

MOBILITY AND ACCESSIBILITY - THE CASE OF BRUSSELS

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Summary. The consumers' search for greater mobility and the goods and service providers' search for the best accessibility have always shaped our territory. However, the growth of automobile mobility over the last thirty years is slowly suffocating the cities. Until now, the remedies have most of all tried to satisfy the need for mobility by acting on the supply of transport. This approach has proved to be all but ineffective.

A new, more global approach aiming to improve both mobility and accessibility which is being implemented in Brussels leads to the proposal of a new strategy divided into 5 lines of action :

- a regional development policy orienting the location of entities creating important movements of people into the city centre in the vicinity of the busiest nodes of the public transport networks;
- improvement of the links in public transports between the city centre and the suburbs (suburban metro/suburban express rail system);
- parking control;
- decrease of automobile traffic in residential areas and limitation of the congestion in the city centre by means of traffic-flow control measures;
- improvement of the travel conditions of pedestrians and cyclists.

1. The Concepts of Mobility and Accessibility

Mobility, meaning the possibility to move from one place to another, constitutes a freedom sought by all citizen, enabling them to maintain or expand choices in everyday life. It permits them to choose an employer or a workplace not located in the vicinity of their home, to go shopping where they want and where prices are best, as well as to spend their holidays at ever increasingly distant places thanks to the relative decrease in the cost of transport. This explains why mobility is quite a normal concern for any consumer. The private car meets this concern perfectly well, and this is the reason for its wide popularity.

However, thanks to an increase in revenue and to the mobility cars have provided them with, inhabitants of cities are now able to leave city centres to live in a more attractive atmosphere of less populated areas. By doing so, they are partly responsible for the depopulation of urban centres and for the congestion of their access roads.

Accessibility, meaning ease of access, is a concern more closely related to the production and distribution of products or services. In trade and non-trade sectors, players try to place their establishment in order to minimise transportation costs or to minimise the amount of time their clients spend travelling. The search for accessibility, acting as a mainspring, has shaped and still shapes our territory. At a time when public transport was the main answer to the mobility demand of the people, the competition for accessibility was responsible for the success of the town-centres for commercial and office establishments. More recently, the development of automobile mobility has re-oriented the search for accessibility by distributors of goods and services to more peripheral locations. This has led to the establishment of businesses, workshops, storage areas and offices areas along high speed roads and urban ring roads or in the vicinity of highway interchanges and, at the same time, to the decline of these activities in the city centres.

The combination of consumers' mobility in private cars and the search for accessibility on the producers' side therefore induced a process of delocalisation of housing as well as production and commercial functions, which contributes to strengthening the dependence on cars for satisfying the need for mobility.

The effects of this behaviour of a greater search for mobility by the consumers and for a better accessibility by the producers combine to multiply themselves and lead to the congestion of road infrastructure, to the deterioration of the service quality of public transport and to the worsening of the quality of life in the cities, thereby accelerating the process of destructuration and decline of the cities.

Up until a little while ago, the reactions of politicians responsible for urban transport policy most of all consisted in trying to satisfy or control mobility by measures affecting the offer of transport (successively, creation of high-speed urban roads, building of tubes and, after that, improvement of the performance of surface public transport modes).

These mobility strategies, while sophisticated, not only fail to take into account the pernicious evolution described above but even accelerate this evolution.

As a reaction to this, the idea is slowly emerging that strategies have to be based on more global perspectives including not only actions on the supply of transport but also actions aimed at influencing the demand and the trends in the urban players' choice of location.

This new approach leads to larger strategies aiming at reducing the need for moving about in private cars by improving the general accessibility to city centres and by orienting the location of functions and activities toward those centres.

The illustration below shows the steps that were taken in this direction in the elaboration of the new Land Use/Transport Development Plan of Brussels (IRIS Plan).

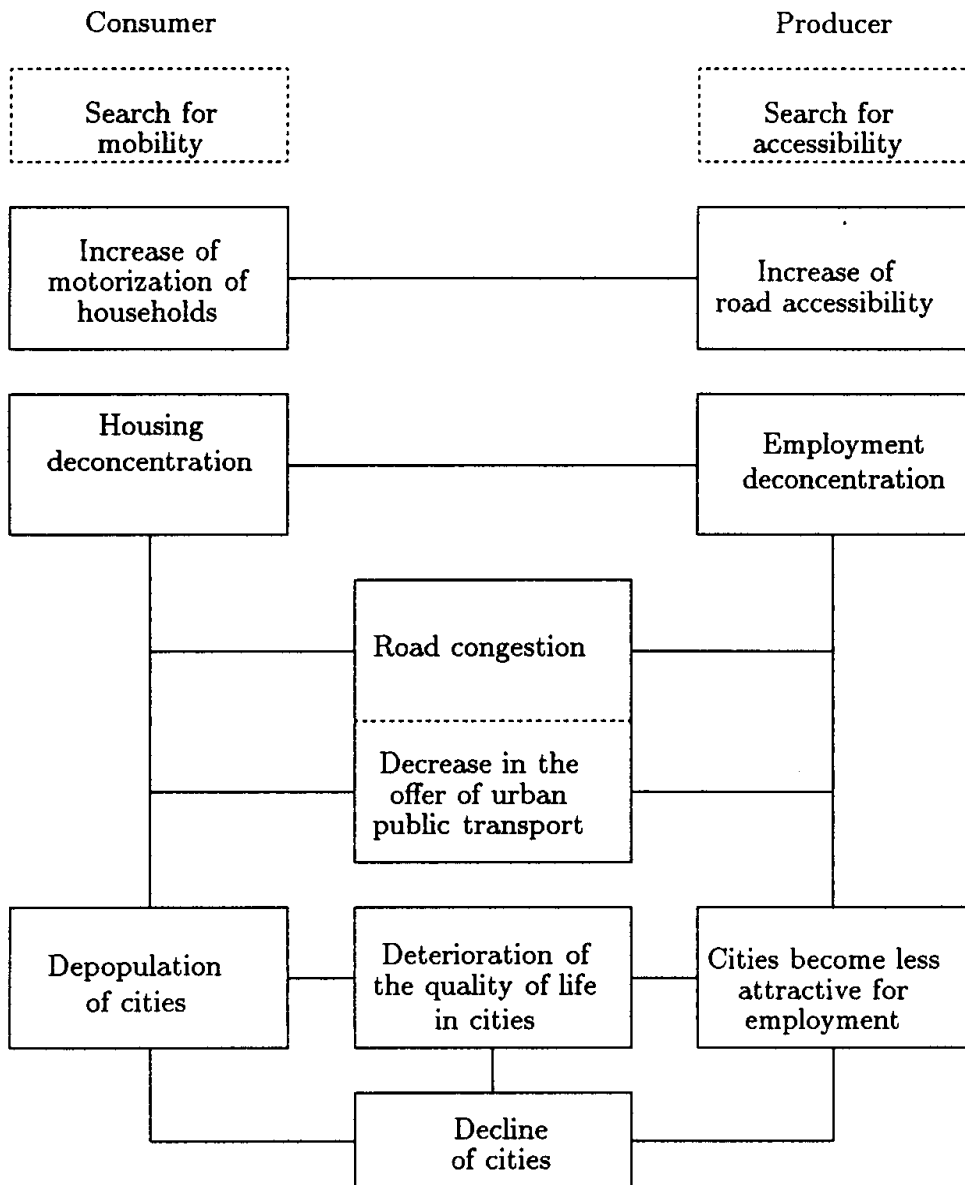


Fig. 1.1. The cycles of urban decline

2. Urban Mobility at a Deadlock

2.1 The Citizens' Frustrations

Inhabitants of cities, and particularly those of Brussels, its surroundings and, to a lesser extent, those of the rest of the country, feel that the transportation system which is at their disposal in order to travel around the city or to get to the city imposes higher and higher restrictions on their mobility. These restrictions vary according to the case concerned :

- Some have seen the time it took them to travel to work by car doubled in less than ten years due to the congestion of access roads to Brussels ; moreover, once they arrive close to their destination, they cannot find a place to park their car.
- Others who used to take the train or tube to go to work now have to go in their own car because their employer moved from the city centre to a new building in the periphery that is not accessible enough by public transport.
- Children of some people do not have effective public transport at their disposal to reach their school, and their parents are thus obliged to drive them to school and back.
- Another category are households that do not live in the vicinity of shops or basic services and are obliged to use their car or public transport in order to carry out some trips they could make on foot or with their bicycle if facilities were better distributed.
- Finally, people who do not have a car because of their age, a physical disability or insufficient revenues, which means those who are called "captive" users of public transport are more and more limited in their possibilities to travel where they want when they want because of the suppression of services due to the increased scarcity of public transport users.

These drawbacks are not insignificant. They are responsible for a decrease in the quality of life in cities and the frustrations they cause cannot be ignored by political leaders.

2.2 Threats to Prosperity

The ease of contacts and exchange of goods and services is the basis of the urban society's prosperity. Any hindrance to these contacts and exchanges has a negative effect on this prosperity.

Many companies leave city centres for locations which are considered more accessible by their suppliers, clients and staff.

At the same time, the comparative advantages of housing in cities are decreasing, which reinforces the tendency of better-off inhabitants to look for a place to live in the surrounding area of the city, whereas the poorest inhabitants tend to accept housing left in the centres.

Because of the narrowness of the territory of the Brussels-Capital Region, this phenomenon extends beyond the limits of the region, entailing a loss of its substance and a relative impoverishment, as shown by the table below.

Table 2.1. Share of Brussels in the National Economy

	1980	1990
Share of Brussels in the Gross National Product	15.5%	13.4%
Part of Brussels in the global amount of taxable revenue of individuals of the country	11.6%	9.8%

These global trends, as well as the results of the more precise analyses, show that the Brussels-Capital Region is seriously endangered by an evolution similar to that of some North American cities whose centre has been completely deserted by a lot of companies as well as by the middle-class population or the most well-off.

2.3 Tendentia Evolution

Mobility is a capacity all consumers try to develop in order to increase their freedom of choice. For it is thanks to this that an employee can prospect in a larger part of the employment market or that a household will be able to choose among more suppliers, goods and services.

The car is the perfect answer to this need, and the evolution of the motorization of households proves this success. Since 1975, the average annual increase in the number of vehicles on the road in Belgium has been 2.6%.

On January 1st, 1991, the average number of private cars at the disposal of households per 100 inhabitants in the country amounted to 38. The trend of the evolution observed this last decade suggests that the growth of the motorization rate will continue in the coming years, although possibly at a lesser speed because of a progressive saturation effect in the demand for vehicles.

The general assumption in Belgium is that this saturation point will be reached at 50 vehicles per 100 inhabitants. It is relatively modest compared to the levels already reached in North America (nearly 60 vehicles per 100 inhabitants).

Of course, households also took advantage of the new form of mobility that a private car offers in order to change the way they choose where they live. For many of them, the comparison of the advantages and the price of a location in the old urban centre with those of a location in the suburbs has led to the choice of the latter.

The rise in population in the suburbs of Brussels shown in figure 2.1¹ is a consequence of this choice.

The increase in mobility due to the car has also had indirect consequences on the suppliers of goods and services by extending their market areas and by modifying the conditions of competition that they impose on each other and by

¹Source: STRATEC, Regional Movements Plan, Trend Scenario, report (p), July 1992

forcing them to reconsider their location criteria. For some of them, especially traders, the location choice is a question of survival because accessibility to their sale points is a critical element of competition. The increase of jobs in the periphery of the city shown in figure 2.2 indicates that decisions against the city were of large scale in the 80's. This contributed to the decline of the city.

In the last decade, the combination of these movements has led to an increase in commuting from home to work in Brussels from 276,000 units in 1980 to 322,000 units in 1990.

If the demographic and economic trends are confirmed, this commuting could rise to 357,000 in 2000 and to more than 400,000 in 2005 (see figure 2.3).

The combined effect of the deconcentration of housing and of employment and the increase in motorization of the population has led to a very important increase in automobile traffic both around and in the city. According to the surveys of the Ministry of Public Works, this increase has now reached an average rate of 5.8% a year for the years 1985 to 1990.

The situation as it was during the morning peak period at the beginning of 1991, has been reproduced with the help of traffic simulation models (see figure 2.4). If the deconcentration of employment and of housing and the increase in motorization continue as the trends show and all the other variables remain unchanged, especially as far as the offer of transport is concerned, the congestion of the road network will develop as shown in figure 2.5. The result of this is a doubling of automobile travel time during the morning peak period.

Such an evolution is, of course, not realistic because it would lead to an unbearable deterioration of the functioning conditions of the city :

- Urban economic players cannot accept such a situation because the worsening of their accessibility endangers their very survival; if nothing is done to change the situation, their reaction will be to leave the city for a more or less far peripheral location.
- The inhabitants will support neither the impediments to mobility due to congestion nor the increase in pollution that will result from it; their reaction will be similar to that of the economic players: those who can afford it will leave the city in huge numbers.
- As far as the regional public authorities are concerned, they too cannot stay put without any reaction to the threat of seeing a rise in the exodus of inhabitants and employment.

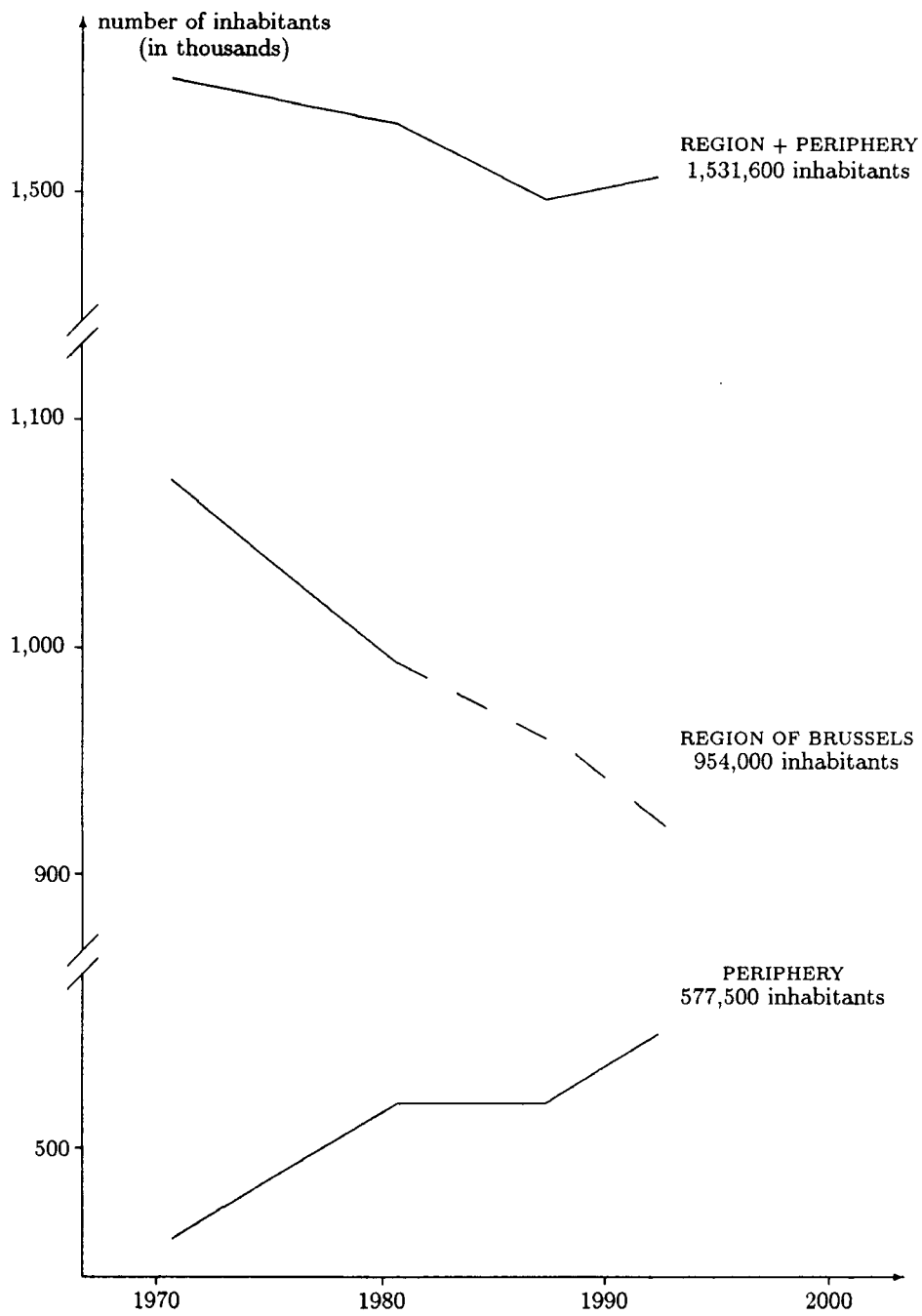


Fig. 2.1. Evolution of the population of the Brussels region and its periphery in the period 1971-1991.

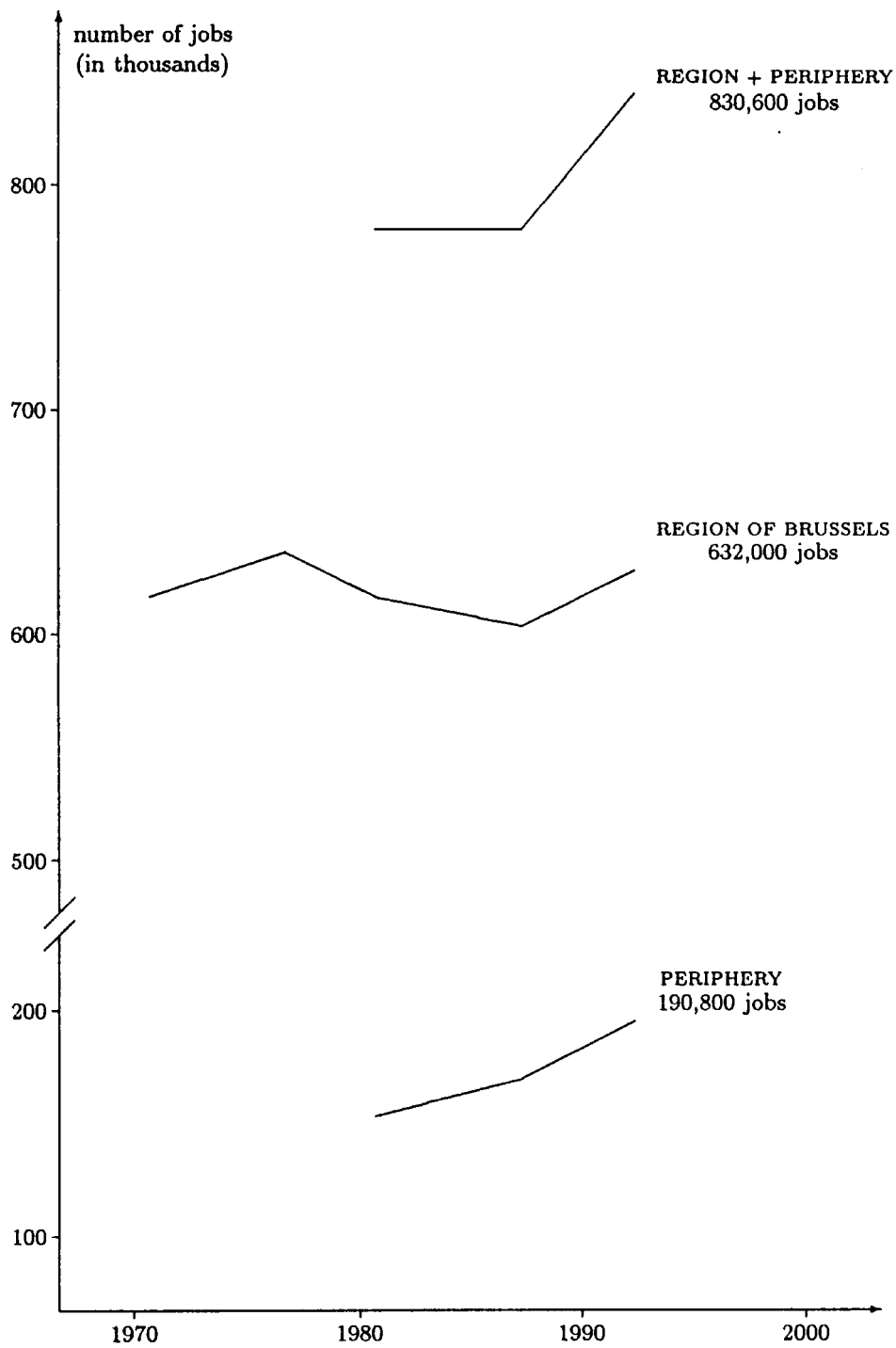


Fig. 2.2. Evolution of employment in the Brussels region and its periphery in the period 1971-1991.

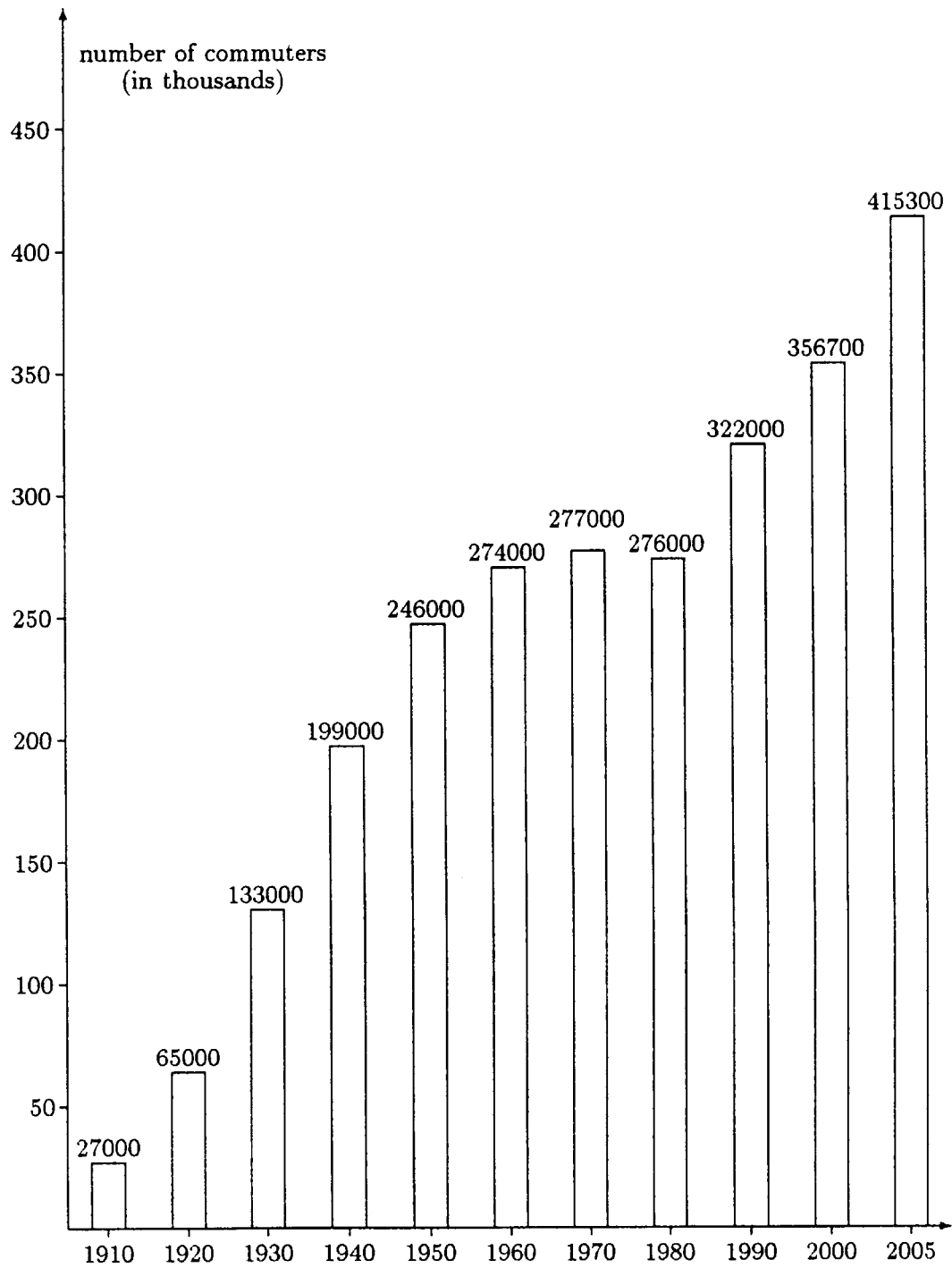


Fig. 2.3. Region of Brussels - commuting from home to work in the city.

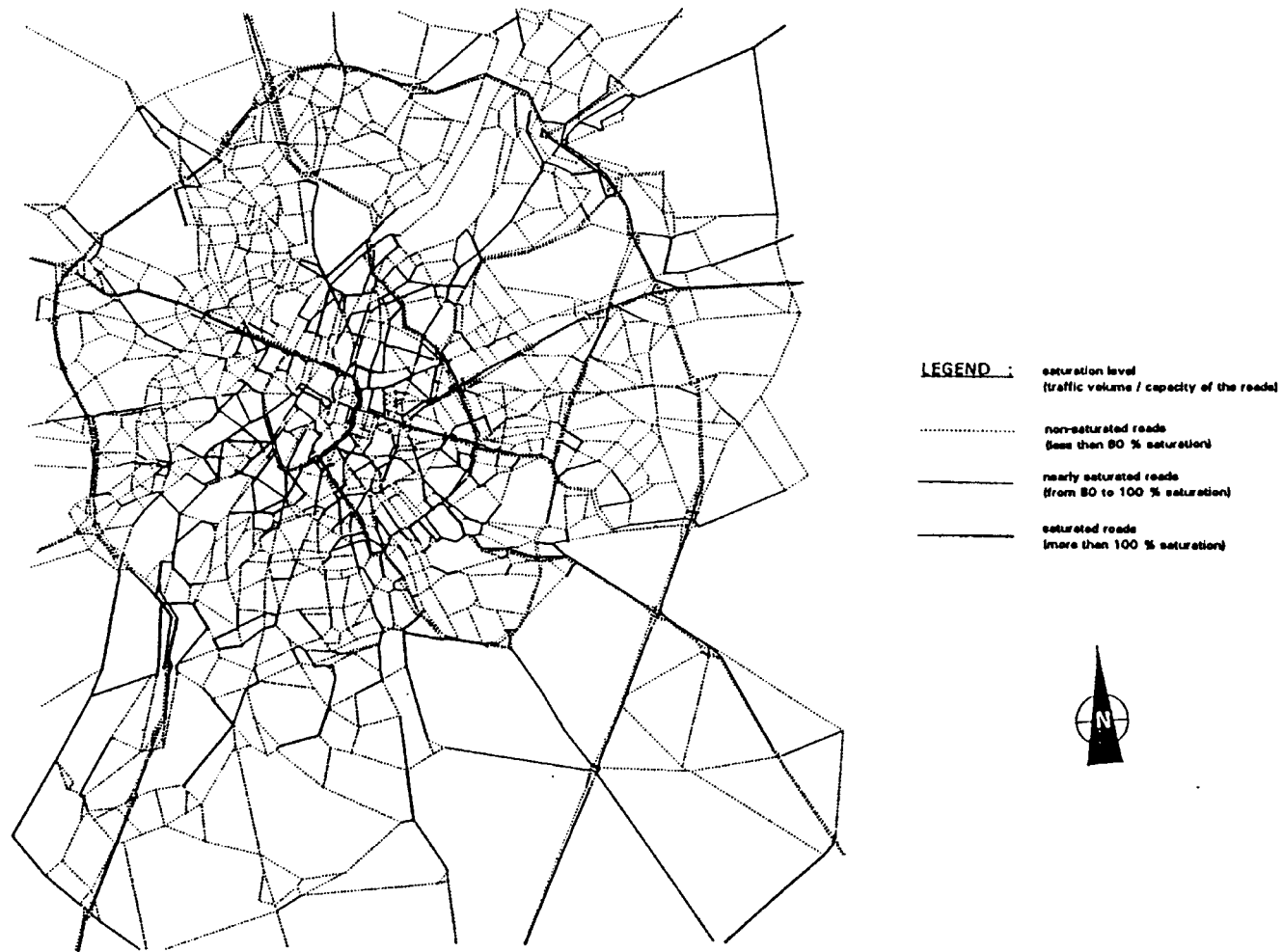


Fig. 2.4. Congestion of the road network in 1991

(Source : STRATEC - Plan Régional des Déplacements - Rapport (q) - July 1992)

Fig. 2.5. Congestion of the road network in 2005

(Source : STRATEC - Plan Régional des Déplacements - Rapport (q) - July 1992)

3. The Inefficiency of Old Remedies

Restoring mobility by healing symptoms of road traffic congestion, that is, trying to suppress the traffic bottlenecks, increasing the capacity of the main road networks, creating new parking lots or implementing sophisticated techniques of traffic management, is no longer a realistic strategy in the long term.

These are the answers that have been applied for years with only one objective: increase the flow and fluidity of automobile traffic. They are responsible for their own inefficiency because any possibility of an increase in mobility is used by residential and economic players to increase even further their demand of automobile travel.

Experience has shown that in any city where measures were taken to increase the fluidity of traffic, the initial problems reappear some years later in an even more acute form.

Indeed, in cities where road networks are very congested, this approach only results in a slight shift of the thresholds and a slight postponement of the critical point. This is, therefore, not a strategy and has no significance but from a tactical point of view. It enables a management of the situation in the short term, but does not modify the fundamental causes of the problem. In any case, it does not contribute to creating the new conditions required for a sustainable development of cities.

In the case of Brussels, it would be particularly harmful because it would favour the centrifugal powers that, because of the Region's small area, would empty it of its substance.

4. A Strategy of Selective Actions on the Accessibility of the City

The diagnosis that finally emerged from the analysis may be summarised in the following way :

- The two main dangers of the current trends are :
 - the deterioration of the general accessibility of the city, because this is an immediate danger for the source of its economic prosperity;
 - the excess of automobile mobility in the city, because the problems it creates for the environment is a threat to the population but also to the economy.
- With regard to these two dangers, the reactions that can be considered by the Region's public authorities must be selective; these are:
 - selective improvement of accessibility by public transport;
 - selective restriction of accessibility by private cars.

The global strategy emerging from this diagnosis centres around five groups of action that respectively aim at :

- urban structure;
- public transport;
- car parking;
- automobile traffic;

- getting around on foot and by bicycle.

The actions proposed and their justification are listed below.

4.1 Actions on Urban Structure

An analysis of the mechanisms leading to an increase in automobile mobility shows that more and more city users are obliged to move around in their own cars because urban functions to which they must or want to have access (workplace, services, shops, hospitals,...) are located in places where public transport does not go.

As far as Brussels is concerned, this conclusion was drawn from the observation of the modal distribution of trips during the morning peak period, as a function of whether the destination of these trips was in the Brussels-Capital region or more to the outside and whether the place of residence was located inside the Brussels-Capital Region, outside the Region at its periphery (outer suburbs comprising 33 townships) or in the rest of the country. Table 4.1² compares data collected on :

- the Central Business District from the large central roads up to the Cinquanteenaire park, accessible by train through the Central station, the Congrès station, the Quartier Léopold station and the Schuman station and by the tube through the central sections of lines 1A, 1B, 2 and 3;
- the inner suburbs between the large middle ring roads and the outer limits of the region, accessible by some suburban railway stations and by the ends of the tube lines.

The very large differences in the modal distribution shown in table 4.1 are principally caused by the difference of accessibility between the Central Business District and the inner suburbs.

The Central Business District is easily accessible by public transport, from everywhere in the city thanks to the tube, and from the whole country to the railway; on the other hand, access by car is more difficult because of the congestion and the difficulty of finding a parking place.

By contrast, the inner suburbs are relatively easily accessible by road, among others because of the presence of the ring road, and is less easily accessible by public transport (the ends of the tube lines).

² Source: STRATEC, Regional Movements Plan, report (q), July 1992

Table 4 1 shows that, with everything else remaining unchanged :

Table 4.1 The effects of the locations of origin and destination on the modal distribution of movements. Situation in 1991, average workday, 7 a.m. - 9 a.m.

Travel to the central business district			
Origin	Total amount	% in public transport	% in privately owned vehicle
Region	56900	51	49
Periphery	14200	42	58
Rest of the country	31900	71	29
TOTAL	103000	56	44
Travel to the inner suburbs			
Origin	Total amount	% in public transport	% in privately owned vehicle
Region	57900	29	71
Periphery	31300	13	87
Rest of the country	24100	35	65
TOTAL	113300	26	74
Travel across the whole region			
Origin	Total amount	% in public transport	% in privately owned vehicle
Region	271200	39	61
Periphery	94200	21	79
Rest of the country	113900	51	49
TOTAL	479400	38	62

- a certain grouping - together of - motorised trip destinations (workplace and higher education areas, among others) in the city centre would allow reducing the total number of trips by car to the Region; in this way, the transfer of 10,000 destinations of trips from the middle ring to the centre would allow reducing by 3,000 the number of trips by car to the city, as 74% of the trips to the inner suburbs are made by car against 44% for the trips to the Central Business District;
- in the same way, returning to live in the Region by a part of the population which today lives in the periphery, would have a positive influence as 79% of the trips from the periphery are made by car against 61% from the Region itself;
- on the other hand, it can be seen that commuting to Brussels from the rest of the country contributes to a lesser extent to the automobile traffic in the city than other trips.

These global observations, completed by ideas directed more specifically to the development of areas ideal for walking and cycling and with access to public

transport, have led to the formulation of a series of recommendations which, via the Land Use Master Plan , can have determining effects on the needs of trips by car and on the problems these trips cause. These recommendations are listed in table 4.2.

Table 4.2. Actions on Urban Structures

<ol style="list-style-type: none">1. To improve the accessibility of workplaces :<ul style="list-style-type: none">• Concentrate the employment which generates a high traffic of people per m² in areas which are easily accessible by public transport.• Favour the development of dense residential areas along zones where there is a good public transport service.• Reserve dense housing areas within reach by foot of highly concentrated employment areas.• Facilitate Park & Ride and Kiss & Ride for the access to and from less densely populated areas.• Preserve the industrial railway lines in order to re-allocate them to passenger transport.2. To facilitate movement during the working day :<ul style="list-style-type: none">• Accelerate processes of renewed use of the ground in the central areas in order to avoid an under-utilisation and to avoid “no man’s lands” whose presence increases the need for motorised transport.• Organise a mix of mutually complementary activities that do not depend on car use , in the centre of the city.3. To facilitate accessibility of shops and services :<ul style="list-style-type: none">• Promote small local shopping centres.• Maintain and re-vitalise the big commercial centres in the Central Business District.4. To facilitate accessibility to collective facilities :<ul style="list-style-type: none">• Locate the regional facilities in the centre.• Promote the growth of local facilities.5. To preserve the accessibility of education establishments :<ul style="list-style-type: none">• Maintain the network of neighbourhood education establishments.• Discourage the establishment of comprehensive schools at the periphery of urban areas.

4.2 Actions on Public Transport

The analysis of the behaviour of users who have the possibility to use either their car or public transport to get around show that the choices they make are indeed strongly linked to the respective characteristics of the travel they make in one of these two modes. More precisely, the choice of public transport to effect a given trip is most probable if the gap between the duration of the trip by public transport and the duration of the trip with a private car is small (see figure 4.1). Improving the quality of the service offered by public transport is therefore not a useless proposition.

In the case of Brussels, urban public transport offers a relatively good service to the centre from points of origin located in the Region , and the railway is also very effective from any city in the country. By contrast, the service of public transport from the periphery (see table 4.3³) and generally from a distance of 35 km around Brussels is poor.

Table 4.3. Average duration of movement during the morning peak period (7 a.m.-9 a.m.) to the business centre of Brussels (in minutes)

Origin	Average duration of trips		
	By public transport (1)	By private car (2)	Difference (1)-(2)
Region	34.0	24.3	9.7
Periphery	62.5	44.1	18.4
Rest of the country	68.9	64.5	4.4

This is why measures leading to the creation of a suburban railway service are first on the list of objectives of the Regional Movements Plan of Brussels-Capital concerning public transport (see table 4.4 below). These measures should allow reducing the actual duration of trips by at least a quarter of an hour.

4.3 Actions on the Parking of Private Cars

When calibrating the model shown in table 4.1, it appeared that the gap between the trip durations was insufficient to explain the distribution of the observed modes of behaviour. Other elements contribute to determining the choice. The most important of these is parking: when time needed in order to find a parking place increases

³ Source: STRATEC, Regional Movements Plan, report (q), July 1992

Table 4-4- Actions on Public Transport

<ul style="list-style-type: none">• Improve the accessibility of the periphery by developing the suburban services of the National Railway Company (by creating an express suburban rail network).• Improve the accessibility of the centre by railway through a more efficient use of the railway infrastructures originally aimed at transporting goods but which are at the moment unused (East and West orbital lines).• Create Park & Ride infrastructures in areas where the deconcentration of housing makes it impossible to offer good public transport services.• Take advantage of existing underground infrastructures (metro and premetro) which account for nearly 50% of the present volume of users of the urban transportation company.• Improve the commercial speed of the surface urban network:<ul style="list-style-type: none">▪ reserved rights of way;▪ construction measures near crossroads enabling public transport to have priority;▪ remote control of the traffic lights by public transport vehicles.

because the number of spaces is limited or parking is not free, the probability that someone chooses public transport increases significantly.

This confirms the importance to be attached to the control of public parking in order to control automobile mobility. This all the more so as actions on parking can be made selectively : by way of a parking policy, one can aim to reduce the use of private cars for long trips (eg. from home to work), without limiting this use for smaller trips (shopping, business,...).

Proposed actions concerning parking are listed in table 45 below.

Table 4.5. Actions on Automobile Parking

<ul style="list-style-type: none">• Reduce parking possibilities on streets in the city centre by severely limiting long-term parking and by re-allocating the public space thereby gained to short-term parking, to pedestrians and to lanes reserved for public transportation and to green areas or planting areas.• Strengthen control on the duration of parking in alternating “even-day / odd-day” places.• Implement an effective system of restricting parking along roads to residents living in housing areas without garages.• Review the rules and regulations relating to the building of off-road parking spaces and vary their maximum number according to the number of jobs, the kind of activity and the level of service offered by public transportation networks in the local area.

4.4 Actions on Automobile Traffic

All actions proposed in tables 4.1. and 4.3. will lead to a global reduction of the pressure of the automobile in the city. This decrease must immediately be made to lead to a better control of the rest of the traffic and to a suppression of all inter-area transit traffic in residential areas and in shopping and leisure areas where the traffic is most often perceived as an aggression (noise, risks of accidents for the children, pollution, etc.) Actions of this type are listed under a, b and c of table 4.6 showing strategic actions on automobile traffic.

However, collective problems caused by automobile traffic congestion will not necessarily disappear, at least not until the implementation of a system of charging fees for the use of road infrastructures equal to the marginal cost of congestion.

Until the time such a user fee system is implemented, congestion must be brought under control, that is, limited to places where it causes the least problems. These are the aims of actions d and e in table 4.6.

Table 4.6. Actions on Automobile Traffic

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| <ul style="list-style-type: none">• Extending to the whole region the concept of dividing the territory into zones inaccessible to motor transit• Strengthen the hierarchy of the roads (transit ways, local access roads) and at the same time strengthen the general need for accessibility, respect the areas' characteristics and protect those areas from transit traffic.• Implement in these areas methods of one way traffic and of speed limitations (30 km areas).• No increase and even sometimes decrease the capacity of roads giving access to the city in order to contain the morning congestion out of its limits.• Regulate the capacity of roads leaving the city in order to limit the risks of congestion of its internal network during the evening peak hour. |
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4.5 Actions in Favour of Walking and Cycling

At present, in Brussels about 40% of the people who leave their home during the day only move about on foot. The regional movements policy must be more attentive to these two categories of users than it used to be.

On the other hand, very few people, about 1%, use a (motor)bike although they are much more numerous in cities such as Brussels where promotion campaigns in favour of their use were conducted. These two subjects constitute the last part of the action proposals for the Regional Movements Plan. They are listed in table 4.7.

Table 4.7. Actions in the Field of Pedestrian and two-wheel traffic

- Improve the comfort and safety of pavements and pedestrian crossings on roads by measures concerning parking.
- Develop cycle lanes across "non-transit" areas.
- Promote combined "bicycle-public transport" travel.

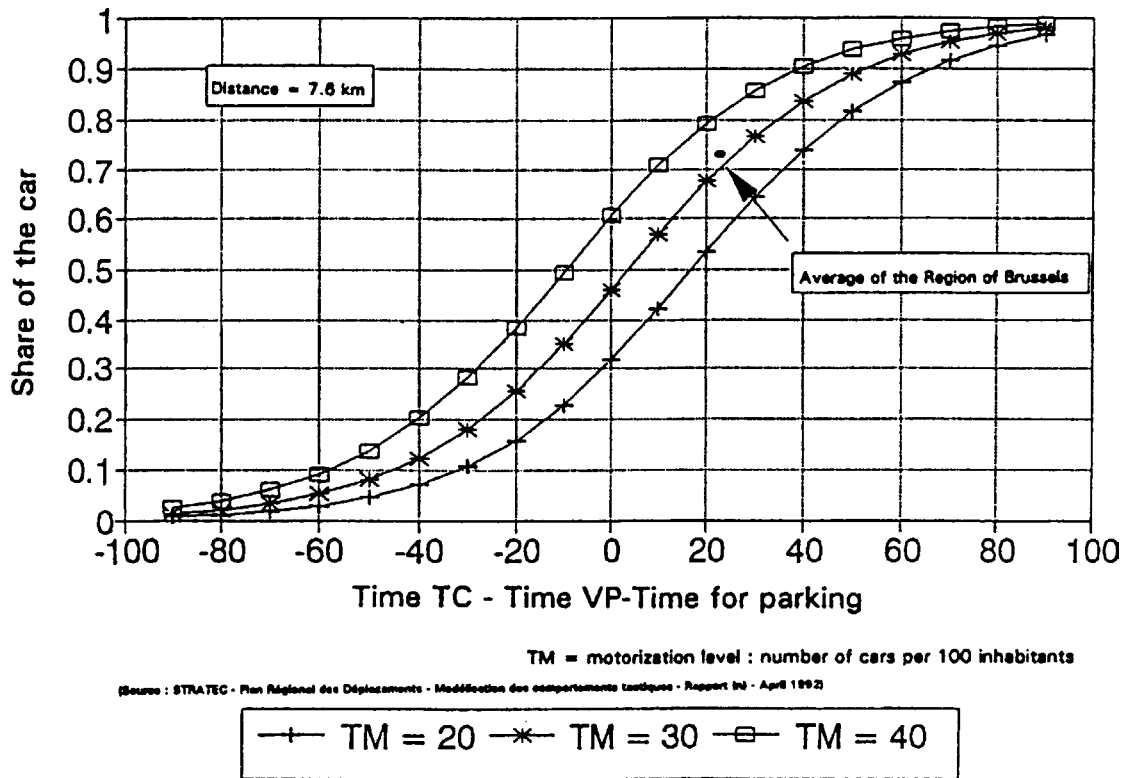


Fig. 4.1. Proportion of the use of the private car by working people as a function of the difference in the travel duration between public and private transport, by motorization-level class.