

## Evaluation of 2008 Traffic Safety Policies in Jordan

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### ABSTRACT

The problem of traffic accidents is a major problem in the Hashemite Kingdom of Jordan and represents a serious safety and economic challenge for the state. Traffic accidents are considered the second leading cause of death. This paper evaluated the impacts of the traffic policies undertaken in 2008 on traffic accidents and fatalities, including the intensification of police enforcement and implementation of traffic law with stiff penalty levels. To accomplish this objective, accidents' data of 1990 through 2009 were obtained from Jordan Traffic Institute and other related sources.

Results of analysis revealed that Jordan has experienced huge human and economic losses as well as social and emotional negative impacts. Furthermore, the safety policy measures undertaken in 2008, including the intensification of police enforcement and the increase of penalties for excessive speed had an overall positive influence in reducing accidents and fatalities. However, the application of 2007 traffic policy with stiffer penalties was the most effective measure. Finally, it is highly recommended to reapply 2007 traffic law with stiffer penalties since it contributed in reducing accidents and fatalities more than 2008 traffic law. In addition, it is recommended to apply all the needed safety polices to reduce the traffic accidents phenomenon in Jordan.

**KEYWORDS :** Safety policies, Traffic accidents, Fatalities.

### INTRODUCTION

Highway transportation has provided considerable opportunities for humans, particularly the freedom to move from place to place at one's will and convenience. The positive aspect of the highway mode, however, goes hand in hand with numerous negative aspects, which include traffic congestion, accidents, pollution and parking difficulties. The most dangerous negative aspect is the accidents as they are considered the eighth cause of death in the middle-income countries according to the World Health Organization (WHO, 2002). In

addition to pain grief and social suffering, these accidents cost countries 1% to 2% of their gross national products (Peden et al., 2004).

The problem of traffic accidents in Jordan started to appear as a serious issue in the mid 1980s (Al-Masaeid, 2009). Starting early 1990s, the number of vehicles started rising up dramatically in Jordan, where the number of registered vehicles almost doubled in the last 10 years (JTI, 2009) as shown in Figure 1. This is due to the development in Jordan and the rising income in general. For the same period, the number of population increased from 5039 to 5980 thousands (about 16% increase).

Fatalities per 100000 inhabitants increased slightly

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during the past 20 years, except the last three years, where this number started to decrease as shown in Figure 2. In 2008, Jordan is considered the eighth country (compared to other countries) in term of fatality rate per 100000 capita (JTI, 2009), as shown in Figure 3. The increasing number of registered vehicles,

combined with the population increase, resulted in an increase in the number of accidents over the past twenty years. Figure 4 shows the continuous increase in the number of accidents (except the last three years). The number of accidents increased significantly during the last 10 years.

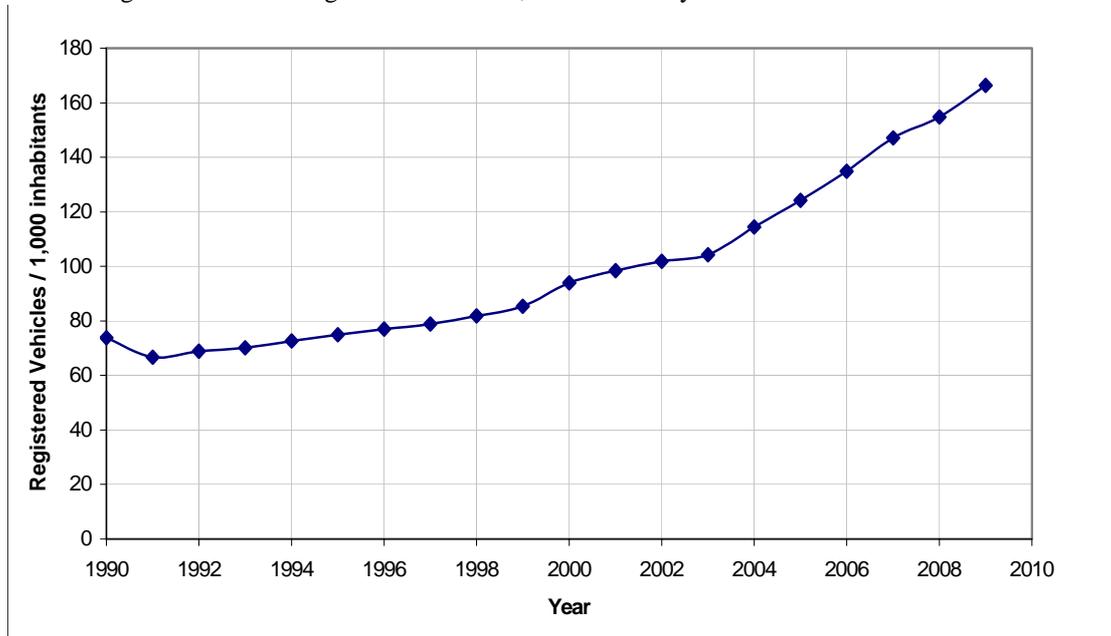


Figure 1: Number of registered vehicles / 1000 inhabitants

At the end of January 2008, as a result of the drastic increase in traffic accidents and casualties and after a horrific bus accident on Irbid-Amman highway, His Majesty King Abdullah II instructed the government to draw a comprehensive strategy to curb accidents and casualties in Jordan (Al-Masaeid, 2009). In this paper, the effect of the new strategy on traffic accidents in Jordan is investigated including the main adjustments applied on the 2001 and 2007 traffic laws of Jordan to become the law which is currently used (2008 traffic law). Furthermore, the safety policies undertaken in 2008 to reduce the accidents and fatalities are also illustrated. Full details of this study can be found in (Haddad, 2011).

## LITERATURE REVIEW

### Analysis of Traffic Accidents

Traffic accidents are a complex phenomenon. They

are caused by a multitude of factors, including roadway and its environment, road users' behavior and vehicle. This section illustrates some studies that were conducted to uncover the different aspects of this dangerous phenomenon.

Dissanayake et al. (1999) evaluated the critical highway safety needs for special population groups and found that the school age children group was ranked the second after the older drivers among a set of selected population groups that were ranked according to their importance.

Choueiri et al. (2002) realized after comparing traffic accidents in many different countries that traffic accidents are mainly caused due to different factors, like: roads are not proper, drivers' attitude and behavior are not appreciable, pedestrian alertness is not notable, obstructions on the road (vegetable carts), unauthorized

parking... etc. Also, it was found that traffic situation is getting even worse due to: lack of coordination, lack of definite national policies and strategies, poor public

awareness of the extent of the problem, insufficient traffic safety training and non-existence of deterrent legislation or severe penalties for traffic offenders.

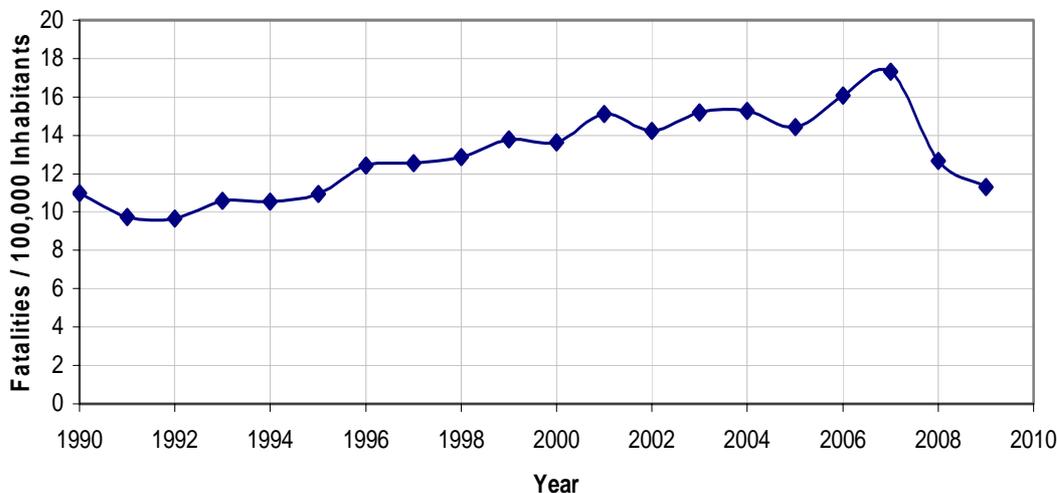


Figure 2: Fatalities per 100000 inhabitants

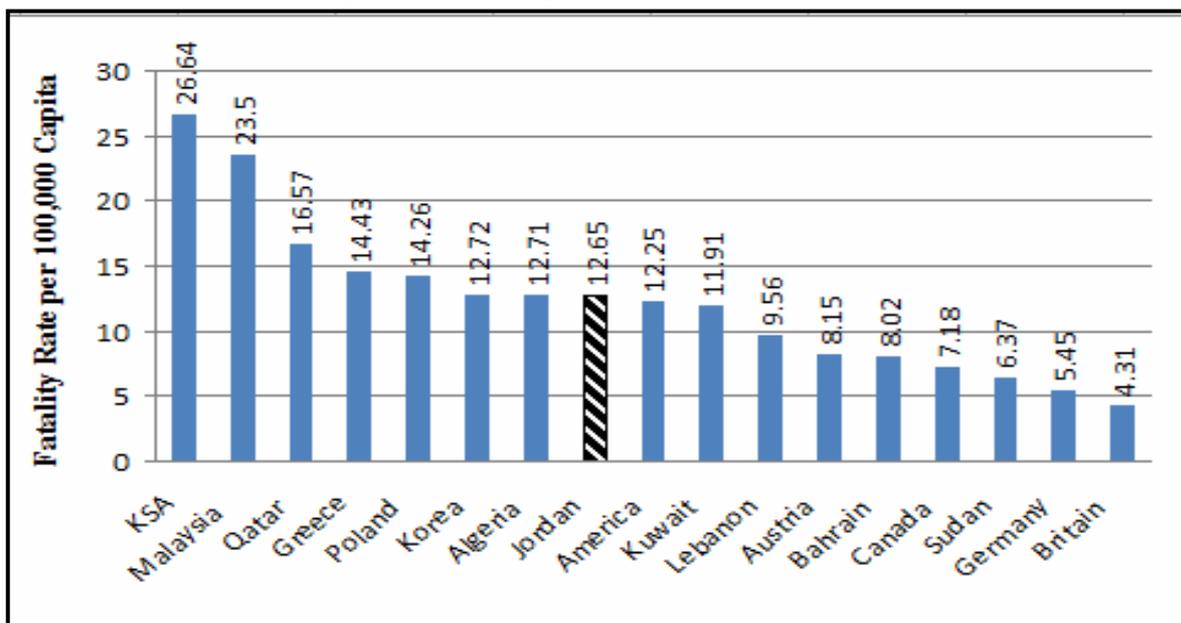


Figure 3: Fatality rate per 100000 capita worldwide in 2008

Mayou and Bryant (2003) described the immediate and later physical, social and psychological consequences of a road traffic accident for vehicle occupants, motorcyclists, cyclists and pedestrians

amongst consecutive hospital attendees at an accident and emergency department. Differences were marked in injury pattern and immediate reaction between road user groups. Pedestrians and motorcyclists suffer the most

severe injuries and report more continuing medical problems and greater resource use, especially in the first three months. There were few differences in

psychological or social outcomes at any stage of follow-up.

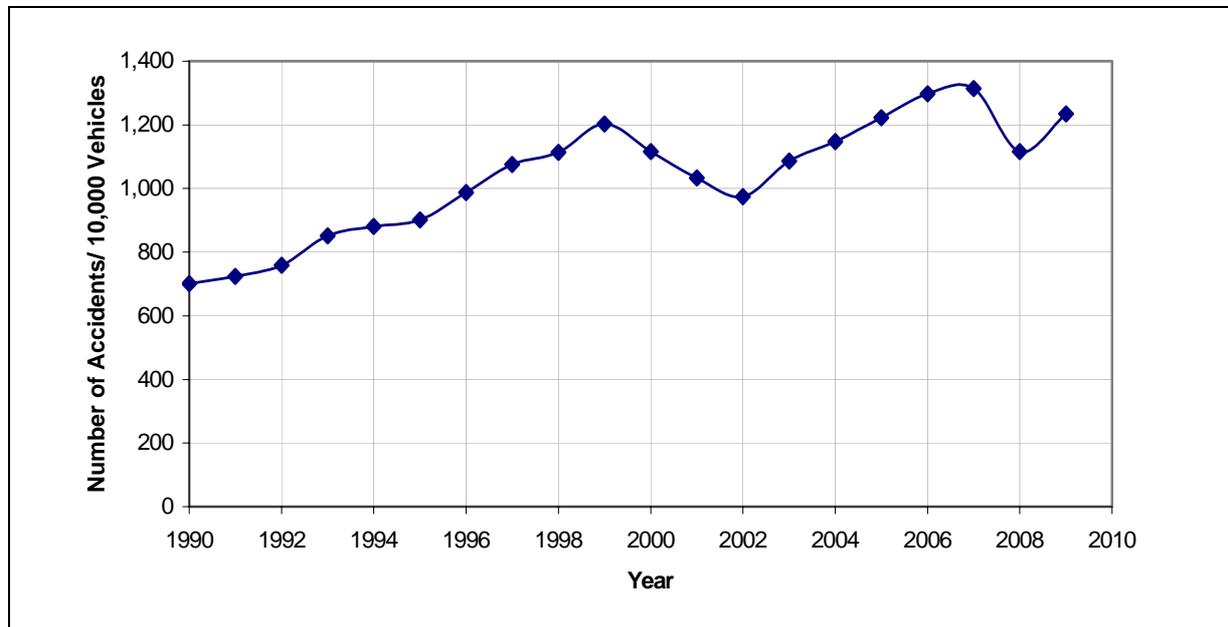


Figure 4: Accident numbers / 10000 registered vehicles

Al-Ghamdi (2003) investigated traffic accidents that occurred at both intersections and non-intersection sites, since previous studies have shown that intersection-related accidents account for about 50% of all accidents registered annually in Riyadh, the capital of the Kingdom of Saudi Arabia (KSA). The study found that improper driving behavior is the primary cause of accidents at signalized urban intersections in Riyadh; running a red light and failing to yield are the primary contributing causes. The analysis indicates that there is an urgent need to review the existing intersection geometry along with the traffic control devices installed at these sites. In addition, public education campaigns and law enforcement strategies are urgently needed.

#### ***Analysis of Traffic Accidents in Jordan***

In Jordan, road accidents are a serious problem in scale and nature through the extensive human and

economic losses. This section illustrates several studies that have been conducted to study and analyze traffic accidents in Jordan.

Ismail (1988) conducted an overview of traffic safety in Jordan and noticed a sharp increase in accidents during the summer months (June - August). He referred that to school children who play on the streets during school holiday, the days that are long and warm prompting people to go outdoors, in addition to the presence of large numbers of visiting Jordanian expatriates.

Gharaybeh (1991) have studied accident frequency, accident rate, critical rate and accidents' seriousness measures and then incorporated to develop a technique for ranking the sites for future improvement. It was proven that the use of accident frequency as the sole criterion for identifying or ranking hazardous locations may be misleading.

**Table 1. Law item numbers and brief description of the common provisions**

Traffic Law 2001	Traffic Law 2007	Traffic Law 2008	Description of the Law Items Common Provisions
Law Item No.	Law Item No.	Law Item No.	
N.A.	62	26-A	Concerned with the violations related to the use of the driver's license or vehicle illegally to wriggle on law.
		28	
46	64-A	26-B	Concerned with the violations related to driving the vehicle in an unsafe manner, such as driving under the influence of drugs or carrying dangerous materials or not fixing the goods in a safe way.
47	64-B	29	Concerned with many violations, but the most prominent ones are related to crossing the red traffic light, driving in the opposite way of the traffic flow and driving at night without using the vehicle's lights among many others.
	65	29	Concerned with the violations related to the use of the driver's license or vehicle illegally, like driving a Jordanian public vehicle with a foreign driving license.
31			
48-A	66	34	Concerned with many violations, but the most prominent ones are related to driving the vehicle in an unsafe manner and driving in a way that annoys people and causes noise like: using audio at high volume and using the bright lights among many others.
		35	
	67	36	Concerned with many violations, but the most prominent ones are related to driving at high speed, not giving priorities and not respecting the rights of others.
48-B	67	36	As mentioned before.
49-A	67	36	As mentioned before.
	68	37	Concerned with many violations, but the most prominent ones are related to non-compliance with traffic laws, like: not driving on the right side at a low speed and returning opposite to the traffic flow among many others.
49-B	68	37	As mentioned before.
	69	38	Concerned with many violations, but the most prominent ones are related to non-compliance with traffic laws and carrying out unjustified actions that disturb others, like: smoking in public transportations, stopping the vehicle beside the road to enjoy sitting under trees and having lunch among many others.
49-C	69	38	As mentioned before.
N.A.	70	39	Concerned with many violations, but the most prominent ones are related to non-compliance with traffic law, like: stopping opposite to traffic flow and stopping at the left side of the road among many others.
50	71	Not any more	Concerned with many violations, but the most prominent ones are related to non-compliance of pedestrians with traffic laws, like: not crossing at crosswalks and low crossing speed among many others.
N.A.	72	41-A	Concerned with the violations related to stopping near train railways or not following the instructions related to trains and crossing railways.
		41-B	

**Table 2. Main adjustments in 2001 and 2007 traffic laws**

Traffic Law 2001		Traffic Law 2007		Traffic Law 2008	
Item No.	Penalty	Item No.	Penalty	Item No.	Penalty
N.A.	N.A.	62	Penalized by imprisonment for [3-6] months or a fine of [500 to 1000] JD, or both penalties.	26-A	Remained the same penalty as in 2007.
				28	Penalized by imprisonment for [2 weeks to 3 months] or a fine of [150 to 300] JD, or both penalties.
46	Penalized by imprisonment for [1-6] months or a fine of [100-200] JD, or both penalties, and suspension of driving license for [(3-6) months from the date of the violation.	64-A	Penalized by imprisonment for [3-6] months or a fine of 500 JD, or both penalties, and suspension of driving license for one year from the date of the violation.	26-B	Penalized by imprisonment for [1-3] months or a fine of [250 to 500] JD, or both penalties.
47	Penalized by imprisonment for [15 days to 3 month] or a fine of [50-100] JD, or both penalties.	64-B	Penalized by imprisonment for [1-3] months or a fine of 250 JD, or both penalties, and suspension of driving license for one year from the date of the violation.	29	Penalized by imprisonment for [1 week to 1 month] or a fine of [100-200] JD, or both penalties.
		65	Penalized by imprisonment for [1 week to 1 month] or a fine of 150 JD, and suspension of driving license for one year from the date of the violation.	29	Penalized by imprisonment for [1 week to 1 month] or a fine of [100-200] JD, or both penalties.
				31	Penalized by imprisonment for [1week to 1 month] or a fine of [50-100] JD.
48-A	Penalized by paying a fine of [30-60] JD.	66	Penalized by imprisonment for [1 week to 1 month] or a fine of 100 JD.	34	Penalized by paying a fine of (50-100) JD.
				35	Penalized by paying a fine of 40 JD.
		67	Penalized by paying a fine of 50 JD.	36	Penalized by paying a fine of 30 JD.
48-B	Penalized by paying a fine of [20-50] JD.	67	As mentioned above.	36	As mentioned above.
49-A	Penalized by paying a fine of [15-30] JD.	67	As mentioned above.	36	As mentioned above.
		68	Penalized by paying a fine of 25 JD.	37	Penalized by paying a fine of 20 JD.
49-B	Penalized by paying a fine of [10-20] JD.	68	As mentioned above.	37	As mentioned above.
		69	Penalized by paying a fine of 15 JD.	38	Remained the same as in 2007.
49-C	Penalized by paying a fine of [5-10] JD.	69	As mentioned above.	38	As mentioned above.
N.A.	N.A.	70	Penalized by paying a fine of 10 JD.	39	Remained the same as in 2007.
50	Penalized by paying a fine of 1 JD.	71	Penalized by paying a fine of 5 JD.	N.A	Not anymore.
N.A.	N.A.	72	Penalized by imprisonment for [2 months to 1 year] or a fine of [500 to 1000] JD, or both penalties.	41-A	Penalized by imprisonment not less than 6 months or a fine of [500 to 1000] JD.
				41-B	Remained the same as in 2007.

Note: N.A= Not Applicable.

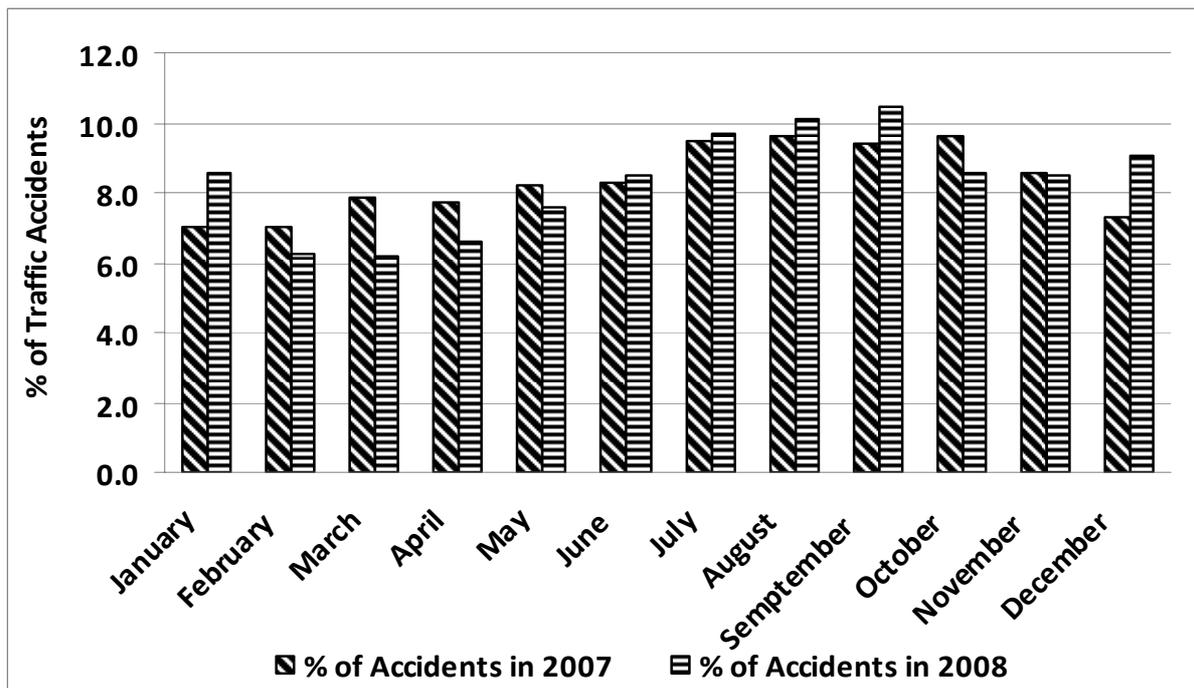


Figure 5: Comparison of accident percentages of the years 2007 and 2008 in Jordan

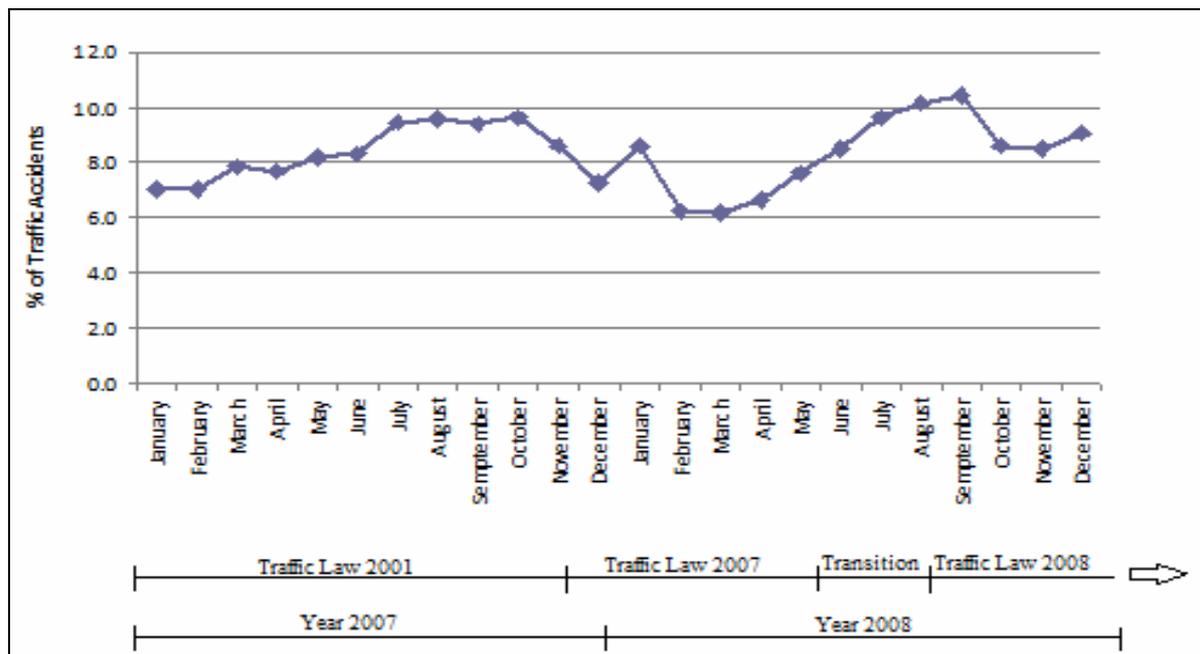


Figure 6: Accident percentages during the years 2007 and 2008 in Jordan

Al-Masaeid et al. (1997) have investigated the impact of traffic, geometric and environmental/land-use

variables on the frequency of pedestrian accidents on urban arterial mid-blocks in Irbid City, Jordan. The study was based on 68 arterial mid-blocks on seven radial major arterials and considered the accident data for the year 1994. They found that mid-block pedestrian accidents are significantly influenced by: peak traffic flow, percentage of commercial areas, percentage of green areas, number of public buildings, average sidewalk width and parking conditions.

Al-Masaeid (1998) has studied the characteristics

and costs of road accidents in Jordan and estimated the yearly economic consequences of road accidents to be approximately 2 percent of the National Domestic Product (NDP) of Jordan.

Al-Masaeid et al. (1999) found that the costs of road accidents in Jordan were estimated to be about JD 103 million (US\$ 146.3) in the year 1996. And although fatal accidents constituted only 1.3% of the total number of accidents, they accounted for about 28% of the total costs.

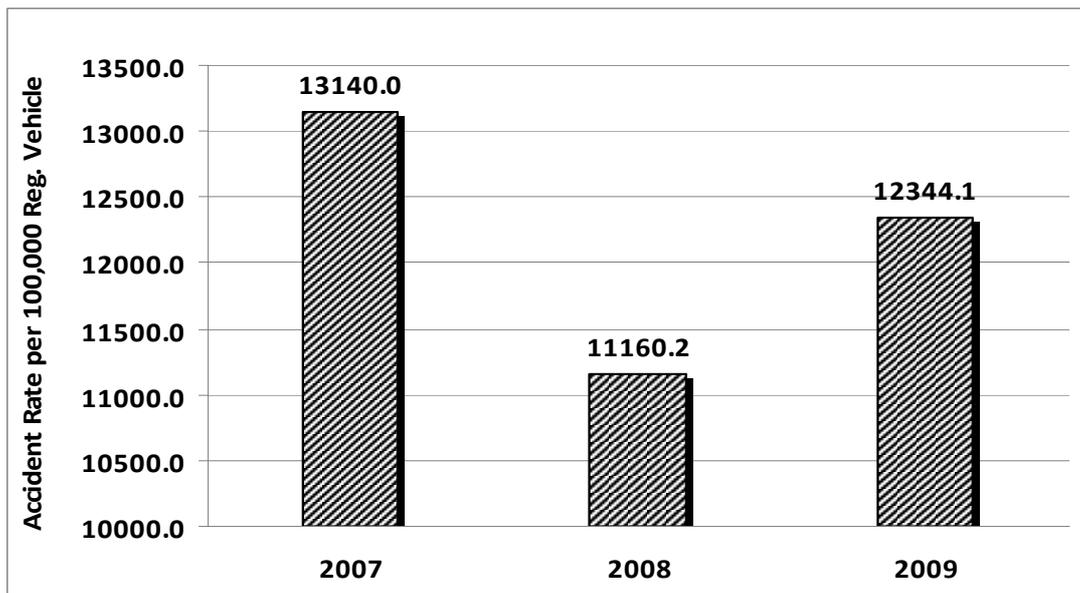


Figure 7: Traffic accident rates per 100000 registered vehicles in Jordan

#### **Main Adjustments in 2001 and 2007 Traffic Laws**

The previous traffic law (No. 49, 2001) was replaced on 19/11/2007 by a new temporary traffic law (No. 52, 2007) which imposed stiffer penalties. After five months, due to drivers' complaints, the new traffic law was relaxed on 6/5/2008, and a less restrictive permanent traffic law (No. 49, 2008) was issued in July 2008 and applied since August 2008.

Many adjustments were applied on 2001 traffic law to get 2007 traffic law; many of 2007 traffic law items

did not exist in 2001 traffic law. The new law imposed stiffer penalties in an attempt to reduce the number of accidents and fatalities. Although 2007 traffic law was effective in reducing the number of accidents, it faced a huge interposition from the road users. As a result of the interposition, many adjustments were applied on 2007 traffic law to get less restrictive law (2008 traffic law). Therefore, many penalties were modified and reduced, some others were deleted and few of them remained the same. It is worth to mention here that despite the

reduction in penalties in 2008 traffic law in general, the penalties related to the excessive speed were increased, as will be discussed later. Table (1) presents the law items' numbers as found in 2001, 2007 and 2008 traffic laws and a brief description of main common provisions impaneled under these law items. Furthermore, Table (2) presents the main adjustments applied for the 2001 and 2007 traffic law items and shows the penalties for the same provisions before and after the amendments.

### Main Differences between 2007 and 2008 Traffic Laws

The application of 2008 traffic law was not the only measure to reduce the stiff traffic violation penalties, but also two very successful safety policies were undertaken in 2008, which contributed in reducing the number of traffic accidents. The two traffic policies can be summarized as follows:

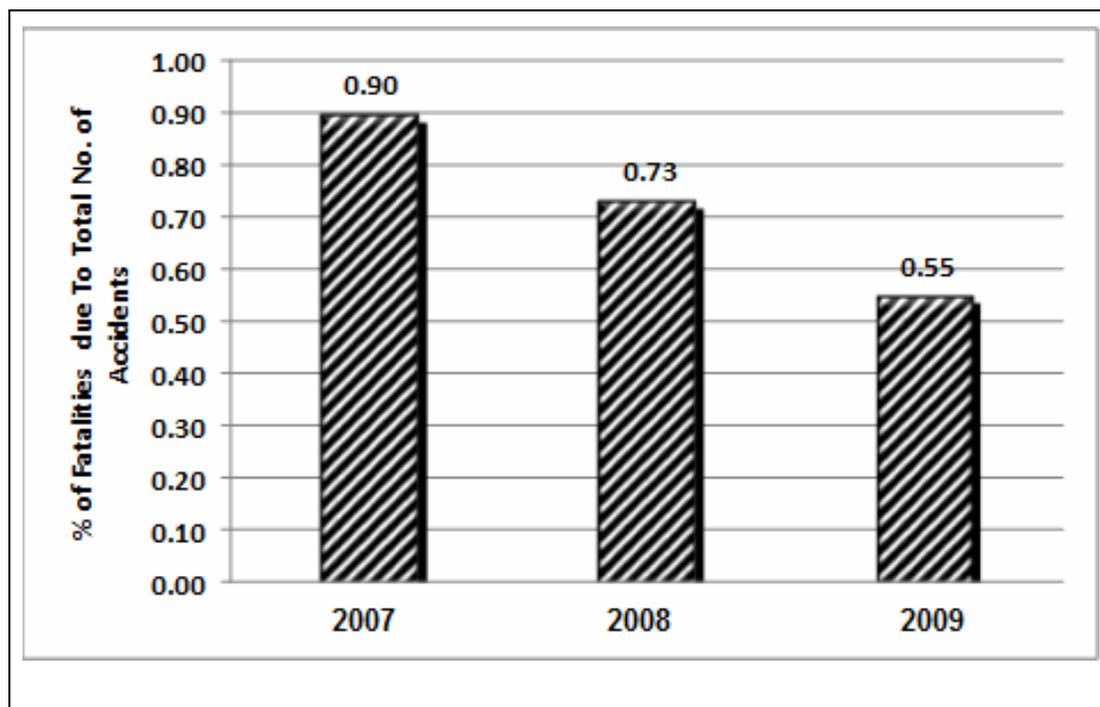


Figure 8: Fatalities percentages in Jordan (2007-2009)

The first safety policy was the increasing of penalties for excessive speed. In the temporary traffic law (No. 52, 2007), Item (67), the penalty was:

- A fine of (50) JD for driving small passenger cars and combined transport, freight and small motorcycles at speeds exceeding the speed limit by no more than (40) km/h.
- A fine of (50) JD for driving medium and large trucks, and medium-sized passenger cars, buses and cars licensed for the distribution of gas faster than the limit set by no more than (20) km/h.

But in the new law (No. 49, 2008), Item (30), the penalties were increased as shown below:

- Penalized by imprisonment for not less than two weeks and not exceeding three months or a fine of (100) JD, or both penalties for driving a vehicle at a speed which exceeds the limit set by more than (50) km/h.
- A fine of (30) JD for driving a vehicle at a speed above the limit set by more than (30) km/h and up to (50) km/h.
- A fine of (20) JD for driving a vehicle at a speed

above the limit set by more than (10) km/h and up to (30) km/h.

The second safety policy was the intensification of traffic police enforcement, which continued up to the present time.

As a result of the previous two policies, the amount of fines increased to 2.14 million in 2008, compared

with 1.36 million in 2007. The most important thing was the increase in the number of fines for excessive speeding, which increased from 144 thousands in 2007 to nearly 180 thousands in 2008. The positive combined effect of these policy measures was a decline in the number of accidents and fatalities as shown in the next section, (Al-Masaeid, 2009).

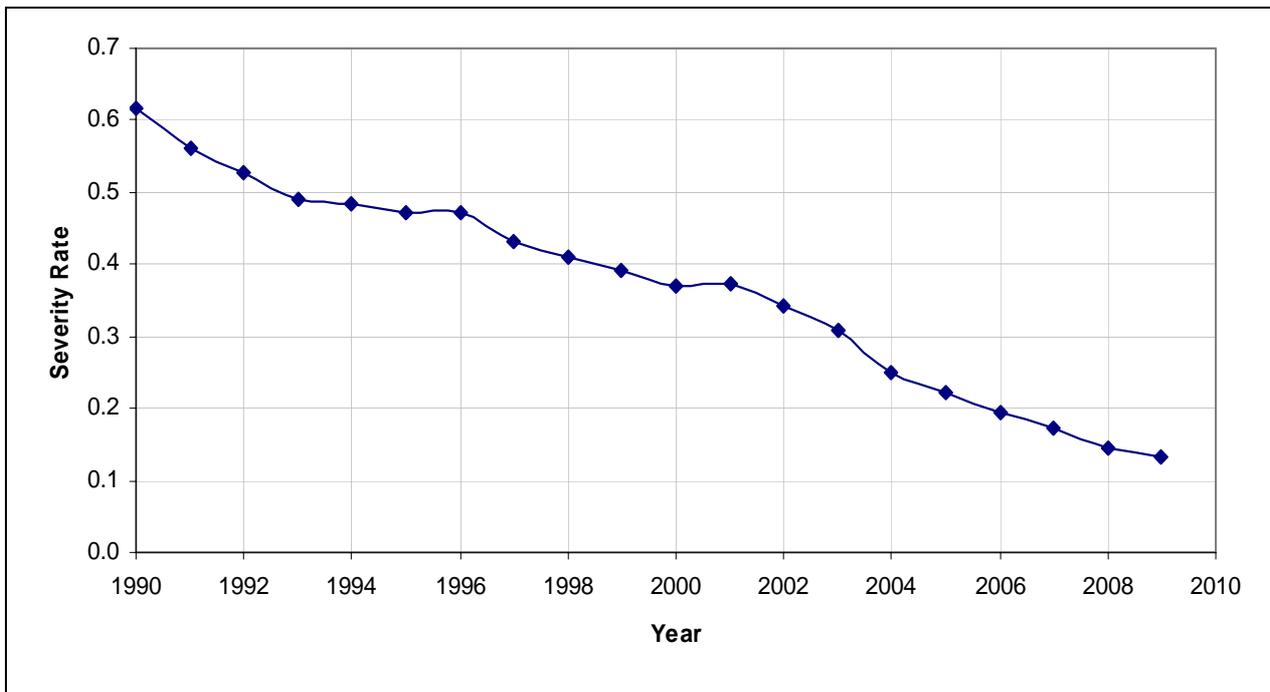


Figure 9: Severity rate of accidents in Jordan

Despite the fact that the combined effect of the traffic law 2008 and the increase in the enforcement level had an overall positive influence in reducing accidents and fatalities, the application of the law with stiffer penalties was the most effective measure. Figure 5 and Figure 6 show the accidents' percentages by month for 2007 and 2008. It can be noticed that for December [in the year 2007] and for January, February, March, April and May [in the year 2008], which is the period in which the temporary law (No. 52, 2007) was applied, the accident percentages during these months was found to be significantly lower than those during other months in 2007 and 2008.

### Impact of 2008 Traffic Accident Policies

#### Impact of 2008 Policy on Traffic Accidents

Safety policy measures undertaken in 2008, including intensification of police enforcement and improvement of traffic laws, were found to be effective in reducing total traffic accidents and fatalities in 2008. An increment was found in the traffic accident rates in 2009, but it can be noticed that it is still less than the traffic accidents in 2007 as shown in Figure 7 and Figure 8.

Although the accident rates increased in 2009, the fatalities percentages decreased by about 18% as shown in Figure 8. The increase in the accident rates in 2009 is

a result of the following reasons:

- Steady increase in the population; the increase in population for the year 2009 was (2.2%) compared to 2008.
- Increase in the number of registered vehicles by (9.8%) in 2009 compared to 2008.
- Increase in the number of foreign vehicles entering

the Kingdom by (9.0%) compared to 2008.

- Absence of engineering improvements of roads in proportion to the steady increase in the population, vehicles and drivers.
- Some people tend, when accidents occurred, to make croquets regardless the material damage just to benefit from the insurance companies.

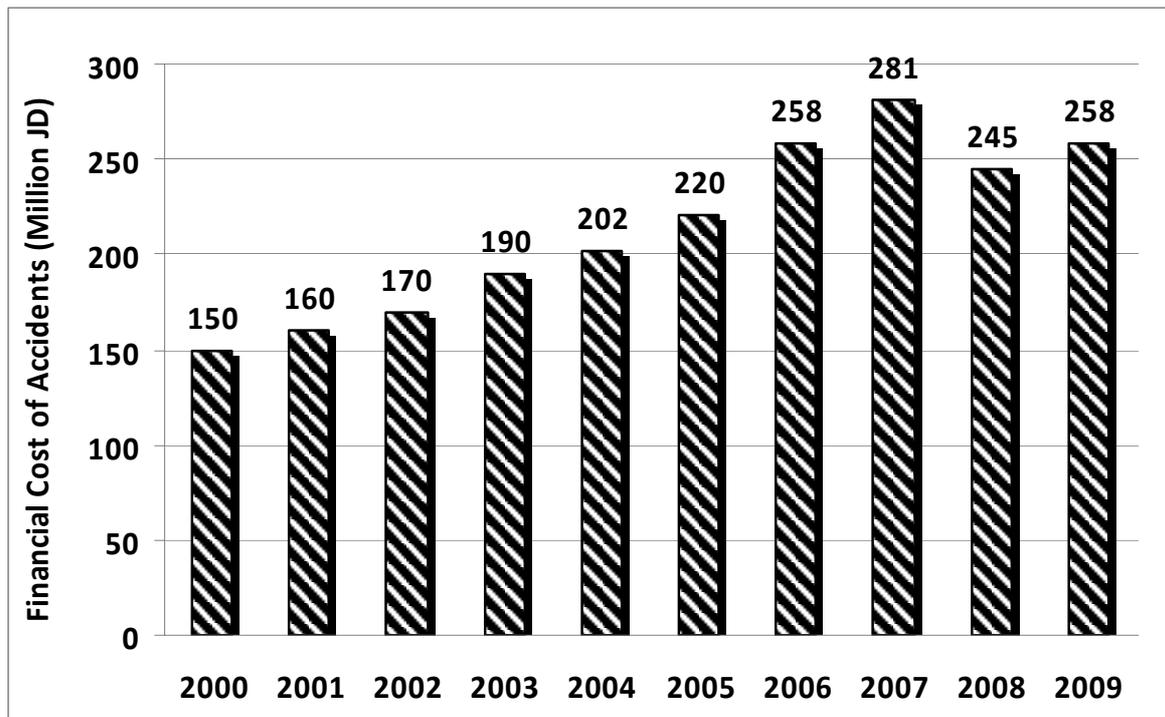


Figure 10: Financial cost of accidents in Jordan (JTI, 2009)

**Impact of 2008 Traffic Policy on Severity Rate**

The severity rate of accidents (which is defined as the sum of numbers of fatalities and injuries divided by the total number of accidents) in Jordan in general decreased since the number of fatalities and severe injuries decreased combined with an increase of the number of accidents during the year 2009 (JTI, 2009), see Figure 9.

**Impact of 2008 Policy on Financial Cost**

The financial cost of accidents in Jordan decreased in 2008 by 12.8% and then increased in 2009 by 5% as compared to 2008. Although the accidents increased in 2009 for many reasons mentioned earlier, it is worth to

say that the cost still remained less than the cost before the application of the permanent traffic law (No. 49, 2008), see Figure 10.

**CONCLUSIONS AND RECOMMENDATIONS**

After studying the effect of the safety policy measures undertaken in 2008, including the intensification of police enforcement and the increase of penalties for excessive speed, it can be concluded that:

1. 2007 traffic law "applied in December 2007 till May 2008" was very effective in reducing the numbers of traffic accidents and fatalities as compared to 2001 traffic law. However, it was

replaced by a less restrictive law (2008 traffic law) as a result of drivers' complaints.

2. During the year 2008, two laws influenced the traffic statistics; 2007 traffic law and 2008 traffic law. The numbers of traffic accidents and fatalities decreased during the year 2008 as compared to the numbers of accidents and fatalities in 2007 which were under 2001 traffic law. It is worth to mention that, in the year 2008, the months in which 2007 traffic law was applied witnessed a less number of accidents than the rest of months in which 2008 traffic law was applied. During the year 2009, only 2008 traffic law was applied. The number of traffic accidents increased in the year 2009, however, the number of fatalities kept decreasing.
3. The severity rate continued to decrease during the years 2008 and 2009 (0.14 and 0.13, respectively) as compared to the severity rate during the previous

years.

4. The 2007 traffic law was more effective in reducing the number of accidents compared to the 2008 traffic law.

Finally, it is highly recommended to reapply 2007 traffic law with stiffer penalties, since it contributed in reducing accidents and fatalities more than 2008 traffic law. In addition, it is recommended to apply all the needed safety polices to reduce the impact of traffic accidents' phenomenon in Jordan through raising the traffic awareness of families, youth and children through brochures, lectures and youth centers' activities. Cooperation between the public and private sectors to create a safe traffic environment through constructing bridges and crosswalks and a vehicle periodic inspection are recommended to ensure that vehicles are in good condition and equipped with the necessary safety devices.

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