TRAFFIC ACCIDENT RISKS IN DEVELOPING COUNTRIES: SUPERSEDING BIASED APPROACHES

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Current conditions

Traffic accidents are a major problem in both developed and developing countries, although related to different historical reasons and circumstances. The single clear, common feature is the impact caused by the use of the automobile.

In the industrialised countries, the traffic accident problem started to become serious in the first decades of the century in the US, when the number of automobiles increased sharply. After WWII, the problem became serious also in most European countries, and Japan as well. In developing nations, the traffic accident problem has been increasing since at least the 1970s, when several countries became dependent on motorised transportation in general and on automobile transportation in particular. It is reaching epidemic proportions.

Traffic accidents are a major public health problem all over the world. It is estimated that 1.2 million road traffic deaths occur and about 50 million people are injured in the world every year (WHO, 2004), most of them in developing countries. From a public health perspective, traffic fatalities have become increasingly more significant among overall fatalities and are affecting mainly the most vulnerable users. Actual figures are certainly higher than those reported, due to underreporting, the fail in relating reported deaths to traffic causes and the fail in registering post-accident deaths. The number of injuries is unknown, once the mentioned drawbacks are even more severe. If we assume a 1:15 ratio between killed and injured people, and the aforementioned global number of fatalities, then we may estimate a world figure of about 11 million injured people per year.

If current traffic safety conditions in developing countries are already extremely serious, it will undoubtedly worsen in the near future, in face of the rapid increase in the use of motorised means, within a travelling and social environments that are not prepared to experience such changes. The increased use of motorised means, especially automobiles and motorcycles, have been pursued intensively by most developing countries in an irresponsible, socially unacceptable way. As will be discussed below, traffic accidents are and will continue to be the worse transport-related externality in developing countries, unless a dramatic change in current policies is made.
A social perspective: who hits who

The most important questions from a social perspective relate to who is harmed by traffic accidents and who is responsible. Early studies made with data from the 70’s in four developing countries show that pedestrians, cyclists and motorcyclists (the most vulnerable roles) accounted for 56 per cent to 74 per cent of fatalities (Hill and Jacobs, 1981). This is the main difference with respect to developed countries, where the corresponding figure is 20 per cent (Guitink and Flora, 1995).

In developing countries, the share of non-motorised means (pedestrians, cyclists) and that of motorised (all forms of motor two wheeler vehicles) in traffic accidents vary according to fleet composition. For instance, in Asia, where motorcycles abound, they are responsible for a high share in fatal accidents, while in Latin America in general and Brazil in particular, motorcycles correspond to a small part of the fleet and pedestrians and cyclists are the most harmed by traffic accidents (tables 1 and 2).

Table 1: Condition in traffic of people killed in traffic accidents, selected countries.

<table>
<thead>
<tr>
<th>Country</th>
<th>Fatalities (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pedestrians</td>
</tr>
<tr>
<td>Developing</td>
<td></td>
</tr>
<tr>
<td>Thailand, 1987</td>
<td>47</td>
</tr>
<tr>
<td>South Korea, 1995</td>
<td>42</td>
</tr>
<tr>
<td>Poland, 1992</td>
<td>40</td>
</tr>
<tr>
<td>East Germany, 1989</td>
<td>30</td>
</tr>
<tr>
<td>Malaysia, 1994</td>
<td>15</td>
</tr>
<tr>
<td>Developed</td>
<td></td>
</tr>
<tr>
<td>Japan, 1992</td>
<td>27</td>
</tr>
<tr>
<td>Germany, 1993</td>
<td>17</td>
</tr>
<tr>
<td>NL, 1990</td>
<td>10</td>
</tr>
<tr>
<td>Australia, 1990</td>
<td>18</td>
</tr>
<tr>
<td>USA, 1995</td>
<td>13</td>
</tr>
</tbody>
</table>


Table 2: Condition in traffic of people killed in traffic accidents, selected cities.

<table>
<thead>
<tr>
<th>City</th>
<th>Fatalities (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pedestrians</td>
</tr>
<tr>
<td>Delhi (India)(^1), 1994</td>
<td>42</td>
</tr>
<tr>
<td>Bandung (Indonesia)(^1), 1990</td>
<td>33</td>
</tr>
<tr>
<td>Beijing (China), 1994(^2)</td>
<td>16</td>
</tr>
<tr>
<td>Colombo (Sri Lanka)(^1), 1991</td>
<td>38</td>
</tr>
<tr>
<td>Nairobi (Kenya)(^3), 1977-94</td>
<td>65</td>
</tr>
<tr>
<td>São Paulo (Brazil)(^4)1999</td>
<td>51</td>
</tr>
</tbody>
</table>

(a) motorised two-wheelers; (1) Mohan, 1999; (2) Navin et coll, 1994; (3) Khayesi, 1997; (4) CET, 1999.
When such figures are adjusted for population on each age group, there is often a common pattern of increasing rates with increasing ages. In Argentina, for instance, motor vehicle fatality rates per 100,000 people in 1990, adjusted for population, were about 3-4 for the group up to 14 years old, about 10 in the ‘productive phase’ (from 25 to 44 years old) and more than 15 for the elderly (over 65 years old). A similar pattern (although with very different figures) was identified for other Latin American countries such as Chile, Brazil, Costa Rica and Mexico (Roberts, 1997). With cities, the same pattern holds, although local social and transport characteristics may introduce differences.

Traffic fatalities and gender

Males outnumber females as traffic accident victims. This reflects a public health issue but should not be used for comparisons in transport analysis without the proper accounting for the degree of exposition to traffic – distances travelled on roads – and to the type of exposition as well – the roles played while circulating, that of pedestrians, cyclists of vehicle occupants. In the Americas, traffic fatality rates adjusted for age and gender population shows a common pattern: male rates are always higher than female’s, in a proportion of about 1 to 3 or 4: in Argentina, male fatality rate was 12 as compared to female’s fatality rate of 4; in Chile, corresponding figures were 15.6 and 4.2 and in Costa Rica corresponding figures were 19.6 and 4.8 (Roberts, 1997). Such figures still do not account for the exposure to traffic.

A better example may be that of São Paulo: males make 2.0 trips per day as compared to 1.7 by women (CMSP, 1997); however, males correspond to 76 per cent of pedestrian fatalities and 86 percent of vehicle occupant fatalities (CET, 1997), revealing a disproportionate exposure to danger.

The hidden effect: disabled people

Accident data analysis uses to concentrate on fatalities and on the overall number of injured people (whenever available). It is often neglected that traffic accidents cause several physical damages to those who survive. Some of these effects are temporary, some are permanent. Among the latter, some people will be totally impaired for most activities, others will be partially harmed. A study made in 1990 by the Pan-American Health Association with nine-teen countries in the region (Roberts, 1997) showed that 29 percent of deaths attributed to injury were due to intentional causes (homicides, suicides, war) while 71 percent were due to unintentional causes. Among the latter, motor vehicles were the most important single cause, with 39% of all cases.

In the developing world a large number of hospital beds are occupied by road casualties, representing high social security costs for often tiny budgets. The personal and social costs of these injuries are enormous and are aggravated by the lack of

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### Table 3: Traffic fatalities by age-group, selected countries

<table>
<thead>
<tr>
<th>Age Range</th>
<th>South Korea</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Thailand</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>18.6</td>
<td>9 ( &lt;15)</td>
<td>19.7</td>
<td>18.8</td>
<td>9.5</td>
</tr>
<tr>
<td>15-20</td>
<td>2.9</td>
<td>47 (15-39)</td>
<td>29.8</td>
<td>22.0</td>
<td>29.1</td>
</tr>
<tr>
<td>21-30</td>
<td>10.3</td>
<td>24 (40-59)</td>
<td>23.9</td>
<td>29.1</td>
<td>34.1</td>
</tr>
<tr>
<td>31-40</td>
<td>12.1</td>
<td>20 (&gt;60)</td>
<td>18.7</td>
<td>12.9</td>
<td>19.4</td>
</tr>
<tr>
<td>41-50</td>
<td>13.1</td>
<td>7.3 (&gt;60)</td>
<td>17.3</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>(&gt;51)</td>
<td>42.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

proper social security support to most of the poor people affected by the problem. World figures from country-level studies estimate that traffic accident costs correspond to 1 to 2 per cent of the GNP. In the case of Brazil, annual urban costs of traffic accidents were recently estimated as R$ 5.4 billion (U$ 2 billion) corresponding to about 0.5% of the GNP; if highway accident costs are added, the final figure goes up to more than R$ 10 billion (U$ 4 billion).

Figure 1 shows the estimated overall consequences of traffic accidents in the city in 1995.

**Vehicles involved in accidents**

Motorised vehicles in general are much more damaging, in face of the much higher kinetic energy involved and its harming potential. However, actual damage depends on the mix of motorised vehicles, the speed and the behaviour of drivers. When motorised vehicles are large (trucks, buses and automobiles) or travel at high speeds (automobiles and motorcycles) danger of severe harm is much higher, especially against pedestrians and cyclists (and motorcycles drivers as well). As a general rule, in Latin America and middle-income Asian countries automobiles are more numerous than motorcycles, while in Africa and low-income Asian countries motorcycles - sometimes along with mini buses - constitute the larger share. In a large city such as Delhi, traffic mix is very complex, with seven different vehicles using streets. Accident patterns reflect such complexity and motorised vehicles play a major role as causes of traffic fatalities.

Fig. 1: Tree of social costs of traffic accidents (São Paulo, 1995)\(^1\)

\[\begin{array}{c}
\text{Victims} \\
\text{60,000}
\end{array}\]

\[\begin{array}{c}
\text{Fatal} \\
\text{2,300}
\end{array}\]

\[\begin{array}{c}
\text{Injured} \\
\text{57,700}
\end{array}\]

\[\begin{array}{c}
\text{Light/moderate} \\
\text{48,800}
\end{array}\]

\[\begin{array}{c}
\text{Serious/critical} \\
\text{8,900}
\end{array}\]

\[\begin{array}{c}
\text{Stayed in hospital} \\
\text{11,000}
\end{array}\]

\[\begin{array}{c}
\text{Post hospital treatment} \\
\text{(129,000 days)}
\end{array}\]

\[\begin{array}{c}
\text{Recovered} - 3,050 \\
\text{Irreversible} - 5,850 \\
\text{(1,100,000 days)}
\end{array}\]

\(^1\) figures in ‘people’ (except for days, as noted); estimated values; current figures are about 20 per cent lower due to safety programs.

Overall, Mohan and Tiwari demonstrate that VRU - vulnerable road users, seen as pedestrian, cyclists ad motorcyclists - 'constitute 77 per cent of the fatal road traffic accident victims in Delhi and that trucks and buses are involved in almost two-thirds of the crashes' (1998, p35). In Hanoi, motorbikes are responsible for 61% of accidents (Bell and Kuranami, 1994).
This accident pattern is completely different from that of cities of developing countries with high percentage of automobile usage. Table 4 shows, for São Paulo, that cars are involved in most traffic accidents and particularly in 70 per cent of pedestrian accidents.

Table 4: Traffic accidents by involved vehicles, São Paulo, 1997.

<table>
<thead>
<tr>
<th>Accident type</th>
<th>Vehicles involved (%)</th>
<th>Cars</th>
<th>Motorcycles</th>
<th>Trucks</th>
<th>Buses</th>
<th>Bikes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian</td>
<td></td>
<td>70</td>
<td>11</td>
<td>6</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Vehicular, damage-only</td>
<td></td>
<td>70</td>
<td>2</td>
<td>19</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>Vehicular, with victims</td>
<td></td>
<td>62</td>
<td>19</td>
<td>9</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>


**The impact of the automobile: the death payroll**

The increase in accidents is related to the increase in heavy or speedy motorised vehicles, especially automobiles. Relating the number of fatalities to the number of automobiles in a country with rapidly growing auto fleet may be very useful to estimate its impact.

The increase in car use has had serious negative effects in all Eastern Europe however they appear to have been more dramatic in Eastern Germany. The motorization rate almost doubled between 1988 and 1992 (from 225 to 415 cars per thousand people). From 1989 to 1991, traffic fatalities increased from 1,784 to 3,759 (111 per cent) and that of traffic injuries from 41,037 to 83,580 (104 per cent) (Pucher and Lefèvre, 1996). This means that the increase in the number of vehicles in this period (about 1.5 million), was related to 3,950 extra fatalities and 85,086 extra injuries to people (adding 1990 and 1991 events). Although the use of car alone may not be blamed for all problems (the whole society passed through profound behaviour changes), it is undoubtedly the main factor behind such enormous social price. Not considering the differences that would arise from making a yearly account of the fleet increase, it may be said the each additional 1,000 cars in Eastern Germany led to 2.6 extra fatality and 56 extra injuries. The same negative consequence happened in other socialist countries: in Poland, the number of traffic fatalities per thousand people rose from 13.4 in 1984 to 18.1 in 1992 (Pucher and Lefèvre, 1996) and in Hungary from about 16 in the 80's to about 24 in 1990 (Brühning, 1997). In Poland, each additional 1,000 cars purchased between 1989 and 1991 is related to 1.8 extra traffic fatality and about 27 extra injured persons (assuming 15 injuries per each fatality) (basic data from Reksnis, 1995). If we now consider China, the recent increase in vehicle fleet from 1994 to 1997 was of about 6 million (2 million a year), while yearly traffic fatalities increased from 66,362 to 73,861 (Dianpin, 1999), Therefore, every new 1,000 vehicles in China may be associated with 1.25 extra traffic fatality.

In addition to such impacts, the increase of accidents was made at the expense of the most vulnerable roles: pedestrians and cyclist are the most harmed in the former socialist countries, corresponding, for instance, to 40 per cent of fatalities in Eastern Germany, 49 per cent in Poland and 46 per cent in Hungary (Pucher and Lefèvre, 1996).

These estimations lead us to a key issue for developing countries: how many people will die or get handicapped until traffic safety improves? The technical, even cynical view that ‘ultimately’ traffic accidents will decrease has to be firmly rejected.
Alternative approaches to understanding current conditions

The increase in the number and gravity of traffic accidents is directly related to the increase in the use of motorised transport, especially that of private cars. This problem originated in developed countries in the first decades of this century. Early on, accidents were considered either an act of God, or an unavoidable consequence of modern life. Only as accidents became increasingly common throughout the physical space of road networks, industrialised countries began to realise they were facing a new phenomenon. The first major change was seeing the accident as a man-made problem and no longer as a question of fate. Therefore, they could be prevented. The second major change that followed was seeing the accident as a public health problem, therefore deserving special attention from the state. From a public policy point of view, the transformation of the accident problem into a vital political issue became a major factor to be acknowledged. The mobilisation of society and the State around this issue led to new combined efforts in dealing with accidents.

Unlike developed countries, the accident problem in developing countries has not yet assumed the status of a social issue. Public acknowledgement of the problem is still divided into conflicting views, ranging from the ‘fatalistic’ to the ‘unavoidable-cost-of-development’ approaches. Therefore, policy decisions have entailed different and sometimes conflicting actions, pursued independently by various public agencies, with poor outcomes.

Built environment and accidents: unsafe in any place

Traffic accidents occur in built environments that is a man-made environment. Both the way the city is constructed, and the way the circulation structure is formed, have a direct effect on the nature of traffic conflicts and hence the probability of traffic accidents. A crucial issue is the vulnerability of the roles played in traffic: non-motorised roles, as pedestrians and cyclists (the majority in developing countries), are much more vulnerable because accidents affect them more severely.

As stressed before, there are several difficulties in relating accidents to the possible explanatory factors. A relative idea of a country's situation can be obtained by analysing two accident rates. The first represents the accident-propensity of the space, by revealing how many fatalities are associated with each motorised vehicle. The second rate shows the inequity-propensity of the space, by revealing who is being harmed, pedestrians, cyclists, driver and/or passengers. As shown before, higher propensities are characteristic of developing countries: more people die per vehicle and, among the killed, the majority are the most disadvantaged.

The actual result of this sort of spatial occupation reveals a hidden feature of the built environment in developing countries: it is inherently dangerous for the majority of the population. This situation derives from several factors related to the built environment that was organised. First, street systems have been either constructed or adapted to allow for greater mobility in space, implying relatively high average speeds by motor vehicles. Most of the adapted streets do not have proper sidewalks, or do not have sidewalks at all, forcing the pedestrians to share the space with vehicles. In addition, street widening is often made at the expense of sidewalks, squeezing the pedestrians into the remaining space and generating large distances to be traversed. When new roads are open, they usually cross high density pedestrian areas, changing a once pedestrian-friendly environment into a new, automobile-friendly one. Urban social networks are disrupted and remaining pedestrian movements have to face heavy traffic. The ultimate objective of this urban surgery is to insert a grid-pattern paved
street system, where mobility is enhanced for those using private transport. The street is turned from a habitat for people into a habitat for cars.

Second, these new road systems require a higher level of flow optimisation, ensured by proper traffic management techniques, especially one-way streets and signal coordination. Such measures tend to allow for higher speeds, further restraining pedestrian movements. As stressed by Wright (1992, p7 and p179) when criticising the ‘soft’ image marketed for the car ‘most realistic images of the automobile include...the disappearance ....of the elementary right to walk safely ...'(and the causation of) ....traffic accidents that kill more people than do the machines of war'.

The coexistence of high speed motor traffic and low speed pedestrian traffic make accidents unavoidable: this is especially problematic in areas of intense pedestrian traffic, such as those in front of schools, bus stops, parks and commercial areas. The existing circulation environment turns out to be inherently dangerous and the situation is uncontrollable. As stated by Sachs (1992, p192) ‘space conformed to speed destroys space conformed to the pedestrians.’

The failure to acknowledge the importance of the built environment, along with a persistent attempt of explaining accidents as ‘behaviour’ faults, lead to faulty diagnoses about the nature of the problem and hence to less-than-optimal policy proposals. In historically shaped pedestrian and cyclist environments being transformed into motorised environments, to blame pedestrians and cyclists can be called ‘blaming the victim’ (Irwin, 1985, p45). Moreover, the assumption that in developing countries pedestrians and cyclists are harmed more just because they happen to be more numerous does not diminish the social nature of the problem. Conversely, it highlights the violent imposition of a new automotive based environment.

In addition to its hostility to the weaker pedestrian and cyclist roles, the built environment in developing countries is also dangerous for the driver. Most developing countries committed themselves to extensive road building programs, following the automotive-oriented development model. This investment was not followed by appropriate operational and maintenance efforts, leading to fast physical deterioration and unsafe traffic conditions. Such a risky environment poses serious questions about the attempt to place most of the blame on the human factor. The bias in analysing developing countries' accident problems has been enhanced somehow unwittingly by the influence of studies conducted in developed countries, especially in Europe, most of which emphasise the human factor as the primary cause of accidents in industrialised countries. Although disregard for traffic rules, speeding, poor vehicle maintenance and drinking and driving can be said to account for a significant part of accidents in developing countries, the built environment has a very important effect.

Ralph Nader (1965) produced a devastating report about the safety of American automobiles, called ‘Unsafe at any speed’. When thinking about developing countries, one needs to change the point of view from the driver to the pedestrian and the public transportation passenger. In developing countries the travelling environment is unsafe in any place, especially for pedestrians and cyclists. The built environment is auto-oriented, hence speed oriented, hence pedestrian hostile. In developing countries, the prime objective is to change this built environment in order to ensure people's safety, rather than adapting it to ensure driver's mobility.

Ivan Illich (1974) in his analysis of energy and equity, emphasised the mobility inequity brought about by car ownership and use. The analysis made so far shows that irresponsible use of the car results also in safety inequity, with the car as a device for threatening others and violently occupying the circulation space. Therefore, the irresponsible introduction of the car in developing countries, and the corresponding space adaptation measures, deeply altered the environment, generating one with new
dangerous characteristics, where the majority is being harmed. Despite the interference of human and vehicle factors, traffic accidents result mostly from the specific form assumed by this environment and the corresponding traffic conflicts.

The political and technical conditions that generate and reproduce this sort of environment are discussed ahead. Such critical assessment has to be performed to supersede some misleading ways of explaining traffic accidents. Two aspects are specially important to emphasise before the reassessment. First, in respect to viewing accidents as externalities. Cervero (1998, p48) states that ‘most economists do not view traffic accidents as an externality ....costs are largely borne by those who willfully choose to travel.... the very act of travel suggests that they (people) generally consider net benefits to offset whatever risks’. In the case of developing countries, this is a mistaken assumption that forgets that people travel in inadequate conditions because they have no alternative. And while travelling they cannot properly protect themselves from the savage travelling environment. In addition, the fact that some drivers pay insurance for their cars do not disqualify traffic accidents as externalities (Baumol and Oates, 1988). Second, one has to emphasise the peculiar characteristics of the ‘barrier effect’ and the corresponding ‘avertive behaviour’, as leading to a disguising effect that induces faulty diagnosis. Hillman (1988) and Whitelegg (1993) point out that motorised traffic causes increasing burden of responsibility on road users, especially parents, that in face of fear take their children out of the street, to reduce exposure to risk. The disguising effect in respect to accidents, with relevant impact to traffic policies, is that the decrease in non-motorised traffic leads to a false conclusion that accidents have been reduced. In fact, the most vulnerable roles were forced out of roads by the most powerful roles and a new circulation environment, pedestrian-free, is organised to ease the flow of motorised vehicles.

**Traffic accidents and the political environment**

In developing countries deep class divisions, translated into social, cultural, economic and political differences between people, have profound consequences for the access to transportation modes and for the use of the circulation space. Democracy - in its broader sense - is weakly institutionalised. The decision-making process is highly concentrated and affected by the nature of the technocracy, with strong political commitments to the middle class lifestyle and ideology. This results in an auto-oriented modernisation strategy, which often neglects the needs of pedestrians, cyclists and public transportation passengers. Further, the economic importance of the automotive industry constrains any opposition to motor car use (and motorcycles use as well). The inherent impulse of the system is to preserve the automobile option rather than control it, or, less imaginable, ban it. Considering the necessary relationship between the government and the automotive industry, in face of its enormous economic impact, this impulse has profound and permanent effects on policy outcomes.

Another important consequence is that citizenship, as political consciousness about collective behaviour, is weakly developed: there is a loose apprehension of rights and duties, which is weakened still further by the bias of formal justice in societies characterised by deep class differences. Drivers and pedestrians often develop informal ways of dividing space, that either ignore or interpret differently formal traffic laws. This creative behaviour also reveals that the built environment is ‘chaotic’ and highlights the inefficiency of formal traffic education: there is a basic contradiction between what is proposed as adequate behaviour and what is observed in daily life. An additional element is at stake with respect to traffic behaviour: class differences are translated into assumed differences in the right to occupy space. On one hand, people in the role of drivers actually think, as political human beings, that they have priority in occupying the circulation space. On the other hand, people in the role of pedestrians or
public transportation passengers actually think, as political human beings, that they do not have priority in occupying the circulation space (it is common to see pedestrians thanking drivers who allow them to cross the street first). Formal rules giving priority to pedestrians are seldom respected. Hence, on practical grounds, the priority of spatial appropriation by drivers has already been established in many developing countries, although traffic laws often state the opposite. In developing countries pedestrians are ‘second class citizens’. This has an important social meaning, for most of walking trips are made by poor people, as independent trips or combined with public transportation trips. Conversely, middle and upper sectors often travel by car and park close to their destinations, minimising their exposure as pedestrians. When figures about pedestrian accidents and walking distances are considered, the dangerousness of pedestrian travel appears very clearly: to use the street as a pedestrian is indeed much more dangerous than using it as a driver.

Traffic accidents and the technical environment
Transport planners are not trained, much less compelled to consider safety as a priority issue. Many still see accidents as ‘fatalistic’ or as inevitable outcomes of development. Most are deeply committed to the auto and mobility oriented approaches. Therefore, the provision of high-capacity facilities and free-flowing streets are primary objectives. Further, planners usually belong to established public agencies, with a long history of ‘technical’ work, where road building and adaptation play the central role. In most developing countries, transportation and traffic agencies have road departments but few have traffic safety departments. The technical expertise to design and build roads is highly advanced in some countries, but the expertise to analyse and address traffic accidents is poorly developed in most. As non-motorised social groups often do not have access to the decision-making process, pressures come from the well-organised, motorised groups, and the road construction sector. Therefore, the technical expertise within state agencies is comfortable in pursuing the prime objective of good roads, while treating the accident problem as a marginal, and sometimes incidental one.

Foremost to our purposes, this behaviour is reinforced because planners and engineers have no formal obligation to be responsible for the traffic safety consequences of their acts as transportation planners. The built environment of roads is thought of as good, and the blame for accidents is placed mainly on humans or vehicles (Whitelegg, 1981).

Traffic accidents and the enforcement environment
The consequences of this dangerous built environment are enhanced by the poor performance of traffic police and the judicial system. There are three major problems related to police performance. First, police personnel are seldom properly qualified. Second, there is a low supply of personnel, vehicles and specialised equipment, such as radars and alcohol-measuring devices. Third, enforcement logistics give priority to parked-vehicle offenses, that often have little impact in safety. This is so for several reasons: unrestricted mobility is seen as a right and policeman act accordingly, focusing on traffic fluidity; parking enforcement is easily performed on foot and is highly productive; the lack of proper equipment makes it difficult for the policeman to enforce moving vehicles and enforcement is primarily organised to enhance mobility.
Traffic accidents and the judiciary environment

The judiciary process is extremely complicated and slow moving. Moreover, no penalty is imputed to most of the serious traffic offenders. Some are ‘more citizens than others’: a peculiar form of citizenship based on personal relations introduces large bias in favour of those who have direct relationships to power and use them to avoid punishment. As a consequence, a socialisation of the feeling of impunity reinforces poor traffic behaviour. A vicious circle is formed, with severe consequences for traffic safety. Within this environment, formal traffic laws are often disregarded and traditional traffic education becomes nonsensical and counterproductive.

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