

## INTRODUCTION

### A. Main Findings

At the end of 2007, there were 2,284,000 motor vehicles in Israel - an increase of 5% compared with the end of 2006; following an increase of 3.2% in 2006 and an increase of 3.4% in 2005. The growth rate of private cars was 5.6%, compared with 3.6% in 2006 and 3.8% in 2005.

Of the total number of vehicles, there were approximately 1,779,000 private cars, approximately 358,000 trucks, approximately 95,000 motorcycles, approximately 16,000 minibuses, approximately 12,900 buses, approximately 18,300 taxis, and approximately 3,800 special vehicles.

Approximately 39% of the vehicles used in Israel were manufactured in Japan. Japan maintains its position as the main country of production. In 2007 South Korea's relative share increased. Only 0.1% of all vehicles were manufactured in Israel.

**Vehicles in Israel, by manufacturing country (percentages)**

Country of Production	2007	2006	2005	2004	2003	2002	2001
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Japan	38.7	38.0	37.7	37.4	37.3	37.3	37.6
South Korea	10.9	10.7	10.1	9.1	8.1	7.5	7.4
France	9.8	10.5	11.0	11.5	11.9	12.1	11.9
Spain	9.2	9.3	9.4	9.5	9.5	9.3	9.0
Germany	7.7	8.2	8.6	9.1	9.7	10.4	10.8
Italy	4.5	5.1	5.5	6.0	6.5	7.0	7.4
USA	3.8	4.0	4.1	4.3	4.7	4.8	4.9
Other countries	15.4	14.2	13.6	13.1	12.3	11.6	11.0

In 2007, the number of vehicles increased by approximately 250,000, of which approximately 218,000 were new (approximately 77,000 were 2007 production year models and approximately 141,000 were 2008 production year models). During this period, approximately 142,000 vehicles were subtracted. Thus, the net growth in the number of vehicles amounted to only about 108,000.

Of the new vehicles that were added in 2007, approximately 171,000 were private cars, mostly produced by the following manufacturers:

**New private cars that were added each year in 2001-2007,  
by manufacturer (percentages)**

Year	Total	Mazda	Hyundai	Toyota	Ford	Subaru	Daihatsu	Honda	Chevrolet	Suzuki	Other
2007	100.0	15.8	12.6	11.0	7.1	5.8	5.7	5.5	5.3	4.7	26.5
2006	100.0	16.2	14.5	13.1	7.5	5.8	4.0	3.4	5.2	4.0	26.3
2005	100.0	17.3	15.7	12.1	7.1	4.9	1.6	4.2	8.0	4.2	24.9
2004	100.0	19.4	16.0	9.9	6.0	4.5	0.9	4.6	8.0	3.7	27.0
2003	100.0	20.3	10.5	11.2	7.7	4.1	1.4	6.6	4.2	3.0	31.0
2002	100.0	15.0	5.3	10.9	6.0	3.5	1.2	4.7	0.8	4.0	48.6
2001	100.0	12.9	6.0	7.0	5.6	3.4	0.9	3.9	1.1	4.3	54.9

The average age of motor vehicles at the end of 2007 was 6.9 years, as in 2006. Since 1998, there has been a continuous increase in the average age of motor vehicles – from 5.9 years in 1997 to 6.9 years in 2006. The constant upward trend in the average age of motor vehicles declined in 2007, mainly due to the substantial increase in the number of new vehicles, most of which were private cars. Still, the upward trend continued in the age of trucks, from an average of 4.8 years in 1997 to 6.7 in 2007; and in the age of minibuses, from 2.0 years in 1994 to 7.4 in 2007. Approximately 883,000 (39%) of all vehicles are new, up to 4 years old (2003+ production year models), approximately 671,000 (29%) are 5-9 years old, and 730,000 (32%) are 10 years old and over.

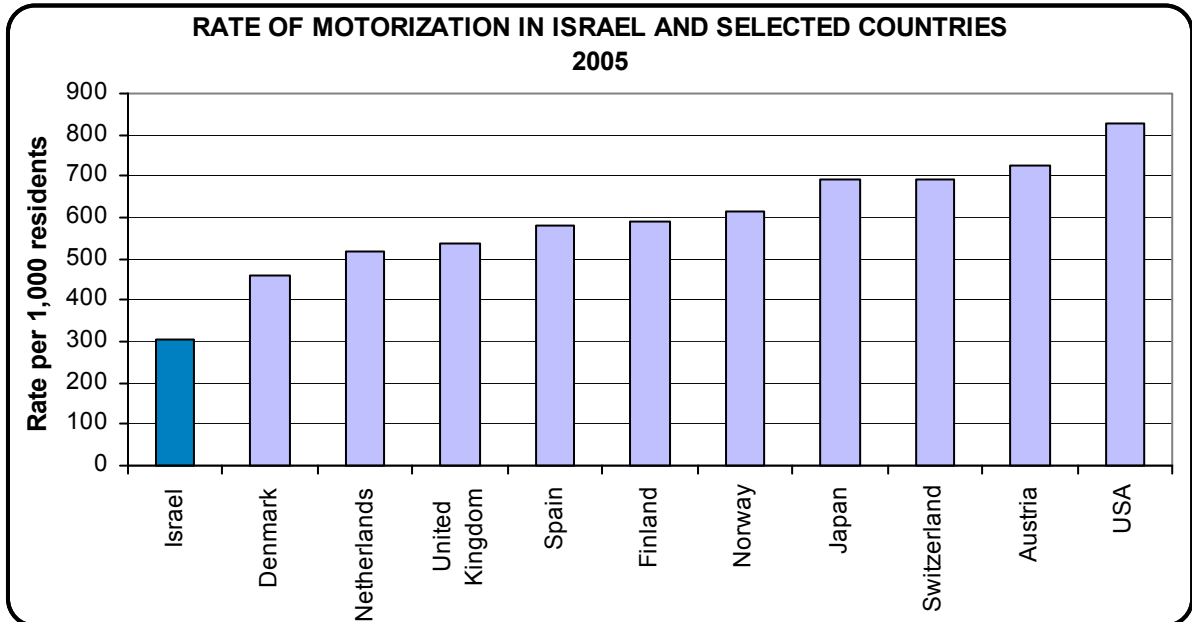
The trend of switching to the use of **diesel-powered vehicles** rather than gasoline-powered vehicles has stopped. The number of diesel-powered vehicles continued to grow, although the number of private cars using diesel fuel was still only 49,000, which constitutes approximately 2.7% of all private cars.

In 2007, approximately 4,500 vehicles had gas engines, of which approximately 3,200 were private cars.

**Percentage of diesel-powered vehicles (out of total vehicles of the same type)  
during 2001-2007**

Year	Total	Private car	Truck up to 4 tons	Truck over 4 tons	Minibus	Bus	Taxi	Special vehicle	Motor-cycle
2007	16.4	2.7	73.1	99.7	98.1	100.0	98.4	96.0	-
2006	16.6	2.6	75.2	99.7	97.8	100.0	99.0	94.9	-
2005	16.5	2.6	73.5	99.7	97.4	100.0	99.2	93.9	-
2004	16.5	2.6	67.3	99.8	97.1	100.0	99.6	93.7	-
2003	16.0	2.5	64.1	99.8	96.6	100.0	99.5	91.5	-
2002	15.5	2.4	60.4	99.7	96.2	100.0	99.4	88.4	-
2001	14.5	2.0	55.9	99.7	95.5	100.0	99.3	84.8	-

In 2007, the rate of motorization in Israel was still relatively low in comparison with other countries (315 vehicles per 1,000 residents, compared with 306 at the end of 2006). Of those vehicles, 246 were passenger cars (including private cars, taxis and minibuses with up to 8 seats, in addition to the driver).



The rate of involvement of motor vehicles in road accidents with casualties, per 1,000 licenced vehicles, differs among the various types of vehicles.

**Involvement of vehicles in road accidents with casualties, by type of vehicle –  
rate per 1,000 licenced vehicles**

Year	Total	Private car	Truck up to 4 tons	Truck over 4 tons		Minibus	Bus	Taxi	Special vehicle	Motor-cycle
				Total	Thereof: 34+ tons					
2007	12.5	11.1	12.7	15.9	50.7	27.1	45.9	63.5	9.6	28.5
2006	14.5	12.6	14.4	18.2	63.5	27.1	53.9	65.0	10.3	30.5
2005	14.7	13.0	14.4	18.5	72.0	28.0	46.4	65.3	17.0	30.5
2004	16.3	14.5	16.0	22.1	90.9	28.5	46.3	70.0	12.2	31.0
2003	17.0	14.6	16.8	23.0	78.3	34.0	45.5	72.8	12.7	32.2
2002	17.6	15.5	17.2	25.1	88.1	33.3	45.5	77.2	14.5	34.6
2001	17.5	15.3	17.1	24.8	85.8	36.4	50.3	81.6	14.0	33.1

As shown in the table above, the rate of involvement of public vehicles (minibuses, buses and taxis) and heavy trucks weighing 34 tons and more (gross weight) in accidents with casualties, is very high. It should be noted that these vehicles have a high annual rate of kilometers travelled.

**Air pollution from transportation:** Most of the **carbon monoxide** (CO) emissions result from vehicle transportation. Carbon monoxide is emitted as a result of incomplete combustion of fuels. The relative share of the transportation sector in total emission of CO is about 95%. Data from the traffic monitoring stations, as reported by the Ministry of the Environment, indicate zero deviations from the half-hourly standard, from the day the stations started to monitor up to the end of 2007. Approximately 85% of total hydrocarbon (HC) emissions from transportation derived from gasoline-powered vehicles.

Approximately a third of total **nitrogen oxide** (NO<sub>x</sub>) emissions are from vehicles; mostly (approximately 70%) from diesel-powered vehicles. The traffic monitoring stations indicate scores of deviations for NO<sub>x</sub>. At all stations, the maximal half-hour values obtained in 2007 exceeded the standards by tens of percentages.

The relative amount of suspended particulate matter (SPM) in total emissions from transportation was about 10%. Most SPM emissions from transportation (approximately 85%) derived from diesel-powered vehicles.

The contribution of vehicles to total sulphur oxides (SO<sub>x</sub>) emissions was marginal (less than 0.5%).

## B. Definitions and Explanations

**Limitations of data:** The data in this publication are based on processing of the "Vehicle File" which is received from the Information Systems Department of the Ministry of Transport. In fact, the data reflect the state of the "Vehicle File" at the end of 2007; therefore, the quality of data processing depends on the quality and level of updating in the "Vehicle File".

The fleet of motor vehicles presented in this publication includes all types of motor vehicles registered at the Licencing Office, whose licences were valid on 31.12.07 or expired during 2007. It does not include army and police vehicles, towed vehicles, tractors, vehicles of foreign citizens and of holders of provisional vehicle licences, vehicles registered in the Palestinian Authority, vehicles of tourists staying in Israel less than 3 months, diplomatic and U.N. vehicles, and the like.

**Motor vehicle:** Any kind of mechanically propelled vehicle, excluding vehicles towed by a motor vehicle.

**Year of production:** The production year is not identical to the calendar year. During the second half of a calendar year, vehicles are imported whose year of production is greater by 1 than the year of purchase.

**A truck (including "commercial vehicle"):** A vehicle intended to transport freight. As of 1978, does not include dual-purpose vehicles (that were transferred to the private vehicles category). As of 1993, this type does not include "Minibus" (see definition and explanation below). As of 1996, the "Special truck for passengers" was included under "Bus".

Two main sub-types of trucks are distinguished by gross weight:

**a. Truck up to 4 tons ("commercial vehicle")**

1. **Van:** A truck with a closed back, without separation between the driver's cab and the back load unit. As of 1993 this type does not include "Minibus" (See definition and explanation below).
2. **Pick-up:** A truck with separation between the driver's cab and the back load unit (open or closed).

**b. Trucks over 4 tons**

1. **Ordinary truck:** A truck with the back open permanently.
2. **Closed truck:** A truck with the back closed permanently.
3. **Tip-lorry:** A truck for transport of freight, that tips up mechanically in order to unload the freight.
4. **Tanker:** A vehicle used or designed for use in the transport of liquids, cement in bulk or gas.
5. **Road tractor:** A motor vehicle designed to haul a semi-trailer and/or a trailer.

**Hauled vehicle:**

1. **Trailer:** A non-motor vehicle designed to be hauled by a motor vehicle, excluding sidecars.
2. **Semi-trailer:** A non-motor vehicle designed in such way that its front part rests on the road tractor.

**Gross weight:** The weight of the truck plus the weight of the passengers and load carried by it, as permitted by the Licencing Office.

**Load capacity:** Load permitted by the Licencing Office to be transported by the vehicle.

**Minibus:** A motor vehicle of up to 4 tons gross weight, licenced to transport up to 15 passengers in addition to the driver, and described in its licence as a minibus.

Up to 1992, it was included under the type "Truck up to 4 tons – van".

**Bus:** A motor vehicle designed to transport 16 or more passengers in addition to the driver and described in its licence as a bus. As of 1996 the "Special truck for passengers" is included under "Bus", instead of under "Truck".

There are three sub-types of bus or minibus:

1. Private - unpaid passenger transportation
2. Public - paid passenger transportation
3. Touring - paid passenger transportation on special tours

**Taxi:** A public motor vehicle that is not a bus or a minibus designed to transport up to 10 passengers in addition to the driver; and is described in its licence as a taxi. Changes have

occurred in the maximum number of passengers permitted: up to February 1993 – 7 passengers; from March 1993 to December 1997 – 8 passengers; and as of January 1998 – 10 passengers.

**Private car:** A vehicle that is neither a public service vehicle, a commercial vehicle nor a two-wheeled vehicle.

**Special vehicle:** A vehicle designed for special services: ambulance, medical van, sanitary vehicle, recovery vehicle, engineering vehicle, crane, etc.

**Motorcycle:** A motor vehicle with two or three wheels, described in its licence as a motorcycle, including tricycle and motorcycle with sidecar.

As of 1992, the Licencing Department has stopped classifying motorcycles by type (scooter, motor scooter, motorcycle etc.) and classifies only by engine capacity (in cc). The new legal classification regarding driving licences relates to four principal types:

1. Up to 50 cc (corresponds to "scooter" or "motor bicycle" by the previous classification)
2. 51-250 cc
3. 251-500 cc
4. Over 500 cc.

**Rate of motorization:** The number of vehicles per 1,000 residents (permanent residents at the end of the year).

**Locality (address) of the vehicle owner:** It should be emphasized that the data in the publication are presented according to the locality (address) of the *registered owner* of the vehicle, and **not** of the actual user of the vehicle. Thus, for example, Tel Aviv-Yafo is assigned a large number of vehicles, since state vehicles and vehicles of large enterprises are registered there, even though they do not necessarily operate in the Tel Aviv-Yafo area. This problem exists in other localities as well. When enterprises owning large vehicle fleets change the registered address of their fleet, it causes a "jump" in the rate of motorization for the "recipient" locality (compared to the previous year). However, that "jump" does not reflect any change in the number of vehicles available to the residents of that locality. The locality (address) of the registered owner also affects the average age of the vehicles in that locality. The average age of the enterprises fleets, especially renting and leasing companies, is low and thus influences the average age of vehicles in the registered locality, for example in Bene Beraq (see Table 16).

**Additions:** Vehicles that were included in the number of motor vehicles (as defined above) for the year of processing the data, but not in the number of vehicles in the previous year.

**Subtractions:** Vehicles that were included in the number of motor vehicles for the previous year, but are not included in the year of the data processing.

**Vehicles supplied to the local market:** The definitions of "vehicles supplied to the local market" that appear in the *Transport Statistics Quarterly* and in the *Monthly Bulletin of Statistics* differ slightly from the definition of "private car" presented for the number of motor vehicles. Therefore, when comparing the data, the different definitions should be noted:

1. Vehicles supplied to the local market are registered upon leaving the factory, or when they are imported and released from the port. These vehicles appear in the number of motor vehicles only upon registration at the Licencing Department.
2. Vehicles supplied to the local market, by definition, do not include vehicles that were taken off the road, and whose licences were renewed during the year of processing the data.
3. Vehicles supplied to the local market also include security vehicles and vehicles sold to the Palestinian Authority.

**Air Pollution from Transportation:** Quantities of air pollution emissions are calculated in the Agriculture and Environment Sector at the Central Bureau of Statistics, on the basis of:

1. Annual quantities of fuels consumed by motor vehicles.
2. Annual kilometers travelled by the various types of vehicles, by age of vehicle.
3. Emission factors of air pollutants from vehicles are based on research conducted at the Technion.<sup>1</sup> These emission factors have been calculated to date only for private motor vehicles and buses. Emission factors for other types of vehicles and other fuel types were based on European factors, which were obtained from the Air Quality Division (Mobile Sources Division) at the Ministry of Environmental Protection.

Concentrations of air pollutants from traffic stations were obtained from the Air Quality Division (Israeli Air Monitoring Center) of the Ministry of Environmental Protection.

**Carbon Dioxide (CO<sub>2</sub>):** Originates from complete combustion of fuel. It is considered a greenhouse gas which causes global warming.

**Carbon Monoxide (CO):** A gas produced by incomplete combustion of fuels, mainly from emissions of motor vehicles. This gas obstructs the supply of oxygen to the body; inhaling high concentrations of the gas may cause choking.

**Sulphur Oxides (SO<sub>x</sub>):** Originates mainly from emissions of power stations, refineries and manufacturing establishments. The main effect of sulphur oxides on health is among groups at risk from pollutants, such as asthmatics.

**Nitrogen Oxides (NO<sub>x</sub>):** Acid gases that originate mainly from emissions of power stations, manufacturing establishments and motor vehicles (mainly from diesel-powered engines). These gases may cause damage to the respiratory and the immune systems.

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<sup>1</sup> Tartakovski et al., Estimation of Emission Factors from Diesel Vehicles in Israel (First Stage – Buses), Research Report 277/2000, May 2000, p. 64.

**Hydrocarbons (HC):** Compounds of carbon and hydrogen emitted during combustion and evaporation of fuels. These compounds originate mainly from emissions of motor vehicles and refineries. These compounds contain toxic and carcinogenic materials.

**Suspended Particulate Matter (SPM):** A series of atmospheric materials based on carbon, produced by natural sources (sand, pollen, etc.) and by human activity (combustion, construction, quarrying, etc.). The most dangerous particles are those smaller than 10 micron in diameter (**PM10 – Respirable Suspended Particulates**), which can be inhaled into the respiratory system. They usually originate from natural sources and include the group of particles that are 2.5 microns or less in diameter (**PM2.5 – Fine Respirable Suspended Particulates**), which are usually emitted by industry, transportation, and domestic heating.

**Lead (Pb):** A heavy metal that was a necessary additive to gasoline for many years. This toxic metal may damage the nervous system, especially in children.

**Unleaded gasoline:** Over the years, the Israeli economy has been converted to the use of unleaded gasoline. Cars that use unleaded gasoline also pollute the air with lead, but to a significantly lesser extent. In Israel, as in other developed countries, cars produced as of 1993 are required by law to have catalytic converters installed so only unleaded gasoline can be used by them. With time, the number and relative share of vehicles using unleaded gasoline, have risen.

**Air quality standard:** Defines the maximum concentration of a pollutant permitted during a specific time period.

**Maximal value for half-hour/8 hours/24 hours:** The maximum half-hour/8 hours/daily (respectively) value recorded during the year.

**Traffic stations:** Monitoring stations for air pollutants originating in motor vehicles, and located next to major highways. Measurement is carried out at the height of the motor vehicle and represents the quality of local air that is actually breathed by people who cross or remain near to major highways. In these stations, air pollutants that are characteristic to emissions from vehicles are measured continuously and automatically by special monitors. These data are stored temporarily at the station, averaged every five minutes, and transmitted to the National Air Monitoring Center of the Ministry of Environmental Protection, for the purpose of permanent storage and continued processing. Most of the traffic monitoring stations has been in full operation since 1998. All of them belong to National Air Monitoring Center of the Ministry of Environmental Protection, except for the Em HaMoshavot station, which is owned by the Petah Tiqwa municipality.

The values in the monitoring station in Petah Tiqwa are calculated with a moving average.

**Uptime of monitoring stations:** The percentage of time a station worked during the year. Uptime rates below 100% can be attributed to daily time devoted to scaling, instrument failure or disruption of work at the station.