

How to Reduce Traffic Crashes in China

----Experience and Difficulties

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Abstract: In the past five years (2002-2007), traffic crashes and road toll have reduced significantly in China. The main features are as follows:

1. Even though the number of MV increased by 100% in comparison with that in 2002, traffic crashes reduced 57.68%, among them crashes of MV reduced 54.31%, crash from pedestrians and passengers reduced 70.95%.
2. The death toll reduced 25.36%, in which the death number from MV crash reduced 9.91%, those from pedestrians and passengers reduced most, going up to 70.84%.
3. The road traffic injured reduced 32.31%, in which injuries from MV crash reduced 24.38%, and those from pedestrians / passengers reduced most, going up to 74.96%.

Finally, based on the analysis of the successful experience and existed problems, the author believes that if the top government leaders greatly pay attention to the traffic safety and traffic administrators do their best to strictly carry out all the traffic regulations and adopt related measures for traffic safety, traffic crashes and road toll will be definitely and remarkably reduced.

1 Recent achievements of road traffic safety in China

In 1978, Chinese government began to carry out a reform and open policy, since then, national economy has developed rapidly. Generally speaking, the GDP increased over 10% each year and almost every city built many new highways and high buildings. In addition, road traffic crashes and road toll increased greatly (Table 1, Fig 1-3).

Table 1. Comparison of number of motor vehicle (MV) traffic crashes and road toll between 1978 and 2002 in China

Year	Total number of MV	Number of traffic crashes	Death toll	The injured toll
1978	1 588 700	107 251	19 096	77 471
2002	79 756 763	773 137	109 381	562 074
2002/1978	50.20	7.21	5.73	7.62

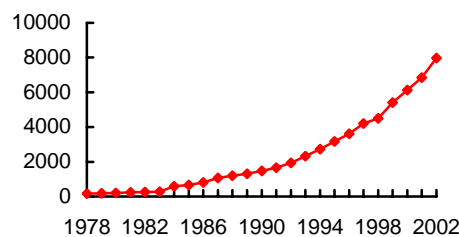


Fig 1. Changes of MV number from 1978 to 2002 in China

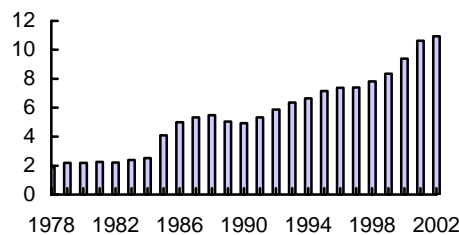


Fig 2. Changes of death toll from road traffic crashes from 1978 to 2002 in China

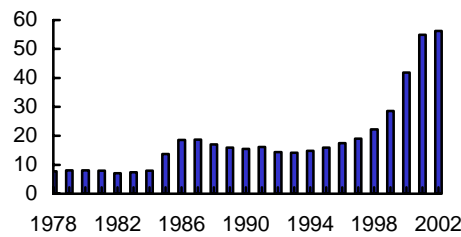


Fig 3. Changes of the injured number from road traffic crashes between 1978 and 2002 in China

After 2002, the government adopted a series of intensive measures to improve traffic safety, thus effectively prevent the continuous increasing tendency. It's notable that even though the number of MV increased tremendously, the road toll showed decreasing tendency (Table 2. Fig 4-6)^[1, 2].

Table 2. Comparison of number of MV traffic crashes and road toll between 2002 and 2007

Year	Total number of MV	Number of traffic crashes	Death toll	The injured toll
2002	79 756 763	773 137	109 381	562 074
2007	159 777 589	327 209	81 649	380 442
2007/2002	2.00	0.42	0.75	0.68

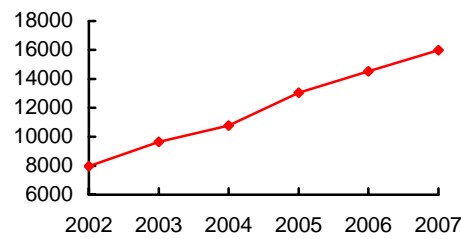


Fig 4. Changes in number of MV between 2002 and 2007 in China

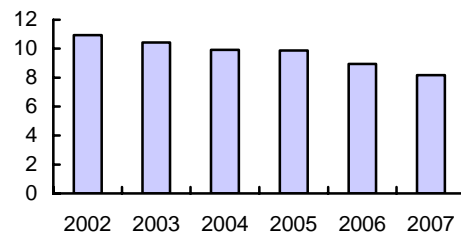


Fig 5. Changes in death toll from road traffic crashes between 2002 and 2007 in China

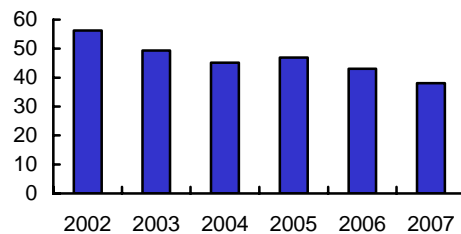


Fig 6. Changes in the injured number from road traffic crashes between 2002 and 2007 in China

Generally, if the increasing rate of national GDP surpasses 4%-6%, the traffic crashes will definitely increase, but in China, it was not the case in the past several years^[3].

Table 3. Causes of traffic crashes between 2002 and 2007

Year	Total crash		MV		non-MV		pedestrians & passengers		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%
2002	773 137	100	675 449	87.39	22 114	2.87	18 800	2.43	56 774	7.34
2007	327 209	100	208 595	94.32	12 472	3.81	5 467	1.66	681	0.21
decrease in 2007	445 928	57.68	366 854	54.31	9 642	43.60	13 339	70.95	56 093	98.80

It showed in table 3 that although the number of MV in 2007 increased by 100% in comparison with that in 2002, the traffic crashes reduced 57.68%. Among them, crashes of MV reduced 54.31%, non-MV crashes reduced 43.60%, road crashes due to pedestrians and passengers reduced most, which was 70.95%^[1, 2].

Table 4. Comparison of death toll causes between 2002 and 2007

Year	Death toll		MV		non-MV		pedestrians & passengers		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%
2002	109 381	100	85 916	78.55	4 589	4.20	6 798	6.21	12 078	11.04
2007	81 649	100	77 401	94.80	1 968	2.41	1 982	2.43	298	0.36
reduction of 2007/2002	27 732	25.36	8 515	9.91	2 621	57.11	4 816	70.84	11 780	97.53

Table 4 shows that compared to those in 2002, the death toll reduced 25.36%, among them, crashes of MV reduced 9.91%, non-MV crashes 57.11%, pedestrians and passengers reduced most, which was 70.84%^[1, 2].

Table 5. Comparison of injured causes from traffic crash between 2002 and 2007

Year	Total injured from crashes		MV		non-MV		pedestrians & passengers		Others	
	No.	%	No.	%	No.	%	No.	%	No.	%
2002	562 074	100	479 452	85.29	19 238	3.44	16 144	2.87	47 240	8.40
2007	380 442	100	362 539	95.29	12 954	3.41	4 043	1.06	906	0.24
reduction of 2007/2002	181 632	32.31	116 913	24.38	6 284	32.66	12 101	74.96	46 334	98.08

It indicated in table 5 that from 2002 to 2007, the road traffic injured reduced 32.31%. Among them, the injured from MV crashes reduced 24.38%, much greater than the reduction percentage of death toll; while non-MV crashes caused injuries reduced 32.68%, less than the reduction percentage of death toll. The injured pedestrians and passengers reduced 74.96%, a little bit more than the reduction percentage of death toll^[1, 2].

It showed from the data mentioned above, among the factors of traffic safety, human ones widely improved, non-MV crashes causing casualties reduced significantly, that of pedestrians and passengers reduced most, indicating traffic safety, especially safety protection and safety consciousness of human being improved remarkably. This is the one of basic causes for the improvement of traffic safety.

2 Experience in improving traffic safety

It showed from the above presentation that in the past five years, the traffic safety has improved in China. It's the result of comprehensive treatment in a long period of time. The main measures were as follows:

2.1 Completing relative law and monitoring by government

On May 1, 2004, a "national road traffic law" was approved by the Standing Committee of the National People's Congress. Since then all road users and administrators have to act according to the traffic law. All road users should obey the law, while all traffic administrators should strictly carry out the law. Everybody is on an equal footing to face the law.

Actually, in October 1986, the State Council reformed the system of road traffic administration, establishing unitive commandingness, giving full play the superiority with high effectiveness, authorities and unity, and forming a complete set of new traffic administrative model fitting for Chinese reality.

It was important that the top leaders of the government always paid attention to the traffic safety, and inspect if everything about traffic regulations and measures had been carried out and let each traffic administrator know that his/her main task is to keep good traffic order, prevent and reduce traffic crashes. In addition, they should improve installations on traffic safety, insist on one's responsibility, strengthen safety education to drivers; strictly carry out the system of rewards and penalties for traffic safety. Using broadcast, TV, newspapers, journals and other mass media, active propaganda about traffic safety was continuously preceded, thus improving all people's safety consciousness. After adopting these measures, traffic order turned better, traffic jam significantly alleviated, the rising tendency has been prevented. For instance, in 1986, traffic road death was 61.12 persons per 10,000 MV, while in 1996 it reduced to 20.41 persons per 10,000 MV^[5].

During the period of rectification, the top leaders very much concerned about the progress of traffic safety, seriously pointed out that great number of traffic crashes may play a very negative influence on social stabilization and development. Therefore every road users should do his best to restrain these grave traffic crashes.

2.2 Renewing the safety idea and emphasizing prevention

For a long time most people have had a tragic thinking that the traffic crashes is inevitable, because so many motor vehicles always run on the road, and so many road users always drive or take the motor vehicles, ride bicycles or walk by foot on the road.

However, based on the experience of developed countries, it is confirmed that to a great extent the traffic crashes may be preventable. According to this idea, Swedish parliament approved a "Vision Zero" plan in 1997 calling all traffic administrators and road users do their best to continuously improve traffic safety. Since then, in the developed countries, including Sweden, traffic crashes and road toll have been progressively reduced. In the 1950' Chinese government used to put forward a principle for traffic administration, i.e. "safety first and prevention predominant", but it didn't carry out well.

Another wrong thinking is that almost all crashes are caused by drivers. Actually, when driving or walking, drivers or pedestrians all are in a nervous state, thus easily cause fatigue, low response, distracted attention, etc. and finally result in crashes and road toll. However, talking about the responsibility of crash, it is not completely drivers and other road users' fault. Traffic administrators should consider this situation and help road users to deal with or avoid these risky factors.

After change of idea all traffic administrators may consciously and actively safeguard traffic order and traffic safety.

2.3 Scientific administration and advanced equipment

Recently in most big and moderated cities in China traffic administration has realized automation. Traffic administrators may monitor the running of motor vehicles on various sections of road all the time. Local broadcast establish a special channel on traffic safety, which deals with propaganda about traffic safety education, and continuously report the running condition of motor vehicle on various road section, thus may avoid or reduce traffic jam. In all important road sections, there equipped with speed-monitoring system and infrared photography, overtaking should be punished.

2.4 Strictly training drivers

Although China has had a complete set of method for training motor vehicle drivers for a long time, it was carried out not strictly. For instances, some people have paid the tuition fee to the driving school, but rarely listened to the lecture and practice, finally they still can get a driving license. Some other people have mastered the driving skill, but they lack of responsibility and safety consciousness.

Some private owners of passenger/freight transport made vehicles overloaded in order to make much more money; some instructors of driving school were not so good in quality, etc.

Recently in some cities, like Shanghai and Chongqing, it has developed a social and open safety education to drivers. Standard administration education is divided into two parts: ordinary and special. Ordinary education includes "class hour rules", i.e. only drivers finish all courses, are they able to attend the yearly examination and investigation. Special education includes to prevent breaking rules and regulations, crash prevention education before yearly changing license investigation for passenger transport drivers and those coming from other places. It is confirmed that after traffic administration adopted these measures traffic safety improved remarkably.

2.5 Prevention is predominant

Using GIS (geographic information system) general analysis to road traffic safety may be improved. It may be divided into three layers:

First, to analyze current situation and tendency of traffic crashes in one predictive region. The analysis of statistics and prediction can be realized with mathematic method and it may be related with local economic development, road installations, traffic flow and other factors. Therefore, it is of benefit to know and control the development of traffic crash objectively.

Second, it's an analysis of regional traffic crashes, including traffic characteristics, frequency and other related factors thus may mastering the overall condition of traffic crash in this area.

Third, it is a micro analysis and may clarify the rule and mechanism of traffic crash development in a road section or in one event.

GIS has multiple functions, such as storing up related data, analysis of these parameters, displaying and helping to make decision with visible map. GIS is really one of the advanced and key techniques in traffic safety administration system. It will be further popularized for application.

- Professor Jin put forward the following three main measures for strengthening prevention of traffic crash:
- Screening and eliminating drivers who have crash tendency (about 6%-8% drivers).
- Scientifically train safety drivers, thus may reduce about 60% crashes.
- Comprehensive treatment of traffic environment.

3 Difficulties

Improving traffic safety is a long period of task, and it is closely related with the development of economy and advanced administration. Although recently traffic safety has been improved to some extent in China, it remains to have a long way to go. In addition, owing to the vast territory and great difference in economic development in various regions of China, it was not even in traffic safety in whole country.

During the reducing process of traffic crashes in whole country, in some regions, however, there was an increasing tendency. It indicates that many road users remained to violate traffic regulations, such as overtaking, drinking / drunk driving, fatigue driving, etc. In addition, extremely severe crashes still occurred. In 2007, there was 1,472 times of extremely severe crashes (i.e. more than 3 deaths for each crash) and inflicted 5,718 death toll. Quite a few traffic administrators could not strictly carry out the traffic regulation. Part of road design was not so scientific, maintenance of some motor vehicles, especially low-priced ones, were not regular. The consciousnesses of traffic safety in some drivers and other road users have not improved yet, etc. It's my belief that all developing countries, as China, should sum up his own experience and learn from the advanced experience of developed countries on traffic safety.

Let's do our great effort to realize "Vision Zero" worldwide.