With regard to increasing supply in the long run, to date tenders have been issued for the desalination of some 160 million cu. m. a year. The price per cu. m., including bringing the water to the national water-carrier, is at least 55 cents. This does not include the negative effects on the environment of desalination—air pollution and the destruction of the sea-coast—which is far higher than the current marginal cost of fresh water (also irrespective of environmental effects): some 30 cents. If there is any economic justification for desalination, it exists only when a wide range of considerations—the marginal cost of pumping water and transporting it, and the negative and positive externalities of agriculture vis-à-vis those of desalination—is taken into account. Note, however, that desalination has a political and security advantage: the existence of joint desalination plants with Jordan and/or the Palestinians will mean that Israel has common interests with them. The cost of recycling effluent is relatively low, some 27 cents per cu. m. Projects involving 50 million cu. m. can be established within a relatively short time, about four years, but are not implemented because of disputes between the Ministry of Finance and the *Mekorot* Water Company.

4. Transport and communications

The growth of the industry was checked in 2001, after several years of rapid expansion.

After expanding by an annual average rate of 5 percent in the last three years, in 2001 this industry did not grow at all (Table 1.19). Because labor input dipped by about one percent, labor productivity rose by the same amount. The wages paid by the industry rose by 5 percent, however, as was the case in the entire business sector, serving to reduce its profitability. Prices in the industry remained unchanged, in line with those of the business sector as a whole. Investment in transport and communications rose by 8 percent, mainly due to the marked increase in investment in the transport infrastructure, although it is still far below the desired level.

The importance of the industry is greater than is reflected by its share in business-sector product.

The industry's share of business-sector product continued to rise, reaching 12 percent, because it was less adversely affected than other industries, but the importance of the industry is greater than is reflected by its share of business-sector product. This is because it is an infrastructure industry with externalities, and the services of a large part of its capital—roads—are included not only in the product of transport but also in that of the industries that use them. Private vehicle services, which use its capital, are not included in business-sector product either. The industry is crucially important for the quality of life, as well as facilitating the economic and social integration of the various parts of the country. The transport and communications industry is capital-intensive; relative to the business sector as a whole, capital per worker was 4.5 times higher, product per worker 80 percent greater, and the average wage 30 percent more.

Table 1.19
Transport and Communications, Main Indicators, 1995–2001

(annual change, constant prices, percent)

	Total					Transport[a]					Communications and deliveries				
	1995–2000	1998	1999	2000	2001	1995–2000	1998	1999	2000	2001	1995–2000	1998	1999	2000	2001
Total gross product	5	6	4	7	0	4	2	4	5	–3	9	16	2	9	6
Gross investment	5	–3	17	12	8	4	–8	22	8	17	11	13	6	25	–15
Capital stock[b]	8	7	6	7	7										
Employees	5	1	8	7	2	3	1	5	0	–2	12	–1	19	30	12
Labor input	5	1	9	9	–1	3	1	6	2	–5	12	–1	21	33	9
Labor productivity	0	5	–5	–3	1	1	1	–1	3	2	–3	17	–16	–18	–2
Total factor productivity	–1	2	–4	–2	–3										
Real labor cost[c]	3	1	4	–2	4	3	0	2	–3	5	4	6	7	1	2
Real wage[d]	1	1	1	1	4	2	1	1	2	5	0	1	–2	0	2

[a] Including Palestinian employees.
[b] At beginning of year.
[c] Adjusted for transport and communications prices.
[d] Deflated by the CPI.
SOURCE: Based on Central Bureau of Statistics data.

The fall in demand caused transport product to contract, while communications continued to expand

The expansion of the industry was checked by the fall in demand, connected with the recession and the contraction of incoming tourism. These trends had a negative impact on transport, but did not prevent the rapid expansion of communications, which grew by 6 percent; transport contracted by 3 percent, the steep drop in air travel being particularly notable (Table 1.20). The one percent rise in prices in the industry expresses slight price fluctuations: the price of air travel increased, that of land transport—particularly trucks—dipped, and that of communications remained stable (Table 1.19 and Figure 1.30). Alongside the 3 percent decline in transport activity there was a steeper 5 percent drop in labor input, so that labor productivity rose by 2 percent. The

Table 1.20
Real Product and Prices in Transport and Communications, 1998–2001

(annual change, percent)

	Share in product	Real product				Relative price[a]			
	2001	1998	1999	2000	2001	1998	1999	2000	2001
Land transport	37	–1	3	3	–1	1	–5	9	–1
of which Buses	9	–3	4	2	–6	2	–12	7	2
Sea transport	10	5	3	8	–5	12	2	–1	–1
Air services	7	8	10	8	–16	–11	–1	–3	2
Other	11	7	7	9	1				
Total transport	65	2	4	5	–3	0	–3	5	0
Communications	35	16	2	9	6	–6	–10	–1	0
Total product	100	6	4	7	0	–2	–5	3	0

[a] Deflated by implicit index of business-sector product price.
SOURCE: Table 1.A.1.31

increase in wages per hour worked was faster, however—5 percent—so that unit labor cost grew. Note that when this is examined over a period of two or three years—a period for which estimates of this kind are more reliable—costs have not increased.

Although investment in the transport infrastructure rose steeply, it is still inadequate.

Investment in the transport and communications infrastructure rose by 5 percent in 2001, expressing sharp and conflicting shifts in the two parts of the industry: investment in communications fell by some 15 percent, while in the transport infrastructure it rose by an impressive 29 percent (Table 1.21). This increase is of the utmost importance, and while it is crucial for the economy, it is not enough to bring investment in land transport as a share of GDP up to the level prevailing in Europe (Figure 3 in Box 1.12). Note, too, that overcoming the longstanding backlog in the infrastructure requires greater investment than the European average.

Demand for most transport services fell.

The slump stemmed from the fall in demand for the services of the transport industry. In addition to the overall decline, demand for transport was affected directly by the drop in tourism, due to the deterioration in the security situation in Israel and the rest of the world, and tourists' apprehensions about coming to Israel. This impacted primarily on air travel services, whose product contracted by 16 percent as incoming tourism plummeted, as well as on air freight. The decline in bus services may also have been affected by the security situation. Demand for sea travel also contracted, but this was due less to the decline of demand in Israel than to the steep fall in transport between foreign ports—a category which is affected by the global movement of goods and constitutes most of the activity of Israel's shipping. The output of trains soared, however,

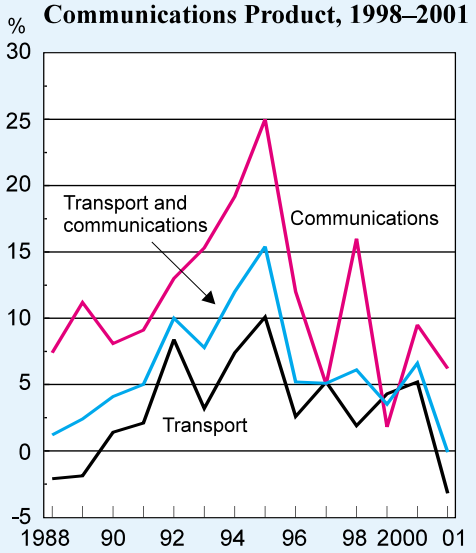
Table 1.21
Investment in Transport and Communications, 1999–2001

(percent)

	Investment in 2001 (current prices)		Real change		
	Actual (NIS mill.)	Relative	1999	2000	2001
1. Transport infrastructure	6,988	31	–13	24	29
Air and sea ports	2,098	9	16	72	41
Land transport	4,858	22	–14	15	26
Roads	3,584	16	–17	18	15
Trains	856	4	–40	–14	106
Other[a]	418	2	13	3	0
2. Total vehicles	11,094	49	46	2	11
Passenger cars	4,329	19	–1	34	–9
Ships and planes[b]	2,764	12	1197	–66	181
3. Communications[c]	4,471	20	6	25	–15
4. Transport and communications infrastructure (1+3)	11,459	51	–4	24	5
5. Transport and communications (1+2+3)	22,553	100	17	12	8

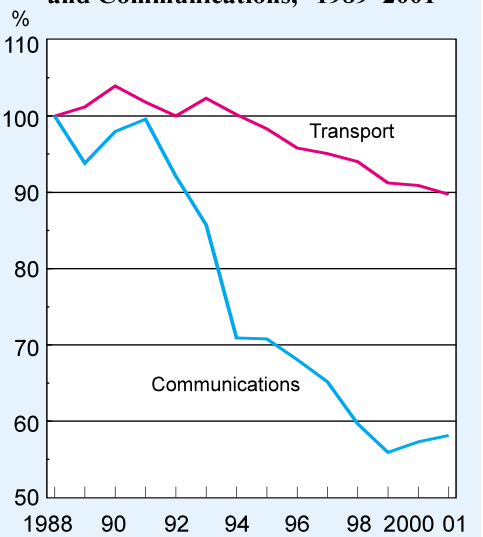
[a] Transport services, local authority transport, and gas and oil pipelines.
[b] Excluding exports.
[c] Including mail and package delivery.
SOURCE: Based on Central Bureau of Statistics data.

Figure 1.29
Growth of Transport and Communications Product, 1998–2001



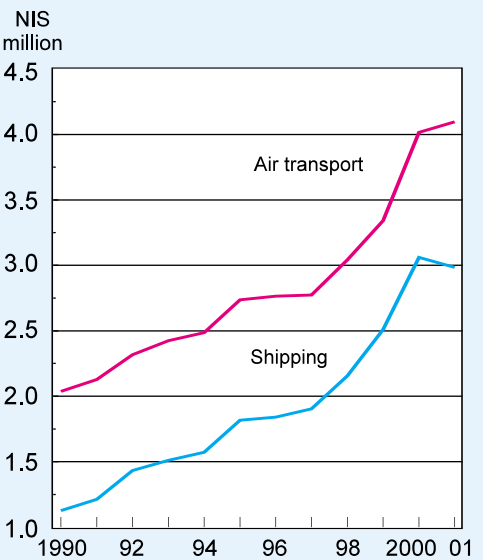
SOURCE: Based on CBS data.

Figure 1.30
Relative Price Indices of Transport and Communications,[a] 1989–2001



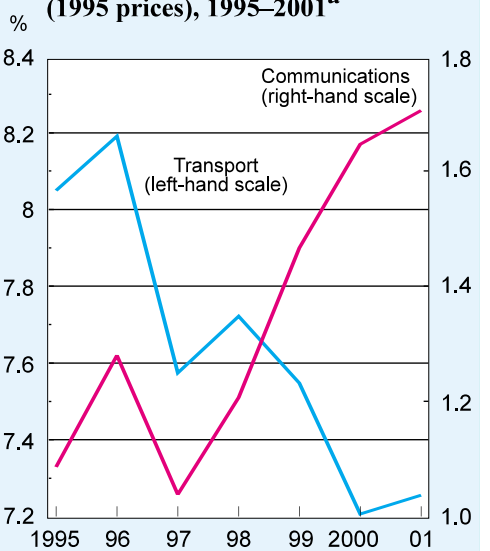
[a] Relative to business-sector product price; 1987 = 100.
SOURCE: Based on CBS data.

Figure 1.31
Revenue of Air Transport and Shipping (1995 prices), 1990–2001



SOURCE: Based on CBS data.

Figure 1.32
Share in GDP of Private Consumption Expenditure on Communications and Transport (1995 prices), 1995–2001[a]



[a] Data for 2001 extrapolated from data for first two quarters.
SOURCE: Based on CBS data.

while that of travel agents, trucks, taxis, and storage rose moderately—and it is not always clear what demand gave rise to which increase in each industry.

On the supply side, it seems reasonable to assume that the fall in share prices acted to reduce investment in the communications industry by increasing the cost of raising capital. The reduction of capacity in passenger air travel also reduced the supply of air-freight.

Box 1.9
Long-Term Planning and Infrastructure Development

The physical infrastructure is of crucial importance for both business and leisure activities. Planning is essential in this respect, determining a country's standard of living and quality of life in the long term. Infrastructures are expensive both to construct and in terms of their alternative land use. Israel's land shortage is particularly acute since it is a small country, its population density is among the highest among the advanced economies, and its demographic growth rate is also very high. In order to reduce the economic gap between Israel and the advanced economies it is necessary to speed up the pace of development, and this uses up land. The intense shortage of land requires extremely careful planning of land use, hence the importance of statutory preparation and implementation. The Economic Arrangements Law for 2002 paves the way for disregarding these considerations by enabling the approval of infrastructure projects even if they conflict with existing national master-plans. Most infrastructure investment is initiated by the government, and generally also financed by it, but the government does not have a defined plan for infrastructure development as regards either the overall extent of investment in the long run or the path of investment. As a result, the state of the infrastructure is far from what it should be.

The importance of planning for the process of land development derives from the existence of market failures in the utilization of this limited resource. The market does not internalize the implications of development for the relevant term—several generations—or its environmental repercussions, not even the normative value of equality in the allocation of land. Because of the market failures, the market cannot be expected to bring about maximum social welfare in the long run, and it is necessary to intervene through planning. To enable planning to take various social considerations into account, an adequate decision-making process is needed.

There are two kinds of planning, initiatory and regulatory, which interact with one another. Initiatory planning is undertaken by entities that intend to set up projects for which land is required; regulatory planning sets aside the land that will be needed for future activities in accordance with a master-plan, seeking to balance economic, social, and environmental considerations.

Regulatory planning formulates national policy in the area of geographical planning, bearing in mind residential, employment, transport, and services policies. This kind of planning has come a long way: in the first years of Israel's existence efforts were made to distribute the population over a large area, and open spaces were regarded as wasteland that had to be conquered and made to bloom. Today, however, the aspiration is to concentrate the population in urban centers, and preserve open spaces, which are considered a national asset.

Regulatory planning is undertaken by means of the national master-plan, which is prepared by the National Council for Planning and Construction. It instigates the national plans, approves changes to the regional master-plans, and adjudicates in disputes regarding local master-plans—and sometimes even on minor details. The national master-plans include plans for roads, railways, the mass transport network in Tel Aviv, airports, nature reserves and national parks. The National Council has 32 members,[1] who constitute a system of checks and balances among differing interests, and it is completely autonomous in its decisions. It is run by the Planning Authority in the Ministry of the Interior, which provides it with professional and administrative services but is not responsible for its decisions. Nevertheless, the national plans have to be approved by the government and signed by the Minister of the Interior before going into effect. Six regional committees operate under the council and have semi-legislative authority; they also work independently, and their composition ensures a system of checks and balances.

Initiatory planning is undertaken by means of the master-plans, which define policy in such areas as water, air transport, and land transport. The master-plan is the blueprint which every entity must prepare in order to function in an orderly way, even though the document is not legally binding. When a blueprint has implications for land use—such as the area where the Airports Authority seeks to develop an airport—this is brought before regulatory planning. If the National Council for Planning and Construction incorporates these demands in the approved master-plan, the required land is set aside for that purpose. This prevents the land being designated for other uses, and also enables other entities to take the intended use into account in the framework of their planning. It is therefore important for entities with potential land use requirements to prepare master-plans well in advance. Legislation has been enacted that is intended to ensure that the various land use requirements are dealt with in an orderly and far-sighted manner.

Initiating, planning, and usually also financing the infrastructure is undertaken by the government, which determines the extent, composition, and timetable of infrastructure investment. Notwithstanding the importance of the infrastructure,

[1] Twelve ministers or their representatives, ten elected representatives of the public, and ten professional members and representatives of institutions.

for both the economy and the quality of life, the government does not always act in a well-ordered way in this respect. It has not discussed the extent of infrastructure investment required in the long run in order to reach an appropriate and feasible level of service. In the absence of a definition of needs, there is inevitably no definition of the ensuing long-term investment path.

The constant pressure on the budget has harmed infrastructure investment. One reason for this is the government's tendency to allocate resources to activities for which a lobby exists, and regrettably there is no infrastructure lobby. Another reason is that the return on infrastructure investment becomes apparent only in the long term, while policymakers want immediate results. This has led to a serious backlog in the infrastructure (see Box 1.12).

Planning and budgeting to the most detailed level is undertaken by the government. It allocates resources for planning and advancing projects, and examines each individual project with respect to its economic viability as well as such aspects as its contribution to regional development, its availability, etc. It cannot be stressed sufficiently how important it is to allocate adequate funds for the planning and implementation of projects.

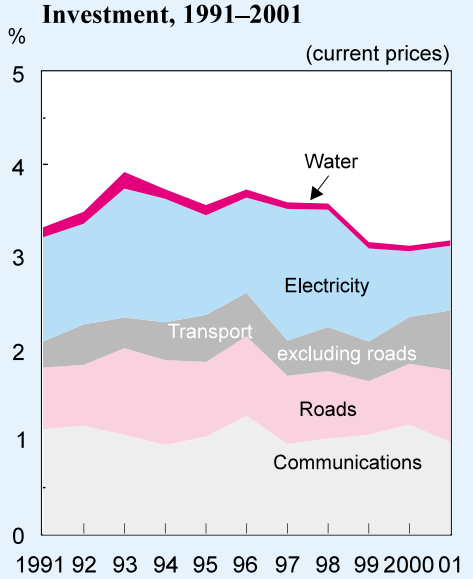
One of the main considerations in the transport master-plan is the improvement of the quality of life—preserving and reviving the urban centers, where 90 percent of the population live, and improving the transport system in order to ease traffic congestion. This will serve to make residential land use more efficient while preserving open spaces and the coast for the benefit of the populace. Greater population density is also more appropriate for an efficient public transport system, which is the recommended long-term transport solution, because Israel has limited land for building additional roads in the long run. Thus, the master-plans seek to develop public transport solutions within and between the urban centers and encourage residential construction along these routes.

Investment

Government intervention in investment in the transport infrastructure is justified.

Infrastructure investment is one of the few spheres of economic activity in which direct government intervention is justified. That is because a private entity will not invest enough in most infrastructure areas as the return on it is lower than that to the economy as a whole (externalities). The infrastructure is essential for economic activity and growth because it links economic agents, both internally and between countries. It is therefore extremely important to continue investing in the infrastructure, especially that intended to ease metropolitan bottlenecks by such means as public transport systems (bus lanes and railway lines) and interurban highways, and sea- and air-ports. Long-term planning is of particular importance for infrastructure projects (see Box 1.9). The government does not invest in the communications infrastructure, which operates on a business basis, and for which the government lays the legislative and administrative groundwork.

Figure 1.33
Share in GDP of Infrastructure Investment, 1991–2001



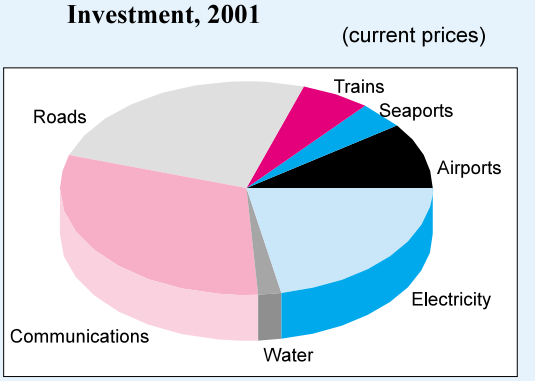
SOURCE: Based on CBS data.

Infrastructure investment rose by 4 percent in 2001, after remaining stable in the preceding two years. This rise expresses the stagnation of investment in infrastructure not allied with transport and communications (electricity, water, sewage)—which accounts for some 25 percent of the entire infrastructure—and the 8 percent expansion of investment in communications and transport (Figure 1.33). The latter reflects a 15 percent decline in investment in communications and an impressive 29 percent increase in investment in the transport infrastructure. Further expansion of these investment categories is planned in the 2002 budget. Note that the backdrop to this increase is a grave backlog in the transport infrastructure, following many years of under-investment (Box 1.12). In 2001 the share in GDP of investment in the transport infrastructure returned to its 1994–96 level, and even exceeded it, although investment in roads has not yet reached that level (Figure 1.35). The budget stresses the promotion of investment in public transport, which utilizes the infrastructure more efficiently than privately-owned vehicles; this is particularly important in view of Israel's limited land and budget. Special emphasis is placed on investing in railways (light and suburban railways), but also on the development of special lanes for buses and taxis. Since this investment is financed or initiated by the government, it should not decline in a slump, as occurred in 2001. On the contrary, it is important to increase investment, thereby using unutilized capacity.

The sharp increase in transport investment should be seen in the context of a marked backlog.

The upsurge in investment in transport extended to all its principal components. The main beneficiary was investment in roads (which rose by 15 percent, most notably in the Cross Israel Highway), air- and sea-ports (which went up by 41 percent, particularly the Jubilee Port and *Natbag 2000*), and railways (which soared by 106 percent). Note that the backdrop to the marked rise in

Figure 1.34
Distribution of Infrastructure Investment, 2001



SOURCE: Based on CBS data.

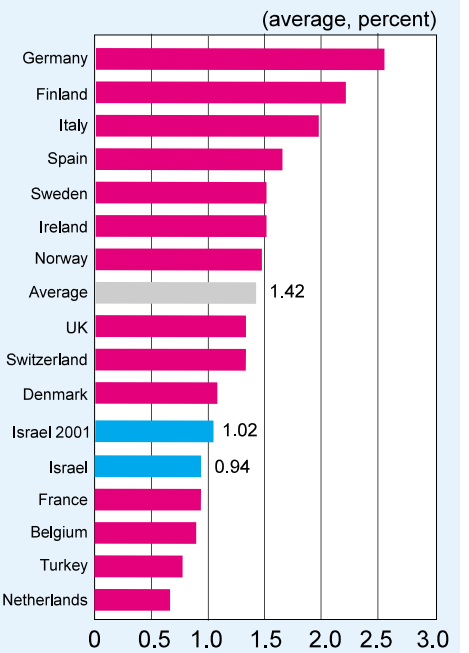
There was a notable rise in investment in roads, air- and sea-ports, and trains.

investment in air- and sea-ports and trains, which is important and desirable, is the low level of investment in the past.

An increase in private-sector involvement in infrastructure investment usually has positive implications.

Formerly, investment in transport was financed solely by the government. In recent years, however, the government has gone over to sharing the financing of infrastructure projects with the private sector (e.g., under BOT and PFI systems, see Box 1.11). In the long run, cooperation of this kind does not reduce the cost of projects to the government; as regards financing, there is no difference between joint projects or those financed solely by the government through loans to a developer who is repaid by means of a toll paid by users. The benefit of a joint project is that it can overcome the limitations of the national budget for a purpose that is justified from an economic standpoint. This makes it possible to increase infrastructure investment in the short run despite short-term political and budgetary restrictions. In addition, in certain projects the private sector has advantages as regards efficiency of implementation. Cooperation with the private sector should not extend to projects in which the financing consideration (i.e., by-passing the national budget) is the main reason, however, because in this respect the private sector has a comparative disadvantage, incurring a higher risk premium on credit.

Figure 1.35
Share in GDP of Investment in Transport Infrastructure, 1991–95



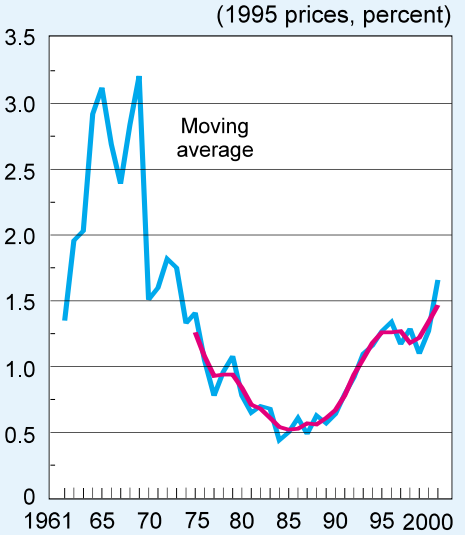
SOURCE: Israel: based on CBS data; ECMT: *Investment In Transport Infrastructure, 1985-1995,* ECMT Publications.

The government contributes financially and in other ways to projects in which the private sector has a part.

In examining projects which are candidates for joint investment in conjunction with the private sector, clear accounting rules should be set out for recording the expenditure in the national budget. Transparency must be maintained as to the financial implications of the government's involvement in these projects, whether budgetary or extra-budgetary. The government contributes its comparative advantage to these projects, particularly with regard to the statutory and land-clearance processes; it also makes the projects more attractive, for example through ties with complementary networks. In addition, government involvement reduces the risks associated with projects, which would otherwise be imposed solely on the government. Note that even though every such developer should be carefully checked for financial probity and soundness, it is also important to assess the future burden these projects will impose on the national budget.

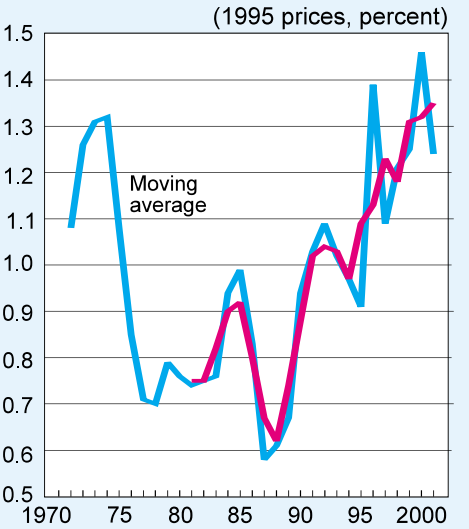
Highway no. 6 (Cross Israel) illustrates the private sector's ability to implement at the construction stage. The extent of the developer's annual investment in the project

Figure 1.36
Share in GDP of Investment in Transport Excluding Vehicles, 1961–2001



SOURCE: Based on CBS data.

Figure 1.37
Share in GDP of Investment in Communications, 1970–2001



SOURCE: Based on CBS data.

is equivalent to that of the Public Works Department for the country as a whole. It is to be hoped that the experience acquired in managing the Cross Israel Highway will benefit other projects. Lessons learned abroad have been applied in the Cross Israel Highway project, and the government shares the risks that are not under the developer's control—land requisition and clearance, shifts in capital costs over time, exchange-rate risks, and uncertainty as to how much traffic there will be.[38] Another two projects are going ahead on a BOT basis: the Carmel tunnels in Haifa and the light railway line in Jerusalem, which should be inaugurated in 2006. Some progress has recently been made towards water desalination, and it is important to proceed with private-sector cooperation in generating electricity. Projects to recycle effluent are also under way under the BOT system in which recycling plants are planned and built by private entities, and the water is sold to local authorities. This system has been employed in several towns in the last few years, and is expected to expand. An important step towards alleviating traffic congestion in the Tel Aviv metropolitan area was taken in August 2000, when the government decided to submit a national master-plan for a joint light railway-underground system in Tel Aviv, using the BOT system. All the necessary permits have been obtained, except that of the National Council for Planning and Construction. The first line is expected to be ready for use in 2009.

In addition to the Cross Israel Highway, other transport projects in which the private sector is participating are progressing.

Under the proposed Tel Aviv-Kfar Saba railway scheme, structures will be erected with government financing, whereas the purchase and operation of equipment will be

[38] The government should reduce only those risks over which the developer has no control. Partial utilization of the project due to faulty service should not benefit from state indemnity.

undertaken by private enterprise. A project is currently under way to build a railway line from Tel Aviv to Jerusalem, under the BOT system. It is not clear whether there is scope for involving private developers in projects to build schools and court-houses, as their contribution should be expressed solely in financing.

Investment in communications, which is usually volatile, declined.

Investment in communications was down by 15 percent from 2000. The decline may be due to the crisis in high-tech shares, which made it more expensive to raise capital, but it is difficult to identify effects and causes, because investment in communications tends to fluctuate because of the need for permits, which are issued from time to time for new spheres of activity and operators, and the penetration of new technologies. Despite the steep drop in 2001, the level of investment is still 8 percent higher than in 1999.

Box 1.10
Obstacles to Increasing the Efficiency of Israel's Sea-Ports

Israel's sea-ports are an important infrastructure, constituting the key to international trade in goods, whose contribution to productivity and the standard of living is crucial. The ports handle almost all incoming and outgoing cargo (except for oil and coal), while the airports handle only about one percent, in volume terms. The ports use capital stock that is very expensive and employ some 2,400 workers.

The ports are not properly utilized, *inter alia* the infrastructure is not used to the full throughout the day, and the relative price of the various services paid by importers and exporters does not reflect its cost. In the rest of the world it is customary for the ports to be run by the private sector, and often different quays in the same port are managed by different enterprises. Only a few large ports are managed by the public sector. Competition can lead to more efficient utilization of capital and labor, as well as better and cheaper service. While the intention had been to create competition with the Ports Authority, largely by means of the private operation of the Jubilee and Carmel ports, the effort failed due to pressure exerted by the workers.

The proper functioning of the ports at a low price and reliable timetable is important for economic activity, and especially for the import and export of raw materials and finished products. The service currently provided by the ports is inadequate. There is a serious backlog, expressed in long waiting time for ships, and users pay a high price for this (hiring a ship can cost $ 30,000 or more a day). The wait for service and also the uncertainty associated with its length, *inter alia* because of strikes and sanctions, causes inventories to rise and impairs Israel's competitiveness.

The management of the ports is not flexible enough. The Ports and Railways Authority comprises elements which use the services of the ports, and the resulting conflicts of interest often hamper the decision-making process. Even when

decisions are made, in many cases the approval of the government and the Knesset is needed, and this also gives rise to delays.

For users of Israel's ports to fully utilize the services provided, they must be apprized of the relative price of the various services. At present this is not the case, and the quay fee is determined on the basis of the value of the cargo. In addition, the fee on imports is far higher than on exports. A government committee has recommended reducing the import fee and raising the other ones, bringing them into line with handling costs, but these recommendations have not been implemented.

Since every port has a natural monopoly on its geographical hinterland, there is no real competition between Israel's two main ports—Haifa and Ashdod. Some potential for creating competition is implicit in granting a permit to the Israel Dockyards, which are close to Haifa port, to utilize their capacity and provide limited port services (because of infrastructure restrictions, not to large or container ships). The dockyards are privately-owned and managed, and the owners wanted to compete with the nearby Haifa port. To date the permit has not been granted, and the owners of the dockyards have threatened to close them down and dismiss over 500 workers.

A greater contribution could be made to competition between the ports if the new quays of the Haifa and Ashdod ports were operated as independent ports—the Carmel port in Haifa and the Jubilee port in Ashdod. Two years ago it was decided to establish the Jubilee port at an estimated cost of NIS 3 billion, in effect doubling the adjacent Ashdod port. A BOT-type tender was to be issued (building and operating for thirty years), according to which ownership would eventually remain in the hands of the Ports Authority.

In the wake of the decision to operate the Jubilee port by the private sector the workers went out on strike, inflicting serious harm on the economy. The two sides had almost reached an agreement to permit private operation, but this was thwarted and instead it was decided that Israel's ports would be administered separately by subsidiaries of the Ports Authority. It is not clear to what extent inter-port competition will be created, because no clear definition of this administration has been made. What is clear is that this will be limited, because the Ports Authority will not have to compete with any other port management. If the Jubilee quay is incorporated in Ashdod port and the Carmel quay is incorporated in Haifa port, any possibility of real competition between ports serving the same area[1] will be precluded.

At the same time as the idea of setting up competing ports was dropped, an agreement to increase the efficiency of the port workers was signed, offering

[1] If the Jubilee and Carmel quays are operated by separate subsidiaries, the gain from dismantling the Ports Authority at a later date will be greater. Any such subsidiary will be an independent port services company, and this will benefit users.

them pecuniary incentives. It was agreed that *inter alia*, new norms should be calculated for premiums, shift work would continue throughout most of the day, and there would be larger teams per shift, especially the third one. In order to better utilize the port, users should be encouraged to increase use of it at night, especially at the weekend.[2]

[2] Using a port outside normal working hours has the advantage of enabling complementary infrastructure, such as roads, to be used at off-peak hours.

Structural changes in transport

Structural changes are particularly important in transport.

Structural changes are most important for improving services and utilizing the industry's infrastructure; this is particularly the case in an industry with a long history of concentration and lack of competition such as transport and some areas of communications. It easier to introduce competition into communications than into transport, since less investment is required to establish alternative networks (and they no longer have a natural monopoly).

Resort to public transport is important, as it is economical in its use of the infrastructure.

The demand for land transport infrastructure has grown with the expansion of economic activity, and this was further accelerated by the fall in the share of travel by public transport in Israel, which also characterizes other advanced economies (bombs on buses in Israel have added to this, at least immediately after such incidents). The switch to private vehicles accelerates the growth in demand for infrastructure because they use it less efficiently than does public transport.

Public transport is boosted by the subsidization of the cooperatives. In 2001 35 percent of their expenses were subsidized (to the tune of NIS 1.5 billion annually in 2001 and 2002). This way of encouraging public transport use could be positive, were it not for the fact that the subsidies were diverted to purposes that did not involve improving service.[39] This is explained by the monopoly each cooperative has in its geographical area. Consequently, this method of subsidization is being abandoned, and bus fares are gradually being raised by more than the CPI (in 2001 they went up by one percentage point). The policy of restricting parking places, as has recently been introduced by the Jerusalem municipality, could also help to encourage public transport use.

Another way of improving service is to create competition. The government decided to do this in 1997, and in 1999 it issued a plan to this effect. Contracts have been signed with the public transport cooperatives, and several routes have been offered at auction for operation by other entities, with good results—prices are 21–45 percent lower. The process of issuing tenders for the competitive operation of public transport routes is proceeding, the main obstacles to competitive service being the cooperatives' control of the public transport infrastructure[40] and the difficulty of joint ticketing between

[39] See Reuben Gronau (1997), "Intervention and Competition in the Motor Transport Market," Falk Institute for Economic Research, *Discussion Paper* no. 97.03 (Hebrew). This is also indicated by the relatively low prices obtained recently at auctions for (unsubsidized) public transport routes.

[40] The Director-General, the Anti-Trust Authority pronounced the *Natzba* and *Stations Operators* companies to be a monopoly, and the exclusive agreement between *Egged* and *Natzba* and *Stations Operators* to be a restrictive arrangement, and hence not legal.

them and the new operators. Alongside the planning of the light railway in Jerusalem, bus routes have been remapped, and it is vital to rationalize them throughout the country. With the construction of special public transport lanes, as is planned at the entrances to Tel Aviv and Jerusalem, excess capacity beyond public transport needs will be created, and the intention is to sell this to other means of transport. The rates for using the capacity can change according to road conditions, thereby creating a congestion charge on the basis of the time and place at which it occurs.

Advances in public transport were achieved by establishing special lanes and increasing competition.

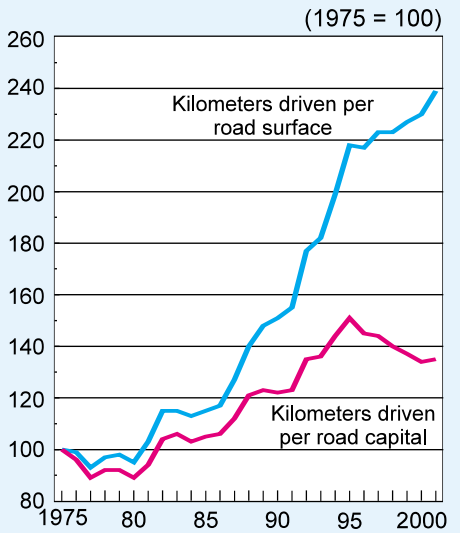
In air transport, there was no substantial change in 2001 in the number of permits issued to Israeli companies to operate in competition with El-Al's regular routes, or in charter and freight routes (the Civil Airport Authority operated for a long time without a permanent director). In the area of ground services a second fuel service provider was chosen for Ben-Gurion Airport, the process of selecting a second cargo service provider is proceeding, and should soon be concluded. Insufficient progress has been made on increasing supervision of excess loads on trucks, which is important for improving safety and reducing the infrastructure depreciation rate.

There were no major changes in the regulation of air transport.

The privatization of government infrastructure companies such as Bezek,[41] Zim, and El-Al is also proceeding slowly, although this is very important because the government has no advantage over the private sector in managing companies. The implementation of the government decision to split the Oil and Energy Infrastructures Company into a company for haulage and another for storage, in order to privatize the latter, has also

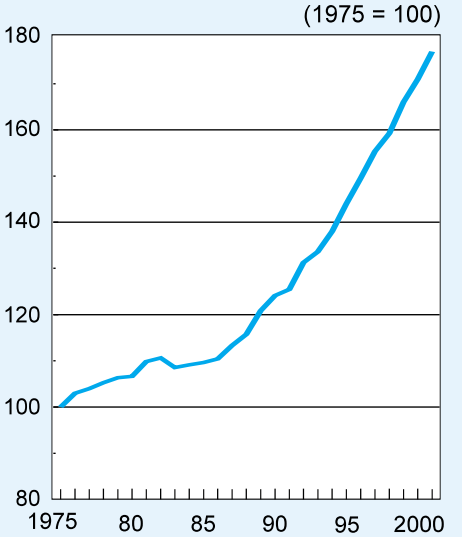
The privatization of government corporations is proceeding slowly.

Figure 1.38
Indices of Road Congestion, 1975–2001



SOURCE: Table 1.A.1.36.

Figure 1.39
Average Cost of Road Capital, 1975–2001



SOURCE: Ratio of indices in Figure 1.38.

[41] The Israel Telecommunication Corporation, Ltd.

failed. The introduction of competition into the sea-ports is also lagging (see Box 1.10).[42] Note that in cases where the number of competitors is small, it is not difficult to coordinate prices and carve up the market, so that there is no guarantee that consumers will benefit from competition.

The transport and roads infrastructure

The infrastructure has been neglected for many years, and the level of service it provided was poor.

The level of service of the transport infrastructure—roads and railways—in Israel lags behind what is accepted in the west, in the wake of a cumulative backlog in investment, so that it is important to increase investment in it. This has surged as a share of GDP, reaching almost one percent (Figure 1.35), but is still far below the average in the OECD countries—1.4 percent (Box 1.12). While the rise in roads investment—the main component of the transport infrastructure—was a steep 15 percent,[43] and its share of GDP rose from 0.7 percent in 1991–2000 to about 0.8 percent in 2001 (Figure 4 in Box 1.12), there is still a long way to go to reach the level of the OECD countries, which is just over one percent on average.

Congestion in Israel's transport infrastructure is considerable, because investment in it was very low for several years, until its recent increase (Figure 1.36). Thus, in order to overcome the backlog extensive investment is required (Box 1.12). The previous section mentioned several large investment projects in roads and the light railway which are already under way or about to begin, using the BOT method, as was increased investment in the railway, which complements the land transport system. Note in this connection that because the Israel Railways Company has started upgrading the old Tel Aviv–Jerusalem track via Beit-Shemesh, the construction of a fast railway to Jerusalem via Modi'in may be postponed.

The two main indicators of road congestion lead us to conflicting conclusions about developments in 2001. Kilometers driven, representing the quantity of road services demanded, rose less than road capital, which represents supply, indicating that road congestion has fallen. The other indicator, however, in which road surface represents supply, indicates that congestion has risen (Figure 1.38).[44] At any rate, according to both indicators road congestion is very high in comparison with the 1970s, and according to the second indicator congestion is higher than in any western country (Box 1.12). The discrepancy between the two indicators stems from the growing cost of road-building (Figure 1.39). The high level of congestion has an adverse effect on economic and leisure activity—making travel time longer, increasing fuel consumption, and aggravating pollution—thereby harming economic growth and the quality of life.

[42] In the energy field, note the decision not to break up the oil refineries into two separate companies, in contrast to the recommendations of professional committees.

[43] Roads investment data include investment in the territories.

[44] Because incremental capital better represents marginal utility than additional surface. A prominent example of this is the construction of a junction: its surface may be small relative to road area, but its cost and utility can be infinitely higher.

Box 1.11
Involving the Private Sector in Infrastructure Projects

In the past there was general hostility to the idea of private ownership of infrastructure assets, especially since involving the private sector in such projects often meant bringing in foreign investors. This approach changed gradually, so that greater importance was attached to market forces and less to government control, ownership, and management of economic enterprises. All over the world there is private involvement in investing in and managing roads, fast railways, suburban transport systems, tunnels, bridges, and air- and sea-ports. Nonetheless, the share of private investment still appears to be low.

The advantages of involving the private sector are the ability to invest in the infrastructure (and sometimes to plan it too) flexibly, efficiently, and rapidly. This also applies to maintaining and managing the service of a completed project. The private developer is not susceptible to cuts in the national budget, which tends to allocate funds to subjects for which there is a strong lobby or which yield an immediate return, as well as to reduce finance to a level below the optimum for investment in infrastructure, which does not have a clear lobby and yields a return only in the long run.

The drawbacks of the private sector in this area are costlier funding, and if the use of the project involves paying a toll from which users of an alternative public project are exempt, the private project will not be sufficiently utilized.[1] The alternative—financing from the national budget—is not free of defects either, as the debt on it is repaid by means of taxes, which impact adversely on the allocation of resources.

The main concepts mentioned in the context of cooperation with the private sector are:

- BOT (Build, Operate, Transfer), in which the private developer builds the project and operates it for a given period, selling the project's services to users, and ultimately transferring it to the government. Examples of BOT in Israel are Israel Oil Refineries, the Carmel Tunnels, the Cross Israel Highway, and the light railways planned for Tel Aviv and Jerusalem.[2]
- PFI (Private Finance Initiative), a similar kind of project, but one in which the government rather than the user pays the developer for the service. The return from the government may be determined in advance, or a shadow toll may be charged on the basis of use. An example of a PFI project is the sea-water desalination project, in which the government undertook to buy preset amounts of water from the developer every year.

[1] This does not apply in areas where it is customary to pay a toll on the use of public projects, such as electricity, water, or air- and sea-ports, or where the government undertakes to pay for the use of a business-sector project (e.g., shadow tolls it pays for vehicles on private roads).

[2] *Natbag 2000* is not a BOT project, but one for which the Airport Authority is responsible. A project management team was set up for it, in which private management companies with experience in the field were successfully incorporated.

There are many different versions of private-sector participation (including the methods mentioned above), which vary in the details.

The extent to which developers are involved in road-building in Europe is indicated by the report of the World Bank.[3] About one third of the road network (by length) is developed by private enterprise—9 percent by private companies and 24 percent by the public sector. Some 96 percent of them are toll roads and 4 percent are roads on which the government pays the developer. In developing economies, too, there is considerable private-sector involvement in infrastructure projects.[4]

Examples of private-sector involvement are projects in communications, water, energy, and transport. Roads in Hungary (M15, M1, and M5), shadow tolls on roads in the UK, a plan for a toll road in Poland, roads in France, the Vasco da Gama bridge in Lisbon, the Oresond link between Sweden and Denmark, the Channel Tunnel between France and the UK, the TGV train in Belgium, the suburban railway in Buenos Aires, the underground in Rio de Janeiro, air-ports in Greece and Warsaw, the Gioia Tauro sea-port in Italy, and port services in Chile.

[3] The World Bank lists over 500 transport projects launched in the 1990s in cooperation with the private sector, in advanced economies, accounting for some $ 0.5 trillion. See http//www.worldbank.org/html/fpd/privatesector/PPIDBweb/subtrans.pdf, in which sea-ports accounted for some $ 9 billion (1998 prices), see http//www.worldbank.org/html/fpd/notes/193/193somme.pdf.

[4] See http//www.worldbank.org/files/2400_wps2675.pdf. These projects involve a long-term association (30 years on average) which includes maintenance and operation as well as construction.

Note that these indices of congestion are not perfect; *inter alia*, not all the capital invested is expressed in the actual road supply. The heavy investment in the Cross Israel Highway is an example of this; it is included in capital but has not yet reduced congestion. The indicators are averages, and hence reflect neither congestion at different times and areas nor the particularly bad situation in the metropolitan areas. The damage caused in the latter by congestion is not limited to the ongoing effects listed above, but extend to the long-term impact on urban life and business centers, most of which is irreversible. City centers are weakened by the development of alternative business areas on the periphery and the expansion of the suburbs, which increase dependence on private vehicles, and require support for the development of their physical and community infrastructures.

Box 1.12
Road Congestion and Investment: an International Comparison

Israel's roads are very congested in comparison with both previous years and other countries. Congestion, which is measured by the ratio of kilometers traveled to road length, is approximately two and a half times as high in Israel as the average in the sample of advanced economies for which we

have data (Figure 1).[1] Congestion in Portugal, which comes after Israel, is a third less.

The small amount of roads in Israel can on the face of it be justified by its limited surface area, but the international comparison shows that even relative to its area Israel has fewer roads than the west: 0.7 kilometers per kilometer of area, compared with 1.3 kilometers in the sample (Figure 2).[2] In Holland, which has very high population density, road length per square kilometer is four times greater than in Israel.[3] Like many other countries, it has a wealth of other forms of transport—far longer railway lines than Israel, as well as waterways. Hence the comparison does not give the full picture of the paucity of Israel's transport infrastructure.[4]

Despite the considerable congestion and low intensity of Israel's roads, investment in them in recent years has been below the average in the west (one percent of GDP, Figure 3). The relative paucity of roads and the high level of congestion in Israel stems from a low level of investment over time: an annual average of some 0.6 percent of GDP in 1965–2001 (Figure 4). Note in this connection the cumulative difference in that period between actual investment in Israel and the average in the west, which amounted to over 10 percent of annual GDP (more than NIS 40 billion at 2001 prices)— lost investment of several decades, according to the present rate. Another estimate of what is needed to overcome the backlog is the investment that will bring congestion in Israel (km. traveled per road area) to the average level in the west—some NIS 70 billion at 2001 prices. Hence, if Israel aspires to use transport in the same way as the west,[5] it must invest extensively in closing the gap. To do this within ten years will require investing 2–2.5 percent of GDP a year instead of one percent, as was the case in the last few years. Another facet of the shortage of roads in Israel is the high rate of return on investment in them, as indicated by the viability studies used in approving road-building budgets.

[1] This indicator of congestion is an average, and hence gross. In addition, road length represents their capacity here, although their area is the preferred variable (but unfortunately is not available). Thus, the comparison is based on the assumption that Israel's roads resemble those abroad in width, but since this is evidently not the case (they are narrower), they are even more congested than the figure indicates. Roads data for Israel and abroad include dirt tracks, and for Israel they also include data on roads investment in the territories.

[2] Very large countries—Australia, the US, and Canada—were excluded from the sample, but this changed the sample average only slightly: 1.04 with them and 1.37 without them.

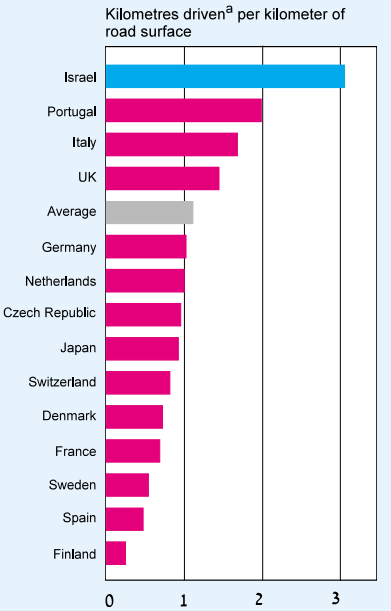
[3] It has 3 km. of roads per km. of area. It could be claimed that the comparison underestimates Israel's road intensity as the calculation of area includes the uninhabited areas of the Negev. While the claim underscores the weakness of the index, in that it is an average, other countries also have sparsely inhabited areas, e.g., the Austrian Alps. When those are included in the sample the road density is higher than the average.

[4] It could be said that Israel's geo-political situation reduces the demand for roads because they are not used for travel to and from neighboring countries. Nevertheless, the figure shows that congestion is far higher than in the west.

[5] Drawing conclusions about what is desirable for Israel on the basis of developments in the west is based on the assumption that there is no excess road area or investment there. The source for the international comparison (for which data from 1996, or 1995, in the absence of the former, were used), was: International Roads Federation, *World Roads Statistics 1999*.

Road Congestion and Investment; International Comparison

Figure 1
Index of Road Congestion, 1996



[a] Weighted by traffic disturbance factor (see Table 1.36).

Figure 2
Road Intensity, 1996

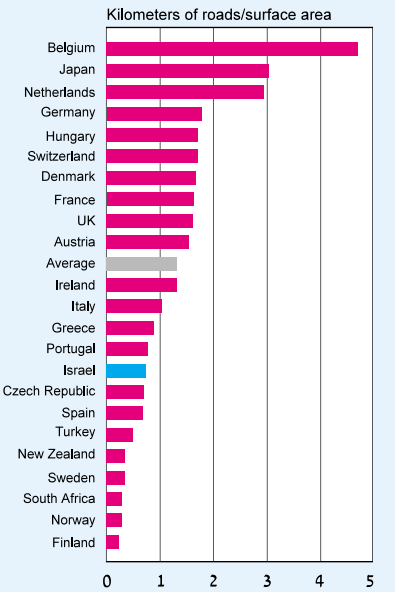


Figure 3
Investment in Road Infrastructure/GDP, 1991–1996

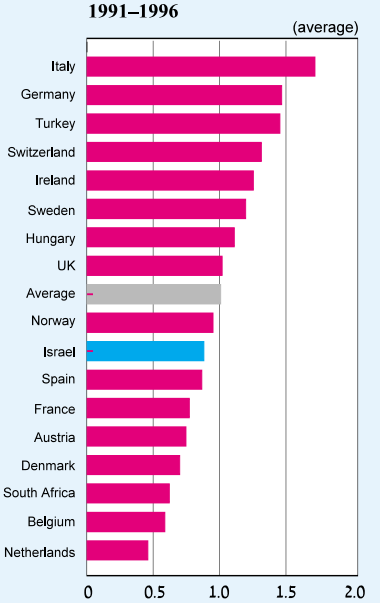
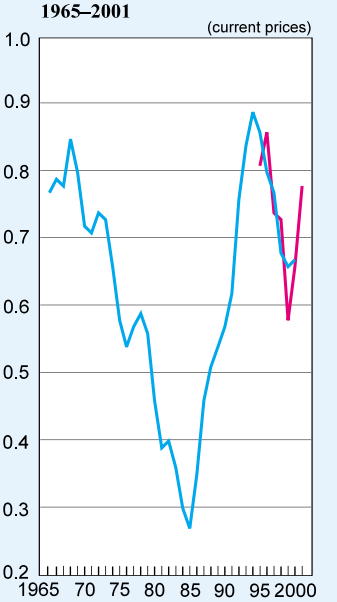


Figure 4
Investment in Road Infrastructure/GNP, 1965–2001

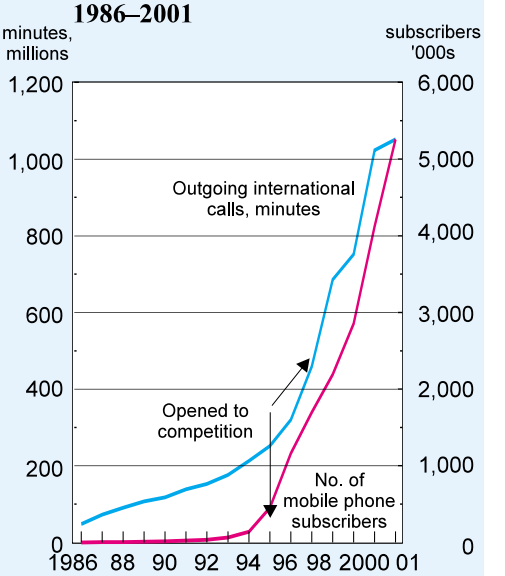


Communications

The product of the industry rose by 6 percent in 2001, compared with an annual average growth rate of 9 percent in the previous three years. Investment declined and its price rose in step with the CPI as a whole. The growth of the industry and investment in it are characterized by wide swings, accelerating when new technologies are introduced and licenses issued to new companies. Labor productivity in the industry is high: product per worker has exceeded that of the entire business sector by 75 percent in the last few years, reflecting its high capital intensity. This, together with the industry's considerable level of concentration, accounts for its high wages—40 percent above the business-sector average.

Communications continued to expand in 2001.

Figure 1.40
Number of Mobile Phone Subscribers and Minutes of Outgoing International Calls, 1986–2001



SOURCE: Ministry of Communications.

The most outstanding development in the industry in 2001 was the increased competition in supplying TV services due to the significant penetration by satellite TV, rapid progress in introducing fast internet services, and continued competition in the sphere of mobile phones. The turnaround that has occurred in the market in the last decade is expressed *inter alia* in the share of mobile phone income in telecommunications revenue (electronic communication excluding deliveries and mail): in 2001 it is estimated at 50 percent,[45] compared with only one percent in 1990.

TV, mobile phone, and rapid internet services grew.

In recent years, both in Israel and abroad, the communications industry has developed far more rapidly than the other principal industries. In the past it was generally accepted that the industry is a natural monopoly, but after competition was introduced it began to develop far more dynamically. This indicates the benefit that can be obtained from competition and its interaction with technological developments, e.g., the convergence of computerization and communications and rapid advances in computers. As a result, there has been a surge in development of the internet and electronic mail. Obtaining information in various spheres has improved beyond recognition as regards both speed and ease, its price has plummeted, and opportunities for electronic commerce have opened up. Interpersonal communications have also benefited from these developments.[46]

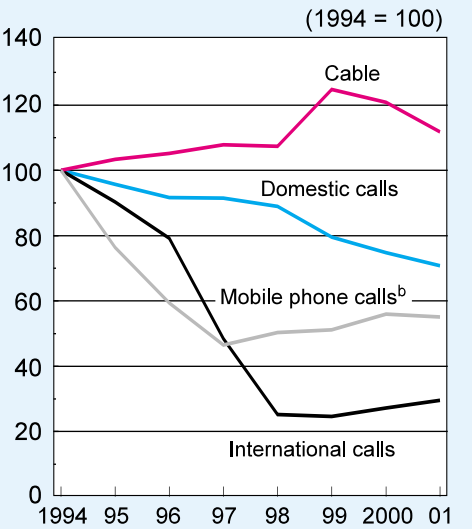
The growth of the industry was nourished by competition and technological advances.

[45] See Ministry of Communications:
http//www.moc.go.il/new/documents/about/presentations/lect1_acrobat_03.12.01.pdf

[46] An example of the growing irrelevance of distance is the establishment of telephone service centers by firms far away from their business centers.

The benefits of competition in the industry are illustrated by the continued decline in the price of the various communications services to the individual consumer relative to the CPI[47] (Figure 1.41). Note that competition has lowered the price for firms even more than is reflected in the CPI.

Figure 1.41
Relative Rates in Communications,[a] 1994–2001



[a] Deflated by CPI.
[b] Until 1997, according to *Pelephone* rates only, weighted at 1/3 for off-peak and 2/3 for peak rates.
SOURCE: Ministry of Communications (*Pelephone* rates) and CBS data.

In 2001, after a protracted delay, legislation was passed regarding the use that would be made of the cable TV networks for transmitting data more rapidly (broadband) and telephony.[48] After the appropriate investment has been made they will be able to compete with Bezek. On the other hand, the privatization of Bezek is being held up, and a public committee has only recently been set up to examine the establishment of a national communications authority that will regulate activity in the industry, as is customary in the west (e.g., the FCC in the US and OFTEL in the UK). This authority will be empowered to flexibly regulate the market which, as stated, is developing extremely rapidly in both technological and business terms.

The change in the structure of the industry continued.

The change in the structure of the industry continued in 2001, with a rise in the share of mobile phones and the internet, as regards both penetration and extent of use. Use of the fixed network (in terms of minutes per call) increased by 16 percent,[49] due to a 6 percent decline in the number of minutes per call within the network, offset by a rise in other uses: the number of minutes of internet connection went up by 70 percent, and communications between the fixed network and mobile phones rose by 9 percent. The shift in uses is also reflected in the change in the structure of the communications network. The number of direct lines grew by only 3 percent, while that of fixed lines used for broadband internet soared by 114 percent, continuing the 25 percent increase

[47] In mobile phones the decline was checked after the criterion for granting a new operator a license in 1998 was the return to the state rather than the price to the consumer, as was formerly the case.

[48] The Communications (Bezek and Broadcasts) Law, which was passed in 2001, regulates the transition from a regime of concessions to one of broadcasting licenses. The law also makes it possible to permit cable companies to broadcast general programs, abolishes the exclusive right of the cable companies to broadcast cable TV, and anchors the agreement regarding the revenue to be paid to the state by a cable company. The law enables communications entities to use the telecommunications networks of other companies (unbundling), regulates the joint use of internal channeling, etc.

[49] The source of these data and those in the two subsequent paragraphs is the Ministry of Communications.

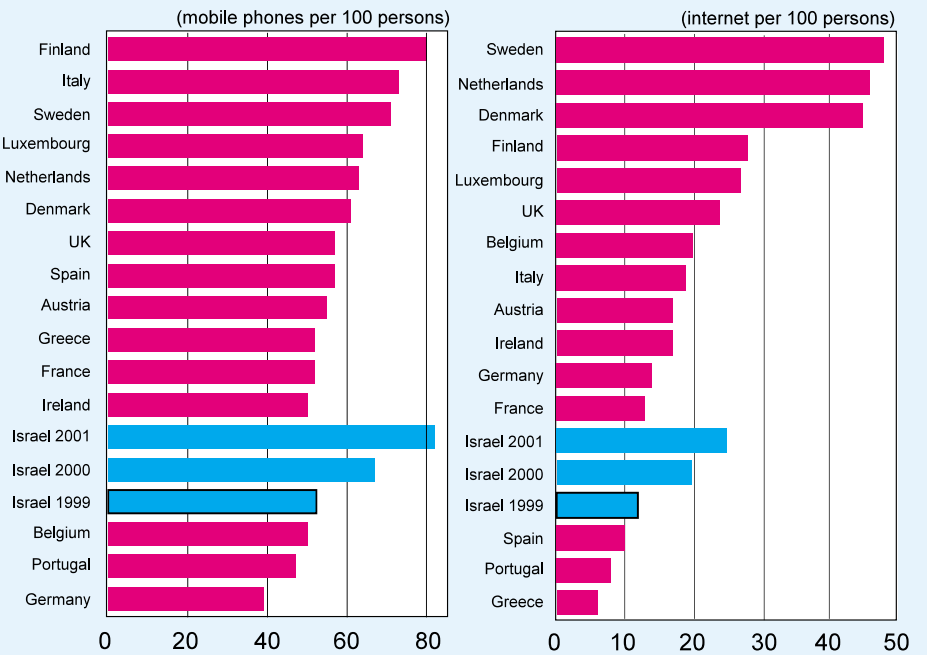
in 2000. Moreover, it is possible to incorporate voice and data transfer and fast internet in a regular phone line without adding additional lines (as in the ADSL service). These lines can be continually open, thereby altering communications use. According to estimates, the number of internet subscribers surged by 40 percent in 2001, and some 25 percent of households are connected.[50] Mobile phone penetration continued to grow by 25 percent, and by the end of 2001 encompassed 82 percent of the population. On the basis of an international comparison using the most recent data available to us, those for end-1999, however, the penetration rate in Israel is still relatively low (Figure 1.42).

The extent of use of international communications (excluding the internet) rose by 5 percent in 2001, after a sharp 23 percent increase in 2000.

The penetration by multi-channel digital TV has risen markedly.

In the area of multi-channel broadcasts, the competition resulting from satellite broadcasts was evident, and at the end of 2001 it was estimated to account for 18 percent of the market. Cable networks were also expanded, and the number of subscribers to the digital TV service, whose penetration began in 2001, reached 32 percent of the market.

Figure 1.42
Mobile Phone and Internet Penetration in OECD Countries, 1999–2001



SOURCE: Based on CBS data.

OECD *Just Numbers*, European Commission Publication.

[50] According to the CBS survey of family expenditure.

Regulatory changes will cause the industry to develop in several directions.

In the area of the competition between Bezek and the cable companies for the fast internet, the arrangement permitting this has been completed, licenses have been granted, and the companies may start introducing this service in 2002.

In international communications, at the beginning of 2002 the exclusive licenses of the three current operators expire. The Ministry of Communications' new policy will include granting licenses to all applicants as of 2003.

In the field of the internet, internet providers will be permitted to buy data capacity directly from the undersea cable operator.

5. Construction

Construction was in deep recession in 2001; the number of building starts was at its lowest level since the late 1980s.

The construction industry was in deep recession in 2001. Its product and output, which has been falling for the last three years, fell even more steeply (Table 1.22), and this applied especially to privately-initiated residential construction. The number of building starts in 2001, 32,000, was the lowest since the end of the 1980s, and far below the (net) additional number of households, which is estimated at 45,000. The industry's share of business-sector product continued to decline (Figure 1.43).

The decline in construction output extended to almost all its component industries, and the 16 percent fall in private construction output (excluding renovations), which accounts for 40 percent of the industry's output, is particularly prominent. The output of earthworks (representing 19 percent of total output) rose by 15 percent, apparently due to the increase in road-building.

The fall in demand and excessive demand forecasts are among the main reasons for the slump in the industry in 2001.

There are two main reasons for the slump in the industry in 2001. The first is the drop in demand, for both residential and nonresidential construction. Another reason is what appears *ex post* to be an excessive demand forecast in the first three quarters of 2000 (before the outbreak of the *intifada*), together with a decline in prices and rise in

Table 1.22
Output and Product in Construction, 1986–2001[a]

				Annual average change (percent)							
	1999	2000	2001	1986–89	1990–95	1996	1997	1998	1999	2000	2001
Total output (*millions of 1995 NIS*)	36,601	34,526	31,966	3.3	14.2	8.6	1.8	–6.5	–10.3	–5.7	–7.4
Residential	18,707	17,253	14,941	3.2	13.0	6.1	0.9	–9.5	–7.5	–7.8	–13.4
Nonresidential	15,588	14,754	14,348	5.4	19.1	11.4	3.1	–3.9	–14.6	–5.4	–2.7
Other[b]	2,306	2,519	2,677	–1.3	0.6	10.4	0.6	0.9	–2.0	9.2	6.3
Total area of building starts *(thousands of sq. m.)*	9,038	9,704	7,232	1.4	22.2	–10.4	–7.6	–12.8	–8.0	7.4	–25.5
Residential	6,195	7,107	5,210	2.8	21.1	–13.9	–6.8	–12.8	–9.8	14.7	–26.7
Nonresidential	2,843	2,597	2,022	–2.6	25.3	–1.5	–9.5	–12.6	–3.7	–8.7	–22.1
Residential starts *(thousand units)*	39	46	32	–1.3	24.2	–19.1	–9.4	–16.9	–12.8	18.3	–30.6
Residential completions *(thousand units)*	46	43	37	–2.6	9.4	37.6	28.4	–20.9	–14.1	–7.2	–14
Change in construction product				3.7	7.5	9.5	2.1	–7.3	–9.0	–4.8	–9.2

[a] Calculated from unrounded figures; some figures may differ from Hebrew original due to corrections.
[b] Includes defense construction and an estimate of maintenance.
SOURCE: Based on Central Bureau of Statistics data.