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Speed enforcement in China: National, provincial and city initiatives and their success

Jie He[a,b,*], Mark King[b], Barry Watson[b], Andry Rakotonirainy[b], Judy Fleiter[b]

[a] Transportation College, Southeast University, Nanjing 210096, Jiangsu, China
[b] Centre for Accident Research and Road Safety-Qld, Queensland University of Technology Kelvin Grove Campus, Brisbane Q 4059, Australia

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ABSTRACT

China is motorizing rapidly, with associated urban road development and extensive construction of motorways. Speeding accounts for about 10% of fatalities, which represents a large decrease from a peak of 17.2% in 2004. Speeding has been addressed at a national level through the introduction of laws and procedural requirements in 2004, in provinces either across all road types or on motorways, and at city level. Typically, documentation of speed enforcement programmes has taken place when new technology (i.e. speed cameras) is introduced, and it is likely that many programmes have not been documented or widely reported. In particular, the national legislation of 2004 and its implementation was associated with a large reduction in fatalities attributed to speeding. In Guangdong Province, after using speed detection equipment, motorway fatalities due to speeding in 2005 decreased by 32.5% comparing with 2004. In Beijing, the number of traffic monitoring units which were used to photograph illegal traffic activities such as traffic light violations, speeding and using bus lanes illegally increased to 1958 by April 1, 2009, and in the future such automated enforcement will become the main means of enforcement, expected to account for 60% of all traffic enforcement in Beijing. This paper provides a brief overview of the speeding enforcement programmes in China which have been documented and their successes.

1. Introduction

China has had the fastest-growing major economy in the world for the past 30 years with an average annual GDP growth rate above 10% (USA Today, 2007), leading to a marked increase in average incomes and greater availability of a range of consumer goods. The demand for motor vehicles and travel has increased accordingly. At the end of 2009, the number of motor vehicles in China had increased to 186.58 million, of which cars comprised 76.20 million, giving a growth rate for 2009 of 9.83% (Automobile Association of China, 2010). Table 1 and Fig. 1 show the rapid growth in numbers of motor vehicles in China.

In 1988, China built its first motorway. By the end of 2001, provision of motorways had reached 19,000 km, and since then China's motorway system has become the second longest in the world, after the United States. As seen in Table 1, by the end of 2009, motorway length had increased to 65,000 km, while the total highway length in China had reached 3.83 million km (Ministry of Transport, 2010). Not surprisingly, traffic fatalities have risen as well. Official figures indicate that around 100,000 people were killed on the road each year from 2001 to 2007 in China (67,759 in 2009), although differences in definition and issues with reporting (which occur to a lesser or greater extent in all countries) have led the World Health Organization (WHO) to suggest that the true figure may be twice as high as this (China News Net, 2007; WHO, 2004). Speeding contributes to a significant proportion of fatalities, as explained below, although progress has been made in reducing its contribution. Rapid motorization and economic expansion have required equally rapid responses to road safety problems including speeding, through both the implementation of programmes and the development of the technological and human capacity to respond. China, with its large geographical area and many large population centres, is characterized both by national coordination of programmes and by initiatives at the provincial and city levels to address emerging or growing problems, and road safety is no different. This paper provides a brief overview of the documented programmes aimed at enforcing speed legislation in China, and their effectiveness, where known. In addition to searching the academic literature, which provided very little information, broader searches were conducted, and included media stories as well as official reports. Much of the fatality data in this report were obtained from official Chinese road statistics, published by the Traffic Administration Bureau of the Ministry of Public Security of the People's Republic of China (2003, 2004, 2005, 2006, 2007, 2008, 2009), and all

* Corresponding author at: Transportation College, Southeast University, Nanjing 210096, Jiangsu, China. Tel.: +86 13951018974.
E-mail address: hejie@seu.edu.cn (J. He).

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Table 1
Number of motor vehicles and motorway length in China from 2000 to 2009.

Year	Number of motor vehicles (million)	Total motorway length (km)
2000	60.0	16,314
2001	68.5	19,437
2002	79.8	25,130
2003	96.5	29,745
2004	107.8	34,288
2005	130.4	41,005
2006	145.2	45,339
2007	159.8	53,913
2008	169.9	60,302
2009	186.6	65,056

unreferenced data in this report were obtained from these publications.

2. The contribution of speeding to crashes in China

2.1. National statistics on speed-related crashes

Speeding contributes to a substantial proportion of crashes in China. The statistics below present the statistical picture for China in 2004 and 2005. The subsequent changes in the statistics will be addressed in Section 3.3 on national programmes.

In 2004 there were 517,889 crashes reported in China, of which 64,474 crashes were attributed to speeding, accounting for 12.5% of the total number of traffic crashes. Of the 107,077 traffic fatalities, 18,410 persons were killed in speed-related crashes, accounting for 17.2% of total deaths. The number of people injured in speed-related crashes was 60,645, accounting for 12.6% of the total 480,864 injuries. Speeding resulted in direct property loss (consisting of vehicles, goods, roadside furniture and so on) of 320,997,671 Yuan, which accounted for 13.4% of the total direct property loss due to traffic crashes (Traffic Administration Bureau, 2004).

In 2005 the picture was similar. There were 450,254 crashes in China, of which 52,655 crashes were attributed to speeding, accounting for 11.7% of the total number of traffic crashes. Of the 98,738 traffic fatalities, 16,015 persons were killed in speed-related crashes, accounting for 16.2% of total deaths. The number of people injured in speed-related crashes was 53,038, accounting for 11.3% of the total 469,911 injuries. Speeding resulted in direct property loss of 251,834,922 Yuan, which accounted for 13.4% of the total direct property loss due to traffic accidents (Traffic Administration Bureau, 2005).

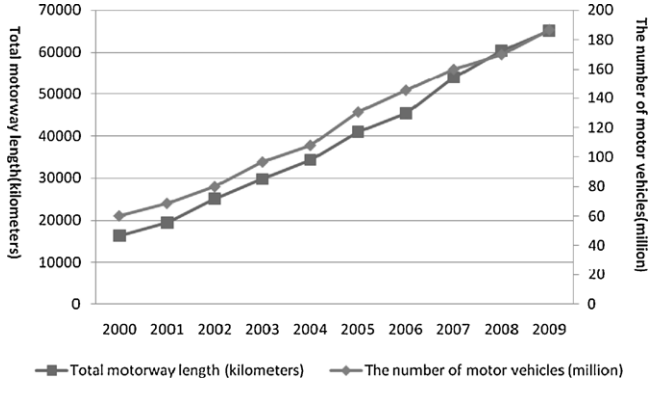

Fig. 1. Number of motor vehicles and motorway length in China from 2000 to 2009.

2.2. Speed-related crashes on motorways

As noted above, by the end of 2009, the total motorway length in China had increased to 65,000 km. Legislation for motorways sets both a maximum speed of 120 km/h and a minimum speed of 60 km/h. Passenger cars have a maximum legal speed of 120 km/h and other vehicles (e.g. trucks, buses) should not exceed 100 km/h.

There are many traffic crashes on motorways, and statistics show that more than 10% of these crashes are the result of speeding. From 2003 to 2007 inclusive there were 105,687 traffic crashes on motorways in China, which resulted in 30,588 fatalities, 77,505 injuries and direct property loss of 2.62 billion Yuan. While these crashes made up 4.5% of all recorded crashes in China, they constituted 6.4% of all fatalities, indicating a higher severity level. Injuries were correspondingly less (3.4% of all reported injuries) but direct property loss was much higher (25.4% of total property loss due to road crashes). It is unclear why this last figure is so high. In annual terms, these totals equate to 21,137 crashes each year, leading to 6118 persons killed, 15,501 persons injured and direct property loss of 520 million Yuan. More details about traffic crashes on motorways from 2003 to 2009 are shown in Table 2.

From the table above, it can be seen that the total number of traffic crashes on motorways substantially decreased from 2003 to 2009; however, the number of fatalities did not change much in the same period. The reasons for this trend are complex. One of the reasons is that the percentage of severe crashes increased for all traffic crashes. In recent years, China's economy has boomed, resulting in a rapid increase in both the development of road infrastructure and the standard of the infrastructure. Thus the speed of the motor vehicles has increased gradually and high speeds on motorways have led to more severe crashes. Meanwhile, multi-vehicle collisions have increased on motorways and these typically result in more fatalities per crash. From the direct property loss figures in the table above, it can also be seen that crashes on motorways are very costly, accounting for about one-third of the direct property loss costs due to road crashes in China.

Police crash data record the involvement of unsafe or illegal behaviours in fatal crashes on motorways. For motorway crashes, driving while fatigued is the most commonly reported illegal activity, contributing to 15.1% of the total fatalities. Speeding is next, contributing to 10.6% of total fatalities. Illegal road use (such as motorcycles or tractors driving on motorways), unlicensed driving, and illegal loading and driving on the road by occupying the inappropriate lane (e.g. trucks occupying the car lane) contribute to 4.1%, 3.0%, and 2.6% of total fatalities, respectively (http://bbs.auto.ifeng.com/thread-31231-1-14.html).

3. National speeding legislation and its success

Legislation on the operation of vehicles has been in effect in the People's Republic of China since 1955. Legislation entitled *Urban Traffic Rules* was approved by the State Council of People's Republic of China on June 21, 1955, and on August 6 in the same year it was implemented by the Ministry of Public Security. It set maximum speed limits of 50 km/h for passenger cars and 40 km/h for other vehicles (trucks, buses). The State Council issued *Road Traffic Regulations of the People's Republic of China* on March 9, 1988. On August 1, 1988 these regulations were implemented and at the same time *Urban Traffic Rules* was abolished. The *Road Traffic Regulations of PRC* raised the maximum legal speed for passenger cars to 80 km/h and the limit for other vehicles (trucks, buses) to 70 km/h on roads with median strips. The old speed limits remained for roads without a median strip. However, although these different forms of legislation and regulation addressed vehicle operation matters which were sometimes relevant to safety, there was no dedicated national law