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A Strategy for Enhancing the Efficiency in Dealing with Traffic Accidents in Hsinchu Science Park, Taiwan

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Abstract: The area of Hsinchu Science Park (HSP) in Taiwan is 6.5 sq km, encompassing some 500 enterprises and 150,000 employees. On average about 200,000 motor vehicles drive in and out of the park every day, resulting in frequent traffic accidents. Number of fatalities in accidents is over 1000 cases for every year. These accidents often cause traffic jams that may delay enterprises' operations of human flow, cargo flow and financial flow and cause big losses. This study thus aims to improve the efficiency of dealing with traffic accidents to reduce the ensuing economic loss. The study uses management thinking to step by step review service planning, scheduling and commanding of traffic police operations and builds a new SOP for the specific duty service of dealing with traffic accidents. After practical application, the model herein not only removes the obstacles of traffic accidents quickly but also improves people's satisfaction towards the HSP traffic police force.

Key words: Traffic accident, management performance, SOP, people's satisfaction

INTRODUCTION

There are about 500 firms and 150,000 employees in Taiwan's Hsinchu Science Park (here after referred to as HSP). The park's operating revenue is about NT\$1 trillion with approved investment exceeding NT\$1 trillion. HSP is about 6.5 sq km, accounting for only 4/10000 of the area of Taiwan but its output value of about US\$40 billion a year helps Taiwan's hi-tech products enjoy a strong international reputation, making it an important hub for economic development. With 150,000 employees and 200,000 motor vehicles in the science park, traffic accidents often happen at high number. From official records, there is 1540 cases traffic accidents occurred in 2011, resulting in considerable loss of social cost. According to Lin (2000), when an accident occurs, in addition to the direct life and property loss of those at fault and related personnel, economic and goodwill are also lost due to traffic delays from passing by the accident site and the loss of social cost from fuel consumption and air pollution. He therefore, called the police to remove obstacles once a traffic accident occurs in order to reduce the various losses caused by the accident. This present study focuses on the enhancement of efficiency in dealing with traffic accidents by police in order to decrease the various losses from the accidents.

DEFINITION AND CLASSIFICATION OF TRAFFIC ACCIDENTS

According to the definition of Road Traffic Handling Standard of Taiwan, road traffic accidents refer to accidents involving injury and/or death, or damages to vehicles, motor machinery and property caused by the vehicle or motor machinery moving on the road. A major road traffic accident is an accident that results in one of the following situations:

- The number of deaths is more than 3, or deaths and injuries are more than 10, or injuries are more than 15
- When transported dangerous goods have exploded or are burning, or when toxic liquid (gas) or radioactive materials have leaked

For the convenience of filing reports and management, traffic accidents are classified as follows: Class A1 accident is when a person has died on the spot, or someone has died within 24 h after the accident; class A2 accident is if there are any injuries or someone has died more than 24 h after the accident; class A3 accident is if when there is only property damage.

The traditional concept of police is that public security is this civil force's most important task. However,

Table 1: Comparisons between public security cases and traffic accident cases during 2007-2011

Year	Traffic cases				Injuries	Violent cases	Criminal security and criminal cases		
	A1	A2	A3	Total			Ordinary criminal cases	Other cases	Total
2007	0	432	512	944	487	1	121	174	296
2008	3	518	524	1045	601	3	137	19	159
2009	1	517	546	1063	587	0	105	24	129
2010	4	678	768	1450	788	1	114	12	127
2011	1	761	778	1540	859	0	68	23	91

Compiled by first company of third corps, special police second headquarters in Taiwan

the security situation in HSP is relatively simple as the traffic accident rate is much higher than the crime rate. Table 1 shows the comparisons between public security cases and traffic accident cases in HSP during 2007-2011. There were 1056 criminal cases 2007-2011, averaging 211.2 cases per year, while there were 6042 traffic accidents, averaging 1208.4 cases per year or nearly six times that of criminal cases. This highlights the urgency for improving the efficiency in dealing with traffic accidents in HSP.

COUNTER-POLICY FOR SOLVING PROBLEMS

The personnel quota of traffic police in HSP is nine, including one section chief who is responsible for review and leading the team. Eight policemen are responsible for dealing with traffic accidents. Taking year 2011 as an example during which 1540 traffic accidents occurred, on average each police officer needs to handle 192.5 cases per year. The park is small at 6.5 sq km but has 150,000 people and about 200,000 motor vehicles driving in and out every day. If we do not take traffic engineering projects and negligence in personal driving behaviors into consideration, there are only five traffic police in HSP. After deducting two officers off each day, one duty officer, one officer dealing with parking violations and one officer on annual leave or on vacation, then actually 3-4 policemen are responsible for dealing with an average of 4.2 traffic accidents per day-that is, each officer deals with 1-2 accidents per day.

The problem is that there are more traffic accident cases in HSP than in any other place in Taiwan and in addition to handling accidents, a traffic police officer also needs to take care of many administrative affairs, even taking turns at common duty as an ordinary policeman. The traffic police force in HSP is overloaded in physical strength and in spirit. Furthermore, it is impossible to estimate the probability of traffic accidents and hence the duty time arranged by the duty roster is never in line with the exact point in time that an accident occurs. Because of duty time and day-off time often cannot be fixed, the workload for dealing with traffic accidents is unevenly distributed. The paperwork for dealing with traffic accidents is also particularly tedious, bringing about great work pressure on traffic police and affecting the

performance of dealing with accidents. Based on our studies, we make the following counter-policies recommendations to improve this situation.

Re-planning specific responsibility duty: Ho *et al.* (2003) argued that although the Taiwan National Police Agency implemented a plan for overall improving the quality of dealing with traffic accidents in 2000 and discussed it with policemen who practically deal with traffic problems and re-positioned the main tasks, duty items and properties, the plan did not provide substantial improvement measures. Ho *et al.* (2003) therefore, recommended to again overall enhancing the quality of dealing with traffic accidents.

In their opinions, to improve the quality of dealing with accidents, traffic police should first be relieved from taking turns at ordinary police duties and then the police force should adopt the duty concept of probing crimes by criminal police and consider handling accidents as criminal cases. In other words, when a traffic accident occurs, in addition to the administrative operations of the preservation of facts and evidence, quickly cleaning up the accidents and easing traffic jams, the traffic police are also probing criminal cases involved in the accident such as drunk driving, hit-and-run and public safety violations. Therefore, this study recommends to modify specific plans of responsibilities and draw up “Main Points for Implementing Specific Responsibility Duties of Dealing with Traffic Accidents” in order to outline duty items and classes, particularly for reasonably planning the criminal probe of any hit-and-run and drunk driving. Moreover, the police force should reasonably demarcate the scope of jurisdiction, population and number of road networks to regulate the personnel quota in units. Only when specific responsibility personnel are relieved of taking turns at common duties will the documentation of handling accidents be complete and comprehensive. On the other hand, the authorities should apply management thinking to personnel planning, including recruitment, education and making the best use of and retaining talented people. This should not stop at just using talented people but should also involve promotion measures to retain talented individuals who will positively and substantially be helpful to the specific responsibility, expertise, performance and image of the police force.

Establish SOP for handling an accident scene: Hsiao (1988) stressed that a traffic accident involves criminal, civic and administrative responsibilities and so it is hard to identify which responsibilities should be followed for an accident. The authorities have to establish a better and more complete SOP (standard operating procedure) for handling an accident scene so as to provide traffic police with an appropriate route to solve arguments according to different types of accidents. Building a SOP could also enhance the efficiency of dealing with an accident. To adjudicate the fault for a traffic accident, Hsieh (1989) argued for trusting those parties that followed the traffic rules. If there is no identification of deliberation and both parties reach an agreement on the amount of compensation, then the accident can be reconciled and settled. The evidence collected by traffic police at the accident scene cannot affect the amount of compensation. Thus, for police handling a traffic accident that causes no injury, the most important thing is to draw up the graph of related positions on the scene and take photo evidence of vehicle damages as soon as possible for both parties and get the road cleared of any obstruction.

Regarding the identification of accident responsibility, Tang (2000) introduced the concept of right of way to determine fault liability. The so-called “right of way” is a person’s or a car’s right for using or accessing a road. If a person or car did not have right of way but he/she used or was passing through the road, then the legal interest of his/her life, body, or property is not protected and that person should be punished even if no accident happens. Traffic police can therefore use the concept of “right of way” to preliminarily determine who should take responsibility for the accident.

Fang (2004) recommended that a traffic police officer play a role as an accident handler with the main responsibility of helping get any injured person to a doctor, collecting and surveying evidence at the accident scene and determining and analyzing the accident responsibility before deciding whether to transfer the case to a criminal investigation according to the opinions of the two parties involved in the accident. In fact, according to the statistics of class A2 traffic accidents in HSP during 2002 and 2007, the ratio of traffic accidents going to court was very low (under 4.4%) as Table 2 shows. Therefore, in order to restore full use of the road as soon as possible, traffic police should shorten the time for handling an accident scene.

Figure 1 shows the SOP established by this study, from Fig. 1 we see that when taking care of A2 or A3 accidents, in order to reduce the delayed travel time, the police should measure and draw the scene, collect evidence and take photos so as to quickly remove

Table 2: The ratio of traffic accidents going to court after causing bodily harm

Year	A2	No. of injuries	Gone to court	Ratio (%)
2007	432	487	14	3.20
2008	518	601	13	2.50
2009	517	587	15	2.90
2010	678	788	28	4.10
2011	761	859	32	4.20

Compiled by first company of third corps, special police second headquarters in Taiwan

obstacles caused by the accident, take the two parties involved in the accident back to headquarters to help with the investigation and partially implement handling of the scene and any follow-up paperwork, bringing the road to be cleared of any obstruction quickly. Regarding A1 accidents, an increase in the police force is needed for collecting evidence on the scene-for example, support from criminal police, retrieve nearby traffic cameras’ videos, inform the family members of an injured party to make a record, re-organize materials after going back to headquarters and dealing with detaining the suspect and transferring the case to the district court. Under practical operational, there is only one traffic police who leaves and he is responsible to standby with while others going out to handle an accident. Because every member has experience at handling accidents, how to divide duties on the scene must be planned in advance to meet the requirement of completing the handling of A1 accidents within 90 min. Because there are policemen who help control and direct traffic, if the accident does not occur during rush hour, then it may have little impact on delayed travel time and could shorten the time for removing any obstacles at the scene caused by the accident. Regarding the handling of accidents that occur on a road not for public use, it is impossible to give a preliminary judgment as per traffic safety rules but the police should still follow the requirements of handling A3 accidents and complete handling procedures on scene within 40 min. If both parties reach agreement on accident responsibility and move the vehicles away from scene, then the traffic police will invite the respective parties to headquarters to tray and come to a compromise.

RESULTS AND DISCUSSION

The frequency of transferring traffic police to other departments from traffic department for specific responsibilities should be reduced in order to meet requirements for quickly and efficiently handling traffic accidents and to directly enhance overall organizational effectiveness. Due to organizational reforms and trimming employees in government, human resource management has become a top problem that all government agencies

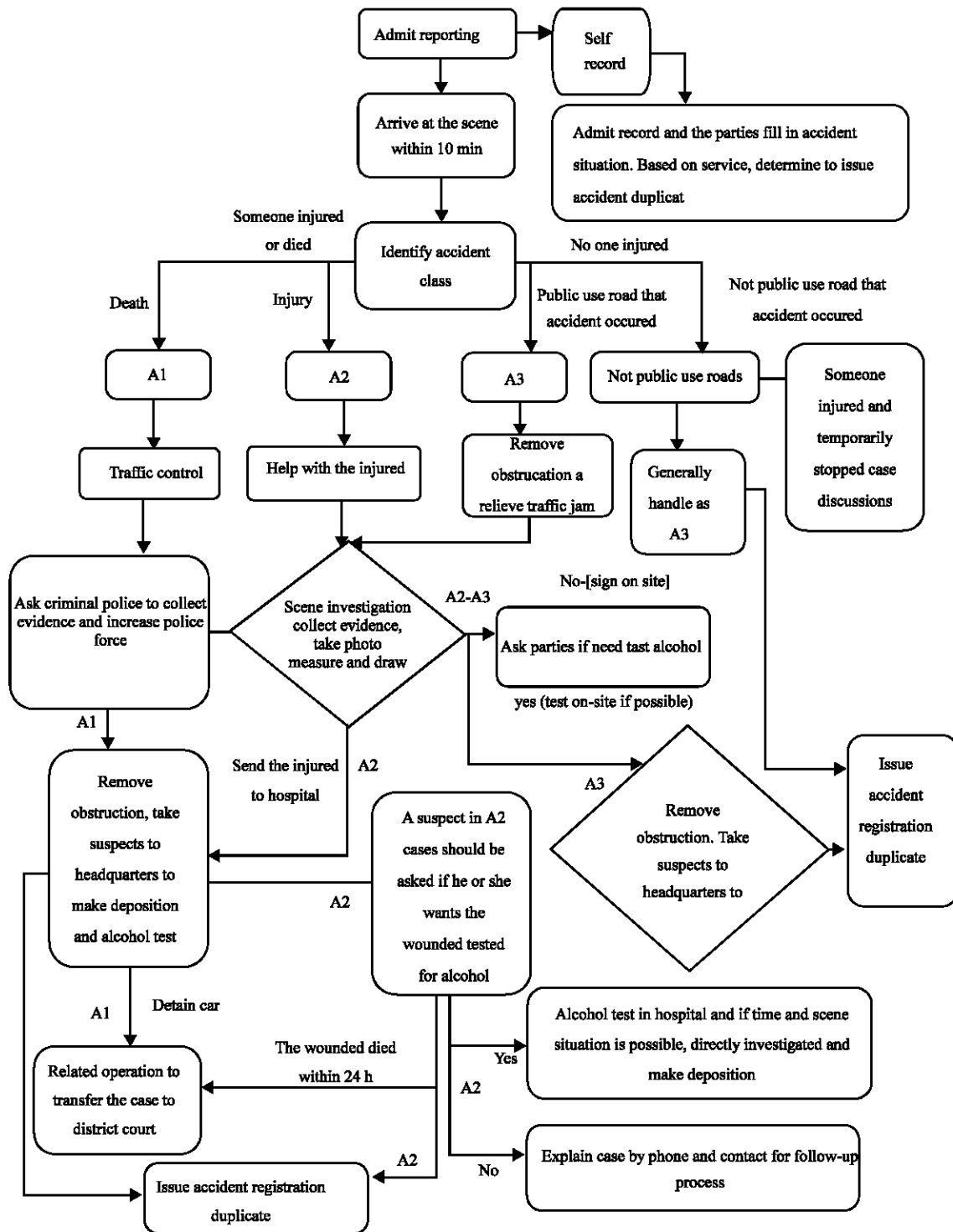


Fig. 1: SOP for handling an accident scene

need to learn and solve. Despite the fact that there are a great number of methods, theories and successful examples of human resource management, any practical

application still needs strategy planning and analysis of problems, management, leadership and control so as to yield twice the results with half the effort. We thus draw

up “Main Points for Implementing Specific Responsibility Duties of Dealing with Traffic Accidents” and create “SOP for Handling an Accident Scene”.

How can a police force put forth both good quality and performance in dealing with traffic accidents? Conceptually, slow work yields excellent products-that is, if police can quickly handle an accident and achieve good performance, then the quality of accident evidence may not be perfect. In practice, police officers are always the last to arrive at the scene and seek to preserve all evidence and correctly draw up a graph of the scene. Years ago, there lacked supporting information such as monitoring videos and the respective parties often kept to their own arguments. It is rather hard to assess the extent of restoring the truth based only on drawing graphs and evidence at the scene. Taking an A3 accident as an example, there are often big differences between the court’s decision and the expected results on compensation after the accident and so the importance of evidence is less than that for A1 and A2 accidents. If police officers spend too much time on A3 and non-public use road accidents, then the requirements of human resource management will not be met. Fortunately, technological equipments have been developed and monitors and vehicle video recorders are now quite common, helping to enhance the accuracy of determining the causes of accidents and reduce handling time. Therefore, it is necessary to draw up “SOP for Handling an Accident Scene”, which should achieve the purpose of quickly removing obstacles caused by the accidents.

The social costs caused by traffic accidents are becoming a greater concern now, resulting in research on the related elements of accident responsibility, such as fault inference and contents of right of way. With auto insurance and electronic supporting instruments now quite popular, it has become necessary to set up a process planning and simplified operational procedure for handling accidents. According to the accident handling standard announced by Taiwan National Police Agency and referring to the above-mentioned literature reviews, this study offers “SOP for Handling an Accident Scene”. Following this SOP, traffic police can reduce the time for handling accidents and in turn relatively lower the social costs caused by travel delays and achieve the satisfaction of more than 95% of the parties involved in a traffic accident.

CONCLUSION

Through business management thinking, the planning, scheduling and commanding of a police force and the control of its performance in handling traffic

accidents can reach the goal of quickly removing obstacles at accident scenes and save social costs. This study also provides recommendations to Taiwan’s National Police Agency and builds “Main Points for Implementing Specific Responsibility Duty of Dealing with Traffic Accidents” in order to remove any unclear situation of specific responsibility positioning and to ease the work pressure of specific police personnel. Each jurisdiction should also initiate “SOP for Handling an Accident Scene” to enhance scene handling performance and to implement a strategy for grading and staging operation targets by response, scene handling and follow-up procedures, which should achieve the purpose of quickly removing obstacles caused by traffic accidents. For A1 and A2 accidents, if alcohol tests at hospitals are needed to be conducted, we recommend that the team leader of the police go there and supervise the procedure of verification to avert any moral hazard problem. This study believes that establishing “SOP for Handling an Accident Scene” will enhance accident handling quality and protect the rights and interests of those persons involved in traffic accidents.

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