TI 2004-126/3
Tinbergen Institute Discussion Paper

Urban Transport Policies

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Urban transport policies:

the Dutch struggle with market failures

and policy failures

August 2004

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Abstract

Transport is characterised by market failures that are of particular importance in urban settings. This paper reviews market failures and policy failures in The Netherlands for various transport markets, including road transport, public transport and biking. Special attention is paid to parking problems, and possibilities to cope with these by pricing measures. It is demonstrated that in some cases parking externalities lead to non-convexities that make pricing policies less attractive. In that case parking restrictions are called for. A general shift is observed from national to municipality policy initiatives. In terms of both effectiveness and social and political acceptability, the municipal policies definitely score better.

1. **Introduction**

Transport is characterised by various market failures that are of particular importance in urban settings. A basic market failure concerns environmental externalities, such as pollution and noise, that are of special relevance in densely populated areas. Traffic safety is also germane in this context. Other externalities relate to congestion on expressways leading into the cities, and on the underlying urban transport networks. Regarding the supply of infrastructure, cities have to deal with the public character of roads: it is so difficult and costly to charge city road users for their use of roads that a private supplier would never supply them. Another failure is the criminality, which affects travellers and transport companies and adds to the cost of urban transport, as it calls for expensive preventive actions from the side of private and public actors. Still another example of market failure is that suppliers of transport services in monopolistic markets may supply poor and expensive services. Related failures occur due to lack of information on, for example, the availability of unoccupied parking places, the supply of taxi services, and public transport services. This failure leads to constrained efficiency.

In light of these examples, it is inevitable that in many countries the public sector is heavily involved in urban transport policies. However, it is well-known that public sector involvement to foster social welfare considerations may well have unintended side effects of considerable size. For instance, the introduction of paid parking in cities to stimulate efficient use of parking places will probably lead to shorter parking durations, more car movements, and hence more nuisance by cars in cities. And subsidies to public transport with the aim of reducing car use and its environmental effects may well have adverse effects on the environment when the substitution between car and public transport is limited.

I will use the Netherlands as a special case here, because it is a highly urbanised country that has considerable experience, not only of successful policies but also of policies that have failed, that are relevant for other countries. Insiders claim that the reputation of the

Netherlands for its well-developed transport policy is mainly based on the visionary policy memoranda and that the actual implementation is much less impressive. But also the policy failures may contain interesting lessons, as I will demonstrate below. The main focus in this contribution is on the private car (car use and parking, discussed in Sections 2 and 3). Since parking is of special relevance in urban areas, I will treat this subject in more detail. Public transport and non-motorised transport (in particular the bicycle) are dealt with briefly in Sections 4 and 5. Section 6 concludes.

2 Curtailing Car Use in Cities

Externalities in car use in the form of emissions, noise, accidents and congestion have been a dominant policy concern in The Netherlands during the past 15 years. The Netherlands is a small country, smaller than almost all the states in the USA. It is no surprise, therefore, that the national government plays a large role in the formulation of transport policies. A major aim has been to slow down the growth of car use. Then, congestion gradually became the major concern, since it has increased strongly during this period. It is concentrated in the Western part of the country known as the 'Randstad', situated below sea level, where the four major cities (Amsterdam, Rotterdam, The Hague, Utrecht) are located in an urban ring. These metropolitan areas have populations ranging from 500,000 to 1,000,000. With distances of 30-70 km between the four city centres of these cities, these metropolitan areas are very close to each other. However, in contrast to many gridlocked city centres in the rest of the world, in the Randstad most congestion problems occur on expressways at distances of 10-25 kms from each of the main city centres.

During the 1970s and 1980s, transport policy was mainly supply oriented by building expressways. Since then, road construction has continued, but at a more moderate pace, mainly in the form of adding lanes to existing links. A new development was that, on certain

expressways, extra road capacity was built to create *dedicated lanes for freight traffic*. Another initiative was an experiment with dedicated lanes for high occupancy vehicles (a driver plus two or more passengers). This pilot scheme failed because of public acceptability problems: most car drivers seem to be more prepared to accept travel time losses in the long term with the hope that new roads will finally be built in the future, instead of accepting demand management principles in the present.

In the 1980s, taxes on petrol were already relatively high in The Netherlands. They were further increased to 1 euro per litre, but this did nothing to prevent the emergence of the congestion problems. This is no surprise given the rather low price elasticities of demand, in particular during the peak. A fuel tax does not divert traffic from the peak to other times of the day, and, to make matters even worse: the demand of commuters (being the major road users during the morning peak) has a low fuel price elasticity compared with other trip purposes. Therefore, as a promising alternative, road pricing differentiated according to time and place has been prominent in policy proposals during the last 15 years. Indeed, from an economic perspective, road pricing should be an indispensable element of policy making to address congestion. Policy initiatives have come mainly from the central government, and given the polynuclear structure of the Dutch city system, these proposals had to be involved and implemented in more than one city. The first proposal, launched at the end of the 1980s, involved a fee to be paid in electronic ally for passing two cordons around the Randstad cities during peak hours. This proposal led to lengthy debates on the technical feasibility of the system, the problem of rat running (traffic diverted to the underlying road network in order to avoid the payment of fees), and the problem of privacy. The proposal met with heavy criticism and was replaced by a much more modest proposal in the form of conventional tolls.

In 1995, a new government returned to the high-tech proposal; it involved the introduction of electronic tolls around the four major Dutch cities in the year 2001. Again a cordon system was proposed (with one or two cordons). The system was only envisioned for the morning

peak hours between 7.00 and 9.00 a.m., with a flat fee of about 2.50 euros for those who pay electronically and 3.50 euros for those who pay otherwise. The proposed system resembles the ERP (electronic road pricing scheme) implemented in Singapore in 1998.

A constant feature of the various proposals has been that the cordons are at some distance from city centres. In most cases, the proposed distance is about 7.5 to 20 km away from the centre. Given the fairly small size of the Dutch cities under consideration, this means that the toll points would all be located outside the cities. This scenario implies a spatial setting which is different from that of Singapore or the Norwegian toll rings, where the cordon is much closer to the centre, and also from the system introduced in Central London in 2003. An important consequence is that in The Netherlands modal shift will be less easy because at these longer distances there is no fine-meshed urban transport system as an alternative for car users. Hence, the major behavioural effect of road pricing that one may expect in this case is a change in departure time to avoid the toll.

Given the social and political resistance to congestion pricing, in 2000 the national government finally decided to drop the congestion pricing proposal and replace it with a kilometre charge similar to the model introduced in Switzerland for freight traffic in 2001. This was intended to become a flat charge per kilometre that would be differentiated according to car type, but not according to location and time of day. As a consequence its contribution to the solution of congestion problems could only be minor. After another election in 2002, the new Dutch government decided to drop the whole idea of congestion and kilometre charges.

This led to the interesting situation, whereby The Netherlands, which was the forerunner in congestion charge proposals at the end of the 1980s, gradually became part of the rearguard. Price-related measures in terms of tolls or congestion charges were unacceptable to the public, and therefore their introduction nation-wide in the short run is improbable. The policy

discussion of road pricing appears to be much more sensitive to issues related to equity than to efficiency; and policy makers largely ignore the voice of economists who argue that congestion pricing can have both attractive efficiency and equity effects, i.e. when the receipts flowing to the government are redistributed in a proper way (Rietveld and Verhoef, 1998). A possible alternative scenario would be the gradual introduction of road pricing schemes on newly opened expressways, as observed in the USA (see, for example, Small and Gomez Ibanez, 1998 and Richardson and Bae, 1998). The 2003 London congestion charging programme is another example of how regional or local authorities may in the end be more successful than the national government. This is indeed a striking result obtained by considering the development of parking policies in The Netherlands, which is the topic in the next section.

3. Parking Problems.

To date, parking has received relatively little attention in the transport research literature (Young, 2000). This is rather surprising since parking is a major policy issue in many cities. One may also note that the average duration per day that a car is actually used is only about 1 hour, which leaves 23 hours when it is just parked, making the parking theme even more pertinent. So, where the car is parked during about 96% of the time, it seems that parking attracts less than 4% of the time of the researchers in the field. As a small step in the correction for this lack of balance I pay extra attention to the parking theme in this chapter. The market for parking space is characterised by various distortions. Examples of distortions are externalities, lack of information, monopoly power of the owner of private parking places, and high transaction costs. We will discuss some of these in more detail here.

Parking and market distortions

Parking is an activity that may easily give rise to *externalities*. A well-known example is a lorry parked on a city-centre street to be loaded or unloaded, thus blocking the way for other

road users. Also road capacity that is used for parking cannot be used for traffic, this implies a reduction in capacity which may slow down driving speeds. Another example is the effect that parking a car on a parking place may have on extending the time other road users have to spend trying to find a parking place. Non-road users too may be affected by parked cars, as parked cars reduce the scenic quality of the city centres for both visitors and residents, and they reduce the opportunity to use the road for other purposes, e.g. a playground for children. Note also that parked cars on sidewalks hinder pedestrians. Indirectly, parking is also related to the externalities of car traffic, such as noise, emissions, accident risks, etc. Another problem with parking is the *lack of information* on demand and supply, leading to constrained efficiency. This may lead car drivers to look for a parking place, implying search and waiting costs that could be avoided if adequate information had been available. The *monopoly pricing* issue is relevant because parking facilities usually serve a very local market, and within many cities there are clear barriers to entry for new entrants on the parking area market. *Transaction costs* relate to the costs of letting car users pay for the use of parking places (for example, by introducing metering for on-street parking). These costs may be so high that the authority responsible for the parking places may decide to offer them free. This is an example of the *non-excludability* property of infrastructure, meaning that it is impossible, or very costly to exclude people who do not want to pay for its use.

I will distinguish four important sub-markets in the analysis of policy efforts to address these market failures:

- Parking in residential areas: new city neighbourhoods versus existing areas;
- Parking at workplaces: new versus existing.

As will become clear, capacity planning and parking regulations play an important role in the case of new areas, whereas prices are more important for existing areas. The background is that, at the land use design stage in a new area, it is rather inexpensive to take into account the parking needs of the car users in a quantitative sense. But when land use is already fixed, the expansion of parking space is very expensive, so here capacities are assumed as given and

price measures become pertinent. However, as we will show below there are some striking exceptions to this rule that the price instrument will do the job.

Parking in new residential areas.

Housing plots in the Netherlands tend to be rather small. The share of single-standing or semi-detached houses is limited, especially in urban areas, and also the share of dwellings with a private garage or a parking place is low. Hence, residents of most dwellings park their car on the public road. This leads to the question of how many parking places should be allowed on public roads. In the Netherlands, about 60% of the households own one car and about 20% own two or more cars. This brings the average number of cars per dwelling close to 1.0. Most municipalities apply a parking standard of about 1.5 parking places (including places on private land) per dwelling in new residential areas (Dijken, 2002). This seems sufficient, but in reality there may soon be capacity problems at the very local level where some multiple car households are neighbours, and when parking by visitors and of freight vehicles is taken into account. In addition, new neighbourhoods often attract households with an above-average numbers of cars.

Some municipalities use parking regulations as a policy measure to reduce car ownership and use by applying low parking standards slightly above 1.0 in certain neighbourhoods. This policy is problematic, however. It easily leads to competition between municipalities in terms of parking standards, so that developers in municipalities with lax parking standards are more successful in attracting new residents. Municipalities that apply strict parking standards will receive less for the land they sell to the developers.

Parking in existing residential areas.

In older residential areas, demand for parking places at zero price level is usually higher than the available capacity. In the large cities, this lack of capacity is substantial. Most medium sized and large municipalities have introduced paid parking on the public roads during the last

decade. Paid parking usually starts in centrally-located neighbourhoods near shopping areas and then spreads to a much wider area. An interesting question is who has to pay the bill: residents or visitors (for example commuters). Since the municipality introduces the system, it is not surprising that it tries to shift the tax burden to visitors. The own residents receive preferential treatment: they usually get a parking pass at a low price that gives them the right to park throughout the year. Even in large cities, the price does not exceed 200 euros per year. So, naturally, especially in the centres of large cities, there is still a large excess demand for parking places. This leads to a system of rationing, which means that many households who would like to have a parking pass have to wait many years before they actually get one.

A possibility that has not been implemented thus far is a combination of rationing and pricing in the form of tradable parking permits. For example, in a certain area with 50 parking places and 100 dwellings, a limited number of parking permits may be distributed among the households such that each household receives, say, of a 0.5 permit. Then trading will lead to the situation that half of the households with a low willingness to pay for the permits will sell their permits to the other half who have a higher willingness to pay. This ensures that total parking remains within the capacity, so that unnecessary search costs are avoided. Households for whom parking space is most important are guaranteed a place. The advantage for the other households is that they get an additional source of income. The differences with the current situation are as follows: parking places would be distributed according to willingness to pay; total receipts would be higher, and these receipts would not accrue to the municipality, but to the residents.

An interesting case is where the public sector supplies not only on-street parking space but also off-street in garages. There are a good number of examples where the prices charged for renting the garages are lower than those for on-street parking. From a cost perspective, one would expect the reverse, because the provision of parking places in garages tend to be much more expensive (about 40 times, according to Dijken, 2002). The reason behind this pricing

policy is that on-street parking is perceived to have a negative effect on the attractiveness of residential areas.

Quite a substantial number of urban authorities have even taken further steps to enhance the environment by turning part of the city centre into car-free pedestrian areas. Parking facilities have been created at the fringe of the pedestrian areas, and sometime also underground. Where there is no space for this, parking places have been created at greater distances with public transport connections linking these places to the central cities. The general result is that the shops in these pedestrian areas have benefited in terms of extra trade. However, much depends on the precise demarcation and size of the pedestrian areas.

As already mentioned above, economists usually prefer the use of prices to correct for externalities, but in the present case of pedestrian areas, economic theory can be used to defend the policy of imposing constraints instead of pricing. In Figure 1 we sketch how the marginal external costs will look like in the case of attractive historical centres. The striking point is that, as the number of parked cars increases, the marginal costs involved decrease: when a street is already almost completely lined on both sides with parked cars, the additional negative effect on the attractiveness of the street will be very small. This has some interesting implications for the use of parking charges to arrive at the optimal balance between the benefits and costs of parking. As Figure 1 demonstrates, there may be two or more points of intersection between the curves related to the marginal costs and ben efits of parking (the analysis below bears some resemblance to that of Rouwendal et al., 2001, although the context is different).

<<< Figure 1. Pricing policies addressing the negative effect on historical cities of parked cars >>>

Case B in Figure 1 implies that the optimum is found near the full use of the parking space. In this case the marginal costs are low. On the other hand, in the case of A, the volume of parked cars is low; and here the marginal costs and benefits are both high. However, this cannot be an optimum, since moving away from A to the left will lead to an allocation where the benefits will decrease less than the gain in environmental quality. A move to the right will also be favourable, which means that point A relates to minimum in stead of maximum net benefits.

A third policy option would be the extreme zero parking solution C. Whether C is more attractive than B depends on the exact form and location of the curves. This leads to an interesting conclusion. If one wanted to correct for this type of parking externalities by means of prices, the charge will be either very small (case B), or very high (case C). This means that prices are probably not a good means to solve this type of parking externality. If case C were to be the optimum, a much more straightforward solution would be to impose the physical constraint that parking is forbidden. This is in fact what many cities do: they introduce a car-free zone, or the construction of underground parking space so that parking does not spoil the historical centre of the city. If, on the other hand, case B were to be optimal, it would most probably be better not to impose a parking charge since the welfare gain from a very low charge would most probably be smaller than the transaction costs of collecting the money. This example is a nice illustration of the fact that prices do not deal well with non-convexities.

Parking at new work locations.

During the 1990s, the national government implemented a rather stringent location policy with respect to firms at new locations. This was known as the 'ABC policy' and its aim was to stimulate modal shift away from the car to public transport by getting 'the right firm in the right place'. This policy attracted wide attention and contributed to the view expressed by Hall (1998): *"In The Netherlands, the government has taken some kind of world-wide lead in*

trying to integrate land use and transport planning, within an environmental strategy, at the national level". The policy was based on a differentiation of locations: *A locations* are locations that are easily accessible by public transport and not by car (for example, locations close to intercity railway stations in city centres); *B locations* are easily accessible via both public transport and car; and *C locations* are the other locations. The parking standards associated with these locations are given in Table 1.

insert Table 1 here

The rationale behind these parking standards is that firms that attract many workers or customers (e.g. business services) are only allowed at A locations. At the other extreme, firms with small numbers of workers per m^2, and that rely on freight transport, are only allowed at C locations. At B locations, firms are welcome that have an intermediate position in terms of the traveller flows they generate.

The ABC location policy was a rather stringent one, and it generated a number of tensions that appeared so problematic that the fixed parking standards were finally abolished in 2001. One area of tension related to the level of government: the policy was formulated by the national government, but implemented by municipalities. Many of the municipalities with A or B locations had a tendency to give priority to employment growth, and were afraid that the strict parking standards would discourage potential users and developers. Therefore, these municipalities tried to be as flexible as possible in issues like interpreting whether a location is an A or B location, and what type of firms would qualify for a B or C location. Another source of tension arising from the ABC policy concerned the competitive position of new locations with restricted parking versus existing ones where parking standards are less strict. This led to a distortion of competition that discouraged the development of new sites.

One of the features of the ABC policy is that it was imposed at the level of individual firms. But some firms may find it much easier to live with strict parking standards than other firms. Therefore, an alternative would be to impose a constraint on the collective of employers in a certain zone. However, such refinements have no chance: though the ABC location policy was implemented during the 1990s, because of the reasons mentioned above the use of fixed parking standards was discontinued in 2001.

Parking at existing work places.

The gradual introduction of paid parking on public parking space in many municipalities has made firms become more active in terms of parking policies. In the short run, the parking space on their areas is fixed so that they face the problem of distributing parking places among the own personnel.

When there are capacity problems, employers sometimes distribute parking permits according to certain hierarchy rules. However, the distribution of tradable parking permits among employees would be an interesting and more efficient and equitable alternative to ensure that the scarce parking places are used only by those with the highest willingness to pay. As indicated by Gomez-Ibanez (1997), the case of free parking is an example of bundling a trip and the related activity, such as work or shopping with the supply of a parking place. The consequence of bundling is that employees are not encouraged to look for other transport modes. The cash-out of parking subsidies (meaning that those who do not use the parking place get compensation for this) would change the situation: employees would be stimulated to use car-pooling or public transport as alternatives (see for example Shoup, 1997). A similar result is found when people are obliged to pay for the parking place. Whether cashing-out really leads to a change in modal choice depends on the amount of money involved, and on the availability of travel alternatives. It is clear that, in the case of jobs in the centres of large metropolitan areas, both factors are more favourable to induce such a change compared with other locations.

An interesting question is whether counting the value of a free parking place provided by employers as part of taxable income would have noticeable effects on commuting behaviour. It appears that, in high-density areas, the value of a parking space is indeed substantial. If we assume that the costs of providing an underground parking place would be about 30,000 euros, the addition to annual income might be about 3,000 euros, which would mean that, with a marginal income tax of about 50%, net income would decrease by about 1500 euros per year, which is significant. However, for the large majority of commuters one would find much lower values of parking space, so that counting them as income would have negligible effects on travel behaviour. Given the very local-specific aspects of valuing parking places, one can understand why the national Ministry of Finance has to date been reluctant to bring free parking space under the umbrella of the income tax.

The pricing of parking is sometimes advocated as a *second best policy for road pricing*. If for some reason the direct solution of road pricing is not possible, one may charge road users in an indirect way via parking. However, it is only a rather crude pricing measure, since a parking charge does not differentiate according to the origin of the trip: it may be charged to car drivers who did not contribute to congestion. Additional problems are that a parking charge does not address through traffic (Glazer and Niskanen, 1992), and that some of the cars that are involved in congestion will park on private parking places. Hence, the pricing of parking places is in general a rather ineffective way to address congestion problems.

We conclude that, in the Netherlands, the introduction of pricing has proceeded further with parking than with driving. This is probably due to the fact that parking charges can easily be implemented in a gradual way so that citizens get used to them, whereas road charging programmes were conceived as large-scale high-tech initiatives that cannot easily be tested at a smaller scale. The low-tech character of parking charges and the availability of alternatives (parking facilities somewhat further away) will also have made their acceptance easier.

4. Public Transport: a plus for the environment?

The share of public transport is rather low in the Netherlands - about 12% of the total distance travelled, about half of which is on the national railways. One important reason for the low share of public transport is that cycling is a very popular and viable alternative (see also Section 5). Urban public transport receives substantial subsidies from the public sector: the share of subsidies in total receipts varies between 40% and 65%. There are several good reasons why the government should support public transport in urban areas. First, given average occupancy rates, public transport is more environmentally-friendly than private transport. Second, public transport helps to mitigate congestion on the road so that cities remain accessible. And further, it may help to reduce social exclusion of handicapped and elderly residents. A final reason concerns the argument that extra travellers in public transport justify the provision of greater service frequency which lowers expected waiting times as well as the costs of early and late arrival for all travellers. This is the well-known Mohring effect, as it is an example of a positive externality that can be used to argue in favour of public transport subsidies (Mohring, 1976).

From an economic perspective, however, some of these reasons for subsidising public transport are not entirely convincing. First, consider the environmental argument. A public transport subsidy is essentially a second best approach to a first-best policy that explicitly addresses the negative externalities of the private car. Such a first-best policy would not only discourage car use in general and at places with high nuisance levels in particular, but it would also stimulate road users to choose cars with a favourable environmental performance. With a second best subsidy approach, the favourable effect on technology choice is lost. Concerning the level of car use a second best approach is only attractive when: 1) there is a high degree of substitutability between car use and public transport; and 2) low public transport fares do not attract many new travellers or alternatives from other modes. However, in the case of the Netherlands, these conditions are not met. It appears that demand for public

transport has a rather high elasticity with respect to fares, but that this is not primarily because of a modal shift between car and public transport. Cheaper public transport induces many current users to use it more extensively by making more and longer trips, but the modal change between car and public transport is limited. Thus, public transport subsidies are a rather inefficient way to reduce the environmental externalities of car use.

An example of the substitution between car and train is provided in Van Wee and Rietveld (2003). Given estimates of own and cross-price elasticities, it appears that cheaper train tickets that reduce car use by one car passengerkm will induce an increase of no less than 5 train passengerkms. Even from the perspective of environmental effects this is not favourable since, on the basis of average emissions per passenger, the reduction in car emission is more than off-set by an increase in train emissions.

An extreme example of subsidised transport can be observed in the city of Hasselt, just across the border in Belgium. Here, the municipality decided to introduce free public transport for its bus services. The effect is indeed as may be expected according to of the above arguments (Veeneman, 2002): car use declined only marginally and bus use more than doubled.

Given these results, one may wonder why policies are so strongly oriented towards the stimulation of public transport. A first reason is that the environmental performance of public transport seems to be overrated. Given the rather low occupancy rates in public transport, the emissions per passenger are higher than technically feasible. Second, there is a clear misperception among policy makers and the general public concerning the degree of substitutability between car and public transport. Third, while equity issues may be a correct reason for government subsidies, the question remains whether the present subsidy system is the best way to address it. More focussed income support, or user side subsidies might well be considered for this purpose.

5. Cycling below sea level

A paper on urban transport policy in the Netherlands cannot be complete without a discussion of the bicycle, which –after the tulips, the windmills and the wooden shoes- has become one of the major symbols of the country, and with good reason. The bicycle has been a surprisingly robust transport mode in this country during the last century. Where many European cities had high bicycle shares during the first part of the 20 th century, later these shares dropped to low levels (below 5% of all trips) in most countries, whereas in the Netherlands bicycle use has remained at a high level of about 35% of all trips within a range of 7.5 km. There are medium-sized municipalities with bicycle shares close to 50% of all trips within this distance range. The average number of bicycle trips per person per day is very close to 1.0, implying that, on average, half of the population of the country makes a return cycle trip per day.

Obvious factors that stimulate cycling in the Netherlands are the country's physical conditions, such as a mild climate and a flat surface. But in many cities in other countries with similar conditions this has not led to similar cycling patterns, and in Dutch cities that happen to be hilly (found in the South-Eastern part of the country), the share of cycling is still about 15%. Thus, there must be other factors at play, including cultural ones: migrants from foreign countries and their children tend to cycle much less than native Dutch residents. But it is not culture alone that matters. Little can be achieved without the long-run commitment of municipalities to develop and maintain adequate bicycle networks and facilities (see Rietveld and Daniel, 2004).

Although from an international perspective the infrastructure is adequate for Dutch cyclists, there appear to be substantial differences between municipalities in their policies with respect to cyclists. These differences concern, among other things, the maintenance of cycling lanes,

priority rules at crossings, and the detours that cyclists have to make. An interesting example is the municipality of Houten, a new town with about 40,000 inhabitants with a bicycle share of about 45%. Here cyclists and pedestrians have their own direct routes to the city centre, while cars have to make considerable detours. In addition, parking charges appear to impact on bicycle use. There is a clear tendency for the share of the bicycle to be lower in large cities than elsewhere. For example, in the four biggest cities it is about 25%. Some factors that may explain this lower figure are the high service levels of public transport in these cities, the high share of residents of foreign origin who have no cultural experience of cycling, and the high risk of theft of bicycles in the large cities. It may well be that the risk of bicycle theft and the perception of lack of public safety in cities are the main reasons why local residents do not to use the bicycle as much as in more rural areas. This would also imply that measures to counter these types of 'minor crimes' may be more effective to stimulate cycling than policies in the transport domain itself.

6. Conclusions

Given the high population density in the Netherlands, market failures are important, and it is therefore no surprise that the public sector has been heavily involved in urban transport. The success of this involvement to address the market failure is mixed. In some cases, such as the use of road pricing to mitigate congestion externalities, government intentions have been good, but their plans were never implemented. And in other cases, such as the subsidisation of public transport to avoid problems of social exclusion, the costs for the taxpayer are substantial. But particularly in the field of parking provision, substantial progress has been made during the last decade.

This development runs parallel to a general shift from national to municipality initiatives. In terms of both effectiveness and social and political acceptability, the municipal policies definitely scored better. Of special importance in urban areas is the position of non-motorised

transport modes (pedestrians and cyclists). Given the vulnerability of these transport modes, they cannot function adequately without government intervention. Cycling has been a surprisingly vital element in Dutch urban transport, which is the result not only of the country's favourable physical conditions but also of the municipalities' consistent and long run commitment to develop bicycle-friendly road infrastructures.

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Table 1. Maximum parking standards for firms according to type of location

Type of Location	Number of parking places per 100 workers	One parking place per m^2 gross sales area
A locations in the Randstad and large cities outside the Randstad.	10	250
A locations elsewhere.	20	125
B locations in the Randstad and large cities outside the Randstad.	20	125
B locations elsewhere.	40	65
C locations	No constraints	No constraints

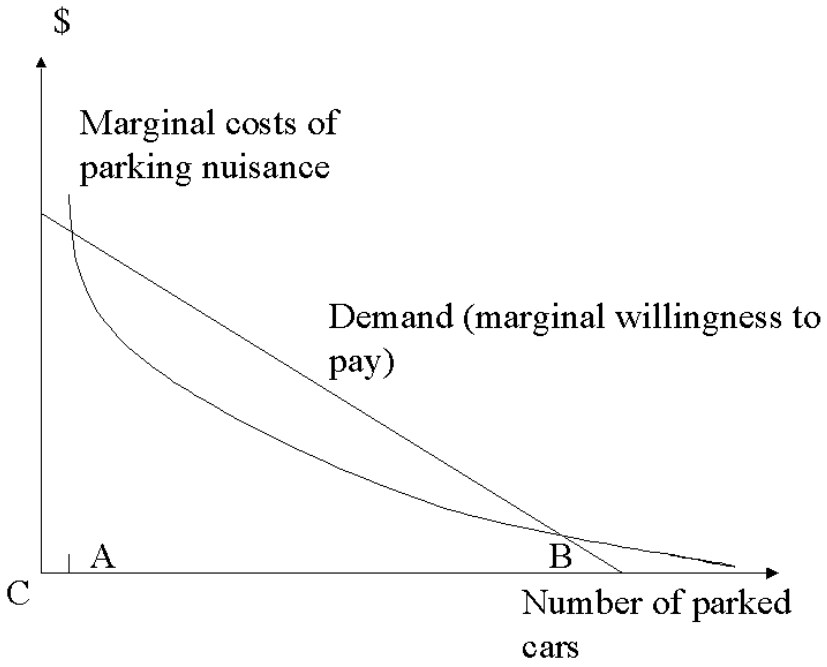

Figure 1. Pricing policies addressing the negative effect on historical cities of parked cars.