

Special Technical Session

The Legal System of Japan on Motor Vehicles*

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Part 1: Outline of Legal System on Motor Vehicles

Introduction

In Japan, the recent progress of motorization has been remarkable, and today we cannot talk about social activities without including motor vehicles. In this series entitled "Legal System of Japan on Motor Vehicles", we will explain in seven installments the contents of various systems mainly on structures of vehicles in the environments surrounding motor vehicles.

As the first installment of the series, we explain in the present issue the outline of the legal system relating to motor vehicles centering around the Road Vehicles Act so as to provide a general picture of how the laws and acts relating to motor vehicles have been legislated in Japan. We hope this series will be of help to those concerned with motor vehicles in foreign countries in understanding the various measures in Japan governing motor vehicles from the side of hardware.

Outline of This Series

Before embarking on the main subject, we will explain the outline of contents of the respective installments.

1st Installment: Outline of Legal System on Motor Vehicles

Explanation will be made on various systems under the Road Vehicles Act and at the same time the outline of the Road Traffic Law, the Air Pollution Control Law, etc.

2nd Installment: Safety Regulations for Motor Vehicles

Furthermore, as to the Safety Regulations for Road Vehicles, explanation will be made on the environment surrounding motor vehicles such as the number of motor

vehicles, the number of traffic accidents, etc. and also on the system of safety regulations under the Road Vehicles Act and circumstances leading up to the main amendment. On the other hand, contents of recommendations by the Council for Transport Technics which is preparing a plan to strengthen and expand the safety regulations will be explained.

3rd Installment: Motor Vehicle Pollution Control Measures and Energy-Saving Measures

As to the regulations of exhaust emissions for motor vehicles and the regulations of noise, explanation will be made on the outline and circumstances of regulations and at the same time on the environmental standards laid down by the Basic Law for Environmental Pollution Control and the present pollution situation, etc.

In addition, regarding the energy-saving measures of motor vehicles, the Rationalization of Energy Consumption Act and the standards such as a goal for improving fuel consumption, etc. based on the said Act will be explained.

4th Installment: Motor Vehicle Type Approval System

As the type approval systems for the purpose of examining whether motor vehicles meet safety and pollution control regulations, there are two systems, the Type Designation System and the Type Notification System, which will be explained in this installment.

In applying such systems, for a concrete application of safety and pollution control regulations, technical requirements, standards for type approval testing and test procedures are determined, an outline of which will be provided.

In addition, reference will be made to the recall system, which will be applied in case the structure and devices of a motor vehicle have any defect which may cause a problem affecting the safety or pollution control.

5th Installment: Motor Vehicle Inspection and Registration System

Explanation will be made not only on the vehicle inspection system whereby the Government itself inspects motor vehicles at its Land Transport Office to determine whether they meet the safety regulations, but also on the actual inspection procedures, facilities, personnel, etc.

Further, the registration system for motor vehicles which have passed the inspection will also be explained.

* Received 10th July, 1980

6th Installment: Motor Vehicle Accident Preventive Measures and Research System of the Government

Explanation will be made on various measures for preventing motor vehicle accidents and also on measures for prevention of accidents from the sides of operational management and vehicle maintenance of motor vehicle transportation businesses.

Further, explanation will be made on the safety measures for the transportation of dangerous materials such as gasoline, liquefied petroleum gas, high-pressure gas, etc. In addition, we will explain the test and research system conducted by the Government relating to the safety, pollution and energy-saving of motor vehicles.

7th Installment: Maintenance and Repair of Motor Vehicles

Explanation will be made on the periodical inspection and maintenance system for the prevention of motor vehicle accidents and at the same time reference will be made to the actual procedures of maintenance and repair and the conditions of application.

Further explanation will be made on the approval system aiming at a sound development of motor vehicle maintenance and repair business and the designated motor vehicle repair business system whereby the motor vehicle inspection conducted at the Land Transport Office can be substituted by repair and inspection at designated maintenance and repair shops.

Explanation will also be made on the authorization system of motor vehicle maintenance and repair mechanics aiming at improving their skills in maintaining and repairing motor vehicles.

Outline of Legal System on Motor Vehicles

The total number of motor vehicles in use in Japan was only 140,000 in 1945, but in recent years there has been a remarkable increase in the number of motor vehicles in use. The number doubled to 5 million in 1963, 10 million in 1967 and 20 million in 1971 and reached 37 million at the end of March, 1980, a jump of about 7% over each previous year, and the number of persons who have driver's licenses now exceeds 40 million (Table 1: Number of motor vehicles in use and number of persons who have driver's licenses). During the above period, the performance of motor vehicles also improved greatly, and with the improvement of roads, enlargement of economic scale, etc. the diffusion of motor vehicles increased outstandingly, with the result that they have considerable influence on Japan's economic and social life.

Incidental to such spread and popularization of motor vehicles, the legal system has been improved and completed gradually. The following chart outlines the main laws and acts relating to motor vehicles:

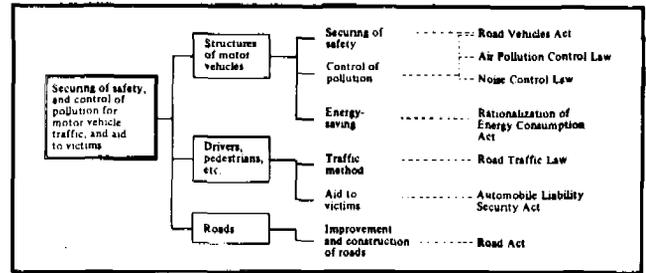


Chart of legal system relating to motor vehicles.

The outline of these main Acts and Laws is as follows:

The Road Vehicles Act, or 1951-Law No. 185, was enacted on June 1, 1951 and has been the changing conditions.

This Act sets out requirements for structures and systems of motor vehicles for the purpose of ensuring the safety and pollution control of motor vehicles and at the same time establishes a system for inspection and registration of motor vehicles, aiming at their appropriate use. Further, the Act also obliges proper maintenance and repair of motor vehicles in order to ensure the safe performance, etc. of structures and systems of motor vehicles and provides for the maintenance and repair business.

Since the Act is the fundamental law to regulate motor vehicle structure, further explanation will be made on the outline of the main items:

Safety regulations for road vehicles:

In order to secure the safety of motor vehicles and control pollution on the structures and systems of motor vehicles, the minimum technical requirements for safety are determined. Therefore, motor vehicles must be manufactured so as to meet such requirements.

Further, regulations must be met in conducting maintenance and inspection of motor vehicles which are presently used. The respective technical requirements are determined in the "Safety Regulations for Road Vehicles" as the Ministry of Transport Ordinance (Ministry of Transport Ordinance No. 67 of July 28, 1951) under the provisions of the Act.

Registration system of motor vehicles:

In order to certify officially the ownership of motor vehicles, all motor vehicles (excluding motorcycles and motor vehicles with special structures) must be registered and must bear motor vehicle registration number plates. No unregistered motor vehicle is permitted to run on the roads.

EXPERIMENTAL SAFETY VEHICLES

Table 1. Number of motor vehicles in use and number of persons who have driver's licenses.

Year	Number of motor vehicles (1)											Number of persons who have driver's licenses	
	Buses, passenger cars, trucks								Others(4)	Grand total	Index		
	Buses	Index	Passenger Cars(2)	Index	Trucks(3)	Index	Total	Index					
1954	34,187	18	138,518	2	234,598	4	407,303	3	343,952	751,255	4	2,788,888	10
'55	34,187	18	153,325	2	250,005	5	437,517	4	520,656	958,173	5	3,780,241	13
'56	38,050	20	181,074	3	294,213	6	513,337	4	537,873	1,051,210	6	4,299,688	15
'57	42,724	23	218,524	3	372,442	7	633,690	5	606,783	1,240,473	7	5,009,417	17
'58	46,957	25	259,631	4	454,617	9	761,205	6	673,372	1,434,577	8	6,025,653	21
'59	51,030	27	318,758	5	574,481	11	944,269	8	812,646	1,756,915	10	7,654,152	27
'60	56,179	30	419,921	6	738,001	14	1,214,101	10	1,118,577	2,332,678	13	10,723,136	37
'61	63,450	34	569,469	9	971,306	18	1,604,225	13	1,544,814	3,149,039	18	11,871,634	41
'62	72,029	38	742,918	11	1,245,543	24	2,060,490	17	2,029,971	4,090,461	23	13,919,536	48
'63	81,414	43	1,009,868	15	1,608,535	30	2,699,817	22	1,949,477	4,649,294	26	16,211,847	56
'64	93,011	49	1,370,591	21	2,042,629	39	3,506,231	29	2,284,532	5,790,763	32	18,989,959	66
'65	102,695	55	1,787,501	27	2,469,322	47	4,359,518	36	2,632,737	6,992,255	39	21,103,820	73
'66	114,289	59	2,337,606	36	3,019,827	57	5,471,722	48	3,033,858	8,505,580	48	22,856,547	79
'67	129,217	69	3,095,070	47	3,699,541	70	6,923,828	58	3,589,340	10,513,168	59	24,697,215	86
'68	148,286	79	4,067,173	62	4,358,308	82	8,573,767	71	4,312,304	12,886,071	72	26,343,152	92
'69	170,137	91	5,296,090	81	4,934,128	93	10,400,355	87	5,062,958	15,463,313	87	24,782,107	100
'70	187,980	100	6,534,558	100	5,299,821	100	12,022,359	100	5,826,497	17,848,856	100	26,449,229	92
'71	194,360	104	7,871,277	120	5,639,560	106	13,705,197	114	6,381,642	20,086,839	117	28,000,367	97
'72	202,819	108	9,531,576	146	6,078,692	115	15,813,087	132	6,790,727	22,603,814	127	29,474,643	107
'73	212,622	113	11,429,191	175	6,617,875	114	18,259,688	154	6,909,085	25,168,773	141	30,778,778	102
'74	222,430	118	12,927,078	183	6,950,769	131	20,100,277	167	6,839,366	26,939,643	151	32,143,688	112
'75	226,284	120	14,625,196	224	7,298,479	138	22,149,959	184	6,028,405	28,178,364	158	33,482,514	116
'76	222,796	119	15,667,959	240	7,656,609	144	23,547,364	196	6,162,736	29,710,100	166	35,148,742	122
'77	224,648	120	17,112,567	262	8,054,405	152	25,391,620	211	6,696,783	32,088,403	190	37,022,922	129
'78	226,970	121	18,976,620	290	8,365,869	158	27,569,459	229	6,628,987	34,198,457	192	39,174,099	136
'79	229,039	122	20,447,090	313	8,670,578	164	29,346,707	244	6,961,074	36,307,781	203	41,042,876	166

- (1) Excluding small-sized special motor vehicles and two-wheel motor vehicles
 (2) Excluding light motor vehicles
 (3) Excluding light motor vehicles
 (4) Large-sized special vehicles, vehicles for special uses, light passenger and cargo carrying vehicles

Table 2. Actual length of roads.

Year	Actual extension	Index	(Unit: km) (Paving rate: %)		Extension of sidewalks	
			Paving rate	Index	Index	Index
1956	943,430	92	2.1	12	-	-
'57	952,932	93	2.3	13	-	-
'58	959,950	94	2.5	14	-	-
'59	961,914	94	2.8	15	-	-
'60	972,949	95	3.1	17	-	-
'61	968,441	95	3.5	19	-	-
'62	971,522	95	4.1	23	-	-
'63	967,534	95	5.1	28	-	-
'64	984,753	96	6.2	34	-	-
'65	988,774	97	7.4	41	-	-
'66	996,630	97	9.0	49	-	-
'67	994,926	97	10.8	59	-	-
'68	1,004,315	98	12.6	69	-	-
'69	1,013,951	99	14.9	82	-	-
'70	1,022,936	100	18.2	100	17,004.7	100
'71	1,036,895	101	21.7	119	21,438.9	126
'72	1,048,496	103	25.1	138	26,288.1	155
'73	1,057,648	103	28.6	157	29,539.5	174
'74	1,066,028	104	31.6	174	33,750.0	199
'75	1,077,320	105	34.4	189	38,920.5	229
'76	1,086,230	106	37.1	204	42,959.8	253
'77	1,095,053	107	40.0	220	47,394.6	279
'78	1,103,731	108	42.8	235	52,032.1	306

Note: Statistical data of the Ministry of Construction (excl. national expressway)

Table 3. Running distance of motor vehicles.

Year	(Unit: km) (Paving rate: %)							
	Total running kilometers	Index	Buses	Index	Passenger cars	Index	Trucks	Index
1956	13,859,887	6	1,398,674	26	4,852,452	4	7,608,761	8
'57	16,695,533	7	1,575,229	29	6,774,381	6	9,345,923	9
'58	19,207,242	9	1,748,883	32	6,641,197	6	10,817,162	11
'59	21,492,342	10	1,932,814	36	7,433,941	6	12,125,587	12
'60	28,163,992	13	1,994,286	37	8,724,773	7	17,444,933	17
'61	35,545,397	16	2,206,014	41	11,866,980	10	21,472,403	22
'62	42,963,344	19	2,448,188	45	15,388,572	13	25,126,584	25
'63	56,282,902	25	2,775,045	51	20,934,617	17	32,573,240	33
'64	70,329,156	31	3,326,712	62	25,913,310	22	41,089,134	41
'65	82,155,224	36	3,589,909	67	34,002,311	28	44,563,004	45
'66	104,746,513	46	3,898,335	72	43,489,704	36	57,358,474	57
'67	132,213,728	59	4,278,356	83	58,100,265	48	69,835,107	70
'68	163,421,042	72	4,707,369	87	76,207,835	63	82,505,838	83
'69	193,602,944	86	5,013,385	93	96,572,290	80	92,017,269	92
'70	226,016,858	100	5,394,083	100	120,582,367	100	100,040,408	100
'71	243,478,952	108	5,378,047	100	137,399,672	114	100,701,233	101
'72	259,593,276	115	5,666,980	105	146,272,038	121	107,654,258	108
'73	276,194,188	122	5,473,747	102	164,010,339	136	106,710,102	107
'74	266,484,708	118	5,318,404	99	161,009,634	134	100,156,670	100
'75	286,345,148	127	5,450,669	101	176,035,354	146	104,859,155	105
'76	309,698,312	137	5,469,302	101	186,082,581	154	118,146,429	118
'77	342,325,595	151	5,722,674	106	205,366,844	170	131,236,077	131
'78	361,261,270	160	5,896,439	109	220,362,502	183	135,002,329	135

Note: Statistical data of the Ministry of Transport

SECTION 5: TECHNICAL SESSIONS

On the other hand, for the identification of motor vehicles, the number and type must be embossed on the chassis and engine.

Motor vehicle inspection system:

In order to ensure the safety of motor vehicles and control pollution by motor vehicles, a motor vehicle inspection system is provided and all motor vehicles which run on the roads must have received such inspection and obtained a valid motor vehicle inspection certificate. In case of a new motor vehicle which has not yet obtained the inspection certificate, the vehicle must be inspected

by the Government (initial inspection) to obtain the inspection certificate. In the certificate, the effective period of two years in case of a passenger carrying motor vehicle and one year each in case of bus and truck is entered, respectively.

In case such a motor vehicle is to be used continuously after the effective period, the motor vehicle must be inspected by the Government or a maintenance and repair shop designated by the Government (continuation inspection) and the effective period may be extended. The result of inspection will be judged on the basis of whether the motor vehicle meets the Safety Regulations for Road Vehicles and the related circular notices or not.

Table 4. Changes in volume of traffic by transportation means.

1. Cargo:		Tonnage of domestic cargo transported (Unit: 1 million tons)							Ton-kilometers of domestic cargo transported (Unit: 100 million ton-kilometers)							Transportation share (%)						
Year	Total	Motor vehicles		Railways			Domestic airways	Total	Motor vehicles		Railways			Domestic airways	Tonnage				Ton-kilometers			
		Total	Japan National Railways	Private railways	Coastal vessels	Japan National Railways			Private railways	Coastal vessels	Domestic airways	Motor vehicles	Railways		Coastal vessels	Airways	Motor vehicles	Railways	Coastal vessels	Airways		
1950	523	309	165	136	29	49	-	647	54	338	333	5	255	-	59	31	9	-	8	52	39	-
'55	831	569	193	160	33	69	-	818	95	433	426	7	290	-	69	23	8	-	12	53	35	-
'59	1,394	1,062	220	181	39	112	-	1,198	183	505	497	8	510	-	76	16	8	-	15	42	43	-
'60	1,533	1,156	238	195	43	139	0.009	1,389	208	545	536	9	636	0.06	75	16	9	0	15	39	46	0
'61	1,841	1,437	251	206	45	153	0.015	1,562	266	584	575	9	712	0.40	78	14	8	0	17	37	46	0
'62	2,012	1,602	248	202	46	162	0.018	1,615	324	572	563	9	719	0.12	80	12	8	0	20	35	45	0
'63	2,378	1,948	253	206	47	177	0.024	1,810	420	602	592	10	788	0.15	82	11	7	0	23	33	44	0
'64	2,634	2,210	259	207	52	165	0.031	1,842	472	599	589	10	771	0.20	84	10	6	0	26	32	42	0
'65	2,626	2,193	253	200	53	180	0.033	1,864	484	574	564	9	806	0.21	83	10	7	0	26	31	43	0
'66	3,106	2,654	250	196	54	202	0.051	2,095	649	559	550	9	887	0.32	85	8	7	0	31	27	42	0
'67	3,744	3,272	259	203	56	213	0.070	2,442	811	595	585	10	1,036	0.43	87	7	6	0	33	24	43	0
'68	4,330	3,813	254	199	55	263	0.082	2,704	1,015	600	590	10	1,088	0.52	88	6	6	0	38	22	40	0
'69	4,741	4,165	253	197	56	323	0.104	3,152	1,199	612	602	10	1,340	0.65	88	5	7	0	38	19	43	0
'70	5,259	4,626	256	199	57	377	0.116	3,506	1,359	634	624	10	1,512	0.74	88	5	7	0	39	18	43	0
'71	5,434	4,796	251	193	58	387	0.127	3,621	1,427	623	613	10	1,570	0.81	88	5	7	0	39	17	44	0
'72	5,876	5,203	239	182	57	434	0.167	3,892	1,536	596	586	10	1,759	1.16	88	4	8	0	39	15	46	0
'73	5,716	4,912	229	176	53	575	0.204	4,072	1,410	583	574	9	2,077	1.50	86	4	10	0	35	14	51	0
'74	5,084	4,377	206	158	48	501	0.185	3,758	1,308	525	516	9	1,924	1.40	86	4	10	0	35	14	51	0
'75	5,030	4,393	185	142	43	452	0.190	3,609	1,297	474	466	8	1,836	1.52	87	4	9	0	36	13	51	0
'76	5,000	4,356	186	141	45	458	0.200	3,734	1,326	463	455	8	1,943	1.60	87	4	9	0	36	12	52	0
'77	5,101	4,456	175	132	43	470	0.226	3,869	1,431	413	406	7	2,023	1.83	88	3	9	0	37	11	52	0
'78	5,541	4,860	178	133	45	503	0.265	4,095	1,561	412	404	8	2,120	2.24	88	3	9	0	38	10	52	0

2. Passengers:		Number of passengers transported (Unit: 1 million persons)							Person-kilometers of passengers transported (Unit: 100 million person-kilometers)							Transportation share (%)			
Year	Total	Motor vehicles		Railways			Coastal vessels	Domestic airways	Total	Motor vehicles		Railways			Domestic airways	Passengers		Person-kilometers	
		Buses	Passenger cars	Japan National Railways	Private railways	Japan National Railways				Private railways	Coastal vessels	Domestic airways	Motor vehicles	Railways		Motor vehicles	Railways		
1950	9,813	1,393	122	3,001	5,297	-	-	1,146	83	7	691	365	-	15	85	8	92		
'55	14,116	3,556	706	3,849	5,932	74	0.00	1,658	233	42	912	449	20	2	30	70	17	83	
'59	18,985	5,937	1,281	4,813	6,856	96	0.83	2,213	392	88	1,142	561	26	4	38	62	22	78	
'60	20,291	6,291	1,610	5,124	7,166	99	1.22	2,433	440	115	1,240	604	27	7	39	61	23	77	
'61	22,379	7,144	2,150	5,284	7,691	108	2.01	2,663	492	160	1,318	653	29	11	42	58	25	75	
'62	24,190	7,873	2,564	5,610	8,029	111	2.99	2,898	544	196	1,412	698	30	18	43	57	26	74	
'63	26,177	8,411	3,152	6,040	8,458	112	4.05	3,222	629	265	1,527	747	30	24	44	56	28	72	
'64	29,384	10,324	3,695	6,410	8,831	119	4.80	3,556	760	319	1,642	777	31	27	48	52	31	69	
'65	30,792	10,557	4,306	6,722	9,076	126	5.19	3,821	801	406	1,740	814	31	29	48	52	32	68	
'66	32,088	10,794	5,236	6,842	9,081	130	4.89	4,033	839	546	1,758	830	31	29	50	50	35	65	
'67	34,189	11,232	6,663	7,048	9,246	145	6.46	4,422	905	741	1,843	861	33	39	52	48	37	63	
'68	36,107	11,529	8,214	6,868	9,336	152	8.44	4,812	953	1,036	1,848	889	35	51	55	45	42	58	
'69	37,993	11,674	10,111	6,541	9,493	163	10.83	5,281	1,002	1,419	1,815	938	37	70	57	42	47	53	
'70	40,606	11,812	12,221	6,534	9,850	174	15.43	5,872	1,029	1,813	1,897	991	48	94	59	41	50	50	
'71	42,010	11,634	13,687	6,659	9,836	178	16.42	6,177	1,008	2,116	1,903	997	50	103	60	39	52	48	
'72	43,275	11,711	14,572	6,724	10,061	188	18.86	6,482	1,082	2,203	1,978	1,025	67	127	61	39	52	48	
'73	44,563	11,390	15,922	6,871	10,185	171	23.54	6,737	1,117	2,257	2,081	1,048	74	160	62	38	52	48	
'74	45,080	11,206	16,105	7,113	10,476	155	25.26	6,934	1,158	2,284	2,156	1,085	75	176	61	39	52	48	
'75	46,176	10,731	17,681	7,048	10,540	151	25.44	7,104	1,101	2,508	2,153	1,085	66	191	62	38	53	47	
'76	46,667	10,231	18,679	7,180	10,402	147	28.25	7,093	987	2,645	2,107	1,088	65	201	62	38	53	47	
'77	47,548	10,189	19,416	7,068	10,699	143	32.89	7,108	1,046	2,640	1,997	1,126	63	236	62	37	52	44	
'78	49,351	9,964	21,446	6,997	10,763	144	37.10	7,472	1,070	2,960	1,958	1,153	62	269	64	36	54	42	

Type designation system:

The type designation of motor vehicles is established for motor vehicles manufactured in large quantity uniformly. Manufacturers or importers of motor vehicles can apply for type designation of motor vehicles to the Minister for Transport by presenting necessary documents and the motor vehicles.

The type designation will be made by determining whether the subject motor vehicle meets the Safety Regulations and whether motor vehicles identical to the motor vehicle for which application is being submitted can be manufactured.

The person who has obtained the type designation must, if he intends to manufacture and sell the type-designated motor vehicles, inspect the motor vehicles to determine whether they meet the Safety Regulations and that their uniformity is secured (completion inspection) and issue the termination certificate of completion inspection.

If, at the time of initial inspection, this termination certificate of completion inspection is presented, the Government will omit the enforcement of initial inspection and issue a motor vehicle inspection certificate.

Maintenance and repair system and maintenance and repair business system:

In order to ensure constant compliance with the Safety Regulations and prevent any decline in safety and use efficiency of motor vehicles, an operator of a motor vehicle is obliged to conduct a daily inspection before the operation every day and the user of a motor vehicle is obliged to make a periodical inspection and maintenance.

Moreover, it is provided that according to the number of motor vehicles possessed a maintenance and repair supervisor must be appointed and periodical maintenance and repair of the motor vehicles be made with the technology and at the responsibility of such a maintenance and repair supervisor. In addition, in order to improve the ability for maintenance and repair, a system of ability authorization for motor vehicle maintenance and repair mechanics is also provided.

In order to confirm that the disassembling repair of motor vehicles by a motor vehicle disassembling repair business meets the Safety Regulations and to promote the sound development of disassembling repair business, a system of authentication of business is effected based on conditions to the minimum extent required for safety. On the other hand, to rationalize the motor vehicle inspection system and for the convenience of users of motor vehicles, a system is provided to make best use of the inspection ability of private motor vehicle maintenance and repair businesses and to omit the periodical inspection by the Government, if a motor vehicle has received an inspection by a designated maintenance and repair business.

The Road Traffic Law, or 1960-Law No. 105, was enacted on June 25, 1960 and has been revised 16 times up to the present.

This Law provides for traffic control by signals and road signs for the prevention of accidents and smooth traffic on roads and at the same time stipulates the movement of pedestrians and the traffic rules for motor vehicles such as maximum speed, overtaking zones, driving operation, etc.

The Law also stipulates that a person who intends to drive a motor vehicle must obtain a driver's license and other matters to be observed by drivers in driving a motor vehicle such as prohibition of drunken driving, etc.

The Air Pollution Control Law, or 1968-Law No. 97, was enacted on June 10, 1968 and has been revised 6 times up to the present.

The object of this Law is to reduce smoke emitted from industrial plants and harmful gas emitted from motor vehicles to promote the public health.

Especially on motor vehicles, it is provided that the permissible limit of carbon monoxide, hydrocarbon and nitrogen oxides, etc. emitted from motor vehicles must be determined, that prefectures may measure the density of pollutants in the area where air pollution is conspicuous and may, where necessary, make a request or give opinion to the related organizations, etc.

The Noise Control Law, or 1968-Law No. 98, was enacted on June 10, 1968 and has been revised 4 times up to the present.

The object of this Law is to reduce the noise emitted by plants or motor vehicles to protect the living environment.

Especially on motor vehicles, it is stipulated that the permissible limit of noise made by motor vehicles must be determined, that prefectures may measure noise in the designated area and may, where necessary, make a request or give opinion to the related organizations, etc.

The Rationalization of Energy Consumption Act, or 1979-Law No. 49, was enacted on June 22, 1979.

The object of this Act is to save energy consumed by plants, buildings, machinery and equipment to utilize fuel resources as effectively as possible in view of the energy situation in Japan where most energy resources must be imported.

As to motor vehicles, manufacturers and importers of motor vehicles designated by the cabinet order are obliged to meet guidelines to improve and indicate the fuel efficiency, etc.

EXPERIMENTAL SAFETY VEHICLES

The Automobile Liability Security Act, or 1955-Law No. 97, was enacted on July 29, 1955 and has been revised 11 times up to the present.

This Act obliges owners of motor vehicles to take out automobile liability insurance against accidents resulting in injury or death through operation of motor vehicles, in order to aid the victims of accidents by making drivers of motor vehicles which cause accidents indemnify the victims without fail.

The Act also provides for a system whereby the Government carries out the security business to aid the victims of accidents caused by hit-and-run or uninsured motor vehicles.

The Road Act, or 1952-Law No. 180, was enacted on June 10, 1952 and has been revised 29 times up to the present.

This Act stipulates, in order to improve and complete the road networks, that the improvement of sidewalks, bicycle paths, street lighting, etc. as well as the extension of roads through new construction will be carried out.

Moreover, the Act also provides for preventing injuries by road damage and restricts passing roads for motor vehicles exceeding a certain size.

The Government authorities in charge of administering these acts and laws are as follows:

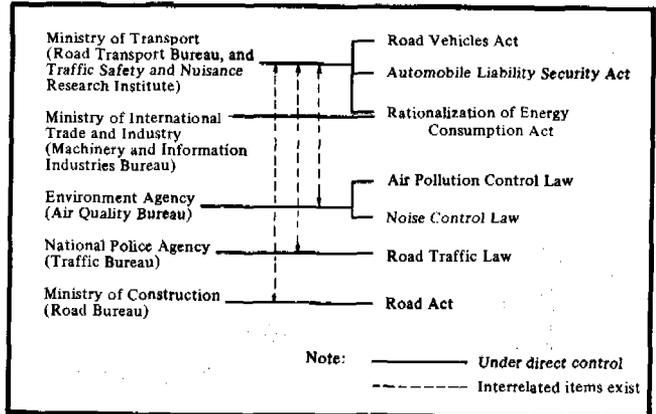


Chart of competent administrative authorities of acts and laws relating to motor vehicles.

Legal System of Japan on Motor Vehicles*

KAZUHIKO MORISAKI**
KUNIO TAKAHASHI**

Part 2: Motor Vehicle Safety Regulations

State of Motor Vehicle Accidents

The number of motor vehicles in Japan was more than 38 million as of the end of July, 1980. Incidental to this figure, the number of persons possessing driver's licenses exceeded 41 million, and motor vehicles are now playing a very important role in society and our daily life. On the other hand, with such an increase in the number of motor vehicles, traffic accidents have also risen sharply, but safety measures against traffic accidents have taken effect resulting in a decrease in the number of traffic accidents which had reached a peak in 1969. Moreover, the number of fatalities also has been decreasing after attaining a peak in 1970. However, even now the number of victims of traffic accidents exceeds 600,000 a year of whom 8,000 are fatalities. Over the past one or two years, the decreasing trend has bottomed out, remaining on the same level (Table 1 and Fig. 1). Compared with traffic accidents in foreign countries, the number of accidents and fatalities had shown a decreasing trend for several years with the number of fatalities in 1976 standing in fourth place after the United States, West Germany and France. The number of fatalities per 100,000 persons was the lowest among 14 countries, the number of fatalities per 10,000 motor vehicles standing thirteenth among the 14 countries (Table 2, Figs. 2 and 3).

According to the number of fatalities by accident patterns in Japan in recent years, while "running weapon-type" accidents (accidents involving pedestrians, bicyclists and motorcyclists) indicate a slightly downward trend, the rate of "running coffin-type" accidents (accidents involving motor vehicle passengers) is rising, so that regarding the number of fatal accidents in 1979 the rates of both were the same (Table 3).

Comparing the number of fatalities by types of accidents with those of foreign countries, we find that while in the United States the number of fatalities among motor vehicle passengers is very large, the number of pedestrian fatalities is considerably larger in European countries, especially in the United Kingdom and West Germany (Fig. 4).

The types of accidents in Japan have been similar to those in European countries, but now there is a tendency toward the types prevailing in the United States.

Next, according to the number of traffic accidents by roads, 69% of the total number of traffic accidents in 1979 occurred in urban areas and the remaining 31% occurred in non-urban areas. Moreover, even in urban areas, most accidents occurred at intersections in cities, and in urban areas other than cities accidents at road sections (road sections excluding intersections, pedestrian crossings, tunnels, curves, etc.) also increased as well as those at intersections.

In non-urban areas, accidents at non-intersected roads are much more common than those at intersections. The number of accidents on expressways is smaller than those on national roads or other roads, but as to fatal accidents, while one fatality occurs with every 59 accidents on ordinary roads, one fatality to 17 accidents occurs on expressways. Therefore, though fewer traffic accidents occur on expressways, traffic accidents on expressways result in a high probability of a fatality.

Traffic accidents by passenger motor vehicles are increasing year by year reflecting an increase in the rate of passenger motor vehicles (Table 4).

However, due to the scale of damage at the time of accidents or the number of fatal accidents per number of motor vehicles, accidents caused by trucks result in serious injuries more often. Recently in Japan, fatal accidents caused by large-sized trucks hitting bicyclists, pedestrians, etc. on their left front or left side in turning

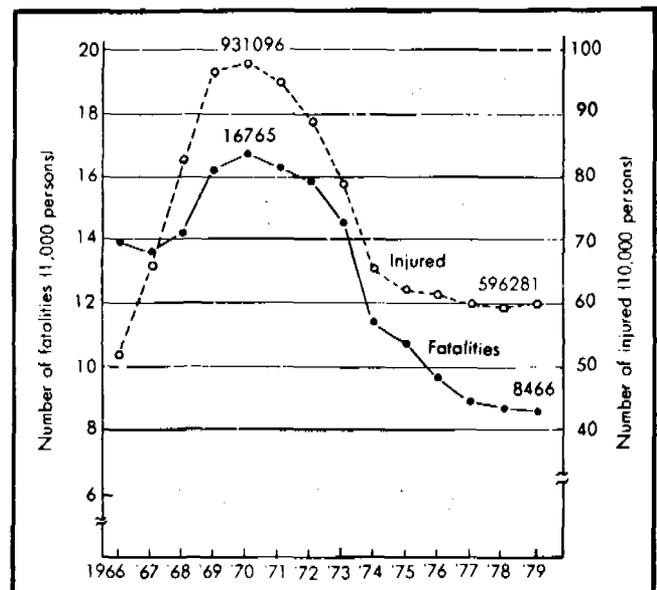


Figure 1. Change in number of fatalities and injured in traffic accidents.

* Received 12th December, 1980

**Engineering Division,
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EXPERIMENTAL SAFETY VEHICLES

Table 1. Chronological change in number of traffic accident situations.

Year	Number of accidents (cases)	Number of fatalities (persons)	Number of injured (persons)	Population (1,000 persons)	Number of fatalities	Number of injured	Number of fatalities	Number of injured
					(per 10,000 motor vehicles)	(per 10,000 motor vehicles)	(per 100,000 population)	(per 100,000 population)
1960	449,917	12,055	289,156	94,302	34.9	837.4	12.8	306.6
1965	567,286	12,484	425,666	99,209	15.8	539.0	12.6	429.1
1970	718,080	16,765	981,096	104,665	9.0	527.9	16.0	937.4
1971	700,290	16,278	949,689	106,100	7.8	455.3	15.3	875.1
1972	659,283	15,918	889,198	107,595	6.8	380.5	14.8	826.4
1973	586,713	14,574	789,948	109,104	5.6	304.5	13.4	724.0
1974	490,452	11,432	651,420	110,573	4.1	235.1	10.3	589.1
1975	472,938	10,792	622,467	111,940	3.7	215.1	9.6	556.1
1976	471,041	9,734	613,957	113,089	3.2	198.7	8.6	542.9
1977	460,649	8,945	593,211	114,154	2.7	180.6	7.8	519.7
1978	464,037	8,783	594,116	115,174	2.5	169.7	7.6	515.8
1979	471,573	8,466	596,282	116,130	2.3	160.3	7.3	513.6

Note: Statistics issued by the Ministry of Transport, National Policy Agency and Prime Minister's Office.

Table 2. Change in number of fatalities by traffic accidents in major countries.

Items Year	Number of fatalities in traffic accidents				Number of fatalities per 100,000 population				Number of fatalities per 10,000 motor vehicles			
	1975	1976	1977	1978	1975	1976	1977	1978	1975	1976	1977	1978
Canada	6,061	5,307	-	-	-	22.0	-	-	-	4.6	-	-
U.S.A.	46,550	45,422	-	-	22.6	21.6	-	-	3.5	3.5	-	-
West Germany	14,870	14,820	14,978	14,662	-	23.6	24.4	23.9	-	6.9	7.0	6.8
France	12,996	13,577	12,961	-	24.9	25.5	24.3	-	7.6	7.0	6.7	-
Italy	9,511	8,927	8,221	7,965	-	15.7	14.5	14.0	-	5.5	5.0	4.9
U.K.	6,366	6,570	6,614	6,831	-	13.4	13.5	13.9	-	4.1	4.1	4.2
The Netherlands	2,321	2,432	2,583	2,294	-	17.4	18.5	16.5	-	5.8	6.1	5.5
Denmark	827	857	828	849	-	16.8	16.2	16.6	-	5.2	5.0	5.1
Belgium	2,346	2,988	2,522	2,589	24.6	25.3	25.6	26.3	8.2	7.9	8.0	8.2
Norway	539	471	442	434	14.5	11.6	10.9	10.7	5.1	3.7	3.5	3.4
Sweden	1,172	1,168	1,031	1,034	-	14.1	12.5	12.5	-	3.8	3.4	3.4
Switzerland	1,243	1,188	1,302	1,268	19.7	18.7	20.5	20.0	-	5.7	6.2	6.1
Australia	-	2,164	-	-	-	28.8	-	-	-	3.1	-	-
Japan	10,792	9,734	8,945	8,783	9.6	8.6	7.8	7.6	3.7	3.2	2.7	2.5

Note: Data of United Nations Economic Commission for Europe and U.N. Statistical Yearbook.

left at intersections (in Japan, motor vehicles drive on left) have occurred in succession and have become a serious social problem.

For the purpose of preventing traffic accidents, first of all we must analyze the circumstances of accidents thoroughly. Whenever a traffic accident occurs, traffic policemen rush to the scene, administer first-aid to the injured and investigate the situation and cause of the accident. The results of such investigation are collected by each prefecture and issued in the form of accident

statistics by the National Police Agency every year, and are considered to be the most authoritative in Japan. In addition, various investigations are carried out to investigate actual situations of traffic accidents scientifically, and for the purpose of ensuring the safety of motor vehicles by examining and analyzing actual accident situations, the Ministry of Transport has been studying in detail several dozen of cases every year since 1973, to determine the relation between the constructions of motor vehicles and physical injuries.

SECTION 5: TECHNICAL SESSIONS

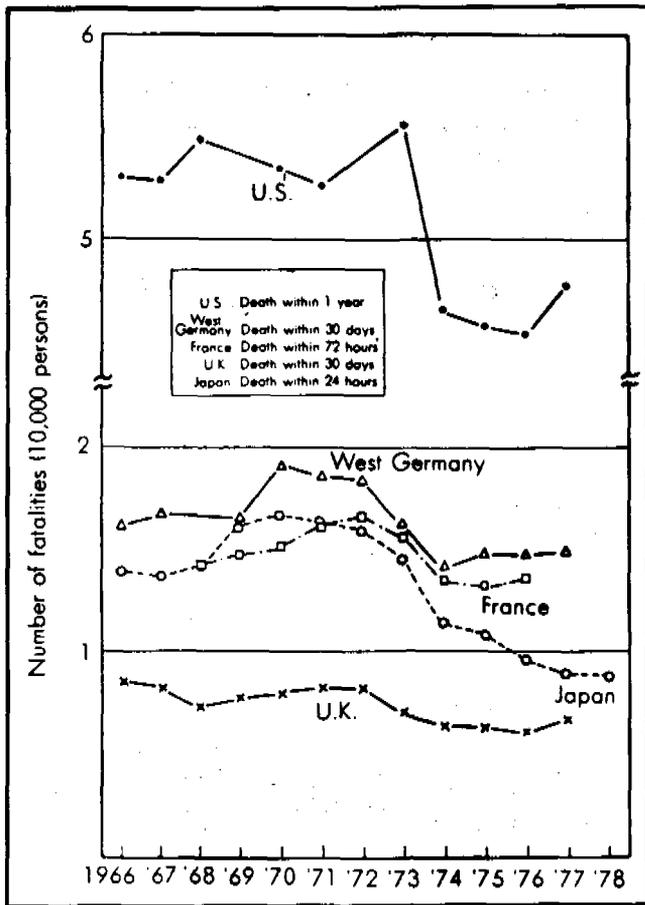


Figure 2. Change in number of fatalities by traffic accidents in major countries.

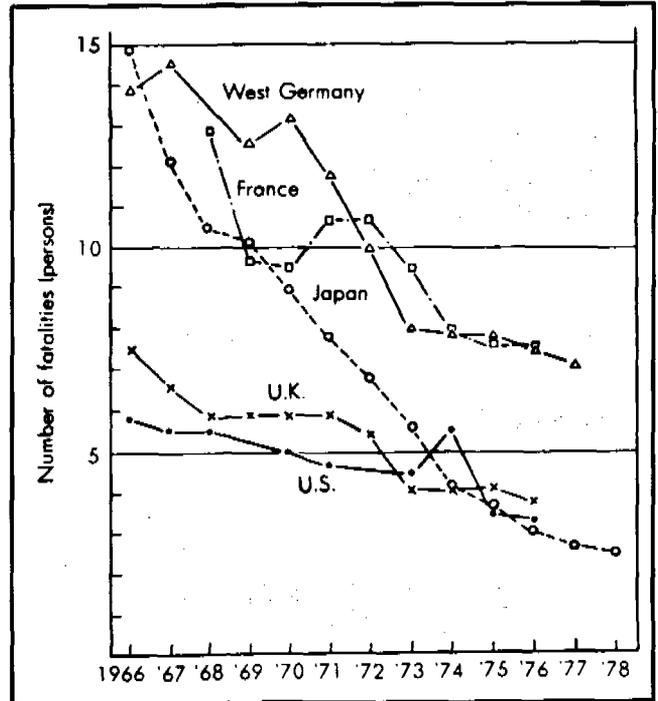


Figure 3. Change in number of fatalities per 10,000 motor vehicles.

Safety Measures in Fields Other Than Motor Vehicles

Most of these traffic accidents are caused by intricately involved factors of drivers, pedestrians, motor vehicles, road environment, etc. Therefore, for ensuring traffic safety, three factors, i.e., the improvement of all environments surrounding motor vehicles (countermeasures taken from the side of environment), elevation of safety consciousness of people such as drivers, passengers and

Table 3. Situation of fatal accidents classified by accident patterns.

Year		1975		1976		1977		1978		1979	
Accident pattern		Number of fatal accidents	Per-centage								
		(cases)	(%)								
Running weapon-type accident	Man vs. motor vehicle	4,632	45.6	4,050	44.0	3,834	45.2	3,770	45.4	3,722	46.2
	Bicycle vs. motor vehicle										
Running coffin type accident	Motor vehicle vs. motor vehicle	5,055	49.7	4,654	50.6	4,330	51.1	4,251	51.2	4,094	50.9
	Motor vehicle itself										
Railroad crossing accidents		395	3.9	302	3.3	270	3.1	244	2.9	190	2.4
Others		83	0.8	190	2.1	53	0.6	46	0.5	42	0.5
Total		10,165	100.0	9,196	100.0	8,487	100.0	8,311	100.0	8,048	100.0

Note: Statistics of National Police Agency

EXPERIMENTAL SAFETY VEHICLES

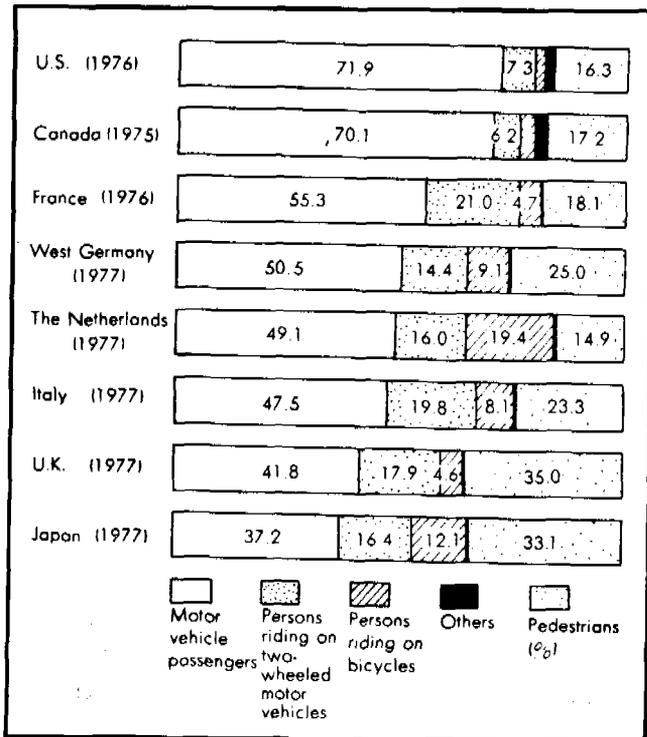


Figure 4. Breakdown of fatalities by traffic accidents in major countries.

pedestrians (countermeasures taken from the human side) and improvement of safety equipment of motor vehicles (safety measures of motor vehicles) must be combined.

Improvement of environment:

As one of three factors of motor vehicle accidents, there is the "environment" surrounding motor vehicles. The environment relating to motor vehicle accidents may be divided into road environment, traffic environment, environment along roads, natural environment, etc. The road environment consists of roads themselves such as expressways, ordinary roads, intersections, median strips and road pavements, and safety facilities such as signals, traffic signs, road lighting, pedestrian crossing bridges, guard rails, etc. The traffic environment consists of the state of traffic such as mixed traffic of motor vehicles and pedestrians, number of pedestrians, volume of traffic, traffic congestion, etc., and traffic regulations such as speed limit, prohibition of parking and stopping, temporary stopping, prohibition of overtaking, prohibition of turning to left or right, one-way passing, etc. As for the environment along roads, they include urban areas, residential areas, commercial areas, fields, mountainous regions, visibility for drivers, state of lighting around roads, etc. Further, concerning natural environment, weather conditions such as rain, snow, fog, wind, etc. are included, and the effect given by the natural environment will be also great.

The total length of roads in Japan was 1,103,731 kilometers in 1978 (including 2,195 kilometers of expressways) paving rate of which is approx. 40%. Compared with foreign countries, the road extension per motor vehicle and the road extension per area in Japan are better than those in foreign countries, but if we consider the quality of roads such as expressway networks, paving rate, width and their visibility, they are not always better.

As for the nation's road improvement program we have the 8th Five-Year Road Improvement Program (term: 1978-1982; total budget: ¥28,500 billion), which places importance on the establishment of a road network system such as national highways, main local roads, improvement

Table 4. Situation of traffic accidents classified by parties concerned causing accidents (1979).

Classification	Number of cases	Percentage
First party		
Passenger motor vehicles		
Buses	3,646	0.8
Micro-buses	1,159	0.2
Ordinary	236,741	50.2
Light	15,659	3.3
Sub-total	257,205	54.5
Trucks		
Special large-sized	6,977	1.5
Large-sized	6,355	1.3
Trailers	765	0.2
Ordinary	71,533	15.2
Light-vans	25,687	5.5
Three-wheelers	71	0.0
Light	23,449	5.0
Light-vans	3,019	0.6
Light three-wheelers	5	0.0
Sub-total	137,861	29.3
Special motor vehicles		
Large-sized	223	0.0
Small-sized	227	0.0
Agricultural vehicles	173	0.0
Sub-total	623	0.0
Two-wheeled motor vehicles		
Small-sized	7,263	1.5
Light	2,190	0.5
2nd class motor-driven cycles	6,477	1.4
Sub-total	15,930	3.4
Total of motor vehicles	411,619	87.2
1st motor-driven cycles	27,059	5.7
Total of motor vehicles and motor-driven cycles	438,678	92.9
Bicycles	14,427	3.1
Other vehicles		
Street cars	42	0.0
Trains	4	0.0
Light vehicles other than bicycles	33	0.0
Sub-total	79	0.0
Pedestrians	15,321	3.3
Unknown	3,141	0.7
Overlapped data	73	-
Total	471,573	100.0

SECTION 5: TECHNICAL SESSIONS

and completion of national expressways, main roads around cities, etc. If this program is successfully implemented, national expressways will be extended to 3,490 kilometers and expressways around cities to 1.5 times the present length. In parallel with the above program, the Five-Year Traffic Safety Facility Improvement Program (1976-1980; total budget ¥1,361 billion) is also in progress for the improvement of sidewalks, construction of bicycle paths, installation of road lights, traffic signals and traffic signs and establishment of traffic control centers. By these programs, the expansion and completion of roads and safety facilities will be realized and such improvements of the road environment, especially separation of sidewalks from roadways, conversion of railroad crossings to flyovers, etc. are expected to significantly reduce the number of cases of man vs. motor vehicle accidents, and railroad crossing accidents (Table 5).

Countermeasures from human side:

Accidents occur when any of three factors, environment, man and motor vehicle, becomes unstable or unbalanced. The most unstable factor among these three is "man". People's mental and physical performance levels are constantly fluctuating, and consequently the "unstable nature of man" is considered to be the most common cause of accident. Of all accidents, accidents caused by drivers account for 97%, accidents by pedestrians are 3% and accidents due to defect or incomplete repair of motor vehicle 0.1%, respectively. It is said that most accidents are caused by drivers. As direct causes of accidents, we can cite violation of speed limits, uncertain handling of the steering wheel, failure to keep an adequate following distance, uncertain operation of brakes, etc. When driving motor vehicles, it is necessary for drivers to recognize at first such information as roads and traffic conditions, etc. and then make judgment accordingly, before starting to

drive. Driving should be performed by combining these factors organically. As indirect causes of accidents, 50% are due to delay in recognition, 40% to mistake in judgment, 5% to mistake in operation and 5% to other causes. Behind these causes, there are mental factors such as character of drivers themselves, mentality, frustration, worry, etc. and physical factors such as fatigue, disease, poor vision, etc. Thus, the true causes of accidents are deeply rooted in man's own mental and physical nature and are intricately connected to one another. Therefore, as long as many accidents are caused by human factors and the person behind the wheel of a motor vehicle is a human being, countermeasures against human beings will be required.

As of 1979, the number of persons who possessed driver's licenses was 41,042,876, which is 35% of the total population, or at a rate of one out of three persons. Therefore, education on safety for drivers who cause most accidents will be important from the viewpoint of accident prevention. As the main forms of education on safety presently carried out, there are training at designated driving schools at the time of obtaining one's driver's license, instruction on acts and laws given while a national traffic safety campaign is being carried out, safe driving instruction given to traffic law violators and various instructional activities given by local public entities and the private sector. On the other hand, instruction on traffic safety and operation control in working places are conducted under two representative systems such as the safe driving supervisor system and operation supervisor system. Under the safe driving supervisor system, "users of motor vehicles shall, in order to cause necessary business to be conducted for the safe operation of motor vehicles, appoint a safe operation supervisor at each place of business using five or more motor vehicles and notify the Public Safety Committee of each prefecture related to such supervisor." The safe operation supervisor will prepare an operational plan and prevent any overwork and

Table 5. Improvement of traffic safety facilities.

Classification Year	Sidewalks (km)	Bicycle paths (km)	Pedestrian crossing bridges (places)	Underground crossings (places)	Road lighting	Signals	Pedestrian crossings
1967	5,590	-	680	160	190,150	10,067	77,643
1968	12,990	-	2,725	265	290,419	13,441	94,956
1969	16,620	-	4,190	304	340,137	16,941	116,934
1970	21,794	-	5,090	388	387,000	19,517	128,125
1971	24,996	1,197	5,865	499	433,968	23,290	134,176
1972	28,656	3,297	6,666	601	484,000	29,396	194,536
1973	35,362	4,967	7,210	838	581,909	38,244	233,011
1974	39,008	7,609	7,630	997	707,458	46,824	280,350
1975	41,738	10,558	7,984	1,210	833,287	55,630	335,123
1976	42,900	14,800	8,389	1,248	873,245	63,846	342,842
1977	46,753	17,385	8,562	1,358	931,281	71,728	379,604
1978	49,660	19,730	8,700	1,390	994,061	79,359	420,889
1979	50,494	26,121	8,930	1,521	1,069,069	87,081	463,984

secure safe operation in unusual weather conditions. On the other hand, under the operation supervisor system, "motor vehicle transportation business entities shall, in order to secure the operation of motor vehicles for business purpose to be disposed of, appoint a qualified operation supervisor at each place of business". The duties of the operation supervisor are to carry out preparation of a work schedule, calling of roll, guidance and supervision of drivers, etc.

Present Situation of Safety Regulations for Motor Vehicles

(1) Safety regulations for road vehicles:

Under the Road Vehicles Act, technical safety requirements are specified in the Ministry of Transport Ordinance on constructions and systems of motor vehicles, riding capacity and maximum loading capacity in order to secure the safety of motor vehicles (refer to Articles 40 to 42 of the Act). In addition to those for motor vehicles, technical safety requirements for motor-driven cycles and light vehicles are also specified in the Ordinance.

Road Vehicles Act (extracts)

CHAPTER III SAFETY REGULATIONS FOR ROAD VEHICLES

Article 40 (Constructions of Motor Vehicles)

No motor vehicle shall be licensed for operation unless its constructions conform to the technical safety requirements to be specified by the Ministry of Transport Ordinance as to the matters enumerated in each of the following Items:

- (1) Length, width and height;
- (2) Minimum ground clearance;
- (3) Gross vehicle weight (referring to the total amount of vehicle weight, maximum loading capacity and the weight obtained by multiplying riding capacity with 55 kg);
- (4) Load onto the wheel;
- (5) The rate of the load onto the wheel and the vehicle weight (referring to the weight of motor vehicle of the state with necessary equipments for operation);
- (6) The rate of the load onto the wheel and the gross vehicle weight;

- (7) Maximum stable inclination angle;
- (8) Minimum turning radius; and
- (9) Road-contact point and its pressure.

Article 41 (Systems and Devices of Motor Vehicles)

No motor vehicle shall be licensed for operation unless it conforms to the technical safety requirements to be specified by the Ministry of Transport Ordinance, concerning the systems and devices enumerated in each of the following Items:

- (1) Prime mover (engine) and power train system;
- (2) Running system, such as wheel and axle, sled, etc.;
- (3) Control system;
- (4) Braking system;
- (5) Buffer system, such as spring, etc.;
- (6) Fuel system and electric system;
- (7) Frame and body;
- (8) Coupling device;
- (9) Riding accommodation and goods-loading accommodation;
- (10) Window glasses, such as windshields, etc.;
- (11) Noise control device, such as silencer, etc.;
- (12) Emission control device;
- (13) Lighting system and reflector, such as head-lamp, number plate lamp, tail lamp, stop lamp, clearance lamp, etc.;
- (14) Warning device, such as horn, etc.;
- (15) Indication device, such as direction indicator, etc.;
- (16) Visibility ensuring device, such as rear-view mirror, windshield wiper, etc.;
- (17) Meter, such as speedometer, odometer, etc.;
- (18) Fire-prevention device, such as fire extinguisher, etc.;
- (19) Pressure container and accessories thereof; and
- (20) Other especially necessary systems and devices of motor vehicles specified by the Cabinet Order.

Article 42 (Riding Capacity or Maximum Loading Capacity)

No motor vehicle shall be licensed for operation unless it conforms to the technical safety requirements to be specified by the Ministry of Transport Ordinance as to the riding capacity or maximum loading capacity.

SECTION 5: TECHNICAL SESSIONS

Table 6. Outline of safety regulations.

Items	Article	Outline of regulations															
Definition	1	Definition of technical term															
Length, width, and height	2	Not exceeding 12 (length) × 2.5 (width) × 3.8 (height) m 250 mm or less outward from the right and left sides 300 mm or less upward Minimum ground clearance															
	3																
Gross vehicle weight	4	Gross vehicle weight: Not exceeding 20 tons															
Axle weight and wheel weight	4-2	Axle weight: Not exceeding 10 tons Wheel weight: Not exceeding 5 tons															
Stability	5	Total weight rate imposed on the steering tire: 20% or more. Maximum stable inclination angle: 35° or more															
Minimum turning radius	6	12m or less															
Road contact pressure	7	Tire: Not exceeding 150 kg/cm Caterpillars: Not exceeding 3 kg/cm ²															
Engine and power train system	8	Starting can be done by the driver in his seat															
Running system	9	Provisions of tire load rate															
Control system	10	To be located within 500 mm from the center of the steering wheel, indication for control devices.															
	11	Equipping of impact absorption steering wheel on passenger motor vehicles															
Locking device	11-2	Locking device															
Braking system	12	Equipping of at least two separate braking systems. Stopping distance for service brake system: <table border="1" style="display: inline-table; vertical-align: top;"> <tr> <td>Max. speed</td> <td>Initial speed</td> <td>Stopping distance</td> </tr> <tr> <td>80 km/h</td> <td>50 km/h</td> <td>22m or less</td> </tr> <tr> <td>35-80</td> <td>35</td> <td>14m or less</td> </tr> <tr> <td>20-35</td> <td>20</td> <td>5m or less</td> </tr> <tr> <td>Less than 20</td> <td>Max. speed</td> <td>5m or less</td> </tr> </table> Operating force: 90 kg or less. Dual safety brake systems. Brake-fluid leakage warning devices. Pneumatic pressure warning devices (motor vehicle using pneumatic brake system). Braking system for tractors and trailers	Max. speed	Initial speed	Stopping distance	80 km/h	50 km/h	22m or less	35-80	35	14m or less	20-35	20	5m or less	Less than 20	Max. speed	5m or less
	Max. speed	Initial speed	Stopping distance														
80 km/h	50 km/h	22m or less															
35-80	35	14m or less															
20-35	20	5m or less															
Less than 20	Max. speed	5m or less															
13	Braking system for tractors and trailers																
Buffer system	14	Spring, etc.: performance of impact absorption															
Fuel system	15	The filler, etc. must be located 300 mm or more apart from open part of exhaust pipe and 200 mm or more apart from exposed electric terminal. The filler, etc. must not open inside passenger compartment.															
	16	Fuel system for producer gas.															
	17	Provision on LPG-fueled motor vehicles															
Electric system	17-2	Secure mounting of wiring, insulation of terminal, etc.															
Body	18	External shape must have no sharp protrusion. Rear body overhang must be 1/2 or less of wheelbase. (2/3 in case of passenger motor vehicles, etc. and 1/20 in case of small-sized motor vehicles)															
		Indication of school bus															

Items	Article	Outline of regulations
Pedestrian protection, side guard etc.	18-2	Equipping of side guard on ordinary trucks and ordinary motor vehicles with gross vehicle weight of 8 tons or more (except buses) Equipping of rear under-ride bumper on ordinary trucks
Coupling device	19	Coupling device for tractor and trailer
Riding accommodation	20	Safe boarding must be secured. Absorption of impact by instrument panel in case of collision
Driver's seat	21	Control of motor vehicle shall not be obstructed. Driver's field of vision shall be secured
Seat	22	400 mm or more in depth and width (spare seat, etc.: 250 × 300 mm or more) (child's seat: 230 × 270 mm or more). Space between seats: 200 mm or more (child's seat: 150 mm). Absorption of impact by seat-back in case of collision
Seat belt	22-3	Driver's seat and other front seat of passenger motor vehicles, small-sized and light trucks: lap and shoulder seat belt. Rear seats of the above: lap seat belt. Driver's seat and other front seat of ordinary trucks: lap seat belt. Performance of seat belt anchorages
Head restraint	22-4	Driver's seat and another front seat of passenger motor vehicles, small-sized and light trucks (4 seats in case of taxicab). Performance of head protection in case of collision
Aisle	23	Bus: (width) 300 mm or more (height) 1,600 mm or more
Standing space	24	Area for one person: 0.14 m ²
Entrance	25	Bus: 1 or more entrances on the left side; (width) 600 mm or more (height) 1,600 mm or more (height of one step) 400 mm or less with anti-slip-ping devices
Emergency exit	26	Bus: On the right side or rear (width) 400 mm or more (height) 1,200 mm or more
Good-loading accommodation	27	Loading accommodation of dump truck must be designed so that it prohibits overloading
High-pressure gas transport device	28	Requirement for pressure container and piping
Window glass	29	Windshield glass: Safety glass, ensuring driver's visibility in case of damage Side and rear glasses: Safety glass
Noise control device	30	Steady running noise and stationary noise must be 85 dB or less.

EXPERIMENTAL SAFETY VEHICLES

Items	Article	Outline of regulations						
		<p>Trucks and buses:</p> <p>Steady running Accelerated noise and stationary running noise</p> <p>Gross vehicle weight exceeding 3.5 tons and engine power exceeding 200 PS. 80 dB 86 dB</p> <p>Gross vehicle weight exceeding 3.5 tons and engine power not exceeding 200 PS. 78 dB 86 dB</p> <p>Gross vehicle weight not exceeding 3.5 tons 74 dB 81 dB</p> <p>Passenger motor vehicles: 70 dB 81 dB</p> <p>Two-wheeled motor vehicles: 74 dB 78 dB</p>						
Emission control device	31	<table border="1"> <tr> <td>Gasoline or LPG-fueled light-duty motor vehicle and passenger motor vehicle</td> <td>10-mode exhaust emission standards</td> </tr> <tr> <td>Gasoline or LPG-fueled heavy-duty motor vehicle</td> <td>8-mode exhaust emission standards</td> </tr> <tr> <td>Diesel-powered motor vehicle</td> <td>Diesel 6 mode exhaust emission standards</td> </tr> </table> <p>All vehicles:</p> <p>CO, 4.5% or less (idling)</p> <p>HC, 1200 ppm or less (idling)</p> <p>Equipping of blow-by gas ventilation devices</p> <p>Equipping of devices preventing evaporative emissions (gasoline-fueled motor vehicle)</p> <p>Restriction of diesel smoke</p>	Gasoline or LPG-fueled light-duty motor vehicle and passenger motor vehicle	10-mode exhaust emission standards	Gasoline or LPG-fueled heavy-duty motor vehicle	8-mode exhaust emission standards	Diesel-powered motor vehicle	Diesel 6 mode exhaust emission standards
Gasoline or LPG-fueled light-duty motor vehicle and passenger motor vehicle	10-mode exhaust emission standards							
Gasoline or LPG-fueled heavy-duty motor vehicle	8-mode exhaust emission standards							
Diesel-powered motor vehicle	Diesel 6 mode exhaust emission standards							
Headlamp	32	<p>A headlamp must be equipped on each side at the front of the motor vehicle and be capable of discerning an obstacle at a distance of 100 m forward at night.</p> <p>The intensity can be dimmed or the direction of beam can be dipped.</p> <p>The main beam must be directed downward.</p> <p>Mounting height: 1.2 m or less above the ground</p> <p>Color of light: white or light yellow</p>						
Auxiliary headlamp	33	<p>Intensity: 10,000 candle power or less</p> <p>Main beam must be directed downward.</p>						
Clearance lamp	34	<p>To be equipped on both sides at the front. Clearly visible at night at a distance of 300 m from the front.</p> <p>Color: white, light yellow or amber</p> <p>Mounting height: 2 m or less above the ground</p>						
Front reflector	35	To be equipped on trailers						
Side marker lamp and side reflector	35-2	To be equipped on large-sized trucks and trailers						
Number plate lamp	36	<p>Number plate must be visible at night at a distance of 20 m to the rear</p> <p>Color: white</p>						

Items	Article	Outline of regulations
Tail lamp	37	<p>On each side at the rear; visible at night at a distance of 300 m to the rear</p> <p>Color: red</p> <p>Mounting height: 2 m or less above the ground</p>
Parking lamp	37-2	<p>On each side at the front and the rear; visible at night at a distance of 150 m to the front rear. Requirement of the lamp is identical with clearance lamp or tail lamp</p>
Rear reflector	38	<p>To be equipped at the rear.</p> <p>Size: Area covering a 30 mm diameter circle, visible at night at a distance of 150 m to the rear.</p> <p>Color: red</p> <p>Mounting height: 1.5 m or less above the ground</p>
Stop lamp	39	<p>To be equipped at the rear, visible in the daytime at a distance of 100 m to the rear.</p> <p>Color: red</p> <p>Mounting height: 2 m or less above the ground</p>
Back-up lamp	40	<p>Intensity: 5,000 candle power or less.</p> <p>Color: white or light yellow.</p> <p>Mounting height: 1.2 m or less above the ground.</p> <p>Main beam must be directed downward and not strike 75 m rearward or more</p>
Direction indicator	41	<p>One each on the left and the right; visible in the daytime at a distance of 100 m to the front and rear.</p> <p>To be equipped on each side of the rear.</p> <p>Size:</p> <p>Motor vehicles with length of 6 m or more: 40 cm² or more.</p> <p>Motorcycles: 7 cm² or more.</p> <p>Others: 20 cm² or more.</p> <p>Color: amber.</p> <p>Mounting height: 2.3 m or less above the ground.</p> <p>To be equipped on both sides of the central part of body for large-sized trucks, etc.</p>
Additional direction indicator	41-2	May be equipped
Hazard warning lamp	41-3	<p>To be designed to actuate all of lamps simultaneously.</p> <p>Color: amber.</p> <p>Mounting height: 2.3 m or less above the ground</p>
Other lights	42	Restriction of light, etc.
Horn	43	<p>Sound level: 115-90 dB at a distance of 2 m to the front.</p> <p>Continuously emit sound whose level and tone are constant</p>
Emergency signal equipment	43-2	Visible at night at a distance of 200 m; red color
Warning reflector	43-3	Visible at night at a distance of 150 m; red triangle
Emergency stop indication device	43-4	<p>Reflected light is visible at night at a distance of 150 m; red color.</p> <p>Fluorescent light is visible in the daytime at a distance of 200 m; red triangle</p>
Rear-view mirror	44	The driver is able to recognize clearly traffic conditions of other vehicles at right and left

SECTION 5: TECHNICAL SESSIONS

Items	Article	Outline of regulations
		sides, straight backwards up to 50 m; structure unlikely to give excessive impact. Large-sized motor vehicles: within 0.3 m from the front and left side is recognizable. Cab-over type large-sized motor vehicles: within 2 m from the front and 3 m from left side is recognizable
Windshield wiper Windshield washing system	45	To be equipped on the windshield
Defroster		Reduction of impact on sunvisor
Speedometer	46	Indication error: +15 ~ -10% (at 35 km/h) Vibration of pointers: ± 3 km/h or less (at 35 km/h) Indication and warning devices over speed limit
Fire extinguisher	47	To be installed on bus, child-carrying motor vehicles, motor vehicles carrying dangerous articles. Requirements for extinguishers
Pressure container and accessories	48	Requirement for pressure containers
Tachograph	48-2	To be equipped on large-sized trucks, etc. Requirements for structures
Speed indication device	48-3	To be equipped on large-sized trucks, etc. Requirements for structures
Riding capacity or maximum loading capacity	53	Maximum capacity to be secured to ride or load
Others	54 ~ 58-2	Exceptions, etc.

The Ministerial Ordinance comprises the Safety Regulations for Road Vehicles (Ministry of Transport Ordinance No. 67 of 1951) providing for the minimum requirements for constructions, devices and performance of motor vehicles as measures for avoiding accidents caused by constructions and devices of motor vehicles, damage-reducing measures for minimizing injury to passengers as far as possible in case of accidents and fire prevention measures. (Table 6: Outline of safety regulations.)

These Safety Regulations are not only standards to be applied at the time of designing and manufacturing motor vehicles, but also standards for the daily maintenance of motor vehicles by the users. If any motor vehicle fails to meet these regulations, it shall be prohibited to operate such motor vehicle as it may endanger the traffic. Furthermore, the actual manner of the test and interpretation of provisions in detail in applying the respective provisions of the Safety Regulations are published by the Ministry of Transport in circular notices. In the provisions of the Safety Regulations, the pollution control standards as well

as safety standards are included from the viewpoint of public welfare, details of which will be stated in the next installment. The Safety Regulations were amended 46 times up to the end of 1980 since their establishment in 1951, and the outline of main amendments relating to the Safety Regulations is set forth in Table 7.

These amendments to the Safety Regulations were made to strengthen the safety of motor vehicles directly corresponding to changes in traffic environments of motor vehicles such as increase of traffic accidents, changes of situation of traffic accidents, sharp increase in the number of motor vehicles in use, congested traffic conditions, extension of expressways, etc.

Main amendments to the safety regulations made recently:

In September, 1972, the first program plan for future motor vehicle safety under the title "Technical Measures for Safety of Motor Vehicles" was presented as a recommendation by the Council for Transport Technics, an advisory organ of the Ministry of Transport, and under this program, amendments to the Safety Regulations were made in 1973 and 1974, respectively. The recommendation stated that strengthening of safety regulations for motor vehicles must be enforced synthetically and systematically. The programs to expand and strengthen Safety Regulations for motor vehicles for five years categorized on 63 items including measures to prevent accidents, measures to reduce injuries and measures to prevent fires (Table 8). Under the recommendation, in July 1973, the safety requirements for 20 items such as strengthening of regulations on lighting apparatus for the prevention of head-on or rear-end collisions as well as expansion of scope of motor vehicles equipped with dual safety braking systems were determined. In November 1974, as countermeasures for preventing accidents, the installation of defrosters became obligatory, and installation of mirrors on large-sized motor vehicles to improve side visibility, installation of side lights or side reflectors on both sides of large-sized trucks, etc., installation of warning devices for drivers in case of trouble of service brake system, improvement of quality of brake-fluid, etc. became statutory respectively. Moreover, as countermeasures to reduce injuries among passengers, the regulations were strengthened by providing for improvement of strength of seats and seat anchorages, increase in number of seats with seat belts, installation of lap and shoulder seat belts on the front seats and to prevent fire, the prevention of fuel leakage at the time of head-on collision in order to avoid damage to fuel tanks and fuel pipings.

EXPERIMENTAL SAFETY VEHICLES

Table 7. Table of main amendments to safety regulations for road vehicles (relating to safety).

Date of amendment	Matters amended
Apr. 11, 1953	Requirements of electrical equipment, requirements for tires, prohibition of exhaust pipe in inside compartment, equipping of number plate lamp (motor-driven cycles), etc.
Sept. 17, 1955	Restrictions on axle weight and wheel weight, restriction on spare seats, equipping of speedometer (motor-driven cycles).
Dec. 27, 1956	Use of safety glass, prohibition of irregular flashers.
Sept. 25, 1958	Provisions on maximum riding capacity of two-wheeled motor vehicles.
Sept. 15, 1959	Prohibition of protrusions, regulations on parking brake of trailers, regulations on rear over-hang constructions of microbus, child-carrying motor vehicles and one-man bus, fire prevention regulations of motor vehicles carrying gunpowders, etc., safety requirements of pole-trailers.
Feb. 1, 1960	Restriction on color of light, improvement of performance of headlamp, restriction on auxiliary headlamp, equipping of rear reflector, mirrors to confirm front of bus, improvement of safety of light three-wheeled vehicles, prevention of fire of motor vehicles carrying dangerous articles.
Sept. 28, 1962	Independent brakes of trailers, equipping of rear-view mirrors on both sides, prohibition of using two-door car for taxi-cab, requirements for conductor's seat of bus.
Oct. 1, 1963	Constructions of LPG-fueled vehicles, strengthening of restrictions on motor-driven cycles (stop lamp, rear-view mirror, number plate lamp, direction indicator, etc.), performance of headlamp of special-purpose motor vehicles, lamp of motor vehicles for road maintenance works.
Sept. 5, 1964	Simplifying and clarifying lamps such as direction indicators and prohibition of use of confusing lamps.
May 16, 1967	Obligation to attach tachograph to large-sized motor vehicles.
Aug. 1, 1967	Obligation to attach dual safety brake systems, rear and side guards and speed indicating devices to large-sized motor vehicles.
July 4, 1968	Regulations of 4 items such as under-mirror (large-sized trucks, etc.), side direction indicator, etc. as safety measures for pedestrians, 6 items such as mounting position of tail lamp, hazard warning lamp, parking lamp, etc. as measures to prevent accidents, and two items such as seat belts, head restraints, etc. as measures for reducing injuries in collision.
June 12, 1969	Warning devices of air brake, indication of school bus, partially tempered glass, fire extinguisher.
Dec. 14, 1970	Improvement of performance of tires, trailer brakes, washer, etc. as measures for higher speed, improvement of performance of parking brake and horn as measures to prevent accidents, requirements for locking devices, defroster of one-man bus, fixing of LPG container, prevention of radio interference.
Mar. 31, 1972	Impact absorption of steering wheel, relaxation of limitation on height (3.5 m to 3.8 m).
Apr. 28, 1973	Technical standards for warning reflector.
July 6, 1973	10 items such as improvement of field of view, improvement of visibility of lamps, improvement of performance of braking system, indication of control device, etc. as measures to avoid accidents, 5 items such as increased use of seat belts and head restraints, use of safety glass, measures for protecting pedestrians as measures to reduce injuries, 5 items such as equipping of locking devices, prevention of overloading of dump trucks, safety measures for motor-driven cycles as safety measures; 20 items in total.
Nov. 21, 1974	Improvement of field of view to the left side, equipping of side marker lamp or side reflector, warning devices of service brake system and speed warning devices and indicators, door retention system, improvement of strength of seats and seat anchorages, stricter regulations on seat belts, absorption of impact from seatback and instrument panel, prevention of fuel leakage in collision.
May 7, 1976	Equipping of rear bumpers to motor vehicles, etc. equipped with gas-transporting container.
Nov. 27, 1978	Technical standards, etc. for emergency stop indication device.
Mar. 15, 1979	Safety measures for preventing accidents from left-turning large-sized trucks.

SECTION 5: TECHNICAL SESSIONS

Table 8. First program plan for future motor vehicle safety regulations. (September, 1972)

(1) Measures to prevent accidents:	34 items
Field of vision	7 items
Visibility	5 items
Anti-glare	3 items
Controllability and stability	1 item
Tires	3 items
Brakes	7 items
Warning devices	4 items
Control systems	2 items
Driving environment	2 items
(2) Measures to reduce injuries	26 items
Strength of vehicle body	6 items
Occupant restraint systems	7 items
Interior impact protection	7 items
Protection of pedestrians	4 items
Measures against motor vehicle damage	2 items
(3) Measures to prevent fire	3 items

Recently, for the prevention of accidents by large-sized trucks when they are turning left, improvement of mirror visibility for drivers, increase of side direction indicators and improvement of pedestrian protection side guards were effected.

Future Trend of Motor Vehicle Safety Regulations

Second program plan for future motor vehicle safety standards:

As to the future trend of Safety Regulations, the Council for Transport Technics had, based on the measures taken on the recommendation of the Council in 1972, updated the recommendation of 1972 for the purpose of meeting the situations surrounding motor vehicles such as occurrence of traffic accidents, changes in motor vehicle use, progress of technological development, etc. As a result, in October 1980, the Council submitted a recommendation to the Minister of Transport on the "Technical Measures for Safety of Motor Vehicles". The recommendation sets forth the second program plan for future safety standards following the first program under the recommendation in September 1972 and will be a foundation for the future strengthening of the Safety Regulations. According to the recommendation, the Ministry of Transport is planning to take necessary administrative measures, mainly amendments to the Safety Regulations.

The following is the outline of the recommendations:

Traffic accidents in Japan had shown a downward trend from around 1970 due to the enforcement of various measures for preventing accidents, but during these past few years they have remained on the same level. In 1980 there were, in fact, signs of an increase in the number of

fatal accidents. Therefore, we will have to make greater efforts to reduce accidents further. For that purpose, in consideration of the occurrence of traffic accidents, situation of motor vehicle use, preservation of the environment, resources and energy problems, and international trends, the second program plan for future motor vehicle safety standards was established. The plan recommended strengthening the existing regulations under a long-term plan and consists of 57 items, each of which sets forth the kinds of administrative measures such as regulatory, study, etc., target time of accomplishment outline of item and applicable motor vehicles. (Table 9: Items of 2nd program plan for future motor vehicle safety standard.)

Furthermore, as important items of the Plan, the following three measures are set forth:

(1) Measures for high-speed driving

With the completion of expressways, there has been an increase in the number of accidents when travelling at high speed and the damage is heavy, so that it will be necessary to improve the performance of the brakes, quality of tires and windshield glass, etc.

(2) Measures to prevent fire

Cases of the accidents in vehicles including large-scale conflagration are increasing, so it will be necessary to adopt measures to prevent fuel leakage in the event of rear-end collisions and to improve the non-flammability of interior materials.

(3) Safety measures for trucks

Since trucks are different from passenger motor vehicles in their constructions and use and tend to sustain heavier damage in accidents compared with passenger motor vehicles, it will be necessary to take measures especially for trucks such as the improvement of braking performance, visibility from driver's seat, visibility of rear end of body, etc.

Further, the recommendation points out the improvement of investigation and analysis of motor vehicle accidents, establishment of requirements for performance and quantitative standards of performance, harmonization with international standards and with environmental, resources and energy issues, etc.

Measures for preventing large-sized motor-vehicle accidents occurring during left-hand turns

In order to reach a fundamental solution for the prevention of left-turn accidents, we had motor vehicle manufacturers produce test vehicles of large-sized trucks with improved direct field of vision from the driver's seat (these included vehicles with lowered driver's seat, door partially changed to glass, or steering wheel shifted to the left. In Japan, vehicles drive on the left, so the steering wheel is generally on the right) and we are carrying out technological evaluation and examination at present.

Table 8. 1st program plan for future motor vehicle safety regulations.

I. Measures to prevent accidents			
		Item	Application
Field of vision	I-1	Field of vision of heavy trucks (S, S)	HT
	I-2	Field of vision of rear-view mirrors (R, S)	P, MP, MC
	I-3	Windshield wiping area (R, S or M)	P, MP, T, B
	I-4	Improvement of headlamp performance (R, S)	P, MP, T, B, MC
	I-5	Rear window defoggers (V, S)	P, MP
	I-6	Headlamp cleaners (V, S)	D
	I-7	Performance of windshield defrosters (A, S)	D
	I-8	Performance of front fog lamps (V, M)	D
	I-9	Cornering lamps (R, M)	D
Visibility	I-10	Color unification of side marker lamps and side reflectors (V, S)	D
	I-11	Rear fog lamps (S, M)	D
	I-12	Visibility of front direction indicators (S, M)	D
	I-13	Chromaticity range of lamps and reflectors (R, M)	P, MP, T, B, MC
	I-14	Visibility of rear end of heavy trucks (S, M)	HT
	I-15	Luminous intensity of rear lamps (S, L)	D
	I-16	Mounting height of rear reflectors (R, S)	P, MP, T, B, MC
Anti-glare	I-17	Adjusting mechanism of headlamp alignment (S, L)	D
	I-18	Polarized headlamps (S, L)	D
Controllability and stability	I-19	Controllability and stability (S, L)	-
	I-20	Minimum ground clearance (S, L)	-
Tires	I-21	Quality of tires (R, S)	P, MP, T, B, MC
	I-22	Tire-rim combinations (R, S)	P, MP, T, B, MC
	I-23	Retentivity of rims in case of tire puncture (R, S)	P, MP
Brakes	I-24	Brake performance at high speed (R, M)	P, MP, T, B
	I-25	Brake performance for fade and recovery (R, M)	P, MP, T, B, MC

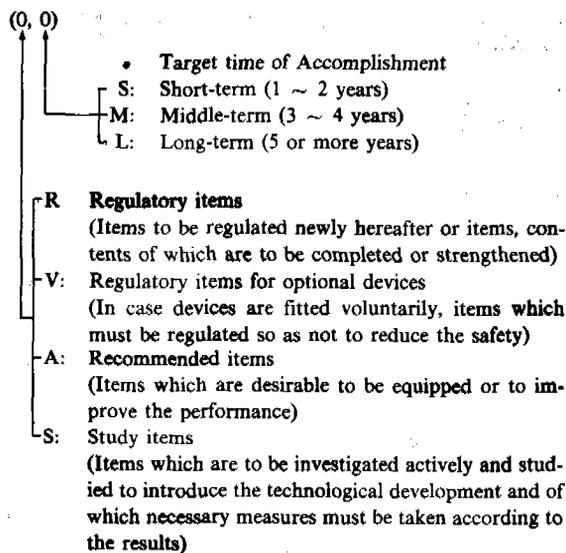
		Item	Application
Warning devices	I-26	Directional stability during braking (R, M)	P, MP, T, B
	I-27	Quality of brake hoses (R, S)	P, MP, T, B, MC
	I-28	Brake performance in case of partial failure of dual brake systems (R, S)	P, MP, T, B
	I-29	Parking brake system for working purpose (V, S)	T
	I-30	Automatic brake adjusters and wear indicators (A, S)	D
	I-31	Anti skid brake systems (A, S)	D
	I-32	Lamp failure warning systems (A, S)	D
	I-33	Reverse warning devices (S, M)	D
	I-34	Dual-level horns (S, M)	D
	I-35	Warning devices for left-turn and obstacle detecting devices (S, S)	HT, HB
Control system	I-36	Location of steering wheel of heavy truck (S, S)	HT
Driving environment	I-37	Interior compartment noise (S, M)	T
Restriction of maximum speed	I-38	Constructional restriction of maximum speed (S, L)	D
	I-39	Maximum range of speedometers (S, L)	D
Good-loading accommodation	I-40	Overloading prevention devices (S, L)	T
II. Measures to reduce injuries			
		Item	Application
Injury Criteria	II-1	Injury Criteria (S, L)	-
Strength of vehicle body	II-2	Amount of deformation into passenger compartment (S, L)	P, MP, T
	II-3	Strength of side doors (S, M)	P, MP, LT
	II-4	Easy opening of doors after collision (S, L)	P, MP, T
Occupant restraint systems	II-5	Easy fastening of seat belts (R, S)	P, MP, LT
	II-6	Lap and shoulder seat belts for rear-outer seats (V, S)	P, MP
	II-7	Seat belts for seats other than outer seats (R, M)	P, MP, T

	Item	Application
II-8	Child restraint systems (V, M)	D
II-9	Passive restraint systems (S, M)	P
Interior impact protection	II-10 Performance of windshield glasses (R, M)	P, MP, LT
	II-11 Windshield mounting (R, M)	P, MP, LT
	II-12 Interior projections (V, S)	P, MP
Constructions of body	II-13 Improvement of rear under-ride bumper (S, M)	HT
Protection of pedestrians	II-14 Impact reduction for pedestrians in collision (S, L)	-
III. Measures to prevent fire		
	Item	Application
Prevention of fire	III-1 Prevention of fuel leakage in collision (R, S)	P, MP
	III-2 Non-flammability of interior materials (R, S)	P, MP, T, B
	III-3 Prevention of combustion (S, M)	-

Table 9. Items of 2nd program plan for future motor vehicle safety standards.

Notes:

1. In the parentheses of items, the following abbreviations are shown;



2. In the column of subject motor vehicles, P: means passenger motor vehicle, MP: multi-purpose motor vehicle, T: truck, LT: light truck, HT: heavy truck, B: bus, HB: heavy bus, MC: motorcycle (two-wheeled motor vehicles), and D: device, respectively.

Legal System of Japan on Motor Vehicles*

RYOICHI MUKAI

Part 3: Environmental Pollution Control Measures and Energy-Saving Measures for Motor Vehicles

Measures Against Environmental Pollution by Motor Vehicles

Along with the rapid growth of the national economy, environmental pollution came to the fore in Japan in the 1960's. From the beginning of the 1970's, however, the general situation of environmental pollution has begun to improve gradually through the active promotion of environmental pollution control measures coupled with the growth of the nationwide movements for promoting the saving of resources including energy. Moreover, such movements have been considerably accelerated as the national economy has entered the stage of low economic growth. On the other hand, public attention has come to be directed towards environmental pollution (or public nuisances) related to the people's individual living environment or urban living environment rather than industrial pollution, and along with this trend, the problems concerning environmental pollution have entered a new phase. As for the traffic pollution, especially motor-vehicle pollution, which is closely related with the lives of the general public, it is now frequently leading to various law suits and disputes among the people, and thus solution of the pollution problem has become a serious social problem.

In this chapter, we are going to discuss mainly exhaust gas pollution and noise pollution caused by motor vehicles in conjunction with the legal control of motor vehicles through the enforcement of the regulations concerning their construction and equipments.

Measures against exhaust emissions from motor vehicles

A. Present condition and trend of air pollution by motor vehicles

Air pollution in Japan has become a serious social problem with the increased consumption of fossil fuels, especially petroleum, accompanying the rapid growth of the national economy. Moreover, air pollution caused by motor vehicles has been posing a particular problem, es-

* Received 25th February 1981.

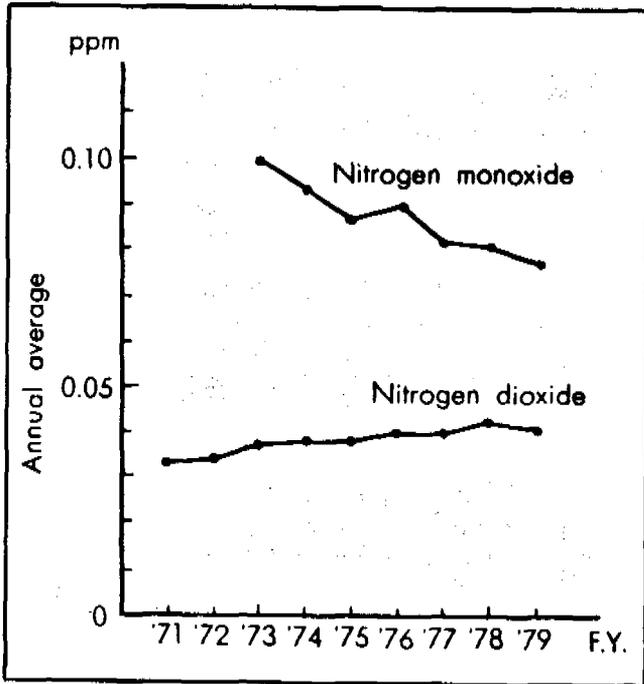


Figure 1. Trend of annual averages of nitrogen dioxide and nitrogen monoxide measured continuously at 26 monitoring stations.

pecially in large cities and areas bordering major highways, due to the rapid advance in motorization since the latter half of the 1970's.

In the following, we take a look at the present condition and trend of air pollution caused by the exhaust emissions from motor vehicles referring to the data concerning air pollutants measured by local public bodies at several monitoring stations along major highways throughout the country.

(i) Nitrogen oxides (NOx)

Nitrogen dioxide (NO₂) demonstrated a slight decreasing trend in 1979 though it had been constantly increasing until that time, according to the trend of change in the annual average of measured values of exhaust emissions from motor vehicles which has been measured consecutively from 1971 at 26 roadside air monitoring stations in various locations throughout the country (see Fig. 1). On the other hand, however, according to the data compiled by 213 monitoring stations which have made effective measurements (stations whose total annual measurement time exceeds 6,000 hours), the concentration of nitrogen dioxide has not been reduced to the level required by the environmental quality standard for air pollution (see 2 B (i) b) as seen in Table 1.

Nitrogen monoxide (NO), too, has been showing a decreasing trend in general (see Fig. 1) according to the

Table 1. Relation with environmental quality standard of NO₂.

Level of annual 98% value of daily average	1979	
	Number of stations	Ratio (%)
Over 0.06 ppm	64	30.0
Over 0.04 ppm and under 0.06 ppm	112	52.6
Under 0.04 ppm	37	17.4
Total	213	100.0

trend of change in annual averages of values measured by the aforementioned 26 monitoring stations which also measure nitrogen dioxide.

(ii) Carbon monoxide (CO)

The concentration of carbon monoxide in the air began to demonstrate a decreasing trend from around 1970, the peak year, as a result of the active enforcement of control measures, according to the trend of change in annual averages of values measured consecutively from 1971 by 23 monitoring stations (see Fig. 2). Also, according to the results of effective measurements in 1979 by 309 monitoring stations, the requirement of the environmental quality standard for the concentration of carbon monoxide has been satisfied in the areas covered by 306 monitoring stations (99.0% of total area covered) when evaluated on a long-term basis, and in the areas covered by 304 monitoring stations (99.4% of total area covered) when measured on a short-term basis.

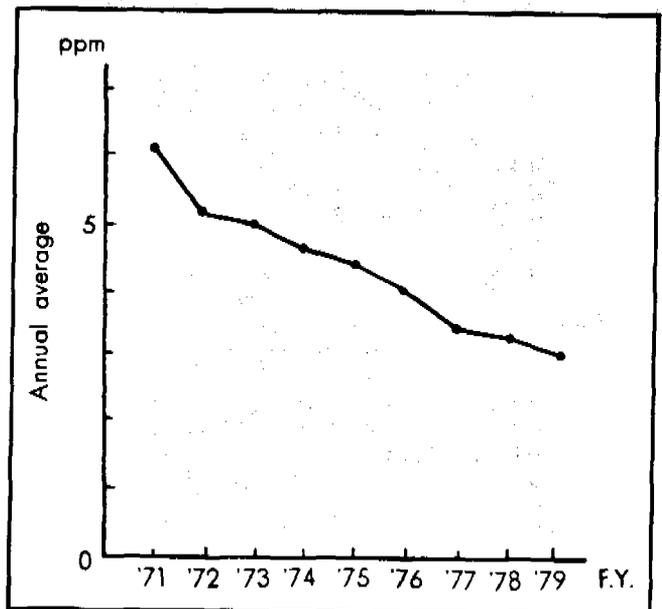


Figure 2. Trend of annual average of carbon monoxide measured continuously at 23 monitoring stations.

(iii) Hydrocarbons (HC)

As for non-methane hydrocarbons, they have been showing decreasing trends as a result of active enforcement of control measures, according to the trends of changes in annual averages of values measured consecutively from 1977 by 18 monitoring stations (see Fig. 3).

As far as total hydrocarbons are concerned, they have been also showing decreasing trends as a result of active enforcement of control measures, according to the trends of changes in annual averages of values measured consecutively from 1971 by 3 monitoring stations (see Fig. 3).

(iv) Suspended particulates

This type of pollutant has been showing a slight increasing trend according to the trend of change in annual averages of values measured consecutively from 1975 by 7 monitoring stations (see Fig. 4). Also, according to the result of long-term basis evaluation of the effective measured values in 1979 by 11 monitoring stations, the requirements of the environment quality standard concerning this type of pollutant were not satisfied in any of the areas covered by these monitoring stations.

B. Measures against motor vehicle exhaust gas

(i) Legal support

a. Basic Law for Environmental Pollution Control (Enacted in 1967)

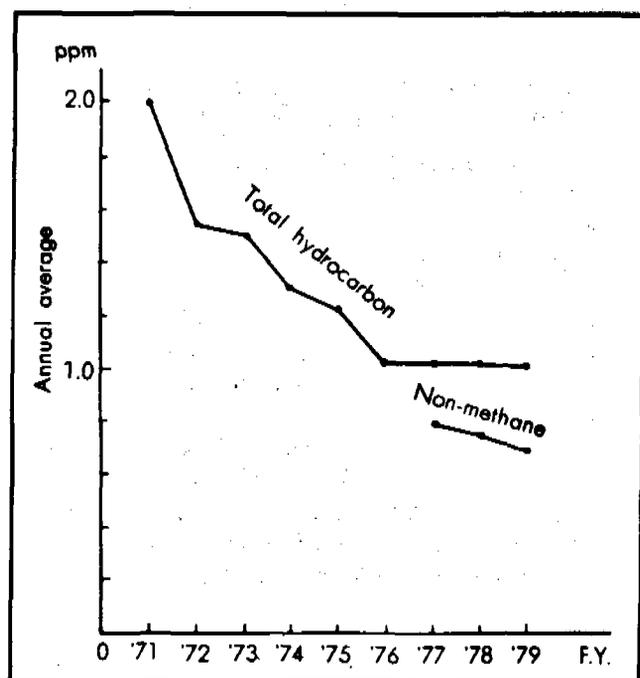


Figure 3. Trend of annual averages of total hydrocarbon and non-methane hydrocarbon measured continuously at several monitoring stations.

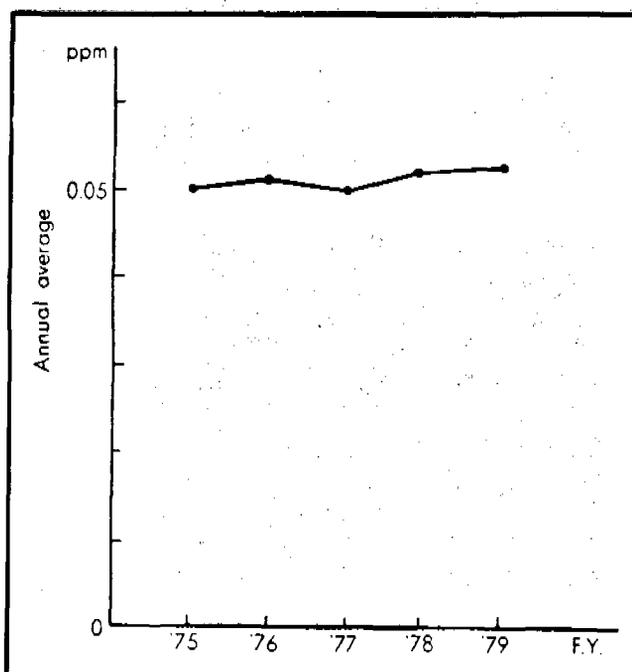


Figure 4. Trend of annual average of suspended particulates measured continuously at seven monitoring stations.

This law was enacted to define the responsibilities of business enterprises, local public bodies and the government for the control of environmental pollution, and to provide the basic requirements for measures to be taken to control environmental pollution.

b. Environmental Quality Standards for Air Pollution (Enacted in 1970 to 1978 for each pollutant in conformity with Notification of Environment Agency) These standards govern concentrations of pollutants such as the sulfur dioxide, carbon monoxide, suspended particulates, photochemical oxidant and nitrogen dioxide and were established in conformity with the provisions of the Basic Law for Environmental Pollution Control in order not only to protect people's health from air pollution but also to preserve a good living environment (see Table 2). The Basic Law for Environmental Pollution Control requires the government to strive to ensure the requirements set forth under these standards.

c. Air Pollution Control Law (Enacted in 1968)

Under this law, the general director of the Environment Agency is authorized to set the permissible limits for exhaust emissions of motor vehicles, and the governor of each prefecture is authorized not only to request the Prefectural Public Safety Commission to regulate motor vehicle traffic according to the Road Traffic Law when the degree of air pollution by motor vehicle exhaust emissions exceeds the set limit but also to express his opinion, whenever necessary, to the road administration or the head of the related

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Table 2. Environmental quality standard for air pollution.

Substance	Sulfur dioxide	Carbon monoxide	Suspended particulates	Photochemical oxidants	Nitrogen dioxide
Environmental conditions	Daily average of hourly values shall be below 0.04 ppm, and one hour value shall be below 0.1 ppm.	Daily average of hourly values shall be below 10 ppm, and eight hour mean value shall be below 20 ppm.	Daily average of hourly values shall be below 0.10 mg/m ³ , and one hour value shall be 0.20 mg/m ³ .	One hour value shall be below 0.06 ppm.	Daily average of hourly values shall be within the range between 0.04 ppm and 0.06 ppm or below.
Measuring methods	Conductometric method	Nondispersive infrared analyzer method	Weight concentration measuring methods based on filtration collection, or light scattering method yielding values having a linear relation with the values of the above method	Absorptiometry using neutral potassium iodide solution, or coulometry	Colorimetry employing Saltzman reagent

government agency, concerning the improvement of the construction or system of roads.

This law also provides for the control of smoke and soot emanating from factories and business facilities, and defines the responsibilities of the operators of such factories or business facilities regarding the payment of compensation in case the human health is injured by air pollution caused by their activities.

d. Maximum Permissible Limits of Motor Vehicle Emissions

(Enacted in 1974 according to the Notification of Environment Agency)

These regulations specify the maximum permissible limits of carbon monoxide, hydrocarbon, nitrogen oxide and the diesel smoke emitted from running motor vehicles established in conformity with the Air Pollution Control Law.

The Air Pollution Control Law states that the Minister of Transport must endeavor to enforce these maximum permissible limits in case he establishes by an order pursuant to the Road Vehicles Act necessary matters on control of motor vehicle emissions.

e. Road Vehicles Law (Enacted in 1951)

This law sets forth the requirements concerning the registration, standards for safety and environmental pollution, maintenance and inspection of motor vehicles (Refer to previous report).

f. Safety Regulations for Road Vehicles

(Enacted in 1951 according to Ministry of Transport Ordinance)

These regulations set forth the technical standards for the construction and equipment of motor vehicles to be met for the purposes of ensuring safety and environmental pollution control, in conformity with the Road Vehicles Law. (Refer to previous report). The

technical standard concerning exhaust gas will be discussed in detail in the following section.

(ii) Measures for the control of exhaust emissions through the establishment of regulations concerning the construction and equipment of motor vehicles

Since 1952, running motor vehicles have been prohibited from emitting excessive harmful gases by the Safety Regulations for Road Vehicles. More recently, however, the Regulations were amended to include quantitative requirements for motor vehicles not including two-wheeled motor vehicles and special motor vehicles and such quantitative requirements have been made increasingly stringent.

a. Stringency of regulations for new vehicles (see Table 3)

Regulations governing gasoline-fueled vehicles commenced with the regulation of CO concentration by 4-modes in 1966, and this was followed by the regulation of blow-by gas (mainly consisting of HC) in 1970 and fuel evaporation gas (mainly consisting of HC). Regulations governing motor vehicles were thus gradually strengthened. As for diesel-powered vehicles, the regulation of smoke by 3-modes (see Table 4) was started in 1972. In 1973, the regulation by weight of three substances (CO, HC and NO_x) by 10-modes (see Fig. 5) or gasoline 6-modes (see Table 5) was commenced for gasoline-fueled vehicles, and in 1974, regulation governing concentration of the same three substances by diesel 6-modes (see Table 6) were enacted for diesel-powered vehicles.

Later, in 1975, the regulations governing the aforementioned three substances for gasoline-fueled passenger vehicles were intensified. As a result, the

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requirements for the reduction of CO and HC have been intensified by more than 90% compared with their levels before the enforcement of the regulations, while the same for NOx has also been strengthened by more than 90% compared with its level before the enforcement of the regulation as a result of the strengthening of the regulations in 1976 and 1978. On the other hand, concerning gasoline-fueled trucks and

buses and diesel-powered vehicles, in 1975, the regulations of CO, HC and NOx for small- and medium-sized gasoline-fueled vehicles were strengthened, and in 1977, the NOx regulation for large-sized gasoline-fueled vehicles and diesel-powered vehicles was intensified. Also, in December, 1977, the Central Council for Control of Environmental Pollution, an advisory organization to the Director-General of the Environ-

Table 3. Details of motor vehicle (including new vehicles) exhaust gas regulations.

		1973	1974	1975	1976	1977	1978	1979
Gasoline-fueled passenger motor vehicles (10-mode)	CO HC NOx	1973 regulation		1975 regulation	1976 regulation (Equivalent inertia weight: under 1 ton)		1978 regulation	
		45		5	20			
		48		8	27		8	
					(Equivalent inertia weight: over 1 ton)			
Gasoline-fueled small- and medium-sized trucks and buses and light trucks (Gross vehicle weight: under 2.5 tons) (10-mode)	CO HC NOx	1973 regulation		1975 regulation				1979 regulation
		45		32				(Small trucks and buses)
		48		35				32
								(Medium-sized trucks and buses and light trucks)
								39
Gasoline-fueled large-sized trucks and buses (Gross vehicle weight: over 2.5 tons) (Gasoline 6-mode)	CO HC NOx	1973 regulation				1977 regulation		1979 regulation
		45				39		42
		48						
Diesel-powered motor vehicles (Diesel 6-mode)	CO HC NOx		1974 regulation			1977 regulation		1979 regulation
			95					(Direct injection type)
			90					36
								(Indirect injection type)
						68		60

		1980 (Current regulation)		1981		1982	
Gasoline-fueled passenger motor vehicles (10-mode)	Max. value (Average value) CO HC NOx	2.70 g/km (2.10)	5				
		0.39 g/km (0.25)	8				
		0.48 g/km (0.25)	8				
Gasoline-fueled small- and medium-sized trucks and buses and light trucks (Gross vehicle weight: under 2.5 tons) (10-mode)	CO HC NOx	17.0 g/km (13.0)	32	1981 regulation Max. value (Average value) NOx 0.84 g/km (0.60) 1.26 g/km (0.90)	1982 regulation Light trucks Max. value (Average value) NOx 1.26 g/km (0.90)		
		2.70 g/km (2.10)	35				
		1.40 g/km (1.00)	32 (Small trucks and buses)				
			39 (Medium-sized trucks and buses and light trucks)				
						29 (Light trucks)	
Gasoline-fueled large-sized trucks and buses (Gross vehicle weight: over 2.5 tons) (Gasoline 6-mode)	CO HC NOx	1.60% (1.20)	45			1982 regulation	
		520 ppm (410)	48			NOx 990 ppm (750)	29
		1390 ppm (1,100)	42				
Diesel-powered motor vehicles (Diesel 6-mode)	CO HC NOx	980 ppm (790)	95			1982 regulation	
		670 ppm (510)	90				
		700 ppm (540)	36 (Direct injection type)				
		450 ppm (340)	60 (Indirect injection type)			NOx 390 ppm (290)	52 (Indirect injection type)

Quantity of exhaust gas before regulation

45

Ratio (%) of exhaust gas level to that before regulation

(10-mode)

Exhaust gas measuring mode

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Table 3. Details of motor vehicle (including new vehicles) exhaust gas regulations (continued).
(Year of enforcement)

	New Models	Models in continuous production	Imported motor vehicles
1973 regulation	1973.4.1	1973.12.1	—
1974 regulation	1974.9.1	1975.4.1	—
1975 regulation	1975.4.1	1975.12.1	1976.4.1 (Applicable only to models in continuous production)
1976 regulation	1976.4.1	1977.12.1	1978.4.1 (Applicable only to models in continuous production)
1977 regulation	1977.8.1	1978.4.1	—
1978 regulation	1978.4.1	1979.3.1	1981.4.1
1979 regulation	1979.1.1	1979.11.1	1981.4.1
1981 regulation	1981.1.1 (Applicable to gasoline-fueled medium-sized trucks and buses from December 1, 1981)	1981.12.1 (Applicable to gasoline-fueled medium-sized trucks and buses from November 1, 1982)	1983.4.1 (Applicable to gasoline-fueled medium-sized trucks and buses from April 1, 1984)
1982 regulation	1982.1.1 (Applicable to diesel-powered vehicles with indirect injection type from October 1, 1982)	1982.12.1 (Applicable to diesel-powered vehicles with indirect injection type from September 1, 1983)	1984.4.1

ment Agency, submitted a Report on the Long-term Policy for Establishment of Maximum Permissible Limits of Motor Vehicle Emissions (see Table 7). Subsequently, the NOx regulation for gasoline-fueled trucks and buses and diesel-powered vehicles was intensified in 1979 as the first phase of the intensification program. Similarly, in the second phase, the NOx regulation for small- and medium-sized gasoline-fueled trucks and buses was intensified in 1981, and the same regulation for diesel-powered vehicles with indirect injection type of engines is expected to be strengthened in 1982.

Table 4. Three modes of black exhaust gas from diesel engines.

	Mode
1	While the engine is running with a full-load at the speed of revolution equal to 40% of the speed at which it produces its maximum output (at 1,000 rpm., if the speed of revolution is less than 1,000 rpm.);
2	While the engine is running with a full-load at the speed of revolution equal to 60% of the speed at which it produces its maximum output; and
3	While the engine is running with a full-load at the speed of revolution at which it produces its maximum output.

As a result of such gradual strengthening of the regulations, as discussed in the preceding section, the air pollution by CO and HC has been considerably alleviated, but NOx pollution has not been reduced significantly. Thus, in order to solve this problem, it is essential to strengthen the regulation governing NOx for diesel-powered vehicles with direct injection type of engines as soon as possible.

Table 5. Six modes of driving pattern of gasoline engine.

	Mode	Weighting factor
1	Engine is idling with no-load.	0.125
2	Engine is operated at a speed of 2,000 rpm with an inlet vacuum of 125 mmHg at intake manifold.	0.114
3	Engine is operated at a speed of 3,000 rpm with an inlet vacuum of 125 mmHg at intake manifold.	0.277
4	Engine is operated at a speed of 3,000 rpm with an inlet vacuum of 2,000 mmHg at intake manifold.	0.254
5	Engine is operated at a speed of 2,000 rpm with an inlet vacuum of 420 mmHg at intake manifold.	0.139
6	Engine is decelerated, with its carburetor gas valve completely closed, from 2,000 rpm with an inlet vacuum of 420 mmHg at intake manifold to 1,000 rpm in 10 sec.	0.091

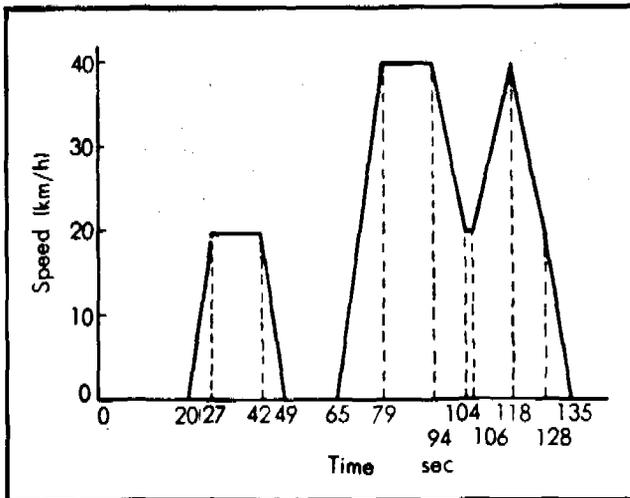


Figure 5. 10-mode driving cycle.

b. Strengthening of regulations for vehicles in use (including new vehicles)

Concerning gasoline-fueled vehicles, a regulation governing CO concentration at idling was enacted in 1970, and this was followed in 1974 by a regulation controlling HC concentration at idling.

For diesel-powered vehicles, a regulation governing smoke emission at no-load acceleration has been in force since 1970.

(iii) Other measures against automotive exhaust emissions

As measures against environmental pollution through traffic control, the government has been promoting not only a more stable and smooth traffic flow but also the normalization (optimization) of traffic flow and reduction of total traffic volume by intensifying the enforcement of comprehensive urban traffic controls.

On the other hand, as measures against environmental pollution through the improvement of the road system,

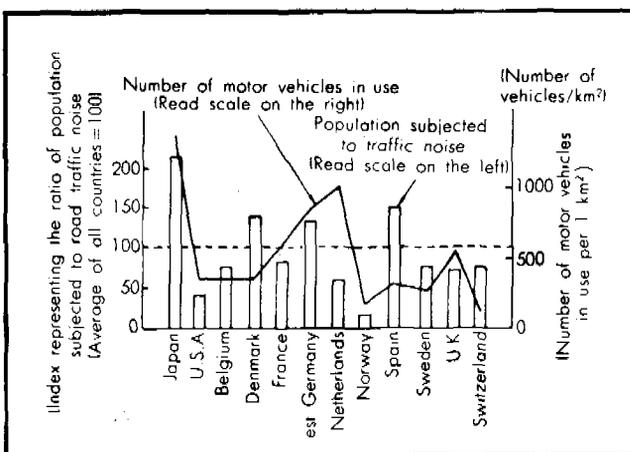


Figure 6. International comparison of road traffic noise (Over 65 dBA (Leq): In the middle of 1970).

Table 6. Six modes of driving pattern of diesel engine.

	Mode	Weighting factor
1	Engine is idling with no-load.	0.355
2	Engine is operated with a full-load and a speed of revolution equal to 40% of the speed at which it produces its maximum power.	0.071
3	Engine is operated with a 25% load of the full-load and at a speed of revolution equal to 40% of the speed at which it produces its maximum power.	0.059
4	Engine is operated with a full-load and at a speed of revolution equal to 60% of the speed at which it produces its maximum power.	0.107
5	Engine is operated with a 25% load of the full-load and at a speed of revolution equal to 60% of the speed at which it produces its maximum power.	0.122
6	Engine is operated with a 75% load of the full-load and at a speed of revolution equal to 80% of the speed at which it produces its maximum power.	0.286

the government has been promoting the construction and improvement of by-passes and ring roads in order to sharply reduce the volume of traffic including that of large vehicles passing through residential areas, and in parallel with such measures, the government has also been promoting the establishment of environmental protection zones.

Furthermore, the government has been striving to reduce the total traffic volume of motor vehicles through the construction and improvement of public mass-transportation means such as subway systems and bus services so that part of the users of individual motor vehicles can switch to using such mass-transportation means, and in parallel with such measures, the government is also promoting the construction and improvement of physical distribution systems and facilities such as distribution business centers and truck terminals in order to realize the rationalization of physical distribution since this also can contribute to the reduction of the total traffic volume of motor vehicles.

Measures against automobile noise

A. Present condition and trend of automobile noise

During the formation of its highly developed economic society, Japan has seen not only the concentration of population and production in large cities but also the rapid progress of motorization, and such rapid progress of motorization coupled with the special condition that the share of trucks in the total number of motor vehicles

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Table 7. Report on the long-term policy for establishment of maximum permissible limits of motor vehicle emissions (report submitted by Central Council for Control of Environmental Pollution on December 26, 1977).

Category of motor vehicle		Target values of maximum permissible limits (average values)		Measurement method
		1st stage	2nd stage	
Diesel-fueled ordinary & small-sized motor vehicles	Direct injection type	540 ppm	470 ppm	Diesel 6-mode
	Indirect injection type	340 ppm	290 ppm	Diesel 6-mode
Gasoline- or LPG-fueled ordinary & small-sized motor vehicles*	With GVW** exceeding 2,500 kg	1,100 ppm	750 ppm	6-mode
	With GVW 1,700 ~ 2,500 kg	1.2 g/km	0.9 g/km	10-mode
	With GVW 1,700 kg or less	1.0 g/km	0.6 g/km	10-mode
Light motor vehicles***		1.2 g/km	0.9 g/km	10-mode

- * Excluding those exclusively used for carrying passengers with a riding capacity of 10 persons or less.
- ** Gross vehicle weight.
- *** Excluding those exclusively used for carrying passengers and equipped with two-stroke engine.

is relatively large compared with other industrialized countries has been causing serious environmental pollution (public nuisances) resulting from automotive noise especially in areas along major highways where motor vehicle traffic is particularly heavy (see Fig. 6).

According to the results of the measurements of automobile noise levels carried out by various prefectural authorities in 1979 at 3,582 monitoring stations consid-

ered to represent various noise levels in each of these prefectures, there were 608 monitoring stations (17%) where the requirement of environmental quality standard for noise (see 2 B b.) was satisfied, and 782 monitoring stations (22%) where the noise levels were higher than the permissible limits (see 2 B c.) (see Fig. 7).

Analyzing the above measurement results by kinds of area, in residential areas where the maintenance of quietness is most desired, it was found not only that the ratio of satisfaction of the environmental quality standard for noise was markedly low but also that the ratio of the noise levels higher than the permissible limits was high.

Also, when the same is analyzed by time period, it was found that in general, the ratio of satisfaction of the environmental quality standard for noise during nighttime was highest compared with other time periods, but it was also found that the number of areas where the noise levels were higher than those specified by the environmental quality standard were increasing.

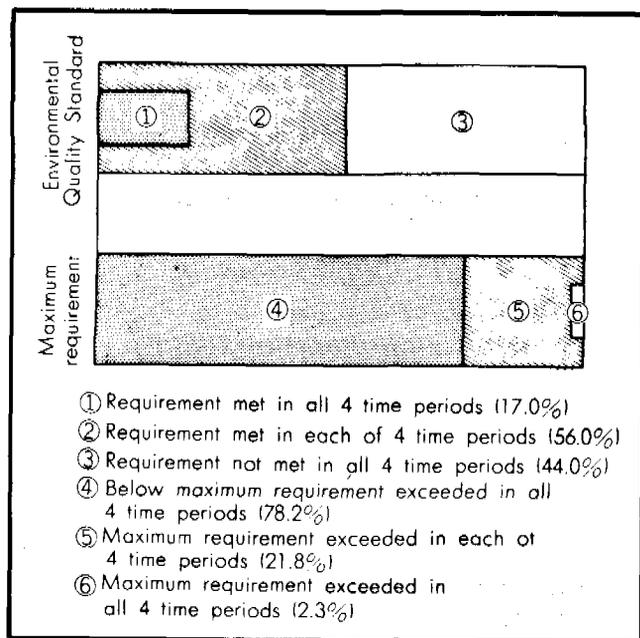


Figure 7. Conditions of conformity and non-conformity to requirements of Environmental Quality Standard by time period.

B. Measures against automobile noise

(i) Legal system for the regulation of noise

- a. Basic Law for Environmental Pollution Control Refer to 1. B. (ii).
- b. Environmental Quality Standards for Noise (Adopted at Cabinet Conference in 1971)

These standards were established in conformity with the Basic Law for Environmental Pollution Control and as the desirable standards to be met concerning noise pollution, similar to the case of air pollution,

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Table 8. Details of motor vehicle exhaust gas regulations (for vehicles currently in use).

Category of motor vehicles	Substance to be controlled	1970	1971	1972	1973 ~ 1974	1975	1976 ~ 1981
Gasoline-fueled motor vehicles	Idling CO	5.5%	←	4.5%	←	←	←
	Idling HC	—	—	—	—	1200 ppm	←
Diesel-powered motor vehicles	Diesel smoke emission at no-load acceleration	—	—	—	—	50%	←

Table 9. Environmental quality standard for noise.

Category of area	Time period			Area concerned
	Daytime	Morning/evening	Nighttime	
AA	Under 45 dB (A)	Under 40 dB (A)	Under 35 dB (A)	Area to be designated by the governor of each prefecture according to Paragraph 2 of government ordinance (No. 159, 1971) concerning the delegation of authority to designate water area and land area in conjunction with Environmental Quality Standard.
A	Under 50 dB (A)	Under 45 dB (A)	Under 40 dB (A)	
B	Under 60 dB (A)	Under 55 dB (A)	Under 50 dB (A)	

Notes: 1. Category AA represents area where special quietness is required such as one where medical center is located.
 2. Category A represents area mainly used as residential area.
 3. Category B represents area where considerable number of residences, commercial and industrial facilities are located together.
 As for areas along roads, the following standards have been established.

Category of area	Time period		
	Daytime	Morning/evening	Nighttime
Of the area of category A, area located along 2-lane road.	Under 55 dB (A)	Under 50 dB (A)	Under 45 dB (A)
Of the area of category A, area located along road with more than two lanes.	Under 60 dB (A)	Under 55 dB (A)	Under 50 dB (A)
Of the area of category B, area located along road with less than two lanes.	Under 65 dB (A)	Under 60 dB (A)	Under 55 dB (A)
Of the area of category B, area located along road with more than two lanes.	Under 65 dB (A)	Under 65 dB (A)	Under 60 dB (A)

from the standpoint of environmental pollution control (see Table 9).

c. Noise Control Law (Enacted in 1968)

As for automobile noise, this law provides that, as in the case of the Air Pollution Control Law, the Director-General of the Environment Agency is authorized to set the permissible limits concerning motor vehicle noise, and that the governor of each prefecture is authorized not only to make requests concerning the traffic regulations in conformity with the Road Traffic Law to the Prefectural Public Safety Com-

mission when the measured noise level exceeds a certain limit (see Table 10) and the living environment along the road concerned is conspicuously disturbed by such noise, but also to express his opinion, when necessary, to the road administration or the head of the related governmental agency concerning the improvement of the construction or system of roads.

d. Maximum Permissible Limits of Motor Vehicle Noise Emission (Established in 1970 by Environment Agency Notification)

This standard specifies the maximum permissible lim-

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Table 10. Maximum permissible limit.

(Unit: dB(A))

	Category of area	Time period		
		Daytime	Morning/ evening	Nighttime
1	Of class-1 area, area located along one-lane road.	55	50	45
2	Of class-2 area, area located along one-lane road.	60	55	50
3	Of class-1 and class-2 areas, areas located along two-lane road.	70	65	55
4	Of class-1 and class-2 areas, areas located along roads with more than two lanes.	75	70	60
5	In class-3 and class-4 areas, areas located along one-lane road.	70	65	60
6	In class-3 and class-4 areas, areas located along two-lane road.	75	70	65
7	In class-3 and class-4 areas, areas located along road with more than two lanes.	80	75	65

Note: *Classes-1, 2, 3 and 4 areas are those designated respectively by the governor of each prefecture according to the following criteria:

- (Class-1 area) Area where the maintenance of quietness is specially required in order to preserve desirable living environment.
- (Class-2 area) Residential area where the maintenance of quietness is necessary.
- (Class-3 area) Area where residential, commercial and industrial districts are located together, and the residential district has to be protected from noise.
- (Class-4 area) Area mainly used for industrial purposes, but extremely offensive noises must be prevented in order to prevent the deterioration of living environment of the people inhabiting in such an area.

its of steady running noise, stationary noise and accelerated running noise for motor vehicles, in conformity with the Noise Pollution Regulation.

The Noise Pollution Regulation provides, just as in the case of the Air Pollution Control Law, that the Minister of Transport must endeavor to enforce this maximum permissible limit in case he establishes by an order pursuant to the Road Vehicle Act necessary matters on control of motor vehicle noise.

e. Road Vehicles Law

Refer to 1. B. (i).

f. Safety Regulations for Road Vehicles

Refer to 1. B. (i).

Technical standards concerning motor vehicle noise will be discussed in detail in the following section.

(ii) Measures against motor vehicle noise through the regulation of the construction and equipments of motor vehicles

The regulations of steady running noise and stationary noise (see Table 12) concerning motor vehicles and motor-driven cycles in use (including new ones), except special

motor vehicles have been enforced in conformity with the Safety Regulations for Road Vehicles since 1952 and these regulations were strengthened in 1971.

As for new motor vehicles, in addition to the above-mentioned regulations, the regulation governing accelerated running noise (see Table 12) which is the greatest noise produced by any motor vehicle running on roads in urban areas has been enforced since 1971, and this regulation was further strengthened in 1976 for motor vehicles except passenger motor vehicles and small-sized motor vehicles and for motor-driven cycles, and in 1977 for passenger motor vehicles and small-sized motor vehicles. In the meantime, the Central Council for Control of Environmental Pollution completed a Report on Long-term Targets for Permissible Limits on Motor Vehicle Noise (see Table 13) in June, 1976. In response to this report, as the first phase of measures to be taken, the regulation of accelerated running noise of motor vehicles has been strengthened since 1979, and as the second phase, the regulation of accelerated running noise of passenger motor vehicles is expected to be strengthened in 1982.

As mentioned in the preceding section, the situation concerning motor vehicle noise has still not been im-

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Table 11. Outline of motor vehicle noise.

(Unit: dB)

Type of motor vehicle				1971		1976		1977		1979		1982	
				Steady running and stationary noise	Accelerated running noise	Steady running and stationary noise	Accelerated running noise	Steady running and stationary noise	Accelerated running noise	Steady running and stationary noise	Accelerated running noise	Steady running and stationary noise	Accelerated running noise
Trucks and buses	Large-sized	Gross vehicle weight > 3.5 t	Max. power > 200 PS	80	92	←	89	←	←	86	←	←	
	Medium-sized		≤ 200 PS	78	89	←	87	←	←		←		
	Small-sized	Gross vehicle weight ≤ 3.5 t		74	85	←	←	83	←	81	←	←	
Passenger motor vehicles				70	84	←	←	82	←			←	78
Motorcycles	Small-sized motor vehicle		Engine displacement > 250 cc	74	86	←	83	←	←	78	←	←	
	Light motor vehicle		≤ 250 cc > 125 cc		84	←		←					
Motor driven cycles	Class-1		≤ 50 cc	70	80	←	79	←	←	75	←	←	
	Class-2		≤ 125 cc > 50 cc		82	←		←					

(Date of enforcement)

	Domestic models		Imported motor vehicles
	New models	Models in continuous production	
1971 regulation	1971. 4. 1	1972. 1. 1	
1976 regulation	1976. 1. 1	1976. 9. 1	
1977 regulation	1977. 1. 1	1977. 9. 1	
1979 regulation	1979. 1. 1 (Applicable to diesel-powered motor vehicles, motorcycles and motor-driven cycles from April 1, 1979)	Passenger motor vehicles 1979. 9. 1 (Applicable to diesel-powered two-wheeled and other motor vehicles from December 1, 1979)	1981. 4. 1
1982 regulation	1982. 10. 1	1983. 9. 1	1984. 4. 1

proved to the desirable degree, and thus it is also necessary to enforce the regulation of accelerated running noise for categories of motor vehicles other than passenger motor vehicles as soon as possible as part of the forthcoming second phase of measures.

(iii) Other measures against motor vehicle noise

As measures to protect the living environment, the government is now promoting the transfer of motor vehicle traffic to other means of transport, intensification of traffic control measures, improvement of road structure and improvement of environmental conditions along roads (see 1.B.(iii)).

Energy-Saving Measures for Motor Vehicles

Even if the oil crises in 1974 and 1979 hadn't occurred, the world faces the strong probability of a shortage of energy supplies in the future due to the finite nature of oil resources coupled with the growing trend on the part of the oil producing countries to preserve their resources. For instance, some predict that the gap between supply and demand for oil will become clearly apparent from around the middle of the 1980's.

Japan's energy consumption is now 410 million tons, having increased by about 30% from the 1970 level. As a result, Japan is now the second largest energy consumer next to the U.S. in the free world.

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Table 12. Measuring methods of noises.

Classification	Measuring method
Steady running noise	When a motor vehicle or motor-driven cycle is running on a dry, level and paved road at a steady speed corresponding to either an engine rotating speed equal to 60% of the speed at which the engine produces its maximum power or (a) in the case of a motor vehicle or a 2nd class motor-driven cycle, 35 km/h, (b) in the case of a 1st class motor-driven cycle, 25 km/h, whichever is lower, the noise level shall be measured at a point 1.2 meters from the ground and 7 meters leftward from the longitudinal axis of the vehicle or cycle.
Stationary noise	When an engine is running with no load at a speed of revolution equal to 60% of the speed at which the engine produces its maximum power, the noise level shall be measured at a point 1.2 meters above the ground and 20 meters to the rear from the opening of the exhaust pipe.
Accelerated running noise	A motor vehicle or motor-driven cycle to be tested shall run on a dry, level and paved road at a steady speed corresponding to either an engine rotating speed equal to 75% of the speed at which the engine produces its maximum power or (a) in the case of a motor vehicle other than a light motorcycle with or without sidecar, 50 km/h, (b) in the case of a light motorcycle or a 2nd class motor-driven cycle, 40 km/h, (c) in the case of a 1st class motor-driven cycle, 25 km/h, whichever is lower, and as soon as the vehicle or cycle reaches the acceleration start line, it shall be accelerated and run the 20 meters testing distance with its accelerator pedal fully depressed or its throttle valve fully opened. Meantime, the noise level shall be measured, in the middle of the testing distance, at a point 1.2 meters from the ground and 7.5 meters leftward from the longitudinal axis of the vehicle or cycle.

It is characteristic of the energy supply structure of this country, however, that not only the dependency on oil (74% in 1978) is much higher compared with other major developed countries but also the dependency on imported energy resources is extremely high (88%; figure for oil imports was 99.8% in 1978), and such an energy supply structure is considered to be most vulnerable in case of instability of supply and rising prices of energy

Table 13. Report on long-term targets for permissible limits on motor vehicle noise (Reports submitted by Central Council for Control of Environmental Pollution on June 15, 1976).

Types of vehicle	Target values dB (A)	
	Phase I	Phase II
Vehicles with gross vehicle weight exceeding 3.5 tons	86	83
Vehicles with gross vehicle weight not exceeding 3.5 tons, passenger cars and motorcycles (excluding motor-driven cycles)	81	78
	78	75

Note: The figures stand for values obtained by JIS (Japanese Industrial Standard) 1024 (measurements of noise emitted by automobiles).

sources, situations which are predicted to become increasingly common from now on.

Thus, it is necessary for Japan to promote energy-saving measures actively, and this is especially important in the field of transportation, particularly motor vehicles, which are one of the main consumers of energy.

This chapter is primarily devoted to discussions on energy-saving measures concerning motor vehicles mainly in the light of the legal regulations.

Present condition of energy consumption by motor vehicles

Of the total consumption of energy in this country which has been increasing year by year (see Fig. 8), transportation accounted for 16% as of 1978 (see Fig. 9), but this share is 26% as far as the share of oil consumption is concerned (see Fig. 10).

Of the total consumption of energy in the field of transportation, motor vehicles account for 79% of which the consumption by passenger motor vehicles accounts for 40%.

Looking at the trend of fuel efficiency of passenger motor vehicle (see Fig. 11), it continued to increase up to 1975 mainly due to the increase in the number of large-

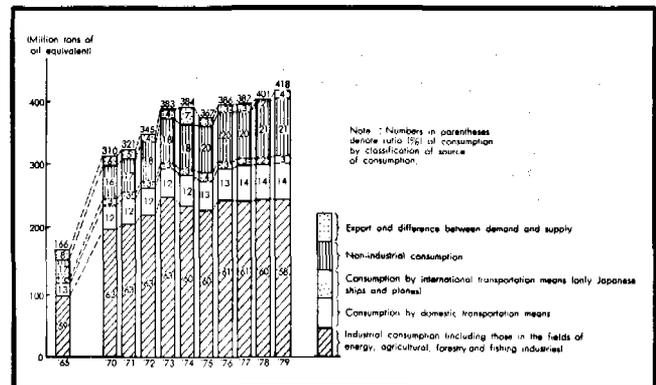


Figure 8. Trend of energy consumption in Japan (Unit: Million tons in terms of oil).

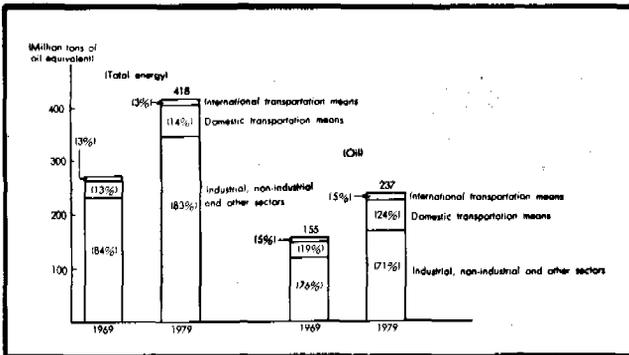


Figure 9. Share of transportation sector in final demand for energy in Japan.

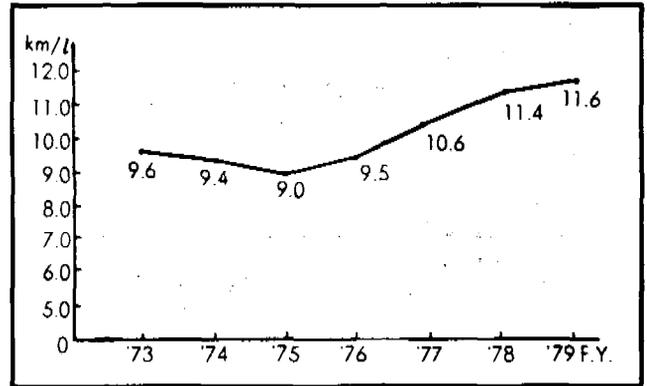


Figure 11. Average 10-mode fuel efficiency of passenger motor vehicles for domestic market.

sized passenger motor vehicles coupled with the increasingly stringent exhaust gas regulations, but it started to mark a down-trend after 1976 mainly thanks to technological advances in automotive engineering.

Energy-saving measures for motor vehicles

A. Legal support

(i) Rationalization of energy consumption law

As for the energy-consuming machines and equipment including motor vehicles, this law stipulates:

- Manufacturers (including importers) shall strive to bring about a reduction of energy consumption through improvement in the performance of their machines and equipments.
- Minister of International Trade and Industry or Minister of Transport shall be authorized to establish standards for the improvement of performance as to

special machines and equipments designated as ones requiring improvement in their performance by Cabinet Order.

- Manufacturers shall be required to indicate the energy efficiencies of designated machines and equipments.
- Minister of International Trade and Industry or Minister of Transport, whenever necessary, shall be authorized to require the manufacturers of designated machines and equipments to report on the conditions of their businesses, or let the personnel of the ministry conduct on-the-spot inspection of the designated machines and equipments at the factories or offices of the manufacturers. In addition, the law stipulates that the entrepreneurs and owners of buildings must meet the requirements and standards laid down, and for the right of relevant ministries not only to give necessary guidance and advice but also to let their staff conduct on-the-spot inspections of such offices and buildings.

(ii) Enforcement Cabinet Order for Rationalization of Energy Consumption Law

This Cabinet Order designates special machines and equipment as type-designated gasoline-fueled passenger motor vehicles according to Rationalization of Energy Consumption Law.

(iii) Ministerial Ordinance Regarding Determination of Automobile Fuel Efficiency

This law provides that the motor vehicle fuel efficiency to be indicated by the manufacturers shall be the 10-mode fuel efficiency determined by the Minister of Transport at the time of type-designation.

(iv) Guidelines for Manufacturers and Others concerning Improvement of Motor Vehicle Performance (Ordinance of Ministry of International Trade and Industry and Ministry of Transport)

These guidelines for manufacturers set the targets of 10-mode fuel efficiency vehicle weight to be attained by

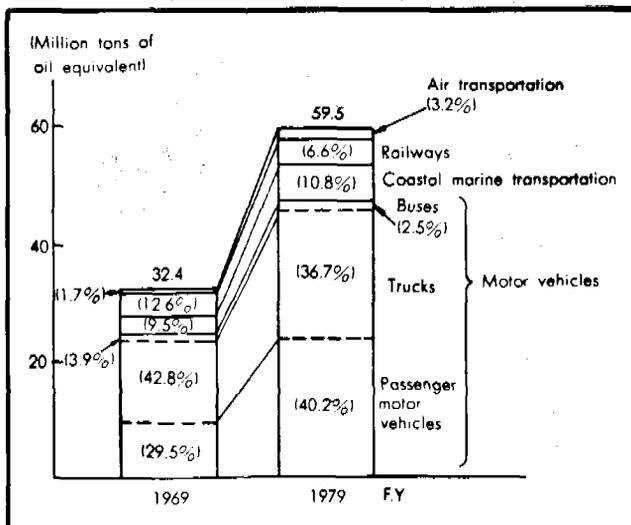


Figure 10. Shares of energy consumption by various domestic transportation means.

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F.Y. 1985 concerning the passenger motor vehicles to be shipped to the domestic market.

Also, these guidelines provide for the contents and methods of indications to be made by manufacturers.

These matters will be explained in detail in the following section.

B. Fuel efficiency standard of motor vehicle and indication of fuel efficiency

Guidelines for manufacturers concerning the improvement of motor vehicle performance provide for the following standards and requirements concerning the indications:

a. Guidelines

As for the 10-mode fuel efficiencies of gasoline-fueled passenger motor vehicles falling under the categories of specified model classifications which will be shipped to the domestic market in F.Y. 1985 (in F.Y. 1988 for imported vehicles), manufacturers are required to ensure that the weighted harmonic averages of such 10-mode fuel efficiencies are better than the fuel efficiency standards shown in the following table.

Category Item	A	B	C	D	(Reference) Overall average
Vehicle weight (kg)	less than 577.5	equal to or more than 577.5 less than 827.5	equal to or more than 827.5 less than 1265.5	equal to or more than 1265.5 less than 2015.5	
(A) Target (km/l)	19.8	16.0	12.5	8.5	12.8

Remarks

In case any manufacturer ships passenger cars both of category 2 and of category 3 to the domestic market, category 2 and category 3 shall be combined into one category, and the target of energy efficiency for the combined category shall be 13.0 km/l.

b. Matters to be indicated

Manufacturers are required to indicate the 10-mode fuel efficiencies and related matters (Type, engine displacement, type of transmission, etc.) clearly in the catalogs of their motor vehicles or on those for display from June 1st, 1980. The fuel efficiency in general is expected to be improved by 12.3% in F.Y. 1985 com-

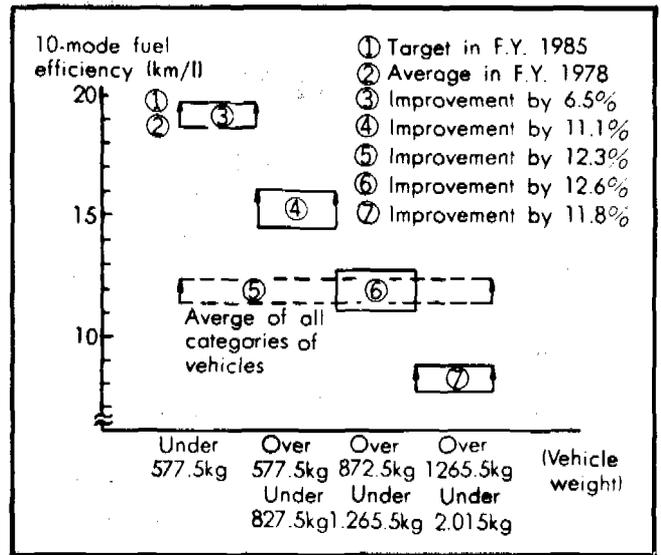


Figure 12. Fuel efficiency improvement target for passenger motor vehicles.

pared with F.Y. 1978 through the enforcement of the above-mentioned measures (see Fig. 12).

C. Other energy-saving measures for motor vehicles

In addition to promoting the technological development for improving fuel efficiency through the establishment of fuel efficiency standards and the introduction of the fuel efficiency indication system described above, the government is also promoting the energy-saving measures for motor vehicles by recommending the following:

- (i) To refrain from abrupt acceleration and to maintain an economic running speed (Recommendations concerning the improvement of driving habits directed at drivers).
- (ii) To carry out proper maintenance such as correct tire pressure and to keep ignition plugs clean (Recommendations concerning maintenance of motor vehicles directed at drivers).
- (iii) To promote the establishment of car pooling and cooperative transportation systems in order to improve the load factor for passenger vehicles and trucks.
- (iv) To encourage the use of public mass transport which is more efficient than individual motor vehicles.

Legal Systems of Japan on Motor Vehicles*

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Part 4: Type Approval System of Motor Vehicles

Outline of Type Approval System of Motor Vehicles

In Japan, before new types of motor vehicles are manufactured or sold, examination is conducted on each type of motor vehicle to determine whether it conforms to the safety requirements and antipollution standards as explained in previous issues. It is carried out as a part of the motor vehicle inspection system under the Road Vehicles Act in order that the inspection of new types of vehicles may be conducted accurately by a limited number of persons on many items in a short period of time. Particulars of the motor vehicle inspection system will be explained on another occasion, but the outline of the type approval system is as follows:

In Japan, every motor vehicle is obliged to undergo an inspection conducted by the Ministry of Transport. Only motor vehicles which, as a result of the inspection, conform with the Safety Regulations for Road Vehicles are allowed to be operated on the roads. The inspection is, in principle, carried out before the motor vehicles are first used on roads and at the time when effective term of motor vehicle inspection certificate expires on the motor vehicles submitted to the District Land Transport Offices located throughout Japan. However, it would be impossible to carry out a detailed technical inspection on all items under the Safety Regulations of Road Vehicles on each motor vehicle at the time of such inspection. Therefore, the type approval system of motor vehicles is established, under which the inspection of each type of motor vehicle is carried out collectively by the Road Transport

Bureau and the Traffic Safety and Nuisance Research Institute, of the Ministry of Transport.

The type approval system is divided into two systems. One is the type designation system for vehicles produced and sold on a mass-production and uniform basis. The other is the type notification system for motor vehicles other than the above mass-production motor vehicles.

In addition to the above two types of approval systems for the motor vehicles as a whole, there is also the type approval system for devices of motor vehicles to ensure that the inspection is conducted efficiently.

Type Designation System

The type designation system is a system under Article 75 of the Road Vehicles Act which reads as follows:

Road Vehicles Act (extract)

Article 75 (Type Designation of Motor Vehicles)

- (1) The Minister for Transport shall designate a motor vehicle as to the type upon receipt of application for the purpose of promotion of the safety of motor vehicles.
- (2) The type designation provided for in the preceding paragraph shall be effected by judging whether the motor vehicle concerned conforms to the Safety Regulations, and besides, whether it has uniformity.
- (3) Any person submitting the application provided for in paragraph 1 shall, in the case where he alienates the motor vehicle of the designated type, inspect whether the motor vehicle concerned conforms to the Safety Regulations, and when he judges that the vehicle conforms thereto, he shall issue a termination certificate of completion inspection and deliver it to the alienee.
- (4) The Minister for Transport may, when the motor vehicle of the designated type has ceased to conform to the Safety Regulations or has ceased to have uniformity, cancel the designation thereof. In this case, the Minister for Transport may limit the effective scope of the cancellation as to the motor vehicles which have been manufactured up until the day of cancellation.

In this system, as provided for in Paragraph 2, it is required that the motor vehicle concerned not only conform to the Safety Regulations, but also that it have uniformity. Furthermore, as provided for in Paragraph 3, the system obligates the applicant to conduct the completion inspection on each type-designated motor vehicle and to deliver the termination certificate of completion

* Received 7th July 1981.

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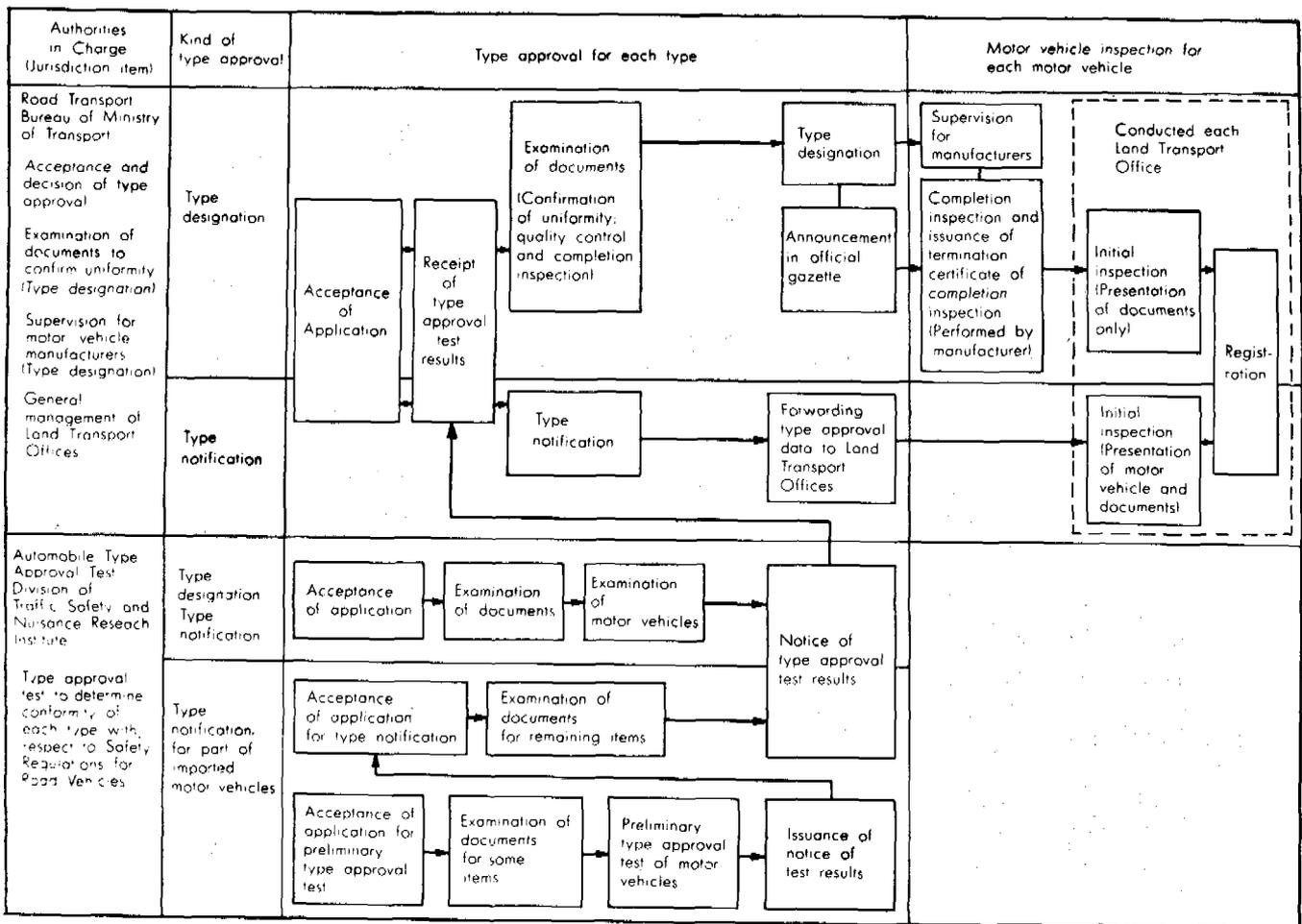


Figure 1. Flow chart of type approval and initial inspection.

inspection, so that the applicant is required to provide a system, facility and staffs to conduct the above inspection. Under the above conditions, there is an advantage that as to type-designated motor vehicles, if the termination certificate of completion inspection is presented at time of initial inspection at the land transport office, presentation of the motor vehicle concerned can be omitted. (Article 59 paragraph 4 of the Road Vehicles Act).

The application procedures under this type designation system, standards of completion inspection, form of termination certificate completion inspection, report on change, measures on defects caused by design or production process are provided by the Type Designation Regulations for Motor Vehicles (Ministry of Transport Ordinance No. 85 of 1951) and the particulars are provided by the Enforcement Procedure for Motor Vehicle Type Designation (Jisha No. 87 and Jisei No. 37 Circulars of 1970), etc. In this system, even after the designation is obtained, inspection of the manufacturer will be conducted on the uniformity of the type-designated motor vehicles, conformity to the Safety Regulations, situation of completion inspection, etc.

For your reference, Figure 1 shows the flow of process

from application under the type designation system or the type notification system and the type designation or notification upon inspection to initial inspection and registration of each motor vehicle. After the application is received by the Road Transport Bureau of the Ministry of Transport, a technical examination is made by the Automobile Type Approval Test Division, Traffic Safety and Nuisance Research Institute of the Ministry. Furthermore, examination of the system for conducting quality control and completion inspection is carried out by the Road Transport Bureau. On the basis of these results, the type will be designated.

Incidentally, most of domestic passenger motor vehicles, small-sized trucks and buses have obtained designation of type. Two types of imported motor vehicles were given designation of type in August 1981 for the first time in recent years.

Type Notification System

The type notification system comes under the Handling Procedure for Motor Vehicle Type Notification (Jisha No. 375 and Jisei No. 86 Circulars of June 12, 1970). This

system obliges a manufacturer of motor vehicles or a person who has a sales contract with the manufacturer to notify the type with the Minister for Transport before he manufactures or sells new type motor vehicles, to carry out a detailed examination as to whether the motor vehicles notified conform to the collective Safety Regulations of the Road Transport Bureau of the Ministry of Transport and the Automobile Type Approval Test Division of the Traffic Safety and Nuisance Research Institute and to inform the result of inspection to the land transport offices throughout Japan together with relevant materials. Under this system, different from the type designation system, the initial inspection at the land transport office is conducted on motor vehicles submitted. However, since the result of the examination has already been sent to the land transport office together with the materials, it is possible to simplify the inspection to confirmation of uniformity of the vehicle, the content of notification and confirmation of enforcement of the modification items in order to efficiently perform the inspection. Further, the uniformity of motor vehicles is not required especially and the applicant is not required to provide any system, facility and staff for conducting the completion inspection. Moreover, no inspection of the applicant after the type is notified will be conducted. At the present time, type notification is made mainly on such motor vehicles whose production volume or number of sales per type is small such as imported motor vehicles, large-sized trucks, buses, etc.

Type Approval System Devices for Motor Vehicles

Under this system, manufacturers, etc. of motor vehicles can obtain type approval of vehicles on noise, exhaust emission control devices and other safety devices in accordance with the provisions of Articles 62-3-2, 62-4 and 63 of the Enforcement Regulations for Road Vehicles Act. The following is an explanation of the type approval on noise and type approval on exhaust emission.

As to the type approval of other devices for safety, explanation is omitted. Hereafter, explanation will be given on the type designation and type notification.

Type approval of motor vehicles on noise:

This is a system to give type approval on each type of motor vehicle in order to carry out effectively the control of noise of new type motor vehicles as provided for in the Safety Regulations for Road Vehicles.

Under the Enforcement Regulations for Road Vehicles Act, persons who are entitled to make an application for such approval are manufacturers of motor vehicles or the sales agent of such motor vehicles. In reality, as to domestic motor vehicles, the manufacturers make such an application and for imported motor vehicles the importer

applies. Prior to application, the applicants must prepare data showing conformity to the noise standards set down in Article 30 of the Safety Regulations for Road Vehicles (as to motor vehicles for which type notification has been filed, the value so notified can be used). (Circular "Procedures for Type Approval of Motor Vehicles on Noise" (Jiko No. 162-2 of 1975)). Then, upon examination of documents, the type approval on noise will be given. At present, some domestic motor vehicles and almost all imported motor vehicles are using this system.

Type approval of exhaust emission control devices:

This is a system to issue type approval for each device (exhaust emission control device) to reduce the exhaust emission such as carbon monoxide, etc. (CO, HC, NO_x and/or Diesel smoke) installed on motor vehicles in order to enforce the exhaust emission control of new type motor vehicles as provided for in the Safety Regulations for Road Vehicles.

The application procedures are the same as those for type approval on noise as mentioned above, but prior to application the applicants must prepare data showing conformity to the exhaust emissions standards as provided for in Article 31 of the Safety Regulations for Road Vehicles (as to motor vehicles for which type notification has been made, the value so notified can be used) and data concerning durability of exhaust emission control devices. (Handling Procedures of Type Approval for Exhaust Emission Control Devices (Jiko No. 115 of 1974)).

Obligations of persons obtaining type approval:

Persons who obtain type approval of motor vehicles on noise or type approval of exhaust emission control devices are subject to the following obligations:

A. Implementation of inspection:

Before transfer of motor vehicles to transferees, persons who obtained the type approval must carry out an inspection as to whether the motor vehicles conform to the noise and exhaust emission standards as provided for in the Safety Regulations pursuant to the provisions of the Enforcement Regulations for Road Vehicles Act. In implementing such an inspection, it is permitted that measuring of noise or exhaust emission for each motor vehicle be replaced by sampling test or quality control through test of pollution-control parts in the course of the process. If it is found that the motor vehicles conform to such standards, as to noise indication will be made by attaching plates to the motor vehicles and as to exhaust emission an approval certificate must be issued to the transferees. Incidentally, if false indication or certification is made, the type approval will be cancelled.

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B. Securing uniformity:

Under the Enforcement Regulations for Road Vehicles Act, persons who acquire the type approval must endeavor to secure the uniformity of devices etc. by establishing quality control procedures in order to guarantee the quality of the noise prevention structures or exhaust emission control devices of motor vehicles and organize a system to perform such procedures. If it is found out that uniformity is not secured, the type approval will be cancelled.

C. Others:

Persons who have acquired type approval must establish an inspection and maintenance procedure and endeavor to publicize them to the users.

Type of Motor Vehicles

The motor vehicles are designated or notified by each type. The type in this case means that the fundamental constructions and devices of vehicles are almost the same, and the scope whereby motor vehicles are recognized as the same type is stipulated by the Judgment Criteria for Identity of Type of Motor Vehicles (Jisha Circular No. 151 of 1971). According to the Circular, if the following matters are different, they will be treated as variant:

- (1) Category of motor vehicles (ordinary motor vehicles, small-sized motor vehicles, light motor vehicles, large-sized special motor vehicles, small-sized special motor vehicles) classified by constructions of vehicle, length, width, height and engine displacement pursuant to the provisions of Articles 1 and 2 of the Enforcement Regulations for Road Vehicles Act.

Vehicle classification by construction.

	Structure of motor vehicles			
	Length	Width	Height	Engine displacement
Ordinary motor vehicles	Motor vehicles not included in other categories			
Small-sized motor vehicles	4.7m or less	1.7m or less	2.0m or less	2.0ℓ or less (excluding Diesel engine)
Light motor vehicles	3.2m or less	1.4m or less	2.0m or less	0.55ℓ or less (0.25ℓ or less for two-wheeler)
Large-sized special motor vehicles	motor vehicles of special structure (vehicles with caterpillar track, etc.)			
Small-sized special motor vehicles	4.7m or less	1.7m or less	2.0m or less	1.5ℓ or less

Note: Maximum speed of small-sized special motor vehicles is less than 15 km/h.

- (2) Use (Passenger motor vehicles, buses, trucks and special purpose motor vehicles).
- (3) Shape of body (in case of passenger motor vehicles: sedan, station-wagon, convertible, etc.)
- (4) Category and main construction of engine (gasoline engine, diesel engine, engine displacement, etc.), power transmission system (rear-wheel drive, front-wheel drive, four-wheel drive, etc.), running system (two-axle, three-axle, etc.), wheel suspension system (independent suspension, rigid axle suspension, etc.) and control system.
- (5) Frame (frame type, frameless type, etc.)
- (6) Wheel base
- (7) Kinds of main brake system (oil pressure, air, mechanical, etc.)
- (8) Difference in exhaust emission standard value cleared (1975 standard, 1976 standard, 1978 standard, etc.)
- (9) Margin of length, width, height and vehicle weight exceeding the prescribed tolerance in the production.

Documents and Motor Vehicles To Be Submitted at Time of Application

Documents to be submitted:

In case of type designation, an applicant is required to submit the following materials together with the application:

- a. Specifications.
- b. External views and external photographs of motor vehicles.
- c. Documents proving compliance with the Safety Regulations for Road Vehicles.
- d. Brief description of constructions and devices.
- e. Documents setting forth operational system and implementation procedures for completion inspection and maintenance procedures of machinery and equipment for inspection.
- f. Documents setting forth operational system for the inspection of devices under the Safety Regulations and implementation procedures.
- g. Documents setting forth procedures for issuing termination certificate of completion inspection.
- h. Documents setting forth motor vehicle inspection and maintenance procedures conducted by user.
- i. Documents setting forth production plan and monthly number of motor vehicles sold by the applicant during the past one year.
- j. In case a person who enters into a sales contract with a manufacturer of motor vehicles applies, a copy of the sales contract.

In case of type notification, documents specified in preceding Items (e), (f), (g) and (i) may be omitted. As to Item (c), documents having more detailed contents will be required in case of type designation.

Motor vehicles to be submitted:

In case of type designation, new motor vehicles and motor vehicles that have been subjected to long distance running as required must be submitted for presentation in accordance with the provisions of the Announcement of Requirements on Durability Vehicles for Type Designation. (Ministry of Transport Announcement No. 356 of 1969). In case of type notification, only new motor vehicles will be submitted. The number of motor vehicles to be submitted will differ according to the variety of construction and devices, that is, one to several vehicles in the ordinary case of type notification or some tens of vehicles in case of series of type designation on large scale.

Judgment Criteria of Technical Examination and Method of Testing

In case application is made for type designation or type notification, a technical examination will be conducted on documents submitted, such as the applicant's test data, etc. and on motor vehicles submitted for presentation and it will be determined whether they conform to all provisions of the Safety Regulations and circulars under the Regulations. As a result, it will be judged whether the motor vehicles subject to the application conform to the Safety Regulations or not. The main circulars used for judgment in the examination are as follows:

- **Technical standards:**

These circulars stipulate deliberately the application scope on the content, test method, requirement, etc. in case the provisions of the Safety Regulations do not specify concrete requirements. As of March 1981, there were 23 standards in total.

- **Type Approval Testing Standards (Jisha No. 626 and Koshin No. 531 Circular of 1972):**

This circular stipulates more concretely necessary parts to be tested in order to determine whether motor vehicles of a new type conform to the Safety Regulations.

- **Motor Vehicle Inspection Procedures (Jisha Circular No. 880 of 1961):**

This circular sets forth the standards for determining reasonably and efficiently whether motor vehicles including new type vehicles conform to the Safety Regulations at the time when the inspection is conducted.

In the meantime, as to the technical standards, in conducting tests relating to the type notification of imported motor vehicles, the following procedure is established. That is to say, if they are proved to conform to the foreign standards which are deemed to be equal to or more stringent than Japanese technical standards by prescribed documents, they are recognized as conforming to the Japanese technical standards. Eleven technical standards are presently recognized as being equal to FMVSS,

10 are recognized as being equal to ECE Regulations and 2 are recognized as being equal to EEC Directives, and 13 technical standards are recognized to be equal to FMVSS, ECE or EEC.

As the circulars providing in detail the test procedures for the official examination of motor vehicles and the test procedures for preparing intra-company data, there are the Type Approval Test Procedures (Koshin Circular No. 453 of 1971) (called "TRIAS").

These circulars are established and amended in consideration of the amendment to the Safety Regulations, appearance of new motor vehicle technology, improvement of measuring techniques, etc. In such cases, opinions are sought from the parties concerned such as motor vehicle manufacturers and importers as the need arises, and as to imported motor vehicles, opinions of foreign motor vehicle manufacturers are sought through the Japan Automobile Importers' Association, etc.

Test Items for Inspection of Submitted Motor Vehicles

Testing of motor vehicles for type approval is conducted on the following items by using motor vehicles submitted to the Automobile Type Approval Test Division.

Test of motor vehicles for type notification (in case of passenger motor vehicles):

- Measurement of specification weight
- Confirmation of construction, devices and function
- Front wheel alignment test
- Braking test
- Noise test (steady running noise level test, accelerated running noise level test, exhaust emission noise)
- Exhaust emission test 10-mode (Note 1) and 11-mode test (Note 1) of gasoline-fueled motor vehicles and fuel evaporation gas test (Note 1) and 6-mode test of Diesel-powered motor vehicles and Diesel engine smoke test
- Heat-damage test (Note 1)
- Lighting device (headlamp, number plate lamp, backup light, auxiliary headlamp) test and rear-view mirror visibility test
- Test of speed warning devices
- Test of brake fluid leakage warning devices
- Horn sound level test

Test of motor vehicles for type designation (in case of passenger motor vehicles):

In addition to the test items of motor vehicles for type notification as set forth in Item (1), tests will be conducted on the following items:

- Specification measurement
- Engine load test

- 10-mode fuel economy test of gasoline-fueled motor vehicles (Note 2)
- Service brake/parking brake systems efficiency test
- Various impact and strength tests such as steering impact test
- Windshield washing system test

Moreover, as to construction and device performance confirmation and exhaust emission test (in case of gasoline-fueled motor vehicles), for the type designation, tests are also conducted on motor vehicles which have run a long distance.

(Note 1) In case of type notification of imported motor vehicles whose annual number imported is 1200 or less, no test is carried out, but it is necessary to attach the test data by the Japan Automobile Transportation Technique Association as the official test institution in Japan to the application.

(Note 2) The test is carried out under the Rationalization of Energy Consumption Act.

Special Treatment of Test of Imported Motor Vehicles

As to the type notification of imported passenger motor vehicles, at the request of foreign countries which are exporting motor vehicles to Japan and from the viewpoint of geographical disadvantages and mutual benefits, favorable measures for carrying out actual tests are provided. One such measure is the use of test results of foreign official test organs and the other is the implementation of a preliminary test. Through the use of these systems, the number of days required to test imported passenger motor vehicles is shortened as much as possible and on average, the number of days is considerably less than that for domestic motor vehicles.

Use of test results of foreign official test organs:

This system is, in the case where a foreign government or official automobile test organ which is recognized by the Japanese Government carries out tests on the following six items under the Japanese test method and the test results are attached to the application together with the certificate, to use such results and has been operated since 1977:

- a. Braking test
- b. Noise test
- c. 10-mode exhaust emission test for gasoline-fueled motor vehicles
- d. 11-mode exhaust emission test for gasoline-fueled motor vehicles
- e. Fuel evaporative emission test for gasoline-fueled motor vehicles

- f. Heat damage test for motor vehicles with exhaust emission control devices

The foreign official test organs recognized by the Japanese Government are the following six organs of four countries

- (1) France:
Union Technique de l'Automobile du Motocycle et du Cycle
(Test to be entrusted: All of the above six items.)
- (2) Federal Republic of Germany:
Rheinisch-Westfälischer Technischer Überwachungs-Verein e.V.
(Test to be entrusted: Items a, c, d, e and f)
Technischer Überwachungs-Verein Bayern e.V.
(Test to be entrusted: Item b)
- (3) United Kingdom:
Vehicle Engineering and Type Approval Centre, Department of Transport
(Tests to be entrusted: All of the above six items.)
- (4) Italy:
Centro Superiore Ricerche e Prove Autoveicoli e Dispositive, di Roma Ministero dei Trasporti
(Tests to be entrusted: Items a and b)
Centro Prove Autoveicoli di Torino Ministero dei Trasporti
(Tests to be entrusted: Items c, d, e and f)

Implementation of preliminary test:

This system is, at the request of the applicant, to carry out the test of motor vehicles on all items normally implemented at the Automobile Type Approval Test Division by dispatching motor vehicle inspectors to overseas motor vehicle manufacturers prior to the application for type notification. Correctly observed, this system renders it unnecessary to bring the motor vehicle concerned for test in Japan. Furthermore, since there is a tendency for applications of notification of imported motor vehicles to be concentrated in the autumn, if the ordinary procedures are taken the tests in this season may tend to be delayed.

This system, on the other hand, makes it possible to handle a great number of types at one time efficiently. This system has been in effect since 1977, when the necessary budgetary allocation for dispatch overseas of inspectors was made. The overseas motor vehicle manufacturers for whom the preliminary type approval test had been carried out up until 1980 were as follows:

United States of America:

General Motors Co., Ford Motor Co., Chrysler Co.

Federal Republic of Germany:

Volkswagenwerk AG, Audi NSU, Auto Union AG, Ford Motor Co.

England:

Rolls-Royce Motors Ltd., British Leyland Ltd.

Sweden:

Volvo Car Co.

Table 1. Ratio of type-notified imported motor vehicles using preliminary test.

(Unit: %)

Year		1977	1978	1979	1980
Ratio of number of tested types	U.S.	35	48	56	59
	Europe	20	16	14	34
	Total	29	34	29	47
Ratio of number of tested vehicles	U.S.	33	52	66	65
	Europe	40	23	25	48
	Total	36	38	40	57

The preliminary test occupies an important position in the test of imported motor vehicles. As shown in Table 1, from 1977 to 1979, on average, approx. 30% of tested types and approx. 40% of tested number of motor vehicles and in 1980 approx. 50% of the tested types and approx. 60% of the tested number of motor vehicles were dealt with by the preliminary test.

Incidentally, the preliminary test is rendered even more efficient when combined with the system of using the test results of foreign official test organs, described in Paragraph (1).

Test Facilities

The main facilities owned by the Automobile Type Approval Test Division for implementation of the type approval test of motor vehicles are as follows:

Kumagaya Proving Ground:

The construction of a proving ground for motor vehicle type approval test was commenced at Kumagaya City, Saitama Prefecture in 1976 for the purpose of strengthening the test system in conjunction with the regulations for safety and antipollution of motor vehicles which were made more strict and partly because no further expansion of the headquarters facilities in Mitaka District was possible. The proving ground covers an area of approx. 240,000 square meters part of which has been in use since 1978, and at present facilities are still being constructed one after another. The total amount expended for the test facilities up to 1981 was approx. 10 billion yen. The facilities presently being used are as follows:

- a. Test course:
(Specifications) Total length: 1,350 meters; width of direct line course: 50 meters (maximum); 25 meters (minimum), asphalt-paved road, durable load: 40 tons (100 km/h); brake test course (21m × 100m; paved with reinforced-concrete)
(Main test items)

Brake test, noise test, road load measurement for exhaust emission test, speed warning device test, steering stability test, etc.

- b. Motor vehicle confirmation laboratory:
(Main facilities) Surface plate (14m × 4m made of cast-iron, 13m × 7m made of concrete); side-slip tester, brake tester, speedometer tester, headlight tester, pit
(Main test items) Test for confirmation of construction, devices and functions, specification measurement, etc.
- c. Measurement test laboratory:
(Main facilities) Weight-meter, brake tester, crane
(Main test items) Weight measurement, braking efficiency test, etc.
- d. Exhaust emission test laboratory and fuel economy and large-sized motor vehicle exhaust emission test laboratory:
(Main facilities) 6 chassis-dynamometers (DC type or EC type; Absorption power: 110 ~ 220kw, diameter of roller: 1,590mm, maximum equivalent inertia weight: 3,500kg (25kg interval) ~ 7,000kg (125kg interval), 6 vehicle speed proportional blowers (maximum airflow: 1,680 ~ 3,900 m³/min; maximum air speed: 80 ~ 100 km/h); 7 exhaust emission analyzers (5 sets for gasoline-fueled motor vehicles and 2 sets for Diesel-powered motor vehicles); 5 CVS devices (2 PDP type units and 3 CFV type units)
(Main test items) 10-mode and 11-mode exhaust emission test for gasoline-fueled motor vehicles, fuel evaporative emission test, 10-mode fuel economy test for gasoline-fueled motor vehicles, 6-mode exhaust emission test for Diesel-powered motor vehicles, Diesel smoke test, 6-mode exhaust emission test of gasoline-fueled motor vehicles.

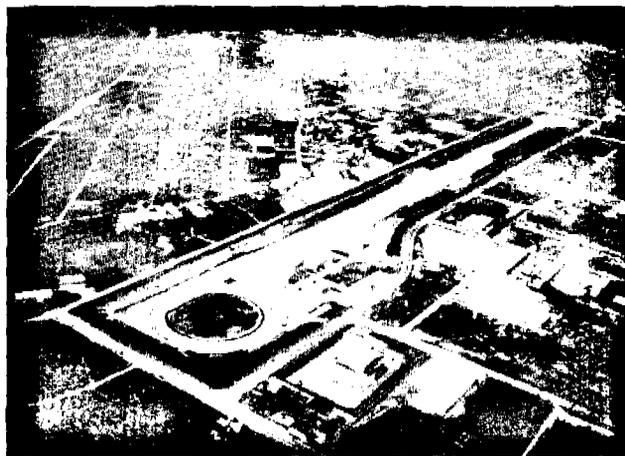


Figure 2. General view of Kumagaya District Motor Vehicle Proving Ground and neighboring area.

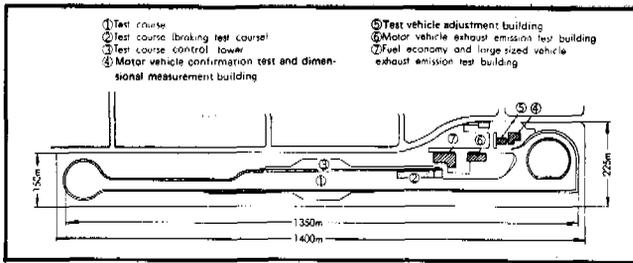


Figure 3. General drawing of Kumagaya District Motor Vehicle Proving Ground.

Mitaka District Headquarters Facilities:

The facilities of Mitaka District Headquarters have been used since 1970 and include, in addition to an administrative building, exhaust emission test facilities (4 chassis-dynamometers), constructions and devices confirmation facilities, and other facilities for specification weight and size measurement equipment, etc. The Mitaka District Headquarters also has the heat damage test facilities (one unit chassis-dynamometer and vehicle speed comparative blower), lighting equipment (head-lamp, etc.) test facilities and maximum inclination angle stability test facilities.

Test and Inspection on Uniformity, etc. of Motor Vehicles for Type Designation

Requirements for type designation are, as stated in Section 2, uniformity of motor vehicles, implementation of completion inspection and delivery of termination certificate of completion inspection in addition to their conformity to the Safety Regulations. Explanation will be made on the examination at time of application of these requirements and inspection of the manufacturer's facilities after the designation as below.

Examination of time of application:

At time of application, the examination including hearing from the applicant will be carried out based on the documents submitted to confirm that there is no problem on the following matters:

- (i) Outline of motor vehicles:

Purpose of development of applied motor vehicles, technical features, newly adopted mechanism, new manufacturing process, variation, optional parts, etc.

- (ii) Specification table:

If there arises any change in the specification table of motor vehicles which have obtained type designation, no motor vehicles after such change will be sold as type designated motor vehicles without obtaining disposition of approval of such change separately. The same shall apply to the exterior drawings of the motor vehicles. If

they are changed, it will be considered as constituting a change in the uniformity.

- (iii) Overall quality guarantee system:

Assignment of works and relationship of the respective divisions from product planning to development, approval of trial production of merchandise, trial production, experiment, evaluation, secondary trial production, evaluation, determination of commercial production, arrangement of parts, preparation of test procedures, application, commencement of production, feedback complaints in market, etc.

- (iv) Warranty of parts manufactured by sub-contractors:

Assessment method of quality warranty system of sub-contractors, check of delivered quality (relationship of shipping test among sub-contractors and acceptance test by motor vehicle manufacturers), communication system and disposition method of defects, whether a system is well arranged so that changes in process and materials of sub-contractors are made correctly and accurately, and so on.

- (v) Quality warranty and completed inspection of intra-manufactured parts and sub-assembly:

Test items and test procedures as sub-assembly in the course of processing and assembly. Items and procedures of completion inspection, layout of test places, disposition of personnel, training of assembly workers and inspection workers, administration of initial products and outbreak of sub-standard products, terms and conditions for suspension of shipment, maintenance and management procedures of test equipment, etc.

- (vi) Others:

Sampling inspection of completed motor vehicles carried out for quality control (measurement of specifications, 10- and 11-mode exhaust emission test, etc., not included in items of completion test.)

On-the-spot inspection of manufacture after designation:

Ministry of Transport officials make on-the-spot inspection regularly of the designated motor vehicle manufacturers pursuant to the provisions of Article 100 of the Road Vehicles Act. The object of the inspection is to make on-the-spot inspection on the quality control of the type designated motor vehicles and on the points recognized as improper as a result of the inspection, guidance such as recommendation for improvement, etc. will be given. If the motor vehicles lose their uniformity or do not conform to the Safety Regulations, disposition to cancel the designation will be made. On-the-spot inspections will be made of more than 50 factories every year to inspect the following matters:

SECTION 5: TECHNICAL SESSIONS

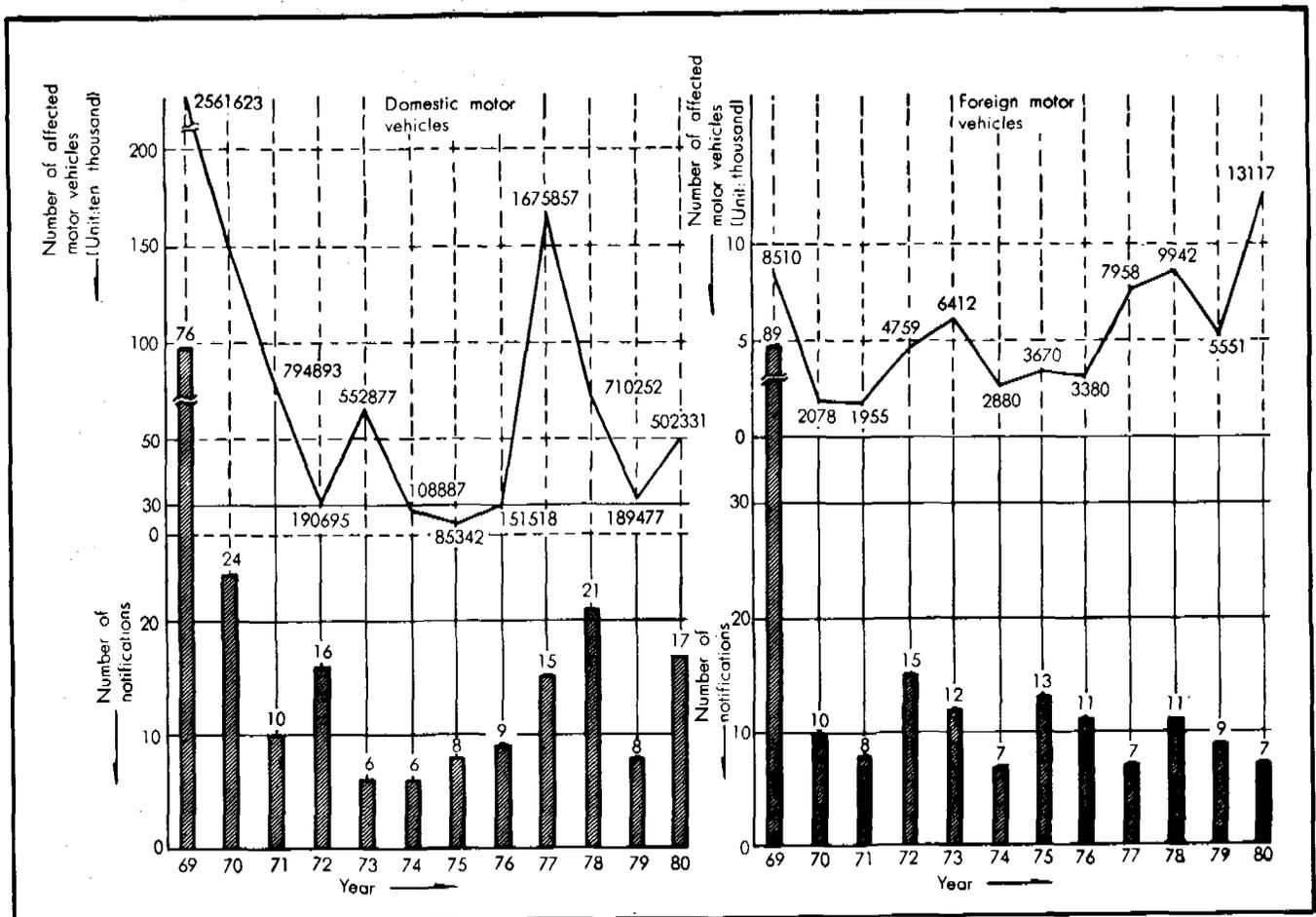


Figure 4. Number of notifications on defective motor vehicles and number of affected motor vehicles.

(i) Inspection of documents:

Situation of implementation of matters in Paragraph (1), (i) to (vi), completion of detailed application rules, records of various tests, records of sub-standard products, and record of training.

(ii) Plant inspection:

Inspection will be made on the following items:

- Production plan and procedures for issuing production directives, procedures for parts control (storing place and giving advice to carry parts near production line) and procedures for changing production methods when the order of production process is changed.
- Process control (process standard, work standard and arrangement of sub-standard products disposition system)
- Precision control (change of cutting tools, rationalization of workers' placement, method of recovering from work delay (placement of new workers, mistake in assembly work, parts shortage, etc.) placement of standard samples, model samples, etc.

- Inspection process (implementation of procedures from acceptance test to completion test of parts, and to sampling test of completed motor vehicles, filing and collection of test records, maintenance and management of machinery and equipment for inspection, such as regular tests)
- Stamping of chassis numbers and engine types and issue of termination certificate of completion inspection (prevention of erroneous stamping and occurrence of missing numbers, disposition of such incidents, etc.)
- Sampling of completed motor vehicles: Sampling will be made from among motor vehicles which have passed completion inspection for static test to confirm the quality.

Recall System

In the type designation, Article 13 of the Type Designation Regulations for Motor Vehicles under Article 75 paragraph 4 of the Road Vehicles Act provides that if a manufacturer of type-designated motor vehicles finds that the construction, devices or performance of certain type-

EXPERIMENTAL SAFETY VEHICLES

Table 2. Record of recalls relating to safety (100,000 or more affected motor vehicles).

Date of notification	Category and use	Number of affected motor vehicles	Condition of defect and its cause
1977	Small-sized Passenger car	142,119	Danger of carburetor screw coming off and throttle not returning
1977	Small-sized Passenger car	146,932	Weak carburetor cap which may cause leakage of fuel from the defective part.
1977	Ordinary and Small-sized Passenger car	300,147	A part of fuel hose is easily damaged by fuel, which may cause fuel leakage from the hose.
1977	Motorcycle	178,087	Danger of opening lever of fuel tank cap being accidentally touched by human body, which may cause opening of the cap.
1980	Light Truck	178,354	<ol style="list-style-type: none"> 1. Steering devices: Nut of connecting metal of steering wheel axis can come loose, leading to possible loss of control. 2. Electrical devices: Contact with engine body will damage the wiring cover of electrical wiring, which may cause fire.

Table 3. Records of recalls relating to pollution (total number).

Year	Category and use	Number of affected motor vehicles	Condition of defect and its cause
1974	Ordinary Passenger car	30	Defective temperature control valve of EGR devices may cause an increase in NOx emission.
1976	Ordinary Passenger car	25	Circulation of some pipes of devices for controlling fuel evaporating gas are defective which may cause insufficient performance of the devices.
1976	Ordinary Passenger car	403	Defective connection of vacuum hose of EGR devices may cause damage to hose.
1977	Small-sized and Ordinary Passenger car	388,758	Insufficient strength of BPT (back pressure transducer) valve of EGR devices will cause defective operation of valve and may increase NOx emission.
1977	Small-sized Passenger car	899,248	Insufficient heat resistance of temperature-sensor switch used in ignition-time control devices may damage the switch.
1978	Small-sized and Ordinary Passenger car	426,593	Insufficient strength of BPT valve of EGR devices may cause defective operation of valve and an increase of NOx emission.

Table 4. Record of recalls relating to tires (total number).

Year	Quantity	Condition of defect and its cause
1970	584	Larger-size tubes were inserted into tires by mistake, which may cause puncture.
1976	627	Defective materials, which may lead to puncture.
1976	459	Ditto
1978	20	Ditto
1978	16,000	Based on reports from overseas tire manufacturers.

designated motor vehicles are not in compliance with the requirements of the Safety Regulations for Road Vehicles or there is a possibility that they do not conform to such requirements, and when he recognizes the cause is derived from the design or production process, he shall report the following items to the Minister for Transport:

- (1) Situation of the defect and its cause.
- (2) Measures for improvement.
- (3) Measures to inform the defect to the users and motor vehicle repair business operators.

As to the measures for improvement, the State (Minister for Transport) may direct the alteration and request that the situation concerning implementation of improvement measures be reported to the State. After the report, the person who obtained the designation shall recall the motor vehicle concerned by issuing public notice and conduct the repair to the motor vehicle concerned free of charge. These measures are usually taken by sending direct mail circulars to the users and by inserting a notice in periodicals of the association of motor vehicle disassembling repair business operators (Federation of Japan Associations of Automobile Repair and Maintenance). The State will also make notification through the mass media. Even on type-notified motor vehicles, the same procedures must be taken under the Handling Procedures for Motor Vehicle Type Notification. This recall system was established as a part of the type approval system in 1969.

The number of recall cases in Japan are shown in Figure 4.

These statistics include recalls of motor vehicles each of which obtained type approval and motor vehicles not subject to the motor vehicle inspection such as motor-driven cycles, etc. The number of subject motor vehicles includes those intended for export from Japan. Guidance is also given to exported motor vehicles to ensure recall whether there exists such a recall system or not in the country concerned. Even recall of parts and devices such as tires, etc. is made through the motor vehicle manu-

facturers. According to the figures by devices, the largest number of recalls out of the total number of recalls until March 1980 concerned brake devices accounting for approx. 25%. They were followed by engines with approx. 19%, steering devices with approx. 16% in that order, these three devices accounting for approx. 60% of all recalls.

Examples of recalls made recently are shown in Table 2, Table 3 and Table 4 classified by safety, pollution and tire recall groups.

The completion of recalls carried out under the foregoing system has been approx. 94% on average since 1969. This figure includes recalls of motor vehicles whose inspection and registration is not mandatory (motor driven cycles, etc.). Accordingly, the figures excluding the above vehicles indicate that the recall completion rate is nearly 100% in Japan.

Legal System of Japan on Motor Vehicles*

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Part 5: Motor Vehicle Inspection and Registration System

MOTOR VEHICLE INSPECTION SYSTEM

In Japan, there were approximately 40 million motor vehicles as of the end of September, 1981 and motor vehicles are now indispensable for economic activities and improving the people's living standards. On the other hand, there have arisen such serious social problems as traffic accidents, and environmental pollution caused by exhaust gas, noise, etc. Therefore, there is now a strong need to ensure safety and prevent environmental pollution and various countermeasures are being taken. The inspection of motor vehicles also plays an important role as one of measures to solve these problems.

That is, all motor vehicles are obliged to undergo an inspection conducted by the Government under the Road Vehicles Act. This inspection is to check whether motor vehicles conform to the Safety Regulations for Road Vehicles (Ministry of Transport Ordinance No. 67 of 1951). The Safety Regulations for Road Vehicles are established

* Received 13th October, 1981.

on the structures and devices of motor vehicles for the purpose of securing the safety of motor vehicles and preventing pollution. Unless it is confirmed through this inspection that motor vehicles conform to the Safety Regulations for Road Vehicles, no motor vehicle is permitted to be operated on Japan's roads.

History of Inspection System

It was in 1919 that the inspection of motor vehicles was commenced in Japan. Before that year, the inspection of motor vehicles was conducted locally, but henceforth it was carried out on a nationwide basis. At the time, the number of motor vehicles was very small being approx. 7,000 and contents of inspection were simple compared with those nowadays. When the Road Vehicles Act was promulgated in 1951, the present legal system concerning the inspection was established. Thereafter, several amendments relating to the inspection of motor vehicles were made, including the following major items:

(1) 1952 Amendment

Up until this time, the effective term of the inspection of motor vehicles was a uniform one year, but it was altered to 9 months for buses and taxis, one year for trucks and two years for other motor vehicles, respectively.

(2) 1963 Amendment

- a. A system of designated motor vehicle maintenance business was established, under which the Government designates maintenance business entrepreneurs who have good equipment, technology and management organization and the inspection equipment of the same level as the Government. Such establishments are entrusted with part of the administrative work of inspection otherwise conducted by the Government. (For details of the system of designated motor vehicle maintenance business, please refer to the maintenance of motor vehicles to be published in the later installment.)
- b. The effective inspection term for buses and taxis was extended to one year and that for motor vehicles whose passenger capacity is 11 persons or more, school buses, rental cars and motor vehicles for private use which have been used for more than 10 years was shortened to one year.

(3) 1973 Amendment

It was determined to conduct an inspection on light motor vehicles including four-wheelers with displacement of 0.55 l or below as well as other motor vehicles and the effective term was fixed as two years. Then, the organization to conduct the inspection is the Light Motor Vehicle Inspection Association as a Government-recognized corporation and contents of inspection are almost the same as that conducted by the Government.

(4) Recommendation of Council for Transport Technics

In January 1982, the Council for Transport Technics made a recommendation to the Minister for Transport regarding the inspection of passenger motor vehicles. The Council recommended that the effective term of inspection certificate for new passenger motor vehicles be extended from two years to three years. In accordance with this recommendation, the Ministry of Transport expects to amend the Road Vehicles Act Soon.

Kinds of Inspection

The inspection of motor vehicles is divided into three major phases. They are the initial inspection which must be conducted when a motor vehicle is operated for the first time, continuation inspection which the vehicle must undergo every one or two years and modification inspection of which must be conducted whenever a major alteration or improvement is made. The record of the number of various inspections conducted is shown in Table 1 below:

(1) Initial inspection (Article 59 of the Road Vehicles Act):

This inspection is to be performed when a motor vehicle is operated for the first time or when a motor vehicle whose registration was cancelled because it was not intended to be used for a long period is to be used again, etc. The inspection is performed by submitting the motor vehicle to the Land Transport Offices in the prefectures, but new motor vehicles of which the manufacturer of the motor vehicles has obtained the type designation issued by the Minister for Transport are exempted from submitting the motor vehicles to the office, by presentation of the certificate of completion inspection. In case a motor vehicle has passed the inspection and completed registration, a motor vehicle inspection certificate and licence plate are issued. No motor vehicle may be operated without a motor vehicle inspection certificate.

(2) Continuation inspection (Article 62 of the Road Vehicles Act):

This inspection is conducted on motor vehicles which are registered upon initial inspection, and is performed at regular intervals thereafter. The inspection is made by submitting the motor vehicle to the Land Transport Office, but as for a motor vehicle which is handled by a designated maintenance business entrepreneur, it is exempt from the inspection if a certificate showing that the motor vehicle conforms to the Safety Regulations is submitted.

(3) Modification inspection (Article 67 of the Road Vehicles Act):

This inspection is to check whether a motor vehicle conforms to the Safety Regulations in case it is altered

SECTION 5: TECHNICAL SESSIONS

Table 1. Number of inspected motor vehicles.

(Unit: 1,000 vehicles)

Fiscal year		1965	1970	1975	1980
Items					
Number of motor vehicles submitted for inspection		5,065	12,951	23,276	31,695
Continuation inspection	Conducted by Government	2,198	4,159	5,147	6,121
	Conducted by designated maintenance business	306	1,641	5,666	8,880
	Sub-total	2,504	5,800	10,813	15,001
Initial inspection	Conducted by Government	772	1,161	1,191	1,448
	Type designation	1,000	2,610	3,321	3,588
	Sub-total	1,772	3,771	4,512	5,036
Modification inspection		44	57	46	40
Number of vehicles which did not pass the inspection conducted by Government		555	747	960	1,046
Total number of inspected motor vehicles		4,875	10,375	16,331	21,123

or improved substantially. Alterations which require this inspection are as follows:

- Alteration of length, width or height
- Alteration of shape of body (for instance: Alteration of truck to tank car)
- Change of engine to another type engine
- Alteration of kind of fuel
- Alteration of passenger capacity or maximum loading capacity

Effective Term of Inspection

When a motor vehicle has been determined as conforming to the Safety Regulations upon inspection, a motor vehicle inspection certificate setting forth the date of the next inspection is issued for the motor vehicle. The period until the date of next inspection, that is, the effective term of inspection varies according to the categories of motor vehicles, being either two years or one year. Details are set forth in Table 2. During the term, no inspection is required, but for the purpose of securing safety, motor vehicles are subject to the periodical checking maintenance by the motor vehicle users. This must be undergone every six months for motor vehicles for private use and every month for motor vehicles for business use. However, it must be undergone every month for passenger motor vehicles for private use whose passenger capacity is 11 persons or more, large trucks for private use and rental cars.

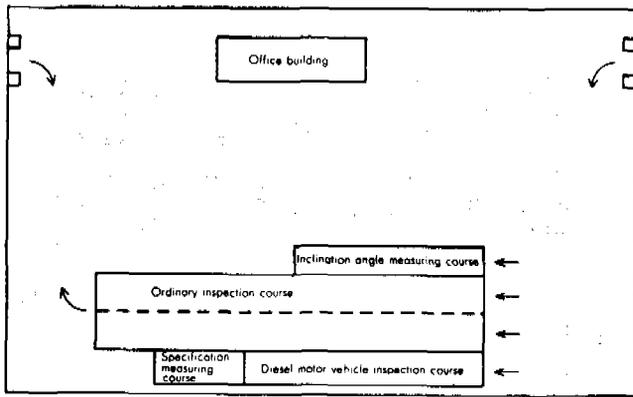
Inspection Facilities

There were 83 inspection centers throughout Japan as of April 1981. This means one inspection facility for approx. 300,000 motor vehicles which are subject to inspection. The inspection center is divided into two: inspection line which conducts the inspection of motor

Table 2. Effective terms of inspection.

Categories of motor vehicles	Effective term of inspection
Trucks Buses Taxis Rental cars Motor vehicles for private use whose passenger capacity is 11 persons or more School buses Passenger motor vehicles for private use which have been used for more than 10 years	1 year
Passenger motor vehicles for private use which have been used for not more than 10 years Motorcycles	2 years

EXPERIMENTAL SAFETY VEHICLES



The drawing shows a place having two ordinary inspection courses

Figure 1. Motor vehicle inspection center.

vehicles and the office where the registration and other businesses are handled, as shown in Figure 1. The inspection line consists of an ordinary inspection course, Diesel motor vehicle inspection course, specification measuring course and inclination angle measuring course. The ordinary inspection course is used to inspect gasoline-fueled and LPG-fueled motor vehicles, Diesel motor vehicle inspection course conducts inspection of Diesel motor vehicles including smoke emission test, the specification inspection course for measuring length, weight, etc., and the inclination angle measuring course for measuring the stability against rollover. The ordinary inspection lines are provided with 1 to 8 courses in the inspection office according to the number of motor vehicles which are subject to inspection in the jurisdiction area. As of April, 1981, there were 266 ordinary inspection courses in the inspection centers throughout Japan, inspecting approx. 120 vehicles per course a day, and the number of government inspectors was 1,058.

Contents of Inspection

The inspection items and method are stipulated in detail by laws, orders and circular notices, so in this section only the outline will be described. In Japan, motor vehicles are obliged to undergo periodical checking maintenance, and motor vehicles which are to be inspected are brought to the inspection center after this periodical checking maintenance. The inspection is conducted by using machinery, equipment and test hammer and through observation of external appearance. The inspection machinery are automated and results of and proce-

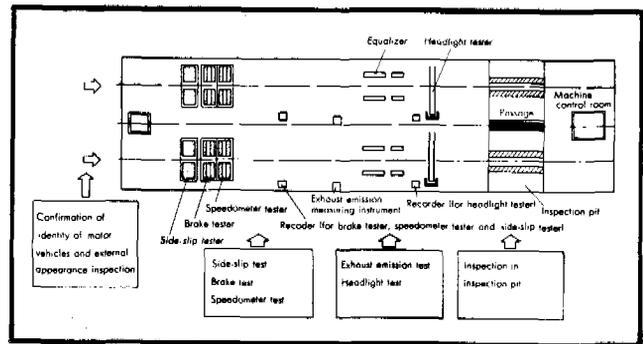


Figure 2. Ordinary inspection course.

dures for the inspection are shown to the applicants. The applicants' vehicles undergo inspection according to directions shown by such indication devices. The ordinary inspection course is as shown in Figure 2.

Motor vehicles to be inspected, after completion of one inspection, proceed to another inspection in succession. The decision whether a motor vehicle passes the inspection or not is made according to the Safety Regulations for Road Vehicles and a motor vehicle which does not conform to the Regulations will be ordered to undergo repair and maintenance and must be inspected again. The causes of re-inspection by devices as of April, 1981 are shown in Table 3. The time required for inspection, though it varies with motor vehicles, is approx. 15 minutes in case of passenger motor vehicles.

The outline of inspection is as follows:

- (1) Confirmation of identity of motor vehicle:
The chassis number, type of engine, etc. as set forth in the motor vehicle inspection certificate is confirmed.
- (2) Examples of contents of inspection of external appearance:
 - Lighting and attaching condition and break of lighting equipment
 - Attaching condition and break of reflectors
 - Break of rear-view mirrors
 - Operating condition of wipers
 - Attaching condition of seat-belts and head-restraints
 - Wear of tires
 - Play of brake pedal
 - Play of steering wheel
- (3) Contents of inspection by means of machinery
 - i) Side-slip test: The motor vehicle is made to travel

Table 3. Causes of re-inspection by devices as of April 1981.

	Engine	Power transmission	Steering	Brakes	Chassis	Head lights	Waste emissions	Markers and other lights	Others
Share (%)	5.8	7.5	6.3	9.7	7.8	34.6	8.1	7.5	12.7

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in a straight line on the testing platform to measure the extent of side-slip. The standards are 5 millimeters or less when running one meter.

- ii) **Brake test:** Wheels are placed on two spline-shaped rollers and the braking force is measured by rotating the rollers. The circumferential speed of rollers is 3 to 6 cm per second. The standards for determination are as follows:
- Total braking force of right and left wheels: 60% or more of axle load
 - Difference between braking force of right wheels and that of left wheels: 8% or less of the axle load
- iii) **Speedometer test:** The wheels of the motor vehicle are revolved at a fixed speed so that the motor vehicle's speedometer indicates 40 km/h and the error is measured with a tester. The standards are +4.4 ~ -5.2 km/h. For front-wheel-drive motor vehicles, a guide roller to prevent bodily swing of the vehicles is provided so that safe and correct inspection may be conducted. Moreover, in the Diesel motor vehicle inspection course, free-rollers are provided in parallel with the tester in order to allow inspection of two-axle rear wheels of large trucks.
- iv) **Exhaust emission test:** NDIR-type tester is used to measure the density of emitted carbon monoxide and hydrocarbon at time of idling of engine. The standards are as follows:
CO is 4.5% or less and HC is 1,200 ppm or less for 4-stroke-engine vehicles, 7,800 ppm or less for 2-stroke-engine vehicles and 3,300 ppm or less for rotary-engine vehicles.
As to Diesel motor vehicles, a test is conducted for smoke emission at time of no-load acceleration and the standard is 50% or less of smoke emission.
- v) **Headlight test:** Using a condenser type tester, the brightness and deviation of the optic axis of the headlights on main beam are measured. The standards are as follows:
- Luminous intensity:
 - 4 lights system: 12,000 cd or more
 - 2 lights system: 15,000 cd or more
 - Deviation of optic axis:
 - Right lamp: Up 0, down 2/100, left 2/100, right 1/100 or less
 - Left lamp: Up 0, down 2/100, left 2/100, right 2/100 or less

(4) Inspection in the pit

The pit is generally 2.3 meters deep and provided with a table lift adjustable up or down enabling inspectors to make inspection in the most suitable posture. The top of the pit has a cover of acrylic resin and the bridge portion is provided with an air-curtain to prevent entry of exhaust emission to the pit. The inspection items are as follows:

Table 4. Fees of inspection.

Categories of motor vehicles	Fees for inspection
Small-sized motor vehicles (displacement: 2,000 cc or less)	¥1,200
Ordinary motor vehicles (displacement: Over 2,000 cc)	¥1,300

- Brake fluid leakage from and damage to brake hoses and pipes
- Looseness and damage of steering devices
- Water leakage from radiator
- Oil leakage from transmission
- Play and distortion of propeller-shaft joint
- Oil leakage and distortion of shock-absorber
- Exhaust pipe damage
- Attachment and damage of catalyst equipment and heat insulation plate

Fees for inspection

A charge is levied for the inspection and the income is used to defray the cost of operating the inspection centers. Fees for inspection vary according to the category of motor vehicles. (See Table 4.)

MOTOR VEHICLE REGISTRATION SYSTEM

Outline

The registration of motor vehicles under the provisions of the Road Vehicles Act (Law No. 185 of 1951) is an administrative requirement for the operation of motor vehicles and a civil requirement for establishing the ownership of motor vehicles against a third party.*

That is to say, the registration system of motor vehicles has two aspects, one termed "administrative registration" which is required to ascertain the actual situation, etc. of use of motor vehicles (Article 4 of the Road Vehicles Act) and the other is called "civil registration" required to confer the power to set up against a third party for the safety of transactions of motor vehicles (Article 5 of the Road Vehicles Act).

The Road Vehicles Act

(General effect of registration)

Article 4. Motor vehicles (excluding light motor vehicles, small-sized special motor vehicles and two-wheeled

*The term "to set up against a third party" means that a juridical relation which becomes effective between the parties is claimed against a third party. For instance, if Party X assigns a motor vehicle to Party A and Party B jointly, Party B who has not registered the ownership so assigned cannot claim any legal ownership of such motor vehicle against Party A who has registered the ownership.

small-sized motor vehicles; hereinafter the same in this Chapter, except Articles 29 to 32) shall not be operated unless they have been registered in the motor vehicle registration file.

Article 5. The acquisition or loss of ownership of motor vehicles which have registered shall not set up against a third party, unless it is registered.

2. The provisions in the preceding paragraph shall not apply to large sized-special motor vehicles as provided for in the proviso of Article 2 of the Motor Vehicle Mortgage Law (Law No. 187 of 1951).

The subject motor vehicles are ordinary motor vehicles, three-wheeled and four-wheeled small-sized motor vehicles and large-sized special motor vehicles (including motor vehicles with caterpillars, etc.). The registration is effected, upon application by owners of motor vehicles, by the Minister for Transport. However, at the present time, under the provisions of the Road Vehicles Act Enforcement Order (Cabinet Order No. 254 of 1951) the governors of prefectures having jurisdiction over the place where such motor vehicles are authorized to make registration and the business is handled by the Land Transport Offices (including branches and sub-branches located at 80 places throughout Japan).

Computer Registration Processing System

As mentioned in the introduction, the postwar growth of the number of motor vehicles in Japan has been outstanding, so that the registration business of motor vehicles expanded and became increasingly complicated year by year. To cope with such a tendency, the Ministry of Transport introduced a computer registration processing system in March 1970 for the purpose of rationalizing and modernizing the registration business. To handle the business accurately and speedily, the Land Transport Offices throughout Japan were linked by an on-line system to the motor vehicle registration center to centralizedly control the registration records of motor vehicles in the motor vehicle registration file.

Further, in January 1979, the Ministry of Transport changed the system by introducing larger and more highly efficient computers for further rationalization of the registration business and improvement of the administrative service.

(Reference 1) Growth of Holding Number of Motor Vehicles

(Unit: 1,000 vehicles)

As of the end of fiscal 1955	150.2
As of the end of fiscal 1960	340.4
As of the end of fiscal 1965	812.3
As of the end of fiscal 1970	18,919.0
As of the end of fiscal 1975	29,143.4
As of the end of fiscal 1980	38,992.0

Method of Application for Registration

The application for registration of a motor vehicle, in principle, is filed jointly by the person who is entitled to make the registration (the person who obtains the right of ownership upon registration—normally the purchaser) and the person who is obligated to make the registration (the person who relinquishes the right of ownership—ordinarily the dealer) or his attorney, who appears at the Land Transport Office.

However, joint application is required only for the registration of transfer of ownership and registration of creation of pledge.* Application for initial registration, registration of cancellation, etc. can be made alone by the person who is entitled to make the registration, while registration of alteration can be made alone by the owner (registered owner).

Kinds of Registration

As to the registration of motor vehicles, there are various registration procedures such as the initial registration in case where motor vehicles which have not previously been registered are registered, the registration of alteration in case where any registered matter has been altered, the registration of alteration in case where the ownership has changed, etc. However, the growth in the number of main items handled in various registration procedures is as shown in Reference 2 and the contents are briefly explained below:

(Reference 2) Growth in Number of Main Items Handled Relating to Registration

Fiscal year	1965	1970	1975	1980
Number of registered motor vehicles	5,017,155	12,779,069	23,018,860	31,249,900
Initial registration	1,747,307	3,693,353	4,466,734	4,850,288
Registration of alteration	484,626	1,278,085	1,230,743	1,613,723
Registration of transfer of ownership	722,559	1,607,312	2,616,039	3,366,115
Registration of cancellation	930,731	1,939,329	2,507,008	3,798,769

(1) Initial registration (Article 7 of the Road Vehicles Act)

This refers to the case where motor vehicles which have not previously been registered are registered, including

*This means that in case Party A lends money to Party X, in order to secure the repayment of such money, a motor vehicle owned by Party X can be provided as security by leaving the use of such motor vehicle to Party X. If no repayment is made, the ownership of the motor vehicle will be transferred from Party X to Party A.

the case where motor vehicles whose registration has been cancelled are registered again. The owner can use the motor vehicle concerned for operation upon registration and set up the ownership of the motor vehicle against a third party.

(2) Registration of alteration (Article 12 of the Road Vehicles Act)

This registration is to alter the former records when there occurs alteration in type of motor vehicle, chassis number, type of engine, locality of principal place of use, and the owner must apply for registration of alteration within 15 days from the day when such alteration is effected.

Incidentally, the alteration of ownership comes under the registration of transfer of ownership as stated below and is not included in the registration of alteration.

(3) Registration of transfer of ownership (Article 13 of the Law)

This registration is made when ownership of a motor vehicle which has been registered is changed, and the new owner must apply for registration of transfer of ownership within 15 days from the day when such transfer occurs. In case the registration is made thereby, the new owner will be able to set up the ownership of the motor vehicle against a third party.

(4) Registration of cancellation (Articles 15 and 16 of the Road Vehicles Act)

There are two categories of registration of cancellation: One is made by the owner of a registered motor vehicle when the motor vehicle is lost, disassembled or no longer used as a motor vehicle or when the chassis of the motor vehicle differs unidentical from that at time of initial registration due to alteration within 15 days from the day when such alteration occurs, and the other is made by the owner of a registered motor vehicle when he suspends use of the motor vehicle at his discretion. If registration is made of a motor vehicle which can be operated, the motor vehicle will be handled as a mere personal property under civil law and cannot be used unless the initial registration is made again.

(5) Registration of mortgage (Article 5 of the Motor Vehicle Mortgage Law) (Law No. 187 of 1951)

A registered motor vehicle can be used for mortgage and by registering the acquisition, loss or alteration of the mortgage in the motor vehicle registration file, the power to set up the ownership against a third party will be given. The recent trend has been toward a decline in use of the motor vehicle mortgage system due to utilization of the ownership reservation system (this means that the ownership of the subject motor vehicle is reserved by the seller until the price is fully paid after the delivery of the said motor vehicle), comparative decline in the price of motor vehicles, etc.

(6) Other registrations

There are also registration through commission which is effected by authorities in case of attachment, etc. under

laws and orders (Article 9 of the Order, Article 71 of the National Tax Collection Law, etc.), registration of correction to correct or supplement any mistake or omission in the registration (Articles 25 to 28 of the Order), etc.

Motor Vehicle Registration Number and Motor Vehicle Registration Number Plate (Article 11, etc. of the Road Vehicles Act)

The motor vehicle registration number specifies the motor vehicle which has been registered for administrative purpose and is determined for the motor vehicle at time of initial registration, and the motor vehicle registration number is indicated on the motor vehicle registration number plate.

The motor vehicle registration number is determined by combining the indication of location of Land Transport office or its branch, classification number according to the category of motor vehicle, Japanese hiragana syllable or capital letter of Roman alphabet and figures of four digits or less, in this order.

Moreover, the motor vehicle registration number plate is not only a means to facilitate confirmation of the identity of the motor vehicle, but also a sign to show that the motor vehicle has already been registered. Therefore, the delivery of number plates is performed by the Government, but it is a work requiring such discretion that it cannot be entrusted to the private sector. Accordingly, under Article 25 of the Road Vehicles Act a system of agents for delivery of motor vehicle registration number plates has been created to entrust a person appointed by the Director-General of District Land Transport Bureau having jurisdiction over his place of business with the delivery business of motor vehicle registration number plates.

Sealing of Motor Vehicle Registration Number Plates (Article 11 of the Road Vehicles Act)

This stipulates that the owner of a registered motor vehicle must confirm that the motor vehicle conforms with the motor vehicle registration number plate when the number plate is attached to the motor vehicle and that in order to prevent the number plate from being removed he must agree to its sealing thereof by the governor of the urban or rural prefecture, agent for delivering number plates entrusted by the governor of the urban or rural prefecture, etc. (Article 11 of the Road Vehicles Act).

However, if the motor vehicle registration number plate is lost, seal is removed and so on, the attachment of seal which becomes necessary for such reason will be con-

EXPERIMENTAL SAFETY VEHICLES

ducted by the governor of the urban or rural prefecture, because it is specially required to handle the matter strictly for the purpose of indicating the motor vehicle registration number plate setting forth the genuine motor vehicle registration number.

Temporary Operation and Forwarding Operation of Motor Vehicle

(1) Permission for temporary operation (Articles 34 to 36 of the Road Vehicles Act)

In case of test run of a motor vehicle or forwarding of motor vehicle to be submitted for the application for initial registration, initial inspection, etc. or other case of necessity, the Director-General of District Land Transport Bureau, etc. may give permission for temporary operation for an effective period not exceeding five days. Permission for temporary operation will be given only as an exceptional measure by specifying the object and route of such operation for the motor vehicle concerned and in case such permission is given, the certificate of permission for temporary operation will be delivered and the temporary operation permission number plate will be loaned.

A motor vehicle for which permission is given for temporary operation can be operated legally by anyone on condition that it is operated according to the object and route as set forth in the permission for temporary operation kept by the motor vehicle.

(2) Permission for forwarding operation (Article 36-2 of the Road Vehicle Act)

The Director-General of District Land Transport Bureau may give permission for forwarding operation of motor vehicles for the effective period not exceeding one year to a person who is engaged in the business of manufacture, land forwarding or sale of motor vehicles. The governor of each prefecture will deliver the certificate of permission for forwarding operation in the number deemed necessary upon application and at the same time loan a corresponding number of forwarding operation permission number plates. The certificate of permission for forwarding operation will set forth the object and route of forwarding and the effective period must not exceed one month.

The features of the permission for forwarding operation compared with the permission for temporary operation are that while the former is permission for an individual motor vehicle (permission to the subject item), the latter is permission to the operator (permission to the person). Accordingly, in case of permission for forwarding operation, the permission will be effective only in case where the person himself uses it.

(Reference 3) Holding number of motor vehicles (As of the end of October, 1981)

(Unit: vehicles)

Function	Categories of motor vehicles	Use	Number of vehicles	
Trucks	Ordinary motor vehicles	Private use	1,072,521	
		Business use	458,706	
		Total	1,531,227	
	Small-sized motor vehicles	4-wheeled	Private use	7,078,908
			Business use	87,107
		Total	7,166,015	
		3-wheeled	Private use	10,115
		Business use	518	
	Total	10,633		
	Trailers	Private use	8,610	
		Business use	49,803	
		Total	58,413	
	Light motor vehicles	4-wheeled	5,118,419	
		3-wheeled	1,349	
	Total trucks		13,886,056	
Buses	Ordinary motor vehicles	Private use	22,383	
		Business use	85,490	
		Total	107,873	
	Small-sized motor vehicles	Private use	119,830	
Business use		3,891		
	Total	123,721		
	Total buses		231,594	
Passenger motor vehicles	Ordinary motor vehicles	Private use	520,475	
		Business use	1,608	
		Total	522,083	
	Small-sized motor vehicles	Private use	21,499,658	
		Business use	249,551	
	Total	21,749,209		
	Light 4-wheeled motor vehicles		2,107,665	
	Total passenger cars		24,378,957	
Special-purpose motor vehicles	Ordinary motor vehicles	Private use	319,689	
		Business use	76,643	
		Total	396,332	
	Small-sized motor vehicles	Private use	117,947	
		Business use	4,071	
	Total	122,018		
	Large-sized special motor vehicles	Private use	296,586	
		Business use	3,791	
		Total	300,377	
	Total special purpose cars		818,727	
Motor-cycles	Small-sized mopeds		510,165	
	Light motorcycles		635,220	
	Total mopeds/motorcycles		1,145,385	
Grand Total			40,460,719	

(Number of registered motor vehicles: 32,087,901)

Legal System of Japan on Motor Vehicles*

JUN MASUI

Engineering Division
Road Transport Bureau
Ministry of Transport
Tokyo

AKIO SASAKI

Inspection and Safety Transport Division
TOSHINORI URANO
Radioactive Materials Safety Transport Of-
fice
Inspection and Safety Transport Division

Part 6: Motor Vehicle Accident Prevention Measures and Research System of the Government

Motor Vehicle Accident Prevention Measures

Outline of accident prevention measures

To reduce motor vehicle accidents, it is necessary to adopt overall measures from various sides, and at the present time the Head Office for Traffic Policy of the Cabinet as the central organ is taking various measures for traffic safety in cooperation with the competent ministries.

The Ministry of Transport is no exception. It is the fundamental mission of the transportation administration to ensure safety of transportation facilities, and for the purpose of promoting motor vehicle accident prevention measures, the following measures are taken: (1) Improvement of Inspection system and Maintenance and repair system of motor vehicles, (2) Strengthening of guidance and supervision from the side of safety of motor vehicle transportation business, (3) Establishment of regulations concerning the construction and equipment of motor vehicles and (4) Improvement of test and research system.

The above measures are shown in Figure 1 and efforts are exerted so that these systems work effectively and are improved by coping with changes in traffic environments and improvement of structures of motor vehicles.

Some of these systems and measures have been already explained in detail and some others will be explained in this part or the next part. The outlines of the measures will be enumerated and explained as follows:

(i) Motor vehicle inspection system (details were already explained in Part 5):

For the purpose of preventing accidents due to mechanical troubles of motor vehicles, the periodical inspection system is provided for motor vehicles and in order to improve such system, by creating special accounts for motor vehicle inspection and registration since fiscal 1964, the inspection facilities and personnel have been increased in keeping with the growth of the number of motor vehicles. Furthermore, in order to make the activities smooth and to cover a shortage in the number of personnel, the enlargement of the designated motor vehicle repair business system (inspection system by private repair shops) and rationalization of business through introduction of computers are being promoted.

(ii) Motor vehicle type designation system (details were already explained in Part 4):

New model motor vehicles must be examined before marketing to determine whether they conform to the Safety Regulations for Road Vehicles and have uniformity of production. The motor vehicles whose type was designated are exempted from submission of each vehicle at the time of initial inspection. In addition, supervision is extended for manufacturers of motor vehicles whose type has been designated.

In the meantime, a policy to strengthen the examination of motor vehicles against the problem of defective motor vehicles in 1969 was determined, and according to such policy the Type Designation Regulations for Motor Vehicles were amended. Since then, the type examination system has been reinforced year by year.

(iii) Approval system of motor vehicle maintenance and repair business (details to be explained in Part 7):

In order to upgrade the maintenance and repair motor vehicle maintenance and repair business, an approval system of maintenance and repair shops is employed. Since most of maintenance and repair businesses are smaller enterprises, they are designated as businesses under the Small and Medium Enterprise Modernization Promotion Law and their modernization is being promoted.

(iv) Authorization system of motor vehicle maintenance and repair mechanics (details to be explained in Part 7):

In order to upgrade the maintenance and repair techniques of motor vehicles, examination of skills of motor vehicle maintenance and repair mechanics and designation of training facilities of such mechanics are made.

Number of applicants for the examination:	193,019 persons (fiscal year 1979)
Number of training facilities:	383 facilities (as of the end of March 1980)

* Received 19th April, 1982

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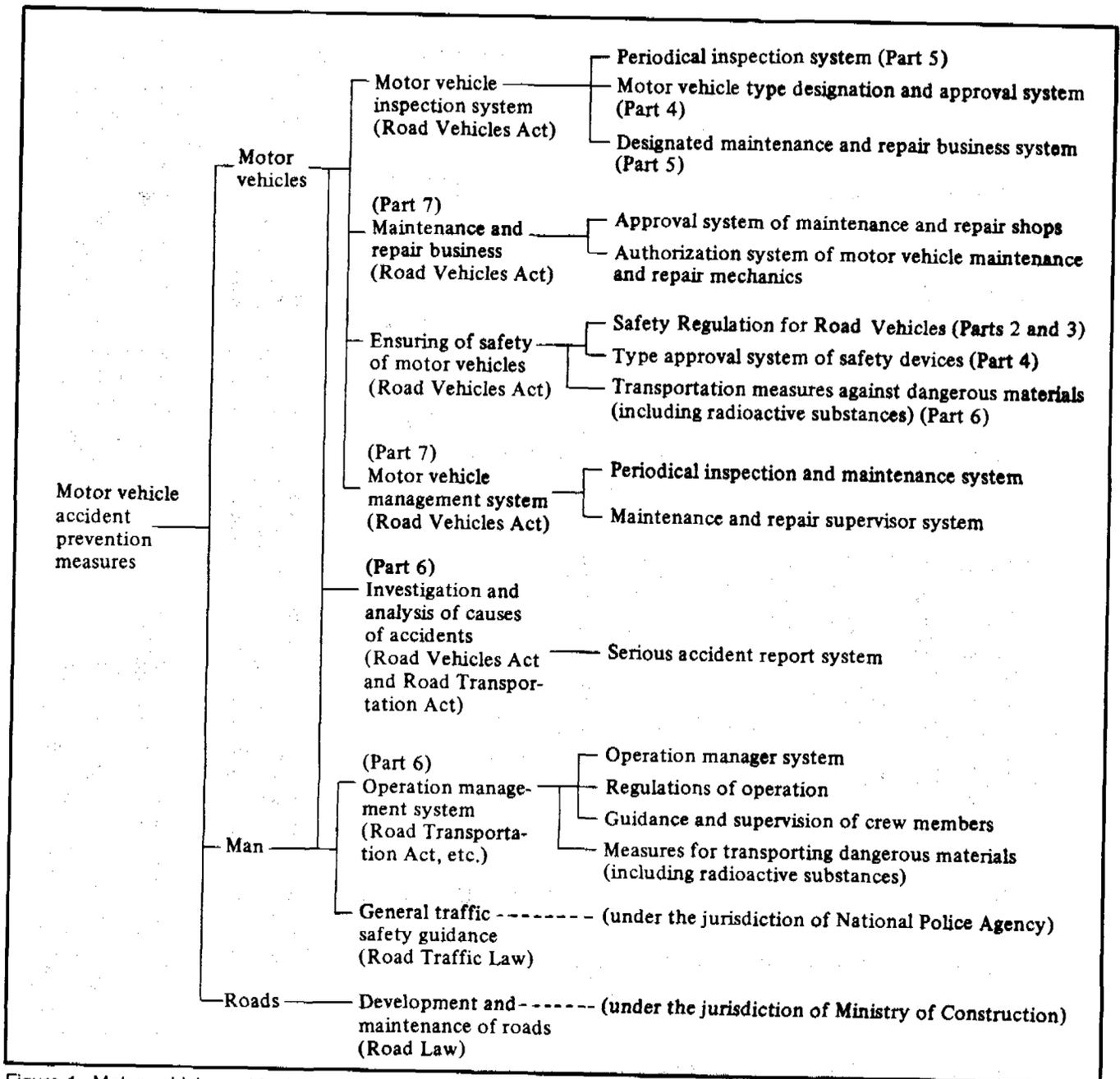


Figure 1. Motor vehicle accident prevention measures.

(v) Safety regulations for motor vehicles (details were already given in Parts 2 and 3):

Under the Safety Regulations for Road Vehicles established in 1951, the size, weight, braking system, lamps, meters, exhaust emission, noise, etc. are stipulated. These Safety Regulations have been amended one by one according to changes, etc. in the traffic environment, actual situation of use, etc. since their promulgation.

(vi) Periodical inspection and maintenance system (details to be explained in Part 7):

The users of motor vehicles are obligated to make daily

inspection before driving and the periodical inspection and maintenance every month or every six months.

(vii) Maintenance and repair supervisor system (details to be explained in Part 7):

In order to ensure that the periodical inspection and maintenance are conducted without fail, a person who uses a large number of motor vehicles is obligated to appoint a qualified person as a maintenance and repair supervisor.

Number of maintenance and repair supervisors:	232,393 persons (as of the end of March, 1980)
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(viii) Others:

In addition to the above measures under the Road Vehicles Act, for the purpose of ensuring safety from the side of motor vehicle transportation business operators, (a) establishment of operation management system and investigation and analysis of serious accidents are made under the Road Vehicles Act and the Road Transportation Act, which will be explained in Section (2) below.

Furthermore, safety measures for transporting dangerous materials such as gasoline, explosives, high-pressure gas, radioactive materials, etc. are adopted pursuant to the Road Vehicles Act, etc., which will be explained in Section (3) below.

Ensuring safety in motor vehicle transportation business:

Operation management:

(i) System of operation managers:

The mission of motor vehicle transportation business is to transport passengers or goods safely, surely and rapidly. From the viewpoint of public importance of motor vehicle transportation business, a responsible system to ensure the safety of transportation must be established in the organization of the motor vehicle transportation business.

Accordingly, it is necessary that all business affairs relating to the safety of daily operations be carried out by a responsible person. Furthermore, the responsible person must conduct his duties at all times during the operation of motor vehicles at each place of business.

However, sometimes it will be difficult for an operator to perform operation management directly by himself because of the operational scale of the business.

For that reason, a responsible person who disposes matters relating to safety of transportation must be designated under the Road Transportation Act (Law No. 183 of 1951; hereinafter referred to as the "Transportation Act") to appoint an operation manager.

(ii) Appointment of operation managers:

a. Place of business where the appointment of operation managers is required:

The place of business where the motor vehicle transportation business operators must appoint operation managers is stipulated according to the number of motor vehicles for business use as set forth in Table 1 under the Transportation Regulations for Motor Vehicles Transportation Business, etc. (Ministry of Transport Ordinance No. 44 of 1956; hereinafter referred to as the "Transportation Regulations").

b. Requirements for operation managers:

The operation manager has an important obligation to ensure the safety of operation of motor vehicles for busi-

Table 1. Place of business where operation managers are required.

Kind of business	Number of motor vehicles operated
(1) Passenger motor vehicle transportation business:	
Bus	1 or more
Taxi	5 or more
Specific passenger and free passenger transportation	1 or more (in case passenger capacity is 11 persons or more) 5 or more (in case passenger capacity is not more than 11 persons)
(2) Truck transportation business:	
General route	1 or more (in case of motor vehicles operating on specific routes) 5 or more (delivery motor vehicles excluding light motor vehicles)
General area	5 or more (excluding light motor vehicles)
Specific goods and free goods	5 or more (excluding light motor vehicles)

ness use on behalf of the operator. Accordingly, the operation manager is required to perform his duties with responsibility and to have sufficient specialized knowledge and experience for disposing affairs relating to safety.

Requirements for the operation manager as provided for in the Transportation Regulations are having experience in any of the following items:

- ① A person who has business experience of one year or more in the operation management of motor vehicles for business use or a person who has business experience of three years or more in driving motor vehicles for business use, who has finished the training given by the Director-General of the District Land Transport Bureau.
 - ② A person who has business experience of three years or more in the operation of motor vehicles for the same kind of business.
 - ③ A person who has business experience of seven years or more in the driving of motor vehicles for the same kind of business.
 - ④ A person who is recognized by the Director-General of District Land Transport Bureau to have an ability equivalent or superior to the person of Item ①, ② or ③ above in the management of operation of motor vehicles.
- c. Notification on appointment of operation managers:
The motor vehicle transportation business operator

must, if an operation manager is appointed or any matter already notified is altered, notify the Director-General of District Land Transport Bureau not later than 15 days from the date of such appointment or alteration.

d. Discharge of operation manager:

If any operation manager does not conform to the Transportation Act or the Transportation Regulations, the Director-General of the District Land Transport Bureau may order the motor vehicle transportation business operator concerned to discharge such operation manager.

(iii) Operation management rules and safety service rules:

The motor vehicle transportation business operator must establish standards on matters relating to the service and authority of the operation manager and ensuring of the safety of motor vehicles for business use, that is, the "operation management rules" and submit them to the Director-General of the District Land Transport Bureau.

Table 2 shows the minimum extent of matters to be disposed of by the operation manager. It is stipulated that the operation manager must perform his duties to dispose those matters surely under the Operation Management Rules.

Moreover, passenger motor vehicle transportation businesses and general route truck transportation businesses are operating motor vehicles systematically by employing many crew members. Since the crew members perform most of their operations in places where direct supervision by supervisors is not possible, it is necessary to thoroughly educate them concerning standards for safe and sure performance of their daily operation. For this reason, they are obligated to establish safety operation guidelines on matters to be observed by such crew members and their services under the Transportation Regulations.

In the meantime, motor vehicle transportation business operators must give adequate guidance and supervision for the observance of the operation management rules to the operation managers and at the same time it is necessary to guide and supervise crew members under the safety service rules.

(iv) Operation management services:

The principal matters of operation management services are the management of drivers. In order to perform the management of drivers properly, it is necessary to complete the acceptance system inside the enterprises which can maintain a good level of driver proficiency. At the same time, necessary measures must be taken to upgrade drivers and to ensure that safety operation can be maintained at all times under all circumstances. For that purpose, it is required that a system to effect the operation management be established in the motor vehicle transportation businesses.

The operation management services are divided into three main categories as listed in Figure 2, (a) personnel

management, (b) data management and (c) driving management. The personnel management referred to in this part includes that conducted in ordinary business companies, but it does not aim at merely raising the productivity, but means the special personnel management to those who are engaged in the special duties of driving motor vehicles.

The main purpose of data management is to obtain effective data for performing better personnel management. Such data will be indispensable for drawing up a rational operation plan and accident prevention measures, because it can be checked whether the daily operation is carried out as scheduled and it becomes possible to seize the actual record of operation.

Driving management is viewed as a measure to ensure that the respective drivers are in their best condition in different working places by taking the necessary measures before the commencement of daily operation. Unless any harmony exists between a motor vehicle and a driver, it cannot be expected to secure the safety of transportation in traffic, so that no matter how adequately training of drivers is made, the safety of transportation cannot be ensured without proper management of the driving. Besides, it is necessary as pre-conditions for proper execution of driving management that the personnel management and data management be carried out properly.

(v) Training of operation managers:

The Transportation Regulations stipulate as a series of measures for preventing accidents that motor vehicle transportation business operators must have their operation managers receive training executed by the Director-General of District Land Transport Bureau as to practices, techniques, etc. required for the management of operation. Through this training, the operation managers obtain the knowledge and improve the skill required for the performance of their duties in consideration of the public nature of their business which involves the transportation of lives and property.

Investigation and analysis of serious accidents:

(i) Report system of serious accidents:

In order for the Ministry of Transport to grasp the actual situation of motor vehicle accidents caused by motor vehicle transportation businesses and analyze it to prevent the recurrence of such accidents, the Transportation Act stipulates that a "report of accidents" be made and the Motor Vehicle Accident Report Regulations (Ministry of Transport Ordinance No. 104 of 1951; hereinafter referred to as the "Accident Report Regulations") stipulates in concrete detail how to make the report, etc.

SECTION 5: TECHNICAL SESSIONS

Table 2. Minimum extent of matters to be disposed of by the operation manager.

No.	Transportation regulations	Contents of matters to be disposed of	Kinds of motor vehicle transportation business	
			Motor vehicles for passengers	Motor vehicles for cargoes
1	Article 15 paragraph 1	Boarding service of a conductor	Bus, chartered bus, specific and free passenger transportation (passenger capacity of 11 or more)	—
2	Article 20	Measures to be taken at time of extraordinary weather conditions, etc.	○	○
3	Article 21 paragraph 1	Prevention of overwork (working hours and boarding hours)	○	○
4	Article 21 paragraph 3	Ditto (the health condition of drivers)	○	○
5	Article 21 paragraph 4	Ditto (for long-distance or night driving, arrangement of relief drivers, etc.)	Bus and chartered bus	Route and area truck
6	Article 22	Roll-call, etc.	○	○
7	Article 22-2	Boarding record	○	○
8	Article 22-3 Article 44-4	Recording by tachograph	Bus, chartered bus, specific and free passenger transportation (in case of bus, operation routes of 100km or more)	○
9	Article 45-3 paragraph 3 item 3	Placement of motor vehicles with tachographs	Ditto	○
10	Article 23 paragraph 1	Standard driving chart manual, etc.	Bus	—
11	Article 23 paragraph 2	Operation schedule	Ditto	—
12	Article 24	Investigation, etc. of routes	Chartered bus	—
13	Article 25-6 Article 45-2	Appointment of drivers	○	○
14	Article 25-8 paragraph 2	Certificate of boarding crew member	Taxi	—
15	—	Indication of certificate of driver (Article 13 of the Taxi Business Rationalization Temporary Measures Law)	Ditto	—
16	Article 26	Supervision of crew members	○	○
17	Article 29 paragraph 2	Provision of emergency signal equipment, etc.	○	○
18	—	Limitation of drivers (Article 27 of the Road Transportation Act)	○	—
19	—	Warning of accident (Article 5 of the Regulations of Reporting Motor Vehicle Accidents)	○	○
20	Article 45-3 paragraph 1	Prohibition of operation of over-loaded motor vehicles	—	○
21	Article 44-3	Standards for boarding service	—	Route truck (applicable to operation route of 100km or more)

Note: Mark "○" is applicable to all motor vehicle transportation businesses.

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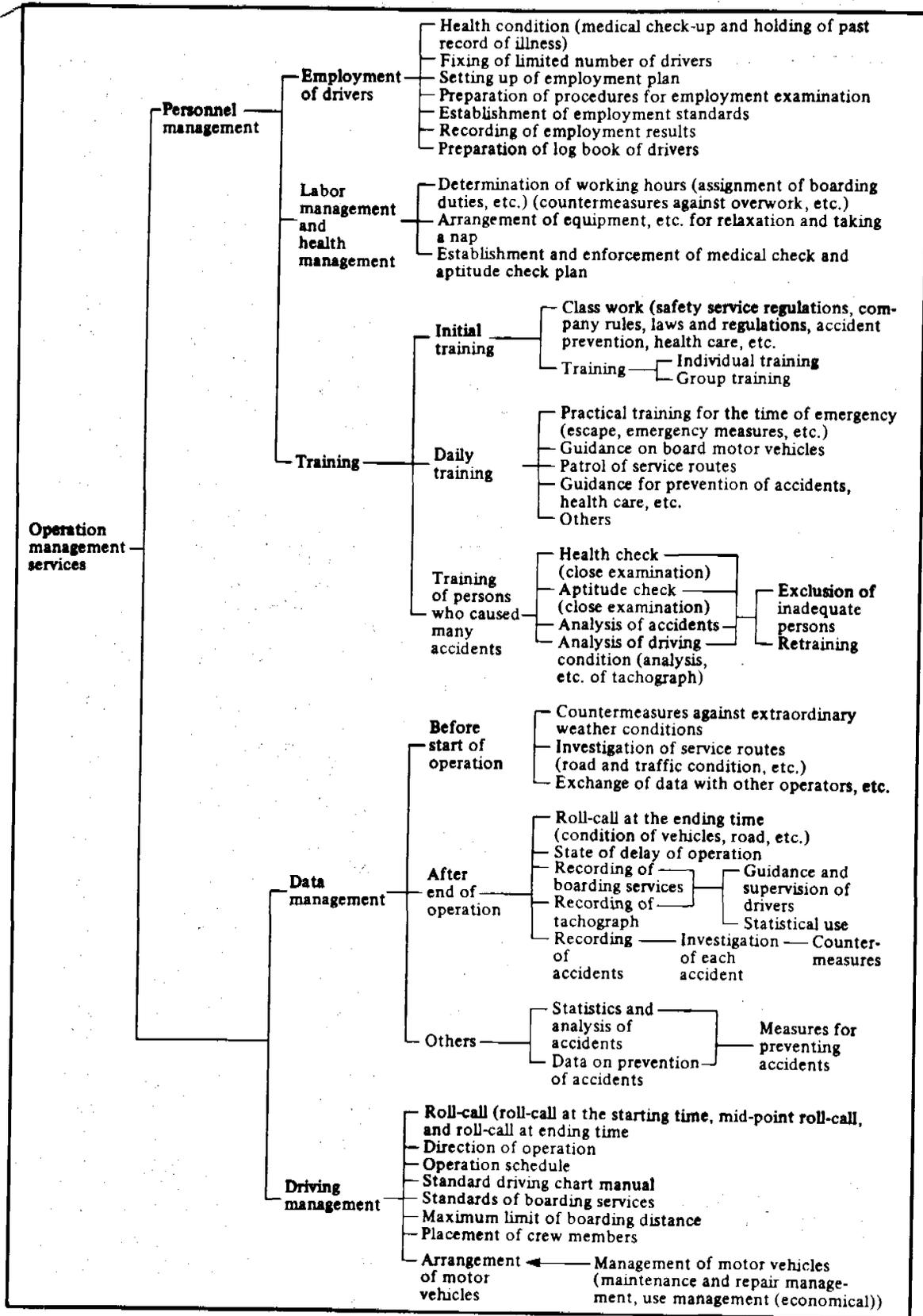


Figure 2. Categories of operation management services.

SECTION 5: TECHNICAL SESSIONS

(ii) Report of serious accidents:

It is stipulated that motor vehicle transportation business operators must, if their motor vehicles have caused any accident which comes under any of the following items (hereinafter referred to as for "serious accident"), report such accident to the Minister for Transport through the Land Transport Office concerned in the prescribed form within ten days from the day of the accident in accordance with the provisions of the Transportation Act and the Accident Report Regulations.

Furthermore, the Minister for Transport or the Director-General of the District Land Transport Bureau assesses the circumstances of accidents and trend of accidents, etc. through such accident reports and the prompt report stated below and takes measures to prevent accidents through warnings, etc.

Kinds of serious accidents:

- a. Roll-over accident
- b. Fall-down accident
- c. Fire accident
- d. Grade-crossing accident
- e. Death or serious injury accident
- f. Accident whose damage exceeds 500,000 yen in total
- g. Accident causing immobilization of the motor vehicle due to breakdown

(iii) Prompt report of accidents:

Motor vehicle transportation business operators must, if there occurs any accident in the above categories of serious accidents which causes roll-over, fall-down, fire and grade-crossing collision, with resultant fatalities and seriously injured cases, promptly report the outline of such accident to the competent Land Transport Office within 24 hours by telephone, telegram or other proper means.

In addition, the outline of any accident other than the above which causes conspicuously large numbers of fatalities and injured or which is considered to have a very serious influence on the society, will be reported promptly, too.

Safety measures for transportation of dangerous materials

Related laws

Safety measures for the transportation of so-called dangerous materials such as gasoline, liquefied petroleum gas, explosives, poisonous substances, powerful poisonous substances, cobalt 60, plutonium, etc. by motor vehicles are adopted on the basis of the related laws.

The general requirements concerning the handling of dangerous materials such as storage, transportation, containers to be used, etc. are prescribed by each of the following laws:

- (i) As for dangerous materials such as gasoline, ether, acetone, etc., the Fire Prevention Act (Law No. 186 of 1948) stipulates that the quality of containers, loading method and transportation method be in conformity with the technical standards prescribed by the related cabinet order.

Furthermore, as for the transportation of dangerous materials by mobile tanks (such as tank lorries), the presence of a certified dangerous materials handler in the transportation vehicle together with the driver, his technical ability being in conformity with the standard prescribed by the related cabinet order, and his possession of the certificate with him in performing his duty are also provided by the above-mentioned law.

- (ii) As for the handling of high-pressure gases such as methane, hydrogen, oxygen, liquefied petroleum gas, etc., the High-Pressure Gas Control Act (Law No. 204 of 1951) stipulates that the quality of containers, loading method and transportation method for the transportation of high-pressure gases be in conformity with the technical standards prescribed by the ordinance of the Ministry of International Trade and Industry. Furthermore, the standard concerning a container fixed on a vehicle (such as that of a tank lorry) that is established to supplement the requirements of such ordinance requires a) the warning mark of dangerous materials to be indicated at a readily visible place on the container, b) the contents of the gas in the container not to exceed 18,000 litres in the case of inflammable gases such as oxygen, and 8,000 litres in the case of poisonous gases, and c) in the case of containers other than those whose discharging outlets are provided at their rear, a container to be fixed on a vehicle so that the horizontal distance between its rear and the rear of the bumper will not become shorter than 30 cm.

(iii) Explosives

As for the transportation of explosives, the Gunpowder Control Act (Law No. 149 of 1950) stipulates that the carrier of the explosive must notify the competent prefectural public safety commission to obtain a certificate proving that the necessary notification has been submitted, and shall carry such certificate during the transportation of the explosive. Furthermore, the transportation route, loading method, indication of the warning mark and transportation method are stipulated to be in conformity with the technical standards prescribed by the ordinance of the Prime Minister's Office.

- (iv) Poisonous substances and powerful poisonous substances.

As for the transportation of poisonous substances or powerful poisonous substances such as mercury, sulfuric acid, etc., the condition of the container, loading method,

transportation method, the conditions concerning the presence of the shift driver and helper in the transportation vehicle, indications of the sign on the vehicle must be in conformity with the Enforcement Order and the Enforcement Regulations of the Poisonous Substances and Powerful Poisonous Substances Control Law (Law No. 303 of 1950).

- (v) As for the transportation of radio isotopes (such as cobalt 60) and nuclear fuel materials (such as uranium, plutonium, etc.), the conditions of the transportation are regulated by the Law Concerning the Prevention of Radiation Hazards due to Radioactive Isotopes, etc. (Law No. 167 of 1957) and the Law Concerning Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors (Law No. 166 of 1957). The outline of the regulations provided by these laws will be explained later in C.

Road Vehicles Act

As for the constructions and equipments of motor vehicles to be used for the transportation of dangerous materials, the following standards have been established in conformity with the Safety Regulations for Road Vehicles (Ministry of Transport ordinance already explained in Parts 2 and 3) based on the Road Vehicles Act, in order to enforce the inspection of vehicles (already explained in Part 5) for ensuring safety during the transportation of dangerous materials by preventing the occurrence of fire or explosion.

- (i) Vehicles to transport any of the following dangerous materials, etc. are required to have a fire extinguisher installed.
- * Dangerous materials such as gasoline (when the quantity exceeds the designated quantity)
 - * High-pressure gas (when the quantity is over 150 kg, and it is flammable)
 - * Explosive (5 kg or more)
 - * Radioactive and nuclear fuel materials
- (ii) Any motor vehicle used to carry such dangerous materials must meet the following standards:
- * The electric system shall be insulated properly.
 - * The rear body and engine shall be separated by non-inflammable partition walls.
 - * The parts of the exhaust pipes and silencers within the range of 200 mm respectively from the surface of the tank shall be covered with appropriate-heat prevention fittings.
 - * The rear of the frame shall be provided with a bumper and other buffer system in order to protect the tank and its accessories from being damaged in the event of collision.
 - * Others.
- (iii) Any motor vehicles with gas-transporting containers

(high-pressure gas) shall meet the following standards:

- * The rear of the frame shall be provided with a bumper and other buffer system in order to protect the gas container and its accessories from being damaged in the event of collision.
 - * The buffer system shall be located sufficiently away from the rear side of the container and its accessories.
 - * Others.
- (iv) Any motor vehicles carrying explosives shall meet the following standards:
- * The rear body and engine shall be separated with non-inflammable partition walls.
 - * The electric system shall be insulated properly.
 - * Others.

Radioactive materials (radio isotopes, nuclear fuel materials, etc.)

The technical standards for the transportation of radioactive materials have been established in conformity with the "Regulations for the Safe Transport of Radioactive Materials" (1973 Revised edition) of IAEA (International Atomic Energy Agency), the "Techniques for the Transportation of Radioactive Materials" published by the Atomic Energy Commission in January, 1975, and the "Report on the Amendment of the Standard for the Transportation of Radioactive Materials or Substances Contaminated by Radioactive Materials" recommended by the Council for Radiation in August 1977. As a result, this standard has become one of the most stringent standards in the world.

(i) Standard for transported goods

The quantity of transported goods is specified by an ordinance of Prime Minister's Office in consideration of the kinds of transported goods. On this basis, radioactive materials are classified into type L, type A, type B(M) and type B(U).

- type L: Substance to be transported in the least dangerous quantity.
- type A: Substance whose radioactivity is less than the specified level.
- type B(M) or type B(U): Substance whose radioactivity is higher than the specified level.

Of the above classifications, the least dangerous quantity means less than one thousandth of the specified quantity. Also, the transported goods are required to meet the technical standards applicable to type L, type A, type B(M) and type B(U) respectively, shown in Table 3.

(ii) Standard for transportation method

In order to ensure the safety during transportation, the ordinance of the Ministry of Transport stipulates that the

SECTION 5: TECHNICAL SESSIONS

Table 3. Technical standards to be met by the categories of the transported goods.

Standard	Type L	Type A	Type B(M)	Type B(U)
1. All the sides of the container should be longer than 10cm.	○	○	○	○
2. Handling should be easy and safe.	○	○	○	○
3. Container should be free of cracks or damage during transportation.	○	○	○	○
4. Container should be sealed.	○	○	○	○
5. Surface contamination should be lower than permissible concentration.	○	○	○	○
6. Radiation leakage level should be lower than the standard value.				
(1) Surface (m rem/h)	0.5	200	200	200
(2) 1m from surface (m rem/h)	—	10	10	10
7. Unnecessary articles should not be put in the container.	—	○	○	○
8. Under normal testing conditions:				
(1) Maximum permissible radiation level on the surface (m rem/h)	—	200	200	200
(2) Permissible leakage of radioactive substances (1h)	—	No leakage permitted	$A_2 \times 10^{-6}$	$A_2 \times 10^{-6}$
(3) Surface temperature should be under 50°C.	—	—	○	○
(4) Surface contamination should be under permissible concentration.	—	—	○	○
9. Under special testing conditions:				
(1) Maximum permissible radiation level 1m from surface (m rem)	—	—	1,000	1,000
(2) Permissible leakage of radioactive substance (1W)	—	—	A_2	$A_2 \times 10^{-3}$
(3) -40°C test.	—	—	—	○
10. Use of filter and mechanical cooling equipment shall be prohibited.	—	—	—	○
11. Internal pressure should be under 7kg/cm ² (G).	—	—	—	○

(Note) Besides the standards listed in the above table, as for the fissionable materials, the standards for preventing such materials from reaching the critical state must also be observed.

place of handling, loading method, method of indication, etc. must be in conformity with the standards listed in the following Table 3.

(iii) Approval for the transportation of radioactive materials

When transporting transported goods (such as type B(M) or B(U) transported goods) for which special care for the prevention of radiation leakage and the critical state is required, the transported goods to be transported must be approved by the prime minister or the general director of the Science and Technology Agency, and the method of transportation by the Minister for Transport respectively in order to confirm that both the transported goods to be transported and the method of transportation are in conformity with the related technical standards, respectively. Also, when transporting the transported goods, the user of such materials is required to notify the competent prefectural public safety commission to that effect.

(iv) Measures to be taken at time of accident during transportation

When an accident has occurred during transportation of radioactive materials, the carrier who is responsible for the transportation of such materials not only shall immediately take the necessary measures such as preventing the general public from approaching the vehicle but also shall immediately notify all the related parties to that effect.

Testing and Research Systems by the Government

Outline of the traffic safety and nuisance research institute:

The increase of traffic accidents, air pollution by exhaust gas from motor vehicles and so forth have gradually

EXPERIMENTAL SAFETY VEHICLES

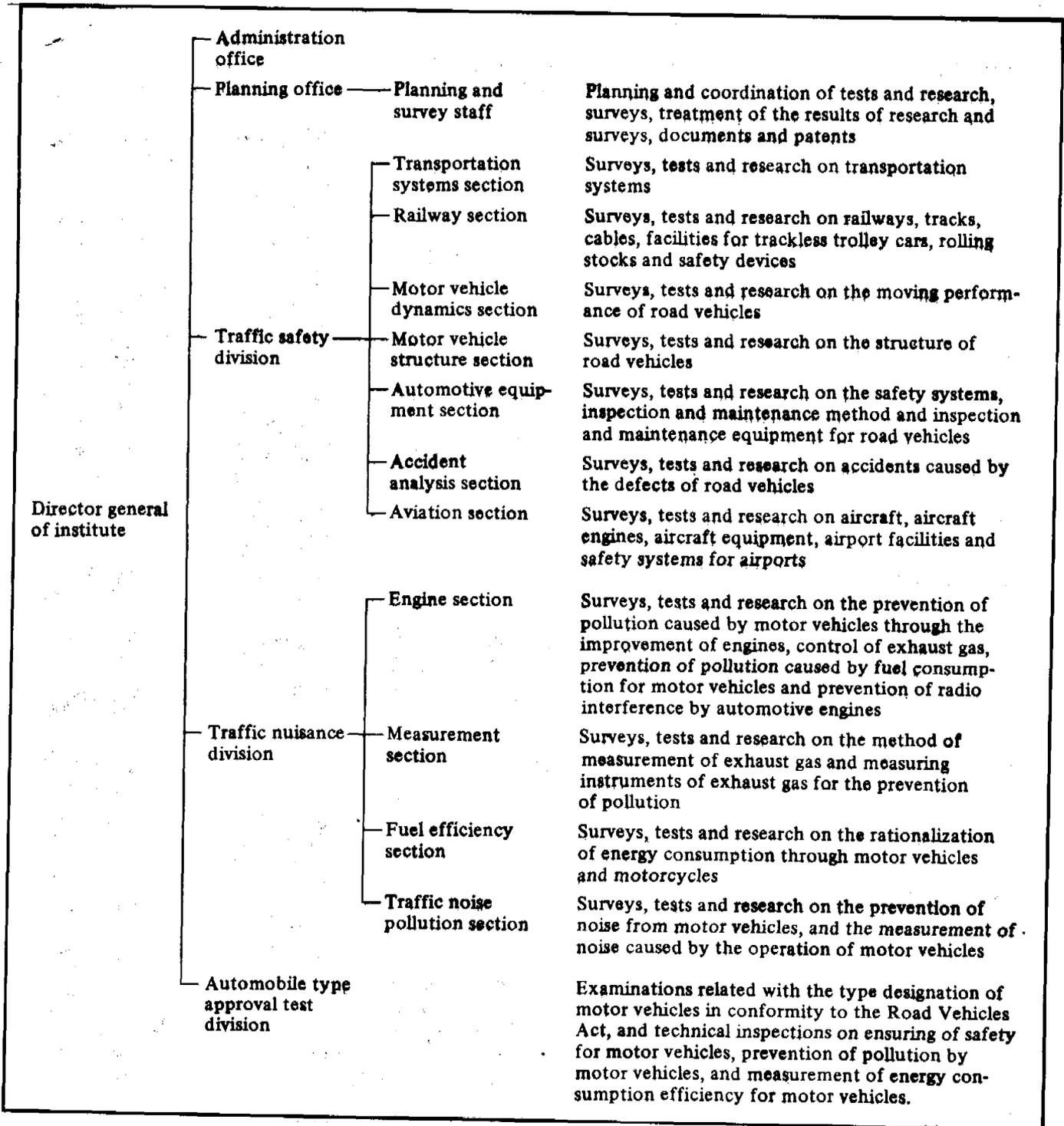


Figure 3. Organization and duties in traffic safety and nuisance research institute.

come to the fore as social problems from about 1965 along with the progress of the motorization in this country. Besides, the existence of defective motor vehicles had become another social problem by 1969. In order to cope effectively with the problems of increasing traffic accidents, public nuisances caused by vehicles and the existence of defective vehicles, the traffic safety and nuisance research institute was founded in 1970 as a subsidiary

organ of the Ministry of Transport to undertake tests and research that can be utilized for traffic administration.

This institute also includes the Automobile Type Approval Test Division as already explained in Part 4 and the research section for railway traffic and air navigation. In this part, however, we are going to take up only the section concerned with safety for motor vehicles, prevention of pollution and energy saving.

Organization and duties in the traffic safety and nuisance research institute:

The organization and duties in this institute are as shown in Figure 3. The traffic safety division is responsible for the research on the safety of motor vehicles.

A. The traffic safety division comprises the four research sections for motor vehicles, and these research sections are currently engaged in the following principal research projects respectively.

- (i) The motor vehicle dynamics section is now engaged in researches on the controllability and stability of motor vehicles based on the technical data obtained through experiments using models and actual motor vehicles.
- (ii) The motor vehicle structure section is now conducting research on improving the brake performance of motor vehicles based on the technical data obtained not only through experiments using individual brakes and braking systems for high-speed vehicles but also through experiments using actual motor vehicles.
- (iii) The automotive equipment section is now undertaking research on how to make the optimum vision available for drivers of motor vehicles based on the technical data concerning the running speed, locus and the scope of driver's eyes obtained through the experiments using actual motor vehicles.
- (iv) The accident analysis section is now carrying out research on how to reduce the damage to vehicle and driver at the time of collision and the strengths of the structure and equipment of motor vehicles based on the technical data obtained through the collision experiments.

B. On the other hand, research on the prevention of pollution caused by motor vehicles and energy-saving systems for motor vehicles are undertaken by the traffic nuisance division. This division comprises the four research sections for motor vehicles, and these research sections are engaged in the following principal research projects respectively.

- (i) The engine section is now engaged in research on how to measure the characteristics of exhaust gas from gasoline engines in use, measurement of the performance of exhaust gas control systems for motor vehicles, and generation and prevention of toxic substances from engines and exhaust systems based on technical data obtained through experiments using actual motor vehicles and individual engines.

- (ii) The measurement section is engaged in research on the measurement of NOx emitted from large diesel engine motor vehicles based on technical data obtained through experiments using actual motor vehicles.

- (iii) The fuel efficiency section is conducting research on how to measure the fuel efficiency of motor vehicles, how to mix fuel with alcohol for practical use, and how to reduce fuel consumption while motor vehicles are running, based on technical data obtained through experiments using actual motor vehicles and individual engines.

- (iv) The traffic noise pollution section is responsible for research on the method of measurement and estimate of noise from motor vehicles based on technical data obtained through experiments using actual motor vehicles and anechoic chamber.

C. The traffic safety and nuisance research institute is also conducting research entrusted by other parties, providing technical guidance to other parties, and cooperating with the police and judicial authorities by providing them with the technical data that they need in performing their duties, in addition to its own research activities.

Remark: Originally scheduled for this issue, the 6th installment of "Maintenance and Repair of Motor Vehicles" has been postponed to the next issue No. 9, since partial revision of the law pertaining to it is now being made.

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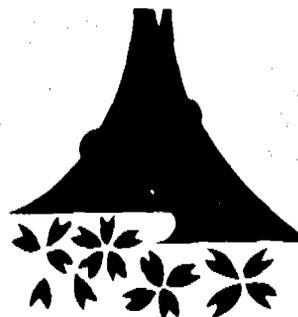
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EXPERIMENTAL SAFETY VEHICLES

Table 4. Standard for transportation method.

Item	Requirements
Place of handling	Handling in any place that is readily accessible by outsiders should be prohibited.
Loading method	Loading and unloading should be done with adequate attention to safety. Loading operation in any place that is readily accessible by outsiders should be prohibited.
Prevention of critical state (Applicable only to nuclear fuel materials)	Under no circumstances should the radioactive substance be allowed to reach its critical state during transportation.
Restriction of mixed loading	Mixed loading of explosives and high-pressure gases should be restricted. Any material whose heat-radiating rate is higher than 15 W/m^2 should not be loaded together with other materials unless special measures are taken.
Limitation of radiation level for the container	Surface: Under 200 m rem/h; 1m from surface: Under 10 m rem/h; Permissible surface density should be restricted.
Transport index	Calculation method of transport index should be specified.
Labeling or indication	Labeling for transported goods, indication of "Full load", indication of type (such as type A or type B), indication of the "Full load" for type B material should be specified.
Limitation of load	Total transport index per vehicle should be under 50.
Permissible radiation level for vehicle	Surface of vehicle: under 200 m rem/h, 1m from surface of vehicle: under 10 m rem/h, driver's cabin: under 2 m rem/h.
Labeling related with vehicle	Vehicle labeling should be indicated on both sides and rear of the vehicle.
Documents concerning the handling to accompany the material to be transported	Documents indicating the kind, quantity, handling method, cautions and measures to be taken at the time of accident should accompany the material to be transported.
Shift driver	In case the material has to be transported over a long distance or during nighttime, a shift driver should be provided in order to prevent driver fatigue.
Guard	Parked vehicle should be watched by a guard.
Measures to be taken in transporting type B (M) transported goods	In transporting type B (M) transported goods, radiation detector, protective devices and specialist should accompany the material to be transported.

CONFERENCE CLOSING



Closing Remarks by the Head of the Japanese and American Delegations at the Ninth ESV Conference

NORIYOSHI UNO

Director-General of Traffic Safety and Nuisance Research Institute, Ministry of Transport

The Ninth ESV International Technical Conference is about to come to a close. The Conference has been a great success, and, as the representative of the sponsoring country, I should now like to add a few words of my own.

This is the second time that the ESV conference has been held in Japan. The first was in March 1973. All Japanese involved in automobile safety technology have been most happy to sponsor these two conferences. The technical results brought about in the context of ESV Programs to date have become the common property of the automobile industry, research laboratories, and government organizations throughout the world. Some of them have been incorporated into the design of mass-produced automobiles, with the result that mankind now enjoys the benefits of the motor car with increasing safety. Accompanying the development of motorization, the safety and anti-pollution requirements made on automobiles are growing ever greater; particularly noticeable is the development of technical innovation in the automobile industry with both specific safety technology and testing methods becoming ever more complex and advanced. Indeed, I believe that it would be no exaggeration to say that without international cooperation it would be virtually impossible for any individual country to carry out such research and to establish regulations entirely on its own. The purpose of this conference is to allow experts in the field of automobile safety technology from throughout the world to gather in a single place and exchange their various studies and findings in order to create a common awareness of the problems involved. This should make it possible to create an international consensus regarding the results of safety research and the fundamental data used in the establishment of regulations.

Technical sessions on a wide variety of themes have been held at this conference. In the field of biomechanics and dummy development, meaningful results have been obtained from new concepts. A significant exchange of opinions has occurred in such essential areas of research as the collection and analysis of accident survey data. A technical session was newly set up at this conference for the purpose of discussing automobile safety ratings. Problems from previous ESV conferences were discussed, and new points for discussion were identified.

I should like to express my warmest feelings of gratitude to the United States government, which has contributed so much to the sponsorship and success of this Conference. May I also take this opportunity to offer my thanks to all of you for coming to Kyoto and participating in this Conference.

Thanks must also go to the interpreters who have put so much effort into conquering the language barriers, and to those involved on the Japanese side in ensuring the smooth flow of conference proceedings.

Participants in this Conference will have had the opportunity to come into contact with the culture and customs of Japan, and I hope that this experience will have helped towards ever greater understanding of Japan. As I am sure you are aware, Kyoto is both the ancient capital of Japan and, at the same time, a modern city. It is an ideal city for coming into contact with the culture and customs of Japan. I should like to conclude these remarks by saying how much I hope that you will be able to find the time after the closing of this Conference to appreciate for yourselves the beauty of this city, in which the autumnal tints are now at their peak.

Lastly, the next ESV meeting is going to be held in the Spring of 1985 in the U.K. at the kind invitation of the government of the United Kingdom. I would like now to declare the Ninth International Technical Conference on ESV closed. I look forward to meeting all of you again at the next meeting.

Michael M. FINKELSTEIN

National Highway Traffic Safety Administration

As this Ninth International Technical Conference on Experimental Safety Vehicles comes to a close, we in the auto safety community again have tangible evidence of the benefit gained from our effort to seek solutions to our common problems. As we progress beyond the development of Experimental Safety Vehicles to the examination of the full range of vehicle safety problems facing us all, it is clear that our success to date in the ESV program must serve as a model for future cooperation.

Here in Kyoto, we have had four days of wide-ranging

discussions of vehicle safety. We've heard and discussed papers of the highest quality; papers whose importance will grow as we have time to study them and incorporate these new findings into our own future research.

We would be remiss if we did not take this opportunity on behalf of Deputy Secretary Trent, Administrator Peck, and the entire United States delegation—I am sure I can say without fear of contradiction, on behalf of all of the conference participants—to express our gratitude for the generosity, hospitality, and remarkable efficiency of our Japanese hosts: the Government of Japan, the Japanese Auto Manufacturer's Association, and the Japanese Automobile Research Institute. Thank you all.