Strategic Traffic Safety Decisions for Developing Countries: Lessons from Developed Countries

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Motivated by the declining traffic accident fatalities in developed countries, there is a growing interest in the safety experiences and initiatives that have led to this result by the developing world to address the growing traffic accident casualties. However, despite the overall decreasing trend of the traffic accident fatalities in the developed countries, there is significant variation in the traffic safety status and development. In US, for example, per capital fatality rate is three times of that of Japan and there is also notable difference in the rate of the road safety improvement. Moreover, safety issue in developing countries may be evolving in a situation different from that of the developed countries. At the same economic level the rate of motorization trend and infrastructural provision, mobility etc for the developed and developed countries, which affects the safety level, may vary significantly. Taking into account the above issues, this paper looks at the evolution of the safety in the developed countries over long period of time, at different economic level, and identifies not only the successful practices, but also relative failures due to lost opportunities and its implication for the developing world. Based, on this the paper is to help developing countries in taking integrated traffic safety decisions in the long term interest by taking into account the dynamics of the transport system, mobility and safety level, with emphasizing on the importance of timing of the policies at different socio-economic development stages.

Key Words : *traffic safety, transport system, mobility, safety strategy, Safety policy*

1. INTRODUCTION

Developing countries , where 90% of the world road accident fatalities estimated to occur, are attracted toward the safety initiatives in developed countries due declining traffic safety fatalities in these countries.

The discussion in this regard mainly focuses on lack of legislations, and laxity in their reinforcement in the developing countries. Currently, overwhelming majority of African and Asian developing countries have introduced prominent safety legislations: seatbelt, drink driving and helmet laws are adopted by 87%,88%, 95% of Asian developing (AD) countries respectively, while the corresponding level of the introduction of the laws in Africa is 73%,97% and 73% respectively[1)].

Even if developing countries succeed in implementing safety initiatives similar to that of developed countries, despite their limitation in resources which makes that difficult, doesn't necessarily mean low fatality rates. In US, for example, per capital fatality rate is three times of that of Japan and there is also notable difference in the rate of the road safety improvement: Japan could reduce the fatality by more than 70% since 1970 while US could only reduce by just 30%. This difference exists despite the similarity in their safety level *fatality per vehicle kilometer travelled (VKT)*, which is achieved by mainly introducing safety legislation, improving vehicle safety and education over decades of period. This variation may be attributed, at least partly, to the transport system and mobility as discussed by subsequent chapters of

this paper.

Transport system and mobility is mainly discussed in the context of environmental burden, and not in the safety aspect of the transportation, specially in developing countries. Most of the discussion on addressing safety issue has focused on improving the safety level. This may be understandable in the case of developed countries where the transport system has already been established. However, developing countries still do have the opportunity to shape the transport system to a safer one.

Moreover, the nature of traffic safety in developing countries, and socioeconomic dynamics may not be necessarily the same as that of the developed countries, which may make some innovative policies necessary. AD countries like Malaysia, Thailand, and Viet Nam have different motorization rate and nature even at the same economic level compared to that of Japan. It is, therefore, important to re-evaluate traffic safety strategies in such countries and include new perspectives.

This paper looks at the evolution of the safety in the developed countries over long period of time, at different economic level, and identifies not only the successful practices, but also relative failures due to lost opportunities and its implication for the developing world. Safety issue in developing countries may be evolving in a situation different from that of the developed countries. At the same economic level the rate of motorization trend and infrastructural provision, mobility etc for the developed and developed countries, which affects the safety level, may vary. Taking into account the above issues, the paper will attempt to outline fundamental long term traffic safety decisions for the developing countries.

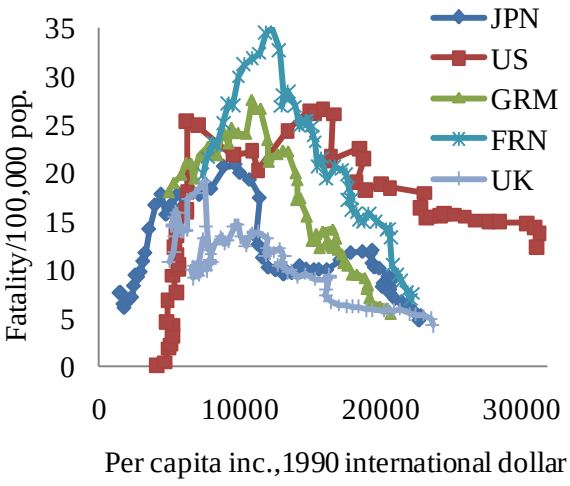

Fig. 1 Fatality trend by income of developed countries

2. SAFETY AND TRANSPORT SYSTEM

Even though fatalities in industrialized countries are decreasing there is a variation in the trend, risk level, etc even at the same economic level (Figure 1, 2). US, for example, doesn't show a sharp fall in the fatality or the fatality rate after its peak compared to other countries (Figure 2). Japan and UK has reduced the fatality at an average rate of 1.9% and 1.6% respectively every year, while US could only reduce at a rate of just 0.9% every year. Thus, US could only reduce

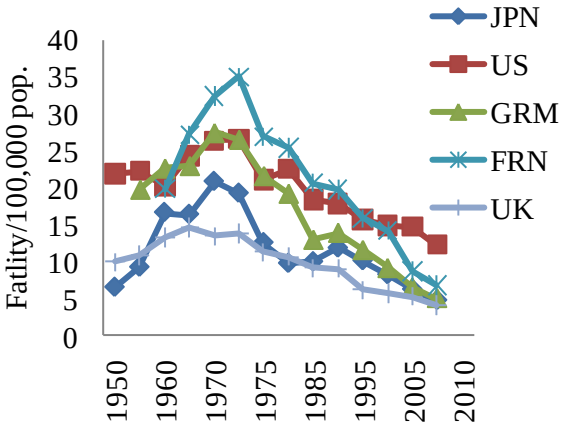

Fig. 2 Trend of fatality rate in some developed countries

Table 1 Fatality reduction since peak

Country	Year		Fatality	Reduced (%)	Rate (%/year)
Japan	Peak	1970	21795	72.4	1.9
		2008	6023		
US	Peak	1972	55600	33.0	0.9
		2008	37261		
UK	Peak	1966	7985	68.2	1.6
		2008	2538		

its death by 33% of its peak, which is less than half of Japan and UK (Table 1). Moreover, safety level has improved

and converging recently in many of the developed countries, yet there is significant difference in the fatality rates. US, for example, sustain fatality rate as high as almost three times as that of Japan, even though they have similar fatality per vehicle kilometer travelled in 2008. The main differences and possible sources are explored in the following sections.

(1) Safety level

Road environment, vehicle safety and human factors are generally the three major factors intensively discussed in addressing road safety. Making the infrastructure safer through engineering and introduction of new technologies to make the vehicles safer

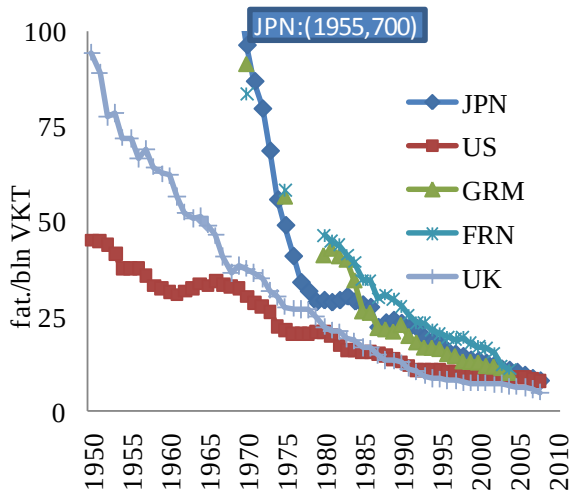

Fig. 3 Fatality trend

Table 2 Safety improvement rate

Country	Year		Fat./bln VKT	Avg-reduction rate (Fat./ BVKT)
Japan	Peak	1970	96	2.3
		2008	8	
US	Peak	1972	27	0.5
		2008	8	
UK	Peak	1966	46	1.0
		2008	5	

beside the education and adaptation of the legislation to promote safer travel behavior are common measures pursued to improve road safety. Post crash emergency service also plays important role in saving lives.

Developed countries have, in general, set up national initiatives to implement the above safety measures, and safety level has significantly improved (Figure 3). Even though the fatality per vehicle kilometer travelled (VKT) is recently converging, a significant gap existed in 1970s. For example, Japan has Fat./billion VKT of about 700 in 1955, which is about 10 to 20 times of that of UK and US (Figure 3). However, the safety gap has been narrowed as Japan has improved its safety level at a rate more than 4 and 2 times of that of US and UK respectively since the peak.

The variation in the rate of safety level improvements as shown in Table 2, and how this difference has resulted in has great implication for the developing countries to understand the best practices among developed countries rather than generalize the experience of the developed countries .The variation could be mainly related to the timing of the safety initiatives and proper implementation of the initiatives as discussed in the next chapter.

Moreover, even if the developing countries effectively apply safety initiatives similar to that of the industrialized country, despite their limited resource, that doesn't necessarily mean low fatality in the long term. This is because even at high safety level, i.e low Fat./VKT, is achieved the fatality may remain high due to the high mobility and the transport system, as disucussed in the following section.

(2) Transport System

Improving safety level is critical, as we have seen in the previous section, to save lives. However, transport system is also as much important to address safety issues in the mid- and long-term. As Table 3, shows per capita fatality rate in US is about three times as high as that of Japan, even though the safety level is similar. This simply means, in US relatively three times as many lives as that of Japan are lost every year due to traffic accident. This may be attributed to the transport system or the motorization and of degree the reliance of vehicles and mobility. The per capita VKT of US is about three times as that of Japan, while on average each vehicle travels 51km/day in contrast to the 27km /day of Japan. In another word, US could have saved two-third of the fatalities if it had transport system similar to that of Japan.

This has big implication for the developing world, where the role of transport system is largely marginalized in their safety initiatives. Transport system evolves with the economic development, and developed countries

Table 3 Safety and mobility (2008)

Country	Fat./100,000 Popn	Fat/ billion VKT	Veh/1000 Popn	(VKT/ Veh) per day	VKT/capita per day
UK	4.2	5	542	41	22.9
Japan	4.72	8	606	27	16.0
US	12.25	8	816	51	43.1

have more or less stabilized their system with the economy. However, it should be underlined that the developing countries have still the opportunity to shape their transport system to save many lives in the long term. Timing is important to shape the transport system, as it would be difficult if not impossible to bring significant change at a later stage where economy and transport system are established.

3. SAFETY INSTUITIONS AND POLICIES

(1) Institutional set up

Traffic safety issue is multi-sectoral as efforts to address it is not only limited in improving road environment and vehicle safety, but also legislating and law reinforcement, emergency or medical services besides increasing awareness (education) and securing necessary funds etc. Therefore coordinating the efforts of all relevant sectors is critical and challenging, to make a safety initiative effective.

Different countries have taken different approach, which may have influenced. In Japan, for example, nationwide traffic safety was enacted in 1970. The national initiative was led by a council of twelve relevant cabinet ministers led by the prime minster. This high level political commitment was important in many aspects, such as issuing safety legislations. The program is evaluated and revised every five year with setting specific targets to achieve with the roles of each sector. In contrast, US has generally decentralized system. In fact the Ministry of Transport play certain role to oversee the nationwide efforts, but it's limited. For example, safety rules like helmet use varies from state to state. Nationwide efforts in UK are also led by the Department for Transport. The department issues guidelines that regional administration has to met, in order to secure fund for the local initiatives. Compared to Japan, passing safety legislatives isn't

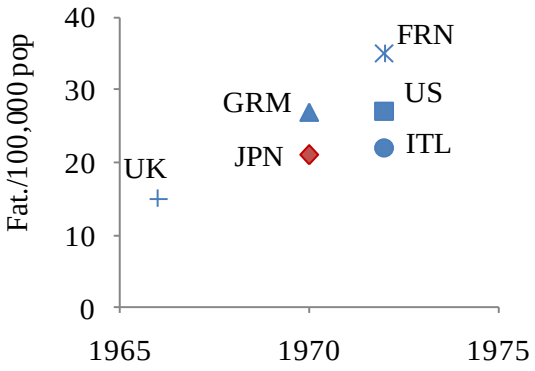

Fig. 4 Fat./100,000 pop. at peak fatality

easy: attempts was made to make seatbelt law compulsory before it was temporarily approved in 1983 after which it become permanent in 1986 (DfT annual report

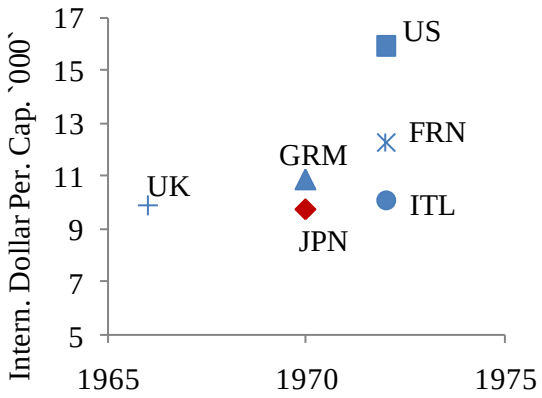

Fig. 5 : Income at peak fatality

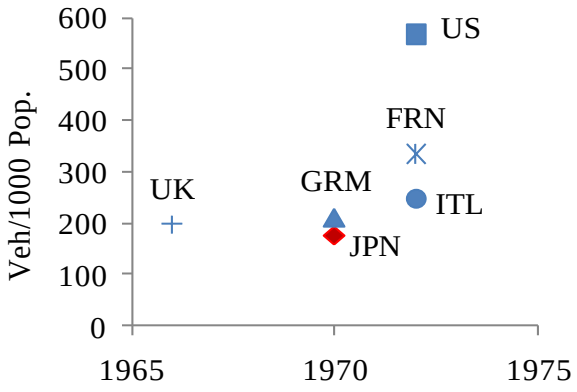

Fig. 6 : Motorization at peak fatality

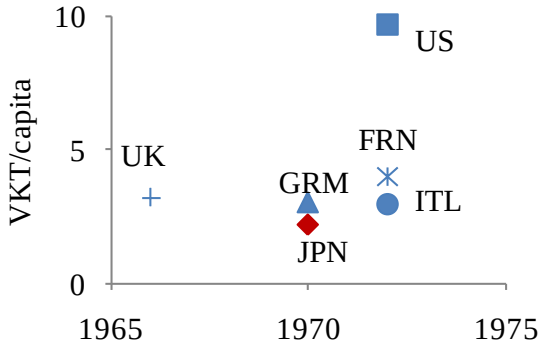

Fig. 7 : Mobilty at peak fatality

2007) [2)]

(2)Timing of traffic safety initiatives

Ideally, the sooner the intervention the more lives that could be saved. As shown in Figures 4 to 7, however, that different countries recorded their peak fatality at different stage: not only in terms of the risk, but also

motorization, mobility and income. US, for example, fatality risk per hundred-thousand population reached 27, while it reached 21 in Japan before both countries succeeded in bringing down (Fig. 3a). In another word, US lagged about a quarter of a century than Japan, in terms of the risk. As Figure 4 to 7 show, Japan has also acted relatively at an early stage, in terms of income, motorization and mobility.

Timing of transport policies is also important for shaping the mobility and transport system as discussed in the previous chapter. As we have seen, US per capita VKM travelled is three times as that of Japan. The difference in the per capita VKT of US and Japan is the result of transport policies adopted over long period of time, which is difficult to reverse. Developing countries where the transport system is still evolving have the opportunity to make strategic decisions to adopt safer transport system. Decreasing the reliance on private vehicle, as it is the case in US, isn't only about saving lives, but also being socially more efficient and environmentally friendlier.

4. CONCLUSION

Despite the overall decreasing trend of traffic accident fatalities, significant difference exists among developed countries. The fact that US has fatality rate as high as three times of that of Japan despite having similar safety level, is a typical example. Interestingly, US`s per capita vehicle travelled is almost three times as that Japan, which may account for the diffidence in the fatality, partly at least. There is also differences in the institutional set ups, safety initiative timing, beside the transport system which all contributed to the safety development. Developing countries need to understand the differences that exist among developed countries so that they grasp missed opportunities. Among other, developing countries shouldn't miss the opportunity to shape their transport system to a safer one at this early stage.

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