The Effects of Restrictive Parking Policy on the Development of City Centers

Report for the Ministry of Transport

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Content

Executive summary

Introduction

1. The Ministry of Transport has recently adopted a new, more restrictive, system of parking norms. The new policy replaces the previous system based on minimum parking norms with a system based on maximum parking norms for a number of types of land uses, the most important of which are the office and retail sectors. The new policy relates the maximum norms to the proximity to competitive public transport systems, with the strictest norms applying to the areas around nodes of train and light rail systems (for more details on the Israeli policy, see Chapter 2, Sections 3 and 4).

2. In the past year, the policy has been formally adopted by the Municipalities of Jerusalem and Haifa. A number of municipalities in the Tel Aviv area, however, have expressed reservations with regard to the policy, as they fear that the introduction of the new parking norms may have unwanted economic affects. More specifically, these municipalities fear that offices and retail may start to avoid the core of the Tel Aviv metropolitan area and instead locate in areas with less stringent parking norms.

3. The current research has been carried out against this background. The goal of the research was to provide insights into the possible impacts of the introduction of a restrictive parking policy in the Tel Aviv area by analyzing European cities that have introduced a comparable parking policy. More specifically, the goal of the research was:

> *To assess the impacts of restrictive parking policies on the economic development of cities and their centers.*

4. The report that lies in front of you is the result of this assessment in four selected European cities: Edinburgh (Scotland, UK), Frankfurt am Main (Germany), Rotterdam (the Netherlands), and Zürich (Switzerland).

Research questions

5. The assessment of the economic impacts of restrictive parking policies requires the analysis of a number of issues. The most important of these are the existing transport situation and the relevant transport-related policies, as both shape the relation between restrictive parking policies and economic development of city and city center. This insight is reflected in the research questions that have guided the research:

   1. *What are the particulars of the parking policy in the case study cities?*
   2. *Under what transport circumstances was the restrictive parking policy introduced?*
   3. *What complementary policies have been introduced to limit possible negative economic impacts of the parking policy?*
   4. *What economic developments have occurred in the case study cities since the introduction of the restrictive parking policy?*
   5. *What were the economic impacts of the introduction of the restrictive parking policy?*

The research questions have been answered using a combination of document analysis, data analysis, and in-depth interviews. Below, the conclusions with regard to each research question are presented.

Conclusions with regard to parking policies

6. The parking policies of the four case study cities are largely comparable with the policy proposed for Israel. Each city uses a system of norms that differentiates according to location and type of land use. In each case, the definition of locations is strongly linked to public transport accessibility, with some cities distinguishing between three types of areas (Rotterdam) and others between as much as six (Edinburgh). The policies are also largely comparable with regard to the distinction between land uses. The main categories are office, retail, and light industry/ storage/distribution. Each city, with the exception of Rotterdam, has set maximum parking norms for all of these land uses. The Rotterdam policy, in contrast, has only set maximum norms for parking related to office buildings.

7. The table below summarizes the maximum parking norms for the area with the highest public transport accessibility, for selected land uses. The table shows that the norms in the four cities are largely comparable and at the same level as the Israeli norms. This is especially true for the office sector. Here, the maximum parking norms in the cities lie between 1:400 m2 and 1:500 m2, if the norms are re-calculated to gross floor area. In comparison, the proposed norms for Israel of 1:250 m2 are relatively low. The differences are somewhat larger for the retail sector and industry and storage.

8. Based on the analysis of the restrictive parking policies in the four case study cities, the following conclusion can be drawn:

    1. **The proposed Israeli parking norms are moderate in comparison to the international examples.**

Table 1 Maximum parking norms for areas with the highest public transport accessibility, for selected land uses.[1]

	Edinburgh (1)	Frankfurt (2)	Rotterdam (2)	Zürich (1) (3)	Israel
Offices	1:500 m2	1:350 m2	1:270 m2	1:467 m2	1:250 m2 (1)
Retail	1:60 m2 (4)	1:300 m2	minimum	1:356 m2	1:250 m2 (5)
Industry/storage	1:1000 m2	--	minimum	1:778 m2	1:250 m2 (6)

(1) Gross floor area
(2) Net floor area
(3) Figures relate to the Zürich CBD, more restrictive norms apply to the historical core of Zürich
(4) The norm is a maximum that can be further restricted by the Edinburgh City Council
(5) Net floor area ('ירקיע חטש')
(6) Brutto surface area ('וטורב תופצר חטש')

Conclusions with regard to public transport systems availability

9. The four case study cities differ widely in terms of transport circumstances. Frankfurt and Zürich stand out as cities with high quality public transport systems. Both cities have an extensive system of commuter rail and an excellent public transport system at the urban level. Rotterdam and Edinburgh have less well-developed public transport systems. Rotterdam lacks a well-developed commuter rail system, while the public transport system in Edinburgh is dominated by

[1] Throughout the report data refer to the municipal area of the cities under study, unless stated otherwise.

a system of urban and metropolitan buses. Both cities are fairly well comparable to the Tel Aviv metropolitan area.

Table 2 Main characteristics of the public transport systems in the four case study cities and Tel Aviv.

	Edinburgh	Frankfurt	Rotterdam	Zürich	Tel Aviv area
Long distance rail	basic network	extensive network	extensive network	extensive network	basic network
Commuter rail	basic network	9 lines	basic network	25 lines	4 lines
Underground	--	7 lines	2 lines	--	--
Light rail	--		--	--	--
Tram	--	8 lines	9 lines	13 lines	--
Bus	extensive network	40 lines	extensive network	extensive network	extensive network

10. The differences in the public transport system are only partly reflected in the modal split data (see Table 3). Especially the high share of public transport for Edinburgh is remarkable, given the lack of a lightrail or underground public transport system there. Note also that the data for Rotterdam are slightly inflated, given the importance of the bicycle in the modal split in Rotterdam. The high car share for Tel Aviv can partly be related to the fact that the data refer to the metropolitan area rather than the city. For the city, the share of public transport is probably substantial higher and closer to the levels of case study cities Edinburgh, Frankfurt and Rotterdam. Zürich definitely stands out, with a public transport share that is much larger than the share of the car. The figures suggest that the other three cities have introduced restrictive parking policies under what could be called 'hostile' circumstances of high levels of car use. This suggests that cities have not waited for the modal split impacts of improved public transport systems, but have rather used restrictive parking policies to help change the trends in modal split (see also below).

11. The data concerning the transport circumstances give rise to the following conclusions:
    2. **Cities with public transport systems comparable to the public transport system in the Tel Aviv metropolitan area have introduced restrictive parking policies in the past (most notably Edinburgh and Rotterdam).**
    3. **Cities have introduced restrictive parking policies under 'hostile' circumstances of high levels of car use in home-to-work trips.**

Table 3 Modal split for motorized trips, for the four case study cities and Tel Aviv.

	Edinburgh (1)	Frankfurt (2)	Rotterdam (3)	Zürich (4)	Tel Aviv area (5)
Car	59%	62%	71%	36%	80%
Public transport	41%	38%	22%	65%	20%

(1) Modal split for home-to-work trips with destination Edinburgh, for 2000
(2) Modal split for trips made by inhabitants of Frankfurt, for 2003
(3) Modal split for trips with origin and/or destination in Rotterdam, for 2000
(4) Modal split for all trips with origin and/or destination in Zürich, for 2000
(5) Modal split for all trips with origin and/or destination in Tel Aviv metropolitan area ('Machoz Tel Aviv'), for 2003

Conclusions with regard to complementary policies

12. Each case study city has adopted a number of policies over the years that are complementary or supportive to the adoption and implementation of the restrictive parking policies. The cities show a strong overlap in these complementary policies.

13. First of all, all cities have introduced parking demand measures with regard to *public* parking prior to the introduction of restrictions on *private* parking and/or parking related to land uses. These parking demand measures have generally been introduced to guarantee an efficient use of public parking places (to guarantee short-stay parking for visitors and shoppers) and to reduce the

negative impacts on residents in areas with high demand for parking. The measures have subsequently been used to limit the negative impacts of, and to increase the effectiveness of, restrictive parking norms for private parking. In other words, all cities have used parking management to prevent commuters from using on-street and off-street public parking places instead of – limited available – private parking places.

14. Second, all cities have invested substantially in the improvement of the public transport system. In the case of Frankfurt and Zürich, much of the improvements in the system were carried out before the adoption of the restrictive policy for private parking places, while investments continued after the introduction of the policy. However, in the case of Edinburgh and Rotterdam, substantial improvements in the public transport system were only announced at the time of the introduction or adoption of the restrictive parking policy. In both cases, the proposed improvements in the public transport were instrumental in generating support for the proposed changes in the parking norms. The fact that the adoption of the restrictive norms was not postponed till *after* the completion of the proposed improvements in the public transport system, suggests that the involved parties felt that the existing public transport systems would provide an acceptable alternative for, and be able to 'absorb', commuters that would switch from car use to public transport use due to a lack of parking places.

15. The third complementary policy concerns land use policies. Here, the case study cities differ. Rotterdam has the most full-fledged land use policy supporting the restrictive parking policy, in terms of formal regulations, regional coverage, and in enforcement of the policy. Edinburgh represents the other extreme of the spectrum. Here, only 'soft' planning guidelines existed at the time of the adoption of the restrictive parking norms. Frankfurt and Zürich represent positions in between these two extremes, with land use policies discouraging but not blocking out-of-town developments. Of importance here is the fact that the lack of strong, watertight, land use policies has not prevented the cities of Edinburgh, Frankfurt and Zürich to introduce restrictive parking policies.

16. The analysis of the complementary policies in the four case study cities gives rise to the following conclusions:

4. **Management of on-street and off-street public parking spaces is a 'natural' complement of restrictive norms with regard to private parking places.**
5. **Restrictive parking policies and public transport improvements go hand-in-hand, but public transport improvements do not need to precede the adoption of a restrictive parking policy.**
6. **Restrictive parking policies have been introduced without supporting, watertight, planning regulations preventing unwanted suburbanization of economic activities.**

Table 4 Overview of complementary policies in the four case study cities.

	Edinburgh	Frankfurt	Rotterdam	Zürich
Public parking management	yes	yes	yes	yes
Public transport improvements	after policy adoption	before and after	after policy introduction	before and after
Land use regulations	largely lacking	partial	strong	partial

Conclusions with regard to economic developments

17. The analysis of the economic development of the four case study cities has revealed an overall picture of vital cities and city centers. Each of the cities has seen a substantial growth in total and/or third sector employment since the introduction of the restrictive parking policy. The growth figures are especially high for Edinburgh and Rotterdam. The first has seen a tremendous growth of the office sector employment, while the second has seen a strong growth in city center

employment. Frankfurt and Zürich show lower growth numbers, but here, too, the third sector has seen substantial growth since the introduction of the parking policies in both cities. Other data, for instance on prime office rents and on office take-up, show the continuing dominance of the city center in the office markets in all four cities. In all cities, the strong position of the city center has gone hand in hand with a considerable development of office concentrations at urban-edge locations, inside and outside the central city borders.

18. The analysis of the economic development in the four case study cities gives rise to the following conclusions:

7. **The cities and city centers show an ongoing economic vitality after the introduction of the restrictive parking norms.**
8. **The city centers remain the dominant office location in all case study cities.**

Table 5 Growth in total employment and office/third sector employment in the case study cities.

		Edinburgh (1)	Frankfurt (2)	Rotterdam (3)	Zürich (4)
City center	Total employment	--	--	21.0%	--
	Office/third sector employment	--	--	--	--
City	Total employment	6.7%	7.0%	--	1.0%
	Office/third sector employment	30.7%	10.0%	--	11.0%

(1) Data for 1998-2002
(2) Development in total employment for 1987-2002, office sector 1999-2002
(3) Data for 1994-2001
(4) Development in total employment for 1985-2001, third sector employment 1995-2001

Conclusions with regard to the economic impact of restrictive parking policies

19. The data presented above and in the main chapters of the report, sketch a picture of strong and vital cities and city centers and suggest that the restrictive parking policies have not had any significant influence on the economic development. The in-depth interviews with experts in the four case study cities confirm this observation. The experts have provided insight into the factors that move the office and the retail markets in the cities, factors that can explain the 'missing' causal relationship between parking restrictions and economic development. The experts sketch a picture of the office market that is driven largely by other considerations than parking. The factors that determine location decisions of offices include proximity to (business) clients, proximity to decision-making centers (leading companies), attractiveness of the city center for employees, and the status and the image of the city center. The public transport accessibility of the city center is an additional location factor that makes the ongoing concentration of offices possible. These factors play a role in all city centers with the exception of Rotterdam, which lacks a clearly dominant office sector that 'pulls' other offices to the city center.

20. The experts also generally stress the inevitability of the rise of additional office concentrations *in addition* to the city center. First, exactly because of its popularity among offices, the city center features rent levels that are too high for a substantial part of the office sector. Second, especially the city centers in Edinburgh and Zürich lack the physical space for a substantial expansion of the office sector. A third reason that plays a role in Frankfurt and Zürich is the taxation of company income, which is higher in both cities than in the surrounding localities. These factors are the main 'push' factors that result in the growth of office concentrations on the urban edge and in the surrounding localities. The experts point out that a large part of these developments are inevitable against the background of the factors mentioned before and that peripheral office locations can be viewed as complementary rather than competitive to the city center.

21. Finally, there is common agreement among the experts about the limited role of parking in the location decisions of offices. All agree that parking does play a role, but only a limited one, and that other factors tend to prevail over parking. Only special office sectors that are dependent on car-based travel, like companies employing a large number of sales agents, will attach a relatively high importance to parking in their location decisions. But for these offices, too, parking is only one among a set of considerations.

22. These observations of the experts suggest that the parking restrictions have had no negative impact on the economic development of the case study cities. Some experts even suggest the opposite. They point out that one of the main strengths of the city center lies in its attractive urban environment and that the restrictive parking policies are instrumental in protecting and strengthening this quality. These experts thus suggest that the restrictive parking policies have positive rather than negative impacts on the economic development of city centers.

23. These results of the in-depth interviews with experts in the case study cities give rise to the following conclusions:

    9. **Parking is a relatively unimportant location factor in the location decisions of offices.**
    10. **The city center has strong qualities that make it attractive for a large part of the office sector and that compensate for the parking restrictions.**
    11. **The decentralization of offices and the rise of peripheral office concentrations is the inevitable result of the dynamics in the office market, in which parking considerations play only a minor role.**

Core conclusion of the research

24. The above observations and conclusions lead to the following overall conclusion of the research:

    12. **Parking restrictions have had no significant influence on the economic development of the selected cities and city centers.**
    13. **The economic dynamics in the case study cities suggest that parking restrictions will not have negative economic impacts if implemented in cities with a strong and vibrant economic structure.**

Chapter 1 Introduction

25. The Ministry of Transport has recently adopted a new, more restrictive, system of parking norms. The new policy replaces the previous system based on minimum parking norms with a system based on maximum parking norms for a number of types of land uses, the most important of which are the office and retail sectors. The new policy relates the maximum norms to the proximity to competitive public transport, with the strictest norms applying to areas around nodes of train and light rail systems. The policy furthermore introduces a system of 'building percentages', with higher building percentages allowed in areas served by competitive public transport and lower building percentages in areas that lack high quality public transport. A third feature of the new system of parking norms is its introduction in stages as a function of the development of the competitive public transport system.

26. In the past year, the policy has been formally adopted by the Municipalities of Jerusalem and Haifa. A number of municipalities in the Tel Aviv area, however, have expressed reservations with regard to the policy, as they fear that the introduction of the new parking norms may have unwanted economic affects. More specifically, these municipalities fear that offices and retail may start to avoid the core of the Tel Aviv metropolitan area and instead locate in areas with less stringent parking norms.

27. The current research has been carried out against this background. The goal of the research was to provide insights into the possible impacts of the introduction of a restrictive parking policy in the Tel Aviv area by analyzing European cities that have introduced a comparable parking policy. More specifically, the goal of the research was:

> *To assess the impacts of restrictive parking policies on the economic development of cities and their centers.*

28. The report that lies in front of you is the result of this assessment. It consists of eight chapters, including this introduction. Chapter 2 provides an outline of the types of parking policies that can be found nowadays in European countries and a description of the key characteristics of the proposed Israeli parking policy. Chapter 3 contains a presentation of the research approach taken in this study. It includes an argumentation for the selection of the case study approach, a selection of the case study cities, and a set of research questions that have guided the research in the four selected case study cities. The selected cities are: Edinburgh, Frankfurt, Rotterdam and Zürich. In Chapter 4 to 7 the findings of the research are presented. Each chapter covers one specific case study city and consists of seven sections: (1) description of parking policy including detailed parking norms; (2) description of policies that strengthen or complement the restrictive parking policy; (3) assessment of the transport circumstances at the time of the introduction of the parking policy, including public transport system, car ownership and modal split; (4) analysis of the economic development of city and city center; and (5) an in-depth analysis of the impacts of the parking norms on the economic development of city and city center based on a series of interviews. The report ends with a synopsis, in which the main findings of the study are summarized (Chapter 8).

Chapter 2 Parking norms as a policy tool

2.1 Four types of parking policies

29. Parking policies have been part and parcel of transportation policies of many European cities for the past decades.[2] The OECD/ECMT report 'Urban travel and sustainable transport' ascribes the relative popularity of parking policies to the acceptance by both the general public and politicians and the comparative ease with which parking policies can be introduced and enforced. Within the OECD countries four types of parking policies can be distinguished (Figure 2.1).

First type

30. The first type of parking policy is based on the 'predict and provide' paradigm. In this case, the amount of parking places is adjusted as much as possible to the demand for parking. In many cases this kind of approach goes hand in hand with parking provision free of charge, but it is also possible to combine the approach with paid parking. In the later case the parking fee is not used to manage car traffic, but rather serves as income generator to cover expenses related to provision and maintenance of car infrastructure. This 'first type policy' can be found in some OECD countries in Southern and Eastern Europe and in smaller cities and towns in many countries around the world.[3] It was also the policy in the major cities in Israel up till recently, and it still is the dominant approach in virtually all smaller cities and towns throughout Israel.

Second type

31. The second type of parking policy aims to limit the use of public parking by commuters in favor of customers, shoppers, visitors and residents.[4] The policy thus focuses on the management of public parking space, both on-street and off-street, rather than private parking space linked to offices or housing. The focus on public parking spaces is related to the relative ease with which this type of parking space can be regulated by local authorities. Local authorities are usually fully in control when it comes to the regulation of public *on-street* parking facilities, both with regard to the price and amount of public on-street parking. They also tend to have tools available to regulate the amount and price of public *off-street* parking, such as statutory land use plans and building permits or contracts with owners of parking lots and garages.

32. The goal of the 'second type policy' is usually to limit the use of public parking by commuters in favor of customers, shoppers, visitors and residents. Usually both the price and the amount of parking are used as a tool to achieve this goal. By pricing public parking places, they become less attractive for long-term parking and therefore for the commuter. Parking places previously used by commuters thus become available for short duration use by customers. The consequence of paid parking is a higher parking turnover and a rise in car traffic, as a parking space previously used by one commuter is now used for short term parking by several customers consecutively.

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[2] OECD/ECMT (1995) Urban travel and sustainable transport. Paris, OECD, European Conference of Ministers of Transport (ECMT), p. 6.

[3] OECD/ECMT (1995) Urban travel and sustainable transport. Paris, OECD, European Conference of Ministers of Transport (ECMT).

[4] Topp, H. H. (1995) The role of parking in traffic calming. *World Transport Policy & Practice*, 1/3, p. 17-18.

Therefore, pricing of parking usually goes hand in hand with the management of the amount of parking, in order to manage the level of car traffic.[5]

33. The second type policy has been introduced in the centers of most medium-sized and major cities in Northern European countries. Good examples of such cities are Amsterdam, Rotterdam and Utrecht in the Netherlands, and Zurich and Bern in Switzerland.[6]

Third type

34. The third type of parking policy focuses on the management of private parking spaces. Generally the focus is on private parking related to commercial land uses: offices, retail, and public facilities such as cinemas and theaters. The general goal of this 'third type policy' is to limit the use of the private car, mostly by commuters but in some cases also by customers of retail activities and visitors of public facilities. The policy is usually limited to areas that are well served by public transport and/or historic areas that are vulnerable to car traffic.[7] The policy generally relies on the amount of parking as its primary tool. For various types of land uses maximum parking norms are set in relation to the floor space or the number of employees. The policy is usually enforced through land use plans and building permits. The price instrument is hardly used as a tool to manage private parking space related to various land uses. However, recently it has been considered in the UK and it has also been discussed in several other countries.[8]

35. The third type of policy can be found in a number of cities in Europe. Examples are, among others, Helsinki, Frankfurt am Main, and Zürich.[9]

Fourth type

36. The fourth type of parking policy is actually a planning policy that combines the management of private parking spaces with a location policy for specific land uses. Like the third type policy, the general goal of a 'fourth type policy' is to limit the use of the private car, mostly by commuters but in some cases also by customers of retail activities and visitors of public facilities. The fourth type policy is, on the one hand, a response to possible location dynamics related to third type policies (see Section 2.2 on these location dynamics). On the other hand, its goal is to guarantee that activities that generate a lot of traffic are sited on locations readily accessible by public transport. The 'fourth type policy' aims to achieve this by including guidelines about the allowed locations of various types of land uses in relation to public transport facilities, in combination with limitations with regard to the amount of parking places that can be provided at each location. The most well known example of this type of policy is the Dutch abc locations policy.[10] The policy proposed for Israel with regard to private parking includes all key elements of a fourth type parking policy, and adds some additional elements, as described below in Section 2.3.

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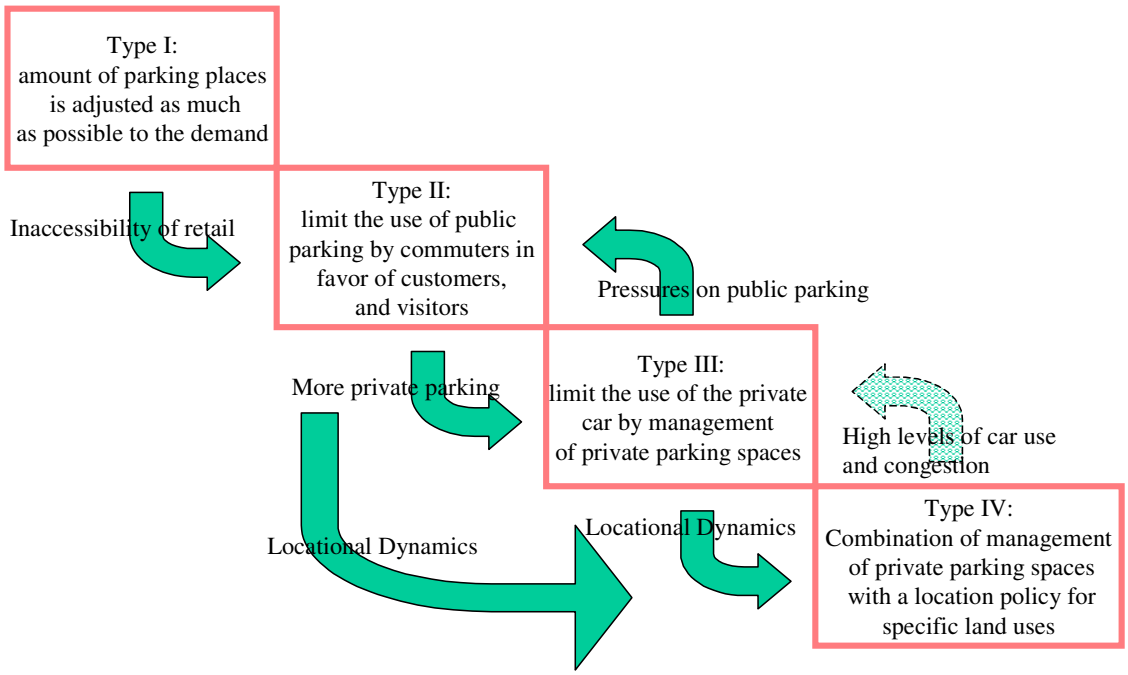
[5] Topp, H.H. (1995) The role of parking in traffic calming. *World Transport Policy & Practice*, 1/3, p. 35.
[6] Bonnel, P. (1995) Urban car policy in Europe. *Transport Policy*, 2/2, p. 89.
[7] Topp, H.H. (1998) Errecihbarkeit, Parraum und Einzelhandel der Innenstadt. *Raumforschung und Raumordnung*, 2/3.
[8] Department of Environment Transport and the Regions (UK) (1999) *Towards an urban renaissance: final report of the Urban Task Force chaired by Lord Rogers of Riverside*. DETR/E&FN Spon, p. 105; OECD/ECMT (1995) Urban travel and sustainable transport. Paris, OECD, European Conference of Ministers of Transport (ECMT), p. 6.
[9] COST Secretariat (2001) *Parking Policy Measures and their Effects on Mobility and the Economy - Finland Case Studies*.; Topp, H. H. (1999) Stellplatzsatzungen wirken sich langfristig aus: ein Laender- und Staedtevergleich. *Der Staedtetag*, 7; COST Secretariat (2001) Parking Policy Measures and their Effects on Mobility and the Economy - Swiss Case Studies.
[10] Martens, K. (2000) Debatteren over mobiliteit: over de rationaliteit van het ruimtelijk mobiliteitsbeleid. Faculty of Policy Sciences. Nijmegen, University of Nijmegen.

Figure 2.1 Four types of parking policies and their interrelationships



2.2 Interrelations between parking policies

37. The four types of parking policies are related in various ways, in the sense that the adoption of one type of parking policy can under certain circumstances call for the introduction of another type of policy. These interrelations between the policies will be shortly discussed below.

38. The adoption of a 'first type policy' in major urban areas tends to lead to a severe shortage of parking places, especially in city centers. There are several reasons for this. Most prominently is the fact that the centers of most cities have at least in part been developed before the rise of the motorcar. These older areas tend to have relatively few parking spaces available and limited possibilities for an extension in parking capacity. Even if space is available, provision of additional parking space – following the 'predict and provide' approach – has proven to be difficult in many cases. The result is an often severe shortage of parking spaces in comparison to the total demand for parking under a parking regime of the 'first type'. Especially customers of shops and visitors to central areas experience these parking shortages, as car commuters will occupy most available parking places for the entire day. Providing additional parking spaces usually does not provide the answer, for two reasons. First, these additional parking spaces are likely to be occupied by commuters, as they tend to arrive earlier at their destination than customers or visitors.[11] Second, given the concentration of traffic generating activities and the lack of space in major urban centers, the total demand for parking generated by commuters, customers and visitors will tend to grow faster than the provision of additional supply. The

[11] Verhoef, E. T.,P. Nijkamp, et al. (1995) The economics of regulatory parking policies: the (im)possibilities of parking policies in traffic regulation. *Transportation Research Part A: General*, 29/2.

resulting lack of parking spaces especially for customers of retail activities will lead to a demand among retailers for parking space dedicated to their customers. The most efficient way to do this is to introduce paid parking close to concentrations of shops and shopping areas, so these parking spaces become less attractive for commuters and instead available for customers. Thus parking dynamics in the centers of larger urban areas tend to lead from a shift of a first type policy to a second type policy (see Figure 2.1).

39. The adoption of a second type policy also has its dynamics and impacts. A very obvious consequence of the introduction of the introduction of paid parking in centers of large urban areas is the shifting of commuter parking to streets just outside parking management area. Here, the obviously solution – implemented in many cities around Europe – is a further extension of the area with a paid parking regime. A second, more serious, dynamic that may occur around the introduction of a second type parking policy is increased provision of private parking on the grounds of offices, retail centers and other traffic generating activities.[12] While such a dynamic does not endanger the provision of parking for customers and visitors, it will lead to an increase in traffic volumes in the inner city areas. This, in turn, may have unwanted effects in terms of congestion, accessibility, pollution and a high reliance on the private car. Especially in cases in which the goal of parking policy is to reduce the share of the car in the modal split, these dynamics may lead to the adoption of a parking policy that regulates the amount of private parking space. Thus, the adoption of a second type policy may under certain circumstances call for the adoption of a third type policy (see Figure 2.1).

40. A third dynamic that may be related to the introduction of a second type parking policy, are location dynamics of retail, offices and other commercial activities. The introduction of paid public parking may induce retail customers to shop in other, often more suburban, retail centers. This, in turn, may tempt shops to leave the city center and relocate in suburban retail centers. Likewise, offices and other employers may decide to move out of (or not move into) the central area, because of the lack of parking places for their employees (commuters). In case these location dynamics become severe, the adoption of a second type policy may lead to the adoption of a fourth type policy (see Figure 2.1).

41. The adoption of a third type of parking policy may also lead to dynamics that call for the adoption of further parking policies. First, the adoption of a third type policy that focuses only on private parking and leaves public parking unaffected, is highly likely to cause heavy pressure on public parking space as commuters will 'take over' the public parking in the vicinity of their workplace. As a result, there will be a lack of parking for customers of retail and visitors of other commercial activities. The introduction of a third type policy may thus lead to a call to introduce a second type parking policy in the vicinity of workplaces.

42. Like a second type parking policy, a third type policy may lead to location dynamics that call for the adoption of a fourth type policy. Depending on the circumstances, employers may want to move out of (or not move into) central areas in order to ensure sufficient parking place for their employees. Such processes will obviously erode the center of urban areas, which may in turn be the reason to call for the adoption of a fourth type of policy.

43. The adoption of a fourth type of parking policy ideally offers 'full' control over land use and parking. However, in case a fourth type of policy only focuses on the regulation of land use without limiting the amount of parking, such a policy could result in high levels of car use and

[12] Topp, H. H. (1995) A critical review of current illusions in traffic management and control. *Transport Policy*, 2/1, p. 38.

congestion in centers of urban areas. Such a policy can thus, under specific circumstances, lead to erosion of the accessibility of central areas. This, in turn, may lead to a call to control the use of the private car, especially in home-to-work trips. One of the possible tools then may be the limitation of private parking for commuters. The adoption of a land use policy alone may thus, under certain circumstances, lead to a call for the adoption of a third type policy (Figure 2.1).

44. It is important to emphasize that the dynamics described above are not inevitable. It will depend to a large extend on the specific circumstances whether they will occur or not. In case a city center is very accessible by public transport, the adoption of a second type parking policy may lead to a reduction in car use, rather than in an increase in private parking places or a relocation of offices to areas with free parking. And in case a city center is strong and offers a lot of agglomeration economies, companies may prefer to reside in the city center despite lack of parking places. In such a case, the adoption of a third type policy is much less likely to result in unwanted location dynamics. The description of the relationships provided above, then, is not meant to show inevitable processes, but to show how various types of parking policies are related to one another.

2.3 Israel's parking policies

45. The division between four types of parking policies enables us to position Israel's parking policies in relation to the possible policies, in relation to other countries and cities, and in relation to possible parking dynamics that may develop around it.

Existing policies for public and on-street parking

46. The current parking policies in Israel's main cities can be positioned between a first and second type policy (Figure 2.1). Like in a second type policy, the cities of Jerusalem, Tel Aviv and Haifa have introduced paid public parking, both on-street and off-street. However, the introduction of paid parking has only been used to a limited extent to guarantee parking places to customers of retail and visitors of (commercial) activities. The introduction of paid parking through the 'blue-and-white' system, for instance, has only a limited impact on the use of parking spaces by commuters. First, the relatively low prices and poor – though increasing – levels of enforcement do not scare all commuters away. Second, the blue and white system does not limit people that live and work within one parking area, e.g. the center of Tel Aviv, from using parking places for a whole day. Thus, many parking places close to retail activities are occupied for a major part of the day, thus decreasing the car accessibility of shops and businesses.

Proposed policy for private parking

47. The proposed policy of the Ministry of Transport with regard to private parking is of a totally different category. The policy has the characteristics of a fourth type parking policy (Figure 2.1) but adds a number of other features.

48. Like a fourth type parking policy, the proposed policy for Israel limits the amount of parking through a system of maximum parking norms for a large number of land uses. The maximum norms are linked to the proximity to competitive public transport systems. Four areas are distinguished:[13]

- Area A: Areas well-served by competitive public transport systems. This comprises all areas within 350 meter around stations of mass transit systems.

[13] השמשוני, ג. (2004) הנחיות לתכנון חניה: תקנות התכנון והבניה (התקנת מקומות חניה). ירושלים

- Area B: Areas that have a intermediate accessibility by public transport and a reasonable accessibility by car. This encompasses all areas between 350 and 650 meter around station of mass transit systems.
- Area C: Areas that have high levels of car accessibility and low public transport accessibility and that are located further than 650 meter from stations of mass transit systems.
- Area D: Areas with low public transport and car accessibility suitable for 'green' land uses (agriculture, parks, national parks, and natural areas).

49. Like a fourth type parking policy, the proposed policy also includes land use regulations that delineate which types of land uses can locate at which type of locations. Given these characteristics (parking norms linked to public transport accessibility and land use regulations) the Israeli policy is most closely related to the Dutch abc locations policy, which is described in detail below in the chapter on Rotterdam (Chapter 6, Section 2).

50. The proposed Israeli policy adds two further elements which are generally not a part of fourth type parking policy. The first is the system of 'building percentages' which regulates the amount of building that is allowed on a plot in relation to the proximity to competitive public transport systems. Higher building percentages are allowed in areas well served by public transport (Areas A and B), while limitations are set for the other areas. Furthermore, the maximum parking norms are adjusted in accordance with the building percentage. Thus, stricter parking norms apply when a higher building percentage is realized. E.g., in the case of retail development the maximum parking norm in Area A is 1:250 m2 (see below) for all floor area up to a building percentage of 400%, while the norm is 1:500 m2 for building percentages between 400% and 500%. The system of building percentages proposed for Israel is comparable to a similar system adopted in the nineties for Central London.

Table 2.1 Maximum parking norms per square meter primary surface area ('שטח רצפות עיקרי')

Building percentage	Area A	Area B	Area C
less than 250%	1:250 m2	1:125 m2	1:50 m2
250%-300%	1:300 m2	1:175 m2	zero parking
300%-400%	1:400 m2	zero parking	zero parking
400%-500%	1:500 m2	zero parking	zero parking
more than 500%	zero parking	zero parking	zero parking

51. The second additional element in the proposed Israeli parking policy is the temporal element. The proposed policy introduces a system of parking norms that is adjusted in accordance with the improvements in the competitive public transport system. The system allows higher levels of parking provision in the period before the development of the mass transit systems in the metropolitan areas, while the norms become more restrictive with the development of the mass transit system. The regulation further requires that the areas or part of building that have been designated for parking under the more lenient norms, are adjusted to serve other land uses than parking once the competitive public transport system is up and running.

2.4 Proposed parking norms for Israel

52. The combination of maximum parking norms, land use limitations, building percentages and temporality create a complex but sophisticated system of parking norms. The most crucial maximum norms for metropolitan areas are outlined in the table below.

Table 2.2 Proposed system of maximum parking norms for metropolitan areas in Israel.[14]

	Area A		Area B		Area C		Area D	
	parking	building perc	parking	building perc	parking	building perc	parking	building perc
Offices - public sector (1)	1:250 m2	--	1:125 m2	--	no offices allowed in Area C; if offices are		no offices allowed in Area D; if offices are	
Offices - general (1)	1:250 m2	--	1:125 m2	--	allowed maximum parking of 1:50 m2 and		allowed maximum parking of 1:50 m2 and	
Offices - research institutes (1)	1:250 m2	--	1:125 m2	--	max building percentage of 80-100%		max building percentage of 80-100%	
Retail till 10,000 m2 (2)	1:250 m2	--	1:125 m2	--	1:50 m2	80-100%	retail development in Area D is not	
Retail over 10,000 m2 (2)	1:250 m2	--	1:125 m2	--	1:50 m2	80-100%	recommended	
Industry and light industry (3)	1:250 m2	--	1:250 m2	--	1:50-70 m2	--	1:100 m2	0%
Storage (3)	1:600 m2	--	1:600 m2	--	1:300 m2	--	--	0%

(1) Parking norms per gross floor area
(2) Parking norms per net floor area ('ירקיע חטש')
(3) Parking norms per brutto surface area ('וטורב תופצר חטש')

[14] Based on השמשוני, ג. (2004) הנחיות לתכנון חניה: תקנות התכנון והבניה (התקנת מקומות חניה). ירושלים

Chapter 3 Research approach

3.1 Introduction

53. The goal of the research is the assessment of the impacts of restrictive parking policies on the economic development of cities and city centers. This assessment can be done in various ways. Given the complexity of the issue, we have decided to adopt a case study approach. Section 3.2 provides the argumentation for the selection of this research approach. In Section 3.3, the selection of cases is discussed. Then the research questions are presented. The chapter ends with a number of short notes on the research methods and data collection (Section 3.5).

3.2 Case study approach

54. The assessment of the economic impacts of restrictive parking policies is not a simple task. The city is not a 'simple' system in which causes and effects can be related to each other in a simple and straightforward way. Rather, it is a complex system in which various causes work together at the same time, sometimes strengthening and sometimes weakening each other, to generate a multitude of effects. Given these characteristics the assessment of the relationship between one cause and one effect requires the analysis of the wider 'environment'.

55. This observation also holds true for the assessment of the impacts of restrictive parking policies. Such parking policies are never introduced in a vacuum. They are introduced in a city or region with a specific economic structure, with an existing public transport system, with an existing motorization level, with existing land use policies, etc. Each of these factors has an impact on the economic development of cities and city centers. A restrictive parking policy, in turn, may not only have its own impact on the economic development, it may also have an effect on some of these factors, such as the motorization rate. The motorization rate, in turn, may affect the use of the public transport system, thus changing the strength of this system and therefore its possible impact on the economic development of cities and city centers. And so forth.

56. Given these feedback loops and complex interrelationships it is not feasible to directly assess the relationship between restrictive parking norms (as the relevant 'cause') and the economic development of cities and city center (as the relevant 'effect'). Rather, as much attention as possible has to be paid to the environment in which the cause acts upon the effect. Given the need to analyze the environment within which restrictive parking policies have been introduced and enforced, we have decided to employ a *case study approach* to assess the economic impacts of restrictive parking policies.

57. The case study approach offers several advantages over other research methods. First of all, it focuses the research efforts on a limited number of cases and thus enables the researchers to do in-depth analyses of the selected cases. This, in turn, makes it possible to gain an understanding of the complex interrelationships between various factors and processes in a specific case and to single out as much as possible the relative importance of parking policies within this complex set of factors. Second, it allows a flexible approach with regard to data-gathering and analysis. Unlike for instance modeling or statistical approaches, case study research can use a wide variety

of data sources and relate to them in an appropriate way. This is especially useful in studying cities in different countries, as these often show large differences in data availability and data definition. Third, the case study approach makes it possible to combine quantitative and qualitative research methods and link the results together in a consistent fashion. This is an important quality, especially given the complexity of the issue at hand and the expected limitations in terms of data availability.

58. In short, the case study approach is particularly suited to answer 'how' and 'why' questions and to examine links and changes over time.[15] Because of these qualities, the method is well-suited for the assessment of the impacts of restrictive parking policies on the economic development of cities and city centers.

3.3 Case study selection

59. The selection of cases is a crucial step in any case study research. The selection of case study cities has been based on the following criteria.

60. *Parking policy.* The first criterion concerns the parking policy. Given the aim of the research project to generate insights about the possible economic impacts of the parking policy proposed in Israel, only cities were selected that have introduced a parking policy comparable to the one in Israel. This concerns comparability in terms of the goals of the parking policy (reduction in car use), the areas to which the policy applies (linked to public transport nodes), the land uses to which the policy applies (focusing on offices and/or retail), and the height of the parking norms (comparable or even stricter standards).

61. *City size and structure.* The second criterion relates to city size and structure. The selection has focused on cities that are comparable in size and structure to Tel Aviv and/or the Tel Aviv metropolitan area. This criterion has implied that large urban conurbations, like London or Paris, were excluded from the selection. Urban structure has also played a role in the case study selection, in the sense that cities with a modern lay out comparable to Tel Aviv were preferred over cities dominated by a historical urban structure, such as for instance Amsterdam.

62. *Transport system.* The possible economic impacts of a restrictive parking policy will depend to a large extent on the availability of a public transport in the case study city. It is also for this reason that the introduction of the parking policy in Israel is intrinsically linked with the development of a mass transit system within the metropolitan areas. Given this interdependence, we have selected cities with various levels of public transport, including both cities with excellent mass transit systems and cities with less well-developed public transport systems.

63. *Data availability and accessibility.* The final criterion that has played an important role in the case study selection is data availability and accessibility. Given the languages spoken by the researcher (English, Dutch and German), case study selection focused on the following countries: UK and Ireland, the Netherlands and Belgium, and Germany, Switzerland and Austria. Within these countries, an assessment was made of data availability mainly using key internet sites (websites of cities and national bureaus of statistics). The limitation of the case study selection based on the languages spoken by the researcher proofed to be a prudent decision, as much of the data on the selected case study cities were only available in the language of the country itself.

[15] Yin, R. K. (1984) *Case study research: design and methods*. Beverly Hills, Sage Publications

Selected case studies

64. Following the above mentioned criteria, the search of case study cities focused on countries for which data would be relatively easily accessible in terms of language: Germany, Switzerland and Austria, the Netherlands and Belgium, the UK and Ireland. In each of these countries, cities comparable in size to Tel Aviv were identified. Then, the parking policies of these cities were identified and compared to the proposed policy for Israel.[16] Finally, the public transport system and city structure played a role in the final case study selection. Based on this process, the following four case study cities were selected.

65. *UK: Edinburgh.* The number of cities in the UK with a parking policy comparable to the one proposed for Israel is still limited. Most cities have only developed such a policy in the second half of the nineties, following the major changes in the UK transport policies.[17] Edinburgh is the only city that introduced a restrictive parking policy in an earlier stage and is comparable in terms of size to Tel Aviv. For these reasons, Edinburgh was selected as the case study city in the UK.

66. *Germany: Frankfurt am Main.* A substantial number of German cities has adopted a restrictive parking policy in the eighties or nineties. Examples of such cities are Koln, Stuttgart, Freiburg, Nürnberg, and Frankfurt am Main.[18] Frankfurt was selected based on the characteristics of the restrictive parking policy (closely linked to public transport nodes and comparable maximum parking norms), its economic position within Germany (like Tel Aviv the main economic center in the country), and the quality of its public transport system (high quality suburban rail and underground/lightrail system).

67. *The Netherlands: Rotterdam.* Following the adoption of a restrictive parking policy by the Dutch national government, all large and medium-sized cities in the Netherlands have adopted a restrictive parking policy comparable to the one proposed in Tel Aviv. From all these cities, only Amsterdam, Rotterdam and Den Haag are comparable in size to Tel Aviv. Amsterdam and Den Haag are less relevant as a comparison, the first because of the predominance of the historical core, and the second because of the predominance of the government in the office sector. Against this background, Rotterdam was selected as the Dutch case study city.

68. *Switzerland: Zürich.* The number of German speaking Swiss cities is limited to three: Basel, Bern, and Zürich. Each of thee cities has adopted a restrictive parking policy in the past. However, the parking policy of Zürich is the most comparable to the one proposed for Israel. Zürich is also the city that is most comparable to Tel Aviv in terms of size and in terms of its economic position within Switzerland (like Tel Aviv the main economic center in the country). For these reasons, Zürich was selected as the Swiss case study city.

3.4 Research questions

69. The assessment of the impacts of restrictive parking policies on the economic development of cities and city centers is not a simple and straightforward task, as outlined above. The economic

[16] The Stage B report of this research project titled '*Literature review and potential case study cities*' (November 2002) contains a description of the parking policies in a number of cities that were not selected as case studies.

[17] Goodwin, P. B. (1999) Transformation of transport policy in Great Britain. *Transportation Research Part A: Policy and Practice*, 33

[18] Topp, H. H. (2001) *Stellplatzsatzungen im Staedtevergleich.*

development of cities and city centers is determined by a multitude of factors and the parking policy is only one of a great number of factors. The research can thus not be limited to the two core 'variables': parking policy and economic development. It will also have to address other aspects that may be expected to directly influence the relation that exists between parking policy on the one hand and economic development on the other. This insight is reflected in the research questions that have guided the research.

70. The first research question focuses on the first core 'variable': parking policies. A detailed understanding of the parking policy in each city is necessary to understand its possible economic impacts. Of special importance is an assessment of the parking policy in terms of the land uses and areas to which it applies, of the system of parking restrictions itself, and of the historical development of the policy. For instance, in case a parking policy only relates to office buildings and not to retail, the analysis of economic impacts needs to focus only on the first. Likewise, a negative economic development in an area that does not have any parking limitations is obviously of no importance for the current study. Against this background, the first research question has been formulated as follows:

1. What are the characteristics of the parking policy?
1a. When was the parking policy introduced and when adjusted?
1b. To what land uses does the past and current parking policy apply?
1c. To what areas in the city does the past and current parking policy apply?
1d. What are the past and current parking norms for various land uses and city areas?

71. Parking policies are usually part of a larger set of policies or even of a policy package. Examples of related policies include land use policies that limit new developments to specific areas, or policies to promote public transport. Such policies will influence the impacts of parking policies on economic development. Stringent land use policies, for instance, can prevent location dynamics that may result from the introduction of parking policies (see Section 2.2). Likewise, investments in public transport may reduce the negative impacts of parking policies for the car owner and thus its possible impacts on economic development. The second set of research questions focuses on these complementary policies:

2. What complementary policies have been introduced to limit possible negative economic impacts of the parking policy?
2a. Has the parking policy been strengthened with supportive land use policies?
2b. Has the parking policy been strengthened with investments in public transport or with policies to promote public transport?
2c. Has the parking policy been strengthened with any other policies?

72. The possible impacts of a parking policy also depend on the characteristics of the transport system at the time of the introduction of the policy. For instance, a highly developed public transport will most likely limit any negative impacts related to a parking policy. Likewise, parking policies may have stronger effects in a region with high levels of car ownership and car use, than in a region that is characterized by high levels of public transport ridership. The third research question focuses on this issue:

3. Under what transport circumstances was the restrictive parking policy introduced?
3a. What was the quality of the public transport system at the time of policy introduction?
3b. What was the level of car ownership level at the time of policy introduction?
3c. What was the modal split at the time of policy introduction, especially with regard to home-to-work travel?

73. The fourth research question focuses on the second core 'variable': economic development of city and city center. The assessment of the economic developments in the case study cities will focus on those economic sectors that are most relevant for the Israeli case: offices and retail. Furthermore, the analysis will focus on the developments in the city center given the concentration of economic activities in this area in the selected cities, and given the fact that the most severe parking restrictions apply to this area. The fourth research question has been formulated as follows:

4. What economic developments have occurred in the case study cities since the introduction of the restrictive parking policy?
4a. Which developments have occurred in the office sector?
4b. Which developments have occurred in the retail sector?
4c. Which developments have occurred in the city center?

74. The final research question links the two core 'variables': parking policies and economic development. The answers to the research questions outlined above provide the material to link these two 'variables'. Based on the insight into the core 'variables' – parking policy and economic development – and into the 'intervening variables' – complementary policies and transport circumstances – an answer to the key question of the research:

5. What were the economic impacts of the introduction of the restrictive parking policy?

3.5 Research methods and data collection

75. Three research methods have been employed to generate answers to the research questions outlined above: document analysis, data analysis, and in-depth interviews.

76. *Document analysis* has primarily been used to provide an answer to the first and third research question. The analysis has included policy documents, background reports, and acts and regulations. For each case study city documents have been collected that could provide information on the parking policy itself (policy documents, formal regulations), on the reasons for the introduction of the policy (background documents), and on planning and transport policies (policy documents, formal plans, background reports). Relevant documents have been identified through internet search and through direct contacts with relevant bodies (primarily the four involved municipalities). In addition, research papers and research reports have been used where available. A complete overview of all the documents that have been analyzed as part of the research can be found in the reference list at the back of this report.

77. *Data analysis* has been used to answer the second and fourth research question, focusing on transport data and economic data. Data analysis refers here to the fact that *existing* quantitative data are used to answer the research questions. In other words, no primary data have been collected for the purpose of the research. The prime challenge to provide an answer to the second and fourth research questions has thus been to collect the appropriate data. The data collection has been a major effort in each of the case study cities. Using internet search and direct contacts with experts in each city, relevant data sources have been identified. The success of this search has been different for each city, given the substantial differences in data availability between the cities. In some cases, data could be retrieved using an online data-system that enabled the specification of the variables, areas, and periods. In other cases, only data were available in a specific format or for a specific period of time. In each city, data have been collected from a

variety of sources, such as the municipality, central bureau of statistics, labor market organizations, real estate agents, and more. The result is that a different data set is available for each city. It also means that, even where comparable data are available (e.g. on total employment in the cities), direct comparison of the data from different cities is problematic due to differences in definitions and categories employed by each data source. While a statistical standardization of the data sets that are available for every city might solve some of these problems, this is neither feasible nor necessary within the framework the research. It is not feasible, given the large number of *additional* data that are necessary to carry out such a standardization. It is not necessary, given the choice for a case study approach to answer the research questions. The goal of case study approach is to examine and understand the links and changes over time *in each case*, rather than to enable a direct (statistical) *comparison between the cases*. Such a case-specific analysis is very well possible with the data set available for each case study city. In sum, we have been able to collect enough data on the economic development in each city to enable a case-specific examination of the relation between restrictive parking norms and economic development.

78. The *in-depth interviews* have been primarily used to gain an understanding of the relation between parking policy and economic development, and thus to provide an answer to the fifth research question. In each case study city at least four experts have been interviewed by telephone. The experts have been selected from various organizational backgrounds, relying on internet search and the referral method (one experts suggests another) to identify most relevant experts. In each case study city, representatives of local government and experts on real estate have been included in the interview round. Each interviewed lasted from at least half an hour to more than one and a half hours, with an average of about an hour. Each time, the structure of the interview was adjusted to the background of the expert. Thus, interviews with representatives of local government would include questions concerning complementary polices, while interviews with real estate agents would include detailed questions on the office market in the city. The core of each interview, however, consisted of 'neutral' questions about the economic development in the city and city center and about the role of the parking policy in shaping these developments. The word 'neutral' refers to the fact that questions were organized in such a way that parking policy and economic development were only linked in later stages of the interview. Thus, much of the discussion in each of the interviews was about a wide variety of factors shaping the economic development of the city and the relative popularity of various areas in the city for businesses. The questions concerning the parking policy where then placed against this background in order to understand the relative importance of parking policies in shaping economic development.

Chapter 4 Case study 1: Edinburgh

4.1 Introduction

79. The City of Edinburgh is located in the southwest of Scotland, on the coast of the North Sea. The city is located within the Lothian region, which further includes the local authorities of Midlothian, West Lothian and East Lothian. The city has close to 450,000 inhabitants and accounts for over half the regional population. Edinburgh has recently acquired the status of 'Capital of Scotland' as a result of the changes in the government structure in the UK.

Table 4.1 Population, surface area and density of Edinburgh and the Lothian region.[19, 20]

	Edinburgh		Tel Aviv	
Population				
City	449,020	(2001)	363,400	(2003)
Metropolitan area	779,180	(2001)	1,164,300	(2003)
Surface area (km2)				
City	262.3	(2001)	51.8	(2003)
Metropolitan area	1,460.2	(2001)	171.0	(2003)
Density (persons/ha)				
City	17.1	(2001)	70.2	(2003)
Metropolitan area	5.3	(2001)	68.1	(2003)

Figure 4.1 Edinburgh in the region

[19] Source for Edinburgh: Office for National Statistics,General Register for Scotland, 2001. Sources for Tel Aviv: Israeli Central Bureau of Statistics (http://www1.cbs.gov.il/reader/shnatonenew.htm) and Municipality Tel Aviv (2003) Statistical yearbook 2003. The Edinburgh metropolitan area covers the Lothian region. The Tel Aviv metropolitan area covers the area of the Tel Aviv District ('Machoz Tel Aviv').

[20] Throughout the report data refer to the municipal area of the cities under study, unless stated otherwise.

4.2 Parking policy

80. The Edinburgh City Council has been engaged in parking management since the early 70s. The first measures focused on public on-street parking. In 1974, the Edinburgh City Council introduced a Controlled Parking Zone (CPZ) in the city centre and extended it into inner residential areas in 1976. The CPZ prevents commuters from using on-street parking spaces, encourages short stay parking by visitors (e.g. shoppers or business people) through a scheme of car park tariffs, and limits the negative impacts for residents.

81. The first restrictions on private parking were introduced in 1978. The norms introduced at that time related only to the city center and only to the office sector. The maximum norm for office space was set at 1 parking place per 500 m2 gross floor space. Outside the city center, the minimum parking norm of 1:50 m2 gross floor space remained unchanged. The policy was introduced in a period when higher level planning regulations prevented office development outside urban areas.

82. The system of maximum parking norms for the office sector was extended to cover the whole municipal area of Edinburgh in 1994. For the city center, the maximum norm of 1:500 m2 was upheld, while lower maximum norms were set for other areas. Generally, the further away from the city center, the less strict the norms. For public transport corridors a norm of 1:60 m2 gross floor area was set, and a maximum of 1:50 m2 for developments on the urban edge. The parking policy of 1994 did not set maximum parking norms for other land uses than the office sector. For land uses like retail and housing, minimum norms were set that graded out from the City center towards the edge of the city. Thus, lower minimum norms were set for the city center and higher minimum norms towards the edge of the city. For retail development in the City center no norms were set. Here, the number of parking places was to be decided upon by the City Council on a site-specific basis.

83. The parking policy was once again adapted in 1999. This time the norms for the office sector remained basically unchanged, but maximum norms were set for, among others, the retail sector. Like for the office sector, a spatial differentiation of the parking norms was adopted, with more restrictive norms in the city center and less restrictive norms towards the urban edge. The exact norms for key land uses are presented in the table below.

Table 4.2 Maximum parking norms per square meter Gross Floor Area, for offices, industry and storage/distribution.[21]

	Office/Light Industry	General Industry	Storage or distribution
City center	1:500 m2 or less	1:1000 m2 or less	1:3000 m2 or less
Periphery of city center	1:120 m2 to 1:500 m2	1:240 m2 to 1:1000 m2	1:720 m2 to 1:3000 m2
Public transport corridors	1:60 m2 to 1:120 m2	1:120 m2 to 1:240 m2	1:360 m2 to 1:720 m2
Medium accessibility areas	1:40 m2 to 1:60 m2	1:80 m2 to 1:120 m2	1:240 m2 to 1:360 m2
Major growth areas	1:50 m2	1:100 m2	1:300 m2
Rest of city	1:30 m2 to 1:50 m2	1:60 m2 to 1:100 m2	1:180 m2 to 1:300 m2

[21] City of Edinburgh (1999) *Parking standards for development control*. Edinburgh, City of Edinburgh.

Table 4.3 Edinburgh's maximum parking norms per square meter Gross Floor Area, for the retail sector. [22]

Note that parking provision for the retail sector in the city center and the periphery of the city center are judged 'on merit'. The City Council may set maximum norms here according to the situation, but the parking provision will not exceed the maximum in the table (presented in italics).

	Retail warehouses	Other shops under 500 m2	Other shops over 500 m2
City center	*1:60 m2*	*1:50 m2*	*1:25 m2*
Periphery of city center	*1:60 m2*	*1:50 m2*	*1:25 m2*
Public transport corridors	1:50 m2 to 1:60 m2	1:40 m2	1:20 m2 to 1:25 m2
Medium accessibility areas	1:25 m2 to 1:30 m2	1:20 m2	1:10 m2 to 1:12 m2
Major growth areas	1:50 m2 to 1:60 m2	1:40 m2	1:20 m2 to 1:25 m2
Rest of city	1:25 m2 to 1:30 m2	1:20 m2	1:10 m2 to 1:12 m2

4.3 Complementary policies

84. The changes in the parking policy in 1994 were accompanied by a number of complementary policies.

85. The first policy concerns the management of on-street parking spaces. As pointed out in Chapter 2, the limitation of off-street parking spaces related to offices and other land uses creates the risk of a spillover effect: car users will start to use on-street parking spaces in the areas around the offices or other land uses to which maximum parking norms apply. This reduces the effectiveness of the maximum parking norms and can create nuisance for other car users and residents in the area.

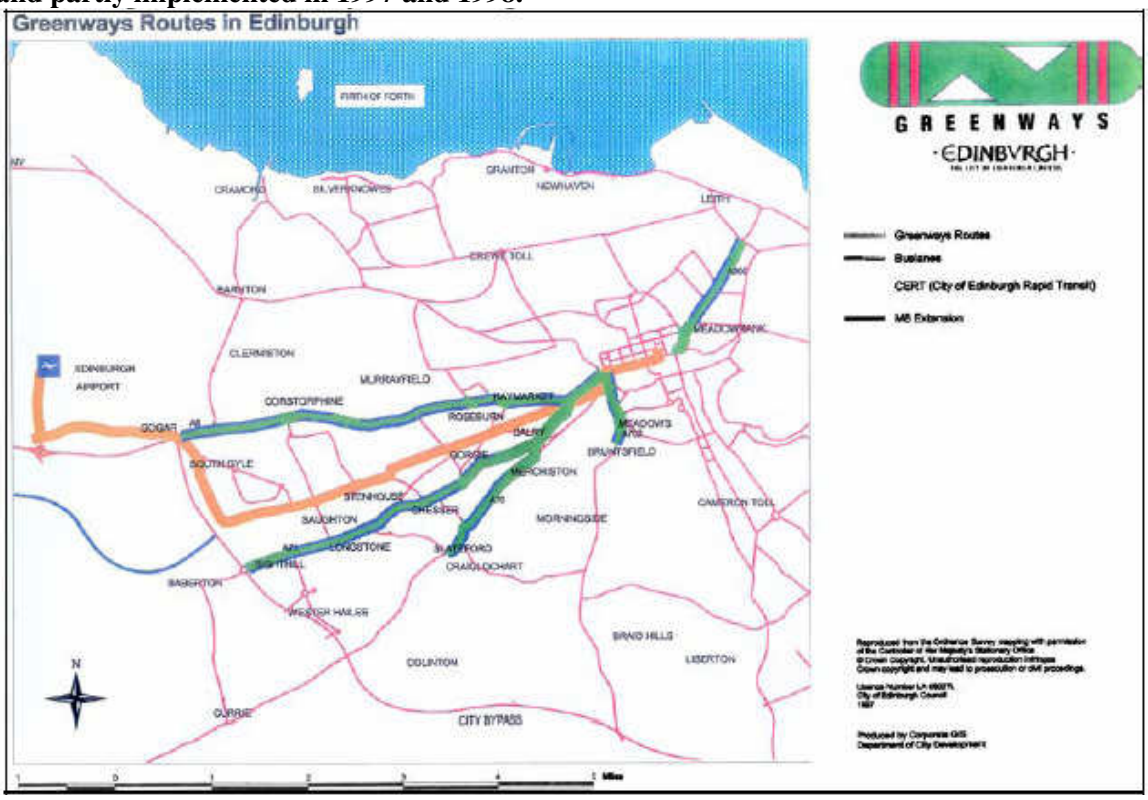
86. Edinburgh City Council has dealt with this issue since the early 70s. In 1974, the Council introduced a Controlled Parking Zone (CPZ) in the city centre and extended into inner residential areas in 1976. The introduction of the CPZ was developed as a tool to cope with ever increasing demand for residents' car parking as car ownership grows, in competition with the demand for public parking and servicing. To reduce the impact of car trips to the city center, the Council has expanded car parks at railway stations, providing park-and-ride sites at the edge of the city. Council policy on public parking in the center has focused on two actions. The first is replacing on-street with off-street public parking, to return street space to pedestrians, cyclists and buses, and make it easier to guide drivers to parking spaces. To ensure the public parking stock supports city center retailing, the Council has sought to retain the overall number of short stay public spaces serving the centre. This policy is being undermined at some city centre car parks, which operate in a way that encourages long stay commuter parking. Therefore, the second element of public parking policy has been to ensure that car park tariffs encourage short stay parking.

87. The second policy that strengthens the maximum parking norms is the improvement of public transport. A plan to substantially improve Edinburgh's bus system was approved parallel to the adoption of the revised parking policy in 1994. This so-called 'Moving Forward' transport strategy includes the following measures: (1) extension of the system of free bus lanes; (2) upgrading of the existing bus lanes to so-called 'greenways'; (3) realization of an express bus way connecting the city center with South Gyle (a major shopping center on Edinburgh's urban edge), Edinburgh Park (Edinburgh's main urban edge office location), and Edinburgh Airport; and (4) improvement of park-and-ride facilities to stimulate combined use of car and public

[22] City of Edinburgh (1999) *Parking standards for development control*. Edinburgh, City of Edinburgh.

transport.[23] The 'greenway' concept provides a more comprehensive alternative to the traditional bus lanes. It includes a system of strictly enforced bus lanes on main radial routes operating for longer than normal periods. Parking and stopping in the greenways are strictly prohibited and enforcement is carried out by a dedicated police team over the whole length of the bus lanes. Note that the implementation of these measures only started after the introduction of the parking policies. For instance, the first 13 kilometer of greenways came into operation only in 1997 and a further 13 kilometer in 1998. [24]

Figure 4.2 Prime 'greenways' – Edinburgh's high quality bus lanes – as proposed in 1994 and partly implemented in 1997 and 1998.[25]



88. The third 'complementary' policy lies in the actual enforcement of the parking norms. The Edinburgh interviewees have indicated that the parking policy is backed by both the planners working for the City Council and by the political echelon. As a result, the maximum parking norms are upheld in almost all cases, with a few exceptions due to unique circumstances.

89. In contrast, land use regulations have hardly played a role in the Edinburgh case in the first years after the adjustment of the parking policy in 1994. Overall, the planning guidelines of the Scottish Executive (the Scottish government) have been rather lenient: they discouraged urban edge and out-of-town development, but the lacked real 'teeth' to block developments. The situation only improved towards the end of the 90s, when the planning guidelines became more restrictive with regard to office and retail development outside existing urban areas.

[23] Baker, G. J. (1998) *Edinburgh greenways*. Edinburgh, Royal Academy of Engineering; Edinburgh City Council (1999) *Interim local transport strategy 2000 to 2003*. Edinburgh, Edinburgh City Council

[24] Source: http://www.edinburgh.gov.uk/CEC/City_Development/Economic_Development_and_Estates/-Edinburgh_Facts_and_Figures/Road/road.html, last accessed 10 October 2004.

[25] Baker, G. J. (1998) Edinburgh greenways. Edinburgh, Royal Academy of Engineering.

4.4 Transport circumstances at the time of the introduction of the parking policy

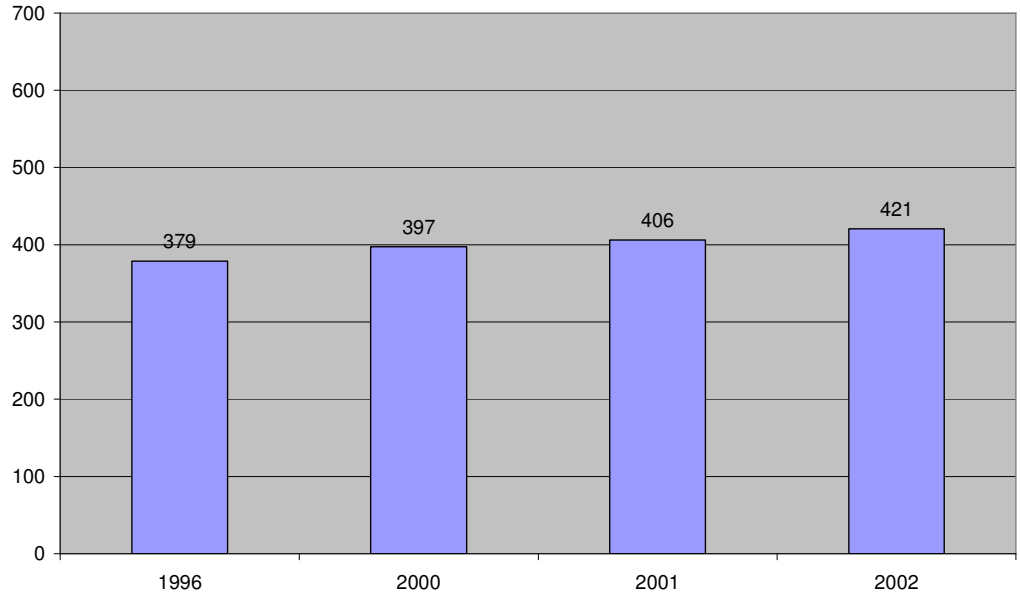
Public transport

90. Edinburgh's public transport system is dominated by buses and – to some extent – commuter and long distance rail. The city is covered with a dense network of bus lines and a basic network of dedicated bus lanes or 'greenways' on the prime roads through the city.[26] The heart of the bus network is the city center, through which most buses travel. The city center is also well served by rail through the Waverly Station, while a new train station was opened at the Edinburgh Park in 2003, the second most important office location in Edinburgh after the city center. The Waverly station has connections with most important cities throughout the UK, and with adjacent cities such as Glasgow, Aberdeen and Inverness. A comparable network of intercity bus services exist. Note that no quantitative data about the public transport system are available.

Motorization rate

91. The motorization rate in Edinburgh has seen a substantial rise over the past years: from 379 in 1996 to 421 in 2002. The rate is low in comparison with Frankfurt and Zürich, but substantially higher than the motorization rate of Tel Aviv, which stood at 247 in 1995.

Figure 4.3 Motorization rate in Edinburgh, 1996-2002.[27]



Parking availability

92. The number of parking places in the city center of Edinburgh is comparable to Frankfurt but substantially higher than that for Zürich. Off-street public parking accounts for 52% of total public parking in the city center of Edinburgh, or 5,975 spaces in 2003. This is close to the amount of public off-street parking in the city center of Rotterdam. Edinburgh furthermore has a relatively high number of private parking spaces in comparison to e.g. Frankfurt and Zürich. This may in part be explained by the fact that the vast majority of office buildings in the city center of

[26] See for instance http://download.edinburgh.gov.uk/Edinburgh_Area_Map.pdf and http://download.-edinburgh.gov.uk/Edinburgh_City_Centre_Map.pdf , accessed 2 October 2004.

[27] Data based on Gainey, G. (2004) Key indicators Edinburgh. Edinburgh, Edinburgh City Council/City Development Section.

Edinburgh was realized before the introduction of the restrictive parking norms. The Edinburgh city center thus has a reservoir of private parking available linked to these existing office buildings. The situation is different in Frankfurt and Rotterdam, where a larger share of office space was realized after the introduction of the restrictive parking norms.

Table 4.4 Number of parking places in the case study cities.[28]

		Edinburgh (1)	Frankfurt	Rotterdam	Zürich
City center	Private parking	10,300	7,900	--	6,600
	Public parking	11,475	12,200	6,680 (2)	2,100
	Total	21,775	20,100	--	8,700
City	Private parking	--	--	--	202,400
	Public parking	--	--	37,650	51,500
	Total	--	--	--	253,900
(1) Partly based on estimates (2) Includes only parking places in public parking garages					

Commuting

93. In 1991, slightly more than 29% of all jobs in Edinburgh were held by people living outside the city. The travel mode of these commuters is comparable to those traveling within the city. About half travels by car, while bus and train account for one third of all trips. According to qualitative date, the share of commuters among the workforce in Edinburgh has increased substantially since the early 90s risen.[29] Data documenting this rise, or data on the changes in the modal split, are not available.

Modal split

94. Data on the modal split in Edinburgh show that about one third of home-to-work trips with origin and destination in Edinburgh are made by public transport. Cycling and walking account for about one fifth of all the trips. The car, in turn, is good for about 40% of all the home-to-work trips with origin and destination in Edinburgh. While the share of the car has increased in the period 1996-2000, it has slightly decreased since then. The Edinburgh interviewees ascribe this development to both the improvements in the public transport system (greenways program) and the maximum parking norms. Note that the share of the car is substantially lower for home-to-work trips to the city center, but no specific data are available.

95. Data on the modal split for shopping trips to the city center of Edinburgh show that the use of the car has decreased in the period 1985-1999. In this period, the share of the car dropped from 31% to 22%. The share of public transport has remained fairly stable over this period (bus and train), while especially the share of visits by foot has increased substantially from 16% in 1985 to 25% in 1999.[30]

[28] Source for Edinburgh: Gainey, G. (2004) *Key indicators Edinburgh*. Edinburgh, Edinburgh City Council/City Development Section

[29] See http://manage.edinburgh.gov.uk/capitalreview/Transport/Table_C1.html#1, last accessed 20 September 2004.

[30] City of Edinburgh (2000) *Edinburgh and Lothian shopping surveys 1999: key findings*.

Table 4.5 Modal split for home-to-work trips with origin and destination within Edinburgh, 1991-2002.[31]

	Home-to-work trips within Edinburgh			All home-to-work trips with destination Edinburgh
	1991	2000	2002	1991
Car	40%	45%	42%	41%
Car passenger	6%	7%	7%	7%
Bus	31%	25%	26%	31%
Rail	1%	1%	1%	3%
Bicycle	2%	3%	4%	2%
Walking	15%	17%	17%	12%
Other	6%	2%	2%	5%

Parking

96. The vast majority (60%) of people traveling by car to their workplace in Edinburgh park for free on parking places provided for by the employer. Another 28% finds free on-street parking or on free-of-pay car parks. Only 11% of all drivers traveling to work have pay for their parking. Of these, 8% parks on a parking place provided by, but not paid by, the employer.

97. The high percentage of car users that park for free at parking places provided by the employer seems to be in contrast to the restrictive parking norms. However, it should be noted that the figures of today are the result of policies of the past. Many employers are located in buildings or at premises that have received planning approval before the introduction of the restrictive parking policies. Many of these buildings and premises offer parking places well above the current maximum norms, to a large part as a result of the minimum norms that were applied before the introduction of the maximum norms in 1978, 1994 and 1999. This is true for office buildings in the city center that have been built before the introduction of the parking policy in 1978, and for both office and industry premise developed before the adoption of the new parking norms in 1994 and 1999 in areas outside the city center. The result is that a substantial part of the workforce still can make use of parking places provided by the employer.

Table 4.6 Type of car parks used by people traveling by car to their workplace within Edinburgh, 1999/2000.[32]

Type of parking facility	Share of car users using the facility
Car park from employer, free	60%
On street, free of charge	24%
Another car park, free of charge	4%
Car park from employer, driver must pay	8%
On street, driver must pay	1%
Commercial car park	2%
Elsewhere	1%

4.5 Economic development

98. This section provides an overview of the economic development in the Edinburgh region. Part of the data compares Edinburgh city with the surrounding localities in the Lothian region, but as far as possible comparisons are made at the level of employment concentrations. The section starts

[31] Sources: Gainey, G. (2004) Key indicators Edinburgh. Edinburgh, Edinburgh City Council/City Development Section; http://www.scotland.gov.uk/stats/bulletins/00134-19.asp; and http://manage.-edinburgh.gov.uk/capitalreview/Transport/Table_C2.html , last accessed 10 October 2004.
[32] Source: http://www.scotland.gov.uk/stats/bulletins/00134-21.asp , last accessed 10 October 2004.

with a discussion of the overall development of the city, and then discusses the office and retail sectors in detail.

Economic development of the city

99. Edinburgh has seen a steady growth in *employment* over the period 1984-2002. The number of jobs in the city has grown from 230,000 in 1984 to over 300,000 in 2002, which means a yearly growth of 1.5%. In comparison with the surrounding localities the city has faired well over the period 1998-2002, for which comparative data are available. Edinburgh accounts for the vast share of employment growth in the region (82%) and has seen an above average growth rate. As a result, the share of the city in regional employment has been steady at 72-3% over the last years.

Table 4.7 Development in employment for Edinburgh and the Lothian region, 1998-2002.[33]

	1998	1999	2000	2001	2002	Change	
Edinburgh	278,004	270,214	291,848	297,341	308,865	30,861	6.7%
East Lothian	24,370	23,255	24,471	24,143	25,034	664	-3.6%
Midlothian	21,946	22,230	22,486	24,052	24,463	2,517	6.9%
West Lothian	63,835	60,129	66,948	67,632	67,296	3,461	5.0%
Total Region of Lothian	388,155	375,828	405,753	413,168	425,658	37,503	5.8%
Share of Edinburgh in region	72%	72%	72%	72%	73%	82%	

100. A further indicator for the performance of the city in relation to the surrounding localities is the so-called *entrepreneurial activity*, which can be derived from data on VAT registrations and de-registrations. Data show that the vast majority of all VAT registrations and de-registrations occurs within Edinburgh, with shares lying between 65-71%. West Lothian comes second in line, but has a much lower level of entrepreneurial activity than the city, with a share not higher than 16% in the period 1995-2002. These data suggest that the city has remained the focal point of economic activity over the past decade.

Table 4.8 Entrepeneurial activity in Edinburgh and the Lothian region as reflected in VAT registrations and de-registrations, 1995-2002.[34]

	Registrations						De-registrations					
	1995		1998		2002		1995		1998		2002	
Edinburgh	1275	68%	1555	71%	1250	66%	1100	65%	1225	71%	1335	69%
East Lothian	185	10%	180	8%	180	10%	180	11%	170	10%	200	10%
Midlothian	120	6%	130	6%	160	8%	125	7%	105	6%	100	5%
West Lothian	305	16%	330	15%	300	16%	275	16%	220	13%	300	16%
Total Region of Lothian	1885	100%	2195	100%	1890	100%	1680	100%	1720	100%	1935	100%

Developments in the office sector

101. The office sector in Edinburgh has seen a tremendous growth over the past decades, with an annual *employment* growth rate of 13% over the period 1984-2002. The figures reflect the shift from industry to service sector, which has taken place in cities throughout the industrialized world. In Edinburgh, the share of the service sector (excluding the public sector, education and health sectors) has risen from 13% in 1984 to 34% in 2002. It currently employs over 100,000 people. The city has also performed well in comparison to the other localities in the Lothian region. Over the period 1998-2002, virtually all growth in office sector employment has taken place in the city (93%). During this period, the office sector has grown with 30.7%, which is above the regional average. As a result, the city has managed to further strengthen it dominance in the regional office sector employment: its share in total office employment has risen from 85% in 1998 to 87% in 2002.

[33] Source: http://www.llmu.org/factsandfigures/default.htm, last accessed 8 September 2004.
[34] Source: http://www.llmu.org/factsandfigures/default.htm, last accessed 8 September 2004.

Table 4.9 Development in office sector employment (banking, finance, insurance etc) for Edinburgh and the Lothian region, 1998-2002.[35]

	1998	1999	2000	2001	2002	Change	
Edinburgh	77,359	72,373	86,086	97,106	101,096	23,737	30.7%
East Lothian	2,104	1,983	2,525	2,627	2,419	315	15.0%
Midlothian	3,081	2,071	2,465	4,308	4,069	988	32.1%
West Lothian	8,824	5,653	8,287	8,313	9,201	377	4.3%
Total Region of Lothian	91,368	82,080	99,363	112,354	116,785	25,417	27.8%
Share of Edinburgh in region	85%	88%	87%	86%	87%	93%	

102. The prime office locations in the Edinburgh region are the city center of Edinburgh and Edinburgh Park (South Gyle). These two locations account for the vast majority of office space in the region. Both of them are located within the municipal boundaries of Edinburgh. In addition, small concentrations of often no more than a few office buildings can be found in the north of Edinburgh (Leith) and in the surrounding localities. The relative importance of the various office locations can be derived from a number of indicators: office requirements; office take-up; and prime rent. Each of these indicators is discussed below.

103. The term *office requirements* refers to all companies looking for new office space, whether it is part of a relocation, an expansion, or other. Most companies that are searching for new office space have a clear preference with regard to the area in which they would like to rent/buy new office space. As a result, the office requirements provide an indicator for the relative popularity of the various locations in the Edinburgh region. Data from Jones Lang LaSalle show that the city center is preferred by most companies, with a share of 43% to 70% of total office requirements over the period 1999-2003. However, the city center seems to have lost some of attractiveness to peripheral locations over the last past years.

Table 4.10 Office requirements in Edinburgh region by type of location, 1999-2003.[36]

	1999	2000	2001	2002	2003
City Center	70%	54%	43%	56%	58%
Edinburgh Park	9%	9%	17%	14%	12%
Other decentralized	8%	14%	17%	17%	11%
Non specific	13%	23%	23%	13%	19%

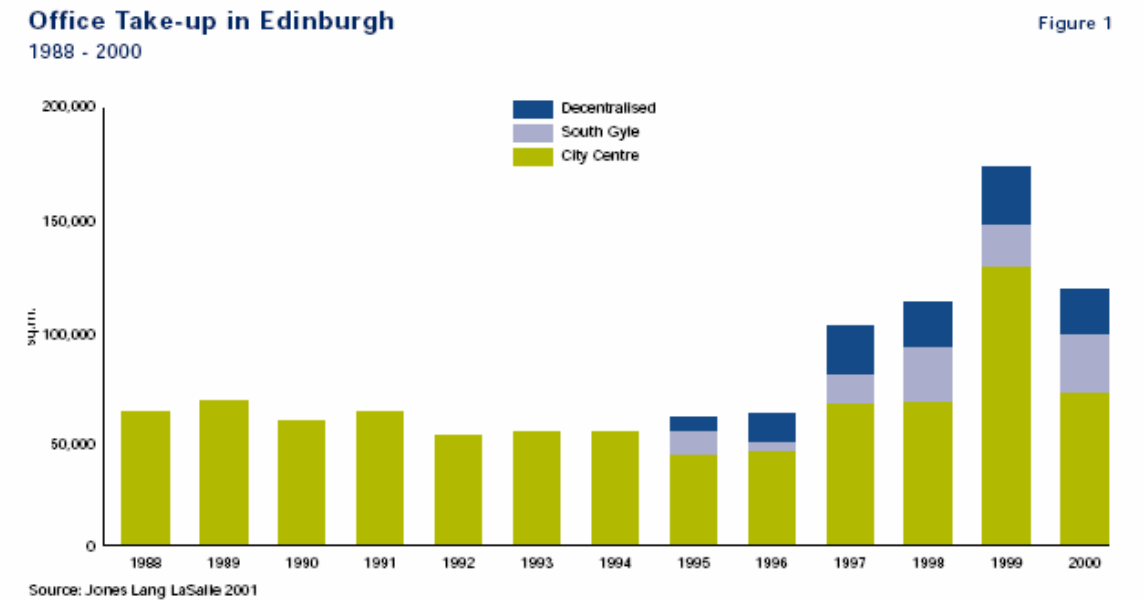
104. The *take-up of office space* is another indicator to describe the trends in the office market. The term 'office space take-up' refers to all new contracts closed between an office user (company, business) and an owner of office space. It includes the extension of existing contracts (in which case a company remains in the same office space), contracts for existing buildings (in which case a new company moves into an existing building), and contracts for new office space (in which case a company moves into a new office building).

105. Like the data on office requirements, the data on office space take-up reflect the growing importance of peripheral office locations in the Edinburgh region, and most importantly the increasing importance of Edinburgh Park (South Gyle). Until 1994 virtually all office take-up took place in the city center. From that year onwards, Edinburgh Park and other peripheral

[35] Source: http://www.llmu.org/factsandfigures/default.htm, last accessed 8 September 2004.
[36] Jones Lang LaSalle (2000) Edinburgh city report spring 2000. Edinburgh, Jones Lang LaSalle, Jones Lang LaSalle (2001) Edinburgh city report spring 2001. Edinburgh, Jones Lang LaSalle, Jones Lang LaSalle (2002) Edinburgh city report spring 2002. Edinburgh, Jones Lang LaSalle, Jones Lang LaSalle (2004) Edinburgh city report spring 2004. Edinburgh, Jones Lang LaSalle.

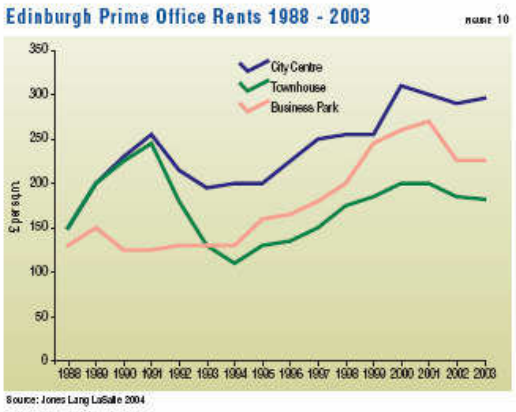
locations have become more important at the expense of the city center. Over the period 1998-2003, the city center has accounted for 45-74% of all office space take-up, and Edinburgh Park for 6-30%. While it is difficult to distill a trend from the available data, they suggest that Edinburgh Park/South Gyle has established its position as a key office area in the Edinburgh region and that the interest in other peripheral office locations is rising.

Figure 4.4 Office take-up in Edinburgh, 1988-2001.[37]



106. A third indicator for the relative attractiveness of the various office locations in the Edinburgh region is the level of *prime rents*. The data for the period 1988-2003 show that the city center has performed relatively well. The city center features the highest prime rents over the whole period and a strong increase over the years. However, the gap between Edinburgh Park and the city center seems to be closing since 1994-1995, which can be considered as an indicator for its increasing attractiveness among office users.

Figure 4.5 Development in prime office rents for the three main office locations in Edinburgh (city center, Edinburgh Park and Townhouse), 1988-2003.[38]

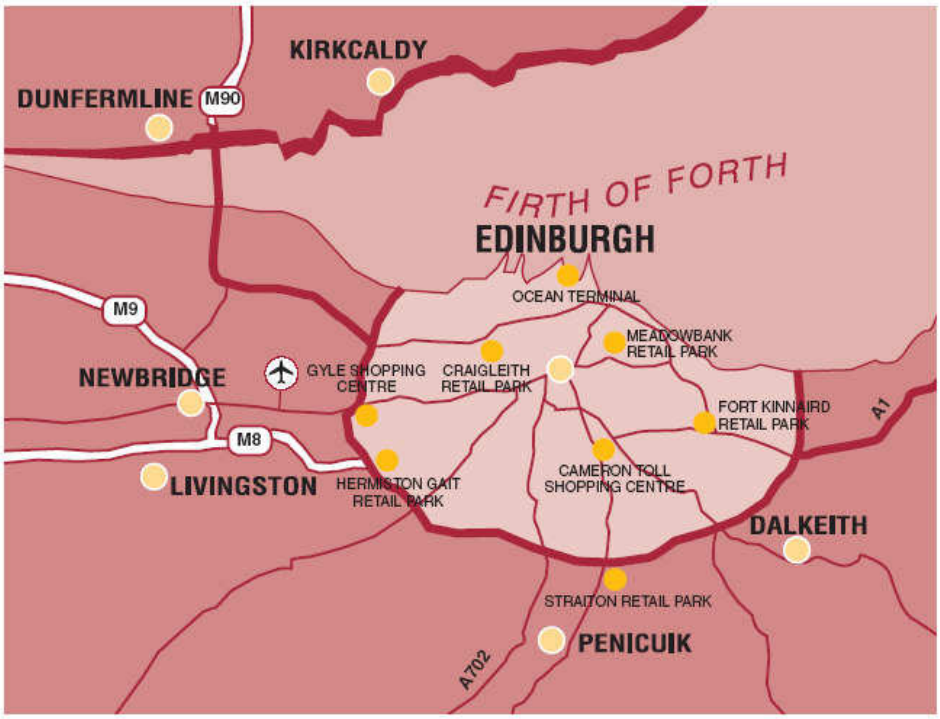


[37] Source: Jones Lang LaSalle 2001.
[38] Source: Jones Lang LaSalle (2004) Edinburgh city report spring 2004. Edinburgh, Jones Lang LaSalle.

Developments in the retail sector

107. The retail market in the Edinburgh region is dominated by eleven retail centers. This includes the city center of Edinburgh, the city center of Glasgow, eight retail centers located in and around Edinburgh, and one retail center located in Livingstone. Three of the retail parks in Edinburgh are located on an urban-edge or out-of-town location (see map). Data on two indicators of the relative performance of the retail sector in Edinburgh are available: prime rent levels and shopping spending.

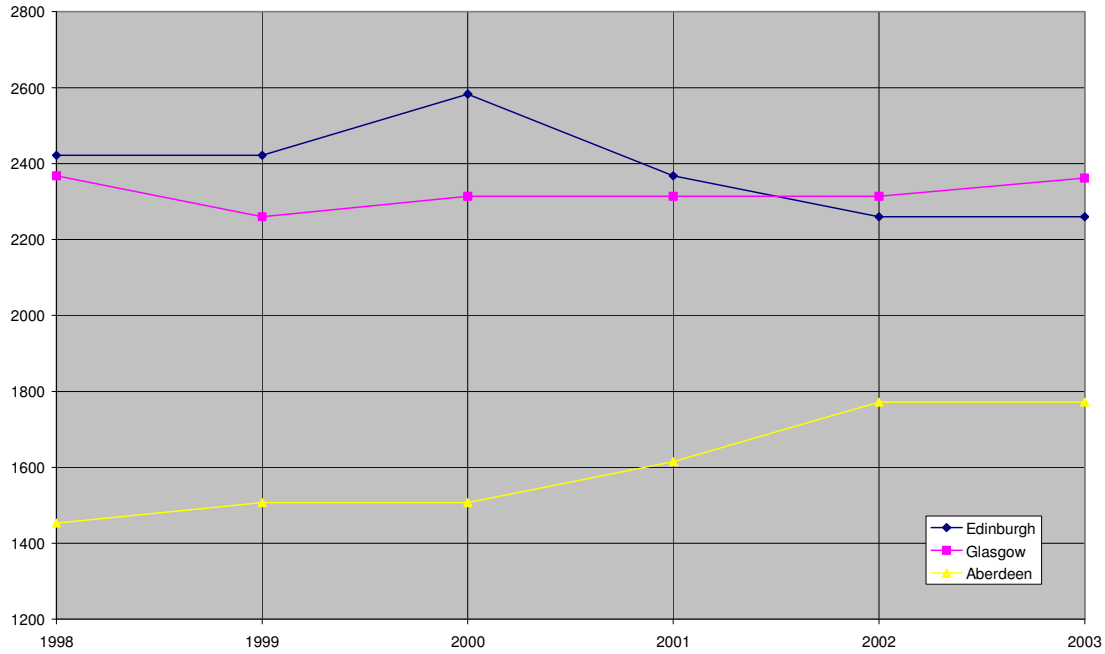
Figure 4.6 Prime retail locations in the Edinburgh region.[39]



108. The developments in the *prime rent level* over the period 1998-2003 show that the city center of Edinburgh has performed relatively poor compared to the adjacent major cities of Glasgow and Aberdeen. While the last two cities have seen stable or slowly increasing prime rent levels, Edinburgh city center has seen a slight decrease in the prime rent level since 2000. This suggests a weakening interest in retail real estate in the city center.

[39] Source: Jones Lang LaSalle (2004) Edinburgh city report spring 2004. Edinburgh, Jones Lang LaSalle.

Figure 4.7 Development of prime rent levels in the retail sector, for the city centers of Edinburgh, Glasgow and Aberdeen, 1998-2003.[40]



109. The data on *shopping spending* in the Edinburgh region show a less negative trend of the performance of the city center. Despite the rise in urban-edge shopping centers, the city center still accounts for 32% of non-food shopping spending by residents of the Lothian area. The other retail centers have far lower shares. The most prominent centers, Almondvale located in Livingstone and Gyle located at the urban edge of Edinburgh, have shares of 9.1% and 8.6% respectively in non-food spending. Glasgow has a slightly higher share in non-food spending than these two peripheral retail centers (9.4%). The city center of Edinburgh thus retains its dominant position in the non-food sector. Data on the attraction of the city center per locality confirm this: the city center accounts for 42.6% of spending by Edinburgh shoppers, 26.7% of East Lothian spending, 32.3% of Midlothian spending and 12.1% of West Lothian spending. The city center is this a prime shopping destination for a major part of Lothian residents in the Lothian region. The low figure for West Lothian can be attributed to the fact that this municipality includes the Almondvale retail center and is located relatively close to Glasgow.[41]

4.6 Impacts of parking policy on economic development: interview results

110. The data on the economic development in the Edinburgh region suggest that the city and city center have preformed relatively well since the introduction of a restrictive parking policy in the City of Edinburgh as early as 1978. The interview-round among experts in the Edinburgh area strengthens this assessment and provides additional insights into the reasons for the ongoing economic vitality of the city and city center. The informants include three professionals from the

[40] Sources: Jones Lang LaSalle (2000) *Edinburgh city report spring 2000*. Edinburgh, Jones Lang LaSalle, Jones Lang LaSalle (2001) *Edinburgh city report spring 2001*. Edinburgh, Jones Lang LaSalle, Jones Lang LaSalle (2002) *Edinburgh city report spring 2002*. Edinburgh, Jones Lang LaSalle; Jones Lang LaSalle (2004) *Edinburgh city report spring 2004*. Edinburgh, Jones Lang LaSalle.
[41] City of Edinburgh (2000) *Edinburgh and Lothian shopping surveys 1999: key findings*.

City of Edinburgh and two real estate agents representing the two leading real estate agencies in the Edinburgh area (see appendix).

Office sector

111. All of the informants stress the attractiveness of the city center for the office sector. A prime factor that contributes to this attractiveness is the concentration in the city center of high value offices and decision-making centers, such as banks and insurance companies, and the related prestige of the inner city area. Further factors are the attractive urban environment offered by the city center, given the variety of services available in the direct proximity of the offices: cafes, restaurants, shops, cultural activities such as museums and galleries, and also 'practical' services provided by e.g. government bodies. These factors make the city center the most attractive office location in the Edinburgh area. The high quality of the public transport system in the city center, which is well accessible by bus and served by the central train station, further adds to the attractiveness of the city center.

112. The attractiveness of the city center is reflected in the real estate prices, most notably the prime office rent. The fact that office rents are higher in the city center than in other locations triggers certain types of offices to look for alternative locations. This is especially true for offices that do not 'need' to be in the city center, such as back office activities, and for offices that cannot afford to pay the high rents, such as lower value activities. Such offices will generally look for other locations outside the city center, either within the city or in the surrounding localities. However, sectors closely linked to the banking sector, such insurance companies or legal services, and headquarters of bank themselves will prefer to be located in the city center, close to their business customers and to the decision-making centers. The rent levels will not scare them away.

113. In addition to the rent levels, the physical limitations of the city center play a role in the location dynamics of the office sector. First, because of the historical character of the city center – which is largely dominated by buildings from the 18th and 19th century – the number of existing large office buildings available in the city center is limited. Second, there are no vacant areas left within or adjacent to the city center. Thus, new, large scale developments can only be realized through redevelopment – which makes it more complicated and expensive to realize large-scale office space. The lack of space is especially important in Edinburgh. Because it is the Capital of Scotland, the office market is characterized by an over-representation of headquarter offices and government functions. All of these require large office spaces, sometimes for thousands of employees. The physical limitations of the city center may induce large offices to locate at other locations. Especially Edinburgh Park is attractive in this sense, as it can offer tailor-made large office spaces in an attractive environment.

114. The physical limitations of the city center also place the rise of Edinburgh Park as an office location in perspective. Given its limitations, the city center can simply not absorb all demand for new office space in the Edinburgh region. There is a need for additional locations that offer a high quality office environment. In this sense, Edinburgh Park does not only compete with, but is also complementary to, the city center, as it is the only location in the region that offers such a high quality office location, in terms of image and services such as restaurants and cafes. The informants thus suggest that the rise of Edinburgh Park should not be seen as a result of the reduced attractiveness of the city center, but rather as an inevitable development in the office sector.

115. The informants note that the competition between Edinburgh city center and office locations in the surrounding localities is very limited. The number of office concentrations outside Edinburgh is small and most consist of not more than one or two office buildings. The city is extremely

strong in relation to these locations: it offers a high quality workforce and an extremely high and appreciated quality of life.

116. The informants thus point at a number of factors that can explain the ongoing attractiveness of the city center vis-à-vis other office locations. They also stress that parking plays a relatively small role in the office dynamics. As one real estate agent put it: "Individual companies often want more parking places and express that they are not satisfied with the number of parking spaces offered in the city center. However, in the end the pull of the city center is so great that they are willing to accept fewer parking spaces in return for a location in the center." Parking is mainly important for offices that are dependent on car-based travel, such as offices that employ a high share of sales people. But even for these offices, parking is not the only location factor. For other offices, parking is clearly only one among a number of factors that is weighed in the location decisions of an office, and it definitely not the principle factor, according to the informants.

Retail sector

117. The informants draw a different picture for the retail sector. They generally feel that the retail sector in the city center has lost some of its attractiveness among shoppers. They attribute this to the stiff competition between the city center and urban-edge retail centers, to the lack of possibilities to strengthen the shopping facilities in the city center, and to the problematic car accessibility of the city center.

118. The urban-edge shopping centers have been able to attract a substantial part of total retail spending in Edinburgh, to a large extent because of the convenience they offer to shoppers in terms of free and plentiful parking and easy car accessibility. The city center scores less well in these respects. Various access roads to the city center do not provide direct access to a parking garage or parking lot and on-street parking is often problematic. At other access roads parking garages are available, but they are often located at several hundred meters from the core of the shopping area.

119. Note that these parking problems are not the result of the maximum parking norms for the city center. The lack of parking is not caused by the maximum parking norms, but rather by the problematic provision of public parking in the city center. In large part due to the historic structure of the center, it has proven to be difficult to develop large-scale parking garages close to the shopping area. Thus, physical limitations rather than maximum parking norms cause the problematic parking situation. The maximum parking norms may actually strengthen the city center, as they will limit the number of parking places available urban-edge retail centers. The norms may thus limit the parking advantage of these centers vis-à-vis the city center.

120. The historical structure of the city center has also made it difficult to strengthen the city center shopping area by realizing a new shopping center within it. Such new investments can attract more shoppers to the city center. However, there have been two initiatives over the past few years, but both have failed. This lack of investments undermines the strength of the city center as a retail center.

Parking policy and economic development

121. The outcomes of the interview-round suggest that the restrictive parking policy has not had any negative impacts on the economic development of the city or city center of Edinburgh. The city center has upheld its strong position and remains the prime office location in the Edinburgh region. The retail sector in the city center has performed less well, but hardly as a result of the restrictive parking policies. While the problematic parking provision in the city center does play a role in the relatively poor performance of the city center, this problematic provision is not so

much the result of the restrictive parking policy, but rather of the difficulties to provide adequate parking within historical structure of the city center. The restrictive parking policy may actually be expected to strengthen the retail sector in the city center, as it will limit parking provision at the competitive urban-edge retail centers, for which parking is far more important as a tool to attract customers.

Chapter 5 Case study 2: Frankfurt

5.1 Introduction

122. Frankfurt am Main is located in the center of Germany and is the main financial center of the country. The city is part of the so-called 'Planungsverband Ballungsraum Frankfurt / Rhein-Main', an area consisting of 75 municipalities. Frankfurt is by far the largest city in the region with about 650,000 inhabitants. Other cities of substantial size include Offenbach am Main (over 110,000 inhabitants), Hanau (about 90,000 inhabitants), Ruesselsheim (60,000 inhabitants) and Bad Homburg (52,000). All other towns in the region are substantially smaller. The result is a dispersed spatial structure with a relatively low density, certainly in comparison to major cities like Paris and London (see map).

Table 5.1 Frankfurt versus Tel Aviv in tems of inhabitants, surface area and density. [42]

	Frankfurt		Tel Aviv	
Population				
City	642,670	(2003)	363,400	(2003)
Metropolitan area			1,164,300	(2003)
Region	2,174,407	(2003)	2,741,300	(2003)
Surface area (km2)				
City	248.4	(2003)	51.8	(2003)
Metropolitan area			171.0	(2003)
Region	2458.6	(2003)	1,344.0	(2003)
Density (persons/ha)				
City	25.9	(2003)	70.2	(2003)
Metropolitan area			68.1	(2003)
Region	8.8	(2003)	20.4	(2003)

Figure 5.1 The spatial structure of the Frankfurt region in comparison to London and Paris regions.

[42] Source for Frankfurt: http://www.pvfrm.de/download/ZF-2004.pdf , last accessed 6 October 2004. Sources for Tel Aviv: Israeli Central Bureau of Statistics (http://www1.cbs.gov.il/reader/shnatonenew.htm) and Municipality Tel Aviv (2003) Statistical yearbook 2003. The Frankfurt region covers the area of the 'Planungsverband Ballungsraum Frankfurt Rhein/Main'. The Tel Aviv metropolitan area covers the area of the Tel Aviv District ('Machoz Tel Aviv'), whereas the Tel Aviv region covers the area of the Tel Aviv and Central Districts.

5.2 Parking policy

123. The current parking policy of Frankfurt is based on the Building Act of the State of Hessen ('Hessische Bauordnung'), the most recent version of which has been adopted in June 2002.[43] The Act gives local authorities in Hessen a broad authority in the regulation of parking and the setting of parking norms. Among others, the Act enables local authorities to limit the number of parking places 'for reasons of traffic and urban structure'. The Act furthermore enables a local authority to charge financial compensation for the parking places that are not realized – more specifically, for the difference between the 'required parking spaces' based on transport demand and the number of parking places that a developer actually builds. Thus, a developer can at the same time be required to limit the number of parking spaces he provides *and* be forced to pay compensation for the parking spaces he does not provide. This seems a paradox, but as Topp points out, the demand to pay compensation can also be viewed as a development in the direction of a public transport accessibility contribution on behalf of the developer, especially if the revenues are used for the improvement of public transport.[44]

124. The City of Frankfurt has adopted the philosophy of the parking policy of Hessen. The latest parking ordinance dates from July 1998.[45] The ordinance sets a minimum parking norm for each land use, enables the reduction of these minimum norms, and demands the payment of compensation for the number of parking places not realized because of factual or legal reasons. The 'legal reasons' include the maximum norms that also have been set by the city. The ordinance also sets the height of the compensation:
    - DM 20,000 per parking place in the central city area
    - DM 10,000 per parking place in the rest of the city

125. The parking ordinance also outlines the purposes for which the revenues collected through the parking compensation regulation are to be used: (1) provision of parking facilities by the municipality; (3) maintenance of existing parking facilities; (3) measures to improve public transport services; or (4) measures to improve bicycle facilities. At least half of the income has to be used for the first two purposes.[46]

126. The maximum parking norms are a result of the combination of the parking ordinance of 1998 ('Stellplatzsatzung') and the parking limitation ordinance of 1998 ('*Stellplatzeinschraenkungs-satzung'*). As mentioned above, the first ordinance distinguishes between ten types of land uses and defines minimum parking standards for each of them. The amount of parking to be provided is subsequently limited in the parking limitation ordinance through the 'percentage system'. The whole city is divided into four areas and for each area a different percentage applies. Area 1 includes the inner city and the area around the central train station. The area is served very well by public transport. The maximum parking standard is limited to 10% of the minimum standard or 'necessary parking places'. Area 2 follows the main lines of the U-bahn system (lightrail and underground) and the areas around stations that are served by more than one line of the S-bahn (commuter rail). Here, the maximum parking standard is 30%. In the third area, located around other U- and S-bahn stations, the maximum standard is 60%. For the rest of Frankfurt a standard

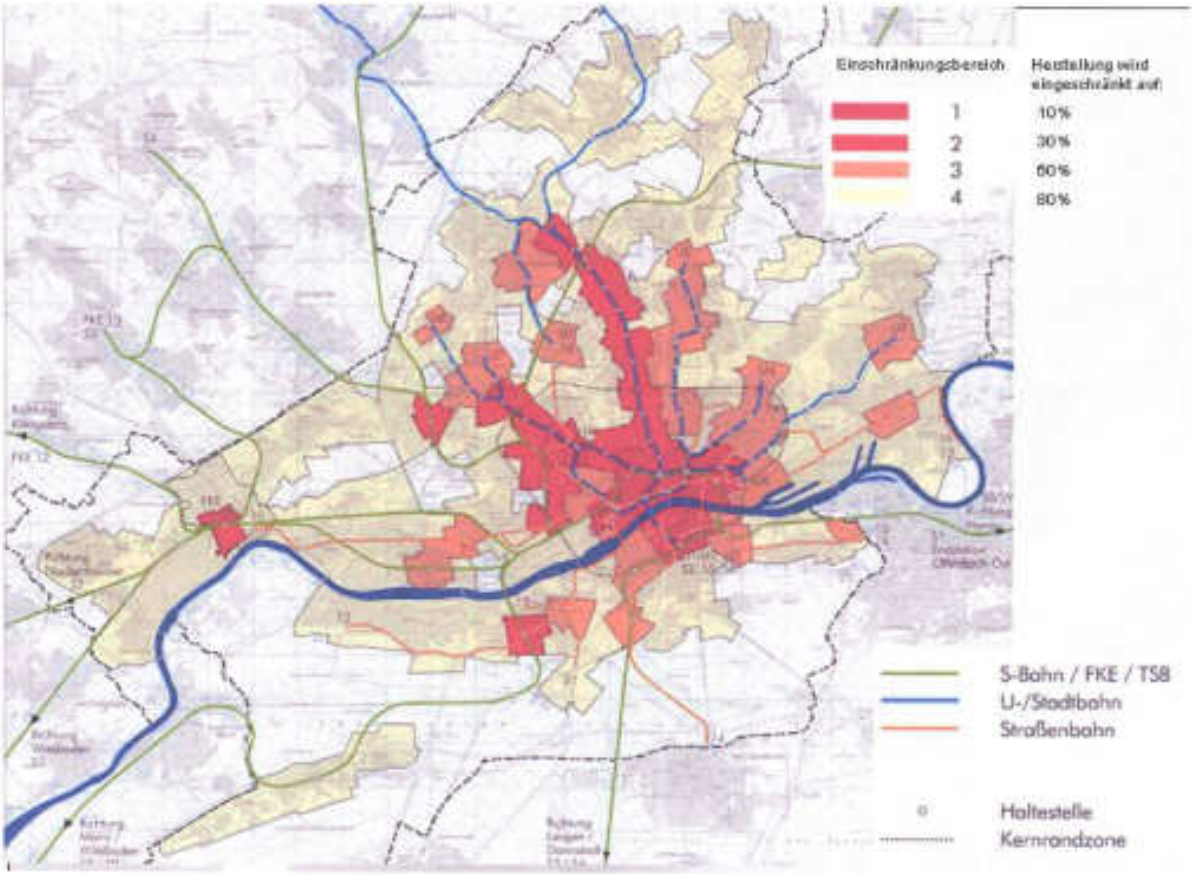
[43] Land Hessen (2002) *Hessische Bauordnung (HBO)*
[44] Topp, H. H. (1999) Stellplatzsatzungen wirken sich langfristig aus: ein Laender- und Staedtevergleich. *Der Staedtetag*, 7, p. 12
[45] Stadt Frankfurt (1998) *Satzung ueber die Pflicht zur Schaffung von Stellplaetzen fuer Kraftfahrzeuge und Garagen sowie von Abstellplaetzen fuer Fahrraeder (Stellplatzsatzung)*
[46] Stadt Frankfurt (1998) *Satzung ueber die Einschraenkung der Zahl von Stellplaetzen oder Garagen fuer Kraftfahrzeuge im Gebiet der Stadt Frankfurt am Main (Stellplatzeinschraenkungssatzung)*, p. 2.

of 80% is defined. In the resulting standards in parking places per square meter are summarized in the table below.

Table 5.2 Maximum parking norms in Frankfurt for key land uses.[47]

Land use	Minimum norm	Maximum norm			
		Area 1 - 10%	Area 2 - 30%	Area 3 - 60%	Area 4 - 80%
Offices	1:35 m2 net floor area	1 : 350 m2	1 : 117 m2	1 : 58 m2	1 : 44 m2
Shops	1:30 m2 sales floor space	1 : 300 m2	1 : 100 m2	1 : 50 m2	1 : 38 m2
Retail centers larger than 1200 m2	1:15 m2 sales floor space	1 : 150 m2	1 : 50 m2	1 : 25 m2	1 : 19 m2

Figure 5.2 The four parking areas in relation to the main public transport network, including the limitation through the percentage system.[48]



[47] Stadt Frankfurt (1998) *Satzung ueber die Pflicht zur Schaffung von Stellplaetzen fuer Kraftfahrzeuge und Garagen sowie von Abstellplaetzen fuer Fahrraeder (Stellplatzsatzung),* Stadt Frankfurt (1998) *Satzung ueber die Einschraenkung der Zahl von Stellplaetzen oder Garagen fuer Kraftfahrzeuge im Gebiet der Stadt Frankfurt am Main (Stellplatzeinschraenkungssatzung)*

[48] Source: Stadt Frankfurt (no date) *Stellplatzsatzung und Stellplatzeinschraenkungssatzung in Frankfurt am Main*, Presentation Stadtplanungsamt Verkehrplanung

5.3 Complementary policies

127. Frankfurt has adopted a number of policies over the past years that are complementary or supportive to the parking policy introduced in the city.

128. First, the city has invested substantial efforts in the management of public on-street and off-street parking places. Since the late eighties, the formal parking concept of the City Frankfurt is based on a drastic reduction of on-street parking by employees and a moderate parking supply for customers and visitors suited to the public transport quality in the area considered.[49] Like in the other case-study cities, public on-street parking place is being managed through a system of pricing and time limitations. These measures prevent commuters form using on-street parking places, especially in areas with high parking pressure. The City of Frankfurt has also set limitations concerning the use of public off-street parking by commuters, by limiting the share of parking places that can be let out on a permanent basis. This sets limits as to the number of additional parking spaces that offices and other businesses can rent in order to compensate for the restrictions on private parking provision. In the beginning of the nineties, about 40% of approximately 8,000 spaces in parking garages were permanently let, mostly for use by commuters and, to a lesser extent, by visitors of business.[50]

129. Second, the city and the region have invested substantially in the improvement of public transport. The attention has especially been directed to the S-bahn and U-bahn system. The most recent improvements in the U-bahn system – the underground – include the extension of various lines during the 90s. The improvements include the extension of line U7 (1992), the extension of the U5 on the existing underground track of U4 in 1998, the underground extension of line U6 in 1999, and the underground extension of U4 with two stations in 2001. The S-bahn was also substantially improved over the past decade. In the early nineties, connections to important towns like Offenbach and Hanau were opened, while in the second half of the nineties lines to the adjacent cities of Darmstadt and Wiesbaden were added. Recent improvements include the extensions of line S1 and S2 to a number of suburban localities.[51]

130. Third, since the late seventies efforts have been made to guide land use developments in the Frankfurt region through the development of a comprehensive land use plan accepted and supported by all localities in the region. The development of this plan took close to a decade and was finally approved in 1987 by the Interior Minister of Hessen.[52] Since then, the plan has played an important role in guiding the spatial development in the Frankfurt region. More recently, the Planungsverband Ballungsraum Frankfurt/Rhein-Main was established. The taks of the 'Verband' is to develop a new comprehensive land use plan, of which transport will be a key part.[53]

5.4 Transport circumstances at time of introduction of the parking policy

Public transport

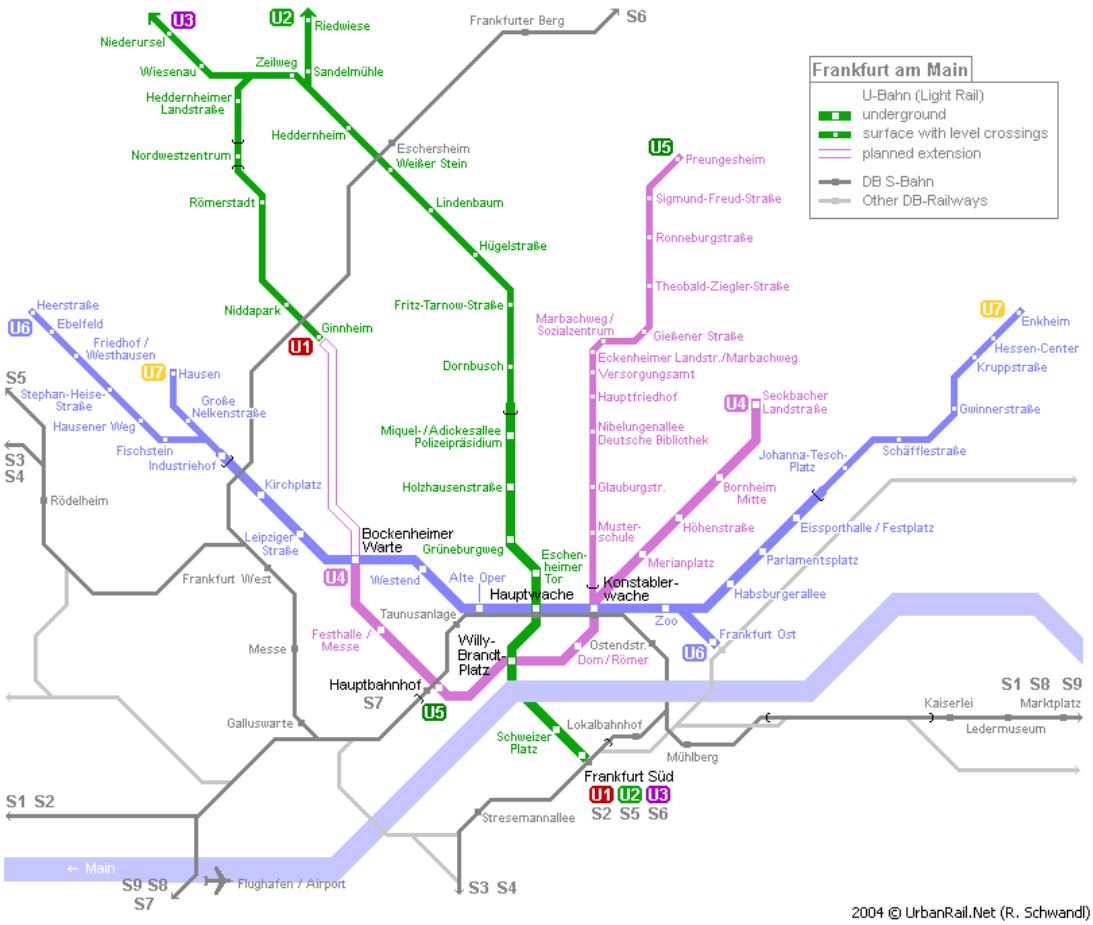
131. Frankfurt has a highly develop public transport system that encompasses railways, S-bahn (suburban rail), U-bahn (consisting of both above ground stretches with regular road crossings and underground stretches), tramways, and a local and regional bus system. The S-bahn concept

[49] Topp, H. H. (1993) Parking policies to reduce car traffic in German cities. *Transport Reviews*, 13/1, p. 84
[50] Topp, H. H. (1991) Parking policies in large cities in Germany. *Transportation*, 18, p. 9
[51] Source: http://www.s-bahn-frankfurt.de/, last accessed November 2004.
[52] Source: http://www.pvfrm.de/FNP/fnpuvf.asp, last accessed November 2004.
[53] Source: http://www.pvfrm.de/planung/planung.asp, last accessed November 2004.

was introduced at the end of the seventies and has been continuously upgraded since then.[54] It now consists of nine lines, connecting the most important suburbs and outlying towns to Frankfurt. The U-bahn encompasses seven lines that link the various parts of the city and more nearby suburbs with the city center of Frankfurt. The first parts of the U-bahn system have been opened in the sixties and the network has been extended regularly since then. The most recent improvements include the extension of various lines during the nineties (see above).[55] In addition to the U-bahn, Frankfurt has eight regular tram lines and around 40 urban and suburban buslines.

132. The integration of the various public transport modes is entrusted to the Rhein-Main Verkehrsverbund (RMW). The RMV is a public body, established in 1995, to coordinate the public transport in 11 cities and 15 local authorities. Frankfurt is one of the core cities in the area and in the public transport network. The RMW is responsible for, among others, improvements in the network, quality control, a unified tariff system, and marketing of the public transport. Since its establishment, the number of public transport passengers in the RMW area has risen substantially: from 530 million passengers in 1995 to 628 million in 2002, a growth of 18%.[56]

Figure 5.3 The U-bahn system in Frankfurt.



[54] Source: http://www.nahverkehr-ffm.de/, last accessed September 2004.
[55] Source: http://www.u-bahnen-in-deutschland.de/f/frankfurt.htm, last accessed September 2004.
[56] Source: http://www.rmv.de/coremedia/generator/RMV/WirUeberUns/Rhein-Main-Verkehrsverbund/ZahlenDatenFakten/, last accessed September 2004.

133. Like in the RMV area, Frankfurt shows a rise in the number of public transport trips in the period 1995-2002. However, the growth is with 2.3% much less significant than in the RMW area. On a per-person basis, the city has performed slightly better, with a 3.8% increase in the number of public transport trips per person. The small increase in ridership has gone hand in hand with a reduction in the quantity of public transport as expressed in total vehicle kilometers: -4.8% in absolute numbers and -1.1% on a per-person basis.

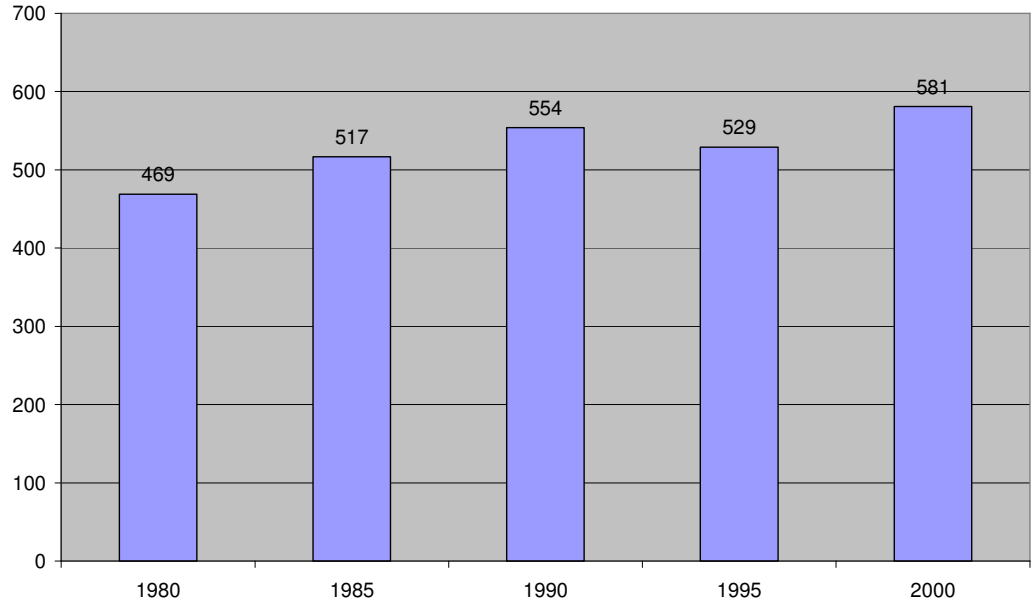
Table 5.3 Performance of the Frankfurt public transport system, 1995-2002.[57]

	1995	2000	2002	Growth
Public transport trips per year	151,807,345	156,988,112	155,342,453	2.3%
Total vehicle kilometers per year	37,691,767	37,144,733	35,879,586	-4.8%
Public transport trips per year per inhabitant	232	241	239	3.8%
Total vehicle kilometers per year per inhabitant	58	57	55	-1.1%

Motorization rate

134. Frankfurt has seen a steady increase in the level of motorization over the past twenty years. The current motorization rate of 581 cars per 1000 persons (situation 2000) is high in comparison with Edinburgh and Rotterdam, and nearly twice as high as the motorization rate of Tel Aviv (247 in 1995). However, within the region, Frankfurt has a relatively low level of motorization. Especially many suburban towns have substantially higher motorization rates, of up to 765 cars per 1000 persons in Liederbach. The motorization rate for the whole region (Umweltverband Frankfurt) stands at 531.[58]

Figure 5.4 Development in motorization rate of Frankfurt, 1980-2000.[59]



[57] Source: http://www.frankfurt.de/sixcms/media.php/2236/JB_03_K09x.pdf (tabel 9.3), last accessed October 2004

[58] Umlandverband Frankfurt (2000) *Generalverkehrsplan 2000*. Frankfurt, Umlandverband Frankfurt, p. 43

[59] Sources: Stadt Frankfurt (2000) *Statistisches Jahrbuch Frankfurt am Main 2000*. Frankfurt, Stadt Frankfurt, Stadt Frankfurt (2003) *Statistisches Jahrbuch Frankfurt am Main 2003*. Frankfurt, Stadt Frankfurt.

Parking availability

135. The number of parking places in the city center of Frankfurt is comparable to Edinburgh but substantially higher than that for Zürich. The city center, with a surface area of 255 hectare, contains a total of 20,100 parking places. About 405 of these are private, while about 60% is publicly accessible. In comparison to Edinburgh, the share of public parking is relatively high, which may to some extent explain the policy of the City of Frankfurt to allow parking garages to rent out part of its parking spaces to companies (see above).

Table 5.4 Number of parking places in the case study cities.[60]

		Edinburgh (1)	Frankfurt	Rotterdam	Zürich
City center	Private parking	10,300	7,900	--	6,600
	Public parking	11,475	12,200	6,680 (2)	2,100
	Total	21,775	20,100	--	8,700
City	Private parking	--	--	--	202,400
	Public parking	--	--	37,650	51,500
	Total	--	--	--	253,900
(1) Partly based on estimates (2) Includes only parking places in public parking garages					

Commuting

136. Frankfurt is the dominant employment center Rhein-Main region. As a result, the majority of jobs in Frankfurt is hold by people living outside the city. The number of commuters into Frankfurt has been growing steadily over the past decade: from 59% in 1990 to 65% in 2002 (Table 5.5). The number of people living in Frankfurt and working outside the city is substantially lower: about 25% of Frankfurt residents, or 50,000 persons, worked outside the city in 1998. Data on the modal split of in-commuters are limited. Data from 1987 (!) show large differences between localities, depending on car ownership levels, road access, and public transport availability. For instance, commuters coming from Offenbach show a public transport share of about 30%, while in Grävenwiesbach the public transport share is 12%. The public transport share in all commuter trips into Frankfurt dropped from 46% in 1970 to 33% in 1987.[61]

Table 5.5 Share of commuters in total employment in Frankfurt, 1990-2002.[62]

	1990	1995	2000	2002
Total employment in Frankfurt	481,961	458,579	481,961	477,694
Incoming commuters Frankfurt	285,909	277,843	306,275	314,999
Share of commuters in total employment	59%	61%	64%	65%

Modal split

The number of data on the modal split in Frankfurt is limited. The data from Newman and Kenworthy on Frankfurt show that the city has experienced a sharp increase in care use like most of the industrialized world during the period 1960-1980. In these years the share of the car in journeys to work rose from 14% to 54%.[63] More recent data suggest that this trend continued at

[60] Sources for Frankfurt: Topp, H. H. (1991) Parking policies in large cities in Germany. *Transportation*, 18, p. 9; Topp, H. H. (1998) Errecihbarkeit, Parraum und Einzelhandel der Innenstadt. *Raumforschung und Raumordnung*, 2/3, p. 191

[61] Umlandverband Frankfurt (2000) *Generalverkehrsplan 2000*. Frankfurt, Umlandverband Frankfurt, pp. 114, 116, 69

[62] Source: http://www.frankfurt.de/sixcms/media.php/2236/JB_03_K04x.pdf, last accessed September 2004.

[63] Newman, P. W. G. and J. R. Kenworthy (1989) *Cities and automobile dependence: a sourcebook*. Aldershot/Brookfield, Gower Technical

the regional level, but stopped at the level of the city. In the Frankfurt region 78% of all motorized trips were made by car in 1994, against 22% by public transport.[64] At the level of the city, the picture is different: the share of the car in the total journeys of the inhabitants of Frankfurt stood at nearly 40% in the beginning of the nineties and at 38% in 2003.[65] The share of the car is even lower for trips with origin and destination within the city. Here, the car accounts for only 32% of all trips.

137. Note that these numbers relate to the inhabitants of the city, and thus include trips for other purposes than work. The picture may be different for home-to-work travel. Public transport may even have a higher share in the commuting trips into Frankfurt. The relative importance of park-and-ride in trips to the center of Frankfurt strengthens this assumption. While only 2-6% of all train passengers uses the car to reach the train station, over 20% of the train passengers traveling to the city center uses park-and-ride.[66] This figure stresses the competitive position of train travel versus car travel in trips to the city center.

Table 5.6 Modal split for trips made by the inhabitants of Frankfurt, for 2003.[67]

	internal trips	all trips
Car	32%	38%
Public transport	23%	23%
Bicycle	11%	9%
Walking	34%	30%

5.5 Economic development

138. This section provides an overview of the economic development in Frankfurt and the Frankfurt region. Part of the data compares the city as a whole with the surrounding region, but as far as possible comparisons are made at the level of employment concentrations. The section starts with a discussion of the overall development of the city, and then discusses the office sector. Unfortunately, no relevant data on the developments in the retail sectors have been retrieved. Note that the data presented below partly refer to the number of 'employed social security contributors' rather then total employment. This group excludes among others the self-employed and people with a small part-time job.

Economic development of the city

139. A first indicator concerning the performance of the city in relation to the surrounding region, is the development in *total employment*.

140.

141. Table 5.7 shows that Frankfurt as a whole has seen a substantial growth of 7% over the period 1987-2002, but has performed less well than the area covered by the Umlandverband Frankfurt or the Rhein-Main Region as a whole. The result is that the share of Frankfurt in total employment in the Umlandverband area has decreased from 50% to 48% and in the region from 27% to 25%. Despite this decrease, the city remains the most important employment area at the regional level, especially in relation to its population and surface area (see Section 4.1).

[64] Umlandverband Frankfurt (2000) *Generalverkehrsplan 2000*. Frankfurt, Umlandverband Frankfurt
[65] Topp, H. H. (1993) Parking policies to reduce car traffic in German cities. *Transport Reviews*, 13/1, p. 87
[66] Umlandverband Frankfurt (2000) *Generalverkehrsplan 2000*. Frankfurt, Umlandverband Frankfurt, p. 88
[67] Stadt Frankfurt (no date) *Stellplatzsatzung und Stellplatzeinschraenkungssatzung in Frankfurt am Main*, Presentation Stadtplanungsamt Verkehrplanung

Table 5.7 Development in number of employed social security contributors, 1987-2002.[68]

	1987	1992	1995	2000	2002	Change	
Frankfurt	456,593	496,894	458,579	477,694	487,736	31,143	7%
Umlandverband Frankfurt	905,610	1,007,800	945,975	992,573	1,006,244	100,634	11%
Rhein-Main Region	1,662,889	1,850,966	1,878,170	1,822,049	1,951,798	288,909	17%
Share of city in Umlandverband	50%	49%	48%	48%	48%	31%	--
Share of city in Region	27%	27%	24%	26%	25%	11%	--

142. The data on the *Total Gross Added Value* serve as a second indicator for the overall economic development of Frankfurt. Here, Frankfurt shows hardly any growth, whereas the metropolitan area and the region reveal substantial growth over the period 1996-2001. The result is a decrease in the share of the city in total metropolitan and regional Gross Added Value.

Table 5.8 Development in Gross Added Value, 1996-2001.[69]

	Total Gross Added Value			
	1996	1998	2001	Growth
Frankfurt	42,956	38,446	43,555	1%
Umlandverband Frankfurt	69,309	78,635	87,289	26%
Rhein-Main Region	141,749	137,576	158,950	12%
Share of city in Umlandverband	62%	49%	50%	--
Share of city in Region	30%	28%	27%	--

Developments in the office sector

143. The office sector in Frankfurt has seen a strong growth in *total employment* over the period 1999-2000. In this period, the number of jobs has grown by a solid 10%, which is substantially than the growth in total employment. Despite this growth, the share of the city has dropped at both the metropolitan and regional level as a result of even stronger growth at these levels (Table 5.9). Especially the development at the level of the Umlandverband is remarkable. At this level, the share of Frankfurt has dropped from 67% in 1999 to 57% in 2002. This can be partly explained by the crisis in the banking sector at the beginning of the new millennium, which had a stronger impact on the city than on the region due to the over-representation of the banking sector in the city.

Table 5.9 Development in number of employed social security contributors in the office sector, 1999-2002.[70]

	1999	2000	2002	Change	
Frankfurt	254,271	265,955	279,548	25,277	10%
Umlandverband Frankfurt	380,538	460,872	487,207	106,669	28%
Rhein-Main Region	767,282	803,076	891,957	124,675	16%
Share of city in Umlandverband	67%	58%	57%	24%	--
Share of city in Region	33%	33%	31%	20%	--

144. Data on *Gross Added Value* can serve as second indicator for the development in the office sector. The data show that Frankfurt has performed very well in this respect, with a growth factor of 52% over the period 1996-2001. This growth is substantially higher than the growth in Total

[68] Source: Planungsverband Ballungsraum Frankfurt/Rhein-Main (2000, 2001, 2002, 2003) *Region Frankfurt/Rhein-Main: Statistik Trends 2000, 2001, 2002, and 2003* (four separate publications).
[69] Source: Planungsverband Ballungsraum Frankfurt/Rhein-Main (2000, 2001, 2002, 2003) *Region Frankfurt/Rhein-Main: Statistik Trends 2000, 2001, 2002, and 2003* (four separate publications).
[70] Sources: Planungsverband Ballungsraum Frankfurt/Rhein-Main (2000, 2001, 2002, 2003) *Region Frankfurt/Rhein-Main: Statistik Trends 2000, 2001, 2002, and 2003* (four separate publications).

Gross Added Value for all economic sectors. However, the metropolitan area and the region have fared even better, which also here results in a drop in the city's share in Gross Added Value of the office sector.

Table 5.10 Development in Gross Added Value, 1996-2001.[71]

	1996	1998	2001	Growth
Frankfurt	24,017	32,101	36,450	52%
Umlandverband Frankfurt	38,098	61,624	69,406	82%
Rhein-Main Region	70,207	104,150	121,932	74%
Share of city in Umlandverband	63%	52%	53%	--
Share of city in Region	34%	31%	30%	--

145. The number of data on the development of the office sector *at the level of employment areas* is limited. Data from Jones Lang LaSalle show that Frankfurt city center is still the prime office location in the metropolitan area.[72] First, the city center shows the highest rent levels. This is especially true for the banking area, but also for the areas directly surrounding the banking quarter (see map). Second, the areas directly around the banking area still attract a substantial amount of speculative development of office space. For instance, in the first quarter of 2004, the majority of such development was realized in the area around the main train station and directly west of the banking area. A third indicator for the continuing strength of the city center is provided by the data for 2003. They reveal that the city center has performed relatively well in terms of office space take up, number of inquiries and future office supply. In each case, the city center is responsible for about 35-40% of the total office market. This is considerably higher than the two main office areas that compete with the city center of Frankfurt (Niederrad and Eshborn).

Figure 5.5 Main office areas in and directly around Frankfurt.

[71] Sources: Planungsverband Ballungsraum Frankfurt/Rhein-Main (2000, 2001, 2002, 2003) *Region Frankfurt/Rhein-Main: Statistik Trends 2000, 2001, 2002, and 2003* (four separate publications).
[72] Jones Lang LaSalle (2004) *City Profile Frankfurt am Main: 4th Quarter 2003*. Frankfurt am Main, Jones Lang LaSalle, Jones Lang LaSalle (2004) *City Profile Frankfurt am Main: Update Q1 2004*. Frankfurt am Main, Jones Lang LaSalle

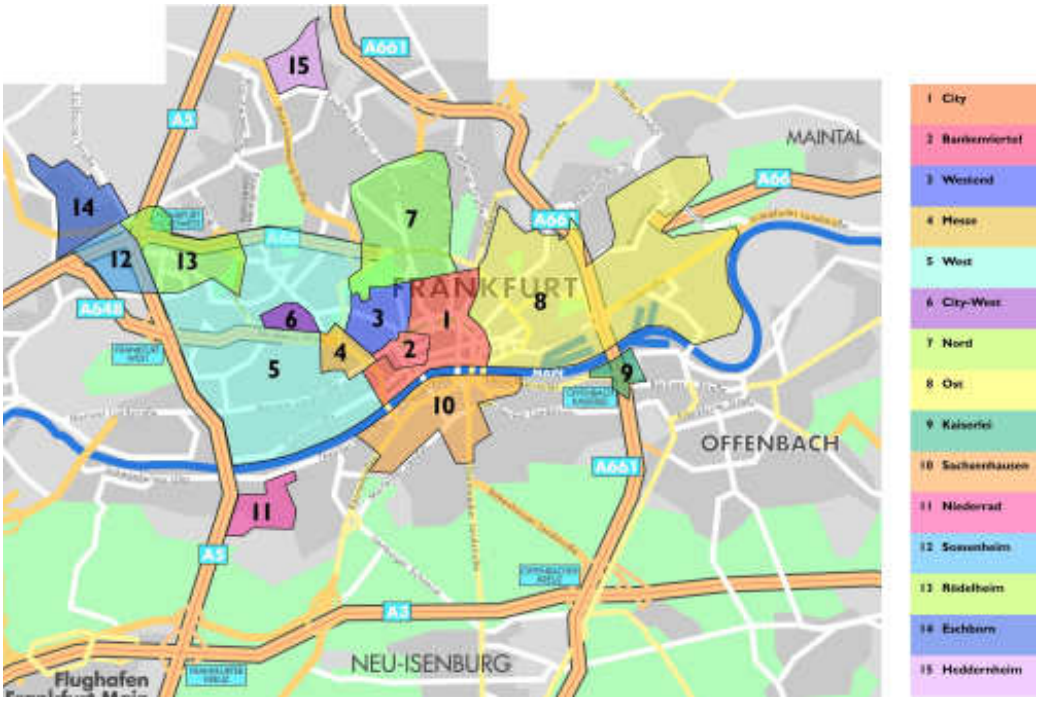


Table 5.11 Developments in the three prime office locations in Frankfurt, for 2003.[73]

	Office space take up		New inquiries		Future office space supply 2004-2005	
	m2	Share	m2	Share	m2	Share
City Center Frankfurt	183,800	35%	129,000	42%	168,600	42%
Niederrad	30,600	6%	20,400	7%	43,000	11%
Eshborn	47,900	9%	17,200	6%	12,400	3%
Total metropolitan area	520,100	100%	310,600	100%	401,700	100%

5.6 Impacts of parking policy on economic development: interview results

146. The data on the economic development in Frankfurt suggest that the city and city center have remained attractive as a location for offices and retail since the introduction of a restrictive parking policy. The office sector in the city has seen a steady growth during the second half of the nineties and the city center has remained the prime office location. The interviews with the experts in Frankfurt provide insights into the reasons for the ongoing economic vitality of the city and city center. The informants that were contacted in Frankfurt include a representative from the municipality, three experts from three different real estate agencies, and a representative of the Frankfurt Economic Development Company, an independent government company (see appendix).

Office sector

147. The informants have provided a number of reasons for the ongoing strength of the city center vis-à-vis other office locations. The pull factors that attract offices to the city center include the concentration of banks in the urban core, the status and prestige of the city center, the availability of restaurants, shops, cultural and leisure activities in the direct proximity of the offices, and the high quality of the public transport system. The concentration of the banks is a prime location factor for other banks and for sectors related to the banking sector, such as insurance and legal services. The proximity to the decision-making centers is of utmost importance, both for the

[73] Source: Jones Lang LaSalle (2004) *City Profile Frankfurt am Main: 4th Quarter 2003*. Frankfurt am Main, Jones Lang LaSalle.

management of the banks themselves and for the related office sectors. Especially for smaller offices it is of importance to be close to the decision-making centers. The presence of the Deutsche Bank and the European Central Bank in the city center only add to the importance of being in the city center. The urban qualities of the city center are of increasing importance as a location factor, also as a tool to attract employees.

148. The city center does not only offer qualities that attract offices. The interviewees stress the importance of two push factors that reduce the attractiveness of the city center: rent levels and corporate taxes. The corporate tax ('Gewerbesteuer') is a tax on the income of businesses, the level of which is determined to a large extent by the local government. The tax is substantially higher in Frankfurt than in the surrounding localities, and thus plays a role in the competition over offices between the localities. The same holds true for the rent level. Because of its attractiveness, the city center is the most expensive office location in terms of rent levels. The informants point out that rent levels and corporate taxes especially play a role in periods of high demand for office space. In such a period office rents are high and offices seek possibilities to reduce costs. Especially offices that do not need to be in Frankfurt will in such cases prefer locations outside the city center (to reduce rents) or even outside Frankfurt (to reduce rents and taxes). The informants note, however, that the importance of rents and taxes depends on the sector. The banking and legal sectors will not exchange a location in the city center for a more peripheral location, even in periods of high costs. Banks will keep their front offices and management in the city center and locate back offices in more peripheral locations. Legal and other sectors directly related to the banking sector will prefer to stay in the city center, in order to be close to their clients (among many from the financial sector). On the other hand, sectors like the consultancy, marketing or high tech are more sensitive to costs and the rent and tax levels play an important role in their decision to locate outside the city center at more peripheral, cheaper, locations. Likewise, large offices feel the impacts of rent and tax levels more and will thus be more inclined to locate outside the city center and/or Frankfurt, than smaller offices.

149. All informants stress that parking restrictions play a relatively minor role in the office dynamics. They give two prime reasons for this. First, the other location factors mentioned above play a much larger role in the location decisions of offices than parking provision. E.g. a law firm would never decide to leave the city center because of lack of parking, simply because the proximity to the banking sector is too important for such a firm. The second reason is the high quality of public transport in the city center. The excellent accessibility of the city center by commuter train, underground and tram and bus system makes the low levels of parking provision much less problematic. As one informant put it: "Parking is number four or five on the list of location factors. More important are the corporate tax, the rent levels, and the urbanity and related attractiveness of the city center."

Retail sector

150. Only one informant was able to provide information on the development in the retail sector. He stresses the role of parking in the competition between retail centers. Free and plentiful parking does attract customers and works to the advantage of the peripheral retail centers. However, the city center offers other advantages: a wider range of shops and other services, a better atmosphere, and a nicer urban environment, than the peripheral retail centers. These factors guarantee the ongoing attractiveness of the city center. The restrictive parking policy has not played a significant role in the competition between the retail centers, as the parking provision in the city center is not limited as a result of the norms. For the future, land use policies will play a major role, as new policy guidelines do only allow peripheral retail developments if they do not have any negative impacts on the economy of the city center.

Parking policy and economic development

151. The results of the interview-round suggest that the restrictive parking norms has not had any significant negative impacts on the economic development of the city and city center. Two prime factors contribute to this in the Frankfurt. First, the strength of the city center and of the city as an office location. The city center has maintained its attractiveness for high-value offices, due to the concentration of the banking sector and decision-making centers in the area, its status and prestige, and the urban quality it offers. The second reason lies in the excellent quality of the public transport system. Because of the excellent accessibility of the city center by train, underground and trams, the effect of the parking restrictions is limited. The public transport system guarantees the accessibility of the city center and compensates for the limitations set on the number of parking places.

Chapter 6 Case study 3: Rotterdam

6.1 Introduction

152. Rotterdam is the second largest city in the Netherlands. It is home to the world largest harbor, which takes up a large share of the municipal area. The city is located in the south of the so-called Randstad-Holland area, which also includes Amsterdam, The Hague and Utrecht. The region of Rotterdam includes a number of small cities and towns, between which exist intensive spatial relations. Rotterdam accounts for approximately half of the regional population.

Table 6.1 Rotterdam versus Tel Aviv in terms of inhabitants, surface area and density.[74]

	Rotterdam		Tel Aviv	
Population				
City	603,300	(2004)	363,400	(2003)
Metropolitan area	1,191,417	(2003)	1,164,300	(2003)
Surface area (km2)				
City	209	(2002)	51.8	(2003)
Metropolitan area	591	(2002)	171.0	(2003)
Density (persons/ha)				
City	28.9	(2002)	70.2	(2003)
Metropolitan area	20.2	(2002)	68.1	(2003)

Figure 6.1 The location of Rotterdam in the region.[75]

[74] Sources for Rotterdam: http://www.cos.nl/pdf/kc2003NL.pdf; http://statline.cbs.nl/StatWeb/ and http://www.cos.nl/pdf/kc2003NL.pdf, last accessed 10 October 2004. Sources for Tel Aviv: Israeli Central Bureau of Statistics (http://www1.cbs.gov.il/reader/shnatonenew.htm) and Municipality Tel Aviv (2003) Statistical yearbook 2003. The data for Rotterdam only include surface area and exclude the large water areas. They do, however, include the huge harbor area.

6.2 Parking policy

153. The current parking policy in Rotterdam is based on the national parking policy. This so-called abc location policy was first introduced in the National Spatial Plan of 1986. The policy became a centerpiece of the national policy from 1990 onwards with the publication of the so-called 'Working paper'.[76] The Working paper makes a distinction between three types of locations and three types of employment.

154. The locations were coined 'A', 'B' and 'C'. The locations differ in terms of their so-called 'accessibility profile'. A-locations are highly accessible by public transport and usually located in the center of large and medium-sized cities. The accessibility by car is considered of less importance for these locations. B-locations have a good accessibility by both car and public transport. They are located close to public transport nodes on the edges of cities, close the network of highways. C-locations, in turn, are directly accessible from the highway network. They thus have an excellent accessibility by car, while the accessibility by public transport is considered to be of less importance.

155. Employment is categorized according to 'mobility profile'. A-locations are reserved for offices and other activities that attract a high number of employees and visitors per square meter floor space. B-locations are intended for offices and other activities with a moderate number of employees per square meter floor space and with hardly any visitors. C-locations, finally, are reserved for activities that are dependent on road based travel and have a low number of employees per square meter. Examples are highly robotized industries and distribution companies.[77]

156. The national policy was formally adopted in the Rotterdam region in 1995, with the signing of the Regional Transport Plan and the Vinex-covenant dealing with the location of new urban areas.[78] These documents outline, among others, the demarcation of the A, B and C locations in the region, the maximum parking norms for each (type of) location, and an implementation program.

157. Like the national policy, the policy for Rotterdam distinguishes between three types of locations (see map):
    - A-locations located around a number of centrally located train and metro stations. Each of these stations is usually served by a number of train, bus and metro lines. Taken together, the stations cover a large part of the city center of Rotterdam.
    - B-locations located around a station that combines metro and bus lines or train and bus lines. The locations are located throughout Rotterdam along the metro and train lines.
    - C-locations are located along major highways and in the harbor area of Rotterdam.

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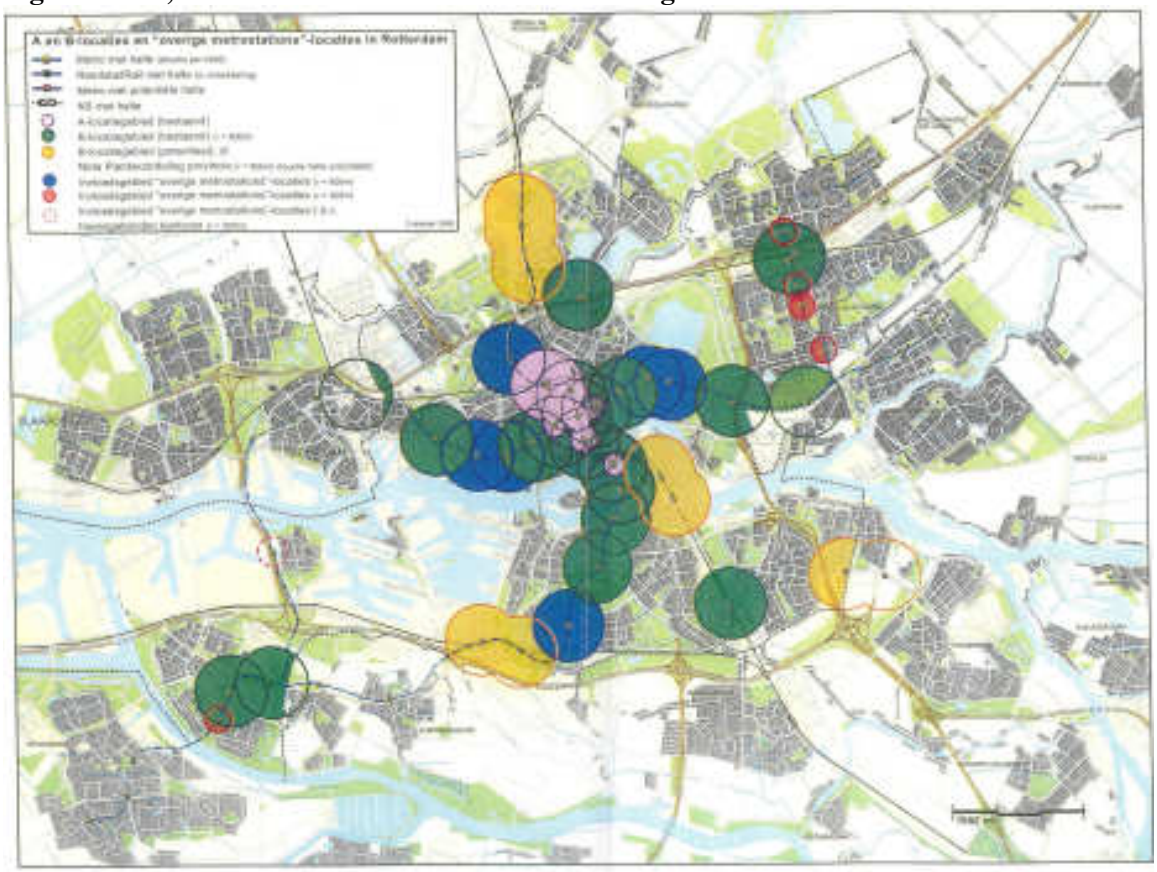
[75] Source: http://www.cwpages.nl/alpha/rotterdam-eo/kaart.htm.

[76] Ministerie van Volkshuisvesting Ruimtelijke Ordening en Milieubeheer (NL),Ministerie van Verkeer & Waterstaat (NL), et al. (1990) *Werkdocument Geleiding van de mobiliteit door een locatiebeleid voor bedrijven en voorzieningen*..

[77] Martens, K. (2000) *Debatteren over mobiliteit: over de rationaliteit van het ruimtelijk mobiliteitsbeleid*. Faculty of Policy Sciences. Nijmegen, University of Nijmegen.

[78] Stadsregio Rotterdam (2000) *Evaluatie ABC-locatiebeleid Stadsregio Rotterdam*. Rotterdam

Figure 6.2 A, B and C-locations in the Rotterdam region.[79]



158. The A and B locations are suited for offices and services with a so-called 'high intensity of employees and visitors'. This means that the number of employees and visitors attracted by a business is high in relation to the floor space of offices and services. C locations are suited for businesses that attract high levels of cargo transport and high levels of road-depended business travel (e.g. sales people). More specifically, buildings intended for employment are distinguished using so-called mobility profiles:
    - Office buildings: buildings in which the office space covers more than 90% of total floor space.
    - Mixed buildings: buildings in which the office space covers between 50-90% of total floor space, or a large office space (>2000 m2) in combination with even larger buildings for other purposes, resulting in a office space of less than 50% of total floor space.
    - Building for businesses with low labor intensity: a low level of office space in relation to total floor space (< 50%) or a small absolute size of office space (< 200 m2).

159. The Rotterdam policy requires office buildings and mixed buildings to be concentrated on A- and B- locations as described above and indicated on the map.

160. The City of Rotterdam has defined – in deliberation with the national and regional government – detailed parking norms for office development and mixed office development. The norms for offices are at the same time minimum and maximum norms. For all other land uses, including retail, the City of Rotterdam has set minimum parking norms. Both the maximum and the

[79] Gemeente Rotterdam (2000) *Hand-out parkeerzaken*.

minimum parking norms vary according to the type of location. The locations are marked as A, B and C zones. The A zone corresponds to the core of the city center, which has the highest density of high speed public transport services (central train station and two urban train stations, five metro stations, and the central bus and tram station). The B zone includes the outer zone of the city center and four additional locations located around key train stations (mainly Rotterdam Alexanderpolder) and metro stations. The C zone encompasses the remaining area of the municipality. The minimum and maximum parking norms for each of the zones are specified in the table below.

Table 6.2 Maximum (max) and minimum (min) parking norms for key land uses in Rotterdam.[80]

Land use type	A location	B location	C location
Offices (max)	1 : 270 m2	1: 190 m2	1 : 50 m2
Conference space (min)	1 : 60 m2	1 : 30 m2	1 : 15 m2
Retail (min)	1 : 165 m2	1 : 115 m2	1 : 50 m2
Cafes (min)	1 : 100 m2	1 : 50 m2	1 : 15 m2
Industrial use (min)	1 : 200 m2	1 : 100 m2	1 : 50 m2

6.3 Complementary policies

161. The parking policy outlined above was introduced in Rotterdam together with a number of complementary policies and measures. These included:
- Land use policy
- Development of public transport and car infrastructure
- Enforcement by the national and regional governments

162. The regulation of land uses is an integral part of the abc locations policy that introduced the new parking norms. The abc locations policy does not only define maximum parking norms, but also delineates where which types of land uses can locate. Key element is the regulation of the location of offices and other labor intensive activities. These can only locate at the A and B locations designated in the *Plan van Aanpak ABC-locatiebeleid* agreed upon in 1995 by all involved government levels.[81] The land use policy has proofed to be very successful, with 80% of all offices locating on A and B locations in the period 1995-2000.[82] The policy has been less successful regarding large hospitals and other health institutions. Many of these were and still are located at locations with poor public transport accessibility.

163. The introduction of the parking policy has also been accompanied with a package of investments in public transport, roads, and transport measures, including transport demand management. The package included the following improvements in the public transport system:
- Capacity enlargement of metro stations in the center of Rotterdam
- Extension/development of two new metro lines
- Improvement of train connections with surrounding main cities
- Development of new tram line
- Introduction of free bus lanes

[80] Source: Gemeente Rotterdam (2000) *Hand-out parkeerzaken*
[81] Stadsregio Rotterdam (1995) *Plan van Aanpak ABC-locatiebeleid Stadsregio Rotterdam*. Rotterdam
[82] Stadsregio Rotterdam (2000) *Evaluatie ABC-locatiebeleid Stadsregio Rotterdam*. Rotterdam

164. Note that the new parking policy was introduced *before* the improvements in public transport were implemented. The transport investment package was first and foremost meant to gain support for the abc location policy and related parking norms among key actors, most notably the Municipality of Rotterdam. Here, the package certainly played an important role. However, financial limitations of the relevant authorities have resulted in a delay in the execution of some of the planned infrastructure projects. This has obstructed the location of offices on the northern edge of Rotterdam and other locations outside Rotterdam. Given the lack of high quality public transport, these locations did not acquire B location status and could thus not be developed as office locations.[83]

165. The introduction of the abc locations policy and the related parking norms has further been accompanied by a substantial investments in enforcement of land use regulations on the side of the national and regional governments. Each of the regional offices of the Ministry of Spatial Planning was enlarged in terms of manpower to oversee the implementation of the policy. In addition, the regional governments (Provinces) were eager to take up their role as gatekeepers of the policy, thereby strengthening their position as a key player in land use planning. The enforcement efforts of both bodies have helped to ensure the implementation of both the land use component and the parking norms in local level plans and decisions on building permits.[84]

166. In sum, the policies and measures that have been introduced parallel to the introduction of the new parking norms have played an important role helped to create support for the parking norms. The strict land use policy and the enforcement of both land use and parking policies by the national and regional level reduced the fears of Rotterdam regarding unfair competition between cities and suburbs and between cities themselves. The agreement about investments in public transport and other transport infrastructure has further contributed substantially to the acceptance of the new parking norms by the City of Rotterdam.

6.4 Transport circumstances at time of introduction of the parking policy

Public transport system

167. Rotterdam has a mixed public transport system. It includes five main train lines that connect some of the surrounding suburbs to the urban core, two metro lines, a number of tram and express tram lines, and an extended bus system (see map).

168. The ridership levels on the internal public transport system have remained relatively stable during the nineties. The ridership levels on the bus system has decreased slightly, whereas especially the metro lines have seen a growth in passenger kilometers. This growth on the metro lines is partly caused by an increase in home-to-work and shopping traffic to the city center, according to the public transport operator of the metro, the RET.[85]

[83] Stadsregio Rotterdam (2000) *Evaluatie ABC-locatiebeleid Stadsregio Rotterdam*. Rotterdam, p. 8
[84] Stadsregio Rotterdam (2000) *Evaluatie ABC-locatiebeleid Stadsregio Rotterdam*. Rotterdam, pp. 10-12
[85] Dienst Stedebouw + Volkshuisvesting (2001) *De mobiele stad: kennis en feiten over verkeer en vervoer in Rotterdam / 2000.* Rotterdam, Gemeente Rotterdam: 12.

Table 6.3 Train and metro services, existing and under construction, in Rotterdam.[86]

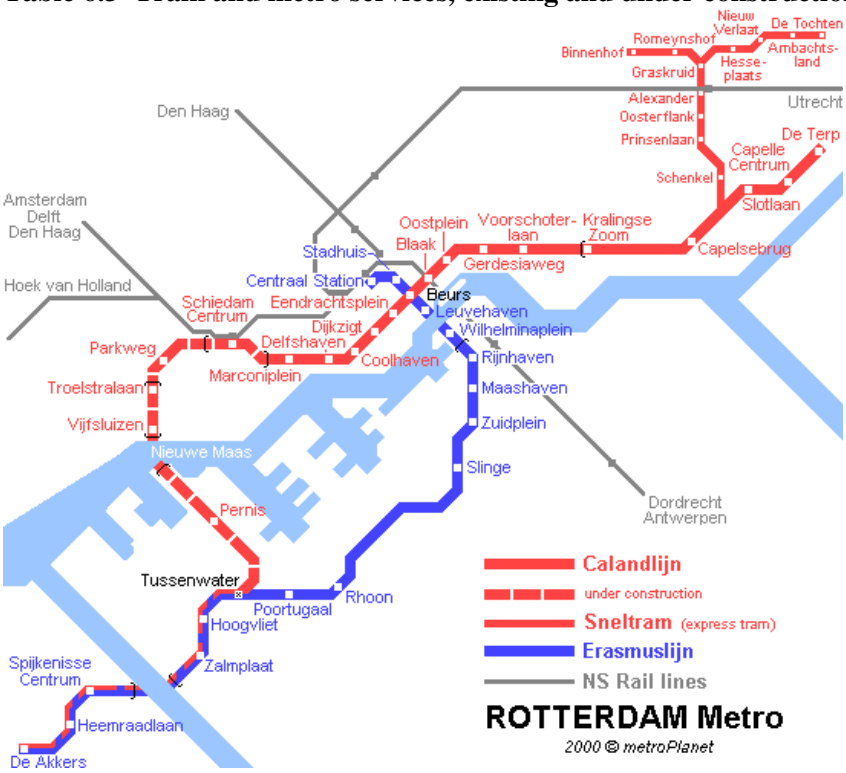
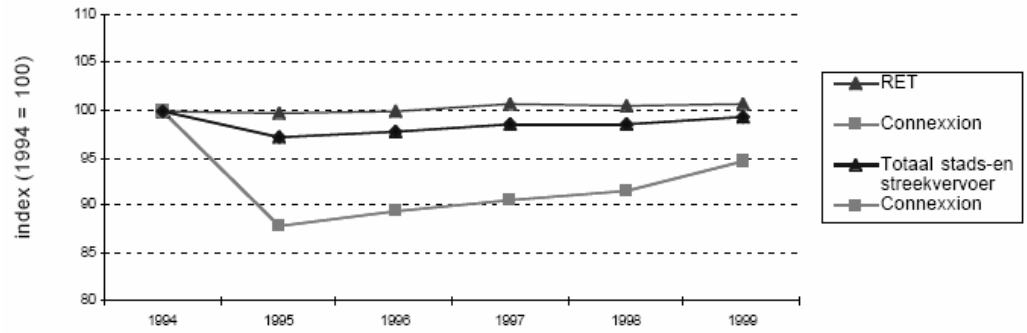


Figure 6.3 Growth in passenger kilometers in public transport in Rotterdam.[87]



Motorization rate

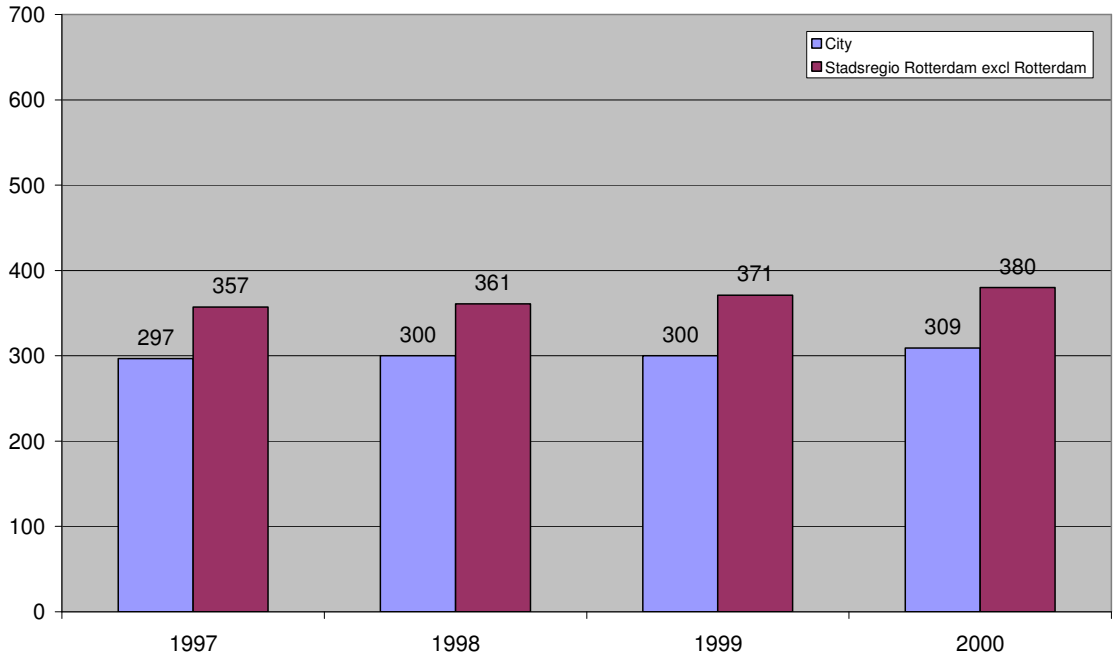
169. Rotterdam has a relatively low level of motorization in comparison to the other case study cities. The current motorization rate stands at 309 cars per 100 inhabitants (situation 2000), which is probably only slightly higher than current motorization rate in Tel Aviv, given that the rapid increase in car ownership in Israel since 1995, when the motorization rate stood at 247. The motorization rate in the Rotterdam region is higher than the rate for the city, but still comparatively low in comparison to other case study cities and the Netherlands as a whole. Both

[86] Source: koti.welho.com/ tviitan2/hollanti.html, last accessed September 2004

[87] Source: Dienst Stedebouw + Volkshuisvesting (2001) *De mobiele stad: kennis en feiten over verkeer en vervoer in Rotterdam / 2000.* Rotterdam, Gemeente Rotterdam.

the city and the region have seen a steady, but relatively low growth pace over the period 1997-2000.

Figure 6.4 Development in motorization rate of Rotterdam and the Rotterdam region, 1997-2000.[88]



Parking

170. Data on the number of parking places in Rotterdam are limited. The city center offers a total of 6,680 parking places in parking garages, all of which are managed by the Municipality of Rotterdam itself. The number is comparable to the number of off-street public parking places in Edinburgh. In addition to public off-street parking, the city center offers a substantial amount of public on-street parking and private off-street parking, but not data are available.

Table 6.4 Number of parking places in the case study cities.[89]

		Edinburgh (1)	Frankfurt	Rotterdam	Zürich
City center	Private parking	10,300	7,900	--	6,600
	Public parking	11,475	12,200	6,680 (2)	2,100
	Total	21,775	20,100	--	8,700
City	Private parking	--	--	--	202,400
	Public parking	--	--	37,650	51,500
	Total	--	--	--	253,900
(1) Partly based on estimates (2) Includes only parking places in public parking garages					

[88] Source: Dienst Stedebouw + Volkshuisvesting (2001) *De mobiele stad: kennis en feiten over verkeer en vervoer in Rotterdam / 2000.* Rotterdam, Gemeente Rotterdam

[89] Source for Rotterdam: Annemarie Roode, Gemeente Rotterdam, personal communication, September 2004

Modal split

171. Data on the modal split in Rotterdam show that more than half of all trips with origin and/or destination in Rotterdam (excluding walking) are made by car (driver and passenger). The car is even more dominant in trips with origin *or* destination in Rotterdam. Here, the car accounts for 70% of all trips. The bicycle comes second in importance after the car, with a share of close to 27% in all trips. Obviously, the share in trips that cross the municipal borders of Rotterdam is substantially lower (7.5%), while the share in internal trips is higher (35%). In comparison to the other case study cities, the public transport network is of relatively limited importance in the transport system of Rotterdam. Bus, tram and metro account for 13% of all trips, while the train is good for about 4%. Note that all data refer to the total number of trips regardless of trip purpose, but do not include walking trips. Because walking is not included, the shares of the other modes are relatively high in comparison to the modal split data as presented for the other case study cities.

Table 6.5 Modal split for total number of trips with origin and/or destination in Rotterdam, excluding walking trips, for 2000.[90]

	Within Rotterdam	To Rotterdam	From Rotterdam	Total
Car	49.8%	70.5%	70.3%	55.7%
Train	0.7%	12.0%	12.2%	3.9%
Bus, tram, metro	15.0%	10.1%	10.1%	13.6%
Bicycle	34.5%	7.5%	7.5%	26.8%
Share in total trips	71.6%	14.2%	14.2%	

6.5 Economic development

172. The analysis of the economic development in Rotterdam and the surrounding region has focused on the developments in the city center, the area of Rotterdam Alexander, the city as a whole and the region as a whole. The city center represents the most important A-location in Rotterdam and therefore the most important location where the strict parking norms apply. Rotterdam Alexander is an office area located along the highway and adjacent to the Rotterdam-Alexander train station. The location is designated as a B-location and thus lower parking norms apply to this area. Both the city center and Rotterdam Alexander are attractive office locations and a comparison of the development in both can thus shed some light on the impact of parking restrictions. A comparison with the developments in both the city as a whole and the region can further help to interpret the performance of the city center of Rotterdam.

173. The data available on the economic development of Rotterdam and Rotterdam-city center include the following: total employment, office sector development, employment in the shopping and café sector, and shopping flows. Each of them will be discussed below.

Total employment

174. The development in total employment is depicted in Table 6.6. The table reflects the economic growth experienced in the Netherlands in the nineties. The city center if Rotterdam has been faring relatively well: performing better than the city as a whole and in the second half of the nineties also better than the region as a whole. Rotterdam Alexander has performed substantially better than the city center. However, in absolute numbers the city center has grown nearly three times as strongly as Rotterdam Alexander (15,500 versus 5,700 new jobs). Furthermore, the city center has increased its share in total employment in the city and maintained its share in total

[90] Source: Taco Molenaar, personal communication, October 2004.

regional employment. Currently, the city center houses nearly one third of all urban employment and close to one fifth of all regional employment – substantially more than the main competitor Rotterdam Alexander.

Table 6.6 Development in employment, 1994-2001.[91]

	number of employees			growth		share in city			share in region		
	1994	1998	2001	abs	%	1994	1998	2001	1994	1998	2001
City Center	75,380	80,024	90,935	15,555	21%	28%	28%	30%	19%	18%	19%
Alexander	18,011	21,329	23,704	5,693	32%	7%	8%	8%	4%	5%	5%
Rotterdam	266,587	283,966	305,016	38,429	14%	-	-	-	65%	64%	63%
Region	407,316	442,277	486,569	79,253	19%	-	-	-	-	-	-

Office sector

175. The development in the office sector is the most important indicator, given its crucial importance in the urban economy and especially the city center and the fact that the parking policy in Rotterdam directly targets the office sector. The key office areas in Rotterdam include the city center (partly A and partly B location), Rotterdam Alexander (B location), and Brainpark (C location), all located within the Municipality of Rotterdam, and Rivium (C location), located in the neighboring town of Capelle aan de IJssel. The available data on the office sector relate to total office supply, and to supply and take-up of new office space.

176. The development since the introduction of the abc location policy show a strengthening of the office sector at A and B locations. During 1995-2000 80% of all new office space in the Rotterdam region has been realized at these locations, which include the city center and Rotterdam Alexander. This is a high percentage in comparison to the existing office space, of which 60-65% is located on A and B locations. The abc locations policy has thus been accompanied by an increasing concentration of offices on the locations to which maximum parking norms apply.

177. The city center is the prime office location within the Rotterdam region. The data on the total supply of office space for 2004 show that over half of all the office space in the city is located in Rotterdam city center. The city center is also performing relatively well in terms of vacancies: the share in total vacancies is slightly lower than the share in total supply (48% versus 52%) and the vacancy rate lies on the same level as other office areas (about 8%). In contrast, the urban nodes, which include primarily B locations, show relatively high vacancy rates.

Table 6.7 Supply of office space and vacancies in Rotterdam in 2004.[92]

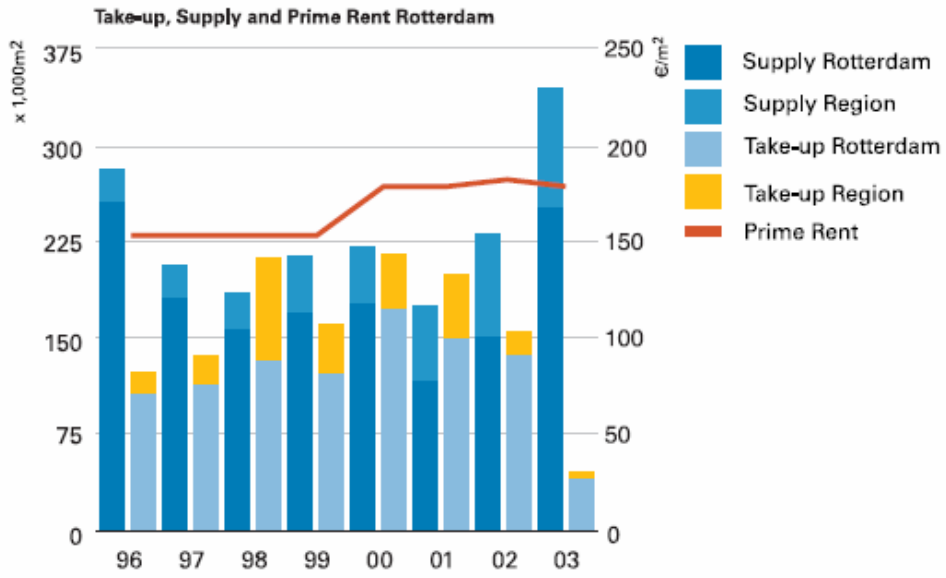
Area	Supply		Vacancy		Vacancy rate in %
	m2	%	m2	%	
Office boulevards	939,360	31%	73,357	28%	7.8
Remaining City Center	635,263	21%	52,923	20%	8.3
Total City Center	1,574,623	52%	126,280	48%	8.0
Urban nodes	450,971	15%	50,638	19%	11.2
Residential areas	439,604	14%	38,598	15%	8.8
Employment areas	575,471	19%	46,166	18%	8.0
Totaal	3,040,669	100%	261,682	100%	8.6

[91] Based on data from Centrum voor Onderzoek en Statistiek, Municipality of Rotterdam, website: http://www.cos.nl/pdf/kernarb/tabel4.1.pdf, last accessed September 2004.

[92] Based on data from Centrum voor Onderzoek en Statistiek, Municipality of Rotterdam, website: http://www.rotterdam.nl/smartsite.dws?id=225138, last accessed October 2004.

178. The data on concerning new office space for the period 1996-2003 do not reveal a clear pattern. Both Rotterdam and the region show strong variances in the supply and take up of new office space (Figure 6.5). However, the underlying market analysis of Jones Lang LaSalle provides some insight into continuing attractiveness of the city center for the office sector. First, the city center is still the location with the highest office rent and even shows a slight increase in rental levels since 1999 (see prime office rent in Figure 6.3). Second, the city center remains a prime location for the realization of new office space. E.g., a large share of the new office space rented out in 2003 was located in the city center, and a large share of office space to be realized in 2005 will be located once again in the city center. Finally, the suburban location in Capelle aan de IJssel shows a relatively high vacancy rate of 21.9%. [93]

Figure 6.5 Take-up, supply and office rent, 1996-2003.[94]



Retail sector

179. The development of the retail sector provides a third indicator for the economic development of Rotterdam and the city center. Apart from the city center, Rotterdam has two other large shopping areas: Alexandrium and Zuidplein. Zuidplein is comparable to the city center in terms of the types of shops and goods offered, but is substantially smaller than the city center. Alexandrium, which is located close to the office area Alexander and the train station Rotterdam-Alexander, is dominated by large furniture shops, large scale retailers, and home-center types of shops. Alexandrium was substantially expanded by the Municipality of Rotterdam in the second half of the nineties (see below), and now consists of a three large buildings that function like shopping malls. The city center has the highest parking prices, followed by Zuidplein. Parking is (still) free at the Alexandrium.

180. Table 6.8 shows that all three main shopping areas have grown in the period 1994-1999, but that growth in Zuidplein and Alexandrium has outpaced the growth in the city center in terms of shops

[93] Jones Lang LaSalle (2004) *Rotterdam office market Q4 2003*. Rotterdam, Jones Lang LaSalle
[94] Jones Lang LaSalle (2004) *Rotterdam office market Q4 2003*. Rotterdam, Jones Lang LaSalle

and floor area. In contrast, the city center has performed well in terms of sales, with a growth of 35% over 1994-1999, a number substantially higher than both the city as a whole and Zuidplein. In absolute numbers, the city center has also outpaced Alexandrium in the growth of sales. It further should be noted that the high growth figures for Alexandrium can be largely attributed to the planned extension of this area.

Table 6.8 Development of the retail sector, 1994-1999.[95]

	number of shops				floor area in m2				sales in million gulden			
	1994	1999	growth	%	1994	1999	growth	%	1994	1999	growth	%
Rotterdam	4,361	4,483	122	3%	577,650	704,090	126,440	22%	5217.9	5925.5	708	14%
City Center	536	599	63	12%	131,310	143,586	12,276	9%	1,250	1,687	437	35%
Alexandrium	89	160	71	80%	18,850	104,655	85,805	455%	200	425	225	113%
Zuidplein	108	135	27	25%	28,500	34,788	6,288	22%	400	440	40	10%

181. The various growth rates in the three retail centers have not threatened the position of the city center as the dominant shopping center of Rotterdam. The city center is still by far the most important retail center. It accounts for 13% of all shops in the area, 20% of all surface area, and 36% of total retail sales (Table 6.9). Furthermore, the share of the city center has grown in the period 1994-1999, with the exception of its share in total floorspace. This can, of course, be attributed to the large expansion of Alexandrium and the large-scale retail shops located there. Perhaps the clearest evidence for the continued vitality and attractiveness of the city center are the figures about the 'share in total purchases'. These figures indicate which share of the purchases by residents of Rotterdam are being made in a specific area. Table 6.9 shows that the city center has managed to increase its share from 29% to 32% in the period 1994-1999. In simpler terms: the citizens of Rotterdam do nearly one third of all their shopping in the city center. The shares of Alexandrium and Zuidplein are much smaller and both retail centers also reveal smaller growth or no growth at all. These figures suggest that the city center has managed to more than uphold its attractiveness as the main shopping center of the city of Rotterdam.

Table 6.9 Share of retail centers in total retail sector of Rotterdam, 1994-1999.[96]

	share in total number of shops			share in total floor area			share in total sales			share in total purchases		
	1994	1999	growth	1994	1999	growth	1994	1999	growth	1994	1999	growth
City Center	12%	13%	1%	23%	20%	-2%	34%	36%	2%	29%	32%	3%
Alexandrium	2%	4%	2%	3%	15%	12%	7%	9%	2%	6%	8%	2%
Zuidplein	2%	3%	1%	5%	5%	0%	13%	12%	0%	11%	11%	0%

6.6 Impacts of parking policy on economic development: interview results

182. The data on Rotterdam presented above show that the city and the city center have performed well over the past decade. The employment in both city and city center has risen substantially during this period, while the city center has maintained its dominant central position in the retail sector. The interview-round with the experts in Rotterdam provides insights into the reasons for the ongoing economic vitality of the city and city center. The informants that were interviewed include three representative from the municipality (covering the fields of transport, parking and economic development), two real estate agents, and a representative of a development company (see appendix).

[95] Source: BRO (2000) *Winkelatlas 1999 Gemeente Rotterdam: Hoofdrapport*. Rotterdam, Gemeente Rotterdam

[96] Source: Based on BRO (2000) *Winkelatlas 1999 Gemeente Rotterdam: Hoofdrapport*. Rotterdam, Gemeente Rotterdam

Office sector

183. The informants in Rotterdam suggest that the parking policy did have some impact on the office market in the Rotterdam region. One informant distinguishes between three phases since the introduction of the parking policy:

184. The first two years after the intro of the parking policy showed some stagnation in the office market. Offices were afraid to locate on A location because of the parking restrictions. Some offices relocated from A locations to B locations in this period. However, because of a high overall demand for office space, the A locations still performed relatively well. The situation changed one-two years after the introduction of the policy. All actors – local authorities, developers, real estate, and companies – learned to live and work with the policy. The A locations became attractive once again, especially among less car-dependent offices. Also, the actors learned how to treat the strict parking norms in a flexible way. On the one hand, often a temporal element was introduced: following pressure from local authorities and market actors, national and regional government accepted higher parking norms as a temporary solution till public transport services would be improved.

185. The situation started to change once again at the beginning of the new millennium. The 'mood' in the society changed and the government adopted a more market-led approach to planning and transport. As part of this change, the idea of strict maximum parking norms, top-down defined, also came to be criticized. This resulted in the formal abolishment of the parking norms. Currently, local authorities have more freedom to define there own parking norms and to set other standards. This new approach has not resulted in a return to the situation from before the maximum parking norms. On the one hand, the awareness remained that it is not possible to provide parking without limitations. For the main actors, including market parties like developers, it is clear that car use has to be managed in order to guarantee accessibility, and parking is an integral part of this management. On the other hand, local authorities now influence the amount of parking in a different way. All large cities in the Netherlands currently have strict demands concerning the spatial and visual quality of office areas. They do not longer accept surface parking, but rather request underground parking or parking in garages. The cost for the development of these facilities is sometimes so high, that the result is a limited provision of parking.

186. In general, the informants suggest that the restrictive parking policy does play a role in the office dynamics in the Rotterdam region. It adds to other pull factors that decrease the attractiveness of the city center: high rents, lack of large space for new office developments, high development costs, and problematic car accessibility.

187. The fact that the city center has preformed relatively well over the past few years can be mainly attributed to three strong pull factors of the city center: its image and status, its attractiveness as a working environment, and its concentration of harbor related offices. Because of these factors, the city center is still the prime office location in the region, especially for offices that are less dependent on car-based travel, such as government and semi-government offices, and for offices related to the harbor. Businesses that are more dependent on road-based travel, such as consultancies, tend to prefer more peripheral locations adjacent to the highway system. A factor that has also contributed to the economic performance of the city is the lack of competition in the region. The only important office location in the surrounding localities is Rivium in Capelle aan de IJssel. However, the quality of this location is relatively low due to the mix of offices and light industries on the site and the spatial development one-by-one basis. Because of the lack of quality it is much less attractive for offices than city center or office locations in Rotterdam itself. The competition with surrounding cities is also limited. The two most nearby cities, Den Haag and

Delft, focus on other activities than Rotterdam. Den Haag focuses on offices related to government, while Delft is primarily dominated by offices linked to the technical university and research institutes.

Parking policy and economic development

188. The Rotterdam case shows both the sensitivity of the involved actors to the parking issue and the relative limited importance of parking restrictions for the office market. A short time after the actors got used to the new parking limitations, the office market returned back to normal and the city center became attractive once again. The concentration of offices in the city center, the related image and status of the area, and the attractiveness of the city center as a working environment, all contributed to the ongoing 'pull' of the city center for the office sector. The parking norms do play a role in the location dynamics, especially in the preferences of offices with high levels of car-based transport, such as consultancies. In general, the informants in Rotterdam seem to give more weight to parking provision as a location factor than the interviewees in the other case study cities. This may be attributed to three reasons. First, unlike the other cities, the restrictive parking policy in Rotterdam was introduced by the national government. This has definitely contributed greatly to the unease among the actors in the office market and to reservations about the policy in the first year after its introduction. Second, the city center of Rotterdam seems to offer less 'pull' factors for offices than the city centers in the other case study cities. The lack of a clearly dominant office sector, like the banking sector in the other cities, may play a role here. Third, the office sector in the Netherlands seems to be more dominated by office sectors that rely on car-based travel, such as consultancies. The other case study cities show a dominance of the banking sector, which is less dependent on car-based travel than many other office sectors.

Chapter 7 Case study 4: Zürich

7.1 Introduction

189. The City of Zurich is located in the center of Switzerland and is the main economic center of the country. The city has a population of 360,000 and 330,000 jobs. It is the center of a conurbation with a population of close to 1 million, and the capital of the Kanton of Zürich with over 1.2 million inhabitants. The Kanton covers a large area of more than 1,700 km2, 36% of which consists of forests and non-productive areas.[97] The juridicial structure of the area is very fragmented, as the Kanton encompasses a total of 171 municipalities.

Table 7.1 Zürich versus Tel Aviv in tems of inhabitants, surface area and density.[98]

	Zürich		Tel Aviv	
Population				
City	364,528	(2002)	363,400	(2003)
Metropolitan area	1,237,920	(2002)	1,164,300	(2003)
Surface area (km2)				
City	91.9	(2002)	51.8	(2003)
Metropolitan area	1,728.8	(2002)	171.0	(2003)
Density (persons/ha)				
City	39.7	(2002)	70.2	(2003)
Metropolitan area	7.2	(2002)	68.1	(2003)

7.2 Parking policy

190. Zurich's restrictive parking policy with regard to private parking dates back from the late eighties. The policy was updated in 1996, when more restrictive maximum norms were introduced. The policy is based on a definition of the 'normal need' for parking places for various land uses. The 'normal need' is then translated into maximum norms by defining which percentage of the need can actually be provided for. The percentage varies according to the area in which a development is located. Furthermore, the maximum percentage can only be fully used after the pollution levels of NO2 have decreased to the maximum acceptable level. Till that time, even stricter percentages apply. Table 7.2 provides an overview of the five areas and the percentages, while Table 7.3 translates these percentages into maximum parking norms per square meter.

[97] Source: http://www.bfs.admin.ch/bfs/portal/de/index/regionen/regionalportraets/zuerich/blank/-kennzahlen.html, last accessed November 2004.

[98] Sources for Zürich: http://www.bfs.admin.ch/bfs/portal/de/index/regionen/regionalportraets/zuerich/-blank/kennzahlen.html; http://www.stzh.ch/ssz/dienstleistungen/jahrbuch/download/JB_2003_kapitel_2.-pdf; http://www.stadt-zuerich.ch/ssz/themen/bevoelkerung.asp#key; https://data.statistik.zh.ch/. Sources for Tel Aviv: Sources for Tel Aviv: Israeli Central Bureau of Statistics (http://www1.cbs.gov.il/reader/-shnatonenew.htm) and Municipality Tel Aviv (2003) Statistical yearbook 2003. The Zürich metropolitan area covers the area of the Kanton of Zürich. The Tel Aviv metropolitan area covers the area of the Tel Aviv District ('Machoz Tel Aviv').

Figure 7.1 The location of Zürich within its direct surroundings.

Table 7.2 Parking areas and parking restrictions for Zürich.

Area	Maximum percentage as long as NO2 emmision is too high	Maximum percentage in final situation
Area A: historic center of Zürich	10%	10%
Area B: center of Zurich	45%	50%
Area C: areas around the center and around major public transport hubs	70%	75%
Area D: areas around Area C and around smaller public transport nodes	95%	105%
Remaining area of Zurich	130%	130%

Table 7.3 Maximum number of parking places per square meter brutto floor space, for current situation with too high emissions of NO2.

Land uses	'Normal need'	Area A	Area B	Area C	Area D	Rest
Offices up till 500 m2	1 : 120 m2	1200	267	171	126	92
Offices above 500 m2	1 : 210 m2	2100	467	300	221	162
Shops up till 2000 m2	1 : 100 m2	1000	222	143	105	77
Shops above 2000 m2	1 : 160 m2	1600	356	229	168	123
Restaurants, cafes, bars	1 : 40 m2	400	89	57	42	31
Industry and storage	1 : 350 m2	3500	778	500	368	269

7.3 Complementary policies

191. The parking policy outlined above was not introduced in a vacuum. Since the early seventies, the City of Zürich has focused much of its transport policy on the containment of car traffic and the promotion of public transport.[99] The complementary policies include extensive traffic calming measures, intensive investments in the public transport system, expansion of pedestrian and bicycle facilities, management and enforcement of public parking, and land use policies.[100]

[99] Stadt Zuerich (1994) *Verkehrspolitik der Stadt Zuerich: Standt Maerz 1994*. Zuerich, Stadt Zuerich, pp.9-10

[100] Newman, P. W. G. and J. R. Kenworthy (1999) *Sustainability and cities: overcoming automobile dependence*. Aldershot/Brookfield, Gower Technical, pp. 200-204

192. The investments in the public transport system are the most prominent among the complementary policies. After the citizens of Zürich twice voted down a proposal to build an urban metro, the municipality decided to improve the existing public transport services rather than develop a completely new underground metro-system. This decision was backed up by a citizen initiative in 1973. Since then, the municipality has taken a number of measures to improve public transport services:[101]

- Development of separate bus lanes and more dedicated tracks for the trams at the expense of road space for cars;
- Priority for transit vehicles at intersections, regulated by traffic signals that are directly actuated by trams and buses by means of a dynamic traffic control system;
- Installation of information technologies that identify vehicle location and deviations from scheduled timetables, allowing for corrective actions.

These measures have substantially improved the bus and tram system within Zürich and the bus connections with the surrounding localities. Both bus and tram services are now considered as a crucial part of the public transport and are used by virtually all segments of the population – rich and poor, young and old etc.

193. The efforts of the City of Zürich are supported by the policies of the Kanton of Zürich. The Kantonal Public Transport Act of 1988 and the relevant Transport Supply Order calls for the provision of good public transport services for all continuous built-up areas with at least 300 inhabitants, jobs or trainees/students. 'Good' means that there must be a bus or tram stop within a distance of 400 m, or a train stop within a distance of 750 m, with a service frequency of at least one per hour.

194. The majority of the investments in public transport at the level of the Kanton of Zürich have focused on the improvement of the rail system. During the eighties, the train system – which was dominated by longer distance services – was changed into a full-fledge S-bahn system, or commuter rail. The network was completed in May 1990 with the opening of a new tunnel under the old city center and the Zürichberg, including a four track underground station. The network currently encompasses 400 km of suburban rail network, with a fixed interval timetable. Transfers from the S-bahn system to other modes of public transport are made easy through a tariff agreement, which enables free transfer between the region's other transport operators, who were brought together under the Zurich Transport Authority (ZVV) in 1990. Public transport use increased by 22% in the first year after completion of the S-Bahn, and by 40% over the first ten years.[102]

195. The ZVV itself is of crucial importance in the promotion of public transport in the region. The ZVV has the full responsibility for the planning and coordination of all public and private transit services within the Zürich region. Since its establishment, the authority has focused its efforts on the integration of the various public transport servives, the integration of ticketing services, the provision of travel information, and the marketing of the public transport system as a whole. The efforts of the ZVV have been very successful, as is reflected in the steep increase in readership since the introduction of the authority.[103]

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[101] Cervero, R. (1998) *The transit metropolis: a global inquiry*. Washington, DC/Covelo, CA, Island Press, pp.306-307

[102] Ott, R. (2002) *The Zurich experience*. Zuerich, Stadt Zuerich

[103] Cervero, R. (1998) *The transit metropolis: a global inquiry*. Washington, DC/Covelo, CA, Island Press, pp. 300-304; Pucher, J. and S. Kurth (1995) Verkehrsverbund: the success of regional public transport in Germany, Austria and Switzerland. *Transport Policy*, 2/4

196. The city has also put a lot of emphasis on the management of on-street parking places, especially in the city center. In the early nineties the so-called 'historical compromise' was reached that the number of parking places in the city center will remain stable. This means that no parking places are added to the capacity. The current policy is to replace on-street parking by parking in garages and underground. In addition, Zürich has set high parking fees for public parking, especially in the city center, thus discouraging people to travel into town by car and at the same time guaranteeing car accessibility for those that need or prefer the car to travel to the city center.

197. The land use policy of the Kanton of Zürich complements the restrictive parking policy. Much of the land use developments in the region are linked to the public transport system. For instance, a number of large shopping centers have been developed by transit authorities under and around major stations. Furthermore, much of the residential development has been concentrated around the S-bahn service.[104] This obviously increases transit ridership in home-to-work trips and thus reduces the demand for parking at the workplaces.

7.4 Transport circumstances at time of introduction of the parking policy

Public transport system

198. As mentioned above, the public transport system in the Zürich region is managed by the ZVV. The Authority's network comprises 262 lines with a total length of 2,300 km serving the whole of the Canton of Zurich. It includes railways, trams and buses, as well as cable cars, riverboats and ferries. The system consists of three components. The first is the S-bahn system, which connects the city with major urban centers and outlying municipalities through a radially oriented rail system, forming the backbone of the public transport network. The rail system is complemented by the second component, which consists of a system of line-haul buses connecting with the intercity train services at major stations, producing short-wait transfer. These two compenents are supplemented in the core of the region with a fine-grained grid of main tramlines that circulate within dense, built-up areas, providing nearly ubiquitous access and short-haul services in the city.[105]

199. The quality of the public transport in Zürich has risen tremendously over the past decades, as described above. The result has been a strong growth in public transport ridership since the second half of eighties. It currently stands at the highest per capita level in the world, with an average of about 560 transit trips per resident per year.[106] The most recent improvements have focused on the S-bahn system, partly as a response to the growing share of commuters in total home-to-work travel.

[104] Newman, P. W. G. and J. R. Kenworthy (1999) *Sustainability and cities: overcoming automobile dependence*. Aldershot/Brookfield, Gower Technical, pp. 200-203
[105] Cervero, R. (1998) *The transit metropolis: a global inquiry*. Washington, DC/Covelo, CA, Island Press, p. 300
[106] Cervero, R. (1998) *The transit metropolis: a global inquiry*. Washington, DC/Covelo, CA, Island Press, p. 299

Figure 7.2 Development in number of tram and bus passengers in Zürich, 1960-1993.[107]

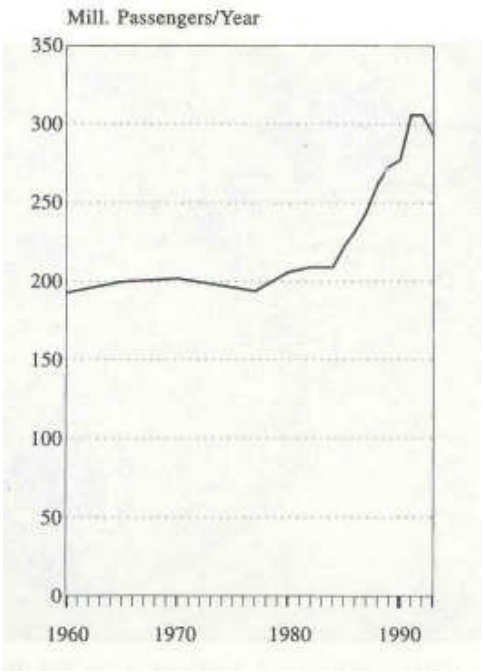
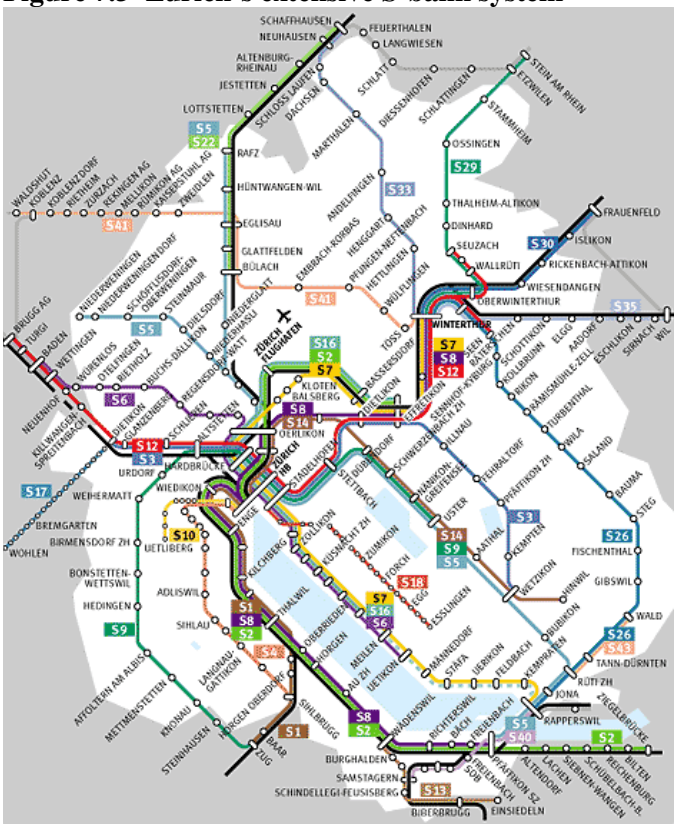


Figure 7.3 Zürich's extensive S-bahn system

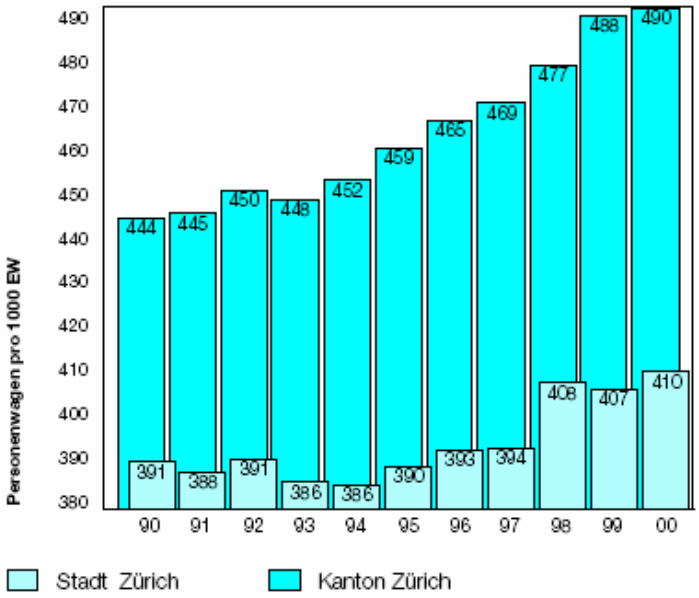


[107] Source: Newman, P. W. G. and J. R. Kenworthy (1999) *Sustainability and cities: overcoming automobile dependence*. Aldershot/Brookfield, Gower Technical, p. 202

Motorization rate

200. Zürich has seen a steady increase in car ownership over the past decade, just like the other case study cities. The motorization level has risen from 391 in 1990 to 410 in 2000. This is relatively high in comparison to Edinburgh and Rotterdam, but substantially lower than the figure for Frankfurt. It is also substantially higher than the motorization level in Tel Aviv, which stood at 247 in 1995. The motorization level is substantially higher at the level of the Kanton of Zürich. Here, the car ownership has risen from 444 in 1990 to 490 in 2000.

Figure 7.4 Development in motorization rate for Zürich and the Kanton of Zürich, 1990-2000. [108]



Parking availability

201. The number of parking places in the city center of Zürich is low in comparison with the other case study cities. This is true for both public and private parking spaces. The low number of public parking spaces can be related to the 'historical compromise' outlining that the number of parking places in the city center will not be changed. As a result no public parking was added to the capacities since the early ninites, unlike e.g. Edinburgh.

Table 7.4 Number of parking places in the case study cities.[109]

		Edinburgh (1)	Frankfurt	Rotterdam	Zürich
City center	Private parking	10,300	7,900	--	6,600
	Public parking	11,475	12,200	6,680 (2)	2,100
	Total	21,775	20,100	--	8,700
City	Private parking	--	--	--	202,400
	Public parking	--	--	37,650	51,500
	Total	--	--	--	253,900

(1) Partly based on estimates
(2) Includes only parking places in public parking garages

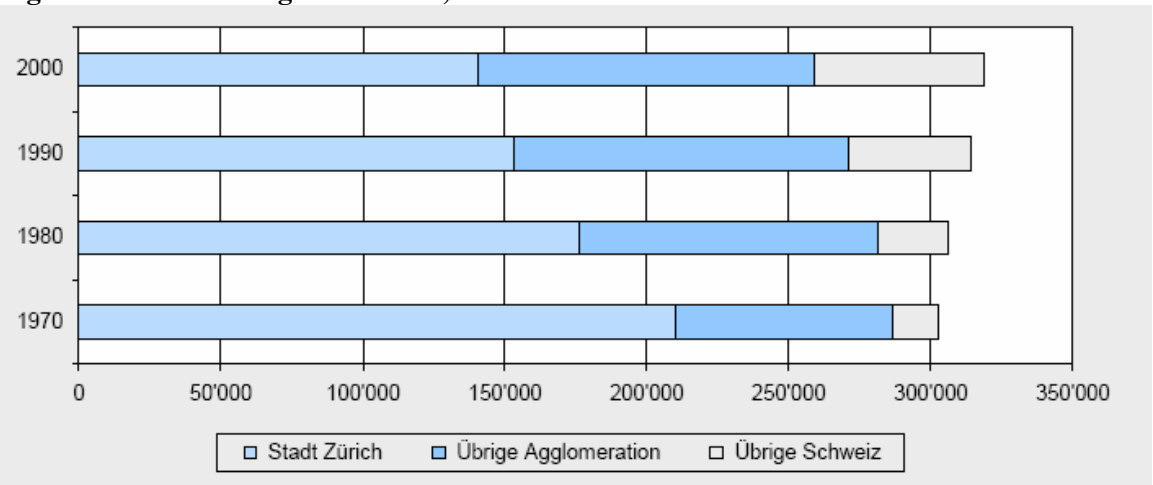
[108] Tiefbauamt der Stadt Zuerich (2002) *Entwicklung in der Personenwagendichte*. Zuerich, Stadt Zuerich

[109] Source for Zürich: Stadtplanungsamt Zuerich (no date) *Stadtverkehr Zuerich: Unterlagen fuer eine Fallstudie der OECD*. Zuerich, Stadt Zuerich, p. 25. Data for Zürich refer to 1990.

Commuting

202. As in the other case study cities, commuting had increased steadily over the past decades in Zürich. In 1970, about one third of Zürich's workers arrived each workday from outside the city. By 1990 commuters accounted for half of all workers. The level of commuting has further risen in the past decade and now stands at 56%.

Figure 7.5 Commuting into Zürich, 1970-2000. [110]



Modal split

203. The results of the heavy investments in the public transport system in Zürich are reflected in the developments in the modal split. This is true for both commuting trips to and internal trips within the city. The share of the car in commuting trips has steadily decreased over the past 25 years, from 50.6% in 1980 to 42.7% in 2000. Already from 1990 onwards, the share of public transport (train, tram and bus) has been higher than that of the car. The position of public transport is even stronger when home-to-work trips to the city center are taken into account. Here, public transport is good for 50% (for trips from the municipalities directly surrounding Zürich), to 55% (for trips from the municipalities at a larger distance from Zürich), to even 76% (for home-to-work trips that originate within the city).

Table 7.2 Modal split for home-to-work trips originating outside Zürich (commuting), 1970-2000.[111]

	1970	1980	1990	2000
Car	45.8	50.6	46.8	42.7
Train	36.3	30.9	39.7	44.9
Bus, tram	10	11.6	10.6	7.8
Organized bus	2.9	0.6	0.9	0.5
Others (incl. walking anc cycling)	3.3	2.4	1.7	2
No response	1.8	3.8	0.3	2.1

[110] Statistik Stadt Zuerich (2004) *Die Pendelmobilitaet der Erwerbstaetigen in der Agglomeration Zuerich: Etwicklungen 1970 bis 2000*. Zuerich, Stadt Zuerich, p. 5

[111] Source: Statistik Stadt Zuerich (2004) *Die Pendelmobilitaet der Erwerbstaetigen in der Agglomeration Zuerich: Etwicklungen 1970 bis 2000*. Zuerich, Stadt Zuerich

204. Public transport is also the dominant mode if other trips than home-to-work trips are taken into account. Public transport accounts for 66% of all internal trips within Zürich, while it has a share of 60% in total traffic with origin and/or destination in Zürich.

Table 7.3 Modal split for all internal trips within Zürich and for all trips with origin and/or destination in Zürich, 1990-2000.[112]

	internal trips		total trips	
	1990	2000	1990	2000
Car	23.5%	17.8%	35.7%	33.1%
Public transport	52.1%	65.9%	52.5%	60.2%
Walking and cycling	24.4%	16.4%	11.9%	6.6%

7.5 Economic development

205. The number of data on the economic development in Zürich and the city center of Zürich are relatively limited. The section starts with a discussion of the overall development of the city and then turns to the office sector. Data on the retail sector were not available for Zürich.

Total employment

206. The most important indicator for the economic performance of the city of Zürich is the development in total number of jobs. The table below shows that Zürich has been able to maintain and even slightly increase the total number of jobs within the city boundaries. However, in the same period the region has shown a strong growth in jobs, with a growth rate of 11% over the period 1985-2001. As a result, the share of the city in total regional employment has dropped from 51% in 1985 to 45% in 2001.

Table 7.4 Development in total employment in Zürich and the region, 1985-2001.[113]

	1985	1991	1995	2001	change	
Zurich	334,857	357,252	317,288	339,529	4,672	1%
Region	661,896	754,475	700,474	746,751	84,855	11%
Share of city	51%	47%	45%	45%	6%	--

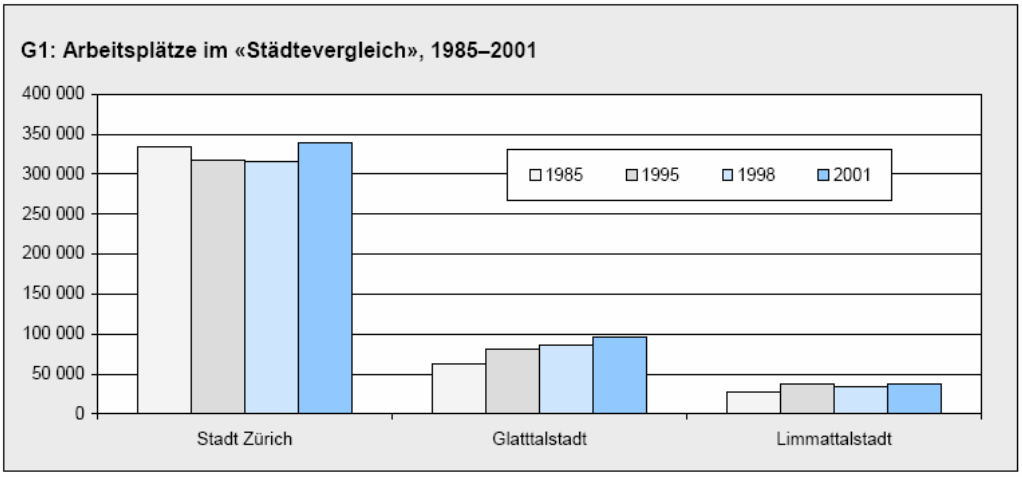
207. Over the past three decades, two large urban concentrations have developed directly on the edge of the city of Zürich: Glattalstadt and Limattalstadt. The first includes eight municipalities located between the city of Zürich and the international airport of Zürich. The second consists of five municipalities located to the northwest of Zürich. Both areas have seen a rapid growth in the period 1985-2001. Glattalstadt has seen a rise of 50% in total employment, while the number of jobs in Limmattalstadt has grown over 40% in this period. Both figures are much higher than the 1% figure for the city of Zürich.

[112] Source: Bundesamt für Statistik, Harmonisierte Personenrecords Volkszählungen 1990 und 2000. Personal e-mail communication with Marc-Aurel Battaglia of the Statistisches Amt des Kantons Zürich, September 2004.

[113] Source: http://www.stadt-zuerich.ch/ssz/dienstleistungen/publikationen/download/xls/A_05_2003.xls, last accessed October 2004.

Figure 7.6 Location of Glattalstadt and Limmattalstadt in relation to Zürich.[114]

Figure 7.7 Development in employment for Zürich, Glattalstadt and Limmattalstadt, 1985-2001.[115]



208. The large differences between Zürich and Glattalstadt and Limmattalstadt are the result of the economic restructuring over the past thirty years. Like in all developed nations, the Zürich region has lost many jobs in the secondary sector during this period. The results of this process have been most strongly felt in the city of Zürich, because of its dominant position in the industry sector. During 1970-2000, Zürich has lost close to 70,000 jobs in industry. It is this loss of jobs that is responsible for the low growth rates in the city of Zürich. In contrast, the service sector in Zürich has performed extremely well over the same period, with a growth of close to 70,000 jobs.

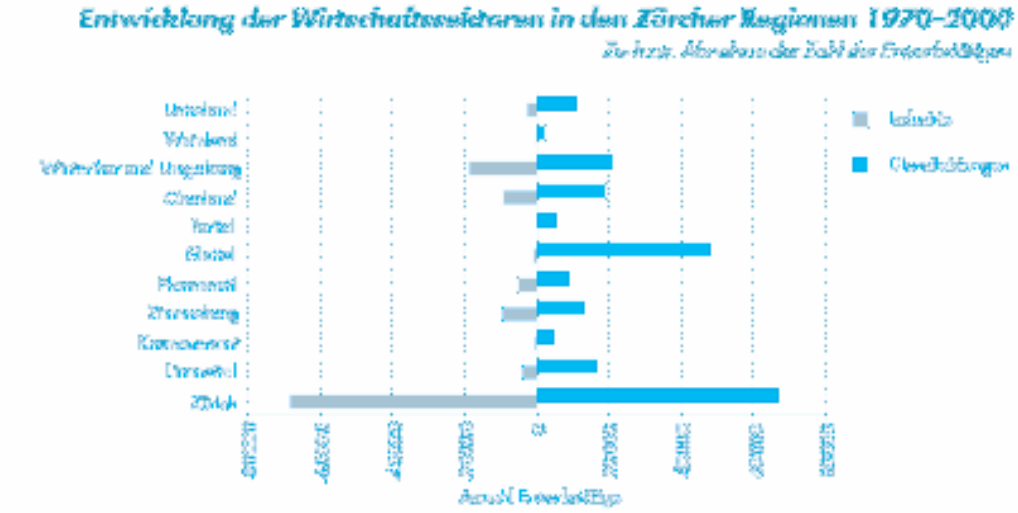
[114] Source: Statistik Stadt Zuerich (2004) *Glattalstadt und Limmattalstadt im Vergleich zur Stadt Zuerich*. Zuerich, Stadt Zuerich

[115] Statistik Stadt Zuerich (2004) *Glattalstadt und Limmattalstadt im Vergleich zur Stadt Zuerich*. Zuerich, Stadt Zuerich

This number means that Zürich has accounted for over 30% of the growth in the service sector in the Kanton of Zürich, while Glattalstadt and Limmattalstadt have accounted for 22% and 8% respectively.[116]

209. In addition, it should be noted that Zürich remains by far the most important employment center in the Kanton of Zürich. In 2001, the city had a share of 71% in the total employment of the three areas together, while Glattalstadt accounted for 20% and Limmattalstadt for only 8%.

Figure 7.8 Growth in number of industry and service sector jobs for various areas in the Kanton of Zürich, 1970-2000.[117]



Developments in the office sector

210. The office sector has seen a tremendous development in the Zürich over the past decades. *Total employment* in the service sector, which includes the office sector, has seen a growth of 11% in the period 1995-2001. This figure is especially impressive in comparison to the low growth rate for the total employment in the city. While third sector employment has increased slightly faster in the Kanton of Zürich, the city has maintained its dominant position, with a share of 57% of total regional service sector employment. Note also that Zürich accounts for 52% of the growth in the service sector jobs over the period 1995-2001. This is substantially higher than the share of 30% over the period 1970-2000 (see above), suggesting that the city has increased its attractiveness for the service sector in the last decade.

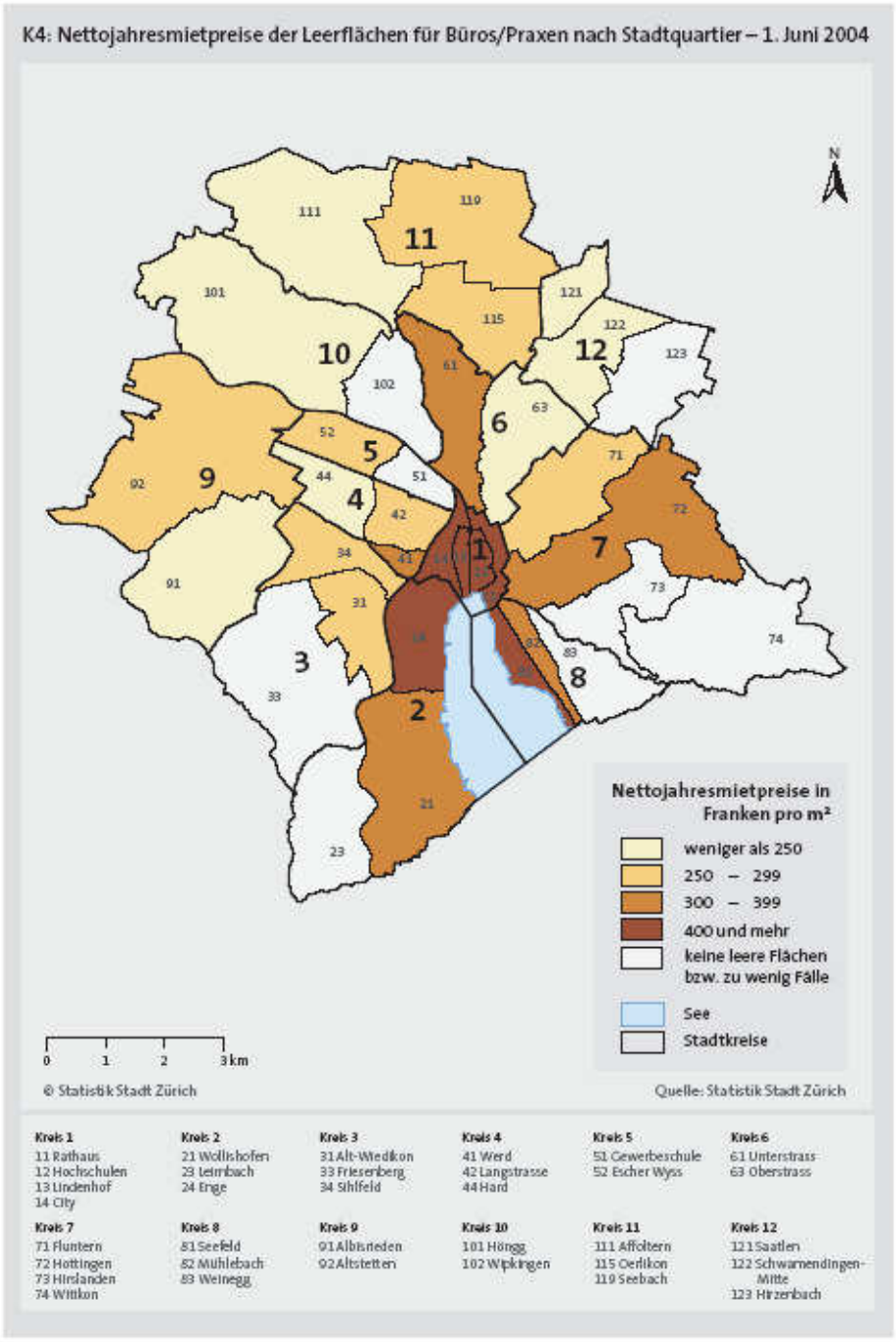
Table 7.5 Development in the service sector employment in Zürich and the Kanton of Zürich, 1995-2001.[118]

	1995	1998	2001	change	
City	264,659	270,142	296,576	31,917	11%
Region	460,429	470,124	521,444	61,015	12%
Share of city	57%	57%	57%	52%	

[116] Source: calculations KM based on http://www.statistik.zh.ch/publikationen/ktzhiz/ktzhiz04.pdf, last accessed November 2004.
[117] Source: http://www.statistik.zh.ch/publikationen/ktzhiz/ktzhiz04.pdf, last accessed November 2004.
[118] Sources: http://www.stadt-zuerich.ch/ssz/themen/erwerbsleben.asp#key and http://www.stadt-zuerich.ch/ssz/dienstleistungen/publikationen/download/xls/A_05_2003.xls, last accessed October 2004.

211. The *rent levels* are a second indicator of the performance of the office sector in the city. Data from the Richard Ellis real estate company show that the city center of Zürich is by far the most attractive office location. The rent level is about twice as high as the average rent for the whole of Zürich.[119]

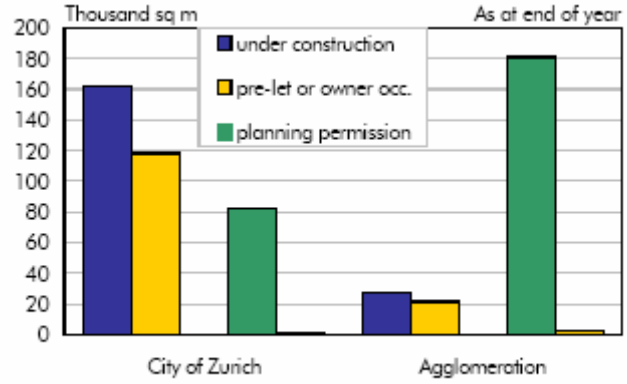
Figure 7.9 Rent levels for vacant office space in Zürich, 2004.[120]



[119] CB Richard Ellis (2003) *Zuerich office market index brief Q4 2003*. Zuerich, CB Richard Ellis
[120] Statistik Stadt Zuerich (2004) *Buero- und Geschaeftsflaechen in der Stadt Zuerich: Leerflaechenzaehlung vom 1. Juni 2004*. Zuerich, Stadt Zuerich

212. A third indicator is the *development of new office space*. Ones again, data from the Richard Ellis real estate company can provide some insight. The data show that a large share of new office developments is under construction within the city of Zürich. At the end of 2003, the total amount of office space planned and under construction in the city of Zürich amounted to 360,000 m2, while the figure was about 240,000 m2. These figures point to the continued strength of the Zürich in the office market.

Figure 7.10 New office space, planned and under construction, at the end of 2003.[121]



Source: CB Richard Ellis

7.6 Impacts of parking policy on economic development: interview results

213. The data presented above show that Zürich has preformed well over the past decade. The interviews with the experts in Zürich provide insights into the reasons for the ongoing economic vitality of the city and city center. The informants that were interviewed include three representatives from the municipality (covering the fields of transport, economic development, and business relations) and two experts from two different estate agencies (see appendix).

Office sector

214. The informants in Zürich stress that "the city center is thriving despite the strict parking norms". The city center is especially attractive among headquarters offices, the banking sector, and insurance and legal services. The informants attribute this to a number of factors. First, the proximity to the banking sector and centers of decision making is important for these types of offices. The management of the various banks prefer to be located close to each other, while legal services prefer a location close to the banks as they are prime clients. The image and status that the city center offers also play a role for these office sectors. Another pull factor of the city center is the attractive urban environment offered by the city center. The proximity of shops, restaurants, cafes and cultural and leisure facilities, make the city center a very attractive location for offices and employees alike. This urban quality is important for e.g. the banking sector that serves an international clientele.

215. The attractiveness of the city center is reflected in the high rental levels. This, in turn, is a prime reason for offices in various sectors to locate in other office areas. This is true for the back offices of the banking sector, but also for e.g. the high-tech, telecom and media sectors. These sectors cannot afford the high rents in the city center and also do not need the proximity of the banks and

[121] CB Richard Ellis (2003) *Zuerich office market index brief Q4 2003*. Zuerich, CB Richard Ellis

other decision-making centers located in the city center. The image of the city center also plays a role in the location preferences of the high-tech, telecom and media sectors. The city center has a traditional image, dominated as it is by the banking sector. Many high-tech companies prefer a 'younger' image and tend to locate close to other high-tech companies, which are located primarily in the Zürich West area.

216. Another factor that 'pushes' offices out off the city center is the dominance of historical buildings and the lack of space for new, large scale, developments. Because of the dominance of historical buildings, the number of large office premises available in the city center is limited. This may deter large offices or offices that want to concentrate their activities from locating in the city center. The same holds true for the lack of space. Offices that want to locate in a new office building will have problems to find a suitable location to develop such a new building within the city center. Such office may thus opt for locations out of the city center where large plots are more readily available.

217. A final factor that plays some role in the location dynamics in the office sector in Zürich are corporate taxes. Like in Frankfurt, the local and regional (Kanton) levels of government set the taxes concerning company income. These tax rates are substantially higher within the Kanton of Zürich than in the Kanton of Zug, which encourages some offices to locate in Zug rather than in Zürich.

218. All informants agree that parking plays only a minor role in the location dynamics of the office sector in Zürich. The factors mentioned above are far more important than the parking restriction in the city center or at other locations. The excellent public transport system of Zürich plays a key role here. Because of the excellent public transport accessibility of the city center and also of office locations like Zürich West, the parking restrictions are of relatively limited important. The accessibility of offices is guaranteed thanks to the excellent public transport system. Some informants even stress that the efforts to reduce the use of the private car adds to the attractiveness of the city and city center. They suggest that the reduction in car use is crucial for the improvement in the quality of the environment and thus the quality of life in the city. In this sense, the parking restrictions actually contribute to the ongoing attractiveness of the city and city center in Zürich.

Parking policy and economic development

219. The results of the interview-round suggest that the restrictive parking policy has not had any negative impacts on the economic development of the city or city center of Zürich. The city and city center have maintained their attractiveness for the office sector, despite the strict parking norms. The ongoing attractiveness of the city center can in large part be attributed to the concentration of the banking sector and decision-making centers in the area, to its image and status, and to the attractive urban environment that it offers. The public transport system also plays a key role: because of the excellent public transport accessibility the parking restrictions are of relatively limited importance.

Chapter 8 Synposis and conclusions

8.1 Introduction

220. In the previous chapters the results from the analysis of the developments in the four case study cities have been presented in detail. In this final chapter, the results of the study are presented in a coherent fashion. The chapter starts with a short section recounting the reasons underlying the study. Then, a brief overview is provided of the research approach and research questions. The last section brings together the results from the case study analyses and draws a set of conclusions relevant for the Israeli situation.

8.2 Goal of study

221. The Ministry of Transport has recently adopted a new, more restrictive, system of parking norms. The new policy replaces the previous system based on minimum parking norms with a system based on maximum parking norms for a number of types of land uses, the most important of which are the office and retail sectors. The new policy relates the maximum norms to the proximity to competitive public transport systems, with the strictest norms applying to the areas around nodes of train and light rail systems (for more details on the Israeli policy, see Chapter 2, Section 4).

222. In the past year, the policy has been formally adopted by the Municipalities of Jerusalem and Haifa. A number of municipalities in the Tel Aviv area, however, have expressed reservations with regard to the policy, as they fear that the introduction of the new parking norms may have unwanted economic affects. More specifically, these municipalities fear that offices and retail may start to avoid the core of the Tel Aviv metropolitan area and instead locate in areas with less stringent parking norms.

223. The current research has been carried out against this background. The goal of the research was to provide insights into the possible impacts of the introduction of a restrictive parking policy in the Tel Aviv area by analyzing European cities that have introduced a comparable parking policy. More specifically, the goal of the research was:

> *To assess the impacts of restrictive parking policies on the economic development of cities and their centers.*

8.3 Research approach

224. The assessment of the economic impacts of restrictive parking policies on the economic development of cities and city centers is not a simple task. The city is not a ‘simple’ system in which causes and effects can be related to each other in a simple and straightforward way. Rather, it is a complex system in which various causes work together at the same time, sometimes strengthening and sometimes weakening each other, to generate a multitude of effects. Given

these characteristics the assessment of the relationship between one cause and one effect requires the analysis of the wider 'environment'.

225. This observation also holds true for the assessment of the impacts of restrictive parking policies. Such parking policies are never introduced in a vacuum. They are introduced in a city or region with a specific economic structure, with an existing public transport system, with an existing motorization level, with existing land use policies, etc. Each of these factors influences each other, the economic development of cities and city centers, and the possible impacts of a restrictive parking policy on the economic development. And so forth.

226. Given these feedback loops and complex interrelationships and the need to analyze the environment within which restrictive parking policies have been introduced and enforced, we have adopted a *case study approach* to assess the economic impacts of restrictive parking policies. The case study approach is especially suited to answer 'how' and 'why' questions and to examine links and changes over time. Because of these qualities, the method is well-suited for the assessment of the impacts of restrictive parking policies on the economic development of cities and city centers.

227. Following the case study approach, four case study cities were selected for an in-depth analysis. In the selection of the case study cities the following criteria have played a role: comparability of the parking policy, city size and structure, qualities of the public transport system, and data availability and accessibility. Furthermore, the aim was to select cities from a number of countries. Based on these criteria, the following four cities were selected: Edinburgh (Scotland/UK), Frankfurt (Germany), Rotterdam (the Netherlands), and Zürich (Switzerland).

228. The analysis of each case study city has been guided by the following five research questions:

1. *What are the particulars of the parking policy in the case study cities?*
2. *What complementary policies have been introduced to limit possible negative economic impacts of the parking policy?*
3. *Under what transport circumstances was the restrictive parking policy introduced?*
4. *What economic developments have occurred in the case study cities since the introduction of the restrictive parking policy?*
5. *What were the economic impacts of the introduction of the restrictive parking policy?*

229. The research questions have been answered using a combination of document analysis, data analysis, and in-depth interviews.

8.4 Main conclusions

230. The analyses of the four case study cities have generated a vast amount of data and knowledge on the economic impacts of restrictive parking policies. In this section, the results are brought together and conclusions are drawn.

Conclusions with regard to parking policies

231. The parking policies of the four case study cities are largely comparable with the policy proposed for Israel. Each city uses a system of norms that differentiates according to location and type of land use. In each case, the definition of locations is strongly linked to public transport accessibility, with some cities distinguishing between three types of areas (Rotterdam) and others between as much as six (Edinburgh). The policies are also largely comparable with regard to the

distinction between land uses. The main categories are office, retail, and light industry/ storage/distribution. Each city, with the exception of Rotterdam, has set maximum parking norms for all of these land uses. The Rotterdam policy, in contrast, has only set maximum norms for parking related to office buildings.

232. The table below summarizes the maximum parking norms for the area with the highest public transport accessibility, for selected land uses. The table shows that the norms in the four cities are largely comparable and at the same level as the Israeli norms. This is especially true for the office sector. Here, the maximum parking norms in the cities lie between 1:400 m2 and 1:500 m2, if the norms are re-calculated to gross floor area. In comparison, the proposed norms for Israel of 1:250 m2 are relatively low. The differences are somewhat larger for the retail sector and industry and storage.

233. Based on the analysis of the restrictive parking policies in the four case study cities, the following conclusion can be drawn:

1. **The proposed Israeli parking norms are moderate in comparison to the international examples.**

Table 8.1 Maximum parking norms for areas with the highest public transport accessibility, for selected land uses.

	Edinburgh (1)	Frankfurt (2)	Rotterdam (2)	Zürich (1) (3)	Israel
Offices	1:500 m2	1:350 m2	1:270 m2	1:467 m2	1:250 m2 (1)
Retail	1:60 m2 (4)	1:300 m2	minimum	1:356 m2	1:250 m2 (5)
Industry/storage	1:1000 m2	--	minimum	1:778 m2	1:250 m2 (6)

(1) Gross floor area
(2) Net floor area
(3) Figures relate to the Zürich CBD, more restrictive norms apply to the historical core of Zürich
(4) The norm is a maximum that can be further restricted by the Edinburgh City Council
(5) Net floor area ('ירקיע חטש')
(6) Brutto surface area ('וטורב תופצר חטש')

Conclusions with regard to public transport systems availability

234. The four case study cities differ widely in terms of transport circumstances. Frankfurt and Zürich stand out as cities with high quality public transport systems. Both cities have an extensive system of commuter rail and an excellent public transport system at the urban level. Rotterdam and Edinburgh have less well-developed public transport systems. Rotterdam lacks a well-developed commuter rail system, while the public transport system in Edinburgh is dominated by a system of urban and metropolitan buses. Both cities are fairly well comparable to the Tel Aviv metropolitan area.

Table 8.2 Main characteristics of the public transport systems in the four case study cities and Tel Aviv.

	Edinburgh	Frankfurt	Rotterdam	Zürich	Tel Aviv area
Long distance rail	basic network	extensive network	extensive network	extensive network	basic network
Commuter rail	basic network	9 lines	basic network	25 lines	4 lines
Light rail	--	7 lines	--	--	--
Underground	--		2 lines	--	--
Tram	--	8 lines	9 lines	13 lines	--
Bus	extensive network	40 lines	extensive network	extensive network	extensive network

The differences in the public transport system are only partly reflected in the modal split data. Especially the high share of public transport for Edinburgh is remarkable, given the lack of a

lightrail or underground public transport system there. Note also that the data for Rotterdam are slightly inflated, given the importance of the bicycle in the modal split in Rotterdam. The high car share for Tel Aviv can partly be related to the fact that the data refer to the metropolitan area rather than the city. For the city, the share of public transport is probably substantial higher and closer to the levels of case study cities Edinburgh, Frankfurt and Rotterdam. Zürich definitely stands out, with a public transport share that is much larger than the share of the car. The figures suggest that the cities have introduced restrictive parking policies under what could be called 'hostile' circumstances of high levels of car use. This suggests that cities have not waited for the modal split impacts of improved public transport systems, but have rather used restrictive parking policies to help change the trends in modal split (see also below).

235. The data concerning the transport circumstances give rise to the following conclusions:

2. **Cities with public transport systems comparable to the public transport system in the Tel Aviv metropolitan area have introduced restrictive parking policies in the past (most notably Edinburgh and Rotterdam).**
3. **Cities have introduced restrictive parking policies under 'hostile' circumstances of high levels of car use in home-to-work trips.**

Table 8.3 Modal split for motorized trips, for the four case study cities and Tel Aviv.

	Edinburgh (1)	Frankfurt (2)	Rotterdam (3)	Zürich (4)	Tel Aviv area (5)
Car	59%	62%	71%	36%	80%
Public transport	41%	38%	22%	65%	20%

(1) Modal split for home-to-work trips with destination Edinburgh, for 2000
(2) Modal split for trips made by inhabitants of Frankfurt, for 2003
(3) Modal split for trips with origin and/or destination in Rotterdam, for 2000
(4) Modal split for all trips with origin and/or destination in Zürich, for 2000
(5) Modal split for all trips with origin and/or destination in Tel Aviv metropolitan area ('Machoz Tel Aviv'), for 2003

Conclusions with regard to complementary policies

236. Each case study city has adopted a number of policies over the years that are complementary or supportive to the adoption and implementation of the restrictive parking policies. The cities show a strong overlap in these complementary policies.

237. First of all, all cities have introduced parking demand measures with regard to public parking prior to the introduction of restrictive parking policies with regard to private parking and/or parking related to land uses. These parking demand measures have generally been introduced to guarantee an efficient use of public parking places (to guarantee short-stay parking for visitors and shoppers) and to reduce the negative impacts on residents in areas with high demand for parking. The measures have subsequently been used to limit the negative impacts of, and increase the effectiveness of, restrictive parking norms for private parking. In other words, all cities have used parking management to prevent commuters from using on-street and off-street public parking places instead of – limited available – private parking places.

238. Second, all cities have invested substantially in the improvement of the public transport system. In the case of Frankfurt and Zürich, much of the improvements in the system were carried out before the adoption of the restrictive policy for private parking places, while investments continued after the introduction of the policy. However, in the case of Edinburgh and Rotterdam, substantial improvements in the public transport system were only announced at the time of the introduction or adoption of the restrictive parking policy. In both cases, the proposed improvements in the public transport were instrumental in generating support for the proposed

changes in the parking norms. The fact that the adoption of the restrictive norms was not postponed till *after* the completion of the proposed improvements in the public transport system, suggests that the involved parties felt that the existing public transport systems would provide an acceptable alternative for, and be able to 'absorb', commuters that lack a parking place.

239. The third complementary policy concerning land use policies. Here, the case study cities differ. Rotterdam has the most full-fledged land use policy supporting the restrictive parking policy, in terms of formal regulations, regional coverage, and in enforcement of the policy. Edinburgh represents the other extreme of the spectrum. Here, only 'soft' planning guidelines existed at the time of the adoption of the restrictive parking norms. Frankfurt and Zürich represent positions in between these two extremes, with land use policies discouraging but not blocking out-of-town developments. Of importance here is the fact that the lack of strong, watertight, land use policies has not prevented the cities of Edinburgh, Frankfurt and Zürich to introduce restrictive parking policies.

240. The analysis of the complementary policies in the four case study cities gives rise to the following conclusions:

4. **Management of on-street and off-street public parking spaces is a 'natural' complement of restrictive norms with regard to private parking places.**
5. **Restrictive parking policies and public transport improvements go hand-in-hand, but public transport improvements do not need to precede the adoption of a restrictive parking policy.**
6. **Restrictive parking policies have been introduced without supporting, watertight, planning regulations preventing unwanted suburbanization of economic activities.**

Table 8.4 Overview of complementary policies in the four case study cities.

	Edinburgh	Frankfurt	Rotterdam	Zürich
Public parking management	yes	yes	yes	yes
Public transport improvements	after policy adoption	before and after	after policy introduction	before and after
Land use regulations	largely lacking	partial	strong	partial

Conclusions with regard to economic developments

241. The analysis of the economic development of the four case study cities has revealed an overall picture of vital cities and city centers. Each of the cities has seen a substantial growth in total and/or third sector employment since the introduction of the restrictive parking policy. The growth figures are especially high for Edinburgh and Rotterdam. The first has seen a tremendous growth of the office sector employment, while the second has seen a strong growth in city center employment. Frankfurt and Zürich show lower growth numbers, but here, too, the third sector has seen substantial growth since the introduction of the parking policies in both cities. Other data, for instance on prime office rents and on office take-up, show the continuing dominance of the city center in the office markets in all four cities. In all cities, the strong position of the city center has gone hand in hand with a considerable development of office concentrations at urban-edge locations, inside and outside the central city borders.

242. The analysis of the economic development in the four case study cities gives rise to the following conclusions:

7. **The cities and city centers show an ongoing economic vitality after the introduction of the restrictive parking norms.**
8. **The city centers remain the dominant office location in all case study cities.**

Table 8.5 Growth in total employment and office/third sector employment in the case study cities.

		Edinburgh (1)	Frankfurt (2)	Rotterdam (3)	Zürich (4)
City center	Total employment	--	--	21.0%	--
	Office/third sector employment	--	--	--	--
City	Total employment	6.7%	7.0%	--	1.0%
	Office/third sector employment	30.7%	10.0%	--	11.0%

(1) Data for 1998-2002
(2) Development in total employment for 1987-2002, office sector 1999-2002
(3) Data for 1994-2001
(4) Development in total employment for 1985-2001, third sector employment 1995-2001

Conclusions with regard to the economic impact of restrictive parking policies

243. The data presented below and in the report sketch a picture of strong and vital cities and city centers and suggest that the restrictive parking policies have not have any significant influence on the economic development. The in-depth interviews with experts in the four case study cities confirm this observation. The experts have provided insight into the factors that move the office and the retail markets in the cities, factors that can explain the 'missing link' between parking restrictions and economic development. The experts sketch a picture of the office market that is driven by and large by other considerations than parking. The factors that determine location decisions of offices include proximity to (business) clients, proximity to decision-making centers (leading companies), attractiveness of the city center for employees, and the status and the image of the city center. The public transport accessibility of the city center is an additional location factor that makes the ongoing concentration of offices possible. These factors play a role in all city center with the exception of Rotterdam, which lacks a clearly dominant office sector that 'pulls' other offices to the city center.

244. The experts also generally stress the inevitability of the rise of additional office concentrations *in addition* to the city center. First, exactly because of its popularity among offices, the city center features rent levels that are too high for a substantial part of the office sector. Second, especially the city centers in Edinburgh and Zürich lack the physical space for a substantial expansion of the office sector. A third reason that plays a role in Frankfurt and Zürich is the taxation of company income, which is higher in both cities than in the surrounding localities. These factors are the main 'push' factors that result in the growth of office concentrations on the urban edge and in the surrounding localities. The experts point out that a large part of these developments are inevitable against the background of the factors mentioned before and that peripheral office locations can be viewed as complementary rather than competitive to the city center.

245. Finally, there is common agreement among the experts about the limited role of parking in the location decisions of offices. All agree that parking does play a role, but only a limited one, and that other factors tend to prevail over parking. Only for special office sectors that are dependent on car-based travel, like companies employing a large number of sales agents, will attach a relatively high importance to parking in their location decisions. But for these offices, too, parking is only one among a set of considerations.

246. These observations of the experts suggest that the parking restrictions have had no negative impact on the economic development of the case study cities. Some experts even suggest the opposite. They point out that one of the main strengths of the city center lies in its attractive urban environment and that the restrictive parking policies are instrumental in protecting and

strengthening this quality. These experts thus suggest that the restrictive parking policies have positive rather than negative impacts on the economic development of city centers.

247. These results of the in-depth interviews with experts in the case study cities gives rise to the following conclusions:

9. **Parking is a relatively unimportant location factor in the location decisions of offices.**
10. **The city center has strong qualities that make it attractive for a large part of the office sector and that compensate for the parking restrictions.**
11. **The decentralization of offices and the rise of peripheral office concentrations is the inevitable result of the dynamics in the office market, in which parking considerations play only a minor role.**

Core conclusions of the research

248. The above observations and conclusions lead to the following overall conclusions of the research:

12. **Parking restrictions have had no significant influence on the economic development of the selected cities and city centers.**
13. **The economic dynamics in the case study cities suggest that parking restrictions will not have negative economic impacts if implemented in cities with a strong and vibrant economic structure.**

Appendix: List of interviewees

Edinburgh

1	Mr. Phil Noble	Member of Economic Development Team, City Development Department, City of Edinburgh
2	Mr. Gary Sturgeon	Member of Economic Development Team, City Development Department, City of Edinburgh
3	Ms. Alison Paterson	Acting Development Control Officer, Development Control Section, City of Edinburgh
4	Mr. Mark Robertson	Head of Consulting, Rydens Real Estate
5	Mr. Alan Robertson	Managing Director for Scotland, Jones Lang LaSalle, Edinburgh

Frankfurt

1	Mr. Klaus Janz	Stadtplanungsamt, Fachbereich Verkehrsplanung, Stadt Frankfurt
2	Mr. Gregor Büchner	Director, Strategic Consulting Team, Jones Lang LaSalle Frankfurt
3	Mr. Peter Birchinger	Associate Partner, Cushman & Wakefield Real Estate, Frankfurt
4	Mr. Olivier Debeauregard	Senior Consultant, DTZ Real Estate, Frankfurt
5	Mr. Udo Bausch	Business Consultant, Frankfurt Economic Development Company GmbH

Rotterdam

1	Ms. Gerdi van Dalen	Policy Advisor, Transport Section, Department of Urban Development and Housing, Municipality of Rotterdam
2	Mr. Gerben Vrijkorte	Real Estate Officer, Section of Real Estate Development, Development Company Rotterdam, Municipality of Rotterdam
3	Mr. Huub van de Zande	Expert parking policy, Development Company Rotterdam, Municipality of Rotterdam
4	Mr. Bas van Holten	Director, Jones Lang LaSalle Rotterdam
5	Mr. Arno Ruigrok	Director Research and Development, AM Vastgoed
6	Mr. Thijs Ruiter	Real Estate Agent, Retail Sector, William Properties

Zürich

1	Mr. Rüdi Ott	Fachbereichsleiter, Verkehrsplanung, Tiefbauamt , Stadt Zürich
2	Mr. Alex Martinovits	Projectmanager, Fachstelle fuer Stadtentwicklung, Stadt Zürich
3	Mr. Wolfenschläger	Consultant, Standort Marketing Department, Stadt Zürich
4	Mr. Matthias Meier	Head Corporate Communications, Allreal Real Estate Company
5	Mr. Hans Peter Egloff	Director Real Estate Department, PSP Swiss Property