.Tarred/.Bitumen	1.Good	4.Slippery	7.Flood	10.Others	Speed Limit:		1. Raised Median (a. Paved b. planted)
2. Single Carriageway – Two Way	2. Secondary	2..Mettaled/WBM	2.Poor	5.Wet	8. Speed Breakers		Road works		2. Barrier (a. New jersey Barrier b. Steel
3. Dual Carriageway	3. Collector	3.Earth	3.Muddy	6.Dry	9.Rutted/Pot holes		1.Yes	2.No	

Shoulder	Width, m				Horizontal Features	Vertical Features		Traffic Restrictions	
1. Not available	1.Lane		3.Shoulder,L		1.Straight Road	1. Flat Road	4.Hump	1.No entry of 'HTV'	4.No Parking
2. Paved	2.Median		4.Shoulder,R		2.Slight Curve	2. Gentle Incline	5.Dip	2.Speed Restriction	5.Any Other
3. Unpaved					3.Sharp Turn	3. Steep Incline		3.One Way Street	

Intersection Type		Intersection Control		Landmarks Features	
1. Not at intersection	7. Five or more	1.No Control	7.Yield Sign	1.Near Mosque	7.Near offices
2. Four way	8. Bridge/Flyover	2.Traffic Police Officer	8. Any other sign	2.Near School/College	8.Near Hospital
3. T- type	9.Underpass	3.Traffic Signal - Working	Landmarks Features	3.Near/inside village	9.Open area
4. Y- type	10.Rail crossing at grade	4.Traffic Signal-Out of ord	13.Encroachment	4.Near Recreational Place	10.Near Bus Stop
5. L – type	a. Yes b. No	5.Flashing Signal	14.Narrow Bridge/Culvert	5.Near Factory/Industrial ara	11.Near Petrol Pump
6. Roundabout	11.Other	6.Stop Sign	15. Other	6.At Pedestrian Crossing	12.In market/bazar

Crash Type		Crash Pattern		Contributing Factors	
1.Hit with pedestrian	7.Hit with non-fiixed objects	1.No impact	7.Side by side – Same Direction	1. Fault of driver	6.Fault of passenger
2.Hit with pedal cycle		2.Rear end		2. Bad weather	7.Fault of pedestrian
3.Hit with animal	8.Single vehicle crash	3.Head on	8.Side by side – Opposite Direction	3. Defect in road	8.Poor light condition
4.Hit with train	9.Crash with two or more vehicle	4.Angle – Right		4. Fault of cyclist	9.Mechanical fault in vehicle
5.Hit with parked vehicle		5.Angle – Same Direction	9.Rear to side	5. Fault of driver of another vehicle	
6.Hit with fixed objects	10.Other	6.Angle – Opposite Direction	10.Rear to rear		10.Other

Weather Conditions	Light Conditions
1.Clear	1.Daylight
2.Cloudy	2.Twilight
3.Fog/mist	3.Darkness
4.Light Rain	4.Darkness with street light unlit
5. Heavy Rain	5.Darkness with street light lit
6.Sleet/Hail	

Police Description of the accident (e.g; V1 was overtaking the stopped bus at X location when it hit V2 coming from opposite direction.)

Road Markings

1.None or faded / deleted	2.Only seperating travel directions	3.Seperating travel directions and lanes	4.Only Seperating lanes	5.Other

Vehicle Information	**Vehicle .1**	**Vehicle.2**	**Vehicle.3**
Vehicle Registration Number			
Registration Year and authority			
Vehicle Make			
Vehicle Model			
Model Year			
Engine Number			
Chasis Number			
Fitness Certificate	1.In Force 2.Not in Force	1.In Force 2.Not in Force	1.In Force 2.Not in Force
Insurance No./Company/Expiry Date			
Tax Details			
Vehicle Type *(Refer to Coding Panel)*			
Vehicle Defect *(Refer to Coding Panel)*			
Tyre Brust	1.Yes 2.No	1.Yes 2.No	1.Yes 2.No
Vehicle Light	1.Faulty 2.Misuse	1.Faulty 2.Misuse	1.Faulty 2.Misuse
Vehicle Manoeuvre *(Refer to Coding Panel)*			
Loaded	1.Legal 2.Unlegal	1.Legal 2.Unlegal	1.Legal 2.Unlegal
Skid Length (m)			
Vehicle Damage *(Refer to Coding Panel)*			
No.of non - injured person			

Driver Details	**Driver.1**	**Driver.2**	**Driver.3**
Name			
Gender	1.Male 2.Female	1.Male 2.Female	1.Male 2.Female
Age			
License Type	.Full 2.Learner 3.Expired 4.No Licens	.Full 2.Learner 3.Expired 4.No Licens	1.Full 2.Learner 3.Expired 4.No License
License Number			
Driver Injury Severity *(Refer to Coding Panel)*			
Details of the deceased	1.Died on the Spot 2.On the way	1.Died on the Spot 2.On the way	1.Died on the Spot 2.On the way
Type of Driver Injury *(Refer to Coding Panel)*			
Driver's Education *(Refer to Coding Panel)*			
Alcohol/Drug	1.Yes 2.No	1.Yes 2.No	1.Yes 2.No
Seat Belt/Helmet Worn	1.Yes 2.No	1.Yes 2.No	1.Yes 2.No
Used Mobile Phone	1.Yes 2.No	1.Yes 2.No	1.Yes 2.No
Driver Error *(Refer to Coding Panel)*			

Passenger Details (Fill the table by using code from Coding Panel)

Name	Vehicle Code	Gender	Age	Deceased	Injury Severity	Injury Type	Position	Action	Belt/Helmet
	(e.g; V1)	1.M 2.F		1.On Spot 2. On way					1.Yes 2.No

Pedestrian Details (Fill the table by using code from Coding Panel)

Name	Vehicle Code	Gender	Age	Deceased	Injury Severity	Injury Type	Location	Action
	(e.g; V1)	1.M 2.F		1.On Spot 2. On way				

Symbols	
Vehicle	
Non-Motorist	
Vehicle Direction	
Vehicle Movement	
Link/Road	
Crash	

CRASH DIAGRAM

North

Witness Information and Crash Description		
Name & Address	Description	Phone

Analysis of cause of crash and findings of team.	Remedial measure to prevent these types of crashes.

Coding Panel

Vehicle Type		Vehicle Defect		Vehicle Maneauvre		Vehicle Damage
1.Motorcycle	11.Truck	1.None	10.Windshield/Windows	1.Going ahead	11.Parked vehicle	1.None
2.Scooter	12.Tempo	2.Lights	11.Wipers	2.Right Turn	12.Changing Lanes	2.Front
3.Moped	13.Articulated Vehicle	(head,tail,signal)	12.CNG Cylinder	3.Left Turn	13.Crossing traffic	3.Rear
4.Auto Rickshaw	14.Tractor	3.Brakes	13.Truck coupling	4.U-turn	streams	4.Right
5.Qingqi	15.Light Goods Van	4.Exhaust System	14.Trailer Hitch	5.Overtaking	14.Other	5.Left
6.Car	16.Heavy Goods Van	5.Suspension	15.Safety Chains	6.Merging		6.Top
7.Jeep	17.Animal Drawn	6.Puncture/Blowout	16.Others	7.Diverging		7.Undercarriage
8.Taxi	18.Cart	7.Worn/slick tires		8.Reversing		8.Multiple
9.Bus	19.Other Vehicle	8.Wheels		9.Sudden Start		9.Other
10.Mini Bus		9.Body, Doors		10.Suddent Stop		

Injury Severity	Injury Type		Driver's Education	
1.Fatal	1. Dead before report made	abrasions,swelling, limping etc	1.Illeterate	6.Graduate
2.Serious Injury (H)	2.Visible signs of injury, as bleeding,	4.No visible injury, but complaint	2.Primary	7.Post Graduate
3.Slight Injury (NH)	wound or distorted member or had	of pain,or momentary unconsciousness	3.Secondary	8. Other
4.Non-Injury	to be carried from scene		4.Matriculation	
5.Unknown	3.Other visible injury, asbruises,		5.Intermediate	

Pedestrian Action	Passenger Action	Pedestrian Location		Passenger Position
1.Standing	1.Sitting	1.On pedestria crossing		1.Front seat
2.Crossing road	2.Standing	2.Within 50 m of pedestrian crossing		2.Rear seat
3.Walking along middle	3.Boarding	3.On traffic island		3.Pillion rider
4.Walking along edge	4.Alighting	4.In center of road		4.Bus passenger
5.Playing on road	5.Falling	5.On footpath		5.Back of truk or pick up
6.Other	6.Other	6.On shoulder	7.Other	6.Other

Driver Error			
1.None	7.Overtook on curve	13. Asleep/tired	19.Disregarded police officer
2.Starting off carelessly	8.Cut in sharply after overtaking	14.Disregarded traffic light signal	20.Bad use of headlight
3.Exceeded lawful speed	9.On wrong side of the road	15.Disregarded traffic sign	21. Other
4.Did not give right of way to pedestrian	10.Failed to give signal	16.Lack of attention	
5.Followed too closely	11.Wrong Signal	17.Wrong parking location	
6.Impropoer overtaking	12.Impropoer turn	18.Failed to give way to vehicle	

Committee Members		
	Name	Signature
Police Officer 1		
Police Officer 2		

Selection of Variables

Data variables for the proposed crash report form has been chosen by the thorough study of the following manuals.
a. USA's Model Minimum Uniform Crash Criteria, MMUCC (2012).

b. Common Accident Dataset for Europe, CADAS (2011).

c. Data systems: A road safety manual for decision makers and practitioners by World Health Organization, WHO (2010).
d. Road Safety Guidelines for Asia Pacific Region by Asia Development Bank, ADB, (2003).

These manuals recommend minimum data elements based on extensive research on data sources and the available systems in their respective study area. Further, road crash report form for the traffic police of various countries particularly Tamil Nadu (India), Virginia (USA), UK (Stat 19), Malaysia (POL 27 form) and Zambia has been considered as a sample to being good world-wide examples.

Other than these it was also considered that such variables and their respective values are considered that are useful for analysis, easy to collect and concise and comprehensive for precise and quality data collection. It was important to strike the right balance between amount of detail to be captured about crash and the ability of the police staff to do that in terms of availability of time and staff. The details of variables are tried to cover up to the level that facilitates in understanding the circumstances in which crash occurred however, the collection of un-necessary details is avoided.

Structure of Developed Road Crash Report Form

The road crash report form is developed in a way that facilitates the police officer to commence data collection from the most important and perishable information (which will be present on the spot as a post impact e.g. skid marks) to the information that will be obtained later on like witness statement. The form is tried to be as much coded as it is possible in order to make its format simple, easy to understand and convenient in use. Total 76 different variables are incorporated into seven different categories. Table.2 represents the variables that are included under various categories in the proposed road crash report form for the traffic police of the province Punjab. Further, space for location sketch, collision diagram and reference guide for coding as a panel are also included in the form. The road crash report form that is developed for the traffic police is given in Table.3.

Recommendations

Author recommends that the implementation of the developed road crash report form will bring improvement in road traffic safety and it will act as a valuable tool for the establishment of comprehensive, homogenous and accurate road crash databank. Further, the data collected can be used as an evidence for the evaluation of road safety interventions.

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