
Changes in Traffic Safety Policies and Regulations in Turkey (1950–2010)

1. Introduction

In this report Turkey's policies on traffic safety and the general aspects are examined. First, we provide an overview of the main aspects of the problem of traffic accidents in Turkey. We began with a brief summary of the traffic regulations and transportation policies prior to year 1950. This information will help to clarify the background of the policies after 1950. We consider the issue of traffic accidents after 1950 to be a direct consequence of transportation policies, economic development, educational level, etc., as well as a consequence of various new laws and regulations on traffic. We then provide an overview of all the traffic laws that were in effect from the beginning of the republic period (1923) to the year 2010, highlighting their basic principles and newly adopted ideas. Next we provided important background information related to these laws and regulations, their objectives and goals, and the period in which these laws and policies were in effect. Finally, we explain the development of institutions on traffic safety and road transportation, and clarify their respective aims.

2. Overview of Traffic Accidents in Turkey

Road traffic accidents are a worldwide problem resulting in more than 1.2 million fatalities and between 20 and 50 million injuries every year [1]. Road traffic accidents are currently the ninth leading cause of death around the world. The World Health Organization (WHO) predicts that this figure will rise to become the fifth leading cause of death by the year 2030 (see Figure 1).

TOTAL 2004			TOTAL 2030		
RANK	LEADING CAUSE	%	RANK	LEADING CAUSE	%
1	Ischaemic heart disease	12.2	1	Ischaemic heart disease	12.2
2	Cerebrovascular disease	9.7	2	Cerebrovascular disease	9.7
3	Lower respiratory infections	7.0	3	Chronic obstructive pulmonary disease	7.0
4	Chronic obstructive pulmonary disease	5.1	4	Lower respiratory infections	5.1
5	Diarrhoeal diseases	3.6	5	Road traffic injuries	3.6
6	HIV/AIDS	3.5	6	Trachea, bronchus, lung cancers	3.5
7	Tuberculosis	2.5	7	Diabetes mellitus	2.5
8	Trachea, bronchus, lung cancers	2.3	8	Hypertensive heart disease	2.3
9	Road traffic injuries	2.2	9	Stomach cancer	2.2
10	Prematurity and low birth weight	2.0	10	HIV/AIDS	2.0
11	Neonatal infections and other	1.9	11	Nephritis and nephrosis	1.9
12	Diabetes mellitus	1.9	12	Self-inflicted injuries	1.9
13	Malaria	1.7	13	Liver cancer	1.7
14	Hypertensive heart disease	1.7	14	Colon and rectum cancers	1.7
15	Birth asphyxia and birth trauma	1.5	15	Oesophagus cancer	1.5
16	Self-inflicted injuries	1.4	16	Violence	1.4
17	Stomach cancer	1.4	17	Alzheimer and other dementias	1.4
18	Cirrhosis of the liver	1.3	18	Cirrhosis of the liver	1.3
19	Nephritis and nephrosis	1.3	19	Breast cancer	1.3
20	Colon and rectum cancers	1.1	20	Tuberculosis	1.1

Figure 1 Leading cause of death, 2004 and 2030 compared [1]

The situation is even more severe for the developing countries. Over 90% of the world's traffic fatalities occur in low-income and middle-income countries, despite the fact that these countries have only 48% of the world's vehicles. Low-income and middle-income countries have higher road traffic fatality rates (21.5 and 19.5 deaths for every 100,000 people, respectively) than high-income countries (10.3 deaths per 100,000) [1]. Table 1 presents the accident data from various countries.

Table 1 Comparison of 2009 Traffic Accident Data from Various Countries [2] [3]

Country	Number of Fatal and Injury Accidents	Number of Fatalities	Number of Vehicles (x1,000)	Population (x1,000)	Vehicles per 1,000 population	Fatalities per 100,000 Vehicles	Fatalities per 100,000 People	Fatalities per billion veh-km
Austria	39,468	633	5,972	8,373	713	10.6	7.6	9.0
Canada	151,321	2,130	21,300	34,076	625	10.0	6.3	6.3
C. Republic	16,415	901	8,500	10,512	809	10.6	8.6	19.4
Finland	7,052	279	3,100	5,358	579	9.0	5.2	5.2
France	58,215	4,273	31,951	65,447	488	13.4	6.5	7.8
Germany	320,314	4,152	39,170	81,758	479	10.6	5.1	6.0
Japan	886,864	5,772	90,188	127,380	708	6.4	4.5	7.7
Netherlands	25,308	644	9,200	16,605	554	7.0	3.9	5.6
New Zealand	7,425	384	3,200	4,365	733	12.0	8.8	9.6
Norway	6,733	212	3,029	4,877	621	7.0	4.3	5.4
Poland	46,876	4,572	20,782	38,164	545	22.0	12.0	9.1
Portugal	35,680	840	5,600	10,637	526	15.0	7.9	
Slovenia	11,731	171	1,315	2,057	639	13.0	8.3	9.6
South Korea	209,524	5,838	20,850	49,773	419	28.0	11.7	20.0
Spain	99,797	2,714	30,156	45,989	656	9.0	5.9	
Sweden	16,344	358	5,114	9,349	547	7.0	3.8	4.4
Switzerland	27,088	349	4,986	7,783	641	7.0	4.5	5.7
Turkey	110,906	4,324	14,317	72,561	197	30.0	5.9	43.4*
UK	258,404	2,337	35,409	62,042	571	6.6	3.8	4.6

*Due to the limited resources in travelling data, the figures include only accidents that occurred on freeways, state roads, and province roads.

Turkey, with 5.9 fatalities per every 100,000 people, may at first glance look like one of the safest countries. Yet because Turkey has the lowest vehicle ownership among the given countries, this statistic is misleading. A more meaningful formulation of the data would show that Turkey has a ratio of 30 fatalities per every 100,000 vehicles—which is the highest of all the countries cited above. For the better comparison, we might instead use the exposure data, i.e. the total vehicle-kilometers. When formulated this way, Turkey—with 43.4 fatalities per every billion vehicle kilometers—has by far the highest death ratio.

Moreover, it becomes clear that the situation in Turkey is even worse when traffic data only includes the fatalities that occurred within the day of accident. (Data in most of the other countries include the fatalities that occurred within 30 succeeding days of the accident.)

Accordingly, WHO estimates that these unreported fatalities are added, the number of fatalities in Turkey in 2009 rises from 4,324 to 6,022 [1].

3. Transportation Policies at the Beginning (1923-1950)

Since the founding of the Republic of Turkey, investments in transportation infrastructure have served as the backbone of the country's development policy. In the beginning, there were only 13,900km stabilized road and only 4,000 km of the total road network were in good condition. During the first 30 years of the new state, railroad constructions constituted the biggest government investments, and nearly no motorways were constructed. The natural difficulties in transportation that arose from the geography of the land had a huge role in shaping the social and economic structure of Turkey. The land's mountainous formation and lack of rivers suitable for travel made the transportation very costly and prevented the integration of social and economic life in Anatolia. In the 1920s, the prioritization of railroads was a response to the necessity of an integrated national market and to an increase in the export capacity of the country [4]. Railroad constructions began in 1924, and led to 3,360 km of new network in 20 years. Considering the simple construction technology and scarce resources of that time, construction of railroads was very fast.

Construction of motorways was very slow until the Second World War. Between 1923 and 1929, the length of the road network increased only from 13,900 km to 14,400 km. Yet the majority of these roads were not in good condition—in fact, by today's standards they would not even be regarded as “roads.” Between 1923 and 1933, Turkey constructed 2,600 km of new stabilized road, and repaired 6,170 km of road. Between 1939 and 1945, the war economy brought transportation investments to a halt. In 1947, there was 825 km of asphalt road and 43,743 km of stabilized road [4]. Road infrastructure was not suitable for transportation at all.

4. Traffic Regulations (1923-1950)

The 564th and 565th clauses of Turkish Penal Code (Act No: 765), which came into effect on March 13, 1926, authorized the city police to control drivers who endanger the safety of life and property. These clauses were very effective in preventing traffic accidents. The clause the 565th in particular states that any person endangers another person or property on the street or in any open public space while driving automobile or riding an animal is subject to a jail term of 20 days and a nominal fine. Moreover, if this person is a professional driver or a coachman, he is subject to a one-month suspension of his driver's license. These statements were in effect the first traffic regulations in Turkey. At that time, there were only 1,000 automobiles in all of Turkey, 800 of which were in Istanbul [4].

Municipality Law (Act no: 1580), that came into effect on April 14, 1930, authorized the municipalities to control the maximum cargo limits of vehicles and to determine the classes and numbers of automobiles, trucks, buses and horse cars that travelled on the roads between municipal areas and villages. Moreover, the district municipalities began at this time to monitor driving skills and the health of the drivers. The same clause states that, for borders between towns, the municipalities are

responsible for determining the maximum and minimum speed limits and cruising price lists of carriage vehicles. The law also put municipalities in charge of maintaining traffic order. A traffic guideline was prepared and put into effect in order to accomplish these tasks. The guideline mainly concerns vehicle registrations and the administering of driver's license by conducting traffic tests and controlling the traffic order in big cities. However, by making the municipalities responsible for traffic services, the law resulted in different applications of rules in every municipality. In addition, other consequences of the law included difficulties in vehicle inspections, corruption in driver tests, and difficulties in traffic checks on the intercity roads and rural roads.

In 1934, the law passed regarding police duties gave the police officers the authorization to control drunk driving and other traffic offences that endanger the public safety.

As technology developed, the number of motor vehicles increased rapidly and traffic accidents became a big problem. For this reason, lawmakers and developers began to reconsider the road traffic law that was passed in 1930. As a result, General Directorate of Safety, the Ministry of Internal Affairs, and Ankara, Istanbul, Izmir Municipalities together prepared a new law draft. In 1938, this bill was submitted to the Grand National Assembly of Turkey (TBMM), but it did not pass.

During the Second World War, economic shortage had a negative effect on vehicle supply. After the war, the social and economic developments increased the demand on transportation services. In addition to this, technological advances made high-speed vehicles a real possibility, and countries all around the world began to construct new road systems. Within this global context, the road transportation in Turkey also developed rapidly. Due to all these developments, the number of traffic accidents, fatalities and injuries rapidly increased.

5. Transportation Policies and Traffic Regulations (1950-1980)

5.1 Transportation Policies

In the 1950s, particularly after the start of the U.S. Marshall Plan, construction of strategical roads became very important. Within the framework of Marshall aid, national government abandoned railroad transportation policies and ceased investments in railroads. The construction of motorways took up nearly 95% of all state investments on transportation [6]. Automotive firms that grew tremendously during the Second World War (e.g., American Ford, General Motors and petroleum companies) strongly asserted that they were on the side of road transportation all around the world. Until 1950, Turkey's transportation infrastructure was largely based on rail transport. During the preliminary arrangements to Marshall Aid, the Vice Director of Federal Bureau of Public Roads, Mr. Hilts visited Turkey and prepared a report in 1947 suggesting improvements to the highway system. His suggestions were accepted by Turkish Ministry of Transportation in February 1948. Mr. Hilts' suggestion appears to have been based on the premise of the necessity to distribute the increased

agricultural production nationwide. As a matter of fact, the highway systems of Turkey developed using machinery, asphalt and technical assistance all provided by the U.S. Many Turkish civil engineers were sent to the U.S. for education. On March 1, 1950, Turkey established The General Directorate of Highways (KGM), a bureaucratic division not connected to Ministry of Transportation. KGM began to implement the construction of roads, and the Turkish Government increasingly put more effort into road constructions in the 1950s. Between 1952 and 1962, KGM's budget reached to 10% of the total state budget [4].

The period between 1950 and 1970 witnessed the rapid development of the road network system. In 1950, the total length of repaired and heavy-machinery-constructed roads was 8,024 km; this number increased to 33,000km in 1960. Moreover, the length of roads suitable for transport in any season was 9,624 km in 1950, and 22,000km in 1960 [7]. Between 1960 and 1970, the main policy for road construction was to build roads of low physical and geometrical proportions that were suitable for transport in both summer and winter. The paving of the roads became increasingly important during this period. By the end of 1970, the government initiated the construction of expressways. They had built superstructures for 48,125 km of the total 59,469 km of state and city roads, and asphalted 19,000 km of these roads. In the 1970s, they focused on improving the physical standards of roads, paving with asphalt 32% of the total road network. Road construction investments had the biggest portion of state's transportation budgets at that time. After 1980, despite a decrease in road investments in terms of the total state budget, freight and passenger transport on the roads did not slow down. In the 1980s, Turkey had 62,500 km of long road network, 34,000 km of which were paved with asphalt [7].

After 1960, Turkey's economic progress was promoted with development plans. The State Planning Organization played a major role during this period. Turkey announced that they would enact a series of four five-year development plans between 1960 and 1980. These plans included major development paths for critical economic sectors such as transportation, energy, housing, and finance. At the beginning of the planned period (1963), the portion of passenger transport by roads was 73%, railroads had 24%, maritime transportation had nearly 3%, and air transport had 1%. The portion of railroads in freight transport (43%) was nearly the same as road transportation (40%).

In the first five-year development plan, Turkey determined that the geometric standards of the roads were above the national need, but in the second plan, however, they stated that the standards were not sufficient. For that reason, Turkey began to generate new budgets for improving the geometrical standards as well as the physical standards of the roads.

During the first three plans (1963-1978), the growth of transportation sector was bigger than other sectors, and the portion of this sector in the gross national product increased from 7% in 1960 to 8.6% in 1978. Each plans' emphasis on the construction and repair of roads was not the result of a general concern for traffic safety. In fact, in the first three plans traffic safety precautions were insufficient in several regards. It was not until the second five-year plan (1968) that an emphasis on traffic accident was made, and this emphasis remained in place through the third plan (1973) [5]. Yet these plans stressed only the improvement of road standards. There were no budget plans for improving the traffic

signal system, for increasing awareness on traffic accidents, or for traffic education. In the fourth plan, they stressed the need to improve alternative transportation systems. However, the reason behind this emphasis was not the traffic safety considerations but rather the oil shortages and the recession of automotive sector of that time.

5.2 Traffic Safety Policies and Regulations

The General Directorate of Highways (KGM) was established on March 1, 1950 (Act no: 5539). The main duties of the KGM were improving the infrastructure of road network system and constructing new roads. These projects began to gather pace with the establishment of the KGM. The construction of new roads led to a more frequent use of motorways. As a result, the number of traffic accidents and the number of people killed and injured in traffic accidents rapidly increased. Before the 1950s, authorities did not sufficiently deal with the problem of traffic accident because railroads were still the dominant mode of freight and passenger transportation. Yet eventually, traffic accidents became a life and property threatening problem that had to be dealt with. For this reason, the government began to exert more effort in writing traffic laws, eventually resulting in the Road Traffic Act (Act number: 6085), which was passed by the Grand National Assembly of Turkey and came into force on May 11, 1953. This act was the first general law to deal specifically with road traffic. There has been a previous general law drafted in 1938, but this law did not pass through the parliament due to the general elections. This demonstrates that traffic safety problem had, by 1953, become a national security problem, and that previous laws were not sufficient in handling the problem.

Road Traffic Act (1953) states in its third clause that the “duty of arrangement and inspection of traffic is implemented by city and provincial traffic police who are directly connected to General Directorate of Security. Furthermore, City Security Directorates shall establish traffic bureaux in all city centers and towns where they have organizations.” Through these means the law—passed 30 years after the declaration of the Turkish Republic—made possible the creation of a police organization that deals exclusively in traffic. The law assigned all additional duties to General Directorate of Highways and General Directorate of Security. It also established the City Traffic Commissions for making decisions about traffic order in cities. Furthermore, it gave extra obligations to municipalities in order to arrange traffic and construct infrastructure of roads in municipal borders. Before the Road Traffic Act of 1953, only the municipal police was responsible for the arrangement of traffic, and there was no central organization for traffic control. The new act, however, cancelled the clauses that were relevant to road traffic in the Municipalities Act (Act number: 1580) and assigned the main responsibility of controlling the traffic order was given to the General Directorate of Security.

The Road Traffic Act of 1953 stressed the following three main points:

- Penalties related to traffic offences will be given by the courts of justice,

- The arrangement and control of traffic will be implemented by the traffic police officers who have motorized vehicles,
- Making vehicle inspections and controls, and ensuring traffic safety equipments are the responsibilities of General Directorate of Highways.

With the act number 6547, dated May 2, 1955—Turkey became member of the Road Traffic Agreement that was signed in Geneva, Switzerland on September 19, 1949.

The General Directorate of Security Traffic Organization was established with the passing of Act 6376 on March 20, 1954. The Technical Committee of Roads was founded with the passing of Act 6387 on March 21, 1954. And the Traffic Courts were established with the passing of Act 6406.

Subsequently, due to budget problems the Turkish government was not able to apply the Road Traffic Act throughout the whole of the country. The government had been commissioned to enforce the law gradually over a period of 4 years, with the goal of eventually assuming full enforcement responsibility. In the first year, the act applied only to Istanbul and Ankara. Some of other big cities joined in 1955, such as Bursa, Adana, Izmir and Aydın. In 1956, the act was expanded to apply to thirteen other cities. The remaining 48 cities were included in 1957. Finally, in March, 1958 the government completed the establishment of traffic organizations and applied the Road Traffic Act to all regions of Turkey.

Table 2 Number of Road Motor Vehicles by Type (1950-1980) [8]

Year	Car	Bus	Truck	Light Commercial vehicle*	Minibus, Van*	Motorcycle
1950	13,405	3,755	15,404	-	-	2,661
1951	16,427	4,569	18,356	-	-	3,464
1952	23,938	5,510	24,722	-	-	4,528
1953	27,692	5,933	27,549	-	-	6,587
1954	28,599	6,671	30,250	-	-	8,345
1955	29,970	6,848	34,429	-	-	9,510
1956	33,377	7,914	35,070	-	-	1,135
1957	36,755	8,291	36,919	-	-	9,743
1958	34,244	8,065	39,721	-	-	7,329
1959	37,616	8,881	48,094	-	-	8,215
1960	45,767	1,981	57,460	-	-	9,380
1961	52,381	1,956	64,706	-	-	11,076
1962	60,731	1,437	73,323	-	-	12,816
1963	72,034	1,269	80,695	-	-	15,055
1964	79,449	20,412	75,379	-	-	20,575
1965	87,584	22,169	79,121	-	-	26,094
1966	91,469	12,041	47,931	31,462	10,913	32,099
1967	11,367	13,332	56,889	39,927	16,008	39,647
1968	12,375	13,948	62,616	43,441	18,967	47,062
1969	13,345	15,529	69,478	48,655	20,540	52,959
1970	13,771	15,980	70,730	52,152	20,916	60,994
1971	15,676	17,140	73,433	57,011	22,380	68,417
1972	18,272	18,504	78,920	62,796	25,559	74,402
1973	24,360	20,011	86,780	71,043	30,055	80,860
1974	31,160	21,404	95,309	81,025	34,122	86,028
1975	40,546	23,763	108,381	98,579	40,623	91,421
1976	48,894	25,388	122,176	116,861	46,066	96,984
1977	560,424	27,096	138,093	134,213	51,999	102,127
1978	624,438	28,559	146,551	144,695	56,836	109,890
1979	688,687	30,634	157,095	155,278	61,596	120,378
1980	742,252	32,783	164,893	165,821	64,707	137,931

*Since the number of small trucks, vans and minibuses (Light Commercial Vehicles) are treated together with those of trucks and buses until the year 1966, these items could not be given separately in the table.

Table 3 National Population (1950-1980)[8]

Year	Population In Census Years	Mid-Year Population Estimate
1950	20,947,188	20,807,000
1951		21,351,000
1952		21,951,000
1953		22,569,000
1954		23,204,000
1955	24,064,763	23,857,000
1956		24,540,000
1957		25,250,000
1958		25,981,000
1959		26,733,000
1960	27,754,820	27,506,000
1961		28,227,000
1962		28,931,000
1963		29,652,000
1964		30,391,000
1965	31,391,421	31,149,000
1966		31,936,000
1967		32,750,000
1968		33,586,000
1969		34,443,000
1970	35,605,176	35,321,000
1971		36,215,000
1972		37,132,000
1973		38,073,000
1974		39,037,000
1975	40,347,719	40,026,000
1976		40,916,000
1977		41,769,000
1978		42,641,000
1979		43,531,000
1980	44,736,957	44,439,000

*Annual intercental increase between two consecutive censuses are calculated by formula $P^n = P_0 \cdot e^{r \cdot n}$

**Mid-year population is calculated by the annual population increase rate as of 1st of July

Where;

P_n : Population at n date (at the initial period),

P_{n+t} : Population at n+t date (t years later),

e : Logarithm,

r : Annual growth rate of population,

t : The time period between two dates (in years).

Table 4 Number of Accidents, Fatalities and Injuries on Roads in Turkey from 1955-1980 [8]

Year	Accidents	Fatalities	Injuries
1955	7,493	1,247	8,673
1956	7,397	1,083	7,370
1957	7,816	1,329	8,157
1958	6,856	1,206	6,636
1959	7,542	1,320	7,441
1960	8,136	1,590	7,729
1961	10,309	1,861	10,325
1962	11,770	2,086	11,691
1963	12,619	2,422	12,001
1964	14,043	2,526	13,273
1965	14,805	2,564	13,654
1966	16,218	3,134	15,138
1967	16,763	3,364	15,211
1968	19,973	3,747	16,896
1969	20,009	3,772	17,233
1970	19,207	3,978	16,838
1971	26,783	4,149	19,271
1972	29,891	4,282	21,423
1973	35,254	5,116	24,392
1974	40,674	4,699	25,065
1975	46,643	6,054	30,864
1976	50,475	5,389	30,207
1977	56,467	6,983	33,144
1978	51,853	5,417	30,407
1979	41,481	4,368	25,332
1980	36,960	4,100	23,816

Table 5 Annual Traffic Accident Injuries and Fatalities by Mode of Transport (1955-1960) [9]

Type of Vehicle	1955		1956		1957	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Motorcycle	26	381	17	338	20	282
Automobile	144	2,035	141	1,976	113	1,902
Bus	155	1,416	128	1,268	172	1,142
Minibus						
Truck	655	3,214	565	2,565	722	2,860
Small Truck	68	609	40	389	61	507

Type of Vehicle	1958		1959		1960	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Motorcycle	23	255	19	298	14	274
Automobile	141	1,601	157	1,908	188	1,794
Bus	137	1,147	175	1,390	239	1,383
Minibus						
Truck	656	2,233	713	2,714	800	2,888
Small Truck	72	554	69	542	119	886

As seen in Table 2, vehicle ownership numbers increased four times between 1950 and 1960. This was a result of (1) newly added motorways and (2) changes in transportation policies that caused a decrease in railroad use. Because the road network was used primarily for freight transport, trucks numbered more than any other vehicle type. However, Table 4 shows that there was nearly no changes in the number of road accidents, fatalities and injuries during these years. This indicates that newly adopted traffic regulations and traffic police were efficient in keeping accident numbers approximately the same. Considering vehicle properties and safety criteria in the automotive sector at that time, the increase in the length of asphalt roads can be another reason for the similar numbers.

At first, Turkey experienced many problems in implementation the Road Traffic Act of 1953. After the start of its country-wide implementation in 1958, each traffic organization sustained its own development. The traffic system was improved in terms of vehicle registrations, driver's licenses, traffic signals, vehicle inspection stations, traffic police, tickets, insurances and vehicle taxes. The new traffic system was first becoming similar to the system of developed countries in terms of both organizational and regulational aspects. However, the coordination between different traffic organizations was not developing as expected, and this led to many problems. Hence, the issue of traffic safety remained inefficient.

In 1961, Road Traffic Act was replaced by a new act—Act 232 which was designed to handle the difficulties in applying the traffic law. With this change, police became authorized to issue tickets for certain traffic violations. Furthermore, judicial responsibility for traffic offences was taken form

drivers and given to the vehicle owners. Tractors now had to be registered, and the tractor drivers were obliged to acquire a driver's license.

In 1964 and 1967, two changes were added to the Road Traffic Act based on Acts 471 and 866. Despite all these improvements, however, the problems related to the application of the act continued to persist. The act was not sufficient to handle the expansion of road network, or to respond to the increasing number of vehicle and road accidents. The act also proved ineffective in improving coordination between the various traffic organizations. Between 1960 and 1980, the number of automobiles increased from 46,000 to 742,000. And the rate of increase in the number of motorcycles was even greater. The number of fatalities was nearly 1,900 in the year 1960, and this number gradually increased up to 7,000 in 1977.

The lack of a comprehensive traffic safety plan and proper consideration of traffic safety resulted in a large increase in the number of road accidents. Improvements in geometrical and technical standards of roads in 1970s could not compensate the rapid increase in the number of vehicle ownership. In addition, speed limits were the same as the European countries but the geometry and superstructure of roads were not suitable for those limits.

6. Transportation Policies (1980-2010)

The share of transportation investments in the total public investments was 20.5% in 1983 and it gradually increased to 32.3% in 1988. This made up the largest portion of public investments. In 1988, the transportation sector made up 9.1% of gross domestic product. At the 2nd Izmir Economy Congress, representative of State Planning Organization M. Barutçu, summarized the state's transportation policy as follows:

"...In the field of transportation sector we must aim for (1) the lowest-cost transportation services, (2) fast transportation services,(3) safe transportation services,(4) the permanent improvement and cutting edge technology compatible with transportation services, (5) efficient, comfortable and suitable transportation services. To reach these objectives, we will prepare the "Master Plan of Transportation." The way to have a consistent and progressive transportation policy is to have comprehensive and reliable data and policies. We can only do this by preparing master plans for every economic sector" [6].

During this period, Turkey put together the "1983-1993 Transportation Master Plan," the goal of which was obtaining a healthy transportation structure. With regard to the question of how to enhance the road system, they placed their main emphasis on "the improvement of life- and property-safety in areas of transportation." The plan targeted a decrease in freight- and passenger-transportation ratio on roads in order to effect a structural change in the transportation system. The table below illustrates the

targeted distributions of passenger and freight transport with respect to transportation types in 1980 and 1993.

Table 6 Distribution Targets of Passenger and Freight Transport
by Type of Transportation (1980-1993) [4]

Type of Transportation	Passenger Transport		Freight Transport	
	% 1980	% 1993	% 1980	% 1993
Maritime	1.18	1.08	15.87	32.16
Rail	4.12	4.08	10.41	27.45
Road	93.96	94.06	72.26	36.06
Air	0.74	0.82	0.1	0.2

As seen from Table 6, they envisaged no major change in passenger transport, and instead attempted to transfer the freight transport load to maritime and rail transportation in order to achieve a balance between the transportation types. They intended to revise the plan every three years. However, looking at the final distribution figures, they were ultimately unable to meet their targets. This might show that the master plan was not implemented successfully.

The total length of railroads was 8,397 km in 1980, and it was only increased by 210 km when it reached 8,607 km in 1997. The present railroad network is still not convenient for fast transportation, and the network is at the end of its economic life. Due to these facts, it is clear that the railroad transportation is far behind the road transportation.

Table 7 The Distribution of Passenger and Freight Transport by Transportation Types [4]

Year	Road		Rail	
	Passenger	Freight	Passenger	Freight
1960	37.8	72.9	47.7	24.3
1970	60.9	91.4	21.2	7.6
1980	73.5	94.8	10.1	4.5
1990	81	94.6	10	4.5
1997	92.6	94.8	7.2	3.6

With regard to city roads, subway projects were implemented in big cities such as Ankara and Istanbul for the purpose of decreasing the traffic loads on roads. However, public transportation projects such as the Kızılay-Batıkent Subway in Ankara and the Aksaray-Yeniköy Subway in İstanbul were not effectively meeting the needs of the population growth and, therefore, only the number of subway users increased to problematic levels. The consequences of having an insufficient public transportation system pushed people to buy private vehicles. This resulted in a rapid increase in the number of car ownership and in traffic volumes on the city roads. Traffic congestion and increasing travel times also brought about considerable energy losses [4].

Significantly, in 1980s and 1990s authorities began to acknowledge the importance to freeway constructions. In 1999, the General Directorate of Highways owned 62,611 km of state roads and province roads, and 1,726 km of long freeways. Freeways in Ankara-Istanbul-Edirne, Aydın-Izmir, and Adana-Gaziantep were completed during this period [4].

7. Traffic Safety Policies and Traffic Regulations (1980-2010)

In 1981, Ministry of Internal Affairs started preparing a law draft of a new Road Traffic Act that would respond to the necessities of Turkey and be in accordance with other international laws. In preparation of this law, the ministry made use of the regulations of foreign countries regarding technical topics and common provisions. After a substantial study of the draft, it was passed into law on October 13, 1983 under the name Road Traffic Act 2918. The authorities decided that some of the clauses would be activated after 20 months, so the full effectuation of policies of the law was on June 18, 1985.

With the passing of this law, a new organizing period was initiated in order to begin its implementation. According to the 5th clause of the law, traffic organizations was established in centers, regions, cities and counties. Furthermore, the law authorised traffic police the use of scientific methods for evaluating traffic accidents. Another feature of this law was that it sent a message that anyone who commits a traffic crime risks getting caught, thus increasing the perceived presence of state authority over the roads.

In addition, the law also gave the various ministries of public works, health, national education, transportation, agriculture and forestry the authorizations, duties and responsibilities of making roads safer and improving technical services such as infrastructure services.

The main subjects that the Road Traffic Act (1983) stressed were listed as follows:

- The redetermination of authorities, duties and responsibilities of relevant organizations related to the evaluation of traffic rules, human errors, vehicles and roads.
- The establishment of traffic schools to educate driver candidates.
- Embedding mandatory traffic courses in the curriculum of the primary schools and high schools.
- Putting emphasis on the safety of students in traffic.
- Authorization of traffic police to take the minutes according to the license plates of the vehicles when the driver of the vehicle cannot be identified.
- Improving the standards of vehicle inspections with more scientific methods.
- Determining penalty points for every traffic crime. (It was decided that when a driver exceeds 100 penalty points, his driver's license would be suspended for two months.)

7.1 Main Arrangements in the Road Traffic Act (1983)

(1) Alcohol Levels

It is stated both in the Road Traffic Act and the Road Traffic Regulation that drunk driving is to be regarded as a traffic offence.

The prohibition of driving while under the influence of alcohol (measured by the amount in the blood) falls under two cases:

- Public servants, taxi and jitney drivers, as well as drivers of minibuses, busses, trucks, carriers that transport passengers and cargo are not allowed to drive with any quantity of alcohol in the blood.
- All drivers other than those stated above cannot drive if the alcohol quantity in their blood exceeds 0.5 promils.

If a drunk driver is involved in a traffic accident, the alcohol quantity in his blood is determined and recorded in the accident minutes by the police. If it is the driver's first drunk driving offence, his driver's license will be confiscated for six months. If it is his/her second offence, it will be confiscated for two years. For third-time offenders, the period of suspension is five years. In addition, the driver has to comply with the requirements such as tickets and mandatory traffic trainings. Psychiatric treatment is required if it is the third traffic accident caused by drunk driving. In the cases of accidents involving fatalities and injuries, they will be recorded as serious faults in their accident minutes.

The use of drugs or other pleasure-inducing substances is illegal in Turkey [5]. In addition to the penalties given for the drug usage, if the police detect that a driver used drugs, the driver will be subject to a minimum penalty of a six-months prison sentence, a nominal fine, and an indefinite confiscation of the driver's license.

(2) Speed Limits

The Road Traffic Act contains three clauses that concern speed limits on roads. Unless special arrangements are stated, the speed limit on state roads and province roads is 90km/h. On freeways and in residential areas, the speed limits are 120km/h and 50km/h, respectively.

Table 8 Speed Limits on Turkish Roads [10]

Type of Vehicle	Residential areas	Outside residential areas	Freeways
Automobile	50	90	120
Bus	50	80	100
Minibus, Truck, Small Truck	50	80	90
Motorcycle and Jeep	50	70	80
Vehicle Carrying Hazardous Substances	30	50	60
Bicycle	30	50	-
Tractor and Heavy Equipment	20	20	-

Special Cases on Speed Limits:

- If there is no force majeure, minimum speed limits are 15km/h on intercity roads and 40km/h on freeways.
- Vehicles carrying hazardous substances can move between the speed limits of their vehicle types if they are unloaded.
- The speed limit of truck trailers and wreckers is 15km/h when they are pulling vehicles that have brake failures.
- Ministry of Internal Affairs can increase the speed limits of automobiles on freeways by 20km/h by taking the view of Ministry of Public Works.
- The penalty of exceeding the speed limits by an excess of between 10% and 30% was \$74 (140 Turkish Liras); for exceeding the speed limits by more than 30%, the fine was \$153 (290 TL) in 2010. If a driver exceeds the speed limits by 30% five times within a year, his/her driver's license will be suspended for one year.

(3) Seat Belt Usage and Security Systems

According to the Road Traffic Act, "certain drivers and passengers must use security systems on the roads." The arrangements on the security systems are set out in the Road Traffic Regulation.

- The drivers and passengers of motorcycles and motorized bicycles are required to wear helmets; and the drivers of these vehicles are required to wear safety glasses.
- Drivers and front-seat passengers of automobiles, buses, minibuses, trucks and small trucks are required to wear seat belts. In 1995, a change in traffic regulation made it obligatory to install back-seat passenger seat belts for vehicles imported or produced in Turkey.
- Sitting on the front seats of vehicles is forbidden for children under ten years old.

(4) Space Cushions

The Road Traffic Regulation determined "space cushions" as follows:

- Drivers must not drive too close to the vehicle immediately in front of them. The distance should be at least half of their vehicle speed in km/h in terms of meters.
- The “space cushion” should be equal to the distance that the trailing vehicle moves in two seconds.
- The vehicles carrying hazardous substances have to maintain at least a 50m distance when following another vehicle.
- The drivers of the vehicles moving in a convoy should remain far enough away from the next car to allow for passing vehicle to enter.

8. Road Traffic Accidents in Turkey (1980-2010)

Although the transportation sector offers alternative modes such as maritime, railway and airline, the chief mode of transportation in Turkey is road transportation (Table 6). The dominant role of road transport in passenger and cargo transportation and the low safety level of traffic environment (which is not adequate to the road-dominated transportation system) cause a high frequency of traffic accidents. Some of the main reasons behind these traffic accidents can be listed as following: the rapid increase in the number of motorized vehicles, an insufficient road system, inadequate road safety policies, reckless driving, and inadequate emergency services. Traffic accidents result in deaths, injuries, disabled persons and enormous economical losses.

Table 9 Number of Vehicles by Type (1980-2010) [8]

Year	Car	Bus	Truck	Light Commercial vehicle	Minibus, Van	Motorcycle
1981	776,432	33,839	172,372	172,269	66,514	160,557
1982	811,465	35,432	180,772	178,762	69,598	182,795
1983	856,350	38,478	190,277	186,427	73,585	217,327
1984	919,577	43,638	197,721	198,106	80,697	256,338
1985	983,444	47,119	205,496	212,505	87,951	289,052
1986	1,087,234	50,798	217,111	224,755	97,917	327,326
1987	1,193,021	53,554	225,872	233,480	106,314	369,894
1988	1,310,257	56,172	234,166	240,718	112,885	420,889
1989	1,434,830	58,859	241,392	248,567	118,026	472,853
1990	1,649,879	63,700	257,353	263,407	125,399	531,941
1991	1,864,344	68,973	273,409	280,891	133,632	590,488
1992	2,181,388	75,592	287,160	308,180	145,312	655,347
1993	2,619,852	84,254	305,511	354,290	159,900	743,320
1994	2,861,640	87,545	313,771	374,473	166,424	788,786
1995	3,058,511	90,197	321,421	397,743	173,051	819,922
1996	3,274,156	94,978	333,269	442,788	182,694	854,150
1997	3,570,105	101,896	353,586	529,838	197,057	905,121
1998	3,838,288	108,361	371,163	626,004	211,495	940,935
1999	4,072,326	112,186	378,967	692,935	221,683	975,746
2000	4,422,180	118,454	394,283	794,459	235,885	1,011,284
2001	4,534,803	119,306	396,493	833,175	239,381	1,031,221
2002	4,600,140	120,097	399,025	875,381	241,700	1,046,907
2003	4,700,343	123,500	405,034	973,457	245,394	1,073,415
2004	5,400,440	152,712	647,420	1,259,867	318,954	1,218,677
2005	5,772,745	163,390	676,929	1,475,057	338,539	1,441,066
2006	6,140,992	175,949	709,535	1,695,624	357,523	1,822,831
2007	6,472,156	198,128	729,202	1,890,459	372,601	2,003,492
2008	6,796,629	199,934	744,217	2,066,007	383,548	2,181,383
2009	7,093,964	201,033	727,302	2,204,951	384,053	2,303,261

Table 10 Road Accidents, Fatalities and Injuries (1980-2010) [8]

Year	Population	Number of Driver's Licenses	Number of Accidents	Fatalities	Injuries
1981	45,540,000		40,023	4,327	27,711
1982	46,688,000		46,264	4,832	35,489
1983	47,864,000		55,256	5,200	43,888
1984	49,070,000		60,705	5,684	49,234
1985	50,306,000		63,473	5,477	49,058
1986	51,433,000		92,468	7,278	71,445
1987	52,561,000		110,207	7,661	80,456
1988	53,715,000		107,651	6,848	79,243
1989	54,893,000		103,758	6,352	79,928
1990	56,098,000		115,295	6,317	87,668
1991	57,064,000		142,145	6,231	90,520
1992	57,931,000		171,741	6,214	94,824
1993	58,812,000		208,823	6,457	104,330
1994	59,706,000		233,803	5,942	104,717
1995	60,614,000		279,663	6,004	114,319
1996	61,536,000		344,643	5,428	104,599
1997	62,510,000		387,533	5,125	106,246
1998	63,451,000		440,149	4,935	114,552
1999	64,385,000		465,915	5,713	125,158
2000	65,311,000		500,664	5,510	136,751
2001	66,229,000	14,491,332	442,960	4,386	116,203
2002	67,140,000	14,994,960	439,777	4,093	116,412
2003	68,043,000	15,488,493	455,637	3,946	118,214
2004	68,938,000	16,151,623	537,352	4,427	136,437
2005	69,825,000	16,958,895	620,789	4,505	154,086
2006	70,703,000	17,586,179	728,755	4,633	169,080
2007	70,586,256	18,422,958	528,561	5,007	189,057
2008	71,517,100	19,377,790	950,120	4,236	184,468
2009	72,561,312	20,460,739	1,053,346	4,324	201,380
2010	73,722,988	21,548,381	1,106,201	4,045	211,496

Table 10 shows the trends in the number of accidents, fatalities and injuries that occurred on roads in Turkey between 1981 and 2010. The number of accidents has continued to increase each year, culminating in 1,000,000 accidents in 2009. This increasing trend can be attributed to the rapid increase in population and the high number of vehicles on the road in the last decade. Table 10 shows that the number of persons killed in road accidents have been decreasing since 1988 and 1989, even though the numbers of accidents and persons injured have been increasing after a local decrease in 1988 and 1989. This trend deviation is attributable to the construction of freeways and safer road infrastructures.

Table 11 Annual Traffic Accident Injuries and Fatalities
by Mode of Transport (1990-1999) [11]

Type of Vehicle	1990		1991		1992	
	Fatalities	Injuries	Fatalities	Injuries.	Fatalities	Injuries
Motorcycle	436	8,747	468	9,525	507	11,291
Automobile	2,020	33,034	2,184	35,327	2,115	37,671
Bus	337	5,357	324	5,600	529	5,986
Minibus	187	5,455	230	5,728	241	5,969
Truck	420	4,758	368	5,326	445	5,538
Small Truck	104	2,960	144	3,080	104	3,177

Type of Vehicle	1993		1994		1995	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Motorcycle	556	12,697	405	10,406	356	10,702
Automobile	2,398	44,570	2,379	47,854	2,505	52,609
Bus	447	6,024	316	5,318	293	5,715
Minibus	272	6,278	205	5,760	232	5,812
Truck	386	5,559	430	5,776	530	6,959
Small Truck	146	3,906	152	4,139	149	4,787

Type of Vehicle	1996		1997		1998	
	Fatalities	Injuries	Fatalities	Injuries	Fatalities	Injuries
Motorcycle	139	4,074	172	5,867	327	12,191
Automobile	1,568	22,785	2,520	58,880	3,342	9,3414
Bus	389	2,996	544	7,381	720	12,277
Minibus	113	2,725	270	7,457	414	12,423
Truck	302	4,424	921	1,110	1,908	21,549
Small Truck	127	2,474	316	9,265	602	17,585

Type of Vehicle	1999	
	Fatalities	Injuries
Motorcycle	141	7,778
Automobile	1,208	40,876
Bus	191	3,168
Minibus	135	3,810
Truck	514	5,995
Small Truck	272	8,952

In order to provide a safe traffic environment, various organizations responsible for traffic issues have made considerable effort, and the media has offered its support in raising safety awareness among drivers, pedestrians, passengers and institutions.

In December 2001, the Turkish government established the “National Traffic Safety Program for Turkey“ to diminish the magnitude of the problem caused by traffic accidents. The objectives of this program were as follows

- To increase enforcement on traffic safety with rules, legislations and regulations.

- To minimize losses and damages caused by traffic accidents.
- To improve efficiency of transport infrastructure safety.
- To raise road users' awareness of and willingness to comply with the law.
- To decrease traffic volume on roads by improving other alternative transportation systems.

This safety program covered the period from 2002 to 2011, and established several mid-term and long-term strategies. The objectives of the mid-term strategies (2002-2006) were to reduce the number of road traffic fatalities by 20%, the number of accidents involving unprotected road users by 20% (passengers and cyclists), and the number of accidents involving children aged between 0-14 years by 25%. The long-term strategy has aimed to reduce road traffic fatalities by 40%, the number of accidents involving unprotected road users by 40%, and the number of accidents involving children aged between 0-14 years by 50% [13].

Consequently, in recent years there has been a marked decline in traffic accident; however, traffic accidents still remain one of the most serious problems in Turkey. While the number of fatalities has decreased, the number of injuries has continued to rise in past years. The above-mentioned improvements have helped to decrease the severity of accidents, yet they have not yet eliminated injury risk. It seems that there is still a large potential for improving road safety in Turkey. To achieve this, it is necessary to understand the causes of the accidents and to adopt a methodical approach to find remedial actions.

There are three categories of factors affecting accident occurrences: road environment, vehicles, and road users. These factors have a combined role in causing accidents, and it is necessary to evaluate all three to understand the nature of accidents.

Table 12 Fault Distribution in Police Reports for the Road Traffic Accidents in Turkey [12]

Year	Accident Fault Distribution (%)				
	Driver	Road	Vehicle	Pedestrian	Passenger
2000	96.06	0.77	0.52	2.40	0.25
2001	96.56	0.43	0.38	2.32	0.31
2002	96.82	0.25	0.31	2.39	0.23
2003	97.03	0.22	0.27	2.32	0.16
2004	97.30	0.19	0.22	2.18	0.11
2005	97.39	0.22	0.25	2.03	0.11
2006	98.07	0.13	0.10	1.61	0.09
2007	98.03	0.11	0.14	1.63	0.09
2008*	90.53	0.42	0.26	8.36	0.43
2009*	89.60	0.61	0.29	9.09	0.41
Average	95.74	0.34	0.27	3.43	0.22

* For fatal and injury accidents only

Table 12 shows the fault distributions (according to the police reports) for traffic accidents that occurred between 2000 and 2009 in Turkey. According to this data, drivers are responsible for

95.74% of all accidents, while the road environment and the vehicles are only responsible for 0.34% and 0.27%, respectively. However, the problem is that the majority of the police officers do not have the necessary education about highway design to come up with a sound judgment about the road deficiencies that lead to an accident. Moreover, current accident data forms include a detailed list of driver faults to help the officer decide, while there is little space on the form for road deficiencies. (This is partly because the possible design problems that can cause an accident are innumerable.) Given the current state of the forms, it is much easier to blame drivers rather than conduct a thorough investigation of road deficiencies. Hence, it is understandable that the police officers cite drivers as the sole cause for the majority of the accidents.

Unfortunately, however, merely faulting drivers as the primary cause of accidents will not lead to a reduction in accidents. It should be taken into account that faulty road design is often the cause of human error. The road environment and the vehicles must be designed, built and maintained to inform the road users in a way that minimize the possibility of human error. A well-designed road should allow road users to accurately perceive the demands of the road environment and prevent crashes from occurring in the first place. If there is a failure in the road user's ability to accurately perceive this demand, then the roadway should be "forgiving," i.e. it should enable the road user to recover and continue, thereby changing the outcome of the event or minimizing the severity of the accident. Roadsides designed according to these principles are called "forgiving roadsides" [14].

"Roadside design" is the design of the area between the outside shoulder edge and the right-of-way limits. Considering the limited amount of infrastructure funds, one may question whether spending resources on materials other than pavement is beneficial. Yet statistics show how important roadside safety in the reduction of accident severity [15].

Table 13 shows the number of accidents involving fatality and injuries by the accident types, as occurred in 2009.

Table 13 Number of Accidents in Turkey Involving Fatalities and Injuries
by Accident Type (2009) [12]

Type of Accident	Accidents Involving Fatality		Accidents Involving Injury		Total	
	Number of Accidents	%	Number of Accidents	%	Number of Accidents	%
1) Front collision	333	14.33	5,556	6.21	5,889	6.42
2) Rear-end collision	210	9.04	9,564	10.70	9,774	10.66
3) Side collision	316	13.60	28,540	31.92	28,856	31.46
4) Collision with stationary vehicle	61	2.63	2,350	2.63	2,411	2.63
5) Collision with fixed object	207	8.91	8,684	9.71	8,891	9.69
6) Hitting pedestrian	530	22.82	16,148	18.06	16,678	18.18
7) Hitting animal	5	0.22	312	0.35	317	0.35
8) Overturning	217	9.34	6,798	7.60	7,015	7.65
9) Running off the road	427	18.38	11,090	12.40	11,517	12.56
10) Passengers dropped from the vehicle	16	0.69	316	0.35	332	0.36
11) Supplies dropped from the vehicle	1	0.04	48	0.05	49	0.05
Total	2,323	100	89,406	100	91,729	100
(5+8+9) Roadside Accidents	851	36.63	26,572	29.72	27,423	29.90

Among the given eleven types of accidents in Table 13, three are associated with roadside safety. The majority of accidents involving fixed object collisions, overturning and running off the road occur at the roadside. According to the table, 29.9% of accidents involving fatality and injury happen at the roadside. In other words, one in every three serious accidents ends up at the roadside. The table also shows that 36.63% and 29.72% of the roadside accidents end up with fatality and injury, respectively.

These figures become even more striking when the data is categorized by the accident location, as it is done in Table 14. The table shows that, in rural areas 60.57% of all the fatal and injury accidents are roadside accidents. Hence, for the rural roads, designing a safe roadside becomes much more important than designing the road itself.

Table 14 Number of Accidents in Turkey Involving Fatalities and Injuries by Accident Location and the Accident Type (2009) [12]

Type of Accident	Rural		Urban		Total	
	Number of Accidents	%	Number of Accidents	%	Number of Accidents	%
1) Front collision	1,192	5.49	4,697	6.71	5,889	6.42
2) Rear-end collision	2,789	12.84	6,985	9.98	9,774	10.66
3) Side collision	3,194	14.71	25,662	36.65	28,856	31.46
4) Collision with stationary vehicle	330	1.52	2,081	2.97	2,411	2.63
5) Collision with fixed object	2,246	10.34	6,645	9.49	8,891	9.69
6) Hitting pedestrian	813	3.74	15,865	22.66	16,678	18.18
7) Hitting animal	180	0.83	137	0.20	317	0.35
8) Overturning	3,402	15.66	3,613	5.16	7,015	7.65
9) Running off the road	7,508	34.57	4,009	5.73	11,517	12.56
10) Passengers dropped from the vehicle	41	0.19	291	0.42	332	0.36
11) Supplies dropped from the vehicle	24	0.11	25	0.04	49	0.05
Total	21,719	100	70,010	100	91,729	100
(5+8+9) Roadside Accidents	13,156	60.57	14,267	20.38	27,423	29.90

In Table 15, serious accidents in Turkey (2009) by the number of vehicles involved are presented. The table shows that 47.55% of all serious accidents are single vehicle only. This value supports the previously stated assumption that the majority of fixed object collisions, overturning and running off the road accidents happen at the roadside. Due to the nature of them, single vehicle accidents can only end up with a roadside, pedestrian or animal collision. Subtracting the hitting pedestrian (18.18%) and hitting animal (0.35%) accident ratios from the single vehicle only (47.55%) accident ratio gives 29.02% which is very close to the assumed roadside accident ratio of 29.9%. Therefore, it can be said that approximately 30% of all the serious accidents are single vehicle, running off the road type accidents. Roadside areas are often unsafe, with steep and high side slopes, stone or concrete lined ditches, rock cuttings and hazardous objects (e.g., poles and trees) close to the roadway. Guardrails are often missing. In many medians there are dangerous columns and no guardrails. Deformable and energy absorbing supports are not used.

Table 15 Serious Accidents in Turkey by the Number of Vehicles Involved (2009) [12]

Number of Vehicles Involved	Accidents Involving Death		Accidents Involving Injury		Total	
	Number of Accidents	%	Number of Accidents	%	Number of Accidents	%
Single Vehicle	1,347	57.99	42,266	47.27	43,613	47.55
Two Vehicles	837	36.03	41,839	46.80	42,676	46.52
Multiple Vehicles	139	5.98	5,301	5.93	5,440	5.93
Total	2,323	100	89,406	100	91,729	100

It was suggested in the *Road Improvement and Traffic Safety Project* (Sweroad 2001) that roadside design principles should be reconsidered and a new design code should be prepared. General Directorate of Highways (KGM) prepared a new road design code that was mainly based on AASHTO (American Association of State Highway and Transportation Officials) manual of the US. Before the new code, roadsides were designed and constructed according to the road design regulation prepared in 1965 and revised in 1997 [13]. The old code had insufficient emphasis on the roadside safety. Since 2002, Turkish roads have been designed according to the new code, and roadside improvements have been carried out by KGM.

9. Organizations Relevant to Traffic Safety in Turkey

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

- The General Directorate of Security, under the Ministry of Internal Affairs,
- The General Directorate of Highways under the Ministry of Public Works,
- 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.

Turkey has attempted to establish cooperation on a national scale through two safety councils described below. On a provincial base, the province and town (sub-province) traffic commissions

obtain coordination with one another. These councils and commissions have the rights to make traffic regulation decisions.

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

The main roles and responsibilities of different ministries/organizations are summarized as follows.

(1) Ministry of Internal Affairs - General Directorate of Security and General Commandership of Gendarmerie

- Law enforcement (traffic control and monitoring),
- Registration of the vehicles and issuing driving licenses,
- Taking necessary actions after traffic accidents in order to secure a safe area for other road users, as well as reporting accidents,
- Reporting statistics about vehicle registrations, driving licenses and accidents,
- Public information.

(2) Ministry of Public Works - 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.

(3) 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.

(4) Ministry of Health

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

(5) Ministry of Industry and Commerce

- Vehicle type approvals.

(6) Ministry of Transportation

- Coordination of transportation by issuing regulations in the transportation sector.

(7) Ministry of Forestry

- Traffic regulation for forest roads.

(8) Ministry of State - General Directorate of Village Affairs

- Traffic regulations for village roads.

(9) Ministry of Justice

- Giving necessary help in revising the law.

(10) Municipalities

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

10. Coordination

(1) Supreme Highway Traffic Safety Council

Head: The Prime Minister.

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

Meetings: Twice a year

Tasks and responsibilities: 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.

(2) 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 Gendarmerie, State Standardization Institution, Turkish Drivers and Automobiles Association, Universities, Chamber of Engineers and Architects, Prevention of Traffic Accidents Foundation, Aid for Traffic Accidents Foundation, Metropolitan Municipality of Ankara.

Meetings: Every month

Tasks and responsibilities: Giving proposals to achieve coordination and to reduce accidents. Finding deficiencies in the applications and the legislative deficiencies in traffic safety area.

(3) 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 responsibilities:

- 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, and so on.
- Making decisions about the working conditions of the commercial vehicles in the province has to be approved by Province Traffic Commissions.

(4) Province and Town (sub-provincial) Traffic Commissions

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

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

Tasks and responsibilities:

- To take necessary precautions for achieving traffic regulation and safety in the district.
- To make necessary decisions about upgrading of the infrastructure, and give proposals to the Ministry of Internal Affairs.
- To make decisions about the working conditions of the commercial vehicles in the province, regardless of the regulations issued by the Ministry of Transportation.
- To make decisions about parking areas.

(5) Foundations and Associations (Voluntary Organizations)

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

References:

1. World Health Organization, 2009, *Global Status Report on Road Safety*, Geneva,
2. Organization for Economic Co-operation and Development, International Traffic Safety Data and Analysis Group, 2010, *IRTAD Road Safety 2010 Annual Report*.
3. Directorate of Strategy Development, Branch Office of Transportation and Cost Studies, 2009, *Traffic and Transportation Data*, Ankara.
4. Elmas, G.andB. Yıldızhan, 1999, *Transportation Policies in Turkey and Economic Analysis of Traffic Accidents*, 2ndTransportation and Traffic Congress-Exhibition.
5. T.R. Ministry of Internal Affairs, Research and Investigations Center, *Development of Traffic Regulation in Turkey*, Ankara.
6. Union of Chambers of Turkish Engineers and Architects, 2009, *Necessity of Planning in Transportation and Traffic Policies-Chamber Report*, Ankara.
7. C. Çelik, 2007, *The Territorial Traffic Security In Turkey In The Process Of Adaptation To EU Transmission Policy-MA Thesis*, İstanbul.
8. Turkish Statistical Institute, 2010, *Statistical Indicators 1923-2009*, Ankara.
9. Ministry of Public Works, 1955-1960, *Statistical Yearbook of Traffic Accidents*, Ankara.
10. Road Traffic Regulation, 1997.
11. Turkish Statistical Institute and General Directorate of Security, 1990-1999, *Statistical Yearbook of Road Traffic Accidents*, Ankara.
12. Turkish Statistical Institute and General Directorate of Security, 2011, *Statistical Yearbook of Road Traffic Accidents-2009*, Ankara.
13. Ministry of Internal Affairs& Ministry of Public Works and Settlement & Ministry of National Education& Ministry of Health & Gazi University & SweRoad, 2001,*Road Improvement and Traffic Safety Project – Final Report*, Ankara.
14. New South Wales Roads and Traffic Authority, 2006, *Road Environment Safety*, New South Wales.
15. American Association of State Highway and Transportation Officials, 1996, *Roadside Design Guide*, Washington, D.C.

General References:

16. Road Traffic Act, 1953.

17. Road Traffic Act, 1983.
18. Road Traffic Regulation, 1997.
19. SweRoad, 2001, National Traffic Safety Program for Turkey, Ankara.

<http://www.kgm.gov.tr/SiteCollectionDocuments/KGMdocuments/Eng/Traffic/Executive.pdf>

Websites of state organizations about Traffic and Traffic Safety

- Head of Traffic Services www.trafik.gov.tr
- General Directorate of Highways www.kgm.gov.tr
- General Directorate of Road Transportation www.kugm.gov.tr
- Head of Revenue Administration <http://www.gib.gov.tr/>
- General Directorate of Meteorology <http://www.dmi.gov.tr/>
- Ankara Security Directorate http://www.ankara.pol.tr/2011_v1/
- Bayburt Security Directorate <http://www.bayburt.pol.tr/>

Some of semiofficial websites

- Foundation of Turkish Drivers-Ankara <http://www.tsof.org.tr/>
- Turkish National Committee of Roads <http://www.ytmk.org.tr/>
- Traffic Insurance Information Center <http://www.tramer.org.tr/>
- Vehicle Inspection Stations, Istanbul <http://www.tuvturk.com.tr/>
- Chamber of drivers, Antalya <http://www.antalyasoforlerodasi.com.tr/>

Websites of Some Turkish Universities

- Bogazici University: www.boun.edu.tr
- Istanbul Technical University: www.itu.edu.tr
- Middle East Technical University: www.metu.edu.tr
- Koç University: www.ku.edu.tr

Author:

Ilgin Gökaşar

Assistant Professor,
Department of Civil Engineering,
Bogazici University, Turkey

Ilgin Gökaşar is an Assistant Professor and Vice Chair in the Civil Engineering Department at Bogazici University. She has played an important role in the establishment of the Local Traffic Control Center and Intelligent Transportation Laboratory, a collaborative effort between the University and the Istanbul Metropolitan Municipality. Dr. Gökaşar received her MS degree and PhD from the Department of Civil and Environmental Engineering at Rutgers University, NJ, USA, and her BS degree from the Civil Engineering Department at Bogazici University, Turkey. Her research is in the areas of incident management and traffic safety, real-time traffic control, ramp metering, evacuation modeling, pre-trip information and social influences on mode choice, and economic evaluations of intelligent transportation systems. She has many publications including journal articles, conference papers, and technical reports. She is a technical reviewer for various journals and is involved with many technical committees.

Co-author:

Erhan Emir

Graduate Student,
Department of Civil Engineering,
Bogazici University, Turkey

Erhan Emir is a graduate student in the Civil Engineering Department at Bogazici University. Mr. Emir received his BS degree from the Civil Engineering Department at Bogazici University, Istanbul Turkey. His research is in the areas of intelligent transportation systems, transportation planning, and evacuation modeling. He is a member of the Chamber of Turkish Civil Engineers.

