XXIInd WORLD ROAD CONGRESS
DURBAN 2003

TURKEY - NATIONAL REPORT

STRATEGIC DIRECTION SESSION ST2
Roads and quality of life

EXECUTIVE SUMMARY

Within the framework of Loan Agreement signed between Government of Turkish Republic and World Bank, "Traffic Safety Project" was initiated in July 1998. The total amount of the loan is 91 million US$ of which 65 million US$ is from the credit and 26 million US$ is from the national budget. This project will be completed in July 2003.

The main objective of this project is to determine and implement the vision, aim and strategy in order to reduce the rate of fatality and injuries to 40% due to traffic accidents in the period of 10 years.

Traffic Safety is a system which covers several activities and institutions with a high coordination to provide the desired level. Generally, this system includes Engineering, Enforcement, Education and Information, First Aid Subjects. Task Force Unit has been established in order to provide the coordination and an effective intervention.

Some studies have been initiated to conduct a detailed examine and to find solutions for such a significant problem.

TRAFFIC SAFETY PROJECT

Traffic accidents remain as one of the important national problems that await solution. Each year, close to 10,000 people loose their life, and over 100,000 are injured - some remaining disabled and financial losses reach billions due to traffic accidents.

When we take a close look at the traffic accidents in Turkey, we can see that 98% of traffic accidents are due to driver behaviour. Unfortunately, not enough research has been done on the reasons for bad driver behaviour.

Of the published statistics, another interesting point to note is that a small percentage of accidents 1.5-2% are due to road faults. But, it can also be said that engineering services can be an important factor in the occurrence of traffic accidents, fatalities and injuries in accidents occurring due to "incorrect overtaking" or "speeding", which make up 65% of the traffic accidents.

In Turkey, police enforcement is present in places where there is a concentrated number of accidents. But, to lower the annual average for traffic accidents, a more effective and deterring method of enforcement must be used. To decrease the human error factor in the occurrence of accidents, effective enforcement is only second to education. This can be done with 24 hour enforcement with fully equipped vehicles and an infringement point system.

10% of deaths due to traffic accidents occurs in the first 5 minutes and 50% occur in the first half hour. For this reason, first aid for accidents is of high importance. Fast and effective communication is necessary to reduce the amount of time it takes for first aid to arrive to an accident. Further, more equipped ambulances with more staff is needed.

As you know, Traffic Safety is a system that requires many activities, spans over many organizations and good coordination in order to reach the desired level of success. For this, a system including engineering, enforcement, education and first aid should be coordinated by and a Project administration unit.

An important step has been taken to make in-depth analysis of these important problems and to find solutions for these.

A "TRAFFIC SAFETY PROJECT", to cost a total of $91 million USD ($65milUSD loan and $26milUSD from national budget) has been started, with the agreement between the Republic of Turkey and the World Bank. The Project that started in 1998.

Four different organizations, working together perhaps for the first time, will work toward some determined aims and targets during the Project.
The following organizations will work in their areas to satisfy the aims of within the Project:

- The General Directorate of Highways within the Ministry of Public Works and Settlements, engineering services
- The General Directorate of Security within the Ministry of the Interior, enforcement services,
- Gazi University and the Ministry of Health, emergency aid services
- The related departments of the Ministry of National Education, education services.

The General Directorate of Highways (KGM) is responsible for improving 'Black Spots' (which are spots on the road that have a high concentration of vehicle accidents), so that vehicle accident possibilities are reduced to the minimum and for renewing the vertical and horizontal marking along a 4500km stretch on the main arterials along the Project route. KGM and the General Directorate of Security will work toward building a common data bank that will be the basis for future Traffic Safety concerns and decisions.

The General Directorate of Security (EGM) will form 110 teams to station at each 50-100km mark along the roads nationally that have the highest concentration of accidents. By using computerized and vehicles with modern equipment, these teams will be able to make effective traffic patrols and apply the infringement point system.

The Ministry of National Education will choose 400 teachers from 322 schools national wide to train. Of these teachers 100 will become traffic formator teachers. Drivers of governmental organizations will be trained.

Gazi University has planned to apply the emergency and first aid services in 2 stages. In the first, the University will conduct a pilot project along the Ankara-Konya road (100km) for a period of 2 years. In the second stage, in light of the results from the pilot project, the Ministry of Health will spread the emergency aid services along the whole road.

Within the framework of the project up to now;

- 241 accident black spots were rehabilitated.
- Required materials for traffic signing and guardrails were purchased.
- The common data bank studies are going on.
- Psycho technical evaluation of 780 traffic police have been done, 586 traffic educators and 10 000 drivers have been trained.
- Public information campaigns were arranged about speed and safety belt.
- First aid and emergency project started.

One of the most important subcategories of Traffic Safety Project is to improve and monitor the black spots. General Directorate of Highways annually undertakes the analysis of black spots to improve and to monitor them.

BLACK SPOT ANALYSIS

Introduction:

Road safety is the problem of last century. Continuous increase in severity and cost of accidents lead the governments to perform serious studies on prevention of accidents. In this regard road safety improvement programs are developed.

In detail a proper safety program includes:

- Data collection
- Identifying problem locations (**black spots**)
- Selecting alternative countermeasures
- Programming and implementing countermeasures
- Evaluating effectiveness of countermeasures
- Evaluating the problem

Accident Data:

Reliable accident data is the first step for analysis. Because, by using accident data it is possible to;

- Understand why accident occurs
- Identify **black spots** locations
- Decide safety programs and countermeasures
- Evaluate the countermeasure effectiveness.

Collected data should include additional information like;

- Type of accident
- Severity of accident
- Time of day
- Lighting conditions
- Weather conditions
- Type of traffic controls etc.

The data related to accidents is collected and entered to computer by Police Department in Turkey. But the collected data is insufficient for a satisfactory analysis. Therefore although we use sophisticated methods in accident analysis the results may be unreliable.

Identifying Black Spots:

In general black spots are the locations where the traffic accidents are dense. In other words they are the locations on a given road whose statistically analyzed accident data is higher then a critical value.

Methods for black spot analysis;

- Number of accidents (frequency) method
- Accident rate method
- Number rate method
- Rate quality control method

The first two methods are quite simple and used generally for smaller highway and street systems. The latter two are recommended for larger systems with higher volumes and wider variations of traffic. Rate quality control method is relatively the most superior method. When the black spots are obtained they are collected on a spot map.

Black Spot Analysis in Turkey (till 1994)

Black spots are obtained in two ways:

- Black spots or sections determined by Regional Department of General Directorate of Highways.
- Black spots or sections obtained from 'Rate quality control method'

1.Black Spots by Regional Divisions:

Potentially problem sections or black spots which couldn't be determined by 'Rate quality control method' due to any reason, are found with the cooperation of Traffic, Planning, Survey and Project, Construction Sections of Regional Divisions and therefore a list of hazardous locations is obtained.

2.Black Spots by Rate-Quality Control Method:

A brief explanation of method: In this method, state roads are examined as in the form of 1 km sections. Due to the reason that annual average daily traffic is calculated only for state roads, this method couldn't be used for provincial roads, and motorways.

According to the above mentioned method, three index values, frequency index, accident rate index, severity index, are found for every 1 km section and if all these three index values are greater than one for one section then, that section is named as a 'black spot or black section'.

Inputs of the method are the information on the 'Record of Traffic Accident' forms which are filled out for each accident. Those data on traffic accidents have been provided by the Computer Department of General Directorate of Public Security on magnetic tapes in accordance with the protocol signed by KGM and General Directorate of Public Security.

Difficulties During the Application of Method:

1. Difficulties related to the data received from the General Directorate of Public Security

2. 'Traffic Accident Record' forms are filled out by the patrolmen on the accident locations. These patrolmen have sometimes lack of experience in filling out forms and make mistakes. General mistakes made by patrolmen are as follows:

- Control section number and km of the accident is not written on the form. For example, according to the 1998 statistics, 440 000 traffic accidents were occurred in that year but only in 110 000 forms, control section number and km of accident location parts were filled.
- Sometimes only km of accident location parts of the forms are not filled
- In some forms it can be seen that more than one road characteristics, which are impossible to be together, are written on the form for the same location.

For example, for the same km and for the same point alignment, intersection and curve are written as the road characteristics.

In addition to the difficulties above, receiving the magnetic tapes yearly creates another disadvantage. After accident reports are collected in the Computer Department of General Directorate of Public Security, they input data to the computer and then they are sent to KGM on magnetic tapes in the following year. For example, accident information related to the year 1997 have been received in October in 1998. Because of that reason the analysis and the preparation of countermeasures of a black spot can take approximately 2 years.