CHAPTER IX

CONCLUSIONS

Regardless of the specific administrative and organizational structure of a country, the survey conducted as part of this Report shows that there is consistency in how road funds are allocated and distributed. For "best practice" to accomplish this allocation and distribution, countries have developed - or should develop - an integrated Road and Bridge Management System.

In outline, the management system should be capable of assessing the physical and operating conditions of the current road network with the accuracy and detail desired by the road administration. By using estimates of travel demands -- disaggregated geographically and functionally -- the management system should provide forecasts about future investment requirements, both in capital and rehabilitation outlays as well as routine maintenance to achieve varying levels of system performance. It should also provide input to allocation of costs among road users to help gain adequate and equitable funding of the road network over the long run.

For 'best practices' in resource allocation and distribution decisions, a unified analytical framework is proposed - minimization of user and agency costs. However, a clear distinction is made between network, program and project level systems. The first serves policy applications by the Central Administration and the latter two project prioritization, selection and design, normally applied by the regional executing agency. It is important that all these application purposes are based on the same data.

During the course of its work, the Scientific Expert Group developed a consensus on 'Ten Commandments' which governments and road administrations should follow in developing a method for resource allocation and distribution for road maintenance and rehabilitation programme and for the process that this method might find worthwhile to follow. These 'commandments' are:

I. *Maintenance is an opportunity for enhancing the environment as well as safeguarding the road network asset.*

II. *Road and bridge maintenance should be pursued for the sake of the users. Therefore, public participation is an essential part of developing the road maintenance programme.*

III. *Roads and bridge assets should be maintained in an economical way.*

IV. *An analytical framework is important for delivering an economical and environmentally sound product. In the Report such a framework is termed Road and Bridge Management System (RBMS).*

V. *User costs must treated as important costs and included in the analytical framework, in the RBMS.*

VI. *Budget constraint on the administration's expenditures is an important feature of the analytical procedures. Competitive maintenance and rehabilitation programmes are one important means to address these constraints.*

VII. *The entire road budget and trade-offs between alternative uses must be considered when allocating and distributing resources.*

VIII. *The analytical framework and the management systems used in allocating and distributing resources must be compatible with the road administration's organization and management style.*

IX. *The methods used at network, programme, and project levels must be different but interlocking and utilize the same data base.*

X. *Data systems which support the road and bridge management systems must be timely and reliable.*

ANNEX A

ROAD LENGTHS AND TRAFFIC VOLUMES

Table A.1. **Road length (1,000km) by functional road class** (1989/1990/1991)

	Motorway	Main roads I	Main roads II	Collector roads	Local roads	Urban roads	Privat./ other r.
Canada	1.63	20.7	-[1]	20.81	77.23	36.75	no data
Finland	0.25	7.46	4.04	22.67	42.46	no data	59.2[2]
France	8.04	28.26	not relev.	354.0	526.0	-[3]	no data
Germany	10.96	42.10	-[1]	84.9	88.3	410	no data
Grt-Britain	3.10	12.36	-[1]	35.6	309.0	-[4]	no data
Italy	(no	data	available)				
Japan	5	21	26	131	940	-[5]	no data
Netherlands	2.09	1.96	3.04	48.36	-[4]	48.80	13.38
Norway	(no	data	available)				
Portugal	0.68	2.30	2.22	4.87	10.20	no data	no data
Spain	5.43	15.26	15.26	64.47[6]	-[6]	no data	no data
Sweden	0.94	13.17	11.66	not relev.	72.09	35.7[2]	72.9[2]
Switzerland	1.5	18.3	18.3	-[7]	51.2	-[7]	no data
Turkey	0.39	31.26	31.26	no data	no data	no data	324.7
United States	85	219	219	1,301	4,355	no data	no data

1. Figures for Main roads II included in Main roads I.
2. Only roads with state-subsidies.
3. Figure is included in local roads
4. Figures are included in Collector roads.
5. Figure is included in the other categories.
6. Figures for Local roads included in Collector roads.
7. Figures for Collector roads and Urban roads included in Local roads.

Table A.2. **Road length (1,000 km) by administrative road class** (1989/1990/1991)

	Federal	State	Country	City	Rural community	Other
Canada	not relev.	21.70	20.81	36.75	77.23	no data
Finland	not relev.	77.08	no data	12	no data	59.2
France	not relev.	36.30	354.0	526.0	625.0	no data
Germany	53.1	84.9	88.3	410	-[1]	no data
Grt-Britain	not relev.	15.39[2]	294.0	50.65	-[3]	-[3]
Italy	6.2[4]	46	110	440	192	no data
Japan	not relev.	21	155	940	-[1]	no data
Netherlands	4.05	7.08	29.82	49.22	14.85	12.96
Norway	not relev.	26.27	27.00	35.87	no data	no data
Portugal	no data	20.27	no data	no data	no data	no data
Spain	20.69	71.06	64.66	-[5]	no data	no data
Sweden	not relev.	97.9	not relev.	35.7	not relev.	72.9[6]
Switzerland	1.5	18.3	no data	8	43.2	no data
Turkey	not relev.	not relev.	not relev.	not relev.	not relev.	not relev.
United States	269	1,285	353	1,141	no data	no data

1. Figures for Rural community included in City.
2. Figures stand for Motorways and trunk roads.
3. Figures included in Country.
4. Figures for Federal stand for "Motorways".
5. Figures for City included in figures for Country.
6. Figures for Other stand for Private.

Table A.3. **Traffic loads (million vehicle km travelled) by functional road class** (1989/1990/1991)

	Motorway	Main roads I	Main roads II	Collector roads	Local roads	Urban roads	Privat./ other r.
Canada	47,100	-[1]	-[1]	25,900	-[2]	-[2]	no data
Finland	1,994	11,938	3,777	7,597	4,136	no data	1,175[3]
Germany	140,100	102,700	-[4]	80,800	45,800	139,500	no data
Grt-Britain	61,000	69,400	-[4]	127,000	154,200	-[5]	-[5]
Italy	51,750	(Other	roads	275,250)			
Japan	(Totally	628,581 not	specified	on road	classes)		no data
Netherlands	34,570	7,040	10,050	17,990	-[6]	no data	no data
Norway	(no	data	available)				
Portugal	18,468	8,630	7,470	6,374	no data	no data	no data
Spain	31,148	43,246	35,888	-[7]	-[7]	no data	no data
Sweden	7,090	20,100	4,960	not relev.	12,855	16,000	1,700
Switzerland	(Totally	42,759 not	specified	on road	classes)		
Turkey	no data	26,056	no data	no data	no data	no data	no data
United States	939,580	793,401	629,903	543,591	no data	no data	no data

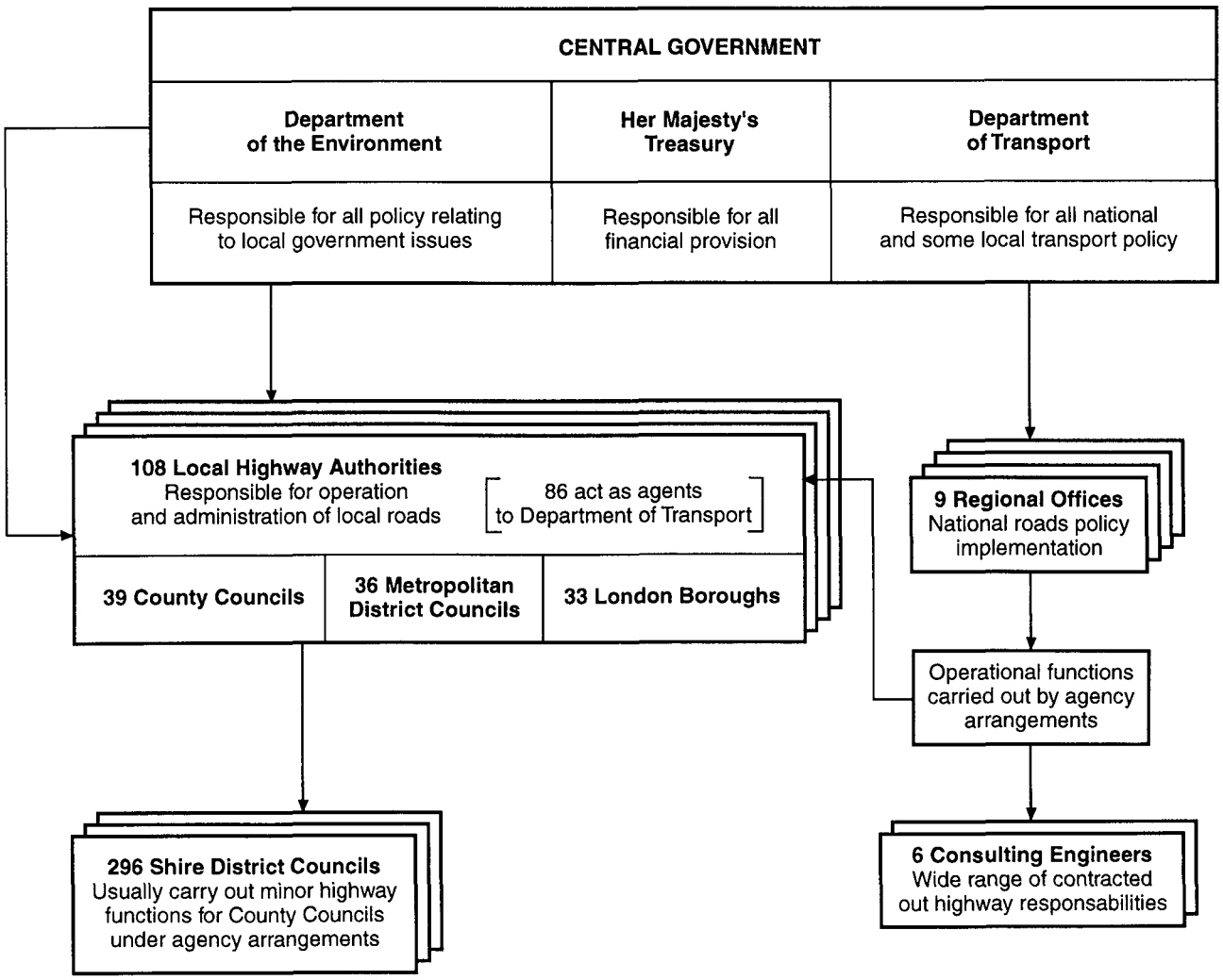
1. Figures for Main roads I and II included in Motorways.
2. Figures for Local and Urban roads included in Collector roads.
3. Only roads with state-subsidies.
4. Figures for Main roads II included in Main roads I.
5. Figures for Urban roads and Private/other roads included in Local roads.
6. Figures for Local roads included in Collector roads.
7. Figures for Collector roads and Local roads included in figures for Main roads II.

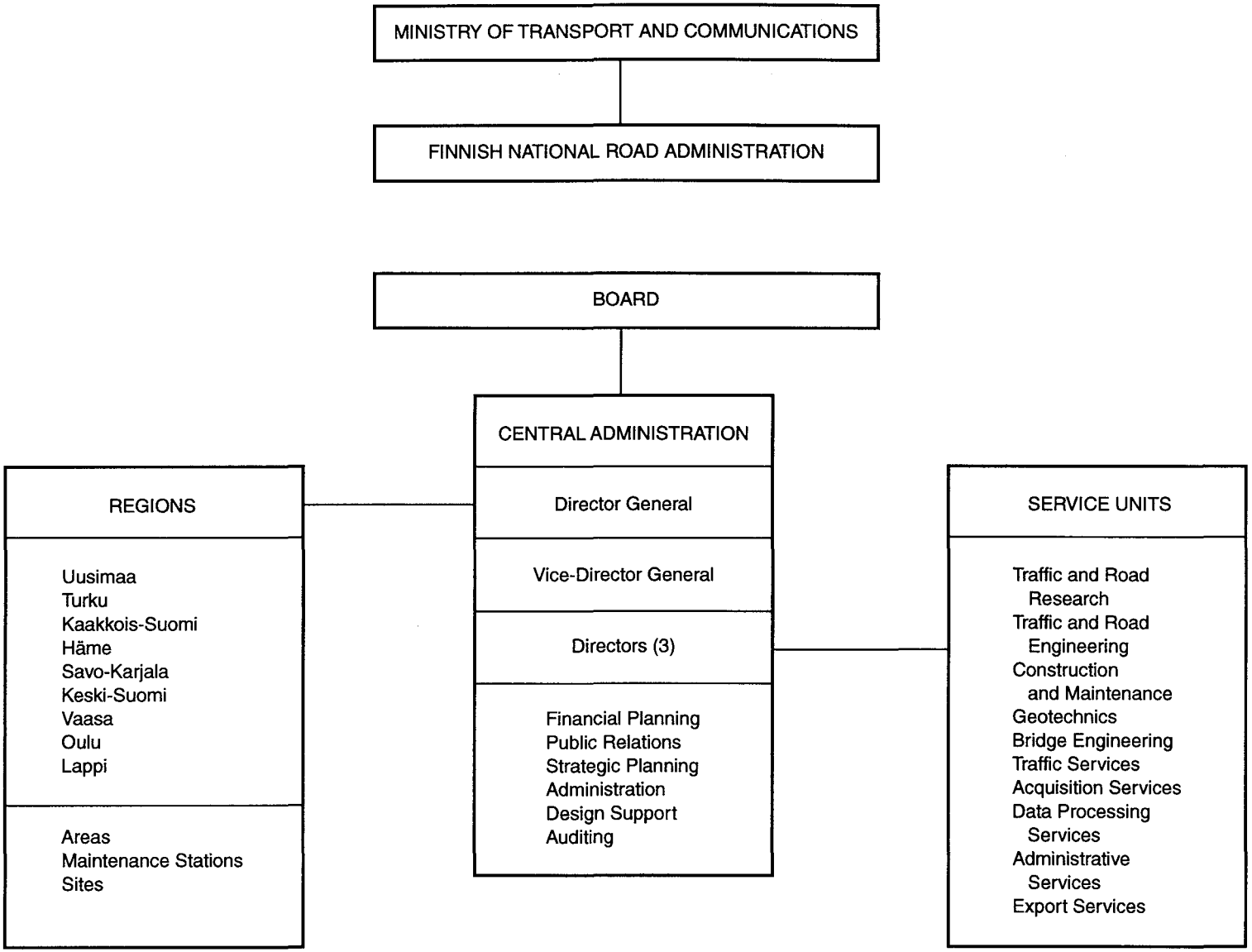
ANNEX B

ORGANISATION OF ROAD ADMINISTRATIONS

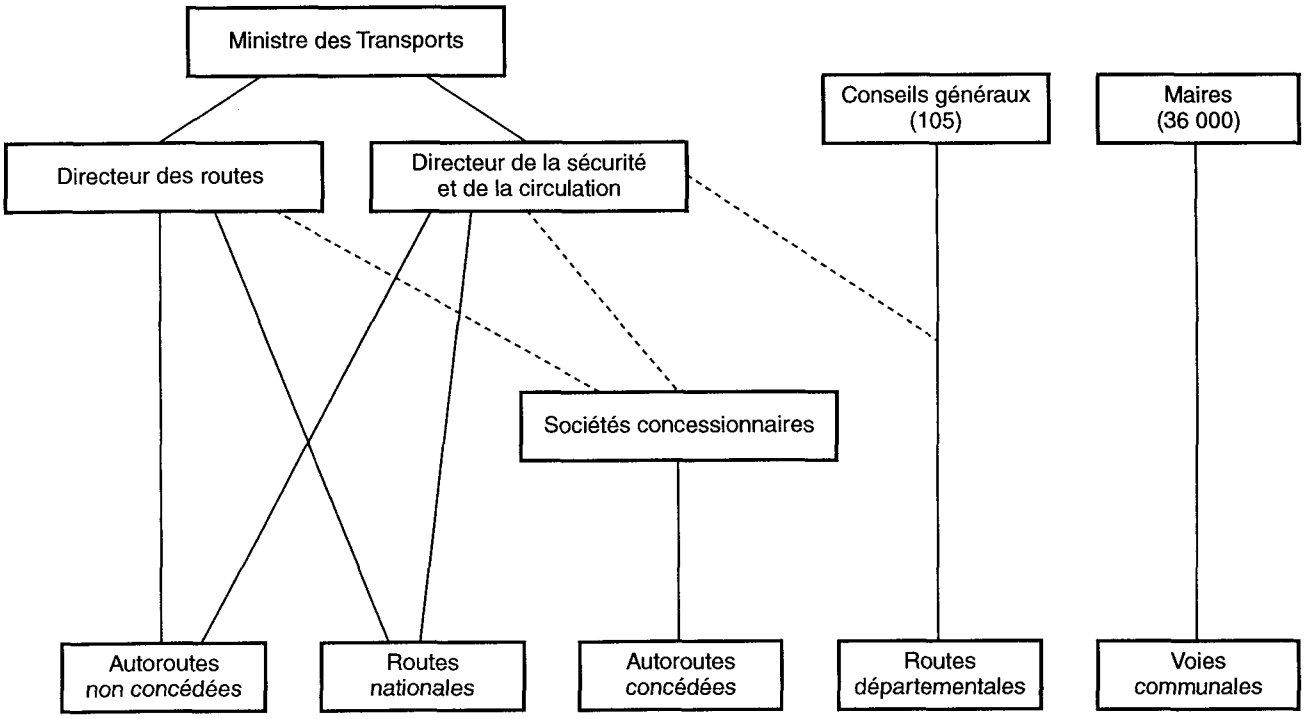
England
Finland
France
Germany
Japan
Netherlands
Norway
Spain
Sweden
Switzerland

Roads Administration in England

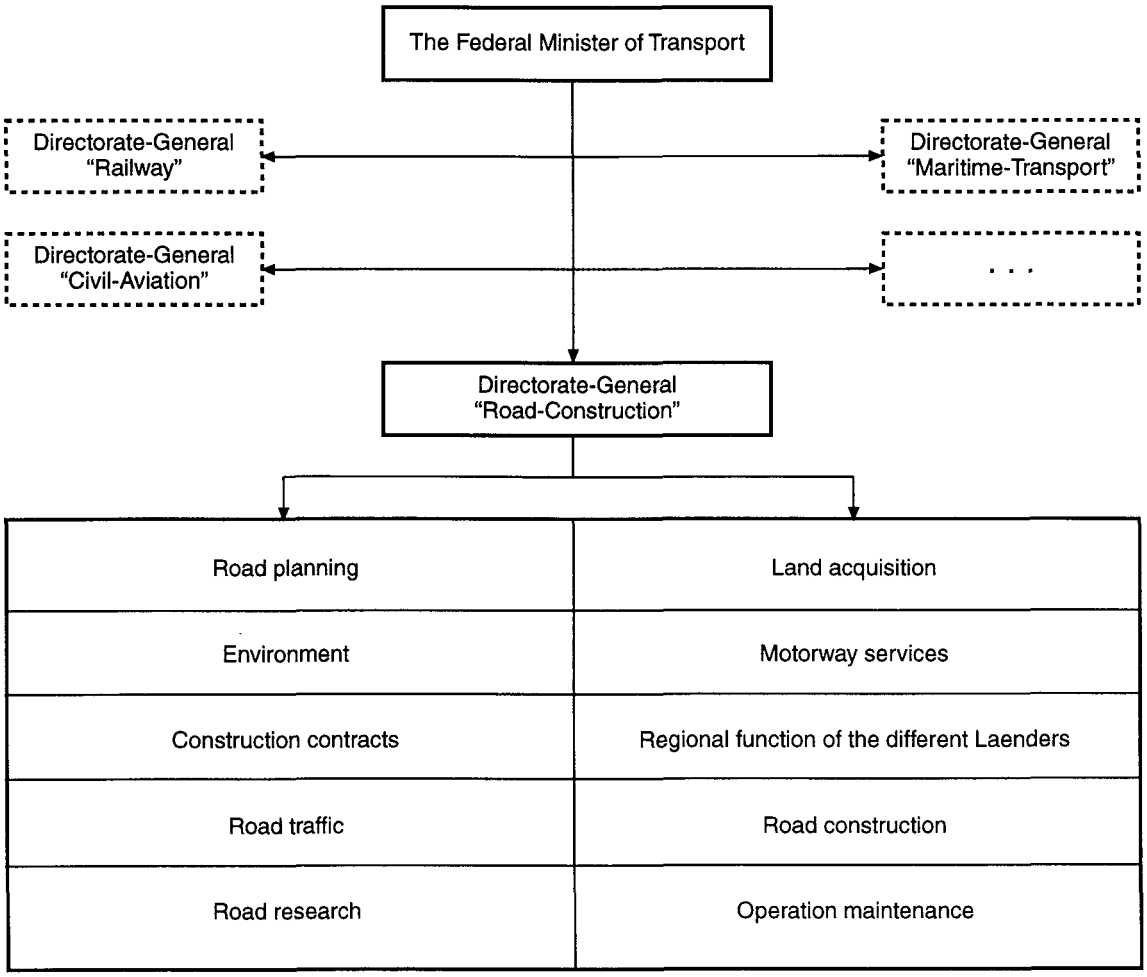



MINISTRY OF TRANSPORT AND COMMUNICATIONS
FINNISH NATIONAL ROAD ADMINISTRATION
BOARD
CENTRAL ADMINISTRATION
Director General
Vice-Director General
Directors (3)
Financial Planning
Public Relations
Strategic Planning
Administration
Design Support
Auditing
REGIONS
Uusimaa
Turku
Kaakkois-Suomi
Häme
Savo-Karjala
Keski-Suomi
Vaasa
Oulu
Lappi
Areas
Maintenance Stations
Sites
SERVICE UNITS
Traffic and Road Research
Traffic and Road Engineering
Construction and Maintenance
Geotechnics
Bridge Engineering
Traffic Services
Acquisition Services
Data Processing Services
Administrative Services
Export Services

Organigramme de l'administration routière de la France

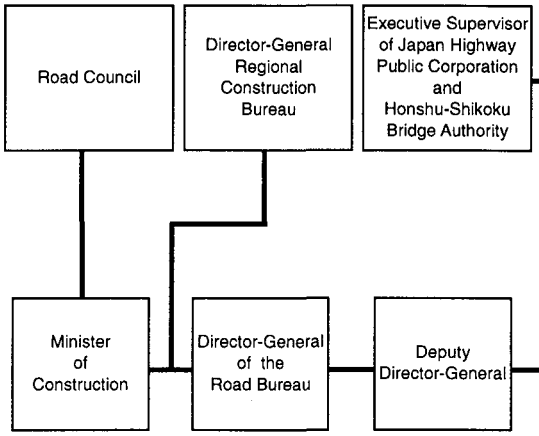


Organisation Chart of the Federal Ministry of Transport
(Germany)



Organisation of the Road Bureau (Japan)

Organization of the Road Bureau



General Affairs Division

1. Coordination of Bureau Affairs
2. Personnel Affairs of Bureau
3. Budgeting
4. Five-Year Road Improvement Program and other Long-Term programs
5. Management of Road Fund

Road Administration Division

1. Drafting of Road related Bills
2. Administration and Supervision of Roads
3. Planning of Networks of National Expressways National Highways, Principal Local Roads and Hokkaido Development Roads
4. Designation of these Highways

Road traffic Control Division

1. Planning and coordination of Road traffic Safety Administration
2. Survey and Research of Road Traffic Safety
3. Supervision of Center for Road Traffic Informantation

Planning division

1. Planning of Important of Roads (Except National Expressways)
2. Survey and Statistics of Roads
3. Technical Structure
4. Technical Standards of Road Work
5. Planning of Road Traffic Safety System

Highway Economic Research Section

1. Economic Survey of Roads
2. Planning of Large Scale Projects

Road Environment Section

1. Preparation of basic Policy for Road Environment
2. Surveys for Environment Problems

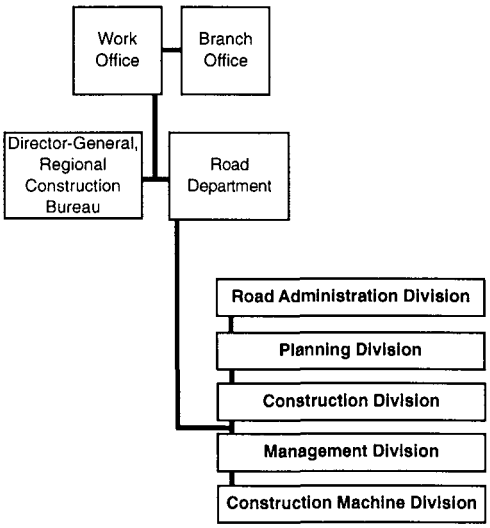
Road Disaster Prevention Section

1. Preparation of basic Policy for Road Disaster Prevention

Toll Road Division

1. Planning and Survey of Toll Roads System
2. Permission for Construction Toll Roads
3. Permission for Motorvehicle ways under Road Transportation Law

Organization of Regional Construction Bureau



National Expressway Division

1. Orders for Construction of National Expressways
2. Survey and Statistics of National Expressways

National Highway First Division

1. Construction and Reconstruction of National Highways
2. Repairs of Designated Sections of National Highways
3. Improvement of National Highways inSnowy and Cold Regions

National Highway Second Division

1. Technical Supervision and Direction of Construction of National Highways
2. Technical Supervision and Direction of Improvement of National Highways in Snowy and Cold Regions

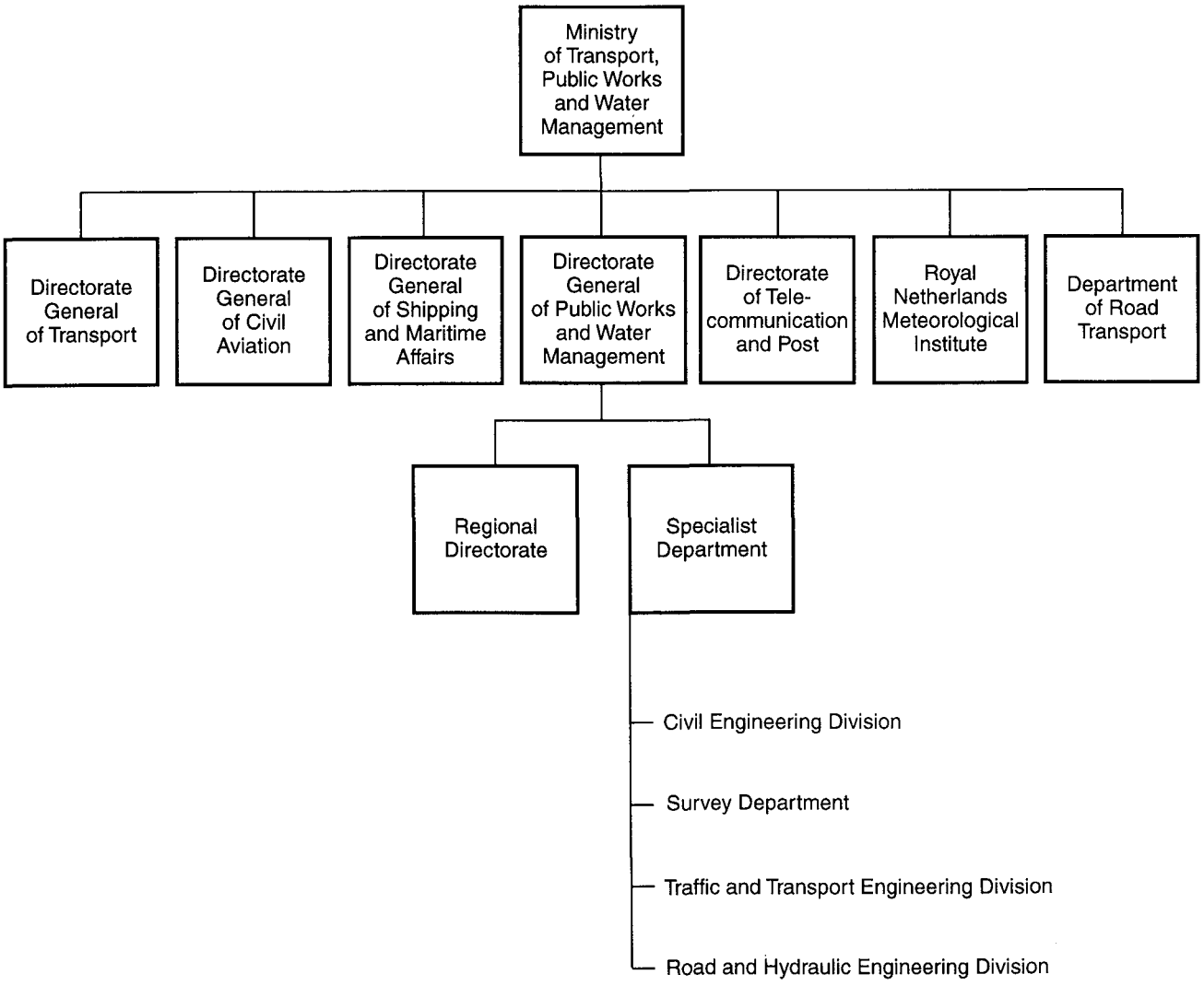
Local Road Division

1. Technical Supervision and Direction of Local Roads
2. Technical Supervision and Direction of Highways in Snowy and Cold Areas
3. Construction, Reconstruction, and Repairs of Hokkaido Development Roads
4. Improvement of Hokkaido Development Roads in Snowy and Cold Regions

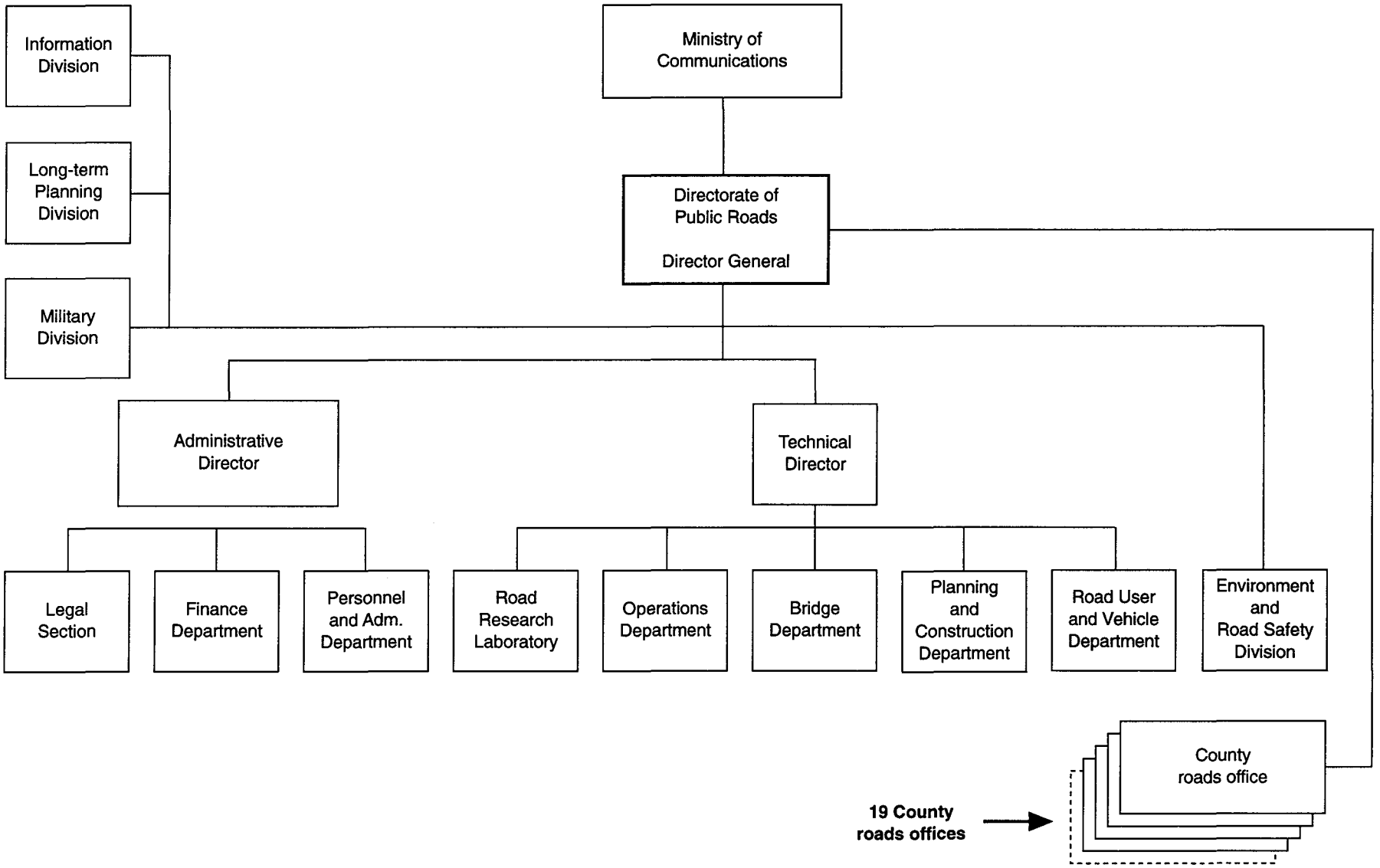
Municipal Road Section

1. Technical Supervision and Direction of City, Town and Village Roads

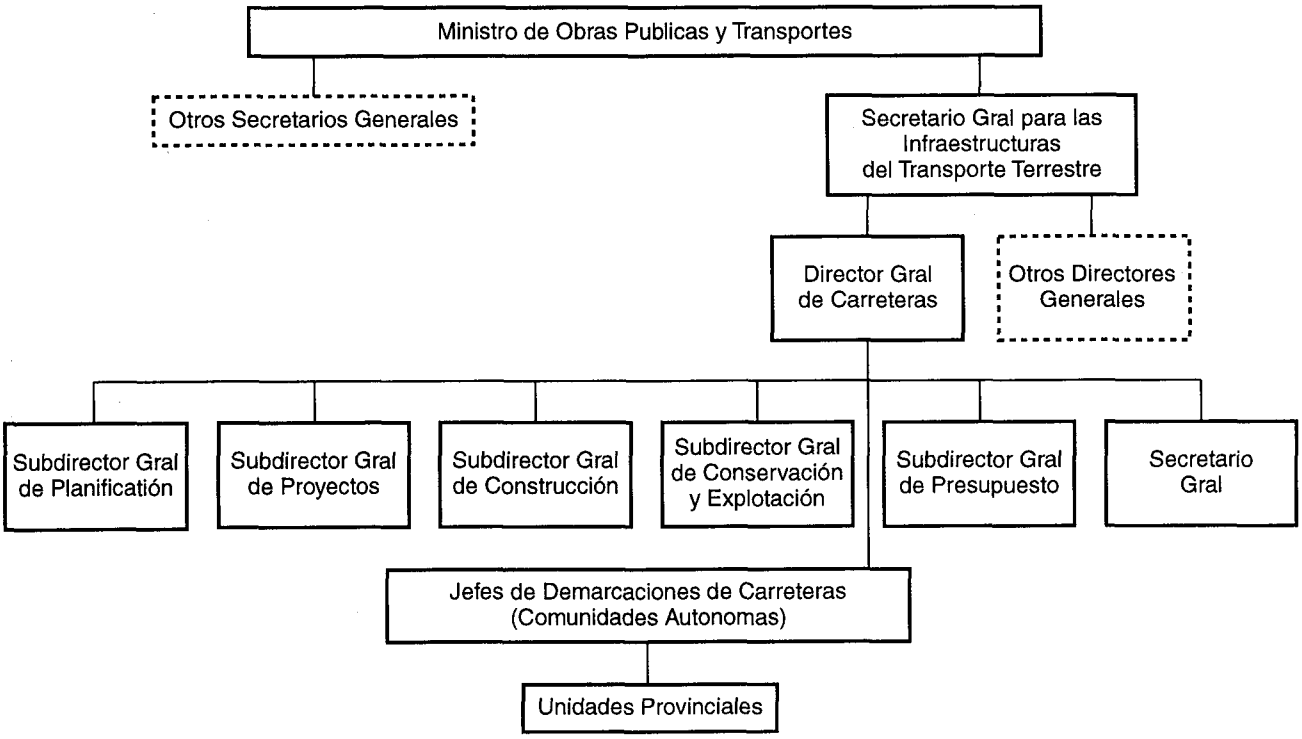
Administration of the Main Road Network in the Netherlands



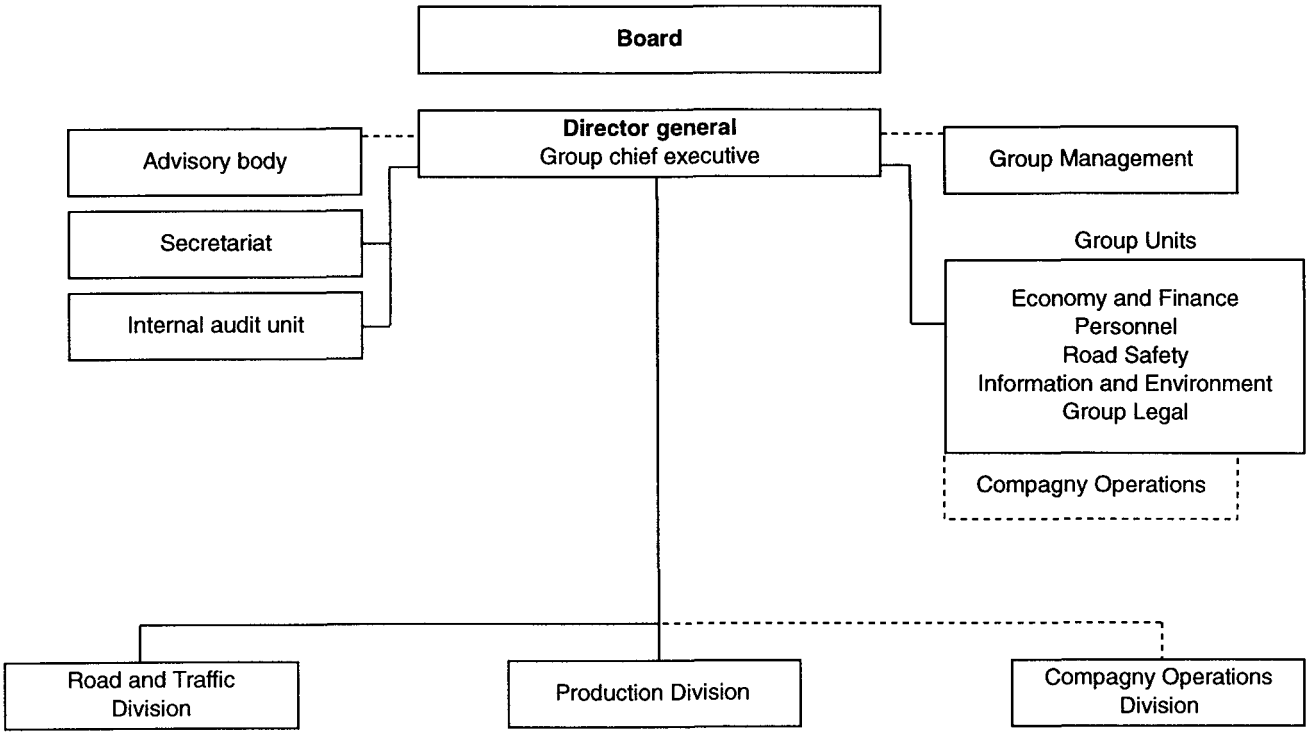
Norvegian Public Road Administration – Organisation



Road administration in Spain

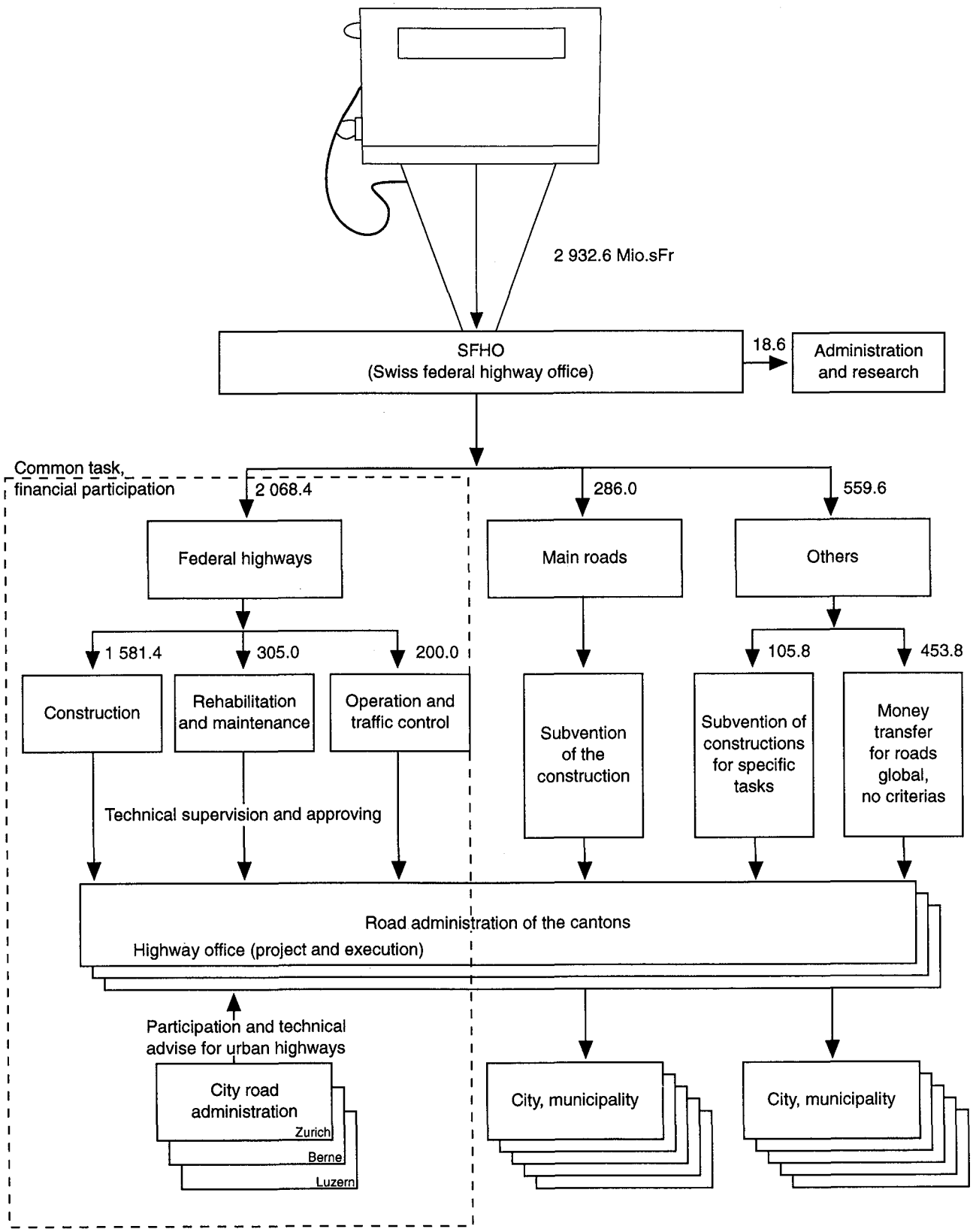


Swedish National Road Administration



Organisation of the road administration (Switzerland)

Finance distribution is based on the budget 1993; in Mio.sFr. (swiss francs)



ANNEX C

LIST OF EXPERTS

Chairman: Mr. Antti TALVITIE

Mr. Harry B. CALDWELL	United States
Mr. Francisco CRIADO	Spain
Mr. Hanspeter DOBLER	Switzerland
Mr. Wolfgang EMDE	Germany
Mr. Melvyn. GAILLAC	France
Mr. Luc-Amaury GEORGE	France
Mr. J.M. GOPPEL	Netherlands
Mr. Michel B. GORSKI	Belgium
Mr. Katsuji HASHIBA	OECD
Mr. Burkhard HORN	OECD
Mr. Arne JOHANSSON	Sweden
Mr. Don KOBI	Canada
Mr. José MACIEIRA	Portugal
Mr. Hisayoshi MORISUGI	Japan
Mr. John OLIVER	United Kingdom
Mr. François PRUDHOMME	France
Mr. Enrico SAMMARTINO	Italy
Mr. Antti TALVITIE	World Bank/Finland
Mr. Raimo TAPIO	Finland
Mr. Tor-Sverre THOMASSEN	Norway
Mr. Jacques THÉDIÉ	France
Mr. Dinçer YIGIT	Turkey

The report was edited by a Co-ordination Group; Messrs. H.B. Caldwell, H. Dobler, M. Gaillac, M.B. Gorski, A. Johansson, J. Oliver, A. Talvitie, R. Tapio, J. Thédié, in co-operation with Messrs B. Horn and K. Hashiba of the OECD Secretariat.