



REPUBLIC OF TURKEY

Road Improvement and Traffic Safety Project

Traffic Safety Project

NATIONAL TRAFFIC SAFETY PROGRAM



FOR TURKEY

MINISTRY OF INTERIOR
MINISTRY OF NATIONAL EDUCATION
MINISTRY OF PUBLIC WORKS AND SETTLEMENT
MINISTRY OF HEALTH
GAZİ UNIVERSITY

APPENDICES
December 2001

This National Traffic Safety Program for Turkey is presented in:

- Main Report and Appendices
- Executive Summary

CONTENTS

Appendix A – Basic principles and structure of the program

Appendix B – Accident statistics and forecasts

Appendix C – Graphs

Appendix D – Some international comparisons

Appendix E – Present organisation for traffic safety in Turkey

Appendix F – Safety visions in Denmark, the Netherlands and Sweden

Appendix G – Target/result-oriented way of working

Appendix H – Top priority safety interventions

Appendix I – Other safety interventions

Appendix A**Basic principles and structure of the program****General**

This National Traffic Safety Program for Turkey is developed in four steps:

1. Analysis of the present accident and casualty problem (“**Problem**”)
2. Formulation of a safety vision (“**Vision**”)
3. Development of a strategy (“**Strategy**”)
4. Development of a safety action plan (“**Plan**”)

Problem

In “Problem”, the road accident and casualty problem in Turkey is analysed, mainly by studying accident statistics and analysing major factors affecting the safety situation. In principle, the analysis should have a wide approach and cover all major safety problems. The Problem forms an important and necessary basis for the Strategy and the Plan.

Vision

In “Vision”, the ultimate and ideal, long-term image for traffic safety is formulated. The Vision forms an important basis for the Strategy and the Plan. The Vision is also necessary in order to increase politicians’, media’s and the general public’s interest in traffic safety.

Strategy

In “Strategy”, overall objectives and long-term targets are developed. It is also proposed what strategic actions should be taken in order to achieve the objectives and targets in an efficient way. The Strategy has to be carefully prepared and agreed upon, and forms an important and necessary basis for the Plan.

The Strategy should be based on the following *general principles*:

The Strategy should have a wide approach and cover all major questions related to traffic safety, while the Plan should be focused on the most severe accident/casualty problems and the most effective actions, in the mid- and short-term perspectives.

The Strategy should address:

- All transport systems and transport policy goals, including traffic safety.
- All major safety problems.
- All road transport system components (roads, vehicles, road users etc.).
- All types of long-, mid- and short-term safety actions: “institutional” (policy, attitudes, organization, staff, funding, data banks, safety R&D etc.), as well as “technical” (roads, vehicles, road users, speed etc.).

The Strategy should be based on, and include:

- A systematic, knowledge based multidisciplinary and multi-sectoral approach.
- The whole “safety process” (incl. setting of goals, planning, implementation and evaluation etc.).
- The whole “safety organization” in cooperation (with all involved relevant bodies).

A target/result-oriented way of working should be applied. That concerns all kinds of goals and targets (“resource goals”, “process and performance goals”, “common status goals” and “overall goals”) (see Appendix G).

In the Strategy, overall objectives and targets should be specified for year 2006 and year 2011, based on the present situation and estimated opportunities and resources available.

The Strategy (as well as the Plan) should include actions and activities from many sectors of society. The reasons for this are that: (i) it underlines the fact that in order to reduce the accident problem, actions from all parts of society are needed, and (ii) various types of actions in different sectors are needed.

The choice of the *most suitable strategic directions and actions* should mainly be based on:

- estimated cost-effectiveness- and cost-benefit-ratios as well as target-attainment,
- acceptance by politicians, decision-makers and the general public. If it is necessary to take unpopular actions, public information activities have to be carried out in order to influence public opinion.

In addition, *high priority* should be given to:

- actions that forcefully and rapidly will decrease fatalities and severe injuries. The purpose of this is to show good results in order to prove to politicians, media and the general public that the safety actions carried out are effective and thus developing confidence in the Strategy (and the Plan),
- safety items connected to the fact that Turkey is a prospective EU member.

It should *be taken into consideration* that it is important to:

- improve attitudes to, interest in and knowledge of traffic safety,
- create more resources for safety (public resources as well as resources from private enterprise and private individuals),
- aim at high quality in all parts of the safety work, for example, basic material for decisions about safety actions,
- recruit and develop competent, talented and efficient staff to work with safety questions in involved organizations,
- improve communication and cooperation between and within involved organizations,
- develop efficient working methods, for example, by using working groups,
- continuously inform about safety and accidents, Vision, Strategy and Plan, as well as actions and results,
- develop and strengthen domestic safety research and development (R&D) and to import, analyze and adapt international knowledge,
- develop good university education on safety.

One top-level organization should be made responsible for the final authorization of the Strategy. One organization should be made responsible for monitoring of progress, follow-up and evaluation. The attainment of targets should be continuously monitored and evaluated. Corrective action should be taken if necessary. The organization should continuously inform the general public about the progress and corrective actions needed.

The Strategy should be revised in 2006, based on the progress, target attainment and new knowledge and experiences.

Plan

In “Plan”, mid- and short-term targets are developed. It is also proposed what actions should be taken in order to attain the targets in an efficient way. The Plan has to be carefully prepared and agreed upon.

The Plan should be based on the following *general principles*:

The Strategy should have a wide approach and cover all major questions related to traffic safety, while the Plan should be focused on the most severe accident/casualty problems and the most effective actions, in the mid- and short-term perspectives.

A target/result-oriented way of working should be applied to the extent possible. That concerns all kinds of goals (“resource goals”, “process and performance goals”, “common status goals” and “overall goals”) (see Appendix G).

In the Plan, targets and actions should be specified for year 2006 and year 2011 if possible. For the proposed safety actions, special targets should be specified to the extent possible. The targets should be well defined and easy to measure, and the measuring parameter should be valid for the target. For each item, suitable methods should be indicated and the plausible safety effects estimated.

The Plan (as well as the Strategy) should include different actions and activities from as many sectors of society as possible. The reasons for this are that: (i) it underlines the fact that in order to reduce the accident problem, actions from all parts of society are needed, and (ii) various types of actions in different sectors are needed.

The final decision on what actions should be included in the Plan, and to what extent and how, depends mainly on the following factors:

- estimated safety effects,
- estimated costs (incl. both investment and maintenance),
- estimated cost-effectiveness,
- target attainment,
- estimated other effects, e.g., travel time, vehicle operating costs (VOC) and environmental effects etc.,
- total funds available,
- estimated acceptance by the politicians and the general public, including the road users.

In addition, *high priority* should be given to:

- actions that forcefully and rapidly will decrease fatalities and severe injuries. The purpose of this is to show good results in order to prove to politicians, media and the
- general public that the safety actions carried out are effective and thus to develop confidence in (the Strategy and) the Plan,
- safety items connected to the fact that Turkey is a prospective EU member.

In developing the Plan, many other items should be taken into consideration (see under Strategy).

One top-level organisation should be made responsible for the final authorisation of the Plan. One organisation should be made responsible for monitoring of progress, follow-up and evaluation. The attainment of targets should be monitored and evaluated continuously. Corrective actions should be taken if necessary.

The Plan should be revised and up-dated after a certain time (e.g., in 2006), based on the progress, target attainment and new knowledge and experiences.

Appendix B

Accident statistics and forecasts

Development and present situation

Accidents, casualties and influencing factors

The *historic development* of reported road traffic accidents and casualties as well as some influencing parameters are illustrated in diagrams in Appendix C.

The diagrams and tables in this Appendix B give a summary and analysis of the development. The annual numbers of reported accidents, injuries and fatalities are shown in Figure B1, B2 and B3 respectively.

**Traffic accidents
(1970-2000)**

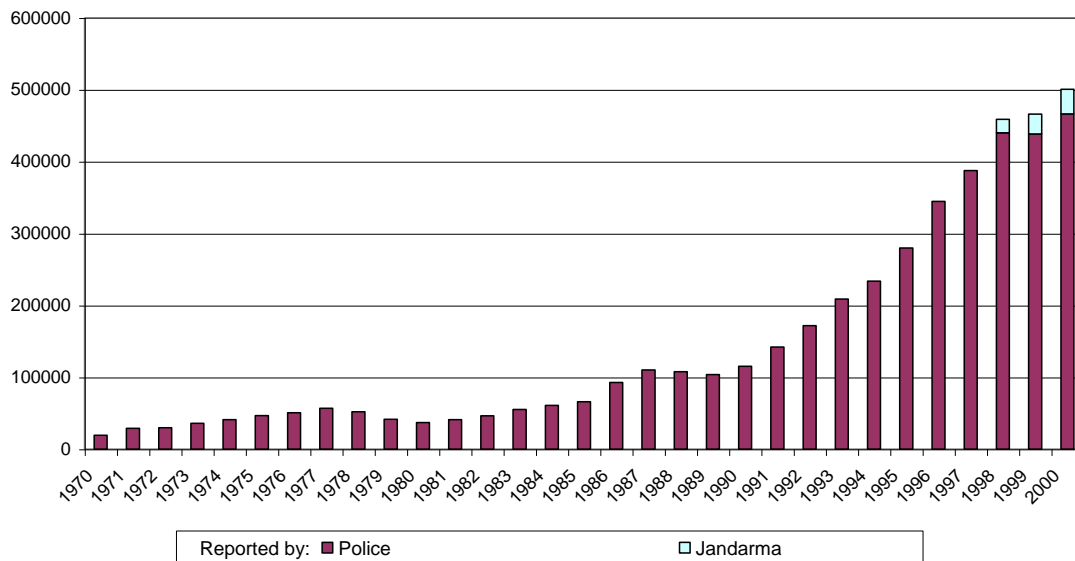


Figure B1: Number of reported accidents (Police and Jandarma).

**Injuries in traffic accidents
(1970-2000)**

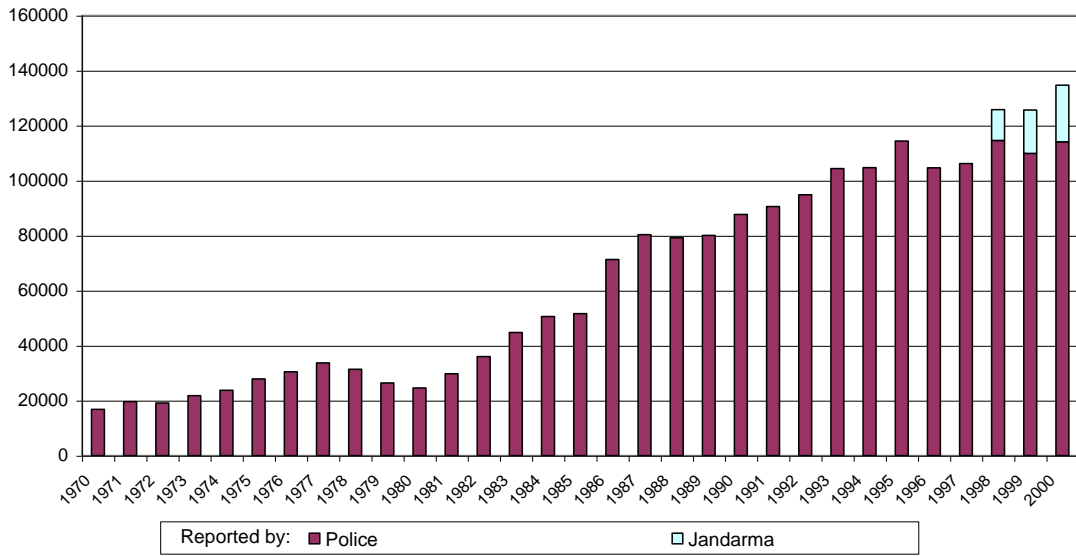


Figure B2: Number of reported injuries (Police and Jandarma).

**Fatalities in traffic accidents
(1970-2000)**

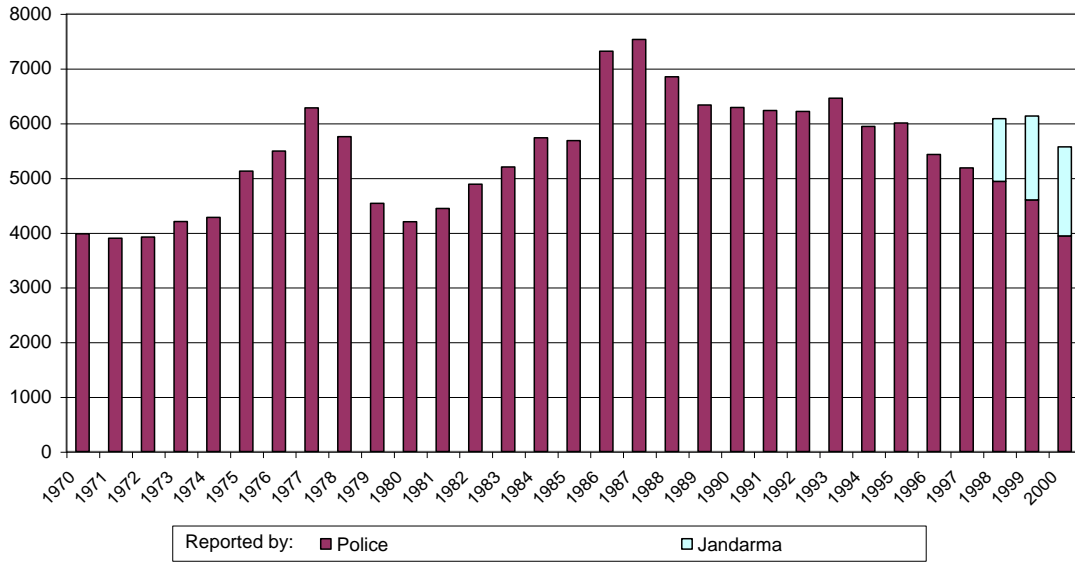


Figure B3: Number of reported fatalities (Police and Jandarma).

The development of accidents and casualties is summarized in Table B1.

Table B1: Number of reported accidents, injuries and fatalities (Police and Jandarma).

Reported :*)	1970**)	1990**)	Ratio 1990/1970	Increase (%/year)	1999***)	2000 ***)	Ratio 1999/1990	Increase (%/year)
Accidents	19 207	115 295	6.0	9.4	465 915	500 653	4.04	16.8
Injuries	16 838	87 693	5.2	8.9	125 586	134 618	1.43	4
Fatalities	3 978	6 286	1.58	2.3	6 130	5 566	0.975	0
Injury accidents	—	50 681		—	67 732	71 771	1.34	—
Fatal accidents	—	5 090	—	—	4 537	4 210	0.89	—
Injuries per injury accident	—	1.73	—	—	1.85	1.88	—	—
Fatalities per fatal accident	—	1.23	—	—	1.35	1.32	—	—

*) “hit and run” cases not included. **) EGM only. ***) EGM plus Jandarma.

The development can be described as follows:

- The number of reported road traffic fatalities (by EGM and Jandarma) has increased from 3 978 in 1970 to 6 130 in 1999. The trend has fluctuated. The average annual change the last nine years has been zero. In 2000, the number was 5566. In addition, the number of “hit and run” cases was 433 in 1999.
- The number of reported injuries has increased from 16 838 in 1970 to 125 586 in 1999. The annual increase the last nine years has been 4 percent. In 2000, the number was 134 618. In addition, the number of “hit and run” cases in 1999 was 10 664.
- The number of reported accidents has increased from 19 207 in 1970 to 465 915 in 1999. The annual increase the last nine years has been almost 17 percent. In 2000, the number was 500 653. In addition, the number of “hit and run” cases was 14 021 in 1999.
- It must be observed that accidents and casualties in Jandarma regions are included only in the 1997 (partly), 1998, 1999 and 2000 figures. This means that accident and casualty numbers from previous years are underestimated.

It seems as if the number of fatalities for year 2000 is quite different from the numbers for previous years. The year 2000 has therefore been considered as somewhat exceptional, and year 1999 has been selected as the “base year” for comparisons with targets.

The developments for some major influencing parameters are illustrated in Table B2.

Table B2: GNP/capita, number of inhabitants, passenger car ownership, number of passenger cars, motor vehicle ownership, and number of motor vehicles.

Variable	1970	1990	Ratio 1990/1970	Increase (%/year)	1999	Ratio 1999/1990	Increase (%/year)
Inhabitants (100000)	353	561	1.59	2.4	644	1.15	1.6
GNP *) (USD/cap)	519	2 665	5.13	8.5	2 996	1.12	1.3
Passenger car ownership/1000 inh	4.05	33.12	8.18	11.1	73.62	2.22	9.2
Passenger cars **) (million)	0.143	1.858	12.99	13.7	4.740	2.55	11.0
Motor vehicle ownership/1000 inh	13.86	72.9	5.26	8.7	137.3	1.88	7.3
Motor vehicles **) incl. mc and tractors (million)	0.490	4.092	8.35	11.2	8.837	2.16	8.9
Motor vehicles **) excl. mc and tractors (million)	0.328	2.785	8.49	11.3	6.721	2.41	10.3

*) SIS and SPO. **) EGM statistics.

From the table it can be seen that:

- The number of inhabitants has increased from 35 million in 1970 to 64 million in 1999. The average annual increase the last nine years has been 1.6 percent.
- The GNP per capita has increased from USD 519 in 1970 to USD 2 996 in 1999. The annual increase has been 1.1 percent*). In 2000, the corresponding value was USD 3100. For 2001 the value will be substantially lower.
- Passenger car ownership has increased from 4 passenger cars per 1 000 inhabitants in 1970 to 74 in 1999. The annual increase has been 9.2 percent*).
- The number of passenger cars has increased from 0.14 million in 1970 to 4.7 million in 1999. The annual increase has been 11 percent*).
- Motor vehicle ownership**) has increased from 14 motor vehicles per 1 000 inhabitants in 1970 to 137 in 1999. The annual increase has been 7.3 percent*).
- The number of motor vehicles**) has increased from 0.49 million in 1970 to 8.8 million in 1999. The annual increase has been 8.9 percent*).

Based on reported numbers of inhabitants and registered motor vehicles**), the development has been as follows:

- The number of reported fatalities per 100 000 inhabitants has decreased slowly from 11 in 1990 to 9.5 in 1999.
- The number of reported injuries per 100 000 inhabitants has increased slowly from 156 in 1990 to 195 in 1999.
- The number of reported accidents per 100 000 inhabitants has increased rapidly from 205 in 1990 to 724 in 1999.
- The number of reported fatalities per 100 000 motor vehicles**) has decreased from 154 in 1990 to 69 in 1999.

*) nine years.

**) incl. mc. and tractors. EGM statistics.

- The number of reported injuries per 100 000 motor vehicles**) has decreased from 2 143 in 1990 to 1 421 in 1999.
- The number of reported accidents per 100 000 motor vehicles**) has increased rapidly from 2 818 in 1990 to 5 272 in 1999.

The *present situation* concerning accident and casualty statistics can be characterized as follows:

- EGM and Jandarma report accidents, injury accidents, injuries, fatal accidents and fatalities (dead at the accident scene)*). From 1999, special data for so-called “hit and run” cases are also reported by EGM.
- There is no official information available concerning how many injured persons die during transport to medical care.
- MoH publishes hospital statistics concerning annual number of deaths in hospital from “motor vehicle accidents” and from “other transport accidents”.

Altogether this means that it is very difficult to get a true picture of the total accident and casualty situation. Actual and estimated numbers for the years 1997 to 1999 are presented in Table B3.

Table B3: Number of accident and casualties reported by Police, Jandarma and MoH

Data source	1997			1998			1999		
	Fatalities	Injuries	Accidents	Fatalities	Injuries	Accidents	Fatalities	Injuries	Accidents
EGM	5 181	106 146	387 533	4 935	114 552	440 149	4 596	109 899	438 338
Jandarma	-	-	-	1 148	11 241	18 512	1 534	15 687	27 577
(“hit and run”)	?	?	?	?	?	?	433	10 664	14 021
Subtotal 1	5 181	106 146	387 533	6 083	125 793	458 661	6 130	125 586	465 915
Subtotal 2*)	5 181+?	106146+?	387 533+?	6 083+?	125 793+?	458 661+?	6 563	136 250	479 936
<i>Deaths during transport to medical care:</i>									
• motor vehicle accidents:	?			?			?		
• other transport accidents:	(?)			(?)			(?)		
<i>MOH, deaths in hospital****)</i>									
• motor vehicle accidents:	3 478			2 861			2 694 (prel.)		
• other transport accidents:	(441)			(292)			(279) (prel.)		
Estimated subtotal **)	3 307+?			2 692+?			2 536+? (prel.)		
TOTAL 1**)	8 488+??			8 775+??			8 666+? (prel.)		
TOTAL 2 ***)	8 488+??			8 775+??			9 099+? (prel.)		

*) including “hit and run” if known, **) estimated values 30—days definition, ***) estimated values 30—days definition, including “hit and run” if known. ****) fatalities in some private hospitals, university hospitals and social security hospitals are not included.

*) According to some information, EGM/Jandarma statistics can include some (very few) persons who die within 24 hours.

As can be seen from this table, the *estimated* number of fatalities, which are reported by EGM, Jandarma and MoH, is more than 8 488 in 1997 and 8 775 in 1998. In 1999, the corresponding value is 8 666. If “hit and run” cases are added, the value is 9 099 in 1999. To these values should be added the number of injured who die during transport to hospital. This number is unknown, but could be estimated to be about 5 percent of the total number. This means that the total number of fatalities (with the 30-days definition of a road fatality) amounts to somewhere between 8 900 (in 1997) and 9 550 (in 1999, including “hit and run”). The numbers for year 2000 are lower than the corresponding values for 1997-1999.

The number of reported injuries has been between 106 146 and 125 793. If the “hit and run” cases are added, the total for 1999 amounts to 136 250. The number of reported accidents has varied between 387 533 and 465 915. If the “hit and run” cases are added, the total for 1999 amounts to 479 936.

In addition to EGM, Jandarma and MoH statistics, insurance companies keep files for insurance reported accidents, accidents with (severe only?) injuries and accidents with fatalities. According to the Union of Insurance Companies, the numbers of accident “cases” are as shown in Table B4.

Table B4: Number of accident “cases” reported to insurance companies.

Accident “cases”	1997	1998	1999
Fatal accident “cases”	10 818	7 550	7 244
All accident “cases”	393 412	425 805	489 752

It must be observed that there is some double-counting, that is, there are on the average more than one accident “case” for each accident, because there are often more than one insured vehicle involved. It has not been possible to get information about the proportion of double-counting. Therefore, it is for the moment impossible to use insurance statistics to estimate the total number of fatal accidents or fatalities.

It can be mentioned that according to information from Yapı Kredi Sigorta, about 75 to 80 percent of all vehicles are insured, and there are normally 1.5 to 1.8 fatalities per fatal accident. According to PP road statistics, there are more than 1.4 fatalities (on the spot) per fatal accident. This means that if those who die during transport and in hospital are included, the factor is substantially higher say 1.8 to 2.0. So, for example, if there are 5 000 insurance reported fatal accidents, there were 9 000 to 10 000 fatalities. To this should be added the number of fatalities with non-insured vehicles.

Major accident types and problems

The statistics and results shown below are extracted from EGM’s annual statistical reports and concern EGM reported accidents only.

Speeding

Although it is defined as a secondary driver fault, statistics show that speeding is one of the major problems in Turkish traffic. In 1999, speeding was the “main cause” of accidents in which 3 012 people were killed, 1 207 of them were in urban and 1 805 in rural areas. This is 66 percent of all reported fatalities in traffic accidents in 1999.

Pedestrians, especially children and elderly people

In 1999, there were 929 pedestrians killed. 277 of them were children younger than 16 years and 228 of them were older than 60 years. This means that 54 percent of the killed pedestrians belong to these two age groups.

Pedestrians in darkness

In 1999, there were 367 pedestrians killed and 4 293 injured during night-time or twilight. These figures show the importance of using special reflective devices to be more visible.

Seat belts

On urban roads 16 percent and on rural roads 35 percent of all drivers involved in traffic accidents were using seat belts. 81 percent of all killed drivers (1 280) were not using seat belts.

Drunken driving

In 1999, there were 56 fatalities in urban areas and 51 in rural areas, in which drunken driving was stated as the “main cause” of the accident. The corresponding number of injuries were 3 876 and 1551. Altogether in 1999, 83 789 drivers were caught by the police and their licenses revoked.

Junctions

In urban areas, 33 percent of the accidents occurred at junctions in 1999. In these accidents there were 275 fatalities and 17 464 injuries.

For rural areas, the values are not that high, but for the whole country, 29 percent of all accidents occurred at junctions, 313 people were killed and 18 548 injured.

Undivided rural roads

There were 1 405 fatal accidents on undivided rural roads in 1999. This is 43 percent (2 287 fatalities) of all fatal accidents and 50 percent of all fatalities in 1999.

Darkness

In 1999, 43 percent of all fatal accidents and 25 percent of all accidents occurred during night-time or twilight. In these accidents, there were 1 978 fatalities and 39 585 injuries.

Forecasts of motorization, accidents and casualties

The *developments for the last nine years and forecasts* for several parameters up to and including 2011 are illustrated in Appendix C. The following tables give a summary of the forecasts. Table B5 shows predictions of some of the major influencing parameters.

Table B5: Predicted number of inhabitants, GNP/capita, passenger car ownership, number of passenger cars, motor vehicle ownership and number of motor vehicles.

Year	Population (million)	GNP/inhabitant (USD/cap)	Passenger car ownership (passenger cars/1000 inh)	Passenger cars (million)	Motor vehicle ^{*)} ownership (motor vehicles/1000 inh)	Motor vehicles ^{*)} (million)
1990	56.1	2 665	33	1.86	73	4.09
1999	64.4	2 996	74	4.74	137	8.84
2006	70.7	3 002	95.5	6.75	171	12.11
2011	75.2	4 140	109.2	8.21	193	14.54

^{*)} incl. mc. and tractors. EGM statistics.

The predicted average annual increases of the parameters from 1999 to 2011 are illustrated in Table B6.

Table B6: Predicted increases in number of inhabitants, GNP/capita, passenger car ownership, number of passenger cars, motor vehicle ownership and number of motor vehicles.

Year	Population	GNP/inhabitant	Passenger car ownership	Passenger cars	Motor vehicle**)	Motor vehicles**)
1999-2011	1.3	2.7*)	3.3	4.7	2.9	4.2
Source:	SIS	SPO + SweRoad	SweRoad	SweRoad	SweRoad	SweRoad

*) According to 8th V-years Development Plan, the goal is 7 %. **) incl. mc. and tractors. EGM statistics.

It should be mentioned that the annual increases which have been used, for example, 4.7 percent for passenger cars and 4.2 percent for motor vehicles are low compared with the increases during the period 1990 – 1999.

In addition to what is shown in the tables, it should be noted that fuel prices are high and will probably remain so during the time-period in question. This will tend to reduce both passenger car and motor vehicle ownership, and especially the number of annual vehicle-kilometers traveled by cars.

In Table B7 predictions are shown of future reported accidents, injuries and fatalities by EGM and Jandarma. The predictions are based on the shown influencing parameters and have been estimated by using three principles:

- statistical development the last ten and thirty years (average annual increase),
- estimates of number of accidents/casualties per inhabitant,
- estimates of number of accidents/casualties per motor vehicle.

Table B7: Predictions of future number of reported accidents, injuries and fatalities.

Accidents/casualties Principle	2006	2011
<u>Accidents*</u>		
Statistical development, average	1 116 000	2 193 000
Accident per inhabitant	769 000	1 043 000
Accident per motor vehicle**)	784 000	1 064 000
“Best estimate”	800 000 (750 000-1 050 000)	1 150 000 (1 050 000-2 150 000)
<u>Injuries*</u>		
Statistical development, average	193 000	262 000
Injury per inhabitant	158 000	181 000
Injury per motor vehicle**)	144 000	162 000
“Best estimate”	155 000 (145 000-180 000)	180 000 (165 000-250 000)
<u>Fatalities*</u>		
Statistical development, average	5 876	6 197
Fatality per inhabitant	5 830	5 900
Fatality per motor vehicle**)	5 855	6 183
“Best estimate”	5 850 (5 825-5 900)	6 050 (5 900-6 200)

*) “hit and run” cases not included. **) incl. mc. and tractors. EGM statistics.

A summary of the “best estimates” is shown in Table B8, together with estimated costs of the accidents/casualties.

Table B8: Actual and predicted numbers of reported accidents, injuries and fatalities as well as estimated accident and casualty costs (1999 price level).

Year	Fatalities (number/year)	Injuries (number/year)	Accidents (number/year)	Costs**) (TL billion/year)
1990	6 286*)	90 520	115 295	1 360 000
1999	6 130*)	125 586	465 915	1 780 000
2006 best estimate	5 850	155 000	800 000	2 060 000
2011 best estimate	6 050	180 000	1 150 000	2 420 000

*) "hit and run" cases not included. **) 1999 price level. Reported casualties only.

From the table, it can be seen that if safety interventions are being carried out "as usual" (i.e., if no additional or special safety actions are taken):

- the number of reported accidents will increase by 250 percent from 1999 to 2011,
- the number of reported injuries will increase by 40 percent,
- the number of reported fatalities will decrease by 1 percent,
- the costs of reported accidents and casualties will increase by 36 percent.

To these estimates of reported accidents and casualties (by EGM and Jandarma) the number of "hit and run" cases and the number of fatalities during transport to hospital and in hospital should be added. The total estimated numbers are given in Table B9.

Table B9: Predictions of total fatalities and reported injuries and accidents for 2006 and 2011.

Year	Fatalities (number/year)	Injuries (number/year)	Accidents (number/year)	Costs**) (TL billion/year)
2006 best estimate, Table B7	5 850	155 000	800 000	2 060 000
"hit and run"	351 (6 %)***)	12 400 (8 %)***)	24 000 (3 %)***)	130 000
Deaths during transport and in hospital (50 %)***)	2 925			330 000
TOTAL 2006	9 126	167 400	824 000	2 520 000
2011 best estimate, Table B7	6 050	180 000	1 150 000	2 420 000
"hit and run"	303 (5 %)***)	12 600 (7 %)***)	34 500 (3 %)***)	130 000
Deaths during transport and in hospital (47%)***)	2 844			320 000
TOTAL 2011	9 197	192 600	1 184 500	2 870 000

*) "hit and run" cases included. **) 1999 price level. ***) percentage of "best estimate".

Altogether, it is estimated that there will be approximately:

in 2006:

- 9 125 fatalities
- 167 000 injuries (reported)
- 824 000 accidents (reported)

at the cost of TL 2 500 000 billion (1999 price level).

in 2011:

- 9 200 fatalities
- 193 000 injuries (reported)
- 1 185 000 accidents (reported).

at the cost of TL 2 900 000 billion (1999 price level).

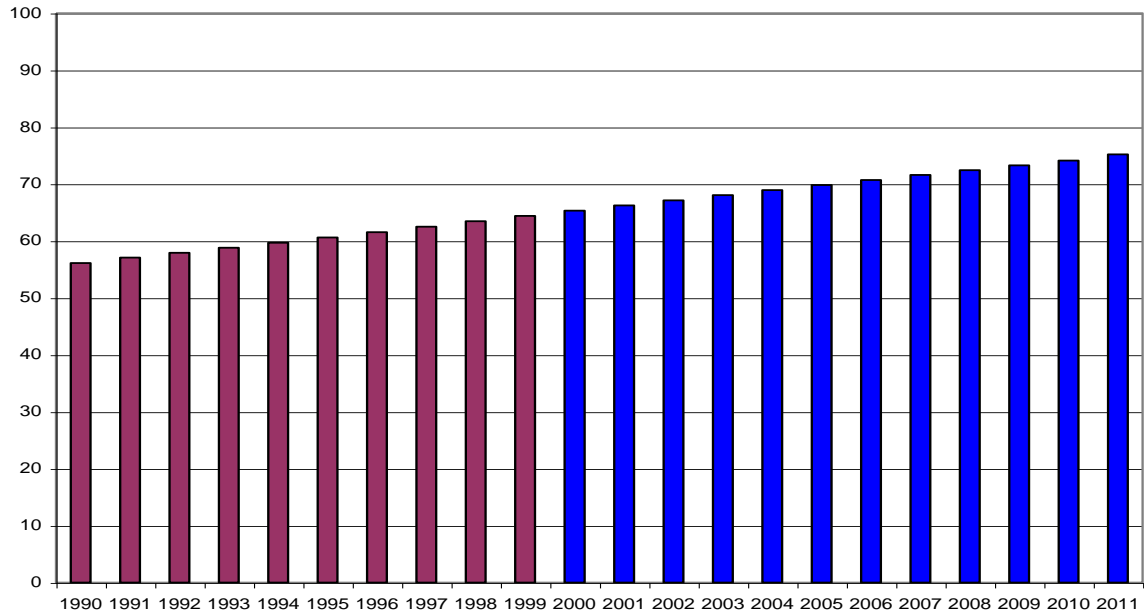
According to a small study of the development of fatalities in relation to number of inhabitants and motor vehicles (see Appendix D), the number of fatalities in 2006 and 2011 will be around 9 600 and 9 900 respectively, if no additional or special safety actions are taken. This result coincides reasonably well with the above given values.

The numbers are based on the assumption that the “historic development” in a way repeats itself in the next 10-year period. If, however, there will be substantial changes in attitudes towards safety and increases in safety interventions, the numbers can be reduced substantially.

It must be observed that the above numbers are based on available statistics up to 2000. If there are substantial improvements in 2001, the given numbers may be somewhat too high. It must also be remembered that the forecasted numbers are “best estimates” with a considerable degree of uncertainty.

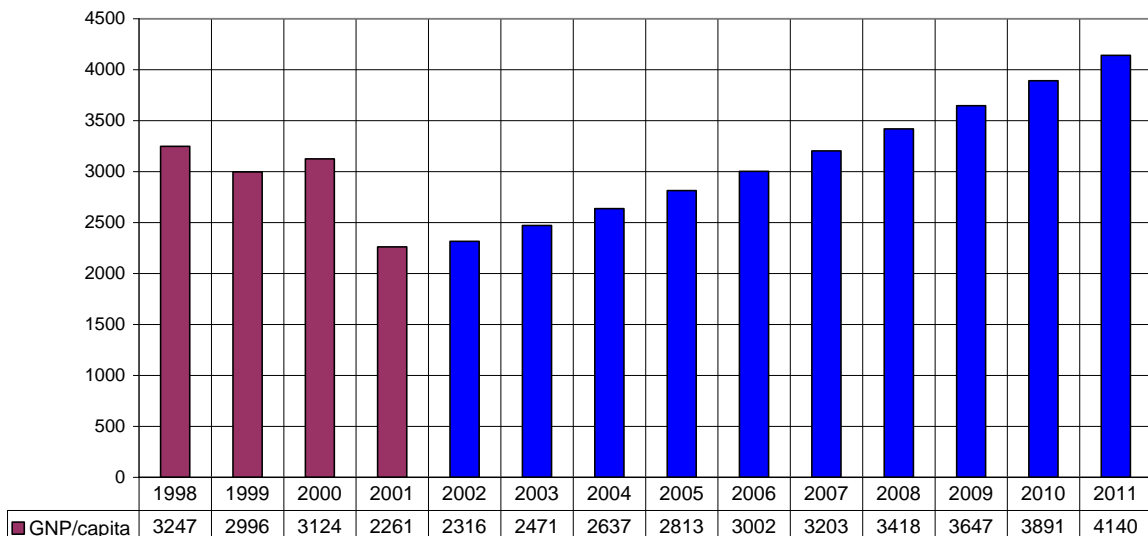
Appendix C

**Number of inhabitants (million)
(1990-2011)**



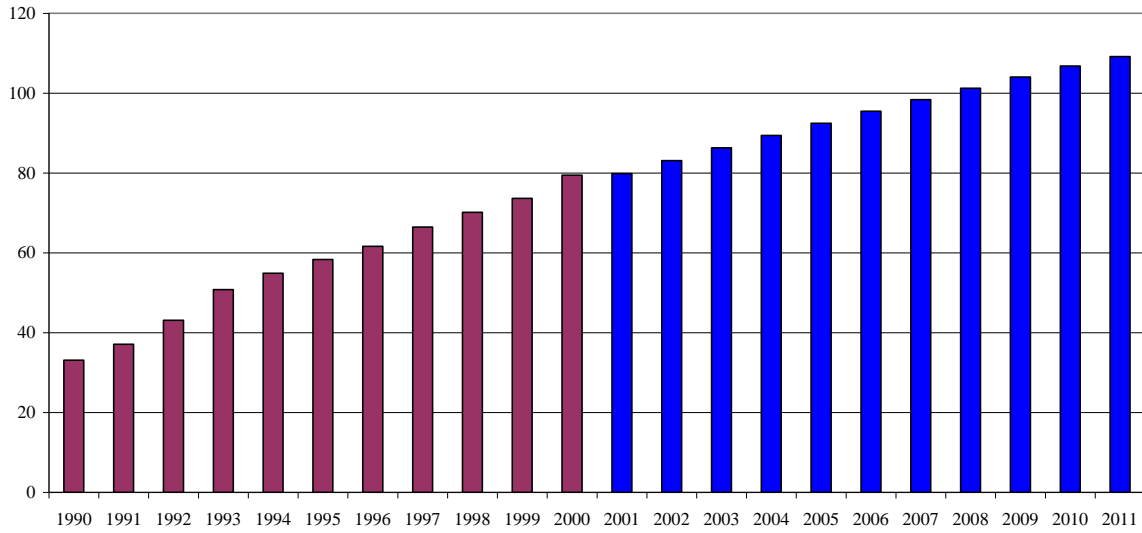
Based on mid year forecasts made by the State Institute of Statistics(SIS).

**GNP per capita (USD)
(1998-2011)**



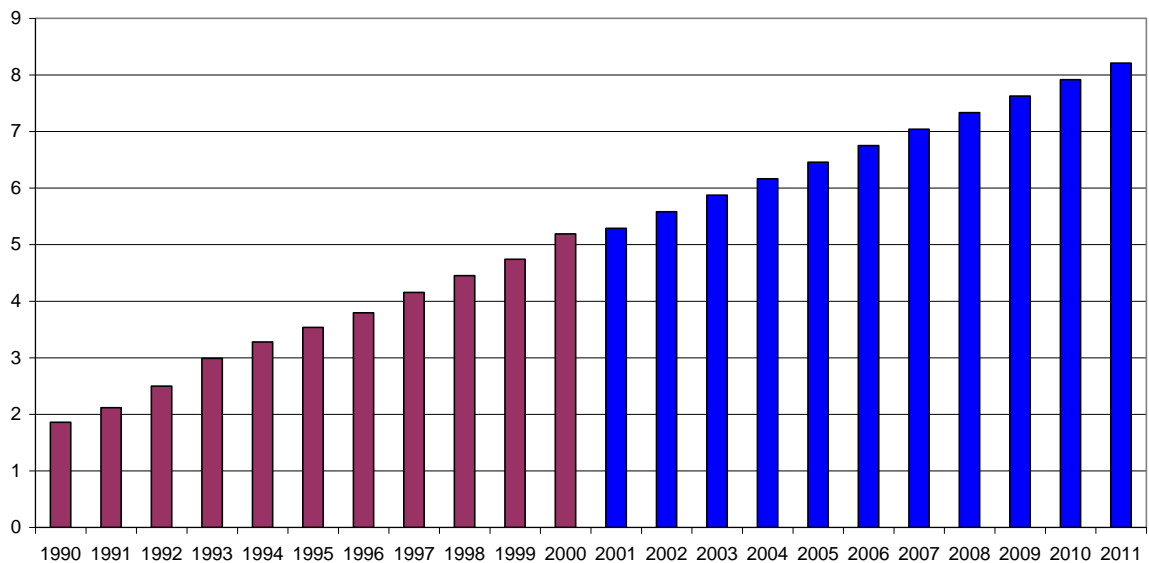
Based on 8th 5-Years Development Plan and Government Budget Plan for 2002.

**Passenger car ownership
(passenger car per 1 000 inhabitants)
(1990-2011)**



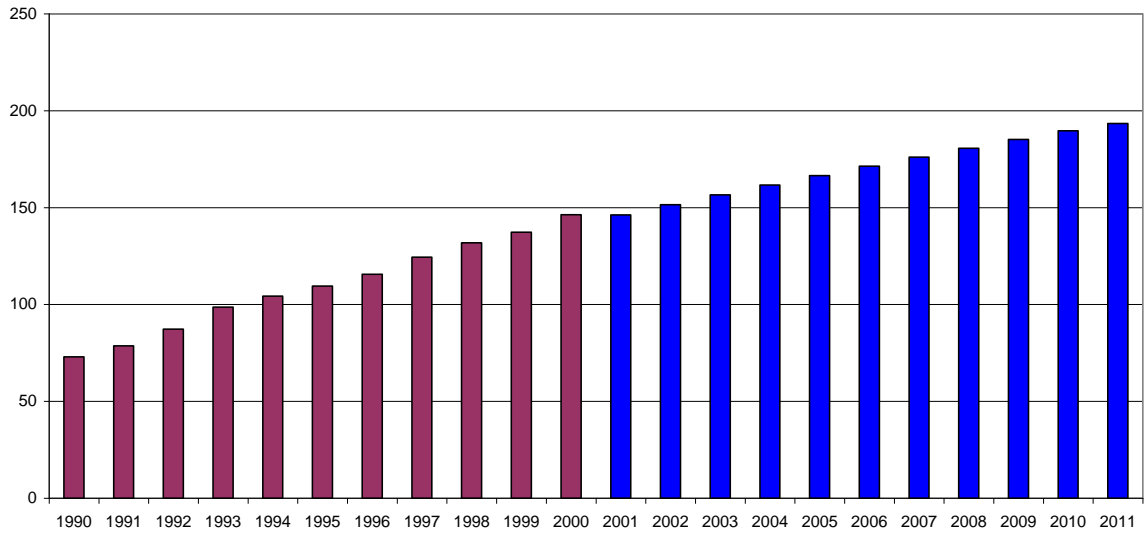
Based on EGM statistics.

**Number of passenger cars (million)
(1990-2011)**



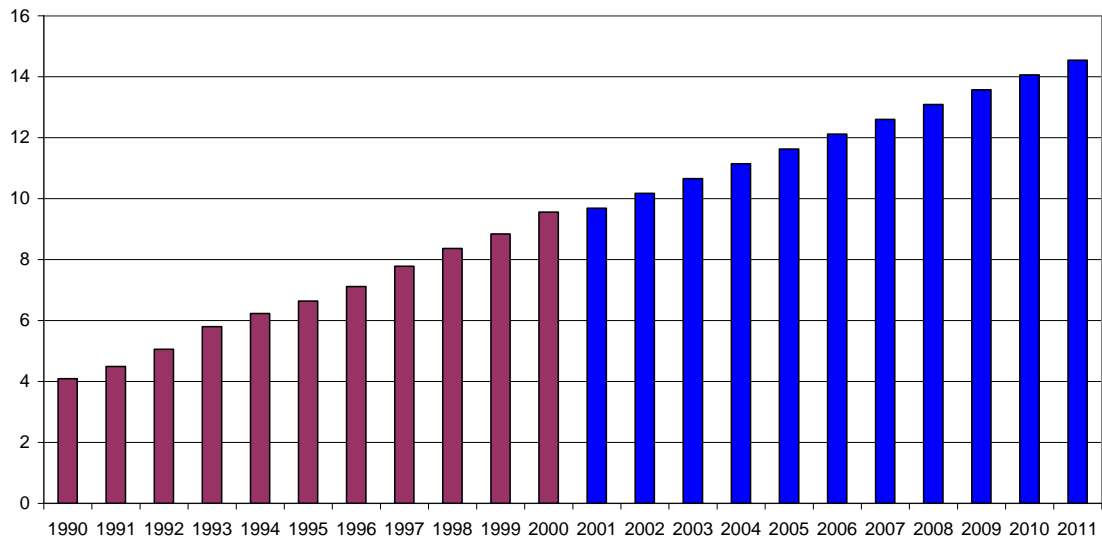
Based on EGM statistics.

**Motorvehicle* ownership
(motorvehicles per 1 000 inhabitants)
(1990-2011)**



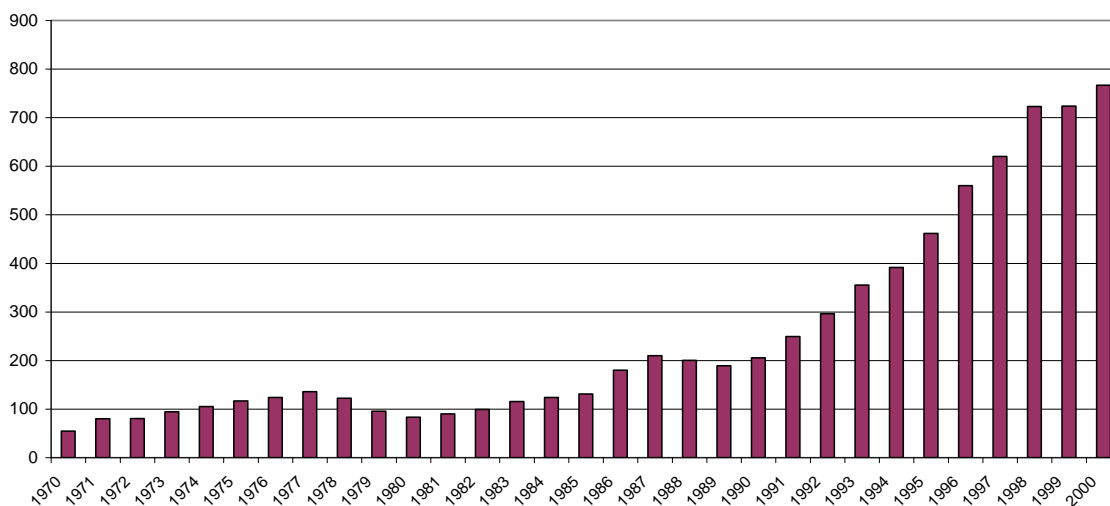
*) including motorcycles and tractors.
Based on EGM statistics.

**Number of motorvehicles* (million)
(1990-2011)**



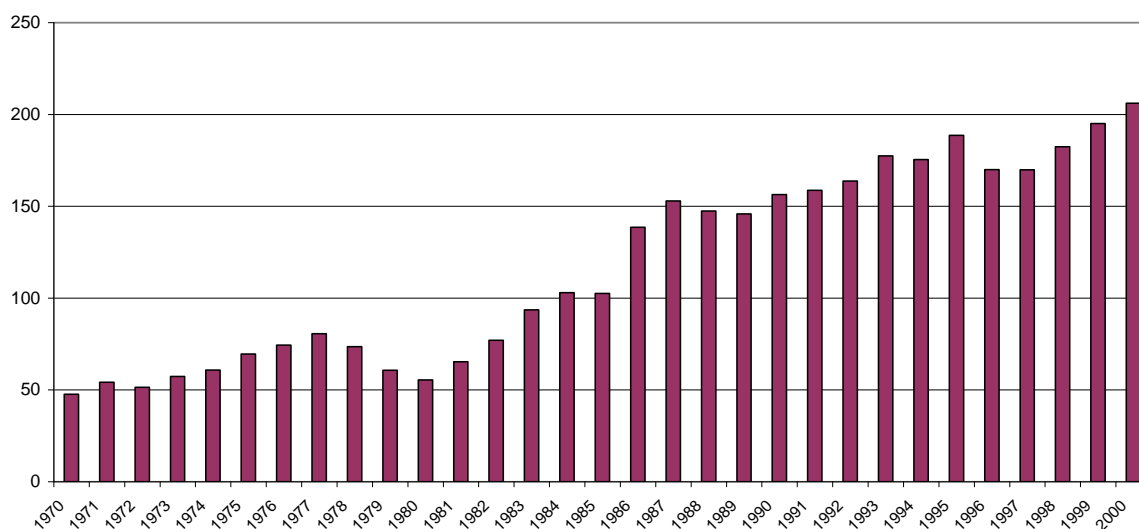
*) including motorcycles and tractors.
Based on EGM statistics.

**Number of accidents* per 100 000 inhabitants
(1970-2000)**



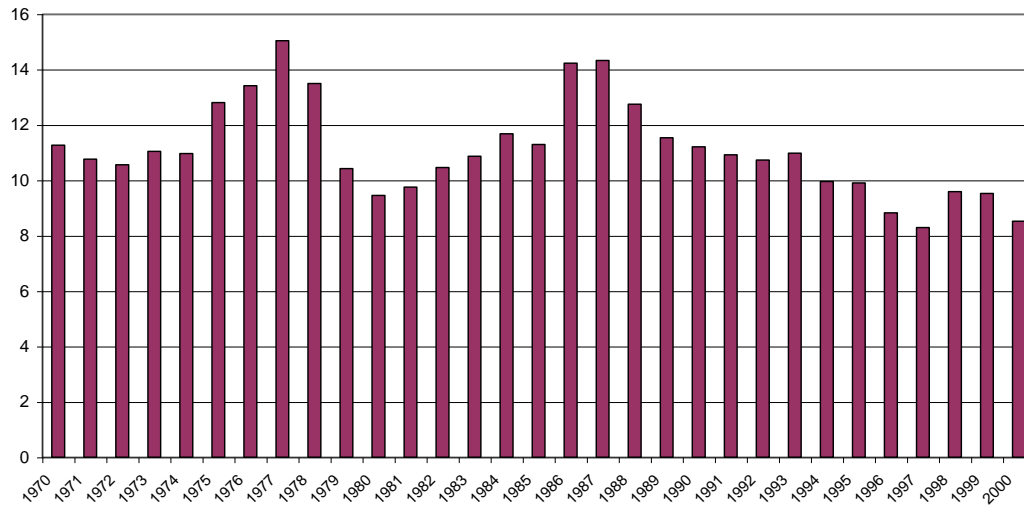
*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.
Based on EGM and SIS statistics.

**Number of injuries* per 100 000 inhabitants
(1970-2000)**



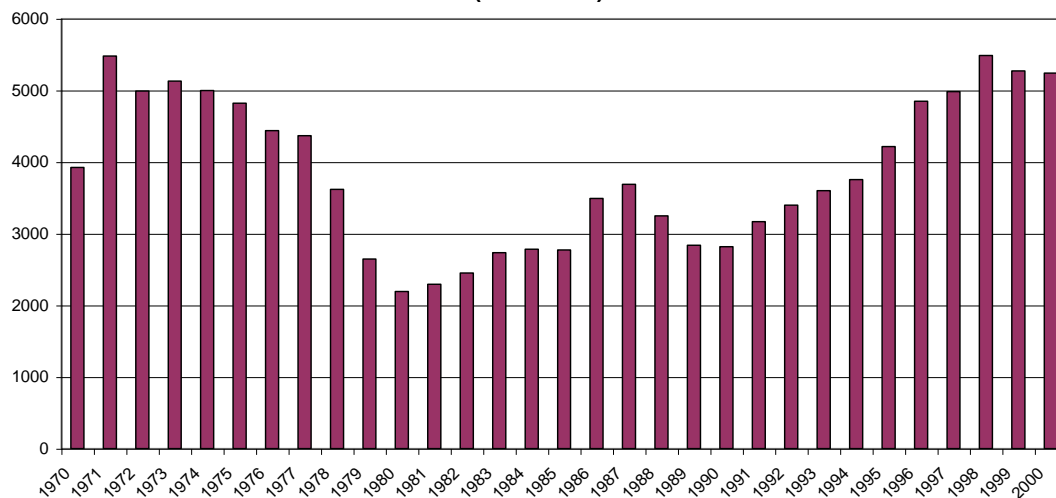
*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM and SIS statistics.

**Number of fatalities* per 100 000 inhabitants
(1970-2000)**



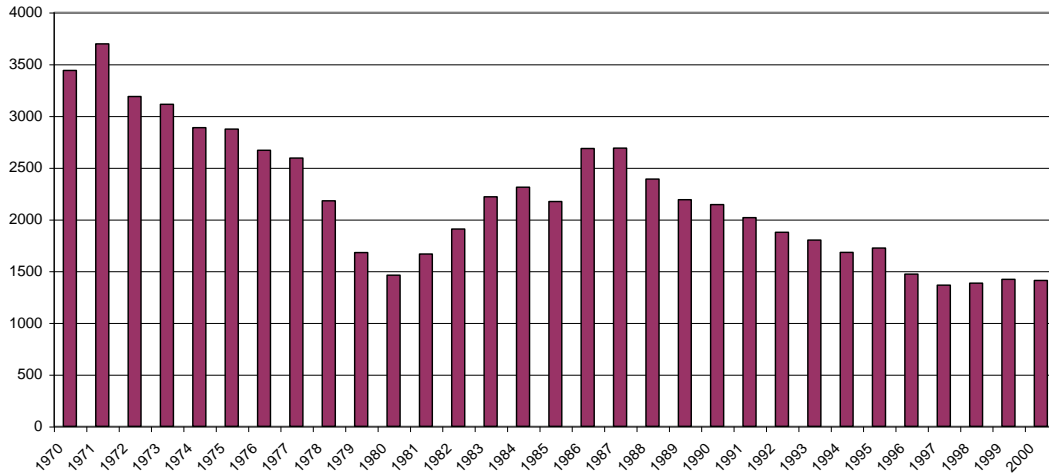
*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM and SIS statistics.

Number of accidents* per 100 000 motorvehicles
(1970-2000)**



*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.
**) including motorcycles and tractors.
Based on EGM statistics.

Number of injuries* per 100 000 motorvehicles
(1970-2000)**

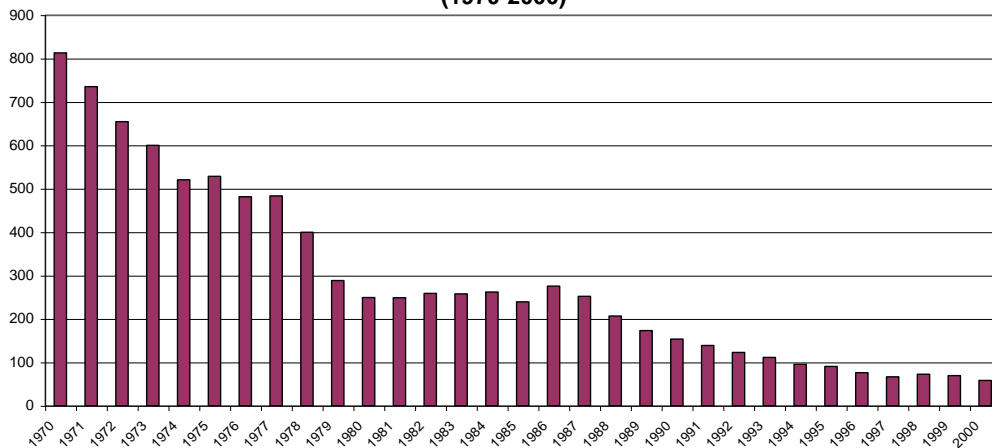


*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.

**) including motorcycles and tractors.

Based on EGM statistics.

**Number of fatalities* per 100 000 motorvehicles
(1970-2000)**

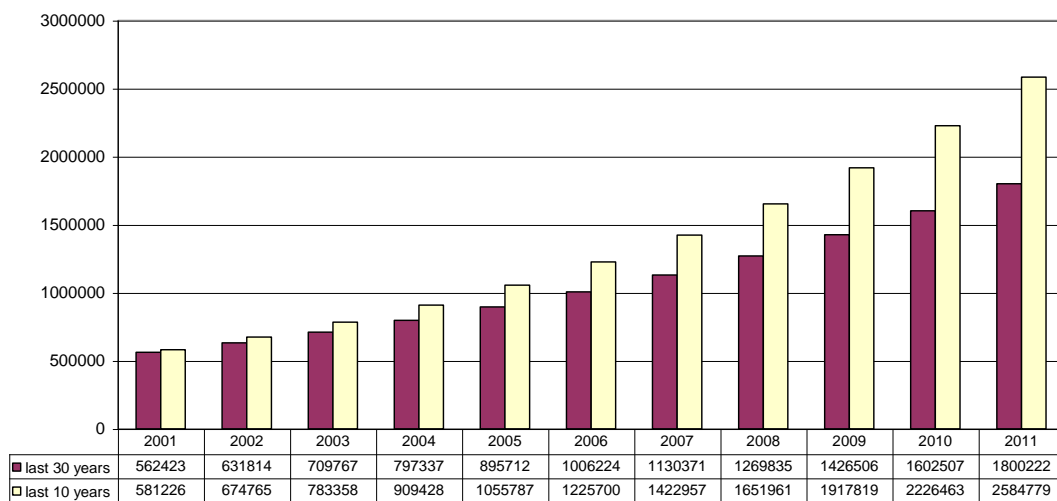


*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included.

**) including motorcycles and tractors.

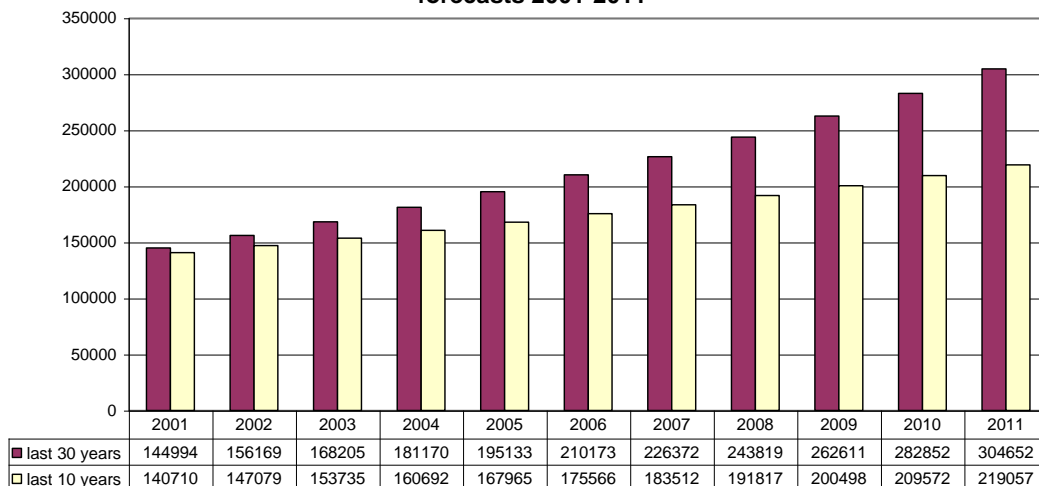
Based on EGM statistics.

**Number of accidents*
forecasts 2001-2011**



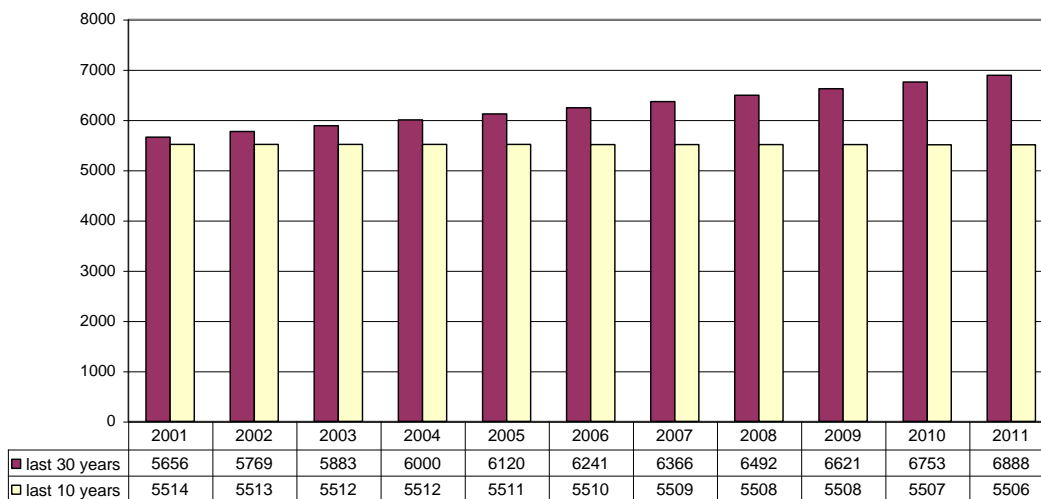
*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.

**Number of injuries*
forecasts 2001-2011**



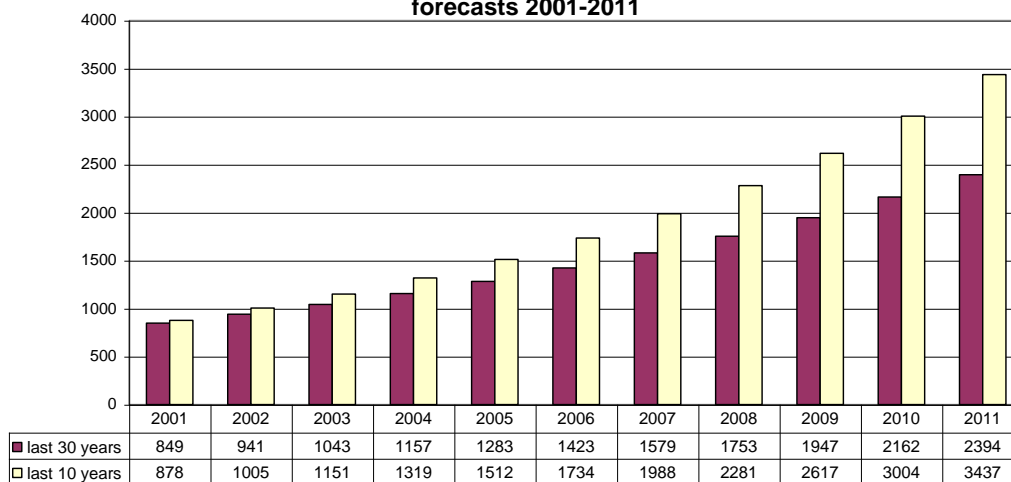
*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.

**Number of fatalities*
forecasts 2001-2011**



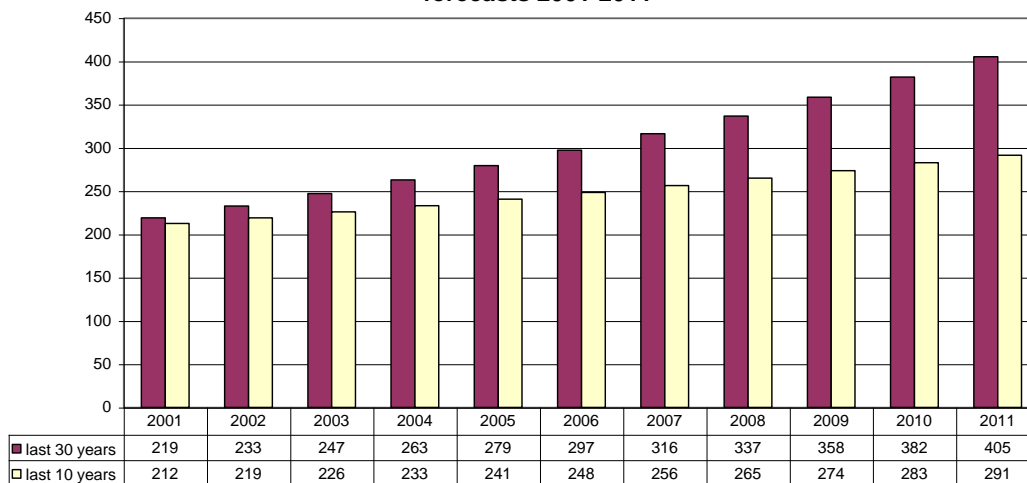
*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included.

**Number of accidents* per 100 000 inhabitants
forecasts 2001-2011**



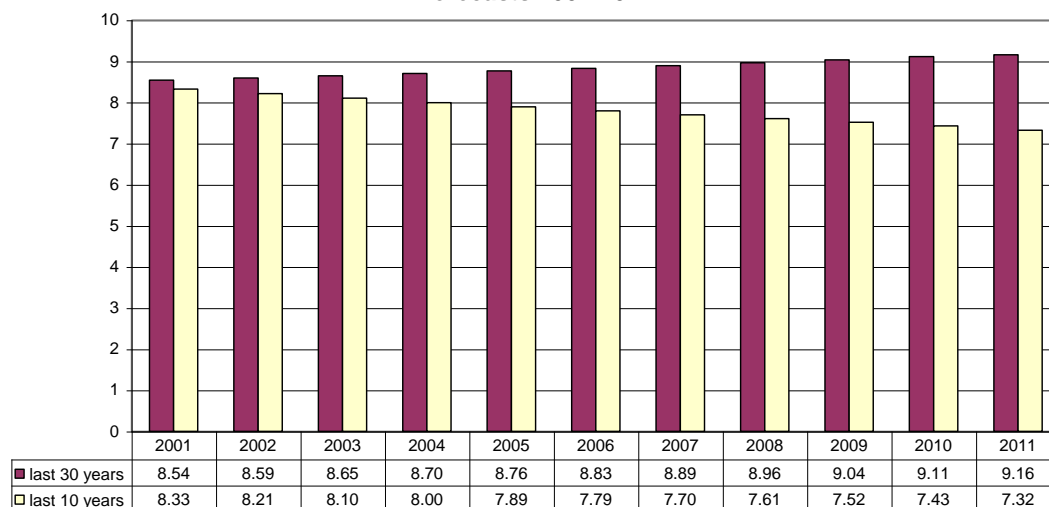
*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.
Based on EGM and SIS statistics.

**Number of injuries* per 100 000 inhabitants
forecasts 2001-2011**



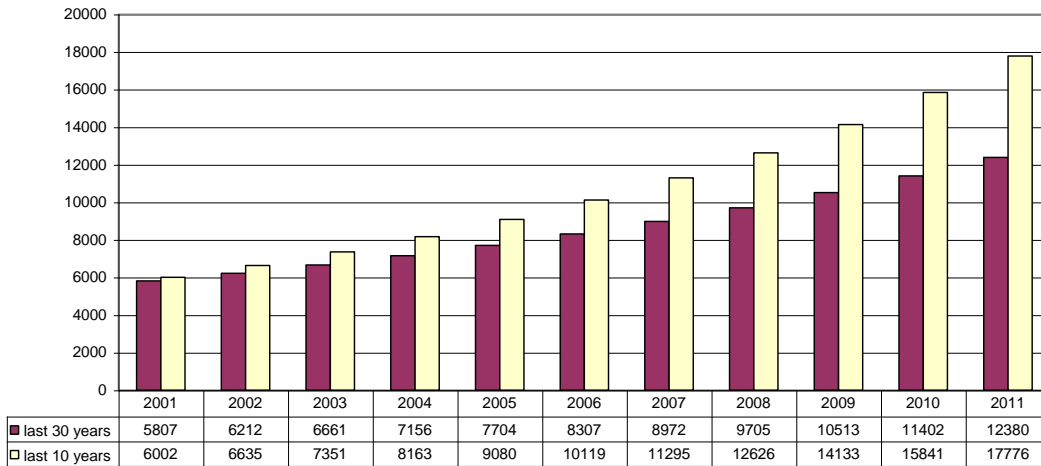
*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM and SIS statistics.

**Number of fatalities* per 100 000 inhabitants
forecasts 2001-2011**



*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM and SIS statistics.

Number of accidents* per 100 000 motor vehicles
forecasts 2001-2011**

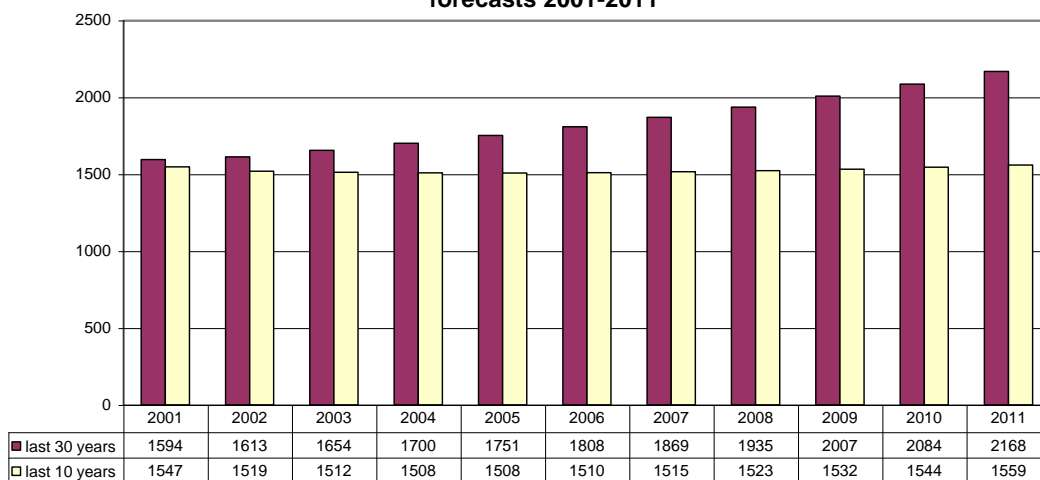


*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.

**) including motorcycles and tractors.

Based on EGM statistics.

Number of injuries* per 100 000 motorvehicles
forecasts 2001-2011**

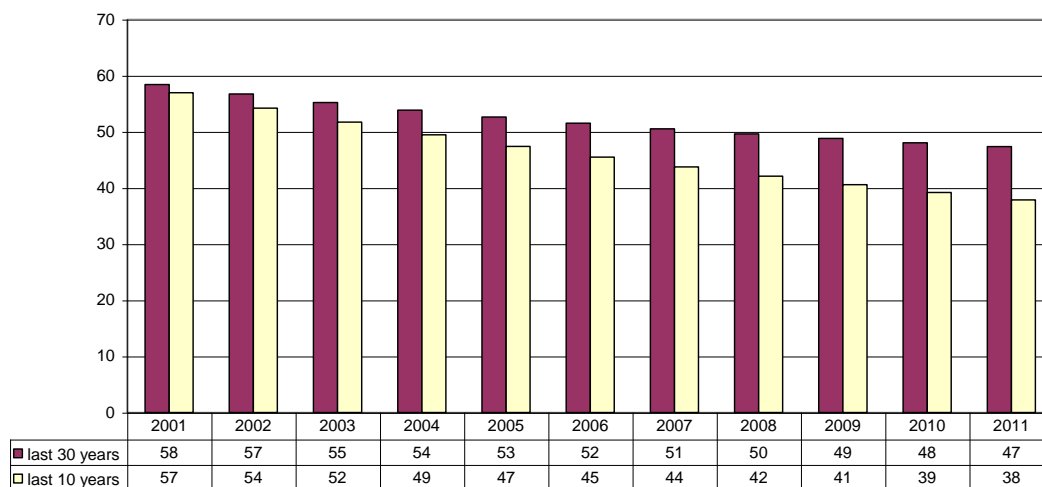


*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.

**) including motorcycles and tractors.

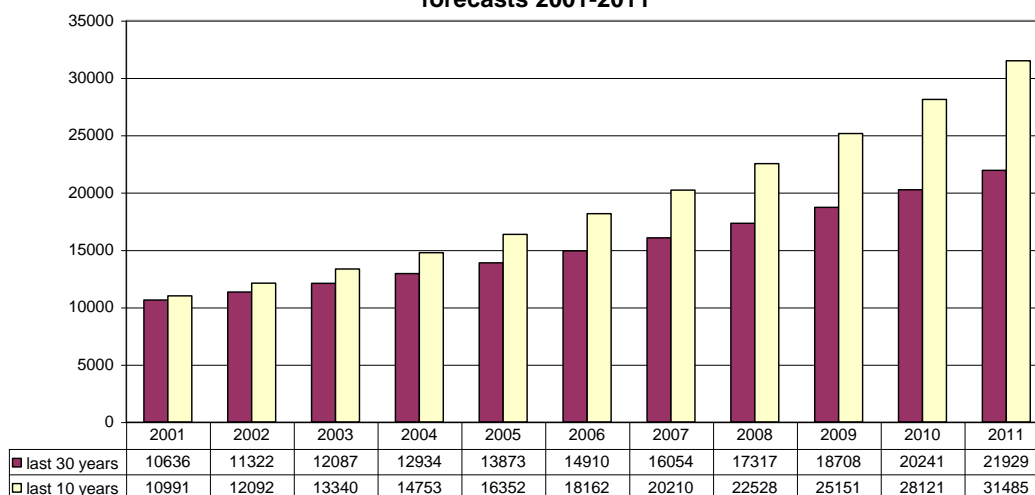
Based on EGM statistics.

Number of fatalities* per 100 000 motor vehicles forecasts 2001-2011**



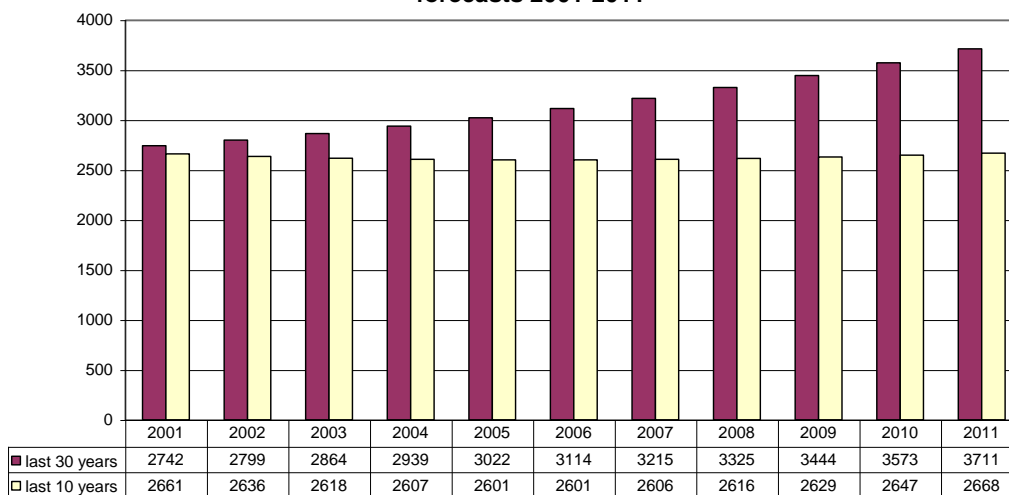
*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included
 **) including motorcycles and tractors
 Based on EGM statistics

Number of accidents* per 100 000 passenger cars forecasts 2001-2011



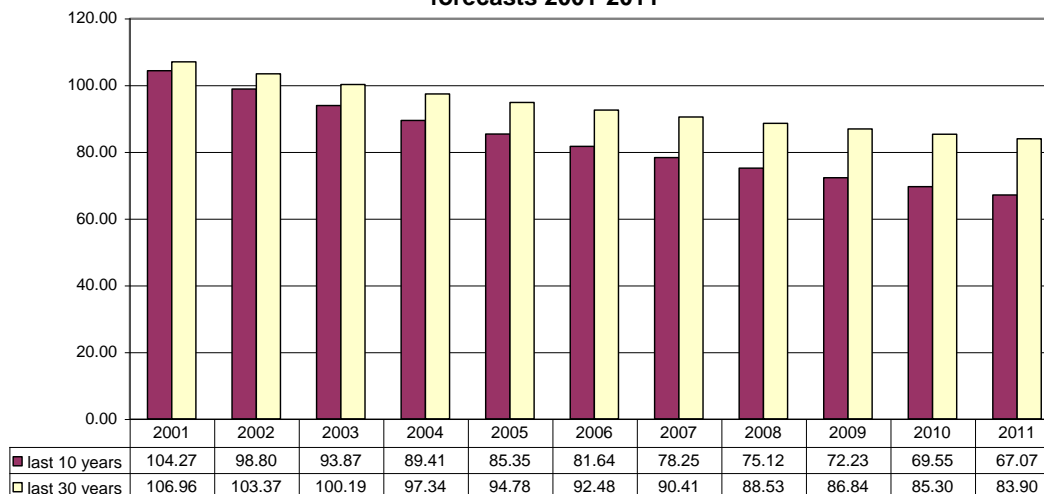
*) EGM and Jandarma reported accidents. "Hit and run" cases are not included.
 Based on EGM statistics.

**Number of injuries* per 100 000 passenger cars
forecasts 2001-2011**



*) EGM and Jandarma reported injuries at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM statistics.

**Number of fatalities per 100 000 passenger cars
forecasts 2001-2011**



*) EGM and Jandarma reported fatalities at the accident site. "Hit and run" cases and hospital statistics are not included.
Based on EGM statistics.

Appendix D**Some international comparisons****Background**

It is often difficult to make reliable comparisons concerning both the traffic safety situation in different countries and the development over time in a specific country. The main reasons are differences in definitions of accidents and casualties, quality of data and degree of reporting. The most reliable statistics concern fatalities.

In this Appendix two comparisons will be made:

- Turkey versus Sweden,
- Turkey and Sweden according to Smeed's method.

Turkey versus Sweden

The following table gives numbers of road fatalities, inhabitants and motor vehicles for 1999. In addition, the ratios between fatalities and inhabitants and motor vehicles respectively are indicated.

	Turkey	Sweden
Fatalities ^{*)}	~ 9 550	580
Inhabitants (million)	64.4	8.86
Motor vehicles (thousand)**)		
- Cars	6 721	4 259
- cars + mc	7 706	4 410
- cars + mc + tractors	8 837	4 735
Killed per 10 ⁵ inhabitants	14.8	6.5
Killed per 10 ⁵ motor vehicles		
- cars	142	14
- cars + mc	124	13
- cars + mc + tractors	108	12

^{*)} 30-days definition. ^{**)} EGM statistics.

The number of fatalities for Turkey according to the 30-days definition of a road fatality has been estimated to 9,550 (see below).

Motor vehicles are usually defined as motor driven vehicles including passenger cars, lorries/trucks, busses, motorcycles and mopeds, and excluding tractors and similar motor driven tools. However, if tractors are frequent in road traffic they constitute a risk factor and could therefore be considered in comparisons. In the table above, different definitions have been used to illustrate the magnitude of the variations. As the numbers of mopeds are not known, mopeds have been excluded from the comparison.

From the table can be seen that the number of killed per 100,000 inhabitants is about 14.8 in Turkey and 6.5 in Sweden. The ratio between the value for Turkey and the value for Sweden is about 2.3.

The number of fatalities per 100,000 motor vehicles depending on the definition varies between 142 and 108 for Turkey, and between 14 and 12 for Sweden. The ratios between the Turkish values and the Swedish ones vary between 10 and 9.

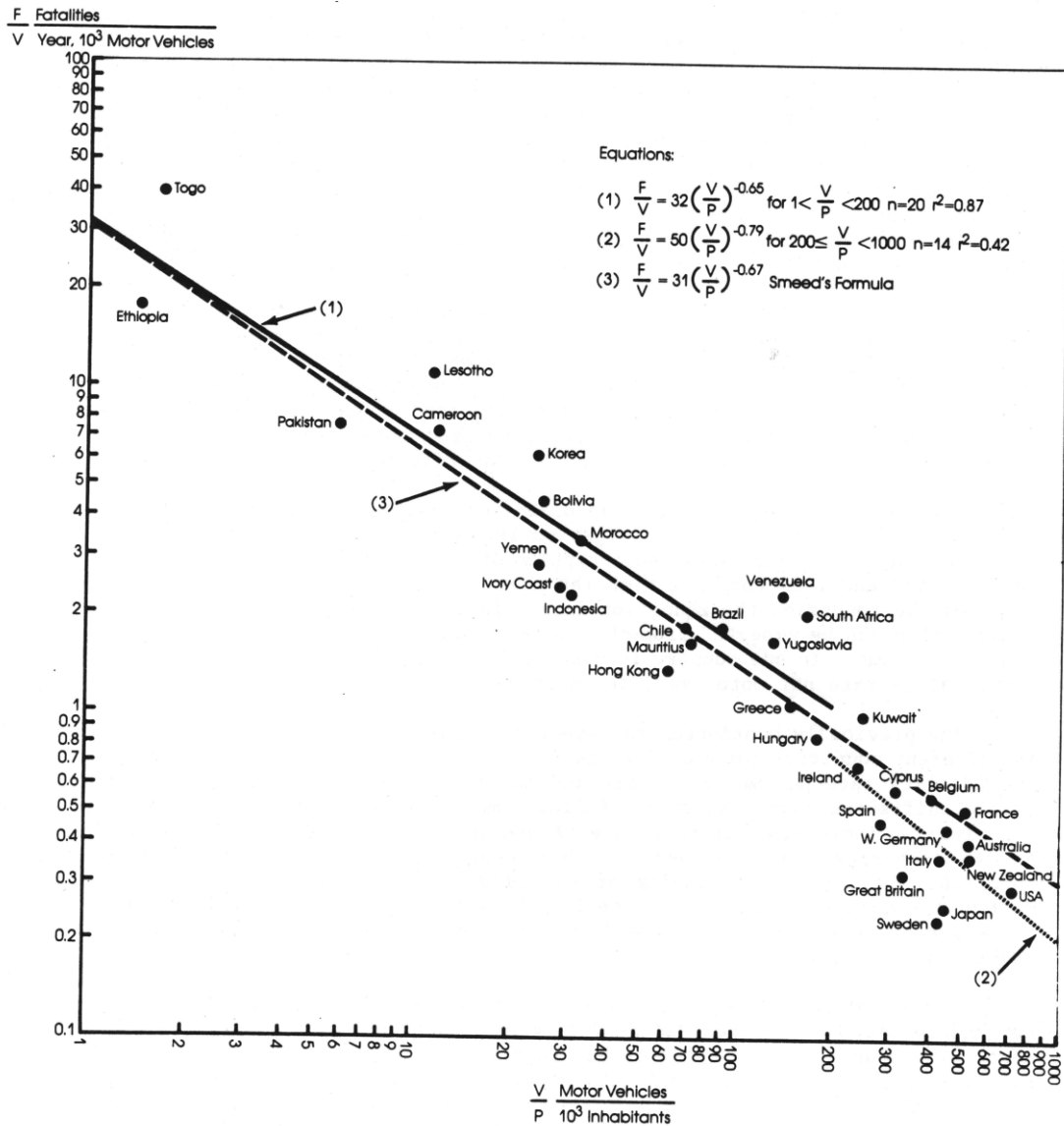
The average values for the EU countries in 1999 were:

- 11 fatalities per 100,000 inhabitants,
- 19.5 fatalities per 100,000 motor vehicles.

Based on this, it can be concluded that there is a great potential for safety improvements in Turkey.

Turkey and Sweden according to Smeed's method

One method for international comparisons was suggested by an English researcher, Smeed, around 1950. He compared data on fatalities, motor vehicles and population for different countries. He found a strong relationship between the number of fatalities per motor vehicle and the number of motor vehicles per inhabitant. The number of fatalities per vehicle is lower the higher the level of motorization. This has later been confirmed by other researchers. The relationship is illustrated by the following figure, which shows data for 34 countries from 1979–1983 as well as Smeed's original formula (Carlsson, Hedman, 1990). The graph is in logarithmic scales.

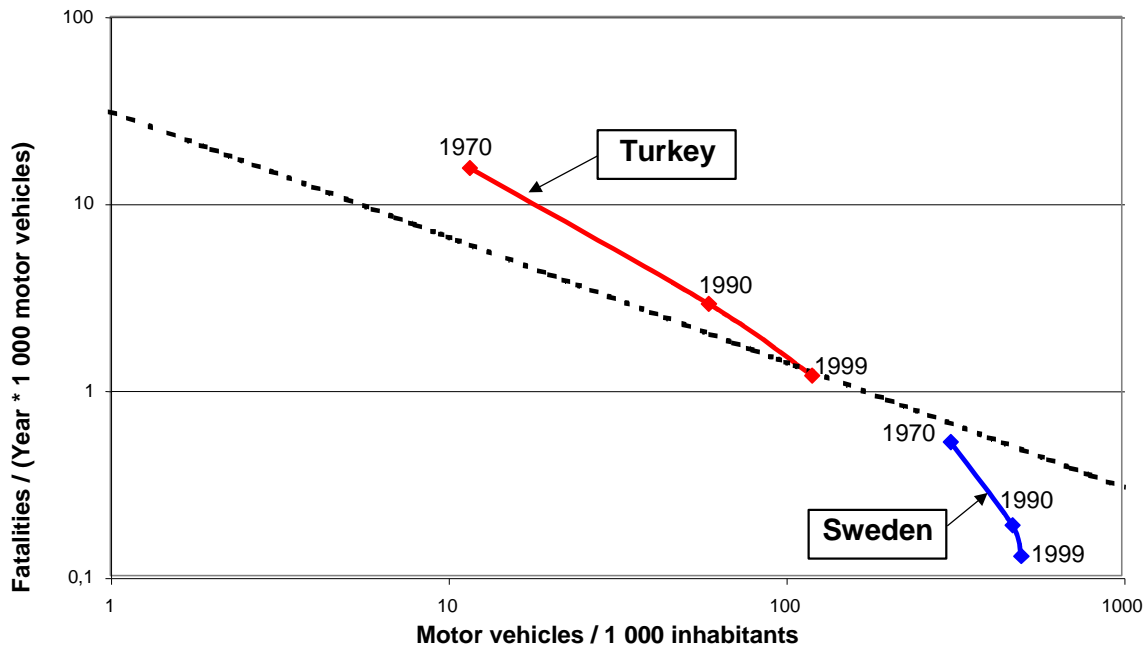


The mathematical formula for Smeed's relationship is:

$$F/V = 31 * (V/P) \exp(-0.67)$$

- where F = number of road fatalities per year
- V = number of motorvehicles in thousands
- V' = number of motorvehicles
- P = population in thousands

The following figure illustrates the development for Turkey and Sweden since 1970 (motor vehicles defined as cars (passenger cars, trucks and busses) plus motorcycles).



From the graph can be seen that in 1970 Turkey was less safe than many other countries with regard to population and motor vehicle ownership, that is, the values were well above Smeed's curve. After that, the development in Turkey seems to have been quite favorable (the number of fatalities per motor vehicle has fallen sharply), especially from 1990 to 1999, and the values are now below Smeed's curve.

For comparison, the development in Sweden has also been shown in the figure. As can be seen, Sweden has had an almost constant vehicle ownership during the last decade while the number of fatalities has fallen substantially.

If future development in Turkey will follow the favorable development from 1990 to 1999, the number of fatalities in 2006 and 2011 will be around 9,600 for 2006 and about 9,900 for 2011. If more resources and more efforts are allocated to the safety work, the numbers will be lowered and the curve will get steeper gradient.

The curve for Turkey is based on the following *estimated* figures:

	1970	1990	1999
Fatalities per year			
EGM	3 978	6 286	4 596
Jandarma	50	100	1 534
“hit and run”	282(7%) ^{x)}	447(7%) ^{x)}	433
Killed during transport and in hospital	2 027	2 909	2 991
Total fatalities**)	6 337	9 742	9 554
Other variables			
Inhabitants (thousand)	35 320	56 100	64 400
Motor vehicles (thousand) ***)			
- cars + mc	408	3 322	7 706
- cars + mc + tractors	490	4 092	8 837
Fatalities per thousand motor vehicles			
- cars + mc	15.5	2.9	1.2
- cars + mc + tractors	12.9	2.4	1.1
Motor vehicles per thousand inhabitants			
- cars + mc	11.6	59.2	119.7
- cars + mc + tractors	13.9	72.9	137.2

italic figures indicate estimates.

x) estimated percentage of total EGM + Jandarma.

**) estimate according to the 30-days definition of a road fatality.

***) EGM statistics.

The corresponding values for Sweden are indicated in the following table:

	1970	1990	1999
Total fatalities**)	1 307	772	580
Other variables			
Inhabitants (thousand)	8 081	8 591	8 861
Motor vehicles (thousand)			
- cars + mc	2 486	4 025	4 410
- cars + mc + tractors	2 726	4 359	4 735
Fatalities per thousand motor vehicles			
- cars + mc	0.53	0.19	0.13
- cars + mc + tractors	0.48	0.18	0.12
Motor vehicles per thousand inhabitants			
- cars + mc	308	469	498
- cars + mc + tractors	337	507	534

Appendix E**Present organization for traffic safety in Turkey****Summary**

There are many Ministries and governmental agencies involved in traffic safety. Some of the more important ones are listed in the following table:

Agency	Area of responsibility
Parliament	Laws Funds
Government <ul style="list-style-type: none"> State Planning Organization 	Yearly and 5-year sectoral investment plans and budget proposals
Ministry of Interior <ul style="list-style-type: none"> EGM Jandarma 	Law enforcement Registration of vehicles Issuing drivers licenses Accident statistics Arrange penalty tickets for traffic breaches ^{*)}
Ministry of Public Works and Settlement <ul style="list-style-type: none"> KGM 	Make necessary arrangement and markings on roads within its own responsibility Regulations on signs and markings Suitability of road side facilities Periodic vehicle inspection Stationary and mobile control of vehicle weights
Ministry of National Education	Regulations on driving schools and licensing Pre-school, primary-school and high-school education Public information
Ministry of Health	Regulations on first aid and medical care and rehabilitation
Ministry of Industry and Commerce	Type approval of vehicles
Ministry of Transportation	Regulations for transportation (incl. coordination)
Ministry of Forestry	Regulations on forest roads
Ministry of State <ul style="list-style-type: none"> Directorate of Village Affairs 	Regulations on village roads
Ministry of Justice	Law proposa preparationss
Provinces <ul style="list-style-type: none"> Provincial traffic commissions Sub-provincial traffic commissions 	Provincial traffic safety issues
Municipalities <ul style="list-style-type: none"> Municipal traffic units 	Municipal traffic safety issues Sub-provincial traffic commissions

In addition, there are some private organizations engaged in the safety work, for instance:

- Turkish Automobiles and Drivers Association
- Automotive Manufacturers Association
- Prevention of Traffic Accidents Foundation
- Aid for Traffic Accidents Foundation

^{*)} Ministry of Finance is responsible for collection of some fines.

The Turkish Parliament

The Turkish Parliament makes the decision on funds and laws influencing traffic policy and traffic safety. The government has together with related ministries the overall responsibility for the execution, coordination and control of matters concerning transport and traffic policies and statues and regulations in the field of transportation.

In the present situation, although different ministries and organizations share the responsibilities, the main actors on the national level are:

- General Directorate of Security, under the Ministry of Interior.
- General Directorate of Highways under the Ministry of Public Works and Settlement.
- 81 Municipalities. Although there are some unions of municipalities, they are not acting as representative bodies in the traffic safety area.

There are several voluntary organizations but they are not represented by one single organization. Some of them have the right to attend coordination councils.

The Ministry of Transportation has a very minor role in highway transportation and traffic safety. Railway transportation is governed by the Ministry of Transportation and it is also responsible for regulation of the transportation sector.

Attempts have been made to establish cooperation on a national scale through two safety councils as described later. On the provincial base, coordination is obtained through the province and town (sub-province) traffic commissions. These councils and commissions have rights to take traffic regulation decisions.

The State Planning Organization, which is directly subordinated to the Prime Ministry, evaluates plan and budget proposals. There are no transportation sectoral mid- and long-term plans. There are short-term plans. There is also a lack of plans for traffic safety.

The main roles and responsibilities of different ministries/organizations are summarized in the following paragraphs.

Ministry of Interior - General Directorate of Security and General Commandership of Jandarma

- Law enforcement (traffic control and monitoring)
- Registration of the vehicles, issuing driving licenses
- Necessary actions after traffic accidents to get a safe area for other road users; reporting of accidents is also included
- All statistical reporting about vehicle registrations, driving licenses and accidents
- Public information

Ministry of Public Works and Settlement - General Directorate of Highways

- Physical arrangements and signing for a safe road transportation
- Decisions on the standards of signs
- Roadside facilities (gasoline stations, accesses, lighting, etc.)

- Periodic vehicle inspections
- Stationary and mobile weight controls

Ministry of National Education

- Regulation of driving license schools and performing tests (including issuing certificates)
- Pre-school, primary school and high school as well as public traffic education and training (including coordination with other agencies)
- Public information

Ministry of Health

- Regulation and implementation and follow-up of first aid and emergency services as well as medical care and rehabilitation.

Ministry of Industry and Commerce

- Type approval of vehicles

Ministry of Transportation

- Coordination of transportation (issuing regulations in the transportation sector)

Ministry of Forestry

- Traffic regulation for forest roads

Ministry of State - General Directorate of Village Affairs

- Traffic regulations for village roads

Ministry of Justice

- Giving necessary help in revising the law

Municipalities

- Physical implementation and regulation of traffic safety measures on municipality roads

International Contacts

There is no unique organization responsible for international contacts; each organization follows its own issues internationally.

Coordination**Supreme Highway Traffic Safety Council**

Head: The Prime Minister.

Participants: Ministers of the following Ministries: Justice, Interior, Finance, National Education, Public Works and Settlement, Health, Transportation, Forestry, State (which holds General Directorate of Village Affairs).
Head Commander of Jandarma, Under Secretary of State Planning Organization, General Directors of General Directorate of Security and General Directorate of Highways.

Meetings: Twice a year

Task: The issues are prepared by Traffic Services Department (General Directorate of Security), approved by the Highway Traffic Safety Council, and later discussed in the High Council. The decisions (proposals) are followed and precautions for the coordination are taken by the Council in its implementation areas.
Secretarial work of the Council is given by General Directorate of Security. Guidelines related to Council's work are arranged by regulations prepared by the Cabinet.

Highway Traffic Safety Council

Head: The Director of the Traffic Services Department in General Directorate of Security.

Participants: Related Heads of Departments of the Ministries and Organizations stated above.

Representatives from:

- Commandership of Jandarma
- State Standardization Institution
- Turkish Drivers and Automobiles Association
- Universities
- Chamber of Engineers and Architects
- Prevention of Traffic Accidents Foundation
- Aid for Traffic Accidents Foundation
- Head of Greater Ankara

Meetings: Every month

Tasks and res-

- ponsibilities:
- Give proposals to achieve coordination
 - Give proposals to reduce accidents
 - Find deficiencies in the applications
 - Find legislative deficiencies in traffic safety area

Municipal traffic units

UKOME (Transportation Coordination Centre)

Head: Mayor (Head of greater municipality).

- Participants:
- General Directors or Directors of Municipal transportation/traffic units.
 - General Directors or Regional Directors of Organizations related with transportation/traffic.
 - Mayors of towns within the province border.
 - The number of municipal representatives must not exceed the number of participants from other organizations.

Tasks and res-

- ponsibilities:
- Follow and monitor fulfilment of the tasks given to municipalities by the traffic law and other tasks related to urban transportation by the municipality law.
 - Monitor competition and balance among different urban transportation modes by arranging tariffs, ticket prices, etc.
 - Decisions about the working conditions of the commercial vehicles in the province have to be approved by Province Traffic Commissions.

Province and Town (sub-provincial) Traffic Commissions

Head: Governor/Deputy governor/Head official of a district.

Participants: Representatives from:

- Municipality
- Security (police)
- KGM
- Jandarma
- Automobile and Drivers Association
- Other representatives from universities, etc., approved by the governor (maximum three persons).

Tasks and re-

- sponsibilities:
- Take necessary precautions for achieving traffic regulation and safety in the district.
 - Take necessary decisions about upgrading of the infrastructure. Give proposals to the Ministry of Interior.
 - Take decisions about the working conditions of the commercial vehicles in the province regardless the regulations issued by the Ministry of Transportation.
 - Take decisions about parking areas.

Foundations and Associations (Voluntary Organizations)

- Turkish Automobiles and Drivers Association
- Automotive Industry Association
- Prevention of Traffic Accidents Foundation
- Aid for Traffic Accidents Foundation

Appendix F**“Safety visions” in Denmark, the Netherlands and Sweden****“Every accident is one too many”**

In Denmark, the government has launched the vision that “every accident is one too many”. This vision sets a strategic direction towards a future road transport system with no accidents and focuses on preventive actions, that is, interventions should aim at accident prevention.

The vision makes requirements on public agencies and employees as well as on every individual road user. The vision implies that all agencies, both on national and local level, undertake to do their utmost in planning, design, construction and maintenance of the transport system in order to prevent accidents.

In Denmark, for the mid-term perspective (12 years), the following intermediate targets have been set:

	Year 2012 ^{*)}
<input type="checkbox"/> fatalities and severe injuries	- 40 %
^{*)} Compared with 1998	

The focus is on killed and severely injured. This is a change in comparison with the previous objectives. This does not mean that interventions to reduce slight accidents should be forgotten. It is mentioned that actions to reduce severe injuries also have a positive “contagious” effect on slight injuries and accidents.

The target should be attained irrespective of traffic growth and for all road user groups together. However, it is mentioned that in the follow-up and evaluation, special focus should be on road user groups with high accident risks, bicyclists, pedestrians and children.

“Sustainable Safety”

In the Netherlands, it has been stated that: “no longer can we accept that we hand over a road transport system to the next generation in which we tolerate that road transport leads to thousands of fatalities and tens of thousands of injuries every year”.

Based on this statement, the concept “Sustainable safety” has been formulated. The starting point is to drastically reduce the probability of accidents by means of infrastructure design and, where accidents still occur, the severity of these accidents should be influenced, so that serious injury is virtually excluded.

The concept is based on the principle that man is the reference standard. A sustainable transport system has an infrastructure that is adapted to the limitations of man through proper road design, vehicles fitted with ways to simplify the driving task and constructed to protect the vulnerable human being, and a road user who is educated, informed and, when necessary, controlled.

The key to arrive at a sustainable and safe system is said to lie in the systematic and consistent application of three principles:

1. Functional use of the road network by preventing unintended use of roads.
2. Homogeneous use by preventing large differences in vehicle speed, mass and direction.
3. Predictable use, thus preventing uncertainties amongst road users by enhancing the predictability of the road's course and the behavior of other road users.

In a sustainable and safe road transport system, the road user represents the central element. He must be prepared to accept an infrastructure, vehicles, rules of behavior, information and control systems that may restrict his "freedom", in return for a higher level of safety. If this willingness does not exist, there will be resistance. Then it is necessary to use "social marketing" to increase the willingness. Restricted freedom without good arguments should never be offered to the road user.

With respect to the *road users*, public awareness, public participation and education are key elements to create support for implementation.

With respect to the *vehicles*, the diversity of vehicles should be kept to a minimum. Concerning passive safety, equipment working without the participation of the occupants are important, for example, solid occupant compartments, deformable zones and airbags as well as improved frontend designs to reduce injuries to pedestrians and cyclists.

With respect to the *roads*, the functional use of roads and streets should be specified according to: the flow function, the distributor function, the access function and the residential function. One important part of sustainable, safe road transport is said to lie in the removal of all function combinations, in order to create mono-functional roads and streets. Multi-functionality leads to contradictory design requirements and to higher risks.

In the Netherlands, for the short- and mid-term perspective, the following intermediate targets have been set:

	Year 2000 ^{*)}	Year 2010 ^{*)}
<input type="checkbox"/> fatalities	- 25 %	- 50 %
<input type="checkbox"/> injuries	- 25 %	- 40 %

^{*)} Compared with 1985 and 1996 respectively

"Vision Zero"

In Sweden, the "Vision Zero" has been developed. This vision implies that the ultimate, ideal goal should be a road transport system with zero *fatalities* and zero *serious injuries*. As the road system is very complicated and difficult to control, it has not been considered possible or necessary to establish a vision of zero *slight injuries* and zero *accidents*.

However, a vision meaning that forces creating fatal, permanent or long-lasting damage to the human body should be avoided was considered as reasonable and possible. To attain this ideal situation will of course take a very long time, cost huge amounts of money and imply many other efforts and sacrifices.

But is it really realistic to try to design a system in which nobody is going to be killed or seriously injured? Perhaps not, but it should be possible to get very close to zero if all parties concerned: the "system designers" (politicians, rule makers, road authorities, traffic police,

car makers etc.) and the road users, really start to accept the vision and act accordingly.

The ethical basis for this vision is that human mistakes and errors, which are made and always will be made, should not lead to loss of life or serious injury. The road system must be designed so that road user mistakes do not result in such disastrous consequences.

In practice, the “Vision Zero” means that the forces to the human body will set the limits to maximum permitted decelerations and speeds in the system. If the forces are reduced by improved technical means, then, for example, higher speeds could be permitted. The speed can thus be seen as the regulating factor of the system and the “Vision Zero” can, theoretically, always be achieved by reducing the speed to a “safe” level.

The “Vision Zero” means that the vulnerable road users (pedestrians, bicyclists, etc.) will determine some of the safety demands on the system. For example, in streets where pedestrians and bicyclists cannot be separated from car traffic, the speeds have to be reduced to or below 30 km/h in order almost to guarantee that no one is killed in an accident. Some other examples are that in side-on collisions speeds should not exceed 50 km/h and in head-on collisions, speeds should not exceed 70 km/h in order to avoid serious injuries.

One important question is the obedience to the traffic rules. In a Norwegian study calculations have been made of what will happen if all road users followed all existing rules (Elvik, 1997). The result shows that fatalities should be reduced by almost 50 percent and injuries by 30 percent, which means that 50 percent of the fatalities and 70 percent of the injuries should remain even if all road users followed all rules. This illustrates that the road transport system really is very unsafe and that it is too simple just to blame the road users. The “system designers” have to take a greater responsibility for the safety of the system.

The “Vision Zero” implies that every fatality, and in a longer time perspective also every serious injury, have to be investigated properly with the aim to study what could have been done to prevent the casualty, and this knowledge has to be used to further improve the system.

A decision to adopt a “Vision Zero” implies a widespread commitment from society to give priority to prevent the worst consequences of road accidents. The politicians and the individual road users must be convinced of the necessity and possibility to reform the present system to a “new and better” system, in which people are not being killed or permanently injured by just using the system.

In Sweden, the “Vision Zero” has put traffic safety on the political agenda and safety discussions among professionals and in mass media have been very intense. This is a new and positive experience, because, in the past, increased political interest in safety has appeared only in connection with alarming increases in the number of casualties. The discussions have to a large extent been focused on the realism of the vision. Most of the articles in newspapers have shown a positive attitude, but there have also been some critical views. Among those professionally working for safety, attitudes have been mainly positive. The “Vision Zero” and the political intent for the vision will most probably be a very useful tool to promote safety issues in competition with other kinds of improvements in society.

The “Vision Zero” has created a discussion climate, which has made it easier to discuss important safety problems, which previously have been seen as politically sensitive. The

most obvious issue is the importance of speed for the number and consequences of accidents. Now, for instance, even motorist organizations have formed a much more fact-oriented attitude to the importance of obeying speed limits and also to reducing some of the present limits. In addition, the police have raised their interest to enforce the speed limits in a more efficient way. The “Vision Zero” has also brought some simple, but cost-effective, safety measures into focus, for instance, median guardrails on two-lane roads (actually 1+2 lanes).

In Sweden, for the short- and mid-term perspective, the following intermediate targets have been set:

	Year 2000 ^{*)}	Year 2007 ^{*)}
□ fatalities	- ca 35 %	- 50 %
□ severe injuries	- ca 15 %	-
□ total injuries	- ca 15 %	-

^{*)} Compared with 1994 and 1996 respectively

The targets for year 2000, however, have not been attained, mainly due to an unforeseen rapid increase in vehicle-kilometers traveled.

Appendix G**Target/result-oriented way of working**

In traffic safety discussions the following statements can be heard: *"One of the most important problems of our country is the traffic accidents. Therefore, special importance has been given to traffic safety. Enforcement activities are being focused. Traffic safety is a part of education and necessary education is going to be given in schools. Black spots have been improved one by one. We know that first aid rescues the victims so the number of first aid stations along roads has been increased."*

On the other hand, these statements do not give complete answers to the following questions: What is the priority of traffic accidents in the country's agenda? Which parameters indicate the importance given to traffic safety? Which changes have been achieved in these parameters during the last five years? Are there one year and/or five years targets in order to reduce traffic accidents, fatalities and injuries? Are these targets connected with work plans and resources? To which areas are enforcement activities concentrated? How many teachers have been trained for safety education and what is the target number for the next year? Which plan has been followed in opening new first aid stations?

The answers to these questions are normally difficult to give. Since no targets are defined, resources can not be distributed accordingly. Because of these uncertainties, no relevant evaluation can be made in order to measure the effectiveness of the work.

"A target/result-oriented way of working" can be introduced as a system in order to use resources more efficiently. The actions presented in this type of planning are interrelated as chain circles. The chain starts with resources and related targets and continues with process issues. This includes "performance goals/targets". Then follows, "common status goals/targets" where institutional operations are being evaluated. The chain ends with general "overall goals/targets" (see figure below).

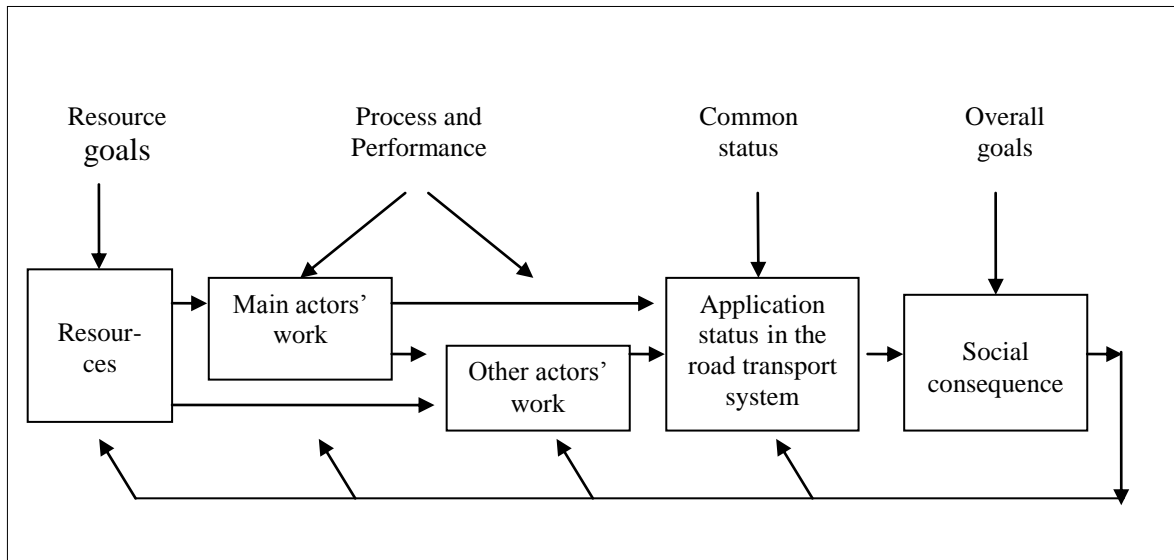
In the work with traffic safety, targets specified in number of traffic accidents, fatalities and injuries are evaluated in "overall targets". In order to clarify the differences between targets and wishes, overall targets have to be related to common status-operational-targets. To reach each operational (status) target, resources and performances have to be arranged accordingly.

Attainable and measurable targets create a chance to make relevant follow-up and evaluation. In this way, evaluations and necessary revisions can be made at any stage of the work.

The activities, in which results can be compared with the pre-stated targets, can be called "Works/Plans controlled by targets/results". The targets have to be attainable and measurable. In order to have such kind of targets, they have to be connected with type of work and resources. A typical model that can be used in safety work is illustrated in the following figure.

The target/result-oriented way of working has become a dominating and efficient way for

directing and controlling within many public organizations during the 1990s.



As an example, resources should be used to improve the roads. The Road Administration’s resources and work result in changes in road conditions. Other actors can also effect the road transport system. All these changes will have consequences for the social and economic development of the country and its inhabitants.

For each of these steps in the ”chain”, there could be goals/targets according to the following example:

Type of goal/target	KGM	EGM
Resource targets	5 % of maintenance budget should be used for safety interventions	Patrol teams should be supported by two additional personnel for surveillance on busy roads during six months
Process and performance targets	All maintenance districts should allocate min. 30 % of the working hours for traffic work	25 % of the working hours should be used for speed control
Common status targets	Percentage of road kilometers without hazardous road sides	Percentage of vehicles exceeding the speed limits
Overall targets	Less than XXXX fatalities year 2011	Less than XXXX fatalities year 2011

Effective targets must be expressed in such terms that those, for whom the targets are set, really feel that they have the possibility to influence the result. In order to work effectively, it is necessary to know the relationships between the different steps in the chain, from resources to performance targets to common status targets and the final overall targets. This means, for example, that it is necessary to know the relationship between:

- the main actor’s work, for example, a certain design improvement of a black spot junction,
- status, for instance, speed and reduction of speed at that junction,
- overall targets, for example, the reduction of fatalities and injuries at the junction in question.

Appendix H**Top priority safety interventions****Introduction**

In this Appendix, some comments and proposals are given concerning the seven top priority interventions stated in the Strategy and the Plan:

1. Increase the awareness of, and interest in, traffic safety of high-level decision-makers in the Parliament, the government and the administration.
2. Establish a Traffic Safety Secretariat to support the existing safety Councils. Study if it is suitable to establish a special Traffic Safety Directorate.
3. Strengthen university education on traffic safety and arrange special courses for safety staff.
4. Establish a nationwide, comprehensive and reliable traffic safety database.
5. Establish a national Center for applied traffic safety research and development (R&D)
6. Strengthen the organization for traffic safety information and campaigns.
7. Improve traffic safety education in schools.

1 Increase the awareness of, and interest in, traffic safety of high-level decision-makers in the Parliament, the government and the administration**1.1 Background**

It is of utmost importance for traffic safety work that high-level decision-makers are aware of the immense humanitarian and economic problem caused by road traffic accidents, and that it is actually possible to do something about it. The main reason is that these persons can influence the safety situation both by strategic decisions on national, provincial and also local level, and that their general attitudes, behavior and views concerning safety will be noticed and probably to some extent adopted by the general public.

It is a basic pre-condition for improved traffic safety in a country that high-level decision-makers are aware of, interested in, and actively supporting the safety work.

1.2 Objectives

High level decision-makers should, among other things:

- accept, decide and authorize the National Traffic Safety Program for Turkey, especially the Vision and the Strategy, including the proposed safety targets,
- give priority to traffic safety, and ensure that safety is taken into account in all decisions having an influence on safety,
- supply sufficient funding to make it possible to attain the targets and to carry out the safety interventions according to the Plan.

1.3 Methods

The awareness and interest of high-level decision-makers should be increased by continual direct and indirect information and pressure, for example, by:

- direct information to members of the national Parliament and national and provincial governments given by the two Councils and other related organizations,
- safety information campaigns directed towards the general public, focused on specific target groups and topics,
- frequent information to media about the safety situation and actions taken,
- safety seminars and congresses to which high-level decision-makers are invited to speak,
- a “traffic safety day” (or week) to promote safety, preferably supported by the President and/or the Prime Minister.

2 Establish a Traffic Safety Secretariat to support the existing safety Councils. Investigate if it is suitable to establish a special Traffic Safety Directorate

2.1 Background

The institutional and organizational structure for traffic safety in a country is of great importance for the success of the traffic safety work.

The present organization in Turkey is briefly described in Appendix E. Some of the identified deficiencies are listed in the Problem section. The main, national public traffic safety organizations are:

- the Supreme Highway Traffic Safety Council (SHSC, “High” Council),
- the Highway Traffic Safety Council (HTSC, “Lower” Council).

In addition, there are many other national, public organizations working with safety, for example, KGM, EGM, MoNE and MoH, as well as some private organizations.

In this section, first some general ideas about safety organization will be discussed and some proposals for Turkey will be given. After that, some more details will be given concerning the proposals.

2.2 Organization for traffic safety

2.2.1 Basic conditions

In brief, it can be stated that:

- the road accident and casualty problem is extremely urgent and complex,
- there are many different kinds of interventions possible and necessary,
- there are many “actors” and sectors of society involved. For many of them traffic safety is not the top priority,
- some safety actions can affect other road transport variables, for example, accessibility, speed and environmental impact.

Based on this, it is obvious that:

- strong and decisive action has to be taken immediately,
- established and well-functioning cooperation is necessary,
- a systematic approach is needed.

In order to achieve this, a strong and effective institutional and organizational structure is needed.

2.2.2 Foreign experiences

A recent review of experiences concerning national organization for traffic safety (GRSP, Review of Traffic Safety Management) has shown that:

- Lead responsibility for traffic safety needs to be defined (and should include coordinating role) and accepted by key organization.
- A good bi-lateral working relationship between traffic police and road authorities should be the second priority.
- Multi-sectoral coordination should be based on successful local precedents. If none exist, the safety coordinating body should be limited to key ministries.
- Working groups and technical committees should be used both to promote the participation of business and civil society in developing road safety policy.
- Council and committee members will have a large role in the success of a program. Members need to be committed and pro-active.
- A traffic safety central office will be required, regardless of the organizational model chosen, with adequate financial and technical resources to be effective.

In general, it seems as if experience has shown that there should be one central body with overall responsible for traffic safety in a country, and that this body should be responsible for creating effective cooperation and coordination with all major, relevant “actors”, preferably both public and private ones, and at all levels (national, provincial and local).

Normal organizational structures are:

- *either* a Lead Ministry (and/or possibly a Lead Authority) with overall responsibility for traffic safety, including co-operation and co-ordination,
- *or* a National Traffic Safety Council/Commission, with responsibility mainly for co-operation and co-ordination and some overall safety activities,
- *and*, in addition:
 - a number of other involved, national public organizations, responsible for their respective fields, for example, a National Road Administration, a National Police Board and a National Board of Education,
 - a number of public, provincial and local safety councils/groups,
 - a number of NGOs at different levels.

2.2.3 Organizational options for Turkey

Based on what has been stated above, the following options for public organization on the national level could be applicable for Turkey:

1. Appoint a Lead Ministry, for example, the Ministry of Transport, the Ministry of Public Works and Settlement, or the Ministry of Interior, and establish a safety unit with overall responsibility for traffic safety, for example:
 - a special unit within the Ministry,
 - an existing, subordinate authority (e.g., KGM or EGM),
 - a new, subordinate authority, a “Traffic Safety Directorate”.
2. Strengthen the existing Safety Councils (SHSC and HTSC) by defining duties, authority, responsibility and accountability for the two Councils, and by establishing an effective Traffic Safety Secretariat supporting the Councils.
3. Establish an independent “Traffic Safety Directorate”.

For all these options, the other involved, public organizations should continue their safety work. In some cases, minor adjustments of their duties etc. could be necessary.

Because of what is stated in the existing Traffic Law, it may be difficult at present to create a Lead Ministry, even if this is considered to be an effective type of organization in many countries. It could perhaps also be difficult to create an independent Traffic Safety Directorate in the near future. Therefore, for the time being, it is proposed that the present solution with the two Councils should be preserved and strengthened by establishing a Traffic Safety Secretariat supporting the Councils. The Secretariat is suggested to be subordinate to the Prime Minister’s office.

In a longer time perspective, it is suggested that an investigation should be carried out to assess if it is suitable to establish either a fully independent Traffic Safety Directorate, superior to the involved ministries and subordinate to the Prime Minister’s office, or a special Directorate under one of the involved ministries. If either one turns out to be a suitable option, the proposed Traffic Safety Secretariat could constitute one important base for the future Directorate.

2.2.4 Requirements

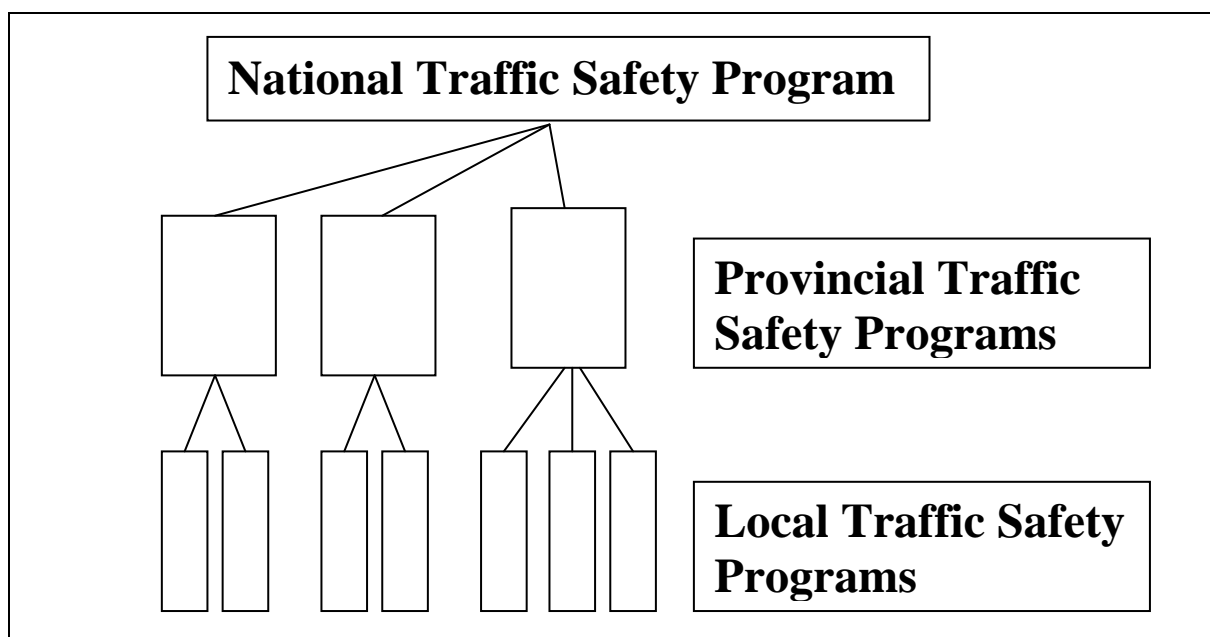
Experience from several countries has shown that in order to be effective the national, public traffic safety organization should:

- have sufficient resources (staff, knowledge, funds, equipment, etc.),
- have a sufficiently high level “position” to be respected,
- have statutory powers to carry out its duties,
- have sufficient authority,
- be responsible and accountable for traffic safety on an overall level,
- rely on support from high Parliament and government levels.

2.2.5 Commitment from all parties and levels

It should be noted that traffic safety is not a question for national and central organizations only. Provincial and local levels should also be integrated into the safety work. One reason for this is that important parts of the safety work have to be carried out close to the road users. In this way, each local body and individual person could feel more involved and understand that it is possible to affect the safety situation and therefore may want to participate in the work. The national safety body should be responsible for creating effective cooperation and coordination on an overall level.

In principle, it is suitable to establish traffic safety programs at all levels (national, provincial and local level, at least in major cities), based on the national program according to the following figure:



It should also be observed that traffic safety is not a question for Parliament, government, government agencies and other public bodies only. Partnership and integration with private enterprises and NGOs have to be established in order to be successful in the safety work.

2.2.6 Provincial and local safety organization

As was mentioned above, it is necessary to have effective provincial and local safety bodies. This is usually arranged by establishing:

- Provincial Safety Councils.
- Local Safety Coordination Groups.

Members of Provincial Safety Councils could be: Provincial government, Road administration, Police, Municipalities, Educational organizations, Medical care units, Voluntary safety organizations and other NGOs.

The duties of such Provincial Safety Councils could be to:

- develop a provincial traffic safety program, based on the national program,
- work for high priority to safety within all sectors of the region,
- continuously work for improved cooperation with all major involved bodies,
- continuously monitor, follow up and evaluate the safety situation of the region,
- transfer knowledge and experiences.

Members of Local Safety Coordination Groups could be: Local authority (incl. street department), Road administration, Police, Provincial government, Schools, Medical care units, Voluntary safety organizations and other NGOs.

The duties of such Local Safety Coordination Groups could be to:

- develop a local traffic safety program, based on the provincial program,
- work for high priority to safety within all sectors of the district/municipality,
- continuously work for improved co-operation with all major involved bodies,
- continuously monitor, follow up and evaluate the safety situation of the district/municipality,
- transfer knowledge and experiences.

In Turkey, there are already provincial and sub-provincial traffic commissions and municipal traffic units. It is suggested that their function, duties and composition should be reviewed, with the view to make them more effective concerning safety issues.

2.2.7 Partnership and integration

In order to be successful it is imperative to involve private enterprise and NGOs in the safety work.

Private enterprise could include car makers and importers, car insurance companies, heavy vehicle transport industry (trucks and busses), taxi industry, driving training schools, universities, consultants and media etc.

NGOs working with safety are voluntary safety organizations (such as the Turkish Traffic Safety Association), motoring associations, labor unions, and pedestrian and bicyclist organizations etc.

It is also important to involve interested and ambitious private individuals in the safety work.

One way to involve these organizations and individuals is to create advisory working committees and groups on different safety topics. Such groups could be established at all levels (national, provincial and local). It is suggested that such committees and groups should be formed as soon as possible.

2.3 Proposed duties of the Councils and the Secretariat

2.3.1 SHSC, “High” Council

Main duties:

- Be responsible and accountable for, and take decisions about, all *major and overall* traffic safety issues in Turkey.

Other duties:

- Overall responsibility for safety in Turkey, taking into account the interests of society, trade and industry, road user groups, and individuals, as well as other transport related aspects, for example, environmental impact.
- Be responsible for coordination of the safety work of all major organizations involved in traffic safety.

- Be responsible for national safety programs for Turkey, including visions and targets and necessary break down of targets on organizations, problem areas and geographic regions, etc.
- Be responsible for procurement of sufficient funds, personnel and equipment for safety actions to all involved public and national organizations.
- Be responsible for monitoring, follow-up and evaluation of implementation of the national safety programs and other major national safety actions.
- Be responsible for investigations about the performance of involved public and national organizations and requests (“orders”) to improve their safety activities (control function).
- Encourage provincial and local safety work.
- Promote traffic safety in general.

2.3.2 HTSC, “Lower” Council

Main duties:

- Assist the SHSC by preparing, discussing and approving background material, proposals and other kinds of basic material for decisions on major and overall traffic safety issues (that is, to act as a “preparatory group” for the SHSC).
- Be responsible for, and take decisions about, *overall* safety issues, which are not of the magnitude that they require decisions by the SHSC (see duties of the SHSC and the Secretariat).

2.3.3 Secretariat

Main duties:

- Assist the SHSC and the HTSC by preparing background material, proposals, analyses and other kinds of basic material for discussions and decisions.
- Give advise on all traffic safety matters to the Parliament and the government as well as to other public agencies.
- Be responsible for the execution of Council decisions for which there are no other responsible public organizations, for example, major nationwide safety information and campaigns.

Other duties:

- Monitor and analyze the accident situation and trends. Inform the Councils about the situation and development.
- Prepare draft traffic safety programs for Turkey as well as up-dates of these programs (including visions and targets and the break-down of targets on organizations, problem areas and geographic regions, etc.).
- Coordinate planning of safety activities on a national level. Coordinate practical work between involved Ministries, government authorities and other public and private organizations.
- Monitor, follow-up and evaluate the implementation and effects of the safety programs and other major national safety actions. Inform the Councils about the results.
- Carry out investigations about the performance of involved organizations and draft proposals on how involved public organizations should improve their safety activities (to

be submitted to, and decided by, the SHSC). This could, for example, concern KGM, EGM, Jandarma, MoNE and MoH, as well as provincial organizations.

- Encourage and assist in developing provincial and local safety work.
- Initiate education and training programs/courses for those in charge of safety work.
- Assist the Councils in studies related to safety. Carry out multi-disciplinary studies and initiate matters to be considered by the Councils (and possible sub-committees).
- Prepare background briefing papers. Give advice and present accident and casualty data analyses to support the work of the Councils (and possible sub-committees).
- Develop a draft long-term plan for national safety information and publicity campaigns.
- Develop, and after Council decisions, launch and coordinate major safety campaigns in close cooperation with relevant organizations. Be responsible for follow-up and evaluation of the campaigns.
- Develop, and after Council decisions, disseminate informational material and publish information, publicity and propaganda in cooperation with other organizations. Be responsible for follow-up and evaluation of the information activities.
- Develop guidelines for safety campaigns etc.
- Establish a joint group for safety information and campaigns to coordinate information and campaign activities between involved public and private organizations.
- Develop, and after Council decisions, launch and coordinate special safety projects in key sectors in close cooperation with relevant organizations.
- Liase with Provincial and Local Safety Committees to encourage and support safety activities at provincial and local level. Keep the Councils informed about such activities.
- Collect and collate the reporting of safety programs and strategies by responsible bodies.
- Liase with foreign and international organizations involved in traffic safety to acquire sample publications, educational and publicity materials, educational films, etc.
- Initiate and commission traffic safety R&D to universities and other R&D-bodies.
- Promote traffic safety in general.

3 Strengthen university education on traffic safety and arrange special courses for safety staff

It is an urgent task to start a well prepared graduate program on traffic safety in Turkey. At present, more than 20 Civil Engineering undergraduate programs offer some transport and traffic courses in different universities. These courses are mainly related with basic highway engineering introduction subjects and some elective traffic engineering headings.

Some graduate courses are also given and master thesis have been prepared in the transportation area. Some universities have intended to open individual transportation and traffic graduate programs but student profile and course contents have not been considered properly.

New graduate programs have to be organized carefully and opened at one of the powerful universities that can handle the task regarding manpower and other resources. For the first years, it is necessary to hire some foreign specialists in the traffic safety area from abroad.

It is also necessary to send some graduates from the above mentioned program abroad for PhD and post-graduate studies so that they can become the future professors of the program.

In addition, it is necessary to make legal arrangements to enable employment of these graduates by the related organizations and municipalities.

In order not to create conflicts between technical and social aspects of traffic safety, the education can be considered as two individual branch programs having common courses. The graduates from both disciplines can work cooperatively in different organizations that are related with traffic safety (municipalities, etc.).

The following paragraphs describe the details of the proposed program:

Two Areas (Branches):

- 1. Technical - Engineering**
- 2. Social - Social Sciences**

(Two semester courses, one semester thesis plus additional one semester thesis if needed, maximum four semesters, i.e., two years.) (Summer schools can be accepted as a semester.)

1. Technical – Engineering

- **Prerequisite:**
 - a. BS in Civil Engineering
 - b. BS? in City Planning*

* City Planning graduates subject to attend CE Transportation Courses during their undergraduate education)
- **Compulsary subjects**
 - a. Mathematics
 - b. Statistical Methods
 - c. Advanced Transportation (Highway) Engineering
 - d. Advanced Traffic Engineering
 - e. City and Transportation Planning
 - f. Accident Analysis and Safety
- **Semester I (4 subjects, 4*4=16 hrs per week, 15 weeks)**
 - a. Mathematics
 - b. Statistical Methods
 - c. Advanced Transportation (Highway) Engineering
 - d. Elective (Transport Economy)
- **Semester II (4 subjects, 4*4=16 hrs per week, 15 weeks)**
 - a. Advanced Traffic Engineering
 - b. Accident Analysis and Safety
 - c. City and Transportation Planning
 - d. Elective (Vehicle Technique)
- **Course contents**
 - a. Advanced traffic engineering
 1. Traffic Flow-Volume-Density
 2. Capacity and Level of Service
 3. Road Sections-Freeways-Arterials-Local streets
 4. Unsignalized Junctions (Capacity-LoS)
 5. Signalized Junctions (Capacity-LoS)
 6. Traffic Forecasting

7. Traffic Generation-Distribution-Modelsplit-Assignment
- b. Advanced transportation (highway) engineering
 1. Highway Design (special emphasis to road safety)
 2. Junction Design (special emphasis to road safety) and Type Selection
 3. Clearance Zone and Road Equipment
 4. Urban Street Design
- c. Accident Analysis and Safety
 1. Accident Statistics and Analysis
 2. Blackspot Definition - Clerification.
 3. Accident Analysis, Diagnosis
 4. Countermeasures - effects and selection
 5. Priority lists and Deciding upon Countermeasure
 6. Follow-up and Evaluation
 7. Safety Audits (planned roads, existing roads)
 8. Conflict Technique

2. Social – Social Sciences

- **Prerequisite:**

All four years Bachelor of social sciences (psychology, etc.), faculty of law and Police Academy graduates can apply to the program.

- **Compulsary subjects:**

(The below mentioned courses can be given in two semesters, (3+3). The remaining two courses can be selected from the elective list or can be taken from the main list depending upon their validity):

- a. Introduction to Psychology (general psychology with an emphasis on cognitive and physiological process)
- b. Introduction to road-user behavior and traffic safety (traffic psychology: in depth analyses of road-user behavior, especially drivers)
- c. Foundations of Human Factors/Ergonomics (human factors in traffic and transportation, role of human factors and ergonomics in traffic and transportation)
- d. Human Factors Physiology (physiological processes)
- e. General statistics for social sciences (fundamental statistics for social sciences)
- f. Multivariate statistics and Structural Equation Modeling in analyses data for transportation and traffic studies (advance statistics and latent variable analyses for traffic and transportation data)
- g. Driver Assessment: Psychotechnical and psychological assessment (assessment of drivers' motor, cognitive and psychological fitness)
- h. Accident Analysis and Safety (this course will be taken from technical branch)

- **Elective subjects:**

- a. Psychology of Trauma and Rehabilitation (for rehabilitation of accident survivors) (techniques that can be used for accident survivors and post-traumatic stress)
- b. Environment and road user interaction: Environment psychology (the interaction between environment and road-user behavior, role of different environmental settings on road users behavior)
- c. Seminar on police enforcement and traffic codes
- d. Social psychology of driving (role of attitudes, values and culture on road-user behavior and cultural differences, conflict management etc.)

- e. Political analyses of transportation
- f. Transit Planning and Management
- g. Traffic Safety and Injury Prevention (planning for traffic safety and injury control, pre-crash, crash, and post-crash models; roles of vehicle, roadway, traffic, driver, and environment; crash and injury causations; vehicle and occupant dynamics; accident investigation; crash and injury control etc.)
- h. Transportation and Traffic Demand Analysis (development and application of transport demand models and analysis, link between preferences, utility and demand, welfare measures of consumer and producer etc.)

3. Elective courses for both branches (technical + social)

- a. Transport Economics
- b. Emergency Aid in Traffic Accidents
- c. Vehicle Technique
- d. Transportation Policy
- e. Traffic Legislation and Enforcement
- f. Traffic Medicine

4. Arrangement of special courses for safety staff

It is essential to arrange special courses for safety staff in the related organisations.

For example, in the General Directorate of Highways (KGM), the following proposal can be followed (similar courses should be prepared for the traffic police):

*New engineers who start work at KGM must attend a course called "Highways Basic Course". At least two weeks of the (total = 60 hrs; 10 days * 6 hours) course program has to be dedicated to traffic safety matters. Besides this, all personel who are working and are going to work in KGM Traffic Division have to take a similar two week course with the below content (this course is optional for the design engineers):*

- a. Traffic Safety Perspective in Highway Engineering (3 hrs)
- b. Black spots (Site, Diagnosis, Treatment, Follow-up) (12 hrs)
- c. Safety Audits (Projects, existing roads - site visits) (12 hrs)
- d. Target-oriented way of working in traffic engineering (3 hrs)
- e. Basic principles of traffic engineering (Speed, flow, capacity, level of service) (12 hrs)
- f. Unsignalized and signalized intersections (6 hrs)
- g. Traffic signs and markings (3 hrs)
- h. Roadside facilities, vehicle inspections (3 hrs)
- i. Effects of speeding, vulnerable road users, others. (6 hrs)

4 Develop a nationwide, comprehensive and reliable traffic safety database

Accident and casualty databases are indispensable tools to allow for objective assessment of the traffic accident problem, identification of priority areas for action and for evaluation of

the effectiveness of different countermeasures. Such databases are also needed to help define target levels and to facilitate a systems approach in defining suitable strategies.

The national database has to include EGM, Jandarma and MoH accident and casualty statistics. That is, the database should, to the extent possible, include all road accidents and casualties in Turkey and permit links between accidents and casualties on the one hand and roads, traffic, vehicles, license holders, enforcement and weather conditions etc. on the other.

One important question is to use suitable definitions of persons killed and injured in road accidents. The definition of a person killed in a traffic accident, according to the Vienna Convention, is a casualty who dies at the place of the accident or within 30 days. In order to use this international definition, it is necessary to develop reliable procedures to follow up the medical progress of the victims up to 30 days after they have arrived at the hospital.

Concerning injuries, the question could be even more difficult to handle. In many countries the terms “slightly injured” and “seriously injured” are used. It is, however, very difficult for the reporting policeman to determine if a victim is slightly or seriously injured. One complicating factor, for example, is that certain injuries can appear some time after the accident (e.g., so-called whiplash injuries). In order to define injuries somewhat more precise, it has been proposed (e.g., by IRTAD) that the term “hospitalised” should be used instead of “seriously injured”. But even this term is not as reliable as the term “fatality”. This question has to be studied and decided.

It is important to develop national procedures for recording and reporting accidents from EGM/Jandarma and MoH to the authorities producing the official accident statistics.

It would be most valuable for accident analysis to have access to reliable information about annual vehicle-kilometers and person-kilometers traveled by different means of transport (also, by foot and bicycle), and to be able to link this information with accidents and casualties.

The database should from now on be developed in connection with corresponding international development, for example, in the European Union.

The injury and accident reporting should be based on linked hospital (MoH) and police (EGM/Jandarma) information.

The information in the database should be made accessible to R&D-organizations and possibly also the general public, for instance, via Internet.

Some ideas about how a comprehensive database could be used, especially by KGM, are given in Ref. 117, 161.

5 Establish a national Center for applied traffic safety research and development (R&D)

5.1 Instruction

The main task of a Turkish Road Transport Research Institute/Center should be to conduct multidisciplinary applied research and development (R&D) concerning the road transport system (including infrastructure, traffic and transport). The Institute should be the National Turkish Institute for such R&D. Another task of the Institute could be to finance some applied R&D concerning the road transport system.

SweRoad thinks it is usually better for a research institute to have a “global” perspective, that is, to work with all transport modes (e.g., road, public, rail, air and maritime) and with all transport policy objectives (e.g., accessibility, safety, transport quality, environment and regional development). Working with all modes, however, is a much more demanding undertaking than working with road transport only. Therefore, to start with, SweRoad suggests the scope of the Institute be confined to road transport.

The combination of conducting and financing R&D is not very common. One example, however, is the German Federal Highway Research Institute, BAST. If R&D are combined with funding activities, it is of great importance that the funding is carried out impartially, in order to avoid any rumours or impressions that projects at the Institute are favoured at the expense of projects in other R&D organizations.

5.2 Scope

The Institute should carry out R&D, and finance R&D, concerning all road transport policy objectives, for example, safety, accessibility, environment, transport quality and regional development.

SweRoads suggests that the scope in principle should cover all policy objectives, but it is of course possible to focus on traffic safety from the beginning and then to widen the scope to other objectives.

5.3 Tasks

The Institute should, among other things, work with the following R&D tasks:

- develop, test and apply methods and models for goal and target analysis and measurement of present conditions/status,
- study and analyze causal relations and relationships between characteristics of road users, roads and vehicles etc., and transport policy objectives (“effects”),
- develop, test, implement and evaluate models to forecast future conditions and effects,
- develop, test, apply and evaluate methods and models for planning, follow-up and evaluation,
- develop, test and improve actions and measures that can be used to improve the function of the road transport system,
- perform special applied investigations and measurements,

- support the proposed Traffic Safety Secretariat with scientific knowledge and evaluations,
- carry out (standard) testing of materials and products for roads and vehicles, etc. (accrediting?),
- develop and operate a road transport library, as well as information retrieval services, etc.,
- organize and take part in national and international conferences, seminars and courses,
- as Turkish experts, serve in national and international working groups, etc.

The R&D work should be performed with high relevance to the Turkish society and good scientific quality and in close cooperation with involved ministries and directorates as well as other users of R&D results.

The Institute should take part in international R&D cooperation concerning the road transport system.

The Institute should also work as a R&D funding agency in the field of road transport, that is, as a Road Transport Research Board. This means, that the Institute should:

- develop, publish and up-date road transport R&D programs,
- examine and grant R&D applications from other R&D institutions, for example, universities,
- evaluate the relevance and scientific quality of performed R&D.

The funding of R&D in other R&D organizations should be carried out with great impartiality.

The Institute should also be responsible for transfer of acquired knowledge to the main users and to relevant educational bodies, for example, universities.

Normally it is considered better to separate R&D from executing, operational duties. Therefore, the Institute should not be responsible for any operational duties, such as developing traffic safety programs and implementation of safety interventions. The Institute could, however, assist in developing, testing and evaluating methods and models for such activities, and its staff could take part in such activities as specialists.

5.4 Staff

The Institute should have a multidisciplinary staff, including, among other disciplines: engineers, architects, natural, behavioral and social scientists, economists, medical doctors (?) as well as computer, software and measurement specialists (see Appendix H-1).

It is estimated that a staff of about 150 persons is required when fully implemented. At least 100 of them should be researchers.

5.5 Other resources

The Institute will need different types of research equipment, mainly:

- in- and outdoor laboratories (test tracks, vehicle test facilities, crash test facilities etc.),

- equipment for measuring characteristics of road users, roads, vehicles and traffic, noise and air pollution in laboratory and field, as well as for standard testing of materials and products,
- driving and other simulators,
- computers,
- models/computer models,
- databases,
- conference facility (also for education and training),
- library.

5.6 Ownership

The Institute should be owned by the Turkish State and be subordinate to the Prime Minister's Office.

5.7 Funding

The Turkish State should provide the main part of the funding. Other parts could be contributions from the private sector and payments for R&D work commissioned to the Institute.

Normally, SweRoad thinks a combination of state grants, contributions and payments is the best type of R&D funding. One idea is that the funding could be composed as follows:

- | | |
|-------------------------------------|------|
| • State grants | 60 % |
| • Contributions from private sector | 20 % |
| • Payments for commissioned R&D | 20 % |

R&D could be commissioned to the Institute by public organizations, that is, state and provincial governments and government agencies, such as KGM and EGM, and by private enterprise.

The reasons for this proposal are:

- *It is reasonable that the Turkish State, which has a major interest in efficient road transport, provides the main part of the funding. This will also secure long-term financial stability.*
- *It is also reasonable that private enterprise related to road transport, for instance, car makers/importers and car insurance companies, should contribute.*
- *By making paid commissioned R&D possible, the research will most probably be more efficient, and the results more useful and applicable.*

5.8 Organization

The Head of the Institute should be a General Director. He should be responsible for the management of the Institute. The Institute should be governed by a Board, composed of members of Parliament and main users of the R&D results. The Board should, among other things, be responsible for the long-term strategic direction of the R&D and the funding

activities. The General Director should conduct the tasks of the Institute under the supervision of the Board.

The internal organization of the Institute should promote multidisciplinary work.

5.9 Research areas and support etc.

(see Appendix H-1).

5.10 Ways to establish such an Institute/Center

There are different ways to establish such an Institute/Center, for example:

1. Start to form a so-called research unit (according to TÜBİTAK's terminology) consisting of 5-10 specialists representing one major university and some associated universities. The unit should be multi-disciplinary in composition. For example, one major technical university could take the main responsibility for the unit and some other universities could supply specialists in economical, social and medical disciplines.

The unit could then apply for research grants to TÜBİTAK. If the grants are approved, the R&D-work can start. After three years the results will be evaluated by TÜBİTAK, and others. If the results are found to be good, the unit could apply for new grants for another three years.

If the results are found to be good also after six years, and the demand for road transport R&D is great, it could be possible to form a R&D-institute within TÜBİTAK, similar to other R&D-institutes under TÜBİTAK.

2. Start to form an independent R&D-institute for road transport, subordinate to the Prime Minister's office and with similar conditions as those of TÜBİTAK. The institute has to be built up in steps, for example, starting by employing a number of safety specialists (e.g., 15-20) and procuring equipment necessary for safety R&D. Then, after some years, and if the institute has turned out to be effective and shown good results, the number of staff and other resources could gradually be increased and eventually reach the scale proposed above. During this development, the scope could be extended to include also other transport policy objectives.

6 Strengthen the organization for traffic safety information and campaigns

6.1 Background

In many countries there are government/public agencies responsible for safety information and campaigns. In addition, there are often voluntary and independent NGOs promoting safety in different ways. The combination of public and voluntary efforts is considered to be effective.

Based on this, the present organization for safety information and campaigns is proposed to be strengthened in two ways:

- include the responsibility for overall safety information and campaigns in the duties of the proposed Traffic Safety Secretariat,
- strengthen the existing voluntary NGOs for safety.

6.2 Traffic Safety Secretariat

(See section 2.3.3 of this Appendix.).

6.3 Voluntary Traffic Safety Association

6.3.1 Background

In many countries there is one major non-governmental organization (NGO) working for improved traffic safety. This, for example, is the case in most EU countries and the Nordic countries (see Appendix H-2). There is also an international “umbrella” organization for these bodies, called “La Prévention Routière Internationale, PRI”.

One important reason for having an independent, voluntary traffic safety organization is that such a body can give advice and also criticize public and other safety organizations without any ties.

In Turkey there are a few voluntary NGOs for traffic safety, for example, the Turkish Traffic Safety Association and the Turkish Foundation of Traffic Accidents. The former organization is the active member of PRI. In the following, some ideas are given on how a major voluntary safety organization could work.

6.3.2 Objectives

In general, the objectives could be to:

- promote traffic safety in general,
- promote awareness of, and interest in, the accident problem and the possibilities to reduce it by different safety interventions,
- rouse public opinion and awareness of everyone’s right to demand safe road traffic in which fatalities and serious injuries are considered unacceptable,
- increase people’s ability to contribute to safe road traffic,
- promote private and public traffic safety interventions.

6.3.3 Methods

There are many methods that could be used:

- develop, produce, disseminate, follow up and evaluate safety educational and information material and safety campaigns,
- work with representatives in national, provincial and local safety committees/groups,
- building of network for voluntary, non-governmental safety bodies and individuals (national, provincial and local levels), and thus “amplify” the voice of each individual demanding safe traffic,

- give consumer information to promote better informed actions when selecting safety equipment,
- give consulting and telephone services on certain safety issues,
- give ideas for improvement of safety actions taken by responsible organizations, for example, road engineering (KGM and local authorities responsible), enforcement (EGM and Jandarma responsible), and curricula and materials for ordinary schools and driving schools (MoNE responsible),
- follow the development in society concerning safety issues,
- evaluate and give comments on safety questions to relevant bodies,
- influence decision-makers,
- form and disseminate opinions on safety topics.

6.3.4 Organization

In many countries, this type of safety body has a very scattered organization. Members could be private enterprise, for example, car makers and importers, car insurance companies and motorists associations, as well as voluntary safety groups. These member groups are often spread over the whole country. Therefore, it is usual to have one national umbrella body with a central Secretariat, and provincial and local groups.

6.3.5 Staff

The central Secretariat could have a staff including the following disciplines:

- traffic and automobile engineering
- perception and cognition
- sociology
- pedagogy
- statistics
- journalism
- publicity

The number of professional staff at a central Secretariat for Turkey could from the start be 10 - 15 and, after some years and if performance is considered to be good, be increased to 20 - 30.

6.3.6 Other resources

The Center will need equipment to produce information and campaign materials, for example:

- computers
- printing equipment
- video equipment

6.3.7 Funding

The funding could be based on membership fees, donations and government grants.

7 Improve traffic safety education in schools

7.1 Background

In many countries research has shown that road accidents is the leading cause of accidental injury amongst children and young people. Killed and injured children lead to the greatest amount of lost years.

The actual traffic safety education in Turkey seems to focus very much on rules and vehicles, less on behavior, risks and foresight.

Basically there are two reasons for improving and implementing traffic safety education in schools:

- Children are both today's and tomorrow's road users.
- Children should learn about proper behavior in traffic to prevent and avoid accidents.

It is a governmental responsibility to establish an obligatory school subject and a curriculum for the subject – and subsequently to facilitate it by all means. Relevant safety education should be facilitated by appropriate and modern methods and educational materials and carried out by trained teachers.

The situation could be improved for the children by addressing the children themselves through education, but also by addressing parents, teachers and future teachers, as well as other relevant adults with responsibility for children. It is necessary that this is stated by high-level decision-makers.

7.2 Objectives

Teachers are trained in working within their own subjects; they do not normally teach subjects in which there is little or no educational material and where they have no background. Traffic safety education is not a part of the teacher education at present.

Therefore, authorities should:

- lay down minimum standards for traffic safety education in schools,
- implement curricula for children of all ages,
- guarantee the connection between curricula and materials within safety education and relevant research,
- coordinate the connection between safety education and other kinds of education,
- develop and implement relevant materials for education,
- be responsible for teachers' education (both in service and prospective teachers),
- be responsible for regular evaluations and regulations within curricula, materials and education,
- establish and facilitate networks between relevant partners.

Some of the above mentioned items should be carried out by the Ministry of National Education (MoNE), others could be handled by the proposed future central Traffic Safety Organization.

7.2.1 Basic conditions

Schools should contribute to the general education of children with this subject. Besides, schools could be seen as mediators of messages carried home by the children and discussed with their parents. Therefore, the schools have a key position also in respect of reaching other people than the children themselves. The schools can also play a role as a central institution in a local area.

It is important that the traffic safety education in schools is seen as a long-term undertaking. Common strategic goals and continuity between the active partners should be key words for the education.

Many bodies and persons with responsibility for children could and should be involved, for example, local authorities, traffic planners, pedagogical staff, police, and parents. All of them have the responsibility for children's safety in general. They should have an obligation to work for children's safety and health also from a traffic safety perspective.

Central authorities should work systematically (based on knowledge) as innovators, producers, coordinators and pedagogical advisors within the field.

7.2.2 Organization

Depending on the organization of the general traffic safety work, it must be decided how the disciplines and expertise within traffic safety education could be anchored to other kinds of safety work and to educational expertise in close relation with research and statistics about traffic and accidents.

Concerning curricula, MoNE should play the main role, both regarding education for children and for teachers. Curricula should be evaluated and revised regularly.

7.2.3 Requirements

A curriculum based on recommendations from SweRoad and adapted to Turkish circumstances and traffic problems should be implemented (see Ref. 133).

A framework is needed to follow up on the requirements of the curriculum.

In order to give weight to the establishment of a competent organization, it is necessary that personal and other resources are allocated to the safety field.

Shortly after the starting point, the new initiatives should be given focus in public media and in proper educational connections (relevant media, magazines, etc.) in order to start discussions in public and focus on the problem of children and traffic safety.

Experiences from many countries indicate that safety education in schools is often given a low priority among teachers and that it is totally depending on:

- the (non-)existence of actual and inspiring educational materials easy for the students and teachers to use,

- the background and motivation of the teachers. This has to be based on legislation (an obligatory subject) and a curriculum (guidelines for the subject), and it has to be followed by courses or other types of education for teachers.

A major criterium for success is a well functioning central - local cooperation. Therefore, the central Traffic Safety Organization should cooperate with local contact persons in a network of “ambassadors” within the field of safety education and children’s safety in traffic. These persons could be local politicians, pedagogical staff, school leaders, the parents’ board, the police, local authorities and others. The cooperation between the central organization and the locally based network is decisive for the commitment and the results of the education and for the follow-up of results.

7.2.4 Commitment from ‘actors’ at all levels

Apart from the responsibility that lies with the ministry and the specialists, it is necessary to raise commitment for children’s traffic safety also in local authorities and among parents. Parents’ committees in the schools could be a good organization to build on and cooperate with, both for strategical and practical matters.

All political, private and non-governmental organizations working with traffic safety should be encouraged to work for children’s safety in traffic, and as a substantial part of this, they should work for traffic safety education in schools. It is necessary that the different ‘actors’ in the field work towards well defined goals and targets and that the role of each ‘actor’ is well defined.

7.3 Methods

To pursue the objectives mentioned above and ensure engagement and continuity within the work for safety education it is necessary to establish a central traffic safety organization (Traffic Safety Secretariat or Directorate) working with traffic safety in general (see section 2 of this Appendix). In this organization the work for children’s safety and education should be an integrated part. It should be based on knowledge about children’s risks and accidents.

7.3.1 The organization

The above mentioned central organization should have the overall responsibility for the pursuit of children’s traffic safety education and it should cooperate with MoNE. The organization should focus on children’s safety as a continuous effort. Therefore, the organisation should work in cooperation with the responsible units for different age-groups in MoNE in a long-term effort.

7.3.2 Research, support etc.

It is fundamental for the quality and the strategic planning of the work that it is based on actual knowledge and research within traffic and pedagogy. It must also be based on updated educational methods and means. Evaluation and updating should be planned as part of the process.

The central Traffic Safety Organization must therefore have a close relation to the proposed national Center for applied traffic safety research and development (see section 5 of this Appendix) and to the existing national bodies for educational research.

7.3.3. Obligations

Experiences from European countries show that it is necessary that the subject is stated by law in the School Act. This could be either as a proper subject or as part of social and health studies. There are varying experiences with the two models, so it is not possible to point out one before the other. Traffic safety education can also be given as an integrated part of existing subjects (e.g., mother tongue). This seems to be a good idea at the youngest stages. The conclusion is that it is good to connect the contents of safety education with other subjects or activities – but at the same time make sure that it does not “disappear”.

MoNE should work for traffic safety education as an obligatory subject in all classes in school.

A valid curriculum must be implemented for the subject. The curriculum should give guidelines for the contents of the subject as well as guidelines for the pedagogical approach. A minimum standard for the subject should be stated.

A Traffic Safety Organization must be established for the implementation, pursuit and follow-up of the subject (as described above). Within this organization the continuous work for the improvement of traffic safety education should be established – with reference to MoNE.

The work of this central safety organization should be carried out in two phases. In the establishing phase the unit must work on central matters, producing materials and planning how to train teachers. In a later phase, further external contacts could be taken up and worked on.

Phase I:

The Traffic Safety Organization should – in cooperation with MoNE – be responsible for:

- taking all relevant strategic initiatives to promote a traffic safety education based on relevant research for the different age-groups,
- production of age relevant and updated educational materials and activities for all age-groups. It must be taken into account that the materials should be available for children and schools,
- training of teachers and other pedagogical staff (in service and prospective teachers),
- involvement of parents in any educational program for children,
- development and adjustment of new methods in safety education through initiation and evaluation of pilot projects,
- quality testing and evaluation of educational materials and activities.

Phase II:

Later, when the basic strategic work is established and functioning – maybe after 3-4 years – the organization should also consider:

- networking. registration of already existing networks that can be intensified – or new could be established. It is very important to find and build on local partners in schools and local areas. Groups of responsible contact persons should be identified and contacted,
- lobbying on a regular basis towards, for example, politicians, politically interesting and interested groups and associations or potential sponsors (sport clubs, insurance companies, driving schools etc.,
- coordination and cooperation with relevant partners in relation to schools that could contribute to relevant safety education. This could be teachers' organizations, parents' organizations, police staff, health care centers, driving schools, rescue staff, traffic victims and relatives of traffic victims, as well as local NGOs or authorities.

7.3.3 Staff

The specialists working within the field should have:

- Good abilities regarding coordination: Ability to work across different sectors and facilitate establishment of networks with relevant partners both centrally and locally.
- Knowledge about traffic and traffic safety matters – or they should quickly be offered basic training within the field.
- Knowledge and experience about the educational system and its practice. They should be able to transfer research results into adequate and relevant methods and materials for traffic safety education.
- Knowledge about communication and pedagogy in theory and in practice.

The specialists should be given resources to develop the area. They should be committed to the subject, and the organization should be given competence, “authority” and “position” to pursue the goals in different ways.

7.3.5 Funding and resources

Ideally, the Traffic Safety Organization working strategically for traffic safety education should be funded fully by public finances to ensure continuity and professionalism in the work.

If found necessary, additional funding could be supplied with private financing. This could be in form of sponsorships or contributions. The sponsors could be different kinds of companies who want their image to be related with safety and/or will gain from the effect of the safety work. They should be allowed to be exposed in connection with the sponsorship, but they should never influence the contents of the work being carried out. First of all insurance companies should feel obliged to support the work, but also others who earn money on children and young people. Sponsorships could be considered both as long-term projects and as support limited to one type of material or one action. Even local sponsorships should be considered.

Funding could also come from private organizations, NGOs with idealistic purposes and interest groups, etc. Funds could also be raised on special occasions (one day, one week or one action or initiative with focus on traffic safety, etc.).

Private persons working freely in their local area (NGOs/grassroots) represent a big resource that could be built on in combination with public funding. They should be given basic information or training depending on what they are asked to do, and they should refer to the traffic safety organisation which should keep them updated and motivated.

Appendix H-1

Outline of a Turkish Road Transport Research Institute/Center

1 Research areas

Subject	<u>Disciplines</u>	<u>Staff (no)</u>
Transport policy analysis. Transport economy. Transport analysis and modelling (incl. all modes, as well as transport supply and demand, forecasts, appraisal methods and values, transport costs, accident costs, vehicle operating costs etc.).	Transport economy Geography (cultural) Statistics Applied mathematics	4 2 3 2
Land-use and transport planning (incl. public transport). (safety aspects and <i>other aspects, such as accessibility and transport costs, etc.</i>)	Architecture (town planning) Civil/Road engineering Traffic engineering Geography (cultural) Statistics	2 1 2 1 0.5
Safety concepts and policy. Accident statistics and analysis. Methods and basic material for safety strategies and plans.	Statistics	6.5
Road planning (incl. rural and urban, methods for long-term investment and maintenance planning). Road design (incl. rural and urban, basic information for design guidelines, safety audits etc.) (safety aspects and <i>other aspects, such as capacity, speeds, delays, vehicle operating costs, environmental aspects etc.</i>)	Road engineering Traffic engineering Human factors Statistics Technician	2 2 1 0.5 1
Road equipment (incl. basic information for guidelines on guardrails, markings, delineators, signs, signals, lighting, columns and poles etc.) (safety aspects and <i>other aspects, such as speeds etc.</i>)	Road engineering Traffic engineering Human factors Mechanical engineering Statistics Technician	1 2 1.5 0.5 0.5 1
Road maintenance and operation (incl. basic information for guidelines on maintenance and operation) (safety aspects and <i>other aspects, such as accessibility, speeds, vehicle operating costs, environmental aspects etc.</i>)	Road engineering Traffic engineering Human factors Statistics Technician	3 2 0.5 0.5 1
Vehicle design, equipment and inspection (incl. basic information for guidelines and regulations on active and passive safety, vehicle pavement interaction, stability, brakes, tires, friction, etc.) (safety aspects and <i>other aspects, such as comfort, performance, fuel consumption etc.</i>)	Mechanical (automotive engineering) Human factors Statistics Technicians	3.5 1 0.5 2

<p>Crash safety (incl. basic information for guidelines and regulations on human tolerances, vehicles and road equipment etc.)</p>	<p>Mechanical engineering Traffic medicine (physiology etc.) Technicians</p>	<p>3 1 2</p>
<p>Road users (incl. basic information for education, legislation, information and campaigns etc.)</p> <ul style="list-style-type: none"> <input type="checkbox"/> perception <input type="checkbox"/> cognition <input type="checkbox"/> attitudes <input type="checkbox"/> behavior <input type="checkbox"/> safety education in schools and driver education <input type="checkbox"/> safety information and campaigns <input type="checkbox"/> alcohol, drugs and drowsiness <input type="checkbox"/> children and youths <input type="checkbox"/> young drivers <input type="checkbox"/> elderly <input type="checkbox"/> disabled <input type="checkbox"/> surveys and questionnaires <p>(mainly safety aspects, but also <i>other aspects, such as mobility and comfort etc.</i>)</p>	<p>Human factors Sociology Pedagogy Statistics Technicians</p>	<p>10 2 2 1 2</p>
<p>Man – road - vehicle interaction. Intelligent Transport Systems (ITS). Human- machine interface. (mainly safety aspects, but also <i>other aspects, such as accessibility, congestion, travel time/speed, transport costs etc.</i>)</p>	<p>Traffic engineering Mechanical (automotive) engineering Electrical engineering Human factors Statistics Technician</p>	<p>2 1 1 2 0.5 1</p>
<p>Environmental impact (incl. basic information for guidelines on energy consumption, air pollution, traffic noise, impact on natural surroundings and human development, environmental impact assessment, waste management, sustainable development etc.)</p>	<p>Chemistry/Chemical engineering Physics/Physical engineering Biology/Zoology/Ecology Geology/Hydrogeology Landscape architecture Statistics Technician</p>	<p>2 2 3 1 1 0.5 1</p>
<p>Special research areas:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Surveillance and enforcement <input type="checkbox"/> Emergency rescue and medical care etc. <input type="checkbox"/> Other areas <p>(mainly safety aspects, but also <i>other aspects, such as accessibility, congestion, travel time/speed, transport costs etc.</i>)</p>	<p>Traffic police expertise Sociology Legal expertise Emergency expertise Medical expertise Human factors Statistics Technicians etc. Total ca</p>	<p>10</p>

<i>Road construction (earthworks, structural design, bearing capacity, asphalt and concrete, mineral aggregates, pavement design, PMS, etc.)</i>	<i>Not included (at present at KGM)</i>	
<i>Bridge and structural design, construction and Maintenance (foundations, concrete and steel structures, bridges, tunnels, retaining walls, rock blasting, slope stability etc.)</i>	<i>Not included (at present at KGM and universities)</i>	
<i>Road maintenance and operation (methods and materials etc.)</i>	<i>Not included (at present at KGM)</i>	
	Total ca	102

2 Research support

Subject	<u>Disciplines</u>	<u>Staff (no)</u>
Research coordination (incl. international)	Research administration	3
Monitoring, follow-up and evaluation – general	Planning expertise Statistics	2 1
Measurement equipment and laboratory Pool of research technicians	Measurement expertise (many kinds of variables, human, road, vehicle and traffic etc.) Electrical engineering Mechanical engineering Technicians Total ca	10
Pool of administrative secretaries for R&D units	Business administration	10
	Total ca	26

3 Administrative unit(s)

Subject	<u>Disciplines</u>	<u>Staff (no)</u>
General Director and Secretary		2
Economy (incl. budgeting, accounting, control etc.)	Economy expertise	3
Personnel	Personnel expertise	3
Information (incl. scientific) and marketing (PR)	Information and Marketing expertise	2
IT (computers and software etc.)	IT, computer and software specialty	3

Library and database searches etc.	Library specialty	3
Education and training (incl. courses and seminars etc.)	Pedagogy	2
Premises (incl. stationary and establishment, etc.)		4
	Total ca	22
	TOTAL ca	150

Appendix H-2**Examples of two non-governmental, national traffic safety organizations and one international safety “umbrella” organization****1 The Swedish National Society for Road Safety****1.1 Organization**

The National Society for Road Safety (NTF) is a non-governmental organization, which works to improve traffic safety.

NTF is a national umbrella organization and consists of 24 county (provincial) traffic safety federations, 2 city associations, about 70 national organizations, and hundreds of local voluntary associations. The national network is made up of thousands of people working to contribute to safe road traffic.

NTF was started in 1934 in order to promote “improved traffic culture and traffic safety”. In 1935, the first safety information was broadcasted in the Swedish national radio.

The highest decision body of NTF is the Congress. The provincial federations and the member organizations elect the members. NTF has one national Board and one Board in each province. One central Secretariat and 23 regional Secretariats administrate the activities of NTF. The central Secretariat has about 20 persons employed.

1.2 Objectives

- NTF rouses public opinion of everyone’s right to safe road traffic in which fatalities and serious injuries are considered unacceptable.
- NTF increases both people’s will to call for, and their ability to contribute to, safe road traffic.
- NTF promotes awareness of the importance of traffic safety to public health.

1.3 Four activity areas

- Network
- Formation of opinions
- Consumer information and guidance
- Safe transports

1.3.1 Network

NTF is represented in hundreds of organizations nationwide. NTF’s task as an umbrella organization is to inspire, initiate, co-ordinate and give support to safety activities and to offer safety education. NTF will strengthen the voice of each individual for a safe traffic environment.

1.3.2 Formation of opinions

NTF is actively pursuing safety questions and supports local groups working for safer traffic environment. NTF influences decision-makers to give priority to safety. Important decision-makers are politicians, civil servants, authorities, transport sellers and buyers, as well as car manufacturers.

In order to start discussions about unsatisfactory state of things and to require improvements, NTF observes closely different phenomena related to safety in society.

1.3.3 Consumer information and guidance

NTF wants to stimulate all road users to be active consumers, making deliberate choices to improve safety. NTF also works for consumers to require safe products, services and traffic environment, and helps consumers to use the right product in the right way through dissemination of knowledge.

NTF answers questions about: safe cars, safety helmets for cyclists, safe cycles, children in cars, air bags, tires, retro-reflective devices, and safe traffic environment etc.

1.3.4 Safe transports

A substantial part of all travelling takes place in organized forms, for example, public transport, school busses, transportation service for old and disabled persons, taxi cabs etc. NTF works for and supports local authorities, provincial councils, private enterprise, other groups and private individuals to require and procure safe such transports.

2 The Danish Road Safety Council

2.1 Organization

The Danish Road Safety Council (RfSF) is a private association of authorities and national organizations in Denmark. The number of member organizations is currently 38. The Council has existed since 1935.

The Council works to improve traffic safety by way of information, consulting, information campaigns, and production of instruction materials. The aim is for the population to gain knowledge and understanding of the safety aspects and to act in a safe manner.

The top authority of the Council is the Executive committee. The daily work is handled by a Secretariat, currently consisting of a staff of about 30.

The Council has one representative in each of the 54 police districts of the country. The representatives coordinate and communicate the activities of the Council locally.

The Council cooperates widely with local safety committees in provinces, municipalities, and police districts on annual joint campaigns and local efforts. There are around 60 local committees.

The Council is a member of the international traffic safety organization, La Prévention Routière Internationale (PRI).

2.2 Objectives

- To promote safety by dissemination of knowledge and comprehension of the risks and problems road users face in transport and to give the road users knowledge of traffic rules and safety equipment
- To promote implementation of safety actions.
- To carry out its activities by production and dissemination of educational material and information campaigns.

2.1.1 Strategy

The Council works according to the overall objectives set by the Danish government and the Traffic Safety Commission in Denmark. The heading of the government strategy reads: "Each and every accident is one accident too many – Traffic Safety begins with you".

The Safety Commission Action Plan covers the period of 2001-2012. The aim is to reduce the number of fatal and severe casualties by at least 40 percent. The four main contribution areas are: Accidents at too high speed, Drunken driving accidents, Accidents in crossings, and Accidents with cyclists.

In the autumn of 1999, an overall strategy was designed for the activities of the Council:

- The Council shall through its attitude-effecting and debate-creating work be visible to the public.
- The Council shall thus promote the society, including the central government, counties, and municipalities, to use, as far as possible, the resources for prevention of road accidents.
- Based on the fact that each and every accident is one too many, the Council shall by way of informative activities make every road user aware that they are responsible for the lives of other people as well as for their own lives.

2.1.2 Activities

The Council aims to inform and advise on traffic safety from the moment of birth to the time of old age. Offers are adapted to the problem complexes relevant to the particular age-group. In addition to the active information and consulting, the Council has a daily telephone service to the citizens on safety issues.

Through visiting nurses, the Council has contact with parents and informs by way of free leaflets particularly about how to transport your child in your car and on your bicycle in the safest possible way.

All children will, when reaching the age of three, receive an offer of membership of the Children's traffic club in Denmark. This club has existed for 30 years and is an offer to parents and their children of help for traffic training. Around 40 percent register for membership. The children will subsequently receive a traffic pack with a training booklet and toys every six months until they reach the age of 6½ years.

When the child reaches the age of admission to school, it will become acquainted with safety in the schools. In Denmark, safety is a compulsory subject but the number of hours to be used for this subject has not been specified. It will thus have to be taught at various times throughout the age of admission to school, and it will be the teachers who will identify how and when the teaching is to be done. This may be in disciplinary or interdisciplinary courses. The Council will prepare and sell instruction materials to the pupils in all school forms, and the materials will be regularly renewed and updated.

At most Danish schools, one of the teachers has been appointed safety contact teacher. He or she is the Council contact person at the school, will communicate news on safety teaching to his/her colleagues, as well as coordinate and handle the cooperation with the police, the municipality, and the province on issues concerning school and traffic safety.

The Council further issues material for training of school patrol children who will help the younger pupils move in the road traffic around the schools. There are around 18,000 school patrol children in Denmark. This scheme celebrated its 50-year anniversary in 1999.

A traffic informer, normally a young person who is handicapped because of a traffic accident, may visit the upper forms. The traffic informer will use his/her own accident as a starting point for the meeting with the pupils. There are almost 40 traffic informers in Denmark.

The Council is also responsible for the moped teaching offered to the young through the continuation schools.

2.1.3 Campaigns

The Council will prepare and run campaigns and various information activities, including, for example, information on new laws.

A five-year speed strategy has been designed to cut speeds, mainly in urban areas. Two campaigns have been run, one accounting for the great increase in risk even at slight overspeeding, and the other on the effect on the body in the event of being hit at 30, 40, and 50 km/h.

Further, drunken driving campaigns are run to reduce the number of drunken drivers, seat belt campaigns to increase the use of seat belts, and campaigns aiming to reduce accidents in crossings.

In recent years, activities have also been focussed on companies. The "Safety through conversation" campaign aims to make truck drivers talk to each other about safety problems. Another campaign is about making companies draw up safety plans.

3 La Prévention Routière Internationale

3.1 Organization

The International Road Safety Organization (PRI) is a non-governmental organization, founded in 1959 to promote co-operation amongst national institutions dealing with traffic

safety. Some fifty countries are represented within PRI from Africa, America, Asia, Europe and the Middle East. Turkey is also a member (the Turkish Traffic Safety Association).

The seat of the association is in the Grand Duchy of Luxembourg.

PRI has Consultative Status at the United Nations Organization, The Council of Europe and the European Conference of Ministers of Transport. It works in official relations with the World Health Organization.

PRI works in close relationship with international bodies concerned with the improvement of safety.

Three specific methods are devoted to the improvement of safety: education, information and research. To this end, PRI assures:

- a horizontal exchange of ideas, experience and documentation among its member associations;
- a vertical exchange of studies, research results, evaluation work, proposals for measures, among its various categories of members.

To this effect, it organizes international conferences on specific road safety themes.

3.2 Objectives and Tasks

The aims of PRI are:

- to promote traffic safety at an international level.
- to encourage efficient action to improve road accident prevention.

To this end, the tasks of PRI are in particular the following:

- advise and assist national bodies;
- promote the co-operation of national and international bodies, of all individuals, research centers and firms interested directly or indirectly in the promotion and improvement of road traffic and safety;
- create throughout the world an awareness of the consequences of traffic accidents;
- support as much as possible research into all matters relating to safety;
- collect and disseminate relevant documentation and publications in order to promote best practices in terms of research, safety policies and implementation;
- organize and promote joint safety actions, congresses, seminars, round table conferences, exhibitions, competitions and international events aimed at increasing fitness for the road and at developing interest in safety problems among all age categories and among all road user categories;
- promote the training of specialists and the exchange of experience in the field of traffic safety.

3.3 Activities

Amongst the many activities of PRI, the world congresses on traffic safety (Vienna 1984, Luxembourg 1986, Montreal 1988, Tokyo 1990, Istanbul 1992, Cape Town 1994, Budapest 1996, Lisbon 1998, Tunis 1999) can be cited as well as the symposia on audiovisual media and safety, the workshops on topical safety questions such as "Say YES to Safer Driving", the round table conferences involving governmental and non-governmental organizations etc. These events incite PRI to carry out studies and give its views on specific questions in the field of road accident prevention. PRI is an international forum of road traffic and safety specialists.

To carry out its activities, PRI has close relations with those governmental and non-governmental institutions dealing with traffic safety in the fields of information, research and education. These are in particular the United Nations Organization, the Organization for Economic Cooperation and Development, the European Conference of Ministers of Transport, the Council of Europe, the European Road Safety Federation etc.

In order to increase the effectiveness of its actions and the implementation of its programs, PRI has institutionalized close cooperation with university centers and research institutions, which deal with road traffic and its safety.

Appendix I**Other safety interventions****“Technical” actions****Safer road infrastructure - urban roads and streets**

- Increase the use of working groups with members from different organizational units and experts from different disciplines in the local safety work.

Safer vehicles

- Study if the present sharing of responsibilities between at least four Ministries concerning vehicle safety and environmental matters is suitable. Implement changes needed.
- Study the differences between the registers for vehicle population at the State Institute of Statistics and the Vehicle Register at EGM. Implement actions needed.
- Study if there are many crashes and injuries resulting from misunderstanding and misuse of anti-lock brake systems. Inform if necessary.
- Finalize the ongoing International Technical Legislation Adaptation works.
- Study the suitability of implementing the EU Directive making antilock systems compulsory on all new buses, coaches and large goods vehicles. Introduce if suitable.
- Study the suitability of introducing compulsory seat belts in new buses, coaches and minibuses and three-point belts and stronger cabs in heavy goods vehicles. Introduce if suitable.
- Study the suitability if making the use of winter tires compulsory in some provinces. Introduce if suitable.

Safer road users - driver training and licensing

- Help older drivers to drive safely for as long as they are fit to do so, rather than taking measures to prevent them from driving at all.
- Introduce a voluntary logbook for learner car drivers covering all necessary conditions, for example, driving in darkness.
- Study the suitability of implementing a graduated licencing system. Develop, test and evaluate such a system. Implement if suitable.
- Implement processes to improve road infrastructure to safely accommodate older drivers, e.g., at junctions.
- Develop and implement more effective strategies for driver license suspension/revocation.
- Enhance the competence of drivers with suspended/revoked licenses through an improved renewal system.
- Study the suitability of introducing novice driver plates. Implement if suitable.

Safer road users - vulnerable road users

- Develop special training programs for learner motorcycle riders, as well as continued training for experienced riders.
- Introduce compulsory basic training program for learner moped riders.

- Introduce European whole type approval for new motorcycles, which harmonises construction requirements and standards throughout the EU, and requires independent approval and verification through government agencies.
- Improve road design, maintenance and operation that consider the special needs of motorcycle operating requirements and dynamics, e.g., concerning gravel on the road surface.
- Encourage provinces and local authorities to become active in public outreach and training on pedestrian and cyclist safety.

Better surveillance and enforcement

- Introduce penalties that better fit the offence. Serious offences merit strong penalties (from careless to dangerous driving). In general, penalties should be increased and made dependable of the offender's economic situation.

Reduced regional problems

- Inform car drivers about the dangers of driving on roads where there are many agricultural tractors.
- Inform drivers of tractors etc. about the dangers of not using proper lighting and retro-reflective devices.