REQUIREMENTS OF ROAD TRAFFIC INJURY PREVENTION IN KARACHI

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ABSTRACT

While road traffic injuries are the second leading cause of death worldwide among both children (5 – 14 years) and young people aged 15 – 29 years (WHO, 2004), its prevention is a neglected field especially in developing countries like Pakistan.. Fatality rate in the biggest city of Pakistan i.e. Karachi is about 4 times to that in Japan. The severity index is also very high (about 50%).

This paper describes some of the results of a study conducted by student of NED University, Karachi, under the supervision of author of this paper. Enforcement plays a vital role in prevention of road accidents. However it is quite weak in Karachi. A number of cuts in medians have been closed in recent years to reduce points of conflicts. This has caused an adverse effect on road safety, as a large number of vehicles are found moving in the wrong direction. Therefore, the magnitude of this wrong side movement and other causes of accidents have been discussed. Breaking of traffic signals in the absence and presence of traffic police have also been examined to look into the effectiveness of traffic police posted at signalized intersections. The paper also includes possible measures which could be taken for road traffic injury prevention in Karachi and other similar big cities of developing countries.

A significant percentage of drivers were found to drive their vehicles in the wrong direction. Majority of them were motorcyclists. Lot of variation was observed in the degree of effectiveness of presence of traffic police in reducing red light signal violations depending on the number and mobility of traffic police at different locations.

1. INTRODUCTION

Road traffic injuries are major but neglected problem throughout the world specially in developing countries including Pakistan. As per WHO the number of people killed in road traffic crashes each year is estimated 1.2 million, while the number injured could be as high as 50 million. In low income & middle income countries road accident deaths are expected to increase by as much as 80% between 2000 & 2020 [1]. In economic terms, the cost of road crash injuries is estimated at roughly 1% of gross national product in low-income countries. As per CDGK, Transport & Communication Department, on an average one person is killed every 14 hours due to road accident in Karachi. Fatality rate in Karachi is about 4 times to that in Japan and seventy index is also very high (about 50%). This critical situation require concerted efforts for effective & sustainable prevention. A study of road accident & traffic enforcement was conducted by Final Year Engineering and M. Engineering students of NED University under the supervision of author of this paper in 2005-06. This paper discusses road traffic injury situation in Karachi in the light of this study and recommends possible measures which may be taken for improvement.

2. VEHICULAR GROWTH

Table 1 shows the number of cars & motorcycles registered during last four years (2001-05), as per Excise & Taxation record (Daily Jung, Nov.2005). a rapid increase in the population of cars is taking place, which is mainly due to easy car leasing policy of banks. On an average 125 additional cars are coming on the road each day increasing congestion & safety problem. Table 1 also shows fast growth of two wheelers, which are most vulnerable to severe & fatal accidents. The share of two wheelers is about 38% of total vehicular population (1.4 million) of this mega city of Pakistan. As per DIG traffic [2] rate of growth of total registered vehicles has been 2.83, 5.69, 8.74 & 11.85 percent during 2002, 03, 04 & 05 respectively.

Table 1- Number of cars and motorcycles registered during 2001-05

Year	Registered Cars (thousands)	Registered Motorcycles (thousand)
2001-2002	16.8	7.7
2002-2003	22.5	13.5
2003-2004	33.9	41.3
2004-2005	45.5	65.7

3. PRESENT SITUATION OF ROAD SAFETY

Table 2 shows Accident Rates, Fatality Rates & Severity Index during 1994-2004 [4]. While there is a general trend of decrease of Accident & Fatality Rates, the Severity Index has remained very high (around 50%) in Karachi in comparision to 2-4% in developed countries, which is mainly due to lack of medical aid and delayed treatment.

Table 3 shows involvement of various types of vehicles in road accident during 1994-2001 [4]. Except 1995, the share of motorcycles in total road accidents has been highest which is obvious due to large number of two wheelers on road. Second highest involvement is that of minibus, which may be due to long hours of driving (12-15 hours) and poorly trained drivers [5]. As per Hemline P, the risk of being involved in a crash doubles after 11 hours of work.

Table 4 shows involvement of pedestrians in total and fatal accidents during 1994-2002. Pedestrians are involved in more them 40% of total accidents (except-2001) and more than 50% of fatal accidents, which is higher than those observed- in Delhi and Colombo (42 & 38%). These high figures warrant better pedestrian facilities, protection of right of way of pedestrians at pedestrian crossings and imposing lower speed limits. Pedestrians incur a risk of about 80% of being killed at a collision speed of 50 km/h as opposed to a 10% risk at speed of 30 km/h (Mckay, 83 & Tingvell, 2000).

Table 5 shows increasing involvement of drivers in wrong direction movements even on main roads like University Road. This is a new trend which is very risky and need immediate attention. As many cuts in the medians have been closed in last two years, many drivers move in wrong direction to avoid long correct route. The total percentage of drivers observed moving in wrong direction were found to vary between 12 to 86. The involvement of motorcyclists in this wrong act was quite high varying between to 13.3 to 100.0 percent.

Table 2- Accident and Fatality Rates

Year	Accident Rate per 10,000 vehicles	Fatality Rate per 10,000 vehicles	Severity Index
1994	14.0	6.5	47.1
1995	12.0	6.25	53.0
1996	13.7	6.8	49.8
1997	11.1	6.0	51.1
1998	11.3	5.9	52.2
1999	10.2	5.6	55.3
2000	10.4	5.3	51.2
2001	11.0	5.3	48.0
2002	10.6	5.6	52.2
2003	10.3	5.2	49.8
2004	9.2	4.7	50.5

Table 3- Involvement of various vehicles in road accidents (%)

Vehicle / year	1994	1995	1996	1997	1998	1999	2000	2001
Motorcycle	24.5	24.0	29.4	32.1	33.2	30.0	33.4	37.2
Rickshaws	3.3	4.4	4.6	4.0	3.1	5.5	4.5	4.1
Cars	20.9	10.0	13.9	13.1	10.8	10.2	9.8	10.0
Pickups	14.0	13.0	13.5	12.0	15.4	14.0	16.8	10.8
Trucks	3.0	5.3	5.3	5.5	3.4	3.0	2.6	3.7
Minibus	24.0	31.6	26.3	26.0	26.7	25.8	25.2	25.0
Bus	7.0	8.9	4.9	5.3	4.5	10.0	4.35	5.7
Others	3.3	2.8	2.1	2.0	2.9	1.5	3.35	3.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4- Pedestrian involvement in accidents

Year	Involvement in Total Accidents %	Involvement in Fatal Accidents %
1994	44.2	62.9
1995	48.2	59.5
1996	44.4	52.7
1997	46.6	56.9
1998	45.4	56.1
1999	48.0	59.4
2000	47.1	57.1
2001	34.0	51.0
2002	42.2	57.3

Table 5- Wrong direction movement

Location	Percentage of total traffic moving in wrong direction	Percentage of motorcyclists moving in wrong direction
Water Pump	36.0	53.0
Nagan Chowranghi	19.7	32.3
Shara-e-Faisal (CSD)	12.0	13.3
Samama, University Road	15.0	60.0
Karachi University Gate	86.0	100.0

4. ENFORCEMENT

Table 6 shows significant percentage of drivers, specially motorcyclists breaking traffic signal even in the presence of traffic police. The total percentage of those involved in traffic signal violation varied from 0% at Regent Plaza Intersection to 22.3% at NIPA Chowrangi.

Out of six locations surveyed, at three locations the effect of presence of police was found to be insignificant. At one location (Rashid Minhas Intersection at Shara-e-Faisal) increase in violation (by bus, mini & coaches) was observed in the presence of police instead of decrease, which shows very weak enforcement. However, at other three locations, where traffic sergeants were present, significant drop in violations (10.3 to 30.9%) was recorded, which shows that significant improvement can be obtained if enforcement is strong.

Table 6- Traffic signal violations

Location	Violation in the presence of police %	Violations in the absence of police %	Difference % (Degree of effectiveness)
Rashid Minhas Intersection (Shara-e-Faisal)	4.0	5.2	1.2
NIPA Chowranghi	22.3	37.6	15.3
Water Pump	13.0	44.0	31.0
Aisha Manzil	7.5	10.3	2.8
Regent Plaza Intersection	0	12.0	12.0
Sakhi Hasan Chowranghi	7.7	9.3	1.6

5. CAUSES OF ACCIDENTS

An accident occurs due to some error in Road-Vehicle-User System. Following are some of the common reasons of road accidents in Karachi and other cities of Pakistan:

- Over speeding and overloading
- Poorly trained drivers
- Fatigued public service vehicle drivers
- Use of drugs
- Careless attitudes of drivers and pedestrians
- Easy licensing and malpractices in issuing license
- Unfilled cuts and open manholes
- Unfit vehicles
- Breaking of traffic signals and moving in wrong directions
- Lack of strict enforcement

6. RECOMMENDATIONS

Road safety measures should include the following:

- Reduce exposure to risk to prevent road traffic crashes occurrence
- Reduce severity of injury in the event of a crash
- Reduce the consequences of injury through improved post collision care

Haddon matrix may be used which deals with improvement of human, vehicle, road environment factors to take care of pre-crash, crash and post-crash phases.

Challenging but achievable road safety targets are to be developed properly implemented and well monitored. Sweden's Vision Zero (fixing ultimate goal of no severe road injury) and "Sustainable Safety Policy" of Netherlands should be taken as model. Speed management would be one of control themes. Experience with Netherlands with 30 km/h zones had shown that a causality reduction of 22% could be achieved [1].

Keeping in view very large number of motorcyclists involved in road accidents, use of helmet by all motorcyclists should be ensured. Availability of helmets suitable for tropical climate at cheaper price is necessary for that. Head trauma is the main cause of death in road accidents of two wheeler riders. Also encourage use of seat belts in cars. Use of seat belts in front seats can reduce fatalities 40-65% [1].

One of the major risk factor in road traffic is the quality and availability of emergency services and good trauma care. Increasing the number of hospitals equipped with adequate trauma facilities and authorized to deal medico legal cases (at least one in each town of the city), quick transportation of victims to the hospitals and proper post crash care are also warranted to reduce death and disability of those injured in accidents, as most of the road deaths occur within few hours of accidents.

Enforcement levels need to be high. Engineering measures alone cannot improve the situation until unless supported by strict enforcement. For example construction of a well designed bus layby is useless unless buses are made to use it. Similarly staggering of an

intersection for reducing point of conflicts is useless if drivers are allowed to move in wrong direction, as happened after closing many cuts in the median of University Road and other roads. Racing, overloading, overtaking from wrong side, stopping buses in the middle of road and breaking of red-light cannot be checked without strict enforcement. Laws are effective only when the probability of being caught is made very high. Beside other measures, for better enforcement, the number of traffic police and their mobility will have to be increased. Moreover, their wages and allowances should also be increased in relation to their tough work.
The engineering measures should take into account human limitations, making task of driver easier and providing adequate information.

As a long time measure, improve road user behavior through traffic education and awareness. As per Mr. Downing of TRL (UK) we should focuss more on educating and training children to get better results and to have new drivers with right attitude from the start [6]. Due to increased use of motorcycles, motorcyclists should also be trained and tested, as being done in Singapore. However, studies show that it is not necessary that people act according to what they know is correct. Some groups like teenagers even end up doing opposite of what they are told is correct [3]. For effective education there should be joint efforts by community leaders (including religious leaders) media, schools and professionals.

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